



Copyright Undertaking

This thesis is protected by copyright, with all rights reserved.

By reading and using the thesis, the reader understands and agrees to the following terms:

1. The reader will abide by the rules and legal ordinances governing copyright regarding the use of the thesis.
2. The reader will use the thesis for the purpose of research or private study only and not for distribution or further reproduction or any other purpose.
3. The reader agrees to indemnify and hold the University harmless from and against any loss, damage, cost, liability or expenses arising from copyright infringement or unauthorized usage.

IMPORTANT

If you have reasons to believe that any materials in this thesis are deemed not suitable to be distributed in this form, or a copyright owner having difficulty with the material being included in our database, please contact lbsys@polyu.edu.hk providing details. The Library will look into your claim and consider taking remedial action upon receipt of the written requests.

**INVESTIGATING THE RETINAL PROTEOME IN MYOPIA SIGNALING
PATHWAYS USING EXPERIMENTALLY INDUCED MOUSE MYOPIA**

SZE YING HON

PhD

The Hong Kong Polytechnic University

2025

The Hong Kong Polytechnic University

School of Optometry

Investigating the Retinal Proteome in Myopia Signaling Pathways

Using Experimentally Induced Mouse Myopia

SZE Ying Hon

**A thesis submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy**

August 2024

CERTIFICATE OF ORIGINALITY

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

_____ (Signed)

SZE YING HON _____ (Name)

Abstract

Myopia (short-sightedness) has become the leading cause of vision impairment, with epidemic prevalence, particularly in Asia. Its severity can progress to high myopia, the second most common cause of blindness. This thesis developed and optimized techniques for precise biometric measurements of refraction, vitreous chamber deepening, and axial elongation in minus lens-induced mice eyes, mimicking established animal models such as chicks and guinea pigs. We investigated the role of the proteome in the myopia signaling pathway using experimentally induced myopia mouse models, focusing on the involvement of proteins in tight junction, HIF-1, cAMP, AMPK signaling pathways, and dopaminergic synapses. Various advanced mass spectrometry techniques optimized for retinal tissues were employed, including isobaric tags, data-dependent acquisition, data-independent acquisition, and multiple reaction monitoring acquisition. This thesis presents the largest retinal-specific spectral library, consisting of 9401 proteins. Our findings revealed dysregulation of retinal Glut1 protein expression during myopia progression and identified the PPAR gamma agonist rosiglitazone as a novel therapeutic agent that regulates insulin sensitivity to slow myopia progression. Additionally, we examined optical defocus-mediated differential protein phosphorylation in early myopia and hyperopia development in chick retinas. The post-translational modifications (PTMs) revealed key bidirectional changes in retinal rhodopsin, violet-sensitive opsin, and blue-sensitive opsin in response to myopic and hyperopic defocus. Kinase enrichment analysis highlighted the dysregulation of protein kinases PDHK1, PDHK4, CDK, CDK10, CLK3, and MTOR, emphasizing their unexplored roles in PTMs related to myopia pathogenesis. In summary, this thesis presents a comprehensive investigation into the proteomic mechanisms of myopia, offering novel insights into the molecular pathways involved in myopia development and identifying potential therapeutic targets. The findings on animal models of myopia, retinal proteome, protein phosphorylation, and drug discovery warrant further research into myopia and emmetropization.

List of manuscript publications, patents, awards, presentations, posters, and abstracts

Publication

1. **Ying Hon Sze**, Bing Zuo, Da Qian Lu, King Kit Li, Dennis Yan Yin Tse, Qian Zhao, Thomas Chuen Lam. Comparative Analysis of Ocular Biometrics using Spectral Domain Optical Coherence Tomography with Purkinje Image and Optic Nerve Head Alignments in Mice. *Eur. J. Med. Res.* 2025 (Accepted)
2. **Sze YH**, Tse DYY, Zuo B, Li KK, Zhao Q, Jiang X, Kurihara T, Tsubota K, Lam TC. Deep Spectral Library of Mice Retina for Myopia Research: Proteomics Dataset generated by SWATH and DIA-NN. *Sci Data.* 2024 Oct 10;11(1):1115. doi: 10.1038/s41597-024-03958-x. PMID: 39389962; PMCID: PMC11467338.
3. Tse JS, **Sze YH**, Ka-Wai Cheung J, Li KK, Lam TC. A Protein Suspension-Trapping Sample Preparation for Tear Proteomics by Liquid Chromatography-Tandem Mass Spectrometry. *J Vis Exp.* 2023 Dec 1;(202). doi: 10.3791/64617. PMID: 38108381.
4. Kwong JMK, Caprioli J, Lee JCY, Song Y, Yu FJ, Bian J, **Sze YH**, Li KK, Do CW, To CH, Lam TC. Differential Responses of Retinal Neurons and Glia Revealed via Proteomic Analysis on Primary and Secondary Retinal Ganglion Cell Degeneration. *Int J Mol Sci.* 2023 Jul 28;24(15):12109. doi: 10.3390/ijms241512109. PMID: 37569482; PMCID: PMC10418669.
5. Pan L, **Sze YH**, Yang M, Tang J, Zhao S, Yi I, To CH, Lam C, Chen DF, Cho KS, Do CW. Baicalein-A Potent Pro-Homeostatic Regulator of Microglia in Retinal Ischemic Injury. *Front Immunol.* 2022 Feb 21;13:837497. doi: 10.3389/fimmu.2022.837497. PMID: 35265083; PMCID: PMC8899187.
6. Tse JSH, Cheung JKW, Wong GTK, Lam TC, Choi KY, So KHY, Lam CDM, **Sze AYH**, Wong ACK, Yee GMC, Chan HHL. Integrating Clinical Data and Tear Proteomics to Assess Efficacy, Ocular Surface Status, and Biomarker Response After Orthokeratology Lens Wear. *Transl Vis Sci*

- Technol. 2021 Sep 1;10(11):18. doi: 10.1167/tvst.10.11.18. PMID: 34559185; PMCID: PMC8475286.
7. Kwong JMK, Caprioli J, **Sze YH**, Yu FJ, Li KK, To CH, Lam TC. Differential Retinal Protein Expression in Primary and Secondary Retinal Ganglion Cell Degeneration Identified by Integrated SWATH and Target-Based Proteomics. *Int J Mol Sci.* 2021 Aug 10;22(16):8592. doi: 10.3390/ijms22168592. PMID: 34445296; PMCID: PMC8395271.
 8. Cheung JK, Bian J, **Sze YH**, So YK, Chow WY, Woo C, Wong MT, Li KK, Lam TC. Human tear proteome dataset in response to daily wear of water gradient contact lens using SWATH-MS approach. *Data Brief.* 2021 May 12;36:107120. doi: 10.1016/j.dib.2021.107120. PMID: 34095372; PMCID: PMC8165404.
 9. Wang Q, Banerjee S, So C, Qiu C, **Sze Y**, Lam TC, To CH, Pan F. The Effect of Low-Dose Atropine on Alpha Ganglion Cell Signaling in the Mouse Retina. *Front Cell Neurosci.* 2021 May 5;15:664491. doi: 10.3389/fncel.2021.664491. PMID: 34025362; PMCID: PMC8131517.
 10. Ma JYW*, **Sze YH***, Bian JF, Lam TC. Critical role of mass spectrometry proteomics in tear biomarker discovery for multifactorial ocular diseases (Review). *Int J Mol Med.* 2021 May;47(5):83. doi: 10.3892/ijmm.2021.4916. Epub 2021 Mar 24. PMID: 33760148; PMCID: PMC7992922. *Equal contribution
 11. Bian J, **Sze YH**, Tse DY, To CH, McFadden SA, Lam CS, Li KK, Lam TC. SWATH Based Quantitative Proteomics Reveals Significant Lipid Metabolism in Early Myopic Guinea Pig Retina. *Int J Mol Sci.* 2021 Apr 29;22(9):4721. doi: 10.3390/ijms22094721. PMID: 33946922; PMCID: PMC8124159.
 12. **Sze YH**, Zhao Q, Cheung JKW, Li KK, Tse DYY, To CH, Lam TC. High-pH reversed- phase fractionated neural retina proteome of normal growing C57BL/6 mouse. *Sci Data.* 2021 Jan 26;8(1):27. doi: 10.1038/s41597-021-00813-1. PMID: 33500412; PMCID: PMC7838270.

13. Yu FJ, Lam TC, **Sze AY**, Li KK, Chun RK, Shan SW, To CH. Alteration of retinal metabolism and oxidative stress may implicate myopic eye growth: Evidence from discovery and targeted proteomics in an animal model. *J Proteomics*. 2020 Jun 15;221:103684. doi: 10.1016/j.jprot.2020.103684. Epub 2020 Feb 13. PMID: 32061809.
14. Tse JS, Lam TC, Cheung JK, **Sze YH**, Wong TK, Chan HH. Data on assessment of safety and tear proteome change in response to orthokeratology lens – Insight from integrating clinical data and next generation proteomics. *Data Brief*. 2020 Jan 28;29:105186. doi: 10.1016/j.dib.2020.105186. PMID: 32071970; PMCID: PMC7013139.

Patents

1. TREATING REFRACTIVE DISORDERS BY TARGETING PEROXISOME PROLIFERATOR- ACTIVATED RECEPTOR (PPAR) SIGNALING PATHWAY (Provisional Utility Patent US63/496,688; Non-Provisional Patent US-18/332,751)
2. 通过靶向过氧化物酶体增殖物激活受体(PPAR)信号通路治疗屈光性疾病 (国家知识产权局, 202410759585.9, China)

Awards

1. Best free papers award. A. Liu*, **Y. H. Sze***, B. C. Y. Chu, C. H. Y. Lai, T. C. Lam, W. C. Lam. The Downregulation of Apolipoprotein A4 in the Tear Fluid of Preterm Infants may be a Promising Potential Retinopathy of Prematurity Biomarker. APAO 2024. *Equal contribution
2. Best free papers award. A. H. Y. Liu*, **Y. H. Sze***, T. C. Lam, C. Y. Chu, H. Y. Lai, W. C. Lam. Discovery of tear fluid protein markers in preterm infants with retinopathy of prematurity: a cross-sectional pilot study using mass spectrometry-based proteomics. APAO 2023. *Equal contribution
3. Best oral presentation award. K. W. Cheung, **Y. H. Sze**, J. F. Bian, K. K. Li, L. Zhou, C. H. To, C. Lam. A chick vitreous proteome database and differential vitreous protein expressions during

myopia development using SWATH-based quantitative proteomics. The 3rd ABCT Research Postgraduate Symposium 2022.

4. GoodSeed, SIE Fund, Hong Kong Government, HKD 100k. Team leader: **Y. H. Sze**
5. CEF, Institute for Entrepreneurship, The Hong Kong Polytechnic University, HKD 220k. Team leader: **Y. H. Sze**

Presentation, posters, and abstracts

1. Liu*, **Y. H. Sze***, B. C. Y. Chu, C. H. Y. Lai, T. C. Lam, W. C. Lam. The Downregulation of Apolipoprotein A4 in the Tear Fluid of Preterm Infants may be a Promising Potential Retinopathy of Prematurity Biomarker. APAO 2024. *Equal contribution
2. **Y. H. Sze**, D. Y. Y. Tse, B. Zou, K. K. Li, T. C. Lam. Quantitative Analysis of Early Signaling Pathways in Lens-induced Myopia in C57BL/6J Mice Retina Proteome by SWATH-MS. HUPO 2023.
3. **Y. H. Sze**, K. W. Cheung, K. K. Li, L. Zhou, T. C. Lam. Identification of Mice Retinal Proteome using Robust Zeno-SWATH Acquisition in ZenoTOF 7600 Mass Spectrometry. AOHUPO 2023.
4. **Y. H. Sze**, S. H. Tse, K. W. Cheung, T. C. Lam. Diagnostic potential of protein biomarkers in tear fluid for ocular and systemic diseases. Hong Kong Laureate Forum 2023.
5. A. H. Y. Liu*, **Y. H. Sze***, T. C. Lam, C. Y. Chu, H. Y. Lai, W. C. Lam. Discovery of tear fluid protein markers in preterm infants with retinopathy of prematurity: a cross-sectional pilot study using mass spectrometry-based proteomics. APAO 2023. *Equal contribution
6. A. Liu*, **Y. H. Sze ***, C. Y. Chu, C. Lai, T. Lam, W. C. Lam. The down-regulation of apolipoprotein A4 in the tear fluid of preterm infants maybe a promising potential retinopathy of prematurity biomarker. APVRS 2023. *Equal contribution

7. W. C. Lam*, A. Liu*, **Y. H. Sze***, C. Y. Chu, C. Lai, Q. Li, G. Cheng, K. Jalal, M. Wong, T. Lam. Down-regulated apolipoprotein A4 in premature infants' tear samples as novel retinopathy of prematurity biomarker. ASRS 2023. *Equal contribution
8. A. Liu*, **Y. H. Sze***, C. Y. Chu, C. Lai, G. Cheng, K. Jalal, M. Wong, T. Lam, W. C. Lam. The down-regulation of apolipoprotein A4 level in premature infants' tear samples may be a novel retinopathy of prematurity biomarker for non-invasive screening. EURetina 2023. *Equal contribution
9. A. H. Y. Liu*, **Y.H. Sze***, T. C. Lam, B. C. Y. Chu, K. Jalal, C. H. Y. Lai, M. S. C. Wong, W. C. Lam. Discovery of tear fluid protein markers in preterm infants with retinopathy of prematurity: a cross-sectional pilot study using mass spectrometry-based proteomics. EURetina 2022. *Equal contribution
10. **Y. H. Sze**, K. W. Cheung, K. K. Li, T.C. Lam. Comprehensive profiling of neural retina proteins in C57BL/6 mouse with S-Trap and high-pH peptide fractionation by mass spectrometry. HUPO 2019.
11. **Y. H. Sze**, T.C. Lam. Tears Collection with Schirmer's Strip or Capillary Tube, A Proteomics Perspective. iCover 2018.

Acknowledgments

I am deeply grateful to my chief supervisor, Dr. Thomas Chuen Lam, for his invaluable advice, unwavering support, and guidance throughout my PhD studies. His exceptional knowledge and extensive experience have been instrumental in shaping my academic research and have become an integral part of my daily life.

I would also like to express my gratitude to my co-supervisor, Dr. Qian Zhao, from the Department of Applied Biology and Chemical Technology at The Hong Kong Polytechnic University. Her expertise in chemical biology, systems biology, and insights has been invaluable to my work.

I extend my sincere appreciation to the Faculty of Health and Social Sciences for providing me with the funding opportunity to pursue my studies at the School of Optometry at The Hong Kong Polytechnic University. I would like to acknowledge Mr. King-Kit Li for his technical support throughout my research. I am also grateful to all the team members of our research group, including Dr. Jing-Fang Bian, Dr. Ka-Wai Cheung, Dr. Feng-Juan Yu, and Mr. Sung-Hei Tse, for the meaningful time we spent together in the laboratory and during social activities. Lastly, I would like to express my heartfelt thanks to my family and friends for their encouragement and support throughout my academic journey. Their presence has been a constant source of motivation, inspiration, and comfort.

Table of Contents

| | |
|--|----|
| Abstract..... | 3 |
| List of manuscript publications, patents, awards, presentations, posters, and abstracts..... | 4 |
| Acknowledgments..... | 9 |
| Table of Contents..... | 10 |
| List of Tables..... | 16 |
| List of Figures..... | 17 |
| List of Appendix..... | 20 |
| Chapter 1. Introduction..... | 21 |
| 1.1. Definition and classification of myopia..... | 21 |
| 1.2. Prevalence, and impact of myopia..... | 22 |
| 1.3. Models of emmetropization and myopia..... | 24 |
| 1.4. Genetic factors in myopia development..... | 26 |
| 1.5. Environmental factors for the development of myopia..... | 27 |
| 1.6. Mouse models of myopia..... | 29 |
| 1.7. Retina in myopia..... | 30 |
| 1.8. Emerging pharmaceutical drugs in animal models..... | 32 |
| 1.9. Methods in mass spectrometry-based proteomics..... | 34 |
| 1.10. Mass spectrometry in myopia research..... | 36 |
| Chapter 2. General method development and optimization..... | 37 |
| 2.1. Lens-induced myopia model in mice..... | 37 |
| 2.2. Intraperitoneal administration of anesthetics in mice..... | 38 |
| 2.3. Measurement of refractive error in mice with infrared photorefractor..... | 41 |
| 2.4. Measurement of mice eye dimension with optical coherence tomography..... | 42 |
| 2.5. Extraction of the neural retina in mice..... | 45 |

| | | |
|---|--|----|
| 2.6. | Optimization of ex-vivo protein extraction in mice retina..... | 45 |
| 2.7. | Quantification of mice retinal proteins with NanoDrop One..... | 47 |
| 2.8. | Optimization of protein sample preparation using S-Trap | 52 |
| 2.9. | Statistical analysis of proteomic data..... | 53 |
| Chapter 3. Comprehensive mouse retinal proteome profile by high-pH reversed-phase | | |
| | fractionation | 55 |
| 3.1. | Introduction..... | 55 |
| 3.2. | Methods..... | 56 |
| 3.2.1. | Animals | 56 |
| 3.2.2. | Refractive error measurement with infrared photorefractor | 57 |
| 3.2.3. | Ocular dimension measurement using SD-OCT..... | 57 |
| 3.2.4. | Mice retinal protein extraction..... | 58 |
| 3.2.5. | Sample preparation for mass spectrometry-based proteomics..... | 58 |
| 3.2.6. | High-pH reversed-phase peptide fractionation | 59 |
| 3.2.7. | Data-dependent acquisition (DDA) of retina samples | 59 |
| 3.2.8. | Generation of spectral library for data-independent acquisition (DIA)..... | 60 |
| 3.3. | Results..... | 60 |
| 3.3.1. | Ocular parameters in normal C57BL/6 mice | 60 |
| 3.3.2. | Characteristics of the mice's retinal proteome..... | 63 |
| 3.3.3. | Comprehensive Retinal Proteome Knowledge Base in C57BL/6 Mice | 67 |
| 3.4. | Discussion..... | 69 |
| 3.5. | Conclusion | 70 |
| Chapter 4. Deep Quantitative Spectral Library of Normal and Myopic Mice Retinas: Proteomics | | |
| | Datasets from SWATH-MS and DIA-NN | 71 |
| 4.1. | Introduction..... | 71 |

| | | |
|--|---|----|
| 4.2. | Method | 72 |
| 4.2.1. | Animals | 72 |
| 4.2.2. | Lens-induced myopia in C57BL6/J mice | 73 |
| 4.2.3. | Ocular biometric measurements in mice..... | 73 |
| 4.2.4. | Tissue homogenization and protein extraction | 74 |
| 4.2.5. | Mass spectrometry sample preparation..... | 74 |
| 4.2.6. | Data-independent acquisition of the mouse retina proteome..... | 75 |
| 4.2.7. | Quantitative analysis and generation of the retinal-specific spectral library..... | 76 |
| 4.3. | Data Record | 76 |
| 4.4. | Results..... | 77 |
| 4.4.1. | Reassembly of axial elongation during myopia progression | 77 |
| 4.4.2. | Intra-batch performance, precision, and reproducibility..... | 79 |
| 4.4.3. | Technical validation of retinal-specific peptide-centric spectral library | 82 |
| 4.5. | Discussion..... | 83 |
| 4.6. | Conclusion | 85 |
| Chapter 5. Comparison of Ocular Biometrics using Spectral Domain Optical Coherence | | |
| Tomography with Purkinje Image and Optic Nerve Head Alignments in Mice | | |
| 5.1. | Introduction..... | 86 |
| 5.2. | Methods..... | 88 |
| 5.2.1. | Animals | 88 |
| 5.2.2. | Refractive error measurement using an infrared photorefractor..... | 88 |
| 5.2.3. | Two alignment methods for spectral domain optical coherence tomography | 89 |
| 5.2.4. | Ocular biometric measurements using spectral domain optical coherence tomography..... | 91 |
| 5.3. | Results..... | 93 |

| | | |
|--|---|-----|
| 5.3.1. | Validation of instrumental variation in photorefractor and optical coherence tomography | |
| | | 93 |
| 5.3.2. | Comparison of intraocular biometrics with two alignment methods..... | 95 |
| 5.3.3. | Comparative analysis of ocular biometrics in two alignment methods..... | 98 |
| 5.4. | Discussion..... | 104 |
| 5.5. | Conclusion..... | 106 |
| Chapter 6. Dysregulation of retinal GLUT1-mediated insulin sensitivity in myopia revealed by | | |
| | untargeted quantitative proteomics..... | 107 |
| 6.1. | Introduction..... | 107 |
| 6.2. | Methods..... | 107 |
| 6.2.1. | Animals..... | 107 |
| 6.2.2. | Lens-induced myopia in C57BL6/J mice..... | 108 |
| 6.2.3. | Ocular biometric measurements in C57BL/6J mice..... | 109 |
| 6.2.4. | Isolation of the neural retina from mouse eyes..... | 111 |
| 6.2.5. | Tissue homogenization and protein extraction..... | 111 |
| 6.2.6. | Mass spectrometry sample preparation..... | 112 |
| 6.2.7. | Data-dependent acquisition of the mouse retinal proteome spectral library..... | 112 |
| 6.2.8. | Label-free quantitative SWATH-MS acquisition of the mouse retina proteome..... | 113 |
| 6.2.9. | Targeted proteomics analysis of tryptic-digested Glut1 peptides..... | 115 |
| 6.2.10. | Statistical analysis..... | 116 |
| 6.3. | Results..... | 116 |
| 6.3.1. | Accelerated eye growth and refractive development in lens-induced myopia..... | 116 |
| 6.3.2. | Proteomic profiling of retinal changes induced by lens-induced myopia..... | 120 |
| 6.3.3. | Signaling pathways and differential protein expression in lens-induced myopia..... | 140 |
| 6.3.4. | Validation of Glut1 downregulation using targeted Zeno MRM proteomics..... | 142 |

| | | |
|---|---|-----|
| 6.4. | Discussion..... | 145 |
| 6.5. | Conclusion | 148 |
| Chapter 7. Intravitreal administration of PPAR gamma agonist attenuates myopia progression in chick..... | | |
| | | 150 |
| 7.1. | Introduction..... | 150 |
| 7.2. | Methods..... | 151 |
| 7.2.1. | Animals..... | 151 |
| 7.2.2. | Lens-induced myopia in chicks | 152 |
| 7.2.3. | Ocular biometric measurements in the avian model..... | 152 |
| 7.2.4. | Intravitreal injection of rosiglitazone in avian model..... | 153 |
| 7.2.5. | Isolation of neural retina in chick eyes | 154 |
| 7.2.6. | Label-free, library-free SWATH-MS acquisition of chick retina proteome..... | 155 |
| 7.2.7. | Statistical analysis..... | 155 |
| 7.3. | Results..... | 156 |
| 7.3.1. | Intravitreal injection of rosiglitazone ameliorates myopia progression and restores glut1 expression in an avian model..... | 156 |
| 7.3.2. | Rosiglitazone does not affect normal growing chick eyes nor axial length or refractive power | 160 |
| 7.4. | Discussion..... | 161 |
| 7.5. | Conclusion | 165 |
| Chapter 8. Optical defocus mediated differential phosphorylation expression in early myopia and hyperopia development in chick retina | | |
| | | 166 |
| 8.1. | Introduction..... | 166 |
| 8.2. | Methods..... | 168 |
| 8.2.1. | Hatching and handling of chicks..... | 168 |

| | | |
|--|--|-----|
| 8.2.2. | Experimental lens-induced myopia in chicks | 169 |
| 8.2.3. | Isolation of neural retina in chick eyes | 169 |
| 8.2.4. | Tissue homogenization and protein extraction | 170 |
| 8.2.5. | Phosphorylated peptide enrichment and TMT labeling..... | 171 |
| 8.2.6. | LC-MS/MS for phosphoproteomics analyses..... | 171 |
| 8.2.7. | Target validation with PRM strategy..... | 172 |
| 8.3. | Results..... | 172 |
| 8.3.1. | Axial elongation in the myopic eye and shortening in the hyperopic eye in chick | 172 |
| 8.3.2. | Differential expression of phosphopeptides in the retina after three days of lens-induced myopia (LIM)..... | 175 |
| 8.3.3. | Differential expression of phosphopeptides in the retina after three days of lens-induced hyperopia (LIH) | 177 |
| 8.3.4. | Kinase enrichment analysis revealed distinct protein kinase targets modulated by myopia and hyperopia treatments. | 179 |
| 8.4. | Discussion..... | 181 |
| 8.5. | Conclusion | 183 |
| Chapter 9. Summary and future perspectives | | 184 |
| 9.1. | Summary..... | 184 |
| 9.2. | Future perspectives | 186 |
| Appendices..... | | 188 |
| References..... | | 591 |

List of Tables

| | |
|--|-----|
| Table 1. Representative drugs targeting pathways to slow myopia progression. | 33 |
| Table 2. Anesthesia dosage for C57BL/6 mice aged between postnatal days 21 and 63..... | 39 |
| Table 3. Dimension of ocular compartments between ages 25 and 46..... | 61 |
| Table 4. Ocular biometrics measured with Purkinje image-based alignment. | 95 |
| Table 5. Ocular biometrics measured with optic nerve head alignment..... | 96 |
| Table 6: Comparison of axial length and vitreous chamber depth with two alignment methods..... | 99 |
| Table 7. List of significantly differentiated retinal proteins quantified by SWATH-MS mode in mice retina at P35. | 123 |

List of Figures

| | |
|--|----|
| Fig. 1: Graphical illustration comparing a myopic and emmetropic eyes. | 22 |
| Fig. 2: Estimated prevalence of myopia in the Asia Pacific region and globally..... | 23 |
| Fig. 3: Schematic representation of the human eye, retinal cell types, and functional sites of associated genes. | 27 |
| Fig. 4: Visible light spectrum in its monochromatic spectral colors. | 29 |
| Fig. 5: Schematic diagram of retinal layers. | 32 |
| Fig. 6: The assembly of the spectacle system tailor-made for mice. | 38 |
| Fig. 7: Distribution of body weight in wild-type C57BL/6 mice from P21 to P140. | 40 |
| Fig. 8: Layout for the measurement of refractive error using a photorefractor. | 42 |
| Fig. 9: Layout for the measurement of mouse eye dimensions using SD-OCT. | 43 |
| Fig. 10: Comparison of ocular biometric measurements with radial scans in SD-OCT..... | 44 |
| Fig. 11: Optimization of protein extraction for ex vivo mouse neural retina tissue using various volumes of lysis buffer (n=15)..... | 46 |
| Fig. 12: Appropriate liquid column formation using various loading volumes in the NanoDrop One instrument. | 49 |
| Fig. 13: Benchmark and measurement of standard calibration, mouse retinal protein lysates, and digested peptides using NanoDrop One and the BCA protein assay..... | 51 |
| Fig. 14: Protein loading amount and peptide recovery of S-Trap Micro and S-Trap Mini. | 53 |
| Fig. 15: Ocular dimensions in normal growing C57BL/6 mice between postnatal days 25 and 46.... | 62 |
| Fig. 16: Statistical analysis of the proteomics data..... | 64 |
| Fig. 17: False discovery rate control and TIC chromatogram. | 67 |
| Fig. 18: Proteomic analysis of high-pH fractionated mouse retina. | 69 |
| Fig. 19: Ocular biometric measurements. | 78 |
| Fig. 20: Characteristics of retinal proteome quantification. | 80 |

| | |
|--|-----|
| Fig. 21: Distribution of protein abundances and fold-change..... | 81 |
| Fig. 22: Rank and distribution of quantified proteins in a spectral library..... | 83 |
| Fig. 23: Schematic illustration of SD-OCT and infrared photorefractor measurements with two alignment methods..... | 90 |
| Fig. 24: Representative Ocular Dimension Measurement using SD-OCT..... | 92 |
| Fig. 25: Distribution and variation of refractive error and ocular biometrics using infrared photorefractor and optical coherence tomography..... | 94 |
| Fig. 26: Comparative analysis of ocular biometrics using two alignment methods by SD-OCT..... | 97 |
| Fig. 27: Comparative analysis of ocular biometrics in two alignment methods by SD-OCT..... | 100 |
| Fig. 28: Bland–Altman analysis of the ocular biometric differences in two alignment methods..... | 102 |
| Fig. 29: Operator replicates of ocular biometric differences in two alignment methods..... | 103 |
| Fig. 30: Representative image of ocular dimension in mice, captured by SD-OCT..... | 110 |
| Fig. 31: Ocular biometric measurements of lens-induced myopia in mice..... | 119 |
| Fig. 32: Spectral library and SWATH-MS quantification of the mouse retinal proteome..... | 121 |
| Fig. 33: Pathway and upstream regulator analysis of differentially expressed proteins..... | 142 |
| Fig. 34: Targeted Zeno pulsing-enabled high-resolution multiple reaction monitoring (Zeno MRM ^{HR}) assay of tryptic-digested peptides from Glut1 protein..... | 144 |
| Fig. 35: Representative image of A-scan biometry in chicks..... | 153 |
| Fig. 36: Ocular biometrics in unilateral lens-induced myopia with intravitreal rosiglitazone in chick eyes..... | 159 |
| Fig. 37: Body weight, ocular biometric, and refractive error measurements of normal growing chicks with unilateral, randomized intravitreal injection of 5 mM rosiglitazone treatment and the vehicle in contralateral control eyes (n=4)..... | 161 |
| Fig. 38: Schematic representation of lens-induced myopia animal models and retinal proteomics analysis that offers insights into new therapeutic molecules..... | 162 |

Fig. 39: Ocular biometric measurements in chick eyes.174

Fig. 40: Characteristics of phosphoproteins and phosphopeptides in the retina after 3 days of LIM treatment.176

Fig. 41: Characteristics of phosphoproteins and phosphopeptides in the retina after 3 days of LIH treatment.178

Fig. 42: Kinase enrichment analysis of phosphopeptides profiles in LIM and LIH experiments.180

List of Appendix

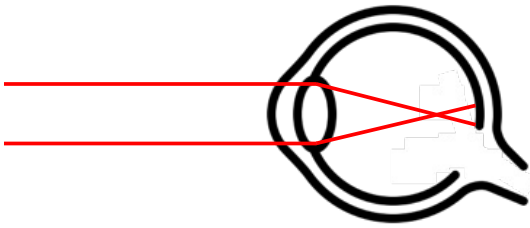
| | |
|--|-----|
| Appendix 1. List of reviewed proteins in the fractionated retinal library of C57BL/6J mice. | 188 |
| Appendix 2. Table of variable window parameters for SWATH-MS acquisition. | 585 |
| Appendix 3. Python script for managing extensive refractive error measurements from raw data... | 589 |

Chapter 1. Introduction

1.1. Definition and classification of myopia

Myopia, commonly known as nearsightedness, is a prevalent visual disorder that affects a significant portion of the global population. It is an ocular condition that arises from a mismatch between the refractive power and axial length of the eye. The refractive state reflects changes in the structure or positioning of the light-forming components of the eye, primarily the cornea and lens. Axial myopia, a myopic refractive state, is primarily caused by an axial elongation greater than normal, resulting in parallel light rays focusing in front of the retina and producing a blurred image. In contrast, emmetropic eyes with relaxed accommodation focus parallel light rays directly on the retina, resulting in a clear and sharp image (Fig. 1). Myopia is classified into three categories: physiological, intermediate, and pathological myopia. This classification is based on factors such as the degree of myopia, age of onset, and medical or hereditary history. Quantitative thresholds define myopia when ocular accommodation is relaxed, specifically when the spherical equivalent refractive error is ≤ -0.50 diopters (D). Low myopia is defined as a refractive error between ≤ -0.50 D and > -5.00 D, while high myopia is characterized by a refractive error of ≤ -5.00 D. The term pre-myopia is used in children to indicate potential myopia progression when the refractive state is between $\leq +0.75$ D and > -0.50 D. Baseline refraction, age, genetic risk factors, quantifiable biomarkers, and environmental factors are all considered together to assess the likelihood of developing myopia.

a) Myopic eye



b) Emmetropic eye

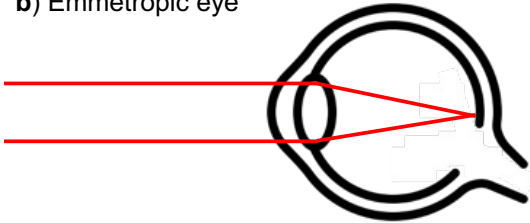


Fig. 1: Graphical illustration comparing a myopic and emmetropic eyes.

a) In the myopia eye, the blurred image occurs because parallel light rays focus in front of the retina.

b) In the emmetropic eye, parallel light rays focus on the retina, resulting in a clear and sharp image.

1.2. Prevalence, and impact of myopia

In recent years, the prevalence of myopia has been steadily increasing globally, particularly in urbanized areas and among younger individuals. In 2020, myopia emerged as the leading cause of distance vision impairment, affecting approximately 108 million individuals worldwide, and ranked as the second most common cause of blindness². The economic burden associated with refractive error was estimated to be around US\$ 202 billion annually³. The prevalence of myopia varies across countries, with a particularly notable increase among younger individuals in East Asia. In Hong Kong, myopia affects an average of 38% of primary school students and over 50% of students in Grades 5 and 6⁴. The combination of vision impairment resulting from uncorrected myopia and irreversible vision loss due to myopia-related complications imposes a significant burden on the economy and healthcare services. Myopic macular degeneration is the most common cause of irreversible blindness, accounting for 12% of vision impairment cases in Japan and affecting approximately 200,000 individuals. A comprehensive systematic review and meta-analysis of 145 studies covering 2.1 million

participants estimated that in 2020, approximately 1,406 million people had myopia, representing 23% of the world population. The model predicted a drastic increase to 4,758 million individuals, or 50% of the world population, with myopia by 2050 (Fig. 2)⁵. Among them, 938 million people may experience high myopia and be at risk of myopia-related complications and potential vision loss². Furthermore, high degrees of myopia are associated with various structural alterations in the eye, affecting the retina, retinal pigment epithelium (RPE), choroid, sclera, Bruch’s membrane, and optic nerve head (ONH). The term pathologic myopia was proposed to the World Health Organization (WHO) to describe excessive axial elongation associated with myopia, leading to structural changes in the posterior segment of the eye. These changes include posterior staphyloma, myopic maculopathy, and high myopia-associated optic neuropathy, which can result in significant loss of visual acuity even with optimal refractive correction. This surge in myopia cases has sparked significant interest and research efforts to better understand its causes, mechanisms, and potential management strategies. Additionally, investigating disrupted emmetropization may provide insights into how the eye senses, processes, and responds to manipulated optical defocus in laboratory myopia models.

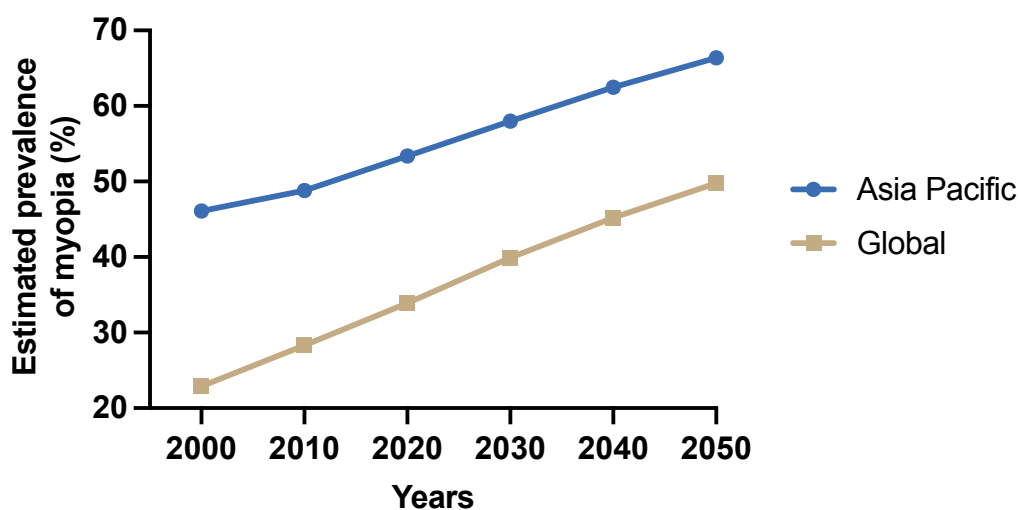


Fig. 2: Estimated prevalence of myopia in the Asia Pacific region and globally.

The Asia Pacific region exhibits a significantly higher prevalence of myopia compared to the global average. Projections indicate that by 2050, a staggering 66.4% of the Asia Pacific population and 50%

of the global population will be affected by myopia. The data were extracted from the original publication.

1.3. Models of emmetropization and myopia

Experimental models of emmetropization and myopia have been demonstrated in a range of species, from primates to invertebrates, showing that visual signals modulate eye growth, as summarized in a review⁶. For example, experiments inducing refractive errors, such as form-deprivation myopia (FDM) or lens-induced myopia (LIM), have demonstrated that the eye can recover and restore the correct refractive state. This active process is considered a compelling indication of emmetropization⁷. In contrast, passive emmetropization refers to the proportional growth of the eye in correlation with refractive errors. As the eye enlarges and undergoes axial elongation, the dioptric power decreases to accommodate these changes. In clinical studies, axial length is universally adopted as a useful measure for identifying myopia progression, often accompanied by measurements of vitreous chamber depth, which are commonly employed in axial myopia. In animal studies, myopia may involve changes in the anterior segment of the eye, including the cornea, anterior chamber, and lens—differing from the posterior eye growth observed in the vitreous chamber of humans. Retinal defocus plays a crucial role in regulating the growth and refractive state of the eye, as evidenced by observations in various animal models during the emmetropization process. These models have provided valuable insights into different aspects of eye growth regulation, including form-deprivation, natural recovery from form-deprivation, and active compensation for optically induced defocus. Form-deprivation experiments involve depriving animals of clear image-forming stimuli by occlusion. Animals subjected to form deprivation show abnormal eye growth, but when the deprivation is removed, a natural recovery process occurs, indicating the influence of visual signals related to retinal defocus. Norton et al. reported that the peak period of susceptibility to deprivation-induced myopia in tree shrews is between 15 and 45 days after eye opening. During this period, tree shrews did not show

changes in corneal curvature but exhibited significant myopia and axial elongation⁸. Wallman et al. found that chicks developed severe myopia and vitreous chamber elongation rapidly during early life, with most changes occurring within only 3 days of visual occlusion⁹. Howlett et al. reported that form-deprived myopia could be induced in guinea pigs by raising them with a diffuser for 6 days, starting from 5 days of age (n=16)¹⁰. Mice were also found susceptible to form-deprivation myopia when wearing diffuser goggles from 6 to 12 weeks of age¹¹. These findings highlight susceptibility to deprivation-induced myopia across primates, mammals, and avian models, with references to critical periods and durations of visual deprivation required to induce myopia and related ocular changes.

The human eye has an innate ability to achieve emmetropia, or image formation on the retina during youth, and to maintain it with age. However, the precise causes and mechanisms of this emmetropization process and unregulated eye growth remain largely unknown. A notable observation is the shift from a Gaussian distribution of refractive errors centered around hypermetropia at birth to a non-Gaussian leptokurtosis distribution centered around emmetropia in adults¹². Evidence supporting active emmetropization comes from studies showing that the human eye actively responds to focusing errors imposed by lenses. In full-term newborns, the mean axial length is approximately 16.8 mm. The most significant axial elongation occurs before age 2, after which growth slows to approximately 0.4 mm per year until age 4. From ages 4 to 10, the eye elongates by approximately 1 mm per year. After ages 10 to 15 and beyond, axial length increases minimally¹³. Genetic disorders can disrupt the emmetropization mechanism, leading to large congenital refractive errors and non-progressive myopia. Conditions such as Stickler syndrome and Leber's amaurosis are examples of genetic disorders that cause failure in the emmetropization mechanism¹⁴. Overall, understanding emmetropization and its underlying mechanisms remains an ongoing and important area of research.

1.4. Genetic factors in myopia development

Numerous studies on familial aggregation have consistently demonstrated a positive association between parental myopia and the occurrence of myopia in their children¹⁵. This suggests a hereditary component in the development of myopia, indicating a genetic influence on the condition. A comprehensive genome-wide association meta-analysis (GWAS) involving 160,420 subjects revealed a significant genetic correlation (>0.78) between individuals of European and Asian descent. This highlights the shared genetic factors underlying myopia susceptibility across different ethnic populations. The GWAS also pinpointed specific genes involved in rod- and cone-bipolar synaptic neurotransmission, anterior segment morphology, and angiogenesis as key players in myopia development. These findings support the existence of a light-dependent retina-to-sclera signaling cascade, where light signals received by the retina are transmitted to the sclera (Fig. 3)¹⁶. Despite the identification of 161 common genetic variants associated with refractive errors, these variants account for only 8% of the phenotypic variance in myopia. This limited contribution suggests that environmental factors play a dominant role in the recent epidemic rise in myopia prevalence. The phenomenon of school myopia, which typically appears in late primary or early secondary school years, highlights the complex interaction between genetic predisposition and environmental influences in the development of myopia.^{17,18}.

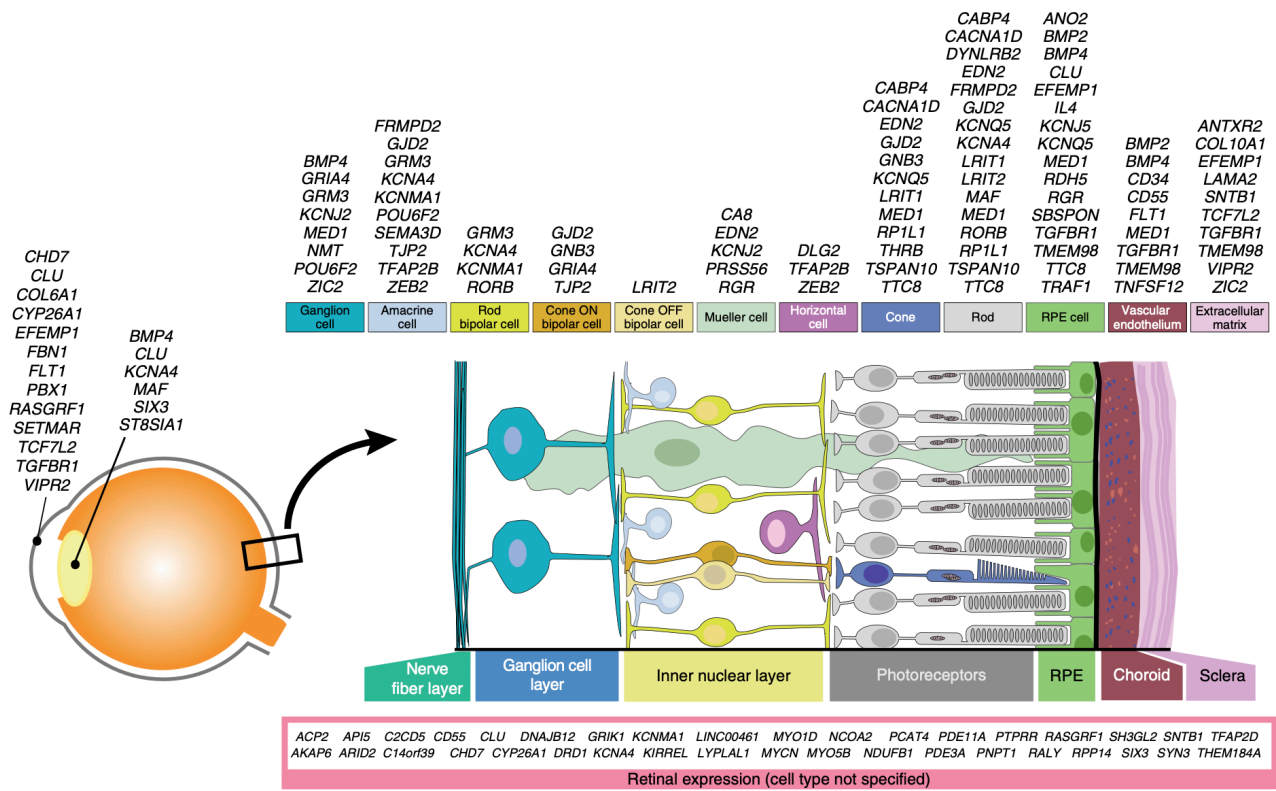


Fig. 3: Schematic representation of the human eye, retinal cell types, and functional sites of associated genes.

Genes appear to be distributed across all cell types connected by neuronal synapses in the retina representing potential routes of molecular signaling cascade from retina to sclera during myopia progression. Image reproduced from publication¹⁶.

1.5. Environmental factors for the development of myopia

Environmental factors play a significant role in the development and progression of myopia, with one notable factor being the amount of time spent outdoors. It has been observed that increased outdoor activities provide a protective effect against the development of myopia in school children¹⁹. Bright light encountered outdoors is believed to play a key role in this phenomenon by stimulating the release of dopamine, an abundant neurotransmitter in the retina²⁰. The relationship between light exposure and myopia progression has been further elucidated through studies investigating the effects of light on myopia development. Dopamine antagonists have been shown to diminish the protective

effect of light against myopia progression²¹. This suggests that dopamine release stimulated by bright light plays a crucial role in mitigating the development of myopia. Adequate outdoor activity in adolescents is effective in preventing myopia progression²². This effect is likely attributed to increased exposure to bright light outdoors, particularly during the summer season²³. A recent study examined the impact of repeated low-level red-light treatment on children aged between 8 and 13 years (n=246). The treatment involved the use of a desktop light therapy device emitting red light at a wavelength of 650 nm, an illuminance level of approximately 1600 lux, and a power of 0.29 mW. The children underwent two daily sessions, each lasting 3 minutes, with a minimum interval of 4 hours between sessions, for 5 days per week. The results showed that the treatment group had a statistically significant reduction of 0.26 mm (95% CI, 0.20–0.31 mm) in axial length and –0.59 D (95% CI, –0.72 to –0.46 D) in refractive error compared to the control group (n=129)²⁴. However, deciphering various environmental factors can be difficult in human studies.

Research has also focused on the impact of ambient lighting conditions on emmetropization. For instance, studies conducted on rhesus monkeys under reduced ambient lighting or dim light environments showed obvious form-deprivation myopia (FDM) without any signs of recovery. Additionally, a few isometropia monkeys exhibited abnormal refractive errors during the recovery period, primarily due to elongation of the vitreous chamber. These findings suggest that while dim light may not be a strong myopic stimulus, it can impair the optical regulation of refractive development in primates²⁵. Moreover, interspecies variations in response to light-induced myopia have been observed. A prolonged day/night cycle with extended light periods (18/6 hours dark/light) in mice can induce axial elongation, suggesting differences in susceptibility to light-induced myopia between small laboratory animals, avian, and primate models²⁶.

The spectral composition of light can also affect emmetropization and myopia development. For example, UVA light (360–400 nm) has been shown to suppress myopia and reduce axial length in humans²⁷. Visible light consists of a range of wavelengths spanning approximately 380 to 780 nm (Fig. 4)²⁸. Jiang et al. reported that blue light can suppress axial myopia induced using negative lenses, effectively reducing the elongation of the eye in the treatment group. Conversely, red light and positive lenses did not induce hyperopia in guinea pigs²⁹. These findings highlight the differential effects of specific types of light on ocular development and refraction. Blue light, with its shorter wavelength in the visible spectrum, appears to have a protective effect against myopia by counteracting axial elongation. Understanding the effects of different wavelengths of light on ocular development is crucial and has become a trending topic in recent research and investigation.

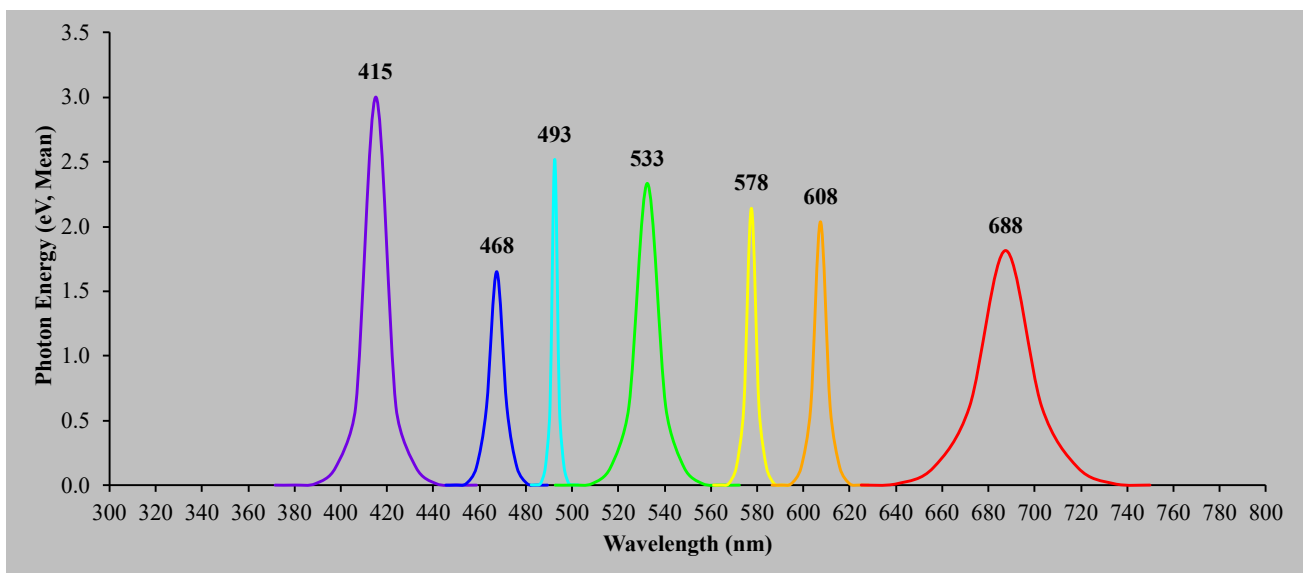


Fig. 4: Visible light spectrum in its monochromatic spectral colors.

Approximate values of mean photon energy and wavelength are given for violet (3.01 eV), blue (2.52 eV), cyan (2.34 eV), green (2.15 eV), yellow (2.04 eV), orange (1.82 eV), and red (1.66 eV) colors.

1.6. Mouse models of myopia

Schaeffel et al. demonstrated in 2004 that form deprivation and spectacle lenses could induce myopia in mice, a finding later replicated by another group in 2008^{30,31}. Further research confirmed

that this model resembled the features of primate myopia and laid the foundation for emerging myopia research using mice and the study of emmetropization^{32,33}. The use of the C57BL/6 mouse for myopia research leverages its fully sequenced genome and permissive genetic background, which is already commonly used in research to facilitate the expression and analysis of genetic mutations. Previous studies have identified major cell populations in the C57BL/6J mouse retina. Jeon et al. (1998) reported seven major cell populations, including rod photoreceptors, cone photoreceptors, Müller glia cells, retinal ganglion cells (RGCs), horizontal cells, amacrine cells, and bipolar cells³⁴. Advances in transcriptomic analyses, such as single-cell RNA sequencing (scRNA-seq), have further revealed 39 distinct cell populations, uncovering novel subtypes of microglia, retinal endothelial cells, and astrocytes³⁵. In addition to wild-type C57BL/6J mice, animal models like the retinal degeneration 10 (rd10) mutant mouse and InsAkita mouse have been instrumental in studying neuronal degeneration³⁶ and diabetes-related complications³⁷. Although several animal models have been reported, including *Gallus gallus* (chicken), guinea pigs, and various genetic variants in mice, the study of retinal diseases has been challenging due to the lack of *in vitro* retinal cell lines comparable to the neural retina. Limited cell lines exist, such as D407 and ARPE19 for the retinal pigment epithelium (RPE)^{38,39}, and RGC-5 for retinal ganglion cells⁴⁰. Therefore, profiling the normal growing C57BL/6 mouse retinal proteome can serve as a valuable reference dataset to advance our understanding of retinal physiology and ocular functions. Similar approaches have also been applied in other organisms, including guinea pigs⁴¹, zebrafish⁴², and humans⁴³.

1.7. Retina in myopia

The regulation of eye size involves a homeostatic process that incorporates visual signals to detect and maintain emmetropization. This process modulates the axial elongation rate of the eye and involves remodeling of the sclera. Wallman et al. summarized the pioneering research on homeostasis and the local control of eye shape⁴⁴. First, several scientists discovered that blocking the optic nerve

or action potential does not affect form-deprivation myopia (FDM). Second, researchers found that inducing regional myopia and enlarging the eye is possible by imposing a diffuser or negative lenses that cover only half of the retina. Third, while retinal signals may also interact with the brain, sectioning the optic nerve affects eye growth but does not prevent lens compensation. Finally, studies on pigeons revealed that the local refractive error in the lower visual field is myopic in proportion to the distance from the eye to the ground. Additionally, chicks raised with a patterned ceiling above their heads became more myopic in the upper visual field, demonstrating the impact of manipulating local refractive error on eye growth.

The retina, composed of ten interconnected layers of neurons and synapses, serves as a target for various posterior ocular diseases such as retinal detachment⁴⁵, diabetic retinopathy (DR)⁴⁶, age-macular degeneration (AMD)⁴⁷, glaucoma⁴⁸, and myopia⁴⁹. These layers include the inner limiting membrane (ILM), nerve fiber layer, ganglion cell layer, inner plexiform layer (IPL), inner nuclear layer (INL), outer plexiform layer (OPL), outer nuclear layer, outer limiting membrane (OLM), photoreceptor layer (PL), and retinal pigment epithelium (RPE) (Fig. 5)⁵⁰. Understanding the function and interaction of these multilayered retinal populations, as well as the proteome of the retina—particularly in animal models like the C57BL/6J mouse and chicks provides valuable insights into retinal physiology, ocular functions, and potential disease mechanisms.

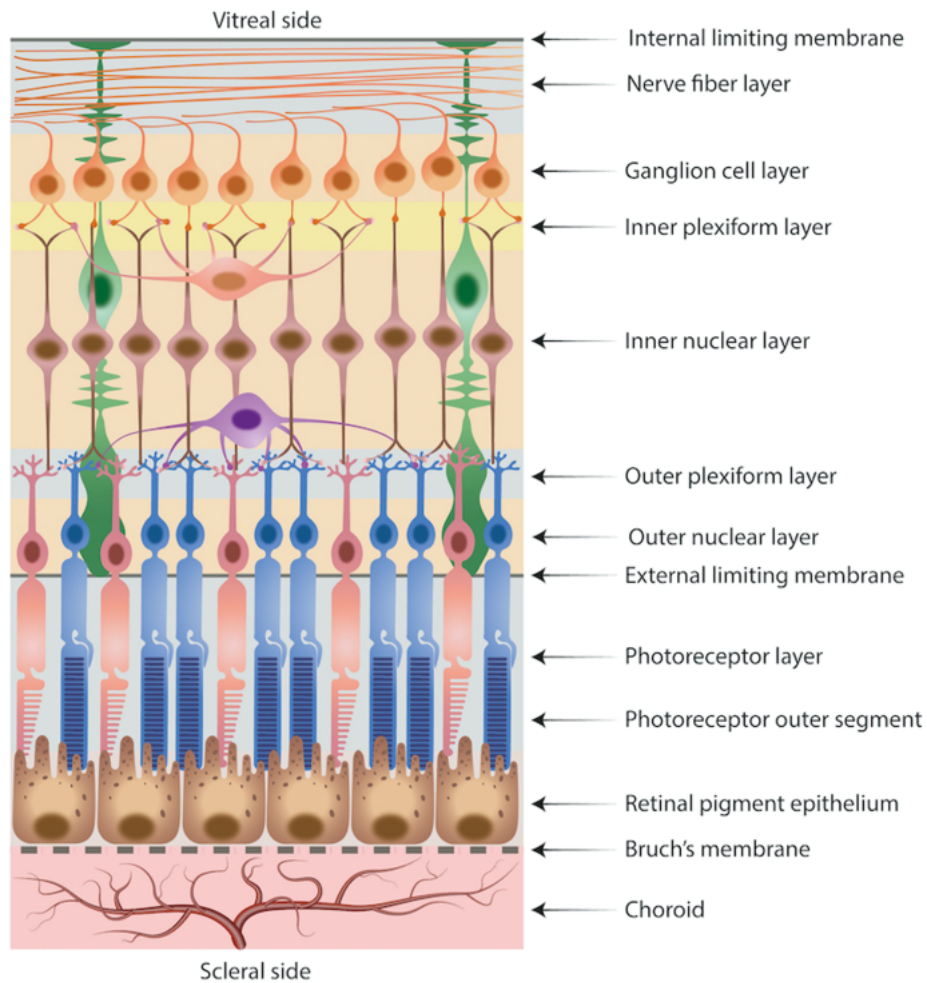


Fig. 5: Schematic diagram of retinal layers.

The structural layers of the retina consist of the internal limiting membrane, nerve fiber layer, ganglion cell layer, inner plexiform layer, inner nuclear layer, outer plexiform layer, outer nuclear layer, external limiting membrane, photoreceptor layer, photoreceptor outer segment, retinal pigment epithelium, Bruch's membrane, and choroid, arranged from the vitreal side to the scleral side. Image adapted from the review on the biomechanical properties of the retina and choroid⁵¹.

1.8. Emerging pharmaceutical drugs in animal models

The management of myopia has primarily focused on correcting the mismatch between optical power and axial length. Currently, there are no pharmaceutical agents approved by the US FDA specifically for myopia treatment. However, several drugs have been studied in clinical trials, including atropine⁵², pirenzepine⁵³, and 7-methylxanthine (7-MX)⁵⁴. Among these, atropine is a non-

selective, competitive antagonist of muscarinic acetylcholine receptors (mAChRs). It works by blocking the stimulation of these receptors by the neurotransmitter acetylcholine. Recent clinical trials of atropine for myopia control have been summarized in a review⁵⁵.

Researchers have also identified novel pharmaceutical targets in experimental models of induced myopia. For example, peroxisome proliferator-activated receptor (PPAR) agonists have shown promise: daily peribulbar injections of the PPAR α agonist (GW7647) inhibited form-deprivation myopia (FDM) in guinea pigs, while the PPAR α antagonist (GW6471) induced a myopic shift in unoccluded eyes⁵⁶. Additionally, a prostanoid receptor (EP2) agonist (butaprost) promoted myopia, whereas an antagonist (AH6809) inhibited myopia progression in guinea pigs by interacting with PPAR α ⁵⁷. Similarly, the PPAR γ agonist (GW1929) inhibited FDM progression, while the PPAR γ antagonist (GW9662) induced a myopic shift in unoccluded eyes in guinea pigs⁵⁸. Furthermore, inhibiting certain developmental biology signaling pathways has the potential to ameliorate myopia progression. Examples include the canonical Wnt pathway inhibitor niclosamide⁵⁹ in mice, a TGF- β inhibitor (oxymatrine) that mitigated apoptosis in an LRPnAP1 mutant zebrafish⁶⁰, and cyclopamine, an alkaloid that inhibits the Hedgehog signaling pathway in guinea pigs⁶¹. These pathways have also been extensively studied in other animal models^{62,63} and humans⁶⁴ (Table 1). It is important to note that further research is needed to fully understand the effectiveness and safety of these pharmaceutical targets and signaling pathway inhibitors in the context of myopia treatment.

Table 1. Representative drugs targeting pathways to slow myopia progression.

Muscarinic acetylcholine receptor (mAChR), peroxisome proliferator-activated receptor (PPAR), mammalian target of rapamycin (mTOR), N-methyl-D-aspartate (NMDA), signal transducer and activator of transcription (STAT), free fatty acid receptor (FFAR), endoplasmic reticulum (ER) stress, and transforming growth factor- β (TGF- β).

| Year | Pathways / targets | Type (Drug) | Animals | PMID |
|------|---------------------|--|------------------|----------|
| 1989 | Dopamine receptors | Agonist (Apomorphine) | Chicks | 2911600 |
| 1993 | mAChR | Antagonist (Atropine) | Chicks | 8425826 |
| 2002 | Glucagon receptor | Agonist (Glucagon) | Chicks | 12688670 |
| 2018 | PPAR | Agonist (GW7647) | Guinea pig | 30521668 |
| 2018 | mTOR | Antagonist (Salidroside) | Guinea pig | 29987045 |
| 2019 | NMDA receptors | Antagonist (Crocetin) | Mice | 30670743 |
| 2020 | Prostanoid receptor | Agonist (Butaprost) | Guinea pig | 32725213 |
| 2021 | STAT protein | Inhibitor (Niclosamide) | Mice | 34259818 |
| 2021 | FFAR | Agonist (ω -3 Polyunsaturated fatty acids) | Guinea pig, mice | 34675076 |
| 2022 | ER Stress | Antagonist (4-PBA) | Mice | 36216837 |
| 2022 | TGF- β | Inhibitor (Oxymatrine) | Zebrafish | 36261846 |

1.9. Methods in mass spectrometry-based proteomics

Proteins are fundamental components of cells and play a crucial role in understanding cellular function⁶⁵. The proteome encompasses all proteins encoded by the genome, while proteomics involves the comprehensive analysis of protein mixtures and their polypeptide components. Over time, protein research and proteomics have evolved, becoming more sophisticated and quantitative. Initially, proteomics focused on the qualitative identification of proteins in samples, laying the groundwork for future research. However, to characterize protein regulation and pathological conditions, quantitative proteomics analysis became necessary⁶⁶. As a result, proteomic platforms were developed to measure protein expression and post-translational modifications (PTMs), becoming integral to current proteomic studies⁶⁷.

Discovery-based proteomics involves analyzing a small set of samples to identify and quantify differentially expressed proteins. These proteins can then be verified and validated with a larger sample cohort to account for biological variation, specificity, and longitudinal changes in expression. Data-dependent acquisition (DDA) was the first approach used to survey abundant peptide masses in an unknown mixture, where precursors were isolated and fragmented to generate a unique fingerprint spectrum of amino acid sequences for peptide identification in a high-resolution mass spectrometer. However, DDA has limitations in quantification due to its bias toward abundant proteins, poor reproducibility of signals, and limited coverage of low-abundance proteins⁶⁸. Data-independent acquisition (DIA) utilizes software-controlled mass isolation windows across the chromatogram, providing superior reproducibility and consistent acquisition, making it ideal for quantitative results⁶⁹. In particular, Sequential Window Acquisition of All Theoretical Mass Spectra (SWATH-MS) extends the data analysis concept of a targeted approach to achieve high-throughput DIA data extraction and statistical validation. SWATH-MS is one of the first methods to record all fragment ions of detectable peptide precursors and highly multiplexed fragment ion maps, including those of low-abundance peptides⁷⁰. DIA relies on a high-quality mass spectral library generated from the DDA approach for peptide identification and remains the only label-free quantification method to survey and quantify hundreds of thousands of proteins in complex biological samples without prior knowledge of fragment mass transitions and peptide occurrences. Advancements in proteomics have been accompanied by intensive progress in computational interfaces, such as databases, data processing algorithms, decoy peptides, accurate protein identification, and analysis of large proteome datasets⁷¹. Isobaric tags for relative and absolute quantitation (iTRAQ) and tandem mass tags (TMT) are isobaric labeling methods used in quantitative proteomics^{72,73}. These methods are based on covalent labeling of peptides with designated reporter mass tags.

1.10. Mass spectrometry in myopia research

In 2006, Lam et al. were among the first to introduce proteomics into eye research and to build a retinal proteome database using postnatal chick retinal tissue. They identified 155 proteins and revealed differentially expressed retinal proteins during early ocular development using matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) mass spectrometry⁷⁴. Bertrand et al. reported the discovery that apolipoprotein A-I (ApoA1) serves as a characteristic signal in the retina, halting myopic growth in chicks. They supplemented this finding by applying the PPAR α agonist GW7647 intraocularly, which upregulated ApoA1 levels and led to a significant reduction in experimental myopia using liquid chromatography-tandem mass spectrometry (LC-MS/MS)⁷⁵. These mass spectrometry techniques were complemented by other approaches such as gel electrophoresis⁷⁶, liquid chromatographic separation⁷⁷, offline peptide fractionation⁷⁷, quantitative isobaric labeling^{78,79}, and SWATH-based proteomics⁴¹. Moreover, researchers have expanded their investigations to various ocular tissues including the cornea⁸⁰⁻⁸², aqueous humor⁸³, vitreous⁸⁴, retina⁸⁵, retinal pigment epithelium⁸⁶, choroid⁸⁷, and sclera^{88,89}. These integrated approaches have greatly expanded proteome coverage and advanced the investigation of various ocular tissues in the visual system, significantly contributing to our understanding of eye-related conditions, especially myopia and hold promise for future developments in the field.

Chapter 2. General method development and optimization

2.1. Lens-induced myopia model in mice

The customized spectacle system was adopted from a previous publication and pre-assembled onto the frame⁹⁰. A dispersive lens made of polymethyl methacrylate (PMMA) was designed with a 9.0 mm diameter, 8.0 mm base curve, and -30 D power (E&E Optics, Hong Kong). A commercially available acrylic nail tip and the desired lenses were affixed to the metal spectacle frame using instant glue (All-purpose Type 201, Aron Alpha, Japan) accordingly (Fig. 6a). Subsequently, the length of the nail tip was trimmed to approximately 3–5 cm to prevent scratches by the mice's paws. Each eye's pupil was dilated with a drop of Mydrin-P ophthalmic solution containing 0.5% tropicamide and 0.5% phenylephrine hydrochloride for 15 minutes. Mice were then sedated with a mixture of ketamine (70 mg/kg) and xylazine (10 mg/kg) delivered by intraperitoneal injection. A small incision was made on the scalp with scissors to expose an approximately 0.8 cm² area of the skull by lifting the skin upward with forceps. The periosteum was removed by applying the etching liquid primer from the self-curing adhesive resin cement kit (Super-Bond universal kit, Sun Medical, Japan). A base fitted with an M1.4–10 mm screw was then adhered to the skull using the polymer adhesive in the kit and left to air-dry. Once the mice had recovered from anesthesia, the spectacle frame was carefully adjusted to fit the geometry of their eyes, and the spectacle lenses were secured in place by fastening an M1.4 nut (Fig. 6b).

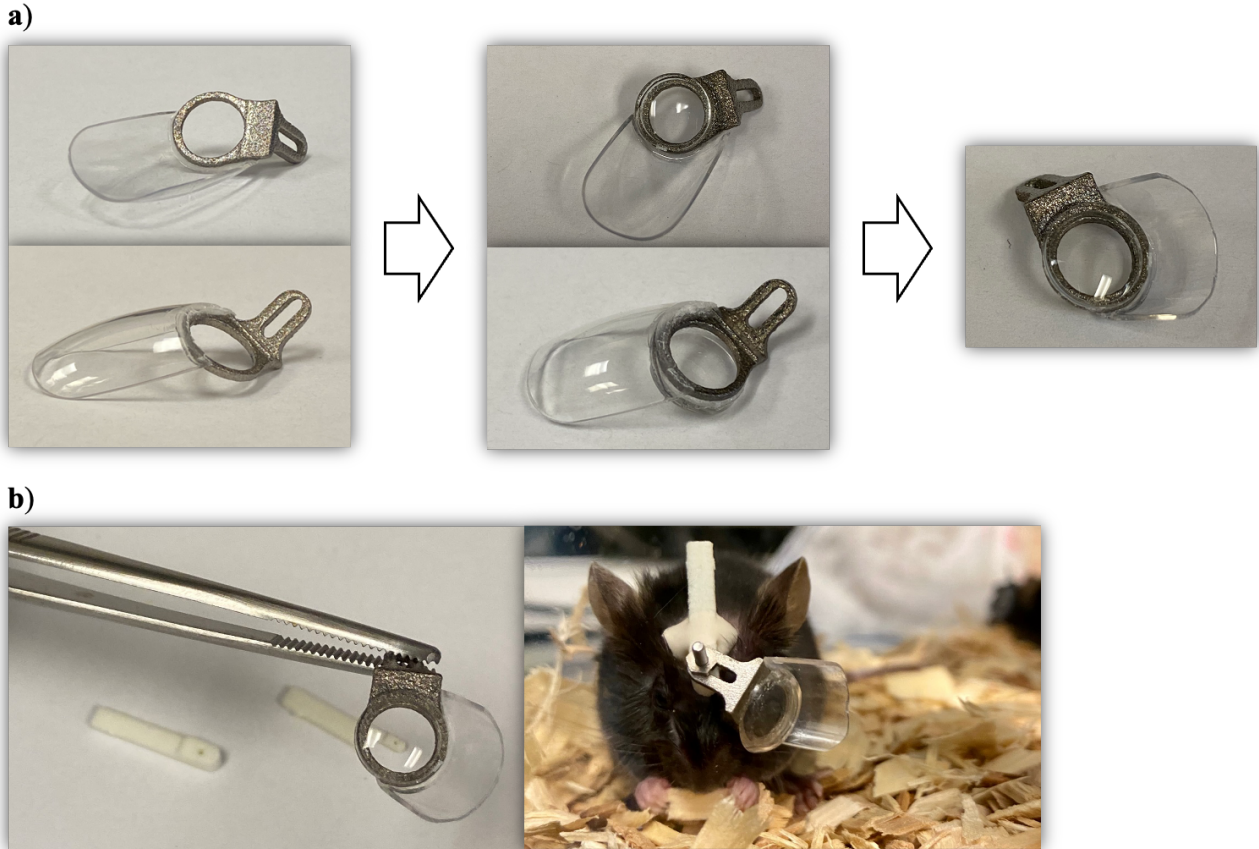


Fig. 6: The assembly of the spectacle system tailor-made for mice.

a) Sequential steps showing the attachment of the nail tip and lens to the metal frame, with the length of the nail tip trimmed for the best fit on mice. b) Illustration of the assembled spectacle with a concave lens, showing a diminished image and demonstrating the use of the spectacle on mice.

2.2. Intraperitoneal administration of anesthetics in mice

Mice were administered anesthesia using a ketamine and xylazine cocktail (KX) via intraperitoneal injection at a dosage of 0.1 mL per 20 g of body weight. The KX mixture (10 mL) was prepared by combining 1.75 mL of ketamine (100 mg/mL, Alfasan International B.V.), 1.25 mL of xylazine (20 mg/mL, Alfasan International B.V.), and 7 mL of saline. The dosage was optimized for mature mice weighing 20 g, resulting in a final concentration ratio of 7:1 with 17.5 mg/mL ketamine and 2.5 mg/mL xylazine. The anesthetic dosage of 0.07 mg/g ketamine and 0.01 mg/g xylazine is detailed in Table 2. The body weight distribution of C57BL/6J mice from postnatal day 21 to 140 was

referenced from publicly accessible data provided by The Jackson Laboratory. We interpreted the logarithmic growth rate for male mice with the equation $y = 7.46 \ln(x) + 10.47$, and for female mice, $y = 4.54 \ln(x) + 10.59$. C57BL/6 male mice exhibited the greatest linear growth rate of 3.18 g/week ($R^2 = 0.924$) from postnatal day (P) 21 to P49, while female mice showed a slightly slower gain at 2.74 g/week ($R^2 = 0.895$) from P21 to P42. It should be noted that the body weight growth rate of female mice slowed down one week earlier compared to age-matched males (Fig. 7). The plots show body weight with mean \pm standard deviation for males at P21 as 10.2 ± 1.6 g (n=28), at P28 as 14.9 ± 2.2 g (n=27), and at P35 as 18.1 ± 2.7 g (n=14) (Fig. 7a). For female mice, the weights were 9.5 ± 1.2 g at P21 (n=16), 14.0 ± 1.2 g at P28 (n=16), and 16.6 ± 1.2 g at P35 (n=12) (Fig. 7b). These data suggest that our in-house colonies fall within the expected body weight ranges for male and female mice between postnatal days 21 and 35.

Table 2. Anesthesia dosage for C57BL/6 mice aged between postnatal days 21 and 63.

The optimum dosage of the mixture of ketamine (0.88 mg/g) and xylazine (0.013 mg/g) in phosphate-buffered saline (PBS) for C57BL/6J mice, with typical age references obtained from The Jackson Laboratory.

| Postnatal age (P) | Body weight (g) | Injection (μ L) | Ketamine (mg) | Xylazine (mg) |
|-------------------|-----------------|----------------------|---------------|---------------|
| P21 | 10 | 50 | 0.88 | 0.13 |
| P28 | 15 | 75 | 1.31 | 0.19 |
| P35 | 19 | 95 | 1.66 | 0.24 |
| P42 | 21 | 105 | 1.84 | 0.26 |

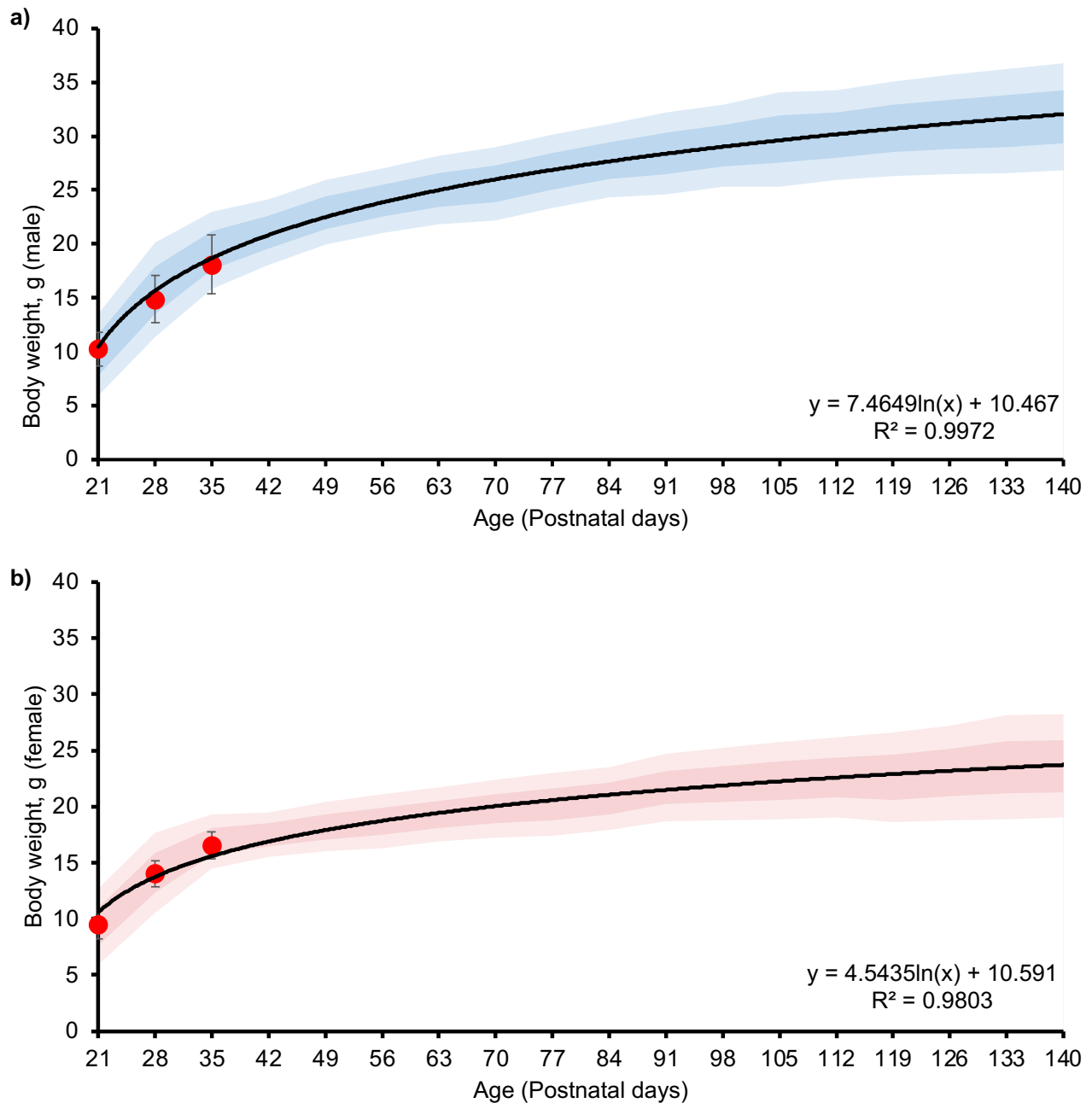
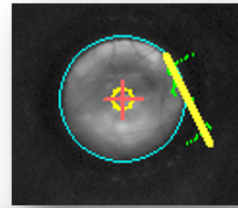
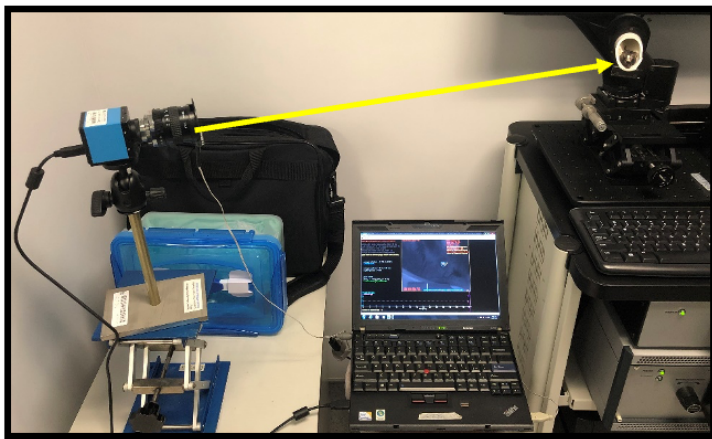


Fig. 7: Distribution of body weight in wild-type C57BL/6 mice from P21 to P140.

The figure displays the body weight distribution of male and female C57BL/6J mice from age P21 to P140. The colored areas represent ± 1 standard deviation (dark) and ± 2 standard deviations (pale) from the mean value. **a)** Male, mean \pm SD weight at P21 (n=28), P28 (n=27), and P35 (n=14). **b)** Female, mean \pm SD weight at P21 (n=16), P28 (n=16), and P35 (n=12). The reference data were retrieved from The Jackson Laboratory.

2.3. Measurement of refractive error in mice with infrared photorefractor

Refractive error measurements were obtained using an eccentric infrared photorefractor (Steinbeis Transfer Centre, Germany), as previously described in the literature^{11,91}. Refractive error measurements were obtained using an eccentric infrared photorefractor (Steinbeis Transfer Centre, Germany), as previously described in the literature. In brief, the pupils of each eye were dilated using Mydrin-P ophthalmic solution, consisting of 0.5% tropicamide and 0.5% phenylephrine hydrochloride, for 15 minutes. The mice were then sedated by intraperitoneal injection of ketamine (70 mg/kg) and xylazine (10 mg/kg). Subsequently, the mice were positioned on a cylindrical platform designed for SD-OCT, ensuring an appropriate distance from the camera for optimal image acuity. The image brightness was adjusted to fall within the range of 200 to 300 units of exposure. To accurately align the mouse eye, the Purkinje image was utilized, and gaze control was implemented in the x- and y-axes, with deviations smaller than or equal to 5 units. The software automatically collected 99 data points within the established gaze control threshold. This process was repeated in triplicate from the default mouse position on the platform to ensure independent measurements across replications. The refractive error was quantified as the mean value in diopters (D). It is important to note that accurately measuring refraction in mice poses several challenges due to their anatomical characteristics (Fig. 8). As summarized by Pardue et al., mice have rudimentary ciliary muscles and lack lenticular accommodation. Additionally, they do not possess a fovea, resulting in poor visual acuity estimated at approximately 0.4 cycles/degree (c/d) using optokinetic tracking. This level of acuity is significantly lower compared to other species such as chickens (8.0 c/d), primates (15 c/d), and humans (20 c/d). Lastly, mice exhibit a depth of field that reportedly exceeds 20 diopters (D).



```
average refraction = -7.58 +/- 0.05 D  
(MYOPIC)  
  
average pupil size 1.76 +/- 0.00 mm  
pupil brightness = 136.1  
  
gaze control:  
gaze_x = 0 deg, gaze_y = -1 deg  
P1 found and eye position OK
```

Fig. 8: Layout for the measurement of refractive error using a photorefractor.

The image shows the readings of average refraction, average pupil size, and gaze control in the x- and y-axes in the demonstration.

2.4. Measurement of mice eye dimension with optical coherence tomography

The ocular dimension was measured in radial volume mode in duplicate (A-scans = 1000 lines, B-scans = 6, 32 frames, 80 lines of inactive A-scans, 0.4 mm diameter). The length of each component is represented as the mean value in micrometers. Segmented ocular dimensions were measured using spectral domain optical coherence tomography (SD-OCT, Envisu R4310, Leica, Germany) equipped with a 50° probe for mice. Mice were reset to the default position after each SD-OCT measurement, and measurements were acquired in duplicate. Ocular segmentation was analyzed manually using a digital caliper within the OCT data analysis software (InVivoVue, ver. 2.4, Leica) (Fig. 9). Axial length (AL) was represented as the sum of all ocular segments, including corneal thickness (CT), measured from the anterior corneal surface to the posterior corneal surface. The anterior chamber depth (ACD) is the distance from the posterior corneal surface to the anterior lens surface. Lens thickness (LT) is the distance from the anterior lens surface to the posterior lens surface. Vitreous chamber depth (VCD) is the distance from the posterior lens surface to the retinal nerve fiber layer. Retinal thickness (RT) is

the depth from the retinal nerve fiber layer to the retinal pigment epithelium. Ocular biometric measurements were obtained from the whole eye survey scan using SD-OCT in mice at postnatal day 21 (n=3) and acquired in triplicate for each condition. Six angles of rotation were acquired in radial scans in an anticlockwise direction, starting from the default position (rotation 0) up to rotation position 5 (Fig. 10a). To enhance the signal-to-noise ratio and improve image clarity, averaged scans of all rotations were combined to eliminate background noise in SD-OCT measurements using the built-in algorithm in the SD-OCT data processing software (InVivoVue, ver. 2.4, Leica). Coefficient of variation (CV) analysis revealed comparable and low CV values below 10% between the average scan and single scans across all ocular components (Fig. 10b). The absolute difference between the average scan and single scans showed consistent systematic variation in all ocular segments, with mean values below 10 μm (Fig. 10c). The mean %CV across all scan rotations relative to the default position also suggested low variability, with CV values below 10% and the least variation observed in axial length (Fig. 10d). The absolute difference between average scans and single scans demonstrated mean values below 5 μm between scan rotations (Fig. 10e). Finally, differences in all rotation positions relative to the default position were shown individually for each ocular component, with all rotations and segments exhibiting a mean difference below 10 μm (Fig. 10f).

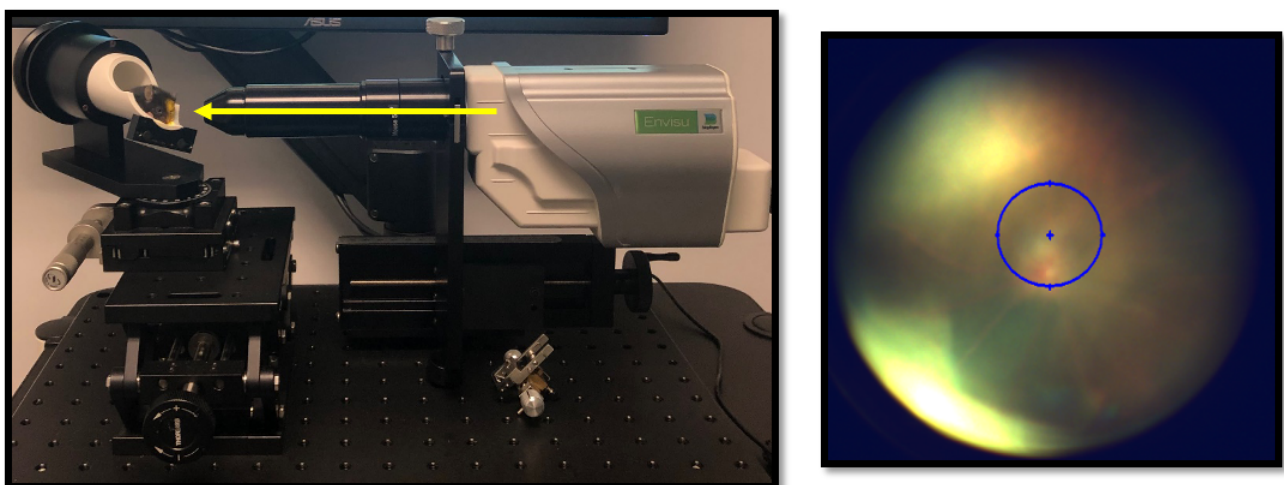


Fig. 9: Layout for the measurement of mouse eye dimensions using SD-OCT.

The placement of the mice on the OCT platform and its relative position in the retinal fundus image.

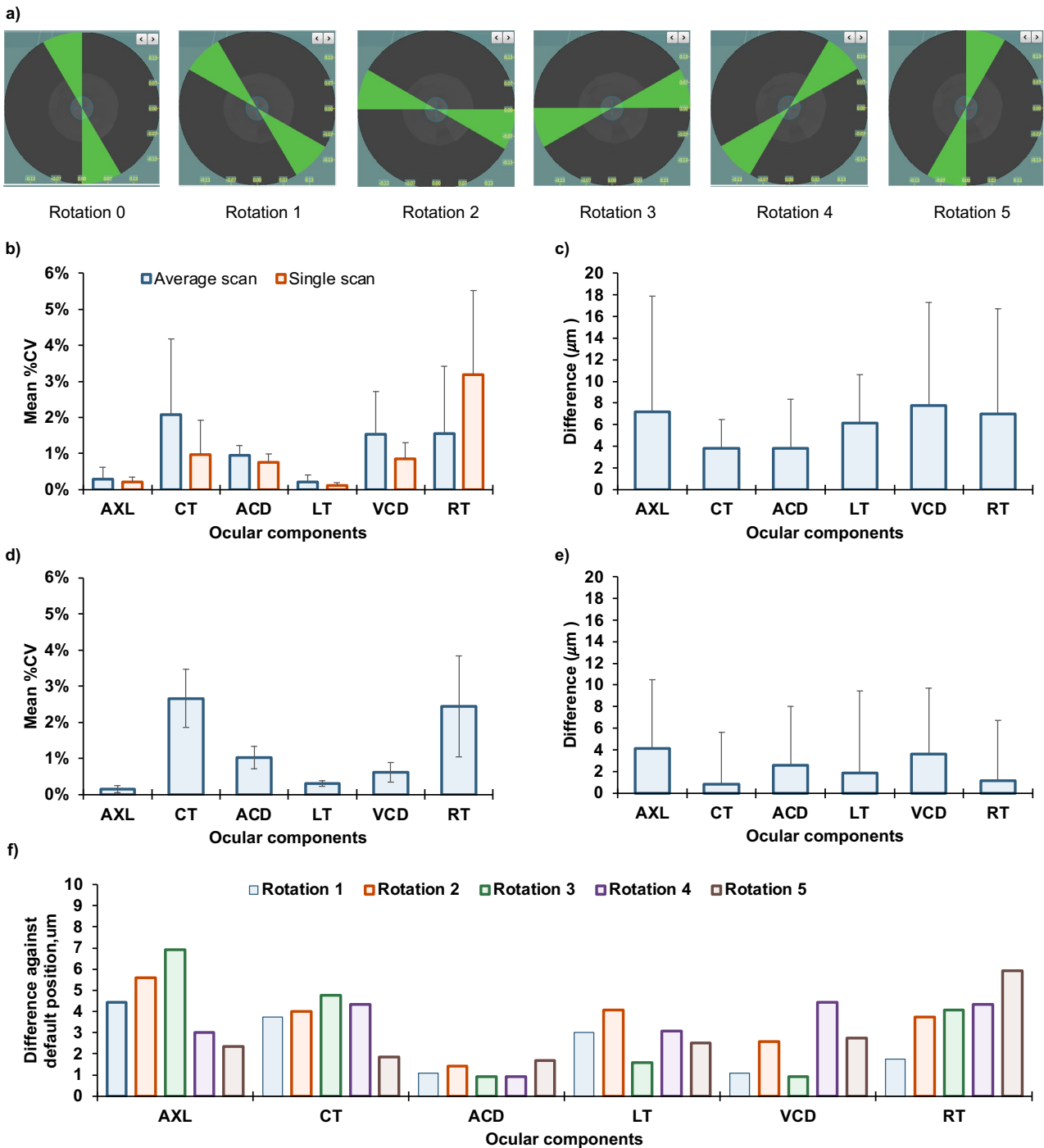


Fig. 10: Comparison of ocular biometric measurements with radial scans in SD-OCT.

a) Rotation of radial scans in an anticlockwise direction, starting from the default position (rotation 0).

b) Comparison of the mean %CV between averaged scans of all rotations and a single scan, aiming to

enhance the signal-to-noise ratio and improve image clarity. **c)** Absolute difference between the averaged scans and a single scan for all ocular components. **d)** Comparison of the mean %CV in all scans relative to the default position. **e)** Absolute difference of all rotation scans relative to the default position. **f)** Bar chart of absolute differences in all rotation positions relative to the default position for each ocular component. The segmented ocular structures include axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT), as obtained from the whole eye survey scan.

2.5. Extraction of the neural retina in mice

The sacrifice of age-matched mice at postnatal day 21 was carried out via cervical dislocation after *in vivo* ocular measurement using spectral domain optical coherence tomography (n=15). Following enucleation of both eyes, they were immediately submerged in ice-cold phosphate-buffered saline (PBS). To separate the cornea, the eye was hemisected equatorially with scissors, and the crystalline lens was removed from the eye cup using forceps. The remaining tissue was then placed in an ice-cold PBS-filled cell culture dish. By gently shaking the tissue and holding the posterior sclera with forceps, the retinal layer was detached from the retinal pigment epithelium (RPE) and choroidal sclera outer layer. The isolated retina was rinsed with ice-cold PBS, transferred to a 1.7 mL Eppendorf tube, and snap-frozen in liquid nitrogen.

2.6. Optimization of ex-vivo protein extraction in mice retina

To optimize protein extraction from mouse retinas aged between postnatal day 21 and day 42, snap-frozen retinas were transferred to a homogenization tube (CKMix, Precellys Lysing Kit) containing varying volumes of 5% (w/v) sodium dodecyl sulfate (SDS) in 50 mM triethylammonium bicarbonate (TEAB) lysis buffer: 50 μ L, 100 μ L, 150 μ L, 200 μ L, and 250 μ L. The samples were homogenized at 4 °C, 7,000 rpm for 30 s \times 4 cycles with 20 s intervals. After a brief centrifugation, the

soluble retina lysate was collected and further centrifuged at 15,000 rpm for 30 minutes at 4 °C. The supernatant was collected, and the protein concentration of each sample was determined using the bicinchoninic acid assay (Pierce Rapid Gold BCA Protein Assay, A53225, Thermo Fisher). Protein concentration decreased with increasing volumes of lysis buffer. However, with the addition of 250 μL of lysis buffer, the desired concentration of $\geq 1 \mu\text{g}/\mu\text{L}$ was maintained, with the least variation observed at a mean \pm SD concentration of $1.46 \pm 0.17 \mu\text{g}/\mu\text{L}$. Hence, the optimum volume for protein extraction from the neural retina in mice was determined to be 250 μL of 5% SDS in 50 mM TEAB lysis buffer (Fig. 11). These results demonstrate an optimized protocol for protein extraction from mouse retinas, providing valuable information for subsequent proteomics analyses in retinal research.

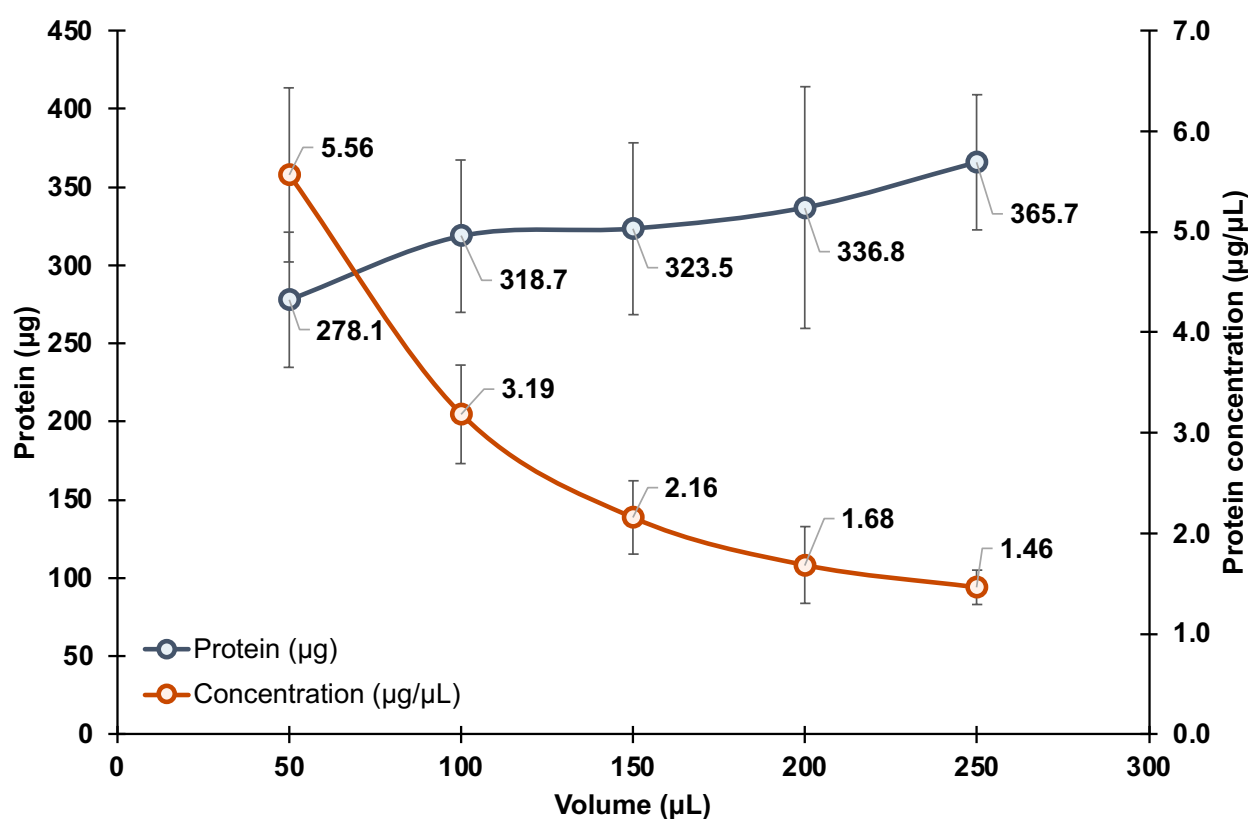


Fig. 11: Optimization of protein extraction for ex vivo mouse neural retina tissue using various volumes of lysis buffer (n=15).

Maximum protein extraction was achieved with a lysis buffer volume of 250 μL , resulting in an average yield of 365.7 ± 43.4 μg protein per mouse retina. This extraction method provided a desired concentration of 1.46 ± 0.17 $\mu\text{g}/\mu\text{L}$, ensuring that the protein concentration remained above the 1 $\mu\text{g}/\mu\text{L}$ threshold required for subsequent sample preparation. By using the appropriate volume of lysis buffer, over-dilution of the retinal protein extracts was avoided. Extraction efficiency was normalized against the 250 μL volume. Extraction efficiencies decreased to 76% for 50 μL , 87% for 100 μL , 89% for 150 μL , and 92% for 200 μL , compared to the optimal 250 μL volume.

2.7. Quantification of mice retinal proteins with NanoDrop One

Proteomics relative quantification requires accurate measurement and normalization of protein loading and concentration before sample preparation and enzymatic digestion. Colorimetric and spectroscopic measurements are commonly used for protein quantification. The bicinchoninic acid (BCA) assay, Lowry protein assay, and Bradford protein assay are popular colorimetric methods. The BCA assay involves the reduction of Cu^{2+} to Cu^{1+} under alkaline conditions, offering a one-step process compared to the two-step workflow of the Lowry assay, which relies on Folin phenol and copper chelation^{92,93}. The Bradford protein assay utilizes the binding of Coomassie Brilliant Blue to proteins, resulting in a shift in absorption wavelength from 465 nm to 595 nm, with color stability for up to 1 hour⁹⁴. Regardless of the specific protein assay, bovine serum albumin (BSA) is often employed as a standard for colorimetric calibration. However, there can be significant variability between BSA standards and quantitative amino acid analysis (AAA), which is considered the gold standard method⁹⁵. The protocol was established using the BCA protein assay due to compatibility limitations of solvents in the Bradford and Lowry protein assays, particularly with the 5% SDS buffer, although the Lowry protein assay exhibited the least variation among the three assays⁹⁶. Furthermore, the BCA protein assay demonstrated similar sensitivity and reproducibility of protein measurement in tissue lysates, showing a comparable coefficient of variation (CV) to both the Lowry and Bradford assays⁹⁷. To

enable measurements across various absorption wavelengths, including peptides at 205 nm, purified proteins at 280 nm, and colorimetric protein assays such as BCA (562 nm), Bradford (595 nm), and Lowry (650 nm), the NanoDrop One micro-volume UV-Vis spectrophotometer (Thermo Fisher Scientific) was used. It measures a wide spectral range from 190 nm to 850 nm with an optimal sample volume of 2 μ L, making it highly efficient for diverse protein quantification assays (Fig. 12). The absorption of amino acid side chains, including tryptophan (Trp), phenylalanine (Phe), tyrosine (Tyr), and histidine (His), significantly contributes to the absorption signal at 205 nm, with moderate absorption contributed by arginine (Arg), methionine (Met), and cysteine (Cys). While the extinction coefficient at 205 nm can be influenced by Phe content in peptides, the Scopes method has been reported to accurately measure protein concentration within $\pm 2\%$ using an extinction coefficient value of 31 (ϵ_{205} 1 mg/mL), provided there is no contamination from substances that interfere at 205 or 280 nm⁹⁸.

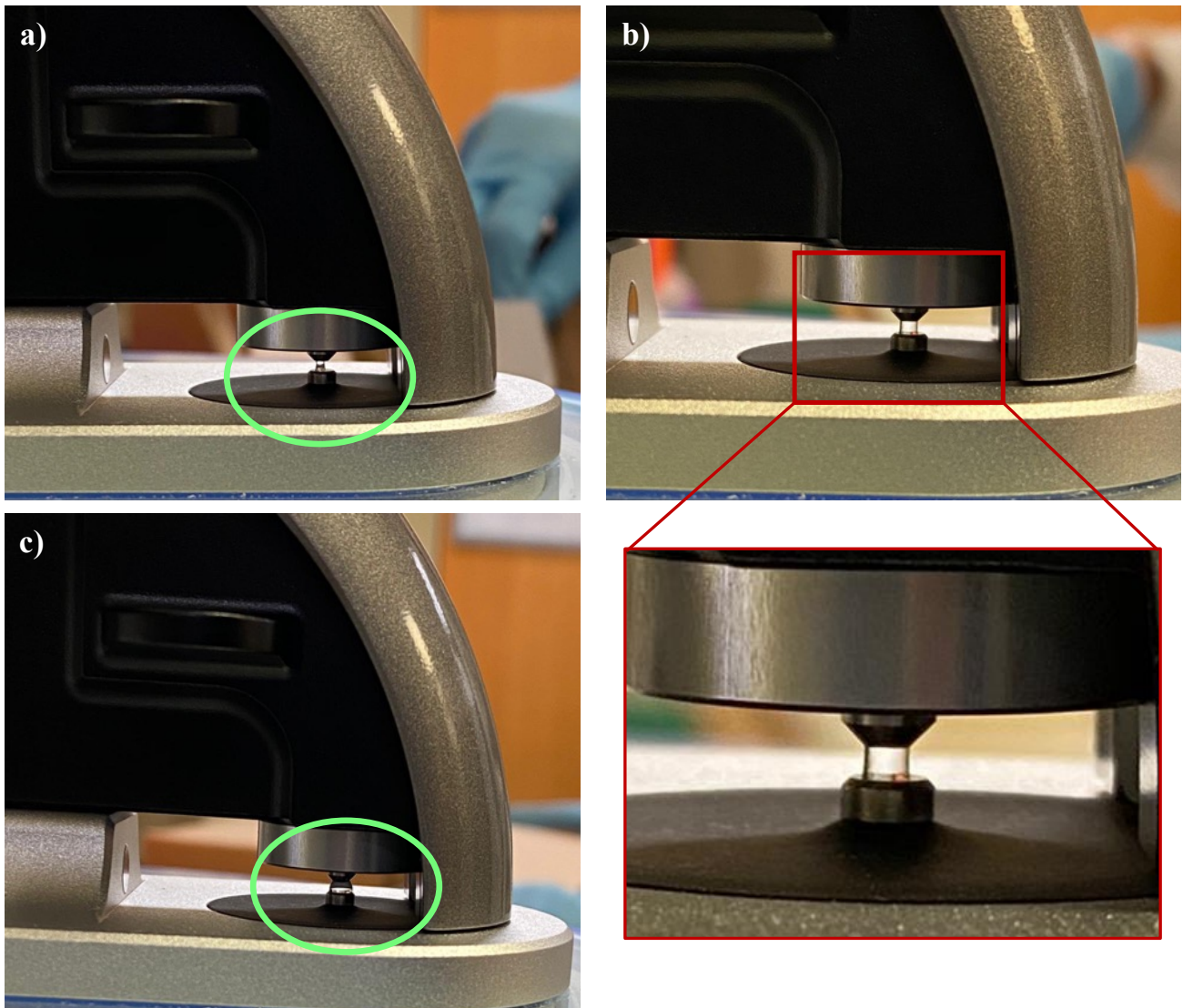


Fig. 12: Appropriate liquid column formation using various loading volumes in the NanoDrop One instrument.

a) Pedestal sample loading with a 1 μL volume results in potential liquid column breakage, leading to inaccurate measurement. b) The optimum 2 μL sample loading creates a proper liquid column for spectrophotometric analysis. c) Excessive sample loading with a 5 μL volume results in overflow and an unstable liquid column.

The BCA protein assay was utilized to benchmark protein measurement using the NanoDrop One spectrophotometer. Calibration was established using in-house prepared BSA by weight, with 98% purity determined by electrophoresis (Cat. No. 23209, Thermo Fisher Scientific), and a 2 mg/mL BSA

standard (Cat. No. 23209, Thermo Fisher Scientific). The BSA standard stock was subsequently diluted from 2 mg/mL to 0.1 mg/mL. First, a blank measurement using deionized water was acquired by the A205 Scopes method. The BSA standard calibration showed linear regression regardless of the buffer used, including 5% SDS, 50 mM TEAB solution, and deionized water. However, all calibrations resulted in an overestimation of BSA concentration using the NanoDrop One spectrophotometer (Fig. 13a). The in-house prepared BSA calibration displayed reproducible linear regression across the solvents tested. Notably, there was a marked difference in calibration slope between the BSA standard (slope = 1.23) and the in-house prepared BSA solution in water (slope = 0.64) (Fig. 13b). The A205 Scopes method showed signal saturation at approximately 68 mg/mL BSA concentration for the prepared BSA solution. Furthermore, the A205 Scopes method demonstrated linear regression with a slope of 0.82 and an estimated limit of quantification (LOQ) of 0.124 mg/mL using a quantitative peptide assay standard (Cat. No. 23295, Thermo Fisher Scientific) (Fig. 13c).

Retinas from age-matched mice at postnatal day 21 (n=6) were homogenized in 5% SDS, 50 mM TEAB buffer, and the peptide concentration was measured using a qualitative colorimetric peptide assay. Subsequently, 2 μ L of the retinal extract was loaded onto the NanoDrop One pedestal and measured using the A205 Scopes method. The mean percentage accuracy between methods was $98.5\% \pm 8.6\%$ for sample concentrations between 1.23 and 2.73 μ g/ μ L. In retinal lysates spiked with BSA standard, an average recovery of $92.9\% \pm 11.1\%$ was obtained in triplicate, with an accuracy of 83.8% for reconstituted peptides from enzymatically digested retinal proteins at a concentration of 2.39 μ g/ μ L in duplicate (Fig. 13d). The technical variation in NanoDrop One measurements (n=24) at a 95% confidence interval ranged from 0.05% to 1.71%, with measurements acquired in triplicate (Fig. 13e). These results demonstrate that the A205 Scopes method on the NanoDrop One spectrophotometer produces results comparable to the BSA protein assay and quantitative colorimetric peptide assay for

direct protein quantification of mouse retinal lysates homogenized in the optimized volume of 250 μL of 5% SDS, 50 mM TEAB buffer, using only a 2 μL sample volume with low technical variation.

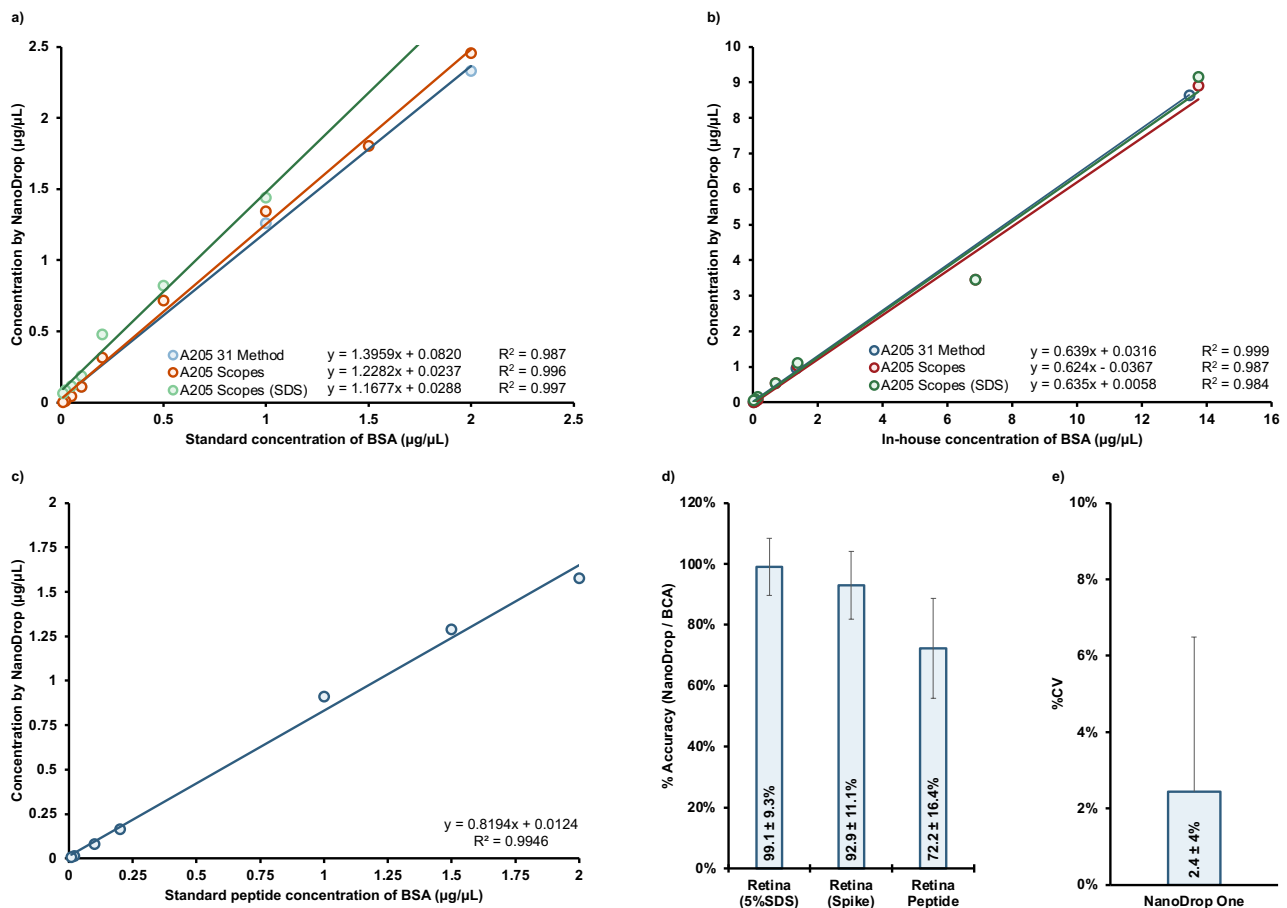


Fig. 13: Benchmark and measurement of standard calibration, mouse retinal protein lysates, and digested peptides using NanoDrop One and the BCA protein assay.

a) Calibration of BSA protein standard using NanoDrop One with concentrations ranging from 0.1 to 2 $\mu\text{g}/\mu\text{L}$. b) Linear regression analysis of calibration using in-house prepared BSA solution by weight from 0.1 to 14 $\mu\text{g}/\mu\text{L}$. c) Linear regression analysis of the BSA peptide standard calibration with concentrations ranging from 0.1 to 2 $\mu\text{g}/\mu\text{L}$ using the A205 Scopes method. d) Percentage accuracy of neural retina lysates homogenized in 5% SDS, retinal lysates spiked with BSA, and peptides after enzymatic digestion. e) Coefficient of variation analysis of retinal lysates by the NanoDrop A205 Scopes method (n=40, triplicates).

2.8. Optimization of protein sample preparation using S-Trap

The filter-aided sample preparation (FASP) method is an ultrafiltration technique used for detergent removal, protein digestion, and peptide elution with clean-up of undigested material in proteomics. A newer approach called suspension trapping (S-Trap) has recently become available on the market, incorporating a depth quartz filter and a C18 hydrophobic compartment. This design allows for efficient retention of fine protein suspensions while eliminating contaminants and lysate buffers⁹⁹. In terms of total protein identification, procedural consistency, and ease of use, the S-Trap configuration has demonstrated superior performance compared to typical FASP filters in both urea-based and SDS-based lysates¹⁰⁰.

To determine the optimal protein loading amounts for both the S-Trap Micro (25–200 µg) and S-Trap Mini (50–400 µg) form factors, age-matched mouse retinas at postnatal day 21 (n=10) were homogenized in 5% SDS, 50 mM TEAB using the procedures described earlier. Linear regression analysis revealed that both form factors exhibited a linear relationship, with a mean recovery of 53.7% ± 10.6% for S-Trap Micro and 47.9% ± 5.1% for S-Trap Mini. Optimal recovery was achieved with a protein loading of 25 µg in S-Trap Micro, resulting in a peptide recovery of 71.8%, while a protein loading of 50 µg in S-Trap Mini yielded a peptide recovery rate of 53.9%. The simplicity of the procedure and the minimal steps involved contributed to a low technical variation of 13.5% ± 11.9% across all retina samples prepared in duplicate (Fig. 14).

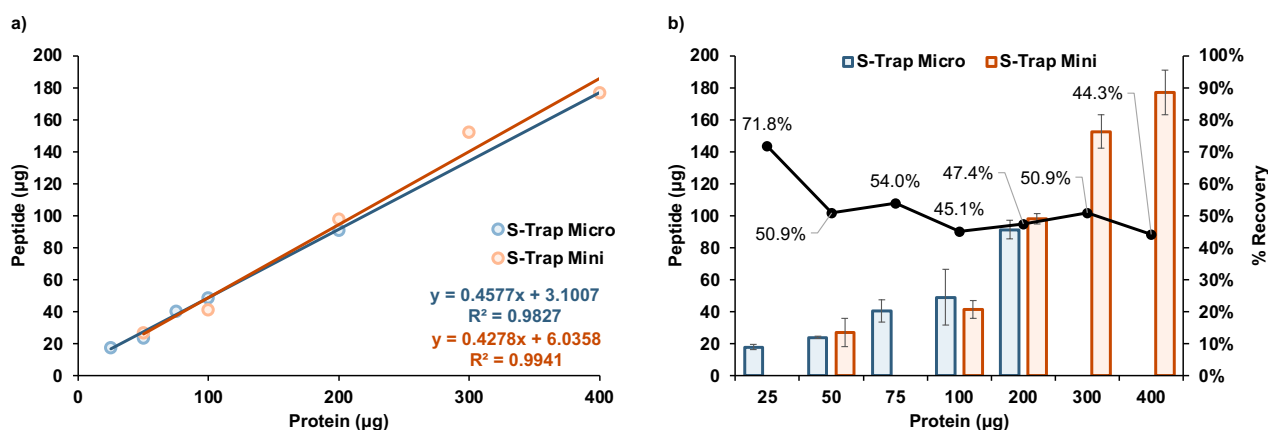


Fig. 14: Protein loading amount and peptide recovery of S-Trap Micro and S-Trap Mini.

a) Scatter plot illustrating the relationship between the loaded protein amount and peptide recovery for S-Trap Micro (25 µg to 200 µg, blue) and S-Trap Mini (50 µg to 400 µg, orange). The plot shows a consistent linear regression trend for both S-Trap configurations (n=10, duplicates). **b)** Percentage recovery of peptides based on the protein loaded onto the S-Trap column.

2.9. Statistical analysis of proteomic data

The selection of statistical methods was guided by the nature of the data and the research questions, with particular attention paid to the assumptions underlying each method. Prior to conducting the main analyses, tests for homogeneity of variance were performed to verify that the variances across groups were sufficiently similar, including the Shapiro-Wilk, Kolmogorov-Smirnov, and Anderson-Darling tests. These tests provide p-values for hypothesis testing, with the null hypothesis being that the data are normally distributed. When significant deviations were found, appropriate adjustments were made, such as employing Welch's ANOVA instead of nonparametric tests. Nonparametric tests do not assume normality or equal variances but test for differences in distributions rather than means. While nonparametric tests are more robust under severe assumption violations or non-normal data, they often have less statistical power compared to Welch's ANOVA when the data are roughly normal but heteroscedastic. Furthermore, proteomics data are frequently log-transformed or normalized to approximate normality, supporting the use of Welch's ANOVA.

When omnibus tests indicated statistically significant effects, post hoc tests were conducted to pinpoint specific group differences. These post hoc analyses were carefully chosen based on the nature of the data and the homogeneity test results; for example, Tukey's HSD was used when equal variances were assumed.

Chapter 3. Comprehensive mouse retinal proteome profile by high-pH reversed-phase fractionation

3.1. Introduction

Jeon et al. (1998) reported seven major cell populations in the C57BL/6 mouse retina, including rod photoreceptors, cone photoreceptors, Müller glia cells, retinal ganglion cells (RGCs), horizontal cells, amacrine cells, and bipolar cells³⁴. Modern transcriptomic analyses have recently revealed 39 transcriptionally distinct cell populations using single-cell RNA sequencing (scRNA-seq), supporting the presence of novel candidate cell subtypes such as microglia, retinal endothelial cells, and astrocytes³⁵. In addition to the wild-type mouse (*Mus musculus*), other well-established mouse models include the retinal degeneration 10 (rd10) mutant, which is used to study neuronal degeneration of the retina³⁶, and Ins2Akita, employed for research into early retinal complications in diabetes³⁷. The study of retinal diseases has been limited by a lack of retinal cell lines comparable to the neural retina, with only limited provision of retinal pigment epithelium (RPE) cells^{38,39} (D407, ARPE19) and RGC cells (RGC-5)⁴⁰. Therefore, profiling normally growing C57BL/6 mouse retinal proteins could provide an important reference dataset to advance the understanding of retinal physiology and ocular function. A similar approach has been applied recently to guinea pig⁴¹, human⁴³, and zebrafish⁴² tissues. In particular, supplementary analyses of nine C57BL/6 mouse tissue samples (brain, gallbladder, pancreas, large intestine, small intestine, liver, lung, stomach, and urinary bladder) reported a total of 11,340 proteins acquired from 180 samples comprising 437 DDA scans¹⁰¹.

Highly sensitive mass spectrometry has become an indispensable tool to investigate protein expression, interaction, and post-translational modification (PTM). Data-dependent acquisition (DDA) extracts the most abundant eluted parent ions during a survey scan (MS1) and subsequently fragments them in a collision chamber (MS2) to enable peptide sequencing and identification via software data processing. The bias toward abundant proteins has hindered reproducible quantification between

sample runs. Generation of a spectral library facilitates the construction of data-independent acquisition (DIA) approaches, particularly sequential windowed acquisition of all theoretical fragment ion mass spectra (SWATH-MS), which allows reproducible and precise quantification of thousands of proteins in complex tissues⁷⁰. New biological insights have been made possible by the combination and reuse of open-access retinal spectral libraries for interrogation by SWATH-MS.¹⁰²

Here, we present the most comprehensive DDA spectral library compiled using offline high-pH fractionation, containing 5,950 non-redundant proteins (54,865 peptides) at 1% FDR from the C57BL/6 mouse retina, accounting for 35% of the total reviewed proteins listed in the UniProt protein database (*Mus musculus*, UP000000589). The library was generated by combining DDA results from a total of 38 injections, including 36 peptide samples and two pooled samples extracted from normal adult mouse retinas. The dataset was generated using a combined sample preparation protocol of suspension trapping (S-Trap)¹⁰³ and a commercially available high-pH fractionation kit that allows ultrafast, reproducible lysis, digestion, and fractionation of the neural retina. This submission provides a reference list of proteomes identified *in vitro* in the C57BL/6 mouse neural retina for ocular proteomics research. The generated data have been accepted by the PRIDE repository for open access¹⁰⁴.

3.2. Methods

3.2.1. Animals

Mice were maintained as in-house breeding colonies at the centralized animal facility of The Hong Kong Polytechnic University. Wild-type C57BL/6 mice ($n = 3$) were refracted between 3 and 6 weeks of age to assess refractive development under unmanipulated visual conditions. Each animal's eye was examined at postnatal day 25 using high-resolution spectral-domain optical coherence tomography (SD-OCT) to confirm that the physiology of the external and internal ocular structures

was normal. Animals were housed in standard mouse cages at 25 °C on a 12:12-hour light/dark cycle, with mouse pellets and water available ad libitum. Researchers were licensed by the Department of Health, HKSAR government, and all procedures performed in this study received ethics approval from the Animal Subjects Ethics Sub-Committee (ASESC) of The Hong Kong Polytechnic University and complied with the Association for Research in Vision and Ophthalmology (ARVO) statement on the use of animals in ophthalmic and vision research.

3.2.2. Refractive error measurement with infrared photorefractor

Refractive error was measured with a customized infrared photorefractor (Steinbeis Transfer Centre, Germany) as previously described^{11,91}. In brief, the pupil of each eye was dilated with Mydrin-P ophthalmic solution, containing 0.5% tropicamide and 0.5% phenylephrine HCl, for 15 minutes. The mouse was sedated (ketamine 70 mg/kg; xylazine 10 mg/kg delivered by intraperitoneal injection) and then placed on the SD-OCT cylindrical platform, with the distance from the camera adjusted based on image acuity. The mouse eye was aligned to its Purkinje image with gaze control in the x- and y-axes at or below 5. The software automatically collected 99 data points within this gaze control, repeated for three technical replicates. The refractive error is represented as the mean value in diopters (D).

3.2.3. Ocular dimension measurement using SD-OCT

The axial length and dimensions of each ocular component were analyzed using an SD-OCT system (Envisu R4310, Leica, Germany) with a 50° mouse probe after refractive error measurement. First, the mouse was aligned and positioned close to the probe under free scan mode. The optic disc position was identified and adjusted to 2 mm above the optic nerve. This distance allowed visualization of the entire eye structure from the corneal apex to the choroidal sclera layer. The eye was scanned in radial volume mode (A-scans = 1000 lines, B-scans = 6, 32 frames, 80 lines of inactive A-scans, 0.4 mm diameter), repeated to obtain three technical replicates. The length of each component is

represented as its mean value in millimeters. Axial length (AXL) was defined as the distance from the corneal apex to the posterior retina. Corneal thickness (CT) was measured from the corneal apex to the posterior cornea¹⁰⁵. Corneal thickness (CT) was measured from the corneal apex to the posterior cornea. Anterior chamber depth (ACD) was measured from the posterior cornea to the anterior lens. Lens thickness (LT) was measured to the posterior lens. Vitreous chamber depth (VCD) was measured to the retinal nerve fiber layer. Retinal thickness (RT) was measured to the retinal pigment epithelial layer.

3.2.4. Mice retinal protein extraction

Three normal retinas from different individuals were homogenized in a liquid nitrogen-cooled tissue homogenizer (Precellys Evolution, Bertin Instruments, France) with 150 μ L of lysis buffer containing 5% sodium dodecyl sulfate (SDS) and 50 mM triethylammonium bicarbonate (TEAB). The sample was homogenized at 4 °C, 7,000 rpm for 30 s \times 4 cycles with 20 s intervals in the homogenization tube (CKMix, Precellys Lysing Kit). The sample was briefly centrifuged, and the soluble retina lysate was recovered and centrifuged at 15,000 rpm for 30 minutes at 4 °C. The supernatant was collected, and the protein concentration of each sample was determined using the bicinchoninic acid assay (Pierce Rapid Gold BCA Protein Assay, A53225, Thermo Fisher).

3.2.5. Sample preparation for mass spectrometry-based proteomics

An aliquot of retinal lysates (200 μ g) was reduced with 20 mM dithiothreitol (DTT) at 95 °C for 10 minutes and then alkylated with 40 mM iodoacetamide (IAA) at room temperature in the dark for 10 minutes. The SDS lysate was acidified with 12% aqueous phosphoric acid, 1:10 (v/v), to a final concentration of 1.2%. The solution was then diluted with S-Trap protein binding buffer (90% methanol, 0.1 M TEAB, pH 7.55) at a 6:1 ratio (v/v, S-Trap: total volume). The mixture was transferred to the S-Trap micro spin column and centrifuged at 4,000 g for 20 seconds. The captured protein was

washed with 150 μL of S-Trap protein binding buffer, and the centrifugation steps were repeated three times. Protein digestion was performed using 20 μL of digestion buffer containing trypsin at a 1:25 ratio (w/w, trypsin:protein), added to the top of the microcolumn, and incubated at 47 °C for 1 hour. Peptides were eluted in three sequential steps: (1) 40 μL of 50 mM TEAB; (2) 40 μL of 0.2% aqueous formic acid; and (3) 35 μL of 50% acetonitrile with 0.2% formic acid. The three eluents were pooled and dried by vacuum centrifugation at 4 °C (Labconco, Kansas City, MO, USA). Peptides were re-suspended in 20 μL of 0.1% formic acid (FA) for fractionation.

3.2.6. High-pH reversed-phase peptide fractionation

Peptides (100 μg) were diluted to 300 μL with 0.1% trifluoroacetic acid. Fractionation was performed as described in the manufacturer's manual (Cat No. 84868, Thermo Fisher Scientific). In brief, retina samples were fractionated with six increments of acetonitrile (ACN) in 0.1% TFA: 5%, 7.5%, 10%, 12.5%, 15%, and 17.5%. These eluents were dried using a vacuum centrifuge at 4 °C. Peptide concentration was measured using a colorimetric peptide assay (Cat No. 23275, Thermo Fisher Scientific). Peptide samples were normalized to 0.5 $\mu\text{g}/\mu\text{L}$ with 0.1% formic acid in water for mass spectrometric analysis.

3.2.7. Data-dependent acquisition (DDA) of retina samples

Peptides were loaded with isocratic loading buffer (0.1% FA, 5% ACN in water) onto a reversed-phase chromatography trap column (C18, 350 $\mu\text{m} \times 0.5 \text{ mm}$) at 2 $\mu\text{L}/\text{min}$ for 15 minutes. Peptides were separated by a C18 reversed-phase analytical column (Acclaim PepMap 100, C18, 100 \AA , 5 μm , 100 $\mu\text{m} \times 30 \text{ cm}$) at a flow rate of 350 nL/min with the following gradient: 0–0.5 min: 5% B (98% ACN, 0.1% FA); 0.5–90 min: 10% B; 90–120 min: 20% B; 120–130 min: 45% B; 130–135 min: 45% B; 135–141 min: 80% B and 20% buffer A (2% ACN, 0.1% FA); 141–155 min: 5% B. Peptides were introduced into the mass spectrometer (Sciex TripleTOF 6600) via a SilicaTip electrospray

emitter (New Objective, FS360-20-10-N-20-C12, 10 μm) controlled by nano-flow liquid chromatography (NanoLC 415, Eksigent). MS1 spectra were obtained from 350 to 1800 m/z. The top 50 ions exceeding a threshold of 125 cps, with charge states from +2 to +5 in each cycle, were selected using an accumulation time of 250 ms and a dynamic exclusion time of 18 s. Precursor peptides were fragmented by collision-induced dissociation (CID) with rolling collision energy for peptides with charge 2+, and a collision energy spread of 15 eV was applied.

3.2.8. Generation of spectral library for data-independent acquisition (DIA)

Raw data files from all fractions were analyzed using ProteinPilot 5.0.1 software (SCIEX, USA). The *Mus musculus* (mouse) proteome database, containing 17,015 reviewed proteins, was acquired from the UniProt proteome dataset UP000000589. Trypsin was set as the enzyme for digestion, and Carbamidomethylation was set as a fixed modification, with all possible biological modifications selected. FDR analysis was performed by searching MS/MS spectra against a target database combined with a reverse-sequence decoy proteome database. Peptide samples were injected in volumes between 4 and 6 μL , ranging from 1.2 to 2 μg due to varying peptide concentrations.

3.3. Results

3.3.1. Ocular parameters in normal C57BL/6 mice

The nocturnal mouse model has the potential to become an important model for studying genetic and proteome alterations in the control of eye growth and myopia. The proteome dataset was built using untouched, normal C57BL/6 mice at postnatal age (days) P46. Biometric measurements were performed at ages P25, P32, P39, and P46, respectively (Table 3). Interocular differences were analyzed for each ocular component: corneal thickness, anterior chamber depth, lens thickness, vitreous chamber depth, and retinal thickness (Fig. 15). Axial length growth and lens thickness could be described by linear regressions. The observed constant growth rate in the C57BL/6 mouse was

similar to that previously reported¹⁰⁶. The observed axial length of about 2.9 mm on day 22 was consistent with values reported in a study measuring from age 22 to 100 days in C57BL/6 mice¹⁰⁷. Despite similar axial lengths, there were noticeable differences in the distribution of other components, with a thicker corneal layer (0.0887 mm on P21) and increased anterior chamber depth (0.2854 mm on P21). However, no statistically significant differences were observed in axial length, corneal thickness, anterior chamber depth, lens thickness, vitreous chamber depth, or retinal thickness from age 25 to 46. The interocular difference was calculated by averaging and subtracting the dimension of the contralateral eye at the same time point.

Table 3. Dimension of ocular compartments between ages 25 and 46.

Rx = refraction in diopters; AXL = axial length (mm); CT = corneal thickness (mm); ACD = anterior chamber depth (mm); LT = lens thickness (mm); VCD = vitreous chamber depth (mm); RT = retinal thickness (mm).

| Age | P25 | P32 | P39 | P46 |
|-----------------|------------|-----------|-----------|-----------|
| Rx (D) | -3.2 ± 2.5 | 3.1 ± 7.6 | -0.1 ± 4 | 2.4 ± 6.4 |
| AXL (µm) | 3066 ± 62 | 3124 ± 38 | 3218 ± 35 | 3279 ± 21 |
| CT (µm) | 98 ± 10 | 85 ± 15 | 96 ± 8 | 98 ± 9 |
| ACD (µm) | 260 ± 20 | 324 ± 9 | 344 ± 16 | 355 ± 28 |
| LT (µm) | 1779 ± 19 | 1848 ± 19 | 1911 ± 15 | 1969 ± 20 |
| VCD (µm) | 755 ± 50 | 680 ± 23 | 701 ± 19 | 689 ± 8 |
| RT (µm) | 181 ± 11 | 192 ± 9 | 172 ± 10 | 172 ± 13 |

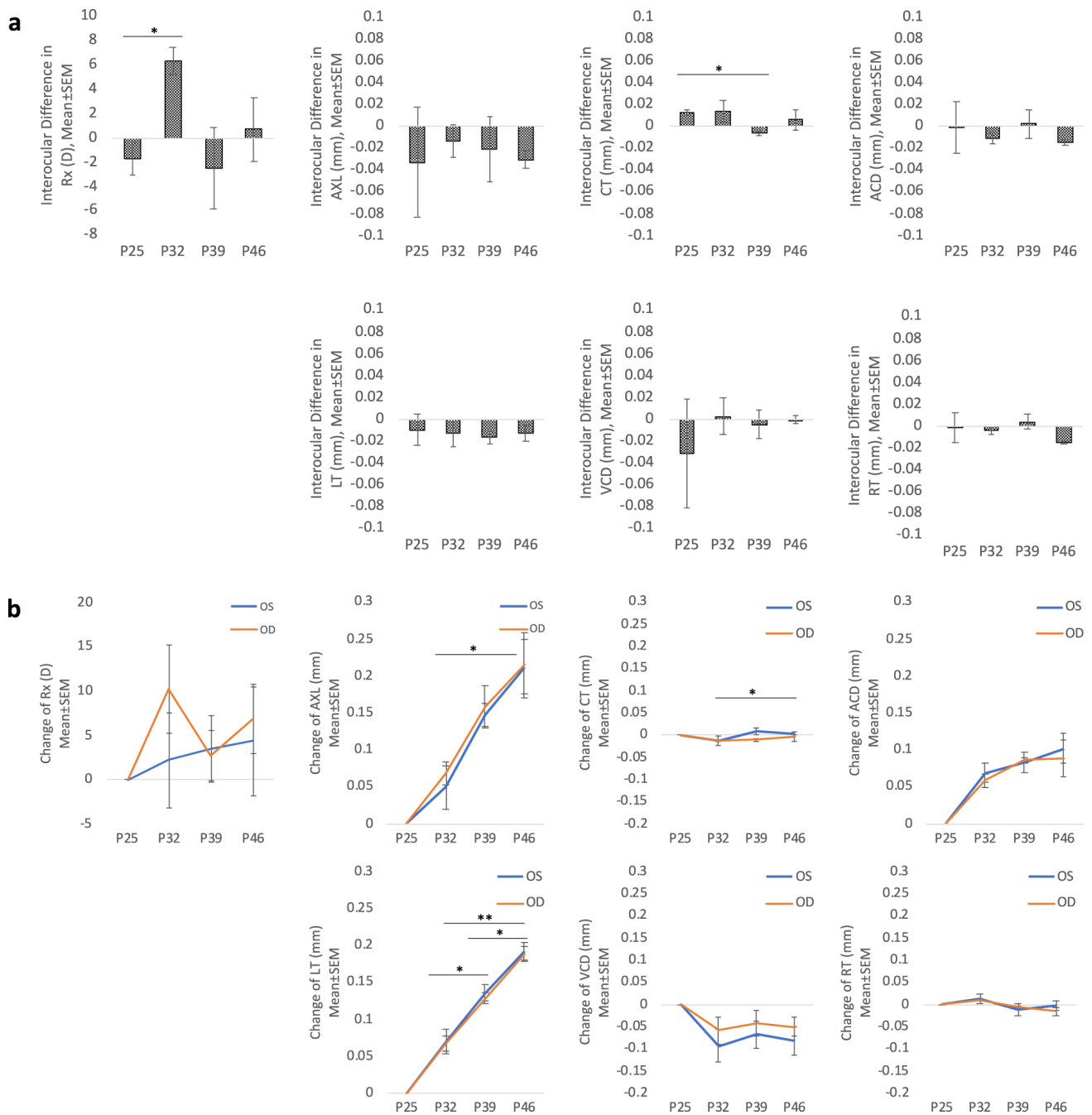


Fig. 15: Ocular dimensions in normal growing C57BL/6 mice between postnatal days 25 and 46. Changes in ocular structures in normal growing C57BL/6 mice in Rx, AXL, CT, ACD, LT, VCD, and RT. **a)** Interocular differences in each component at P25, P32, P39, and P46. Significant intraocular differences were observed in refraction at P32 and corneal thickness at P39 ($n = 3$, $p < 0.05$). **b)** Significant relative elongation in axial length (mm) and lens thickness (mm) at all time points ($n = 3$, $*p < 0.05$; $**p < 0.01$).

3.3.2. Characteristics of the mice's retinal proteome

The combination of S-Trap protein extraction and high-pH peptide fractionation procedures allowed for rapid and reproducible sample preparation of mouse retinas. This dataset represents the first application of the S-Trap protocol to retinal samples for biological investigation using the SWATH-MS approach. The overall characteristics of the generated DDA spectral library are presented. Enzymatic digestion efficiency was demonstrated by the identification of 78.2% canonical sequence peptides, 5% over-cleaved peptides, and 15.8% under-cleaved peptides. Additionally, the distribution of peptide precursor charge states showed a predominance of doubly charged ions at 60%, with the remainder distributed across higher charge states up to 5+. The tryptic digestion resulted in cleavage at the C-terminus with 46% and 52% specificity for lysine and arginine, respectively (Fig. 16a). The identified peptide sequence mass-to-charge values and their retention times during C18 chromatographic separation are shown (Fig. 16b). The strong correlation observed between MS1 intensity and identified peptide signal, as well as the good correlation between MS2 signals and their corresponding MS1 intensities, demonstrates the robustness of the mass spectrometry system in ion transmission. This consistent relationship enhances confidence in the quality of MS2 peptide mass fingerprint spectra (Fig. 16c).

The tryptic digestion yielded uncontrolled C-terminal cleavage, with 46% and 52% corresponding to lysine (K) and arginine (R) residues, respectively. The peptide charge states ranged from +2 to +5, with the majority (60%) of peptides found in the +2 charge state. The instrument was maintained for high mass accuracy and showed a positive correlation in ion intensity between MS1 and MS2. The false discovery rate (FDR) was controlled at 1% at both the protein and peptide levels using ProteinPilot (SCIEX, US), a stringent community standard in proteomics assays. FDR cut-offs at 1%, 5%, and 10% were applied, along with nonlinear fitting of ranked proteins, ROC plots of identification, and estimated FDR at the protein and peptide levels (Fig. 17a-b). At the 1% FDR cut-

off, the dataset identified 5,950 proteins and 54,865 peptides. The total ion chromatogram and heatmap of ion intensity were acquired during a 120-minute gradient separation. Individual analysis of fractions 1 to 6 identified 2,721, 4,325, 4,800, 4,391, 3,847, and 3,766 unique proteins at 1% FDR, respectively (Fig. 17c). This high-confidence retina proteome dataset represents the first and largest DDA spectral library, at the time of submission, for eye and vision research using the popular C57BL/6 mouse model.

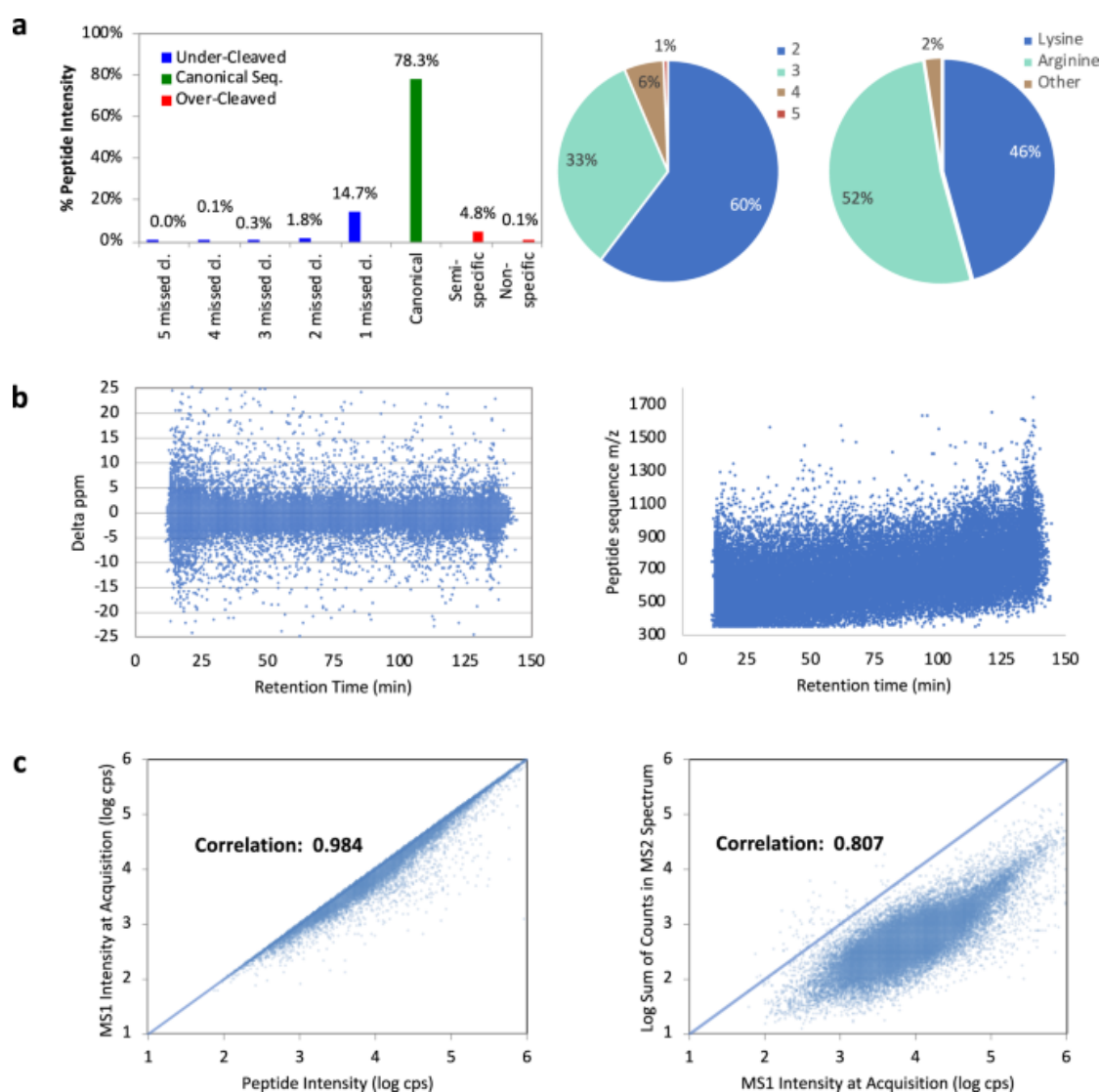


Fig. 16: Statistical analysis of the proteomics data.

a) Enzymatic digestion efficiency showed 78.2% of expected canonical sequence peptides, 5% over-cleaved sequence peptides, and 15.8% under-cleaved sequence peptides; the distribution of peptide precursor charge states included 60% doubly charged, decreasing to +5 accordingly. The tryptic

digestion resulted in uncontrolled C-terminal cleavage, with 46% and 52% corresponding to lysine and arginine, respectively. **b)** Precursor mass error in ppm during acquisition. The identified peptide sequence mass-to-charge values and their retention times in C18 chromatographic separation. **c)** The correlation of MS1 intensity showed good agreement with identified peptide intensity and a strong correlation between MS2 signals and MS1 intensity, demonstrating the robustness of the mass spectrometry system in ion transmission and corresponding confidence in the MS2 peptide mass fingerprint spectrum.

a Protein-Level FDR Analysis

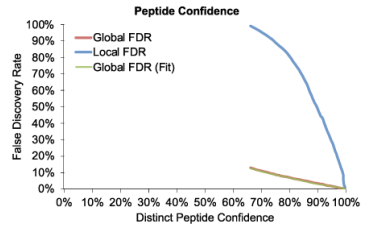
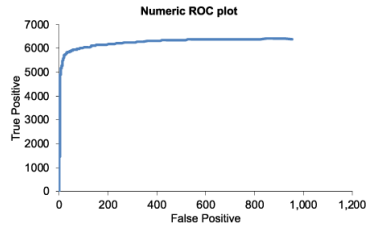
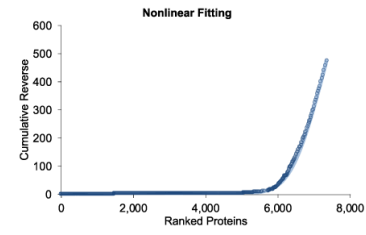
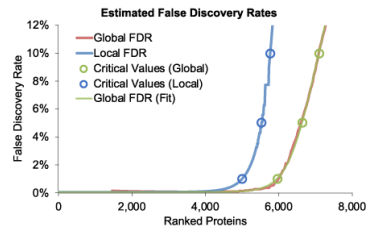
Proteins Identified at Critical False Discovery Rates

| Number of Proteins Detected | | | |
|-----------------------------|-----------|------------|-------------------|
| Critical FDR | Local FDR | Global FDR | Fitted Global FDR |
| 1.0% | 5,001 | 5,991 | 5,950 |
| 5.0% | 5,528 | 6,598 | 6,628 |
| 10.0% | 5,764 | 7,350 | 7,089 |

Correspondence between FDR Levels and ProteinPilot Reported Confidences

| Corresponding ProteinPilot Confidence | | | |
|---------------------------------------|-----------|------------|-------------------|
| Critical FDR | Local FDR | Global FDR | Fitted Global FDR |
| 1.0% | 99.7% | 97.0% | 97.4% |
| 5.0% | 99.1% | 85.9% | 84.9% |
| 10.0% | 98.8% | 73.1% | 72.5% |

| Corresponding Unused ProtScore | | | |
|--------------------------------|-----------|------------|-------------------|
| Critical FDR | Local FDR | Global FDR | Fitted Global FDR |
| 1.0% | 2.56 | 1.53 | 1.59 |
| 5.0% | 2.04 | 0.85 | 0.82 |
| 10.0% | 1.93 | 0.57 | 0.56 |



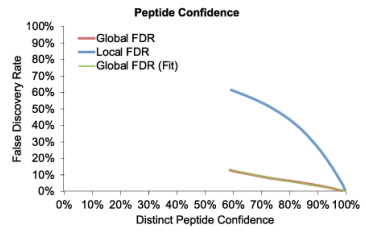
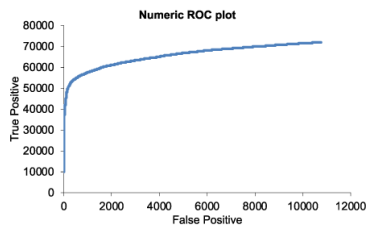
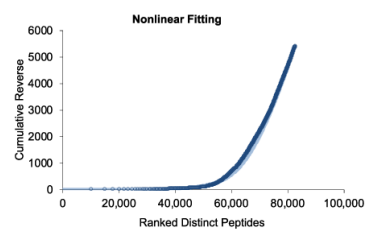
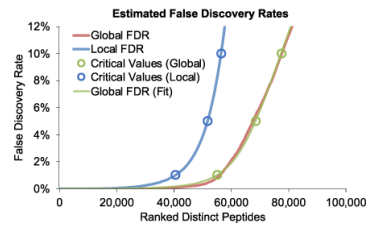
b Distinct Peptide Level FDR Analysis

Peptides Identified at Critical False Discovery Rates

| Number of Peptides Identified | | | |
|-------------------------------|-----------|------------|-------------------|
| Critical FDR | Local FDR | Global FDR | Fitted Global FDR |
| 1.0% | 40,489 | 55,852 | 54,865 |
| 5.0% | 51,673 | 67,574 | 68,377 |
| 10.0% | 56,353 | 82,886 | 77,305 |

Correspondence between FDR Levels and ProteinPilot Reported Confidences

| Corresponding ProteinPilot Confidence | | | |
|---------------------------------------|-----------|------------|-------------------|
| Critical FDR | Local FDR | Global FDR | Fitted Global FDR |
| 1.0% | 99.6% | 97.0% | 97.4% |
| 5.0% | 98.5% | 85.0% | 83.7% |
| 10.0% | 96.7% | 66.8% | 67.2% |



c

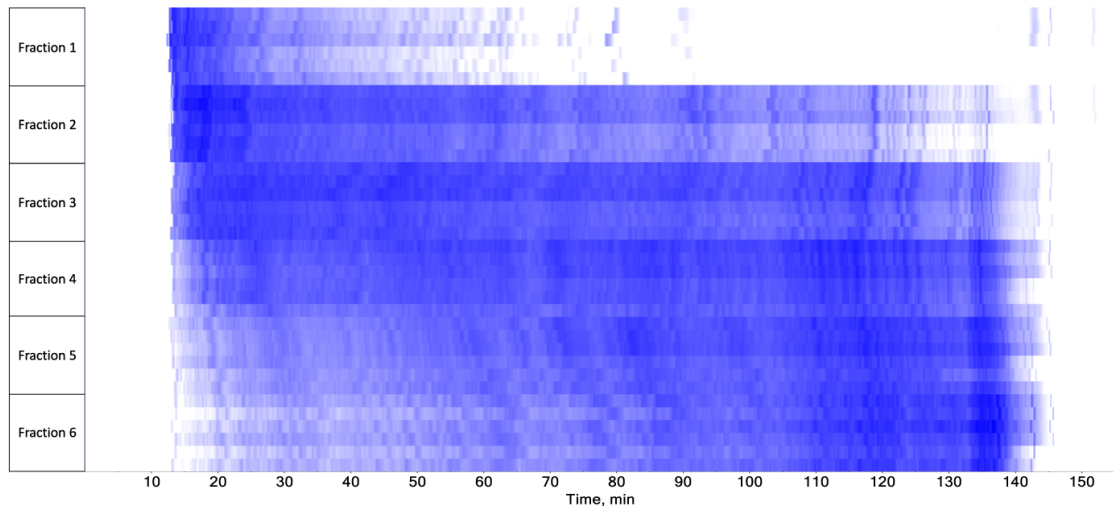
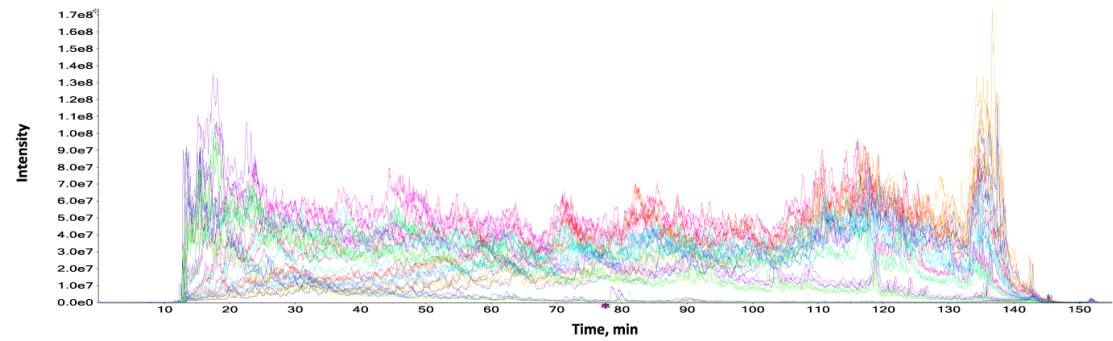


Fig. 17: False discovery rate control and TIC chromatogram.

False discovery rate (FDR) cut-offs were applied at 1%, 5%, and 10% confidence levels. Nonlinear fitting of tracked proteins, ROC curves for identification, and estimated FDR are shown at (a) The protein level and (b) The peptide level. At the 1% FDR threshold, a total of 5,950 proteins and 54,865 peptides were identified. (c) The total ion chromatogram (TIC) and a heatmap of ion intensities were acquired over a 120-minute gradient separation. Individual analyses of fractions 1 through 6 identified 2,721, 4,325, 4,800, 4,391, 3,847, and 3,766 unique proteins, respectively, all at 1% FDR.

3.3.3. Comprehensive Retinal Proteome Knowledge Base in C57BL/6 Mice

To extend knowledge and achieve in-depth retinal proteome coverage in the mouse retina, the protein lysate was fractionated using high-pH reversed-phase chromatography as described in previous sections. For comparison, only 2,306 proteins were identified by single data-dependent acquisition (DDA) in unfractionated retina samples. In contrast, the combined search of all fractionated retina samples resulted in 5,651 unique proteins (1% FDR, n=3, duplicates). In total, 7,122 unique proteins were identified when considering all search results (Fig. 18a). GO enrichment analysis was performed using the PANTHER database. UniProt accessions were mapped to the PANTHER reference proteome set, converting 7,122 proteins to 6,476 (91%). These proteins were categorized into cellular component classifications: cell (2,290, 46%), organelle (1,529, 31%), protein complex (687, 14%), membrane (290, 6%), extracellular (126, 2.5%), cell junction (57, 1.1%), supramolecular complex (14, 0.3%), and synapse (14, 0.3%) (Fig. 18b). Total numbers of protein identifications and their percentage coverage among other fractions are shown (Fig. 18c). The identified 7,122 proteins were also analyzed with the KEGG database; the plot shows the top 30 signaling pathways and the number of associated KEGG entries mapped against the KEGG reference, including MAPK, PI3K-Akt, mTOR, cAMP, insulin, HIF-1, Wnt, and PPAR signaling pathways involved in myopia progression (Fig. 18d). A tabular list of all identified proteins is provided in Appendix 1.

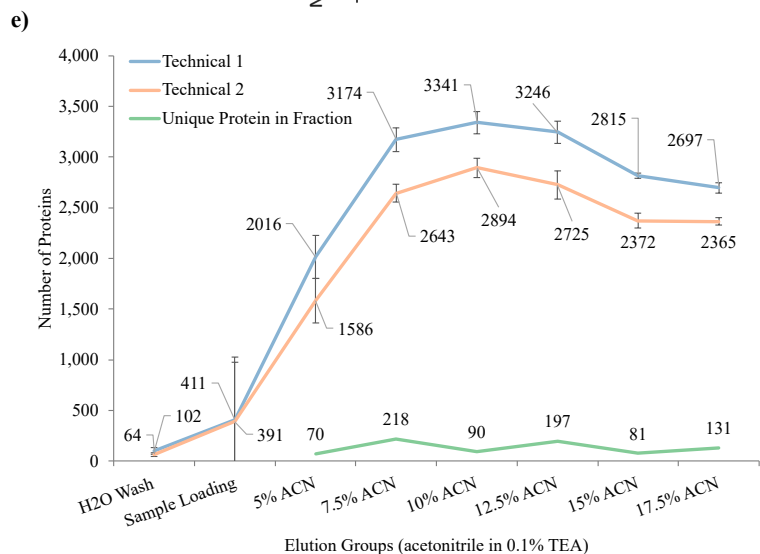
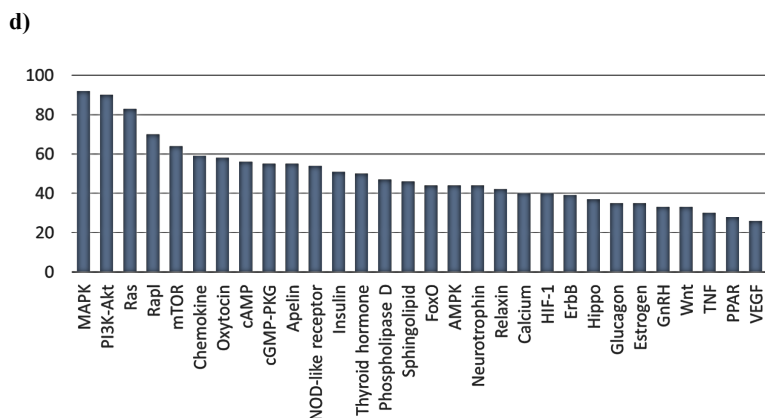
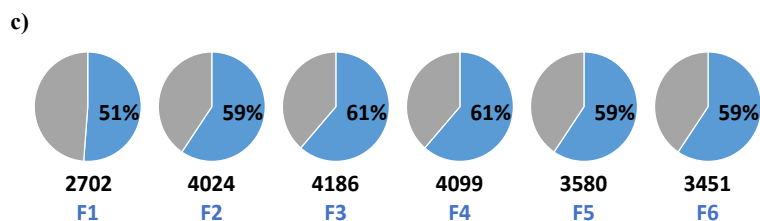
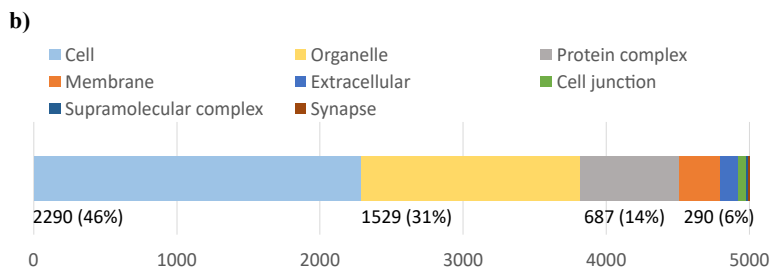
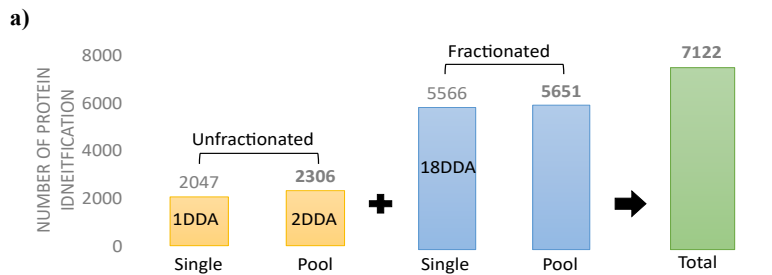


Fig. 18: Proteomic analysis of high-pH fractionated mouse retina.

(a) A total of 7,122 unique proteins were identified, including 2,306 proteins from the unfractionated retina and 5,651 proteins from the fractionated retina. (b) Gene Ontology (GO) enrichment analysis was performed using the PANTHER database. UniProt accession IDs were mapped to the PANTHER reference proteome, resulting in 6,476 gene targets (a 91% conversion rate). The distribution of cellular components included Cell (2,290; 46%), Organelle (1,529; 31%), Protein complex (687; 14%), Membrane (290; 6%), Extracellular (126; 2.5%), Cell junction (57; 1.1%), Supramolecular complex (14; 0.3%), and Synapse (14; 0.3%). (c) Total number of non-redundant proteins (1% FDR) identified per fraction (n=3 replicates) and the percentage of proteins shared between fractions. (d) KEGG pathway analysis identified the top 30 signaling pathways, including MAPK, PI3K-Akt, mTOR, cAMP, insulin, HIF-1, Wnt, and PPAR pathways implicated in myopia progression. (e) Scatter plot showing the number of proteins identified under various elution conditions, from H₂O wash and sample loading to increasing volumes of acetonitrile in 0.1% TEA during high-pH fractionation.

3.4. Discussion

The generation of mass spectrometry spectral libraries is critical for the analysis of data-independent acquisition (DIA) methods, such as SWATH-MS¹⁰⁸. In addition to organism-specific spectral libraries, collections from several tissue types serve general applications⁴³. This study presents the most comprehensive data-dependent acquisition (DDA) spectral library for the C57BL/6 mouse retina, encompassing 5,950 non-redundant proteins and 54,865 peptides at a 1% false discovery rate (FDR). The first mouse retinal spectral library accounts for approximately 35% of the total reviewed proteins in the UniProt database for mice (*Mus musculus*). Several approaches can greatly improve the quality of spectral libraries, such as gas phase fractionation¹⁰⁹ strong cation exchange (SCX) fractionation¹¹⁰, high-pH reversed-phase fractionation¹¹¹, and multidimensional fractionation¹¹². Here, the integration of high-pH offline fractionation with filter-aided sample preparation (FASP), where S-

Trap enabled straightforward sample preparation and an optimized workflow, helped uncover the retinal proteome complexity for biologists. The implementation of offline high-pH reversed-phase peptide fractionation achieved two-dimensional fractionation without compromising instrument acquisition time¹¹³. Moreover, a spectral library built from a sample size of comparable scale improves proteome coverage of low-abundance proteins¹¹⁴. This suggests that this retinal spectral library will benefit most studies with similar sample sizes more than a large organism spectral library repository¹¹⁵. This is particularly important in ocular research, where variations in protein expression can directly impact our understanding of retinal physiology and disease mechanisms due to the multilayered nature of the retina¹¹⁶. The substantial number of proteins identified in this study provides a foundational reference for future investigations into retinal diseases, including diabetic retinopathy,¹¹⁷ age-related macular degeneration¹¹⁸, and myopia¹¹⁹. Given that the retina is a complex tissue with diverse cell populations, the ability to identify and quantify such a wide array of proteins will facilitate deeper insights into the molecular pathways involved in these conditions.

3.5. Conclusion

This comprehensive DDA spectral library represents a significant advancement in retinal proteomics. It provides an invaluable resource for understanding the complex protein landscape of the mouse retina and serves as a foundational tool for future studies aimed at elucidating the molecular mechanisms underlying retinal diseases. As exploration of the proteomic intricacies of the retina continues, this library will undoubtedly facilitate discoveries that could lead to improved diagnostic and therapeutic approaches for ocular conditions.

Chapter 4. Deep Quantitative Spectral Library of Normal and Myopic Mice Retinas: Proteomics

Datasets from SWATH-MS and DIA-NN

4.1. Introduction

The neural retina is a light-sensitive tissue composed of 10 morphological layers connected by neuronal synapses. The complexity of the retinal proteome is evident from the presence of six major cell types characterized by marker expressions in rods (Pde6a), cones (Pde6c), bipolar cells (Vsx2), amacrine cells (Pax6), Müller glia cells (Vim), horizontal cells (Onecut1), and retinal ganglion cells (Slc17a6), as well as from 38 retinal clusters identified by single-cell transcriptomics¹²⁰. However, the lack of retinal cell lines comparable to the neural retina has hindered research in myopia and other retinal or neurological diseases, with only limited ocular cell lines available for retinal pigment epithelium (RPE)^{121,122}, including the ARPE-19 and D407 lines; retinal ganglion cell line RGC-5^{123,124}, and cone photoreceptor cell line 661W¹²⁵. Therefore, understanding the retinal profile in normal and myopia development is crucial for investigating retinal proteins in myopia⁸⁵ and retinal diseases¹²⁶⁻¹²⁸. Additionally, the retina has emerged as a potential gateway for screening and monitoring neurological diseases such as Alzheimer's disease¹²⁹⁻¹³², schizophrenia^{133,134}, and Parkinson's disease^{135,136}.

Sequential window acquisition of all theoretical mass spectra (SWATH-MS) is a specific variant of data-independent acquisition (DIA) that enables consistent, reproducible quantitative proteomics results^{70,137}. Traditional DIA workflows require tissue-specific spectral libraries with extensive proteome coverage generated through fractionation techniques such as high-pH reversed-phase peptide fractionation¹³⁸, strong cation-exchange (SCX) chromatography¹³⁹, or gas-phase fractionation¹⁴⁰. In a previous study, a retinal-specific spectral library was generated using high-pH reversed-phase peptide fractionation, consisting of 5,609 proteins and 50,776 peptide sequences, acquired through data-dependent acquisition (DDA) on the TripleTOF 6600 mass spectrometer (Q-TOF, Sciex)⁷⁷. However, recent advancements have introduced a library-free approach^{109,141,142}, for

DIA analysis facilitated by DIA-NN¹⁴³. DIA-NN utilizes neural networks to search the in-silico protein digestion of the reference proteome, an approach previously introduced^{141,142}. This method eliminates the prerequisite spectral library and enables flexibility in analyzing DIA data from different mass spectrometry vendors and software tools. Recent studies have demonstrated the superior performance of DIA-NN compared to other software, supporting various raw data and spectral library formats^{143,144}.

This study demonstrates deep proteome identification and quantification without fractionation during myopia development, resulting in an average of $6,263 \pm 86$ unique protein groups, surpassing the reported spectral libraries prepared through fractionation with quantitative analysis in individual mouse retinas. Furthermore, a comprehensive mouse retinal-specific spectral library was generated using DIA-NN, comprising a total identification of 9,401 protein groups, 70,041 peptides, 95,339 precursors, and 761,868 transitions. This retinal-specific spectral library is comparable to spectral libraries derived from multiple organs with 11,000 proteins but lacking eye tissues in mice¹⁰¹ and guinea pigs¹⁰². Additionally, it is also comparable to the spectral libraries generated from multiple rabbit eye tissues prepared through high-pH reserved-phase fractionation¹¹⁸. This dataset demonstrates proprietary protocols for protein analysis of the murine retina utilizing simple, ultrafast sample preparation with S-Trap¹⁰³, robust quantification via SWATH-MS, and a library-free approach with the MaxLFQ algorithm¹⁴⁵ using DIA-NN. The in-depth retinal-specific spectral library will significantly contribute to a better understanding of the proteome complexity of the neural retina and will serve as an indispensable reference for investigating retinal proteomes in myopia research and other retinal or neurological diseases.

4.2. Method

4.2.1. Animals

Black C57BL/6J wild-type mice were obtained from The Jackson Laboratory (Farmington, CT, USA). Mice were maintained as in-house breeding colonies at the centralized animal facility of The

Hong Kong Polytechnic University. Animals were housed in standard mouse cages (Sealsafe Plus GM500, Tecniplast, Varese, Italy) at a temperature of 25 °C with a 12:12 hour light/dark cycle in a room with a light intensity of 150 lux. Food and water were provided ad libitum. Mice were weaned on postnatal day 21 and housed until postnatal day 35. All procedures performed in this study received ethics approval from the Animal Subjects Ethics Sub-Committee (ASESC) of The Hong Kong Polytechnic University and complied with the Association for Research in Vision and Ophthalmology (ARVO) statement on the use of animals in ophthalmology and vision research.

4.2.2. Lens-induced myopia in C57BL6/J mice

For all procedures in mice, including fixation of the spectacle system, refractive error, and ocular biometric measurements, anesthesia was administered. Briefly, the pupil of each eye was dilated with Mydrin-P ophthalmic solution, which contains 0.5% tropicamide and 0.5% phenylephrine HCl, for 15 minutes. The mouse was then sedated through an intraperitoneal injection of a mixture of ketamine (70 mg/kg) and xylazine (10 mg/kg). The customized spectacle system, previously described in a publication, was assembled onto the frame in advance⁹⁰. A randomized eye received unilateral lens-induced myopia (LIM) treatment from postnatal day 21 to 35. Ocular biometrics were measured at P21, P28, and P35 using an infrared photorefractor and SD-OCT.

4.2.3. Ocular biometric measurements in mice

The eccentric infrared photorefractor was purchased from the manufacturer (Steinbeiss-Transfer Centre for Biomedical Optics, Tuebingen, Germany) and used according to the user manual³⁰. Refractive errors were acquired by aligning to the Purkinje image from the corneal reflection, known as P1, using software-controlled gaze control in the x- and y-axes, with a tolerance of 5 or less. Additionally, each measurement was carefully adjusted to be as close as possible to zero on both the x- and y-axes, collecting 99 measurements per eye. The measurement was represented as the mean

value in diopters \pm SD and repeated in triplicate. The ocular dimension was measured in radial volume mode, with duplicate measurements (A-scans = 1000 lines, B-scans = 6, 32 frames, 80 lines of inactive A-scans, 0.4 mm diameter). The length of each component was represented as the mean value in micrometers. Spectral domain-optical coherence tomography (SD-OCT, Envisu R4310, Leica, Germany) equipped with a 50° probe for mice was used to measure the segmented ocular dimensions. After each SD-OCT measurement, the mice were reset to the default position, and duplicate measurements were acquired. Ocular segmentation was manually analyzed using a digital caliper in OCT data analysis software (InVivoVue, ver. 2.4, Leica). Axial length (AL) was represented as the depth from the corneal surface to the retinal pigment epithelium layer.

4.2.4. Tissue homogenization and protein extraction

Retinas (n=22) of age-matched mice at postnatal day 21 were individually homogenized using a liquid nitrogen-cooled tissue homogenizer (Precellys Evolution, Bertin Instruments). The homogenization was performed with 250 μ L of lysis buffer containing 5% sodium dodecyl sulfate (SDS) and 50 mM triethylammonium bicarbonate (TEAB) for the mouse retina, while 350 μ L of lysis buffer was optimized for the chick retina. The sample was homogenized at 7,000 rpm for 30 seconds \times 4 cycles with 20-second intervals at 4 °C in a homogenization tube (CKMix, Bertin Instruments, France). After homogenization, the sample was briefly centrifuged, and the supernatant was transferred to a new 1.5 mL Eppendorf tube. It was then centrifuged at 15,000 rpm for 30 minutes at 4 °C. The protein concentration was determined using the bicinchoninic acid assay (Pierce Rapid Gold BCA Protein Assay, A53225, Thermo Fisher Scientific).

4.2.5. Mass spectrometry sample preparation

The protocol was adopted from a previous publication and followed the manufacturer's procedure^{77,103}. Suspension trap columns (S-Trap micro, Protifi, USA) were purchased for the

experiment. A total of 50 µg of protein was reduced with a final concentration of 20 mM dithiothreitol (DTT) at 95 °C for 10 minutes. After cooling to room temperature, the protein was alkylated with a final concentration of 40 mM iodoacetamide (IAA) at room temperature in the dark for 10 minutes. The SDS lysate was acidified with a final concentration of 1.2% aqueous phosphoric acid. The solution was diluted using six volumes of protein binding buffer (90% methanol, 0.1 M TEAB, pH 7.5). The mixture was loaded onto an S-Trap spin column and centrifuged at 4,000 g for 20 seconds. The captured protein was washed with 150 µL of protein binding buffer and centrifuged at 4,000 g for 20 seconds. This washing step was repeated three times. Protein digestion was performed by adding 20 µL of digestion buffer (50 mM TEAB) containing trypsin (V5111, Promega, USA) at a ratio of 1:25 (w/w, trypsin:protein) to the filter, and the mixture was digested at 47 °C for 1 hour. Peptides were eluted in three sequential steps: 40 µL of 50 mM TEAB, 40 µL of 0.2% aqueous formic acid (FA), and 35 µL of 0.2% FA in 50% acetonitrile. The three eluted peptide solutions were pooled and lyophilized using vacuum centrifugation at 4 °C (CentriVap, Labconco, USA). The peptides were then resuspended in 20 µL of 0.1% FA. The peptide concentration was measured and normalized to 0.5 µg/µL with 0.1% FA solution using a colorimetric peptide assay (Cat. No. 23275, Thermo Fisher Scientific) for mass spectrometric analysis.

4.2.6. Data-independent acquisition of the mouse retina proteome

Peptides (1 µg) were acquired in duplicate using SWATH-MS mode on the Sciex ZenoTOF 7600 mass spectrometer (Concord, Ontario, Canada). The MS1 survey scans were acquired from 350 to 1800 Da with an accumulation time of 50 ms. Precursors were fragmented in CID mode and measured using 100 variable windows ranging from 350 to 1800 Da with a 25 ms accumulation time and rolling collision energy (Appendix 2). The 100 variable windows were determined based on frequencies in DDA acquisition of the mouse retina sample using the SWATH variable window calculator (Ver. 1.2, Sciex). Peptides were loaded with isocratic loading buffer (2% ACN, 0.1% FA)

onto a reversed-phase chromatography trap column packed with 5 μm particles, 180 μm \times 20 mm (nanoEase M/Z Symmetry C18, Waters) at a flow rate of 3 $\mu\text{L}/\text{min}$ for 15 minutes. Chromatographic separation was performed using a C18 reversed-phase analytical column with 1.8 μm particles, 75 μm \times 200 mm (nanoEase M/Z HSS C18 T3, Waters) at a flow rate of 0.3 $\mu\text{L}/\text{min}$. The following gradient was used: 0–0.5 min: 5% B (ACN, 0.1% FA); 0.5–90 min: 10% B; 90–120 min: 20% B; 120–130 min: 28% B; 130–135 min: 45% B; 135–141 min: 80% B; and finally equilibration between 141–155 min with 5% B using mobile phase A (0.1% FA, deionized water). Nano-microscale liquid chromatography was performed using the ACQUITY UPLC M-Class system (Waters). The column outlet was connected to an OptiFlow Turbo V ion source equipped with a NanoSpray probe (Cat. No. 5029431, Sciex).

4.2.7. Quantitative analysis and generation of the retinal-specific spectral library

The raw data files in .wiff format were analyzed using DIA-NN (ver. 1.8.1) in library-free mode with default settings. The analysis was performed in “robust LC (high precision)” mode with precursor m/z values ranging from 300 to 1800, precursor charges between 1 and 4, MS1 and MS2 accuracy set to 20 ppm, and 10 scan windows. The match-between-run (MBR) option was enabled¹⁴³. Protein quantification was carried out using the MaxLFQ algorithm implemented in the software. Protein identities were assigned by searching against the *in silico* tryptic digestion using the UniProt *Mus musculus* reference database (UP000000589, 17,173 reviewed proteins, Oct 2023).

4.3. Data Record

The mass spectrometry proteomics data have been deposited to the ProteomeXchange Consortium via the PRIDE¹⁴⁶ partner repository with the dataset identifier PXD046983¹⁴⁷. Each run is identified by its date, unique reference number, eye (OS/OD), treatment group (LIM/CTL), and technical replication (T1/T2). This structured file name can be easily expanded into columns using the

delimiter. Each uploaded raw file consists of four native types: .wiff, .wiff2, .wiff.scan, and .timeseries.data from the Sciex mass spectrometer. Additionally, each raw file is accompanied by a .wiff.quant file generated by the software DIA-NN. Three .tsv file-based outputs are generated from the dataset. The library.tsv file contains the mass spectrometry-based spectral library. The report.pg_matrix.tsv file contains all protein groups found by searching the associated raw file. The report.pr_matrix.tsv file contains aggregated evidence for each identified peptide. The matrix.tsv file contains a matrix table that expands both horizontally by sample and vertically by protein group or peptide. The number of rows and columns in the matrix is determined by the number of unique values in the specified fields and is represented as intensity computed by the MaxLFQ algorithm. Users can also refer to the developer manual on GitHub (<https://github.com/vdemichev/DiaNN>) for more information.

4.4. Results

4.4.1. Reassembly of axial elongation during myopia progression

Mice were subjected to unilateral -30 diopter spectacle treatment, while the contralateral eye served as an age-matched control from P21. Ocular biometric measurements were conducted on P21 (n=11), P28 (n=6), and P35 (n=5) to assess changes in the eyes. As expected, there were no significant differences in axial length between the treated and control eyes on P21 (Fig. 19a). After one week of LIM treatment, a statistically significant increase in axial length was observed at P28, with a mean difference of 31 μm ($p < 0.01$) (Fig. 19b). This difference further increased after two weeks of LIM treatment at P35, with a mean difference of 41.4 μm ($p < 0.05$) (Fig. 19c). Similarly, there were no significant differences in refractive error between eyes at P21 (Fig. 19d). However, a significant difference in refractive error was observed after one week of LIM treatment at P28, with a mean difference of -7.1D ($p < 0.01$) (Fig. 19e). This difference persisted and further developed after two weeks of LIM treatment at P35, with a mean difference of -10.1D ($p < 0.01$) (Fig. 19f). Statistical

analysis was performed using a paired Student's t-test with Prism software (ver. 9.5). These results resemble those expected, showing that unilateral LIM treatment induces significant axial elongation after one and two weeks of manipulated optical defocus, supporting the model of myopia and therefore the acquired library of normal and myopic retinal proteomes

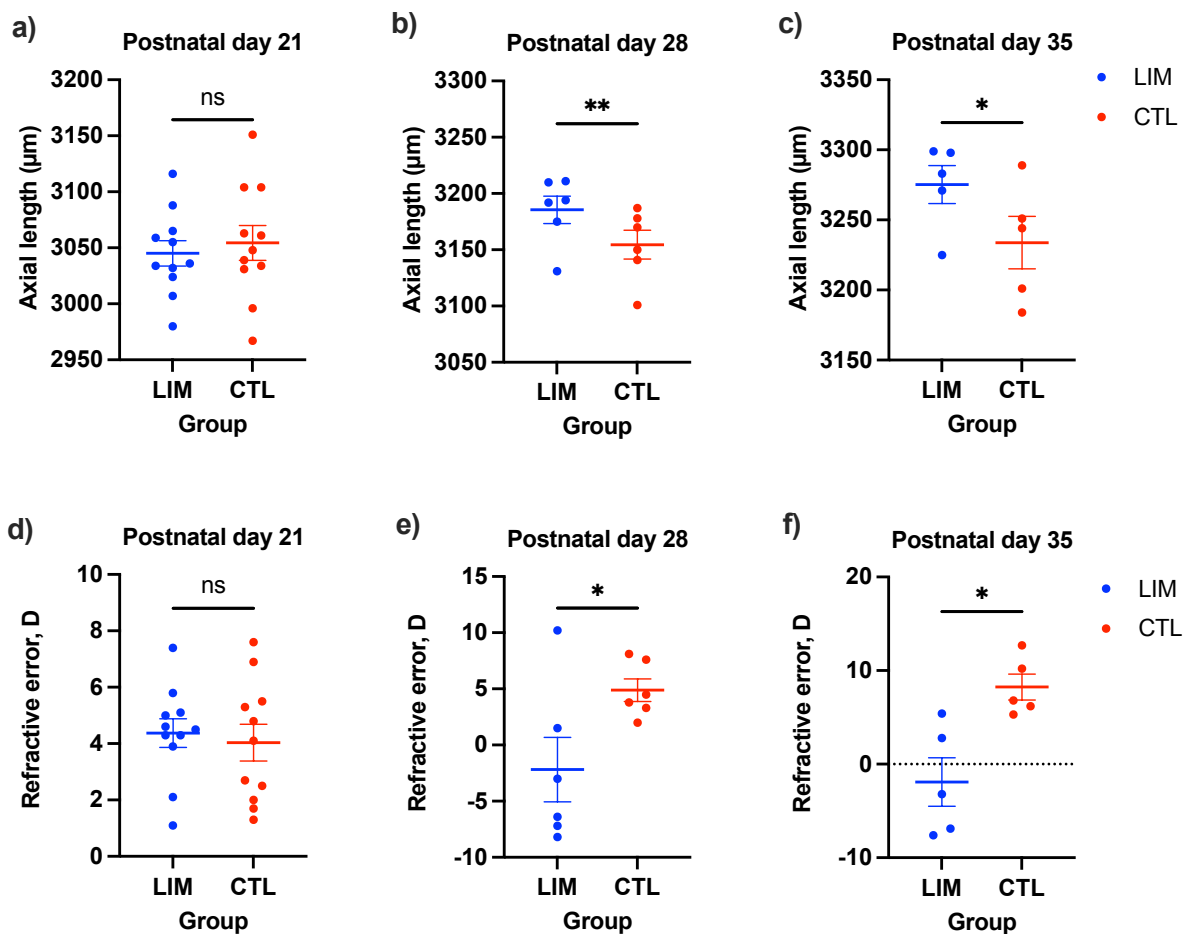


Fig. 19: Ocular biometric measurements.

Scatter plots of axial length at postnatal days a) P21, b) P28, and c) P35 are shown. Refractive error measurements in diopters at d) P21, e) P28, and f) P35 for eyes treated with LIM (blue) and contralateral control eyes (red) are presented as mean \pm SEM. Statistical analyses were performed using paired Student's t-tests. Statistical significance levels are indicated as * for $p \leq 0.05$, ** for $p \leq 0.01$, and ns for not significant.

4.4.2. Intra-batch performance, precision, and reproducibility

The analysis of mouse retinas revealed 6,586 unique protein groups quantified with a 1% false discovery rate (FDR), accounting for 38% of the reference proteome (UP000000539), which contains 17,173 reviewed proteins annotated in the UniProt database (Fig. 20a). There were 68,396 unique peptide sequences, with 93,688 precursors identified in the mouse retina (Fig. 20b). The in-depth analysis allowed for consistent quantification of the retinal proteome, with an average of $6,263 \pm 86$ unique protein groups in individual mouse retinas (Fig. 20c). These results suggest that the method preserved the quantitative features of the majority of proteins. The software-computed 1% FDR cut-off was applied to individual samples, resulting in the identification of 5,512 out of 6,586 (83.7%) proteins in all samples acquired in duplicate (Fig. 20d). The coefficient of variation (CV) analysis demonstrated that proteins quantified with three or more peptides had the least variation, with a mean CV of 6.6% and median of 5.1%. Proteins with only two peptides showed increased CV, with a mean of 16.5% and median of 15.8%, while proteins quantified with only one peptide had a mean CV of 18% and median of 16.5% (Fig. 20e). To evaluate quantitative robustness, variance analysis was performed, revealing that 6,190 (94%) of the proteins quantified had CV values below the 20% threshold (Fig. 20f). The distribution of protein fold-change between technical replicates varied depending on the number of identified peptides. Proteins quantified with ≥ 3 peptides exhibited the least variation ($\text{Log}_2\text{FC} \pm \text{SD}$: -0.02 ± 0.07), while those with 2 peptides showed slightly higher variation ($\text{Log}_2\text{FC} \pm \text{SD}$: -0.04 ± 0.16), and proteins quantified with only 1 peptide showed the largest variation ($\text{Log}_2\text{FC} \pm \text{SD}$: -0.02 ± 0.22) (Fig. 20g,h). The method quantified 5,584 (84.8%) proteins with ≥ 3 peptides, 609 (9.2%) proteins with 2 peptides, and 393 (6%) proteins with only 1 peptide (Fig. 20i). These results highlight the high proteome coverage and robust quantification achieved through the library-free approach for proteins with ≥ 3 peptide identities per protein. Among the 93,688 precursors, charge states ranged from +1 to +4, with a predominance of +2 and +3 charges (Fig. 20j). Peptide lengths ranged from 7 to 26 amino acids, with peptide masses between 612 and 2,822 Da, and precursor m/z

values between 315 and 1,101 (Fig. 20k-m). The protein fold-change histogram revealed that most proteins (5,342, 81.5%) exhibited minimal differences between technical replicates, with fold-change values (Log₂) ranging from -0.1 to 0.1 (Fig. 20n). The uniformly distributed protein abundances in retinal tissues acquired in technical duplicate demonstrated no significant differences in intra-batch variation between acquisitions (Fig. 21a). Similarly, there was no significant distortion of the average protein intensity in each retinal tissue (Fig. 21b). Finally, protein fold changes showed that the majority of proteins were unchanged, with Log₂FC values ranging from -0.104 to +0.101 in the 5–95% percentile range (Fig. 21c). These findings provide valuable insights into the retinal proteome associated with lens-induced myopia, demonstrating the robustness and coverage of our developed quantitative proteomics approach.

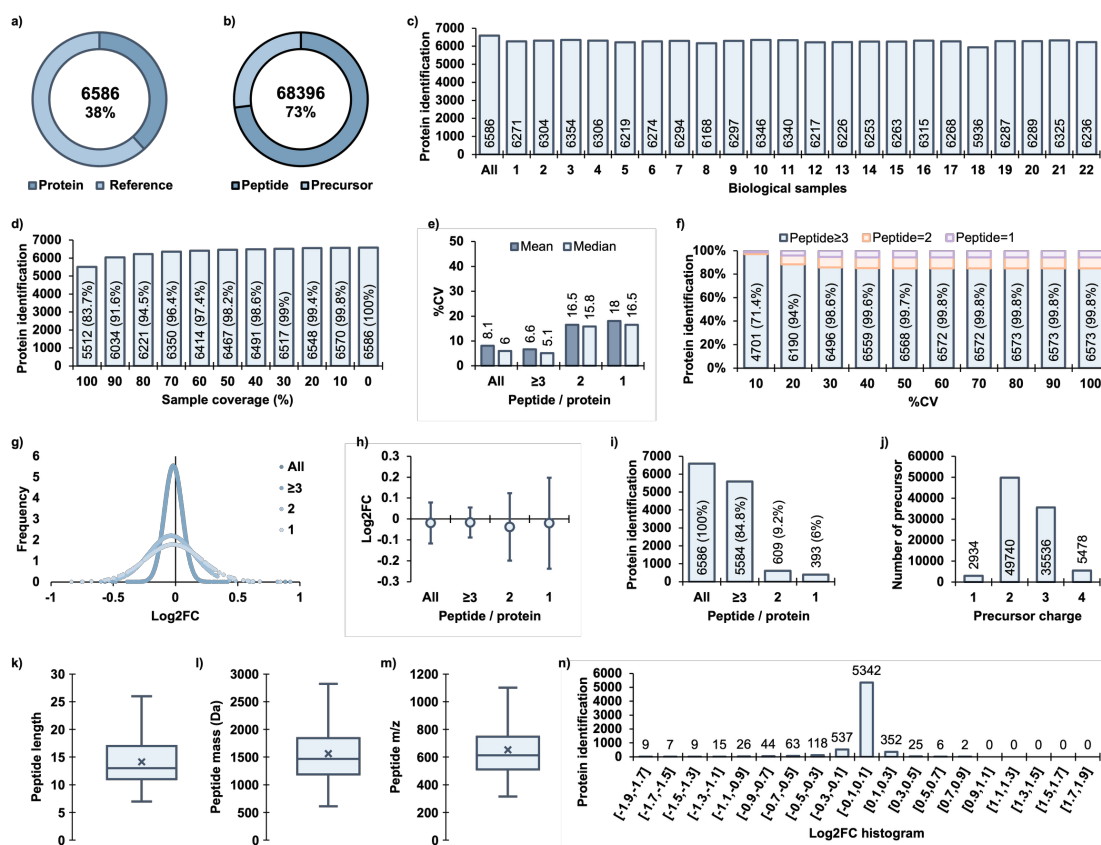


Fig. 20: Characteristics of retinal proteome quantification.

a) Total quantified unique protein groups in the reference proteome, b) Total quantified unique peptides in precursors, c) Number of protein groups quantified in each sample at 1% FDR, d) Number of protein groups according to sample coverage with missing values, e) Variance analysis of all quantified proteins and groups of protein quantified with ≥ 3 , 2, and only 1 peptide, f) Number of proteins at specific %CV thresholds, g) Normal distribution of each protein fold-change in technical duplicates, h) Protein fold-change represented as mean \pm SD by peptide groups, i) Number of identified peptides per protein, j) Precursor charges, k) Peptide length, l) Peptide monoisotopic mass, m) Peptide m/z values, n) Histogram of protein fold-change.

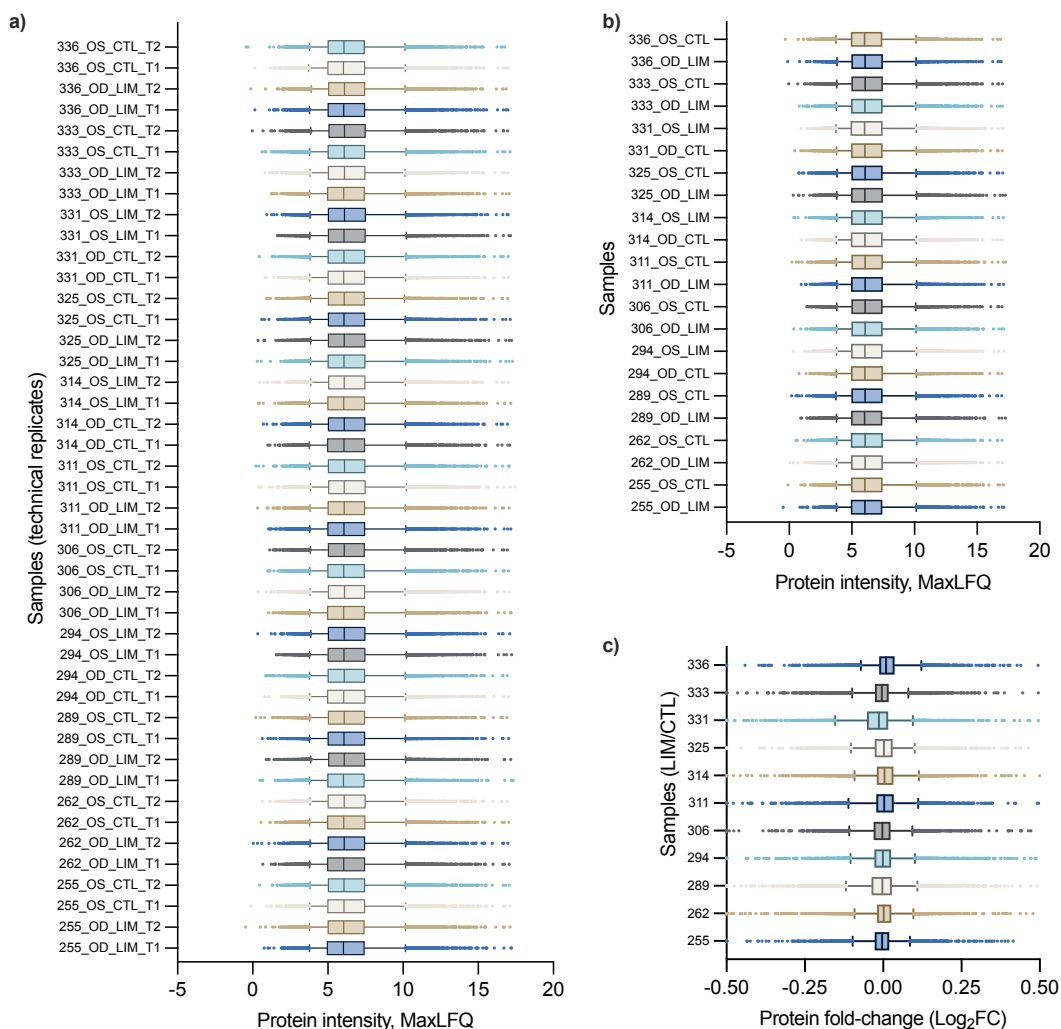


Fig. 21: Distribution of protein abundances and fold-change.

Box plots of **a)** Technical replications of each acquired sample, **b)** The averaged protein intensity of each retinal tissue from technical replications, **c)** Protein fold-change of the paired LIM-treated eye and contralateral control eye in an individual C57BL/6J mice.

4.4.3. Technical validation of retinal-specific peptide-centric spectral library

The generation of a comprehensive spectral library specific to mouse retinas using DIA-NN enables accurate identification and precise quantification of proteins in independent experiments. The library consists of a total of 9,401 protein groups, 70,041 peptides, 95,339 precursors, and 761,868 transitions (Fig. 22a-b). The quantified proteins are distributed across the retinal proteome expression levels, as demonstrated by the ranking of protein abundance (Fig. 22c). The histogram shows the variation in individual proteins, with a median value of 6% (Fig. 22d). Moreover, the method maintains sequence coverage with a median of 5 peptides per protein identification (Fig. 22e). Finally, the peptide-centric method was capable of quantifying 5,512 proteins in an individual sample, with only a fraction of proteins missing values in all samples (Fig. 22f). This highlights the peptide-centric workflow using DIA-NN in capturing a more comprehensive view of the retinal proteome.

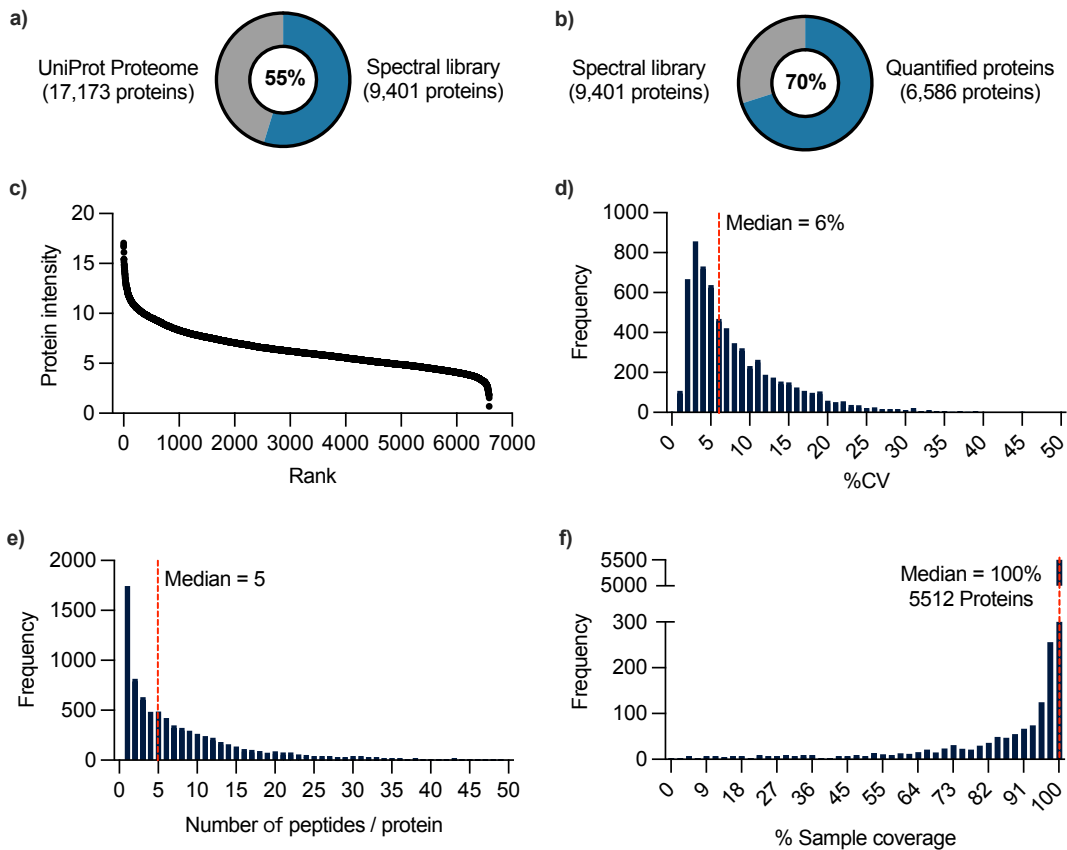


Fig. 22: Rank and distribution of quantified proteins in a spectral library.

a) Number of proteins in the spectral library, **b)** Number of quantified proteins in the spectral library, **c)** Protein abundance, **d)** Distribution of the coefficient of variation of protein, **e)** Distribution of the number of quantified peptides per protein identification, **f)** Distribution of proteins by percentage sample coverage. The dashed red line indicates the median value of the dataset.

4.5. Discussion

Recently, peptide-centric analysis without a data-dependent acquisition (DDA) library has represented a promising advancement in mass spectrometry-based proteomics¹⁴⁸. The library-free approach enables direct analysis of data-independent acquisition (DIA) data, such as SWATH-MS, using bioinformatic tools like MaxDIA¹⁴⁹, DIA-NN¹⁴³, and Spectronaut¹⁵⁰. This study presents a significant advancement in the identification and quantification of the retinal proteome during myopia development, achieving a remarkable quantification of 6,263 unique protein groups without the need

for sample fractionation, as previously described in Chapter 3⁷⁷. This approach not only surpasses the DDA spectral library generated through high-pH reversed-phase peptide fractionation but also provides a comprehensive retinal-specific spectral library acquired by SWATH-MS. The spectral library comprises 9,401 protein groups, 70,041 peptides, 95,339 precursors, and 761,868 transitions¹¹⁹. The depth of this proteomic analysis is crucial for understanding the complex biological processes involved in myopia and highlights the potential of using DIA techniques in ocular research. Furthermore, this approach streamlines the quantitative workflow to study biological samples, whereas the implementation of fractionation techniques would complicate quantitative assessment¹⁵¹.

The generation of a robust retinal-specific spectral library using DIA-NN and SWATH-MS represents a paradigm shift in proteomic analysis¹⁵². The combination of these technologies enables ultra-high-throughput proteomics analysis¹⁵³. The integration of ultrafast sample preparation techniques such as S-Trap, as mentioned in Chapter 3, demonstrates that high-quality proteomic data can be obtained efficiently, enabling biologists and other non-mass spectrometry specialists to explore the intricate dynamics of retinal proteins during myopia progression. The findings align with previous literature indicating state-of-the-art quantitative analysis of over 5,000 retinal protein expressions in mice^{154,155}. The use of DIA-NN bioinformatic software is powered by deep learning techniques that improve identification accuracy compared to other DIA data analysis approaches¹⁴⁴. DIA-NN also provides robust quantification capabilities powered by the proven label-free quantification technology, MaxLFQ¹⁴⁵. Here, we demonstrate that the workflow is capable of handling large sample sizes, making it suitable for myopia research. In comparison to the DDA library, DIA-NN is a versatile software tool designed to support various raw data formats from Sciex, Thermo Fisher Scientific, Bruker instruments, and consensus formats such as mzML¹⁵⁶.

4.6. Conclusion

This study showcases a significant advancement in mass spectrometry-based proteomics by introducing a peptide-centric analysis approach without relying on data-dependent acquisition (DDA) libraries. This method, utilizing data-independent acquisition (DIA) techniques like SWATH-MS with tools such as MaxDIA, DIA-NN, and Spectronaut, facilitated the direct analysis of the retinal proteome during myopia development. By quantifying 6,263 unique protein groups without sample fractionation—surpassing the limitations of DDA spectral libraries, and creating a comprehensive retinal-specific spectral library with 9,401 protein groups, this research provides crucial insights into the complex biological processes underlying myopia.

Chapter 5. Comparison of Ocular Biometrics using Spectral Domain Optical Coherence Tomography with Purkinje Image and Optic Nerve Head Alignments in Mice

5.1. Introduction

The C57BL/6J wild-type mouse, a common inbred strain of laboratory mice, is an emerging model for experimental myopia³⁰, including lens-induced myopia (LIM)⁹⁰, form-deprived myopia (FDM)¹⁵⁷, lid suture³¹, and light conditions¹⁵⁸, as summarized in a recent review¹⁵⁹. In experimental myopia research, ocular segmentation and refractive error measurements are relatively challenging in mice compared to chicks (*Gallus gallus*) and guinea pigs (*Cavia porcellus*). Mice have relatively poor vision, a restricted cone photoreceptor population, and adaptation to a dim-light habitat rather than a bright-light environment. These traits are accompanied by reduced cone b-wave amplitude, speed, and oscillatory potentials in ERG measurements due to circadian rhythm¹⁶⁰. Despite these challenges, murine models offer several advantages over traditional avian myopia models, including transgenic features, a mature and validated genome for signaling pathway analysis, and structural similarity of the mouse retina to that of humans, except that it lacks a fovea, making it useful for investigating retinal diseases³³.

Previous studies have explored various imaging techniques for measuring mouse eyes, including micro-computed tomography (Micro-CT)⁹⁰, partial coherence interferometry (PCI)¹⁶¹, and spectral domain optical coherence tomography (SD-OCT). Each method has its strengths and limitations, which are important to consider for accurate eye measurement. Micro-CT provides detailed anatomical information about the eye but is limited by lower resolution compared to optical methods, resulting in poor correlation with SD-OCT measurements; previous studies report a positive linear correlation coefficient (R^2) of less than 0.5⁹⁰. While valuable for anatomical visualization, Micro-CT's resolution and instrument availability can hinder precise dimensional analysis and ocular segmentation. In contrast, PCI has demonstrated a high level of agreement with SD-OCT for measuring axial length,

achieving an intraclass correlation coefficient of 0.92¹⁶¹ , indicating excellent precision and repeatability. However, PCI requires careful alignment during measurement, where misalignment can introduce variability, as evidenced in human studies¹⁶². Finally, SD-OCT stands out for its ability to provide real-time imaging of the eye, allowing visualization of all eye structures with high resolution and speed. Despite its advantages, there is a notable lack of alignment studies specifically focused on mice. Although many studies have utilized SD-OCT to measure mouse eye dimensions, further research is needed to address potential misalignments that could affect measurement accuracy. A recent study found that SD-OCT alignment significantly affects ocular axial measurements in mouse eyes, with optimal consistency achieved when aligned to the temporal or inferior quadrants¹⁶³. Furthermore, even a minor misalignment of two degrees can lead to measurable differences in axial length, highlighting the critical need for precise alignment in SD-OCT imaging to ensure accurate measurements of small eye structures.

In this comparative study, SD-OCT, a noninvasive, in vivo, high-resolution imaging technique, was used to compare reliable micrometer ocular dimension measurements obtained using two alignment methods: Purkinje image-based (P1) and optic nerve head (ONH). The development of refractive error and technical variation in using the infrared photorefractor to capture the Purkinje image of the corneal apex were also assessed. Tkatchenko et al. reported that the susceptibility of mice to experimentally induced myopia declines with age, leveling off at postnatal day 67³². Therefore, experimental myopia studies in mice typically commence at postnatal day 21, after weaning, or at a later stage, such as P28^{11,164}. To investigate the ocular characteristics of normally developing eyes in wild-type C57BL/6J mice, we focused on the period between P21 and P35, a critical time window for myopia research. Our study involved comparing two alignment methods for measuring ocular dimensions using SD-OCT alongside refractive error assessments conducted with an infrared

photorefractor. This approach allowed us to evaluate the precision and reliability of measurements obtained through different alignment techniques.

5.2. Methods

5.2.1. Animals

Black C57BL/6J wild-type mice were imported from The Jackson Laboratory (Farmington, CT, USA), as in our previous work⁷⁷. Mice were maintained as in-house breeding colonies at the centralized animal facility of The Hong Kong Polytechnic University. Animals were housed in standard mouse cages (Sealsafe Plus GM500, Tecniplast, Varese, Italy) at 25 °C with a 12:12-hour light/dark cycle in a room with 150 lux lighting, with food and water available ad libitum. Mice were weaned on postnatal day 21 and housed until postnatal day 35.

5.2.2. Refractive error measurement using an infrared photorefractor

The eccentric infrared photorefractor was developed by Prof. Frank Schaeffel (Steinbeiss-Transfer Centre for Biomedical Optics, Tuebingen, Germany) and used according to the user manual¹⁰⁷. To prepare the mice for measurements, a drop of Mydrin-P ophthalmic solution⁹⁰ containing 0.5% tropicamide and 0.5% phenylephrine hydrochloride, purchased from Santen Pharmaceutical Co., Ltd., was administered to dilate the pupils. After 15 minutes, mice were sedated by intraperitoneal injection with a mixture of ketamine (70 mg/kg) and xylazine (10 mg/kg). Subsequently, they were carefully positioned on the cylindrical platform of the spectral domain optical coherence tomography (SD-OCT) system. All biometric measurements were conducted while the mice were under anesthesia. Refractive errors were acquired by aligning the measurement to the Purkinje image obtained from the corneal reflection, known as P1. Alignment was performed using software-controlled gaze control, with adjustments made to ensure alignment was within 5 degrees along the x- and y-axes. Additionally, each measurement was carefully adjusted to approach zero on both axes, collecting 99 data points per

eye. Refractive error measurements were recorded as the mean value \pm SD in diopters (D), and each measurement was repeated in triplicate. To assess instrument variability, the standard deviation of the technical replicates was calculated for each eye of C57BL/6J mice at postnatal day 21 (n = 170, eyes = 340, triplicates), an early time point for optical-based experimental myopia. A Python script was developed to facilitate the analysis of this large dataset (Appendix 3).

5.2.3. Two alignment methods for spectral domain optical coherence tomography

First, mice were measured using the Purkinje image-based alignment method (P1). The photorefractor was positioned behind the SD-OCT probe holder, ensuring that both shared the same measurement axis. Upon acquiring refractive error data with the photorefractor, ocular segmentation was immediately measured using SD-OCT. The ocular structure was observed by adjusting the probe distance and making horizontal and vertical position adjustments on the OCT platform without further angular movement until the probe was perpendicular to the corneal apex. The retinal fundus image indicated a nasal position relative to the optic disc. The probe was then returned to the optimal distance determined by perpendicular alignment to the corneal apex while maintaining a live view of the entire eye. This was followed by measurement using the optic nerve head (ONH) alignment method. Mice were positioned based on the Purkinje image using an infrared photorefractor. The retinal fundus image was obtained by positioning the OCT probe near the eyeball until a clear retinal fundus image was visualized in the live view window. To facilitate this alignment, the digital single-point centered crosshair was set to a diameter of 0.4 mm. The mouse eye position was then adjusted to approximately 0.2 mm above the optic disc, using the radius of the crosshair as a reference in the software. The mouse position was rotated until a match was achieved. To obtain the length of the entire eye, the SD-OCT probe was returned to the optimal distance determined by perpendicular alignment to the corneal apex with a live view of the whole eye. It is important to note that misalignment between the photorefractor and the ONH position in SD-OCT measurements necessitated repositioning of the mice after refractive

error measurement. This repositioning did not control the measurement angle and relied solely on the retinal fundus position. The differences between the alignment methods and their corresponding retinal positions are visually presented (Fig. 23).

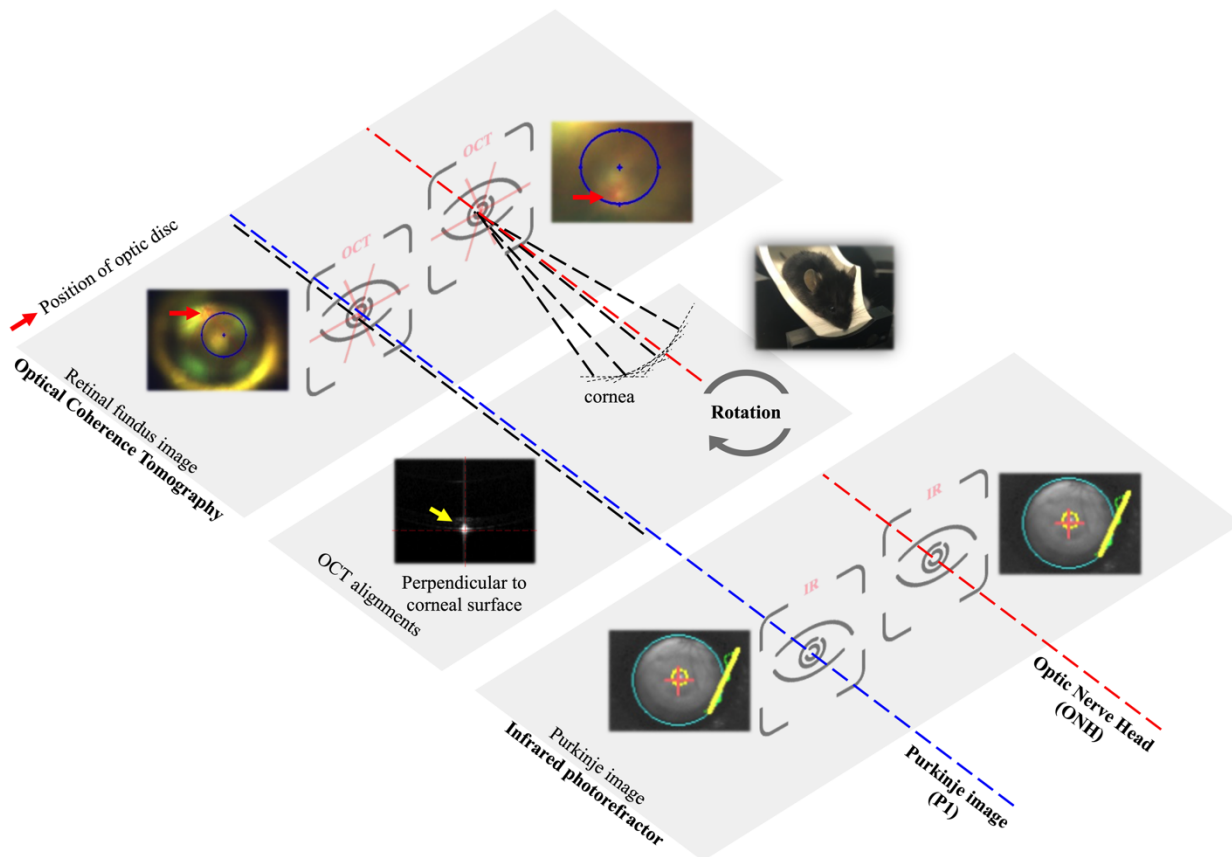


Fig. 23: Schematic illustration of SD-OCT and infrared photorefractor measurements with two alignment methods.

For the Purkinje image-based alignment (P1, blue dotted line), mouse eyes were aligned to the Purkinje image P1. Subsequently, using SD-OCT, the eyes were aligned perpendicular to the corneal apex, ensuring consistent axis measurements between the instruments. The retinal fundus image indicated a nasal position relative to the optic disc. In comparison, the optic nerve head alignment (ONH, red dotted line) involved a standalone SD-OCT operation. The alignment was achieved by positioning the probe 0.2 mm above the optic disc, guided by a digital single-point centered crosshair with a diameter of 0.4 mm (blue circle). It is important to note that this alignment method required rotation of the mice

after refractive error measurement, resulting in a lack of control over the angle of measurement (black dotted line). The retinal image captured from SD-OCT near the optic nerve head (red arrow) highlights the differences between alignment methods and their corresponding retinal positions.

5.2.4. Ocular biometric measurements using spectral domain optical coherence tomography

The eye was scanned using radial volume mode in duplicate (A-scans = 1000 lines, B-scans = 6, 32 frames, 80 lines of inactive A-scans, 0.4 mm diameter). The length of each component was reported as mean \pm SD in micrometers. The segmented ocular dimensions were measured using spectral domain optical coherence tomography (SD-OCT, Envisu R4310, Leica, Germany) equipped with a 50° probe for mice¹⁶⁵. After each SD-OCT measurement, the mice were reset to the default position, and measurements were reacquired in duplicate. Ocular segmentation was analyzed manually using the digital caliper in the OCT data analysis software (InVivoVue, ver. 2.4, Leica). Distances were determined by identifying the intersections between the boundaries of each ocular compartment and the reflected light array from the mice's eyes. Axial length (AL) was defined as the sum of all ocular segments, including corneal thickness (CT), measured from the anterior to the posterior corneal surface. The anterior chamber depth (ACD) is the distance from the posterior corneal surface to the anterior lens surface. Lens thickness (LT) is the distance from the anterior to the posterior lens surface. Vitreous chamber depth (VCD) is the distance from the posterior lens surface to the retinal nerve fiber layer. Lastly, retinal thickness (RT) is the depth from the retinal nerve fiber layer to the retinal pigment epithelium (Fig. 24).

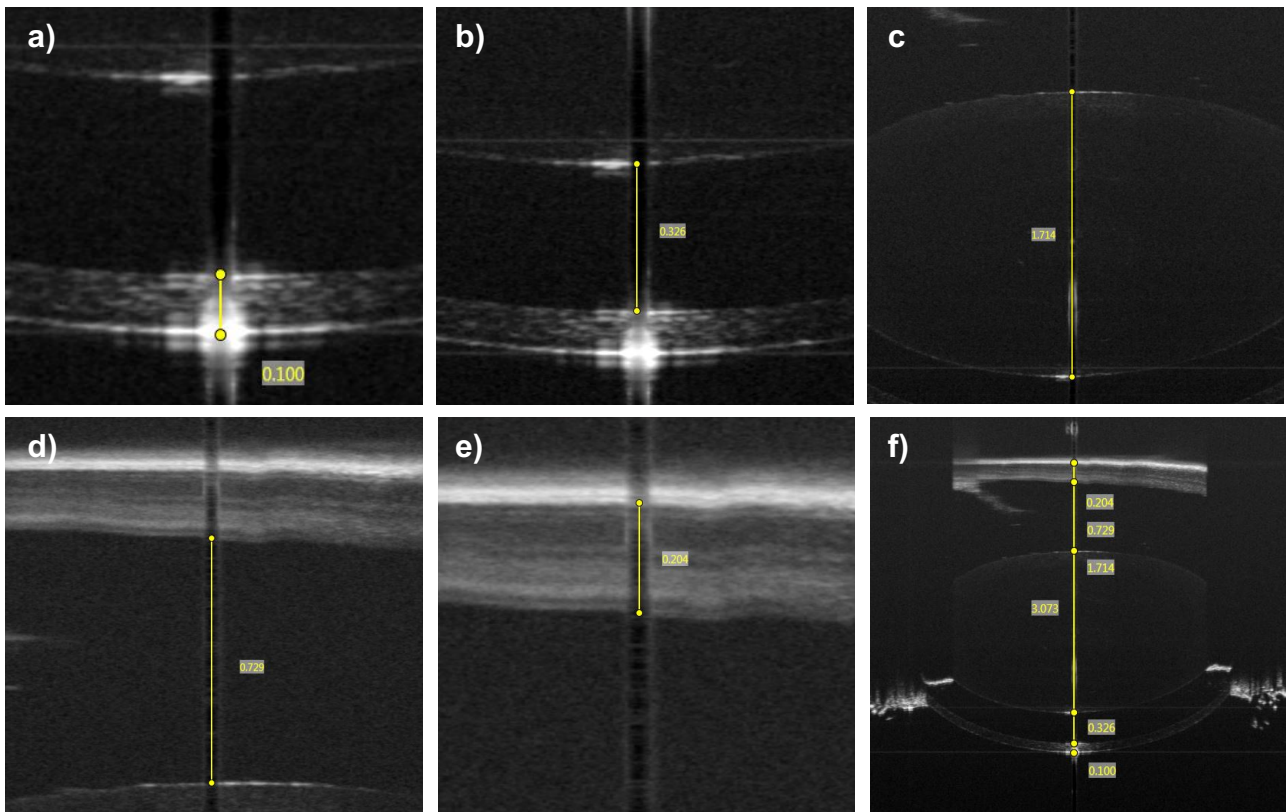


Fig. 24: Representative Ocular Dimension Measurement using SD-OCT.

Digital calipers were used in the optical coherence tomography (OCT) data analysis software (InVivoVue, ver. 2.4, Leica), with values presented in millimeters. **a)** Corneal thickness (CT) measured from the anterior corneal surface to the posterior corneal surface. **b)** Anterior chamber depth (ACD) is the distance from the posterior cornea surface to the anterior lens surface. **c)** Lens thickness (LT) is the distance from the anterior lens surface to the posterior lens surface. **d)** Vitreous chamber depth (VCD) is the distance from the posterior lens surface to the retinal nerve fiber layer. **e)** Retinal thickness (RT) is the depth of the retinal nerve fiber layer up to the retinal pigment epithelium. **f)** A schematic figure with all ocular measurements, axial length (AL, 3.073 mm) represented as the sum of all ocular segments, including CT, ACD, LT, VCD, and RT.

5.3. Results

5.3.1. Validation of instrumental variation in photorefractor and optical coherence tomography

The precision and reproducibility of refractive error measurement were demonstrated by the 95th percentile of the standard deviation (SD) of technical replicates at ± 3.9 D. The mean technical variation was 1.4 ± 1.2 D, with a median of 1.1 D. The mean refractive error (mean \pm SD) was determined to be 1.3 ± 6.5 D ($n = 170$, eyes = 340, triplicates) in mice aged P21 (Fig. 25a). Instrumental variation of SD-OCT measured with two alignment methods ($n = 33$, eyes = 66, duplicates) was assessed using the coefficient of variation (CV). Variation was similar between alignment methods across all ocular components. Axial length (AL) exhibited the least variation, with mean \pm SD CV values of $1.17 \pm 0.24\%$ (P1) and $1.16 \pm 0.14\%$ (ONH alignment). In contrast, retinal thickness showed the highest variation, with CV values of $9.97 \pm 5.04\%$ (P1) and $9.62 \pm 2.97\%$ (ONH) (Fig. 25b). The higher variation in retinal thickness may be attributed to the limited resolution at the retinal pigment epithelium and choroidal-sclera boundary. The ONH alignment method performed slightly better in vitreous chamber depth (VCD) measurement (P1: $3.51 \pm 1.28\%$; ONH: $2.19 \pm 0.33\%$), whereas P1 alignment performed better for corneal thickness (CT) (P1: $3.32 \pm 0.90\%$; ONH: $4.36 \pm 2.38\%$). Overall, ocular segmentation showed variation of less than 5% CV except for retinal thickness, indicating relatively consistent results between alignment methods. The comparable magnitude of CV values obtained with the two alignment methods across all ocular segmentations may suggest systematic variation in measuring ocular dimensions using SD-OCT in mice.

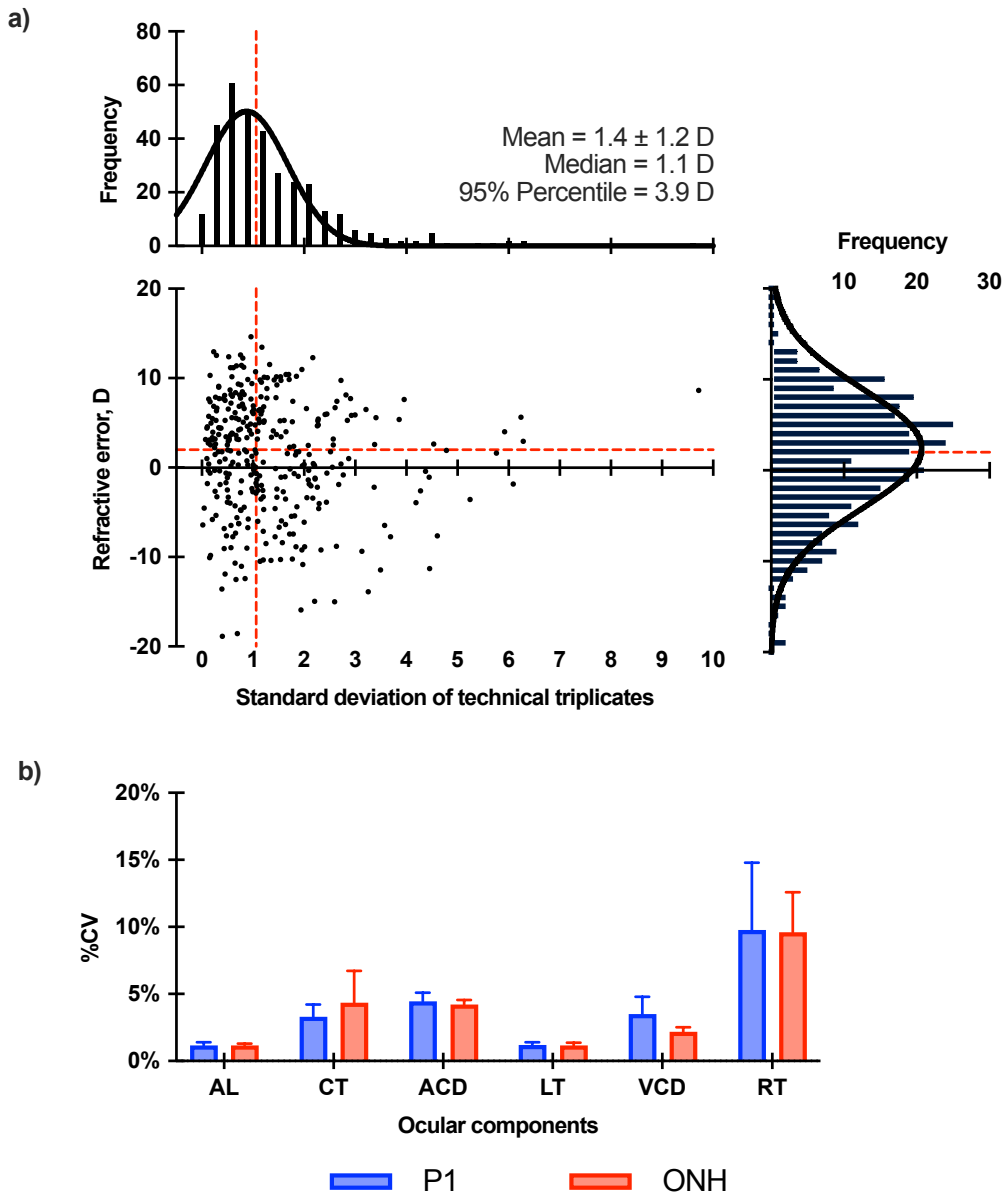


Fig. 25: Distribution and variation of refractive error and ocular biometrics using infrared photorefractor and optical coherence tomography.

a) Scatter plot of refractive error and standard deviation measured by the photorefractor. The distribution and technical standard deviation followed a normal distribution, with a 95% percentile value of 3.9 D. At postnatal age 21, the mean refractive error was 1.3 ± 6.5 D, while the mean standard deviation was 1.4 ± 1.2 D ($n = 170$, eyes = 340, triplicates). **b)** Coefficient of variation (CV) analysis ($n = 33$, eyes = 66, duplicates) of ocular biometrics measured by SD-OCT between alignment methods, with the least variation in axial length (1.2%) and the highest variation in retinal thickness (9.7%).

Median values of each frequency distribution (red lines). Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

5.3.2. Comparison of intraocular biometrics with two alignment methods

Mouse eyes, specifically the right eye (OD) and left eye (OS), were measured using SD-OCT with two alignment methods. The normally growing C57BL/6J mouse eyes showed no statistically significant interocular differences in any of the ocular segments on P21 (n = 10), P28 (n = 15), or P35 (n = 8), analyzed with two-way ANOVA and Bonferroni correction when measured by Purkinje image-based alignment (Fig. 26a, Table 4) and at 0.2 mm above the optic disc (Fig. 26b, Table 5). Notably, both alignments revealed a similar significant elongation in the anterior segments of the eye, including CT, ACD, and LT, from P21 to P35. However, there were no statistically significant differences in VCD, regardless of the alignment method. A minor, inconsistent difference in retinal thickness was observed between alignment methods. In the Purkinje image-based alignment, retinal thickness was significantly shorter between P21 and P35 ($p < 0.05$) in the OD eye, whereas a significantly shorter retinal thickness was noted between P21 and P28 ($p < 0.05$). Overall, the results confirm no significant interocular differences in the ocular segments between the OD and OS eyes, regardless of the alignment method.

Table 4. Ocular biometrics measured with Purkinje image-based alignment.

Data are presented as the mean \pm SD. OD = right eye; OS = left eye; ocular segmentation with axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

| Posnatal Days | P21 | | P28 | | P35 | |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Eyes | OD | OS | OD | OS | OD | OS |
| AL (μm) | 3008.2 \pm 38.2 | 3014.7 \pm 44.4 | 3138.5 \pm 28.3 | 3139 \pm 28.3 | 3219.5 \pm 26.7 | 3205.6 \pm 52.5 |
| CT (μm) | 97.2 \pm 4.8 | 97.6 \pm 4.3 | 106.4 \pm 1.9 | 105.5 \pm 4.5 | 106.4 \pm 2.2 | 107.4 \pm 2.8 |
| ACD (μm) | 318.6 \pm 17.7 | 314.2 \pm 16.5 | 340.3 \pm 10 | 342.4 \pm 14.2 | 362.9 \pm 14.2 | 357.1 \pm 20.6 |
| LT (μm) | 1740 \pm 53.3 | 1716.7 \pm 24.6 | 1805.3 \pm 16.1 | 1809.8 \pm 13.3 | 1880.8 \pm 16.4 | 1885.3 \pm 28.1 |
| VCD (μm) | 687.7 \pm 23.4 | 674.1 \pm 13.8 | 697 \pm 23.7 | 689.3 \pm 21.6 | 684.9 \pm 36.6 | 673.6 \pm 30.5 |
| RT (μm) | 203.3 \pm 19.6 | 211.9 \pm 12.1 | 194 \pm 15.1 | 190.6 \pm 15.7 | 182.4 \pm 25.9 | 182.6 \pm 32.3 |

Table 5. Ocular biometrics measured with optic nerve head alignment.

Data are presented as the mean \pm SD. OD = right eye; OS = left eye; ocular segmentation with axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

| Posnatal Days | P21 | | P28 | | P35 | |
|-----------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Eyes | OD | OS | OD | OS | OD | OS |
| AL (μm) | 3049.8 \pm 35.4 | 3039.6 \pm 40.1 | 3162.5 \pm 31.4 | 3159.6 \pm 32.1 | 3249 \pm 32.3 | 3228.9 \pm 47.7 |
| CT (μm) | 94.4 \pm 3.3 | 96.3 \pm 3.3 | 104.4 \pm 7.1 | 104.7 \pm 7.9 | 107.9 \pm 3.4 | 109.6 \pm 1.8 |
| ACD (μm) | 316.3 \pm 13.8 | 318.6 \pm 15.9 | 339.5 \pm 13.3 | 342.6 \pm 14 | 361.8 \pm 11.7 | 355.4 \pm 17.7 |
| LT (μm) | 1700.4 \pm 20.8 | 1707.3 \pm 26.3 | 1800 \pm 17.9 | 1807.5 \pm 18 | 1882.6 \pm 18.6 | 1884.2 \pm 24.9 |
| VCD (μm) | 733.2 \pm 16.7 | 732.6 \pm 14.8 | 728.2 \pm 14.4 | 724.4 \pm 13.7 | 714.3 \pm 21.9 | 713.4 \pm 15.2 |
| RT (μm) | 203.2 \pm 20.8 | 185 \pm 15.4 | 189.3 \pm 11.5 | 178.9 \pm 9.6 | 179.9 \pm 19.3 | 167.3 \pm 22.1 |

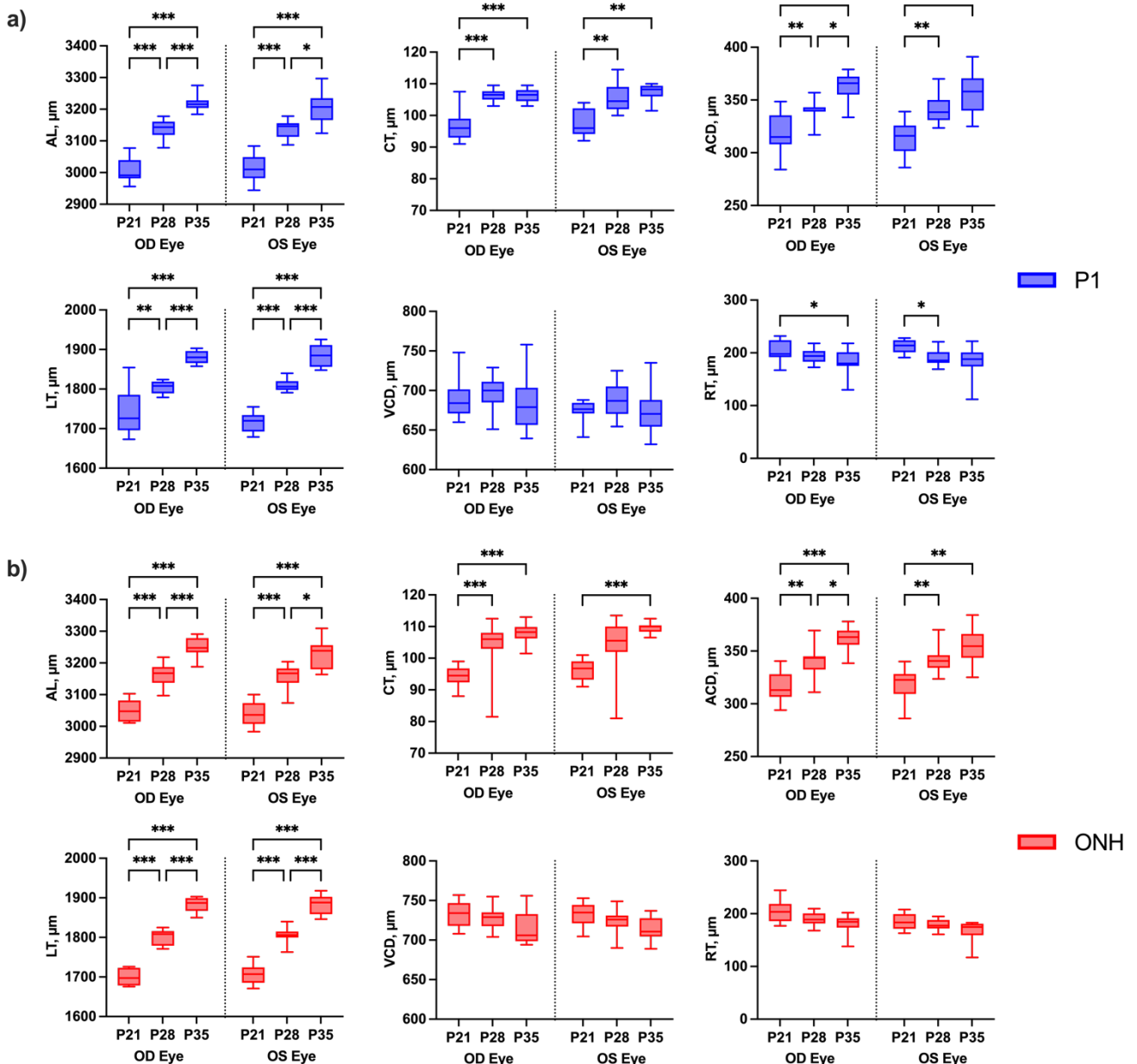


Fig. 26: Comparative analysis of ocular biometrics using two alignment methods by SD-OCT.

a) Box plots of eyes measured by P1 and ONH alignment on P21 (n = 10), P28 (n = 15), and P35 (n = 8). Significantly shorter AL on P21 and P28 and VCD from P21 to P35. Significantly longer retinal thickness was measured on P21. **b)** Scatter plot with linear regressions (solid line) in ocular biometrics measured by two alignment methods and 95% confidence bands (dotted line). There were no significant differences between the slopes between the two alignment methods in AL, CT, ACD, LT, and RT. In contrast, there is a significant difference between the slopes (linear regression, $p = 0.02$) in

VCD. SD-OCT measurements were acquired in duplicate. Statistical analysis was performed using a two-way ANOVA with Bonferroni correction. The statistical significance levels are presented as $p \leq 0.001$ (***), $p \leq 0.01$ (**), and $p \leq 0.05$ (*). Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

5.3.3. Comparative analysis of ocular biometrics in two alignment methods

The OD and OS eyes of mice were not significantly different when analyzed with two-way ANOVA and Bonferroni correction, as mentioned in the previous section. Ocular biometrics on P21 (n = 10, eyes = 20), P28 (n = 15, eyes = 30), and P35 (n = 8, eyes = 16) were consolidated based on alignment methods, regardless of specific eyes. Interestingly, no statistically significant differences were observed in the anterior eye segments, including corneal thickness (CT), anterior chamber depth (ACD), and lens thickness (LT). However, a significantly shorter axial length was observed, presented as mean \pm standard error (SE) of $-33.2 \pm 12.3 \mu\text{m}$, measured with P1 alignment at P21 (P1: $3011.5 \pm 40.5 \mu\text{m}$; ONH: $3044.7 \pm 37.2 \mu\text{m}$, $p = 0.03$). This difference persisted at P28, with a shorter axial length (mean \pm SD: $-22.3 \pm 7.6 \mu\text{m}$) (P1: $3138.8 \pm 27.8 \mu\text{m}$; ONH: $3161 \pm 31.3 \mu\text{m}$, $p = 0.02$). Intriguingly, significantly thicker retinal thickness (mean \pm SE: $18.7 \pm 5.3 \mu\text{m}$) was observed at P21 only (P1: $212.8 \pm 12.9 \mu\text{m}$; ONH: $194.1 \pm 20.1 \mu\text{m}$, $p = 0.001$). Furthermore, a consistent observation of shorter vitreous chamber depth (VCD) measured with Purkinje image-based alignment was found at P21 (mean \pm SE: $-55.8 \pm 4.9 \mu\text{m}$, $p < 0.001$), P28 (mean \pm SE: $-32.2 \pm 4.9 \mu\text{m}$, $p < 0.001$), and P35 (mean \pm SE: $-34.6 \pm 9.4 \mu\text{m}$, $p = 0.004$) (Fig. 27a, Table 6). There is a positive correlation between axial elongation and growth of the anterior segment, specifically CT, ACD, and LT. The 95% confidence bands indicated no significant differences in the measured growth rate between alignment methods in the anterior segment. On average, axial length elongation was approximately $+98 \mu\text{m}/\text{week}$. Corneal thickness increased by $5.5 \mu\text{m}/\text{week}$, contributing 5.6% of total eye growth. Anterior chamber depth increased by $22 \mu\text{m}/\text{week}$, accounting for 22.4% of total growth. Lens thickness contributed

significantly with a growth rate of 84.9 $\mu\text{m}/\text{week}$, accounting for 86.6% of axial elongation. For vitreous chamber depth, there was a significant difference in the slope of the linear regression ($p = 0.02$). Using the Purkinje image-based alignment method, VCD remained relatively constant with the equation $y = 0.4x + 670.8$ ($r^2 = 0.0079$). However, when measured using the ONH alignment method, VCD decreased as mice matured, with the equation $y = 1.52x + 767.6$, tested for linearity with $r^2 = 0.9922$ (Fig. 27b).

Table 6: Comparison of axial length and vitreous chamber depth with two alignment methods.

The Purkinje image-based alignment method (P1) and the optic nerve head (ONH) alignment method. SD-OCT measurements were acquired in duplicate. Statistical analysis was performed using a two-way ANOVA with Bonferroni correction. The statistical significance levels are presented as $p \leq 0.001$ (***), $p \leq 0.01$ (**), and $p \leq 0.05$ (*).

| Postnatal days | Axial length, AL (μm) | | | Vitreous chamber depth, VCD (μm) | | |
|----------------|------------------------------------|-------------------|----------|---|------------------|--------------|
| | P1 | ONH | p^* | P1 | ONH | p^* |
| P21 | 3011.5 \pm 40.5 | 3044.7 \pm 37.2 | 0.03 (*) | 677.2 \pm 15.8 | 732.9 \pm 15.4 | <0.001 (***) |
| P28 | 3138.8 \pm 27.8 | 3161 \pm 31.3 | 0.02 (*) | 694.1 \pm 23.2 | 726.3 \pm 14 | <0.001 (***) |
| P35 | 3212.5 \pm 40.9 | 3238.9 \pm 40.7 | n.s | 679.3 \pm 33 | 713.8 \pm 18.2 | 0.004 (**) |

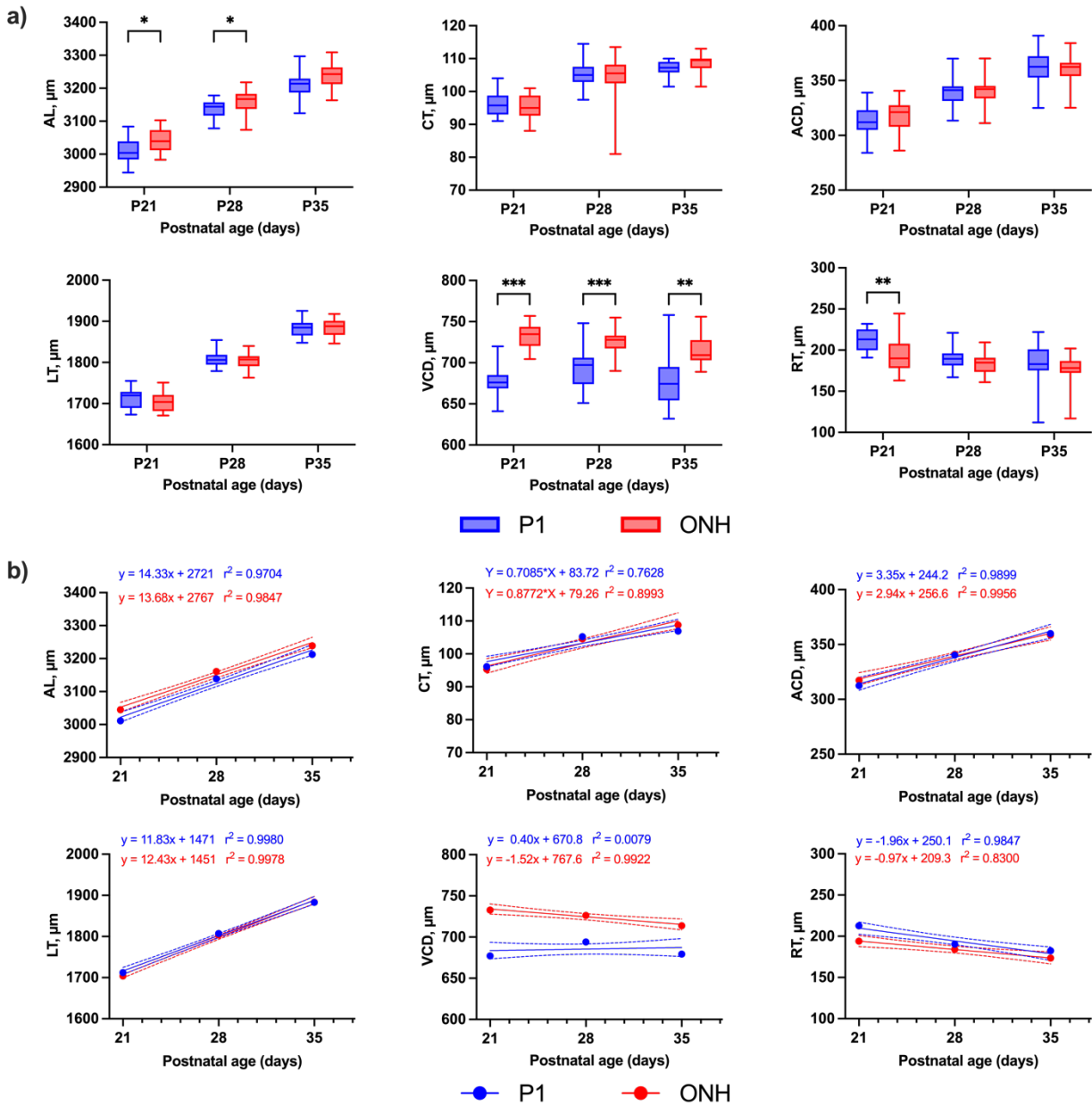


Fig. 27: Comparative analysis of ocular biometrics in two alignment methods by SD-OCT.

a) Box plots of eyes measured by P1 and ONH alignment on P21 (n=10), P28 (n=15), and P35 (n=8). There was significantly shorter AL on P21 and P28, and VCD from P21 to P35, while retinal thickness measured on P21 was significantly longer only at P21 by P1 alignment. **b)** Scatter plot with linear regressions (solid line) in ocular biometrics measured by two alignment methods and 95% confidence bands (dotted line). There were no significant differences between the slopes of the two alignment methods in AL, CT, ACD, LT, or RT. In contrast, significant differences between the slopes (linear regression, $p=0.02$) were observed for VCD. SD-OCT measurements were acquired in duplicate.

Statistical analysis was performed using two-way ANOVA with Bonferroni correction. The statistical significance levels are presented as *** $p \leq 0.001$, ** $p \leq 0.01$, and * $p \leq 0.05$. Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

To compare the differences between alignment methods, Bland–Altman analysis was employed to assess the differences (P1 – ONH) over the average of the two alignment methods from P21 to P35 ($n = 33$, eyes = 66). The mean differences between the methods were examined across all ocular segmentations. The 95% confidence intervals (mean; 95% CI) indicated significant differences between alignment methods in axial length (AL) ($-26.4 \mu\text{m}$; -62 to $9.1 \mu\text{m}$) and vitreous chamber depth (VCD) ($-39.9 \mu\text{m}$; -89.9 to $9.96 \mu\text{m}$). All other ocular segments were similar between alignment methods, including corneal thickness (CT) ($0.118 \mu\text{m}$; -7.9 to $8.1 \mu\text{m}$), anterior chamber depth (ACD) ($-1.47 \mu\text{m}$; -13.5 to $10.6 \mu\text{m}$), lens thickness (LT) ($4.1 \mu\text{m}$; -15.2 to $23.4 \mu\text{m}$), and retinal thickness (RT) ($10.7 \mu\text{m}$; -25.8 to $47.2 \mu\text{m}$) (Fig. 28a).

Additionally, normality testing indicated that the two alignment methods displayed a Gaussian normal distribution in AL, VCD, and RT, but failed normality testing for CT ($p < 0.001$), ACD ($p < 0.001$), and LT ($p < 0.001$), as computed using the D’Agostino & Pearson test (Fig. 28b). These results demonstrate that the significant differences in AL and VCD between methods were represented by Gaussian mean values sampled from normally distributed data. Furthermore, the scatter plot showing individual data points represented as mean \pm SD showed that AL ($-26.4 \pm 18.1 \mu\text{m}$) and VCD ($-39.9 \pm 25.4 \mu\text{m}$) were shorter when measured by Purkinje image-based alignment (Fig. 28c).

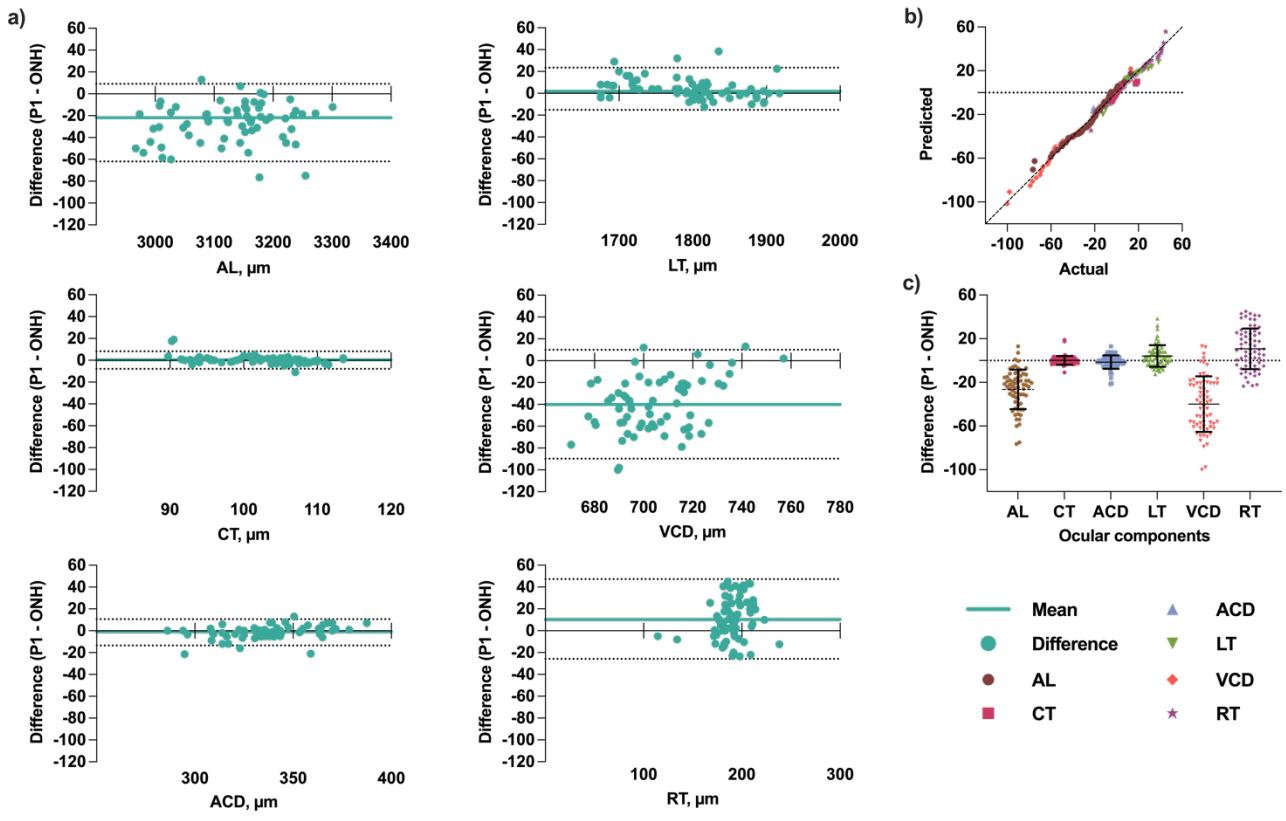


Fig. 28: Bland–Altman analysis of the ocular biometric differences in two alignment methods.

a) Bland–Altman plot comparing differences (P1 – ONH) over the average of the two alignment methods from P21 to P35 (n=33, eyes=66). The mean differences of methods (solid line) and 95% limits of agreement (dotted line) are wide in AL (95% CI: -62 to 9.1) and VCD (95% CI: -89.8 to 9.96), but more similar between alignment methods for other ocular segments. **b)** Normality test on each ocular component represented in the Q–Q plot. **c)** Scatter plot of alignment method differences with mean \pm SD, a significantly shorter AL ($-26.4 \pm 18.1 \mu\text{m}$, paired t-test, $p < 0.001$), and VCD ($-39.9 \pm 25.4 \mu\text{m}$, paired t-test, $p < 0.001$), when measured with Purkinje image-based alignment. SD-OCT measurements were acquired in duplicate. Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

An independent replication was conducted by another operator in a separate batch of animals in duplicate (n = 8, eyes = 16), showing a similar pattern as previously described. Significant

differences (mean; 95% CI) were observed in axial length (AL) ($-27.8 \mu\text{m}$; -62.5 to $6.8 \mu\text{m}$) and vitreous chamber depth (VCD) ($-32.4 \mu\text{m}$; -78.1 to $13.2 \mu\text{m}$), while no differences were found in other segments (Fig. 29a). The Q–Q plot indicates a Gaussian normal distribution in AL, corneal thickness (CT), lens thickness (LT), VCD, and retinal thickness (RT), whereas anterior chamber depth (ACD) failed the normality test ($p < 0.001$) as computed by the D’Agostino & Pearson test (Fig. 29b). The scatter plot shows individual data points, represented as mean \pm SD, with a significant shift in AL ($-27.8 \pm 17.7 \mu\text{m}$) and VCD ($-32.4 \pm 23.3 \mu\text{m}$) (Fig. 29c). These results confirm significant differences between alignment methods, which are consistent when repeated in independent animals by another operator.

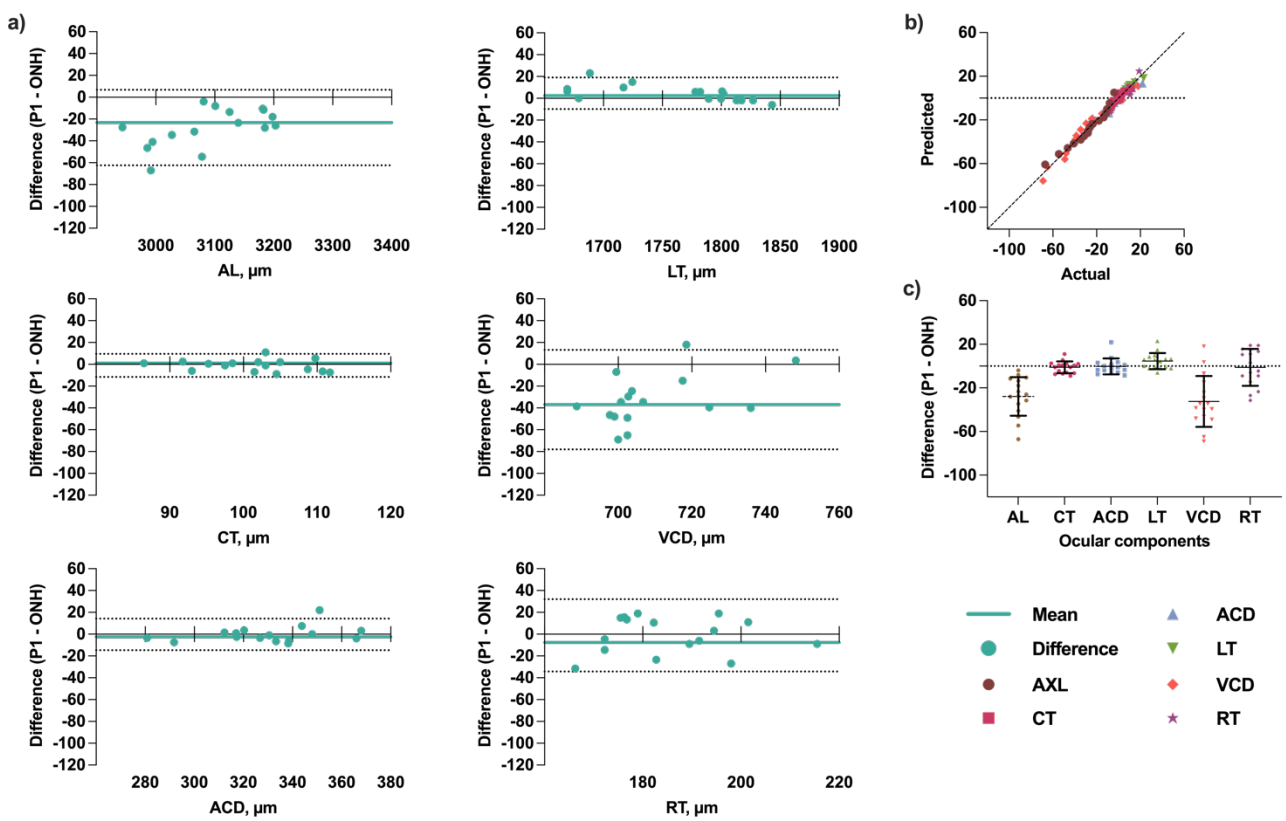


Fig. 29: Operator replicates of ocular biometric differences in two alignment methods.

a) Bland–Altman plot comparing differences (P1 – ONH) over the average of the two alignment methods (n=8, eyes=16, duplicates). The mean differences of methods (solid line) and 95% limits of

agreement (dotted line). Mean differences between methods were observed in AL (95% CI: -62.5 to 6.8) and VCD (95% CI: -78.1 to 13.2). **b)** Normality test on each ocular component represented in the Q–Q plot. **c)** Scatter plot of method differences with mean \pm SD, a significantly shorter AL ($-27.8 \pm 17.7 \mu\text{m}$, paired t-test, $p < 0.001$), and VCD ($-32.4 \pm 23.3 \mu\text{m}$, paired - test, $p < 0.001$) when measured in Purkinje image-based alignment. SD-OCT measurements were acquired in duplicate. Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT).

5.4. Discussion

This dataset demonstrated that the eccentric infrared photorefractor allows rapid collection of 99 scans per measurement via computer-controlled gaze control using the Purkinje image in the Purkinje image-based alignment (P1). The 95th percentile boundary of 3.9 D ($n = 170$, eyes = 340, triplicates) showed that refractive error measurements in early-age mice agree with Schaeffel et al., who reported an average standard deviation of 3.0 D in C57BL/6J mice under tropicamide cycloplegia without anesthesia³⁰. In this study, the refractive error of C57BL/6J mice at the early age of P21 under normal visual conditions was determined to be 1.4 ± 1.2 D (mean \pm SD, $n = 170$, eyes = 340, triplicates), showing a generally hyperopic trend consistent with previous reports in older mice, as summarized in a review.³³ It is worth noting that despite the hyperopic refractive error, small eye artifacts in mice suggest that the true refraction is likely less hyperopic¹⁶⁶. In parallel, spectral-domain optical coherence tomography (SD-OCT) was extensively employed in experimental myopia research. This study used SD-OCT to determine mouse eye dimensions due to several advantages, including high-resolution ocular segmentation, in vivo imaging, and a noninvasive technique that eliminates the need to sacrifice animals—crucial for monitoring axial elongation at multiple time points during myopia development. Unlike other techniques, such as ex vivo fixation, which may cause structural deformation and shrinkage within five minutes after execution⁹⁰, microcomputed tomography (μCT)

requires contrast agent injection into the eye and offers lower ocular resolution than SD-OCT¹⁶⁷. Park et al. reported similar ocular measurements using 780 nm partial coherence interferometry (PCI) compared to SD-OCT and comparable magnitudes measured with magnetic resonance imaging (MRI)^{161,168}.

In murine models, Dräger et al. reported that the optic disc is positioned near the geometric center of the retina in a whole-mount fixation study¹⁶⁹. Sterratt et al. quantitatively reported that the optic disc was located at a colatitude of $3.7 \pm 7.4^\circ$ from the geometric center, computed using 72 flat-mounted adult mouse retinas¹⁷⁰. This highlights a challenge due to the absence of a fovea aligned along the visual axis, as defined in the human eye¹⁷¹, which is replaced by the optic disc in mice. Therefore, optic nerve head (ONH) alignments showed significantly longer vitreous chamber depth (VCD) and axial length (AL) at early ages between P21 and P35 compared to Purkinje image-based alignment (P1), suggesting better agreement with the optical or visual axis of the mouse eye. This observation aligns with a previous report that misalignment in the vertical meridian causes the greatest change in AL but becomes insignificant by postnatal day 58. The shorter VCD and AL in the Purkinje image-based alignment, located in the nasal retina, may indicate uneven retinal thickness distribution superior to the ONH and the representative spherical position in the retina. Notably, computational analysis identified mouse retinas with optic axes at 64° azimuth and 22° elevation¹⁷⁰. Consistent with recent reports, VCD significantly decreased and retinal thickness (RT) significantly increased with increasing degrees from the ONH¹⁶³. Additionally, an uneven distribution of S-opsin was observed across dorsal, nasal, temporal, and ventral retinas in flat mounts, with denser populations in the ventral-nasal retina¹⁷⁰. The constant VCD length from P21 to P35 (Fig. 28b measured in Purkinje image-based alignment, agrees with observations in experimental animal models such as guinea pigs¹⁷² and the relatively constant VCD in mice between postnatal days 21 and 42¹⁶⁸. These differences between alignment methods are further supported by the absence of significant intra-method differences between eyes

(Fig. 27). Most importantly, the significantly longer VCD measured in ONH alignment is clinically relevant, corresponding to reported VCD elongation ranges of 38 to 50 μm in myopia research.³² The retinal thickness thinning measured with Purkinje image-based alignment ($y = -1.96x + 250.1$; $r^2 = 0.985$) is consistent with reported normative retinal thickness in C57BL/6J mice, showing thinning at P28 ($209.9 \pm 3.1 \mu\text{m}$), P56 ($202.2 \pm 2.9 \mu\text{m}$), and P112 ($199.2 \pm 4 \mu\text{m}$)¹⁷³.

5.5. Conclusion

SD-OCT enables precise in vivo measurement of ocular segmentation. It was observed that Purkinje image-based alignment (P1) resulted in a significantly shorter axial length, primarily due to a shorter vitreous chamber depth, compared to ONH alignment. This emphasizes the importance of understanding alignment methods in optical-based techniques. Variations in alignment methods may lead to misleading interpretations of results, particularly in myopia research focusing on axial length. When evaluating temporal ocular growth in mice, a significant shortening of VCD was observed using the ONH alignment method. Therefore, axial length measurements offer better consistency than vitreous chamber depth when different alignments are employed with OCT.

Chapter 6. Dysregulation of retinal GLUT1-mediated insulin sensitivity in myopia revealed by untargeted quantitative proteomics

6.1. Introduction

Myopia, a prevalent refractive error characterized by excessive elongation of the eyeball, has been associated with various metabolic dysregulations, particularly in glucose metabolism^{174,175}. A genetic study found that elevated hemoglobin A1c (HbA1c) levels and reduced adiponectin levels are linked to an increased risk of developing myopia¹⁷⁶. Additionally, previous research has demonstrated a positive correlation between glucose transporter 1 (GLUT1) mRNA levels and HbA1c levels in diabetic patients¹⁷⁷. Recent investigations have highlighted the critical role of GLUT1 in maintaining retinal insulin sensitivity and glucose homeostasis. When glucose entry through GLUT1 is excessive, it can activate the hexosamine pathway, which may inhibit insulin-mediated glucose transport¹⁷⁸. This suggests that dysregulation of GLUT1 may contribute to the pathophysiology of myopia. The connection between glycolysis and myopia is further supported by research showing enhanced glycolytic flux and lactate accumulation in the retinas of form-deprived myopic models, implicating a role for GLUT1 in these metabolic pathways¹⁷⁹. The current study aims to explore alterations in retinal GLUT1-mediated insulin sensitivity under myopic conditions using untargeted quantitative proteomics. By analyzing protein expression changes within the retina, we seek to uncover the molecular mechanisms driving myopia development and identify potential biomarkers for early detection and intervention. A deeper understanding of these pathways could inform therapeutic strategies for managing myopia.

6.2. Methods

6.2.1. Animals

Black C57BL/6J wild-type mice were imported from The Jackson Laboratory (Farmington, CT, USA). Mice were maintained as in-house breeding colonies at the centralized animal facility of The Hong

Kong Polytechnic University. Animals were housed in standard mouse cages (Sealsafe Plus GM500, Tecniplast, Varese, Italy) at 25 °C with a 12:12 hour light/dark cycle in a room with 150 lux lighting, with food and water available ad libitum. Mice were weaned on postnatal day 21 and housed until postnatal day 35. White Leghorn chick-specific pathogen-free (SPF) eggs (*Gallus gallus*) were obtained from Jinan Poultry Co. Ltd., China. Eggs were incubated in an egg incubator (ELYE-3, Onelye, China) for 21 days at an average temperature of 36.6 °C and humidity of 68 g/kg in the centralized animal facilities (CAF) at The Hong Kong Polytechnic University. Eggs were then moved to a hatcher (EH-96H, Onelye, China) for 1 week under identical temperature and humidity conditions. Newborn chicks at 3 days of age were housed in stainless steel brooders under a 12:12 light/dark cycle, with an average luminance of 500 lux at the center of the cage inside the breeding room, which had computer-controlled humidity of 41% at room temperature. Food and water were freely accessible. Researchers were licensed by the Department of Health, HKSAR government, and all procedures performed in this study received ethics approval from the Animal Subjects Ethics Sub-Committee (ASESC) of The Hong Kong Polytechnic University and complied with the Association for Research in Vision and Ophthalmology (ARVO) statement for the use of animals in ophthalmology and vision research.

6.2.2. Lens-induced myopia in C57BL6/J mice

All procedures in mice, including fixation of the spectacle system, refractive error, and ocular biometric measurements, were completed under anesthesia. The customized spectacle system was adapted from a previous publication and assembled onto the frame in advance. A dispersive lens made of polymethyl methacrylate (PMMA) was designed with a 9.0 mm diameter, 8.0 mm base curve, and -30 D power (E&E Optics, Hong Kong). First, the pupil of each eye was dilated with a drop of Mydrin-P ophthalmic solution containing 0.5% tropicamide and 0.5% phenylephrine hydrochloride for 15 minutes. Mice were then sedated with a mixture of ketamine (70 mg/kg) and xylazine (10 mg/kg)

delivered by intraperitoneal injection. A small incision was made on the scalp with scissors to expose an approximately 0.8 cm² area of the skull by lifting the skin upward with forceps. The periosteum was removed by etching with the liquid primer from the self-curing adhesive resin cement kit (Super-Bond universal kit, Sun Medical, Japan). A base fitted with an M1.4–10 mm screw was adhered onto the skull using the polymer adhesive from the Super-Bond universal kit and air-dried. Once the mouse recovered from anesthesia, the spectacle frame was carefully adjusted to fit the geometry of the eyes and secured with an M1.4 nut. A randomized, unilateral lens-induced myopia (LIM) treatment was applied from age P21 to P35.

6.2.3. Ocular biometric measurements in C57BL/6J mice

The eccentric infrared photorefractor was purchased from the manufacturer (Steinbeiss-Transfer Centre for Biomedical Optics, Tuebingen, Germany) and used according to the user manual³⁰. Refractive errors were acquired by alignment to the Purkinje image from the corneal reflection, known as P1, with software-controlled gaze control maintaining the x- and y-axes within 5 degrees. Additionally, each measurement was carefully adjusted as close as possible to zero on both axes to collect 99 data points per eye. Measurements were represented as the mean value in diopters \pm SD and repeated in triplicate. Ocular dimensions were measured in radial volume mode in duplicate (A-scans = 1000 lines, B-scans = 6, 32 frames, 80 lines of inactive A-scans, 0.4 mm diameter). The length of each component is presented as the mean value in micrometers. Segmented ocular dimensions were measured using spectral domain optical coherence tomography (SD-OCT, Envisu R4310, Leica, Germany) equipped with a 50° probe for mice. Mice were reset to the default position after each SD-OCT measurement, and measurements were acquired in duplicate. Ocular segmentation was analyzed manually using a digital caliper in OCT data analysis software (InVivoVue, ver. 2.4, Leica). Axial length (AL) was represented as the sum of all ocular segments, including corneal thickness (CT), measured from the anterior to the posterior corneal surface. Anterior chamber depth (ACD) is the

distance from the posterior corneal surface to the anterior lens surface. Lens thickness (LT) is the distance from the anterior to the posterior lens surface. Vitreous chamber depth (VCD) is the distance from the posterior lens surface to the retinal nerve fiber layer. Retinal thickness (RT) is the depth from the retinal nerve fiber layer to the retinal pigment epithelium (Fig. 30).

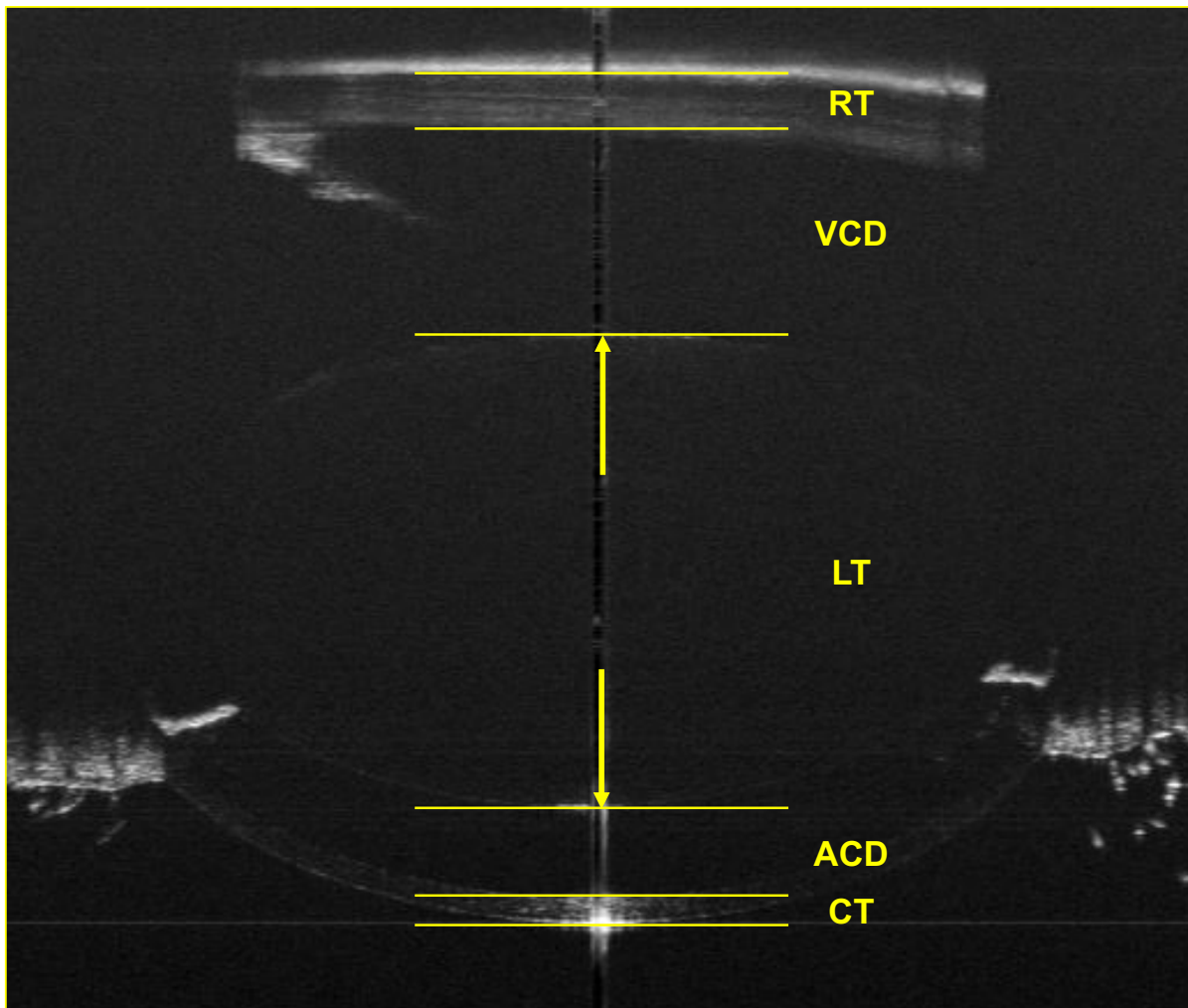


Fig. 30: Representative image of ocular dimension in mice, captured by SD-OCT.

Ocular dimension and segmentation were measured using spectral-domain optical coherence tomography (SD-OCT). Axial length (AL) was represented as the sum of all ocular segments, including corneal thickness (CT) measured from the anterior corneal surface to the posterior corneal surface. The anterior chamber depth (ACD) is the distance from the posterior cornea surface to the anterior lens surface. Lens thickness (LT) is the distance from the anterior lens surface to the posterior

lens surface. Vitreous chamber depth (VCD) is the distance from the posterior lens surface to the retinal nerve fiber layer. Retinal thickness (RT) is the depth of the retinal nerve fiber layer up to the retinal pigment epithelium.

6.2.4. Isolation of the neural retina from mouse eyes

Mice were sacrificed by cervical dislocation. Eyes were immediately pulled using forceps by holding the back of the eye. The eye cup was submerged in ice-cold PBS to remove excess muscles, connective tissues, and blood. A small incision was made using scissors at the center of the equatorial axis and hemisected equatorially to separate the anterior and posterior segments. The large crystalline lens was pulled out with forceps from the posterior eye segment. The posterior eyeball was submerged in fresh, ice-cold PBS. The pale-yellow, transparent neural retina tissue was gently pulled off from the posterior eyeball by holding the edge of the choroidal sclera tissue. A tight grip was applied around the optic nerve head to detach its connection. The isolated retinal tissue was rinsed again in ice-cold PBS, snap-frozen in liquid nitrogen, and stored at $-80\text{ }^{\circ}\text{C}$.

6.2.5. Tissue homogenization and protein extraction

Retinas were homogenized in a liquid nitrogen-cooled tissue homogenizer (Precellys Evolution, Bertin Instruments) with an optimized volume of $250\text{ }\mu\text{L}$ lysis buffer containing 5% sodium dodecyl sulfate (SDS) and 50 mM triethylammonium bicarbonate (TEAB) for mouse retina, and $350\text{ }\mu\text{L}$ optimized for chick retina. Samples were homogenized at 7,000 rpm for 30 seconds \times 4 cycles with 20-second intervals at $4\text{ }^{\circ}\text{C}$ in a homogenization tube (CKMix, Bertin Instruments, France). The sample was briefly centrifuged, and the supernatant was transferred to a new 1.5 mL Eppendorf tube and centrifuged at 15,000 rpm for 30 minutes at $4\text{ }^{\circ}\text{C}$. Protein concentration was determined using the bicinchoninic acid assay (Pierce Rapid Gold BCA Protein Assay, A53225, Thermo Fisher).

6.2.6. Mass spectrometry sample preparation

The protocol was adopted from a previous publication and followed the manufacturer's procedure. Suspension trap columns were purchased from Protifi (S-Trap Micro, USA). Protein (50 µg) was reduced with a final concentration of 20 mM dithiothreitol (DTT) at 95 °C for 10 minutes, cooled to room temperature, and then alkylated with a final concentration of 40 mM iodoacetamide (IAA) at room temperature in the dark for 10 minutes. The SDS lysate was acidified with a final concentration of 1.2% aqueous phosphoric acid. The solution was diluted with six volumes of protein binding buffer (90% methanol, 0.1 M TEAB, pH 7.5). The mixture was loaded onto an S-Trap spin column and centrifuged at $4,000 \times g$ for 20 seconds. The captured protein was washed with 150 µL of protein binding buffer and centrifuged at $4,000 \times g$ for 20 seconds. This step was repeated three times. Protein digestion was performed using 20 µL of digestion buffer containing trypsin (V5111, Promega, USA) at 1:25 (w/w, trypsin:protein) added to the filter and digested at 47 °C for 1 hour. Peptides were eluted in three sequential steps: (1) 40 µL of 50 mM TEAB; (2) 40 µL of 0.2% aqueous formic acid (FA); and (3) 35 µL of 50% acetonitrile and 0.2% FA. The three peptide solutions were pooled and lyophilized by vacuum centrifugation at 4 °C (CentriVap, Labconco, USA). Peptides were resuspended in 20 µL of 0.1% FA. The peptide concentration was measured and normalized to 0.5 µg/µL with 0.1% FA using a colorimetric peptide assay (Cat. No. 23275, Thermo Fisher Scientific) for mass spectrometric analysis.

6.2.7. Data-dependent acquisition of the mouse retinal proteome spectral library

An equally contributed pooled sample of peptides (1 µg) was analyzed by data-dependent acquisition with Zeno pulsing (Zeno DDA) in duplicate and loaded with isocratic loading buffer (2% ACN, 0.1% FA) onto a reversed-phase chromatography trap column packed with 5 µm particles, 180 µm × 20 mm (nanoEase M/Z Symmetry C18, Waters) at 3 µL/min for 15 minutes. Chromatographic separation was performed using a C18 reversed-phase analytical column with 1.8 µm particles, 75 µm

× 200 mm (nanoEase M/Z HSS C18 T3, Waters) at a flow rate of 0.3 µL/min with the following gradient: 0–0.5 min: 5% B (ACN, 0.1% FA); 0.5–90 min: 10% B; 90–120 min: 20% B; 120–130 min: 28% B; 130–135 min: 45% B; 135–141 min: 80% B; and finally equilibration between 141–155 min with 5% B, with mobile phase A (0.1% FA, deionized water). The process was handled by nano-microscale liquid chromatography (ACQUITY UPLC M-Class, Waters). The column was connected to an OptiFlow Turbo V ion source equipped with a NanoSpray probe (Cat. No. 5029431, Sciex) on a ZenoTOF 7600 mass spectrometer (Sciex, USA). The sample was introduced to the mass spectrometer with a silica OptiFlow nanoelectrode (Cat. No. 5070382, Sciex). MS1 spectra were obtained from 350 to 1800 Da with an accumulation time of 250 ms. Data-dependent acquisition (DDA) selected the top 50 peptide precursors with signals over 125 cps and charge states from 2+ to 5+. Selected precursors were excluded for 15 seconds after one occurrence, with dynamic background subtraction and dynamic collision energy algorithms. Precursors were fragmented using collision-induced dissociation (CID) mode with rolling collision energy for peptide charge +2, and a collision energy spread of 15 eV was applied. Fragment ions were scanned from 100 to 1800 Da with an MS2 accumulation time of 5 ms in the time-of-flight mass analyzer. ProteinPilot (ver. 5.0.2, Sciex) was used for identification of the retinal proteome in mice. Protein identities were assigned by searching against the UniProt Mus musculus database (UP000000589, 17,102 reviewed proteins, May 2022) using the Paragon algorithm (ver. 5.0.2). Trypsin was selected for peptide digestion.

6.2.8. Label-free quantitative SWATH-MS acquisition of the mouse retina proteome

Peptides (1 µg) were acquired in duplicate using the liquid chromatography setup described in the previous section. Sequential window acquisition of all theoretical mass spectra (SWATH-MS), a data-independent acquisition (DIA) approach, was used to quantify peptide intensities by mass spectrometry^{70,180}. MS1 survey scans were acquired from 350 to 1800 Da with an accumulation time of 50 ms. Precursors were fragmented in CID mode and measured with 100 variable windows from

350 to 1800 Da, each with a 25 ms accumulation time and rolling collision energy. The isolation windows were determined based on precursor frequencies in the Zeno DDA data of the mouse retina sample. PeakView (ver. 2.2, Sciex) was used to build a consensus spectral library using the prerequisite Zeno DDA data. Retention times acquired in SWATH-MS mode were normalized using endogenous peptides covering the elution profile. Peptides that satisfied a 99% confidence threshold and 1% false discovery rate (FDR) were selected, with the ion extraction window set to 10 minutes and fragment mass tolerance set to 20 ppm; modified peptides were excluded. FDR analysis was performed by searching MS/MS spectra against the target database combined with a reversed-sequence decoy proteome sequence. Quantified peptides in SWATH-MS mode were normalized using the most likely ratio (MLR) method, and technical replicates were represented as mean values for each biological sample in MarkerView (ver. 1.3.1, Sciex). Proteins with abundance ratios ≥ 1.2 or ≤ 0.83 and $p \leq 0.05$ were considered significantly differentiated between LIM and control eyes. Peptides (1 μ g) were acquired in duplicate using the liquid chromatography setup described in the previous section. Sequential window acquisition of all theoretical mass spectra (SWATH-MS), a data-independent acquisition (DIA) approach, was used to quantify peptide intensities by mass spectrometry. MS1 survey scans were acquired from 350 to 1800 Da with an accumulation time of 50 ms. Precursors were fragmented in CID mode and measured with 100 variable windows from 350 to 1800 Da, each with a 25 ms accumulation time and rolling collision energy. The isolation windows were determined based on precursor frequencies in the Zeno DDA data of the mouse retina sample. PeakView (ver. 2.2, Sciex) was used to build a consensus spectral library using the prerequisite Zeno DDA data. Retention times acquired in SWATH-MS mode were normalized using endogenous peptides covering the elution profile. Peptides that satisfied a 99% confidence threshold and 1% false discovery rate (FDR) were selected, with the ion extraction window set to 10 minutes and fragment mass tolerance set to 20 ppm; modified peptides were excluded. FDR analysis was performed by searching MS/MS spectra against the target database combined with a reversed-sequence decoy proteome sequence. Quantified peptides

in SWATH-MS mode were normalized using the most likely ratio (MLR) method, and technical replicates were represented as mean values for each biological sample in MarkerView (ver. 1.3.1, Sciex). Proteins with abundance ratios ≥ 1.2 or ≤ 0.83 and $p \leq 0.05$ were considered significantly differentiated between LIM and control eyes.

6.2.9. Targeted proteomics analysis of tryptic-digested Glut1 peptides

Peptide (1 μg) was loaded with an isocratic flow (2% ACN, 0.1% FA) at 10 $\mu\text{L}/\text{min}$ for 3 minutes onto a reversed-phase chromatography trap column packed with 5 μm particles, 300 $\mu\text{m} \times 50$ mm (nanoEase M/Z Symmetry C18, Waters). Peptide separation was performed using a reversed-phase chromatography column with 1.8 μm particles, 75 $\mu\text{m} \times 100$ mm (nanoEase M/Z HSS C18 T3, Waters) over a 15-minute method at a flow rate of 7 $\mu\text{L}/\text{min}$, with mobile phase A (0.1% FA in water) and mobile phase B (0.1% FA in ACN). The gradient started at 3% B, increased to 10% B in 1 minute, then from 10% to 30% B in 9 minutes, and ramped to 40% B in 10 minutes. The column was rinsed with 95% B from 10 to 12 minutes, followed by a ramp back to the starting conditions of 3% B from 12 to 15 minutes. The liquid chromatography system (ACQUITY UPLC M-Class, Waters) was coupled to a ZenoTOF 7600 mass spectrometer equipped with an OptiFlow source, installed with a low microelectrode (Part No. 5061574, Sciex). All targeted MRMHR analyses were carried out in positive ion mode at a spray voltage of 5500 V. The source curtain gas was set to 45 psi, gas 1 at 20 psi, gas 2 at 15 psi, and the interface heating temperature was set to 150 $^{\circ}\text{C}$. The top six transitions of the top three peptides from the SWATH analyses were chosen and matched with the spectral library. Peptides were analyzed using Zeno pulsing-enabled high-resolution multiple reaction monitoring acquisition (Zeno MRMHR), also known as parallel reaction monitoring (PRM), consisting of the same TOF-MS scan applied in the SWATH-MS experiment, followed by MS/MS scans of the inclusion precursors set to unit Q1 isolation in duplicate. Skyline (ver. 22.2, USA) was used to develop the MRMHR assay, utilizing the prerequisite spectral library and individual biological replicates

acquired in SWATH-MS mode. Targeted peptides were visualized and interpreted in Skyline by comparing the spectral similarity, represented by the dot product (dotp) of the transition peak areas in SWATH-MS measurements and library spectra acquired in DDA mode. In addition, the fragment ion patterns and intensities were matched with the neural network-based predictor software Prosit¹⁸¹. The software predicts the relative intensities of b- and y-ions in each peptide sequence, with the m/z values of the ions derived from the precursor, subsequently forming a full pseudo-MS2 spectrum.

6.2.10. Statistical analysis

Variance analysis of multiple groups was performed using two-way ANOVA followed by Tukey's honest significant difference (HSD) post hoc tests. One-way ANOVA with Tukey's HSD was used for multiple comparisons between doses of intravitreal injection of rosiglitazone in the avian model. Unpaired Student's t-test was used for two-group comparisons in the targeted quantification of GLUT1 peptides. All statistical analyses were performed using Prism (ver. 9.5, GraphPad Software, USA). Data are presented as the mean \pm SEM. Statistical significance tests and the number of samples used are described in the figure legends. Significance values are indicated as * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. Sample size calculation was performed using GPower software (ver. 3.1.9) on targeted validation of GLUT1 peptides acquired in Zeno MRMHR mode. Protein-protein interaction network functional enrichment analysis was performed on statistically significant differentially expressed proteins using the STRING database (ver. 12.0).

6.3. Results

6.3.1. Accelerated eye growth and refractive development in lens-induced myopia

This study investigated the effects of lens-induced myopia (LIM) on ocular growth and refractive changes in mice, focusing on growth rates following unilateral treatment with negative (concave) lenses. The experiment commenced on postnatal day 21 (P21) and continued for two weeks,

assessing relative changes and interocular differences in eye growth between treated and control eyes. Linear regression analysis quantified relative changes in axial length (AL) from baseline, revealing a significant difference in growth rate between the two conditions ($p = 0.02$). LIM-treated eyes demonstrated an average growth rate of $110.8 \mu\text{m}/\text{week}$, while control (CTL) eyes grew at $86.2 \mu\text{m}/\text{week}$ (Fig. 31a). These findings highlight the accelerated axial elongation associated with LIM. The growth rate of corneal thickness (CT) remained consistent between conditions, with $2.4 \mu\text{m}/\text{week}$ in LIM-treated eyes and $2.2 \mu\text{m}/\text{week}$ in CTL eyes, suggesting that LIM did not affect corneal thickening (Fig. 31b). Anterior chamber depth (ACD) growth also contributed to overall axial elongation, with LIM-treated eyes growing at $27.2 \mu\text{m}/\text{week}$ compared to $19.4 \mu\text{m}/\text{week}$ in CTL eyes; this difference reflects the impact of LIM on anterior segment expansion (Fig. 31c). Although lens elongation was observed in both conditions, no significant differences were found between them: LIM-treated eyes exhibited a growth rate of $81.1 \mu\text{m}/\text{week}$ compared to $82.6 \mu\text{m}/\text{week}$ in CTL eyes (Fig. 31d). To understand the underlying mechanisms of axial elongation, the growth rates of individual ocular segments were analyzed. The majority of axial elongation in LIM-treated eyes was attributed to an increased growth rate of vitreous chamber depth (VCD), with LIM-treated eyes exhibiting a growth rate of $17.7 \mu\text{m}/\text{week}$ compared to $-5.7 \mu\text{m}/\text{week}$ in control (CTL) eyes, indicating a distinct pattern of posterior segment elongation in LIM-treated eyes (Fig. 31e). A shortening of retinal thickness (RT) was observed in both LIM and CTL eyes, but the difference between conditions was not statistically significant; growth rates were $-16.1 \mu\text{m}/\text{week}$ in LIM-treated eyes and $-11.7 \mu\text{m}/\text{week}$ in CTL eyes (Fig. 31f). Relative changes in refractive error measurements revealed distinct trends between LIM and CTL eyes. LIM-treated eyes exhibited myopic progression, with a refractive change rate of $-2.86 \text{ D}/\text{week}$, whereas CTL eyes followed a hyperopic trend, with a refractive change rate of $+2.46 \text{ D}/\text{week}$ (Fig. 31g). These opposing trends highlight the impact of LIM treatment on refractive development, complementing the ocular dimensional measurements. Statistical comparisons of age-matched data between LIM-treated and CTL eyes were performed using Welch's t-test.

Furthermore, interocular difference analysis between LIM and CTL eyes from P21 to P35 revealed significantly longer axial length (AL) at P28 ($35.8 \pm 8.8 \mu\text{m}$, $p < 0.01$) and P35 ($41.4 \pm 15.1 \mu\text{m}$, $p < 0.01$) (Fig. 31h). ACD was significantly greater at P35 ($9.2 \pm 5.6 \mu\text{m}$, $p < 0.05$). Regarding posterior segment changes (Fig. 31j), significant increases in VCD were noted at both P28 ($29.8 \pm 8.8 \mu\text{m}$, $p < 0.05$) and P35 compared to P21 ($37.8 \pm 9.7 \mu\text{m}$, $p < 0.05$) (Fig. 31l). No interocular differences were observed in CT, LT, or RT (Fig. 31i, k, m). Significant interocular differences in refractive error were recorded at both P28 ($-6.8 \pm 2.6 \text{ D}$, $p < 0.05$) and P35 ($-10.2 \pm 3.3 \text{ D}$, $p < 0.05$) (Fig. 31n). Statistical analyses were performed using one-way ANOVA with Tukey's honest significant difference (HSD) post hoc test.

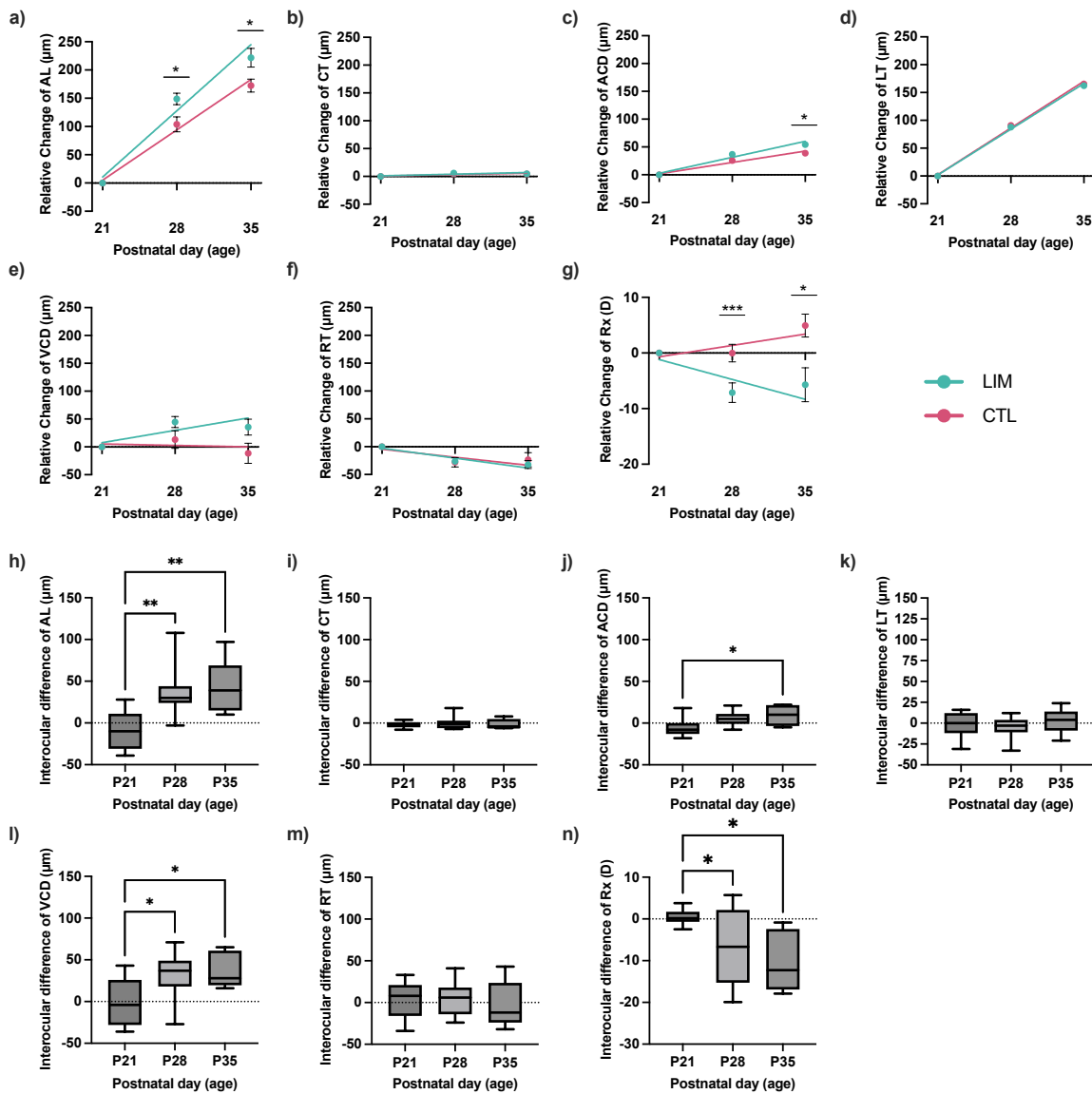


Fig. 31: Ocular biometric measurements of lens-induced myopia in mice.

The influence of randomized unilateral lens-induced myopia (LIM) on ocular dimensions was measured, with the contralateral eye serving as the control (CTL) at postnatal days 21 (P21, n=11), 28 (P28, n=11) and 35 (P35, n=5). Scatter plots show linear regression (solid line) representing the relative changes in ocular dimension and refractive error, expressed as mean \pm SEM. The parameters analyzed include **a)** Axial length (AL). **b)** Corneal thickness (CT). **c)** Anterior chamber depth (ACD). **d)** Lens thickness (LT). **e)** Vitreous chamber depth (VCD). **f)** Retinal thickness (RT). **g)** Refractive error (Rx). Box plots illustrate interocular differences (LIM-CTL). **h)** Axial length (AL). **i)** Corneal thickness (CT). **j)** Anterior chamber depth (ACD). **k)** Lens thickness (LT). **l)** Vitreous chamber depth (VCD).

m) Retinal thickness (RT). **n)** Refractive error (Rx). Statistical analyses were performed using two-way ANOVA with Tukey's HSD post hoc test. Statistical significance levels are indicated as * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$

6.3.2. Proteomic profiling of retinal changes induced by lens-induced myopia

Label-free quantitative proteomics was employed to profile the retinal proteome in mice. A spectral library was generated, encompassing protein identification details such as precursor ion masses, fragment ion masses, fragment ion intensities, and retention times, derived from a pooled retinal sample using data-dependent acquisition with Zeno pulsing (Zeno DDA). In total, we identified 4,738 unique protein groups, 22,335 unique peptides, and 506,557 transitions in the consensus library, which was acquired in duplicate (Fig. 32a). Venn diagram analysis revealed that 3,614 (75%) unique proteins were commonly identified, with 4,228 proteins detected in the first technical replicate (T1) and 4,171 proteins in the second technical replicate (T2) (Fig. 32b). The consensus library comprised peptide precursors with mass-to-charge ratio (m/z) ranging from 350 to 1794 (25 - 75 percentile: 546 to 809 m/z), with a median peptide mass of 662 m/z . The mass accuracy of the spectral library was near zero, with a median delta m/z of -0.0002 (Fig. 32c,d). The library consisted of 80.5% canonical peptides, 14.8% peptides with at least one missed cleavage, and 4.7% semi-specific tryptic peptides (Fig. 32e). The majority of peptides were doubly charged (51.8%), with a decreasing abundance observed for higher charge states; most peptides were identified with intensities around 5 orders of magnitude on the ZenoTOF 7600 mass spectrometer (Fig. 32f, g).

We identified and quantified 3,974 unique proteins from the retinas of mice subjected to LIM treatment for two weeks (LIM/CTL, $n = 5$), achieving a stringent 1% false discovery rate (FDR) in sequential window acquisition of all theoretical mass spectra (SWATH-MS) mode at P35 (Table 7). There was no significant shift in the overall fold-change across the retinal proteome; the \log_2 FC mean

value was -0.03, the median FC was -0.01, and the median coefficient of variation for proteins was 12%, which is lower than multi-laboratory evaluations on SWATH-MS reproducibility (Fig. 32h, i)⁷⁰. Notably, we found 85 downregulated and 39 upregulated proteins that were differentially expressed with $p \leq 0.05$ and protein fold-change (FC) ≥ 1.2 or ≤ 0.83 (Fig. 32j). The consistency of statistically significant upregulated or downregulated proteins was further illustrated through a heatmap (Fig. 32k). These quality control metrics obtained from both the spectral library and library-matched SWATH-MS were satisfactory and comparable to findings from other studies¹⁸².

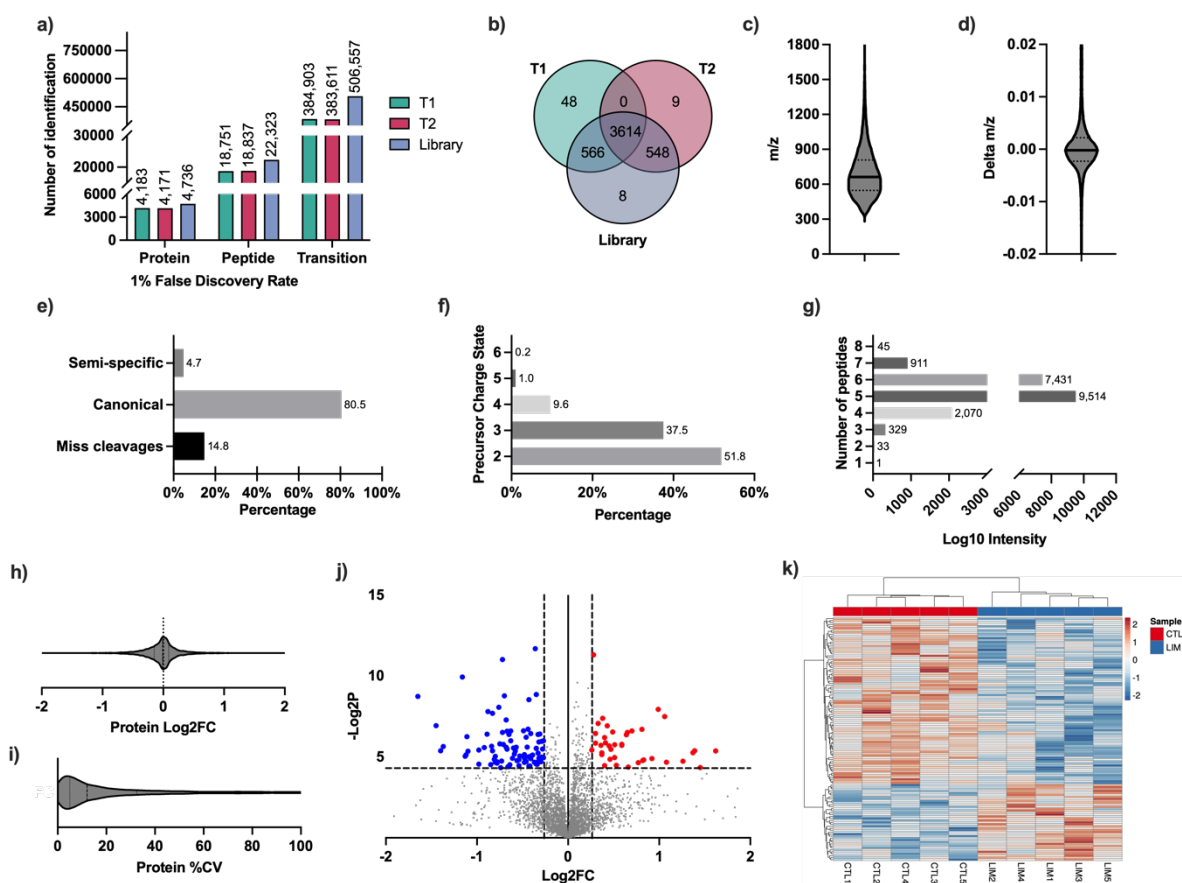


Fig. 32: Spectral library and SWATH-MS quantification of the mouse retinal proteome.

Spectral library metrics for mouse retinas were profiled using Zeno DDA mode. a) protein identification, peptides, and transitions. b) Venn diagram showing protein identification in technical replicate 1 (T1), technical replicate 2 (T2), and the library composed of all acquisitions. c) Distribution of mass-to-charge (m/z) ratios. d) Mass accuracy. e) Frequencies of tryptic digestion. f) Distribution

of precursor charges. g) Peptide abundances. h) Protein fold-changes of all quantified proteins, with the median (dotted line). i) Violin plot showing protein variation for all quantified proteins, with the median (dotted line) and the mean value (solid line). j) Volcano plot illustrating the quantification of the retinal proteome using SWATH-MS acquisition. k) Heat map of differentially expressed proteins clustered using correlation distance and average linkage.

Table 7. List of significantly differentiated retinal proteins quantified by SWATH-MS mode in mice retina at P35.

Proteins were filtered at 1%FDR, $p < 0.05$, and FC (LIM/CTL) ≥ 1.2 or ≤ 0.83 . Entry name, accession, and gene name were obtained from the UniProt database.

| UniProt Accession | Gene Names | Protein names | Number of Peptides | Log2FC | p-value |
|-------------------|------------|--|--------------------|--------|---------|
| Q9DBZ5 | Eif3k | Eukaryotic translation initiation factor 3 subunit K (eIF3k) (Eukaryotic translation initiation factor 3 subunit 12) (eIF-3 p25) | 3 | -0.36 | 0.0003 |
| Q6ZWN5 | Rps9 | Small ribosomal subunit protein uS4 (40S ribosomal protein S9) | 2 | 0.29 | 0.0004 |
| Q9JL35 | Hmgn5 | High mobility group nucleosome-binding domain-containing protein 5 (Nucleosome-binding protein 1) (Nucleosome-binding protein 45) (NBP-45) (Protein GARP45) | 2 | -0.71 | 0.0005 |
| P46718 | Pdcd2 | Programmed cell death protein 2 (Zinc finger protein Rp-8) | 1 | -1.15 | 0.001 |
| Q9EQQ9 | Oga | Protein O-GlcNAcase (OGA) (EC 3.2.1.169) (Beta-N-acetylhexosaminidase) (Beta-hexosaminidase) (Bifunctional protein NCOAT) (Meningioma-expressed antigen 5) (N-acetyl-beta-D-glucosaminidase) (N-acetyl-beta-glucosaminidase) | 3 | -0.36 | 0.0022 |
| Q8BZH4 | Pogz | Pogo transposable element with ZNF domain | 3 | -0.69 | 0.0023 |

| | | | | | |
|--------|----------|--|---|-------|--------|
| Q91WE2 | Psme3ip1 | PSME3-interacting protein (NEFA-interacting nuclear protein NIP30) (PA28G-interacting protein) | 3 | -1.64 | 0.0024 |
| Q8BWU5 | Osgep | tRNA N6-adenosine threonylcarbamoyltransferase (EC 2.3.1.234) (N6-L-threonylcarbamoyladenine synthase) (t(6)A synthase) (O-sialoglycoprotein endopeptidase) (t(6)A37 threonylcarbamoyladenine biosynthesis protein Osgep) (tRNA threonylcarbamoyladenine biosynthesis protein Osgep) | 1 | -0.43 | 0.0027 |
| Q9CPW0 | Cntnap2 | Contactin-associated protein-like 2 (Cell recognition molecule Caspr2) | 1 | -0.76 | 0.0038 |
| P12849 | Prkar1b | cAMP-dependent protein kinase type I-beta regulatory subunit | 1 | 0.99 | 0.0041 |
| Q9CR11 | Yeats4 | YEATS domain-containing protein 4 (Glioma-amplified sequence 41 homolog) (Gas41) | 3 | -0.89 | 0.0045 |
| Q91XY4 | Pcdhga4 | Protocadherin gamma-A4 (PCDH-gamma-A4) | 1 | -0.84 | 0.0048 |
| Q6A009 | Ltn1 | E3 ubiquitin-protein ligase listerin (EC 2.3.2.27) (RING finger protein 160) (RING-type E3 ubiquitin transferase listerin) (Zinc finger protein 294) (Zfp-294) | 3 | 1.06 | 0.0056 |

| | | | | | |
|--------|--------|---|---|-------|--------|
| Q8R2Y8 | Pthr2 | Peptidyl-tRNA hydrolase 2, mitochondrial (PTH 2) (EC 3.1.1.29) | 3 | 0.39 | 0.006 |
| Q6PIP5 | Nudcd1 | NudC domain-containing protein 1 | 1 | -0.69 | 0.0064 |
| Q9D2M8 | Ube2v2 | Ubiquitin-conjugating enzyme E2 variant 2 (Ubc-like protein MMS2) | 3 | 0.32 | 0.0075 |
| Q3TKY6 | Cwc27 | Spliceosome-associated protein CWC27 homolog (Probable inactive peptidyl-prolyl cis-trans isomerase CWC27 homolog) (PPIase CWC27) | 3 | -1.43 | 0.0082 |
| Q9CQ75 | Ndufa2 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2 (Complex I-B8) (CI-B8) (NADH-ubiquinone oxidoreductase B8 subunit) | 1 | 0.42 | 0.0082 |
| Q91WN1 | Dnajc9 | DnaJ homolog subfamily C member 9 | 1 | -0.43 | 0.0096 |
| Q9CQU3 | Rer1 | Protein RER1 | 3 | 0.82 | 0.0096 |
| Q68FM6 | Elfn2 | Protein phosphatase 1 regulatory subunit 29 (Extracellular leucine-rich repeat and fibronectin type III domain-containing protein 2) (Leucine-rich repeat and fibronectin type-III domain-containing protein 6) (Leucine-rich repeat-containing protein 62) | 1 | -0.49 | 0.0103 |

| | | | | | |
|--------|---------|---|---|-------|--------|
| P52927 | Hmga2 | High mobility group protein HMGI-C (High mobility group AT-hook protein 2) | 1 | 0.70 | 0.0103 |
| Q91ZA3 | Pcca | Propionyl-CoA carboxylase alpha chain, mitochondrial (PCCase subunit alpha) (EC 6.4.1.3) (Propanoyl-CoA:carbon dioxide ligase subunit alpha) | 2 | -0.62 | 0.0103 |
| Q9D8W7 | Ociad2 | OCIA domain-containing protein 2 | 3 | -0.67 | 0.0105 |
| Q6PFD9 | Nup98 | Nuclear pore complex protein Nup98-Nup96 (EC 3.4.21.-) [Cleaved into: Nuclear pore complex protein Nup98 (98 kDa nucleoporin) (Nucleoporin Nup98) (Nup98); Nuclear pore complex protein Nup96 (96 kDa nucleoporin) (Nucleoporin Nup96) (Nup96)] | 1 | 0.49 | 0.0107 |
| Q5DTT2 | Psd | PH and SEC7 domain-containing protein 1 (Exchange factor for ADP-ribosylation factor guanine nucleotide factor 6) (Exchange factor for ARF6) (Exchange factor for ARF6 A) (Pleckstrin homology and SEC7 domain-containing protein 1) | 3 | 0.65 | 0.011 |
| Q8VE99 | Ccdc115 | Coiled-coil domain-containing protein 115 (Coiled-coil protein 1) (Ccp1) | 3 | -0.71 | 0.011 |

| | | | | | |
|--------|---------|--|---|-------|--------|
| Q9EQK7 | Icmt | Protein-S-isoprenylcysteine O-methyltransferase (EC 2.1.1.100) (Isoprenylcysteine carboxymethyltransferase) (Prenylated protein carboxyl methyltransferase) (PPMT) (Prenylcysteine carboxyl methyltransferase) (pcCMT) | 1 | 0.30 | 0.0115 |
| Q62018 | Ctr9 | RNA polymerase-associated protein CTR9 homolog (SH2 domain-binding protein 1) (Tetratricopeptide repeat-containing, SH2-binding phosphoprotein of 150 kDa) (TPR-containing, SH2-binding phosphoprotein of 150 kDa) (p150TSP) | 1 | -0.42 | 0.0115 |
| Q9CR68 | Uqcrfs1 | Cytochrome b-c1 complex subunit Rieske, mitochondrial (EC 7.1.1.8) (Complex III subunit 5) (Cytochrome b-c1 complex subunit 5) (Rieske iron-sulfur protein) (RISP) (Rieske protein UQCRFS1) (Ubiquinol-cytochrome c reductase iron-sulfur subunit) [Cleaved into: Cytochrome b-c1 complex subunit 9 (Su9) (Subunit 9) (8 kDa subunit 9) (Complex III subunit IX) (Cytochrome b-c1 complex subunit 11) (UQCRFS1 mitochondrial targeting sequence) (UQCRFS1 MTS) (Ubiquinol-cytochrome c reductase 8 kDa protein)] | 3 | -0.30 | 0.0117 |

| | | | | | |
|--------|--------|---|---|-------|--------|
| Q9DB29 | Iah1 | Isoamyl acetate-hydrolyzing esterase 1 homolog (EC 3.1.-.-) | 2 | -0.89 | 0.0118 |
| Q8CHW4 | Eif2b5 | Translation initiation factor eIF2B subunit epsilon (eIF2B GDP-GTP exchange factor subunit epsilon) | 3 | -0.34 | 0.012 |
| Q91YE7 | Rbm5 | RNA-binding protein 5 (Putative tumor suppressor LUCA15) (RNA-binding motif protein 5) | 3 | -0.64 | 0.012 |
| Q9CQ91 | Ndufa3 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3 (Complex I-B9) (CI-B9) (NADH-ubiquinone oxidoreductase B9 subunit) | 3 | 0.64 | 0.0121 |
| Q61239 | Fnta | Protein farnesyltransferase/geranylgeranyltransferase type-1 subunit alpha (EC 2.5.1.58) (EC 2.5.1.59) (CAAX farnesyltransferase subunit alpha) (FTase-alpha) (Ras proteins prenyltransferase subunit alpha) (Type I protein geranyl-geranyltransferase subunit alpha) (GGTase-I-alpha) | 2 | -1.12 | 0.0131 |
| Q6PIE5 | Atp1a2 | Sodium/potassium-transporting ATPase subunit alpha-2 (Na(+)/K(+) ATPase alpha-2 subunit) (EC 7.2.2.13) (Na(+)/K(+) ATPase alpha(+) subunit) (Sodium pump subunit alpha-2) | 2 | -0.47 | 0.0135 |

| | | | | | |
|--------|---------|--|---|-------|--------|
| Q99ME9 | Gtpbp4 | GTP-binding protein 4 (Chronic renal failure gene protein) (GTP-binding protein NGB) (Nucleolar GTP-binding protein 1) | 3 | 0.40 | 0.0137 |
| Q91W90 | Txndc5 | Thioredoxin domain-containing protein 5 (EC 1.8.4.-) (EC 5.3.4.1) (Endoplasmic reticulum resident protein 46) (ER protein 46) (ERp46) (Plasma cell-specific thioredoxin-related protein) (PC-TRP) (Thioredoxin-like protein p46) | 1 | -0.27 | 0.0157 |
| P56671 | Maz | Myc-associated zinc finger protein (MAZI) (Pur-1) (Purine-binding transcription factor) | 1 | -0.62 | 0.0158 |
| P63330 | Ppp2ca | Serine/threonine-protein phosphatase 2A catalytic subunit alpha isoform (PP2A-alpha) (EC 3.1.3.16) | 3 | -0.29 | 0.0161 |
| Q91VL8 | Terf2ip | Telomeric repeat-binding factor 2-interacting protein 1 (TERF2-interacting telomeric protein 1) (TRF2-interacting telomeric protein 1) (Repressor/activator protein 1 homolog) (RAP1 homolog) | 1 | -0.32 | 0.0166 |
| P53702 | Hccs | Holocytochrome c-type synthase (EC 4.4.1.17) (Cytochrome c-type heme lyase) (CCHL) | 2 | 0.41 | 0.017 |

| | | | | | |
|--------|----------|--|---|-------|--------|
| Q9JM63 | Kcnj10 | ATP-sensitive inward rectifier potassium channel 10 (Inward rectifier K(+) channel Kir4.1) (Potassium channel, inwardly rectifying subfamily J member 10) | 1 | 0.30 | 0.0173 |
| Q3KNM2 | Marchf5 | E3 ubiquitin-protein ligase MARCHF5 (EC 2.3.2.27) (Membrane-associated RING finger protein 5) (Membrane-associated RING-CH protein V) (MARCH-V) (RING-type E3 ubiquitin transferase MARCHF5) | 1 | -0.76 | 0.018 |
| Q8BXA7 | Phlpp2 | PH domain leucine-rich repeat-containing protein phosphatase 2 (EC 3.1.3.16) (PH domain leucine-rich repeat-containing protein phosphatase-like) (PHLPP-like) | 2 | 0.58 | 0.0181 |
| Q8K2Q7 | Brox | BRO1 domain-containing protein BROX (BRO1 domain- and CAAX motif-containing protein) | 2 | -0.71 | 0.0183 |
| Q9CZQ9 | Bbs5 | BBSome complex member BBS5 (Bardet-Biedl syndrome 5 protein homolog) | 2 | 0.51 | 0.0185 |
| Q5SSL4 | Abr | Active breakpoint cluster region-related protein | 1 | 0.58 | 0.0191 |
| B2RXC1 | Trappc11 | Trafficking protein particle complex subunit 11 | 3 | 0.37 | 0.0192 |

| | | | | | |
|--------|--------|--|---|-------|--------|
| Q3UGP8 | Alg10b | Dol-P-Glc:Glc(2)Man(9)GlcNAc(2)-PP-Dol alpha-1,2- glucosyltransferase (EC 2.4.1.256) (Alpha-1,2-glucosyltransferase ALG10-A) (Alpha-2-glucosyltransferase ALG10-B) (Asparagine- linked glycosylation protein 10 homolog B) | 2 | 0.45 | 0.0195 |
| Q3UY34 | Custos | Protein CUSTOS | 1 | -0.84 | 0.0197 |
| P42128 | Foxk1 | Forkhead box protein K1 (Myocyte nuclear factor) (MNF) | 1 | -1.36 | 0.02 |
| Q8BH66 | At1l | Atlastin-1 (EC 3.6.5.-) (Spastic paraplegia 3A homolog) | 3 | -0.45 | 0.0206 |
| Q65Z40 | Wapl | Wings apart-like protein homolog (Dioxin-inducible factor 2) (DIF- 2) (WAPL cohesin release factor) | 3 | -0.58 | 0.0207 |
| Q05D44 | Eif5b | Eukaryotic translation initiation factor 5B (eIF-5B) (EC 3.6.5.3) (Translation initiation factor IF-2) | 1 | -0.69 | 0.0208 |
| P62305 | Snrpe | Small nuclear ribonucleoprotein E (snRNP-E) (Sm protein E) (Sm- E) (SmE) | 3 | -0.92 | 0.021 |
| P26645 | Marcks | Myristoylated alanine-rich C-kinase substrate (MARCKS) | 3 | -0.60 | 0.0213 |
| Q61543 | Glg1 | Golgi apparatus protein 1 (E-selectin ligand 1) (ESL-1) (Selel) (Golgi sialoglycoprotein MG-160) | 3 | -0.36 | 0.0217 |

| | | | | | |
|--------|--------|--|---|-------|--------|
| Q9CWW6 | Pin4 | Peptidyl-prolyl cis-trans isomerase NIMA-interacting 4 (EC 5.2.1.8) (Parvulin-14) (Par14) (Peptidyl-prolyl cis-trans isomerase Pin4) (PPIase Pin4) (Rotamase Pin4) | 1 | -0.36 | 0.0218 |
| Q9R0P9 | Uchl1 | Ubiquitin carboxyl-terminal hydrolase isozyme L1 (UCH-L1) (EC 3.4.19.12) (Neuron cytoplasmic protein 9.5) (PGP 9.5) (PGP9.5) (Ubiquitin thioesterase L1) | 2 | -0.29 | 0.0223 |
| P19536 | Cox5b | Cytochrome c oxidase subunit 5B, mitochondrial (Cytochrome c oxidase polypeptide Vb) | 3 | -0.67 | 0.0224 |
| Q64521 | Gpd2 | Glycerol-3-phosphate dehydrogenase, mitochondrial (GPD-M) (GPDH-M) (EC 1.1.5.3) (Protein TISP38) | 1 | 0.48 | 0.0226 |
| Q9EQ28 | Pold3 | DNA polymerase delta subunit 3 (DNA polymerase delta subunit p66) | 1 | -0.97 | 0.0234 |
| Q8CG76 | Akr7a2 | Aflatoxin B1 aldehyde reductase member 2 (EC 1.1.1.n11) (Succinic semialdehyde reductase) (SSA reductase) | 1 | 0.26 | 0.0234 |
| P62715 | Ppp2cb | Serine/threonine-protein phosphatase 2A catalytic subunit beta isoform (PP2A-beta) (EC 3.1.3.16) | 3 | -1.40 | 0.024 |

| | | | | | |
|--------|--------|---|---|-------|--------|
| Q80ZS3 | Mrps26 | Small ribosomal subunit protein mS26 (28S ribosomal protein S26, mitochondrial) (MRP-S26) (S26mt) | 3 | -0.84 | 0.024 |
| Q9R078 | Prkab1 | 5'-AMP-activated protein kinase subunit beta-1 (AMPK subunit beta-1) (AMPKb) | 3 | 1.40 | 0.0241 |
| Q99JW2 | Acy1 | Aminoacylase-1 (ACY-1) (EC 3.5.1.14) (N-acyl-L-amino-acid amidohydrolase) | 2 | 1.62 | 0.0242 |
| P52196 | Tst | Thiosulfate sulfurtransferase (EC 2.8.1.1) (Rhodanese) | 3 | -0.58 | 0.0242 |
| Q60739 | Bag1 | BAG family molecular chaperone regulator 1 (BAG-1) (Bcl-2-associated athanogene 1) | 1 | -1.09 | 0.0245 |
| P15864 | H1-2 | Histone H1.2 (H1 VAR.1) (H1c) | 3 | 1.37 | 0.0261 |
| Q8JZP2 | Syn3 | Synapsin-3 (Synapsin III) | 1 | 0.37 | 0.0263 |
| Q9CRB2 | Nhp2 | H/ACA ribonucleoprotein complex subunit 2 (Nucleolar protein family A member 2) (snoRNP protein NHP2) | 2 | -0.32 | 0.0267 |
| Q9QY81 | Nup210 | Nuclear pore membrane glycoprotein 210 (Nuclear pore protein gp210) (Nuclear envelope pore membrane protein POM 210) (POM210) (Nucleoporin Nup210) (Pore membrane protein of 210 kDa) | 1 | -0.58 | 0.0275 |

| | | | | | |
|--------|---------|---|---|-------|--------|
| Q8BJI1 | Slc6a17 | Sodium-dependent neutral amino acid transporter SLC6A17 (Sodium-dependent neurotransmitter transporter NTT4) (Solute carrier family 6 member 17) | 1 | -0.47 | 0.0283 |
| Q8BYM5 | Nlgn3 | Neuroigin-3 (Gliotactin homolog) | 1 | 0.38 | 0.0284 |
| Q9JHU9 | Isynal | Inositol-3-phosphate synthase 1 (IPS 1) (EC 5.5.1.4) (Myo-inositol 1-phosphate synthase) (MI-1-P synthase) (MIP synthase) | 2 | -1.12 | 0.0287 |
| Q3UUG6 | Tbc1d24 | TBC1 domain family member 24 | 1 | -0.40 | 0.029 |
| P34022 | Ranbp1 | Ran-specific GTPase-activating protein (HpaII tiny fragments locus 9a protein) (Ran-binding protein 1) (RANBP1) | 2 | -0.40 | 0.0295 |
| F6SEU4 | Syngap1 | Ras/Rap GTPase-activating protein SynGAP (Neuronal RasGAP) (Synaptic Ras GTPase-activating protein 1) (Synaptic Ras-GAP 1) | 2 | -0.54 | 0.0303 |
| Q80XU3 | Nucks1 | Nuclear ubiquitous casein and cyclin-dependent kinase substrate 1 (JC7) | 3 | -1.12 | 0.0304 |
| P63139 | Nfyb | Nuclear transcription factor Y subunit beta (CAAT box DNA-binding protein subunit B) (Nuclear transcription factor Y subunit B) (NF-YB) | 3 | -0.79 | 0.0306 |
| Q9CQI3 | Gmfb | Glia maturation factor beta (GMF-beta) | 3 | -0.43 | 0.0312 |

| | | | | | |
|--------|--------|---|---|-------|--------|
| Q5SS80 | Dhrs13 | Dehydrogenase/reductase SDR family member 13 (EC 1.1.-.-) (Short chain dehydrogenase/reductase family 7C member 5) (Protein SDR7C5) | 3 | -0.29 | 0.0314 |
| Q9D7A6 | Srp19 | Signal recognition particle 19 kDa protein (SRP19) | 2 | 0.51 | 0.0321 |
| Q9DCB8 | Isca2 | Iron-sulfur cluster assembly 2 homolog, mitochondrial (HESB-like domain-containing protein 1) | 3 | -0.27 | 0.0324 |
| Q8JZV9 | Bdh2 | Dehydrogenase/reductase SDR family member 6 (EC 1.1.1.-) ((R)-beta-hydroxybutyrate dehydrogenase) (3-hydroxybutyrate dehydrogenase type 2) (EC 1.1.1.30) (4-oxo-L-proline reductase) (EC 1.1.1.104) (Oxidoreductase UCPA) (Short chain dehydrogenase/reductase family 15C member 1) | 2 | -0.47 | 0.0328 |
| Q62418 | Dbnl | Drebrin-like protein (Actin-binding protein 1) (SH3 domain-containing protein 7) | 1 | -0.32 | 0.0329 |
| Q8CIV8 | Tbce | Tubulin-specific chaperone E (Tubulin-folding cofactor E) | 1 | -0.60 | 0.0333 |
| Q810B6 | Ankfy1 | Rabankyrin-5 (Rank-5) (Ankyrin repeat and FYVE domain-containing protein 1) (Ankyrin repeats hooked to a zinc finger motif) | 1 | 0.92 | 0.0334 |

| | | | | | |
|--------|-----------|--|---|-------|--------|
| P58269 | Dpf3 | Zinc finger protein DPF3 (BRG1-associated factor 45C) (BAF45C) (Zinc finger protein cer-d4) | 3 | -0.42 | 0.0336 |
| Q8BYM8 | Cars2 | Probable cysteine--tRNA ligase, mitochondrial (EC 6.1.1.16) (Cysteinyl-tRNA synthetase) (CysRS) | 2 | -0.81 | 0.0347 |
| Q80XK6 | Atg2b | Autophagy-related protein 2 homolog B | 3 | 0.46 | 0.0347 |
| O88485 | Dync1i1 | Cytoplasmic dynein 1 intermediate chain 1 (Cytoplasmic dynein intermediate chain 1) (Dynein intermediate chain 1, cytosolic) (DH IC-1) | 2 | -0.54 | 0.0354 |
| Q8CGP5 | Hist1h2af | Histone H2A type 1-F | 3 | 0.82 | 0.0356 |
| P09602 | Hmgn2 | Non-histone chromosomal protein HMG-17 (High mobility group nucleosome-binding domain-containing protein 2) | 1 | 0.82 | 0.0364 |
| Q8R0G9 | Nup133 | Nuclear pore complex protein Nup133 (133 kDa nucleoporin) (Nucleoporin Nup133) | 3 | -0.56 | 0.0365 |
| Q8VBZ3 | Clptm1 | Putative lipid scramblase CLPTM1 (Cleft lip and palate transmembrane protein 1 homolog) (Thymic epithelial cell surface antigen) | 2 | -0.74 | 0.0374 |
| Q9ER73 | Elp4 | Elongator complex protein 4 (PAX6 neighbor gene protein) | 3 | 1.26 | 0.0376 |

| | | | | | |
|--------|---------|--|---|-------|--------|
| Q9D1P4 | Chordc1 | Cysteine and histidine-rich domain-containing protein 1 (CHORD domain-containing protein 1) (CHORD-containing protein 1) (Chp-1) (Protein morgana) | 2 | -0.45 | 0.0381 |
| P48193 | Epb41 | Protein 4.1 (P4.1) (4.1R) (Band 4.1) (Erythrocyte membrane protein band 4.1) | 3 | -0.32 | 0.0384 |
| Q9JKK7 | Tmod2 | Tropomodulin-2 (Neuronal tropomodulin) (N-Tmod) | 1 | -0.30 | 0.0385 |
| Q8R001 | Mapre2 | Microtubule-associated protein RP/EB family member 2 (APC-binding protein EB2) (End-binding protein 2) (EB2) | 2 | -0.79 | 0.0385 |
| P70399 | Tp53bp1 | TP53-binding protein 1 (53BP1) (p53-binding protein 1) (p53BP1) | 2 | -0.81 | 0.0393 |
| P28651 | Ca8 | Carbonic anhydrase-related protein (CARP) (Carbonic anhydrase VIII) (CA-VIII) | 3 | -0.38 | 0.0393 |
| Q9Z2D8 | Mbd3 | Methyl-CpG-binding domain protein 3 (Methyl-CpG-binding protein MBD3) | 2 | 1.08 | 0.0394 |
| Q3USH1 | Insyn2a | Inhibitory synaptic factor 2A (InSyn2) | 1 | -0.47 | 0.0395 |
| Q80Y17 | Llgl1 | Lethal(2) giant larvae protein homolog 1 (LLGL) (Mgl-1) (Mlgl) | 2 | 0.77 | 0.0401 |
| P49817 | Cav1 | Caveolin-1 | 3 | -0.79 | 0.0411 |

| | | | | | |
|--------|---------|--|---|-------|--------|
| P17809 | Slc2a1 | Solute carrier family 2, facilitated glucose transporter member 1 (Glucose transporter type 1, erythrocyte/brain) (GLUT-1) (GT1) | 3 | -0.34 | 0.0418 |
| Q8BZR9 | Ncbp3 | Nuclear cap-binding protein subunit 3 | 3 | -0.34 | 0.0424 |
| Q925E7 | Ppp2r2d | Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B delta isoform (PP2A subunit B isoform B55-delta) (PP2A subunit B isoform PR55-delta) (PP2A subunit B isoform R2-delta) (PP2A subunit B isoform delta) | 2 | -0.97 | 0.0427 |
| Q60605 | Myl6 | Myosin light polypeptide 6 (17 kDa myosin light chain) (LC17) (Myosin light chain 3) (MLC-3) (Myosin light chain alkali 3) (Myosin light chain A3) (Smooth muscle and nonmuscle myosin light chain alkali 6) | 3 | -0.34 | 0.043 |
| Q8CCT4 | Tceal5 | Transcription elongation factor A protein-like 5 (TCEA-like protein 5) (Transcription elongation factor S-II protein-like 5) | 3 | -0.86 | 0.0436 |
| Q6PB66 | Lrpprc | Leucine-rich PPR motif-containing protein, mitochondrial (130 kDa leucine-rich protein) (LRP 130) (mLRP130) | 3 | -0.64 | 0.0438 |
| Q5SWD9 | Tsr1 | Pre-rRNA-processing protein TSR1 homolog | 3 | 0.54 | 0.0447 |

| | | | | | |
|--------|--------|---|---|-------|--------|
| Q9CQH7 | Btf3l4 | Transcription factor BTF3 homolog 4 (Basic transcription factor 3-like 4) | 3 | -0.54 | 0.0453 |
| Q9CWL2 | Casz1 | Zinc finger protein castor homolog 1 (Castor-related protein) | 1 | 0.40 | 0.0454 |
| Q9DBR1 | Xrn2 | 5'-3' exoribonuclease 2 (EC 3.1.13.-) (Protein Dhml) | 3 | -0.42 | 0.0462 |
| P47758 | Srprb | Signal recognition particle receptor subunit beta (SR-beta) | 3 | -0.43 | 0.0464 |
| Q99PV0 | Prpf8 | Pre-mRNA-processing-splicing factor 8 (Splicing factor Prp8) | 2 | -0.67 | 0.0478 |
| Q8CE90 | Map2k7 | Dual specificity mitogen-activated protein kinase kinase 7 (MAP kinase kinase 7) (MAPKK 7) (EC 2.7.12.2) (JNK-activating kinase 2) (MAPK/ERK kinase 7) (MEK 7) (c-Jun N-terminal kinase kinase 2) (JNK kinase 2) (JNKK 2) | 3 | 0.66 | 0.0485 |
| Q8BZA9 | Tigar | Fructose-2,6-bisphosphatase TIGAR (EC 3.1.3.46) (TP53-induced glycolysis and apoptosis regulator) (TP53-induced glycolysis regulatory phosphatase) | 3 | 1.45 | 0.0492 |
| Q80WG5 | Lrrc8a | Volume-regulated anion channel subunit LRRC8A (Leucine-rich repeat-containing protein 8A) (Protein ebouriffe) (ebo) (Swelling protein 1) | 3 | -0.74 | 0.0497 |

6.3.3. Signaling pathways and differential protein expression in lens-induced myopia

Protein-protein interaction (PPI) analysis revealed involvement in several signaling pathways associated with myopia progression, as determined by the KEGG gene database function using queries on the STRING database (ver. 12.0)^{183,184}. The pathway enrichment analysis identified 7 key proteins (gene name, Log2FC, p-value) within the most significantly enriched KEGG tight junction pathway, including lethal(2) giant larvae protein homolog 1 (Llg1, 0.77, p=0.04), dual specificity mitogen-activated protein kinase 7 (Map2k7, 0.66, p=0.049), myosin light polypeptide 6 (Myl6, -0.34, p=0.043), serine/threonine-protein phosphatase 2A catalytic subunit alpha isoform (Ppp2ca, -0.29, p=0.016), serine/threonine-protein phosphatase 2A catalytic subunit beta isoform (Ppp2cb, -1.4, p=0.024), serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B delta isoform (Ppp2r2d, -0.98, p=0.043), and 5'-AMP-activated protein kinase subunit beta-1 (Prkab1, 1.39, p=0.024) (Fig. 33a). These differential tight junction proteins were distributed across medium to low abundances in the whole retinal proteome (Fig. 33b). The top ten enriched KEGG pathways revealed, in addition to the tight junction pathway (signal=5.94, FDR<0.0001)¹⁸⁵, the AMPK signaling pathway (signal=2.77, FDR<0.0001)¹⁸⁶, Hippo signaling pathway (signal=2.57, FDR<0.0001), mRNA surveillance pathway (signal=2.09, FDR<0.001), Chagas disease (signal=2.07, FDR<0.001), sphingolipid signaling pathway (signal=1.93, FDR<0.001), dopaminergic synapse (signal=1.91, FDR<0.001)¹⁸⁷, adrenergic signaling in cardiomyocytes (signal=1.83, FDR<0.001), Hepatitis C (signal=1.75, FDR<0.001), and autophagy (signal=1.73, FDR<0.01) (Fig. 33c).

Furthermore, among the identified differentially expressed proteins in myopic retinas, upstream regulator analysis was performed using Ingenuity Pathway Analysis (IPA, Qiagen) to determine potential upstream regulators. Interestingly, the unsupervised upstream regulator analysis identified a small molecule drug, rosiglitazone, with an activation z-score of -2.15, indicating that the drug could inhibit these differentially expressed proteins (Fig. 33f). The proteins affected include

solute carrier family 2, facilitated glucose transporter member 1 (Slc2a2/Glut1, Log2FC= -0.35, p<0.05), propionyl-CoA carboxylase alpha chain, mitochondrial (Pcca, Log2FC= -0.63, p<0.05), atlastin-1 (At1, Log2FC= -0.45, p<0.05), cytochrome c oxidase subunit 5B, mitochondrial (Cox5b, Log2FC= -0.67, p<0.05), and caveolin-1 (Cav1, Log2FC= -0.78, p<0.05) (Fig. 33d). The abundance levels of these five proteins in the retinal proteome are shown in the rank plot of protein intensity, presented in a descending order of retinal expression levels of Glut1, Cox5b, At1, Pcca and Cav1 (Fig. 33e). The significance of the downregulated proteins was analyzed using an unpaired Student's t-test.

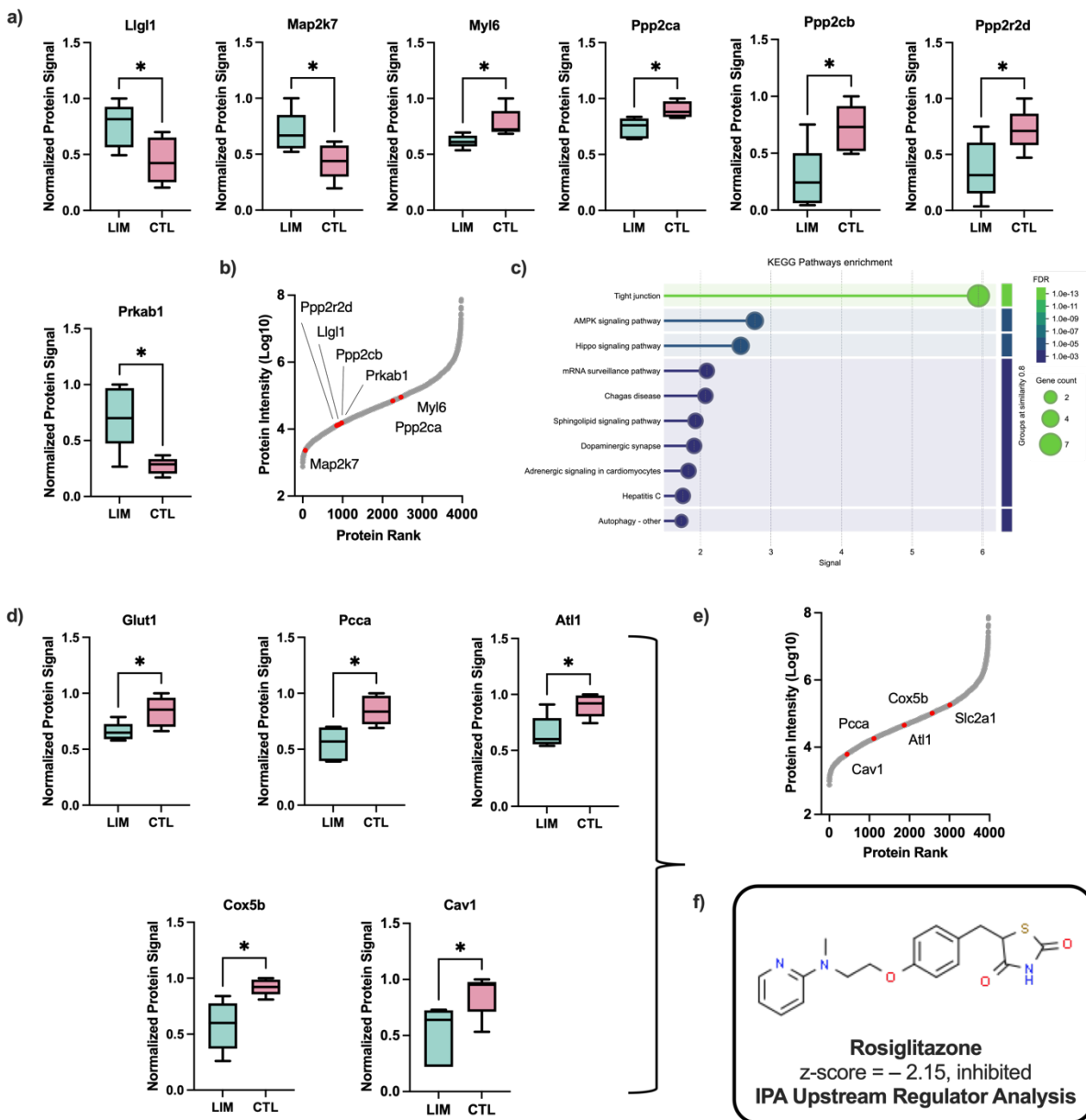


Fig. 33: Pathway and upstream regulator analysis of differentially expressed proteins.

a) Box plot displaying the seven dysregulated proteins within the most significantly enriched KEGG tight junction pathway. The proteins are presented with normalized protein signals for comparison, including Llg11, Map2k7, Myl6, Ppp2ca, Ppp2cb, and Ppp2r2d. b) Rank plot illustrating the abundances of these seven proteins in the mouse retinal proteome. c) Protein-protein interaction and KEGG genome database search identified the top 10 significantly enriched pathways, including tight junction, AMPK signaling pathway, Hippo signaling pathway, mRNA surveillance pathway, Chagas disease, sphingolipid signaling pathway, dopaminergic synapse, adrenergic signaling in cardiomyocytes, Hepatitis C, and autophagy. d) Box plot of five downregulated proteins associated with the identification of the upstream regulator rosiglitazone. e) Rank plot showing the abundances of these five proteins in the mouse retinal proteome. f) Unsupervised upstream regulator analysis identified the small molecule antidiabetic drug rosiglitazone, which has an activation z score of -2.15 according to IPA bioinformatics. Statistical analyses were performed using an unpaired Student's t-test. Statistical significance levels are indicated as * $p \leq 0.05$.

6.3.4. Validation of Glut1 downregulation using targeted Zeno MRM proteomics

Targeted Zeno pulsing enabled high-resolution multiple-reaction monitoring (Zeno MRM^{HR}) proteomics was performed on independent retinal lysates to validate the most abundant protein, Glut1, among the five proteins identified in the upstream regulator analysis. This method confirmed the downregulation of Glut1 protein with a Log₂FC value of -0.35 ($p=0.035$, $n=10$) in the mouse retina. The targeted Zeno MRM^{HR} was constructed using three unique peptides identified in Zeno DDA acquisition and subsequently quantified by SWATH-MS acquisition. Peptides were evaluated for spectral similarity acquired from Zeno DDA using the Skyline dot product (dotp) score and similarity score of the fragment ion patterns and intensities in the neural network-based predictor software Prosit. The method consists of single-origin, tryptic-digested peptide sequences from the Glut1 protein

(precursor charge, dotp score, Prosit score), including KVTILELFR (2+, dotp=0.97, Prosit=0.93), QGGASQSDKTPEELFHPLGADSQV (3+, dotp=0.97, Prosit=0.71), and TPEELFHPLGADSQV (2+, dotp=0.88, Prosit 0.76) (Fig. 34a-c). A representative extracted ion chromatograph consists of the top six transition ions for peak identification and peptide quantification based on the top 3 abundant ions in the Zeno MRM^{HR} validation experiment. The assay quantified a downregulation of Glut1 protein with a Log₂ protein fold-change of -0.19 (p=0.007, n=10), represented by peptide KVTILELFR (Log₂FC=-0.29, p=0.019), QGGASQSDKTPEELFHPLGADSQV (Log₂FC=-0.14, p=0.0055), and TPEELFHPLGADSQV (Log₂FC=-0.12, p=0.16). These distinct peptides were also reported in PeptideAtlas for their uniqueness and independent reproducibility (iProphet probability score =1). These peptides were frequently observed in experiments and had empirical suitability scores (ESSs) of 0.32, 0.26, and 0.68, respectively, as reported across multiple mass spectrometry platforms (Fig. 34d). The power analysis of the targeted quantification of Glut1 protein indicated that the power was determined at 0.82, with parameters set at alpha=0.05, n=10 and a computed effect size of 2.15.

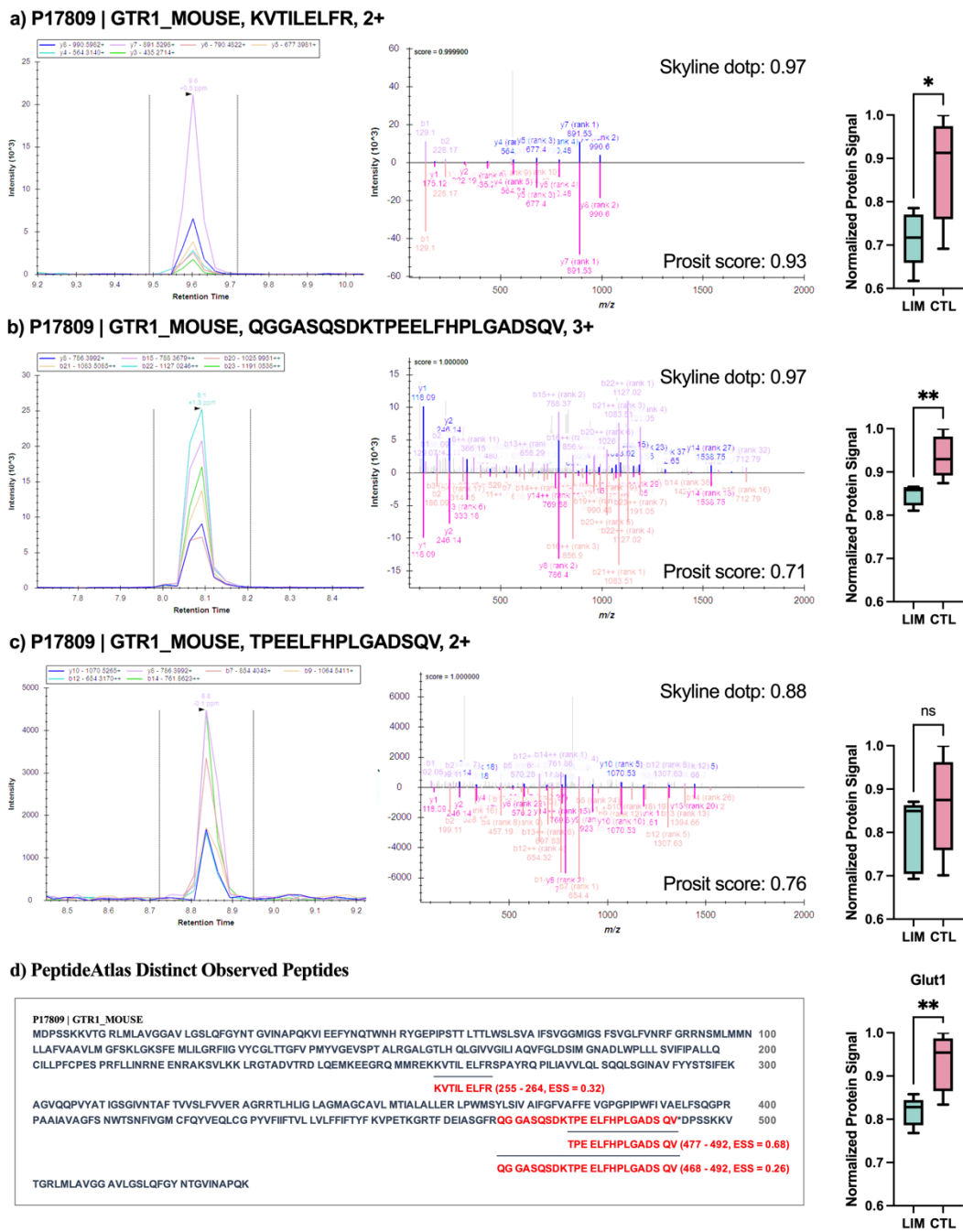


Fig. 34: Targeted Zeno pulsing-enabled high-resolution multiple reaction monitoring (Zeno MRM^{HR}) assay of tryptic-digested peptides from Glut1 protein.

This figure presents the extracted ion chromatography of identified peptide sequences, highlighting the top six transition ions and quantification based on the three most abundant ions. The spectral similarity is represented by the dot product (dotp) in Skyline and the similarity score of the predicted fragmentation mass spectrum in Prosit. The box plot displays normalized protein signals for each

peptide, derived from the top three abundant ions. Statistical analyses were performed using an unpaired Student's t-test on the following peptide sequences: **a)** KVTILELFR. **b)** QGGASQSDKTPEELFHPLGADSQV. **c)** TPEELFHPLGADSQV. **d)** The alignment of distinct peptides within the Glut1 protein is shown, along with their empirical suitability scores (ESS) from PeptideAtlas. Additionally, the box plot illustrates downregulated Glut1 expression in the LIM group ($\log_2FC = -0.19$, $p = 0.007$). Statistical significance levels are indicated as * $p \leq 0.05$, ** $p \leq 0.01$, and ns: not significant.

6.4. Discussion

Animal models have been essential for advancing our understanding of visually guided emmetropization, as summarized in the review¹⁵⁹. Myopia can be experimentally induced through methods such as form-deprivation using a translucent diffuser¹⁸⁸ or lid suture¹⁸⁹, as well as through lens-induced myopia (LIM)¹⁹⁰. Research indicates that the susceptibility to myopia in mice decreases with age, particularly from postnatal days 21 to 67, following one or two weeks of induced myopia^{32,191}. Various studies have explored myopia onset as early as postnatal day 10, frequently focusing on P21 or P28, since pups are typically weaned by 21 days after birth^{31,32,90,107}. Our findings corroborate existing literature that emphasizes the critical role of axial elongation in myopia development across two animal models of chicks and an emerging myopia model in mice. In the chick model, studies have shown that myopia can develop rapidly from day 1 post-hatching to day 14, particularly during the early stages of life, with significant effects observed after just 2 or 3 days of visual restriction^{9,192,193}. Our research effectively illustrates the pathological changes associated with human myopia, where axial elongation results from the deepening of the vitreous chamber, leading to shifts in refractive error shift in LIM-treated eyes after only 3 days in chicks, and for 2 weeks in mice. The pronounced differences in ocular growth rates between LIM-treated and control eyes provide compelling evidence that external optical interventions can significantly alter eye morphology. We conducted an

examination of ocular growth in mice subjected to randomized unilateral LIM treatment. The observed axial elongation was primarily attributed to an increase in VCD and, to a lesser extent, ACD, consistent with previous studies on mice^{32,194}. Notably, the LIM-treated eye exhibited accelerated growth specifically in VCD, mirroring findings from other reports on experimentally induced myopia that primarily affect the posterior segment of the eye¹⁹⁵. Importantly, LIM did not disrupt normal eye growth in CT, LT, or RT, aligning with prior physiological examinations of LIM models³¹. The physiological changes observed in LIM-treated eyes lay a foundational reference for understanding altered protein expression in the mouse retina associated with myopia progression.

This study provides compelling evidence for the downregulation of Glut1 protein in the mouse retina, as validated through a targeted Zeno pulsing-enabled high-resolution multiple-reaction monitoring (Zeno MRM^{HR}) approach^{196,197}. The observed Glut1 downregulation in the context of our experimental model aligns with previous research suggesting that alterations in glucose transport mechanisms may play a critical role in retinal pathophysiology¹⁹⁸. The targeted Zeno MRM^{HR} approach allowed for precise quantification of Glut1 protein levels through the analysis of three unique tryptic peptides. The high dot product (dotp) scores and Prosit similarity scores indicate strong spectral similarity, confirming the reliability of our peptide selection for quantification. Notably, the peptides KVTILELFR, QGGASQSDKTPEELFHPLGADSQV, and TPEELFHPLGADSQV demonstrated distinct downregulation patterns. These findings are particularly noteworthy given that these peptides have been validated in PeptideAtlas for their uniqueness and reproducibility, further supporting the robustness of our results. The power analysis indicates a strong likelihood of detecting true effects under the given experimental conditions.

Among the various differentially expressed proteins in the retina, Glut1 protein plays a crucial role as a facilitated-diffusion glucose transporter localized within blood-tissue barriers¹⁹⁹, the blood-

retinal barrier²⁰⁰, and the retina²⁰¹. Lauren et. al demonstrated that retinal aerobic glycolysis relies on glucose uptake through Glut1, notably, the absence of Glut1 impairs visual function as determined by electroretinogram (ERG) assessments¹⁹⁸. Immunohistochemical analysis has shown that Glut1 is the only glucose transporter present in the outer segment of photoreceptors, suggesting that glucose would be transported to these cells via Glut1 located in the plasma membrane of the inner segment¹⁹⁸. Interestingly, hexokinase-mediated glucose metabolism is also confined to this region²⁰². Light-sensitive photoreceptors are particularly susceptible to metabolic dysfunction, where aerobic glycolysis accounts for 80 to 90% of glucose conversion to lactate even in the presence of oxygen^{203,204}. Moreover, studies reported have linked metabolic disorders such as central obesity, hypertension, hyperglycemia, and dyslipidemia to myopia development¹⁷⁴. Another study reported that diabetes resulted in the downregulation of Glut1 expression in retinal vessels but not in the retinal pigment epithelium, this observation parallels our findings regarding Glut1 downregulation in myopic retinas and its restoration through intravitreal administration of rosiglitazone²⁰¹.

Beyond rod photoreceptors, rod-derived cone viability factor (RdCVF) forms a complex with Glut1 and basigin (Bsg) on cone surfaces to enhance glucose uptake and support cone photoreceptor viability²⁰⁵. Notably, mutations in Bsg have been associated with early early-onset high myopia in humans through next-generation sequencing techniques²⁰⁶. The abundant Glut1 proteins are also co-localized with tight junction proteins such as zonula occludens-1 (ZO-1) within the retina, ciliary body, iris, and blood-ocular barrier²⁰⁷. Similarly, significant downregulation of tight junction proteins like occludin and ZO-1 has been observed in the retinas of highly myopic mice²⁰⁸. The Consortium for Refractive Error and Myopia (CREAM) has identified tight junction protein ZO-2 through genome-wide association studies (GWAS) in humans, reinforcing findings from laboratory animal studies and the KEGG pathway enrichment analysis presented in this study¹⁷. Furthermore, regulation of the developmental Hippo pathway^{85,209}, and activation of AMPK²¹⁰ due to declining cellular energy status

serve as glucose-sensing regulators for maintaining metabolic homeostasis through glycolysis. Emerging evidence indicates that components of the Hippo pathway, such as YAP (Yes-associated protein) and TAZ (transcriptional coactivator with PDZ-binding motif), can promote glycolysis by enhancing the expression of key glycolytic enzymes and glucose transporters²¹¹. AMPK directly influences glycolytic activity by phosphorylating key regulatory proteins. For example, it activates phosphofructokinase 2 (PFK2), which increases the levels of fructose-2,6-bisphosphate, a potent activator of glycolysis²¹².

6.5. Conclusion

Our Animal models have been indispensable for advancing our understanding of visually guided emmetropization and myopia development. Experimental induction of myopia through methods such as form deprivation and lens-induced myopia (LIM) has revealed key insights into the age-dependent susceptibility and ocular growth changes underlying this condition. Our study corroborates previous findings by demonstrating that axial elongation, primarily driven by vitreous chamber depth (VCD) expansion, is a critical feature of myopia progression in both chick and mouse models. The rapid onset of myopia-related changes in chicks and the sustained axial elongation observed in LIM-treated mice highlight the dynamic nature of ocular growth modulation in response to visual cues. Importantly, our data show that LIM selectively accelerates posterior segment growth without disrupting the normal development of other ocular components, such as corneal thickness, lens thickness, or retinal thickness. These physiological changes provide a foundation for exploring molecular alterations associated with myopia. Using a targeted Zeno pulsing-enabled high-resolution multiple-reaction monitoring (Zeno MRMHR) approach, we validated the downregulation of Glut1, a critical glucose transporter in the retina. This finding aligns with previous research implicating altered glucose metabolism in retinal pathophysiology and suggests that metabolic dysregulation may contribute to myopia progression. Glut1's role in facilitating glucose transport across retinal barriers

and supporting photoreceptor metabolism is well-established, and its downregulation may impair retinal function in myopia. Furthermore, the observed modulation of tight junction proteins and pathways related to glucose sensing, such as AMPK and Hippo signaling, underscores the complex interplay between ocular structure, metabolic regulation, and gene expression in myopia development. Overall, our study integrates anatomical, proteomic, and pathway analyses to provide comprehensive insights into the mechanisms driving myopia and identifies potential molecular targets for future therapeutic intervention.

Chapter 7. Intravitreal administration of PPAR gamma agonist attenuates myopia progression in chick

7.1. Introduction

Peroxisome proliferator-activated receptors (PPARs) are a family of ligand-inducible transcription factors that belong to the nuclear hormone receptor superfamily²¹³. Mammals possess three subtypes of PPARs: PPAR alpha (PPAR α), PPAR beta or delta (PPAR β/δ) and PPAR gamma (PPAR γ)²¹⁴. These receptors play a critical role in regulating genes involved in lipid metabolism²¹⁵, inflammation²¹⁶, cellular proliferation²¹⁷, and metabolic homeostasis²¹⁸. Our recent research has demonstrated the involvement of lipid metabolism within the retina during myopia progression⁸⁵. Furthermore, studies have shown that PPARs can modulate refractive error and eye growth across various animal models^{56,58}. The functions of PPAR γ have been extensively studied due to its clinical relevance in antidiabetic therapies^{219,220}. Recent findings suggest that downregulation of solute carrier family 2, facilitated glucose transporter member 1 (GLUT1) expression may provide a strategy to mitigate diabetic complications within the retina^{201,221}. PPAR exerts its effects by interacting with coactivators or corepressors within the transcriptional complex. These interactions can vary in strength, leading to distinct effects on different gene sets²²². Notably, PPARs have unique functional profiles, despite being part of the same class of drugs, such as thiazolidinedione (TZD) derivatives, and other nomenclatures²²³. Emerging evidence indicates that PPARs may also influence axial elongation during myopia progression in guinea pigs⁵⁶⁻⁵⁸. However, existing studies have not conclusively demonstrated efficacy through insulin sensitization or within the thiazolidinedione context. We hypothesized that PPAR γ influences differential protein expression in the murine retina and affects myopia progression through its interactions with specific signaling pathways. Additionally, we aimed to examine the inhibitory effect of rosiglitazone, a potent selective agonist of PPAR γ and an insulin sensitizer approved for the treatment of type 2 diabetes mellitus, on myopia progression using an avian model. We employed untargeted, high-throughput mass spectrometry-based proteomics to quantify the retinal

proteome of C57BL/6J mice subjected to LIM. This approach facilitated the identification of protein subsets associated with PPARs using data-independent acquisition (DIA), with subsequent validation through accurate targeted mass spectrometry techniques. Importantly, our findings demonstrate that rosiglitazone effectively ameliorates axial elongation during myopia progression. These results underscore the therapeutic potential of rosiglitazone in managing axial myopia and pave the way for future investigations into its role within retinal signaling pathways associated with myopia development.

7.2. Methods

7.2.1. Animals

White Leghorn chick-specific pathogen-free (SPF) eggs (*Gallus Gallus*) were obtained from Jinan Poultry Co. Ltd., China. Eggs were housed in an egg incubator (ELYE-3, Onelye, China) for 21 days with an average temperature of 36.6 °C and humidity of 68 g/kg in the centralized animal facilities (CAF) at Hong Kong Polytechnic University. Eggs were moved to a hatcher (EH-96H, Onelye, China) for 1 week under identical temperature and humidity conditions. Newborn chicks at 3 days of age were housed in stainless steel brooders under a 12/12 light/dark cycle with an average luminance of 500 lux at the center of the cage inside the breeding room with a computer-controlled humidity of 41% at room temperature and free access to food and water. Researchers were licensed by the Department of Health, HKSAR government, and all procedures performed in this study received ethics approval from the Animal Subjects Ethics Sub-Committee (ASESC), The Hong Kong Polytechnic University, and complied with the Association of Research in Vision and Ophthalmology (ARVO) statement for the use of animals in ophthalmology and vision research.

7.2.2. Lens-induced myopia in chicks

White Leghorn chicks at the age of 7 days were subjected to randomized eye, unilateral lens-induced myopia (LIM) using a dispersive lens (-10 D) made from PMMA material. The lens was attached to the chicks using a Velcro ring glued on the feather to the area around the eye using epoxy resin a day ahead. Spectacles were cleaned daily to ensure proper vision. Ocular biometric measurements were taken on day 7 (D0) after 3 days of LIM treatment (days of LIM treatment) on day 10 (D4).

7.2.3. Ocular biometric measurements in the avian model

The refractive error was measured using a streak retinoscope (Beta 200 Streak Retinoscope, Germany) with a trial lens bar (± 16 D in 0.5 D steps) in a dim-light environment with 20 cm distance from a hand-held retinoscope by a single-blinded, experienced optometrist. Equivalent sphere measurements were used to define the refractive error as spherical power \pm 0.5 cylindrical power. Measurements of vertical and equatorial axes were measured twice. Each measurement was represented as the mean value in diopters (D) \pm SD and repeated in triplicate. Ocular dimensions were measured with an A-scan ultrasound system (5073PR, Olympus, Japan) coupled with a 30 MHz probe (PZ25-025-R1.00, Panametrics, USA) and an adjustable pump system (505u, Watson Marlow, UK). Saline was used as liquid media in the ultrasonic probe for chick eyes, and deionized water was used for system calibration. A custom-made eyelid retractor was used to keep the chick eyes open during the A-scan measurement without anesthesia and was acquired in triplicate. The axial length (AL) of the eye comprised anterior chamber depth (ACD), lens thickness (LT), and vitreous chamber depth (VCD) (Fig. 35).

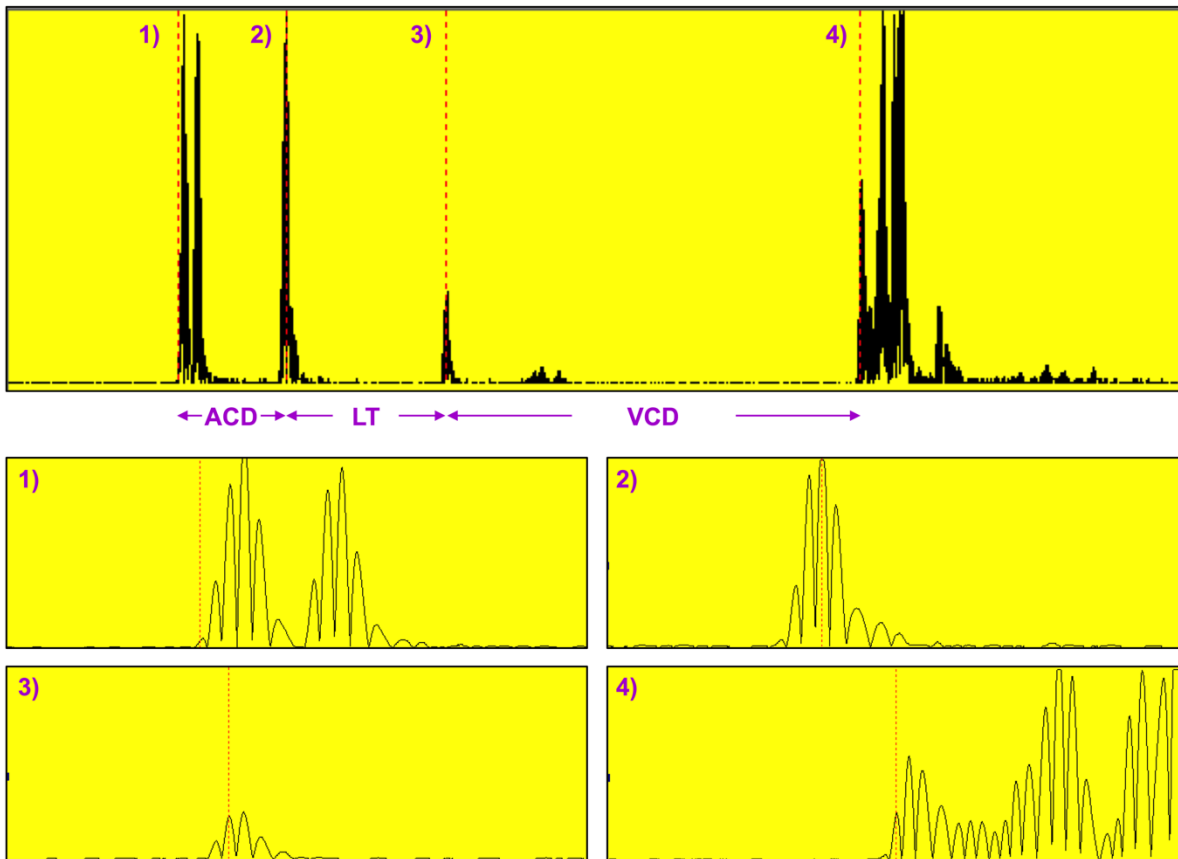


Fig. 35: Representative image of A-scan biometry in chicks.

Ocular annotation from left to right, the anterior corneal surface (1), anterior lens surface (2), the posterior lens (3), and posterior vitreous or retinal surface (4). Axial length (AL) was represented as the distance from the anterior corneal surface to the retinal surface. The peaks in the scan were manually assigned by an experienced user (red dotted line). ACD = anterior chamber depth, LT = lens thickness, VCD = vitreous chamber depth, AL = axial length.

7.2.4. Intravitreal injection of rosiglitazone in avian model

Rosiglitazone powder (HY-17366, MedChemExpress, USA) with a purity of 99.90% was purchased and used without further modification. A stock solution of 300 mM rosiglitazone was prepared in DMSO, equivalent to a concentration of 81.07 $\mu\text{g}/\mu\text{L}$. The working solution was prepared freshly before the experiment by diluting 2 μL of 300 mM rosiglitazone stock solution in DMSO with 98 μL of PBS and further diluting the mixture by addition of 1100 μL of 2% DMSO, PBS to a final

working concentration of 0.5 mM rosiglitazone in 2% DMSO, PBS. The working solution was vortexed briefly, sonicated for 10 min at room temperature, and centrifuged at 14,000 rpm at room temperature for 10 min. For the intravitreal injection of rosiglitazone in chicks. The dispersive lens was removed only before the injection to minimize exposure to normal vision in the LIM-treated eye. A custom-made eyelid retractor was used to keep the chick eyes open, and 10 μ L of rosiglitazone at the desired concentrations of 0.5 mM, 0.1 mM, and 0.02 mM was prepared and delivered using a disposable, sterile Ultra-Fine 31 G x 8 mm, 0.3 cc syringe (Cat. No. 3204440, Becton Dickinson, USA). The intravitreal injection procedure was adopted from a previous publication. After the sclera was penetrated, the needle was advanced toward the center of the eyeball, the solution was gently injected into the center of the mid-vitreous cavity and swiftly removed. On top of the LIM treatment, three consecutive intravitreal injections with drug or vehicle were performed daily on day 7 (D1), day 8 (D2), and day 9 (D3). The contralateral control eyes received a 10 μ L injection of the vehicle, 2% DMSO in PBS.

7.2.5. Isolation of neural retina in chick eyes

Chicks were sacrificed with carbon dioxide overdose, extraocular muscles, and optic nerves were disconnected by small incisions by scissors, and the eyeball was isolated from the orbit. The intact eyeball was rinsed with ice-cold PBS to remove excessive muscles and blood. The eyeball was hemisected equatorially using a stainless-steel razor blade, dissecting the eyeball into two hemispheres. The crystalline lens was pulled out with forceps. The posterior eyeball was submerged into a new, clean ice-cold PBS and shaken gently using forceps holding the edge of the choroidal-sclera tissue. Pale-yellow, transparent neural retina tissue separated from the posterior eyeball, leaving the retinal pigment epithelium (RPE) layer with choroidal-sclera tissue. The isolated retinal tissue was rinsed again in ice-cold PBS, snap-frozen in liquid nitrogen, and stored in a -80 °C freezer.

7.2.6. Label-free, library-free SWATH-MS acquisition of chick retina proteome

The peptide (1 µg) was handled with the 10 min chromatographic separation method mentioned in the MRM^{HR} experiment and analyzed with Zeno pulsing-enabled SWATH-MS acquisition (Zeno SWATH-MS). The MS1 survey scans were acquired from 400 to 800 Da with an accumulation time of 100 ms. Precursors were fragmented in CID mode measured with 64 variable windows ranging from 350 to 750 Da with 13 ms accumulation time and rolling collision energy. DIA-SWATH data acquired on the Waters ACQUITY UPLC M-Class coupled to ZenoTOF 7600 mass spectrometer were analyzed in DIA-NN (ver. 1.8.1) in library-free mode and with default settings in “robust LC (high precision)” with MS1 and MS2 accuracy set to 20 ppm and 10 scan windows with match-between run (MBR) enabled¹⁴³. Protein identities were assigned by searching against the in silico, trypsin-digested library using the UniProt *Gallus Gallus* database (UP000000539, 2305 reviewed proteins, Aug 2023) and quantified using the MaxLFQ algorithm implemented in DIA-NN software.

7.2.7. Statistical analysis

Variance analysis of multiple groups was performed using two-way ANOVA followed by Tukey honest significant difference (HSD) post hoc tests. One-way ANOVA with Tukey’s HSD for multiple comparisons between doses of intravitreal injection of rosiglitazone in the avian model. Unpaired Student’s t-test was used for two-group comparisons in the targeted quantification of GLUT1 peptides. All statistical analyses were performed using Prism (ver. 9.5, GraphPad Software, USA). Data are presented as the mean ± SEM. Statistical significance tests and the number of samples used are described in the figure legends. Significance values are indicated as * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Sample size calculation was performed by G*Power software (ver. 3.1.9) on targeted validation of GLUT1 peptides acquired in Zeno MRM^{HR} mode. Protein-protein interaction network functional enrichment analysis was performed using statistically significantly differentially expressed proteins by the STRING database (ver. 12.0).

7.3. Results

7.3.1. Intravitreal injection of rosiglitazone ameliorates myopia progression and restores glut1 expression in an avian model

To determine the effect of the predicted upstream regulator on myopia development, chicks were subjected to unilateral LIM treatment using -5 D lenses on the randomized eye, along with the contralateral eye serving as a control. Rosiglitazone was delivered intravitreally to the LIM-treated eyes in three concentrations, including 0.2 μ M (n=7), 1 mM (n=6), and 5 mM (n=8). The drug was prepared in 2% DMSO and PBS solution. Additionally, a group of LIM eyes was injected with a vehicle containing only 2% DMSO in PBS solution (n=7). There was no significant relative change in ACD or LT when comparing the age differences (days of LIM) from day 10 (3) to day 7 (0) in the LIM eyes, indicating that LIM treatment had no effect on the growth of the anterior segment (ACD, LT), and rosiglitazone did not induce any additional inhibitory effects on ACD or LT. Statistically significant differences were observed in the relative change in VCD for the 1 mM rosiglitazone group (n=6, p=0.02) and the 5 mM rosiglitazone group (n=8, p=0.009), compared to the vehicle group, suggesting that both doses significantly inhibited the accelerated growth rate induced by LIM. The VCD remains constant in the control eye, indicating minimal natural growth of the VCD in chicks aged 7 to 10 days. The 5 mM rosiglitazone significantly reduced axial elongation induced by LIM compared to the 0.2 mM rosiglitazone group, with mean \pm SEM ($-190.9 \pm 43.8 \mu\text{m}$, $p < 0.001$) and the vehicle group ($-168.8 \pm 43.8 \mu\text{m}$, $p = 0.002$). In comparison, axial elongation was observed across groups ($258.3 \pm 12.1 \mu\text{m}$, n=28). The LIM eye in the vehicle group elongated by $578.3 \pm 46.9 \mu\text{m}$ (n=7), inducing an approximately +124% accelerated axial elongation solely due to optical defocus treatment (Fig. 36a).

To evaluate the efficacy of rosiglitazone, interocular differences of each ocular segment were compared to contralateral control eyes. No significant interocular differences were found between

groups regarding age (days of LIM) on day 10 (D3) for ACD and LT, suggesting no significant impact of LIM or rosiglitazone on anterior segment dimensions. However, a significantly shorter interocular difference in VCD was observed in the 5 mM rosiglitazone group ($-176.4 \pm 59.8 \mu\text{m}$, $p=0.02$) compared to the vehicle group. This difference was also reflected in shorter interocular differences in axial length for the 5 mM rosiglitazone group compared to both the vehicle (-196.3 ± 47.5 , $p<0.001$) and the 0.2 mM rosiglitazone group ($-170.6 \pm 47.5 \mu\text{m}$, $p=0.004$). Statistical analyses were performed using two-way ANOVA with Tukey's HSD post hoc test (Fig. 36b). To illustrate the efficacy of intravitreal rosiglitazone on axial length reduction, the administration of 5 mM rosiglitazone resulted in a 59% reduction in axial elongation during myopia progression, while a reduction of 26% was observed with the 1 mM dose and an 8% reduction with the 0.2 mM dose. Significance between doses was assessed using one-way ANOVA with Tukey HSD post hoc test (Fig. 36c). The half-maximal inhibitory concentration (IC₅₀) for axial length was calculated using responses at doses of 0.2 mM and 1 mM were less than 50%, while responses at 5 mM exceeded this threshold. Nonlinear fitting of the dose-response curve indicated a predicted IC₅₀ dose of approximately 2.24 mM delivered intravitreally (Fig. 36d).

Finally, restoration of retinal Glut1 protein expression ($\text{Log}_2\text{FC}=0.03$, $p=0.52$, $n=8$; unpaired Student's t-test; 1% FDR) in the 5 mM rosiglitazone group was profiled using Zeno pulsing enabled SWATH-MS (Zeno SWATH-MS) acquisition workflows based on six distinct tryptic-digested peptides from Glut1 protein¹¹⁹. These peptide sequences were (Log_2FC , p -value) FLLINRNEENK (0.03, $p>0.05$), GTTDVSSDLQEMK (0.12, $p>0.05$), GTTDVSSDLQEMKEESR (0.04, $p>0.05$), LRGTTDVSSDLQEMK (-0.10, $p>0.05$), MALSFEMLILGR (0.02, $p>0.05$), VTIMELFR (0.03, $p>0.05$) and KVTIMELFR (0.11, $p>0.05$) (Fig. 36e). The analysis utilized the accurate MaxLFQ algorithm in the DIA-NN software, based on 6 distinct tryptic digested peptides. To examine the effect of rosiglitazone on normally growing chick eyes, a randomized unilateral eye received an intravitreal

injection of 5 mM rosiglitazone while the contralateral control eye was injected with a vehicle containing 2% DMSO in PBS (n=4). There were no interocular differences between eyes regarding axial length, ACD, LT, VCD, or refractive error as determined by unpaired Student's t-test (Fig. S1). Overall, the intravitreal administration of 5 mM rosiglitazone ameliorated myopia progression by reducing axial elongation by approximately 59% in LIM eyes while restoring Glut1 retinal expression in this drug-treated avian model.

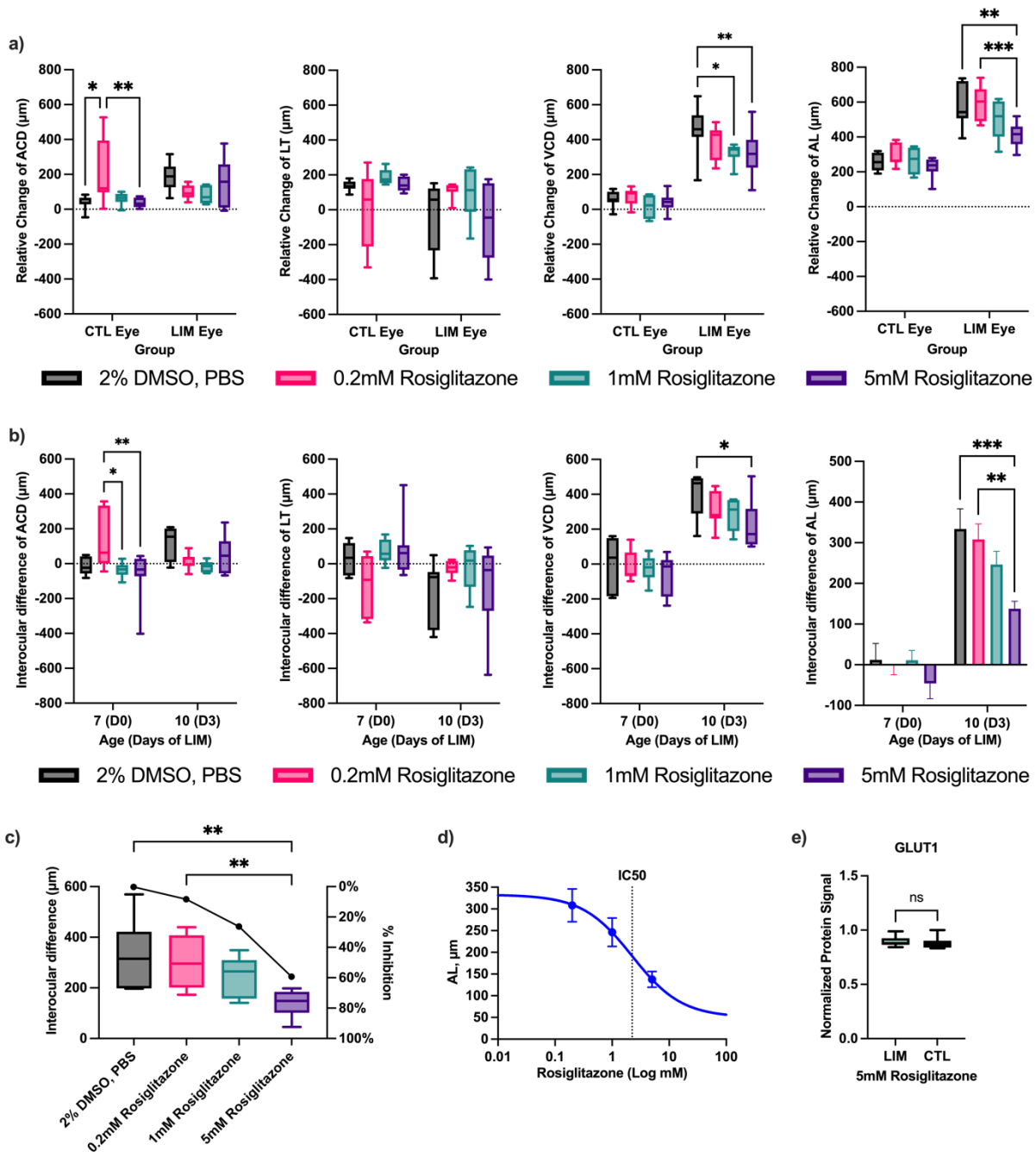


Fig. 36: Ocular biometrics in unilateral lens-induced myopia with intravitreal rosiglitazone in chick eyes.

This figure presents changes in ocular dimensions, including ACD, LT, VCD, and AL, with intravitreal injection of vehicle (2% DMSO, PBS), 0.2 mM, 1 mM, and 5 mM rosiglitazone. **a)** Relative changes in ocular dimensions in both LIM and control (CTL) eyes. **b)** Interocular differences between LIM and contralateral control eyes. **c)** Percentage inhibition of LIM through intravitreal injection of

rosiglitazone from 0.2mM to 5mM. **d)** Predicted *half-maximal inhibitory concentration* (IC50) value from the dose-response curves for 0.2 mM, 1 mM, and 5 mM rosiglitazone. **e)** Normalized Glut1 protein expression levels in the LIM eye treated with 5 mM rosiglitazone compared to the contralateral control eye injected with vehicle (2% DMSO, PBS), quantified using DIA-NN workflow based on six distinct tryptic-digested peptides. Axial length (AL), corneal thickness (CT), anterior chamber depth (ACD), lens thickness (LT), vitreous chamber depth (VCD), and retinal thickness (RT). Statistical analysis was performed with one-way ANOVA with Tukey's post hoc test. Statistical significance levels are indicated as * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, and ns: not significant.

7.3.2. Rosiglitazone does not affect normal growing chick eyes nor axial length or refractive power

To examine the effect of rosiglitazone on normal growing chick eyes, a randomized unilateral eye was selected for intravitreal injection of 5 mM rosiglitazone, and a contralateral control eye injected with 2% DMSO in PBS (n=4). There were no interocular differences between eyes (Drug-vehicle) in axial length, ACD, LT, VCD, and refractive error by unpaired Student's t-test (Fig. 37). Overall, 5 mM rosiglitazone ameliorated myopia progression by a 59% reduction in axial elongation of the LIM eye delivered intravitreally and restored Glut1 retinal expression in the drug-treated LIM avian model.

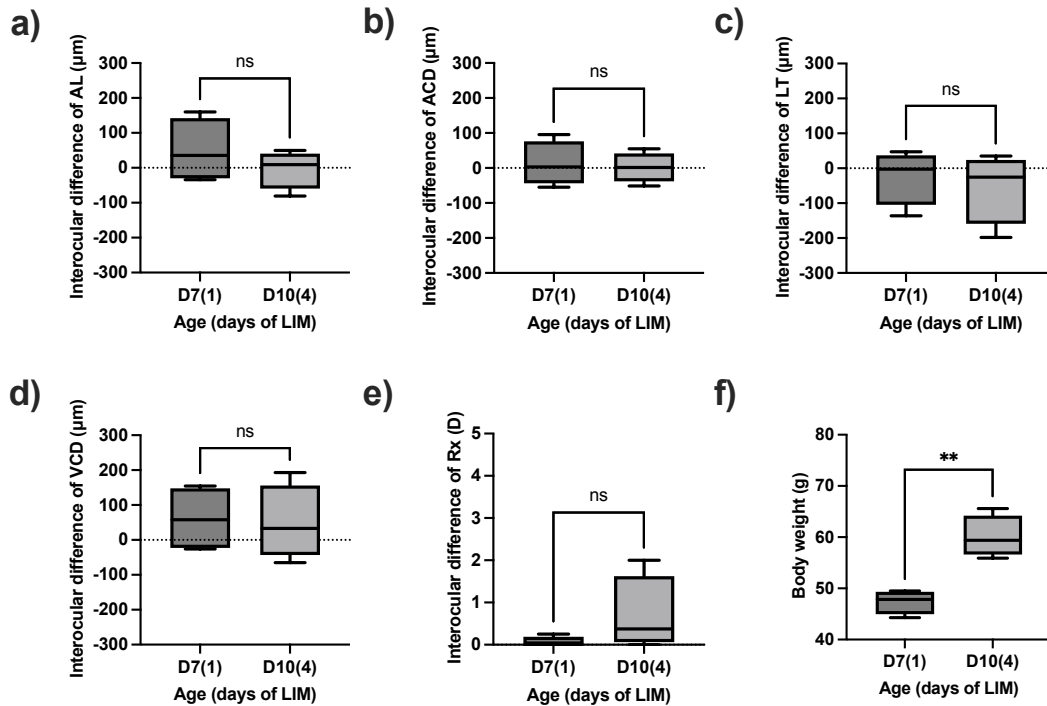


Fig. 37: Body weight, ocular biometric, and refractive error measurements of normal growing chicks with unilateral, randomized intravitreal injection of 5 mM rosiglitazone treatment and the vehicle in contralateral control eyes (n=4).

a-d) Ocular dimension and segmentation measured using an A-scan ultrasound system represented in the interocular difference of rosiglitazone-treated eye – contralateral control eye. e) Refractive error measurement using a streak retinoscope by an experienced optometrist, f) Body weight of chicks on day 7 (1) and day 10 (4). Statistical analysis was performed using an unpaired Student's t-test. The statistical significance levels are presented as * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, and ns: not significant.

7.4. Discussion

We hypothesized that the involvement of PPAR γ in the murine retina leads to differential protein expression and to examine the inhibitory effect of the TZD derivative on myopia progression using an avian model. We employed untargeted, high-throughput mass spectrometry-based proteomics to construct mice retinal proteome specific spectral library, quantified retinal proteome of C57BL/6J mice treated with LIM, leading to the discovery of protein subsets associated with PPARs using data-

independent acquisition (DIA). Furthermore, the observed differential protein expression was validated using accurate and precise targeted mass spectrometry techniques (Fig. 38).

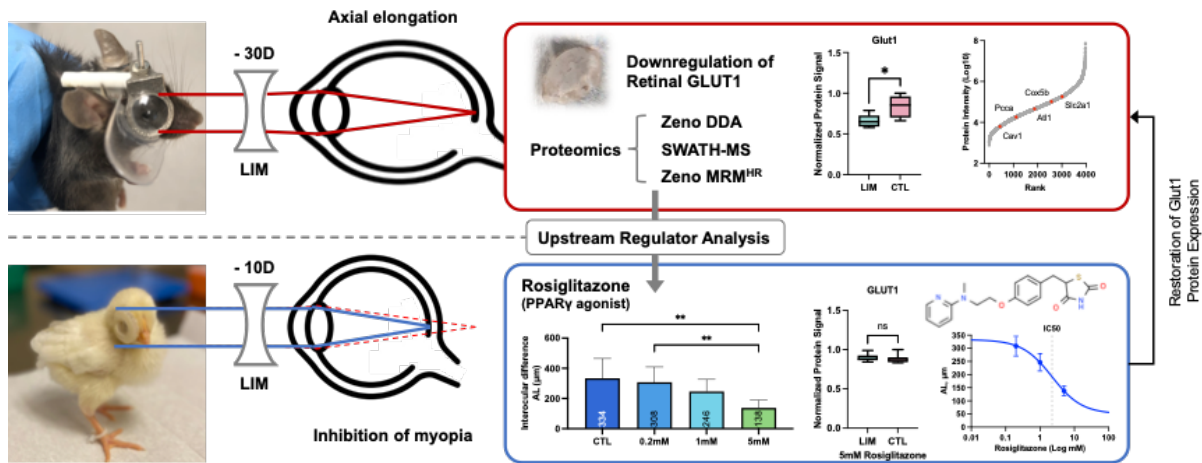


Fig. 38: Schematic representation of lens-induced myopia animal models and retinal proteomics analysis that offers insights into new therapeutic molecules.

The proteomic analysis of the retinal proteome in C57BL/6J mice with elongated eyeball induced by optical treatment. Ex-vivo retinas were analyzed using various mass spectrometry techniques, including data-dependent acquisition (DDA), sequential windows acquisition of all theoretical mass spectra (SWATH-MS), and high-resolution multiple-reaction monitoring (MRM^{HR}). The findings reveal a significant downregulation of retinal Glut1 expression in the murine LIM model. Furthermore, intravitreal administration of rosiglitazone was shown to restore retinal Glut1 expression. Importantly, rosiglitazone demonstrated therapeutic potential in a dose-dependent manner, effectively slowing myopia progression by mitigating axial elongation.

Glut1 holds a unique and critical role in myopia research due to its fundamental function in retinal glucose transport, which profoundly influences retinal metabolism and photoreceptor health. Apart from the proposed involvement of glycolysis in myopia development¹⁷⁵. Glut1 is the primary transporter facilitating glucose uptake across the inner blood-retinal barrier and retinal pigment

epithelium, ensuring supply to photoreceptors and supporting their energy-intensive outer segment renewal process¹⁹⁸. This metabolic support is essential because photoreceptor function and survival depend heavily on glucose-derived anabolic pathways necessary for synthesizing and maintaining visual pigments and cellular structures²²⁴. The uniqueness of Glut1 in myopia lies in its direct connection to retinal energy homeostasis during visual development. Glut1 highlights a metabolic dimension where altered glucose transport could modulate photoreceptor health and, consequently, the structural and functional retina adaptations associated with refractive error development. Reduced or dysregulated Glut1 expression or activity has been linked to photoreceptor degeneration, which can disrupt outer segment maintenance, potentially influencing myopia progression or retinal responses to optical defocus.

Light serves as a primary gauge for synchronizing circadian rhythms, disruptions in light exposure can lead to alterations associated with mood disorders and depression-like states^{225,226}. The circadian clock is primarily driven by the light-dark cycle, while hypoxia can be a mere reaction to environmental changes^{227,228} and such signal regulates diurnal rhythms of baseline glucose levels^{229,230}. Interestingly, violet light has been reported to suppress LIM through neuropsin (OPN5) in the mouse retina, suggesting a significant role for cone photoreceptors in myopia development¹⁹⁰. While much research has focused on scleral signals such as hypoxia observed in scleral tissue¹⁹¹ through activated Glut1 expression, it is essential to consider the broader implications of retinal signaling²³¹. The relationship between circadian rhythm and systemic insulin sensitivity is noteworthy^{178,232}, for instance, Glut1 deficiency syndrome (G1DS) is associated with abnormal sleep-wake patterns²³³. Recent studies by Jian et. al, have shown that light modulates glucose metabolism via a retina-hypothalamus-brown adipose tissue axis, indicating that artificial light exposure may be a risk factor for metabolic disorders²³⁴. These results underscore the multifactorial genetics¹⁷ and environmental²³⁵ factors contributing to myopia development in the neural retina, highlighting the interaction between circadian

rhythm and potential disruption caused by experimentally induced myopia via Glut1 dysregulation. The downregulation of the Glut1 protein induced by LIM treatment may increase the retina susceptibility to microvascular lesions. This reduction in Glut1 expression has been observed in streptozotocin-induced diabetes models, suggesting a link between Glut1 and impaired glucose metabolism²⁰¹. Thiazolidinediones (TZDs), a class of antidiabetic agents that enhance insulin sensitivity, include rosiglitazone, a potent selective PPAR γ agonist effective in improving insulin sensitivity among both diabetic and non-diabetic patients^{236,237}. Recent studies have demonstrated that non-TZD PPAR γ agonist GW1929 can inhibit form-deprived myopia progression while reducing scleral HIF1A expression in guinea pigs⁵⁸. This highlights the potential of PPAR γ agonists to modulate myopia development and their interaction with hypoxia²³⁸. Specifically, PPAR γ agonists have been shown to reverse choroidal layer thinning associated with form-deprived myopia, suggesting that PPAR γ regulated metabolism universally affects eye growth during experimentally induced myopia through form-deprivation and optical defocus⁵⁶. Moreover, prolonged exposure to hypoxia has been reported to elevate transcription levels of the Glut1 gene, coinciding with continuous myopic during experimental induction of myopia²³⁹.

The interaction between hypoxia and PPARs is significant. For instance, hypoxia-dependent downregulation of PPAR α ²⁴⁰, and deletion of HIF1A may inhibit PPAR γ activation within the retina²⁴¹. Additionally, it is important to note that Glut1 deficiency syndrome (G1DS) is associated with thinning of the photoreceptor layer in humans¹⁹⁵, a characteristic also observed in individuals with myopia²⁴². Dietary supplementation of fatty acids has been found to offer protective effects against myopia, suggesting that lipid metabolism, closely regulated by PPAR signals, plays a role in this condition²⁴³. Furthermore, Rosiglitazone has been reported to reduce the endoplasmic reticulum (ER) stress signaling pathway in the ATF6 branch²⁴⁴. Recent studies by Ikeda et al indicated that the ATF6 activation may be associated with HIF1A in LIM, and pharmacological inhibition of scleral ATF6 can

suppress myopia progression²⁴⁵. In addition, the protective effects of rosiglitazone against retinal neuronal damage have been demonstrated through intraperitoneal injections²⁴⁶ and its inhibitory effect on diabetic retinopathy via oral administration²⁴⁷. These findings suggest that rosiglitazone could be explored through alternative drug delivery methods for managing myopia. Administration through instillation or oral routes may yield similar therapeutic effects, providing a potential avenue for further exploration to ameliorate myopia.

7.5. Conclusion

Our study revealed the impairment of insulin sensitivity through Proteomics analysis revealed significant involvement of tight function. Specifically, dysregulation of retinal Glut1 expression induced by optical defocus through LIM during myopia development. Intravitreal administration of the PPAR γ agonist rosiglitazone ameliorated pathological axial elongation associated with myopia progression by enhancing insulin sensitivity and restoring Glut1 expression within the retina. These findings shed light on the underlying pathological changes occurring in the retina during myopia development and position PPARs as promising therapeutic targets for controlling myopia with minimal impact on normal eye growth. This research reinforces established connections between axial elongation and myopia while emphasizing opportunities for targeted therapeutic interventions aimed at mitigating this increasingly prevalent condition.

Chapter 8. Optical defocus mediated differential phosphorylation expression in early myopia and hyperopia development in chick retina

8.1. Introduction

Protein phosphorylation is a vital cellular regulatory mechanism that involves various enzymes and receptors. Among the most prevalent post-translational modifications (PTMs), it plays a significant role in activating or deactivating proteins through phosphorylation and dephosphorylation events mediated by kinases and phosphatases. This reversible mechanism occurs via protein kinases, which add a phosphate group (PO₄) to specific amino acid residues. As a result, these modifications induce changes in chemical properties, transforming hydrophobic apolar regions into hydrophilic polar regions. They also impact protein conformation during interactions with other molecules and facilitate new dimensional interaction within protein complexes during binding, assembly, and detachment processes. Protein kinases responsible for phosphorylation mechanisms have been classified into seven subfamilies: AGC, CaMK, CK1, CMGC, STE, TK, and TKL²⁴⁸. These subfamilies encompass a diverse range of kinases with distinct functions and substrate specificities.

In 1988, the role of protein kinase C (PKC) in the release of dopamine (DA) in the nigrostriatal pathway was investigated through the bi-directional regulation of PKC activity using pharmaceutical PKC agonists and antagonists²⁴⁹. The administration of dopaminergic agents such as levodopa has been shown to inhibit experiment myopia in animal models, through dopamine receptor activation and subsequent signaling pathways involving PKC²⁵⁰. This study suggests the potential involvement of PKC in dopamine release, shedding light on the underlying mechanisms of neurotransmitter regulation. In recent years, mass spectrometry has emerged as a powerful tool for comprehensive screening of phosphorylation sites, including serine or threonine and tyrosine residues, supported by enormous efforts in bioinformatics advancement. This analytical technique enables researchers to identify and analyze various PTMs in purified proteins, a mixture of proteins, and most importantly, native

biological samples consisting of thousands to hundreds of proteins. However, our understanding of the biological consequences of multi-site phosphorylation and the combined use of different PTMs remains limited. These PTMs have the potential to contribute significantly to biological complexity, extending beyond differential expression. They can impact the dynamics of cell signaling, and protein-protein interaction, and potentially elicit switch-like or graded effects dependently²⁵¹. The investigation of phosphorylated sites holds great promise in unraveling the intricate mechanisms underlying cellular processes and their dysregulation in myopia.

In 1990, S. Kato et. al. demonstrated that a synthetic, endogenous PKC activator could induce a significant release of dopamine in isolated fish retinas²⁵². This finding underscores the potential interaction between dopamine and kinases, an area that remains largely unexplored and warrants further investigation. We hypothesize that phosphorylation and kinases may play a substantial role in the progression of myopia, with a particular focus on the dopamine signaling observed during myopia development. Dopamine serves as a crucial neurotransmitter in the retina, playing diverse roles in development, visual signaling, and refractive development. Notably, the light hypothesis proposes that light-stimulated dopamine antagonizes myopia development, exhibiting a linear relationship across a broad range of light intensity. This suggests that the release of dopamine is regulated by light intensity and image contrast, both of which are detected by photoreceptors and have been implicated in myopia development¹⁸⁷. These findings are further supported by the inverse relationship observed between bright light exposure and the risk of developing myopia, as summarized in a review²⁶. Interestingly, light adaptation allows photoreceptors to adjust their sensitivity according to the dynamic range of ambient intensities. A report suggests that eye-specific PKC is activated by an increase in cytosolic calcium and diacylglycerol, an essential component required for light adaptation in insect photoreceptors²⁵³. Recently, a study has indicated that PKC α modulates rod-bipolar cell function by accelerating glutamate-driven signal transduction and termination, further suggesting the role of PCK

in retinal metabolism and functions in mice²⁵⁴. There are limited reports that have investigated phosphorylation during myopia progression. These include findings of decreased phosphorylation activity of beta-tubulin in the retina of recovery eyes after experimental myopia in chick²⁵⁵, and increased connexin 36 phosphorylation in the myopic retina of mice²⁵⁶. After 40 years of research and still counting, here we present the first untargeted profiling of differential phosphorylation expression levels during experimentally induced myopia and hyperopia in the chick retina. More importantly, the differentially expressed phosphopeptides were analyzed for predictions of upstream kinases and their respective kinase groups. These untargeted, quantitative, labeled proteomics results provide novel discoveries and evidence of the involvement of the PI3K/ATK/mTOR signaling transduction pathway, introduced by optical manipulations, from a phosphorylation perspective. Overall, these findings on the intricate relationship between phosphorylation mediated by kinases during myopia progression could potentially uncover new therapeutic targets for myopia controls.

8.2. Methods

8.2.1. Hatching and handling of chicks

White Leghorn chick-specific pathogen-free (SPF) eggs (*Gallus Gallus*) were ordered from Jinan Poultry Co. Ltd., China. Eggs were housed in an egg incubator (ELYE-3, Onelye, China) for 21 days with an average temperature of 36.6 °C and humidity of 68 g/kg in the centralized animal facilities (CAF) at the Hong Kong Polytechnic University. Eggs were moved to a hatcher (EH-96H, Onelye, China) for 1 week under identical temperature and humidity conditions. Newborn chicks at 3 days of age were housed in stainless steel brooders under a 12/12 light/dark cycle with an average luminance of 500 lux at the center of the cage inside the breeding room with a computer-controlled humidity at 41%, in-room temperature, and free access to food and water.

8.2.2. Experimental lens-induced myopia in chicks

White Leghorn chicks at 7 days (D0) of age were measured for refractive errors using a streak retinoscope (Beta 200 Streak Retinoscope Set 2.5v, Heine, Germany) with a trial lens bar ($\pm 16.00\text{D}$ in 0.5D steps) in dim light environment. Equivalent sphere measurements were used to define the refractive error as spherical power ± 0.5 cylindrical power. Ocular parameters were measured with an A-scan ultrasound system (5073PR, Olympus, Japan) coupled with a 30 MHz probe (PZ25-025-R1.00, Panametrics, USA) and an adjustable pump system (505u, Watson Marlow, UK). Saline was used as liquid media in the ultrasonic probe for chick eyes, deionized water was used for system calibration. A custom-made eyelid retractor was used to keep the chick eyes open during A-scan measurement without anesthesia in triplicates. Results were characterized by anterior chamber depth, lens thickness, vitreous chamber depth, retinal thickness, and axial length. Chicks were then subjected to experimental lens-induced myopia (LIM) by a dispersive lens (-10 diopters) made from polymethyl methacrylate (PMMA). The unilateral treatment eyes were selected by computer-controlled randomization. The lens was attached to the chicks using a Velcro ring glued on the fur to the area around the eye using epoxy resin a day ahead. Chicks were housed in a 12/12 light/dark diurnal cycle supplied with *ad libitum* food and water. Lenses were cleaned daily to ensure proper vision. After 3 days of LIM treatment on 10 days (D3), biometric measurements were taken, and tissues were collected for molecular analysis. The handling and operations throughout the experiment complied with the ARVO statement for the Use of Animals in Ophthalmic and Vision Research and approved by the Hong Kong Polytechnic University Animal Subject to Ethics Sub-committee (ASESC).

8.2.3. Isolation of neural retina in chick eyes

Chicks were sacrificed with carbon dioxide overdose, extraocular muscles, and optic nerve were disconnected by small incisions by scissors, and the eyeball was isolated from the orbit. The intact eyeball was rinsed with ice-cold phosphate-buffered saline (PBS) to remove excessive muscles

and blood. The eyeball was hemisected equatorially using a razor blade, dissecting the eyeball into two hemispheres. The crystalline lens was pulled out with forceps. The posterior eyeball was submerged into a new, clean ice-cold PBS and shaken gently using forceps holding the edge of the choroidal-sclera tissue. A pale-yellow, transparent neural retina tissue would separate from the posterior eyeball, leaving the retinal pigment epithelium (RPE) layer with the choroidal sclera tissue. The isolated retina tissue was rinsed again in ice-cold PBS, then snap-freezing in liquid nitrogen and stored at -80 °C freezer.

8.2.4. Tissue homogenization and protein extraction

Chick retina tissues were harvested and immediately frozen in liquid nitrogen. The tissues were then homogenized in 250 µL 100 mM Tris-HCl, 7 M urea, 1mM MgCl₂, 1% benzonase, 1 mM sodium orthovanadate, 1 x phosphoSTOP phosphatases inhibitor and 1 x EDTA-free protease inhibitor. The tissues were homogenized by an automated homogenizer (Bertin Technologies) by running 4 cycles of 10 seconds at 5,800 rpm, with a 30-second break between cycles. Residual debris removal was performed by centrifugation at 12,000 rpm for 30 min at 4 °C. The supernatant was collected for reduction and alkylation. Proteins were reduced by 5 mM dithiothreitol (DTT) for 30 mins at 37 °C with gentle shaking and then incubated with 15 mM iodoacetamide (IAM) at room temperature (RT) for 30 mins in the dark. In-solution digestion was started with MS-grade Lys-C (Wako) at an enzyme/protein ratio of 1:200 (w/w) at 37 °C. A secondary digestion was performed by adding sequencing-grade trypsin (Promega) at an enzyme/protein ratio of 1:50 (w/w) for an additional 12 hours at 37 °C. Peptides were acidified and desalted with a Sep-Pak C18 cartridge (Waters). The samples were dried by a concentrator and stored in a -80 °C freezer.

8.2.5. Phosphorylated peptide enrichment and TMT labeling

Phosphorylated peptide enrichment was performed using TiO₂ according to the method previously described^{257,258}. The sample loading buffer was 50% ACN, 2 M lactic acid; washing buffer was 50% ACN, 0.1% TFA; elution buffer 1 was 10% NH₃·H₂O; elution buffer 2 was 5% NH₃·H₂O and 50% ACN. The enriched phosphorylated peptides were dried and reconstituted in 50 uL 100 mM TEAB (pH 8.5). The peptide concentration was determined with a quantitative fluorometric peptide assay kit (Thermo). The TMT labeling was performed according to the manufacturer with a TMT/peptide ratio of 10:1 (w/w).

8.2.6. LC-MS/MS for phosphoproteomics analyses

LC-MS/MS analyses of retina samples were performed on an Orbitrap Exploris 480 mass spectrometer (Thermo Fisher Scientific) coupled with an UltiMate 3000 UPLC system (Thermo Fisher Scientific). An RSLC C18 analytical column (75 μm×250 mm, 2.0 μm, 100 Å) (Thermo Fisher Scientific) was employed for LC separation. Mobile phase A is 0.1% FA in water and mobile phase B is 0.1% FA in 80% ACN. A 180-min gradient with a 300 nL/min flow rate and an initial 8% mobile phase B was used. Mobile phase B was increased to 32% at 130 min, 90% at 158 min, and held for 10 mins. Then, mobile phase B was back to 8% at 170 min and maintained this composition until 180 min. Data was collected in data-dependent acquisition (DDA) mode. The top ten precursor ions with a charge state of 2⁺ or higher were fragmented by HCD. The MS1 Orbitrap resolution was set at 60,000 and the MS1 AGC target was set at 4 × 10⁵. The MS2 Orbitrap resolution was set at 30,000 while the MS2 AGC target and the maximum injection time were set at 1 × 10⁵ and 54 ms. TMT data were searched against the Homo sapiens UniProt database (Version June 2020, 20368 entries) using the SEQUEST algorithm (Proteome Discoverer 2.4, Thermo Fisher Scientific). Carbamidomethylation of cysteine residues was set as a static modification. TMT tags on lysine residues and peptide N terminal,

phosphorylation of serine (S), threonine (T), tyrosine (Y), and oxidation of methionine residues were set as variable modifications.

8.2.7. Target validation with PRM strategy

PRM analyses of retina samples were performed on an Orbitrap Exploris 480 mass spectrometer (Thermo Fisher Scientific) coupled with an UltiMate 3000 UPLC system (Thermo Fisher Scientific). An RSLC C18 analytical column (75 $\mu\text{m} \times 250 \text{ mm}$, 1.6 μm , 120 \AA) (Aurora, Ion opticks) was employed for LC separation. Mobile phase A is 0.1% FA in water and mobile phase B is 0.1% FA in 80% ACN. A 120-min gradient with a 300 nL/min flow rate and an initial 8% mobile phase B was used. Mobile phase B was increased to 32% at 80 min, 90% at 98 min, and held for 10 mins. Then, mobile phase B was back to 8% at 110 min, and maintained this composition until 120 min. The targeted MS1 parameters were as follows: resolution, 120,000; AGC target, 4.0×10^5 ; and maximum injection time, 100 ms. MS2 scanning was performed at 60,000 resolution, 1×10^5 AGC target, and 1.0 m/z isolation window. After PRM data acquisition, the data was imported into Skyline for analysis. To get reliable identification and quantification, idotp and dotp should be above 0.70. The top three product ions were summed up to represent the peptide abundance.

8.3. Results

8.3.1. Axial elongation in the myopic eye and shortening in the hyperopic eye in chick

In the experimentally induced myopia and hyperopia in chicks, significant differences in ocular dimensions were observed. The lens-induced myopia (LIM) treatment resulted in an interocular difference of 267.3 μm ($n=5$, $p<0.001$), primarily due to the relative change in the treated eye's axial length. Conversely, the lens-induced hyperopia (LIH) treatment led to a shortening of the axial length by 353.6 μm ($n=5$, $p<0.001$) measured through interocular difference, also contributed by the relative change of the treated eye (Fig. 39a). The refractive error measurements exhibited a myopic shift of –

6.65 D (n=5, p<0.001) in the LIM experiment, and a hyperopic shift of + 6.40 D (n=5, p<0.001) in the LIH experiment, as determined by interocular difference. These changes were supported by the alterations induced in the treatment eyes (Fig. 39b). The A-scan measurements of ocular segmentation allowed for the interpretation of the visual impact on the anterior or posterior segment of the eye. Not surprisingly, both LIM and LIH treatments did not induce interocular differences in the anterior chamber depth (ACD). Minor relative changes observed in each eye in both groups indicate a natural variation in animal eye growth (Fig. 39c). A minimal but statistically significant lengthening of lens thickness (LT) was observed in the LIM group, with a mean difference of 74.94 μm (n=5, p<0.01) while the LIH group exhibited a shortening of lens thickness with a mean difference of 81.96 μm (n=5, p<0.001) (Fig. 39d). Furthermore, a significant elongation of the vitreous chamber depth (VCD) was observed in the LIM group, contributing 74.8% to the overall axial elongation observed in chicks, with a mean difference of 199.9 μm (n=5, p<0.01). In contrast, the LIH group showed a shortening of the VCD, contributing 90.6% to the overall shortened eye length, with a mean difference of 320.4 μm (n=5, p<0.01) (Fig. 39e). There were no significant differences in body weight were found between the groups. Additionally, both the LIM and LIH treatments resulted in a slight increase in body weight of approximately 5.4 grams after 3 days, suggesting that these treatments had no significant effect on body weight (Fig. 39f). The correlation between axial length and refractive error was examined using three linear regression methods: interocular difference (n=20, $R^2=0.934$), relative change of the eye (n=20, $R^2=0.885$) and actual eye dimensions (n=40, $R^2=0.711$). These results indicate that interocular difference eliminates minor differences between eyes in animals and axial elongation or shortening is strongly correlated with refractive error in chick eye, with approximately 55.73 μm of change per diopter (Fig. 39g-i).

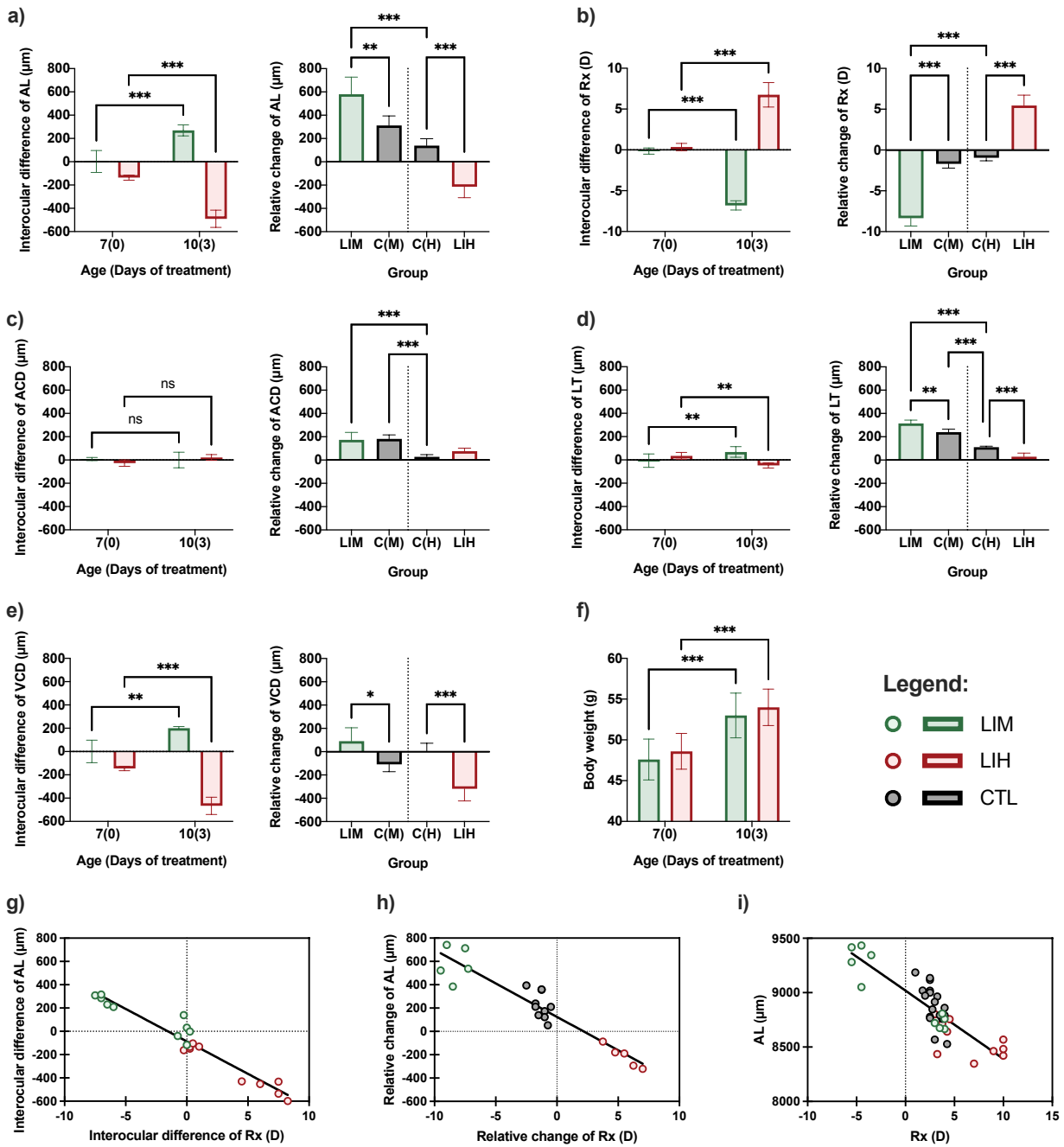


Fig. 39: Ocular biometric measurements in chick eyes.

Data were represented as interocular differences between the unilateral treatment eye and contralateral control eye, and relative changes of the eyes after 3 days of experimentally induced myopia (LIM) or hyperopia (LIH). Contralateral control eyes were presented as C(M) in the myopia group and C(H) in the hyperopia group. **a)** Axial length (AL). **b)** Refractive error (Rx). **c)** Anterior chamber depth (ACD). **d)** Lens thickness (LT). **e)** Vitreous chamber depth (VCD). **f)** Body weight on age (days of treatment)

at Day 7(0) and Day 10(3). Correlation plot between axial length and refractive error presented in, **g**) Interocular difference. **h**) Relative changes. **i**) Matched pairs of axial length and refractive error measurements in each eye). Statistical analysis was performed with one-way ANOVA with Tukey's post hoc test. Statistical significance levels are presented as * $p \leq 0.05$, ** $p \leq 0.01$, *** $p \leq 0.001$, and ns: not significant.

8.3.2. Differential expression of phosphopeptides in the retina after three days of lens-induced myopia (LIM)

The mass spectrometric analysis utilized isotopically labeled reagent TMT-10plex, quantified 3235 protein groups (n=10). Notably, 95.52% of these protein groups were identified as phosphoproteins. Additionally, the method quantified 8189 canonical peptides, and among them, 93.37% were phosphopeptides. The analysis revealed a total of 10943 unique post-translational modification (PTM) sites, with 10150 (92.75%) of them phosphorylation-containing peptide sequences. More importantly, 8540 out of 10150 (84.14%) displayed highly confident phosphorylation motifs, particularly those with multiple amino acids susceptible to phosphorylation modification. It is worth mentioning that the majority of the phosphopeptides were mono-phosphorylated (74.29%), followed by dual phosphorylation sites (23.35%) and the least common was triple phosphorylation sites (2.26%). Regarding the specific amino acids targeted, 87.77% of the localized phosphorylation events occurred on serines (S), while threonines (T) accounted for 10.88%, and tyrosines (Y) only represented 1.35% of the identified sites (Fig. 40a). Furthermore, the analysis identified 12 significantly upregulated phosphopeptides and 13 significantly downregulated phosphopeptides with Log_2 fold change (FC) threshold of ± 0.263 and $-\log_2 P$ value > 4.32 (Fig. 40b). Principal component analysis (PCA) revealed that principal component 1 (PC1) and PC2 explained 58.5% and 20.6% of the total variance, respectively. The prediction ellipses with a probability of 0.95, indicated that biological replicates from the same group fell within the boundaries with some slight overlap between the LIM and CTL groups

(Fig. 40c). A heatmap analysis displayed two distinct clusters of differentially expressed phosphopeptides, categorized based on their correlation. These clusters represented phosphopeptides that were either downregulated or relatively upregulated in the LIM-treated eyes (Fig. 40d).

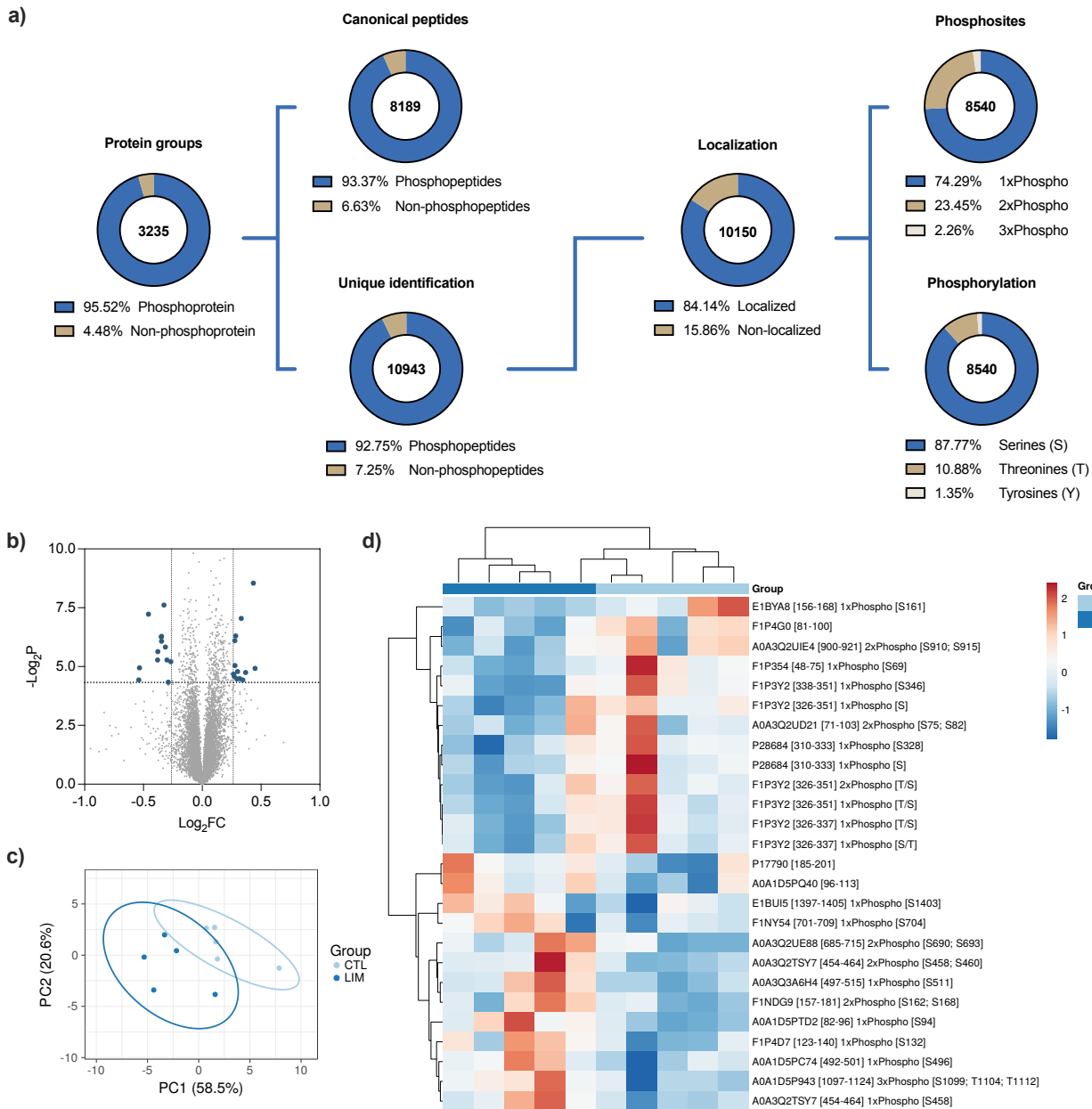


Fig. 40: Characteristics of phosphoproteins and phosphopeptides in the retina after 3 days of LIM treatment.

a) Identification of protein groups, canonical peptides, unique peptide identification, localization of phosphorylation, and characteristics of the modified phosphosites and their distribution on amino acid

residues. **b)** Volcano plot of significant differentially expressed peptide sequences with a Log_2 fold change (FC) threshold of ± 0.263 and $-\log_2P$ value > 4.32 (Blue dots). **c)** The PCA analysis of the LIM-treated eyes (LIM) and contralateral control eyes (CTL). **d)** Heatmap of all significant differentially expressed phosphopeptides.

8.3.3. Differential expression of phosphopeptides in the retina after three days of lens-induced hyperopia (LIH)

The mass spectrometric analysis utilized isotopically labeled reagent TMT-10plex and quantified 3389 protein groups (n=10). Notably, 79.76% of these protein groups were identified as phosphoproteins. Additionally, the method quantified 8873 canonical peptides, and among them, 80.78% were phosphopeptides. The analysis revealed a total of 11334 unique post-translational modification (PTM) sites, with 10089 (89.02%) of them phosphorylation-containing peptide sequences. More importantly, 9325 out of 10089 (92.43%) displayed highly confident phosphorylation motifs, particularly those with multiple amino acids susceptible to phosphorylation modification. It is worth mentioning that the majority of the phosphopeptides were mono-phosphorylated (74.29%), followed by dual phosphorylation sites (23.45%) and the least common was triple phosphorylation sites (2.26%). Regarding the specific amino acids targeted, 87.77% of the localized phosphorylation events occurred on serines (S), while threonines (T) accounted for 10.88%, and tyrosines (Y) only represented 1.35% of the identified sites (Fig. 41a). Furthermore, the analysis identified 95 significantly upregulated phosphopeptides and 108 significantly downregulated phosphopeptides with Log_2 fold change (FC) threshold of ± 0.263 and $-\log_2P$ value > 4.32 (Fig. 41b). Principal component analysis (PCA) revealed that principal component 1 (PC1) and PC2 explained 69.4% and 7.1% of the total variance, respectively. The prediction ellipses with a probability of 0.95, indicating that biological replicates from the same group fell within the boundaries with a clear separation between the LIH and CTL groups (Fig. 41c). A heatmap analysis displayed two distinct clusters of differentially expressed

phosphopeptides, categorized based on their correlation. These clusters represented phosphopeptides that were either downregulated or relatively upregulated in the LIM-treated eyes (Fig. 41d).

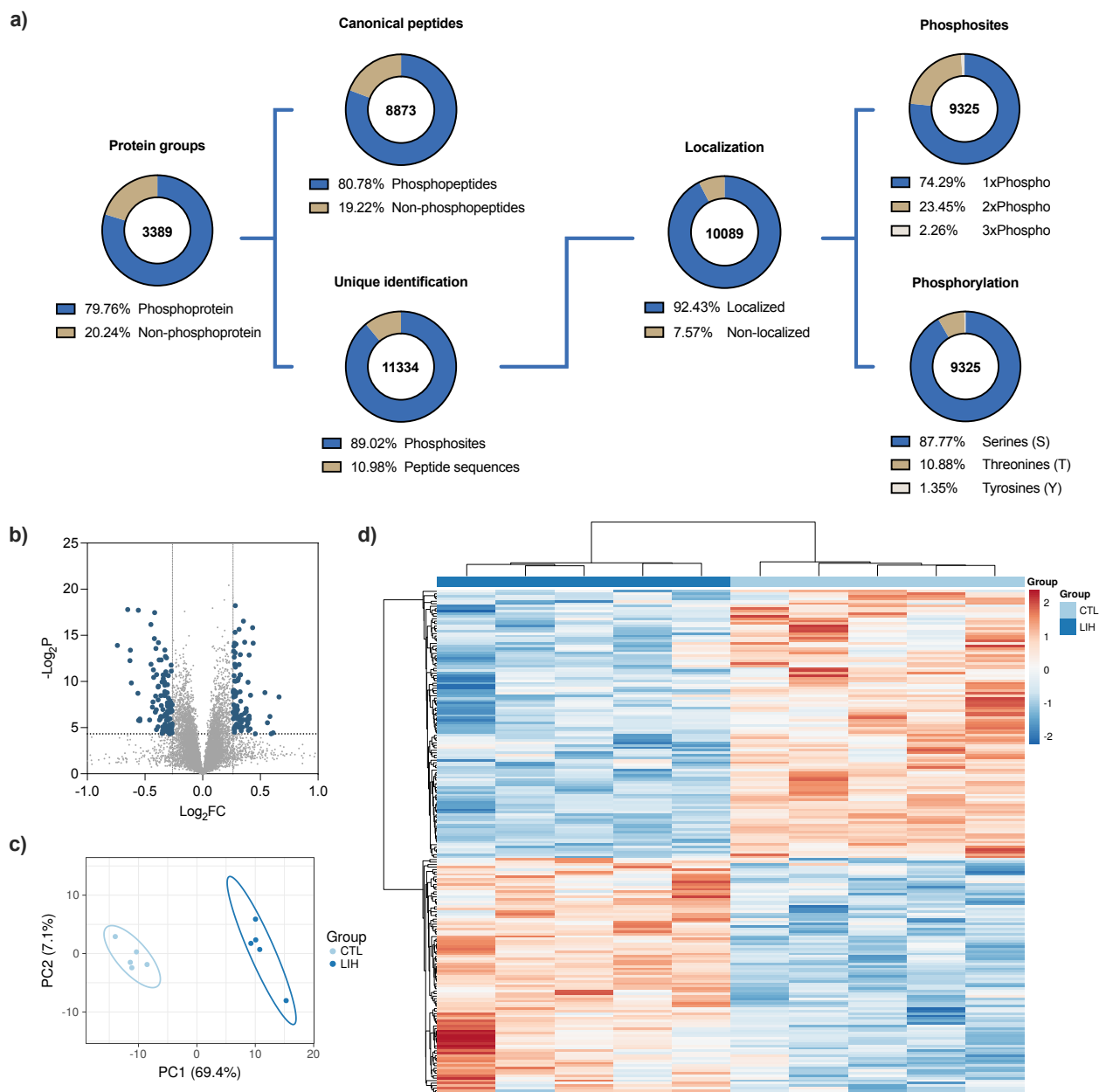


Fig. 41: Characteristics of phosphoproteins and phosphopeptides in the retina after 3 days of LIH treatment.

a) Identification of protein groups, canonical peptides, unique peptide identification, localization of phosphorylation, and characteristics of the modified phosphosites and their distribution on amino acid residues. b) Volcano plot of significant differentially expressed peptide sequences with a Log_2 fold

change (FC) threshold of ± 0.263 and $-\log_2P$ value > 4.32 (Blue dots). **c)** The PCA analysis of the LIH-treated eyes (LIH) and contralateral control eyes (CTL). **d)** Heatmap of all significant differentially expressed phosphopeptides.

8.3.4. Kinase enrichment analysis revealed distinct protein kinase targets modulated by myopia and hyperopia treatments.

The kinase enrichment analysis utilized the atlas of kinase library (ver. 0.0.1), which contains information on approximately 300 human protein Ser/Thr kinases from the human kinome. This library collectively reported over 200,000 Ser and Thr phosphorylation sites on human proteins²⁵⁹. The kinase enrichment analysis was conducted for the phosphopeptides quantified in the LIM and LIH experiments, with a Log₂ FC threshold of $\geq \pm 0.263$ and p-value of ≤ 0.05 . Interestingly, in the LIM experiment, two atypical protein kinases, pyruvate dehydrogenase kinase 1 (PDHK1) and pyruvate dehydrogenase kinase isoenzyme 4 (PDHK4) were significantly upregulated, whereas cyclin-dependent kinase 10 (CDK10) was downregulated (Fig. 42a). In the LIH experiment, there were 4 downregulated protein kinases, including serine/threonine protein kinase mTOR (MTOR), cyclin-dependent kinase 3 (CDK3), dual specificity protein kinase (CLK3) and CDK10 (Fig. 42b). The downregulation of CDK10 was identified in both the LIM (Log₂FC=-0.182, -LogP=4.75) and LIH (Log₂FC=-1.67, -LogP=5.60) experiments, suggesting a modulated molecular function regardless of the optical defocus signals in the retina. Specifically, PDHK1 (Log₂FC=1.71, -LogP=9.56) and PDHK4 (Log₂FC=1.26, -LogP=4.59) were found to be upregulated only in the LIM-treated eyes within the PDHK kinase family, which are subunits of pyruvate dehydrogenase (PDH). PDH is responsible for converting pyruvate from glycolysis into acetyl CoA in the citric acid cycle within the mitochondria. The distinct upregulation of these PDHKs in LIM-treated eyes suggests potentially different mechanisms between myopia and hyperopia progression. In the LIH experiment, the downregulation of protein kinases CDK3 (Log₂FC=-1.39, -LogP=5.6), CDK10 (Log₂FC=-1.7, -

LogP=5.6) and CLK3 (Log₂FC=-1.67, -LogP=5.6) was observed. These results highlight the involvement of kinase CLK3 specifically in the hyperopic defocus experiment (Fig. 42c). The annotations of the phylogenetic tree of the human kinome profile data and the structural features of kinases or functional relationships provided insights into the affected CMGC kinases, such as CLK3 and CDK3 in the LIH experiment, and CDK10 in both LIM and LIH experiment. Additionally, using the KinMap bioinformatics tool, a unique atypical PDHK kinase family was identified only in LIM-treated eyes, and MTOR in the atypical PIKK kinase family was identified in the LIH-treated eyes²⁶⁰ (Fig. 42d).

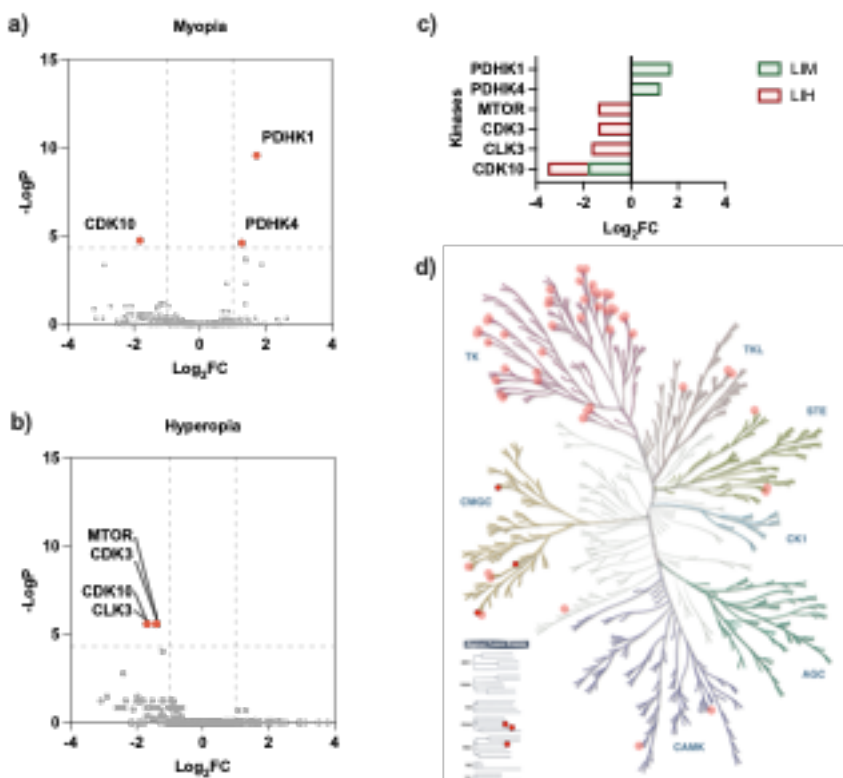


Fig. 42: Kinase enrichment analysis of phosphopeptides profiles in LIM and LIH experiments.

Volcano plots of significantly differentially expressed protein kinases in **a)** LIM experiment. **b)** LIH experiment. **c)** The Log₂FC of six differentially expressed protein kinases with a common kinase target CDK10 in both experiments. **d)** The kinome tree viewers with differentially expressed protein kinase targets in groups of CMGC, PDHK, and PIKK kinase families using the KinMap bioinformatic tool.

8.4. Discussion

The role of phosphorylation in the retina is critical for understanding various ocular diseases, particularly myopia. Phosphorylation, a post-translational modification that regulates protein function, is essential for numerous cellular processes, including those involved in eye growth and refractive error development. It involves the addition or removal of phosphate groups from serine, threonine, tyrosine, and histidine residues, and dysregulated protein kinase signaling often contributes to pathological conditions²⁵⁹. Phosphorylation is a key mechanism that modulates protein activity, stability, and interactions within cells. The retina contains a significant number of phosphoproteins, which are proteins that undergo phosphorylation, a crucial post-translational modification involved in various cellular processes. Recent studies have estimates suggest that there are over 2000 phosphoproteins in the retina ²⁶¹. One of the key findings in recent research is the increased phosphorylation of connexin36 (Cx36) in AII amacrine cells within the myopic retina. Connexin36 is essential for gap junction communication between neurons, facilitating visual signal transmission. In myopia, where distant images are focused in front of the retina, the increased phosphorylation at serine 293 enhances the functional coupling of AII amacrine cells. This adaptation may help filter out noise from defocused images, allowing for better signal processing despite altered visual input conditions²⁵⁶. Studies have shown that elevated levels of MMP-2 are associated with scleral remodeling in myopic eyes. The regulation of MMPs involves various signaling pathways that can be influenced by phosphorylation events. For instance, increased phosphorylation of signaling molecules like PERK and ATF6 has been linked to ER stress responses that promote scleral elongation²⁴⁵. Additionally, the study also indicates that scleral fibroblasts can differentiate into myofibroblasts under pathological conditions, contributing to ECM remodeling. This process is regulated by factors such as FGF-2, which can also influence phosphorylation states within these cells²⁶². Kinases are enzymes that transfer phosphate groups to proteins, while phosphatases remove them. These two enzymatic processes modulate protein activities, frequently in response to external stimuli²⁶³. Here, presented the

involvement of multiple kinases in experimentally induced myopia and hyperopia in retinas, focusing on the protein kinase response to optical defocus treatment in chicks using kinase enrichment analysis.

CMGC kinases derive their name from the initials of the principal kinase families, they encompass, namely CDKs, MAPKs, GSKs, and CLKs, which play critical roles in numerous cellular processes²⁶⁴. Dysregulation of these kinases has been associated with cancer development and progression, and this is the first instance of their involvement in biological changes induced by myopia and hyperopia treatments in chicks. CDK10 has recently been linked to tumor suppression²⁶⁵ and has functions in cell proliferation, transcription, and development²⁶⁶. Interestingly, retinoic acid (RA) treatment of immortalized human retinoblastoma cells led to G0/G1 cell cycle arrest and downregulation of critical genes such as cyclin E, cyclin D3, CDK5, and CDK10²⁶⁷. The observed downregulation of CDK10 expression in the retinas of chicks subjected to optical defocus treatments aligns with previous findings that exogenous retinoic acid-induced myopia in mice²⁶⁸, and oral administration of retinoic acid results in rapid eye elongation in guinea pigs²⁶⁹.

Pyruvate dehydrogenase kinase 1 (PDHK1 / PDK1) is a mitochondrial metabolic regulator that plays a crucial role in the oxidative decarboxylation of pyruvate to form acetyl coenzyme A. It serves as a key link between glycolysis and the tricarboxylic acid cycle, significantly influencing aerobic metabolism²⁷⁰. In hypoxia and cancer, HIF1 α activates the expression of PDK1 and PDK3. Mutations that directly or indirectly activate HIF signals induce the expression of these PDKs. PDK1 is also directly regulated by the proto-oncogene Myc, and its expression level is positively correlated with Myc expression²⁷¹. High expression of PDK isoenzymes in tumor tissues is associated with abnormal glycolysis, particularly PDK1, which is the only kinase capable of phosphorylating the three phosphorylation sites of pyruvate dehydrogenase (E1). A recent study identified scleral HIF-1 α as a prominent regulatory candidate for genetic and environmental interactions in human myopia

progression²⁷². Another study suggests that PDK1 mediates the stimulation of PPAR gamma activity, and their interaction was confirmed by chromatin immunoprecipitation analysis. The binding of PDK1 to PPAR gamma was enhanced by treatment with a PPAR gamma agonist, and PDK1 functioned as a PPAR gamma coactivator independently²⁷³.

8.5. Conclusion

Phosphorylation plays a pivotal role in retinal function and the development of ocular diseases like myopia by regulating protein activity, interactions, and signaling pathways. Increased phosphorylation of specific proteins such as connexin36 in AII amacrine cells highlights adaptive changes in retinal neural connectivity to cope with defocused visual input in myopia. Multiple kinase families, including CMGC kinases and metabolic regulators like PDK1, contribute to the complex signaling networks influencing eye growth, scleral remodeling, and cellular metabolism associated with myopia progression. These phosphorylation-mediated mechanisms provide critical insights into molecular processes underlying refractive error development and offer promising avenues for targeted therapeutic interventions to control myopic eye growth. Further proteomic and phosphoproteomics studies remain essential to fully characterize these dynamic modifications and their pathological implications.

Chapter 9. Summary and future perspectives

9.1. Summary

This thesis is dedicated to exploring the application of next-generation proteomics in myopia research, aiming to deepen our understanding of the molecular mechanisms underlying this prevalent visual disorder. The study employed various optimization techniques and methodologies to enhance the accuracy and reliability of the findings. Initially, we focused on optimizing the anesthesia dosage for early-weaned mice, which served as the baseline for lens-induced myopia (LIM) treatment. Biometric measurements of the eyes were then conducted to assess myopia progression. We optimized the use of an eccentric infrared photorefractor for measuring refractive error and spectral domain optical coherence tomography (SD-OCT) for ocular dimension measurement in mice. A comparative analysis of ocular biometrics using SD-OCT, aligned with Purkinje images and the optic nerve head, demonstrated the accuracy and reproducibility of these measurements, validated by independent operators. Furthermore, the thesis addressed the optimization of protein extraction, quantification, and sample preparation techniques, developing highly reproducible, easy-to-follow, and rapid procedures that ensure consistent and reliable proteomic analysis.

The research yielded significant findings. By utilizing high-pH reversed-phase fractionation and data-dependent acquisition, we generated a comprehensive retinal proteome profile of mice. This approach allowed for detailed examination of protein abundance, coverage, and identifications, serving as a benchmark reference for subsequent proteomic analyses. Through untargeted quantitative proteomics, we discovered dysregulation of retinal GLUT1-mediated insulin sensitivity, providing valuable insights into the molecular mechanisms involved in myopia development. This led to the novel intravitreal delivery of the PPAR gamma agonist rosiglitazone, an off-label use of this anti-diabetic drug, to slow myopia progression. Most importantly, we investigated differential phosphorylation expression in early myopia and hyperopia development in the retina in response to

optical defocus. Research on myopia has largely focused on the overall abundance of ocular proteins and pathways, neglecting the crucial role of post-translational modifications (PTMs) such as phosphorylation in regulating eye growth. Our pioneering data, though preliminary, are exciting, revealing a previously unknown signaling cascade involving opsin phosphorylation and dephosphorylation that may be a critical initial step in regulating eye growth.

Building upon foundations laid by various animal models, including the murine model used in this study, researchers have made significant discoveries regarding refractive errors. Fundamental research has shown that disruptions in early visual experience can lead to abnormal refractive errors like myopia and hyperopia across different species. By manipulating spectacle lens power and modulating bi-directional eye growth—specifically axial elongation in myopia and shortening in hyperopia—these models exhibit characteristics that resemble naturally occurring human myopia. Myopia is a complex disorder influenced by both genetic and environmental factors. While direct translation of findings from animal models to humans can be challenging, these studies provide fundamental insights that complement observations in human populations and enhance our understanding of myopia pathogenesis. Animal studies offer controlled environments that allow researchers to isolate environmental factors and explore the roles of genetic variants. This approach helps identify influences on protein expression levels, investigate protein kinases, test novel pharmaceuticals, and elucidate mechanisms underlying myopia development in the retina. Additionally, animal models grant access to retinal tissue that is often too invasive to obtain from humans.

Overall, this thesis represents a comprehensive exploration of proteomics in myopia research. The optimization of various experimental techniques and the discovery of novel molecular pathways and therapeutic targets contribute to advancing our understanding of myopia and may pave the way for future therapeutic approaches.

9.2. Future perspectives

The future of myopia research is poised for remarkable progress, driven by advancements in mass spectrometry, bioinformatics, and sample preparation methods. These breakthroughs offer unprecedented opportunities to discover, validate, and rationalize novel solutions for managing myopia. In the post-genomic era, proteomics extends beyond the simple cataloging of an organism's proteins. It seeks to unveil the intricate functions of proteins within the integrated systems, considering factors such as cellular location, presence, duration, and interactions with other proteins. This dynamic perspective would enable a more comprehensive understanding of both health and disease²⁷⁴.

While the current study captured static snapshots of protein profiles affected by myopia and hyperopia treatments, the future holds tremendous potential for even more complete quantification of the entire proteome and the dynamic recording of cellular processes. Recent advancements in single-cell proteomics technology would allow for the differentiation of distinct cell populations within the neural retinas and decipher myopic signals down to each retinal layer²⁷⁵. This single-cell level paves the way for decoding the existing knowledge on myopia progression, including the signaling transduction between retinal layers, cell-cell communication, and even higher-order communication with the visual cortex in the brain. The involvement of numerous signaling pathways, receptors, and protein kinases in myopia demands a range of possibilities for drug discovery research in pharmacology. By exploring different drugs that have the potential to pinpoint common or unique signaling pathways that are essential in controlling myopia. The application of artificial intelligence in drug screening can be leveraged to explore known pathways, while drug delivery techniques can be tailored to address challenges such as extended release, solubility issues, and optimum dosage and delivery methods²⁷⁶. Artificial intelligence presents a promising alternative for hypothesis-free drug discovery, paralleling established systems biology methodologies such as proteomics. However, validating the efficacy of drugs and therapeutic outcomes requires the integration of genomics and

proteomics techniques. The animal models, methodologies, and insights on drug discovery and protein phosphorylation presented herein will deepen our understanding of the pathogenesis of myopia and offer valuable clues regarding refractive errors.

Appendices

Appendix 1. List of reviewed proteins in the fractionated retinal library of C57BL/6J mice.

| UniProt Accession | Entry Name | Gene Name | Protein names |
|-------------------|-------------|-----------|--|
| Q6ZQI3 | MLEC_MOUSE | Mlec | Malectin |
| Q6ZWU9 | RS27_MOUSE | Rps27 | 40S ribosomal protein S27 |
| Q9D1X0 | NOL3_MOUSE | Nol3 | Nucleolar protein 3 (Apoptosis repressor with CARD) |
| Q91VY9 | ZN622_MOUSE | Znf622 | Cytoplasmic 60S subunit biogenesis factor ZNF622 (Zinc finger protein 622) |
| Q9D009 | LIPT2_MOUSE | Lipt2 | Putative lipoyltransferase 2, mitochondrial, EC 2.3.1.181 (Lipoate-protein ligase B) (Lipoyl/octanoyl transferase) (Octanoyl-[acyl-carrier-protein]-protein N-octanoyltransferase) |
| P63030 | MPC1_MOUSE | Mpc1 | Mitochondrial pyruvate carrier 1 (Brain protein 44-like protein) |
| A2RSJ4 | UH1BL_MOUSE | Uhrf1bp11 | UHRF1-binding protein 1-like (Syntaxin-6 Habc-interacting protein of 164 kDa) |
| Q4V9Z5 | SE6L2_MOUSE | Sez6l2 | Seizure 6-like protein 2 (Brain-specific receptor-like protein A, BSRP-A) |
| P04344 | CRGB_MOUSE | Crygb | Gamma-crystallin B (Gamma-B-crystallin) (Gamma-crystallin 3) |
| Q6P5F9 | XPO1_MOUSE | Xpo1 | Exportin-1, Exp1 (Chromosome region maintenance 1 protein homolog) |
| Q3UU96 | MRCKA_MOUSE | Cdc42bpa | Serine/threonine-protein kinase MRCK alpha, EC 2.7.11.1 (CDC42-binding protein kinase alpha) |
| Q9ESX4 | ZCC17_MOUSE | Zcchc17 | Zinc finger CCHC domain-containing protein 17 (Nucleolar protein of 40 kDa, pNO40) (Putative S1 RNA-binding domain protein, PS1D protein) |
| Q64378 | FKBP5_MOUSE | Fkbp5 | Peptidyl-prolyl cis-trans isomerase FKBP5, PPIase FKBP5, EC 5.2.1.8 (51 kDa FK506-binding protein, 51 kDa FKBP, FKBP-51) (FK506-binding protein 5, FKBP-5) (Rotamase) |
| O08688 | CAN5_MOUSE | Capn5 | Calpain-5, EC 3.4.22.- (New calpain 3, nCL-3) |
| Q640N2 | AR13B_MOUSE | Arl13b | ADP-ribosylation factor-like protein 13B (ADP-ribosylation factor-like protein 2-like 1, ARL2-like protein 1) (Protein hennin) |
| Q8C2Q3 | RBM14_MOUSE | Rbm14 | RNA-binding protein 14 (RNA-binding motif protein 14) |
| Q3TX08 | TRM1_MOUSE | Trmt1 | tRNA (guanine(26)-N(2))-dimethyltransferase, EC 2.1.1.216 (tRNA 2,2-dimethylguanosine-26 methyltransferase) (tRNA(guanine-26,N(2)-N(2))methyltransferase) (tRNA(m(2,2)G26)dimethyltransferase) |

| | | | |
|--------|-------------|----------|---|
| Q60974 | NCOR1_MOUSE | Ncor1 | Nuclear receptor corepressor 1, N-CoR, N-CoR1 (Retinoid X receptor-interacting protein 13, RIP13) |
| Q6RHR9 | MAGI1_MOUSE | Magi1 | Membrane-associated guanylate kinase, WW and PDZ domain-containing protein 1 (BAI1-associated protein 1, BAP-1) (Membrane-associated guanylate kinase inverted 1, MAGI-1) |
| Q9EQP6 | ARRC_MOUSE | Arr3 | Arrestin-C (Cone arrestin, cArr) (Retinal cone arrestin-3) |
| Q9DAS9 | GBG12_MOUSE | Gng12 | Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-12 |
| P70434 | IRF7_MOUSE | Irf7 | Interferon regulatory factor 7, IRF-7 |
| Q9Z218 | DPP6_MOUSE | Dpp6 | Dipeptidyl aminopeptidase-like protein 6 (DPPX) (Dipeptidyl aminopeptidase-related protein) (Dipeptidyl peptidase 6) (Dipeptidyl peptidase IV-like protein) (Dipeptidyl peptidase VI, DPP VI) |
| Q8BG16 | S6A15_MOUSE | Slc6a15 | Sodium-dependent neutral amino acid transporter B(0)AT2 (Sodium- and chloride-dependent neurotransmitter transporter NTT73) (Solute carrier family 6 member 15) (Transporter v7-3) |
| Q9CQB5 | CISD2_MOUSE | Cisd2 | CDGSH iron-sulfur domain-containing protein 2 (MitoNEET-related 1 protein, Miner1) (Nervous system overexpressed protein 70) |
| Q91V92 | ACLY_MOUSE | Acly | ATP-citrate synthase, EC 2.3.3.8 (ATP-citrate (pro-S-)-lyase) (Citrate cleavage enzyme) |
| Q60649 | CLPB_MOUSE | Clpb | Caseinolytic peptidase B protein homolog, EC 3.6.1.- (Suppressor of potassium transport defect 3) |
| Q9CZ69 | CKLF6_MOUSE | Cmtm6 | CKLF-like MARVEL transmembrane domain-containing protein 6 (Chemokine-like factor superfamily member 6) |
| Q8VHS2 | CRUM1_MOUSE | Crb1 | Protein crumbs homolog 1 |
| Q9CRD0 | OCAD1_MOUSE | Ociad1 | OCIA domain-containing protein 1 |
| Q8K411 | PREP_MOUSE | Pitrm1 | Presequence protease, mitochondrial, EC 3.4.24.- (Pitrylsin metalloproteinase 1) |
| Q8R1Q8 | DC1L1_MOUSE | Dync1li1 | Cytoplasmic dynein 1 light intermediate chain 1 (Dynein light chain A, DLC-A) (Dynein light intermediate chain 1, cytosolic) |
| Q99MN9 | PCCB_MOUSE | Pccb | Propionyl-CoA carboxylase beta chain, mitochondrial, PCCase subunit beta, EC 6.4.1.3 (Propanoyl-CoA:carbon dioxide ligase subunit beta) |
| Q8BTI8 | SRRM2_MOUSE | Srrm2 | Serine/arginine repetitive matrix protein 2 |
| Q62383 | SPT6H_MOUSE | Supt6h | Transcription elongation factor SPT6 |
| Q8CGP0 | H2B3B_MOUSE | H2bu1 | Histone H2B type 3-B (H2B.U histone 1) |

| | | | |
|--------|-------------|---------|---|
| Q8VDQ8 | SIR2_MOUSE | Sirt2 | NAD-dependent protein deacetylase sirtuin-2, EC 2.3.1.286 (NAD-dependent protein defatty-acylase sirtuin-2, EC 2.3.1.-) (Regulatory protein SIR2 homolog 2) (SIR2-like protein 2, mSIR2L2) |
| Q7SIG6 | ASAP2_MOUSE | Asap2 | Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 2 (Development and differentiation-enhancing factor 2) (Paxillin-associated protein with ARF GAP activity 3, PAG3) (Pyk2 C-terminus-associated protein, PAP) |
| P70452 | STX4_MOUSE | Stx4 | Syntaxin-4 |
| Q80X90 | FLNB_MOUSE | Flnb | Filamin-B, FLN-B (ABP-280-like protein) (Actin-binding-like protein) (Beta-filamin) |
| Q61753 | SERA_MOUSE | Phgdh | D-3-phosphoglycerate dehydrogenase, 3-PGDH, EC 1.1.1.95 (A10) |
| Q91W86 | VPS11_MOUSE | Vps11 | Vacuolar protein sorting-associated protein 11 homolog |
| P01942 | HBA_MOUSE | Hba | Hemoglobin subunit alpha (Alpha-globin) (Hemoglobin alpha chain) [Cleaved into: Hemopressin] |
| Q9EQJ9 | MAGI3_MOUSE | Magi3 | Membrane-associated guanylate kinase, WW and PDZ domain-containing protein 3 (Membrane-associated guanylate kinase inverted 3, MAGI-3) |
| Q9CQI7 | RU2B_MOUSE | Snrpb2 | U2 small nuclear ribonucleoprotein B", U2 snRNP B" |
| Q8BPN8 | DMXL2_MOUSE | Dmxl2 | DmX-like protein 2 (Rabconnectin-3) |
| Q61414 | K1C15_MOUSE | Krt15 | Keratin, type I cytoskeletal 15 (Cytokeratin-15, CK-15) (Keratin-15, K15) |
| Q99P88 | NU155_MOUSE | Nup155 | Nuclear pore complex protein Nup155 (155 kDa nucleoporin) (Nucleoporin Nup155) |
| Q2TPA8 | HSDL2_MOUSE | Hsdl2 | Hydroxysteroid dehydrogenase-like protein 2, EC 1.-.- |
| Q6ZPZ3 | ZC3H4_MOUSE | Zc3h4 | Zinc finger CCCH domain-containing protein 4 |
| Q91W96 | APC4_MOUSE | Anapc4 | Anaphase-promoting complex subunit 4, APC4 (Cyclosome subunit 4) |
| Q8BG79 | C19L2_MOUSE | Cwf19l2 | CWF19-like protein 2 |
| Q99KK7 | DPP3_MOUSE | Dpp3 | Dipeptidyl peptidase 3, EC 3.4.14.4 (Dipeptidyl aminopeptidase III) (Dipeptidyl arylamidase III) (Dipeptidyl peptidase III, DPP III) (Enkephalinase B) |
| Q78WZ7 | RPA43_MOUSE | Polr1f | DNA-directed RNA polymerase I subunit RPA43 (DNA-directed RNA polymerase I subunit F) (Twist neighbor protein) |
| Q68ED2 | GRM7_MOUSE | Grm7 | Metabotropic glutamate receptor 7, mGluR7 |
| P37804 | TAGL_MOUSE | Tagln | Transgelin (Actin-associated protein p27) (Smooth muscle protein 22-alpha, SM22-alpha) |
| P98200 | AT8A2_MOUSE | Atp8a2 | Phospholipid-transporting ATPase IB, EC 7.6.2.1 (ATPase class I type 8A member 2) (P4-ATPase flippase complex alpha subunit ATP8A2) |

| | | | |
|--------|-------------|---------|--|
| Q69ZW3 | EHBP1_MOUSE | Ehbp1 | EH domain-binding protein 1 |
| Q8CBC4 | CNST_MOUSE | Cnst | Consortin |
| Q9JHU2 | PALMD_MOUSE | Palmd | Palmdelphin |
| Q9DCS9 | NDUBA_MOUSE | Ndufb10 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 10 (Complex I-PDSW, CI-PDSW) (NADH-ubiquinone oxidoreductase PDSW subunit) |
| P52431 | DPOD1_MOUSE | Pold1 | DNA polymerase delta catalytic subunit, EC 2.7.7.7 (3'-5' exodeoxyribonuclease, EC 3.1.11.-) |
| Q9CQN1 | TRAP1_MOUSE | Trap1 | Heat shock protein 75 kDa, mitochondrial, HSP 75 (TNFR-associated protein 1) (Tumor necrosis factor type 1 receptor-associated protein, TRAP-1) |
| Q7TPH6 | MYCB2_MOUSE | Mycbp2 | E3 ubiquitin-protein ligase MYCBP2, EC 2.3.2.33 (Myc-binding protein 2) (Pam/highwire/rpm-1 protein) (Protein Magellan) (Protein associated with Myc) |
| P80206 | OTX2_MOUSE | Otx2 | Homeobox protein OTX2 (Orthodenticle homolog 2) |
| Q91VH2 | SNX9_MOUSE | Snx9 | Sorting nexin-9 |
| Q91WG2 | RABE2_MOUSE | Rabep2 | Rab GTPase-binding effector protein 2 (Rabaptin-5beta) |
| Q6P069 | SORCN_MOUSE | Sri | Sorcin |
| Q9CVB6 | ARPC2_MOUSE | Arpc2 | Actin-related protein 2/3 complex subunit 2 (Arp2/3 complex 34 kDa subunit, p34-ARC) |
| Q8BH50 | CR025_MOUSE | | Uncharacterized protein C18orf25 homolog |
| O09131 | GSTO1_MOUSE | Gsto1 | Glutathione S-transferase omega-1, GSTO-1, EC 2.5.1.18 (Glutathione S-transferase omega 1-1, GSTO 1-1) (Glutathione-dependent dehydroascorbate reductase, EC 1.8.5.1) (Monomethylarsonic acid reductase, MMA(V) reductase, EC 1.20.4.2) (S-(Phenacyl)glutathione reductase, SPG-R) (p28) |
| Q9WU00 | NRF1_MOUSE | Nrf1 | Nuclear respiratory factor 1, NRF-1 (Alpha palindromic-binding protein, Alpha-pal) |
| Q91Y86 | MK08_MOUSE | Mapk8 | Mitogen-activated protein kinase 8, MAP kinase 8, MAPK 8, EC 2.7.11.24 (Stress-activated protein kinase JNK1) (c-Jun N-terminal kinase 1) |
| Q9QYG0 | NDRG2_MOUSE | Ndr2 | Protein NDRG2 (N-myc downstream-regulated gene 2 protein) (Protein Ndr2) |
| Q8CE90 | MP2K7_MOUSE | Map2k7 | Dual specificity mitogen-activated protein kinase kinase 7, MAP kinase kinase 7, MAPKK 7, EC 2.7.12.2 (JNK-activating kinase 2) (MAPK/ERK kinase 7, MEK 7) (c-Jun N-terminal kinase kinase 2, JNK kinase 2, JNKK 2) |
| P23818 | GRIA1_MOUSE | Gria1 | Glutamate receptor 1, GluR-1 (AMPA-selective glutamate receptor 1) (GluR-A) (GluR-K1) (Glutamate receptor ionotropic, AMPA 1, GluA1) |

| | | | |
|--------|-------------|---------|--|
| Q8BX70 | VP13C_MOUSE | Vps13c | Intermembrane lipid transfer protein VPS13C (Vacuolar protein sorting-associated protein 13C) |
| Q9JKC8 | AP3M1_MOUSE | Ap3m1 | AP-3 complex subunit mu-1 (AP-3 adaptor complex mu3A subunit) (Adaptor-related protein complex 3 subunit mu-1) (Mu-adaptin 3A) (Mu3A-adaptin) |
| Q8VHI5 | VITRN_MOUSE | Vit | Vitrin (Akhirin) |
| Q6PF93 | PK3C3_MOUSE | Pik3c3 | Phosphatidylinositol 3-kinase catalytic subunit type 3, PI3-kinase type 3, PI3K type 3, PtdIns-3-kinase type 3, EC 2.7.1.137 (Phosphoinositide-3-kinase class 3) |
| Q8K327 | CHAP1_MOUSE | Champ1 | Chromosome alignment-maintaining phosphoprotein 1 (Zinc finger protein 828) |
| P14206 | RSSA_MOUSE | Rpsa | 40S ribosomal protein SA (37 kDa laminin receptor precursor, 37LRP) (37 kDa oncofetal antigen) (37/67 kDa laminin receptor, LRP/LR) (67 kDa laminin receptor, 67LR) (Laminin receptor 1, LamR) (Laminin-binding protein precursor p40, LBP/p40) (OFA/iLRP) |
| Q99JT9 | MTND_MOUSE | Adi1 | Acireductone dioxygenase (Acireductone dioxygenase (Fe(2+)-requiring), ARD', Fe-ARD, EC 1.13.11.54) (Acireductone dioxygenase (Ni(2+)-requiring), ARD, Ni-ARD, EC 1.13.11.53) (Membrane-type 1 matrix metalloproteinase cytoplasmic tail-binding protein 1, MTCBP-1) |
| Q91YM4 | FAKD4_MOUSE | Tbrg4 | FAST kinase domain-containing protein 4 (Protein TBRG4) (Transforming growth factor beta regulator 4) |
| B1AWL2 | ZN462_MOUSE | Znf462 | Zinc finger protein 462 (Zinc finger PBX1-interacting protein, ZFPIP) |
| Q9D379 | HYEP_MOUSE | Ephx1 | Epoxide hydrolase 1, EC 3.3.2.9 (Epoxide hydratase) (Microsomal epoxide hydrolase, mEH) |
| Q80Y50 | CMTA2_MOUSE | Camta2 | Calmodulin-binding transcription activator 2 |
| Q9DBR1 | XRN2_MOUSE | Xrn2 | 5'-3' exoribonuclease 2, EC 3.1.13.- (Protein Dhm1) |
| Q0P678 | ZCH18_MOUSE | Zc3h18 | Zinc finger CCCH domain-containing protein 18 (Nuclear protein NHN1) |
| Q9Z1Q2 | ABHGA_MOUSE | Abhd16a | Phosphatidylserine lipase ABHD16A, EC 3.1.-.- (Alpha/beta hydrolase domain-containing protein 16A, Abhydrolase domain-containing protein 16A) (HLA-B-associated transcript 5, mBAT5) (Monoacylglycerol lipase ABHD16A, EC 3.1.1.23) |
| P43406 | ITAV_MOUSE | Itgav | Integrin alpha-V (Vitronectin receptor subunit alpha) (CD antigen CD51) [Cleaved into: Integrin alpha-V heavy chain; Integrin alpha-V light chain] |
| O70166 | STMN3_MOUSE | Stmn3 | Stathmin-3 (Hippocampus abundant transcript 3) (SCG10-like protein) (SCG10-related protein HiAT3) |
| A2ALU4 | SHRM2_MOUSE | Shroom2 | Protein Shroom2 (Protein Apxl) |

| | | | |
|--------|-------------|----------|---|
| Q9D1E8 | PLCE_MOUSE | Agpat5 | 1-acyl-sn-glycerol-3-phosphate acyltransferase epsilon, EC 2.3.1.51 (1-acylglycerol-3-phosphate O-acyltransferase 5, 1-AGP acyltransferase 5, 1-AGPAT 5) (Lysophosphatidic acid acyltransferase epsilon, LPAAT-epsilon) |
| P41216 | ACSL1_MOUSE | Acs11 | Long-chain-fatty-acid--CoA ligase 1, EC 6.2.1.3 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 1, LACS 1) (Phytanate--CoA ligase, EC 6.2.1.24) |
| Q60790 | RASA3_MOUSE | Rasa3 | Ras GTPase-activating protein 3 (GAP1(IP4BP)) (GapIII) (Ins P4-binding protein) |
| P58929 | GMEB2_MOUSE | Gmeb2 | Glucocorticoid modulatory element-binding protein 2, GMEB-2 |
| Q9CW79 | GOGA1_MOUSE | Golga1 | Golgin subfamily A member 1 (Golgin-97) |
| P27641 | XRCC5_MOUSE | Xrcc5 | X-ray repair cross-complementing protein 5, EC 3.6.4.- (ATP-dependent DNA helicase 2 subunit 2) (ATP-dependent DNA helicase II 80 kDa subunit) (CTC box-binding factor 85 kDa subunit, CTC85, CTCBF) (DNA repair protein XRCC5) (Ku autoantigen protein p86 homolog) (Ku80) (Nuclear factor IV) |
| Q8CC12 | CDAN1_MOUSE | Cdan1 | Codanin-1 |
| P35822 | PTPRK_MOUSE | Ptprk | Receptor-type tyrosine-protein phosphatase kappa, Protein-tyrosine phosphatase kappa, R-PTP-kappa, EC 3.1.3.48 |
| Q8BH16 | FBXL2_MOUSE | Fbx12 | F-box/LRR-repeat protein 2 (F-box and leucine-rich repeat protein 2) |
| Q99MD9 | NASP_MOUSE | Nasp | Nuclear autoantigenic sperm protein, NASP |
| Q80X85 | RT07_MOUSE | Mrps7 | 28S ribosomal protein S7, mitochondrial, MRP-S7, S7mt |
| Q80U63 | MFN2_MOUSE | Mfn2 | Mitofusin-2, EC 3.6.5.- (Hypertension-related protein 1) (Mitochondrial assembly regulatory factor, HSG protein) (Transmembrane GTPase MFN2) |
| Q3U3Q1 | ULK3_MOUSE | Ulk3 | Serine/threonine-protein kinase ULK3, EC 2.7.11.1 (Unc-51-like kinase 3) |
| P57080 | UBP25_MOUSE | Usp25 | Ubiquitin carboxyl-terminal hydrolase 25, EC 3.4.19.12 (Deubiquitinating enzyme 25) (Ubiquitin thioesterase 25) (Ubiquitin-specific-processing protease 25, mUSP25) |
| Q9EPU0 | RENT1_MOUSE | Upf1 | Regulator of nonsense transcripts 1, EC 3.6.4.12, EC 3.6.4.13 (ATP-dependent helicase RENT1) (Nonsense mRNA reducing factor 1, NORF1) (Up-frameshift suppressor 1 homolog, mUpf1) |
| Q9ERL9 | GCYA1_MOUSE | Gucyl1a1 | Guanylate cyclase soluble subunit alpha-1, GCS-alpha-1, EC 4.6.1.2 (Guanylate cyclase soluble subunit alpha-3, GCS-alpha-3) (Soluble guanylate cyclase large subunit) |
| P46097 | SYT2_MOUSE | Syt2 | Synaptotagmin-2 (Inositol polyphosphate-binding protein, IP4-binding protein, IP4BP) (Synaptotagmin II, SytII) |

| | | | |
|--------|-------------|----------|--|
| Q8BVA2 | TM222_MOUSE | Tmem222 | Transmembrane protein 222 |
| Q6NSR8 | PEPL1_MOUSE | Npepl1 | Probable aminopeptidase NPEPL1, EC 3.4.11.- (Aminopeptidase-like 1) |
| Q8CHW4 | EI2BE_MOUSE | Eif2b5 | Translation initiation factor eIF-2B subunit epsilon (eIF-2B GDP-GTP exchange factor subunit epsilon) |
| O35130 | NEP1_MOUSE | Emg1 | Ribosomal RNA small subunit methyltransferase NEP1, EC 2.1.1.- (18S rRNA (pseudouridine(1248)-N1)-methyltransferase) (18S rRNA Psi1248 methyltransferase) (Nucleolar protein EMG1 homolog) (Protein C2f) (Ribosome biogenesis protein NEP1) |
| E9PVA8 | GCN1_MOUSE | Gcn1 | eIF-2-alpha kinase activator GCN1 (GCN1 eIF-2-alpha kinase activator homolog) (GCN1-like protein 1) (General control of amino-acid synthesis 1-like protein 1) (Translational activator GCN1) |
| Q9D6M3 | GHC1_MOUSE | Slc25a22 | Mitochondrial glutamate carrier 1, GC-1 (Glutamate/H(+) symporter 1) (Solute carrier family 25 member 22) |
| P48758 | CBR1_MOUSE | Cbr1 | Carbonyl reductase [NADPH] 1, EC 1.1.1.184 (15-hydroxyprostaglandin dehydrogenase [NADP(+)], EC 1.1.1.196, EC 1.1.1.197) (20-beta-hydroxysteroid dehydrogenase) (Alcohol dehydrogenase [NAD(P)+] CBR1, EC 1.1.1.71) (NADPH-dependent carbonyl reductase 1) (Prostaglandin 9-ketoreductase, PG-9-KR) (Prostaglandin-E(2) 9-reductase, EC 1.1.1.189) |
| Q9JKS5 | HABP4_MOUSE | Habp4 | Intracellular hyaluronan-binding protein 4, IHABP-4, IHABP4 (Hyaluronic acid-binding protein 4) |
| Q8CHH9 | SEPT8_MOUSE | Septin8 | Septin-8 |
| Q9D479 | UVSSA_MOUSE | Uvssa | UV-stimulated scaffold protein A |
| P53810 | PIPNA_MOUSE | Pitpna | Phosphatidylinositol transfer protein alpha isoform, PI-TP-alpha, PtdIns transfer protein alpha, PtdInsTP alpha |
| P21981 | TGM2_MOUSE | Tgm2 | Protein-glutamine gamma-glutamyltransferase 2, EC 2.3.2.13 (Isopeptidase TGM2, EC 3.4.-.-) (Protein-glutamine deamidase TGM2, EC 3.5.1.44) (Protein-glutamine dopaminyltransferase TGM2, EC 2.3.1.-) (Protein-glutamine histaminyltransferase TGM2, EC 2.3.1.-) (Protein-glutamine noradrenalinyltransferase TGM2, EC 2.3.1.-) (Protein-glutamine serotonyltransferase TGM2, EC 2.3.1.-) (Tissue transglutaminase, tTG) (Transglutaminase II, TGase II) (Transglutaminase-2, TG2, TGase-2, TGase2) |
| P62305 | RUXE_MOUSE | Snrpe | Small nuclear ribonucleoprotein E, snRNP-E (Sm protein E, Sm-E, SmE) |
| Q9DBS5 | KLC4_MOUSE | Klc4 | Kinesin light chain 4, KLC 4 (Kinesin-like protein 8) |

| | | | |
|--------|-------------|---------|---|
| Q91ZA3 | PCCA_MOUSE | Pcca | Propionyl-CoA carboxylase alpha chain, mitochondrial, PCCase subunit alpha, EC 6.4.1.3 (Propanoyl-CoA:carbon dioxide ligase subunit alpha) |
| P24549 | AL1A1_MOUSE | Aldh1a1 | Aldehyde dehydrogenase 1A1, EC 1.2.1.19, EC 1.2.1.28, EC 1.2.1.3, EC 1.2.1.36 (3-deoxyglucosone dehydrogenase) (ALDH-E1) (ALHDII) (Aldehyde dehydrogenase family 1 member A1) (Aldehyde dehydrogenase, cytosolic) (Retinal dehydrogenase 1, RALDH 1, RalDH1) |
| Q8BGZ4 | CDC23_MOUSE | Cdc23 | Cell division cycle protein 23 homolog (Anaphase-promoting complex subunit 8, APC8) (Cyclosome subunit 8) |
| Q91XD6 | VPS36_MOUSE | Vps36 | Vacuolar protein-sorting-associated protein 36 (ESCRT-II complex subunit VPS36) |
| Q8C754 | VPS52_MOUSE | Vps52 | Vacuolar protein sorting-associated protein 52 homolog |
| Q91WM1 | STRBP_MOUSE | Strbp | Spermatid perinuclear RNA-binding protein |
| P23881 | TCEA3_MOUSE | Tcea3 | Transcription elongation factor A protein 3 (Transcription elongation factor S-II protein 3) (Transcription elongation factor TFIIS.h) |
| Q8BYI6 | PCAT2_MOUSE | Lpcat2 | Lysophosphatidylcholine acyltransferase 2, LPC acyltransferase 2, LPCAT-2, LysoPC acyltransferase 2, EC 2.3.1.23 (1-acylglycerol-3-phosphate O-acyltransferase 11, 1-AGP acyltransferase 11, 1-AGPAT 11, EC 2.3.1.51) (1-acylglycerophosphocholine O-acyltransferase) (1-alkenylglycerophosphocholine O-acyltransferase, EC 2.3.1.25) (1-alkylglycerophosphocholine O-acetyltransferase, EC 2.3.1.67) (Acetyl-CoA:lyso-platelet-activating factor acetyltransferase, Acetyl-CoA:lyso-PAF acetyltransferase, Lyso-PAF acetyltransferase, LysoPAFAT) (Acyltransferase-like 1) |
| Q14CH7 | SYAM_MOUSE | Aars2 | Alanine--tRNA ligase, mitochondrial, EC 6.1.1.7 (Alanyl-tRNA synthetase, AlaRS) |
| P98195 | ATP9B_MOUSE | Atp9b | Probable phospholipid-transporting ATPase IIB, EC 7.6.2.1 (ATPase class II type 9B) |
| P97393 | RHG05_MOUSE | Arhgap5 | Rho GTPase-activating protein 5 (Rho-type GTPase-activating protein 5) (p190-B) |
| Q9R0Q6 | ARC1A_MOUSE | Arpc1a | Actin-related protein 2/3 complex subunit 1A (SOP2-like protein) (Sid 329) |
| P98197 | AT11A_MOUSE | Atp11a | Phospholipid-transporting ATPase IH, EC 7.6.2.1 (ATPase IS) (ATPase class VI type 11A) (P4-ATPase flippase complex alpha subunit ATP11A) |
| Q8CI78 | RMND1_MOUSE | Rmnd1 | Required for meiotic nuclear division protein 1 homolog |
| Q9QUM9 | PSA6_MOUSE | PsmA6 | Proteasome subunit alpha type-6 (Macropain iota chain) (Multicatalytic endopeptidase complex iota chain) (Proteasome iota chain) |
| P70303 | PYRG2_MOUSE | Ctps2 | CTP synthase 2, EC 6.3.4.2 (CTP synthetase 2, CTPsH) (UTP--ammonia ligase 2) |
| O70496 | CLCN7_MOUSE | Clcn7 | H(+)/Cl(-) exchange transporter 7 (Chloride channel 7 alpha subunit) (Chloride channel protein 7, ClC-7) |

| | | | |
|--------|-------------|---------|---|
| Q9JKY5 | HIP1R_MOUSE | Hip1r | Huntingtin-interacting protein 1-related protein, HIP1-related protein |
| Q6P5D4 | CP135_MOUSE | Cep135 | Centrosomal protein of 135 kDa, Cep135 (Centrosomal protein 4) |
| Q9Z130 | HNRDL_MOUSE | Hnrnpdl | Heterogeneous nuclear ribonucleoprotein D-like, hnRNP D-like, hnRNP DL (JKT41-binding protein) |
| Q9CQA3 | SDHB_MOUSE | Sdhb | Succinate dehydrogenase [ubiquinone] iron-sulfur subunit, mitochondrial, EC 1.3.5.1 (Iron-sulfur subunit of complex II, Ip) |
| Q80W14 | PR40B_MOUSE | Prpf40b | Pre-mRNA-processing factor 40 homolog B (Huntingtin yeast partner C) (Huntingtin-interacting protein C) |
| P35980 | RL18_MOUSE | Rpl18 | 60S ribosomal protein L18 |
| Q3TQM9 | ALG11_MOUSE | Alg11 | GDP-Man:Man(3)GlcNAc(2)-PP-Dol alpha-1,2-mannosyltransferase, EC 2.4.1.131 (Asparagine-linked glycosylation protein 11 homolog) (Glycolipid 2-alpha-mannosyltransferase) |
| Q9CXR1 | DHRS7_MOUSE | Dhrs7 | Dehydrogenase/reductase SDR family member 7, EC 1.1.1.- (Retinal short-chain dehydrogenase/reductase 4, retSDR4) (Short chain dehydrogenase/reductase family 34C member 1, Protein SDR34C1) |
| Q9CWF6 | BBS2_MOUSE | Bbs2 | Bardet-Biedl syndrome 2 protein homolog |
| P10637 | TAU_MOUSE | Mapt | Microtubule-associated protein tau (Neurofibrillary tangle protein) (Paired helical filament-tau, PHF-tau) |
| E9Q6P5 | TTC7B_MOUSE | Ttc7b | Tetratricopeptide repeat protein 7B, TPR repeat protein 7B |
| P21271 | MYO5B_MOUSE | Myo5b | Unconventional myosin-Vb |
| Q60629 | EPHA5_MOUSE | Epha5 | Ephrin type-A receptor 5, EC 2.7.10.1 (Brain-specific kinase) (CEK-7) (EPH homology kinase 1, EHK-1) |
| Q8R550 | SH3K1_MOUSE | Sh3kbp1 | SH3 domain-containing kinase-binding protein 1 (Regulator of ubiquitous kinase, Ruk) (SH3-containing, expressed in tumorigenic astrocytes) |
| Q6PFD9 | NUP98_MOUSE | Nup98 | Nuclear pore complex protein Nup98-Nup96, EC 3.4.21.- [Cleaved into: Nuclear pore complex protein Nup98 (98 kDa nucleoporin) (Nucleoporin Nup98, Nup98); Nuclear pore complex protein Nup96 (96 kDa nucleoporin) (Nucleoporin Nup96, Nup96)] |
| Q8C050 | KS6A5_MOUSE | Rps6ka5 | Ribosomal protein S6 kinase alpha-5, S6K-alpha-5, EC 2.7.11.1 (90 kDa ribosomal protein S6 kinase 5) (Nuclear mitogen- and stress-activated protein kinase 1) (RSK-like protein kinase, RLSK) |

| | | | |
|--------|-------------|---------|---|
| Q8K1A6 | C2D1A_MOUSE | Cc2d1a | Coiled-coil and C2 domain-containing protein 1A (Five prime repressor element under dual repression-binding protein 1, FRE under dual repression-binding protein 1, Freud-1) |
| Q6PE01 | SNR40_MOUSE | Snrnp40 | U5 small nuclear ribonucleoprotein 40 kDa protein, U5 snRNP 40 kDa protein (WD repeat-containing protein 57) |
| O35083 | PLCA_MOUSE | Agpat1 | 1-acyl-sn-glycerol-3-phosphate acyltransferase alpha, EC 2.3.1.51 (1-acylglycerol-3-phosphate O-acyltransferase 1, 1-AGP acyltransferase 1, 1-AGPAT 1) (Lysophosphatidic acid acyltransferase alpha, LPAAT-alpha) |
| Q921I1 | TRFE_MOUSE | Tf | Serotransferrin, Transferrin (Beta-1 metal-binding globulin) (Siderophilin) |
| Q9DBG7 | SRPRA_MOUSE | Srpra | Signal recognition particle receptor subunit alpha, SR-alpha (Docking protein alpha, DP-alpha) |
| Q5U3K5 | RABL6_MOUSE | Rabl6 | Rab-like protein 6 (GTP-binding protein Parf) (Rab-like protein 1, RBEL1) |
| Q9CZ42 | NNRD_MOUSE | Naxd | ATP-dependent (S)-NAD(P)H-hydrate dehydratase, EC 4.2.1.93 (ATP-dependent NAD(P)HX dehydratase) (Carbohydrate kinase domain-containing protein) (NAD(P)HX dehydratase) |
| Q99PU8 | DHX30_MOUSE | Dhx30 | ATP-dependent RNA helicase DHX30, EC 3.6.4.13 (DEAH box protein 30) |
| Q80WV3 | CHST2_MOUSE | Chst2 | Carbohydrate sulfotransferase 2, EC 2.8.2.- (Galactose/N-acetylglucosamine/N-acetylglucosamine 6-O-sulfotransferase 2, GST-2) (N-acetylglucosamine 6-O-sulfotransferase 1, GlcNAc6ST-1, Gn6st-1) |
| Q8C0C7 | SYFA_MOUSE | Farsa | Phenylalanine--tRNA ligase alpha subunit, EC 6.1.1.20 (Phenylalanyl-tRNA synthetase alpha subunit, PheRS) |
| Q9DB27 | MCTS1_MOUSE | Mcts1 | Malignant T-cell-amplified sequence 1, MCT-1 (Multiple copies T-cell malignancies 1) |
| P29758 | OAT_MOUSE | Oat | Ornithine aminotransferase, mitochondrial, EC 2.6.1.13 (Ornithine--oxo-acid aminotransferase) |
| Q9CQ19 | MYL9_MOUSE | Myl9 | Myosin regulatory light polypeptide 9 (Myosin regulatory light chain 2, smooth muscle isoform) (Myosin regulatory light chain 9) |
| Q8VE62 | PAIP1_MOUSE | Paip1 | Polyadenylate-binding protein-interacting protein 1, PABP-interacting protein 1, PAIP-1, Poly(A)-binding protein-interacting protein 1 |
| Q922Q8 | LRC59_MOUSE | Lrrc59 | Leucine-rich repeat-containing protein 59 [Cleaved into: Leucine-rich repeat-containing protein 59, N-terminally processed] |
| Q8QZV7 | INT13_MOUSE | IntS13 | Integrator complex subunit 13 (Cell cycle regulator Mat89Bb homolog) (Protein asunder homolog) (Spermatogenesis-associated protein 30) |

| | | | |
|--------|-------------|---------|---|
| Q9WVA4 | TAGL2_MOUSE | Tagln2 | Transgelin-2 (SM22-beta) |
| Q99PJ0 | NTRI_MOUSE | Ntm | Neurotrimin |
| Q3UQA7 | SELH_MOUSE | Selenoh | Selenoprotein H, SelH |
| Q921F4 | HNRLL_MOUSE | Hnrnpll | Heterogeneous nuclear ribonucleoprotein L-like |
| Q9QYF1 | RDH11_MOUSE | Rdh11 | Retinol dehydrogenase 11, EC 1.1.1.300 (Androgen-regulated short-chain dehydrogenase/reductase 1) (Cell line MC/9.IL4-derived protein 1) (M42C60) (Prostate short-chain dehydrogenase/reductase 1) (Retinal reductase 1, RalR1) (Short-chain aldehyde dehydrogenase, SCALD) |
| Q8VC03 | EMAL3_MOUSE | Eml3 | Echinoderm microtubule-associated protein-like 3, EMAP-3 |
| Q8CB62 | CNTRB_MOUSE | Cntrob | Centrobilin (Centrosomal BRCA2-interacting protein) (LYST-interacting protein 8) |
| Q5SS00 | ZDBF2_MOUSE | Zdbf2 | DBF4-type zinc finger-containing protein 2 homolog |
| Q8K099 | LRIT1_MOUSE | Lrit1 | Leucine-rich repeat, immunoglobulin-like domain and transmembrane domain-containing protein 1 (Leucine-rich repeat-containing protein 21) (Photoreceptor-associated LRR superfamily protein) (Retina-specific protein PAL) |
| Q9CWE0 | MFR1L_MOUSE | Mtfr1l | Mitochondrial fission regulator 1-like |
| P47941 | CRKL_MOUSE | Crkl | Crk-like protein |
| Q9D883 | U2AF1_MOUSE | U2af1 | Splicing factor U2AF 35 kDa subunit (U2 auxiliary factor 35 kDa subunit) (U2 snRNP auxiliary factor small subunit) |
| Q52KI8 | SRRM1_MOUSE | Srrm1 | Serine/arginine repetitive matrix protein 1 (Plenty-of-prolines 101) |
| Q9D710 | TMX2_MOUSE | Tmx2 | Thioredoxin-related transmembrane protein 2 (Thioredoxin domain-containing protein 14) |
| Q8BHS3 | RBM22_MOUSE | Rbm22 | Pre-mRNA-splicing factor RBM22 (RNA-binding motif protein 22) |
| P70302 | STIM1_MOUSE | Stim1 | Stromal interaction molecule 1 |
| Q8JZR4 | EAA5_MOUSE | Slc1a7 | Excitatory amino acid transporter 5 (Solute carrier family 1 member 7) |
| Q03173 | ENAH_MOUSE | Enah | Protein enabled homolog (NPC-derived proline-rich protein 1, NDPP-1) |
| Q8VDP2 | STEEP_MOUSE | Steep1 | STING ER exit protein, STEEP |
| O09061 | PSB1_MOUSE | Psmb1 | Proteasome subunit beta type-1 (Macropain subunit C5) (Multicatalytic endopeptidase complex subunit C5) (Proteasome component C5) (Proteasome gamma chain) |
| Q60676 | PPP5_MOUSE | Ppp5c | Serine/threonine-protein phosphatase 5, PP5, EC 3.1.3.16 (Protein phosphatase T, PPT) |
| P62082 | RS7_MOUSE | Rps7 | 40S ribosomal protein S7 |

| | | | |
|--------|-------------|---------|---|
| P13595 | NCAM1_MOUSE | Ncam1 | Neural cell adhesion molecule 1, N-CAM-1, NCAM-1 (CD antigen CD56) |
| P30999 | CTND1_MOUSE | Ctnnd1 | Catenin delta-1 (Cadherin-associated Src substrate, CAS) (p120 catenin, p120(ctn)) (p120(cas)) |
| Q8CFI7 | RPB2_MOUSE | Polr2b | DNA-directed RNA polymerase II subunit RPB2, EC 2.7.7.6 (DNA-directed RNA polymerase II 140 kDa polypeptide) (DNA-directed RNA polymerase II subunit B) (RNA polymerase II subunit 2) (RNA polymerase II subunit B2) |
| Q99J77 | SIAS_MOUSE | Nans | Sialic acid synthase (N-acetylneuraminic acid-9-phosphate synthase, EC 2.5.1.57) (N-acetylneuraminic acid phosphate synthase) |
| Q9DBT5 | AMPD2_MOUSE | Ampd2 | AMP deaminase 2, EC 3.5.4.6 (AMP deaminase isoform L) |
| Q8VEH3 | ARL8A_MOUSE | Arl8a | ADP-ribosylation factor-like protein 8A (ADP-ribosylation factor-like protein 10B) (Novel small G protein indispensable for equal chromosome segregation 2) |
| Q60520 | SIN3A_MOUSE | Sin3a | Paired amphipathic helix protein Sin3a (Histone deacetylase complex subunit Sin3a) (Transcriptional corepressor Sin3a) |
| Q8BMQ2 | TF3C4_MOUSE | Gtf3c4 | General transcription factor 3C polypeptide 4, EC 2.3.1.48 (TF3C-delta) (Transcription factor IIIC 90 kDa subunit, TFIIC 90 kDa subunit, TFIIC90) (Transcription factor IIIC subunit delta) |
| F8VPQ2 | ARI4A_MOUSE | Arid4a | AT-rich interactive domain-containing protein 4A, ARID domain-containing protein 4A (Retinoblastoma-binding protein 1) |
| Q9QUQ5 | TRPC4_MOUSE | Trpc4 | Short transient receptor potential channel 4, TrpC4 (Capacitative calcium entry channel Trp4) (Receptor-activated cation channel TRP4) |
| Q8BKI2 | TNR6B_MOUSE | Tnrc6b | Trinucleotide repeat-containing gene 6B protein |
| Q3TVA9 | CC136_MOUSE | Ccdc136 | Coiled-coil domain-containing protein 136 |
| Q8BHD8 | PCMD2_MOUSE | Pcmdt2 | Protein-L-isoaspartate O-methyltransferase domain-containing protein 2 |
| P53564 | CUX1_MOUSE | Cux1 | Homeobox protein cut-like 1 (CCAAT displacement protein, CDP) (Homeobox protein cux-1) [Cleaved into: CDP/Cux p110] |
| Q9QWL7 | K1C17_MOUSE | Krt17 | Keratin, type I cytoskeletal 17 (Cytokeratin-17, CK-17) (Keratin-17, K17) |
| P28474 | ADHX_MOUSE | Adh5 | Alcohol dehydrogenase class-3, EC 1.1.1.1 (Alcohol dehydrogenase 2) (Alcohol dehydrogenase 5) (Alcohol dehydrogenase B2, ADH-B2) (Alcohol dehydrogenase class-III) (Glutathione-dependent formaldehyde dehydrogenase, FALDH, FDH, GSH-FDH, EC 1.1.1.-) (S-(hydroxymethyl)glutathione dehydrogenase, EC 1.1.1.284) |
| Q8JZN5 | ACAD9_MOUSE | Acad9 | Complex I assembly factor ACAD9, mitochondrial (Acyl-CoA dehydrogenase family member 9, ACAD-9, EC 1.3.8.-) |

| | | | |
|--------|-------------|----------|---|
| Q8CC21 | TTC19_MOUSE | Ttc19 | Tetratricopeptide repeat protein 19, mitochondrial, TPR repeat protein 19 |
| A2AQ19 | RTF1_MOUSE | Rtf1 | RNA polymerase-associated protein RTF1 homolog |
| P35283 | RAB12_MOUSE | Rab12 | Ras-related protein Rab-12 (Rab-13) |
| Q9Z1D1 | EIF3G_MOUSE | Eif3g | Eukaryotic translation initiation factor 3 subunit G, eIF3g (Eukaryotic translation initiation factor 3 RNA-binding subunit, eIF-3 RNA-binding subunit) (Eukaryotic translation initiation factor 3 subunit 4) (eIF-3-delta) (eIF3 p42) (eIF3 p44) |
| Q80T69 | RSBN1_MOUSE | Rsb1 | Lysine-specific demethylase 9, KDM9, EC 1.14.11.- (Round spermatid basic protein 1, Rosbin) |
| Q920E5 | FPPS_MOUSE | Fdps | Farnesyl pyrophosphate synthase, FPP synthase, FPS, EC 2.5.1.10 ((2E,6E)-farnesyl diphosphate synthase) (Cholesterol-regulated 39 kDa protein, CR 39) (Dimethylallyltranstransferase, EC 2.5.1.1) (Farnesyl diphosphate synthase) (Geranyltranstransferase) |
| Q8CHT6 | F169B_MOUSE | Fam169b | Protein FAM169B |
| Q9DB77 | QCR2_MOUSE | Uqcr2 | Cytochrome b-c1 complex subunit 2, mitochondrial (Complex III subunit 2) (Core protein II) (Ubiquinol-cytochrome-c reductase complex core protein 2) |
| Q8C129 | LCAP_MOUSE | Lnpep | Leucyl-cystinyl aminopeptidase, Cystinyl aminopeptidase, EC 3.4.11.3 (Oxytocinase, OTase) |
| Q8CCP0 | NEMF_MOUSE | Nemf | Ribosome quality control complex subunit NEMF (Nuclear export mediator factor) (Serologically defined colon cancer antigen 1 homolog) |
| Q8BWG8 | ARRB1_MOUSE | Arrb1 | Beta-arrestin-1 (Arrestin beta-1) |
| Q99JW2 | ACY1_MOUSE | Acy1 | Aminoacylase-1, ACY-1, EC 3.5.1.14 (N-acyl-L-amino-acid amidohydrolase) |
| Q60739 | BAG1_MOUSE | Bag1 | BAG family molecular chaperone regulator 1, BAG-1 (Bcl-2-associated athanogene 1) |
| Q8K0C4 | CP51A_MOUSE | Cyp51a1 | Lanosterol 14-alpha demethylase, LDM, EC 1.14.14.154 (CYPLI) (Cytochrome P450 51A1) (Cytochrome P450-14DM, Cytochrome P45014DM) (Cytochrome P450LI) (Sterol 14-alpha demethylase) |
| Q922G0 | S2536_MOUSE | Slc25a36 | Solute carrier family 25 member 36 |
| P41778 | PBX1_MOUSE | Pbx1 | Pre-B-cell leukemia transcription factor 1 (Homeobox protein PBX1) |
| Q8BND3 | WDR35_MOUSE | Wdr35 | WD repeat-containing protein 35 |
| Q810A7 | DDX42_MOUSE | Ddx42 | ATP-dependent RNA helicase DDX42, EC 3.6.4.13 (DEAD box protein 42) |

| | | | |
|--------|-------------|---------|--|
| Q8VHK9 | DHX36_MOUSE | Dhx36 | ATP-dependent DNA/RNA helicase DHX36, EC 3.6.4.13 (DEAD/H box polypeptide 36) (DEAH box protein 36) (MLE-like protein 1) (RNA helicase associated with AU-rich element ARE) |
| Q63943 | MEF2D_MOUSE | Mef2d | Myocyte-specific enhancer factor 2D |
| Q3TGF2 | F107B_MOUSE | Fam107b | Protein FAM107B |
| P22892 | AP1G1_MOUSE | Ap1g1 | AP-1 complex subunit gamma-1 (Adaptor protein complex AP-1 subunit gamma-1) (Adaptor-related protein complex 1 subunit gamma-1) (Clathrin assembly protein complex 1 gamma-1 large chain) (Gamma-adaptin) (Gamma1-adaptin) (Golgi adaptor HA1/AP1 adaptin subunit gamma-1) |
| Q9DCD2 | SYF1_MOUSE | Xab2 | Pre-mRNA-splicing factor SYF1 (XPA-binding protein 2) |
| Q9D8W5 | PSD12_MOUSE | Psm12 | 26S proteasome non-ATPase regulatory subunit 12 (26S proteasome regulatory subunit RPN5) (26S proteasome regulatory subunit p55) |
| Q8BU14 | SEC62_MOUSE | Sec62 | Translocation protein SEC62 (Translocation protein 1, TP-1) |
| Q9CYN9 | REN1_MOUSE | Atp6ap2 | Renin receptor (ATPase H(+)-transporting lysosomal accessory protein 2) (ATPase H(+)-transporting lysosomal-interacting protein 2) (Renin/prorenin receptor) [Cleaved into: Renin receptor extracellular fragment; Renin receptor cytoplasmic fragment] |
| P84091 | AP2M1_MOUSE | Ap2m1 | AP-2 complex subunit mu (AP-2 mu chain) (Adaptor protein complex AP-2 subunit mu) (Adaptor-related protein complex 2 subunit mu) (Clathrin assembly protein complex 2 mu medium chain) (Clathrin coat assembly protein AP50) (Clathrin coat-associated protein AP50) (Mu2-adaptin) (Plasma membrane adaptor AP-2 50 kDa protein) |
| Q9CPW7 | ZMAT2_MOUSE | Zmat2 | Zinc finger matrin-type protein 2 |
| Q9CWJ9 | PUR9_MOUSE | Atic | Bifunctional purine biosynthesis protein ATIC (AICAR transformylase/inosine monophosphate cyclohydrolase, ATIC) [Includes: Phosphoribosylaminoimidazolecarboxamide formyltransferase, EC 2.1.2.3 (5-aminoimidazole-4-carboxamide ribonucleotide formyltransferase, AICAR formyltransferase) (AICAR transformylase); IMP cyclohydrolase, EC 3.5.4.10 (IMP synthase) (Inosinicase)] |
| Q925T6 | GRIP1_MOUSE | Grip1 | Glutamate receptor-interacting protein 1, GRIP-1 |
| Q3UJD6 | UBP19_MOUSE | Usp19 | Ubiquitin carboxyl-terminal hydrolase 19, EC 3.4.19.12 (Deubiquitinating enzyme 19) (Ubiquitin thioesterase 19) (Ubiquitin-specific-processing protease 19) |

| | | | |
|--------|-------------|----------|--|
| Q60710 | SAMH1_MOUSE | Samhd1 | Deoxynucleoside triphosphate triphosphohydrolase SAMHD1, dNTPase, EC 3.1.5.- (Interferon-gamma-inducible protein Mg11) (SAM domain and HD domain-containing protein 1, mSAMHD1) |
| P68040 | RACK1_MOUSE | Rack1 | Receptor of activated protein C kinase 1 (12-3) (Guanine nucleotide-binding protein subunit beta-2-like 1) (Receptor for activated C kinase) (Receptor of activated protein kinase C 1) (p205) [Cleaved into: Receptor of activated protein C kinase 1, N-terminally processed (Guanine nucleotide-binding protein subunit beta-2-like 1, N-terminally processed)] |
| Q3UYC0 | PPM1H_MOUSE | Ppm1h | Protein phosphatase 1H, EC 3.1.3.16 |
| Q9DBR7 | MYPT1_MOUSE | Ppp1r12a | Protein phosphatase 1 regulatory subunit 12A (Myosin phosphatase-targeting subunit 1, Myosin phosphatase target subunit 1) |
| Q9CQU0 | TXD12_MOUSE | Txndc12 | Thioredoxin domain-containing protein 12, EC 1.8.4.2 (Endoplasmic reticulum resident protein 19, ER protein 19, ERp19) (Thioredoxin-like protein p19) |
| Q148V7 | RELCH_MOUSE | Relch | RAB11-binding protein RELCH (LisH domain and HEAT repeat-containing protein KIAA1468) (RAB11-binding protein containing LisH, coiled-coil, and HEAT repeats) |
| Q91W53 | GOGA7_MOUSE | Golga7 | Golgin subfamily A member 7 |
| Q6PDI5 | ECM29_MOUSE | Ecpas | Proteasome adapter and scaffold protein ECM29 (Proteasome-associated protein ECM29 homolog) |
| Q9CXI5 | MANF_MOUSE | Manf | Mesencephalic astrocyte-derived neurotrophic factor (Arginine-rich protein) (Protein ARMET) |
| Q6PD26 | PIGS_MOUSE | Pigs | GPI transamidase component PIG-S (Phosphatidylinositol-glycan biosynthesis class S protein) |
| P97447 | FHL1_MOUSE | Fhl1 | Four and a half LIM domains protein 1, FHL-1 (KyoT) (RBP-associated molecule 14-1, RAM14-1) (Skeletal muscle LIM-protein 1, SLIM, SLIM-1) |
| P53395 | ODB2_MOUSE | Dbt | Lipoamide acyltransferase component of branched-chain alpha-keto acid dehydrogenase complex, mitochondrial, EC 2.3.1.168 (Branched-chain alpha-keto acid dehydrogenase complex component E2, BCKAD-E2, BCKADE2) (Dihydrolipoamide acetyltransferase component of branched-chain alpha-keto acid dehydrogenase complex) (Dihydrolipoamide branched chain transacylase) (Dihydrolipoyllysine-residue (2-methylpropanoyl)transferase) |
| P42125 | ECI1_MOUSE | Eci1 | Enoyl-CoA delta isomerase 1, mitochondrial, EC 5.3.3.8 (3,2-trans-enoyl-CoA isomerase) (Delta(3),Delta(2)-enoyl-CoA isomerase, D3,D2-enoyl-CoA isomerase) (Dodecenoyl-CoA isomerase) |

| | | | |
|--------|-------------|---------|--|
| Q61074 | PPM1G_MOUSE | Ppm1g | Protein phosphatase 1G, EC 3.1.3.16 (Fibroblast growth factor-inducible protein 13, FIN13) (Protein phosphatase 1C) (Protein phosphatase 2C isoform gamma, PP2C-gamma) (Protein phosphatase magnesium-dependent 1 gamma) |
| Q8BH66 | ATLA1_MOUSE | At1l | Atlantin-1, EC 3.6.5.- (Spastic paraplegia 3A homolog) |
| Q8BM85 | TBCK_MOUSE | Tbck | TBC domain-containing protein kinase-like protein |
| Q8C0Z1 | F234A_MOUSE | Fam234a | Protein FAM234A (Protein ITFG3) |
| Q9ESV0 | DDX24_MOUSE | Ddx24 | ATP-dependent RNA helicase DDX24, EC 3.6.4.13 (DEAD box protein 24) |
| Q0KL02 | TRIO_MOUSE | Trio | Triple functional domain protein, EC 2.7.11.1 |
| P13020 | GELS_MOUSE | Gsn | Gelsolin (Actin-depolymerizing factor, ADF) (Brevin) |
| Q3URR7 | ZSC10_MOUSE | Zscan10 | Zinc finger and SCAN domain-containing protein 10 (Zinc finger protein 206) |
| Q8BH15 | CNO10_MOUSE | Cnot10 | CCR4-NOT transcription complex subunit 10 |
| P16460 | ASSY_MOUSE | Ass1 | Argininosuccinate synthase, EC 6.3.4.5 (Citrulline--aspartate ligase) |
| Q8VCT3 | AMPB_MOUSE | Rnpep | Aminopeptidase B, AP-B, EC 3.4.11.6 (Arginine aminopeptidase) (Arginyl aminopeptidase) (Cytosol aminopeptidase IV) |
| Q8R344 | CCD12_MOUSE | Ccdc12 | Coiled-coil domain-containing protein 12 |
| Q99L88 | SNTB1_MOUSE | Sntb1 | Beta-1-syntrophin (59 kDa dystrophin-associated protein A1 basic component 1, DAPA1B) (Syntrophin-2) |
| P0C192 | LRC4B_MOUSE | Lrrc4b | Leucine-rich repeat-containing protein 4B (Netrin-G3 ligand, NGL-3) |
| Q99LP6 | GRPE1_MOUSE | Grpel1 | GrpE protein homolog 1, mitochondrial (Mt-GrpE#1) |
| Q80UY2 | KCMF1_MOUSE | Kcmf1 | E3 ubiquitin-protein ligase KCMF1, EC 2.3.2.27 (Differentially expressed in branching tubulogenesis 91, Debt-91) (RING-type E3 ubiquitin transferase KCMF1) |
| P21126 | UBL4A_MOUSE | Ubl4a | Ubiquitin-like protein 4A (Ubiquitin-like protein GDX) |
| Q9DBY8 | NVL_MOUSE | Nvl | Nuclear valosin-containing protein-like, NVLp, Nuclear VCP-like protein |
| P10852 | 4F2_MOUSE | Slc3a2 | 4F2 cell-surface antigen heavy chain, 4F2hc (Solute carrier family 3 member 2) (CD antigen CD98) |
| Q9CR63 | COX16_MOUSE | Cox16 | Cytochrome c oxidase assembly protein COX16 homolog, mitochondrial |
| O35215 | DOPD_MOUSE | Ddt | D-dopachrome decarboxylase, EC 4.1.1.84 (D-dopachrome tautomerase) |
| Q9R0L6 | PCM1_MOUSE | Pcm1 | Pericentriolar material 1 protein, PCM-1, mPCM-1 |
| Q9QYE6 | GOGA5_MOUSE | Golga5 | Golgin subfamily A member 5 (Golgin-84) (Protein Ret-II) (Protein Sumiko) |

| | | | |
|--------|-------------|---------|--|
| Q9D071 | MMS19_MOUSE | Mms19 | MMS19 nucleotide excision repair protein homolog (MET18 homolog) (MMS19-like protein) |
| P07214 | SPRC_MOUSE | Sparc | SPARC (Basement-membrane protein 40, BM-40) (Osteonectin, ON) (Secreted protein acidic and rich in cysteine) |
| Q9QY53 | NPHP1_MOUSE | Nphp1 | Nephrocystin-1 |
| Q05D44 | IF2P_MOUSE | Eif5b | Eukaryotic translation initiation factor 5B, eIF-5B, EC 3.6.5.3 (Translation initiation factor IF-2) |
| Q9CQQ8 | LSM7_MOUSE | Lsm7 | U6 snRNA-associated Sm-like protein LSm7 |
| Q8VEB6 | RNZ1_MOUSE | Elac1 | Zinc phosphodiesterase ELAC protein 1, EC 3.1.26.11 (ElaC homolog protein 1) (Ribonuclease Z 1, RNase Z 1) (tRNA 3 endonuclease 1) (tRNase Z 1) |
| Q8CJF7 | ELYS_MOUSE | Ahctf1 | Protein ELYS (Embryonic large molecule derived from yolk sac) (Protein MEL-28) (Putative AT-hook-containing transcription factor 1) |
| Q61701 | ELAV4_MOUSE | Elavl4 | ELAV-like protein 4 (Hu-antigen D, HuD) (Paraneoplastic encephalomyelitis antigen HuD) |
| P55096 | ABCD3_MOUSE | Abcd3 | ATP-binding cassette sub-family D member 3, EC 3.1.2.-, EC 7.6.2.- (68 kDa peroxisomal membrane protein, PMP68) (70 kDa peroxisomal membrane protein, PMP70) |
| Q8CGZ0 | CHERP_MOUSE | Cherp | Calcium homeostasis endoplasmic reticulum protein (SR-related CTD-associated factor 6) |
| O08967 | CYH3_MOUSE | Cyth3 | Cytohesin-3 (ARF nucleotide-binding site opener 3, Protein ARNO3) (General receptor of phosphoinositides 1, Grp1) (PH, SEC7 and coiled-coil domain-containing protein 3, CLM3) (SEC7 homolog C, mSec7-3) |
| Q91WM3 | U3IP2_MOUSE | Rrp9 | U3 small nucleolar RNA-interacting protein 2 (RRP9 homolog) (U3 small nucleolar ribonucleoprotein-associated 55 kDa protein, U3 snoRNP-associated 55 kDa protein, U3-55K) |
| Q3USB7 | PLCL1_MOUSE | Plcl1 | Inactive phospholipase C-like protein 1, PLC-L1 (Phospholipase C-related but catalytically inactive protein, PRIP) |
| Q8CCF0 | PRP31_MOUSE | Prpf31 | U4/U6 small nuclear ribonucleoprotein Prp31 (Pre-mRNA-processing factor 31) (U4/U6 snRNP 61 kDa protein, Protein 61K) |
| O35954 | PITM1_MOUSE | Pitpnm1 | Membrane-associated phosphatidylinositol transfer protein 1 (Drosophila retinal degeneration B homolog 1, RdgB1) (Mpt-1) (Phosphatidylinositol transfer protein, membrane-associated 1, PITPnm 1) (Pyk2 N-terminal domain-interacting receptor 2, NIR-2) |

| | | | |
|--------|-------------|----------|---|
| Q3TFD2 | PCAT1_MOUSE | Lpcat1 | Lysophosphatidylcholine acyltransferase 1, LPC acyltransferase 1, LPCAT-1, LysoPC acyltransferase 1, mLPCAT1, EC 2.3.1.23 (1-acylglycerol-3-phosphate O-acyltransferase, EC 2.3.1.51) (1-acylglycerophosphocholine O-acyltransferase) (1-alkenylglycerophosphocholine O-acyltransferase, EC 2.3.1.25) (1-alkylglycerophosphocholine O-acetyltransferase, EC 2.3.1.67) (Acetyl-CoA:lyso-platelet-activating factor acetyltransferase, Acetyl-CoA:lyso-PAF acetyltransferase, Lyso-PAF acetyltransferase, LysoPAFAT) (Acyltransferase-like 2) |
| O55176 | PJA1_MOUSE | Pja1 | E3 ubiquitin-protein ligase Praja-1, Praja1, EC 2.3.2.27 (RING-type E3 ubiquitin transferase Praja-1) |
| Q9D2G2 | ODO2_MOUSE | Dlst | Dihydrolipoyllysine-residue succinyltransferase component of 2-oxoglutarate dehydrogenase complex, mitochondrial, EC 2.3.1.61 (2-oxoglutarate dehydrogenase complex component E2, OGDC-E2) (Dihydrolipoamide succinyltransferase component of 2-oxoglutarate dehydrogenase complex) (E2K) |
| Q8BIJ6 | SYIM_MOUSE | Iars2 | Isoleucine--tRNA ligase, mitochondrial, EC 6.1.1.5 (Isoleucyl-tRNA synthetase, IleRS) |
| Q9CXT8 | MPPB_MOUSE | Pmpcb | Mitochondrial-processing peptidase subunit beta, EC 3.4.24.64 (Beta-MPP) (P-52) |
| O35409 | FOLH1_MOUSE | Folh1 | Glutamate carboxypeptidase 2, EC 3.4.17.21 (Folate hydrolase 1) (Folylpoly-gamma-glutamate carboxypeptidase, FGCP) (Glutamate carboxypeptidase II, GCPII) (Membrane glutamate carboxypeptidase, mGCP) (N-acetylated-alpha-linked acidic dipeptidase I, NAALADase I) (Prostate-specific membrane antigen homolog) (Pteroylpoly-gamma-glutamate carboxypeptidase) |
| Q8BYB9 | PGLT1_MOUSE | Poglut1 | Protein O-glucosyltransferase 1, EC 2.4.1.376 (CAP10-like 46 kDa protein) (KTEL motif-containing protein 1) (O-glucosyltransferase Rumi homolog, Rumi) (Protein O-xylosyltransferase POGLUT1, EC 2.4.2.63) (Wing-shaped neural plate protein, Wsnp) |
| Q9CRD2 | EMC2_MOUSE | Emc2 | ER membrane protein complex subunit 2 (Tetratricopeptide repeat protein 35, TPR repeat protein 35) |
| O54865 | GCYB1_MOUSE | Gucy1b1 | Guanylate cyclase soluble subunit beta-1, GCS-beta-1, EC 4.6.1.2 (Guanylate cyclase soluble subunit beta-3, GCS-beta-3) (Soluble guanylate cyclase small subunit) |
| Q6PFQ7 | RASL2_MOUSE | Rasa4 | Ras GTPase-activating protein 4 (Calcium-promoted Ras inactivator) (Ras p21 protein activator 4) (RasGAP-activating-like protein 2) |
| O70503 | DHB12_MOUSE | Hsd17b12 | Very-long-chain 3-oxoacyl-CoA reductase, EC 1.1.1.330 (17-beta-hydroxysteroid dehydrogenase 12, 17-beta-HSD 12) (3-ketoacyl-CoA reductase, KAR) (Estradiol 17-beta-dehydrogenase 12, EC 1.1.1.62) (KIK-I) |

| | | | |
|--------|-------------|---------|---|
| Q9CPQ1 | COX6C_MOUSE | Cox6c | Cytochrome c oxidase subunit 6C (Cytochrome c oxidase polypeptide VIc) |
| Q3ULJ0 | GPD1L_MOUSE | Gpd1l | Glycerol-3-phosphate dehydrogenase 1-like protein, EC 1.1.1.8 |
| Q8BGZ1 | HPCL4_MOUSE | Hpcal4 | Hippocalcin-like protein 4 (Neural visinin-like protein 2, NVP-2) |
| Q6PER3 | MARE3_MOUSE | Mapre3 | Microtubule-associated protein RP/EB family member 3 (EB1 protein family member 3, EBF3) (End-binding protein 3, EB3) (RP3) |
| Q99MI1 | RB6I2_MOUSE | Erc1 | ELKS/Rab6-interacting/CAST family member 1, ERC-1 (CAZ-associated structural protein 2, CAST2) (Rab6-interacting protein 2) |
| O54724 | CAVN1_MOUSE | Cavin1 | Caveolae-associated protein 1 (Cav-p60) (Cavin-1) (Polymerase I and transcript release factor) |
| Q80YE4 | LMTK1_MOUSE | Aatk | Serine/threonine-protein kinase LMTK1, EC 2.7.11.1 (Apoptosis-associated tyrosine kinase, AATYK) (Brain apoptosis-associated tyrosine kinase) (Lemur tyrosine kinase 1) |
| Q8BWW9 | PKN2_MOUSE | Pkn2 | Serine/threonine-protein kinase N2, EC 2.7.11.13 (PKN gamma) (Protein kinase C-like 2) (Protein-kinase C-related kinase 2) |
| O09111 | NDUBB_MOUSE | Ndufb11 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 11, mitochondrial (Complex I-ESSS, CI-ESSS) (NADH-ubiquinone oxidoreductase ESSS subunit) (Neuronal protein 15.6, Np15.6, p15.6) |
| Q91Z22 | PORIM_MOUSE | Tmem123 | Porimin (Transmembrane protein 123) |
| P24788 | CD11B_MOUSE | Cdk11b | Cyclin-dependent kinase 11B (Cell division cycle 2-like protein kinase 1) (Cell division protein kinase 11) (Cyclin-dependent kinase 11, EC 2.7.11.22) (Galactosyltransferase-associated protein kinase p58/GTA) (PITSLRE serine/threonine-protein kinase CDC2L1) |
| O55057 | PDE6D_MOUSE | Pde6d | Retinal rod rhodopsin-sensitive cGMP 3',5'-cyclic phosphodiesterase subunit delta, GMP-PDE delta |
| A2ADY9 | DDI2_MOUSE | Ddi2 | Protein DDI1 homolog 2, EC 3.4.23.- |
| Q8R4D1 | SL9A8_MOUSE | Slc9a8 | Sodium/hydrogen exchanger 8 (Na ⁺)/H ⁺ exchanger 8, NHE-8) (Solute carrier family 9 member 8) |
| Q8CJG1 | AGO1_MOUSE | Ago1 | Protein argonaute-1, Argonaute1, mAgo1 (Argonaute RISC catalytic component 1) (Eukaryotic translation initiation factor 2C 1, eIF-2C 1, eIF2C 1) (Piwi/argonaute family protein meIF2C1) |
| A2A4P0 | DHX8_MOUSE | Dhx8 | ATP-dependent RNA helicase DHX8, EC 3.6.4.13 (DEAH box protein 8) |

| | | | |
|--------|-------------|---------|--|
| Q9DBL7 | COASY_MOUSE | Coasy | Bifunctional coenzyme A synthase, CoA synthase [Includes: Phosphopantetheine adenylyltransferase, EC 2.7.7.3 (Dephospho-CoA pyrophosphorylase) (Pantetheine-phosphate adenylyltransferase, PPAT); Dephospho-CoA kinase, DPCK, EC 2.7.1.24 (Dephosphocoenzyme A kinase, DPCOAK)] |
| Q64516 | GLPK_MOUSE | Gk | Glycerol kinase, GK, Glycerokinase, EC 2.7.1.30 (ATP:glycerol 3-phosphotransferase) |
| Q9CQ06 | RM24_MOUSE | Mrpl24 | 39S ribosomal protein L24, mitochondrial, L24mt, MRP-L24 |
| P05784 | K1C18_MOUSE | Krt18 | Keratin, type I cytoskeletal 18 (Cytokeratin endo B, Keratin D) (Cytokeratin-18, CK-18) (Keratin-18, K18) |
| O35486 | CRYGS_MOUSE | Crygs | Gamma-crystallin S (Beta-crystallin S) (Gamma-S-crystallin) |
| Q99MR8 | MCCA_MOUSE | Mccc1 | Methylcrotonoyl-CoA carboxylase subunit alpha, mitochondrial, MCCase subunit alpha, EC 6.4.1.4 (3-methylcrotonyl-CoA carboxylase 1) (3-methylcrotonyl-CoA carboxylase biotin-containing subunit) (3-methylcrotonyl-CoA:carbon dioxide ligase subunit alpha) |
| Q8R5C5 | ACTY_MOUSE | Actr1b | Beta-centractin (Actin-related protein 1B, ARP1B) |
| O55242 | SGMR1_MOUSE | Sigmar1 | Sigma non-opioid intracellular receptor 1 (Sigma 1-type opioid receptor, Sigma1-receptor, Sigma1R) |
| Q80UW8 | RPAB1_MOUSE | Polr2e | DNA-directed RNA polymerases I, II, and III subunit RPABC1, RNA polymerases I, II, and III subunit ABC1 (DNA-directed RNA polymerase II subunit E) (RPB5 homolog) |
| P23819 | GRIA2_MOUSE | Gria2 | Glutamate receptor 2, GluR-2 (AMPA-selective glutamate receptor 2) (GluR-B) (GluR-K2) (Glutamate receptor ionotropic, AMPA 2, GluA2) |
| Q6PB70 | ANO8_MOUSE | Ano8 | Anoctamin-8 (Transmembrane protein 16H) |
| Q9WU79 | PROD_MOUSE | Prodh | Proline dehydrogenase 1, mitochondrial, EC 1.5.5.2 (Proline oxidase) |
| Q3UQ44 | IQGA2_MOUSE | Iqgap2 | Ras GTPase-activating-like protein IQGAP2 |
| Q6ZWN5 | RS9_MOUSE | Rps9 | 40S ribosomal protein S9 |
| Q99J47 | DRS7B_MOUSE | Dhrs7b | Dehydrogenase/reductase SDR family member 7B, EC 1.1.-.- (Short-chain dehydrogenase/reductase family 32C member 1, Protein SDR32C1) |
| P36536 | SAR1A_MOUSE | Sar1a | GTP-binding protein SAR1a |
| Q60817 | NACA_MOUSE | Naca | Nascent polypeptide-associated complex subunit alpha (Alpha-NAC) (Alpha-NAC/1.9.2) |
| Q9D7Z3 | NOL7_MOUSE | Nol7 | Nucleolar protein 7 |

| | | | |
|--------|-------------|---------|---|
| Q8R0P4 | AAMDC_MOUSE | Aamdc | Mth938 domain-containing protein (LI2) |
| Q80U49 | C170B_MOUSE | Cep170b | Centrosomal protein of 170 kDa protein B (Centrosomal protein 170B, Cep170B) |
| Q9R0Q4 | MO4L2_MOUSE | Morf4l2 | Mortality factor 4-like protein 2 (MORF-related gene X protein) (Sid 393) (Transcription factor-like protein MRGX) |
| Q924K8 | MTA3_MOUSE | Mta3 | Metastasis-associated protein MTA3 |
| Q9DBF1 | AL7A1_MOUSE | Aldh7a1 | Alpha-aminoacidic semialdehyde dehydrogenase, Alpha-AASA dehydrogenase, EC 1.2.1.31 (Aldehyde dehydrogenase family 7 member A1, EC 1.2.1.3) (Antiquitin-1) (Betaine aldehyde dehydrogenase, EC 1.2.1.8) (Delta1-piperidine-6-carboxylate dehydrogenase, P6c dehydrogenase) |
| Q811S7 | UBIP1_MOUSE | Ubp1 | Upstream-binding protein 1 (Nuclear factor 2d9, NF2d9) |
| O54984 | GET3_MOUSE | Get3 | ATPase GET3, EC 3.6.-.- (Arsenical pump-driving ATPase) (Arsenite-stimulated ATPase) (Guided entry of tail-anchored proteins factor 3, ATPase) |
| Q9D898 | ARP5L_MOUSE | Arpc5l | Actin-related protein 2/3 complex subunit 5-like protein (Arp2/3 complex 16 kDa subunit 2, ARC16-2) |
| Q9CS00 | CATIN_MOUSE | Cactin | Cactin |
| Q80TG9 | LRFN2_MOUSE | Lrfn2 | Leucine-rich repeat and fibronectin type-III domain-containing protein 2 |
| Q9WTP6 | KAD2_MOUSE | Ak2 | Adenylate kinase 2, mitochondrial, AK 2, EC 2.7.4.3 (ATP-AMP transphosphorylase 2) (ATP:AMP phosphotransferase) (Adenylate monophosphate kinase) |
| Q4FZC9 | SYNE3_MOUSE | Syne3 | Nesprin-3 (KASH domain-containing protein 3, KASH3) (Nuclear envelope spectrin repeat protein 3) |
| P07309 | TTHY_MOUSE | Ttr | Transthyretin (Prealbumin) |
| P19246 | NFH_MOUSE | Nefh | Neurofilament heavy polypeptide, NF-H (200 kDa neurofilament protein) (Neurofilament triplet H protein) |
| Q9CZR8 | EFTS_MOUSE | Tsfm | Elongation factor Ts, mitochondrial, EF-Ts, EF-TsMt |
| P32233 | DRG1_MOUSE | Drg1 | Developmentally-regulated GTP-binding protein 1, DRG-1 (Neural precursor cell expressed developmentally down-regulated protein 3, NEDD-3) (Translation factor GTPase DRG1, TRAFAC GTPase DRG1, EC 3.6.5.-) |
| P28661 | SEPT4_MOUSE | Septin4 | Septin-4 (Bradeion beta) (Brain protein H5) (CE5B3 beta) (Cell division control-related protein 2, hCDCREL-2) (Peanut-like protein 2) |
| Q9CQW1 | YKT6_MOUSE | Ykt6 | Synaptobrevin homolog YKT6, EC 2.3.1.- |
| Q9D7G0 | PRPS1_MOUSE | Prps1 | Ribose-phosphate pyrophosphokinase 1, EC 2.7.6.1 (Phosphoribosyl pyrophosphate synthase I, PRS-I) |

| | | | |
|--------|-------------|-----------|---|
| Q9D1C8 | VPS28_MOUSE | Vps28 | Vacuolar protein sorting-associated protein 28 homolog (Caspase-activated DNase inhibitor that interacts with ASK1, CIIA) (ESCRT-I complex subunit VPS28) |
| Q9ER58 | TICN2_MOUSE | Spock2 | Testican-2 (SPARC/osteonectin, CWCV, and Kazal-like domains proteoglycan 2) |
| Q91VE0 | S27A4_MOUSE | Slc27a4 | Long-chain fatty acid transport protein 4, FATP-4, Fatty acid transport protein 4 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain-fatty-acid--CoA ligase, EC 6.2.1.3) (Solute carrier family 27 member 4) (Very long-chain acyl-CoA synthetase 4, ACSVL4, EC 6.2.1.-) |
| Q9D0F3 | LMAN1_MOUSE | Lman1 | Protein ERGIC-53 (ER-Golgi intermediate compartment 53 kDa protein) (Lectin mannose-binding 1) (p58) |
| Q8R3C0 | MCMBP_MOUSE | Mcmbp | Mini-chromosome maintenance complex-binding protein, MCM-BP, MCM-binding protein |
| Q9WVB0 | RBPMS_MOUSE | Rbpms | RNA-binding protein with multiple splicing, RBP-MS (Heart and RRM expressed sequence, Hermes) |
| Q06138 | CAB39_MOUSE | Cab39 | Calcium-binding protein 39 (MO25alpha) (Protein Mo25) |
| Q8BKC5 | IPO5_MOUSE | Ipo5 | Importin-5, Imp5 (Importin subunit beta-3) (Karyopherin beta-3) (Ran-binding protein 5, RanBP5) |
| Q9CY58 | PAIRB_MOUSE | Serbp1 | Plasminogen activator inhibitor 1 RNA-binding protein (PAI1 RNA-binding protein 1, PAI-RBP1) (SERPINE1 mRNA-binding protein 1) |
| Q99L48 | NMD3_MOUSE | Nmd3 | 60S ribosomal export protein NMD3 |
| Q91WF7 | FIG4_MOUSE | Fig4 | Polyphosphoinositide phosphatase, EC 3.1.3.-, EC 3.1.3.36, EC 3.1.3.86 (Phosphatidylinositol 3,5-bisphosphate 5-phosphatase) (SAC domain-containing protein 3) (Serine-protein phosphatase FIG4, EC 3.1.3.16) |
| Q8C080 | SNX16_MOUSE | Snx16 | Sorting nexin-16 |
| Q3UPL0 | SC31A_MOUSE | Sec31a | Protein transport protein Sec31A (SEC31-like protein 1) (SEC31-related protein A) |
| P61202 | CSN2_MOUSE | Cops2 | COP9 signalosome complex subunit 2, SGN2, Signalosome subunit 2 (Alien homolog) (JAB1-containing signalosome subunit 2) (Thyroid receptor-interacting protein 15, TR-interacting protein 15, TRIP-15) |
| Q9CY00 | TT30B_MOUSE | Ttc30b | Tetratricopeptide repeat protein 30B, TPR repeat protein 30B |
| Q640R3 | HECAM_MOUSE | Hepacam | Hepatocyte cell adhesion molecule, Protein hepaCAM |
| P21107 | TPM3_MOUSE | Tpm3 | Tropomyosin alpha-3 chain (Gamma-tropomyosin) (Tropomyosin-3) |
| Q8CCK0 | H2AW_MOUSE | Macroh2a2 | Core histone macro-H2A.2, Histone macroH2A2, mH2A2 |
| P57776 | EF1D_MOUSE | Eef1d | Elongation factor 1-delta, EF-1-delta |

| | | | |
|--------|-------------|----------|---|
| Q6P8J2 | SAT2_MOUSE | Sat2 | Thialysine N-epsilon-acetyltransferase, EC 2.3.1.- (Diamine acetyltransferase 2, EC 2.3.1.57) (Spermidine/spermine N(1)-acetyltransferase 2, SSAT-2) |
| Q91XU0 | WRIP1_MOUSE | Wrnip1 | ATPase WRNIP1, EC 3.6.1.- (Werner helicase-interacting protein 1) |
| Q8BWR2 | PITH1_MOUSE | Pithd1 | PITH domain-containing protein 1 |
| P97429 | ANXA4_MOUSE | Anxa4 | Annexin A4 (Annexin IV) (Annexin-4) |
| Q9EQ20 | MMSA_MOUSE | Aldh6a1 | Methylmalonate-semialdehyde dehydrogenase [acylating], mitochondrial, MMSDH, Malonate-semialdehyde dehydrogenase [acylating], EC 1.2.1.18, EC 1.2.1.27 (Aldehyde dehydrogenase family 6 member A1) |
| E9Q557 | DESP_MOUSE | Dsp | Desmoplakin, DP |
| Q8BZM1 | GLMN_MOUSE | Glmn | Glomulin (FK506-binding protein-associated protein, FAP) (FKBP-associated protein) |
| Q9D819 | IPYR_MOUSE | Ppa1 | Inorganic pyrophosphatase, EC 3.6.1.1 (Pyrophosphate phospho-hydrolase, PPase) |
| Q7TPQ3 | SHPRH_MOUSE | Shprh | E3 ubiquitin-protein ligase SHPRH, EC 2.3.2.27, EC 3.6.4.- (RING-type E3 ubiquitin transferase SHPRH) (SNF2, histone-linker, PHD and RING finger domain-containing helicase) |
| Q9R1P0 | PSA4_MOUSE | Psm4 | Proteasome subunit alpha type-4 (Macropain subunit C9) (Multicatalytic endopeptidase complex subunit C9) (Proteasome component C9) (Proteasome subunit L) |
| P63044 | VAMP2_MOUSE | Vamp2 | Vesicle-associated membrane protein 2, VAMP-2 (Synaptobrevin-2) |
| Q9CQW2 | ARL8B_MOUSE | Arl8b | ADP-ribosylation factor-like protein 8B, EC 3.6.5.2 (ADP-ribosylation factor-like protein 10C) (Novel small G protein indispensable for equal chromosome segregation 1) |
| A2ASZ8 | SCMC2_MOUSE | Slc25a25 | Calcium-binding mitochondrial carrier protein SCaMC-2 (Small calcium-binding mitochondrial carrier protein 2) (Solute carrier family 25 member 25) |
| Q7TSC1 | PRC2A_MOUSE | Prrc2a | Protein PRRC2A (HLA-B-associated transcript 2) (Proline-rich and coiled-coil-containing protein 2A) |
| Q99KN9 | EPN4_MOUSE | Clint1 | Clathrin interactor 1 (Enthoprotin) (Epsin-4) (Epsin-related protein, EpsinR) |
| P14869 | RLA0_MOUSE | Rplp0 | 60S acidic ribosomal protein P0 (60S ribosomal protein L10E) |
| Q6P7F1 | MPP4_MOUSE | Mpp4 | MAGUK p55 subfamily member 4 (Discs large homolog 6, mDLG6) |
| Q9CQT1 | MTNA_MOUSE | Mri1 | Methylthioribose-1-phosphate isomerase, M1Pi, MTR-1-P isomerase, EC 5.3.1.23 (S-methyl-5-thioribose-1-phosphate isomerase) (Translation initiation factor eIF-2B subunit alpha/beta/delta-like protein) |

| | | | |
|--------|-------------|---------|---|
| P61957 | SUMO2_MOUSE | Sumo2 | Small ubiquitin-related modifier 2, SUMO-2 (SMT3 homolog 2) (Ubiquitin-like protein SMT3B, Smt3B) |
| Q8CI11 | GNL3_MOUSE | Gnl3 | Guanine nucleotide-binding protein-like 3 (Nucleolar GTP-binding protein 3) (Nucleostemin) |
| Q9CQ75 | NDUA2_MOUSE | Ndufa2 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 2 (Complex I-B8, CI-B8) (NADH-ubiquinone oxidoreductase B8 subunit) |
| Q9JJK2 | LANC2_MOUSE | Lanc12 | LanC-like protein 2 (Testis-specific adriamycin sensitivity protein) |
| P09528 | FRIH_MOUSE | Fth1 | Ferritin heavy chain, Ferritin H subunit, EC 1.16.3.1 [Cleaved into: Ferritin heavy chain, N-terminally processed] |
| Q569Z5 | DDX46_MOUSE | Ddx46 | Probable ATP-dependent RNA helicase DDX46, EC 3.6.4.13 (DEAD box protein 46) |
| P04919 | B3AT_MOUSE | Slc4a1 | Band 3 anion transport protein (Anion exchange protein 1, AE 1, Anion exchanger 1) (MEB3) (Solute carrier family 4 member 1) (CD antigen CD233) |
| E9Q5C9 | NOLC1_MOUSE | Nolc1 | Nucleolar and coiled-body phosphoprotein 1 (140 kDa nucleolar phosphoprotein, Nopp140) |
| Q8VCN9 | TBCC_MOUSE | Tbcc | Tubulin-specific chaperone C (Tubulin-folding cofactor C, CFC) |
| Q9JHW2 | NIT2_MOUSE | Nit2 | Omega-amidase NIT2, EC 3.5.1.3 (Nitrilase homolog 2) |
| P63073 | IF4E_MOUSE | Eif4e | Eukaryotic translation initiation factor 4E, eIF-4E, eIF4E, mRNA cap-binding protein (eIF-4F 25 kDa subunit) |
| Q9DB73 | NB5R1_MOUSE | Cyb5r1 | NADH-cytochrome b5 reductase 1, b5R.1, EC 1.6.2.2 (NAD(P)H:quinone oxidoreductase type 3 polypeptide A2) |
| Q9DBH5 | LMAN2_MOUSE | Lman2 | Vesicular integral-membrane protein VIP36 (Lectin mannose-binding 2) (Vesicular integral-membrane protein 36, VIP36) |
| Q8VDD9 | PHIP_MOUSE | Phip | PH-interacting protein, PHIP (IRS-1 PH domain-binding protein) (Neuronal differentiation-related protein, NDRP) (WD repeat-containing protein 11) |
| Q8BZJ7 | DCNL2_MOUSE | Dcun1d2 | DCN1-like protein 2, DCNL2 (DCUN1 domain-containing protein 2) (Defective in cullin neddylation protein 1-like protein 2) |
| Q6ZQH8 | NU188_MOUSE | Nup188 | Nucleoporin NUP188 |
| Q8R555 | CRAC1_MOUSE | Crtac1 | Cartilage acidic protein 1 (68 kDa chondrocyte-expressed protein, CEP-68) (ASPIC) (Protein CRTAC1-B) |
| P15208 | INSR_MOUSE | Insr | Insulin receptor, IR, EC 2.7.10.1 (CD antigen CD220) [Cleaved into: Insulin receptor subunit alpha; Insulin receptor subunit beta] |

| | | | |
|--------|-------------|---------|---|
| Q9D7P6 | ISCU_MOUSE | Iscu | Iron-sulfur cluster assembly enzyme ISCU, mitochondrial (NifU-like N-terminal domain-containing protein) (NifU-like protein) |
| P97823 | LYPA1_MOUSE | Lypla1 | Acyl-protein thioesterase 1, APT-1, EC 3.1.2.- (Lysophospholipase 1) (Lysophospholipase I, LPL-I, LysoPLA I) (Palmitoyl-protein hydrolase, EC 3.1.2.22) |
| Q8BUH8 | SENP7_MOUSE | Senp7 | Sentrin-specific protease 7, EC 3.4.22.- (SUMO-1-specific protease 2) (Sentrin/SUMO-specific protease SENP7) |
| Q8BJ71 | NUP93_MOUSE | Nup93 | Nuclear pore complex protein Nup93 (93 kDa nucleoporin) (CBP-interacting protein 4) (Nucleoporin Nup93) |
| Q31125 | S39A7_MOUSE | Slc39a7 | Zinc transporter SLC39A7 (Histidine-rich membrane protein Ke4) (Solute carrier family 39 member 7) (Zrt-, Irt-like protein 7, ZIP7) |
| O88643 | PAK1_MOUSE | Pak1 | Serine/threonine-protein kinase PAK 1, EC 2.7.11.1 (Alpha-PAK) (CDC42/RAC effector kinase PAK-A) (p21-activated kinase 1, PAK-1) (p65-PAK) |
| Q91YW3 | DNJC3_MOUSE | Dnajc3 | DnaJ homolog subfamily C member 3 (Interferon-induced, double-stranded RNA-activated protein kinase inhibitor) (Protein kinase inhibitor of 58 kDa, Protein kinase inhibitor p58) |
| Q791V5 | MTCH2_MOUSE | Mtch2 | Mitochondrial carrier homolog 2 (Met-induced mitochondrial protein) |
| Q9JI75 | NQO2_MOUSE | Nqo2 | Ribosyldihyronicotinamide dehydrogenase [quinone], EC 1.10.5.1 (NRH dehydrogenase [quinone] 2) (NRH:quinone oxidoreductase 2) (Quinone reductase 2, QR2) |
| Q8R4X3 | RBM12_MOUSE | Rbm12 | RNA-binding protein 12 (RNA-binding motif protein 12) (SH3/WW domain anchor protein in the nucleus, SWAN) |
| P23475 | XRCC6_MOUSE | Xrcc6 | X-ray repair cross-complementing protein 6, EC 3.6.4.-, EC 4.2.99.- (5'-deoxyribose-5-phosphate lyase Ku70, 5'-dRP/AP lyase Ku70) (ATP-dependent DNA helicase 2 subunit 1) (ATP-dependent DNA helicase II 70 kDa subunit) (CTC box-binding factor 75 kDa subunit, CTC75, CTCBF) (DNA repair protein XRCC6) (Ku autoantigen protein p70 homolog, Ku70) |
| Q5DU25 | IQEC2_MOUSE | Iqsec2 | IQ motif and SEC7 domain-containing protein 2 |
| Q9JM62 | REEP6_MOUSE | Reep6 | Receptor expression-enhancing protein 6 (Polyposis locus protein 1-like 1) (TB2 protein-like 1) |
| P02469 | LAMB1_MOUSE | Lamb1 | Laminin subunit beta-1 (Laminin B1 chain) (Laminin-1 subunit beta) (Laminin-10 subunit beta) (Laminin-12 subunit beta) (Laminin-2 subunit beta) (Laminin-6 subunit beta) (Laminin-8 subunit beta) |

| | | | |
|--------|-------------|---------|--|
| Q2PFD7 | PSD3_MOUSE | Psd3 | PH and SEC7 domain-containing protein 3 (Exchange factor for ADP-ribosylation factor guanine nucleotide factor 6 D, Exchange factor for ARF6 D) (Pleckstrin homology and SEC7 domain-containing protein 3) |
| Q5SRX1 | TM1L2_MOUSE | Tom1l2 | TOM1-like protein 2 (Target of Myb-like protein 2) |
| O88597 | BECN1_MOUSE | Becn1 | Beclin-1 (Coiled-coil myosin-like BCL2-interacting protein) [Cleaved into: Beclin-1-C 35 kDa; Beclin-1-C 37 kDa] |
| P47740 | AL3A2_MOUSE | Aldh3a2 | Aldehyde dehydrogenase family 3 member A2, EC 1.2.1.3, EC 1.2.1.94 (Aldehyde dehydrogenase 3) (Fatty aldehyde dehydrogenase) |
| Q62426 | CYTB_MOUSE | Cstb | Cystatin-B (Stefin-B) |
| Q9D4H8 | CUL2_MOUSE | Cul2 | Cullin-2, CUL-2 |
| O08579 | EMD_MOUSE | Emd | Emerin |
| Q9D6P8 | CALL3_MOUSE | Calml3 | Calmodulin-like protein 3 |
| O35900 | LSM2_MOUSE | Lsm2 | U6 snRNA-associated Sm-like protein LSm2 (Protein G7b) (snRNP core Sm-like protein Sm-x5) |
| A2AGH6 | MED12_MOUSE | Med12 | Mediator of RNA polymerase II transcription subunit 12 (Mediator complex subunit 12) (OPA-containing protein) (Thyroid hormone receptor-associated protein complex 230 kDa component, Trap230) (Trinucleotide repeat-containing gene 11 protein) |
| Q5DTT2 | PSD1_MOUSE | Psd | PH and SEC7 domain-containing protein 1 (Exchange factor for ADP-ribosylation factor guanine nucleotide factor 6, Exchange factor for ARF6) (Exchange factor for ARF6 A) (Pleckstrin homology and SEC7 domain-containing protein 1) |
| Q06890 | CLUS_MOUSE | Clu | Clusterin (Apolipoprotein J, Apo-J) (Clustrin) (Sulfated glycoprotein 2, SGP-2) [Cleaved into: Clusterin beta chain; Clusterin alpha chain] |
| Q8VC33 | NXNL1_MOUSE | Nxn1l | Nucleoredoxin-like protein 1 (Rod-derived cone viability factor, RdCVF) (Thioredoxin-like protein 6) |
| Q7TQK5 | CCD93_MOUSE | Ccdc93 | Coiled-coil domain-containing protein 93 |
| Q9D162 | CC167_MOUSE | Ccdc167 | Coiled-coil domain-containing protein 167 |
| Q9EQ61 | PESC_MOUSE | Pes1 | Pescadillo homolog |
| Q6NZN0 | RBM26_MOUSE | Rbm26 | RNA-binding protein 26 (Protein expressed in male leptotene and zygotene spermatocytes 393, MLZ-393) (RNA-binding motif protein 26) |
| O54781 | SRPK2_MOUSE | Srpk2 | SRSF protein kinase 2, EC 2.7.11.1 (SFRS protein kinase 2) (Serine/arginine-rich protein-specific kinase 2, SR-protein-specific kinase 2) [Cleaved into: SRSF protein kinase 2 N-terminal; SRSF protein kinase 2 C-terminal] |

| | | | |
|--------|-------------|---------|---|
| Q8R088 | GLP3L_MOUSE | Golph3l | Golgi phosphoprotein 3-like |
| Q920R0 | ALS2_MOUSE | Als2 | Alsin (Amyotrophic lateral sclerosis 2 protein homolog) |
| P70175 | DLG3_MOUSE | Dlg3 | Disks large homolog 3 (Synapse-associated protein 102, SAP-102, SAP102) |
| P70122 | SBDS_MOUSE | Sbds | Ribosome maturation protein SBDS (Protein 22A3) (Shwachman-Bodian-Diamond syndrome protein homolog) |
| Q9QUR6 | PPCE_MOUSE | Prep | Prolyl endopeptidase, PE, EC 3.4.21.26 (Post-proline cleaving enzyme) |
| P53026 | RL10A_MOUSE | Rpl10a | 60S ribosomal protein L10a (CSA-19) (Neural precursor cell expressed developmentally down-regulated protein 6, NEDD-6) |
| Q9D1A2 | CNDP2_MOUSE | Cndp2 | Cytosolic non-specific dipeptidase, EC 3.4.13.18 (CNDP dipeptidase 2) (Glutamate carboxypeptidase-like protein 1) (Threonyl dipeptidase) |
| Q9R1A8 | COP1_MOUSE | Cop1 | E3 ubiquitin-protein ligase COP1, EC 2.3.2.27 (Constitutive photomorphogenesis protein 1 homolog, mCOP1) (RING finger and WD repeat domain protein 2) (RING-type E3 ubiquitin transferase RFW2) |
| Q9CX00 | IST1_MOUSE | Ist1 | IST1 homolog (Charged multivesicular body protein 8, CHMP8) |
| Q8R0F6 | ILKAP_MOUSE | Ilkap | Integrin-linked kinase-associated serine/threonine phosphatase 2C, ILKAP, EC 3.1.3.16 |
| P99026 | PSB4_MOUSE | Psmb4 | Proteasome subunit beta type-4 (Low molecular mass protein 3) (Macropain beta chain) (Multicatalytic endopeptidase complex beta chain) (Proteasome beta chain) (Proteasome chain 3) |
| P63280 | UBC9_MOUSE | Ube2i | SUMO-conjugating enzyme UBC9, EC 2.3.2.- (RING-type E3 SUMO transferase UBC9) (SUMO-protein ligase) (Ubiquitin carrier protein 9, mUBC9) (Ubiquitin carrier protein I) (Ubiquitin-conjugating enzyme E2 I) (Ubiquitin-protein ligase I) |
| B9EKI3 | TMF1_MOUSE | Tmf1 | TATA element modulatory factor, TMF (Androgen receptor coactivator 160 kDa protein) (Androgen receptor-associated protein of 160 kDa) |
| P56395 | CYB5_MOUSE | Cyb5a | Cytochrome b5 |
| Q99J39 | DCMC_MOUSE | Mlycd | Malonyl-CoA decarboxylase, mitochondrial, MCD, EC 4.1.1.9 |
| Q7TMM9 | TBB2A_MOUSE | Tubb2a | Tubulin beta-2A chain |
| Q8K2F8 | LS14A_MOUSE | Lsm14a | Protein LSM14 homolog A (Protein FAM61A) (RNA-associated protein 55A, mRAP55A) |
| P00405 | COX2_MOUSE | Mtco2 | Cytochrome c oxidase subunit 2, EC 7.1.1.9 (Cytochrome c oxidase polypeptide II) |
| P27612 | PLAP_MOUSE | Plaa | Phospholipase A-2-activating protein, PLA2P, PLAP |

| | | | |
|--------|-------------|---------|---|
| Q8C6E0 | CFA36_MOUSE | Cfap36 | Cilia- and flagella-associated protein 36 (Coiled-coil domain-containing protein 104) |
| Q80TJ7 | PHF8_MOUSE | Phf8 | Histone lysine demethylase PHF8, EC 1.14.11.27, EC 1.14.11.65 (PHD finger protein 8) ([histone H3]-dimethyl-L-lysine(36) demethylase PHF8) ([histone H3]-dimethyl-L-lysine(9) demethylase PHF8) |
| P09242 | PPBT_MOUSE | Alpl | Alkaline phosphatase, tissue-nonspecific isozyme, AP-TNAP, TNAP, TNSALP, EC 3.1.3.1 (Alkaline phosphatase 2) (Alkaline phosphatase liver/bone/kidney isozyme) (Phosphoamidase) (Phosphocreatine phosphatase, EC 3.9.1.1) |
| Q5SWD9 | TSR1_MOUSE | Tsr1 | Pre-rRNA-processing protein TSR1 homolog |
| Q8CCJ9 | P20L1_MOUSE | Phf20l1 | PHD finger protein 20-like protein 1 |
| D3YZP9 | CCDC6_MOUSE | Ccdc6 | Coiled-coil domain-containing protein 6 |
| Q9CY27 | TECR_MOUSE | Tecr | Very-long-chain enoyl-CoA reductase, EC 1.3.1.93 (Synaptic glycoprotein SC2) (Trans-2,3-enoyl-CoA reductase, TER) |
| Q9CTY5 | MICU3_MOUSE | Micu3 | Calcium uptake protein 3, mitochondrial (EF-hand domain-containing family member A2) |
| Q8VHP6 | CDHR1_MOUSE | Cdhr1 | Cadherin-related family member 1 (Photoreceptor cadherin, prCAD) (Protocadherin-21) |
| B2RUR8 | OTU7B_MOUSE | Otud7b | OTU domain-containing protein 7B, EC 3.4.19.12 (Cellular zinc finger anti-NF-kappa-B protein) (Zinc finger A20 domain-containing protein 1) (Zinc finger protein Cezanne) |
| Q99J99 | THTM_MOUSE | Mpst | 3-mercaptopyruvate sulfurtransferase, MST, EC 2.8.1.2 |
| P62073 | TIM10_MOUSE | Timm10 | Mitochondrial import inner membrane translocase subunit Tim10 |
| O09167 | RL21_MOUSE | Rpl21 | 60S ribosomal protein L21 |
| O70443 | GNAZ_MOUSE | Gnaz | Guanine nucleotide-binding protein G(z) subunit alpha (G(x) alpha chain) (Gz-alpha) |
| P99024 | TBB5_MOUSE | Tubb5 | Tubulin beta-5 chain |
| Q3TKT4 | SMCA4_MOUSE | Smarca4 | Transcription activator BRG1, EC 3.6.4.- (ATP-dependent helicase SMARCA4) (BRG1-associated factor 190A, BAF190A) (Protein brahma homolog 1) (SNF2-beta) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 4) |
| Q9D0J8 | PTMS_MOUSE | Ptms | Parathyrosin |
| Q9CT10 | RANB3_MOUSE | Ranbp3 | Ran-binding protein 3, RanBP3 |

| | | | |
|--------|-------------|----------|--|
| O35643 | AP1B1_MOUSE | Ap1b1 | AP-1 complex subunit beta-1 (Adaptor protein complex AP-1 subunit beta-1) (Adaptor-related protein complex 1 subunit beta-1) (Beta-1-adaptin) (Beta-adaptin 1) (Clathrin assembly protein complex 1 beta large chain) (Golgi adaptor HA1/AP1 adaptin beta subunit) |
| P70333 | HNRH2_MOUSE | Hnrnp2 | Heterogeneous nuclear ribonucleoprotein H2, hnRNP H2 (Heterogeneous nuclear ribonucleoprotein H', hnRNP H') [Cleaved into: Heterogeneous nuclear ribonucleoprotein H2, N-terminally processed] |
| Q8JZX4 | SPF45_MOUSE | Rbm17 | Splicing factor 45 (45 kDa-splicing factor) (RNA-binding motif protein 17) |
| Q99L04 | DHRS1_MOUSE | Dhrs1 | Dehydrogenase/reductase SDR family member 1, EC 1.1.1.- (Short chain dehydrogenase/reductase family 19C member 1, Protein SDR19C1) |
| Q8BUV3 | GEPH_MOUSE | Gphn | Gephyrin [Includes: Molybdopterin adenylyltransferase, MPT adenylyltransferase, EC 2.7.7.75 (Domain G); Molybdopterin molybdenumtransferase, MPT Mo-transferase, EC 2.10.1.1 (Domain E)] |
| Q7TQ95 | LNP_MOUSE | Lnk | Endoplasmic reticulum junction formation protein lunapark (ER junction formation factor lunapark) (Protein ulnaless) |
| P97379 | G3BP2_MOUSE | G3bp2 | Ras GTPase-activating protein-binding protein 2, G3BP-2 (GAP SH3 domain-binding protein 2) |
| P61082 | UBC12_MOUSE | Ube2m | NEDD8-conjugating enzyme Ubc12, EC 2.3.2.34 (NEDD8 carrier protein) (Ubiquitin-conjugating enzyme E2 M) |
| Q8CFI5 | SYPM_MOUSE | Pars2 | Probable proline--tRNA ligase, mitochondrial, EC 6.1.1.15 (Prolyl-tRNA synthetase, ProRS) |
| O88485 | DC1I1_MOUSE | Dync1i1 | Cytoplasmic dynein 1 intermediate chain 1 (Cytoplasmic dynein intermediate chain 1) (Dynein intermediate chain 1, cytosolic, DH IC-1) |
| Q9Z2Q6 | SEPT5_MOUSE | Septin5 | Septin-5 (Cell division control-related protein 1, CDCrel-1) (Peanut-like protein 1) |
| P54923 | ADPRH_MOUSE | Adprh | ADP-ribosylhydrolase ARH1, EC 3.2.2.19 (ADP-ribose-L-arginine cleaving enzyme) ([Protein ADP-ribosylarginine] hydrolase, ADP-ribosylarginine hydrolase) |
| Q9Z0W3 | NU160_MOUSE | Nup160 | Nuclear pore complex protein Nup160 (160 kDa nucleoporin) (Gene trap locus 1-13 protein, GTL-13) (Nucleoporin Nup160) |
| P63005 | LIS1_MOUSE | Pafah1b1 | Platelet-activating factor acetylhydrolase IB subunit beta (Lissencephaly-1 protein, LIS-1) (PAF acetylhydrolase 45 kDa subunit, PAF-AH 45 kDa subunit) (PAF-AH alpha, PAFAH alpha) |
| Q5PR73 | DIRA2_MOUSE | Diras2 | GTP-binding protein Di-Ras2 (Distinct subgroup of the Ras family member 2) |

| | | | |
|--------|-------------|---------|---|
| Q64433 | CH10_MOUSE | Hspe1 | 10 kDa heat shock protein, mitochondrial, Hsp10 (10 kDa chaperonin) (Chaperonin 10, CPN10) |
| P62754 | RS6_MOUSE | Rps6 | 40S ribosomal protein S6 (Phosphoprotein NP33) |
| Q8BVQ5 | PPME1_MOUSE | Ppme1 | Protein phosphatase methylesterase 1, PME-1, EC 3.1.1.89 |
| Q9EPW0 | INP4A_MOUSE | Inpp4a | Inositol polyphosphate-4-phosphatase type I A (Inositol polyphosphate 4-phosphatase type I) (Inositol polyphosphate 4-phosphatase-1, 4-Ptase-1) (Type I inositol 3,4-bisphosphate 4-phosphatase, EC 3.1.3.66) |
| P61294 | RAB6B_MOUSE | Rab6b | Ras-related protein Rab-6B, EC 3.6.5.2 |
| Q9D6J6 | NDUV2_MOUSE | Ndufv2 | NADH dehydrogenase [ubiquinone] flavoprotein 2, mitochondrial, EC 7.1.1.2 (NADH-ubiquinone oxidoreductase 24 kDa subunit) |
| Q5DTM8 | BRE1A_MOUSE | Rnf20 | E3 ubiquitin-protein ligase BRE1A, BRE1-A, EC 2.3.2.27 (RING finger protein 20) (RING-type E3 ubiquitin transferase BRE1A) |
| Q9Z277 | BAZ1B_MOUSE | Baz1b | Tyrosine-protein kinase BAZ1B, EC 2.7.10.2 (Bromodomain adjacent to zinc finger domain protein 1B) (Williams syndrome transcription factor homolog) (Williams-Beuren syndrome chromosomal region 9 protein homolog) |
| O08539 | BIN1_MOUSE | Bin1 | Myc box-dependent-interacting protein 1 (Amphiphysin II) (Amphiphysin-like protein) (Bridging integrator 1) (SH3 domain-containing protein 9) |
| Q8BYM5 | NLGN3_MOUSE | Nlgn3 | Neuroigin-3 (Gliotactin homolog) |
| Q8BK64 | AHSA1_MOUSE | Ahsa1 | Activator of 90 kDa heat shock protein ATPase homolog 1, AHA1 |
| Q8QZY9 | SF3B4_MOUSE | Sf3b4 | Splicing factor 3B subunit 4 |
| P84099 | RL19_MOUSE | Rpl19 | 60S ribosomal protein L19 |
| P34022 | RANG_MOUSE | Ranbp1 | Ran-specific GTPase-activating protein (HpaII tiny fragments locus 9a protein) (Ran-binding protein 1, RANBP1) |
| Q3UHB8 | CC177_MOUSE | Ccdc177 | Coiled-coil domain-containing protein 177 |
| Q80TL0 | PPM1E_MOUSE | Ppm1e | Protein phosphatase 1E, EC 3.1.3.16 (Ca(2+)/calmodulin-dependent protein kinase phosphatase N, CaMKP-N) (CaMKP-nucleus, CaMKN) (Partner of PIX 1) (Partner of PIX-alpha, Partner of PIXA) |
| Q922D4 | PP6R3_MOUSE | Ppp6r3 | Serine/threonine-protein phosphatase 6 regulatory subunit 3 (SAPS domain family member 3) |
| Q8CGC6 | RBM28_MOUSE | Rbm28 | RNA-binding protein 28 (RNA-binding motif protein 28) |
| Q9D7N9 | APMAP_MOUSE | Apmap | Adipocyte plasma membrane-associated protein (Protein DD16) |

| | | | |
|--------|-------------|--------|--|
| Q61036 | PAK3_MOUSE | Pak3 | Serine/threonine-protein kinase PAK 3, EC 2.7.11.1 (Beta-PAK) (CDC42/RAC effector kinase PAK-B) (p21-activated kinase 3, PAK-3) |
| Q9R020 | ZRAB2_MOUSE | Zranb2 | Zinc finger Ran-binding domain-containing protein 2 (Zinc finger protein 265) (Zinc finger, splicing) |
| Q91YT7 | YTHD2_MOUSE | Ythdf2 | YTH domain-containing family protein 2 |
| O35648 | CETN3_MOUSE | Cetn3 | Centrin-3 |
| Q8BYC6 | TAOK3_MOUSE | Taok3 | Serine/threonine-protein kinase TAO3, EC 2.7.11.1 (Thousand and one amino acid protein 3) |
| Q9JM76 | ARPC3_MOUSE | Arpc3 | Actin-related protein 2/3 complex subunit 3 (Arp2/3 complex 21 kDa subunit, p21-ARC) |
| Q76LL6 | FHOD3_MOUSE | Fhod3 | FH1/FH2 domain-containing protein 3 (Formin homolog overexpressed in spleen 2, mFHOS2) |
| Q62277 | SYPH_MOUSE | Syp | Synaptophysin (BM89 antigen) (Major synaptic vesicle protein p38) |
| P63087 | PP1G_MOUSE | Ppp1cc | Serine/threonine-protein phosphatase PP1-gamma catalytic subunit, PP-1G, EC 3.1.3.16 (Protein phosphatase 1C catalytic subunit) |
| P14576 | SRP54_MOUSE | Srp54 | Signal recognition particle 54 kDa protein, SRP54, EC 3.6.5.- |
| Q9CZM2 | RL15_MOUSE | Rpl15 | 60S ribosomal protein L15 |
| Q8BYK4 | RDH12_MOUSE | Rdh12 | Retinol dehydrogenase 12, EC 1.1.1.300 |
| P40201 | CHD1_MOUSE | Chd1 | Chromodomain-helicase-DNA-binding protein 1, CHD-1, EC 3.6.4.12 (ATP-dependent helicase CHD1) |
| Q01405 | SC23A_MOUSE | Sec23a | Protein transport protein Sec23A (SEC23-related protein A) |
| P84104 | SRSF3_MOUSE | Srsf3 | Serine/arginine-rich splicing factor 3 (Pre-mRNA-splicing factor SRP20) (Protein X16) (Splicing factor, arginine/serine-rich 3) |
| Q6P5E4 | UGGG1_MOUSE | Uggt1 | UDP-glucose:glycoprotein glucosyltransferase 1, UGT1, EC 2.4.1.- (UDP--Glc:glycoprotein glucosyltransferase) (UDP-glucose ceramide glucosyltransferase-like 1) |
| Q64345 | IFIT3_MOUSE | Ifit3 | Interferon-induced protein with tetratricopeptide repeats 3, IFIT-3 (Glucocorticoid-attenuated response gene 49 protein, GARG-49, P49) (IRG2) |
| P60487 | PLPP_MOUSE | Pdpx | Chronophin, EC 3.1.3.16, EC 3.1.3.74 (Pyridoxal 5'-phosphate phosphatase) (Pyridoxal phosphate phosphatase, PLP phosphatase) |
| Q9EPN1 | NBEA_MOUSE | Nbea | Neurobeachin (Lysosomal-trafficking regulator 2) |
| Q80ZJ6 | ZER1_MOUSE | Zer1 | Protein zer-1 homolog (Zyg-11 homolog B-like protein) |

| | | | |
|--------|-------------|--------|---|
| P08752 | GNAI2_MOUSE | Gnai2 | Guanine nucleotide-binding protein G(i) subunit alpha-2 (Adenylate cyclase-inhibiting G alpha protein) |
| Q3THW5 | H2AV_MOUSE | H2az2 | Histone H2A.V (H2A.F/Z) (H2A.Z variant histone 2) |
| Q91VK1 | 5MP1_MOUSE | Bzw2 | eIF5-mimic protein 1 (Basic leucine zipper and W2 domain-containing protein 2) |
| Q61765 | K1H1_MOUSE | Krt31 | Keratin, type I cuticular Ha1 (HKA-1) (Hair keratin, type I Ha1) (Keratin-31, K31) |
| P27546 | MAP4_MOUSE | Map4 | Microtubule-associated protein 4, MAP-4 |
| Q91ZR1 | RAB4B_MOUSE | Rab4b | Ras-related protein Rab-4B, EC 3.6.5.2 |
| P61027 | RAB10_MOUSE | Rab10 | Ras-related protein Rab-10, EC 3.6.5.2 |
| O88952 | LIN7C_MOUSE | Lin7c | Protein lin-7 homolog C, Lin-7C, mLin7C (Mammalian lin-seven protein 3, MALS-3) (Vertebrate lin-7 homolog 3, Veli-3) |
| O88307 | SORL_MOUSE | Sorl1 | Sortilin-related receptor (Gp250) (Low-density lipoprotein receptor relative with 11 ligand-binding repeats, LDLR relative with 11 ligand-binding repeats, LR11) (SorLA-1) (Sorting protein-related receptor containing LDLR class A repeats, mSorLA) |
| Q8BL65 | ABLM2_MOUSE | Ablim2 | Actin-binding LIM protein 2, abLIM-2 (Actin-binding LIM protein family member 2) |
| Q99N28 | CADM3_MOUSE | Cadm3 | Cell adhesion molecule 3 (Immunoglobulin superfamily member 4B, IgSF4B) (Nectin-like protein 1, NECL-1) (Synaptic cell adhesion molecule 3) (TSLC1-like protein 1) |
| Q91VS8 | FARP2_MOUSE | Farp2 | FERM, ARHGEF and pleckstrin domain-containing protein 2 (FERM domain including RhoGEF, FIR) (FERM, RhoGEF and pleckstrin domain-containing protein 2) |
| Q9CWN7 | CNO11_MOUSE | Cnot11 | CCR4-NOT transcription complex subunit 11 |
| Q9QXS6 | DREB_MOUSE | Dbn1 | Drebrin (Developmentally-regulated brain protein) |
| Q8VH51 | RBM39_MOUSE | Rbm39 | RNA-binding protein 39 (Coactivator of activating protein 1 and estrogen receptors, Coactivator of AP-1 and ERs) (RNA-binding motif protein 39) (RNA-binding region-containing protein 2) |
| Q80YR5 | SAFB2_MOUSE | Safb2 | Scaffold attachment factor B2, SAF-B2 |
| Q62433 | NDRG1_MOUSE | Ndr1 | Protein NDRG1 (N-myc downstream-regulated gene 1 protein, Protein Ndr1) |
| Q9QXB9 | DRG2_MOUSE | Drg2 | Developmentally-regulated GTP-binding protein 2, DRG-2 (Translation factor GTPase DRG2, TRAFAC GTPase DRG2, EC 3.6.5.-) |
| Q9WTX5 | SKP1_MOUSE | Skp1 | S-phase kinase-associated protein 1 (Cyclin-A/CDK2-associated protein p19) (S-phase kinase-associated protein 1A) (p19A) (p19skp1) |

| | | | |
|--------|-------------|---------|---|
| Q9DAT5 | MTU1_MOUSE | Trmu | Mitochondrial tRNA-specific 2-thiouridylase 1, EC 2.8.1.14 |
| Q8R4U7 | LUZP1_MOUSE | Luzp1 | Leucine zipper protein 1 (Leucine zipper motif-containing protein) |
| Q61024 | ASNS_MOUSE | Asns | Asparagine synthetase [glutamine-hydrolyzing], EC 6.3.5.4 (Glutamine-dependent asparagine synthetase) |
| Q5I043 | UBP28_MOUSE | Usp28 | Ubiquitin carboxyl-terminal hydrolase 28, EC 3.4.19.12 (Deubiquitinating enzyme 28) (Ubiquitin thioesterase 28) (Ubiquitin-specific-processing protease 28) |
| P83741 | WNK1_MOUSE | Wnk1 | Serine/threonine-protein kinase WNK1, EC 2.7.11.1 (Protein kinase lysine-deficient 1) (Protein kinase with no lysine 1) |
| P56183 | RRP1_MOUSE | Rrp1 | Ribosomal RNA processing protein 1 homolog A (Novel nuclear protein 1, NNP-1) (Nucleolar protein Nop52) (RRP1-like protein) |
| Q9Z2A5 | ATE1_MOUSE | Ate1 | Arginyl-tRNA--protein transferase 1, Arginyltransferase 1, R-transferase 1, EC 2.3.2.8 (Arginine-tRNA--protein transferase 1) |
| Q9Z239 | PLM_MOUSE | Fxyd1 | Phospholemman (FXYP domain-containing ion transport regulator 1) (Sodium/potassium-transporting ATPase subunit FXYD1) |
| Q9Z1T6 | FYV1_MOUSE | Pikfyve | 1-phosphatidylinositol 3-phosphate 5-kinase, Phosphatidylinositol 3-phosphate 5-kinase, EC 2.7.1.150 (FYVE finger-containing phosphoinositide kinase) (PIKfyve) (Phosphatidylinositol 3-phosphate 5-kinase type III, PIPkin-III, Type III PIP kinase) (Serine-protein kinase PIKFYVE, EC 2.7.11.1) (p235) |
| Q9Z1S5 | SEPT3_MOUSE | Septin3 | Neuronal-specific septin-3 |
| Q9Z1Q5 | CLIC1_MOUSE | Clic1 | Chloride intracellular channel protein 1 (Nuclear chloride ion channel 27, NCC27) |
| Q9Z1K5 | ARI1_MOUSE | Arih1 | E3 ubiquitin-protein ligase ARIH1, EC 2.3.2.31 (Protein ariadne-1 homolog, ARI-1) (RING-type E3 ubiquitin transferase ARIH1) (UbcH7-binding protein) (UbcM4-interacting protein 77) (Ubiquitin-conjugating enzyme E2-binding protein 1) |
| Q9Z0X4 | PDE3A_MOUSE | Pde3a | cGMP-inhibited 3',5'-cyclic phosphodiesterase 3A, EC 3.1.4.17 (Cyclic GMP-inhibited phosphodiesterase A, CGI-PDE A) |
| Q9Z0X1 | AIFM1_MOUSE | Aifm1 | Apoptosis-inducing factor 1, mitochondrial, EC 1.6.99.- (Programmed cell death protein 8) |
| Q9WVP1 | AP1M2_MOUSE | Ap1m2 | AP-1 complex subunit mu-2 (AP-mu chain family member mu1B) (Adaptor protein complex AP-1 subunit mu-2) (Adaptor-related protein complex 1 subunit mu-2) (Clathrin assembly protein complex 1 mu-2 medium chain 2) (Golgi adaptor HA1/AP1 adaptin mu-2 subunit) (Mu-adaptin 2) (Mu1B-adaptin) |
| Q9WV54 | ASAH1_MOUSE | Asah1 | Acid ceramidase, AC, ACDase, Acid CDase, EC 3.5.1.23 (Acylsphingosine deacylase) (N-acylethanolamine hydrolase ASAH1, EC 3.5.1.-) (N-acylsphingosine |

| | | | |
|--------|-------------|---------|---|
| | | | amidohydrolase) [Cleaved into: Acid ceramidase subunit alpha; Acid ceramidase subunit beta] |
| Q9WU84 | CCS_MOUSE | Ccs | Copper chaperone for superoxide dismutase (Superoxide dismutase copper chaperone) |
| Q9JMH6 | TRXR1_MOUSE | Txnrd1 | Thioredoxin reductase 1, cytoplasmic, TR, EC 1.8.1.9 (Peroxidase TXNRD1, EC 1.11.1.2) (Thioredoxin reductase TR1) |
| Q9JMD3 | STA10_MOUSE | Stard10 | START domain-containing protein 10, StARD10 (PCTP-like protein, PCTP-L) (Serologically defined colon cancer antigen 28 homolog) (StAR-related lipid transfer protein 10) |
| Q9JKB1 | UCHL3_MOUSE | Uchl3 | Ubiquitin carboxyl-terminal hydrolase isozyme L3, UCH-L3, EC 3.4.19.12 (Ubiquitin thioesterase L3) |
| Q9JJ00 | PLS1_MOUSE | Plscr1 | Phospholipid scramblase 1, PL scramblase 1 (Ca(2+)-dependent phospholipid scramblase 1) (Mg(2+)-dependent nuclease, EC 3.1.-.-) (Transplantability-associated protein 1, NOR1, TRA1) |
| Q9JIQ3 | DBLOH_MOUSE | Diablo | Diablo IAP-binding mitochondrial protein (Diablo homolog, mitochondrial) (Direct IAP-binding protein with low pI) (Second mitochondria-derived activator of caspase, Smac) |
| Q9JHI5 | IVD_MOUSE | Ivd | Isovaleryl-CoA dehydrogenase, mitochondrial, IVD, EC 1.3.8.4 (Butyryl-CoA dehydrogenase, EC 1.3.8.1) |
| Q9ET54 | PALLD_MOUSE | Palld | Palladin |
| Q9ERR1 | NDEL1_MOUSE | Ndel1 | Nuclear distribution protein nudE-like 1 (Protein mNudE-like, Protein Nudel, mNudE-L) |
| Q9ERA6 | TFP11_MOUSE | Tfip11 | Tuftelin-interacting protein 11 (Septin and tuftelin-interacting protein 1, STIP-1) (Tuftelin-interacting protein 39) |
| Q9ER39 | TOR1A_MOUSE | Tor1a | Torsin-1A (Dystonia 1 protein) (Torsin ATPase 1, EC 3.6.4.-) (Torsin family 1 member A) |
| Q9DD18 | DTD1_MOUSE | Dtd1 | D-aminoacyl-tRNA deacylase 1, DTD, EC 3.1.1.96 (DNA-unwinding element-binding protein B, DUE-B) (Gly-tRNA(Ala) deacylase) |
| Q9DCJ9 | NPL_MOUSE | Npl | N-acetylneuraminatase lyase, NALase, EC 4.1.3.3 (N-acetylneuraminatase pyruvate-lyase) (N-acetylneuraminic acid aldolase) (Sialate lyase) (Sialate-pyruvate lyase) (Sialic acid aldolase) (Sialic acid lyase) |
| Q9DCC8 | TOM20_MOUSE | Tomm20 | Mitochondrial import receptor subunit TOM20 homolog (Mitochondrial 20 kDa outer membrane protein) (Outer mitochondrial membrane receptor Tom20) |
| Q9DC48 | PRP17_MOUSE | Cdc40 | Pre-mRNA-processing factor 17 (Cell division cycle 40 homolog) (PRP17 homolog) |

| | | | |
|--------|-------------|---------|--|
| Q9D924 | ISCA1_MOUSE | Iscal | Iron-sulfur cluster assembly 1 homolog, mitochondrial (HESB-like domain-containing protein 2) (Iron-sulfur assembly protein IscA) |
| Q9D8B1 | AIG1_MOUSE | Aig1 | Androgen-induced gene 1 protein, AIG-1 (Fatty acid esters of hydroxy fatty acids hydrolase AIG1, FAHFA hydrolase AIG1, EC 3.1.-.-) |
| Q9D4H9 | PHF14_MOUSE | Phf14 | PHD finger protein 14 |
| Q9D2R6 | COA3_MOUSE | Coa3 | Cytochrome c oxidase assembly factor 3 homolog, mitochondrial (Coiled-coil domain-containing protein 56) |
| Q9D0R4 | DDX56_MOUSE | Ddx56 | Probable ATP-dependent RNA helicase DDX56, EC 3.6.4.13 (ATP-dependent 61 kDa nucleolar RNA helicase) (DEAD box protein 56) |
| Q9D0M1 | KPRA_MOUSE | Prpsap1 | Phosphoribosyl pyrophosphate synthase-associated protein 1, PRPP synthase-associated protein 1 (39 kDa phosphoribosypyrophosphate synthase-associated protein, PAP39) |
| Q9CZ83 | RM55_MOUSE | Mrpl55 | 39S ribosomal protein L55, mitochondrial, L55mt, MRP-L55 |
| Q9CYZ2 | TPD54_MOUSE | Tpd52l2 | Tumor protein D54 (Tumor protein D52-like 2) |
| Q9CYH2 | PXL2A_MOUSE | Prxl2a | Peroxiredoxin-like 2A (Peroxiredoxin-like 2 activated in M-CSF stimulated monocytes, Protein PAMM) (Redox-regulatory protein FAM213A) |
| Q9CWZ3 | RBM8A_MOUSE | Rbm8a | RNA-binding protein 8A (RNA-binding motif protein 8A) (Ribonucleoprotein RBM8A) |
| Q9CRB8 | MTFP1_MOUSE | Mtfp1 | Mitochondrial fission process protein 1 (Mitochondrial 18 kDa protein, MTP18) |
| Q9CRB2 | NHP2_MOUSE | Nhp2 | H/ACA ribonucleoprotein complex subunit 2 (Nucleolar protein family A member 2) (snoRNP protein NHP2) |
| Q9CR61 | NDUB7_MOUSE | Ndufb7 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 7 (Complex I-B18, CI-B18) (NADH-ubiquinone oxidoreductase B18 subunit) |
| Q9CQC9 | SAR1B_MOUSE | Sar1b | GTP-binding protein SAR1b |
| Q9CPY7 | AMPL_MOUSE | Lap3 | Cytosol aminopeptidase, EC 3.4.11.1 (Cysteinylglycine-S-conjugate dipeptidase, EC 3.4.13.23) (Leucine aminopeptidase 3, LAP-3) (Leucyl aminopeptidase) (Peptidase S) (Proline aminopeptidase, EC 3.4.11.5) (Prolyl aminopeptidase) |
| Q99M87 | DNJA3_MOUSE | Dnaja3 | DnaJ homolog subfamily A member 3, mitochondrial (DnaJ protein Tid-1, mTid-1) (Tumorous imaginal discs protein Tid56 homolog) |
| Q99K85 | SERC_MOUSE | Psat1 | Phosphoserine aminotransferase, PSAT, EC 2.6.1.52 (Endometrial progesterone-induced protein, EPIP) (Phosphohydroxythreonine aminotransferase) |

| | | | |
|--------|-------------|---------|--|
| Q99K70 | RRAGC_MOUSE | Rragc | Ras-related GTP-binding protein C, Rag C, RagC, EC 3.6.5.- (GTPase-interacting protein 2) (TIB929) |
| Q99JX7 | NXF1_MOUSE | Nxf1 | Nuclear RNA export factor 1 (Tip-associated protein) (Tip-associating protein) (mRNA export factor TAP) |
| Q923G2 | RPAB3_MOUSE | Polr2h | DNA-directed RNA polymerases I, II, and III subunit RPABC3, RNA polymerases I, II, and III subunit ABC3 (DNA-directed RNA polymerase II subunit H) (RPB17) (RPB8 homolog) |
| Q922Q4 | P5CR2_MOUSE | Pycr2 | Pyrroline-5-carboxylate reductase 2, P5C reductase 2, P5CR 2, EC 1.5.1.2 |
| Q91WC0 | SETD3_MOUSE | Setd3 | Actin-histidine N-methyltransferase, EC 2.1.1.85 (Endothelial differentiation inhibitory protein D10) (Protein-L-histidine N-tele-methyltransferase) (SET domain-containing protein 3) |
| Q91VC9 | GHITM_MOUSE | Ghitm | Growth hormone-inducible transmembrane protein (Mitochondrial morphology and cristae structure 1, MICS1) |
| Q8VEK0 | CC50A_MOUSE | Tmem30a | Cell cycle control protein 50A (P4-ATPase flippase complex beta subunit TMEM30A) (Transmembrane protein 30A) |
| Q8VEH8 | ERLEC_MOUSE | Erlec1 | Endoplasmic reticulum lectin 1 (ER lectin, Erlectin) |
| Q8VE47 | UBA5_MOUSE | Uba5 | Ubiquitin-like modifier-activating enzyme 5, Ubiquitin-activating enzyme 5 (UFM1-activating enzyme) |
| Q8VDP6 | CDIPT_MOUSE | Cdipt | CDP-diacylglycerol--inositol 3-phosphatidyltransferase, EC 2.7.8.11 (Phosphatidylinositol synthase, PI synthase, PtdIns synthase) |
| Q8VD33 | SGTB_MOUSE | Sgtb | Small glutamine-rich tetratricopeptide repeat-containing protein beta (Beta-SGT) |
| Q8VCD6 | REEP2_MOUSE | Reep2 | Receptor expression-enhancing protein 2 |
| Q8VCA8 | SCRN2_MOUSE | Scrn2 | Secernin-2 |
| Q8VBV3 | EXOS2_MOUSE | Exosc2 | Exosome complex component RRP4 (Exosome component 2) (Ribosomal RNA-processing protein 4) |
| Q8R238 | SDSL_MOUSE | Sdsl | Serine dehydratase-like, EC 4.3.1.17 (L-serine deaminase) (L-serine dehydratase/L-threonine deaminase) (L-threonine dehydratase, TDH, EC 4.3.1.19) (SDH) |
| Q8R191 | SNG3_MOUSE | Syngr3 | Synaptogyrin-3 |
| Q8K3J1 | NDUS8_MOUSE | Ndufs8 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 8, mitochondrial, EC 7.1.1.2 (Complex I-23kD, CI-23kD) (NADH-ubiquinone oxidoreductase 23 kDa subunit) |
| Q8K3G9 | DP13B_MOUSE | Appl2 | DCC-interacting protein 13-beta, Dip13-beta (Adapter protein containing PH domain, PTB domain and leucine zipper motif 2) |

| | | | |
|--------|-------------|---------|---|
| Q8K2Y9 | CCM2_MOUSE | Ccm2 | Cerebral cavernous malformations protein 2 homolog (Malcavernin) (Osmosensing scaffold for MEKK3) |
| Q8JZN7 | MIRO2_MOUSE | Rhot2 | Mitochondrial Rho GTPase 2, MIRO-2, EC 3.6.5.- (Ras homolog gene family member T2) |
| Q8CIN4 | PAK2_MOUSE | Pak2 | Serine/threonine-protein kinase PAK 2, EC 2.7.11.1 (Gamma-PAK) (p21-activated kinase 2, PAK-2) [Cleaved into: PAK-2p27; PAK-2p34] |
| Q8CF66 | LTOR4_MOUSE | Lamtor4 | Ragulator complex protein LAMTOR4 (Late endosomal/lysosomal adaptor and MAPK and MTOR activator 4) [Cleaved into: Ragulator complex protein LAMTOR4, N-terminally processed] |
| Q8CEE7 | RDH13_MOUSE | Rdh13 | Retinol dehydrogenase 13, EC 1.1.1.300 |
| Q8CE50 | SNX30_MOUSE | Snx30 | Sorting nexin-30 |
| Q8CAE9 | PDXL2_MOUSE | Podxl2 | Podocalyxin-like protein 2 (Endoglycan) |
| Q8C3P7 | MTA70_MOUSE | Mettl3 | N6-adenosine-methyltransferase subunit METTL3, EC 2.1.1.348 (Methyltransferase-like protein 3) (N6-adenosine-methyltransferase 70 kDa subunit, MT-A70) |
| Q8BWZ3 | NAA25_MOUSE | Naa25 | N-alpha-acetyltransferase 25, NatB auxiliary subunit (Mitochondrial distribution and morphology protein 20) (N-terminal acetyltransferase B complex subunit MDM20, NatB complex subunit MDM20) (N-terminal acetyltransferase B complex subunit NAA25) |
| Q8BWF0 | SSDH_MOUSE | Aldh5a1 | Succinate-semialdehyde dehydrogenase, mitochondrial, EC 1.2.1.24 (Aldehyde dehydrogenase family 5 member A1) (NAD(+)-dependent succinic semialdehyde dehydrogenase) |
| Q8BQ47 | CNPY4_MOUSE | Cnpy4 | Protein canopy homolog 4 (Protein associated with Tlr4) |
| Q8BPM2 | M4K5_MOUSE | Map4k5 | Mitogen-activated protein kinase kinase kinase kinase 5, EC 2.7.11.1 (MAPK/ERK kinase kinase kinase 5, MEK kinase kinase 5, MEKKK 5) |
| Q8BLF1 | NCEH1_MOUSE | Nceh1 | Neutral cholesterol ester hydrolase 1, NCEH, EC 3.1.1.- (Acetylalkylglycerol acetylhydrolase, 2-acetyl MAGE hydrolase, EC 3.1.1.71) (Arylacetamide deacetylase-like 1) (Chlorpyrifos oxon-binding protein, CPO-BP) |
| Q8BGN8 | SYNPR_MOUSE | Synpr | Synaptoporin |
| Q810U4 | NRCAM_MOUSE | Nrcam | Neuronal cell adhesion molecule, Nr-CAM (Neuronal surface protein Bravo, mBravo) (NgCAM-related cell adhesion molecule, Ng-CAM-related) |

| | | | |
|--------|-------------|---------|---|
| Q80XI4 | PI42B_MOUSE | Pip4k2b | Phosphatidylinositol 5-phosphate 4-kinase type-2 beta, EC 2.7.1.149 (1-phosphatidylinositol 5-phosphate 4-kinase 2-beta) (Diphosphoinositide kinase 2-beta) (Phosphatidylinositol 5-phosphate 4-kinase type II beta, PI(5)P 4-kinase type II beta, PIP4KII-beta) (PtdIns(5)P-4-kinase isoform 2-beta) |
| Q80VL1 | TDRKH_MOUSE | Tdrkh | Tudor and KH domain-containing protein (Tudor domain-containing protein 2) |
| Q80UG5 | SEPT9_MOUSE | Septin9 | Septin-9 (SL3-3 integration site 1 protein) |
| Q7TMF3 | NDUAC_MOUSE | Ndufa12 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 12 (Complex I-B17.2, CI-B17.2, CIB17.2) (NADH-ubiquinone oxidoreductase subunit B17.2) |
| Q6WQJ1 | DGLA_MOUSE | Dagla | Diacylglycerol lipase-alpha, DAGL-alpha, DGL-alpha, EC 3.1.1.116 (Neural stem cell-derived dendrite regulator) (Sn1-specific diacylglycerol lipase alpha) |
| Q6W8Q3 | PC4L1_MOUSE | Pcp4l1 | Purkinje cell protein 4-like protein 1, PCP4-like protein 1 |
| Q6P8M1 | TATD1_MOUSE | Tatdn1 | Deoxyribonuclease TATDN1, EC 3.1.21.- |
| Q68EF6 | BEGIN_MOUSE | Begain | Brain-enriched guanylate kinase-associated protein |
| Q64373 | B2CL1_MOUSE | Bcl2l1 | Bcl-2-like protein 1, Bcl2-L-1 (Apoptosis regulator Bcl-X) |
| Q63810 | CANB1_MOUSE | Ppp3r1 | Calcineurin subunit B type 1 (Protein phosphatase 2B regulatory subunit 1) (Protein phosphatase 3 regulatory subunit B alpha isoform 1) |
| Q62313 | TGON1_MOUSE | Tgoln1 | Trans-Golgi network integral membrane protein 1 (TGN38A) |
| Q61545 | EWS_MOUSE | Ewsr1 | RNA-binding protein EWS |
| Q61249 | IGBP1_MOUSE | Igbp1 | Immunoglobulin-binding protein 1 (Alpha4 phosphoprotein) (CD79a-binding protein 1) (Lymphocyte signal transduction molecule alpha 4) (Protein phosphatase 2/4/6 regulatory subunit) (p52) |
| Q61207 | SAP_MOUSE | Psap | Prosaposin (Sulfated glycoprotein 1, SGP-1) [Cleaved into: Saposin-A; Saposin-B-Val; Saposin-B; Saposin-C; Saposin-D] |
| Q61026 | NCOA2_MOUSE | Ncoa2 | Nuclear receptor coactivator 2, NCoA-2 (Glucocorticoid receptor-interacting protein 1, GRIP-1) (Steroid receptor coactivator 2, SRC-2) (Transcriptional intermediary factor 2) |
| Q60973 | RBBP7_MOUSE | Rbbp7 | Histone-binding protein RBBP7 (Histone acetyltransferase type B subunit 2) (Nucleosome-remodeling factor subunit RBAP46) (Retinoblastoma-binding protein 7, RBBP-7) (Retinoblastoma-binding protein p46) |
| Q5NCE8 | MRS2_MOUSE | Mrs2 | Magnesium transporter MRS2 homolog, mitochondrial (MRS2-like protein) |

| | | | |
|--------|-------------|---------|--|
| Q3UKJ7 | SMU1_MOUSE | Smu1 | WD40 repeat-containing protein SMU1 (Smu-1 suppressor of mec-8 and unc-52 protein homolog) [Cleaved into: WD40 repeat-containing protein SMU1, N-terminally processed] |
| Q3UDE2 | TTL12_MOUSE | Ttl12 | Tubulin--tyrosine ligase-like protein 12 (Inactive tubulin--tyrosine ligase-like protein 12) |
| Q3THG9 | AASD1_MOUSE | Aarsd1 | Alanyl-tRNA editing protein Aarsd1 (Alanyl-tRNA deacylase alaX, AlaX, AlaXp-II) (Alanyl-tRNA synthetase domain-containing protein 1) |
| Q00420 | GABP1_MOUSE | Gabpb1 | GA-binding protein subunit beta-1, GABP subunit beta-1, GABPB-1 (GABP subunit beta-2, GABPB-2) |
| P97807 | FUMH_MOUSE | Fh | Fumarate hydratase, mitochondrial, Fumarase, EC 4.2.1.2 (EF-3) |
| P97352 | S10AD_MOUSE | S100a13 | Protein S100-A13 (S100 calcium-binding protein A13) |
| P83882 | RL36A_MOUSE | Rpl36a | 60S ribosomal protein L36a (60S ribosomal protein L44) |
| P70399 | TP53B_MOUSE | Tp53bp1 | TP53-binding protein 1, 53BP1, p53-binding protein 1, p53BP1 |
| P62307 | RUXF_MOUSE | Snrpf | Small nuclear ribonucleoprotein F, snRNP-F (Sm protein F, Sm-F, SmF) |
| P62264 | RS14_MOUSE | Rps14 | 40S ribosomal protein S14 |
| P62071 | RRAS2_MOUSE | Rras2 | Ras-related protein R-Ras2, EC 3.6.5.- |
| P61967 | AP1S1_MOUSE | Ap1s1 | AP-1 complex subunit sigma-1A (Adaptor protein complex AP-1 subunit sigma-1A) (Adaptor-related protein complex 1 subunit sigma-1A) (Clathrin assembly protein complex 1 sigma-1A small chain) (Clathrin coat assembly protein AP19) (Golgi adaptor HA1/AP1 adaptin sigma-1A subunit) (HA1 19 kDa subunit) (Sigma 1a subunit of AP-1 clathrin) (Sigma-adaptin 1A) (Sigma1A-adaptin) |
| P61358 | RL27_MOUSE | Rpl27 | 60S ribosomal protein L27 |
| P61161 | ARP2_MOUSE | Actr2 | Actin-related protein 2 (Actin-like protein 2) |
| P60824 | CIRBP_MOUSE | Cirbp | Cold-inducible RNA-binding protein (A18 hnRNP) (Glycine-rich RNA-binding protein CIRP) |
| P59114 | CAPAM_MOUSE | Pcif1 | mRNA (2'-O-methyladenosine-N(6)-methyltransferase, EC 2.1.1.62 (Cap-specific adenosine methyltransferase, CAPAM) (Phosphorylated CTD-interacting factor 1) |
| P54729 | NUB1_MOUSE | Nub1 | NEDD8 ultimate buster 1 (Negative regulator of ubiquitin-like proteins 1) (Protein BS4) |
| P53996 | CNBP_MOUSE | Cnbp | CCHC-type zinc finger nucleic acid binding protein (Cellular nucleic acid-binding protein, CNBP) (Zinc finger protein 9) |

| | | | |
|--------|-------------|----------|---|
| P51491 | OPSB_MOUSE | Opn1sw | Short-wave-sensitive opsin 1, S opsin (Blue cone photoreceptor pigment) (Blue-sensitive opsin, BOP) (Short wavelength-sensitive cone opsin) |
| P48437 | PROX1_MOUSE | Prox1 | Prospero homeobox protein 1 (Homeobox prospero-like protein PROX1, PROX-1) |
| P35290 | RAB24_MOUSE | Rab24 | Ras-related protein Rab-24 (Rab-16) |
| P28667 | MRP_MOUSE | Marcksl1 | MARCKS-related protein (Brain protein F52) (MARCKS-like protein 1) (Macrophage myristoylated alanine-rich C kinase substrate, Mac-MARCKS, MacMARCKS) |
| P26883 | FKB1A_MOUSE | Fkbp1a | Peptidyl-prolyl cis-trans isomerase FKBP1A, PPIase FKBP1A, EC 5.2.1.8 (12 kDa FK506-binding protein, 12 kDa FKBP, FKBP-12) (Calstabin-1) (FK506-binding protein 1A, FKBP-1A) (Immunophilin FKBP12) (Rotamase) |
| P24288 | BCAT1_MOUSE | Bcat1 | Branched-chain-amino-acid aminotransferase, cytosolic, BCAT(c), EC 2.6.1.42 (Protein ECA39) |
| P19783 | COX4I_MOUSE | Cox4i1 | Cytochrome c oxidase subunit 4 isoform 1, mitochondrial (Cytochrome c oxidase polypeptide IV) (Cytochrome c oxidase subunit IV isoform 1, COX IV-1) |
| P17809 | GTR1_MOUSE | Slc2a1 | Solute carrier family 2, facilitated glucose transporter member 1 (Glucose transporter type 1, erythrocyte/brain, GLUT-1, GT1) |
| P10649 | GSTM1_MOUSE | Gstm1 | Glutathione S-transferase Mu 1, EC 2.5.1.18 (GST 1-1) (GST class-mu 1) (Glutathione S-transferase GT8.7) (pmGT10) |
| P04925 | PRIO_MOUSE | Prnp | Major prion protein, PrP (PrP27-30) (PrP33-35C) (CD antigen CD230) |
| O88630 | GOSR1_MOUSE | Gosr1 | Golgi SNAP receptor complex member 1 (28 kDa Golgi SNARE protein) (28 kDa cis-Golgi SNARE p28, GOS-28) |
| O88456 | CPNS1_MOUSE | Capns1 | Calpain small subunit 1, CSS1 (Calcium-activated neutral proteinase small subunit, CANP small subunit) (Calcium-dependent protease small subunit, CDPS) (Calcium-dependent protease small subunit 1) (Calpain regulatory subunit) |
| O55142 | RL35A_MOUSE | Rpl35a | 60S ribosomal protein L35a |
| O55003 | BNIP3_MOUSE | Bnip3 | BCL2/adenovirus E1B 19 kDa protein-interacting protein 3 |
| O35316 | SC6A6_MOUSE | Slc6a6 | Sodium- and chloride-dependent taurine transporter (Solute carrier family 6 member 6) |
| O08582 | GTPB1_MOUSE | Gtpbp1 | GTP-binding protein 1, G-protein 1, GP-1, GP1 |
| E9Q735 | UBE4A_MOUSE | Ube4a | Ubiquitin conjugation factor E4 A, EC 2.3.2.- |
| A6H630 | ARMT1_MOUSE | Armt1 | Damage-control phosphatase ARMT1, EC 3.1.3.- (Acidic residue methyltransferase 1) (Protein-glutamate O-methyltransferase, EC 2.1.1.-) (Sugar phosphate phosphatase ARMT1) |

| | | | |
|--------|-------------|---------|---|
| A2RTL5 | RSRC2_MOUSE | Rsrc2 | Arginine/serine-rich coiled-coil protein 2 |
| Q68FL6 | SYMC_MOUSE | Mars1 | Methionine--tRNA ligase, cytoplasmic, EC 6.1.1.10 (Methionyl-tRNA synthetase, MetRS) |
| Q5SYH2 | TM199_MOUSE | Tmem199 | Transmembrane protein 199 |
| Q924K1 | AIPL1_MOUSE | Aipl1 | Aryl-hydrocarbon-interacting protein-like 1 |
| Q8R146 | APEH_MOUSE | Apeh | Acylamino-acid-releasing enzyme, AARE, EC 3.4.19.1 (Acyl-peptide hydrolase, APH) (Acylaminoacyl-peptidase) |
| P63028 | TCTP_MOUSE | Tpt1 | Translationally-controlled tumor protein, TCTP (21 kDa polypeptide) (p21) (p23) |
| Q9CQE8 | RTRAF_MOUSE | RTRAF | RNA transcription, translation and transport factor protein |
| Q8R1K4 | AT2L2_MOUSE | Phykpl | 5-phosphohydroxy-L-lysine phospho-lyase, EC 4.2.3.134 (Alanine--glyoxylate aminotransferase 2-like 2) |
| P56959 | FUS_MOUSE | Fus | RNA-binding protein FUS (Protein pigpen) |
| P24668 | MPRD_MOUSE | M6pr | Cation-dependent mannose-6-phosphate receptor, CD Man-6-P receptor, CD-MPR (46 kDa mannose 6-phosphate receptor, MPR 46) |
| B1AZP2 | DLGP4_MOUSE | Dlgap4 | Disks large-associated protein 4, DAP-4 (PSD-95/SAP90-binding protein 4) (SAP90/PSD-95-associated protein 4, SAPAP-4) |
| Q99K01 | PDXD1_MOUSE | Pdxdc1 | Pyridoxal-dependent decarboxylase domain-containing protein 1, EC 4.1.1.- |
| Q9D6N5 | NC2A_MOUSE | Drap1 | Dr1-associated corepressor (Dr1-associated protein 1) (Negative cofactor 2-alpha, NC2-alpha) |
| Q6P4S6 | SIK3_MOUSE | Sik3 | Serine/threonine-protein kinase SIK3, EC 2.7.11.1 (Salt-inducible kinase 3, SIK-3) (Serine/threonine-protein kinase QSK) |
| Q99KJ8 | DCTN2_MOUSE | Dctn2 | Dynactin subunit 2 (50 kDa dynein-associated polypeptide) (Dynactin complex 50 kDa subunit, DCTN-50) (Growth cone membrane protein 23-48K, GMP23-48K) (p50 dynamitin) |
| Q9QY42 | GPR37_MOUSE | Gpr37 | Prosaposin receptor GPR37 (G-protein coupled receptor 37) |
| Q9EQP2 | EHD4_MOUSE | Ehd4 | EH domain-containing protein 4 (PAST homolog 2, mPAST2) |
| Q9CXL3 | CG050_MOUSE | | Uncharacterized protein C7orf50 homolog |
| Q6PIP5 | NUDC1_MOUSE | Nudcd1 | NudC domain-containing protein 1 |
| P62137 | PP1A_MOUSE | Ppp1ca | Serine/threonine-protein phosphatase PP1-alpha catalytic subunit, PP-1A, EC 3.1.3.16 |
| Q8VE70 | PDC10_MOUSE | Pdcd10 | Programmed cell death protein 10 (TF-1 cell apoptosis-related protein 15) |
| Q8R1Y2 | MERB1_MOUSE | Bmerb1 | bMERB domain-containing protein 1 (Uncharacterized protein C16orf45 homolog) |

| | | | |
|--------|-------------|----------|--|
| P60766 | CDC42_MOUSE | Cdc42 | Cell division control protein 42 homolog, EC 3.6.5.2 (G25K GTP-binding protein) |
| Q9WUB4 | DCTN6_MOUSE | Dctn6 | Dynactin subunit 6 (Dynactin subunit p27) (Protein WS-3) |
| Q9R069 | BCAM_MOUSE | Bcam | Basal cell adhesion molecule (B-CAM cell surface glycoprotein) (Lutheran antigen) (CD antigen CD239) |
| Q9D198 | SYF2_MOUSE | Syf2 | Pre-mRNA-splicing factor SYF2 (CCNDBP1-interactor) (mp29) (p29) |
| Q8BR65 | SDS3_MOUSE | Suds3 | Sin3 histone deacetylase corepressor complex component SDS3 (Suppressor of defective silencing 3 protein homolog) |
| P62858 | RS28_MOUSE | Rps28 | 40S ribosomal protein S28 |
| Q91YK2 | RRP1B_MOUSE | Rrp1b | Ribosomal RNA processing protein 1 homolog B (RRP1-like protein B) |
| Q9JMD0 | ZN207_MOUSE | Znf207 | BUB3-interacting and GLEBS motif-containing protein ZNF207, BuGZ (49 kDa zinc finger protein) (Zinc finger protein 207) |
| Q9EPL2 | CSTN1_MOUSE | Clstn1 | Calsyntenin-1 (Alcadein-alpha, Alc-alpha) [Cleaved into: Soluble Alc-alpha, SAlc-alpha; CTF1-alpha (C-terminal fragment 1-alpha)] |
| Q8K3H0 | DP13A_MOUSE | Appl1 | DCC-interacting protein 13-alpha, Dip13-alpha (Adapter protein containing PH domain, PTB domain and leucine zipper motif 1) |
| P46662 | MERL_MOUSE | Nf2 | Merlin (Moesin-ezrin-radixin-like protein) (Neurofibromin-2) (Schwannomin) |
| Q8BFP9 | PDK1_MOUSE | Pdk1 | [Pyruvate dehydrogenase (acetyl-transferring)] kinase isozyme 1, mitochondrial, EC 2.7.11.2 (Pyruvate dehydrogenase kinase isoform 1, PDH kinase 1) |
| Q7TSH8 | TMM94_MOUSE | Tmem94 | Transmembrane protein 94 |
| P28658 | ATX10_MOUSE | Atxn10 | Ataxin-10 (Brain protein E46) (Spinocerebellar ataxia type 10 protein homolog) |
| P14069 | S10A6_MOUSE | S100a6 | Protein S100-A6 (5B10) (Calcyclin) (Prolactin receptor-associated protein) (S100 calcium-binding protein A6) |
| Q6NVE8 | WDR44_MOUSE | Wdr44 | WD repeat-containing protein 44 (Rabphilin-11) |
| Q9D0M5 | DYL2_MOUSE | Dynll2 | Dynein light chain 2, cytoplasmic (8 kDa dynein light chain b, DLC8, DLC8b) (Dynein light chain LC8-type 2) |
| Q8K1N4 | SPAS2_MOUSE | Spats2 | Spermatogenesis-associated serine-rich protein 2 (Serine-rich spermatocytes and round spermatid 59 kDa protein) (p59scr) |
| Q91WD5 | NDUS2_MOUSE | Ndufs2 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 2, mitochondrial, EC 7.1.1.2 (Complex I-49kD, CI-49kD) (NADH-ubiquinone oxidoreductase 49 kDa subunit) |
| Q8VEH5 | EPMIP_MOUSE | Epm2aip1 | EPM2A-interacting protein 1 (Laforin-interacting protein) |
| Q91ZV0 | MIA2_MOUSE | Mia2 | Melanoma inhibitory activity protein 2 (CTAGE family member 5 ER export factor) |

| | | | |
|--------|-------------|---------|--|
| Q91WL8 | WVOX_MOUSE | Wwox | WW domain-containing oxidoreductase, EC 1.1.1.- |
| Q56A08 | GPKOW_MOUSE | Gpkow | G-patch domain and KOW motifs-containing protein (Protein MOS2 homolog) |
| Q8JZU2 | TXTP_MOUSE | Slc25a1 | Tricarboxylate transport protein, mitochondrial (Citrate transport protein, CTP) (Solute carrier family 25 member 1) (Tricarboxylate carrier protein) |
| Q9DAW9 | CNN3_MOUSE | Cnn3 | Calponin-3 (Calponin, acidic isoform) |
| P43277 | H13_MOUSE | H1-3 | Histone H1.3 (H1 VAR.4) (H1d) |
| Q811I0 | ATPF1_MOUSE | Atpaf1 | ATP synthase mitochondrial F1 complex assembly factor 1 |
| Q8VC31 | CCDC9_MOUSE | Ccdc9 | Coiled-coil domain-containing protein 9 |
| Q9D937 | CK098_MOUSE | | Uncharacterized protein C11orf98 homolog |
| Q9CQR2 | RS21_MOUSE | Rps21 | 40S ribosomal protein S21 |
| Q91YD4 | TRPM2_MOUSE | Trpm2 | Transient receptor potential cation channel subfamily M member 2 (Long transient receptor potential channel 2, LTrpC-2, LTrpC2) (Transient receptor potential channel 7, TrpC7) |
| P51855 | GSHB_MOUSE | Gss | Glutathione synthetase, GSH synthetase, GSH-S, EC 6.3.2.3 (Glutathione synthase) |
| Q3UHK1 | MYCT_MOUSE | Slc2a13 | Proton myo-inositol cotransporter, H(+)-myo-inositol cotransporter, Hmit (H(+)-myo-inositol symporter) (Solute carrier family 2 member 13) |
| Q3UCV8 | OTUL_MOUSE | Otulin | Ubiquitin thioesterase otulin, EC 3.4.19.12 (Deubiquitinating enzyme otulin) (OTU domain-containing deubiquitinase with linear linkage specificity) (Ubiquitin thioesterase Gumby) |
| P57722 | PCBP3_MOUSE | Pcbp3 | Poly(rC)-binding protein 3 (Alpha-CP3) |
| B1AQ75 | KRT36_MOUSE | Krt36 | Keratin, type I cuticular Ha6 (Keratin-36, K36) (Keratin-5) (MHRa-1) (Type I keratin 48 kDa) |
| Q3UV17 | K22O_MOUSE | Krt76 | Keratin, type II cytoskeletal 2 oral (Keratin-76, K76) (Type-II keratin Kb9) |
| O09044 | SNP23_MOUSE | Snap23 | Synaptosomal-associated protein 23, SNAP-23 (Syndet) (Vesicle-membrane fusion protein SNAP-23) |
| Q8BIJ7 | RUFY1_MOUSE | Rufy1 | RUN and FYVE domain-containing protein 1 (Rab4-interacting protein) |
| Q99LI2 | CLCC1_MOUSE | Clcc1 | Chloride channel CLIC-like protein 1 |
| Q6PEE3 | RIR2B_MOUSE | Rrm2b | Ribonucleoside-diphosphate reductase subunit M2 B, EC 1.17.4.1 (TP53-inducible ribonucleotide reductase M2 B) (p53-inducible ribonucleotide reductase small subunit 2-like protein, p53R2) |
| O88983 | STX8_MOUSE | Stx8 | Syntaxin-8 (Syntaxin-like protein 3I35) |

| | | | |
|--------|-------------|----------|--|
| Q9Z1W9 | STK39_MOUSE | Stk39 | STE20/SPS1-related proline-alanine-rich protein kinase, Ste-20-related kinase, EC 2.7.11.1 (Serine/threonine-protein kinase 39) |
| Q9JLV6 | PNKP_MOUSE | Pnkp | Bifunctional polynucleotide phosphatase/kinase (DNA 5'-kinase/3'-phosphatase) (Polynucleotide kinase-3'-phosphatase) [Includes: Polynucleotide 3'-phosphatase, EC 3.1.3.32 (2'(3')-polynucleotidase); Polynucleotide 5'-hydroxyl-kinase, EC 2.7.1.78] |
| Q02780 | NFIA_MOUSE | Nfia | Nuclear factor 1 A-type, NF1-A, Nuclear factor 1/A (CCAAT-box-binding transcription factor, CTF) (Nuclear factor I/A, NF-I/A, NFI-A) (TGGCA-binding protein) |
| Q8R349 | CDC16_MOUSE | Cdc16 | Cell division cycle protein 16 homolog (Anaphase-promoting complex subunit 6, APC6) (Cyclosome subunit 6) |
| P62245 | RS15A_MOUSE | Rps15a | 40S ribosomal protein S15a |
| P12849 | KAP1_MOUSE | Prkar1b | cAMP-dependent protein kinase type I-beta regulatory subunit |
| O55222 | ILK_MOUSE | Ilk | Integrin-linked protein kinase, EC 2.7.11.1 (59 kDa serine/threonine-protein kinase) (Beta-integrin-linked kinase) (ILK-1) (ILK-2) (p59ILK) |
| Q8K3A9 | MEPCE_MOUSE | Mepce | 7SK snRNA methylphosphate capping enzyme, MePCE, EC 2.1.1.- |
| Q8BJW6 | EIF2A_MOUSE | Eif2a | Eukaryotic translation initiation factor 2A, eIF-2A [Cleaved into: Eukaryotic translation initiation factor 2A, N-terminally processed] |
| Q9QYH6 | MAGD1_MOUSE | Maged1 | Melanoma-associated antigen D1 (Dlxin-1) (MAGE-D1 antigen) (Neurotrophin receptor-interacting MAGE homolog) |
| Q9QYF9 | NDRG3_MOUSE | Ndr3 | Protein NDRG3 (N-myc downstream-regulated gene 3 protein) (Protein Ndr3) |
| Q9JHW4 | SELB_MOUSE | Eefsec | Selenocysteine-specific elongation factor (Elongation factor sec) (Eukaryotic elongation factor, selenocysteine-tRNA-specific, mSelB) |
| Q9ESN6 | TRIM2_MOUSE | Trim2 | Tripartite motif-containing protein 2, EC 2.3.2.27 (E3 ubiquitin-protein ligase TRIM2) (Neural activity-related RING finger protein) (RING-type E3 ubiquitin transferase TRIM2) |
| Q99J95 | CDK9_MOUSE | Cdk9 | Cyclin-dependent kinase 9, EC 2.7.11.22, EC 2.7.11.23 (Cell division protein kinase 9) |
| Q8CIM8 | INT4_MOUSE | Ints4 | Integrator complex subunit 4, Int4 |
| Q8CI75 | DI3L2_MOUSE | Dis3l2 | DIS3-like exonuclease 2, EC 3.1.13.- |
| Q8CCJ4 | AMER2_MOUSE | Amer2 | APC membrane recruitment protein 2, Amer2 (Protein FAM123A) |
| Q7TPE5 | S7A6O_MOUSE | Slc7a6os | Probable RNA polymerase II nuclear localization protein SLC7A6OS (Solute carrier family 7 member 6 opposite strand transcript homolog) |

| | | | |
|--------|-------------|--------|---|
| Q61686 | CBX5_MOUSE | Cbx5 | Chromobox protein homolog 5 (Heterochromatin protein 1 homolog alpha, HP1 alpha) |
| Q5SVQ0 | KAT7_MOUSE | Kat7 | Histone acetyltransferase KAT7, EC 2.3.1.48 (Histone acetyltransferase binding to ORC1) (Lysine acetyltransferase 7) (MOZ, YBF2/SAS3, SAS2 and TIP60 protein 2, MYST-2) |
| P82343 | RENBP_MOUSE | Renbp | N-acylglucosamine 2-epimerase, AGE, EC 5.1.3.8 (GlcNAc 2-epimerase) (N-acetyl-D-glucosamine 2-epimerase) (Renin-binding protein, RnBP) |
| O88824 | JTB_MOUSE | Jtb | Protein JTB |
| O35730 | RING1_MOUSE | Ring1 | E3 ubiquitin-protein ligase RING1, EC 2.3.2.27 (Polycomb complex protein RING1) (RING finger protein 1) (RING-type E3 ubiquitin transferase RING1) (Transcription repressor Ring1A) |
| A2RSY1 | KANL3_MOUSE | Kansl3 | KAT8 regulatory NSL complex subunit 3 (NSL complex protein NSL3) (Non-specific lethal 3 homolog) |
| Q9WUK4 | RFC2_MOUSE | Rfc2 | Replication factor C subunit 2 (Activator 1 40 kDa subunit, A1 40 kDa subunit) (Activator 1 subunit 2) (Replication factor C 40 kDa subunit, RF-C 40 kDa subunit, RFC40) |
| Q9R1S3 | PIGN_MOUSE | Pign | GPI ethanolamine phosphate transferase 1, EC 2.-.-.- (Phosphatidylinositol-glycan biosynthesis class N protein, PIG-N) |
| Q9R017 | YLPM1_MOUSE | Ylpm1 | YLP motif-containing protein 1 (Nuclear protein ZAP3) |
| Q9QZE5 | COPG1_MOUSE | Copg1 | Coatomer subunit gamma-1 (Gamma-1-coat protein, Gamma-1-COP) |
| Q9QZB9 | DCTN5_MOUSE | Dctn5 | Dynactin subunit 5 (Dynactin subunit p25) |
| Q9QZ88 | VPS29_MOUSE | Vps29 | Vacuolar protein sorting-associated protein 29 (Vesicle protein sorting 29) |
| Q9JKV1 | ADRM1_MOUSE | Adrm1 | Proteasomal ubiquitin receptor ADRM1 (110 kDa cell membrane glycoprotein, Gp110) (Adhesion-regulating molecule 1, ARM-1) (Rpn13 homolog) |
| Q9JJG0 | TACC2_MOUSE | Tacc2 | Transforming acidic coiled-coil-containing protein 2 |
| Q9JIG8 | PRAF2_MOUSE | Praf2 | PRA1 family protein 2 |
| Q9JHI7 | EXOS9_MOUSE | Exosc9 | Exosome complex component RRP45 (Autoantigen PM/Scl 1) (Exosome component 9) (P75 polymyositis-scleroderma overlap syndrome-associated autoantigen) (Polymyositis/scleroderma autoantigen 1) (Polymyositis/scleroderma autoantigen 75 kDa, PM/Scl-75) |

| | | | |
|--------|-------------|---------|---|
| Q9EPR4 | S23A2_MOUSE | Slc23a2 | Solute carrier family 23 member 2 (Na ⁺)/L-ascorbic acid transporter 2) (Sodium-dependent vitamin C transporter 2, SVCT-2, mSVCT2) (Yolk sac permease-like molecule 2) |
| Q9DCM2 | GSTK1_MOUSE | Gstk1 | Glutathione S-transferase kappa 1, EC 2.5.1.18 (GST 13-13) (GST class-kappa) (GSTK1-1, mGSTK1) (Glutathione S-transferase subunit 13) |
| Q9DC71 | RT15_MOUSE | Mrps15 | 28S ribosomal protein S15, mitochondrial, MRP-S15, S15mt |
| Q9DAX2 | PLPP2_MOUSE | Plpp2 | Phospholipid phosphatase 2, EC 3.1.3.-, EC 3.1.3.4 (Lipid phosphate phosphohydrolase 2) (PAP2-gamma, PAP2-G) (Phosphatidate phosphohydrolase type 2c) (Phosphatidic acid phosphatase 2c, PAP-2c, PAP2c) |
| Q9D8V0 | HM13_MOUSE | Hm13 | Minor histocompatibility antigen H13, EC 3.4.23.- (Presenilin-like protein 3) (Signal peptide peptidase) |
| Q9D187 | CIA2B_MOUSE | Ciao2b | Cytosolic iron-sulfur assembly component 2B (Mitotic spindle-associated MMXD complex subunit MIP18) |
| Q9CZT6 | CMS1_MOUSE | Cmss1 | Protein CMSS1 (Cms1 ribosomal small subunit homolog) |
| Q9CZN7 | GLYM_MOUSE | Shmt2 | Serine hydroxymethyltransferase, mitochondrial, SHMT, EC 2.1.2.1 (Glycine hydroxymethyltransferase) (Serine methylase) |
| Q9CY66 | GAR1_MOUSE | Gar1 | H/ACA ribonucleoprotein complex subunit 1 (Nucleolar protein family A member 1) (snoRNP protein GAR1) |
| Q9CQJ4 | RING2_MOUSE | Rnf2 | E3 ubiquitin-protein ligase RING2, EC 2.3.2.27 (RING finger protein 1B, RING1b) (RING finger protein 2) (RING-type E3 ubiquitin transferase RING2) |
| Q9CPV4 | GLOD4_MOUSE | Glod4 | Glyoxalase domain-containing protein 4 |
| Q99PP7 | TRI33_MOUSE | Trim33 | E3 ubiquitin-protein ligase TRIM33, EC 2.3.2.27 (Ectodermin homolog) (RING-type E3 ubiquitin transferase TRIM33) (Transcription intermediary factor 1-gamma, TIF1-gamma) (Tripartite motif-containing protein 33) |
| Q99KX1 | MLF2_MOUSE | Mlf2 | Myeloid leukemia factor 2 (Myelodysplasia-myeloid leukemia factor 2) |
| Q923D5 | WBP11_MOUSE | Wbp11 | WW domain-binding protein 11, WBP-11 (Splicing factor that interacts with PQBP-1 and PP1) |
| Q91X52 | DCXR_MOUSE | Dexr | L-xylulose reductase, XR, EC 1.1.1.10 (Dicarbonyl/L-xylulose reductase) |
| Q91X20 | ASH2L_MOUSE | Ash2l | Set1/Ash2 histone methyltransferase complex subunit ASH2 (ASH2-like protein) |
| Q91WG4 | ELP2_MOUSE | Elp2 | Elongator complex protein 2, ELP2 (STAT3-interacting protein 1, StIP1) |
| Q8VCM8 | NCLN_MOUSE | Ncln | Nicalin (Nicastrin-like protein) |
| Q8VCC9 | SPON1_MOUSE | Spon1 | Spondin-1 (F-spondin) |

| | | | |
|--------|-------------|----------|---|
| Q8R0I0 | ACE2_MOUSE | Ace2 | Angiotensin-converting enzyme 2, EC 3.4.17.23 (ACE-related carboxypeptidase, EC 3.4.17.-) [Cleaved into: Processed angiotensin-converting enzyme 2] |
| Q8K3G5 | VRK3_MOUSE | Vrk3 | Inactive serine/threonine-protein kinase VRK3 (Serine/threonine-protein pseudokinase VRK3) (Vaccinia-related kinase 3) |
| Q8K1A5 | TM41B_MOUSE | Tmem41b | Transmembrane protein 41B (Protein stasimon) |
| Q8K199 | COXM2_MOUSE | Cmc2 | COX assembly mitochondrial protein 2 homolog |
| Q8K157 | GALM_MOUSE | Galm | Galactose mutarotase, EC 5.1.3.3 (Aldose 1-epimerase) |
| Q8CI33 | C19L1_MOUSE | Cwf1911 | CWF19-like protein 1 |
| Q8CGF6 | WDR47_MOUSE | Wdr47 | WD repeat-containing protein 47 (Neuronal enriched MAP interacting protein, Nemitin) |
| Q8C5L6 | INP5K_MOUSE | Inpp5k | Inositol polyphosphate 5-phosphatase K, EC 3.1.3.56 (Phosphatidylinositol-3,4,5-trisphosphate 5-phosphatase, EC 3.1.3.86) (Phosphatidylinositol-4,5-bisphosphate 5-phosphatase, EC 3.1.3.36) (Skeletal muscle and kidney-enriched inositol phosphatase) |
| Q8C1Z7 | BBS4_MOUSE | Bbs4 | Bardet-Biedl syndrome 4 protein homolog |
| Q8C0D0 | TRUB1_MOUSE | Trub1 | Pseudouridylate synthase TRUB1, EC 5.4.99.- (TruB pseudouridine synthase homolog 1) (tRNA pseudouridine 55 synthase TRUB1, Psi55 synthase TRUB1, EC 5.4.99.25) |
| Q8BW41 | PMGT2_MOUSE | Pomgnt2 | Protein O-linked-mannose beta-1,4-N-acetylglucosaminyltransferase 2, POMGnT2, EC 2.4.1.312 (Extracellular O-linked N-acetylglucosamine transferase-like) (Glycosyltransferase-like domain-containing protein 2) |
| Q8BU11 | TOX4_MOUSE | Tox4 | TOX high mobility group box family member 4 (Epidermal Langerhans cell protein LCPI) |
| Q8BL74 | TF3C2_MOUSE | Gtf3c2 | General transcription factor 3C polypeptide 2 (TF3C-beta) (Transcription factor IIIC 110 kDa subunit, TFIIC 110 kDa subunit, TFIIC110) (Transcription factor IIIC subunit beta) |
| Q8BJI1 | S6A17_MOUSE | Slc6a17 | Sodium-dependent neutral amino acid transporter SLC6A17 (Sodium-dependent neurotransmitter transporter NTT4) (Solute carrier family 6 member 17) |
| Q8BFT9 | SVOP_MOUSE | Svop | Synaptic vesicle 2-related protein, SV2-related protein |
| Q8BFR2 | FSTL5_MOUSE | Fstl5 | Follistatin-related protein 5 (Follistatin-like protein 5) (m-D/Bsp120I 1-2) |
| Q811P8 | RHG32_MOUSE | Arhgap32 | Rho GTPase-activating protein 32 (Brain-specific Rho GTPase-activating protein) (GAB-associated Cdc42/Rac GTPase-activating protein) (GC-GAP) (Rho-type GTPase-activating protein 32) (Rho/Cdc42/Rac GTPase-activating protein RICS) |

| | | | |
|--------|-------------|----------|--|
| | | | (RhoGAP involved in the beta-catenin-N-cadherin and NMDA receptor signaling) (p200RhoGAP) (p250GAP) |
| Q80YQ2 | MED23_MOUSE | Med23 | Mediator of RNA polymerase II transcription subunit 23 (Cofactor required for Sp1 transcriptional activation subunit 3, CRSP complex subunit 3) (Mediator complex subunit 23) (Protein sur-2 homolog, mSur-2) |
| Q7TNV1 | TLC3B_MOUSE | Tlcd3b | Ceramide synthase, EC 2.3.1.- (Protein FAM57B) (TLC domain-containing protein 3B) |
| Q6R891 | NEB2_MOUSE | Ppp1r9b | Neurabin-2 (Neurabin-II) (Protein phosphatase 1 regulatory subunit 9B) (Spinophilin) |
| Q6PIJ4 | NFRKB_MOUSE | Nfrkb | Nuclear factor related to kappa-B-binding protein (DNA-binding protein R kappa-B) |
| Q69ZF3 | GBA2_MOUSE | Gba2 | Non-lysosomal glucosylceramidase, NLGase, EC 3.2.1.45 (Beta-glucocerebrosidase 2, Beta-glucosidase 2) (Bile acid beta-glucosidase GBA2) (Bile acid glucosyl transferase GBA2) (Cholesterol glucosyltransferase GBA2, EC 2.4.1.-) (Cholesteryl-beta-glucosidase GBA2, EC 3.2.1.-) (Glucosylceramidase 2) (Non-lysosomal cholesterol glycosyltransferase) (Non-lysosomal galactosylceramidase, EC 3.2.1.46) (Non-lysosomal glycosylceramidase) |
| Q62348 | TSN_MOUSE | Tsn | Translin, EC 3.1.-.- (Component 3 of promoter of RISC, C3PO) (Testis/brain RNA-binding protein, TB-RBP) |
| Q5NCH9 | GRM6_MOUSE | Grm6 | Metabotropic glutamate receptor 6, mGluR6 |
| Q3UQU0 | BRD9_MOUSE | Brd9 | Bromodomain-containing protein 9 |
| Q3UFS0 | ZY11B_MOUSE | Zyg11b | Protein zyg-11 homolog B |
| Q3U276 | SDHF1_MOUSE | Sdhaf1 | Succinate dehydrogenase assembly factor 1, mitochondrial, SDH assembly factor 1, SDHAF1 (LYR motif-containing protein 8) |
| Q3TZX3 | S2533_MOUSE | Slc25a33 | Solute carrier family 25 member 33 |
| Q3TVC7 | CCDB1_MOUSE | Ccndbp1 | Cyclin-D1-binding protein 1 (Grap2 and cyclin-D-interacting protein) (Maternal Id-like protein) (Stage specific embryonic cDNA-8 protein, SSEC-8) |
| Q2NL51 | GSK3A_MOUSE | Gsk3a | Glycogen synthase kinase-3 alpha, GSK-3 alpha, EC 2.7.11.26 (Serine/threonine-protein kinase GSK3A, EC 2.7.11.1) |
| Q07813 | BAX_MOUSE | Bax | Apoptosis regulator BAX |
| Q02257 | PLAK_MOUSE | Jup | Junction plakoglobin (Desmoplakin III) (Desmoplakin-3) |
| P63323 | RS12_MOUSE | Rps12 | 40S ribosomal protein S12 |

| | | | |
|--------|-------------|----------|--|
| P52430 | PON1_MOUSE | Pon1 | Serum paraoxonase/arylesterase 1, PON 1, EC 3.1.1.2, EC 3.1.1.81, EC 3.1.8.1 (Aromatic esterase 1, A-esterase 1) (Serum aryldialkylphosphatase 1) |
| O88848 | ARL6_MOUSE | Arl6 | ADP-ribosylation factor-like protein 6 |
| O70404 | VAMP8_MOUSE | Vamp8 | Vesicle-associated membrane protein 8, VAMP-8 (Endobrevin, Edb) |
| O08756 | HCD2_MOUSE | Hsd17b10 | 3-hydroxyacyl-CoA dehydrogenase type-2, EC 1.1.1.35 (17-beta-estradiol 17-dehydrogenase, EC 1.1.1.62) (2-methyl-3-hydroxybutyryl-CoA dehydrogenase, MHBD) (3-alpha-(17-beta)-hydroxysteroid dehydrogenase (NAD(+)), EC 1.1.1.239) (3-hydroxy-2-methylbutyryl-CoA dehydrogenase, EC 1.1.1.178) (3-hydroxyacyl-CoA dehydrogenase type II) (3alpha(or 20beta)-hydroxysteroid dehydrogenase, EC 1.1.1.53) (7-alpha-hydroxysteroid dehydrogenase, EC 1.1.1.159) (Endoplasmic reticulum-associated amyloid beta-peptide-binding protein) (Mitochondrial ribonuclease P protein 2, Mitochondrial RNase P protein 2) (Short chain dehydrogenase/reductase family 5C member 1) (Short-chain type dehydrogenase/reductase XH98G2) (Type II HADH) |
| A2A8Z1 | OSBL9_MOUSE | Osbp19 | Oxysterol-binding protein-related protein 9, ORP-9, OSBP-related protein 9 |
| Q923T9 | KCC2G_MOUSE | Camk2g | Calcium/calmodulin-dependent protein kinase type II subunit gamma, CaM kinase II subunit gamma, CaMK-II subunit gamma, EC 2.7.11.17 |
| Q8BJ05 | ZC3HE_MOUSE | Zc3h14 | Zinc finger CCCH domain-containing protein 14 |
| Q9D8X2 | CC124_MOUSE | Ccdc124 | Coiled-coil domain-containing protein 124 |
| Q0VBL3 | RBM15_MOUSE | Rbm15 | RNA-binding protein 15 (One-twenty two protein 1) (RNA-binding motif protein 15) |
| Q8VCX5 | MICU1_MOUSE | Micu1 | Calcium uptake protein 1, mitochondrial (Calcium-binding atopy-related autoantigen 1 homolog) |
| Q8R1U1 | COG4_MOUSE | Cog4 | Conserved oligomeric Golgi complex subunit 4, COG complex subunit 4 (Component of oligomeric Golgi complex 4) |
| Q99KF1 | TMED9_MOUSE | Tmed9 | Transmembrane emp24 domain-containing protein 9 (Glycoprotein 25L2) (p24 family protein alpha-2, p24alpha2) |
| Q7TMI3 | UHRF2_MOUSE | Uhrf2 | E3 ubiquitin-protein ligase UHRF2, EC 2.3.2.27 (NIRF) (Np95-like ring finger protein) (Nuclear protein 97) (Nuclear zinc finger protein Np97) (RING-type E3 ubiquitin transferase UHRF2) (Ubiquitin-like PHD and RING finger domain-containing protein 2) (Ubiquitin-like-containing PHD and RING finger domains protein 2) |
| Q3TCH7 | CUL4A_MOUSE | Cul4a | Cullin-4A, CUL-4A |

| | | | |
|--------|-------------|---------|---|
| O35343 | IMA3_MOUSE | Kpna4 | Importin subunit alpha-3 (Importin alpha Q1, Qip1) (Karyopherin subunit alpha-4) |
| Q8K3C3 | LZIC_MOUSE | Lzic | Protein LZIC (Leucine zipper and CTNNBIP1 domain-containing protein) (Leucine zipper and ICAT homologous domain-containing protein) |
| Q9D061 | ACBD6_MOUSE | Acbd6 | Acyl-CoA-binding domain-containing protein 6 |
| Q925N0 | SFXN5_MOUSE | Sfxn5 | Sideroflexin-5 |
| Q91Z38 | TTC1_MOUSE | Ttc1 | Tetratricopeptide repeat protein 1, TPR repeat protein 1 |
| Q7TQI3 | OTUB1_MOUSE | Otub1 | Ubiquitin thioesterase OTUB1, EC 3.4.19.12 (Deubiquitinating enzyme OTUB1) (OTU domain-containing ubiquitin aldehyde-binding protein 1) (Otubain-1) (Ubiquitin-specific-processing protease OTUB1) |
| P70392 | RGRF2_MOUSE | Rasgrf2 | Ras-specific guanine nucleotide-releasing factor 2, Ras-GRF2 (Ras guanine nucleotide exchange factor 2) |
| P56375 | ACYP2_MOUSE | Acyp2 | Acylphosphatase-2, EC 3.6.1.7 (Acylphosphatase, muscle type isozyme) (Acylphosphate phosphohydrolase 2) |
| P16332 | MUTA_MOUSE | Mmut | Methylmalonyl-CoA mutase, mitochondrial, MCM, EC 5.4.99.2 (Methylmalonyl-CoA isomerase) |
| Q91WT4 | DJC17_MOUSE | Dnajc17 | DnaJ homolog subfamily C member 17 |
| P97355 | SPSY_MOUSE | Sms | Spermine synthase, SPMSY, EC 2.5.1.22 (Spermidine aminopropyltransferase) |
| Q91W97 | HKDC1_MOUSE | Hkdc1 | Hexokinase HKDC1, EC 2.7.1.1 (Hexokinase domain-containing protein 1) |
| P62823 | RAB3C_MOUSE | Rab3c | Ras-related protein Rab-3C |
| Q6PFY1 | FCSD1_MOUSE | Fchsdl | F-BAR and double SH3 domains protein 1 (Protein nervous wreck 2, NWK2) |
| Q6IQX8 | ZN219_MOUSE | Znf219 | Zinc finger protein 219 |
| Q91W90 | TXND5_MOUSE | Txndc5 | Thioredoxin domain-containing protein 5, EC 1.8.4.-, EC 5.3.4.1 (Endoplasmic reticulum resident protein 46, ER protein 46, ERp46) (Plasma cell-specific thioredoxin-related protein, PC-TRP) (Thioredoxin-like protein p46) |
| D3Z7P3 | GLSK_MOUSE | Gls | Glutaminase kidney isoform, mitochondrial, GLS, EC 3.5.1.2 [Cleaved into: Glutaminase kidney isoform, mitochondrial 68 kDa chain; Glutaminase kidney isoform, mitochondrial 65 kDa chain] |
| Q9JLB0 | PALS2_MOUSE | Pals2 | Protein PALS2 (Dlgh4 protein) (MAGUK p55 subfamily member 6) (P55T protein) (Protein associated with Lin-7 2) |
| Q8K1H1 | TDRD7_MOUSE | Tdrd7 | Tudor domain-containing protein 7 (PCTAIRE2-binding protein) (Tudor repeat associator with PCTAIRE-2, Trap) |

| | | | |
|--------|-------------|---------|--|
| Q8BK63 | KC1A_MOUSE | Csnk1a1 | Casein kinase I isoform alpha, CKI-alpha, EC 2.7.11.1 (CK1) |
| Q9CSN1 | SNW1_MOUSE | Snw1 | SNW domain-containing protein 1 (Nuclear protein SkiP) (Ski-interacting protein) |
| Q80X95 | RRAGA_MOUSE | Rraga | Ras-related GTP-binding protein A, Rag A, RagA, EC 3.6.5.- |
| A2A432 | CUL4B_MOUSE | Cul4b | Cullin-4B, CUL-4B |
| Q7TQF7 | AMPH_MOUSE | Amph | Amphiphysin |
| P58269 | DPF3_MOUSE | Dpf3 | Zinc finger protein DPF3 (BRG1-associated factor 45C, BAF45C) (Zinc finger protein cer-d4) |
| Q9D172 | GAL3A_MOUSE | Gatd3 | Glutamine amidotransferase-like class 1 domain-containing protein 3, mitochondrial |
| P27659 | RL3_MOUSE | Rpl3 | 60S ribosomal protein L3 (J1 protein) |
| P55937 | GOGA3_MOUSE | Golga3 | Golgin subfamily A member 3 (Golgin-160) (Male-enhanced antigen 2, MEA-2) |
| P97760 | RPB3_MOUSE | Polr2c | DNA-directed RNA polymerase II subunit RPB3, RNA polymerase II subunit 3, RNA polymerase II subunit B3 (DNA-directed RNA polymerase II 33 kDa polypeptide, RPB33) (DNA-directed RNA polymerase II subunit C) (RPB31) |
| Q00915 | RET1_MOUSE | Rbp1 | Retinol-binding protein 1 (Cellular retinol-binding protein, CRBP) (Cellular retinol-binding protein I, CRBP-I, mCRBPI) |
| P57746 | VATD_MOUSE | Atp6v1d | V-type proton ATPase subunit D, V-ATPase subunit D (V-ATPase 28 kDa accessory protein) (Vacuolar proton pump subunit D) |
| Q9CYG7 | TOM34_MOUSE | Tomm34 | Mitochondrial import receptor subunit TOM34 (Translocase of outer membrane 34 kDa subunit) |
| Q9CQM9 | GLRX3_MOUSE | Glr3 | Glutaredoxin-3 (PKC-interacting cousin of thioredoxin, PICOT) (PKC-theta-interacting protein, PKCq-interacting protein) (Thioredoxin-like protein 2) |
| Q99JR8 | SMRD2_MOUSE | Smarcd2 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily D member 2 (60 kDa BRG-1/Brm-associated factor subunit B) (BRG1-associated factor 60B, BAF60B) |
| P31648 | SC6A1_MOUSE | Slc6a1 | Sodium- and chloride-dependent GABA transporter 1, GAT-1 (Solute carrier family 6 member 1) |
| P28741 | KIF3A_MOUSE | Kif3a | Kinesin-like protein KIF3A (Microtubule plus end-directed kinesin motor 3A) |
| Q9CWW7 | CXXC1_MOUSE | Cxxc1 | CXXC-type zinc finger protein 1 (CpG-binding protein) (PHD finger and CXXC domain-containing protein 1) |
| O08917 | FLOT1_MOUSE | Flot1 | Flotillin-1 |
| B9EJA2 | CTTB2_MOUSE | Ctnbp2 | Cortactin-binding protein 2, CortBP2 |

| | | | |
|--------|-------------|---------|--|
| Q9Z2V5 | HDAC6_MOUSE | Hdac6 | Histone deacetylase 6, HD6, EC 3.5.1.98 (Histone deacetylase mHDA2) (Tubulin-lysine deacetylase HDAC6, EC 3.5.1.-) |
| Q8R3Z5 | CACB1_MOUSE | Cacnb1 | Voltage-dependent L-type calcium channel subunit beta-1, CAB1 (Calcium channel voltage-dependent subunit beta 1) |
| P45376 | ALDR_MOUSE | Akr1b1 | Aldo-keto reductase family 1 member B1, EC 1.1.1.300, EC 1.1.1.372, EC 1.1.1.54 (Aldehyde reductase) (Aldo-keto reductase family 1 member B3) (Aldose reductase, AR, EC 1.1.1.21) |
| A2AHC3 | CAMP1_MOUSE | Camsap1 | Calmodulin-regulated spectrin-associated protein 1 |
| P62751 | RL23A_MOUSE | Rpl23a | 60S ribosomal protein L23a |
| O55013 | TPPC3_MOUSE | Trappc3 | Trafficking protein particle complex subunit 3 (BET3 homolog) |
| Q9QZQ1 | AFAD_MOUSE | Afdn | Afadin (Afadin adherens junction formation factor) (Protein Af-6) |
| Q8CFS6 | KCNV2_MOUSE | Kcnv2 | Potassium voltage-gated channel subfamily V member 2 (Voltage-gated potassium channel subunit Kv8.2) |
| Q9ESK9 | RBCC1_MOUSE | Rb1cc1 | RB1-inducible coiled-coil protein 1 (Coiled-coil-forming protein 1) (FAK family kinase-interacting protein of 200 kDa, FIP200) (LaXp180) |
| Q9ERE7 | MESD_MOUSE | Mesd | LRP chaperone MESD (LDLR chaperone MESD) (Mesoderm development candidate 2) (Mesoderm development protein) |
| Q9CZH7 | MXRA7_MOUSE | Mxra7 | Matrix-remodeling-associated protein 7 |
| Q62318 | TIF1B_MOUSE | Trim28 | Transcription intermediary factor 1-beta, TIF1-beta (E3 SUMO-protein ligase TRIM28, EC 2.3.2.27) (KRAB-A-interacting protein) (KRIP-1) (RING-type E3 ubiquitin transferase TIF1-beta) (Tripartite motif-containing protein 28) |
| Q5U458 | DJC11_MOUSE | Dnajc11 | DnaJ homolog subfamily C member 11 |
| P56213 | ALR_MOUSE | Gfer | FAD-linked sulfhydryl oxidase ALR, EC 1.8.3.2 (Augmenter of liver regeneration) |
| Q9WUM3 | COR1B_MOUSE | Coro1b | Coronin-1B (Coronin-2) |
| E9Q4N7 | ARI1B_MOUSE | Arid1b | AT-rich interactive domain-containing protein 1B, ARID domain-containing protein 1B (BRG1-associated factor 250b, BAF250B) |
| Q99LH1 | NOG2_MOUSE | Gnl2 | Nucleolar GTP-binding protein 2 |
| Q8C0J2 | A16L1_MOUSE | Atg16l1 | Autophagy-related protein 16-1 (APG16-like 1) |
| Q9R1K9 | CETN2_MOUSE | Cetn2 | Centrin-2 (Caltractin isoform 1) |
| Q8CAK3 | SHFL_MOUSE | Shfl | Shiftless antiviral inhibitor of ribosomal frameshifting protein homolog, SHFL (Repressor of yield of DENV protein homolog, RyDEN) |

| | | | |
|--------|-------------|---------|---|
| Q64521 | GPDM_MOUSE | Gpd2 | Glycerol-3-phosphate dehydrogenase, mitochondrial, GPD-M, GPDH-M, EC 1.1.5.3 (Protein TISP38) |
| P45952 | ACADM_MOUSE | Acadm | Medium-chain specific acyl-CoA dehydrogenase, mitochondrial, MCAD, EC 1.3.8.7 |
| Q60675 | LAMA2_MOUSE | Lama2 | Laminin subunit alpha-2 (Laminin M chain) (Laminin-12 subunit alpha) (Laminin-2 subunit alpha) (Laminin-4 subunit alpha) (Merosin heavy chain) |
| O55201 | SPT5H_MOUSE | Supt5h | Transcription elongation factor SPT5 (DRB sensitivity-inducing factor large subunit, DSIF large subunit) |
| P57780 | ACTN4_MOUSE | Actn4 | Alpha-actinin-4 (Non-muscle alpha-actinin 4) |
| P49615 | CDK5_MOUSE | Cdk5 | Cyclin-dependent kinase 5, EC 2.7.11.1 (Cell division protein kinase 5) (Cyclin-dependent-like kinase 5) (Serine/threonine-protein kinase PSSALRE) (Tau protein kinase II catalytic subunit, TPKII catalytic subunit) |
| O70299 | MB211_MOUSE | Mab2111 | Putative nucleotidyltransferase MAB21L1, EC 2.7.7.- (Protein mab-21-like 1) |
| Q06335 | APLP2_MOUSE | Aplp2 | Amyloid beta precursor like protein 2 (Amyloid beta (A4) precursor-like protein 2) (Amyloid protein homolog) (Amyloid-like protein 2, APLP-2) (CDEI box-binding protein, CDEBP) (Sperm membrane protein YWK-II) |
| Q8C547 | HTR5B_MOUSE | Heatr5b | HEAT repeat-containing protein 5B |
| Q3UIL6 | PKHA7_MOUSE | Plekha7 | Pleckstrin homology domain-containing family A member 7, PH domain-containing family A member 7 (Heart adapter protein 1) |
| Q9WUT3 | KS6A2_MOUSE | Rps6ka2 | Ribosomal protein S6 kinase alpha-2, S6K-alpha-2, EC 2.7.11.1 (90 kDa ribosomal protein S6 kinase 2, p90-RSK 2, p90RSK2) (MAP kinase-activated protein kinase 1c, MAPK-activated protein kinase 1c, MAPKAP kinase 1c, MAPKAPK-1c) (Protein-tyrosine kinase Mpk-9) (Ribosomal S6 kinase 3, RSK-3) (pp90RSK3) |
| P67984 | RL22_MOUSE | Rpl22 | 60S ribosomal protein L22 (Heparin-binding protein HBp15) |
| O35465 | FKBP8_MOUSE | Fkbp8 | Peptidyl-prolyl cis-trans isomerase FKBP8, PPIase FKBP8, EC 5.2.1.8 (38 kDa FK506-binding protein, 38 kDa FKBP, FKBP-38, mFKBP38) (FK506-binding protein 8, FKBP-8) (FKBPR38) (Rotamase) |
| Q922B1 | MACD1_MOUSE | MacroD1 | ADP-ribose glycohydrolase MACROD1 (MACRO domain-containing protein 1) (O-acetyl-ADP-ribose deacetylase MACROD1, EC 3.1.1.106) (Protein LRP16) ([Protein ADP-ribosylaspartate] hydrolase MACROD1, EC 3.2.2.-) ([Protein ADP-ribosylglutamate] hydrolase MACROD1, EC 3.2.2.-) |
| P10126 | EF1A1_MOUSE | Eef1a1 | Elongation factor 1-alpha 1, EF-1-alpha-1 (Elongation factor Tu, EF-Tu) (Eukaryotic elongation factor 1 A-1, eEF1A-1) |

| | | | |
|--------|-------------|---------|--|
| P60335 | PCBP1_MOUSE | Pcbp1 | Poly(rC)-binding protein 1 (Alpha-CP1) (Heterogeneous nuclear ribonucleoprotein E1, hnRNP E1) |
| Q61425 | HCDH_MOUSE | Hadh | Hydroxyacyl-coenzyme A dehydrogenase, mitochondrial, HCDH, EC 1.1.1.35 (Medium and short-chain L-3-hydroxyacyl-coenzyme A dehydrogenase) (Short-chain 3-hydroxyacyl-CoA dehydrogenase) |
| Q80WJ7 | LYRIC_MOUSE | Mtdh | Protein LYRIC (3D3/LYRIC) (Lysine-rich CEACAM1 co-isolated protein) (Metadherin) (Metastasis adhesion protein) |
| P19157 | GSTP1_MOUSE | Gstp1 | Glutathione S-transferase P 1, Gst P1, EC 2.5.1.18 (GST YF-YF) (GST class-pi) (GST-piB) (Preadipocyte growth factor) |
| Q9DCT1 | AKCL2_MOUSE | Akr1e2 | 1,5-anhydro-D-fructose reductase, AF reductase, EC 1.1.1.263 (Aldo-keto reductase family 1 member C-like protein 2) (Aldo-keto reductase family 1 member E1) (Aldo-keto reductase family 1 member E2) |
| Q9EPL8 | IPO7_MOUSE | Ipo7 | Importin-7, Imp7 (Ran-binding protein 7, RanBP7) |
| Q9CQD1 | RAB5A_MOUSE | Rab5a | Ras-related protein Rab-5A, EC 3.6.5.2 |
| P25444 | RS2_MOUSE | Rps2 | 40S ribosomal protein S2 (40S ribosomal protein S4) (Protein LLRep3) |
| O35887 | CALU_MOUSE | Calu | Calumenin (Crocabin) |
| Q61187 | TS101_MOUSE | Tsg101 | Tumor susceptibility gene 101 protein (ESCRT-I complex subunit TSG101) |
| P10639 | THIO_MOUSE | Txn | Thioredoxin, Trx (ATL-derived factor, ADF) |
| P26039 | TLN1_MOUSE | Tln1 | Talin-1 |
| Q9WTX6 | CUL1_MOUSE | Cul1 | Cullin-1, CUL-1 |
| P97855 | G3BP1_MOUSE | G3bp1 | Ras GTPase-activating protein-binding protein 1, G3BP-1, EC 3.6.4.12, EC 3.6.4.13 (ATP-dependent DNA helicase VIII) (GAP SH3 domain-binding protein 1) (HDH-VIII) |
| Q99PT1 | GDIR1_MOUSE | Arhgdia | Rho GDP-dissociation inhibitor 1, Rho GDI 1 (GDI-1) (Rho-GDI alpha) |
| Q8R0A0 | T2FB_MOUSE | Gtf2f2 | General transcription factor IIF subunit 2 (Transcription initiation factor IIF subunit beta, TFIIF-beta) |
| Q6KCD5 | NIPBL_MOUSE | Nipbl | Nipped-B-like protein (Delangin homolog) (SCC2 homolog) |
| Q8BU30 | SYIC_MOUSE | Iars1 | Isoleucine--tRNA ligase, cytoplasmic, EC 6.1.1.5 (Isoleucyl-tRNA synthetase, IRS, IleRS) |
| Q9DCP2 | S38A3_MOUSE | Slc38a3 | Sodium-coupled neutral amino acid transporter 3 (N-system amino acid transporter 1) (Na(+)-coupled neutral amino acid transporter 3) (Solute carrier family 38 member 3, mNAT) (System N amino acid transporter 1) |

| | | | |
|--------|-------------|---------|--|
| Q9DAW6 | PRP4_MOUSE | Prpf4 | U4/U6 small nuclear ribonucleoprotein Prp4 (U4/U6 snRNP 60 kDa protein) (WD splicing factor Prp4) |
| Q91VL8 | TE2IP_MOUSE | Terf2ip | Telomeric repeat-binding factor 2-interacting protein 1, TERF2-interacting telomeric protein 1, TRF2-interacting telomeric protein 1 (Repressor/activator protein 1 homolog, RAP1 homolog) |
| Q5F2E8 | TAOK1_MOUSE | Taok1 | Serine/threonine-protein kinase TAO1, EC 2.7.11.1 (Thousand and one amino acid protein 1) |
| Q91XM9 | DLG2_MOUSE | Dlg2 | Disks large homolog 2 (Channel-associated protein of synapse-110, Chapsyn-110) (Postsynaptic density protein PSD-93) |
| Q9DB50 | AP1S2_MOUSE | Ap1s2 | AP-1 complex subunit sigma-2 (Adaptor protein complex AP-1 subunit sigma-1B) (Adaptor-related protein complex 1 subunit sigma-1B) (Clathrin assembly protein complex 1 sigma-1B small chain) (Golgi adaptor HA1/AP1 adaptin sigma-1B subunit) (Sigma 1B subunit of AP-1 clathrin) (Sigma-adaptin 1B) (Sigma1B-adaptin) |
| Q9JHS9 | CWC15_MOUSE | Cwc15 | Spliceosome-associated protein CWC15 homolog (Embryonic development factor 1, mED1) |
| Q99K46 | UBP11_MOUSE | Usp11 | Ubiquitin carboxyl-terminal hydrolase 11, EC 3.4.19.12 (Deubiquitinating enzyme 11) (Ubiquitin thioesterase 11) (Ubiquitin-specific-processing protease 11) |
| Q9JHS4 | CLPX_MOUSE | Clpx | ATP-dependent Clp protease ATP-binding subunit clpX-like, mitochondrial |
| Q80X41 | VRK1_MOUSE | Vrk1 | Serine/threonine-protein kinase VRK1, EC 2.7.11.1 (Serine/threonine-protein kinase 51PK) (Vaccinia-related kinase 1) |
| P41105 | RL28_MOUSE | Rpl28 | 60S ribosomal protein L28 |
| P16254 | SRP14_MOUSE | Srp14 | Signal recognition particle 14 kDa protein, SRP14 |
| P32020 | SCP2_MOUSE | Scp2 | Sterol carrier protein 2, SCP-2 (Acetyl-CoA C-myristoyltransferase, EC 2.3.1.155) (Non-specific lipid-transfer protein, NSL-TP) (Propanoyl-CoA C-acyltransferase, EC 2.3.1.176) (SCP-2/3-oxoacyl-CoA thiolase) (SCP-2/thiolase, EC 2.3.1.16) (SCP-chi) (Sterol carrier protein X, SCP-X) |
| Q6P8I4 | PCNP_MOUSE | Pcnp | PEST proteolytic signal-containing nuclear protein, PCNP, PEST-containing nuclear protein |
| Q5SUR0 | PUR4_MOUSE | Pfas | Phosphoribosylformylglycinamide synthase, FGAM synthase, FGAMS, EC 6.3.5.3 (Formylglycinamide ribonucleotide amidotransferase, FGAR amidotransferase, FGAR-AT) (Formylglycinamide ribotide amidotransferase) |
| Q9EQ80 | NIF3L_MOUSE | Nif3l1 | NIF3-like protein 1 |

| | | | |
|--------|-------------|----------|--|
| P42859 | HD_MOUSE | Htt | Huntingtin (Huntington disease protein homolog, HD protein homolog) [Cleaved into: Huntingtin, myristoylated N-terminal fragment] |
| P61089 | UBE2N_MOUSE | Ube2n | Ubiquitin-conjugating enzyme E2 N, EC 2.3.2.23 (Bendless-like ubiquitin-conjugating enzyme) (E2 ubiquitin-conjugating enzyme N) (Ubc13) (Ubiquitin carrier protein N) (Ubiquitin-protein ligase N) |
| Q9D1P4 | CHRD1_MOUSE | Chordc1 | Cysteine and histidine-rich domain-containing protein 1 (CHORD domain-containing protein 1, CHORD-containing protein 1, Chp-1) (Protein morgana) |
| E9Q3L2 | PI4KA_MOUSE | Pi4ka | Phosphatidylinositol 4-kinase alpha, PI4-kinase alpha, PI4K-alpha, PtdIns-4-kinase alpha, EC 2.7.1.67 |
| P54731 | FAF1_MOUSE | Faf1 | FAS-associated factor 1 |
| Q80W04 | TMCC2_MOUSE | Tmcc2 | Transmembrane and coiled-coil domains protein 2 |
| Q91Z67 | SRGP2_MOUSE | Srgap2 | SLIT-ROBO Rho GTPase-activating protein 2, srGAP2 (Formin-binding protein 2) (Formin-binding protein 27, FBP-27) |
| Q99J62 | RFC4_MOUSE | Rfc4 | Replication factor C subunit 4 (Activator 1 subunit 4) |
| P97386 | DNLI3_MOUSE | Lig3 | DNA ligase 3, EC 6.5.1.1 (DNA ligase III) (Polydeoxyribonucleotide synthase [ATP] 3) |
| Q6IFX2 | K1C42_MOUSE | Krt42 | Keratin, type I cytoskeletal 42 (Cytokeratin-42, CK-42) (Keratin-17n) (Keratin-42, K42) (Type I keratin Ka22) |
| Q9QXL2 | KI21A_MOUSE | Kif21a | Kinesin-like protein KIF21A |
| O88544 | CSN4_MOUSE | Cops4 | COP9 signalosome complex subunit 4, SGN4, Signalosome subunit 4 (JAB1-containing signalosome subunit 4) |
| Q91YP0 | L2HDH_MOUSE | L2hgdh | L-2-hydroxyglutarate dehydrogenase, mitochondrial, EC 1.1.99.2 (Duranin) |
| Q91W50 | CSDE1_MOUSE | Csde1 | Cold shock domain-containing protein E1 |
| P70195 | PSB7_MOUSE | Psmb7 | Proteasome subunit beta type-7, EC 3.4.25.1 (Macropain chain Z) (Multicatalytic endopeptidase complex chain Z) (Proteasome subunit Z) |
| Q60692 | PSB6_MOUSE | Psmb6 | Proteasome subunit beta type-6, EC 3.4.25.1 (Low molecular mass protein 19) (Macropain delta chain) (Multicatalytic endopeptidase complex delta chain) (Proteasome delta chain) (Proteasome subunit Y) |
| Q6PGC1 | DHX29_MOUSE | Dhx29 | ATP-dependent RNA helicase DHX29, EC 3.6.4.13 (DEAH box protein 29) |
| Q8VE88 | F1142_MOUSE | Fam114a2 | Protein FAM114A2 |
| Q80TL4 | PHF24_MOUSE | Phf24 | PHD finger protein 24 |

| | | | |
|--------|-------------|--------|--|
| Q3TIV5 | ZC3HF_MOUSE | Zc3h15 | Zinc finger CCCH domain-containing protein 15 (DRG family-regulatory protein 1) (Epo-immediate response gene protein FM22) |
| Q80SY6 | ADAL_MOUSE | Adal | Adenosine deaminase-like protein, EC 3.5.4.- |
| Q9D2N4 | DTNA_MOUSE | Dtna | Dystrobrevin alpha, DTN-A (Alpha-dystrobrevin) |
| Q3TLH4 | PRC2C_MOUSE | Prrc2c | Protein PRRC2C (BAT2 domain-containing protein 1) (HLA-B-associated transcript 2-like 2) (Proline-rich and coiled-coil-containing protein 2C) |
| Q99LF4 | RTCB_MOUSE | Rtcb | RNA-splicing ligase RtcB homolog, EC 6.5.1.8 (3'-phosphate/5'-hydroxy nucleic acid ligase) (Focal adhesion-associated protein, FAAP) |
| Q3TIR3 | RIC8A_MOUSE | Ric8a | Synembryn-A (Protein Ric-8A) |
| Q91V41 | RAB14_MOUSE | Rab14 | Ras-related protein Rab-14 |
| O88448 | KLC2_MOUSE | Klc2 | Kinesin light chain 2, KLC 2 |
| Q9Z273 | TULP1_MOUSE | Tulp1 | Tubby-related protein 1 (Tubby-like protein 1) |
| Q80X80 | C2C2L_MOUSE | C2cd2l | Phospholipid transfer protein C2CD2L (C2 domain-containing protein 2-like) (Transmembrane protein 24) |
| P62702 | RS4X_MOUSE | Rps4x | 40S ribosomal protein S4, X isoform |
| P19426 | NELFE_MOUSE | Nelfe | Negative elongation factor E, NELF-E (RNA-binding protein RD) |
| O54828 | RGS9_MOUSE | Rgs9 | Regulator of G-protein signaling 9, RGS9 |
| Q8BZR9 | NCBP3_MOUSE | Ncbp3 | Nuclear cap-binding protein subunit 3 |
| O35129 | PHB2_MOUSE | Phb2 | Prohibitin-2 (B-cell receptor-associated protein BAP37) (Repressor of estrogen receptor activity) |
| Q64514 | TPP2_MOUSE | Tpp2 | Tripeptidyl-peptidase 2, TPP-2, EC 3.4.14.10 (Tripeptidyl aminopeptidase) (Tripeptidyl-peptidase II, TPP-II) |
| Q6PH08 | ERC2_MOUSE | Erc2 | ERC protein 2 (CAZ-associated structural protein 1, CAST1) |
| Q8C5H8 | NAKD2_MOUSE | Nadk2 | NAD kinase 2, mitochondrial, EC 2.7.1.23 (Mitochondrial NAD kinase) (NAD kinase domain-containing protein 1, mitochondrial) |
| Q9DBC3 | CMTR1_MOUSE | Cmtr1 | Cap-specific mRNA (nucleoside-2'-O-)-methyltransferase 1, EC 2.1.1.57 (Cap methyltransferase 1) (Cap1 2'O-ribose methyltransferase 1, MTr1) (FtsJ methyltransferase domain-containing protein 2) |
| Q62167 | DDX3X_MOUSE | Ddx3x | ATP-dependent RNA helicase DDX3X, EC 3.6.4.13 (D1Pas1-related sequence 2) (DEAD box RNA helicase DEAD3, mDEAD3) (DEAD box protein 3, X-chromosomal) (Embryonic RNA helicase) |

| | | | |
|--------|-------------|----------|---|
| P49722 | PSA2_MOUSE | Psm2 | Proteasome subunit alpha type-2 (Macropain subunit C3) (Multicatalytic endopeptidase complex subunit C3) (Proteasome component C3) |
| Q64727 | VINC_MOUSE | Vcl | Vinculin (Metavinculin) |
| Q9DAK9 | PHP14_MOUSE | Phpt1 | 14 kDa phosphohistidine phosphatase, EC 3.9.1.3 (Phosphohistidine phosphatase 1, PHPT1) (Protein histidine phosphatase, PHP) |
| Q9R0N0 | GALK1_MOUSE | Galk1 | Galactokinase, EC 2.7.1.6 (Galactose kinase) |
| Q8CH25 | SLTM_MOUSE | Sltm | SAFB-like transcription modulator (Modulator of estrogen-induced transcription) (SAF-like transcription modulator) |
| Q8CI32 | BAG5_MOUSE | Bag5 | BAG family molecular chaperone regulator 5, BAG-5 (Bcl-2-associated athanogene 5) |
| P47856 | GFPT1_MOUSE | Gfpt1 | Glutamine--fructose-6-phosphate aminotransferase [isomerizing] 1, EC 2.6.1.16 (D-fructose-6-phosphate amidotransferase 1) (Glutamine:fructose-6-phosphate amidotransferase 1, GFAT 1, GFAT1) (Hexosephosphate aminotransferase 1) |
| Q3UH60 | DIP2B_MOUSE | Dip2b | Disco-interacting protein 2 homolog B, DIP2 homolog B |
| B2RXS4 | PLXB2_MOUSE | Plxnb2 | Plexin-B2 |
| E9Q401 | RYR2_MOUSE | Ryr2 | Ryanodine receptor 2, RYR-2, RyR2 (Cardiac muscle ryanodine receptor) (Cardiac muscle ryanodine receptor-calcium release channel) (Type 2 ryanodine receptor) |
| Q91WE2 | PIP30_MOUSE | Psme3ip1 | PSME3-interacting protein (NEFA-interacting nuclear protein NIP30) (PA28G-interacting protein) |
| Q9EQF6 | DPYL5_MOUSE | Dpysl5 | Dihydropyrimidinase-related protein 5, DRP-5 (Collapsin response mediator protein 5, CRMP-5) |
| P43275 | H11_MOUSE | H1-1 | Histone H1.1 (H1 VAR.3) (Histone H1a, H1a) |
| Q3U0V1 | FUBP2_MOUSE | Khsrp | Far upstream element-binding protein 2, FUSE-binding protein 2 (KH type-splicing regulatory protein, KSRP) |
| Q99LI8 | HGS_MOUSE | Hgs | Hepatocyte growth factor-regulated tyrosine kinase substrate |
| P35486 | ODPA_MOUSE | Pdha1 | Pyruvate dehydrogenase E1 component subunit alpha, somatic form, mitochondrial, EC 1.2.4.1 (PDHE1-A type I) |
| P62918 | RL8_MOUSE | Rpl8 | 60S ribosomal protein L8 |
| Q9ER69 | FL2D_MOUSE | Wtap | Pre-mRNA-splicing regulator WTAP (Female-lethal(2)D homolog) (WT1-associated protein) (Wilms tumor 1-associating protein) |
| Q8BSQ9 | PB1_MOUSE | Pbrm1 | Protein polybromo-1 (BRG1-associated factor 180, BAF180) |

| | | | |
|--------|-------------|---------|--|
| Q9CR68 | UCRI_MOUSE | Uqcrfs1 | Cytochrome b-c1 complex subunit Rieske, mitochondrial, EC 7.1.1.8 (Complex III subunit 5) (Cytochrome b-c1 complex subunit 5) (Rieske iron-sulfur protein, RISP) (Rieske protein UQCRFS1) (Ubiquinol-cytochrome c reductase iron-sulfur subunit) [Cleaved into: Cytochrome b-c1 complex subunit 9, Su9, Subunit 9 (8 kDa subunit 9) (Complex III subunit IX) (Cytochrome b-c1 complex subunit 11) (UQCRFS1 mitochondrial targeting sequence, UQCRFS1 MTS) (Ubiquinol-cytochrome c reductase 8 kDa protein)] |
| Q8CH09 | SUGP2_MOUSE | Sugp2 | SURP and G-patch domain-containing protein 2 (Arginine/serine-rich-splicing factor 14) (Splicing factor, arginine/serine-rich 14) |
| O55128 | SAP18_MOUSE | Sap18 | Histone deacetylase complex subunit SAP18 (18 kDa Sin3-associated polypeptide) (Sin3-associated polypeptide p18) |
| Q8K2A1 | GULP1_MOUSE | Gulp1 | PTB domain-containing engulfment adapter protein 1 (Cell death protein 6 homolog) (PTB domain adapter protein CED-6) (Protein GULP) |
| Q8CFE2 | HPF1_MOUSE | Hpf1 | Histone PARylation factor 1 |
| Q80XH2 | IMPG2_MOUSE | Impg2 | Interphotoreceptor matrix proteoglycan 2 (Sialoprotein associated with cones and rods proteoglycan, Spacrcan) |
| P31324 | KAP3_MOUSE | Prkar2b | cAMP-dependent protein kinase type II-beta regulatory subunit |
| Q9Z2U1 | PSA5_MOUSE | Psm5 | Proteasome subunit alpha type-5 (Macropain zeta chain) (Multicatalytic endopeptidase complex zeta chain) (Proteasome zeta chain) |
| P56382 | ATP5E_MOUSE | Atp5f1e | ATP synthase subunit epsilon, mitochondrial, ATPase subunit epsilon (ATP synthase F1 subunit epsilon) |
| Q9QWY8 | ASAP1_MOUSE | Asap1 | Arf-GAP with SH3 domain, ANK repeat and PH domain-containing protein 1 (130 kDa phosphatidylinositol 4,5-bisphosphate-dependent ARF1 GTPase-activating protein) (ADP-ribosylation factor-directed GTPase-activating protein 1, ARF GTPase-activating protein 1) (Development and differentiation-enhancing factor 1, DEF-1, Differentiation-enhancing factor 1) (PIP2-dependent ARF1 GAP) |
| Q9DC69 | NDUA9_MOUSE | Ndufa9 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 9, mitochondrial (Complex I-39kD, CI-39kD) (NADH-ubiquinone oxidoreductase 39 kDa subunit) |
| Q9ES28 | ARHG7_MOUSE | Arhgef7 | Rho guanine nucleotide exchange factor 7 (Beta-Pix) (PAK-interacting exchange factor beta) (p85SPR) |
| Q9JHK4 | PGTA_MOUSE | Rabggta | Geranylgeranyl transferase type-2 subunit alpha, EC 2.5.1.60 (Geranylgeranyl transferase type II subunit alpha) (Rab geranyl-geranyltransferase subunit alpha, Rab |

| | | | |
|--------|-------------|---------|--|
| | | | GG transferase alpha, Rab GGTase alpha) (Rab geranylgeranyltransferase subunit alpha) |
| Q8R180 | ERO1A_MOUSE | Ero1a | ERO1-like protein alpha, ERO1-L, ERO1-L-alpha, EC 1.8.4.- (Endoplasmic reticulum oxidoreductase alpha) (Endoplasmic reticulum oxidoreductin-1-like protein) (Oxidoreductin-1-L-alpha) |
| Q60631 | GRB2_MOUSE | Grb2 | Growth factor receptor-bound protein 2 (Adapter protein GRB2) (SH2/SH3 adapter GRB2) |
| Q9JIG7 | CCD22_MOUSE | Ccdc22 | Coiled-coil domain-containing protein 22 |
| P48453 | PP2BB_MOUSE | Ppp3cb | Serine/threonine-protein phosphatase 2B catalytic subunit beta isoform, EC 3.1.3.16 (CAM-PRP catalytic subunit) (Calmodulin-dependent calcineurin A subunit beta isoform, CNA beta) |
| Q9CZ30 | OLA1_MOUSE | Ola1 | Obg-like ATPase 1 (GTP-binding protein 9) |
| P38647 | GRP75_MOUSE | Hspa9 | Stress-70 protein, mitochondrial (75 kDa glucose-regulated protein, GRP-75) (Heat shock 70 kDa protein 9) (Mortalin) (Peptide-binding protein 74, PBP74) (p66 MOT) |
| Q9CPX6 | ATG3_MOUSE | Atg3 | Ubiquitin-like-conjugating enzyme ATG3, EC 2.3.2.- (Autophagy-related protein 3, APG3-like) |
| P42567 | EPS15_MOUSE | Eps15 | Epidermal growth factor receptor substrate 15, Protein Eps15 (Protein AF-1p) |
| Q6NZC7 | S23IP_MOUSE | Sec23ip | SEC23-interacting protein |
| Q9WVQ1 | MAGI2_MOUSE | Magi2 | Membrane-associated guanylate kinase, WW and PDZ domain-containing protein 2 (Activin receptor-interacting protein 1, Acvrip1) (Atrophin-1-interacting protein 1, AIP-1) (Membrane-associated guanylate kinase inverted 2, MAGI-2) |
| B9EKR1 | PTPRZ_MOUSE | Ptprz1 | Receptor-type tyrosine-protein phosphatase zeta, R-PTP-zeta, EC 3.1.3.48 |
| Q8BKG3 | PTK7_MOUSE | Ptk7 | Inactive tyrosine-protein kinase 7 (Protein chuzhoi) (Protein-tyrosine kinase 7) (Pseudo tyrosine kinase receptor 7) (Tyrosine-protein kinase-like 7) |
| Q8BWW4 | LARP4_MOUSE | Larp4 | La-related protein 4 (La ribonucleoprotein domain family member 4) |
| Q6IRU2 | TPM4_MOUSE | Tpm4 | Tropomyosin alpha-4 chain (Tropomyosin-4) |
| Q80ZI6 | LRSM1_MOUSE | Lrsam1 | E3 ubiquitin-protein ligase LRSAM1, EC 2.3.2.27 (Leucine-rich repeat and sterile alpha motif-containing protein 1) (RING-type E3 ubiquitin transferase LRSAM1) (Tsg101-associated ligase) |
| P11531 | DMD_MOUSE | Dmd | Dystrophin |

| | | | |
|--------|-------------|--------|---|
| Q9CZW5 | TOM70_MOUSE | Tomm70 | Mitochondrial import receptor subunit TOM70 (Mitochondrial precursor proteins import receptor) (Translocase of outer membrane 70 kDa subunit) (Translocase of outer mitochondrial membrane protein 70) |
| P80313 | TCPH_MOUSE | Cct7 | T-complex protein 1 subunit eta, TCP-1-eta (CCT-eta) |
| Q91ZU6 | DYST_MOUSE | Dst | Dystonin (Bullous pemphigoid antigen 1, BPA) (Dystonia musculorum protein) (Hemidesmosomal plaque protein) (Microtubule actin cross-linking factor 2) |
| P47738 | ALDH2_MOUSE | Aldh2 | Aldehyde dehydrogenase, mitochondrial, EC 1.2.1.3 (AHD-M1) (ALDH class 2) (ALDH-E2) (ALDHI) |
| Q6ZWQ0 | SYNE2_MOUSE | Syne2 | Nesprin-2 (KASH domain-containing protein 2, KASH2) (Nuclear envelope spectrin repeat protein 2) (Nucleus and actin connecting element protein, Protein NUANCE) (Synaptic nuclear envelope protein 2, Syne-2) |
| Q91VD9 | NDUS1_MOUSE | Ndufs1 | NADH-ubiquinone oxidoreductase 75 kDa subunit, mitochondrial, EC 7.1.1.2 (Complex I-75kD, CI-75kD) |
| Q9ERG0 | LIMA1_MOUSE | Lima1 | LIM domain and actin-binding protein 1 (Epithelial protein lost in neoplasm, mEPLIN) |
| P61759 | PFD3_MOUSE | Vbp1 | Prefoldin subunit 3 (von Hippel-Lindau-binding protein 1, VBP-1, VHL-binding protein 1) |
| P62317 | SMD2_MOUSE | Snrpd2 | Small nuclear ribonucleoprotein Sm D2, Sm-D2 (snRNP core protein D2) |
| P24622 | CRYAA_MOUSE | Cryaa | Alpha-crystallin A chain |
| Q8CHP5 | PYM1_MOUSE | Pym1 | Partner of Y14 and mago (PYM homolog 1 exon junction complex-associated factor) (Protein wibg homolog) |
| O88271 | CFDP1_MOUSE | Cfdp1 | Craniofacial development protein 1 (27 kDa craniofacial protein) (Bucentaur) (Protein Cp27) |
| Q91ZX7 | LRP1_MOUSE | Lrp1 | Pro-low-density lipoprotein receptor-related protein 1, LRP-1 (Alpha-2-macroglobulin receptor, A2MR) (CD antigen CD91) [Cleaved into: Low-density lipoprotein receptor-related protein 1 85 kDa subunit, LRP-85; Low-density lipoprotein receptor-related protein 1 515 kDa subunit, LRP-515; Low-density lipoprotein receptor-related protein 1 intracellular domain, LRPICD] |
| O35136 | NCAM2_MOUSE | Ncam2 | Neural cell adhesion molecule 2, N-CAM-2, NCAM-2 (Neural cell adhesion molecule RB-8) (R4B12) |
| Q91VN4 | MIC25_MOUSE | Chchd6 | MICOS complex subunit Mic25 (Coiled-coil-helix-coiled-coil-helix domain-containing protein 6) |
| Q8K0T0 | RTN1_MOUSE | Rtn1 | Reticulon-1 (Neuroendocrine-specific protein) |

| | | | |
|--------|-------------|---------|---|
| Q3U186 | SYRM_MOUSE | Rars2 | Probable arginine--tRNA ligase, mitochondrial, EC 6.1.1.19 (Arginyl-tRNA synthetase, ArgRS) |
| Q9JHR7 | IDE_MOUSE | Ide | Insulin-degrading enzyme, EC 3.4.24.56 (Insulin protease, Insulinase) (Insulysin) |
| Q06180 | PTN2_MOUSE | Ptpn2 | Tyrosine-protein phosphatase non-receptor type 2, Protein-tyrosine phosphatase PTP-2, EC 3.1.3.48 (MPTP) |
| P23506 | PIMT_MOUSE | Pcmt1 | Protein-L-isoaspartate(D-aspartate) O-methyltransferase, PIMT, EC 2.1.1.77 (L-isoaspartyl protein carboxyl methyltransferase) (Protein L-isoaspartyl/D-aspartyl methyltransferase) (Protein-beta-aspartate methyltransferase) |
| Q3TTY5 | K22E_MOUSE | Krt2 | Keratin, type II cytoskeletal 2 epidermal (Cytokeratin-2e, CK-2e) (Epithelial keratin-2e) (Keratin-2 epidermis) (Keratin-2e, K2e) (Type-II keratin Kb2) |
| Q6NZM9 | HDAC4_MOUSE | Hdac4 | Histone deacetylase 4, HD4, EC 3.5.1.98 |
| P62492 | RB11A_MOUSE | Rab11a | Ras-related protein Rab-11A, Rab-11, EC 3.6.5.2 |
| Q9R1C7 | PR40A_MOUSE | Prpf40a | Pre-mRNA-processing factor 40 homolog A (Formin-binding protein 11, FBP-11) (Formin-binding protein 3) |
| P62334 | PRS10_MOUSE | Psmc6 | 26S proteasome regulatory subunit 10B (26S proteasome AAA-ATPase subunit RPT4) (Proteasome 26S subunit ATPase 6) (Proteasome subunit p42) |
| P97798 | NEO1_MOUSE | Neo1 | Neogenin |
| Q9D1J3 | SARNP_MOUSE | Sarnp | SAP domain-containing ribonucleoprotein (Nuclear protein Hcc-1) |
| Q8VE37 | RCC1_MOUSE | Rcc1 | Regulator of chromosome condensation (Chromosome condensation protein 1) |
| Q9JLN9 | MTOR_MOUSE | Mtor | Serine/threonine-protein kinase mTOR, EC 2.7.11.1 (FK506-binding protein 12-rapamycin complex-associated protein 1) (FKBP12-rapamycin complex-associated protein) (Mammalian target of rapamycin, mTOR) (Mechanistic target of rapamycin) (Rapamycin target protein 1, RAPT1) |
| O08638 | MYH11_MOUSE | Myh11 | Myosin-11 (Myosin heavy chain 11) (Myosin heavy chain, smooth muscle isoform) (SMMHC) |
| Q7TNV0 | DEK_MOUSE | Dek | Protein DEK |
| P20108 | PRDX3_MOUSE | Prdx3 | Thioredoxin-dependent peroxide reductase, mitochondrial, EC 1.11.1.24 (Antioxidant protein 1, AOP-1) (PRX III) (Perioredoxin-3) (Protein MER5) (Thioredoxin-dependent peroxiredoxin 3) |
| Q9DBJ1 | PGAM1_MOUSE | Pgam1 | Phosphoglycerate mutase 1, EC 5.4.2.11, EC 5.4.2.4 (BPG-dependent PGAM 1) (Phosphoglycerate mutase isozyme B, PGAM-B) |

| | | | |
|--------|-------------|----------|---|
| Q6PFR5 | TRA2A_MOUSE | Tra2a | Transformer-2 protein homolog alpha, TRA-2 alpha, TRA2-alpha (Transformer-2 protein homolog A) |
| Q8C4Y3 | NELFB_MOUSE | Nelfb | Negative elongation factor B, NELF-B (Cofactor of BRCA1) |
| Q6NZJ6 | IF4G1_MOUSE | Eif4g1 | Eukaryotic translation initiation factor 4 gamma 1, eIF-4-gamma 1, eIF-4G 1, eIF-4G1 |
| Q91VT4 | CBR4_MOUSE | Cbr4 | 3-oxoacyl-[acyl-carrier-protein] reductase, EC 1.1.1.100 (3-ketoacyl-[acyl-carrier-protein] reductase beta subunit, KAR beta subunit) (Carbonyl reductase family member 4, CBR4) (Quinone reductase CBR4, EC 1.6.5.10) |
| Q8R570 | SNP47_MOUSE | Snap47 | Synaptosomal-associated protein 47, SNAP-47 (Synaptosomal-associated 47 kDa protein) |
| Q64105 | SPRE_MOUSE | Spr | Sepiapterin reductase, SPR, EC 1.1.1.153 |
| O54990 | PROM1_MOUSE | Prom1 | Prominin-1 (Antigen AC133 homolog) (Prominin-like protein 1) (CD antigen CD133) |
| Q6PDG5 | SMRC2_MOUSE | Smarcc2 | SWI/SNF complex subunit SMARCC2 (BRG1-associated factor 170, BAF170) (SWI/SNF complex 170 kDa subunit) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily C member 2) |
| Q8K284 | TF3C1_MOUSE | Gtf3c1 | General transcription factor 3C polypeptide 1 (TF3C-alpha) (TFIIIC box B-binding subunit) (Transcription factor IIIC 220 kDa subunit, TFIIC 220 kDa subunit, TFIIC220) (Transcription factor IIIC subunit alpha) |
| Q8R001 | MARE2_MOUSE | Mapre2 | Microtubule-associated protein RP/EB family member 2 (APC-binding protein EB2) (End-binding protein 2, EB2) |
| G5E870 | TRIPC_MOUSE | Trip12 | E3 ubiquitin-protein ligase TRIP12, EC 2.3.2.26 (HECT-type E3 ubiquitin transferase TRIP12) (Thyroid receptor-interacting protein 12, TR-interacting protein 12, TRIP-12) |
| Q6Y685 | TACC1_MOUSE | Tacc1 | Transforming acidic coiled-coil-containing protein 1 |
| P17563 | SBP1_MOUSE | Selenbp1 | Methanethiol oxidase, MTO, EC 1.8.3.4 (56 kDa selenium-binding protein, SBP56, SP56) (Selenium-binding protein 1) |
| P11103 | PARP1_MOUSE | Parp1 | Poly [ADP-ribose] polymerase 1, PARP-1, EC 2.4.2.30 (ADP-ribosyltransferase diphtheria toxin-like 1, ARTD1) (DNA ADP-ribosyltransferase PARP1, EC 2.4.2.-) (NAD(+) ADP-ribosyltransferase 1, ADPRT 1) (Poly[ADP-ribose] synthase 1, msPARP) (Protein poly-ADP-ribosyltransferase PARP1, EC 2.4.2.-) |
| Q9Z2H2 | RGS6_MOUSE | Rgs6 | Regulator of G-protein signaling 6, RGS6 |
| Q922Q9 | CHID1_MOUSE | Chid1 | Chitinase domain-containing protein 1 |

| | | | |
|--------|-------------|---------|---|
| B2RSH2 | GNAI1_MOUSE | Gnai1 | Guanine nucleotide-binding protein G(i) subunit alpha-1 (Adenylate cyclase-inhibiting G alpha protein) |
| Q9DAU1 | CNPY3_MOUSE | Cnpy3 | Protein canopy homolog 3 (Protein associated with Tlr4) (Trinucleotide repeat-containing gene 5 protein) |
| Q8BMJ3 | IF1AX_MOUSE | Eif1ax | Eukaryotic translation initiation factor 1A, X-chromosomal, eIF-1A X isoform (Eukaryotic translation initiation factor 4C, eIF-4C) |
| O08915 | AIP_MOUSE | Aip | AH receptor-interacting protein, AIP (Aryl-hydrocarbon receptor-interacting protein) |
| Q9QYE9 | PKHB1_MOUSE | Plekhb1 | Pleckstrin homology domain-containing family B member 1, PH domain-containing family B member 1 (Evectin-1) (PH domain-containing protein in retina 1, PHRET1) (Pleckstrin homology domain retinal protein 1) |
| P07356 | ANXA2_MOUSE | Anxa2 | Annexin A2 (Annexin II) (Annexin-2) (Calpactin I heavy chain) (Calpactin-1 heavy chain) (Chromobindin-8) (Lipocortin II) (Placental anticoagulant protein IV, PAP-IV) (Protein I) (p36) |
| O08848 | RO60_MOUSE | RO60 | RNA-binding protein Ro60 (60 kDa SS-A/Ro ribonucleoprotein, 60 kDa Ro protein, 60 kDa ribonucleoprotein Ro, RoRNP) (TROVE domain family member 2) |
| Q148V7 | RELCH_MOUSE | Relch | RAB11-binding protein RELCH (LisH domain and HEAT repeat-containing protein KIAA1468) (RAB11-binding protein containing LisH, coiled-coil, and HEAT repeats) |
| Q8BFU3 | RN214_MOUSE | Rnf214 | RING finger protein 214 |
| P70372 | ELAV1_MOUSE | Elavl1 | ELAV-like protein 1 (Elav-like generic protein) (Hu-antigen R, HuR) (MelG) |
| Q9R0P5 | DEST_MOUSE | Dstn | Destrin (Actin-depolymerizing factor, ADF) (Sid 23) |
| Q9CYI4 | LUC7L_MOUSE | Luc7l | Putative RNA-binding protein Luc7-like 1 |
| P14094 | AT1B1_MOUSE | Atp1b1 | Sodium/potassium-transporting ATPase subunit beta-1 (Sodium/potassium-dependent ATPase subunit beta-1) |
| P53994 | RAB2A_MOUSE | Rab2a | Ras-related protein Rab-2A, EC 3.6.5.2 |
| P99028 | QCR6_MOUSE | Uqcrh | Cytochrome b-c1 complex subunit 6, mitochondrial (Complex III subunit 6) (Complex III subunit VIII) (Cytochrome c1 non-heme 11 kDa protein) (Mitochondrial hinge protein) (Ubiquinol-cytochrome c reductase complex 11 kDa protein) |
| P23116 | EIF3A_MOUSE | Eif3a | Eukaryotic translation initiation factor 3 subunit A, eIF3a (Centrosomin) (Eukaryotic translation initiation factor 3 subunit 10) (eIF-3-theta) (eIF3 p167) (eIF3 p180) (eIF3 p185) (p162) |
| P05480 | SRC_MOUSE | Src | Proto-oncogene tyrosine-protein kinase Src, EC 2.7.10.2 (Proto-oncogene c-Src) (pp60c-src, p60-Src) |

| | | | |
|--------|-------------|-------------|---|
| Q61464 | ZN638_MOUSE | Znf638 | Zinc finger protein 638 (Nuclear protein 220) (Zinc finger matrin-like protein) |
| Q8R1W8 | IMPG1_MOUSE | Impg1 | Interphotoreceptor matrix proteoglycan 1 (Interphotoreceptor matrix proteoglycan of 150 kDa, IPM-150) (Sialoprotein associated with cones and rods) |
| Q9D554 | SF3A3_MOUSE | Sf3a3 | Splicing factor 3A subunit 3 (SF3a60) (Spliceosome-associated protein 61, SAP 61) |
| Q6GSS7 | H2A2A_MOUSE | Hist2h2aa1; | Histone H2A type 2-A (H2a-614) (H2a-615) (Histone H2A.2) |
| P12970 | RL7A_MOUSE | Rpl7a | 60S ribosomal protein L7a (Surfeit locus protein 3) |
| Q8BHG9 | CGBP1_MOUSE | Cggbp1 | CGG triplet repeat-binding protein 1, CGG-binding protein 1 (20 kDa CGG-binding protein) (p20-CGGBP DNA-binding protein) |
| P62696 | CRBB2_MOUSE | Crybb2 | Beta-crystallin B2 (Beta-B2 crystallin) (Beta-crystallin Bp) |
| Q9CWZ7 | SNAG_MOUSE | Napg | Gamma-soluble NSF attachment protein, SNAP-gamma (N-ethylmaleimide-sensitive factor attachment protein gamma) |
| Q3UJU9 | RMD3_MOUSE | Rmdn3 | Regulator of microtubule dynamics protein 3, RMD-3, mRMD-3 (Protein FAM82A2) (Protein FAM82C) |
| Q8R1B5 | CPLX3_MOUSE | Cplx3 | Complexin-3 (Complexin III, CPX III) |
| Q8VD04 | GRAP1_MOUSE | Gripap1 | GRIP1-associated protein 1, GRASP-1 (HCMV-interacting protein) [Cleaved into: GRASP-1 C-terminal chain (30kDa C-terminus form)] |
| Q8BG02 | 2ABG_MOUSE | Ppp2r2c | Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B gamma isoform (PP2A subunit B isoform B55-gamma) (PP2A subunit B isoform PR55-gamma) (PP2A subunit B isoform R2-gamma) (PP2A subunit B isoform gamma) |
| O55100 | SNG1_MOUSE | Syngr1 | Synaptogyrin-1 |
| P47758 | SRPRB_MOUSE | Srprb | Signal recognition particle receptor subunit beta, SR-beta |
| Q61584 | FXR1_MOUSE | Fxr1 | RNA-binding protein FXR1 (mFxr1p) |
| Q61548 | AP180_MOUSE | Snap91 | Clathrin coat assembly protein AP180 (91 kDa synaptosomal-associated protein) (Clathrin coat-associated protein AP180) (Phosphoprotein F1-20) |
| P62852 | RS25_MOUSE | Rps25 | 40S ribosomal protein S25 |
| Q8BIL5 | HOOK1_MOUSE | Hook1 | Protein Hook homolog 1, mHK1 |
| Q80YV2 | ZC3C1_MOUSE | Zc3hc1 | Zinc finger C3HC-type protein 1 (Nuclear-interacting partner of ALK, mNIPA) (Nuclear-interacting partner of anaplastic lymphoma kinase) |
| Q8R1N4 | NUDC3_MOUSE | Nudcd3 | NudC domain-containing protein 3 |
| P60843 | IF4A1_MOUSE | Eif4a1 | Eukaryotic initiation factor 4A-I, eIF-4A-I, eIF4A-I, EC 3.6.4.13 (ATP-dependent RNA helicase eIF4A-1) |

| | | | |
|--------|-------------|---------|---|
| Q9DC61 | MPPA_MOUSE | Pmpca | Mitochondrial-processing peptidase subunit alpha (Alpha-MPP) (Inactive zinc metalloprotease alpha) (P-55) |
| Q9WUD8 | FAIM1_MOUSE | Faim | Fas apoptotic inhibitory molecule 1 |
| Q9Z0H8 | CLIP2_MOUSE | Clip2 | CAP-Gly domain-containing linker protein 2 (Cytoplasmic linker protein 115, CLIP-115) (Cytoplasmic linker protein 2) |
| Q6PGB8 | SMCA1_MOUSE | Smarca1 | Probable global transcription activator SNF2L1, EC 3.6.4.- (ATP-dependent helicase SMARCA1) (DNA-dependent ATPase SNF2L) (Nucleosome-remodeling factor subunit SNF2L) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 1) |
| Q9EQQ9 | OGA_MOUSE | Oga | Protein O-GlcNAcase, OGA, EC 3.2.1.169 (Beta-N-acetylhexosaminidase) (Beta-hexosaminidase) (Bifunctional protein NCOAT) (Meningioma-expressed antigen 5) (N-acetyl-beta-D-glucosaminidase) (N-acetyl-beta-glucosaminidase) |
| A2AN08 | UBR4_MOUSE | Ubr4 | E3 ubiquitin-protein ligase UBR4, EC 2.3.2.27 (N-recognin-4) (RING-type E3 ubiquitin transferase UBR4) (Zinc finger UBR1-type protein 1) (p600) |
| Q8BUK6 | HOOK3_MOUSE | Hook3 | Protein Hook homolog 3, mHK3 |
| Q9CX80 | CYGB_MOUSE | Cygb | Cytoglobin (Histoglobin, HGb) |
| Q99K51 | PLST_MOUSE | Pls3 | Plastin-3 (T-plastin) |
| P19536 | COX5B_MOUSE | Cox5b | Cytochrome c oxidase subunit 5B, mitochondrial (Cytochrome c oxidase polypeptide Vb) |
| P54728 | RD23B_MOUSE | Rad23b | UV excision repair protein RAD23 homolog B, HR23B, mHR23B (XP-C repair-complementing complex 58 kDa protein, p58) |
| Q9CR00 | PSMD9_MOUSE | Psmc9 | 26S proteasome non-ATPase regulatory subunit 9 (26S proteasome regulatory subunit p27) |
| Q8BP27 | SFR1_MOUSE | Sfr1 | Swi5-dependent recombination DNA repair protein 1 homolog (Meiosis protein 5 homolog) |
| P13864 | DNMT1_MOUSE | Dnmt1 | DNA (cytosine-5)-methyltransferase 1, Dnmt1, Met-1, EC 2.1.1.37 (DNA methyltransferase MmuI, DNA MTase MmuI, M.MmuI) (MCMT) |
| O35857 | TIM44_MOUSE | Timm44 | Mitochondrial import inner membrane translocase subunit TIM44 |
| Q01768 | NDKB_MOUSE | Nme2 | Nucleoside diphosphate kinase B, NDK B, NDP kinase B, EC 2.7.4.6 (Histidine protein kinase NDKB, EC 2.7.13.3) (P18) (nm23-M2) |
| P40336 | VP26A_MOUSE | Vps26a | Vacuolar protein sorting-associated protein 26A (H<beta>58 protein, H beta 58) (Vesicle protein sorting 26A, mVPS26) |

| | | | |
|--------|-------------|---------|--|
| P52825 | CPT2_MOUSE | Cpt2 | Carnitine O-palmitoyltransferase 2, mitochondrial, EC 2.3.1.21 (Carnitine palmitoyltransferase II, CPT II) |
| P32921 | SYWC_MOUSE | Wars1 | Tryptophan--tRNA ligase, cytoplasmic, EC 6.1.1.2 (Tryptophanyl-tRNA synthetase, TrpRS) [Cleaved into: T1-TrpRS; T2-TrpRS] |
| Q61699 | HS105_MOUSE | Hsph1 | Heat shock protein 105 kDa (42 degrees C-HSP) (Heat shock 110 kDa protein) (Heat shock-related 100 kDa protein E7I, HSP-E7I) |
| B2RQC6 | PYR1_MOUSE | Cad | CAD protein [Includes: Glutamine-dependent carbamoyl-phosphate synthase, EC 6.3.5.5; Aspartate carbamoyltransferase, EC 2.1.3.2; Dihydroorotase, EC 3.5.2.3] |
| P56380 | AP4A_MOUSE | Nudt2 | Bis(5'-nucleosyl)-tetrphosphatase [asymmetrical], EC 3.6.1.17 (Diadenosine 5',5'''-P1,P4-tetraphosphate asymmetrical hydrolase, Ap4A hydrolase, Ap4Aase, Diadenosine tetraphosphatase) (Nucleoside diphosphate-linked moiety X motif 2, Nudix motif 2) |
| Q5SFM8 | RBM27_MOUSE | Rbm27 | RNA-binding protein 27 (Peri-implantation stem cell protein 1) (RNA-binding motif protein 27) |
| Q6PB44 | PTN23_MOUSE | Ptpn23 | Tyrosine-protein phosphatase non-receptor type 23, EC 3.1.3.48 |
| Q8CGY8 | OGT1_MOUSE | Ogt | UDP-N-acetylglucosamine--peptide N-acetylglucosaminyltransferase 110 kDa subunit, EC 2.4.1.255 (O-GlcNAc transferase subunit p110) (O-linked N-acetylglucosamine transferase 110 kDa subunit, OGT) |
| Q9JKR6 | HYOU1_MOUSE | Hyou1 | Hypoxia up-regulated protein 1, GRP-170 (140 kDa Ca(2+)-binding protein, CBP-140) |
| O35098 | DPYL4_MOUSE | Dpysl4 | Dihydropyrimidinase-related protein 4, DRP-4 (Collapsin response mediator protein 3, CRMP-3) (UNC33-like phosphoprotein 4, ULIP-4) |
| A2AWA9 | RBGP1_MOUSE | Rabgap1 | Rab GTPase-activating protein 1 (GAP and centrosome-associated protein) (Rab6 GTPase-activating protein GAPCenA) |
| Q922J3 | CLIP1_MOUSE | Clip1 | CAP-Gly domain-containing linker protein 1 (Cytoplasmic linker protein 170, CLIP-170) (Restin) |
| Q8BG32 | PSD11_MOUSE | Psm11 | 26S proteasome non-ATPase regulatory subunit 11 (26S proteasome regulatory subunit RPN6) (26S proteasome regulatory subunit S9) (26S proteasome regulatory subunit p44.5) |
| O70310 | NMT1_MOUSE | Nmt1 | Glycylpeptide N-tetradecanoyltransferase 1, EC 2.3.1.97 (Myristoyl-CoA:protein N-myristoyltransferase 1, NMT 1, Type I N-myristoyltransferase) (Peptide N-myristoyltransferase 1) |

| | | | |
|--------|-------------|---------|--|
| Q9JII6 | AK1A1_MOUSE | Akr1a1 | Aldo-keto reductase family 1 member A1, EC 1.1.1.2, EC 1.1.1.33, EC 1.1.1.372, EC 1.1.1.54 (Alcohol dehydrogenase [NADP(+)]) (Aldehyde reductase) (Glucuronate reductase, EC 1.1.1.19) (Glucuronolactone reductase, EC 1.1.1.20) |
| Q7TPR4 | ACTN1_MOUSE | Actn1 | Alpha-actinin-1 (Alpha-actinin cytoskeletal isoform) (F-actin cross-linking protein) (Non-muscle alpha-actinin-1) |
| Q9DBR0 | AKAP8_MOUSE | Akap8 | A-kinase anchor protein 8, AKAP-8 (A-kinase anchor protein 95 kDa, AKAP 95) |
| Q3U9G9 | LBR_MOUSE | Lbr | Delta(14)-sterol reductase LBR, Delta-14-SR, EC 1.3.1.70 (3-beta-hydroxysterol Delta (14)-reductase) (C-14 sterol reductase, C14SR) (Integral nuclear envelope inner membrane protein) (Lamin-B receptor) (Sterol C14-reductase) |
| Q8BHB9 | CLIC6_MOUSE | Clic6 | Chloride intracellular channel protein 6 |
| Q9Z0R4 | ITSN1_MOUSE | Itsn1 | Intersectin-1 (EH and SH3 domains protein 1) |
| Q920B9 | SP16H_MOUSE | Supt16h | FACT complex subunit SPT16 (Chromatin-specific transcription elongation factor 140 kDa subunit) (FACT 140 kDa subunit) (FACTp140) (Facilitates chromatin transcription complex subunit SPT16) |
| O54983 | CRYM_MOUSE | Crym | Ketimine reductase mu-crystallin, EC 1.5.1.25 (NADP-regulated thyroid-hormone-binding protein) |
| Q9WUA2 | SYFB_MOUSE | Farsb | Phenylalanine--tRNA ligase beta subunit, EC 6.1.1.20 (Phenylalanyl-tRNA synthetase beta subunit, PheRS) |
| O55091 | IMPCT_MOUSE | Impact | Protein IMPACT (Imprinted and ancient gene protein) |
| Q99KP6 | PRP19_MOUSE | Prpf19 | Pre-mRNA-processing factor 19, EC 2.3.2.27 (Nuclear matrix protein 200) (PRP19/PSO4 homolog) (RING-type E3 ubiquitin transferase PRP19) (Senescence evasion factor) |
| Q6A068 | CDC5L_MOUSE | Cdc5l | Cell division cycle 5-like protein (Cdc5-like protein) |
| Q5SUF2 | LC7L3_MOUSE | Luc7l3 | Luc7-like protein 3 (Cisplatin resistance-associated-overexpressed protein) |
| Q91WK2 | EIF3H_MOUSE | Eif3h | Eukaryotic translation initiation factor 3 subunit H, eIF3h (Eukaryotic translation initiation factor 3 subunit 3) (eIF-3-gamma) (eIF3 p40 subunit) |
| P45591 | COF2_MOUSE | Cfl2 | Cofilin-2 (Cofilin, muscle isoform) |
| P18242 | CATD_MOUSE | Ctsd | Cathepsin D, EC 3.4.23.5 |
| Q8BJU0 | SGTA_MOUSE | Sgta | Small glutamine-rich tetratricopeptide repeat-containing protein alpha (Alpha-SGT) |
| Q8R326 | PSPC1_MOUSE | Pspc1 | Paraspeckle component 1 (Paraspeckle protein 1, mPSP1) |
| P10630 | IF4A2_MOUSE | Eif4a2 | Eukaryotic initiation factor 4A-II, eIF-4A-II, eIF4A-II, EC 3.6.4.13 (ATP-dependent RNA helicase eIF4A-2) |

| | | | |
|--------|-------------|---------|---|
| Q8CHP8 | PGP_MOUSE | Pgp | Glycerol-3-phosphate phosphatase, G3PP, EC 3.1.3.21 (Aspartate-based ubiquitous Mg(2+)-dependent phosphatase, AUM, EC 3.1.3.48) (Phosphoglycolate phosphatase, PGP) |
| P70296 | PEBP1_MOUSE | Pebp1 | Phosphatidylethanolamine-binding protein 1, PEBP-1 (HCNPpp) [Cleaved into: Hippocampal cholinergic neurostimulating peptide, HCNP] |
| Q9D6F9 | TBB4A_MOUSE | Tubb4a | Tubulin beta-4A chain (Tubulin beta-4 chain) |
| Q91VR2 | ATPG_MOUSE | Atp5f1c | ATP synthase subunit gamma, mitochondrial (ATP synthase F1 subunit gamma) (F-ATPase gamma subunit) |
| Q8BMJ2 | SYLC_MOUSE | Lars1 | Leucine--tRNA ligase, cytoplasmic, EC 6.1.1.4 (Leucyl-tRNA synthetase, LeuRS) |
| Q91W39 | NCOA5_MOUSE | Ncoa5 | Nuclear receptor coactivator 5, NCoA-5 (Coactivator independent of AF-2, CIA) |
| Q9Z315 | SNUT1_MOUSE | Sart1 | U4/U6.U5 tri-snRNP-associated protein 1 (Hypoxia-associated factor) (Squamous cell carcinoma antigen recognized by T-cells 1, SART-1, mSART-1) |
| Q6ZQ88 | KDM1A_MOUSE | Kdm1a | Lysine-specific histone demethylase 1A, EC 1.14.99.66 (BRAF35-HDAC complex protein BHC110) (Flavin-containing amine oxidase domain-containing protein 2) |
| Q61543 | GSLG1_MOUSE | Glg1 | Golgi apparatus protein 1 (E-selectin ligand 1, ESL-1, Selel) (Golgi sialoglycoprotein MG-160) |
| Q8K440 | ABC8B_MOUSE | Abca8b | ABC-type organic anion transporter ABCA8B, EC 7.6.2.- (ATP-binding cassette sub-family A member 8B) |
| Q9QYI5 | DNJB2_MOUSE | Dnajb2 | DnaJ homolog subfamily B member 2 (DnaJ homolog subfamily B member 10) (mDj8) |
| Q3V3N7 | BBS1_MOUSE | Bbs1 | Bardet-Biedl syndrome 1 protein homolog |
| Q8R409 | HEX11_MOUSE | Hexim1 | Protein HEXIM1 (Cardiac lineage protein 1) |
| Q8CGF7 | TCRG1_MOUSE | Tcerg1 | Transcription elongation regulator 1 (Formin-binding protein 28, FBP 28) (TATA box-binding protein-associated factor 2S) (Transcription factor CA150) (p144) |
| Q9D8S4 | ORN_MOUSE | Rexo2 | Oligoribonuclease, mitochondrial, EC 3.1.15.- (RNA exonuclease 2 homolog) (Small fragment nuclease) |
| Q8CAY6 | THIC_MOUSE | Acat2 | Acetyl-CoA acetyltransferase, cytosolic, EC 2.3.1.9 (Cytosolic acetoacetyl-CoA thiolase) |
| Q8BH58 | TIPRL_MOUSE | Tiprl | TIP41-like protein |
| Q9Z2W0 | DNPEP_MOUSE | Dnpep | Aspartyl aminopeptidase, EC 3.4.11.21 |

| | | | |
|--------|-------------|--------|---|
| Q60597 | ODO1_MOUSE | Ogdh | 2-oxoglutarate dehydrogenase complex component E1, E1o, OGDC-E1, OGDH-E1, EC 1.2.4.2 (2-oxoglutarate dehydrogenase, mitochondrial) (Alpha-ketoglutarate dehydrogenase, Alpha-KGDH-E1) (Thiamine diphosphate (ThDP)-dependent 2-oxoglutarate dehydrogenase) |
| P36993 | PPM1B_MOUSE | Ppm1b | Protein phosphatase 1B, EC 3.1.3.16 (Protein phosphatase 2C isoform beta, PP2C-beta) |
| Q9CWL8 | CTBL1_MOUSE | Ctnnb1 | Beta-catenin-like protein 1 (Nuclear-associated protein, NAP) |
| Q11136 | PEPD_MOUSE | Pepd | Xaa-Pro dipeptidase, X-Pro dipeptidase, EC 3.4.13.9 (Imidodipeptidase) (Peptidase 4) (Peptidase D) (Proline dipeptidase, Prolidase) |
| P17427 | AP2A2_MOUSE | Ap2a2 | AP-2 complex subunit alpha-2 (100 kDa coated vesicle protein C) (Adaptor protein complex AP-2 subunit alpha-2) (Adaptor-related protein complex 2 subunit alpha-2) (Alpha-adaptin C) (Alpha2-adaptin) (Clathrin assembly protein complex 2 alpha-C large chain) (Plasma membrane adaptor HA2/AP2 adaptin alpha C subunit) |
| Q60930 | VDAC2_MOUSE | Vdac2 | Voltage-dependent anion-selective channel protein 2, VDAC-2, mVDAC2 (Outer mitochondrial membrane protein porin 2) (Voltage-dependent anion-selective channel protein 6, VDAC-6, mVDAC6) |
| Q8K2T8 | PAF1_MOUSE | Paf1 | RNA polymerase II-associated factor 1 homolog |
| Q8BPB5 | FBLN3_MOUSE | Efemp1 | EGF-containing fibulin-like extracellular matrix protein 1 (Fibulin-3, FIBL-3) |
| Q3TEA8 | HP1B3_MOUSE | Hp1bp3 | Heterochromatin protein 1-binding protein 3 |
| Q4VA53 | PDS5B_MOUSE | Pds5b | Sister chromatid cohesion protein PDS5 homolog B (Androgen-induced proliferation inhibitor) (Androgen-induced prostate proliferative shutoff-associated protein AS3) |
| Q99PV0 | PRP8_MOUSE | Prpf8 | Pre-mRNA-processing-splicing factor 8 (Splicing factor Prp8) |
| P47753 | CAZA1_MOUSE | Capza1 | F-actin-capping protein subunit alpha-1 (CapZ alpha-1) |
| Q6P9K9 | NRX3A_MOUSE | Nrxn3 | Neurexin-3 (Neurexin III-alpha) (Neurexin-3-alpha) |
| Q8BMP6 | GCP60_MOUSE | Acbd3 | Golgi resident protein GCP60 (Acyl-CoA-binding domain-containing protein 3) (Golgi complex-associated protein 1, GOCAP1) (Golgi phosphoprotein 1, GOLPH1) (PBR- and PKA-associated protein 7) (Peripheral benzodiazepine receptor-associated protein PAP7) |
| Q64737 | PUR2_MOUSE | Gart | Trifunctional purine biosynthetic protein adenosine-3 [Includes: Phosphoribosylamine--glycine ligase, EC 6.3.4.13 (Glycinamide ribonucleotide synthetase, GARS) (Phosphoribosylglycinamide synthetase); Phosphoribosylformylglycinamidine cyclo-ligase, EC 6.3.3.1 (AIR synthase, AIRS)] |

| | | | |
|--------|-------------|----------|---|
| | | | (Phosphoribosyl-aminoimidazole synthetase); Phosphoribosylglycinamide formyltransferase, EC 2.1.2.2 (5'-phosphoribosylglycinamide transformylase) (GAR transformylase, GART)] |
| Q3U319 | BRE1B_MOUSE | Rnf40 | E3 ubiquitin-protein ligase BRE1B, BRE1-B, EC 2.3.2.27 (RING finger protein 40) (RING-type E3 ubiquitin transferase BRE1B) |
| Q8C522 | ENDD1_MOUSE | Endod1 | Endonuclease domain-containing 1 protein, EC 3.1.30.- |
| Q9CR16 | PPID_MOUSE | Ppid | Peptidyl-prolyl cis-trans isomerase D, PPIase D, EC 5.2.1.8 (40 kDa peptidyl-prolyl cis-trans isomerase) (Cyclophilin-40, CYP-40) (Rotamase D) |
| Q8BI72 | CARF_MOUSE | Cdkn2aip | CDKN2A-interacting protein (Collaborator of ARF) |
| Q9D8U8 | SNX5_MOUSE | Snx5 | Sorting nexin-5 |
| Q811D0 | DLG1_MOUSE | Dlg1 | Disks large homolog 1 (Embryo-dlg/synapse-associated protein 97, E-dlg/SAP97) (Synapse-associated protein 97, SAP-97, SAP97) |
| Q8JZQ9 | EIF3B_MOUSE | Eif3b | Eukaryotic translation initiation factor 3 subunit B, eIF3b (Eukaryotic translation initiation factor 3 subunit 9) (eIF-3-eta) (eIF3 p116) |
| Q9QY76 | VAPB_MOUSE | Vapb | Vesicle-associated membrane protein-associated protein B, VAMP-B, VAMP-associated protein B, VAP-B (VAMP-associated protein 33b) |
| Q8R0J7 | VP37B_MOUSE | Vps37b | Vacuolar protein sorting-associated protein 37B, Vps37B (ESCRT-I complex subunit VPS37B) |
| Q99JY9 | ARP3_MOUSE | Actr3 | Actin-related protein 3 (Actin-like protein 3) |
| P97822 | AN32E_MOUSE | Anp32e | Acidic leucine-rich nuclear phosphoprotein 32 family member E (Cerebellar postnatal development protein 1) (LANP-like protein, LANP-L) |
| Q61595 | KTN1_MOUSE | Ktn1 | Kinectin |
| Q3V3R1 | C1TM_MOUSE | Mthfd11 | Monofunctional C1-tetrahydrofolate synthase, mitochondrial, EC 6.3.4.3 (Formyltetrahydrofolate synthetase) |
| Q8QZY1 | EIF3L_MOUSE | Eif3l | Eukaryotic translation initiation factor 3 subunit L, eIF3l (66 kDa tyrosine-rich heat shock protein) (67 kDa polymerase-associated factor) (Eukaryotic translation initiation factor 3 subunit 6-interacting protein) (Eukaryotic translation initiation factor 3 subunit E-interacting protein) (HSP-66Y) (PAF67) |
| Q8C437 | PEX5R_MOUSE | Pex5l | PEX5-related protein (PEX2-related protein) (PEX5-like protein) (Peroxin-5-related protein) (Tetratricopeptide repeat-containing Rab8b-interacting protein, Pex5Rp, TRIP8b) |

| | | | |
|--------|-------------|---------|--|
| Q61017 | GBGT2_MOUSE | Gngt2 | Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-T2 (G gamma-C) (G-gamma-8) |
| P28652 | KCC2B_MOUSE | Camk2b | Calcium/calmodulin-dependent protein kinase type II subunit beta, CaM kinase II subunit beta, CaMK-II subunit beta, EC 2.7.11.17 |
| Q8BZ98 | DYN3_MOUSE | Dnm3 | Dynamin-3, EC 3.6.5.5 |
| Q9QYI3 | DNJC7_MOUSE | Dnajc7 | DnaJ homolog subfamily C member 7 (Cytoplasmic CAR retention protein, CCRP) (MDj11) (Tetratricopeptide repeat protein 2, TPR repeat protein 2) |
| Q61466 | SMRD1_MOUSE | Smarcd1 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily D member 1 (60 kDa BRG-1/Brm-associated factor subunit A) (BRG1-associated factor 60A, BAF60A) (Protein D15KZ1) (SWI/SNF complex 60 kDa subunit) |
| P32037 | GTR3_MOUSE | Slc2a3 | Solute carrier family 2, facilitated glucose transporter member 3 (Glucose transporter type 3, brain, GLUT-3) |
| Q61161 | M4K2_MOUSE | Map4k2 | Mitogen-activated protein kinase kinase kinase kinase 2, EC 2.7.11.1 (Germinal center kinase, GCK) (MAPK/ERK kinase kinase kinase 2, MEK kinase kinase 2, MEKKK 2) (Rab8-interacting protein) |
| O35927 | CTND2_MOUSE | Ctnnd2 | Catenin delta-2 (Neural plakophilin-related ARM-repeat protein, NPRAP) (Neurojungin) |
| Q99LI7 | CSTF3_MOUSE | Cstf3 | Cleavage stimulation factor subunit 3 (CF-1 77 kDa subunit) (Cleavage stimulation factor 77 kDa subunit, CSTF 77 kDa subunit, CstF-77) |
| P60229 | EIF3E_MOUSE | Eif3e | Eukaryotic translation initiation factor 3 subunit E, eIF3e (Eukaryotic translation initiation factor 3 subunit 6) (MMTV integration site 6) (Mammary tumor-associated protein INT-6) (Viral integration site protein INT-6) (eIF-3 p48) |
| O35621 | PMM1_MOUSE | Pmm1 | Phosphomannomutase 1, PMM 1, EC 5.4.2.8 |
| Q9JM93 | AR6P4_MOUSE | Arl6ip4 | ADP-ribosylation factor-like protein 6-interacting protein 4, ARL-6-interacting protein 4, Aip-4 (Splicing factor SRrp37) |
| P30275 | KCRU_MOUSE | Ckmt1 | Creatine kinase U-type, mitochondrial, EC 2.7.3.2 (Acidic-type mitochondrial creatine kinase, Mia-CK) (Ubiquitous mitochondrial creatine kinase, U-MtCK) |
| P19253 | RL13A_MOUSE | Rpl13a | 60S ribosomal protein L13a (Transplantation antigen P198) (Tum-P198 antigen) |
| P53612 | PGTB2_MOUSE | Rabggtb | Geranylgeranyl transferase type-2 subunit beta, EC 2.5.1.60 (Geranylgeranyl transferase type II subunit beta, GGTase-II-beta) (Rab geranyl-geranyltransferase subunit beta, Rab GG transferase beta, Rab GGTase beta) (Rab geranylgeranyltransferase subunit beta) (Type II protein geranyl-geranyltransferase subunit beta) |

| | | | |
|--------|-------------|----------|--|
| P48455 | PP2BC_MOUSE | Ppp3cc | Serine/threonine-protein phosphatase 2B catalytic subunit gamma isoform, EC 3.1.3.16 (CAM-PRP catalytic subunit) (Calcineurin, testis-specific catalytic subunit) (Calmodulin-dependent calcineurin A subunit gamma isoform) |
| Q61335 | BAP31_MOUSE | Bcap31 | B-cell receptor-associated protein 31, BCR-associated protein 31, Bap31 (p28) |
| Q8VE92 | RBM4B_MOUSE | Rbm4b | RNA-binding protein 4B (RNA-binding motif protein 30) (RNA-binding motif protein 4B) (RNA-binding protein 30) |
| Q9QUN9 | DKK3_MOUSE | Dkk3 | Dickkopf-related protein 3, Dickkopf-3, Dkk-3, mDkk-3 |
| O08547 | SC22B_MOUSE | Sec22b | Vesicle-trafficking protein SEC22b (ER-Golgi SNARE of 24 kDa, ERS-24, ERS24) (SEC22 vesicle-trafficking protein homolog B) (SEC22 vesicle-trafficking protein-like 1, mSec22b) |
| Q9WTX8 | MD1L1_MOUSE | Mad1l1 | Mitotic spindle assembly checkpoint protein MAD1 (Mitotic arrest deficient 1-like protein 1, MAD1-like protein 1) |
| Q9JKF6 | NECT1_MOUSE | Nectin1 | Nectin-1 (Herpes virus entry mediator C, Herpesvirus entry mediator C, HveC) (Nectin cell adhesion molecule 1) (Poliovirus receptor-related protein 1) (CD antigen CD111) |
| P61290 | PSME3_MOUSE | Psme3 | Proteasome activator complex subunit 3 (11S regulator complex subunit gamma, REG-gamma) (Activator of multicatalytic protease subunit 3) (Ki nuclear autoantigen) (Proteasome activator 28 subunit gamma, PA28g, PA28gamma) |
| Q6ZQ82 | RHG26_MOUSE | Arhgap26 | Rho GTPase-activating protein 26 (Rho-type GTPase-activating protein 26) |
| P50446 | K2C6A_MOUSE | Krt6a | Keratin, type II cytoskeletal 6A (Cytokeratin-6A, CK-6A) (Keratin-6-alpha, mK6-alpha) (Keratin-6A, K6A) |
| Q9JHQ5 | LZTL1_MOUSE | Lztfl1 | Leucine zipper transcription factor-like protein 1 |
| Q8K442 | ABC8A_MOUSE | Abca8a | ABC-type organic anion transporter ABCA8A, EC 7.6.2.- (ATP-binding cassette sub-family A member 8A) |
| Q61166 | MARE1_MOUSE | Mapre1 | Microtubule-associated protein RP/EB family member 1 (APC-binding protein EB1) (End-binding protein 1, EB1) |
| Q62425 | NDUA4_MOUSE | Ndufa4 | Cytochrome c oxidase subunit NDUFA4 |
| P84084 | ARF5_MOUSE | Arf5 | ADP-ribosylation factor 5 |
| Q9JMA1 | UBP14_MOUSE | Usp14 | Ubiquitin carboxyl-terminal hydrolase 14, EC 3.4.19.12 (Deubiquitinating enzyme 14) (Ubiquitin thioesterase 14) (Ubiquitin-specific-processing protease 14) |
| Q9CWK8 | SNX2_MOUSE | Snx2 | Sorting nexin-2 |

| | | | |
|--------|-------------|----------|---|
| Q8K003 | TMA7_MOUSE | Tma7 | Translation machinery-associated protein 7 (Coiled-coil domain-containing protein 72) |
| Q91WS0 | CISD1_MOUSE | Cisd1 | CDGSH iron-sulfur domain-containing protein 1 (MitoNEET) |
| Q91ZZ3 | SYUB_MOUSE | Sncb | Beta-synuclein |
| P08775 | RPB1_MOUSE | Polr2a | DNA-directed RNA polymerase II subunit RPB1, RNA polymerase II subunit B1, EC 2.7.7.6 (DNA-directed RNA polymerase II subunit A) (DNA-directed RNA polymerase III largest subunit) |
| P80317 | TCPZ_MOUSE | Cct6a | T-complex protein 1 subunit zeta, TCP-1-zeta (CCT-zeta-1) |
| Q8VDJ3 | VIGLN_MOUSE | Hdlbp | Vigilin (High density lipoprotein-binding protein, HDL-binding protein) |
| O88844 | IDHC_MOUSE | Idh1 | Isocitrate dehydrogenase [NADP] cytoplasmic, IDH, IDH1, EC 1.1.1.42 (Cytosolic NADP-isocitrate dehydrogenase) (IDPc) (NADP(+)-specific ICDH) (Oxalosuccinate decarboxylase) |
| Q8BSY0 | ASPH_MOUSE | Asph | Aspartyl/asparaginyl beta-hydroxylase, EC 1.14.11.16 (Aspartate beta-hydroxylase, ASP beta-hydroxylase) (Peptide-aspartate beta-dioxygenase) |
| Q9CZU3 | MTREX_MOUSE | Mtrex | Exosome RNA helicase MTR4, EC 3.6.4.13 (ATP-dependent helicase SKIV2L2) (Superkiller viralicidic activity 2-like 2) (TRAMP-like complex helicase) |
| O08810 | U5S1_MOUSE | Eftud2 | 116 kDa U5 small nuclear ribonucleoprotein component (Elongation factor Tu GTP-binding domain-containing protein 2) (U5 snRNP-specific protein, 116 kDa, U5-116 kDa) |
| Q7TSG1 | CE120_MOUSE | Cep120 | Centrosomal protein of 120 kDa, Cep120 (Coiled-coil domain-containing protein 100) |
| Q60634 | FLOT2_MOUSE | Flot2 | Flotillin-2 (Epidermal surface antigen, ESA) (Membrane component chromosome 17 surface marker 1 homolog) |
| Q8BGW1 | FTO_MOUSE | Fto | Alpha-ketoglutarate-dependent dioxygenase FTO (Fat mass and obesity-associated protein) (Protein fatso) (U6 small nuclear RNA (2'-O-methyladenosine-N(6)-)-demethylase FTO, EC 1.14.11.-) (U6 small nuclear RNA N(6)-methyladenosine-demethylase FTO, EC 1.14.11.-) (mRNA (2'-O-methyladenosine-N(6)-)-demethylase FTO, m6A(m)-demethylase FTO, EC 1.14.11.-) (mRNA N(6)-methyladenosine demethylase FTO, EC 1.14.11.53) (tRNA N1-methyl adenine demethylase FTO, EC 1.14.11.-) |
| Q9WTT4 | VATG2_MOUSE | Atp6v1g2 | V-type proton ATPase subunit G 2, V-ATPase subunit G 2 (V-ATPase 13 kDa subunit 2) (Vacuolar proton pump subunit G 2) |

| | | | |
|--------|-------------|----------|---|
| Q6P5D8 | SMHD1_MOUSE | Smchd1 | Structural maintenance of chromosomes flexible hinge domain-containing protein 1, SMC hinge domain-containing protein 1, EC 3.6.1.- |
| Q9DC07 | LNEBL_MOUSE | Neb1 | LIM zinc-binding domain-containing Nebulette (Actin-binding Z-disk protein) |
| P21836 | ACES_MOUSE | Ache | Acetylcholinesterase, AChE, EC 3.1.1.7 |
| Q9D0R2 | SYTC_MOUSE | Tars1 | Threonine--tRNA ligase 1, cytoplasmic, EC 6.1.1.3 (Threonine--tRNA ligase, cytoplasmic) (Threonyl-tRNA synthetase, ThrRS) (Threonyl-tRNA synthetase 1) |
| Q61205 | PA1B3_MOUSE | Pafah1b3 | Platelet-activating factor acetylhydrolase IB subunit alpha1, EC 3.1.1.47 (PAF acetylhydrolase 29 kDa subunit, PAF-AH 29 kDa subunit) (PAF-AH subunit gamma, PAFAH subunit gamma) |
| P47757 | CAPZB_MOUSE | Capzb | F-actin-capping protein subunit beta (CapZ beta) |
| Q9Z1R2 | BAG6_MOUSE | Bag6 | Large proline-rich protein BAG6 (BAG family molecular chaperone regulator 6) (BCL2-associated athanogene 6, BAG-6) (HLA-B-associated transcript 3) (Protein Scythe) |
| Q8K3K8 | OPTN_MOUSE | Optn | Optineurin |
| Q7TMK9 | HNRPQ_MOUSE | Syncrip | Heterogeneous nuclear ribonucleoprotein Q, hnRNP Q (Glycine- and tyrosine-rich RNA-binding protein, GRY-RBP) (NS1-associated protein 1) (Synaptotagmin-binding, cytoplasmic RNA-interacting protein) (pp68) |
| Q9D2V7 | CORO7_MOUSE | Coro7 | Coronin-7, Crn7 (70 kDa WD repeat tumor rejection antigen homolog) |
| Q6WKZ8 | UBR2_MOUSE | Ubr2 | E3 ubiquitin-protein ligase UBR2, EC 2.3.2.27 (N-recognin-2) (RING-type E3 ubiquitin transferase UBR2) (Ubiquitin-protein ligase E3-alpha-2) (Ubiquitin-protein ligase E3-alpha-II) |
| Q8CBE3 | WDR37_MOUSE | Wdr37 | WD repeat-containing protein 37 |
| Q5U4D9 | THOC6_MOUSE | Thoc6 | THO complex subunit 6 homolog (WD repeat-containing protein 58) |
| Q9JJU9 | CRBB3_MOUSE | Crybb3 | Beta-crystallin B3 (Beta-B3 crystallin) [Cleaved into: Beta-crystallin B3, N-terminally processed] |
| P54227 | STMN1_MOUSE | Stmn1 | Stathmin (Leukemia-associated gene protein) (Leukemia-associated phosphoprotein p18) (Metablastin) (Oncoprotein 18, Op18) (Phosphoprotein p19, pp19) (Prosolin) (Protein Pr22) (pp17) |
| Q91YR1 | TWF1_MOUSE | Twf1 | Twinfilin-1 (Protein A6) |
| Q66JS6 | EI3JB_MOUSE | Eif3j2 | Eukaryotic translation initiation factor 3 subunit J-B, eIF3j-B (Eukaryotic translation initiation factor 3 subunit 1-B) (eIF-3-alpha-B) (eIF3 p35) |

| | | | |
|--------|-------------|----------|---|
| Q7TSV4 | PGM2_MOUSE | Pgm2 | Phosphopentomutase, EC 5.4.2.7 (Glucose phosphomutase 2) (Phosphodeoxyribomutase) (Phosphoglucomutase-1) (Phosphoglucomutase-2, PGM 2, EC 5.4.2.2) |
| P70414 | NAC1_MOUSE | Slc8a1 | Sodium/calcium exchanger 1 (Na(+)/Ca(2+)-exchange protein 1) (Solute carrier family 8 member 1) |
| Q6A026 | PDS5A_MOUSE | Pds5a | Sister chromatid cohesion protein PDS5 homolog A |
| Q7TT50 | MRCKB_MOUSE | Cdc42bpb | Serine/threonine-protein kinase MRCK beta, EC 2.7.11.1 (CDC42-binding protein kinase beta) (DMPK-like beta) (Myotonic dystrophy kinase-related CDC42-binding kinase beta, MRCK beta, Myotonic dystrophy protein kinase-like beta) |
| O88532 | ZFR_MOUSE | Zfr | Zinc finger RNA-binding protein |
| Q8R1B8 | RORB_MOUSE | Rorb | Nuclear receptor ROR-beta (Nuclear receptor RZR-beta) (Nuclear receptor subfamily 1 group F member 2) (Retinoid-related orphan receptor-beta) |
| P84086 | CPLX2_MOUSE | Cplx2 | Complexin-2 (921-L) (Complexin II, CPX II) (Synaphin-1) |
| Q91Z53 | GRHPR_MOUSE | Grhpr | Glyoxylate reductase/hydroxypyruvate reductase, EC 1.1.1.79, EC 1.1.1.81 |
| P63085 | MK01_MOUSE | Mapk1 | Mitogen-activated protein kinase 1, MAP kinase 1, MAPK 1, EC 2.7.11.24 (ERT1) (Extracellular signal-regulated kinase 2, ERK-2) (MAP kinase isoform p42, p42-MAPK) (Mitogen-activated protein kinase 2, MAP kinase 2, MAPK 2) |
| Q501J6 | DDX17_MOUSE | Ddx17 | Probable ATP-dependent RNA helicase DDX17, EC 3.6.4.13 (DEAD box protein 17) |
| Q8VDM6 | HNRL1_MOUSE | Hnrnpul1 | Heterogeneous nuclear ribonucleoprotein U-like protein 1 |
| Q6P9K8 | CSKI1_MOUSE | Caskin1 | Caskin-1 (CASK-interacting protein 1) |
| Q505F5 | LRC47_MOUSE | Lrrc47 | Leucine-rich repeat-containing protein 47 |
| Q8R3V5 | SHLB2_MOUSE | Sh3glb2 | Endophilin-B2 (SH3 domain-containing GRB2-like protein B2) |
| Q9D6Z1 | NOP56_MOUSE | Nop56 | Nucleolar protein 56 (Nucleolar protein 5A) |
| Q8BG39 | SV2B_MOUSE | Sv2b | Synaptic vesicle glycoprotein 2B, Synaptic vesicle protein 2B |
| Q99JY0 | ECHB_MOUSE | Hadhb | Trifunctional enzyme subunit beta, mitochondrial (TP-beta) [Includes: 3-ketoacyl-CoA thiolase, EC 2.3.1.155, EC 2.3.1.16 (Acetyl-CoA acyltransferase) (Beta-ketothiolase)] |
| Q9Z1G4 | VPP1_MOUSE | Atp6v0a1 | V-type proton ATPase 116 kDa subunit a 1, V-ATPase 116 kDa subunit a 1 (Clathrin-coated vesicle/synaptic vesicle proton pump 116 kDa subunit) (Vacuolar adenosine triphosphatase subunit Ac116) (Vacuolar proton pump subunit 1) (Vacuolar proton translocating ATPase 116 kDa subunit a isoform 1) |

| | | | |
|--------|-------------|----------|---|
| P35282 | RAB21_MOUSE | Rab21 | Ras-related protein Rab-21 (Rab-12) |
| Q3TWW8 | SRSF6_MOUSE | Srsf6 | Serine/arginine-rich splicing factor 6 (Pre-mRNA-splicing factor SRP55) (Splicing factor, arginine/serine-rich 6) |
| P83917 | CBX1_MOUSE | Cbx1 | Chromobox protein homolog 1 (Heterochromatin protein 1 homolog beta, HP1 beta) (Heterochromatin protein p25) (M31) (Modifier 1 protein) |
| P59325 | IF5_MOUSE | Eif5 | Eukaryotic translation initiation factor 5, eIF-5 |
| P32958 | ROM1_MOUSE | Rom1 | Rod outer segment membrane protein 1, ROSP1 |
| O35551 | RABE1_MOUSE | Rabep1 | Rab GTPase-binding effector protein 1 (Rabaptin-5) (Rabaptin-5alpha) |
| Q60770 | STXB3_MOUSE | Stxbp3 | Syntaxin-binding protein 3 (MUNC-18-3) (Mammalian homolog of Unc-18c, Munc-18c) (Protein unc-18 homolog 3, Unc18-3) (Protein unc-18 homolog C, Unc-18C) |
| Q99MR6 | SRRT_MOUSE | Srrt | Serrate RNA effector molecule homolog (Arsenite-resistance protein 2) |
| P68368 | TBA4A_MOUSE | Tuba4a | Tubulin alpha-4A chain (Alpha-tubulin 4) (Alpha-tubulin isotype M-alpha-4) (Tubulin alpha-4 chain) |
| Q9Z2K1 | K1C16_MOUSE | Krt16 | Keratin, type I cytoskeletal 16 (Cytokeratin-16, CK-16) (Keratin-16, K16) |
| Q921F2 | TADBP_MOUSE | Tardbp | TAR DNA-binding protein 43, TDP-43 |
| P97470 | PP4C_MOUSE | Ppp4c | Serine/threonine-protein phosphatase 4 catalytic subunit, PP4C, Pp4, EC 3.1.3.16 (Protein phosphatase X, PP-X) |
| P10518 | HEM2_MOUSE | Alad | Delta-aminolevulinic acid dehydratase, ALADH, EC 4.2.1.24 (Porphobilinogen synthase) |
| Q91W40 | KLC3_MOUSE | Klc3 | Kinesin light chain 3 |
| Q9JMC3 | DNJA4_MOUSE | Dnaja4 | DnaJ homolog subfamily A member 4 (MmDjA4) |
| Q9JM96 | BORG4_MOUSE | Cdc42ep4 | Cdc42 effector protein 4 (Binder of Rho GTPases 4) |
| Q9D3P8 | PLRKT_MOUSE | Plgrkt | Plasminogen receptor (KT), Plg-R(KT) |
| Q9D3D9 | ATPD_MOUSE | Atp5f1d | ATP synthase subunit delta, mitochondrial (ATP synthase F1 subunit delta) (F-ATPase delta subunit) |
| Q921M7 | CYRIB_MOUSE | Cyrib | CYFIP-related Rac1 interactor B (Protein FAM49B) |
| Q8WTY4 | CPIN1_MOUSE | Ciapin1 | Anamorsin (Cytokine-induced apoptosis inhibitor 1) (Fe-S cluster assembly protein DRE2 homolog) |
| Q8BSL7 | ARF2_MOUSE | Arf2 | ADP-ribosylation factor 2 |
| Q8BLY2 | SYTC2_MOUSE | Tars3 | Threonine--tRNA ligase 2, cytoplasmic, EC 6.1.1.3 (Threonyl-tRNA synthetase, ThrRS) (Threonyl-tRNA synthetase protein 3) |

| | | | |
|--------|-------------|----------|---|
| Q8BJY1 | PSMD5_MOUSE | Psmd5 | 26S proteasome non-ATPase regulatory subunit 5 (26S protease subunit S5 basic) (26S proteasome subunit S5B) |
| Q78ZA7 | NP1L4_MOUSE | Nap1l4 | Nucleosome assembly protein 1-like 4 |
| Q6PDY2 | AEDO_MOUSE | Ado | 2-aminoethanethiol dioxygenase, EC 1.13.11.19 (Cysteamine dioxygenase) |
| Q63932 | MP2K2_MOUSE | Map2k2 | Dual specificity mitogen-activated protein kinase kinase 2, MAP kinase kinase 2, MAPKK 2, EC 2.7.12.2 (ERK activator kinase 2) (MAPK/ERK kinase 2, MEK 2) |
| Q62448 | IF4G2_MOUSE | Eif4g2 | Eukaryotic translation initiation factor 4 gamma 2, eIF-4-gamma 2, eIF-4G 2, eIF4G 2 (Novel APOBEC-1 target 1) (Translation repressor NAT1) (p97) |
| Q62418 | DBNL_MOUSE | Dbnl | Drebrin-like protein (Actin-binding protein 1) (SH3 domain-containing protein 7) |
| Q62048 | PEA15_MOUSE | Pea15 | Astrocytic phosphoprotein PEA-15 (15 kDa phosphoprotein enriched in astrocytes) |
| Q06185 | ATP5I_MOUSE | Atp5me | ATP synthase subunit e, mitochondrial, ATPase subunit e (ATP synthase membrane subunit e) |
| P28571 | SC6A9_MOUSE | Slc6a9 | Sodium- and chloride-dependent glycine transporter 1, GlyT-1, GlyT1 (Solute carrier family 6 member 9) |
| P28352 | APEX1_MOUSE | Apex1 | DNA-(apurinic or apyrimidinic site) endonuclease, EC 3.1.11.2 (APEX nuclease, APEN) (Apurinic-apyrimidinic endonuclease 1, AP endonuclease 1) (REF-1) (Redox factor-1) [Cleaved into: DNA-(apurinic or apyrimidinic site) endonuclease, mitochondrial] |
| Q61171 | PRDX2_MOUSE | Prdx2 | Peroxiredoxin-2, EC 1.11.1.24 (Thiol-specific antioxidant protein, TSA) (Thioredoxin peroxidase 1) (Thioredoxin-dependent peroxide reductase 1) (Thioredoxin-dependent peroxiredoxin 2) |
| Q6PDL0 | DC1L2_MOUSE | Dync1li2 | Cytoplasmic dynein 1 light intermediate chain 2 (Dynein light intermediate chain 2, cytosolic) |
| Q3THK3 | T2FA_MOUSE | Gtf2f1 | General transcription factor IIF subunit 1 (Transcription initiation factor IIF subunit alpha, TFIIF-alpha) |
| P00493 | HPRT_MOUSE | Hprt1 | Hypoxanthine-guanine phosphoribosyltransferase, HGPRT, HGPRTase, EC 2.4.2.8 (HPRT B) |
| Q9DBG6 | RPN2_MOUSE | Rpn2 | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 2 (Dolichyl-diphosphooligosaccharide--protein glycosyltransferase 63 kDa subunit) (Ribophorin II, RPN-II) (Ribophorin-2) |
| P98191 | CDS1_MOUSE | Cds1 | Phosphatidate cytidylyltransferase 1, EC 2.7.7.41 (CDP-DAG synthase 1) (CDP-DG synthase 1) (CDP-diacylglycerol synthase 1, CDS 1) (CDP-diglyceride |

| | | | |
|--------|-------------|--------|--|
| | | | pyrophosphorylase 1) (CDP-diglyceride synthase 1) (CTP:phosphatidate cytidyltransferase 1) |
| P70168 | IMB1_MOUSE | Kpnb1 | Importin subunit beta-1 (Karyopherin subunit beta-1) (Nuclear factor p97) (Pore targeting complex 97 kDa subunit, PTAC97) (SCG) |
| Q99LE6 | ABCF2_MOUSE | Abcf2 | ATP-binding cassette sub-family F member 2 |
| Q9CRB9 | MIC19_MOUSE | Chchd3 | MICOS complex subunit Mic19 (Coiled-coil-helix-coiled-coil-helix domain-containing protein 3) |
| Q9D2M8 | UB2V2_MOUSE | Ube2v2 | Ubiquitin-conjugating enzyme E2 variant 2 (Ubc-like protein MMS2) |
| Q8CIE6 | COPA_MOUSE | Copa | Coatomer subunit alpha (Alpha-coat protein, Alpha-COP) [Cleaved into: Xenin (Xenopsin-related peptide); Proxenin] |
| Q7TMY8 | HUWE1_MOUSE | Huwe1 | E3 ubiquitin-protein ligase HUWE1, EC 2.3.2.26 (E3Histone) (HECT, UBA and WWE domain-containing protein 1) (HECT-type E3 ubiquitin transferase HUWE1) (Upstream regulatory element-binding protein 1, URE-B1, URE-binding protein 1) |
| Q6DFW4 | NOP58_MOUSE | Nop58 | Nucleolar protein 58 (MSSP) (Nucleolar protein 5) (SIK-similar protein) |
| P68037 | UB2L3_MOUSE | Ube2l3 | Ubiquitin-conjugating enzyme E2 L3, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme L3) (UbcM4) (Ubiquitin carrier protein L3) (Ubiquitin-protein ligase L3) |
| P16054 | KPCE_MOUSE | Prkce | Protein kinase C epsilon type, EC 2.7.11.13 (nPKC-epsilon) |
| Q9ESX5 | DKC1_MOUSE | Dkc1 | H/ACA ribonucleoprotein complex subunit DKC1, EC 5.4.99.- (Dyskerin) (Nopp140-associated protein of 57 kDa) (Nucleolar protein NAP57) (Nucleolar protein family A member 4) (snoRNP protein DKC1) |
| Q9JJY3 | NSMA2_MOUSE | Smpd3 | Sphingomyelin phosphodiesterase 3, EC 3.1.4.12 (Neutral sphingomyelinase 2, nSMase-2, nSMase2) (Neutral sphingomyelinase II) |
| A2ASQ1 | AGRIN_MOUSE | Agrn | Agrin [Cleaved into: Agrin N-terminal 110 kDa subunit; Agrin C-terminal 110 kDa subunit; Agrin C-terminal 90 kDa fragment, C90; Agrin C-terminal 22 kDa fragment, C22] |
| Q9DBE8 | ALG2_MOUSE | Alg2 | Alpha-1,3/1,6-mannosyltransferase ALG2, EC 2.4.1.132, EC 2.4.1.257 (Asparagine-linked glycosylation protein 2 homolog) (GDP-Man:Man(1)GlcNAc(2)-PP-Dol alpha-1,3-mannosyltransferase) (GDP-Man:Man(1)GlcNAc(2)-PP-dolichol mannosyltransferase) (GDP-Man:Man(2)GlcNAc(2)-PP-Dol alpha-1,6-mannosyltransferase) |
| O88559 | MEN1_MOUSE | Men1 | Menin |

| | | | |
|--------|-------------|----------|--|
| Q99020 | ROAA_MOUSE | Hnrnpab | Heterogeneous nuclear ribonucleoprotein A/B, hnRNP A/B (CArG-binding factor-A, CBF-A) |
| P08003 | PDIA4_MOUSE | Pdia4 | Protein disulfide-isomerase A4, EC 5.3.4.1 (Endoplasmic reticulum resident protein 72, ER protein 72, ERp-72, ERp72) |
| P97427 | DPYL1_MOUSE | Crmp1 | Dihydropyrimidinase-related protein 1, DRP-1 (Collapsin response mediator protein 1, CRMP-1) (Inactive dihydropyrimidinase) (Unc-33-like phosphoprotein 3, ULIP-3) |
| Q9QXT0 | CNPY2_MOUSE | Cnpy2 | Protein canopy homolog 2 (MIR-interacting saposin-like protein) (Putative secreted protein ZSIG9) (Transmembrane protein 4) |
| Q9CXW3 | CYBP_MOUSE | Cacybp | Calcyclin-binding protein, CacyBP (Siah-interacting protein) |
| Q9CZX8 | RS19_MOUSE | Rps19 | 40S ribosomal protein S19 |
| Q8VBW6 | ULA1_MOUSE | Nae1 | NEDD8-activating enzyme E1 regulatory subunit (Amyloid beta precursor protein-binding protein 1, 59 kDa, APP-BP1) (Amyloid protein-binding protein 1) |
| Q8R124 | KLH36_MOUSE | Klhl36 | Kelch-like protein 36 |
| Q61164 | CTCF_MOUSE | Ctcf | Transcriptional repressor CTCF (11-zinc finger protein) (CCCTC-binding factor) (CTCF paralog) |
| P15116 | CADH2_MOUSE | Cdh2 | Cadherin-2 (Neural cadherin, N-cadherin) (CD antigen CD325) |
| Q8BLK3 | LSAMP_MOUSE | Lsamp | Limbic system-associated membrane protein, LSAMP |
| Q05793 | PGBM_MOUSE | Hspg2 | Basement membrane-specific heparan sulfate proteoglycan core protein, HSPG [Cleaved into: Endorepellin; LG3 peptide] |
| Q9QXG4 | ACSA_MOUSE | Acss2 | Acetyl-coenzyme A synthetase, cytoplasmic, EC 6.2.1.1 (Acetate--CoA ligase) (Acetyl-CoA synthetase, ACS, AceCS) (Acetyl-CoA synthetase 1, AceCS1) (Acyl-CoA synthetase short-chain family member 2) (Acyl-activating enzyme) (Propionate--CoA ligase, EC 6.2.1.17) |
| O89053 | COR1A_MOUSE | Coro1a | Coronin-1A (Coronin-like protein A, Clipin-A) (Coronin-like protein p57) (Tryptophan aspartate-containing coat protein, TACO) |
| Q61598 | GDIB_MOUSE | Gdi2 | Rab GDP dissociation inhibitor beta, Rab GDI beta (GDI-3) (Guanosine diphosphate dissociation inhibitor 2, GDI-2) |
| Q3UTJ2 | SRBS2_MOUSE | Sorbs2 | Sorbin and SH3 domain-containing protein 2 (Arg-binding protein 2, ArgBP2) (Arg/Abl-interacting protein 2) |
| Q9CR62 | M2OM_MOUSE | Slc25a11 | Mitochondrial 2-oxoglutarate/malate carrier protein, OGCP, alpha-oxoglutarate carrier (Solute carrier family 25 member 11, SLC25A11) |

| | | | |
|--------|-------------|----------|---|
| Q8BV13 | CSN7B_MOUSE | Cops7b | COP9 signalosome complex subunit 7b, SGN7b, Signalosome subunit 7b (JAB1-containing signalosome subunit 7b) |
| Q61001 | LAMA5_MOUSE | Lama5 | Laminin subunit alpha-5 (Laminin-10 subunit alpha) (Laminin-11 subunit alpha) (Laminin-15 subunit alpha) |
| Q3U2P1 | SC24A_MOUSE | Sec24a | Protein transport protein Sec24A (SEC24-related protein A) |
| Q69ZN7 | MYOF_MOUSE | Myof | Myoferlin (Fer-1-like protein 3) |
| Q9DB34 | CHM2A_MOUSE | Chmp2a | Charged multivesicular body protein 2a (Chromatin-modifying protein 2a, CHMP2a) (Vacuolar protein sorting-associated protein 2, mVps2) |
| P17095 | HMGA1_MOUSE | Hmga1 | High mobility group protein HMG-I/HMG-Y, HMG-I(Y) (High mobility group AT-hook protein 1, High mobility group protein A1) |
| Q0VGB7 | PP4R2_MOUSE | Ppp4r2 | Serine/threonine-protein phosphatase 4 regulatory subunit 2 |
| Q8CAA7 | PGM2L_MOUSE | Pgm2l1 | Glucose 1,6-bisphosphate synthase, EC 2.7.1.106 (Phosphoglucomutase-2-like 1) |
| Q9Z2D0 | MTMR9_MOUSE | Mtmr9 | Myotubularin-related protein 9 (Inactive phosphatidylinositol 3-phosphatase 9) |
| P50518 | VATE1_MOUSE | Atp6v1e1 | V-type proton ATPase subunit E 1, V-ATPase subunit E 1 (V-ATPase 31 kDa subunit, p31) (Vacuolar proton pump subunit E 1) |
| Q69ZK9 | NLGN2_MOUSE | Nlgn2 | Neuroigin-2 |
| Q8BX80 | ENASE_MOUSE | Engase | Cytosolic endo-beta-N-acetylglucosaminidase, ENGase, EC 3.2.1.96 |
| Q922R8 | PDIA6_MOUSE | Pdia6 | Protein disulfide-isomerase A6, EC 5.3.4.1 (Thioredoxin domain-containing protein 7) |
| A2AP18 | PLCH2_MOUSE | Plch2 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase eta-2, EC 3.1.4.11 (Phosphoinositide phospholipase C-eta-2) (Phosphoinositide phospholipase C-like 4, PLC-L4, Phospholipase C-like protein 4) (Phospholipase C-eta-2, PLC-eta2) |
| Q9JIS5 | SV2A_MOUSE | Sv2a | Synaptic vesicle glycoprotein 2A, Synaptic vesicle protein 2, Synaptic vesicle protein 2A (Calcium regulator SV2A) |
| Q6P2K6 | P4R3A_MOUSE | Ppp4r3a | Serine/threonine-protein phosphatase 4 regulatory subunit 3A (SMEK homolog 1) |
| Q91WC3 | ACSL6_MOUSE | Acsl6 | Long-chain-fatty-acid--CoA ligase 6, EC 6.2.1.3 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 6, LACS 6) |
| C0HKD9 | MFA1B_MOUSE | Mfap1b | Microfibrillar-associated protein 1B (Spliceosome B complex protein MFAP1B) |
| Q8K2B3 | SDHA_MOUSE | Sdha | Succinate dehydrogenase [ubiquinone] flavoprotein subunit, mitochondrial, EC 1.3.5.1 (Flavoprotein subunit of complex II, Fp) |
| Q8BTY2 | S4A7_MOUSE | Slc4a7 | Sodium bicarbonate cotransporter 3 (Solute carrier family 4 member 7) |

| | | | |
|--------|-------------|---------|---|
| Q62417 | SRBS1_MOUSE | Sorbs1 | Sorbin and SH3 domain-containing protein 1 (Ponsin) (SH3 domain protein 5) (SH3P12) (c-Cbl-associated protein, CAP) |
| P63154 | CRNL1_MOUSE | Crnk11 | Crooked neck-like protein 1 (Crooked neck homolog) |
| P56564 | EAA1_MOUSE | Slc1a3 | Excitatory amino acid transporter 1 (Glial high affinity glutamate transporter) (High-affinity neuronal glutamate transporter, GluT-1) (Sodium-dependent glutamate/aspartate transporter 1, GLAST-1) (Solute carrier family 1 member 3) |
| Q9Z0E0 | NCDN_MOUSE | Ncdn | Neurochondrin (M-Sema F-associating protein of 75 kDa) (Norbin) |
| Q9D8Y0 | EFHD2_MOUSE | Efhd2 | EF-hand domain-containing protein D2 (Swiprosin-1) |
| P62869 | ELOB_MOUSE | Elob | Elongin-B, EloB (Elongin 18 kDa subunit) (RNA polymerase II transcription factor SIII subunit B) (SIII p18) (Transcription elongation factor B polypeptide 2) |
| Q6P5H2 | NEST_MOUSE | Nes | Nestin |
| Q3UNH4 | GRIN1_MOUSE | Gprin1 | G protein-regulated inducer of neurite outgrowth 1, GRIN1 |
| Q3UHL1 | CAMKV_MOUSE | Camkv | CaM kinase-like vesicle-associated protein |
| Q3TXX4 | VGLU1_MOUSE | Slc17a7 | Vesicular glutamate transporter 1, VGluT1 (Brain-specific Na(+)-dependent inorganic phosphate cotransporter) (Solute carrier family 17 member 7) |
| Q9R1P4 | PSA1_MOUSE | Psmal | Proteasome subunit alpha type-1 (Macropain subunit C2) (Multicatalytic endopeptidase complex subunit C2) (Proteasome component C2) (Proteasome nu chain) |
| Q80WQ2 | VAC14_MOUSE | Vac14 | Protein VAC14 homolog |
| Q8C0L0 | TMX4_MOUSE | Tmx4 | Thioredoxin-related transmembrane protein 4 (Thioredoxin domain-containing protein 13) |
| Q9WVJ2 | PSD13_MOUSE | Psm13 | 26S proteasome non-ATPase regulatory subunit 13 (26S proteasome regulatory subunit RPN9) (26S proteasome regulatory subunit S11) (26S proteasome regulatory subunit p40.5) |
| Q05186 | RCN1_MOUSE | Rcn1 | Reticulocalbin-1 |
| P10637 | TAU_MOUSE | Mapt | Microtubule-associated protein tau (Neurofibrillary tangle protein) (Paired helical filament-tau, PHF-tau) |
| Q9DCX2 | ATP5H_MOUSE | Atp5pd | ATP synthase subunit d, mitochondrial, ATPase subunit d (ATP synthase peripheral stalk subunit d) |
| D3YXK2 | SAFB1_MOUSE | Safb | Scaffold attachment factor B1, SAF-B1 |

| | | | |
|--------|-------------|---------|---|
| Q91W43 | GCSP_MOUSE | Gldc | Glycine dehydrogenase (decarboxylating), mitochondrial, EC 1.4.4.2 (Glycine cleavage system P protein) (Glycine decarboxylase) (Glycine dehydrogenase (aminomethyl-transferring)) |
| O88741 | GDAP1_MOUSE | Gdap1 | Ganglioside-induced differentiation-associated protein 1, GDAP1 |
| Q9ERS2 | NDUAD_MOUSE | Ndufa13 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 13 (Cell death regulatory protein GRIM-19) (Complex I-B16.6, CI-B16.6) (Gene associated with retinoic and interferon-induced mortality 19 protein, GRIM-19, Gene associated with retinoic and IFN-induced mortality 19 protein) (NADH-ubiquinone oxidoreductase B16.6 subunit) |
| Q8CJG0 | AGO2_MOUSE | Ago2 | Protein argonaute-2, Argonaute2, mAgo2, EC 3.1.26.n2 (Argonaute RISC catalytic component 2) (Eukaryotic translation initiation factor 2C 2, eIF-2C 2, eIF2C 2) (Piwi/argonaute family protein meIF2C2) (Protein slicer) |
| Q3UL36 | ARGL1_MOUSE | Arglu1 | Arginine and glutamate-rich protein 1 |
| Q61792 | LASP1_MOUSE | Lasp1 | LIM and SH3 domain protein 1, LASP-1 (Metastatic lymph node gene 50 protein, MLN 50) |
| Q3UHX2 | HAP28_MOUSE | Pdap1 | 28 kDa heat- and acid-stable phosphoprotein (PDGF-associated protein, PAP) (PDGFA-associated protein 1, PAPI) |
| Q03717 | KCNB1_MOUSE | Kcnb1 | Potassium voltage-gated channel subfamily B member 1 (Voltage-gated potassium channel subunit Kv2.1) (mShab) |
| Q8R5M8 | CADM1_MOUSE | Cadm1 | Cell adhesion molecule 1 (Immunoglobulin superfamily member 4, IgSF4) (Nectin-like protein 2, NECL-2) (Spermatogenic immunoglobulin superfamily, SgIgSF) (Synaptic cell adhesion molecule, SynCAM) (Tumor suppressor in lung cancer 1, TSLC-1) |
| Q7TNE3 | SPAG7_MOUSE | Spag7 | Sperm-associated antigen 7 |
| Q5DTL9 | S4A10_MOUSE | Slc4a10 | Sodium-driven chloride bicarbonate exchanger (Solute carrier family 4 member 10) |
| Q9QYB5 | ADDG_MOUSE | Add3 | Gamma-adducin (Adducin-like protein 70) |
| O35841 | API5_MOUSE | Api5 | Apoptosis inhibitor 5, API-5 (AAC-11) |
| P28271 | ACOHC_MOUSE | Aco1 | Cytoplasmic aconitate hydratase, Aconitase, EC 4.2.1.3 (Citrate hydro-lyase) (Iron regulatory protein 1, IRP1) (Iron-responsive element-binding protein 1, IRE-BP 1) |
| Q99LD8 | DDAH2_MOUSE | Ddah2 | N(G),N(G)-dimethylarginine dimethylaminohydrolase 2, DDAH-2, Dimethylarginine dimethylaminohydrolase 2, EC 3.5.3.18 (DDAHII) (Dimethylargininase-2) |

| | | | |
|--------|-------------|---------|--|
| Q60769 | TNAP3_MOUSE | Tnfaip3 | Tumor necrosis factor alpha-induced protein 3, TNF alpha-induced protein 3, EC 2.3.2.-, EC 3.4.19.12 (Putative DNA-binding protein A20) (Zinc finger protein A20) |
| P51660 | DHB4_MOUSE | Hsd17b4 | Peroxisomal multifunctional enzyme type 2, MFE-2 (17-beta-hydroxysteroid dehydrogenase 4, 17-beta-HSD 4) (D-bifunctional protein, DBP) (Multifunctional protein 2, MFP-2) [Cleaved into: (3R)-hydroxyacyl-CoA dehydrogenase, EC 1.1.1.n12; Enoyl-CoA hydratase 2, EC 4.2.1.107, EC 4.2.1.119 (3-alpha,7-alpha,12-alpha-trihydroxy-5-beta-cholest-24-enoyl-CoA hydratase)] |
| Q9WUM4 | COR1C_MOUSE | Coro1c | Coronin-1C (Coronin-3) |
| O54734 | OST48_MOUSE | Ddost | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase 48 kDa subunit, DDOST 48 kDa subunit, Oligosaccharyl transferase 48 kDa subunit |
| Q60972 | RBBP4_MOUSE | Rbbp4 | Histone-binding protein RBBP4 (Chromatin assembly factor 1 subunit C, CAF-1 subunit C) (Chromatin assembly factor I p48 subunit, CAF-I 48 kDa subunit, CAF-I p48) (Nucleosome-remodeling factor subunit RBAP48) (Retinoblastoma-binding protein 4, RBBP-4) (Retinoblastoma-binding protein p48) |
| O55234 | PSB5_MOUSE | Psmb5 | Proteasome subunit beta type-5, EC 3.4.25.1 (Macropain epsilon chain) (Multicatalytic endopeptidase complex epsilon chain) (Proteasome chain 6) (Proteasome epsilon chain) (Proteasome subunit X) |
| Q9WVE8 | PACN2_MOUSE | Pacsin2 | Protein kinase C and casein kinase substrate in neurons protein 2 (Syndapin-2) (Syndapin-II, SdpII) |
| Q62108 | DLG4_MOUSE | Dlg4 | Disks large homolog 4 (Postsynaptic density protein 95, PSD-95) (Synapse-associated protein 90, SAP-90, SAP90) |
| Q61136 | PRP4B_MOUSE | Prpf4b | Serine/threonine-protein kinase PRP4 homolog, EC 2.7.11.1 (PRP4 pre-mRNA-processing factor 4 homolog) (Pre-mRNA protein kinase) |
| Q9Z103 | ADNP_MOUSE | Adnp | Activity-dependent neuroprotector homeobox protein (Activity-dependent neuroprotective protein) |
| O35638 | STAG2_MOUSE | Stag2 | Cohesin subunit SA-2 (SCC3 homolog 2) (Stromal antigen 2) |
| P19096 | FAS_MOUSE | Fasn | Fatty acid synthase, EC 2.3.1.85 (Type I Fatty Acid Synthase) [Includes: [Acyl-carrier-protein] S-acetyltransferase, EC 2.3.1.38; [Acyl-carrier-protein] S-malonyltransferase, EC 2.3.1.39; 3-oxoacyl-[acyl-carrier-protein] synthase, EC 2.3.1.41; 3-oxoacyl-[acyl-carrier-protein] reductase, EC 1.1.1.100; 3-hydroxyacyl-[acyl-carrier-protein] dehydratase, EC 4.2.1.59; Enoyl-[acyl-carrier-protein] reductase, EC 1.3.1.39; Acyl-[acyl-carrier-protein] hydrolase, EC 3.1.2.14] |

| | | | |
|--------|-------------|---------|---|
| Q61937 | NPM_MOUSE | Npm1 | Nucleophosmin, NPM (Nucleolar phosphoprotein B23) (Nucleolar protein NO38) (Numatrin) |
| P63011 | RAB3A_MOUSE | Rab3a | Ras-related protein Rab-3A |
| P40142 | TKT_MOUSE | Tkt | Transketolase, TK, EC 2.2.1.1 (P68) |
| P10922 | H10_MOUSE | H1-0 | Histone H1.0 (Histone H1') (Histone H1(0)) (MyD196) [Cleaved into: Histone H1.0, N-terminally processed] |
| Q9WUB3 | PYGM_MOUSE | Pygm | Glycogen phosphorylase, muscle form, EC 2.4.1.1 (Myophosphorylase) |
| Q8JZQ2 | AFG32_MOUSE | Afg3l2 | AFG3-like protein 2, EC 3.4.24.- |
| Q6NZF1 | ZC11A_MOUSE | Zc3h11a | Zinc finger CCCH domain-containing protein 11A |
| P31650 | S6A11_MOUSE | Slc6a11 | Sodium- and chloride-dependent GABA transporter 3, GAT-3 (Sodium- and chloride-dependent GABA transporter 4, GAT-4) (Solute carrier family 6 member 11) |
| Q8BGD9 | IF4B_MOUSE | Eif4b | Eukaryotic translation initiation factor 4B, eIF-4B |
| Q6PHZ2 | KCC2D_MOUSE | Camk2d | Calcium/calmodulin-dependent protein kinase type II subunit delta, CaM kinase II subunit delta, CaMK-II subunit delta, EC 2.7.11.17 |
| P97300 | NPTN_MOUSE | Nptn | Neuroplastin (Stromal cell-derived receptor 1, SDR-1) |
| Q91WD9 | SEGN_MOUSE | Scgn | Secretagogin |
| P39749 | FEN1_MOUSE | Fen1 | Flap endonuclease 1, FEN-1, EC 3.1.-.- (Flap structure-specific endonuclease 1) |
| Q9QX47 | SON_MOUSE | Son | Protein SON (Negative regulatory element-binding protein, NRE-binding protein) |
| P02468 | LAMC1_MOUSE | Lamc1 | Laminin subunit gamma-1 (Laminin B2 chain) (Laminin-1 subunit gamma) (Laminin-10 subunit gamma) (Laminin-11 subunit gamma) (Laminin-2 subunit gamma) (Laminin-3 subunit gamma) (Laminin-4 subunit gamma) (Laminin-6 subunit gamma) (Laminin-7 subunit gamma) (Laminin-8 subunit gamma) (Laminin-9 subunit gamma) (S-laminin subunit gamma, S-LAM gamma) |
| P56546 | CTBP2_MOUSE | Ctbp2 | C-terminal-binding protein 2, CtBP2 |
| P29341 | PABP1_MOUSE | Pabpc1 | Polyadenylate-binding protein 1, PABP-1, Poly(A)-binding protein 1 |
| Q9Z1Q9 | SYVC_MOUSE | Vars1 | Valine--tRNA ligase, EC 6.1.1.9 (Protein G7a) (Valyl-tRNA synthetase, ValRS) |
| Q6GQT9 | NOMO1_MOUSE | Nomo1 | Nodal modulator 1 |
| Q91VM9 | IPYR2_MOUSE | Ppa2 | Inorganic pyrophosphatase 2, mitochondrial, EC 3.6.1.1 (Pyrophosphate phosphohydrolase 2, PPase 2) |

| | | | |
|--------|-------------|---------|---|
| Q9Z0G0 | GIPC1_MOUSE | Gipc1 | PDZ domain-containing protein GIPC1 (GAIP C-terminus-interacting protein) (RGS-GAIP-interacting protein) (RGS19-interacting protein 1) (SemaF cytoplasmic domain-associated protein 1, SEMCAP-1) (Synectin) |
| Q8BH57 | WDR48_MOUSE | Wdr48 | WD repeat-containing protein 48 (USP1-associated factor 1) |
| Q6ZQ08 | CNOT1_MOUSE | Cnot1 | CCR4-NOT transcription complex subunit 1 (CCR4-associated factor 1) |
| Q8VE99 | CC115_MOUSE | Ccdc115 | Coiled-coil domain-containing protein 115 (Coiled-coil protein 1, Ccp1) |
| Q80TV8 | CLAP1_MOUSE | Clasp1 | CLIP-associating protein 1 (Cytoplasmic linker-associated protein 1) |
| Q3UMR5 | MCU_MOUSE | Mcu | Calcium uniporter protein, mitochondrial |
| Q8JZS0 | LIN7A_MOUSE | Lin7a | Protein lin-7 homolog A, Lin-7A, mLin-7 (Mammalian lin-seven protein 1, MALS-1) (Vertebrate lin-7 homolog 1, Veli-1) |
| Q8VEM8 | MPCP_MOUSE | Slc25a3 | Phosphate carrier protein, mitochondrial (Phosphate transport protein, PTP) (Solute carrier family 25 member 3) |
| Q6ZWX6 | IF2A_MOUSE | Eif2s1 | Eukaryotic translation initiation factor 2 subunit 1 (Eukaryotic translation initiation factor 2 subunit alpha, eIF-2-alpha, eIF-2A, eIF-2alpha) |
| O88508 | DNM3A_MOUSE | Dnmt3a | DNA (cytosine-5)-methyltransferase 3A, Dnmt3a, EC 2.1.1.37 (Cysteine methyltransferase DNMT3A, EC 2.1.1.-) (DNA methyltransferase MmuIIIA, DNA MTase MmuIIIA, M.MmuIIIA) |
| Q9D0B6 | PBDC1_MOUSE | Pbdc1 | Protein PBDC1 (Polysaccharide biosynthesis domain-containing protein 1) |
| P46660 | AINX_MOUSE | Ina | Alpha-internexin, Alpha-Inx (66 kDa neurofilament protein, NF-66, Neurofilament-66) |
| P80316 | TCPE_MOUSE | Cct5 | T-complex protein 1 subunit epsilon, TCP-1-epsilon (CCT-epsilon) |
| Q9CXG3 | PPIL4_MOUSE | Ppil4 | Peptidyl-prolyl cis-trans isomerase-like 4, PPIase, EC 5.2.1.8 (Cyclophilin-like protein PPIL4) (Rotamase PPIL4) |
| Q71M36 | CSPG5_MOUSE | Cspg5 | Chondroitin sulfate proteoglycan 5 (Acidic leucine-rich EGF-like domain-containing brain protein) (Neuroglycan C) |
| Q8K4G5 | ABLM1_MOUSE | Ablim1 | Actin-binding LIM protein 1, abLIM-1 (Actin-binding LIM protein family member 1) |
| O88704 | HCN1_MOUSE | Hcn1 | Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 1 (Brain cyclic nucleotide-gated channel 1, BCNG-1) (Hyperpolarization-activated cation channel 2, HAC-2) |
| Q5SV85 | SYNRG_MOUSE | Synrg | Synergilin gamma (API subunit gamma-binding protein 1) (Gamma-synergilin) |

| | | | |
|--------|-------------|----------|---|
| Q64213 | SF01_MOUSE | Sf1 | Splicing factor 1 (CW17) (Mammalian branch point-binding protein, BBP, mBBP) (Transcription factor ZFM1, mZFM) (Zinc finger gene in MEN1 locus) (Zinc finger protein 162) |
| Q58A65 | JIP4_MOUSE | Spag9 | C-Jun-amino-terminal kinase-interacting protein 4, JIP-4, JNK-interacting protein 4 (JNK-associated leucine-zipper protein, JLP) (JNK/SAPK-associated protein 2, JSAP2) (Mitogen-activated protein kinase 8-interacting protein 4) (Sperm-associated antigen 9) |
| Q8BI84 | TGO1_MOUSE | Mia3 | Transport and Golgi organization protein 1 homolog, TANGO1 (Melanoma inhibitory activity protein 3) |
| Q9EP69 | SAC1_MOUSE | Sacm11 | Phosphatidylinositol-3-phosphatase SAC1, EC 3.1.3.64 (Phosphatidylinositol-4-phosphate phosphatase) (Suppressor of actin mutations 1-like protein) |
| Q9Z0N1 | IF2G_MOUSE | Eif2s3x | Eukaryotic translation initiation factor 2 subunit 3, X-linked, EC 3.6.5.3 (Eukaryotic translation initiation factor 2 subunit gamma, X-linked, eIF-2-gamma X) |
| Q9CZD3 | GARS_MOUSE | Gars1 | Glycine--tRNA ligase, EC 6.1.1.14 (Diadenosine tetraphosphate synthetase, Ap4A synthetase, EC 2.7.7.-) (Glycyl-tRNA synthetase 1, GlyRS) |
| Q6PHS9 | CA2D2_MOUSE | Cacna2d2 | Voltage-dependent calcium channel subunit alpha-2/delta-2 (Protein ducky) (Voltage-gated calcium channel subunit alpha-2/delta-2) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-2; Voltage-dependent calcium channel subunit delta-2] |
| Q8C878 | UBA3_MOUSE | Uba3 | NEDD8-activating enzyme E1 catalytic subunit, EC 6.2.1.64 (NEDD8-activating enzyme E1C) (Ubiquitin-activating enzyme E1C) (Ubiquitin-like modifier-activating enzyme 3, Ubiquitin-activating enzyme 3) |
| Q6URW6 | MYH14_MOUSE | Myh14 | Myosin-14 (Myosin heavy chain 14) (Myosin heavy chain, non-muscle IIc) (Non-muscle myosin heavy chain IIc, NMHC II-C) |
| Q8CAQ8 | MIC60_MOUSE | Immt | MICOS complex subunit Mic60 (Mitochondrial inner membrane protein) (Mitofilin) |
| O08788 | DCTN1_MOUSE | Dctn1 | Dynactin subunit 1 (150 kDa dynein-associated polypeptide) (DAP-150, DP-150) (p150-glued) |
| P52480 | KPYM_MOUSE | Pkm | Pyruvate kinase PKM, EC 2.7.1.40 (Pyruvate kinase muscle isozyme) (Threonine-protein kinase PKM2, EC 2.7.11.1) (Tyrosine-protein kinase PKM2, EC 2.7.10.2) |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| Q8CGP1 | H2B1K_MOUSE | H2bc12 | Histone H2B type 1-K |

| | | | |
|--------|-------------|---------|---|
| P62983 | RS27A_MOUSE | Rps27a | Ubiquitin-40S ribosomal protein S27a (Ubiquitin carboxyl extension protein 80) [Cleaved into: Ubiquitin; 40S ribosomal protein S27a] |
| Q9D394 | RUFY3_MOUSE | Rufy3 | Protein RUFY3 (Rap2-interacting protein x, RIPx) (Single axon-regulated protein 1, Singar1) |
| Q64704 | STX3_MOUSE | Stx3 | Syntaxin-3 |
| P18572 | BASI_MOUSE | Bsg | Basigin (Basic immunoglobulin superfamily) (HT7 antigen) (Membrane glycoprotein gp42) (CD antigen CD147) |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| Q91V14 | S12A5_MOUSE | Slc12a5 | Solute carrier family 12 member 5 (Electroneutral potassium-chloride cotransporter 2) (K-Cl cotransporter 2, mKCC2) (Neuronal K-Cl cotransporter) |
| Q8R1M2 | H2AJ_MOUSE | H2aj | Histone H2A.J, H2a/j |
| Q3TXS7 | PSMD1_MOUSE | Psm1 | 26S proteasome non-ATPase regulatory subunit 1 (26S proteasome regulatory subunit RPN2) (26S proteasome regulatory subunit S1) |
| P60840 | ENSA_MOUSE | Ensa | Alpha-endosulfine (ARPP-19e) |
| Q9WUK2 | IF4H_MOUSE | Eif4h | Eukaryotic translation initiation factor 4H, eIF-4H (Williams-Beuren syndrome chromosomal region 1 protein homolog) |
| P51881 | ADT2_MOUSE | Slc25a5 | ADP/ATP translocase 2 (ADP,ATP carrier protein 2) (Adenine nucleotide translocator 2, ANT 2) (Solute carrier family 25 member 5) [Cleaved into: ADP/ATP translocase 2, N-terminally processed] |
| Q70FJ1 | AKAP9_MOUSE | Akap9 | A-kinase anchor protein 9, AKAP-9 (Protein kinase A-anchoring protein 9, PRKA9) |
| Q8K019 | BCLF1_MOUSE | Bclaf1 | Bcl-2-associated transcription factor 1, Btf |
| Q8BTY2 | S4A7_MOUSE | Slc4a7 | Sodium bicarbonate cotransporter 3 (Solute carrier family 4 member 7) |
| P0DP28 | CALM3_MOUSE | Calm3 | Calmodulin-3 |
| Q8K010 | OPLA_MOUSE | Oplah | 5-oxoprolinase, EC 3.5.2.9 (5-oxo-L-prolinase, 5-OPase) (Pyroglutamase) |
| P68404 | KPCB_MOUSE | Prkcb | Protein kinase C beta type, PKC-B, PKC-beta, EC 2.7.11.13 |
| Q9R1C6 | DGKE_MOUSE | Dgke | Diacylglycerol kinase epsilon, DAG kinase epsilon, EC 2.7.1.107 (Diglyceride kinase epsilon, DGK-epsilon) |
| Q9DCE5 | PK1IP_MOUSE | Pak1ip1 | p21-activated protein kinase-interacting protein 1 (PAK1-interacting protein 1) (Putative PAK inhibitor Skb15) |

| | | | |
|--------|-------------|---------|---|
| Q9CPQ3 | TOM22_MOUSE | Tomm22 | Mitochondrial import receptor subunit TOM22 homolog (Translocase of outer membrane 22 kDa subunit homolog) |
| Q8CCJ4 | AMER2_MOUSE | Amer2 | APC membrane recruitment protein 2, Amer2 (Protein FAM123A) |
| Q8BY87 | UBP47_MOUSE | Usp47 | Ubiquitin carboxyl-terminal hydrolase 47, EC 3.4.19.12 (Deubiquitinating enzyme 47) (Ubiquitin thioesterase 47) (Ubiquitin-specific-processing protease 47) |
| Q64291 | K1C12_MOUSE | Krt12 | Keratin, type I cytoskeletal 12 (Cytokeratin-12, CK-12) (Keratin-12, K12) |
| Q3UTJ2 | SRBS2_MOUSE | Sorbs2 | Sorbin and SH3 domain-containing protein 2 (Arg-binding protein 2, ArgBP2) (Arg/Abl-interacting protein 2) |
| B9EJA2 | CTTB2_MOUSE | Cttnbp2 | Cortactin-binding protein 2, CortBP2 |
| Q60932 | VDAC1_MOUSE | Vdac1 | Voltage-dependent anion-selective channel protein 1, VDAC-1, mVDAC1 (Outer mitochondrial membrane protein porin 1) (Plasmalemmal porin) (Voltage-dependent anion-selective channel protein 5, VDAC-5, mVDAC5) |
| Q9QZH3 | PPIE_MOUSE | Ppie | Peptidyl-prolyl cis-trans isomerase E, PPIase E, EC 5.2.1.8 (Cyclophilin E) (Cyclophilin-33) (Rotamase E) |
| Q8BP27 | SFR1_MOUSE | Sfr1 | Swi5-dependent recombination DNA repair protein 1 homolog (Meiosis protein 5 homolog) |
| Q9CSU0 | RPR1B_MOUSE | Rprd1b | Regulation of nuclear pre-mRNA domain-containing protein 1B (Cell cycle-related and expression-elevated protein in tumor) |
| Q810B6 | ANFY1_MOUSE | Ankfy1 | Rabankyrin-5, Rank-5 (Ankyrin repeat and FYVE domain-containing protein 1) (Ankyrin repeats hooked to a zinc finger motif) |
| P23953 | EST1C_MOUSE | Ces1c | Carboxylesterase 1C, EC 3.1.1.1 (Liver carboxylesterase N) (Lung surfactant convertase) (PES-N) |
| Q8BKZ9 | ODPX_MOUSE | Pdhx | Pyruvate dehydrogenase protein X component, mitochondrial (Dihydrolipoamide dehydrogenase-binding protein of pyruvate dehydrogenase complex) (Lipoyl-containing pyruvate dehydrogenase complex component X) |
| O54946 | DNJB6_MOUSE | Dnajb6 | DnaJ homolog subfamily B member 6 (Heat shock protein J2, HSJ-2) (MRJ) (mDj4) |
| Q9Z0N2 | IF2H_MOUSE | Eif2s3y | Eukaryotic translation initiation factor 2 subunit 3, Y-linked, EC 3.6.5.3 (Eukaryotic translation initiation factor 2 subunit gamma, Y-linked, eIF-2-gamma Y) (Spermatogonial proliferation factor, Spy) |
| Q8R2M2 | TDIF2_MOUSE | Dnttip2 | Deoxynucleotidyltransferase terminal-interacting protein 2 |
| Q8R5H1 | UBP15_MOUSE | Usp15 | Ubiquitin carboxyl-terminal hydrolase 15, EC 3.4.19.12 (Deubiquitinating enzyme 15) (Ubiquitin thioesterase 15) (Ubiquitin-specific-processing protease 15) |

| | | | |
|--------|-------------|----------|--|
| Q9QYB8 | ADDB_MOUSE | Add2 | Beta-adducin (Add97) (Erythrocyte adducin subunit beta) |
| P26638 | SYSC_MOUSE | Sars1 | Serine--tRNA ligase, cytoplasmic, EC 6.1.1.11 (Seryl-tRNA synthetase, SerRS) (Seryl-tRNA(Ser/Sec) synthetase) |
| Q80TV8 | CLAP1_MOUSE | Clasp1 | CLIP-associating protein 1 (Cytoplasmic linker-associated protein 1) |
| Q9CZ04 | CSN7A_MOUSE | Cops7a | COP9 signalosome complex subunit 7a, SGN7a, Signalosome subunit 7a (JAB1-containing signalosome subunit 7a) |
| P56399 | UBP5_MOUSE | Usp5 | Ubiquitin carboxyl-terminal hydrolase 5, EC 3.4.19.12 (Deubiquitinating enzyme 5) (Isopeptidase T) (Ubiquitin thioesterase 5) (Ubiquitin-specific-processing protease 5) |
| P04104 | K2C1_MOUSE | Krt1 | Keratin, type II cytoskeletal 1 (67 kDa cytokeratin) (Cytokeratin-1, CK-1) (Keratin-1, K1) (Type-II keratin Kb1) |
| Q80YV4 | PANK4_MOUSE | Pank4 | 4'-phosphopantetheine phosphatase, EC 3.1.3.- (Inactive pantothenic acid kinase 4, mPank4) |
| P54103 | DNJC2_MOUSE | Dnajc2 | DnaJ homolog subfamily C member 2 (Mouse Id associate 1, MIDA1) (Zuotin-related factor 1) |
| Q91YM2 | RHG35_MOUSE | Arhgap35 | Rho GTPase-activating protein 35 (Glucocorticoid receptor DNA-binding factor 1) |
| Q60989 | XIAP_MOUSE | Xiap | E3 ubiquitin-protein ligase XIAP, EC 2.3.2.27 (Baculoviral IAP repeat-containing protein 4) (IAP homolog A) (Inhibitor of apoptosis protein 3, IAP-3, mIAP-3, mIAP3) (RING-type E3 ubiquitin transferase XIAP) (X-linked inhibitor of apoptosis protein, X-linked IAP) |
| Q91VW5 | GOGA4_MOUSE | Golga4 | Golgin subfamily A member 4 (tGolgin-1) |
| P62996 | TRA2B_MOUSE | Tra2b | Transformer-2 protein homolog beta, TRA-2 beta, TRA2-beta (Silica-induced gene 41 protein, SIG-41) (Splicing factor, arginine/serine-rich 10) (Transformer-2 protein homolog B) |
| Q8BML9 | SYQ_MOUSE | Qars1 | Glutamine--tRNA ligase, EC 6.1.1.18 (Glutaminyl-tRNA synthetase, GlnRS) |
| Q1HFZ0 | NSUN2_MOUSE | Nsun2 | RNA cytosine C(5)-methyltransferase NSUN2, EC 2.1.1.- (Myc-induced SUN domain-containing protein, Misu) (NOL1/NOP2/Sun domain family member 2) (mRNA cytosine C(5)-methyltransferase, EC 2.1.1.-) (tRNA cytosine C(5)-methyltransferase, EC 2.1.1.-, EC 2.1.1.203) |
| Q99JP6 | HOME3_MOUSE | Homer3 | Homer protein homolog 3, Homer-3 |
| P70255 | NFIC_MOUSE | Nfic | Nuclear factor 1 C-type, NF1-C, Nuclear factor 1/C (CCAAT-box-binding transcription factor, CTF) (Nuclear factor I/C, NF-I/C, NFI-C) (TGGCA-binding protein) |

| | | | |
|--------|-------------|---------|---|
| Q925E7 | 2ABD_MOUSE | Ppp2r2d | Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B delta isoform (PP2A subunit B isoform B55-delta) (PP2A subunit B isoform PR55-delta) (PP2A subunit B isoform R2-delta) (PP2A subunit B isoform delta) |
| Q9EPE9 | AT131_MOUSE | Atp13a1 | Endoplasmic reticulum transmembrane helix translocase, EC 7.4.2.- (Endoplasmic reticulum P5A-ATPase) |
| Q8BZQ7 | ANC2_MOUSE | Anapc2 | Anaphase-promoting complex subunit 2, APC2 (Cyclosome subunit 2) |
| Q8BSS9 | LIPA2_MOUSE | Ppfia2 | Liprin-alpha-2 (Protein tyrosine phosphatase receptor type f polypeptide-interacting protein alpha-2, PTPRF-interacting protein alpha-2) |
| Q99JP0 | M4K3_MOUSE | Map4k3 | Mitogen-activated protein kinase kinase kinase 3, EC 2.7.11.1 (Germinal center kinase-related protein kinase, GLK) (MAPK/ERK kinase kinase 3, MEK kinase kinase 3, MEKKK 3) |
| Q9EP72 | EMC7_MOUSE | Emc7 | ER membrane protein complex subunit 7 |
| Q3UHU5 | MTCL1_MOUSE | Mtcl1 | Microtubule cross-linking factor 1 (Coiled-coil domain-containing protein 165) (PAR-1-interacting protein) (SOGA family member 2) |
| Q9CX34 | SGT1_MOUSE | Sugt1 | Protein SGT1 homolog (Suppressor of G2 allele of SKP1 homolog) |
| Q9D787 | PPIL2_MOUSE | Ppil2 | RING-type E3 ubiquitin-protein ligase PPIL2, EC 2.3.2.27 (CYC4) (Probable inactive peptidyl-prolyl cis-trans isomerase-like 2, PPIase) |
| Q9D287 | SPF27_MOUSE | Bcas2 | Pre-mRNA-splicing factor SPF27 (Breast carcinoma-amplified sequence 2 homolog) (DNA amplified in mammary carcinoma 1 protein) |
| Q8C181 | MBNL2_MOUSE | Mbnl2 | Muscleblind-like protein 2 |
| Q02819 | NUCB1_MOUSE | Nucb1 | Nucleobindin-1 (CALNUC) |
| P59997 | KDM2A_MOUSE | Kdm2a | Lysine-specific demethylase 2A, EC 1.14.11.27 (F-box and leucine-rich repeat protein 11) (F-box/LRR-repeat protein 11) (JmjC domain-containing histone demethylation protein 1A) ([Histone-H3]-lysine-36 demethylase 1A) |
| Q8C1A5 | THOP1_MOUSE | Thop1 | Thimet oligopeptidase, EC 3.4.24.15 |
| Q9QWI6 | SRCN1_MOUSE | Srcin1 | SRC kinase signaling inhibitor 1 (SNAP-25-interacting protein, SNIP) (p130Cas-associated protein) (p140Cap) |
| Q8VHH5 | AGAP3_MOUSE | Agap3 | Arf-GAP with GTPase, ANK repeat and PH domain-containing protein 3, AGAP-3 (CRAM-associated GTPase, CRAG) (Centaurin-gamma-3, Cnt-g3) (MR1-interacting protein, MRIP-1) |
| P09671 | SODM_MOUSE | Sod2 | Superoxide dismutase [Mn], mitochondrial, EC 1.15.1.1 |
| Q9Z2D8 | MBD3_MOUSE | Mbd3 | Methyl-CpG-binding domain protein 3 (Methyl-CpG-binding protein MBD3) |

| | | | |
|--------|-------------|---------|--|
| Q8R0S4 | CACB4_MOUSE | Cacnb4 | Voltage-dependent L-type calcium channel subunit beta-4, CAB4 (Calcium channel voltage-dependent subunit beta 4) |
| Q61097 | KSR1_MOUSE | Ksr1 | Kinase suppressor of Ras 1, mKSR1, EC 2.7.11.1 (Protein Hb) |
| Q8BLH7 | HIRP3_MOUSE | Hirip3 | HIRA-interacting protein 3 |
| Q8BH95 | ECHM_MOUSE | Echs1 | Enoyl-CoA hydratase, mitochondrial, mECH, mECH1, EC 4.2.1.17, EC 5.3.3.8 (Enoyl-CoA hydratase 1, ECHS1) (Short-chain enoyl-CoA hydratase, SCEH) |
| P35601 | RFC1_MOUSE | Rfc1 | Replication factor C subunit 1 (A1-P145) (Activator 1 140 kDa subunit, A1 140 kDa subunit) (Activator 1 large subunit) (Activator 1 subunit 1) (Differentiation-specific element-binding protein) (ISRE-binding protein) (Replication factor C 140 kDa subunit, RF-C 140 kDa subunit, RFC140) (Replication factor C large subunit) |
| P29974 | CNGA1_MOUSE | Cnga1 | cGMP-gated cation channel alpha-1 (Cyclic nucleotide-gated cation channel 1) (Cyclic nucleotide-gated channel alpha-1, CNG channel alpha-1, CNG-1, CNG1) (Cyclic nucleotide-gated channel, photoreceptor) (Rod photoreceptor cGMP-gated channel subunit alpha) |
| P55258 | RAB8A_MOUSE | Rab8a | Ras-related protein Rab-8A, EC 3.6.5.2 (Oncogene c-mel) |
| Q9CPP6 | NDUA5_MOUSE | Ndufa5 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 5 (Complex I subunit B13) (Complex I-13kD-B, CI-13kD-B) (NADH-ubiquinone oxidoreductase 13 kDa-B subunit) |
| Q5FWK3 | RHG01_MOUSE | Arhgap1 | Rho GTPase-activating protein 1 (Rho-type GTPase-activating protein 1) |
| Q640Q5 | PAN3_MOUSE | Pan3 | PAN2-PAN3 deadenylation complex subunit Pan3 (PAB1P-dependent poly(A)-specific ribonuclease) (Poly(A)-nuclease deadenylation complex subunit 3, PAN deadenylation complex subunit 3) |
| Q8BY71 | HAT1_MOUSE | Hat1 | Histone acetyltransferase type B catalytic subunit, EC 2.3.1.48 (Histone acetyltransferase 1) |
| Q9ET01 | PYGL_MOUSE | Pygl | Glycogen phosphorylase, liver form, EC 2.4.1.1 |
| Q99LG2 | TNPO2_MOUSE | Tnpo2 | Transportin-2 (Karyopherin beta-2b) |
| Q99KV1 | DJB11_MOUSE | Dnajb11 | DnaJ homolog subfamily B member 11 (APOBEC1-binding protein 2, ABBP-2) (ER-associated DNAJ) (ER-associated Hsp40 co-chaperone) (Endoplasmic reticulum DNA J domain-containing protein 3, ER-resident protein ERdj3, ERdj3, ERj3p) |
| Q8R307 | VPS18_MOUSE | Vps18 | Vacuolar protein sorting-associated protein 18 homolog |
| Q8JZM4 | DNER_MOUSE | Dner | Delta and Notch-like epidermal growth factor-related receptor (Brain EGF repeat-containing transmembrane protein) |

| | | | |
|--------|-------------|--------|---|
| Q8BQM8 | EMAL5_MOUSE | Eml5 | Echinoderm microtubule-associated protein-like 5, EMAP-5 |
| Q6P5F7 | TTYH3_MOUSE | Ttyh3 | Protein tweety homolog 3, mTTY3 |
| Q0VGU4 | VGF_MOUSE | Vgf | Neurosecretory protein VGF [Cleaved into: Neuroendocrine regulatory peptide-1, NERP-1; Neuroendocrine regulatory peptide-2, NERP-2; VGF-derived peptide TLQP-21; VGF-derived peptide TLQP-62] |
| Q99L45 | IF2B_MOUSE | Eif2s2 | Eukaryotic translation initiation factor 2 subunit 2 (Eukaryotic translation initiation factor 2 subunit beta, eIF-2-beta) |
| Q8C8N2 | SCAI_MOUSE | Scai | Protein SCAI (Suppressor of cancer cell invasion protein) |
| Q3TDK6 | ROGDI_MOUSE | Rogdi | Protein rogdi homolog (Leucine-zipper-containing LZF) |
| O88286 | WIZ_MOUSE | Wiz | Protein Wiz (Widely-interspaced zinc finger-containing protein) |
| O08529 | CAN2_MOUSE | Capn2 | Calpain-2 catalytic subunit, EC 3.4.22.53 (80 kDa M-calpain subunit, CALP80) (Calcium-activated neutral proteinase 2, CANP 2) (Calpain M-type) (Calpain-2 large subunit) (Millimolar-calpain, M-calpain) |
| Q9WUB0 | HOIL1_MOUSE | Rbck1 | RanBP-type and C3HC4-type zinc finger-containing protein 1, EC 2.3.2.31 (Heme-oxidized IRP2 ubiquitin ligase 1 homolog, HOIL-1) (RING-type E3 ubiquitin transferase HOIL-1) (UbcM4-interacting protein 28) (Ubiquitin-conjugating enzyme 7-interacting protein 3) |
| Q9R1Q7 | PLP2_MOUSE | Plp2 | Proteolipid protein 2 |
| Q9R0A0 | PEX14_MOUSE | Pex14 | Peroxisomal membrane protein PEX14 (PTS1 receptor-docking protein) (Peroxin-14) (Peroxisomal membrane anchor protein PEX14) |
| Q9QUR8 | SEM7A_MOUSE | Sema7a | Semaphorin-7A (Semaphorin-K1, Sema K1) (Semaphorin-L, Sema L) (CD antigen CD108) |
| Q9JJS6 | BCDO1_MOUSE | Bco1 | Beta,beta-carotene 15,15'-dioxygenase, EC 1.13.11.63 (Beta-carotene dioxygenase 1) (Beta-carotene oxygenase 1) |
| Q9JIF7 | COPB_MOUSE | Copb1 | Coatomer subunit beta (Beta-coat protein, Beta-COP) |
| Q9JI46 | NUDT3_MOUSE | Nudt3 | Diphosphoinositol polyphosphate phosphohydrolase 1, DIPP-1, muDIPP1, EC 3.6.1.52 (Diadenosine 5',5'''-P1,P6-hexaphosphate hydrolase 1, EC 3.6.1.-) (Nucleoside diphosphate-linked moiety X motif 3, Nudix motif 3) |
| Q9EPR5 | SORC2_MOUSE | Sorcs2 | VPS10 domain-containing receptor SorCS2 [Cleaved into: SorCS2 122 kDa chain; SorCS2 104 kDa chain; SorCS2 18 kDa chain] |
| Q9DBG5 | PLIN3_MOUSE | Plin3 | Perilipin-3 (Cargo selection protein TIP47) (Mannose-6-phosphate receptor-binding protein 1) |

| | | | |
|--------|-------------|----------|---|
| Q9D9Z5 | DDA1_MOUSE | Dda1 | DET1- and DDB1-associated protein 1 |
| Q9D7S9 | CHMP5_MOUSE | Chmp5 | Charged multivesicular body protein 5 (Chromatin-modifying protein 5) (SNF7 domain-containing protein 2) |
| Q9D735 | TRIR_MOUSE | Trir | Telomerase RNA component interacting RNase, EC 3.1.13.- (Exoribonuclease Trir) |
| Q9CZP7 | CD37L_MOUSE | Cdc3711 | Hsp90 co-chaperone Cdc37-like 1 |
| Q9CZP5 | BCS1_MOUSE | Bcs11 | Mitochondrial chaperone BCS1 (BCS1-like protein) |
| Q9CXF7 | CHD1L_MOUSE | Chd11 | Chromodomain-helicase-DNA-binding protein 1-like, EC 3.6.4.12 |
| Q9CWY8 | RNH2A_MOUSE | Rnaseh2a | Ribonuclease H2 subunit A, RNase H2 subunit A, EC 3.1.26.4 (Ribonuclease HI large subunit, RNase HI large subunit) (Ribonuclease HI subunit A) |
| Q9CRT8 | XPOT_MOUSE | Xpot | Exportin-T (Exportin(tRNA)) (tRNA exportin) |
| Q9CR95 | NECP1_MOUSE | Necap1 | Adaptin ear-binding coat-associated protein 1 (NECAP endocytosis-associated protein 1, NECAP-1) |
| Q99M31 | HSP7E_MOUSE | Hspa14 | Heat shock 70 kDa protein 14 (NST-1) (hsr.1) |
| Q99K10 | NLGN1_MOUSE | Nlgn1 | Neuroigin-1 |
| Q99JB8 | PACN3_MOUSE | Pacsin3 | Protein kinase C and casein kinase II substrate protein 3 |
| Q924S8 | SPRE1_MOUSE | Spred1 | Sprouty-related, EVH1 domain-containing protein 1, Spred-1 |
| Q91WE3 | RPP25_MOUSE | Rpp25 | Ribonuclease P protein subunit p25, RNase P protein subunit p25 |
| Q91V09 | WDR13_MOUSE | Wdr13 | WD repeat-containing protein 13 |
| Q8VD37 | SGIP1_MOUSE | Sgip1 | SH3-containing GRB2-like protein 3-interacting protein 1 (Endophilin-3-interacting protein) |
| Q8R0F5 | RBMX2_MOUSE | Rbmx2 | RNA-binding motif protein, X-linked 2 |
| Q8K2F0 | BRD3_MOUSE | Brd3 | Bromodomain-containing protein 3 (Bromodomain-containing FSH-like protein FSRG2) |
| Q8K124 | PKHO2_MOUSE | Plekho2 | Pleckstrin homology domain-containing family O member 2, PH domain-containing family O member 2 (Pleckstrin homology domain-containing family Q member 1, PH domain-containing family Q member 1) |
| Q8CES0 | NAA30_MOUSE | Naa30 | N-alpha-acetyltransferase 30, EC 2.3.1.256 (N-acetyltransferase 12) (N-acetyltransferase MAK3 homolog) (NatC catalytic subunit) |
| Q8C419 | GP158_MOUSE | Gpr158 | Probable G-protein coupled receptor 158 |
| Q8BZB3 | TM266_MOUSE | Tmem266 | Transmembrane protein 266 |

| | | | |
|--------|-------------|----------|---|
| Q8BX10 | PGAM5_MOUSE | Pgam5 | Serine/threonine-protein phosphatase PGAM5, mitochondrial, EC 3.1.3.16 (Phosphoglycerate mutase family member 5) |
| Q8BWY4 | MBLC1_MOUSE | Mblac1 | Metallo-beta-lactamase domain-containing protein 1, EC 3.1.27.- (Endoribonuclease MBLAC1) |
| Q8BWQ6 | VP35L_MOUSE | Vps35l | VPS35 endosomal protein-sorting factor-like |
| Q8BVI4 | DHPR_MOUSE | Qdpr | Dihydropteridine reductase, EC 1.5.1.34 (HDHPR) (Quinoid dihydropteridine reductase) |
| Q80WW9 | DDRGK_MOUSE | Ddrgk1 | DDRGK domain-containing protein 1 (UFM1-binding and PCI domain-containing protein 1) |
| Q80UV9 | TAF1_MOUSE | Taf1 | Transcription initiation factor TFIID subunit 1, EC 2.3.1.48, EC 2.7.11.1 (Cell cycle gene 1 protein) (TBP-associated factor 250 kDa, p250) (Transcription initiation factor TFIID 250 kDa subunit, TAF(II)250, TAFII-250, TAFII250) |
| Q80U87 | UBP8_MOUSE | Usp8 | Ubiquitin carboxyl-terminal hydrolase 8, EC 3.4.19.12 (Deubiquitinating enzyme 8) (Ubiquitin isopeptidase Y, mUBPy) (Ubiquitin thioesterase 8) (Ubiquitin-specific-processing protease 8) |
| Q7TMC8 | FCSK_MOUSE | Fcsk | L-fucose kinase, Fucokinase, EC 2.7.1.52 |
| Q7JJ13 | BRD2_MOUSE | Brd2 | Bromodomain-containing protein 2 (Female sterile homeotic-related protein 1) (Fsrg-1) (Protein RING3) |
| Q6PDI6 | MINY2_MOUSE | Mindy2 | Ubiquitin carboxyl-terminal hydrolase MINDY-2, EC 3.4.19.12 (Deubiquitinating enzyme MINDY-2) (Protein FAM63B) |
| Q6PB51 | CC117_MOUSE | Ccdc117 | Coiled-coil domain-containing protein 117 |
| Q64324 | STXB2_MOUSE | Stxbp2 | Syntaxin-binding protein 2 (MUSEC1) (Protein unc-18 homolog 2, Munc18-2, Unc18-2) (Protein unc-18 homolog B, Unc-18B) |
| Q63836 | SBP2_MOUSE | Selenbp2 | Selenium-binding protein 2 (56 kDa acetaminophen-binding protein, AP56) |
| Q62417 | SRBS1_MOUSE | Sorbs1 | Sorbin and SH3 domain-containing protein 1 (Ponsin) (SH3 domain protein 5) (SH3P12) (c-Cbl-associated protein, CAP) |
| Q5NCR9 | NSRP1_MOUSE | Nsrp1 | Nuclear speckle splicing regulatory protein 1 (Coiled-coil domain-containing protein 55) (Nuclear speckle-related protein 70, NSrp70) |
| Q5EG47 | AAPK1_MOUSE | Prkaa1 | 5'-AMP-activated protein kinase catalytic subunit alpha-1, AMPK subunit alpha-1, EC 2.7.11.1 (Acetyl-CoA carboxylase kinase, ACACA kinase, EC 2.7.11.27) (Hydroxymethylglutaryl-CoA reductase kinase, HMGCR kinase, EC 2.7.11.31) (Tau-protein kinase PRKAA1, EC 2.7.11.26) |

| | | | |
|--------|-------------|---------|---|
| Q3U5F4 | YRDC_MOUSE | Yrdc | Threonylcarbamoyl-AMP synthase, EC 2.7.7.87 (Ischemia/reperfusion-inducible protein, mIRIP) |
| Q0KK59 | UNC79_MOUSE | Unc79 | Protein unc-79 homolog |
| P62313 | LSM6_MOUSE | Lsm6 | U6 snRNA-associated Sm-like protein LSm6 |
| P56695 | WFS1_MOUSE | Wfs1 | Wolframin |
| P23506 | PIMT_MOUSE | Pcmt1 | Protein-L-isoaspartate(D-aspartate) O-methyltransferase, PIMT, EC 2.1.1.77 (L-isoaspartyl protein carboxyl methyltransferase) (Protein L-isoaspartyl/D-aspartyl methyltransferase) (Protein-beta-aspartate methyltransferase) |
| P0DJE0 | PT100_MOUSE | Pet100 | Protein PET100 homolog, mitochondrial |
| P08414 | KCC4_MOUSE | Camk4 | Calcium/calmodulin-dependent protein kinase type IV, CaMK IV, EC 2.7.11.17 (CaM kinase-GR) |
| O35516 | NOTC2_MOUSE | Notch2 | Neurogenic locus notch homolog protein 2, Notch 2 (Motch B) [Cleaved into: Notch 2 extracellular truncation; Notch 2 intracellular domain] |
| D3Z7P3 | GLSK_MOUSE | Gls | Glutaminase kidney isoform, mitochondrial, GLS, EC 3.5.1.2 [Cleaved into: Glutaminase kidney isoform, mitochondrial 68 kDa chain; Glutaminase kidney isoform, mitochondrial 65 kDa chain] |
| P63163 | RSMN_MOUSE | Snrpn | Small nuclear ribonucleoprotein-associated protein N, snRNP-N (Sm protein D, Sm-D) (Sm protein N, Sm-N, SmN) (Tissue-specific-splicing protein) |
| Q80UM7 | MOGS_MOUSE | Mogs | Mannosyl-oligosaccharide glucosidase, EC 3.2.1.106 (Glucosidase 1) (Glycoprotein-processing glucosidase I) |
| P53811 | PIPNB_MOUSE | Pitpnb | Phosphatidylinositol transfer protein beta isoform, PI-TP-beta, PtdIns transfer protein beta, PtdInsTP beta |
| Q8R0Y6 | AL1L1_MOUSE | Aldh1l1 | Cytosolic 10-formyltetrahydrofolate dehydrogenase, 10-FTHFDH, FDH, EC 1.5.1.6 (Aldehyde dehydrogenase family 1 member L1) |
| Q8BGQ1 | SPE39_MOUSE | Vipas39 | Spermatogenesis-defective protein 39 homolog, hSPE-39 (VPS33B-interacting protein in apical-basolateral polarity regulator) (VPS33B-interacting protein in polarity and apical restriction) |
| Q9D7J9 | ECHD3_MOUSE | Echdc3 | Enoyl-CoA hydratase domain-containing protein 3, mitochondrial |
| E9Q6J5 | BD1L1_MOUSE | Bod11 | Biorientation of chromosomes in cell division protein 1-like 1 |
| Q8R151 | ZNFX1_MOUSE | Znfx1 | NFX1-type zinc finger-containing protein 1 |
| Q9D415 | DLGP1_MOUSE | Dlgap1 | Disks large-associated protein 1, DAP-1 (Guanylate kinase-associated protein) (PSD-95/SAP90-binding protein 1) (SAP90/PSD-95-associated protein 1, SAPAP1) |

| | | | |
|--------|-------------|---------|--|
| Q8K4Z0 | LGI2_MOUSE | Lgi2 | Leucine-rich repeat LGI family member 2 (Leucine-rich glioma-inactivated protein 2) |
| P70265 | F262_MOUSE | Pfkfb2 | 6-phosphofructo-2-kinase/fructose-2,6-bisphosphatase 2, 6PF-2-K/Fru-2,6-P2ase 2, PFK/FBPase 2 (6PF-2-K/Fru-2,6-P2ase heart-type isozyme) [Includes: 6-phosphofructo-2-kinase, EC 2.7.1.105; Fructose-2,6-bisphosphatase, EC 3.1.3.46] |
| Q0VBL1 | TIGD2_MOUSE | Tigd2 | Tigger transposable element-derived protein 2 |
| Q6A0A2 | LAR4B_MOUSE | Larp4b | La-related protein 4B (La ribonucleoprotein domain family member 4B) (La ribonucleoprotein domain family member 5) (La-related protein 5) |
| P62880 | GBB2_MOUSE | Gnb2 | Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-2 (G protein subunit beta-2) (Transducin beta chain 2) |
| Q5SF07 | IF2B2_MOUSE | Igf2bp2 | Insulin-like growth factor 2 mRNA-binding protein 2, IGF2 mRNA-binding protein 2, IMP-2 (IGF-II mRNA-binding protein 2) (VICKZ family member 2) |
| Q9WUR2 | ECI2_MOUSE | Eci2 | Enoyl-CoA delta isomerase 2, EC 5.3.3.8 (Delta(3),delta(2)-enoyl-CoA isomerase, D3,D2-enoyl-CoA isomerase) (Dodecenoyl-CoA isomerase) (Peroxisomal 3,2-trans-enoyl-CoA isomerase, pECI) |
| Q61771 | KIF3B_MOUSE | Kif3b | Kinesin-like protein KIF3B (Microtubule plus end-directed kinesin motor 3B) [Cleaved into: Kinesin-like protein KIF3B, N-terminally processed] |
| Q08639 | TFDP1_MOUSE | Tfdp1 | Transcription factor Dp-1 (DRTF1-polypeptide 1) (E2F dimerization partner 1) |
| Q80TM9 | NISCH_MOUSE | Nisch | Nischarin (Imidazoline receptor 1, I-1, IR1) (Imidazoline receptor I-1-like protein) (Imidazoline-1 receptor, IIR) |
| Q8BRE0 | RD3_MOUSE | Rd3 | Protein RD3 (Retinal degeneration protein 3) |
| Q6A078 | CE290_MOUSE | Cep290 | Centrosomal protein of 290 kDa, Cep290 (Bardet-Biedl syndrome 14 protein homolog) (Nephrocystin-6) |
| P97445 | CAC1A_MOUSE | Cacna1a | Voltage-dependent P/Q-type calcium channel subunit alpha-1A (Brain calcium channel I, BI) (Calcium channel, L type, alpha-1 polypeptide isoform 4) (Voltage-gated calcium channel subunit alpha Cav2.1) |
| Q8CFC2 | MYT1_MOUSE | Myt1 | Myelin transcription factor 1, MyT1 (Neural zinc finger factor 2, NZF-2) |
| Q6P5B0 | RRP12_MOUSE | Rrp12 | RRP12-like protein |
| P97742 | CPT1A_MOUSE | Cpt1a | Carnitine O-palmitoyltransferase 1, liver isoform, CPT1-L, EC 2.3.1.21 (Carnitine O-palmitoyltransferase I, liver isoform, CPT I, CPTI-L) (Carnitine palmitoyltransferase 1A) |
| Q9DC33 | HM20A_MOUSE | Hmg20a | High mobility group protein 20A (HMG box-containing protein 20A) (HMG domain-containing protein HMGX1) (Inhibitor of BRAF35, iBRAF) |

| | | | |
|--------|-------------|---------|--|
| P48428 | TBCA_MOUSE | Tbca | Tubulin-specific chaperone A (TCP1-chaperonin cofactor A) (Tubulin-folding cofactor A, CFA) |
| P46656 | ADX_MOUSE | Fdx1 | Adrenodoxin, mitochondrial (Adrenal ferredoxin) (Ferredoxin-1) |
| Q3UH66 | WNK2_MOUSE | Wnk2 | Serine/threonine-protein kinase WNK2, EC 2.7.11.1 (Protein kinase lysine-deficient 2) (Protein kinase with no lysine 2) |
| Q9CQZ5 | NDUA6_MOUSE | Ndufa6 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 6 (Complex I-B14, CI-B14) (NADH-ubiquinone oxidoreductase B14 subunit) |
| Q60865 | CAPR1_MOUSE | Caprin1 | Caprin-1 (Cytoplasmic activation- and proliferation-associated protein 1) (GPI-anchored membrane protein 1) (GPI-anchored protein p137, GPI-p137, p137GPI) (Membrane component chromosome 11 surface marker 1) (RNA granule protein 105) |
| P57724 | PCBP4_MOUSE | Pcbp4 | Poly(rC)-binding protein 4 (Alpha-CP4) |
| O35386 | PAHX_MOUSE | Phyh | Phytanoyl-CoA dioxygenase, peroxisomal, EC 1.14.11.18 (Lupus nephritis-associated peptide 1) (Phytanic acid oxidase) (Phytanoyl-CoA alpha-hydroxylase, PhyH) |
| E9Q309 | CE350_MOUSE | Cep350 | Centrosome-associated protein 350, Cep350 |
| Q8R3L2 | TCF25_MOUSE | Tcf25 | Transcription factor 25, TCF-25 (Nuclear localized protein 1) |
| Q8BMS1 | ECHA_MOUSE | Hadha | Trifunctional enzyme subunit alpha, mitochondrial (Monolysocardiolipin acyltransferase, EC 2.3.1.-) (TP-alpha) [Includes: Long-chain enoyl-CoA hydratase, EC 4.2.1.17; Long chain 3-hydroxyacyl-CoA dehydrogenase, EC 1.1.1.211] |
| Q80TG1 | KANL1_MOUSE | Kansl1 | KAT8 regulatory NSL complex subunit 1 (NSL complex protein NSL1) (Non-specific lethal 1 homolog) |
| Q9D0D5 | T2EA_MOUSE | Gtf2e1 | General transcription factor IIE subunit 1 (General transcription factor IIE 56 kDa subunit) (Transcription initiation factor IIE subunit alpha, TFIIE-alpha) |
| Q6ZPU9 | KBP_MOUSE | Kifbp | KIF-binding protein (KIF1-binding protein) |
| Q9CCK9 | RBM33_MOUSE | Rbm33 | RNA-binding protein 33 (Proline-rich protein 8) (RNA-binding motif protein 33) |
| Q99K95 | RTF2_MOUSE | Rtf2 | Replication termination factor 2, RTF2 (Replication termination factor 2 domain-containing protein 1) |
| Q6KAU4 | MB12B_MOUSE | Mvb12b | Multivesicular body subunit 12B (ESCRT-I complex subunit MVB12B) (Protein FAM125B) |
| Q3TDD9 | PPR21_MOUSE | Ppp1r21 | Protein phosphatase 1 regulatory subunit 21 (Coiled-coil domain-containing protein 128) (KLRAQ motif-containing protein 1) |
| P97310 | MCM2_MOUSE | Mcm2 | DNA replication licensing factor MCM2 (Minichromosome maintenance protein 2 homolog) (Nuclear protein BM28) |

| | | | |
|--------|-------------|----------|---|
| P81117 | NUCB2_MOUSE | Nucb2 | Nucleobindin-2 (DNA-binding protein NEFA) (Prepronesfatin) [Cleaved into: Nesfatin-1] |
| Q8K2C9 | HACD3_MOUSE | Hacd3 | Very-long-chain (3R)-3-hydroxyacyl-CoA dehydratase 3, EC 4.2.1.134 (3-hydroxyacyl-CoA dehydratase 3, HACD3) (Butyrate-induced protein 1, B-ind1) (Protein-tyrosine phosphatase-like A domain-containing protein 1) |
| Q8C3S2 | TNG6_MOUSE | Tango6 | Transport and Golgi organization protein 6 homolog (Transmembrane and coiled-coil domain-containing protein 7) |
| Q9EQG9 | CERT_MOUSE | Cert1 | Ceramide transfer protein, CERT (Collagen type IV alpha-3-binding protein) (Goodpasture antigen-binding protein, GPBP) (START domain-containing protein 11, StARD11) (StAR-related lipid transfer protein 11) |
| Q9D920 | BORC5_MOUSE | Borcs5 | BLOC-1-related complex subunit 5 |
| Q9R0U0 | SRS10_MOUSE | Srsf10 | Serine/arginine-rich splicing factor 10 (FUS-interacting serine-arginine-rich protein 1) (Neural-salient serine/arginine-rich protein) (Neural-specific SR protein) (Splicing factor, arginine/serine-rich 13A) (TLS-associated protein with Ser-Arg repeats, TASR, TLS-associated protein with SR repeats) (TLS-associated serine-arginine protein, TLS-associated SR protein) |
| O55029 | COPB2_MOUSE | Copb2 | Coatomer subunit beta' (Beta'-coat protein, Beta'-COP) (p102) |
| Q5U4C1 | GASP1_MOUSE | Gprasp1 | G-protein coupled receptor-associated sorting protein 1, GASP-1 |
| Q9QYJ0 | DNJA2_MOUSE | Dnaja2 | DnaJ homolog subfamily A member 2 (mDj3) |
| Q64487 | PTPRD_MOUSE | Ptprd | Receptor-type tyrosine-protein phosphatase delta, Protein-tyrosine phosphatase delta, R-PTP-delta, EC 3.1.3.48 |
| P62311 | LSM3_MOUSE | Lsm3 | U6 snRNA-associated Sm-like protein LSm3 |
| P58158 | B3GA3_MOUSE | B3gat3 | Galactosylgalactosylxylosylprotein 3-beta-glucuronosyltransferase 3, EC 2.4.1.135 (Beta-1,3-glucuronyltransferase 3) (Glucuronosyltransferase I, GlcAT-I) (UDP-GlcUA:Gal beta-1,3-Gal-R glucuronyltransferase, GlcUAT-I) |
| Q9R1L5 | MAST1_MOUSE | Mast1 | Microtubule-associated serine/threonine-protein kinase 1, EC 2.7.11.1 (Syntrophin-associated serine/threonine-protein kinase) |
| Q80UJ7 | RB3GP_MOUSE | Rab3gap1 | Rab3 GTPase-activating protein catalytic subunit (RAB3 GTPase-activating protein 130 kDa subunit) (Rab3-GAP p130, Rab3-GAP) |
| O88851 | RBBP9_MOUSE | Rbbp9 | Putative hydrolase RBBP9, EC 3.-.-.- (B5T-overexpressed gene protein, Protein BOG) (Retinoblastoma-binding protein 9, RBBP-9) |
| Q04736 | YES_MOUSE | Yes1 | Tyrosine-protein kinase Yes, EC 2.7.10.2 (Proto-oncogene c-Yes) (p61-Yes) |

| | | | |
|--------|-------------|---------|---|
| Q6PGL7 | WASC2_MOUSE | Washc2 | WASH complex subunit 2 |
| Q9CPR4 | RL17_MOUSE | Rpl17 | 60S ribosomal protein L17 |
| Q3TC33 | CC127_MOUSE | Ccdc127 | Coiled-coil domain-containing protein 127 |
| P34914 | HYES_MOUSE | Ephx2 | Bifunctional epoxide hydrolase 2 [Includes: Cytosolic epoxide hydrolase 2, CEH, EC 3.3.2.10 (Epoxide hydratase) (Soluble epoxide hydrolase, SEH); Lipid-phosphate phosphatase, EC 3.1.3.76] |
| Q9D662 | SC23B_MOUSE | Sec23b | Protein transport protein Sec23B (SEC23-related protein B) |
| Q3V1U8 | ELMD1_MOUSE | Elmod1 | ELMO domain-containing protein 1 |
| O35474 | EDIL3_MOUSE | Edil3 | EGF-like repeat and discoidin I-like domain-containing protein 3 (Developmentally-regulated endothelial cell locus 1 protein) (Integrin-binding protein DEL1) |
| Q9CQZ6 | NDUB3_MOUSE | Ndufb3 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 3 (Complex I-B12, CI-B12) (NADH-ubiquinone oxidoreductase B12 subunit) |
| Q8BMF4 | ODP2_MOUSE | Dlat | Dihydrolipoyllysine-residue acetyltransferase component of pyruvate dehydrogenase complex, mitochondrial, EC 2.3.1.12 (Dihydrolipoamide acetyltransferase component of pyruvate dehydrogenase complex) (Pyruvate dehydrogenase complex component E2, PDC-E2, PDCE2) |
| Q99KG3 | RBM10_MOUSE | Rbm10 | RNA-binding protein 10 (RNA-binding motif protein 10) |
| Q7TQH0 | ATX2L_MOUSE | Atxn2l | Ataxin-2-like protein |
| Q9D1K2 | VATF_MOUSE | Atp6v1f | V-type proton ATPase subunit F, V-ATPase subunit F (V-ATPase 14 kDa subunit) (Vacuolar proton pump subunit F) |
| P70403 | CASP_MOUSE | Cux1 | Protein CASP |
| Q9CQF9 | PCYOX_MOUSE | Pcyox1 | Prenylcysteine oxidase 1, EC 1.8.3.5 (Prenylcysteine lyase) |
| Q3TC72 | FAHD2_MOUSE | Fahd2 | Fumarylacetoacetate hydrolase domain-containing protein 2A, EC 3.-.-.- |
| P70349 | HINT1_MOUSE | Hint1 | Adenosine 5'-monophosphoramidase HINT1, EC 3.9.1.- (Desumoylating isopeptidase HINT1, EC 3.4.22.-) (Histidine triad nucleotide-binding protein 1) (Protein kinase C inhibitor 1) (Protein kinase C-interacting protein 1, PKCI-1) |
| Q62419 | SH3G1_MOUSE | Sh3gl1 | Endophilin-A2 (Endophilin-2) (SH3 domain protein 2B) (SH3 domain-containing GRB2-like protein 1) (SH3p8) |
| O35382 | EXOC4_MOUSE | Exoc4 | Exocyst complex component 4 (Exocyst complex component Sec8) |
| Q8JZP2 | SYN3_MOUSE | Syn3 | Synapsin-3 (Synapsin III) |

| | | | |
|--------|-------------|--------|--|
| Q3V009 | TMED1_MOUSE | Tmed1 | Transmembrane emp24 domain-containing protein 1 (Interleukin-1 receptor-like 1 ligand) (Putative T1/ST2 receptor-binding protein) (p24 family protein gamma-1, p24gamma1) |
| Q8R317 | UBQL1_MOUSE | Ubqln1 | Ubiquilin-1 (Protein linking IAP with cytoskeleton 1, PLIC-1) |
| Q8BU03 | PWP2_MOUSE | Pwp2 | Periodic tryptophan protein 2 homolog |
| Q8K273 | EMC5_MOUSE | Mmgt1 | ER membrane protein complex subunit 5 (Membrane magnesium transporter 1) (Transmembrane protein 32) |
| Q9JJT9 | PHAX_MOUSE | Phax | Phosphorylated adapter RNA export protein (RNA U small nuclear RNA export adapter protein) |
| Q8VCM7 | FIBG_MOUSE | Fgg | Fibrinogen gamma chain |
| Q3ULD5 | MCCB_MOUSE | Mccc2 | Methylcrotonoyl-CoA carboxylase beta chain, mitochondrial, MCCase subunit beta, EC 6.4.1.4 (3-methylcrotonyl-CoA carboxylase 2) (3-methylcrotonyl-CoA carboxylase non-biotin-containing subunit) (3-methylcrotonyl-CoA:carbon dioxide ligase subunit beta) |
| Q01147 | CREB1_MOUSE | Creb1 | Cyclic AMP-responsive element-binding protein 1, CREB-1, cAMP-responsive element-binding protein 1 |
| Q9CVD2 | ATX3_MOUSE | Atxn3 | Ataxin-3, EC 3.4.19.12 (Machado-Joseph disease protein 1 homolog) |
| Q8R1F6 | HID1_MOUSE | Hid1 | Protein HID1 (HID1 domain-containing protein) (Protein hid-1 homolog) |
| P53996 | CNBP_MOUSE | Cnbp | CCHC-type zinc finger nucleic acid binding protein (Cellular nucleic acid-binding protein, CNBP) (Zinc finger protein 9) |
| Q8R2V3 | ZN445_MOUSE | Znf445 | Zinc finger protein 445 |
| Q8BH24 | TM9S4_MOUSE | Tm9sf4 | Transmembrane 9 superfamily member 4 |
| O35379 | MRP1_MOUSE | Abcc1 | Multidrug resistance-associated protein 1, EC 7.6.2.2 (ATP-binding cassette sub-family C member 1) (Glutathione-S-conjugate-translocating ATPase ABCC1, EC 7.6.2.3) (Leukotriene C(4) transporter, LTC4 transporter) |
| Q99PG2 | OGFR_MOUSE | Ogfr | Opioid growth factor receptor, OGFr (Zeta-type opioid receptor) |
| Q5SWP3 | NACAD_MOUSE | Nacad | NAC-alpha domain-containing protein 1 |
| Q6NXH9 | K2C73_MOUSE | Krt73 | Keratin, type II cytoskeletal 73 (Cytokeratin-73, CK-73) (Keratin-73, K73) (Type II inner root sheath-specific keratin-K6irs3) (Type-II keratin Kb36) |
| Q9CRY7 | GDPD1_MOUSE | Gdpd1 | Lysophospholipase D GDPD1, EC 3.1.4.- (Glycerophosphodiester phosphodiesterase 4) (Glycerophosphodiester phosphodiesterase domain-containing protein 1) |

| | | | |
|--------|-------------|--------|---|
| Q9DCN1 | NUD12_MOUSE | Nudt12 | NAD-capped RNA hydrolase NUDT12, DeNADding enzyme NUDT12, EC 3.6.1.- (NADH pyrophosphatase NUDT12, EC 3.6.1.22) (Nucleoside diphosphate-linked moiety X motif 12, Nudix motif 12) |
| Q8VI64 | HUMMR_MOUSE | Mgarp | Protein MGARP (Corneal endothelium-specific protein 1, CESP-1) (Hypoxia up-regulated mitochondrial movement regulator protein) (Mitochondria-localized glutamic acid-rich protein) (Ovary-specific acidic protein) |
| P41209 | CETN1_MOUSE | Cetn1 | Centrin-1 (Caltractin) |
| Q9D0K2 | SCOT1_MOUSE | Oxct1 | Succinyl-CoA:3-ketoacid coenzyme A transferase 1, mitochondrial, SCOT, EC 2.8.3.5 (3-oxoacid CoA-transferase 1) (Somatic-type succinyl-CoA:3-oxoacid CoA-transferase, SCOT-s) (Succinyl-CoA:3-oxoacid CoA transferase) |
| Q61471 | TOB1_MOUSE | Tob1 | Protein Tob1 (Transducer of erbB-2 1) |
| Q99ME9 | GTPB4_MOUSE | Gtpbp4 | GTP-binding protein 4 (Chronic renal failure gene protein) (GTP-binding protein NGB) (Nucleolar GTP-binding protein 1) |
| Q80U95 | UBE3C_MOUSE | Ube3c | Ubiquitin-protein ligase E3C, EC 2.3.2.26 (HECT-type ubiquitin transferase E3C) (RTA-associated ubiquitin ligase, RAUL) |
| P62715 | PP2AB_MOUSE | Ppp2cb | Serine/threonine-protein phosphatase 2A catalytic subunit beta isoform, PP2A-beta, EC 3.1.3.16 |
| A2BH40 | ARI1A_MOUSE | Arid1a | AT-rich interactive domain-containing protein 1A, ARID domain-containing protein 1A (BRG1-associated factor 250, BAF250) (BRG1-associated factor 250a, BAF250A) (Osa homolog 1) (SWI-like protein) (SWI/SNF complex protein p270) (SWI/SNF-related, matrix-associated, actin-dependent regulator of chromatin subfamily F member 1) |
| P28660 | NCKP1_MOUSE | Nckap1 | Nck-associated protein 1, NAP 1 (Brain protein H19) (MH19) (Membrane-associated protein HEM-2) (p125Nap1) |
| Q78IK4 | MIC27_MOUSE | Apool | MICOS complex subunit Mic27 (Apolipoprotein O-like) (Protein FAM121A) |
| Q9Z140 | CPNE6_MOUSE | Cpne6 | Copine-6 (Copine VI) (Neuronal-copine, N-copine) |
| Q9EQX4 | AIF1L_MOUSE | Aif1l | Allograft inflammatory factor 1-like (Ionized calcium-binding adapter molecule 2) |
| P31230 | AIMP1_MOUSE | Aimp1 | Aminoacyl tRNA synthase complex-interacting multifunctional protein 1 (Multisynthase complex auxiliary component p43) [Cleaved into: Endothelial monocyte-activating polypeptide 2, EMAP-2 (Endothelial monocyte-activating polypeptide II, EMAP-II) (Small inducible cytokine subfamily E member 1)] |

| | | | |
|--------|-------------|---------|---|
| O89106 | FHIT_MOUSE | Fhit | Bis(5'-adenosyl)-triphosphatase, EC 3.6.1.29 (AP3A hydrolase, AP3Aase) (Adenosine 5'-monophosphoramidase FHIT, EC 3.9.1.-) (Adenylylsulfatase, EC 3.6.2.1) (Adenylylsulfate-ammonia adenylyltransferase, EC 2.7.7.51) (Diadenosine 5',5'''-P1,P3-triphosphate hydrolase) (Dinucleosidetriphosphatase) (Fragile histidine triad protein) |
| Q9DC51 | GNAI3_MOUSE | Gnai3 | Guanine nucleotide-binding protein G(i) subunit alpha-3 (G(i) alpha-3) |
| Q9D1R9 | RL34_MOUSE | Rpl34 | 60S ribosomal protein L34 |
| Q3UZV7 | ELAP2_MOUSE | Elapor2 | Endosome/lysosome-associated apoptosis and autophagy regulator family member 2 (Estrogen-induced gene 121-like protein) |
| Q922E4 | PCY2_MOUSE | Pcyt2 | Ethanolamine-phosphate cytidyltransferase, EC 2.7.7.14 (CTP:phosphoethanolamine cytidyltransferase) (Phosphorylethanolamine transferase) |
| Q640M1 | UT14A_MOUSE | Utp14a | U3 small nucleolar RNA-associated protein 14 homolog A (Juvenile spermatogonial depletion-like X-linked protein, Jsd-like X-linked protein) |
| Q9ESU6 | BRD4_MOUSE | Brd4 | Bromodomain-containing protein 4 (Mitotic chromosome-associated protein, MCAP) |
| Q9CQ49 | NCBP2_MOUSE | Ncbp2 | Nuclear cap-binding protein subunit 2 (20 kDa nuclear cap-binding protein) (NCBP 20 kDa subunit, CBP20) |
| P35288 | RAB23_MOUSE | Rab23 | Ras-related protein Rab-23 (Protein open brain) (Rab-15) |
| Q7M6Y3 | PICAL_MOUSE | Picalm | Phosphatidylinositol-binding clathrin assembly protein (Clathrin assembly lymphoid myeloid leukemia, CALM) |
| Q8R1A4 | DOCK7_MOUSE | Dock7 | Dedicator of cytokinesis protein 7 (Protein moonlight) |
| P48725 | PCNT_MOUSE | Pcnt | Pericentrin |
| Q8BG17 | NOL12_MOUSE | Nol12 | Nucleolar protein 12 (Nucleolar protein of 25 kDa) |
| Q99LQ1 | MBIP1_MOUSE | Mbip | MAP3K12-binding inhibitory protein 1 (MAPK upstream kinase-binding inhibitory protein, MUK-binding inhibitory protein) |
| Q8BTJ4 | ENPP4_MOUSE | Enpp4 | Bis(5'-adenosyl)-triphosphatase enpp4, EC 3.6.1.29 (AP3A hydrolase, AP3Aase) (Ectonucleotide pyrophosphatase/phosphodiesterase family member 4, E-NPP 4, NPP-4) |
| O08911 | MK12_MOUSE | Mapk12 | Mitogen-activated protein kinase 12, MAP kinase 12, MAPK 12, EC 2.7.11.24 (Extracellular signal-regulated kinase 6, ERK-6) (Mitogen-activated protein kinase p38 gamma, MAP kinase p38 gamma) (Stress-activated protein kinase 3) |
| Q8CDD9 | LRIF1_MOUSE | Lrif1 | Ligand-dependent nuclear receptor-interacting factor 1 |

| | | | |
|--------|-------------|---------|--|
| Q8BHS8 | SYBU_MOUSE | Sybu | Syntabulin (Golgi-localized syntaphilin-related protein, m-Golsyn) (Syntaxin-1-binding protein) |
| P27671 | RGRF1_MOUSE | Rasgrf1 | Ras-specific guanine nucleotide-releasing factor 1, Ras-GRF1 (CDC25Mm) (Guanine nucleotide-releasing protein, GNRP) (Ras-specific nucleotide exchange factor CDC25) |
| Q80ZW2 | THEM6_MOUSE | Them6 | Protein THEM6 |
| Q99LS3 | SERB_MOUSE | Psph | Phosphoserine phosphatase, PSP, PSPase, EC 3.1.3.3 (O-phosphoserine phosphohydrolase) |
| Q3UJP5 | CF418_MOUSE | Cfap418 | Cilia- and flagella-associated protein 418 |
| Q62393 | TPD52_MOUSE | Tpd52 | Tumor protein D52, mD52 |
| P30306 | MPIP2_MOUSE | Cdc25b | M-phase inducer phosphatase 2, EC 3.1.3.48 (Dual specificity phosphatase Cdc25B) |
| O70546 | KDM6A_MOUSE | Kdm6a | Lysine-specific demethylase 6A, EC 1.14.11.68 (Histone demethylase UTX) (Ubiquitously transcribed TPR protein on the X chromosome) (Ubiquitously transcribed X chromosome tetratricopeptide repeat protein) ([histone H3]-trimethyl-L-lysine(27) demethylase 6A) |
| Q9D162 | CC167_MOUSE | Ccdc167 | Coiled-coil domain-containing protein 167 |
| Q80YV3 | TRRAP_MOUSE | Trrap | Transformation/transcription domain-associated protein (Tra1 homolog) |
| Q7TPM1 | PRC2B_MOUSE | Prcc2b | Protein PRRC2B (HLA-B-associated transcript 2-like 1) (Proline-rich coiled-coil protein 2B) |
| Q9WVR4 | FXR2_MOUSE | Fxr2 | RNA-binding protein FXR2 |
| Q4G0F8 | UBN1_MOUSE | Ubn1 | Ubiquitin-1 (Ubiquitously expressed nuclear protein) |
| P68181 | KAPCB_MOUSE | Prkacb | cAMP-dependent protein kinase catalytic subunit beta, PKA C-beta, EC 2.7.11.11 |
| Q8C0S1 | DI3L1_MOUSE | Dis3l1 | DIS3-like exonuclease 1, EC 3.1.13.- |
| Q91V61 | SFXN3_MOUSE | Sfxn3 | Sideroflexin-3 |
| O88685 | PRS6A_MOUSE | Psmc3 | 26S proteasome regulatory subunit 6A (26S proteasome AAA-ATPase subunit RPT5) (Proteasome 26S subunit ATPase 3) (Tat-binding protein 1, TBP-1) |
| Q8K4K1 | CETN4_MOUSE | Cetn4 | Centrin-4 (Centrin4) |
| P06801 | MAOX_MOUSE | Me1 | NADP-dependent malic enzyme, NADP-ME, EC 1.1.1.40 (Malic enzyme 1) |
| Q9Z2Y3 | HOME1_MOUSE | Homer1 | Homer protein homolog 1, Homer-1 (VASP/Ena-related gene up-regulated during seizure and LTP 1, Vesl-1) |
| Q6P4S8 | INT1_MOUSE | Ints1 | Integrator complex subunit 1, Int1 |

| | | | |
|--------|-------------|---------|---|
| Q60575 | KIF1B_MOUSE | Kif1b | Kinesin-like protein KIF1B |
| Q9DA69 | IFT43_MOUSE | Ift43 | Intraflagellar transport protein 43 homolog |
| Q9D8E6 | RL4_MOUSE | Rpl4 | 60S ribosomal protein L4 |
| O55022 | PGRC1_MOUSE | Pgrmc1 | Membrane-associated progesterone receptor component 1, mPR |
| Q80UM3 | NAA15_MOUSE | Naa15 | N-alpha-acetyltransferase 15, NatA auxiliary subunit (N-terminal acetyltransferase 1) (NMDA receptor-regulated protein 1) (Protein tubedown-1) |
| Q91XL9 | OSBL1_MOUSE | Osbpl1a | Oxysterol-binding protein-related protein 1, ORP-1, OSBP-related protein 1 |
| Q64010 | CRK_MOUSE | Crk | Adapter molecule crk (Proto-oncogene c-Crk) (p38) |
| Q07076 | ANXA7_MOUSE | Anxa7 | Annexin A7 (Annexin VII) (Annexin-7) (Synexin) |
| Q9R0K7 | AT2B2_MOUSE | Atp2b2 | Plasma membrane calcium-transporting ATPase 2, PMCA2, EC 7.2.2.10 (Plasma membrane calcium ATPase isoform 2) (Plasma membrane calcium pump isoform 2) |
| Q9D051 | ODPB_MOUSE | Pdhb | Pyruvate dehydrogenase E1 component subunit beta, mitochondrial, PDHE1-B, EC 1.2.4.1 |
| Q9Z1N5 | DX39B_MOUSE | Ddx39b | Spliceosome RNA helicase Ddx39b, EC 3.6.4.13 (56 kDa U2AF65-associated protein) (DEAD box protein UAP56) (HLA-B-associated transcript 1 protein) |
| Q6PIE5 | AT1A2_MOUSE | Atp1a2 | Sodium/potassium-transporting ATPase subunit alpha-2, Na(+)/K(+) ATPase alpha-2 subunit, EC 7.2.2.13 (Na(+)/K(+) ATPase alpha(+) subunit) (Sodium pump subunit alpha-2) |
| Q6PDN3 | MYLK_MOUSE | Mylk | Myosin light chain kinase, smooth muscle, MLCK, smMLCK, EC 2.7.11.18 (Kinase-related protein, KRP) (Telokin) [Cleaved into: Myosin light chain kinase, smooth muscle, deglutamylated form] |
| Q9Z0P4 | PALM_MOUSE | Palm | Paralemmin-1 (Paralemmin) |
| Q6PDS3 | SARM1_MOUSE | Sarm1 | NAD(+) hydrolase SARM1, NADase SARM1, EC 3.2.2.6 (NADP(+) hydrolase SARM1, EC 3.2.2.-) (Sterile alpha and TIR motif-containing protein 1) |
| Q9D1M4 | MCA3_MOUSE | Eef1e1 | Eukaryotic translation elongation factor 1 epsilon-1 (Elongation factor p18) (Multisynthase complex auxiliary component p18) |
| P08553 | NFM_MOUSE | Nefm | Neurofilament medium polypeptide, NF-M (160 kDa neurofilament protein) (Neurofilament 3) (Neurofilament triplet M protein) |
| P26231 | CTNA1_MOUSE | Ctnna1 | Catenin alpha-1 (102 kDa cadherin-associated protein) (Alpha E-catenin) (CAP102) |

| | | | |
|--------|-------------|---------|--|
| Q9DBP5 | KCY_MOUSE | Cmpk1 | UMP-CMP kinase, EC 2.7.4.14 (Deoxycytidylate kinase, CK, dCMP kinase) (Nucleoside-diphosphate kinase, EC 2.7.4.6) (Uridine monophosphate/cytidine monophosphate kinase, UMP/CMP kinase, UMP/CMPK) |
| Q91VC3 | IF4A3_MOUSE | Eif4a3 | Eukaryotic initiation factor 4A-III, eIF-4A-III, eIF4A-III, EC 3.6.4.13 (ATP-dependent RNA helicase DDX48) (ATP-dependent RNA helicase eIF4A-3) (DEAD box protein 48) (Eukaryotic translation initiation factor 4A isoform 3) [Cleaved into: Eukaryotic initiation factor 4A-III, N-terminally processed] |
| Q9CPU0 | LGUL_MOUSE | Glo1 | Lactoylglutathione lyase, EC 4.4.1.5 (Aldoketomutase) (Glyoxalase I, Glx I) (Ketone-aldehyde mutase) (Methylglyoxalase) (S-D-lactoylglutathione methylglyoxal lyase) |
| Q5XJY5 | COPD_MOUSE | Arcn1 | Coatomer subunit delta (Archain) (Delta-coat protein, Delta-COP) |
| Q9JKC6 | CEND_MOUSE | Cend1 | Cell cycle exit and neuronal differentiation protein 1 (BM88 antigen) |
| Q812A2 | SRGP3_MOUSE | Srgap3 | SLIT-ROBO Rho GTPase-activating protein 3, srGAP3 (Rho GTPase-activating protein 14) (WAVE-associated Rac GTPase-activating protein, WRP) |
| P49194 | RET3_MOUSE | Rbp3 | Retinol-binding protein 3 (Interphotoreceptor retinoid-binding protein, IRBP) (Interstitial retinol-binding protein) |
| Q9DCD0 | 6PGD_MOUSE | Pgd | 6-phosphogluconate dehydrogenase, decarboxylating, EC 1.1.1.44 |
| P14231 | AT1B2_MOUSE | Atp1b2 | Sodium/potassium-transporting ATPase subunit beta-2 (Adhesion molecule in glia, AMOG) (Sodium/potassium-dependent ATPase subunit beta-2) |
| P97351 | RS3A_MOUSE | Rps3a | 40S ribosomal protein S3a (Protein TU-11) |
| Q8CH18 | CCAR1_MOUSE | Ccar1 | Cell division cycle and apoptosis regulator protein 1 (Cell cycle and apoptosis regulatory protein 1, CARP-1) |
| Q7TPV4 | MBB1A_MOUSE | Mybbp1a | Myb-binding protein 1A (Myb-binding protein of 160 kDa) |
| P62761 | VISL1_MOUSE | Vsnl1 | Visinin-like protein 1, VILIP (Neural visinin-like protein 1, NVL-1, NVP-1) |
| Q9Z127 | LAT1_MOUSE | Slc7a5 | Large neutral amino acids transporter small subunit 1 (4F2 light chain, 4F2 LC, 4F2LC) (L-type amino acid transporter 1, LAT1) (Solute carrier family 7 member 5) |
| Q9ER72 | SYCC_MOUSE | Cars1 | Cysteine--tRNA ligase, cytoplasmic, EC 6.1.1.16 (Cysteinyl-tRNA synthetase, CysRS) |
| P47802 | MTX1_MOUSE | Mtx1 | Metaxin-1 (Mitochondrial outer membrane import complex protein 1) |
| Q02248 | CTNB1_MOUSE | Ctnnb1 | Catenin beta-1 (Beta-catenin) |
| P54071 | IDHP_MOUSE | Idh2 | Isocitrate dehydrogenase [NADP], mitochondrial, IDH, EC 1.1.1.42 (ICD-M) (IDP) (NADP(+)-specific ICDH) (Oxalosuccinate decarboxylase) |

| | | | |
|--------|-------------|---------|---|
| O35691 | PININ_MOUSE | Pnn | Pinin |
| Q9CQC6 | 5MP2_MOUSE | Bzw1 | eIF5-mimic protein 2 (Basic leucine zipper and W2 domain-containing protein 1) |
| P54822 | PUR8_MOUSE | Adsl | Adenylosuccinate lyase, ASL, EC 4.3.2.2 (Adenylosuccinase, ASase) |
| Q9Z1Z0 | USO1_MOUSE | Uso1 | General vesicular transport factor p115 (Protein USO1 homolog) (Transcytosis-associated protein, TAP) (Vesicle-docking protein) |
| Q91WN1 | DNJC9_MOUSE | Dnaje9 | DnaJ homolog subfamily C member 9 |
| Q9Z2I9 | SUCB1_MOUSE | Sucla2 | Succinate--CoA ligase [ADP-forming] subunit beta, mitochondrial, EC 6.2.1.5 (ATP-specific succinyl-CoA synthetase subunit beta, A-SCS) (Succinyl-CoA synthetase beta-A chain, SCS-betaA) |
| P80315 | TCPD_MOUSE | Cct4 | T-complex protein 1 subunit delta, TCP-1-delta (A45) (CCT-delta) |
| Q9CXZ1 | NDUS4_MOUSE | Ndufs4 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 4, mitochondrial (Complex I-18 kDa, CI-18 kDa) (Complex I-AQDQ, CI-AQDQ) (NADH-ubiquinone oxidoreductase 18 kDa subunit) |
| P11031 | TCP4_MOUSE | Sub1 | Activated RNA polymerase II transcriptional coactivator p15 (Positive cofactor 4, PC4) (SUB1 homolog) (Single-stranded DNA-binding protein p9) (p14) |
| Q9JKB3 | YBOX3_MOUSE | Ybx3 | Y-box-binding protein 3 (Cold shock domain-containing protein A) (DNA-binding protein A) (Y-box protein 3) |
| Q9CZW4 | ACSL3_MOUSE | Acs13 | Fatty acid CoA ligase Acs13 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 3, LACS 3) (Long-chain-fatty-acid--CoA ligase 3, EC 6.2.1.3) (Medium-chain acyl-CoA ligase Acs13, EC 6.2.1.2) |
| Q9R1T2 | SAE1_MOUSE | Sae1 | SUMO-activating enzyme subunit 1 (Ubiquitin-like 1-activating enzyme E1A) [Cleaved into: SUMO-activating enzyme subunit 1, N-terminally processed] |
| Q9R1Q8 | TAGL3_MOUSE | Tagln3 | Transgelin-3 (Neuronal protein NP25) |
| O08663 | MAP2_MOUSE | Metap2 | Methionine aminopeptidase 2, MAP 2, MetAP 2, EC 3.4.11.18 (Initiation factor 2-associated 67 kDa glycoprotein, p67, p67eIF2) (Peptidase M) |
| Q99L13 | 3HIDH_MOUSE | Hibadh | 3-hydroxyisobutyrate dehydrogenase, mitochondrial, HIBADH, EC 1.1.1.31 |
| P12367 | KAP2_MOUSE | Prkar2a | cAMP-dependent protein kinase type II-alpha regulatory subunit |
| P50580 | PA2G4_MOUSE | Pa2g4 | Proliferation-associated protein 2G4 (IRES-specific cellular trans-acting factor 45 kDa, ITAF45) (Mpp1) (Proliferation-associated protein 1) (Protein p38-2G4) |
| Q8VE97 | SRSF4_MOUSE | Srsf4 | Serine/arginine-rich splicing factor 4 (Splicing factor, arginine/serine-rich 4) |
| Q9CQJ6 | DENR_MOUSE | Denr | Density-regulated protein, DRP |

| | | | |
|--------|-------------|----------|---|
| O88342 | WDR1_MOUSE | Wdr1 | WD repeat-containing protein 1 (Actin-interacting protein 1, AIP1) |
| Q6R0H7 | GNAS1_MOUSE | Gnas | Guanine nucleotide-binding protein G(s) subunit alpha isoforms XLas (Adenylate cyclase-stimulating G alpha protein) (Extra large alphas protein, XLalphas) |
| P62192 | PRS4_MOUSE | Psmc1 | 26S proteasome regulatory subunit 4, P26s4 (26S proteasome AAA-ATPase subunit RPT2) (Proteasome 26S subunit ATPase 1) |
| Q6NZB0 | DNJC8_MOUSE | Dnajc8 | DnaJ homolog subfamily C member 8 |
| P11499 | HS90B_MOUSE | Hsp90ab1 | Heat shock protein HSP 90-beta (Heat shock 84 kDa, HSP 84, HSP84) (Tumor-specific transplantation 84 kDa antigen, TSTA) |
| Q61687 | ATRX_MOUSE | Atrx | Transcriptional regulator ATRX, EC 3.6.4.12 (ATP-dependent helicase ATRX) (HP1 alpha-interacting protein) (HP1-BP38 protein) (Heterochromatin protein 2) (X-linked nuclear protein) |
| Q8JZM7 | CDC73_MOUSE | Cdc73 | Parafibromin (Cell division cycle protein 73 homolog) (Hyperparathyroidism 2 protein homolog) |
| P07724 | ALBU_MOUSE | Alb | Albumin |
| Q9EQH3 | VPS35_MOUSE | Vps35 | Vacuolar protein sorting-associated protein 35 (Maternal-embryonic 3) (Vesicle protein sorting 35) |
| P17183 | ENOG_MOUSE | Eno2 | Gamma-enolase, EC 4.2.1.11 (2-phospho-D-glycerate hydro-lyase) (Enolase 2) (Neural enolase) (Neuron-specific enolase, NSE) |
| Q9Z1M8 | RED_MOUSE | Ik | Protein Red (Cytokine IK) (IK factor) (Protein RER) |
| Q9QW08 | PHOS_MOUSE | Pdc | Phosducin, PHD (33 kDa phototransducing protein) (Rod photoreceptor 1, RPR-1) |
| Q60902 | EP15R_MOUSE | Eps1511 | Epidermal growth factor receptor substrate 15-like 1 (Epidermal growth factor receptor pathway substrate 15-related sequence, Eps15-rs) (Eps15-related protein, Eps15R) |
| P70279 | SURF6_MOUSE | Surf6 | Surfeit locus protein 6 |
| Q11011 | PSA_MOUSE | Npepps | Puromycin-sensitive aminopeptidase, PSA, EC 3.4.11.14 (Cytosol alanyl aminopeptidase, AAP-S) |
| Q9D7X8 | GGCT_MOUSE | Ggct | Gamma-glutamylcyclotransferase, EC 4.3.2.9 |
| P49443 | PPM1A_MOUSE | Ppm1a | Protein phosphatase 1A, EC 3.1.3.16 (Protein phosphatase 2C isoform alpha, PP2C-alpha) (Protein phosphatase IA) |
| Q9Z1X4 | ILF3_MOUSE | Ilf3 | Interleukin enhancer-binding factor 3 |
| Q05920 | PYC_MOUSE | Pc | Pyruvate carboxylase, mitochondrial, EC 6.4.1.1 (Pyruvic carboxylase, PCB) |
| P08226 | APOE_MOUSE | ApoE | Apolipoprotein E, Apo-E |

| | | | |
|--------|-------------|---------|--|
| B2RY56 | RBM25_MOUSE | Rbm25 | RNA-binding protein 25 (RNA-binding motif protein 25) |
| O88543 | CSN3_MOUSE | Cops3 | COP9 signalosome complex subunit 3, SGN3, Signalosome subunit 3 (JAB1-containing signalosome subunit 3) |
| P47963 | RL13_MOUSE | Rpl13 | 60S ribosomal protein L13 (A52) |
| Q91WU5 | AS3MT_MOUSE | As3mt | Arsenite methyltransferase, EC 2.1.1.137 (Methylarsonite methyltransferase) (S-adenosyl-L-methionine:arsenic(III) methyltransferase) |
| Q6NV83 | SR140_MOUSE | U2surp | U2 snRNP-associated SURP motif-containing protein (140 kDa Ser/Arg-rich domain protein) (U2-associated protein SR140) |
| Q61550 | RAD21_MOUSE | Rad21 | Double-strand-break repair protein rad21 homolog, mHR21 (Pokeweed agglutinin-binding protein 29, PW29) (SCC1 homolog) [Cleaved into: 64-kDa C-terminal product (64-kDa carboxy-terminal product)] |
| Q9WU78 | PDC6I_MOUSE | Pdcd6ip | Programmed cell death 6-interacting protein (ALG-2-interacting protein 1) (ALG-2-interacting protein X) (E2F1-inducible protein) (Eig2) |
| O08759 | UBE3A_MOUSE | Ube3a | Ubiquitin-protein ligase E3A, EC 2.3.2.26 (HECT-type ubiquitin transferase E3A) (Oncogenic protein-associated protein E6-AP) |
| O35633 | VIAAT_MOUSE | Slc32a1 | Vesicular inhibitory amino acid transporter (Solute carrier family 32 member 1) (Vesicular GABA and glycine transporter) (Vesicular GABA transporter, mVGAT, mVIAAT) |
| Q08331 | CALB2_MOUSE | Calb2 | Calretinin, CR |
| P62908 | RS3_MOUSE | Rps3 | 40S ribosomal protein S3, EC 4.2.99.18 |
| Q9JLJ2 | AL9A1_MOUSE | Aldh9a1 | 4-trimethylaminobutyraldehyde dehydrogenase, TMABA-DH, TMABADH, EC 1.2.1.47 (Aldehyde dehydrogenase family 9 member A1, EC 1.2.1.3) |
| Q9D8B3 | CHM4B_MOUSE | Chmp4b | Charged multivesicular body protein 4b (Chromatin-modifying protein 4b, CHMP4b) |
| Q9EQU5 | SET_MOUSE | Set | Protein SET (Phosphatase 2A inhibitor I2PP2A, I-2PP2A) (Template-activating factor I, TAF-I) |
| Q8R0S2 | IQEC1_MOUSE | Iqsec1 | IQ motif and SEC7 domain-containing protein 1 |
| Q64511 | TOP2B_MOUSE | Top2b | DNA topoisomerase 2-beta, EC 5.6.2.2 (DNA topoisomerase II, beta isozyme) |
| P46414 | CDN1B_MOUSE | Cdkn1b | Cyclin-dependent kinase inhibitor 1B (Cyclin-dependent kinase inhibitor p27) (p27Kip1) |
| Q61696 | HS71A_MOUSE | Hspa1a | Heat shock 70 kDa protein 1A (Heat shock 70 kDa protein 3, HSP70.3) (Hsp68) |
| Q99L43 | CDS2_MOUSE | Cds2 | Phosphatidate cytidyltransferase 2, EC 2.7.7.41 (CDP-DAG synthase 2) (CDP-DG synthase 2) (CDP-diacylglycerol synthase 2, CDS 2) (CDP-diglyceride |

| | | | |
|--------|-------------|---------|---|
| | | | pyrophosphorylase 2) (CDP-diglyceride synthase 2) (CTP:phosphatidate cytidyltransferase 2) |
| O54774 | AP3D1_MOUSE | Ap3d1 | AP-3 complex subunit delta-1 (AP-3 complex subunit delta) (Adaptor-related protein complex 3 subunit delta-1) (Delta-adaptin, mBLVR1) |
| Q01065 | PDE1B_MOUSE | Pde1b | Dual specificity calcium/calmodulin-dependent 3',5'-cyclic nucleotide phosphodiesterase 1B, Cam-PDE 1B, EC 3.1.4.17 (63 kDa Cam-PDE) |
| O35344 | IMA4_MOUSE | Kpna3 | Importin subunit alpha-4 (Importin alpha Q2, Qip2) (Karyopherin subunit alpha-3) |
| Q62188 | DPYL3_MOUSE | Dpysl3 | Dihydropyrimidinase-related protein 3, DRP-3 (Unc-33-like phosphoprotein 1, ULIP-1) |
| P62281 | RS11_MOUSE | Rps11 | 40S ribosomal protein S11 |
| P32067 | LA_MOUSE | Ssb | Lupus La protein homolog (La autoantigen homolog) (La ribonucleoprotein) |
| P58771 | TPM1_MOUSE | Tpm1 | Tropomyosin alpha-1 chain (Alpha-tropomyosin) (Tropomyosin-1) |
| Q6PDQ2 | CHD4_MOUSE | Chd4 | Chromodomain-helicase-DNA-binding protein 4, CHD-4, EC 3.6.4.12 |
| Q9JIF0 | ANM1_MOUSE | Prmt1 | Protein arginine N-methyltransferase 1, EC 2.1.1.319 (Histone-arginine N-methyltransferase PRMT1) |
| P35235 | PTN11_MOUSE | Ptpn11 | Tyrosine-protein phosphatase non-receptor type 11, EC 3.1.3.48 (Protein-tyrosine phosphatase SYP) (SH-PTP2, SHP-2, Shp2) |
| Q6A0A9 | F120A_MOUSE | FAM120A | Constitutive coactivator of PPAR-gamma-like protein 1 (Oxidative stress-associated Src activator) (Protein FAM120A) |
| Q9WVL4 | GRK1_MOUSE | Grk1 | Rhodopsin kinase GRK1, RK, EC 2.7.11.14 (G protein-coupled receptor kinase 1) |
| Q9JKK7 | TMOD2_MOUSE | Tmod2 | Tropomodulin-2 (Neuronal tropomodulin, N-Tmod) |
| Q9R0P9 | UCHL1_MOUSE | Uchl1 | Ubiquitin carboxyl-terminal hydrolase isozyme L1, UCH-L1, EC 3.4.19.12 (Neuron cytoplasmic protein 9.5) (PGP 9.5, PGP9.5) (Ubiquitin thioesterase L1) |
| Q9Z0H3 | SNF5_MOUSE | Smarb1 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily B member 1 (BRG1-associated factor 47, BAF47) (Integrase interactor 1 protein) (SNF5 homolog, mSNF5) |
| P31938 | MP2K1_MOUSE | Map2k1 | Dual specificity mitogen-activated protein kinase kinase 1, MAP kinase kinase 1, MAPKK 1, EC 2.7.12.2 (ERK activator kinase 1) (MAPK/ERK kinase 1, MEK 1) |
| P62965 | RABP1_MOUSE | Crabp1 | Cellular retinoic acid-binding protein 1 (Cellular retinoic acid-binding protein I, CRABP-I) |
| Q9JMG7 | HDGR3_MOUSE | Hdgfl3 | Hepatoma-derived growth factor-related protein 3, HRP-3 |

| | | | |
|--------|-------------|---------|---|
| P61922 | GABT_MOUSE | Abat | 4-aminobutyrate aminotransferase, mitochondrial, EC 2.6.1.19 ((S)-3-amino-2-methylpropionate transaminase, EC 2.6.1.22) (GABA aminotransferase, GABA-AT) (Gamma-amino-N-butyrate transaminase, GABA transaminase, GABA-T) (L-AIBAT) |
| P47754 | CAZA2_MOUSE | Capza2 | F-actin-capping protein subunit alpha-2 (CapZ alpha-2) |
| Q91VR5 | DDX1_MOUSE | Ddx1 | ATP-dependent RNA helicase DDX1, EC 3.6.4.13 (DEAD box protein 1) |
| Q921M3 | SF3B3_MOUSE | Sf3b3 | Splicing factor 3B subunit 3 (Pre-mRNA-splicing factor SF3b 130 kDa subunit, SF3b130) (Spliceosome-associated protein 130, SAP 130) |
| P26043 | RADI_MOUSE | Rdx | Radixin (ESP10) |
| Q6Q477 | AT2B4_MOUSE | Atp2b4 | Plasma membrane calcium-transporting ATPase 4, PMCA4, EC 7.2.2.10 |
| Q6PAJ1 | BCR_MOUSE | Bcr | Breakpoint cluster region protein, EC 2.7.11.1 |
| Q80VP0 | TCPR1_MOUSE | Tecpr1 | Tectonin beta-propeller repeat-containing protein 1 |
| P80314 | TCPB_MOUSE | Cct2 | T-complex protein 1 subunit beta, TCP-1-beta (CCT-beta) |
| P00920 | CAH2_MOUSE | Ca2 | Carbonic anhydrase 2, EC 4.2.1.1 (Carbonate dehydratase II) (Carbonic anhydrase II, CA-II) |
| Q9D6R2 | IDH3A_MOUSE | Idh3a | Isocitrate dehydrogenase [NAD] subunit alpha, mitochondrial, EC 1.1.1.41 (Isocitric dehydrogenase subunit alpha) (NAD(+)-specific ICDH subunit alpha) |
| Q9JLV5 | CUL3_MOUSE | Cul3 | Cullin-3, CUL-3 |
| Q9ERD7 | TBB3_MOUSE | Tubb3 | Tubulin beta-3 chain |
| P60469 | LIPA3_MOUSE | Ppfia3 | Liprin-alpha-3 (Protein tyrosine phosphatase receptor type f polypeptide-interacting protein alpha-3, PTPRF-interacting protein alpha-3) |
| O54941 | SMCE1_MOUSE | Smarce1 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily E member 1 (BRG1-associated factor 57, BAF57) |
| Q99JI4 | PSMD6_MOUSE | Psmc6 | 26S proteasome non-ATPase regulatory subunit 6 (26S proteasome regulatory subunit RPN7) (26S proteasome regulatory subunit S10) (p42A) |
| P43006 | EAA2_MOUSE | Slc1a2 | Excitatory amino acid transporter 2 (GLT-1) (Sodium-dependent glutamate/aspartate transporter 2) (Solute carrier family 1 member 2) |
| Q8QZT1 | THIL_MOUSE | Acat1 | Acetyl-CoA acetyltransferase, mitochondrial, EC 2.3.1.9 (Acetoacetyl-CoA thiolase) |
| Q9WV80 | SNX1_MOUSE | Snx1 | Sorting nexin-1 |
| Q8CDG3 | VCIP1_MOUSE | Vcpip1 | Deubiquitinating protein VCPIP1, EC 3.4.19.12 (Valosin-containing protein p97/p47 complex-interacting protein 1) (Valosin-containing protein p97/p47 complex-interacting protein p135, VCP/p47 complex-interacting 135-kDa protein) |

| | | | |
|--------|-------------|----------|--|
| Q9DCB1 | HMG3_MOUSE | Hmgn3 | High mobility group nucleosome-binding domain-containing protein 3 |
| Q9WTQ5 | AKA12_MOUSE | Akap12 | A-kinase anchor protein 12, AKAP-12 (Germ cell lineage protein gercelin) (Src-suppressed C kinase substrate, SSeCKS) |
| P28663 | SNAB_MOUSE | Napb | Beta-soluble NSF attachment protein, SNAP-beta (Brain protein I47) (N-ethylmaleimide-sensitive factor attachment protein beta) |
| Q9DCW4 | ETFB_MOUSE | Etfb | Electron transfer flavoprotein subunit beta, Beta-ETF |
| Q9D0L8 | MCES_MOUSE | Rnmt | mRNA cap guanine-N7 methyltransferase, EC 2.1.1.56 (RG7MT1) (mRNA (guanine-N(7))-methyltransferase) (mRNA cap methyltransferase) |
| Q9CQQ7 | AT5F1_MOUSE | Atp5pb | ATP synthase F(0) complex subunit B1, mitochondrial (ATP synthase peripheral stalk-membrane subunit b) (ATP synthase subunit b, ATPase subunit b) |
| Q8R081 | HNRPL_MOUSE | Hnrnpl | Heterogeneous nuclear ribonucleoprotein L, hnRNP L |
| Q62093 | SRSF2_MOUSE | Srsf2 | Serine/arginine-rich splicing factor 2 (Protein PR264) (Putative myelin regulatory factor 1, MRF-1) (Splicing component, 35 kDa) (Splicing factor SC35, SC-35) (Splicing factor, arginine/serine-rich 2) |
| Q9DB05 | SNAA_MOUSE | Napa | Alpha-soluble NSF attachment protein, SNAP-alpha (N-ethylmaleimide-sensitive factor attachment protein alpha) |
| Q9WTM5 | RUVB2_MOUSE | Ruvbl2 | RuvB-like 2, EC 3.6.4.12 (p47 protein) |
| P12960 | CNTN1_MOUSE | Cntn1 | Contactin-1 (Neural cell surface protein F3) |
| P62242 | RS8_MOUSE | Rps8 | 40S ribosomal protein S8 |
| Q3UYV9 | NCBP1_MOUSE | Ncbp1 | Nuclear cap-binding protein subunit 1 (80 kDa nuclear cap-binding protein, CBP80, NCBP 80 kDa subunit) |
| P55088 | AQP4_MOUSE | Aqp4 | Aquaporin-4, AQP-4 (Mercurial-insensitive water channel, MIWC) (WCH4) |
| Q99L47 | F10A1_MOUSE | St13 | Hsc70-interacting protein, Hip (Protein FAM10A1) (Protein ST13 homolog) |
| O89086 | RBM3_MOUSE | Rbm3 | RNA-binding protein 3 (RNA-binding motif protein 3) |
| Q8BH59 | S2512_MOUSE | Slc25a12 | Electrogenic aspartate/glutamate antiporter SLC25A12, mitochondrial (Solute carrier family 25 member 12) |
| P62827 | RAN_MOUSE | Ran | GTP-binding nuclear protein Ran, EC 3.6.5.- (GTPase Ran) (Ras-like protein TC4) (Ras-related nuclear protein) |
| Q8K0U4 | HS12A_MOUSE | Hspa12a | Heat shock 70 kDa protein 12A |
| Q922B2 | SYDC_MOUSE | Dars1 | Aspartate--tRNA ligase, cytoplasmic, EC 6.1.1.12 (Aspartyl-tRNA synthetase, AspRS) |

| | | | |
|--------|-------------|---------|---|
| Q8C854 | MYEF2_MOUSE | Myef2 | Myelin expression factor 2, MEF-2, MyEF-2 |
| P53986 | MOT1_MOUSE | Slc16a1 | Monocarboxylate transporter 1, MCT 1 (Solute carrier family 16 member 1) |
| Q9WV02 | RBMX_MOUSE | Rbmx | RNA-binding motif protein, X chromosome (Heterogeneous nuclear ribonucleoprotein G, hnRNP G) [Cleaved into: RNA-binding motif protein, X chromosome, N-terminally processed] |
| P62900 | RL31_MOUSE | Rpl31 | 60S ribosomal protein L31 |
| Q62446 | FKBP3_MOUSE | Fkbp3 | Peptidyl-prolyl cis-trans isomerase FKBP3, PPIase FKBP3, EC 5.2.1.8 (25 kDa FK506-binding protein, 25 kDa FKBP, FKBP-25) (FK506-binding protein 3, FKBP-3) (Immunophilin FKBP25) (Rapamycin-selective 25 kDa immunophilin) (Rotamase) |
| Q810U3 | NFASC_MOUSE | Nfasc | Neurofascin |
| Q62351 | TFR1_MOUSE | Tfrc | Transferrin receptor protein 1, TR, TfR, TfR1, Trfr (CD antigen CD71) |
| Q9Z2L7 | CRLF3_MOUSE | Crlf3 | Cytokine receptor-like factor 3 (Cytokine receptor-like molecule 9, CREME-9) (Cytokine receptor-related factor 4) |
| Q5SQX6 | CYFP2_MOUSE | Cyfp2 | Cytoplasmic FMR1-interacting protein 2 (p53-inducible protein 121) |
| P46471 | PRS7_MOUSE | Psmc2 | 26S proteasome regulatory subunit 7 (26S proteasome AAA-ATPase subunit RPT1) (Proteasome 26S subunit ATPase 2) |
| Q6ZPY7 | KDM3B_MOUSE | Kdm3b | Lysine-specific demethylase 3B, EC 1.14.11.65 (JmjC domain-containing histone demethylation protein 2B) (Jumonji domain-containing protein 1B) ([histone H3]-dimethyl-L-lysine(9) demethylase 3B) |
| Q9DBG3 | AP2B1_MOUSE | Ap2b1 | AP-2 complex subunit beta (AP105B) (Adaptor protein complex AP-2 subunit beta) (Adaptor-related protein complex 2 subunit beta) (Beta-2-adaptin) (Beta-adaptin) (Clathrin assembly protein complex 2 beta large chain) (Plasma membrane adaptor HA2/AP2 adaptin beta subunit) |
| Q9CZ13 | QCR1_MOUSE | Uqerc1 | Cytochrome b-c1 complex subunit 1, mitochondrial (Complex III subunit 1) (Core protein I) (Ubiquinol-cytochrome-c reductase complex core protein 1) |
| Q9DAR7 | DCPS_MOUSE | Dcps | m7GpppX diphosphatase, EC 3.6.1.59 (DCS-1) (Decapping scavenger enzyme) (Hint-related 7meGMP-directed hydrolase) (Histidine triad nucleotide-binding protein 5) (Histidine triad protein member 5, HINT-5) (Scavenger mRNA-decapping enzyme DcpS) |
| P68254 | 1433T_MOUSE | Ywhaq | 14-3-3 protein theta (14-3-3 protein tau) |
| Q61147 | CERU_MOUSE | Cp | Ceruloplasmin, EC 1.16.3.1 (Ferroxidase) |
| Q7TQH0 | ATX2L_MOUSE | Atxn2l | Ataxin-2-like protein |

| | | | |
|--------|-------------|----------|--|
| Q8BHN3 | GANAB_MOUSE | Ganab | Neutral alpha-glucosidase AB, EC 3.2.1.207 (Alpha-glucosidase 2) (Glucosidase II subunit alpha) |
| P12023 | A4_MOUSE | App | Amyloid-beta precursor protein (ABPP, APP) (Alzheimer disease amyloid A4 protein homolog) (Alzheimer disease amyloid protein) (Amyloid precursor protein) (Amyloid-beta (A4) precursor protein) (Amyloid-beta A4 protein) (Amyloidogenic glycoprotein, AG) [Cleaved into: N-APP; Soluble APP-alpha, S-APP-alpha; Soluble APP-beta, S-APP-beta; C99 (APP-C99) (Beta-secretase C-terminal fragment, Beta-CTF); Amyloid-beta protein 42, Abeta42 (Beta-APP42); Amyloid-beta protein 40, Abeta40 (Beta-APP40); C83 (Alpha-secretase C-terminal fragment, Alpha-CTF); P3(42); P3(40); C80; Gamma-secretase C-terminal fragment 59 (APP-C59) (Amyloid intracellular domain 59, AID(59)) (Gamma-CTF(59)); Gamma-secretase C-terminal fragment 57 (APP-C57) (Amyloid intracellular domain 57, AID(57)) (Gamma-CTF(57)); Gamma-secretase C-terminal fragment 50 (Amyloid intracellular domain 50, AID(50)) (Gamma-CTF(50)); C31] |
| P50516 | VATA_MOUSE | Atp6v1a | V-type proton ATPase catalytic subunit A, V-ATPase subunit A, EC 7.1.2.2 (V-ATPase 69 kDa subunit) (Vacuolar proton pump subunit alpha) |
| P35802 | GPM6A_MOUSE | Gpm6a | Neuronal membrane glycoprotein M6-a, M6a |
| Q3TES0 | IQEC3_MOUSE | Iqsec3 | IQ motif and SEC7 domain-containing protein 3 |
| Q8BFY9 | TNPO1_MOUSE | Tnpol | Transportin-1 (Importin beta-2) (Karyopherin beta-2) |
| Q6A4J8 | UBP7_MOUSE | Usp7 | Ubiquitin carboxyl-terminal hydrolase 7, EC 3.4.19.12 (Deubiquitinating enzyme 7) (Herpesvirus-associated ubiquitin-specific protease, mHAUSP) (Ubiquitin thioesterase 7) (Ubiquitin-specific-processing protease 7) |
| Q9Z2X1 | HNRPF_MOUSE | Hnrnpf | Heterogeneous nuclear ribonucleoprotein F, hnRNP F [Cleaved into: Heterogeneous nuclear ribonucleoprotein F, N-terminally processed] |
| Q6NZL0 | SOGA3_MOUSE | Soga3 | Protein SOGA3 |
| Q80WM3 | CPLX4_MOUSE | Cplx4 | Complexin-4 (Complexin IV, CPX IV) |
| Q99LD4 | CSN1_MOUSE | Gps1 | COP9 signalosome complex subunit 1, SGN1, Signalosome subunit 1 (G protein pathway suppressor 1, GPS-1) (JAB1-containing signalosome subunit 1) |
| Q9QYC0 | ADDA_MOUSE | Add1 | Alpha-adducin (Erythrocyte adducin subunit alpha) |
| Q924C1 | XPO5_MOUSE | Xpo5 | Exportin-5, Exp5 (Ran-binding protein 21) |
| P62814 | VATB2_MOUSE | Atp6v1b2 | V-type proton ATPase subunit B, brain isoform, V-ATPase subunit B 2 (Endomembrane proton pump 58 kDa subunit) (Vacuolar proton pump subunit B 2) |

| | | | |
|--------|-------------|---------|--|
| P62270 | RS18_MOUSE | Rps18 | 40S ribosomal protein S18 (Ke-3, Ke3) |
| Q9ESE1 | LRBA_MOUSE | Lrba | Lipopolysaccharide-responsive and beige-like anchor protein (Beige-like protein) |
| Q9Z204 | HNRPC_MOUSE | Hnrnpc | Heterogeneous nuclear ribonucleoproteins C1/C2, hnRNP C1/C2 |
| P63328 | PP2BA_MOUSE | Ppp3ca | Protein phosphatase 3 catalytic subunit alpha, EC 3.1.3.16 (CAM-PRP catalytic subunit) (Calcineurin A alpha) (Calmodulin-dependent calcineurin A subunit alpha isoform, CNA alpha) (Serine/threonine-protein phosphatase 2B catalytic subunit alpha isoform) |
| Q61655 | DD19A_MOUSE | Ddx19a | ATP-dependent RNA helicase DDX19A, EC 3.6.4.13 (DEAD box RNA helicase DEAD5, mDEAD5) (DEAD box protein 19A) (Eukaryotic translation initiation factor 4A-related sequence 1) |
| Q8CHG3 | GCC2_MOUSE | Gcc2 | GRIP and coiled-coil domain-containing protein 2 (185 kDa Golgi coiled-coil protein, GCC185) |
| P35922 | FMR1_MOUSE | Fmr1 | Fragile X messenger ribonucleoprotein 1 (Fragile X messenger ribonucleoprotein, FMRP) (Protein FMR-1, mFmr1p) |
| Q9QZE7 | TSNAX_MOUSE | Tsnax | Translin-associated protein X (Translin-associated factor X) |
| Q9JLI8 | SART3_MOUSE | Sart3 | Squamous cell carcinoma antigen recognized by T-cells 3, SART-3, mSART-3 (Tumor-rejection antigen SART3) |
| O88447 | KLC1_MOUSE | Klc1 | Kinesin light chain 1, KLC 1 |
| Q62376 | RU17_MOUSE | Snrnp70 | U1 small nuclear ribonucleoprotein 70 kDa, U1 snRNP 70 kDa, U1-70K, snRNP70 |
| O35286 | DHX15_MOUSE | Dhx15 | ATP-dependent RNA helicase DHX15, EC 3.6.4.13 (DEAH box protein 15) |
| Q3UM45 | PP1R7_MOUSE | Ppp1r7 | Protein phosphatase 1 regulatory subunit 7 (Protein phosphatase 1 regulatory subunit 22) |
| Q9WUA3 | PFKAP_MOUSE | Pfkap | ATP-dependent 6-phosphofructokinase, platelet type, ATP-PFK, PFK-P, EC 2.7.1.11 (6-phosphofructokinase type C) (Phosphofructo-1-kinase isozyme C, PFK-C) (Phosphohexokinase) |
| Q8BL66 | EEA1_MOUSE | Eea1 | Early endosome antigen 1 |
| P35279 | RAB6A_MOUSE | Rab6a | Ras-related protein Rab-6A, Rab-6 |
| G3X9K3 | BIG1_MOUSE | Arfgef1 | Brefeldin A-inhibited guanine nucleotide-exchange protein 1, BIG1, Brefeldin A-inhibited GEP 1 (ADP-ribosylation factor guanine nucleotide-exchange factor 1) |
| Q91YI0 | ARLY_MOUSE | Asl | Argininosuccinate lyase, ASAL, EC 4.3.2.1 (Argininosuccinase) |

| | | | |
|--------|-------------|----------|---|
| Q60932 | VDAC1_MOUSE | Vdac1 | Voltage-dependent anion-selective channel protein 1, VDAC-1, mVDAC1 (Outer mitochondrial membrane protein porin 1) (Plasmalemmal porin) (Voltage-dependent anion-selective channel protein 5, VDAC-5, mVDAC5) |
| O70133 | DHX9_MOUSE | Dhx9 | ATP-dependent RNA helicase A, EC 3.6.4.13 (DEAH box protein 9, mHEL-5) (Nuclear DNA helicase II, NDH II) (RNA helicase A, RHA) |
| Q91VI7 | RINI_MOUSE | Rnh1 | Ribonuclease inhibitor (Ribonuclease/angiogenin inhibitor 1) |
| P50247 | SAHH_MOUSE | Ahcy | Adenosylhomocysteinase, AdoHcyase, EC 3.3.1.1 (CUBP) (Liver copper-binding protein) (S-adenosyl-L-homocysteine hydrolase) |
| Q00612 | G6PD1_MOUSE | G6pdx | Glucose-6-phosphate 1-dehydrogenase X, G6PD, EC 1.1.1.49 |
| Q80VD1 | FA98B_MOUSE | Fam98b | Protein FAM98B |
| Q80XI3 | IF4G3_MOUSE | Eif4g3 | Eukaryotic translation initiation factor 4 gamma 3, eIF-4-gamma 3, eIF-4G 3, eIF4G 3 (eIF-4-gamma II, eIF4GII) |
| O08795 | GLU2B_MOUSE | Prkesh | Glucosidase 2 subunit beta (80K-H protein) (Glucosidase II subunit beta) (Protein kinase C substrate 60.1 kDa protein heavy chain, PKCSH) |
| P49312 | ROA1_MOUSE | Hnrnpa1 | Heterogeneous nuclear ribonucleoprotein A1, hnRNP A1 (HDP-1) (Helix-destabilizing protein) (Single-strand-binding protein) (Topoisomerase-inhibitor suppressed) (hnRNP core protein A1) [Cleaved into: Heterogeneous nuclear ribonucleoprotein A1, N-terminally processed] |
| P58281 | OPA1_MOUSE | Opa1 | Dynamin-like 120 kDa protein, mitochondrial, EC 3.6.5.5 (Large GTP-binding protein, LargeG) (Optic atrophy protein 1 homolog) [Cleaved into: Dynamin-like 120 kDa protein, form S1] |
| Q9Z1G3 | VATC1_MOUSE | Atp6v1c1 | V-type proton ATPase subunit C 1, V-ATPase subunit C 1 (Vacuolar proton pump subunit C 1) |
| P40124 | CAP1_MOUSE | Cap1 | Adenylyl cyclase-associated protein 1, CAP 1 |
| Q9D517 | PLCC_MOUSE | Agpat3 | 1-acyl-sn-glycerol-3-phosphate acyltransferase gamma, EC 2.3.1.51 (1-acylglycerol-3-phosphate O-acyltransferase 3, 1-AGP acyltransferase 3, 1-AGPAT 3) (Lysophosphatidic acid acyltransferase gamma, LPAAT-gamma) |
| P14685 | PSMD3_MOUSE | Psm3 | 26S proteasome non-ATPase regulatory subunit 3 (26S proteasome regulatory subunit RPN3) (26S proteasome regulatory subunit S3) (Proteasome subunit p58) (Transplantation antigen P91A) (Tum-P91A antigen) |
| Q9DBC7 | KAP0_MOUSE | Prkar1a | cAMP-dependent protein kinase type I-alpha regulatory subunit [Cleaved into: cAMP-dependent protein kinase type I-alpha regulatory subunit, N-terminally processed] |

| | | | |
|--------|-------------|---------|--|
| Q8BGQ7 | SYAC_MOUSE | Aars1 | Alanine--tRNA ligase, cytoplasmic, EC 6.1.1.7 (Alanyl-tRNA synthetase, AlaRS) (Protein sticky, Sti) |
| P61982 | 1433G_MOUSE | Ywhag | 14-3-3 protein gamma [Cleaved into: 14-3-3 protein gamma, N-terminally processed] |
| P24527 | LKHA4_MOUSE | Lta4h | Leukotriene A-4 hydrolase, LTA-4 hydrolase, EC 3.3.2.6 (Leukotriene A(4) hydrolase) (Tripeptide aminopeptidase LTA4H, EC 3.4.11.4) |
| Q8K1M6 | DNM1L_MOUSE | Dnm1l | Dynamin-1-like protein, EC 3.6.5.5 (Dynamin family member proline-rich carboxyl-terminal domain less, Dymple) (Dynamin-related protein 1) |
| Q9CWS0 | DDAH1_MOUSE | Ddah1 | N(G),N(G)-dimethylarginine dimethylaminohydrolase 1, DDAH-1, Dimethylarginine dimethylaminohydrolase 1, EC 3.5.3.18 (DDAHI) (Dimethylargininase-1) |
| Q9CQI6 | COTL1_MOUSE | Cotl1 | Coactosin-like protein |
| P84244 | H33_MOUSE | H3-3a | Histone H3.3 |
| P18608 | HMGN1_MOUSE | Hmgn1 | Non-histone chromosomal protein HMG-14 (High mobility group nucleosome-binding domain-containing protein 1) |
| Q8K4Z5 | SF3A1_MOUSE | Sf3a1 | Splicing factor 3A subunit 1 (SF3a120) |
| Q8C9B9 | DIDO1_MOUSE | Dido1 | Death-inducer obliterator 1, DIO-1 (Death-associated transcription factor 1, DATF-1) |
| Q9D0I9 | SYRC_MOUSE | Rars1 | Arginine--tRNA ligase, cytoplasmic, EC 6.1.1.19 (Arginyl-tRNA synthetase, ArgRS) |
| Q8CDN6 | TXNL1_MOUSE | Txn1l | Thioredoxin-like protein 1 (32 kDa thioredoxin-related protein) |
| Q8BY87 | UBP47_MOUSE | Usp47 | Ubiquitin carboxyl-terminal hydrolase 47, EC 3.4.19.12 (Deubiquitinating enzyme 47) (Ubiquitin thioesterase 47) (Ubiquitin-specific-processing protease 47) |
| O35526 | STX1A_MOUSE | Stx1a | Syntaxin-1A (Neuron-specific antigen HPC-1) |
| Q9QYX7 | PCLO_MOUSE | Pclo | Protein piccolo (Aczonin) (Brain-derived HLMN protein) (Multidomain presynaptic cytomatrix protein) |
| P80318 | TCPG_MOUSE | Cct3 | T-complex protein 1 subunit gamma, TCP-1-gamma (CCT-gamma) (Matricin) (mTRiC-P5) |
| Q7TNC4 | LC7L2_MOUSE | Luc7l2 | Putative RNA-binding protein Luc7-like 2 (CGI-74 homolog) |
| O55131 | SEPT7_MOUSE | Septin7 | Septin-7 (CDC10 protein homolog) |
| P31786 | ACBP_MOUSE | Dbi | Acyl-CoA-binding protein, ACBP (Diazepam-binding inhibitor, DBI) (Endozepine, EP) |
| Q8BFZ9 | ERLN2_MOUSE | Erlin2 | Erlin-2 (Endoplasmic reticulum lipid raft-associated protein 2) (Stomatin-prohibitin-flotillin-HflC/K domain-containing protein 2, SPFH domain-containing protein 2) |
| Q04750 | TOP1_MOUSE | Top1 | DNA topoisomerase 1, EC 5.6.2.1 (DNA topoisomerase I) |

| | | | |
|--------|-------------|--------|---|
| Q9JL35 | HMG5_MOUSE | Hmgn5 | High mobility group nucleosome-binding domain-containing protein 5 (Nucleosome-binding protein 1) (Nucleosome-binding protein 45, NBP-45) (Protein GARP45) |
| P18760 | COF1_MOUSE | Cfl1 | Cofilin-1 (Cofilin, non-muscle isoform) |
| Q80U28 | MADD_MOUSE | Madd | MAP kinase-activating death domain protein (Rab3 GDP/GTP exchange factor, RabGEF) (Rab3 GDP/GTP exchange protein, Rab3GEP) |
| Q3THE2 | ML12B_MOUSE | My12b | Myosin regulatory light chain 12B (Myosin regulatory light chain 2-B, smooth muscle isoform) (Myosin regulatory light chain 20 kDa, MLC20) (Myosin regulatory light chain MRLC2) |
| Q3U1J4 | DDB1_MOUSE | Ddb1 | DNA damage-binding protein 1 (DDB p127 subunit) (Damage-specific DNA-binding protein 1) (UV-damaged DNA-binding factor) |
| P14152 | MDHC_MOUSE | Mdh1 | Malate dehydrogenase, cytoplasmic, EC 1.1.1.37 (Cytosolic malate dehydrogenase) |
| Q91WQ3 | SYYC_MOUSE | Yars1 | Tyrosine--tRNA ligase, cytoplasmic, EC 6.1.1.1 (Tyrosyl-tRNA synthetase, TyrRS) [Cleaved into: Tyrosine--tRNA ligase, cytoplasmic, N-terminally processed] |
| P67778 | PHB1_MOUSE | Phb1 | Prohibitin 1 (B-cell receptor-associated protein 32, BAP 32) |
| G5E8K5 | ANK3_MOUSE | Ank3 | Ankyrin-3, ANK-3 (Ankyrin-G) |
| Q91YQ5 | RPN1_MOUSE | Rpn1 | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit 1 (Dolichyl-diphosphooligosaccharide--protein glycosyltransferase 67 kDa subunit) (Ribophorin I, RPN-I) (Ribophorin-1) |
| Q99MN1 | SYK_MOUSE | Kars1 | Lysine--tRNA ligase, EC 2.7.7.-, EC 6.1.1.6 (Lysyl-tRNA synthetase, LysRS) |
| P62874 | GBB1_MOUSE | Gnb1 | Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1 (Transducin beta chain 1) |
| P29595 | NEDD8_MOUSE | Nedd8 | NEDD8 (Neddylin) (Neural precursor cell expressed developmentally down-regulated protein 8, NEDD-8) (Ubiquitin-like protein Nedd8) |
| Q8K310 | MATR3_MOUSE | Matr3 | Matrin-3 |
| Q6ZWR6 | SYNE1_MOUSE | Syne1 | Nesprin-1 (Enaptin) (KASH domain-containing protein 1, KASH1) (Myocyte nuclear envelope protein 1, Myne-1) (Nuclear envelope spectrin repeat protein 1) (Synaptic nuclear envelope protein 1, Syne-1) |
| P57784 | RU2A_MOUSE | Snrpa1 | U2 small nuclear ribonucleoprotein A', U2 snRNP A' |
| Q61012 | GBG1_MOUSE | Gngt1 | Guanine nucleotide-binding protein G(T) subunit gamma-T1 (Transducin gamma chain) |
| P15508 | SPTB1_MOUSE | Sptb | Spectrin beta chain, erythrocytic (Beta-I spectrin) |

| | | | |
|--------|-------------|---------|--|
| Q922U2 | K2C5_MOUSE | Krt5 | Keratin, type II cytoskeletal 5 (Cytokeratin-5, CK-5) (Keratin-5, K5) (Type-II keratin Kb5) |
| Q9CZU6 | CISY_MOUSE | Cs | Citrate synthase, mitochondrial, EC 2.3.3.1 (Citrate (Si)-synthase) |
| Q6P542 | ABCF1_MOUSE | Abcf1 | ATP-binding cassette sub-family F member 1 |
| P63158 | HMGB1_MOUSE | Hmgb1 | High mobility group protein B1 (High mobility group protein 1, HMG-1) |
| Q922D8 | C1TC_MOUSE | Mthfd1 | C-1-tetrahydrofolate synthase, cytoplasmic, C1-THF synthase [Cleaved into: C-1-tetrahydrofolate synthase, cytoplasmic, N-terminally processed] [Includes: Methylenetetrahydrofolate dehydrogenase, EC 1.5.1.5; Methenyltetrahydrofolate cyclohydrolase, EC 3.5.4.9; Formyltetrahydrofolate synthetase, EC 6.3.4.3] |
| O35381 | AN32A_MOUSE | Anp32a | Acidic leucine-rich nuclear phosphoprotein 32 family member A (Acidic nuclear phosphoprotein pp32) (Leucine-rich acidic nuclear protein, LANP) (Potent heat-stable protein phosphatase 2A inhibitor I1PP2A) |
| Q9Z0U1 | ZO2_MOUSE | Tjp2 | Tight junction protein ZO-2 (Tight junction protein 2) (Zona occludens protein 2) (Zonula occludens protein 2) |
| Q6PDM2 | SRSF1_MOUSE | Srsf1 | Serine/arginine-rich splicing factor 1 (ASF/SF2) (Pre-mRNA-splicing factor SRp30a) (Splicing factor, arginine/serine-rich 1) |
| P70336 | ROCK2_MOUSE | Rock2 | Rho-associated protein kinase 2, EC 2.7.11.1 (Rho-associated, coiled-coil-containing protein kinase 2) (Rho-associated, coiled-coil-containing protein kinase II, ROCK-II) (p164 ROCK-2) |
| P50396 | GDIA_MOUSE | Gdi1 | Rab GDP dissociation inhibitor alpha, Rab GDI alpha (Guanosine diphosphate dissociation inhibitor 1, GDI-1) |
| Q8CHY6 | P66A_MOUSE | Gatad2a | Transcriptional repressor p66 alpha (GATA zinc finger domain-containing protein 2A) |
| P48036 | ANXA5_MOUSE | Anxa5 | Annexin A5 (Anchoring CII) (Annexin V) (Annexin-5) (Calphobindin I, CPB-I) (Endonexin II) (Lipocortin V) (Placental anticoagulant protein 4, PP4) (Placental anticoagulant protein I, PAP-I) (Thromboplastin inhibitor) (Vascular anticoagulant-alpha, VAC-alpha) |
| P15499 | PRPH2_MOUSE | Prph2 | Peripherin-2 (Retinal degeneration slow protein) |
| P06745 | G6PI_MOUSE | Gpi | Glucose-6-phosphate isomerase, GPI, EC 5.3.1.9 (Autocrine motility factor, AMF) (Neuroleukin, NLK) (Phosphoglucose isomerase, PGI) (Phosphohexose isomerase, PHI) |
| P46935 | NEDD4_MOUSE | Nedd4 | E3 ubiquitin-protein ligase NEDD4, EC 2.3.2.26 (HECT-type E3 ubiquitin transferase NEDD4) (Neural precursor cell expressed developmentally down-regulated protein 4, NEDD-4) |

| | | | |
|--------|-------------|----------|--|
| P14824 | ANXA6_MOUSE | Anxa6 | Annexin A6 (67 kDa calelectrin) (Annexin VI) (Annexin-6) (Calphobindin-II, CPB-II) (Chromobindin-20) (Lipocortin VI) (Protein III) (p68) (p70) |
| Q6P4T2 | U520_MOUSE | Snrnp200 | U5 small nuclear ribonucleoprotein 200 kDa helicase, EC 3.6.4.13 (BRR2 homolog) (U5 snRNP-specific 200 kDa protein, U5-200KD) |
| Q9Z1L4 | XLRS1_MOUSE | Rs1 | Retinoschisin (X-linked juvenile retinoschisis protein homolog) |
| O55023 | IMPA1_MOUSE | Impa1 | Inositol monophosphatase 1, IMP 1, IMPase 1, EC 3.1.3.25 (D-galactose 1-phosphate phosphatase, EC 3.1.3.94) (Inositol-1(or 4)-monophosphatase 1) (Lithium-sensitive myo-inositol monophosphatase A1) |
| Q61656 | DDX5_MOUSE | Ddx5 | Probable ATP-dependent RNA helicase DDX5, EC 3.6.4.13 (DEAD box RNA helicase DEAD1, mDEAD1) (DEAD box protein 5) (RNA helicase p68) |
| Q8CGM2 | RP1L1_MOUSE | Rp111 | Retinitis pigmentosa 1-like 1 protein (Retinitis pigmentosa 1-like protein 1) |
| Q8BRT1 | CLAP2_MOUSE | Clasp2 | CLIP-associating protein 2 (Cytoplasmic linker-associated protein 2) |
| Q99JB2 | STML2_MOUSE | Stoml2 | Stomatin-like protein 2, mitochondrial, SLP-2, mslp2 |
| Q9D855 | QCR7_MOUSE | Uqcrb | Cytochrome b-c1 complex subunit 7 (Complex III subunit 7) (Complex III subunit VII) (Ubiquinol-cytochrome c reductase complex 14 kDa protein) |
| Q8CGC7 | SYEP_MOUSE | Eprs1 | Bifunctional glutamate/proline--tRNA ligase (Bifunctional aminoacyl-tRNA synthetase) [Includes: Glutamate--tRNA ligase, EC 6.1.1.17 (Glutamyl-tRNA synthetase, GluRS); Proline--tRNA ligase, EC 6.1.1.15 (Prolyl-tRNA synthetase, ProRS)] |
| P43274 | H14_MOUSE | H1-4 | Histone H1.4 (H1 VAR.2) (H1e) |
| Q8C1B7 | SEP11_MOUSE | Septin11 | Septin-11 |
| P14211 | CALR_MOUSE | Calr | Calreticulin (CRP55) (Calregulin) (Endoplasmic reticulum resident protein 60, ERp60) (HACBP) |
| Q5XG69 | F169A_MOUSE | Fam169a | Soluble lamin-associated protein of 75 kDa, SLAP75 (Protein FAM169A) |
| Q8BTM8 | FLNA_MOUSE | Flna | Filamin-A, FLN-A (Actin-binding protein 280, ABP-280) (Alpha-filamin) (Endothelial actin-binding protein) (Filamin-1) (Non-muscle filamin) |
| P27664 | PDE6A_MOUSE | Pde6a | Rod cGMP-specific 3',5'-cyclic phosphodiesterase subunit alpha, GMP-PDE alpha, EC 3.1.4.35 |
| Q78PY7 | SND1_MOUSE | Snd1 | Staphylococcal nuclease domain-containing protein 1, EC 3.1.31.1 (100 kDa coactivator) (p100 co-activator) |
| Q64520 | KGUA_MOUSE | Guk1 | Guanylate kinase, EC 2.7.4.8 (GMP kinase) (Guanylate kinase 1) |

| | | | |
|--------|-------------|--------|---|
| P17751 | TPIS_MOUSE | Tpi1 | Triosephosphate isomerase, TIM, EC 5.3.1.1 (Methylglyoxal synthase, EC 4.2.3.3) (Triose-phosphate isomerase) |
| O08749 | DLDH_MOUSE | Dld | Dihydrolipoyl dehydrogenase, mitochondrial, EC 1.8.1.4 (Dihydrolipoamide dehydrogenase) |
| P08228 | SODC_MOUSE | Sod1 | Superoxide dismutase [Cu-Zn], EC 1.15.1.1 |
| Q9QUI0 | RHOA_MOUSE | Rhoa | Transforming protein RhoA, EC 3.6.5.2 |
| Q69Z99 | ZN512_MOUSE | Znf512 | Zinc finger protein 512 |
| Q8VDM4 | PSMD2_MOUSE | Psm2 | 26S proteasome non-ATPase regulatory subunit 2 (26S proteasome regulatory subunit RPN1) (26S proteasome regulatory subunit S2) (26S proteasome subunit p97) |
| Q9CZC8 | SCRN1_MOUSE | Scrn1 | Secernin-1 |
| Q3UEB3 | PUF60_MOUSE | Puf60 | Poly(U)-binding-splicing factor PUF60 (60 kDa poly(U)-binding-splicing factor) |
| A2AGT5 | CKAP5_MOUSE | Ckap5 | Cytoskeleton-associated protein 5 |
| Q8BFR5 | EFTU_MOUSE | Tufm | Elongation factor Tu, mitochondrial |
| P23198 | CBX3_MOUSE | Cbx3 | Chromobox protein homolog 3 (Heterochromatin protein 1 homolog gamma, HP1 gamma) (M32) (Modifier 2 protein) |
| Q9JMH9 | MY18A_MOUSE | Myo18a | Unconventional myosin-XVIIIa (Molecule associated with JAK3 N-terminus, MAJN) (Myosin containing a PDZ domain) (Surfactant protein receptor SP-R210, SP-R210) |
| Q08288 | LYAR_MOUSE | Lyar | Cell growth-regulating nucleolar protein (Ly1 antibody-reactive protein) (Protein expressed in male leptotene and zygotene spermatocytes 264, MLZ-264) |
| Q8CI94 | PYGB_MOUSE | Pygb | Glycogen phosphorylase, brain form, EC 2.4.1.1 |
| Q99LX0 | PARK7_MOUSE | Park7 | Parkinson disease protein 7 homolog (Maillard deglycase) (Parkinsonism-associated deglycase) (Protein DJ-1, DJ-1) (Protein/nucleic acid deglycase DJ-1, EC 3.1.2.-, EC 3.5.1.-, EC 3.5.1.124) |
| P15409 | OPSD_MOUSE | Rho | Rhodopsin |
| Q99PL5 | RRBP1_MOUSE | Rrbp1 | Ribosome-binding protein 1 (Ribosome receptor protein, RRp, mRRp) |
| Q62420 | SH3G2_MOUSE | Sh3gl2 | Endophilin-A1 (Endophilin-1) (SH3 domain protein 2A) (SH3 domain-containing GRB2-like protein 2) (SH3p4) |
| Q8CGK3 | LONM_MOUSE | Lonp1 | Lon protease homolog, mitochondrial, EC 3.4.21.53 (Lon protease-like protein, LONP) (Mitochondrial ATP-dependent protease Lon) (Serine protease 15) |
| Q9QYR6 | MAP1A_MOUSE | Map1a | Microtubule-associated protein 1A, MAP-1A [Cleaved into: MAP1A heavy chain; MAP1 light chain LC2] |

| | | | |
|--------|-------------|---------|---|
| Q8BG05 | ROA3_MOUSE | Hnrnpa3 | Heterogeneous nuclear ribonucleoprotein A3, hnRNP A3 |
| Q60864 | STIP1_MOUSE | Stip1 | Stress-induced-phosphoprotein 1, STI1, mSTI1 (Hsc70/Hsp90-organizing protein, Hop) |
| O08709 | PRDX6_MOUSE | Prdx6 | Peroxiredoxin-6, EC 1.11.1.27 (1-Cys peroxiredoxin, 1-Cys PRX) (Acidic calcium-independent phospholipase A2, aiPLA2, EC 3.1.1.4) (Antioxidant protein 2) (Glutathione-dependent peroxiredoxin) (Lysophosphatidylcholine acyltransferase 5, LPC acyltransferase 5, LPCAT-5, Lyso-PC acyltransferase 5, EC 2.3.1.23) (Non-selenium glutathione peroxidase, NSGPx) |
| Q6IRU5 | CLCB_MOUSE | Cltb | Clathrin light chain B, Lcb |
| Q9JIX8 | ACINU_MOUSE | Acin1 | Apoptotic chromatin condensation inducer in the nucleus, Acinus |
| Q9Z2U0 | PSA7_MOUSE | Psm7 | Proteasome subunit alpha type-7 (Proteasome subunit RC6-1) |
| Q99NB9 | SF3B1_MOUSE | Sf3b1 | Splicing factor 3B subunit 1 (Pre-mRNA-splicing factor SF3b 155 kDa subunit, SF3b155) (Spliceosome-associated protein 155, SAP 155) |
| P47708 | RP3A_MOUSE | Rph3a | Rabphilin-3A (Exophilin-1) |
| Q64012 | RALY_MOUSE | Raly | RNA-binding protein Raly (Maternally-expressed hnRNP C-related protein) (hnRNP associated with lethal yellow protein) |
| Q8BLQ9 | CADM2_MOUSE | Cadm2 | Cell adhesion molecule 2 (Immunoglobulin superfamily member 4D, IgSF4D) (Nectin-like protein 3, NECL-3) (Synaptic cell adhesion molecule 2, SynCAM 2) |
| Q8R1B4 | EIF3C_MOUSE | Eif3c | Eukaryotic translation initiation factor 3 subunit C, eIF3c (Eukaryotic translation initiation factor 3 subunit 8) (eIF3 p110) |
| Q9JME5 | AP3B2_MOUSE | Ap3b2 | AP-3 complex subunit beta-2 (Adaptor protein complex AP-3 subunit beta-2) (Adaptor-related protein complex 3 subunit beta-2) (Beta-3B-adaptin) (Clathrin assembly protein complex 3 beta-2 large chain) |
| Q8R0A5 | TCAL3_MOUSE | Tceal3 | Transcription elongation factor A protein-like 3, TCEA-like protein 3 (Transcription elongation factor S-II protein-like 3) |
| Q60668 | HNRPD_MOUSE | Hnrnpd | Heterogeneous nuclear ribonucleoprotein D0, hnRNP D0 (AU-rich element RNA-binding protein 1) |
| O35295 | PURB_MOUSE | Purb | Transcriptional activator protein Pur-beta (Purine-rich element-binding protein B) (Vascular actin single-stranded DNA-binding factor 2 p44 component) |
| Q9R190 | MTA2_MOUSE | Mta2 | Metastasis-associated protein MTA2 (Metastasis-associated 1-like 1) |
| O55143 | AT2A2_MOUSE | Atp2a2 | Sarcoplasmic/endoplasmic reticulum calcium ATPase 2, SERCA2, SR Ca(2+)-ATPase 2, EC 7.2.2.10 (Calcium pump 2) (Calcium-transporting ATPase sarcoplasmic |

| | | | |
|--------|-------------|-----------|--|
| | | | reticulum type, slow twitch skeletal muscle isoform) (Endoplasmic reticulum class 1/2 Ca(2+) ATPase) |
| P11983 | TCPA_MOUSE | Tcp1 | T-complex protein 1 subunit alpha, TCP-1-alpha (CCT-alpha) (Tailless complex polypeptide 1A, TCP-1-A) (Tailless complex polypeptide 1B, TCP-1-B) |
| P26443 | DHE3_MOUSE | Glud1 | Glutamate dehydrogenase 1, mitochondrial, GDH 1, EC 1.4.1.3 |
| Q9CZ44 | NSF1C_MOUSE | Nsfl1c | NSFL1 cofactor p47 (p97 cofactor p47) |
| Q8VDP4 | CCAR2_MOUSE | Ccar2 | Cell cycle and apoptosis regulator protein 2 (Cell division cycle and apoptosis regulator protein 2) |
| P20444 | KPCA_MOUSE | Prkca | Protein kinase C alpha type, PKC-A, PKC-alpha, EC 2.7.11.13 |
| Q9CQV8 | 1433B_MOUSE | Ywhab | 14-3-3 protein beta/alpha (Protein kinase C inhibitor protein 1, KCIP-1) [Cleaved into: 14-3-3 protein beta/alpha, N-terminally processed] |
| P27773 | PDIA3_MOUSE | Pdia3 | Protein disulfide-isomerase A3, EC 5.3.4.1 (58 kDa glucose-regulated protein) (58 kDa microsomal protein, p58) (Disulfide isomerase ER-60) (Endoplasmic reticulum resident protein 57, ER protein 57, ERp57) (Endoplasmic reticulum resident protein 60, ER protein 60, ERp60) |
| Q6PHN9 | RAB35_MOUSE | Rab35 | Ras-related protein Rab-35 |
| Q9WV34 | MPP2_MOUSE | Mpp2 | MAGUK p55 subfamily member 2 (Discs large homolog 2) (Protein MPP2) |
| Q9D8N0 | EF1G_MOUSE | Eef1g | Elongation factor 1-gamma, EF-1-gamma (eEF-1B gamma) |
| Q9QZQ8 | H2AY_MOUSE | Macroh2a1 | Core histone macro-H2A.1, Histone macroH2A1, mH2A1 (H2A.y) (H2A/y) |
| Q8VIJ6 | SFPQ_MOUSE | Sfpq | Splicing factor, proline- and glutamine-rich (DNA-binding p52/p100 complex, 100 kDa subunit) (Polypyrimidine tract-binding protein-associated-splicing factor, PSF, PTB-associated-splicing factor) |
| Q6PB66 | LPPRC_MOUSE | Lrpprc | Leucine-rich PPR motif-containing protein, mitochondrial (130 kDa leucine-rich protein, LRP 130, mLRP130) |
| Q61644 | PACN1_MOUSE | Pacsin1 | Protein kinase C and casein kinase substrate in neurons protein 1 (Syndapin-1) |
| P39447 | ZO1_MOUSE | Tjp1 | Tight junction protein ZO-1 (Tight junction protein 1) (Zona occludens protein 1) (Zonula occludens protein 1) |
| P35803 | GPM6B_MOUSE | Gpm6b | Neuronal membrane glycoprotein M6-b, M6b |
| Q9CR51 | VATG1_MOUSE | Atp6v1g1 | V-type proton ATPase subunit G 1, V-ATPase subunit G 1 (V-ATPase 13 kDa subunit 1) (Vacuolar proton pump subunit G 1) |

| | | | |
|--------|-------------|----------|---|
| O54988 | SLK_MOUSE | Slk | STE20-like serine/threonine-protein kinase, STE20-like kinase, mSLK, EC 2.7.11.1 (Etk4) (STE20-related kinase SMAK) (STE20-related serine/threonine-protein kinase, STE20-related kinase) (Serine/threonine-protein kinase 2) |
| Q00P19 | HNRL2_MOUSE | Hnrnpul2 | Heterogeneous nuclear ribonucleoprotein U-like protein 2 (MLF1-associated nuclear protein) |
| Q8BGC0 | HTSF1_MOUSE | Htatsf1 | HIV Tat-specific factor 1 homolog |
| Q3UMU9 | HDGR2_MOUSE | Hdgrf2 | Hepatoma-derived growth factor-related protein 2, HRP-2 |
| P26645 | MARCS_MOUSE | Marcks | Myristoylated alanine-rich C-kinase substrate, MARCKS |
| O08553 | DPYL2_MOUSE | Dpysl2 | Dihydropyrimidinase-related protein 2, DRP-2 (Unc-33-like phosphoprotein 2, ULIP-2) |
| P10711 | TCEA1_MOUSE | Tcea1 | Transcription elongation factor A protein 1 (Transcription elongation factor S-II protein 1) (Transcription elongation factor TFIIS.o) |
| P50096 | IMDH1_MOUSE | Impdh1 | Inosine-5'-monophosphate dehydrogenase 1, IMP dehydrogenase 1, IMPD 1, IMPDH 1, EC 1.1.1.205 (IMPDH-I) |
| Q61990 | PCBP2_MOUSE | Pcbp2 | Poly(rC)-binding protein 2 (Alpha-CP2) (CTBP, CBP) (Putative heterogeneous nuclear ribonucleoprotein X, hnRNP X) |
| P42932 | TCPQ_MOUSE | Cct8 | T-complex protein 1 subunit theta, TCP-1-theta (CCT-theta) |
| Q9JIK5 | DDX21_MOUSE | Ddx21 | Nucleolar RNA helicase 2, EC 3.6.4.13 (DEAD box protein 21) (Gu-alpha) (Nucleolar RNA helicase Gu) (Nucleolar RNA helicase II) (RH II/Gu) |
| P56480 | ATPB_MOUSE | Atp5f1b | ATP synthase subunit beta, mitochondrial, EC 7.1.2.2 (ATP synthase F1 subunit beta) |
| P34057 | RECO_MOUSE | Rcvrn | Recoverin (23 kDa photoreceptor cell-specific protein) (Cancer-associated retinopathy protein, Protein CAR) |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| O35685 | NUDC_MOUSE | Nudc | Nuclear migration protein nudC (Nuclear distribution protein C homolog) (Silica-induced gene 92 protein, SIG-92) |
| P08249 | MDHM_MOUSE | Mdh2 | Malate dehydrogenase, mitochondrial, EC 1.1.1.37 |
| Q9Z0F7 | SYUG_MOUSE | Sncg | Gamma-synuclein (Persyn) |
| O35143 | ATIF1_MOUSE | Atp5if1 | ATPase inhibitor, mitochondrial (ATP synthase F1 subunit epsilon) (Inhibitor of F(1)F(o)-ATPase, IF(1), IF1) |

| | | | |
|--------|-------------|---------|--|
| Q8BVE3 | VATH_MOUSE | Atp6v1h | V-type proton ATPase subunit H, V-ATPase subunit H (Vacuolar proton pump subunit H) |
| Q8VDC1 | FYCO1_MOUSE | Fyco1 | FYVE and coiled-coil domain-containing protein 1 |
| P47911 | RL6_MOUSE | Rpl6 | 60S ribosomal protein L6 (TAX-responsive enhancer element-binding protein 107, TAXREB107) |
| O88487 | DC1I2_MOUSE | Dync1i2 | Cytoplasmic dynein 1 intermediate chain 2 (Cytoplasmic dynein intermediate chain 2) (Dynein intermediate chain 2, cytosolic, DH IC-2) |
| P70398 | USP9X_MOUSE | Usp9x | Probable ubiquitin carboxyl-terminal hydrolase FAF-X, EC 3.4.19.12 (Deubiquitinating enzyme FAF-X) (Fat facets homolog) (Fat facets protein-related, X-linked) (Ubiquitin carboxyl-terminal hydrolase FAM) (Ubiquitin thioesterase FAF-X) (Ubiquitin-specific protease 9, X chromosome) (Ubiquitin-specific-processing protease FAF-X) |
| Q76MZ3 | 2AAA_MOUSE | Ppp2r1a | Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A alpha isoform (PP2A subunit A isoform PR65-alpha) (PP2A subunit A isoform R1-alpha) |
| Q91V14 | S12A5_MOUSE | Slc12a5 | Solute carrier family 12 member 5 (Electroneutral potassium-chloride cotransporter 2) (K-Cl cotransporter 2, mKCC2) (Neuronal K-Cl cotransporter) |
| Q9Z2D6 | MECP2_MOUSE | Mecp2 | Methyl-CpG-binding protein 2, MeCp-2 protein, MeCp2 |
| P62631 | EF1A2_MOUSE | Eef1a2 | Elongation factor 1-alpha 2, EF-1-alpha-2 (Eukaryotic elongation factor 1 A-2, eEF1A-2) (Statin-S1) |
| P10107 | ANXA1_MOUSE | Anxa1 | Annexin A1 (Annexin I) (Annexin-1) (Calpactin II) (Calpactin-2) (Chromobindin-9) (Lipocortin I) (Phospholipase A2 inhibitory protein) (p35) [Cleaved into: Annexin Ac2-26] |
| Q9D5V5 | CUL5_MOUSE | Cul5 | Cullin-5, CUL-5 |
| P02535 | K1C10_MOUSE | Krt10 | Keratin, type I cytoskeletal 10 (56 kDa cytokeratin) (Cytokeratin-10, CK-10) (Keratin, type I cytoskeletal 59 kDa) (Keratin-10, K10) |
| P62960 | YBOX1_MOUSE | Ybx1 | Y-box-binding protein 1, YB-1 (CCAAT-binding transcription factor I subunit A, CBF-A) (DNA-binding protein B, DBPB) (Enhancer factor I subunit A, EFI-A) (Nuclease-sensitive element-binding protein 1) (Y-box transcription factor) |
| Q9Z1F9 | SAE2_MOUSE | Uba2 | SUMO-activating enzyme subunit 2, EC 2.3.2.- (Anthracycline-associated resistance ARX) (Ubiquitin-like 1-activating enzyme E1B) (Ubiquitin-like modifier-activating enzyme 2) |
| Q8CGP7 | H2A1K_MOUSE | H2ac15 | Histone H2A type 1-K |

| | | | |
|--------|-------------|----------|--|
| P16125 | LDHB_MOUSE | Ldhb | L-lactate dehydrogenase B chain, LDH-B, EC 1.1.1.27 (LDH heart subunit, LDH-H) |
| P18572 | BASI_MOUSE | Bsg | Basigin (Basic immunoglobulin superfamily) (HT7 antigen) (Membrane glycoprotein gp42) (CD antigen CD147) |
| P68510 | 1433F_MOUSE | Ywhah | 14-3-3 protein eta |
| Q8VDN2 | AT1A1_MOUSE | Atp1a1 | Sodium/potassium-transporting ATPase subunit alpha-1, Na(+)/K(+) ATPase alpha-1 subunit, EC 7.2.2.13 (Sodium pump subunit alpha-1) |
| P08551 | NFL_MOUSE | Nefl | Neurofilament light polypeptide, NF-L (68 kDa neurofilament protein) (Neurofilament triplet L protein) |
| P05201 | AATC_MOUSE | Got1 | Aspartate aminotransferase, cytoplasmic, cAspAT, EC 2.6.1.1, EC 2.6.1.3 (Cysteine aminotransferase, cytoplasmic) (Cysteine transaminase, cytoplasmic, cCAT) (Glutamate oxaloacetate transaminase 1) (Transaminase A) |
| P20612 | GNAT1_MOUSE | Gnat1 | Guanine nucleotide-binding protein G(t) subunit alpha-1 (Transducin alpha-1 chain) |
| Q91ZQ1 | PDE6C_MOUSE | Pde6c | Cone cGMP-specific 3',5'-cyclic phosphodiesterase subunit alpha', EC 3.1.4.35 (cGMP phosphodiesterase 6C) |
| G5E829 | AT2B1_MOUSE | Atp2b1 | Plasma membrane calcium-transporting ATPase 1, EC 7.2.2.10 (Plasma membrane calcium ATPase isoform 1, PMCA1) (Plasma membrane calcium pump isoform 1) |
| Q64331 | MYO6_MOUSE | Myo6 | Unconventional myosin-VI (Protein twist) (Unconventional myosin-6) |
| Q8BMA6 | SRP68_MOUSE | Srp68 | Signal recognition particle subunit SRP68, SRP68 (Signal recognition particle 68 kDa protein) |
| Q93092 | TALDO_MOUSE | Taldo1 | Transaldolase, EC 2.2.1.2 |
| O08585 | CLCA_MOUSE | Clta | Clathrin light chain A, Lca |
| Q99P72 | RTN4_MOUSE | Rtn4 | Reticulon-4 (Neurite outgrowth inhibitor, Nogo protein) |
| Q6DIC0 | SMCA2_MOUSE | Smarca2 | Probable global transcription activator SNF2L2, EC 3.6.4.- (ATP-dependent helicase SMARCA2) (BRG1-associated factor 190B, BAF190B) (Protein brahma homolog) (SNF2-alpha) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 2) |
| P26041 | MOES_MOUSE | Msn | Moesin (Membrane-organizing extension spike protein) |
| P70441 | NHRF1_MOUSE | Slc9a3r1 | Na(+)/H(+) exchange regulatory cofactor NHE-RF1, NHERF-1 (Ezrin-radixin-moesin-binding phosphoprotein 50, EBP50) (Regulatory cofactor of Na(+)/H(+) exchanger) (Sodium-hydrogen exchanger regulatory factor 1) (Solute carrier family 9 isoform A3 regulatory factor 1) |

| | | | |
|--------|-------------|-----------|---|
| Q61081 | CDC37_MOUSE | Cdc37 | Hsp90 co-chaperone Cdc37 (Hsp90 chaperone protein kinase-targeting subunit) (p50Cdc37) [Cleaved into: Hsp90 co-chaperone Cdc37, N-terminally processed] |
| Q9ERU9 | RBP2_MOUSE | Ranbp2 | E3 SUMO-protein ligase RanBP2, EC 2.3.2.- (Ran-binding protein 2, RanBP2) |
| P58252 | EF2_MOUSE | Eef2 | Elongation factor 2, EF-2 |
| Q9ERK4 | XPO2_MOUSE | Cse11 | Exportin-2, Exp2 (Chromosome segregation 1-like protein) (Importin-alpha re-exporter) |
| P35700 | PRDX1_MOUSE | Prdx1 | Peroxiredoxin-1, EC 1.11.1.24 (Macrophage 23 kDa stress protein) (Osteoblast-specific factor 3, OSF-3) (Thioredoxin peroxidase 2) (Thioredoxin-dependent peroxide reductase 2) (Thioredoxin-dependent peroxiredoxin 1) |
| P26350 | PTMA_MOUSE | Ptma | Prothymosin alpha [Cleaved into: Prothymosin alpha, N-terminally processed; Thymosin alpha] |
| Q61035 | HARS1_MOUSE | Hars1 | Histidine--tRNA ligase, cytoplasmic, EC 6.1.1.21 (Histidyl-tRNA synthetase, HisRS) |
| Q8R0A7 | K0513_MOUSE | Kiaa0513 | Uncharacterized protein KIAA0513 |
| Q61292 | LAMB2_MOUSE | Lamb2 | Laminin subunit beta-2 (Laminin-11 subunit beta) (Laminin-14 subunit beta) (Laminin-15 subunit beta) (Laminin-3 subunit beta) (Laminin-4 subunit beta) (Laminin-7 subunit beta) (Laminin-9 subunit beta) (S-laminin subunit beta, S-LAM beta) |
| O88569 | ROA2_MOUSE | Hnrnpa2b1 | Heterogeneous nuclear ribonucleoproteins A2/B1, hnRNP A2/B1 |
| P20029 | BIP_MOUSE | Hspa5 | Endoplasmic reticulum chaperone BiP, EC 3.6.4.10 (78 kDa glucose-regulated protein, GRP-78) (Binding-immunoglobulin protein, BiP) (Heat shock protein 70 family protein 5, HSP70 family protein 5) (Heat shock protein family A member 5) (Immunoglobulin heavy chain-binding protein) |
| Q61768 | KINH_MOUSE | Kif5b | Kinesin-1 heavy chain (Conventional kinesin heavy chain) (Ubiquitous kinesin heavy chain, UKHC) |
| Q7TSJ2 | MAP6_MOUSE | Map6 | Microtubule-associated protein 6, MAP-6 (Stable tubule-only polypeptide, STOP) |
| P46096 | SYT1_MOUSE | Syt1 | Synaptotagmin-1 (Synaptotagmin I, SytI) (p65) |
| Q64704 | STX3_MOUSE | Stx3 | Syntaxin-3 |
| P05202 | AATM_MOUSE | Got2 | Aspartate aminotransferase, mitochondrial, mAspAT, EC 2.6.1.1, EC 2.6.1.7 (Fatty acid-binding protein, FABP-1) (Glutamate oxaloacetate transaminase 2) (Kynurenine aminotransferase 4) (Kynurenine aminotransferase IV) (Kynurenine--oxoglutarate transaminase 4) (Kynurenine--oxoglutarate transaminase IV) (Plasma membrane-associated fatty acid-binding protein, FABPpm) (Transaminase A) |

| | | | |
|--------|-------------|--------|---|
| P63038 | CH60_MOUSE | Hspd1 | 60 kDa heat shock protein, mitochondrial, EC 5.6.1.7 (60 kDa chaperonin) (Chaperonin 60, CPN60) (HSP-65) (Heat shock protein 60, HSP-60, Hsp60) (Mitochondrial matrix protein P1) |
| P51859 | HDGF_MOUSE | Hdgf | Hepatoma-derived growth factor, HDGF |
| Q9D0E1 | HNRPM_MOUSE | Hnrnrm | Heterogeneous nuclear ribonucleoprotein M, hnRNP M |
| P21107 | TPM3_MOUSE | Tpm3 | Tropomyosin alpha-3 chain (Gamma-tropomyosin) (Tropomyosin-3) |
| P63101 | 1433Z_MOUSE | Ywhaz | 14-3-3 protein zeta/delta (Protein kinase C inhibitor protein 1, KCIP-1) (SEZ-2) |
| Q91YR7 | PRP6_MOUSE | Prpf6 | Pre-mRNA-processing factor 6 (PRP6 homolog) (U5 snRNP-associated 102 kDa protein, U5-102 kDa protein) |
| P27546 | MAP4_MOUSE | Map4 | Microtubule-associated protein 4, MAP-4 |
| Q99KI0 | ACON_MOUSE | Aco2 | Aconitate hydratase, mitochondrial, Aconitase, EC 4.2.1.3 (Citrate hydro-lyase) |
| Q4KMM3 | OXR1_MOUSE | Oxr1 | Oxidation resistance protein 1 (Protein C7) |
| Q9D394 | RUFY3_MOUSE | Rufy3 | Protein RUFY3 (Rap2-interacting protein x, RIPx) (Single axon-regulated protein 1, Singar1) |
| O88737 | BSN_MOUSE | Bsn | Protein bassoon |
| Q8CHC4 | SYNJ1_MOUSE | Synj1 | Synaptojanin-1, EC 3.1.3.36 (Synaptic inositol 1,4,5-trisphosphate 5-phosphatase 1) |
| P09405 | NUCL_MOUSE | Ncl | Nucleolin (Protein C23) |
| P43276 | H15_MOUSE | H1-5 | Histone H1.5 (H1 VAR.5) (H1b) |
| Q80TJ1 | CAPS1_MOUSE | Cadps | Calcium-dependent secretion activator 1 (Calcium-dependent activator protein for secretion 1, CAPS-1) |
| P05064 | ALDOA_MOUSE | Aldoa | Fructose-bisphosphate aldolase A, EC 4.1.2.13 (Aldolase 1) (Muscle-type aldolase) |
| Q6ZQ38 | CAND1_MOUSE | Cand1 | Cullin-associated NEDD8-dissociated protein 1 (Cullin-associated and neddylation-dissociated protein 1) (p120 CAND1) |
| P20357 | MTAP2_MOUSE | Map2 | Microtubule-associated protein 2, MAP-2 |
| Q61554 | FBN1_MOUSE | Fbn1 | Fibrillin-1 [Cleaved into: Asprosin] |
| Q99K48 | NONO_MOUSE | Nono | Non-POU domain-containing octamer-binding protein, NonO protein |
| Q80TB8 | VAT1L_MOUSE | Vat1l | Synaptic vesicle membrane protein VAT-1 homolog-like, EC 1.-.-.- |
| P15105 | GLNA_MOUSE | Glul | Glutamine synthetase, GS, EC 6.3.1.2 (Glutamate--ammonia ligase) (Palmitoyltransferase GLUL, EC 2.3.1.225) |
| Q8BMK4 | CKAP4_MOUSE | Ckap4 | Cytoskeleton-associated protein 4 (63-kDa cytoskeleton-linking membrane protein, Climp-63, p63) |

| | | | |
|--------|-------------|--------|--|
| P62984 | RL40_MOUSE | Uba52 | Ubiquitin-60S ribosomal protein L40 (Ubiquitin A-52 residue ribosomal protein fusion product 1) [Cleaved into: Ubiquitin; 60S ribosomal protein L40 (CEP52)] |
| P09103 | PDIA1_MOUSE | P4hb | Protein disulfide-isomerase, PDI, EC 5.3.4.1 (Cellular thyroid hormone-binding protein) (Endoplasmic reticulum resident protein 59, ER protein 59, ERp59) (Prolyl 4-hydroxylase subunit beta) (p55) |
| P62806 | H4_MOUSE | H4c1 | Histone H4 |
| Q6ZWY9 | H2B1C_MOUSE | H2bc4 | Histone H2B type 1-C/E/G |
| Q8VEK3 | HNRPU_MOUSE | Hnrnpu | Heterogeneous nuclear ribonucleoprotein U, hnRNP U (Scaffold-attachment factor A, SAF-A) |
| P17742 | PPIA_MOUSE | Ppia | Peptidyl-prolyl cis-trans isomerase A, PPIase A, EC 5.2.1.8 (Cyclophilin A) (Cyclosporin A-binding protein) (Rotamase A) (SP18) [Cleaved into: Peptidyl-prolyl cis-trans isomerase A, N-terminally processed] |
| P09602 | HMGN2_MOUSE | Hmgn2 | Non-histone chromosomal protein HMG-17 (High mobility group nucleosome-binding domain-containing protein 2) |
| Q71LX4 | TLN2_MOUSE | Tln2 | Talin-2 |
| O35600 | ABCA4_MOUSE | Abca4 | Retinal-specific phospholipid-transporting ATPase ABCA4, EC 7.6.2.1 (ATP-binding cassette sub-family A member 4) (RIM ABC transporter, RIM protein, RmP) (Retinal-specific ATP-binding cassette transporter) |
| P30416 | FKBP4_MOUSE | Fkbp4 | Peptidyl-prolyl cis-trans isomerase FKBP4, PPIase FKBP4, EC 5.2.1.8 (52 kDa FK506-binding protein, 52 kDa FKBP, FKBP-52) (59 kDa immunophilin, p59) (FK506-binding protein 4, FKBP-4) (FKBP59) (HSP-binding immunophilin, HBI) (Immunophilin FKBP52) (Rotamase) [Cleaved into: Peptidyl-prolyl cis-trans isomerase FKBP4, N-terminally processed] |
| P60879 | SNP25_MOUSE | Snap25 | Synaptosomal-associated protein 25, SNAP-25 (Super protein, SUP) (Synaptosomal-associated 25 kDa protein) |
| Q04447 | KCRB_MOUSE | Ckb | Creatine kinase B-type, EC 2.7.3.2 (B-CK) (Creatine kinase B chain) (Creatine phosphokinase B-type, CPK-B) |
| P39053 | DYN1_MOUSE | Dnm1 | Dynamin-1, EC 3.6.5.5 |
| P35564 | CALX_MOUSE | Canx | Calnexin |
| Q9D0F9 | PGM1_MOUSE | Pgm1 | Phosphoglucomutase-1, PGM 1, EC 5.4.2.2 (Glucose phosphomutase 1) (Phosphoglucomutase-2) |

| | | | |
|--------|-------------|---------|--|
| P08113 | ENPL_MOUSE | Hsp90b1 | Endoplasmin (94 kDa glucose-regulated protein, GRP-94) (Endoplasmic reticulum resident protein 99, ERp99) (Heat shock protein 90 kDa beta member 1) (Polymorphic tumor rejection antigen 1) (Tumor rejection antigen gp96) |
| P03995 | GFAP_MOUSE | Gfap | Glial fibrillary acidic protein, GFAP |
| Q569Z6 | TR150_MOUSE | Thrap3 | Thyroid hormone receptor-associated protein 3 (Thyroid hormone receptor-associated protein complex 150 kDa component, Trap150) |
| Q9Z275 | RLBP1_MOUSE | Rlbp1 | Retinaldehyde-binding protein 1 (Cellular retinaldehyde-binding protein) |
| P48193 | EPB41_MOUSE | Epb41 | Protein 4.1, P4.1 (4.1R) (Band 4.1) (Erythrocyte membrane protein band 4.1) |
| E9Q7G0 | NUMA1_MOUSE | Numa1 | Nuclear mitotic apparatus protein 1 (Nuclear mitotic apparatus protein, NuMA protein) |
| F6ZDS4 | TPR_MOUSE | Tpr | Nucleoprotein TPR (NPC-associated intranuclear protein) (Translocated promoter region and nuclear basket protein) |
| P68369 | TBA1A_MOUSE | Tuba1a | Tubulin alpha-1A chain (Alpha-tubulin 1) (Alpha-tubulin isotype M-alpha-1) (Tubulin alpha-1 chain) [Cleaved into: Detyrosinated tubulin alpha-1A chain] |
| P68372 | TBB4B_MOUSE | Tubb4b | Tubulin beta-4B chain (Tubulin beta-2C chain) |
| O08528 | HXK2_MOUSE | Hk2 | Hexokinase-2, EC 2.7.1.1 (Hexokinase type II, HK II) |
| Q8CCT4 | TCAL5_MOUSE | Tceal5 | Transcription elongation factor A protein-like 5, TCEA-like protein 5 (Transcription elongation factor S-II protein-like 5) |
| Q02053 | UBA1_MOUSE | Uba1 | Ubiquitin-like modifier-activating enzyme 1, EC 6.2.1.45 (Ubiquitin-activating enzyme E1) (Ubiquitin-activating enzyme E1 X) (Ubiquitin-like modifier-activating enzyme 1 X) |
| P28738 | KIF5C_MOUSE | Kif5c | Kinesin heavy chain isoform 5C (Kinesin heavy chain neuron-specific 2) |
| P06837 | NEUM_MOUSE | Gap43 | Neuromodulin (Axonal membrane protein GAP-43) (Calmodulin-binding protein P-57) (Growth-associated protein 43) |
| Q99104 | MYO5A_MOUSE | Myo5a | Unconventional myosin-Va (Dilute myosin heavy chain, non-muscle) |
| P09411 | PGK1_MOUSE | Pgk1 | Phosphoglycerate kinase 1, EC 2.7.2.3 |
| P18872 | GNAO_MOUSE | Gnao1 | Guanine nucleotide-binding protein G(o) subunit alpha |
| P23440 | PDE6B_MOUSE | Pde6b | Rod cGMP-specific 3',5'-cyclic phosphodiesterase subunit beta, GMP-PDE beta, EC 3.1.4.35 |
| Q91ZW3 | SMCA5_MOUSE | Smarca5 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 5, EC 3.6.4.- (Sucrose nonfermenting protein 2 homolog, mSnf2h) |

| | | | |
|--------|-------------|---------|--|
| P06151 | LDHA_MOUSE | Ldha | L-lactate dehydrogenase A chain, LDH-A, EC 1.1.1.27 (LDH muscle subunit, LDH-M) |
| P48962 | ADT1_MOUSE | Slc25a4 | ADP/ATP translocase 1 (ADP,ATP carrier protein 1) (ADP,ATP carrier protein, heart/skeletal muscle isoform T1) (Adenine nucleotide translocator 1, ANT 1) (Solute carrier family 25 member 4) |
| Q01853 | TERA_MOUSE | Vcp | Transitional endoplasmic reticulum ATPase, TER ATPase, EC 3.6.4.6 (15S Mg(2+)-ATPase p97 subunit) (Valosin-containing protein, VCP) |
| P63017 | HSP7C_MOUSE | Hspa8 | Heat shock cognate 71 kDa protein, EC 3.6.4.10 (Heat shock 70 kDa protein 8) |
| P05063 | ALDOC_MOUSE | Aldoc | Fructose-bisphosphate aldolase C, EC 4.1.2.13 (Aldolase 3) (Brain-type aldolase) (Scrapie-responsive protein 2) (Zebrin II) |
| P15864 | H12_MOUSE | H1-2 | Histone H1.2 (H1 VAR.1) (H1c) |
| P61264 | STX1B_MOUSE | Stx1b | Syntaxin-1B |
| P60710 | ACTB_MOUSE | Actb | Actin, cytoplasmic 1 (Beta-actin) [Cleaved into: Actin, cytoplasmic 1, N-terminally processed] |
| P52480 | KPYM_MOUSE | Pkm | Pyruvate kinase PKM, EC 2.7.1.40 (Pyruvate kinase muscle isozyme) (Threonine-protein kinase PKM2, EC 2.7.11.1) (Tyrosine-protein kinase PKM2, EC 2.7.10.2) |
| P20443 | ARRS_MOUSE | Sag | S-arrestin (48 kDa protein) (Retinal S-antigen, S-AG) (Rod photoreceptor arrestin) |
| Q9CU62 | SMC1A_MOUSE | Smc1a | Structural maintenance of chromosomes protein 1A, SMC protein 1A, SMC-1-alpha, SMC-1A (Chromosome segregation protein SmcB) (Sb1.8) |
| P16858 | G3P_MOUSE | Gapdh | Glyceraldehyde-3-phosphate dehydrogenase, GAPDH, EC 1.2.1.12 (Peptidyl-cysteine S-nitrosylase GAPDH, EC 2.6.99.-) |
| P48722 | HS74L_MOUSE | Hspa41 | Heat shock 70 kDa protein 4L (Heat shock 70-related protein APG-1) (Osmotic stress protein 94) |
| P48678 | LMNA_MOUSE | Lmna | Prelamin-A/C [Cleaved into: Lamin-A/C] |
| Q6URW6 | MYH14_MOUSE | Myh14 | Myosin-14 (Myosin heavy chain 14) (Myosin heavy chain, non-muscle IIc) (Non-muscle myosin heavy chain IIc, NMHC II-C) |
| P17710 | HXK1_MOUSE | Hk1 | Hexokinase-1, EC 2.7.1.1 (Hexokinase type I, HK I) (Hexokinase, tumor isozyme) |
| Q8CAQ8 | MIC60_MOUSE | Immt | MICOS complex subunit Mic60 (Mitochondrial inner membrane protein) (Mitofilin) |
| P21619 | LMNB2_MOUSE | Lmnb2 | Lamin-B2 |
| O08788 | DCTN1_MOUSE | Dctn1 | Dynactin subunit 1 (150 kDa dynein-associated polypeptide) (DAP-150, DP-150) (p150-glued) |

| | | | |
|--------|-------------|----------|--|
| Q3URD3 | SLMAP_MOUSE | Slmap | Sarcolemmal membrane-associated protein, Sarcolemmal-associated protein |
| Q9CW03 | SMC3_MOUSE | Smc3 | Structural maintenance of chromosomes protein 3, SMC protein 3, SMC-3 (Basement membrane-associated chondroitin proteoglycan, Bamacan) (Chondroitin sulfate proteoglycan 6) (Chromosome segregation protein SmcD) (Mad member-interacting protein 1) |
| Q8C8R3 | ANK2_MOUSE | Ank2 | Ankyrin-2, ANK-2 (Ankyrin-B) (Brain ankyrin) |
| Q03265 | ATPA_MOUSE | Atp5f1a | ATP synthase subunit alpha, mitochondrial (ATP synthase F1 subunit alpha) |
| O08599 | STXB1_MOUSE | Stxbp1 | Syntaxin-binding protein 1 (Protein unc-18 homolog 1, Unc18-1) (Protein unc-18 homolog A, Unc-18A) |
| Q61316 | HSP74_MOUSE | Hspa4 | Heat shock 70 kDa protein 4 (Heat shock 70-related protein APG-2) |
| P61979 | HNRPK_MOUSE | Hnrnpk | Heterogeneous nuclear ribonucleoprotein K, hnRNP K |
| P62259 | 1433E_MOUSE | Ywhae | 14-3-3 protein epsilon, 14-3-3E |
| Q99JF8 | PSIP1_MOUSE | Psip1 | PC4 and SFRS1-interacting protein (Lens epithelium-derived growth factor, mLEDGF) |
| Q8VDD5 | MYH9_MOUSE | Myh9 | Myosin-9 (Cellular myosin heavy chain, type A) (Myosin heavy chain 9) (Myosin heavy chain, non-muscle IIa) (Non-muscle myosin heavy chain A, NMMHC-A) (Non-muscle myosin heavy chain IIa, NMMHC II-a, NMMHC-IIA) |
| Q68FD5 | CLH1_MOUSE | Cltc | Clathrin heavy chain 1 |
| P46460 | NSF_MOUSE | Nsf | Vesicle-fusing ATPase, EC 3.6.4.6 (N-ethylmaleimide-sensitive fusion protein, NEM-sensitive fusion protein) (Suppressor of K(+) transport growth defect 2, Protein SKD2) (Vesicular-fusion protein NSF) |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| Q91XV3 | BASP1_MOUSE | Baspl | Brain acid soluble protein 1 (22 kDa neuronal tissue-enriched acidic protein) (Neuronal axonal membrane protein NAP-22) |
| P13595 | NCAM1_MOUSE | Ncam1 | Neural cell adhesion molecule 1, N-CAM-1, NCAM-1 (CD antigen CD56) |
| P14873 | MAP1B_MOUSE | Map1b | Microtubule-associated protein 1B, MAP-1B (MAP1(X)) (MAP1.2) [Cleaved into: MAP1B heavy chain; MAP1 light chain LC1] |
| Q6PIC6 | AT1A3_MOUSE | Atp1a3 | Sodium/potassium-transporting ATPase subunit alpha-3, Na(+)/K(+) ATPase alpha-3 subunit, EC 7.2.2.13 (Na(+)/K(+) ATPase alpha(III) subunit) (Sodium pump subunit alpha-3) |
| P07901 | HS90A_MOUSE | Hsp90aa1 | Heat shock protein HSP 90-alpha, EC 3.6.4.10 (Heat shock 86 kDa, HSP 86, HSP86) (Tumor-specific transplantation 86 kDa antigen, TSTA) |

| | | | |
|--------|-------------|---------|--|
| Q9QXZ0 | MACF1_MOUSE | Macf1 | Microtubule-actin cross-linking factor 1, isoforms 1/2/3/4 (Actin cross-linking family 7) |
| P17182 | ENOA_MOUSE | Eno1 | Alpha-enolase, EC 4.2.1.11 (2-phospho-D-glycerate hydro-lyase) (Enolase 1) (Non-neural enolase, NNE) |
| Q9JHU4 | DYHC1_MOUSE | Dync1h1 | Cytoplasmic dynein 1 heavy chain 1 (Cytoplasmic dynein heavy chain 1) (Dynein heavy chain, cytosolic) |
| P14733 | LMNB1_MOUSE | Lmnb1 | Lamin-B1 |
| P20152 | VIME_MOUSE | Vim | Vimentin |
| Q62261 | SPTB2_MOUSE | Sptbn1 | Spectrin beta chain, non-erythrocytic 1 (Beta-II spectrin) (Embryonic liver fodrin) (Fodrin beta chain) |
| Q61879 | MYH10_MOUSE | Myh10 | Myosin-10 (Cellular myosin heavy chain, type B) (Myosin heavy chain 10) (Myosin heavy chain, non-muscle IIB) (Non-muscle myosin heavy chain B, NMMHC-B) (Non-muscle myosin heavy chain IIB, NMMHC II-b, NMMHC-IIB) |
| O70318 | E41L2_MOUSE | Epb4112 | Band 4.1-like protein 2 (Erythrocyte membrane protein band 4.1-like 2) (Generally expressed protein 4.1, 4.1G) |
| P16546 | SPTN1_MOUSE | Sptan1 | Spectrin alpha chain, non-erythrocytic 1 (Alpha-II spectrin) (Fodrin alpha chain) |
| Q8CJ40 | CROCC_MOUSE | Crocc | Rootletin (Ciliary rootlet coiled-coil protein) |
| Q64475 | H2B1B_MOUSE | H2bc3 | Histone H2B type 1-B (H2B-clustered histone 3) (h2B-143) |
| Q3TEA8 | HP1B3_MOUSE | Hp1bp3 | Heterochromatin protein 1-binding protein 3 |
| Q64704 | STX3_MOUSE | Stx3 | Syntaxin-3 |
| Q91VM5 | RMXL1_MOUSE | Rbmx11 | RNA binding motif protein, X-linked-like-1 (Heterogeneous nuclear ribonucleoprotein G-like 1) (RNA binding motif protein, X chromosome retrogene) |
| Q60902 | EP15R_MOUSE | Eps1511 | Epidermal growth factor receptor substrate 15-like 1 (Epidermal growth factor receptor pathway substrate 15-related sequence, Eps15-rs) (Eps15-related protein, Eps15R) |
| P63328 | PP2BA_MOUSE | Ppp3ca | Protein phosphatase 3 catalytic subunit alpha, EC 3.1.3.16 (CAM-PRP catalytic subunit) (Calcineurin A alpha) (Calmodulin-dependent calcineurin A subunit alpha isoform, CNA alpha) (Serine/threonine-protein phosphatase 2B catalytic subunit alpha isoform) |
| P84078 | ARF1_MOUSE | Arf1 | ADP-ribosylation factor 1 |
| P30681 | HMGB2_MOUSE | Hmgb2 | High mobility group protein B2 (High mobility group protein 2, HMG-2) |
| P58771 | TPM1_MOUSE | Tpm1 | Tropomyosin alpha-1 chain (Alpha-tropomyosin) (Tropomyosin-1) |

| | | | |
|--------|-------------|--------|---|
| P16330 | CN37_MOUSE | Cnp | 2',3'-cyclic-nucleotide 3'-phosphodiesterase, CNP, CNPase, EC 3.1.4.37 |
| Q6ZPJ3 | UBE2O_MOUSE | Ube2o | (E3-independent) E2 ubiquitin-conjugating enzyme UBE2O, EC 2.3.2.24 (E2/E3 hybrid ubiquitin-protein ligase UBE2O) (Ubiquitin carrier protein O) (Ubiquitin-conjugating enzyme E2 O) (Ubiquitin-conjugating enzyme E2 of 230 kDa, Ubiquitin-conjugating enzyme E2-230K) (Ubiquitin-protein ligase O) |
| P17095 | HMGA1_MOUSE | Hmga1 | High mobility group protein HMG-I/HMG-Y, HMG-I(Y) (High mobility group AT-hook protein 1, High mobility group protein A1) |
| P17426 | AP2A1_MOUSE | Ap2a1 | AP-2 complex subunit alpha-1 (100 kDa coated vesicle protein A) (Adaptor protein complex AP-2 subunit alpha-1) (Adaptor-related protein complex 2 subunit alpha-1) (Alpha-adaptin A) (Alpha1-adaptin) (Clathrin assembly protein complex 2 alpha-A large chain) (Plasma membrane adaptor HA2/AP2 adaptin alpha A subunit) |
| P21279 | GNAQ_MOUSE | Gnaq | Guanine nucleotide-binding protein G(q) subunit alpha (Guanine nucleotide-binding protein alpha-q) |
| Q61553 | FSCN1_MOUSE | Fscn1 | Fascin (Singed-like protein) |
| Q9D0T1 | NH2L1_MOUSE | Snu13 | NHP2-like protein 1 (Fertilization antigen 1, FA-1) (High mobility group-like nuclear protein 2 homolog 1) (Sperm-specific antigen 1) (U4/U6.U5 small nuclear ribonucleoprotein SNU13) (U4/U6.U5 tri-snRNP 15.5 kDa protein) [Cleaved into: NHP2-like protein 1, N-terminally processed] |
| P26369 | U2AF2_MOUSE | U2af2 | Splicing factor U2AF 65 kDa subunit (U2 auxiliary factor 65 kDa subunit) (U2 snRNP auxiliary factor large subunit) |
| Q924M7 | MPI_MOUSE | Mpi | Mannose-6-phosphate isomerase, EC 5.3.1.8 (Phosphohexomutase) (Phosphomannose isomerase, PMI) |
| Q61412 | VSX2_MOUSE | Vsx2 | Visual system homeobox 2 (Ceh-10 homeodomain-containing homolog) (Homeobox protein CHX10) |
| P60867 | RS20_MOUSE | Rps20 | 40S ribosomal protein S20 |
| P0C605 | KGP1_MOUSE | Prkg1 | cGMP-dependent protein kinase 1, cGK 1, cGK1, EC 2.7.11.12 (cGMP-dependent protein kinase I, cGKI) |
| Q61029 | LAP2B_MOUSE | Tmpo | Lamina-associated polypeptide 2, isoforms beta/delta/epsilon/gamma (Thymopoietin isoforms beta/delta/epsilon/gamma, TP beta/delta/epsilon/gamma) |
| Q8K354 | CBR3_MOUSE | Cbr3 | Carbonyl reductase [NADPH] 3, EC 1.1.1.184 (NADPH-dependent carbonyl reductase 3) (Quinone reductase CBR3, EC 1.6.5.10) |
| Q8VED9 | LEGL_MOUSE | Lgalsl | Galectin-related protein (Galectin-related protein A) (Lectin galactoside-binding-like protein A) |

| | | | |
|--------|-------------|----------|--|
| Q921G7 | ETFD_MOUSE | Etfdh | Electron transfer flavoprotein-ubiquinone oxidoreductase, mitochondrial, ETF-QO, ETF-ubiquinone oxidoreductase, EC 1.5.5.1 (Electron-transferring-flavoprotein dehydrogenase, ETF dehydrogenase) |
| Q3KNM2 | MARH5_MOUSE | Marchf5 | E3 ubiquitin-protein ligase MARCHF5, EC 2.3.2.27 (Membrane-associated RING finger protein 5) (Membrane-associated RING-CH protein V, MARCH-V) (RING-type E3 ubiquitin transferase MARCHF5) |
| Q8K2C7 | OS9_MOUSE | Os9 | Protein OS-9 |
| Q6PEE2 | CTIF_MOUSE | Ctif | CBP80/20-dependent translation initiation factor |
| Q9Z2N8 | ACL6A_MOUSE | Actl6a | Actin-like protein 6A (53 kDa BRG1-associated factor A) (Actin-related protein Baf53a) (BRG1-associated factor 53A, BAF53A) |
| Q920Q6 | MSI2H_MOUSE | Msi2 | RNA-binding protein Musashi homolog 2, Musashi-2 |
| Q9Z0Y1 | DCTN3_MOUSE | Dctn3 | Dynactin subunit 3 (Dynactin light chain p24) |
| Q9D1G1 | RAB1B_MOUSE | Rab1b | Ras-related protein Rab-1B, EC 3.6.5.2 |
| Q65Z40 | WAPL_MOUSE | Wapl | Wings apart-like protein homolog (Dioxin-inducible factor 2, DIF-2) (WAPL cohesin release factor) |
| O35345 | IMA7_MOUSE | Kpna6 | Importin subunit alpha-7 (Importin alpha-S2) (Karyopherin subunit alpha-6) |
| Q8JZK9 | HMCS1_MOUSE | Hmgcs1 | Hydroxymethylglutaryl-CoA synthase, cytoplasmic, HMG-CoA synthase, EC 2.3.3.10 (3-hydroxy-3-methylglutaryl coenzyme A synthase) |
| Q62189 | SNRPA_MOUSE | Snrpa | U1 small nuclear ribonucleoprotein A, U1 snRNP A, U1-A, U1A |
| P33173 | KIF1A_MOUSE | Kif1a | Kinesin-like protein KIF1A (Axonal transporter of synaptic vesicles) |
| G3X9J0 | SI1L3_MOUSE | Sipa1l3 | Signal-induced proliferation-associated 1-like protein 3, SIPA1-like protein 3 (SPA-1-like protein 3) |
| Q61206 | PA1B2_MOUSE | Pafah1b2 | Platelet-activating factor acetylhydrolase IB subunit alpha2, EC 3.1.1.47 (PAF acetylhydrolase 30 kDa subunit, PAF-AH 30 kDa subunit) (PAF-AH subunit beta, PAFAH subunit beta) |
| P03975 | IGEB_MOUSE | Iap | IgE-binding protein |
| P14148 | RL7_MOUSE | Rpl7 | 60S ribosomal protein L7 |
| P48774 | GSTM5_MOUSE | Gstm5 | Glutathione S-transferase Mu 5, EC 2.5.1.18 (Fibrous sheath component 2, Fsc2) (GST class-mu 5) |
| Q80U93 | NU214_MOUSE | Nup214 | Nuclear pore complex protein Nup214 (214 kDa nucleoporin) (Nucleoporin Nup214) |

| | | | |
|--------|-------------|---------|--|
| P35550 | FBRL_MOUSE | Fbl | rRNA 2'-O-methyltransferase fibrillarin, EC 2.1.1.- (Histone-glutamine methyltransferase) (Nucleolar protein 1) (U6 snRNA 2'-O-methyltransferase fibrillarin) |
| Q8C1B1 | CAMP2_MOUSE | Camsap2 | Calmodulin-regulated spectrin-associated protein 2 (Calmodulin-regulated spectrin-associated protein 1-like protein 1) |
| O54879 | HMGB3_MOUSE | Hmgb3 | High mobility group protein B3 (High mobility group protein 2a, HMG-2a) (High mobility group protein 4, HMG-4) |
| Q6P1F6 | 2ABA_MOUSE | Ppp2r2a | Serine/threonine-protein phosphatase 2A 55 kDa regulatory subunit B alpha isoform (PP2A subunit B isoform B55-alpha) (PP2A subunit B isoform PR55-alpha) (PP2A subunit B isoform R2-alpha) (PP2A subunit B isoform alpha) |
| Q8BYI9 | TENR_MOUSE | Tnr | Tenascin-R, TN-R (Janusin) (Neural recognition molecule J1-160/180) (Restrictin) |
| Q8BH74 | NU107_MOUSE | Nup107 | Nuclear pore complex protein Nup107 (107 kDa nucleoporin) (Nucleoporin Nup107) |
| P12382 | PFKAL_MOUSE | Pfkl | ATP-dependent 6-phosphofructokinase, liver type, ATP-PFK, PFK-L, EC 2.7.1.11 (6-phosphofructokinase type B) (Phosphofructo-1-kinase isozyme B, PFK-B) (Phosphohexokinase) |
| Q9D880 | TIM50_MOUSE | Timm50 | Mitochondrial import inner membrane translocase subunit TIM50 |
| Q69ZZ6 | TMCC1_MOUSE | Tmcc1 | Transmembrane and coiled-coil domains protein 1 |
| Q9DCN2 | NB5R3_MOUSE | Cyb5r3 | NADH-cytochrome b5 reductase 3, B5R, Cytochrome b5 reductase, EC 1.6.2.2 (Diaphorase-1) [Cleaved into: NADH-cytochrome b5 reductase 3 membrane-bound form; NADH-cytochrome b5 reductase 3 soluble form] |
| Q8BP47 | SYNC_MOUSE | NARS1 | Asparagine--tRNA ligase, cytoplasmic, EC 6.1.1.22 (Asparaginyl-tRNA synthetase, AsnRS) (Asparaginyl-tRNA synthetase 1) |
| Q3THK7 | GUAA_MOUSE | Gmps | GMP synthase [glutamine-hydrolyzing], EC 6.3.5.2 (GMP synthetase) (Glutamine amidotransferase) |
| Q9QZM0 | UBQL2_MOUSE | Ubqln2 | Ubiquilin-2 (Chap1) (DSK2 homolog) (Protein linking IAP with cytoskeleton 2, PLIC-2) (Ubiquitin-like product Chap1/Dsk2) |
| P35585 | AP1M1_MOUSE | Ap1m1 | AP-1 complex subunit mu-1 (AP-mu chain family member mu1A) (Adaptor protein complex AP-1 subunit mu-1) (Adaptor-related protein complex 1 subunit mu-1) (Clathrin assembly protein complex 1 mu-1 medium chain 1) (Clathrin coat assembly protein AP47) (Clathrin coat-associated protein AP47) (Golgi adaptor HA1/API adaptin mu-1 subunit) (Mu-adaptin 1) (Mu1A-adaptin) |
| Q9CY64 | BIEA_MOUSE | Blvra | Biliverdin reductase A, BVR A, EC 1.3.1.24 (Biliverdin-IX alpha-reductase) |

| | | | |
|--------|-------------|---------|---|
| Q9DB20 | ATPO_MOUSE | Atp5po | ATP synthase subunit O, mitochondrial (ATP synthase peripheral stalk subunit OSCP) (Oligomycin sensitivity conferral protein, OSCP) |
| Q61823 | PDCD4_MOUSE | Pdcd4 | Programmed cell death protein 4 (Protein MA-3) (Topoisomerase-inhibitor suppressed protein) |
| Q70IV5 | SYNEM_MOUSE | Synm | Synemin (Desmuslin) |
| P11679 | K2C8_MOUSE | Krt8 | Keratin, type II cytoskeletal 8 (Cytokeratin endo A) (Cytokeratin-8, CK-8) (Keratin-8, K8) (Type-II keratin Kb8) |
| Q9Z2E1 | MBD2_MOUSE | Mbd2 | Methyl-CpG-binding domain protein 2 (Methyl-CpG-binding protein MBD2) |
| Q9CR98 | F136A_MOUSE | Fam136a | Protein FAM136A |
| Q8VDQ1 | PTGR2_MOUSE | Ptgr2 | Prostaglandin reductase 2, PRG-2, EC 1.3.1.48 (15-oxoprostaglandin 13-reductase) (Zinc-binding alcohol dehydrogenase domain-containing protein 1) |
| Q80Z24 | NEGR1_MOUSE | Negr1 | Neuronal growth regulator 1 (Kindred of IgLON, Kilon) (Neurotractin) |
| Q9D024 | CCD47_MOUSE | Ccdc47 | PAT complex subunit CCDC47 (Adipocyte-specific protein 4) (Calumin) (Coiled-coil domain-containing protein 47) |
| Q9Z2R6 | U119A_MOUSE | Unc119 | Protein unc-119 homolog A (Retinal protein 4, mRG4) |
| P70206 | PLXA1_MOUSE | Plxna1 | Plexin-A1, Plex 1, Plexin-1 |
| Q6GQT1 | A2MG_MOUSE | A2m | Alpha-2-macroglobulin-P (Alpha-2-macroglobulin) |
| Q9WTU6 | MK09_MOUSE | Mapk9 | Mitogen-activated protein kinase 9, MAP kinase 9, MAPK 9, EC 2.7.11.24 (Stress-activated protein kinase JNK2) (c-Jun N-terminal kinase 2) |
| Q9D1E6 | TBCB_MOUSE | Tbcb | Tubulin-folding cofactor B (Cytoskeleton-associated protein 1) (Cytoskeleton-associated protein CKAPI) (Tubulin-specific chaperone B) |
| P59808 | SASH1_MOUSE | Sash1 | SAM and SH3 domain-containing protein 1 |
| Q9CWL2 | CASZ1_MOUSE | Casz1 | Zinc finger protein castor homolog 1 (Castor-related protein) |
| Q3TKY6 | CWC27_MOUSE | Cwc27 | Spliceosome-associated protein CWC27 homolog (Probable inactive peptidyl-prolyl cis-trans isomerase CWC27 homolog, PPIase CWC27) |
| P63242 | IF5A1_MOUSE | Eif5a | Eukaryotic translation initiation factor 5A-1, eIF-5A-1, eIF-5A1 (Eukaryotic initiation factor 5A isoform 1, eIF-5A) (eIF-4D) |
| Q7TT45 | RRAGD_MOUSE | Rragd | Ras-related GTP-binding protein D, Rag D, RagD, EC 3.6.5.- |
| Q8BYA0 | TBCD_MOUSE | Tbcd | Tubulin-specific chaperone D (Beta-tubulin cofactor D) (Tubulin-folding cofactor D) |
| Q8VHR5 | P66B_MOUSE | Gatad2b | Transcriptional repressor p66-beta (GATA zinc finger domain-containing protein 2B) (p66/p68) |

| | | | |
|--------|-------------|---------|---|
| P32883 | RASK_MOUSE | Kras | GTPase KRas, EC 3.6.5.2 (K-Ras 2) (Ki-Ras) (c-K-ras) (c-Ki-ras) [Cleaved into: GTPase KRas, N-terminally processed] |
| P59017 | B2L13_MOUSE | Bcl2l13 | Bcl-2-like protein 13, Bcl2-L-13 (Bcl-rambo) (Protein Mil1) |
| P60122 | RUVB1_MOUSE | Ruvbl1 | RuvB-like 1, EC 3.6.4.12 (49 kDa TATA box-binding protein-interacting protein, 49 kDa TBP-interacting protein) (DNA helicase p50) (Pontin 52) (TIP49a) |
| Q69Z98 | BRSK2_MOUSE | Brsk2 | Serine/threonine-protein kinase BRSK2, EC 2.7.11.1, EC 2.7.11.26 (Brain-specific serine/threonine-protein kinase 2, BR serine/threonine-protein kinase 2) (Serine/threonine-protein kinase SAD-A) |
| P51163 | HEM4_MOUSE | Uros | Uroporphyrinogen-III synthase, UROIII, UROS, EC 4.2.1.75 (Hydroxymethylbilane hydrolyase [cyclizing]) (Uroporphyrinogen-III cosynthase) |
| Q9QYI4 | DJB12_MOUSE | Dnajb12 | DnaJ homolog subfamily B member 12 (mDj10) |
| Q9QZD9 | EIF3I_MOUSE | Eif3i | Eukaryotic translation initiation factor 3 subunit I, eIF3i (Eukaryotic translation initiation factor 3 subunit 2) (TGF-beta receptor-interacting protein 1, TRIP-1) (eIF-3-beta) (eIF3 p36) |
| Q99LC3 | NDUAA_MOUSE | Ndufa10 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 10, mitochondrial (Complex I-42kD, CI-42kD) (NADH-ubiquinone oxidoreductase 42 kDa subunit) |
| Q8R1F1 | NIBA2_MOUSE | Niban2 | Protein Niban 2 (Meg-3) (Niban-like protein 1) (Protein FAM129B) |
| Q61474 | MSI1H_MOUSE | Msi1 | RNA-binding protein Musashi homolog 1, Musashi-1 |
| Q9WVA3 | BUB3_MOUSE | Bub3 | Mitotic checkpoint protein BUB3 (WD repeat type I transmembrane protein A72.5) |
| Q8K339 | KIN17_MOUSE | Kin | DNA/RNA-binding protein KIN17 (Binding to curved DNA) (KIN, antigenic determinant of recA protein) |
| Q8K221 | ARFP2_MOUSE | Arfp2 | Arfaptin-2 (ADP-ribosylation factor-interacting protein 2) |
| Q6P6J9 | TXD15_MOUSE | Txndc15 | Thioredoxin domain-containing protein 15 |
| Q8R146 | APEH_MOUSE | Apeh | Acylamino-acid-releasing enzyme, AARE, EC 3.4.19.1 (Acyl-peptide hydrolase, APH) (Acylaminoacyl-peptidase) |
| P62881 | GNB5_MOUSE | Gnb5 | Guanine nucleotide-binding protein subunit beta-5 (Gbeta5) (Transducin beta chain 5) |
| Q8BG05 | ROA3_MOUSE | Hnrnpa3 | Heterogeneous nuclear ribonucleoprotein A3, hnRNP A3 |
| P61028 | RAB8B_MOUSE | Rab8b | Ras-related protein Rab-8B |
| P63037 | DNJA1_MOUSE | Dnaja1 | DnaJ homolog subfamily A member 1 (DnaJ protein homolog 2) (Heat shock 40 kDa protein 4) (Heat shock protein J2, HSJ-2) |
| Q8R3B7 | BRD8_MOUSE | Brd8 | Bromodomain-containing protein 8 |

| | | | |
|--------|-------------|----------|---|
| P47809 | MP2K4_MOUSE | Map2k4 | Dual specificity mitogen-activated protein kinase kinase 4, MAP kinase kinase 4, MAPKK 4, EC 2.7.12.2 (C-JUN N-terminal kinase kinase 1, JNK kinase 1, JNKK 1) (JNK-activating kinase 1) (MAPK/ERK kinase 4, MEK 4) (SAPK/ERK kinase 1, SEK1) |
| Q8R574 | KPRB_MOUSE | Prpsap2 | Phosphoribosyl pyrophosphate synthase-associated protein 2, PRPP synthase-associated protein 2 (41 kDa phosphoribosypyrophosphate synthetase-associated protein, PAP41) |
| Q8BGJ9 | U2AF4_MOUSE | U2af114 | Splicing factor U2AF 26 kDa subunit (U2 auxiliary factor 26) (U2 small nuclear RNA auxiliary factor 1-like protein 4, U2AF1-like 4) |
| Q5SSM3 | RHG44_MOUSE | Arhgap44 | Rho GTPase-activating protein 44 (Rho-type GTPase-activating protein RICH2) (RhoGAP interacting with CIP4 homologs protein 2, RICH-2) |
| Q9CY57 | CHTOP_MOUSE | Chtop | Chromatin target of PRMT1 protein (Friend of PRMT1 protein) (Small arginine- and glycine-rich protein, SRAG) |
| P49446 | PTPRE_MOUSE | Ptpre | Receptor-type tyrosine-protein phosphatase epsilon, Protein-tyrosine phosphatase epsilon, R-PTP-epsilon, EC 3.1.3.48 |
| Q9D8B6 | F210B_MOUSE | Fam210b | Protein FAM210B, mitochondrial |
| Q8C008 | DZAN1_MOUSE | Dzank1 | Double zinc ribbon and ankyrin repeat-containing protein 1 |
| Q9JK48 | SHLB1_MOUSE | Sh3glb1 | Endophilin-B1 (SH3 domain-containing GRB2-like protein B1) |
| Q9CYR6 | AGM1_MOUSE | Pgm3 | Phosphoacetylglucosamine mutase, PAGM, EC 5.4.2.3 (Acetylglucosamine phosphomutase) (N-acetylglucosamine-phosphate mutase) (Phosphoglucomutase-3, PGM 3) |
| Q99LC5 | ETF_A_MOUSE | Etfa | Electron transfer flavoprotein subunit alpha, mitochondrial, Alpha-ETF |
| Q8VEE4 | RFA1_MOUSE | Rpa1 | Replication protein A 70 kDa DNA-binding subunit, RP-A p70 (Replication factor A protein 1, RF-A protein 1) |
| Q5IRJ6 | ZNT9_MOUSE | Slc30a9 | Zinc transporter 9, ZnT-9 (GRIP1-associated coactivator 63, GAC63) (Solute carrier family 30 member 9) |
| Q3UMY5 | EMAL4_MOUSE | Eml4 | Echinoderm microtubule-associated protein-like 4, EMAP-4 |
| Q8C4V4 | FBXL3_MOUSE | Fbxl3 | F-box/LRR-repeat protein 3 (F-box and leucine-rich repeat protein 3A) (F-box/LRR-repeat protein 3A) (Protein after-hours) (Protein overtime) |
| Q8BHK1 | NIPA1_MOUSE | Nipa1 | Magnesium transporter NIPA1 (Non-imprinted in Prader-Willi/Angelman syndrome region protein 1 homolog) |

| | | | |
|--------|-------------|---------|--|
| Q64442 | DHSO_MOUSE | Sord | Sorbitol dehydrogenase, SDH, SORD, EC 1.1.1.- (L-Iditol 2-dehydrogenase, EC 1.1.1.14) (Polyol dehydrogenase) (Xylitol dehydrogenase, XDH, EC 1.1.1.9) |
| Q64332 | SYN2_MOUSE | Syn2 | Synapsin-2 (Synapsin II) |
| Q60714 | S27A1_MOUSE | Slc27a1 | Long-chain fatty acid transport protein 1 (Arachidonate--CoA ligase, EC 6.2.1.15) (Fatty acid transport protein) (Fatty acid transport protein 1, FATP-1) (Long-chain-fatty-acid--CoA ligase, EC 6.2.1.3) (Solute carrier family 27 member 1, Vlc27a1) (Very long-chain acyl-CoA synthetase, EC 6.2.1.-) |
| O70492 | SNX3_MOUSE | Snx3 | Sorting nexin-3 (SDP3 protein) |
| S4R2P9 | NAC3_MOUSE | Slc8a3 | Sodium/calcium exchanger 3 (Na(+)/Ca(2+)-exchange protein 3) (Solute carrier family 8 member 3) |
| Q9Z1Z2 | STRAP_MOUSE | Strap | Serine-threonine kinase receptor-associated protein (UNR-interacting protein) |
| Q9WTJ4 | FIZ1_MOUSE | Fiz1 | Flt3-interacting zinc finger protein 1 |
| Q9R1P1 | PSB3_MOUSE | Psmb3 | Proteasome subunit beta type-3 (Proteasome chain 13) (Proteasome component C10-II) (Proteasome theta chain) |
| Q9R0Q3 | TMED2_MOUSE | Tmed2 | Transmembrane emp24 domain-containing protein 2 (COPI-coated vesicle membrane protein p24) (Membrane protein p24A) (Sid 394) (p24 family protein beta-1, p24beta1) |
| Q9QXV1 | CBX8_MOUSE | Cbx8 | Chromobox protein homolog 8 (Polycomb 3 homolog, Pc3, mPc3) |
| Q9JLB2 | PALS1_MOUSE | Pals1 | Protein PALS1 (MAGUK p55 subfamily member 5) (Protein associated with Lin-7 1) |
| Q9JK38 | GNA1_MOUSE | Gnpnat1 | Glucosamine 6-phosphate N-acetyltransferase, EC 2.3.1.4 (Phosphoglucosamine acetylase) (Phosphoglucosamine transacetylase) (Protein EMeg32) |
| Q9JJZ8 | CNGA3_MOUSE | Cnga3 | Cyclic nucleotide-gated cation channel alpha-3 (Cone photoreceptor cGMP-gated channel subunit alpha) (Cyclic nucleotide-gated channel alpha-3, CNG channel alpha-3, CNG-3, CNG3) |
| Q9ET26 | RN114_MOUSE | Rnf114 | E3 ubiquitin-protein ligase RNF114, EC 2.3.2.27 (RING finger protein 114) (RING-type E3 ubiquitin transferase RNF114) (Zinc finger protein 228) (Zinc finger protein 313) |
| Q9ER35 | FN3K_MOUSE | Fn3k | Fructosamine-3-kinase, EC 2.7.1.171 (Protein-psicosamine 3-kinase FN3K) (Protein-ribulosamine 3-kinase FN3K, EC 2.7.1.172) |
| Q9DCZ4 | MIC26_MOUSE | Apoo | MICOS complex subunit Mic26 (Apolipoprotein O) (MICOS complex subunit Mic23) (Protein FAM121B) |

| | | | |
|--------|-------------|----------|---|
| Q9DCJ5 | NDUA8_MOUSE | Ndufa8 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 8 (Complex I-19kD, CI-19kD) (Complex I-PGIV, CI-PGIV) (NADH-ubiquinone oxidoreductase 19 kDa subunit) |
| Q9DCB1 | HMGN3_MOUSE | Hmgn3 | High mobility group nucleosome-binding domain-containing protein 3 |
| Q9D4H2 | GCC1_MOUSE | Gcc1 | GRIP and coiled-coil domain-containing protein 1 (Golgi coiled-coil protein 1) |
| Q9D328 | NACHO_MOUSE | Tmem35a | Novel acetylcholine receptor chaperone (Peroxisomal membrane protein 52, PMP52) (Transmembrane protein 35A) |
| Q9D0U6 | MAF1_MOUSE | Maf1 | Repressor of RNA polymerase III transcription MAF1 homolog |
| Q9CQE9 | FWCH2_MOUSE | Flywch2 | FLYWCH family member 2 |
| Q9CQ74 | LERL1_MOUSE | Leprotl1 | Leptin receptor overlapping transcript-like 1 (Endospanin-2) |
| Q99LR1 | ABD12_MOUSE | Abhd12 | Lysophosphatidylserine lipase ABHD12, EC 3.1.1.- (2-arachidonoylglycerol hydrolase ABHD12) (Abhydrolase domain-containing protein 12) (Monoacylglycerol lipase ABHD12, EC 3.1.1.23) (Oxidized phosphatidylserine lipase ABHD12, EC 3.1.-.-) |
| Q922Y1 | UBXN1_MOUSE | Ubxn1 | UBX domain-containing protein 1 (Protein 2B28) (SAPK substrate protein 1) (UBA/UBX 33.3 kDa protein, mY33K) |
| Q922H4 | GMPPA_MOUSE | Gmppa | Mannose-1-phosphate guanylyltransferase alpha (GDP-mannose pyrophosphorylase A) (GTP-mannose-1-phosphate guanylyltransferase alpha) |
| Q8R1G2 | CMBL_MOUSE | Cmbl | Carboxymethylenebutenolidase homolog, EC 3.1.-.- |
| Q8K0P3 | MEAK7_MOUSE | Meak7 | MTOR-associated protein MEAK7, MEAK7 (TBC/LysM-associated domain-containing protein 1) (TLD domain-containing protein 1) |
| Q8CIB5 | FERM2_MOUSE | Fermt2 | Fermitin family homolog 2 (Kindlin-2) (Pleckstrin homology domain-containing family C member 1) |
| Q8CG76 | ARK72_MOUSE | Akr7a2 | Aflatoxin B1 aldehyde reductase member 2, EC 1.1.1.n11 (Succinic semialdehyde reductase, SSA reductase) |
| Q8CCN5 | BCAS3_MOUSE | Bcas3 | BCAS3 microtubule associated cell migration factor (Breast carcinoma-amplified sequence 3 homolog) (K20D4) (Protein rudhira) |
| Q8C5W3 | TBCEL_MOUSE | Tbcel | Tubulin-specific chaperone cofactor E-like protein (Leucine-rich repeat-containing protein 35) |
| Q8C1M2 | ZN428_MOUSE | Znf428 | Zinc finger protein 428 |

| | | | |
|--------|-------------|----------|---|
| Q8BVE8 | NSD2_MOUSE | Nsd2 | Histone-lysine N-methyltransferase NSD2, EC 2.1.1.357 (Multiple myeloma SET domain-containing protein, MMSET) (Nuclear SET domain-containing protein 2) (Wolf-Hirschhorn syndrome candidate 1 protein homolog) |
| Q8BR70 | YIPF6_MOUSE | Yipf6 | Protein YIPF6 (YIP1 family member 6) |
| Q810A3 | TTC9C_MOUSE | Ttc9c | Tetratricopeptide repeat protein 9C, TPR repeat protein 9C |
| Q6PGB6 | NAA50_MOUSE | Naa50 | N-alpha-acetyltransferase 50, EC 2.3.1.258 (N-acetyltransferase NAT13) (N-epsilon-acetyltransferase 50, EC 2.3.1.-) (NatE catalytic subunit) |
| Q69ZF7 | CNNM4_MOUSE | Cnnm4 | Metal transporter CNNM4 (Ancient conserved domain-containing protein 4, mACDP4) (Cyclin-M4) |
| Q60996 | 2A5G_MOUSE | Ppp2r5c | Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform (PP2A B subunit isoform B'-alpha-3) (PP2A B subunit isoform B'-gamma) (PP2A B subunit isoform B56-gamma) (PP2A B subunit isoform PR61-gamma) (PP2A B subunit isoform R5-gamma) |
| Q5SSI6 | UTP18_MOUSE | Utp18 | U3 small nucleolar RNA-associated protein 18 homolog (WD repeat-containing protein 50) |
| Q3UMT1 | PP12C_MOUSE | Ppp1r12c | Protein phosphatase 1 regulatory subunit 12C (Protein phosphatase 1 myosin-binding subunit of 85 kDa, Protein phosphatase 1 myosin-binding subunit p85) |
| Q32M02 | FSCN2_MOUSE | Fscn2 | Fascin-2 (Retinal fascin) |
| Q14BI2 | GRM2_MOUSE | Grm2 | Metabotropic glutamate receptor 2, mGluR2 |
| P70677 | CASP3_MOUSE | Casp3 | Caspase-3, CASP-3, EC 3.4.22.56 (Apopain) (Cysteine protease CPP32, CPP-32) (LICE) (Protein Yama) (SREBP cleavage activity 1, SCA-1) [Cleaved into: Caspase-3 subunit p17; Caspase-3 subunit p12] |
| P70182 | PI51A_MOUSE | Pip5k1a | Phosphatidylinositol 4-phosphate 5-kinase type-1 alpha, PIP5K1-alpha, PtdIns(4)P-5-kinase 1 alpha, EC 2.7.1.68 (68 kDa type I phosphatidylinositol 4-phosphate 5-kinase alpha) (Phosphatidylinositol 4-phosphate 5-kinase type I alpha, PIP5KIalpha) (Phosphatidylinositol 4-phosphate 5-kinase type I beta, PI4P5KIbeta) |
| P62746 | RHOB_MOUSE | Rhob | Rho-related GTP-binding protein RhoB |
| P41241 | CSK_MOUSE | Csk | Tyrosine-protein kinase CSK, EC 2.7.10.2 (C-Src kinase) (Protein-tyrosine kinase MPK-2) (p50CSK) |
| P26516 | PSMD7_MOUSE | Psmid7 | 26S proteasome non-ATPase regulatory subunit 7 (26S proteasome regulatory subunit RPN8) (26S proteasome regulatory subunit S12) (Mov34 protein) (Proteasome subunit p40) |

| | | | |
|--------|-------------|----------|--|
| P14115 | RL27A_MOUSE | Rpl27a | 60S ribosomal protein L27a (L29) |
| O88738 | BIRC6_MOUSE | Birc6 | Baculoviral IAP repeat-containing protein 6, EC 2.3.2.27 (BIR repeat-containing ubiquitin-conjugating enzyme, BRUCE) (RING-type E3 ubiquitin transferase BIRC6) (Ubiquitin-conjugating BIR domain enzyme apollon, APOLLON) |
| O88384 | VTI1B_MOUSE | Vti1b | Vesicle transport through interaction with t-SNAREs homolog 1B (Vesicle transport v-SNARE protein Vti1-like 1) (Vti1-rp1) |
| O70480 | VAMP4_MOUSE | Vamp4 | Vesicle-associated membrane protein 4, VAMP-4 |
| O35864 | CSN5_MOUSE | Cops5 | COP9 signalosome complex subunit 5, SGN5, Signalosome subunit 5, EC 3.4.-.- (Jun activation domain-binding protein 1) (Kip1 C-terminus-interacting protein 2) |
| B2RXC1 | TPC11_MOUSE | Trappc11 | Trafficking protein particle complex subunit 11 |
| Q9D4H1 | EXOC2_MOUSE | Exoc2 | Exocyst complex component 2 (Exocyst complex component Sec5) |
| O88876 | DHRS3_MOUSE | Dhrs3 | Short-chain dehydrogenase/reductase 3, EC 1.1.1.300 (Retinal short-chain dehydrogenase/reductase 1, retSDR1) |
| Q91Z31 | PTBP2_MOUSE | Ptbp2 | Polypyrimidine tract-binding protein 2 (Brain-enriched polypyrimidine tract-binding protein, Brain-enriched PTB) (Neural polypyrimidine tract-binding protein) (RRM-type RNA-binding protein brPTB) |
| Q3UUG6 | TBC24_MOUSE | Tbc1d24 | TBC1 domain family member 24 |
| Q9ES63 | UBP29_MOUSE | Usp29 | Ubiquitin carboxyl-terminal hydrolase 29, EC 3.4.19.12 (Deubiquitinating enzyme 29) (Ubiquitin thioesterase 29) (Ubiquitin-specific-processing protease 29) |
| Q8C7X2 | EMC1_MOUSE | Emc1 | ER membrane protein complex subunit 1 |
| P70188 | KIF3A_MOUSE | Kifap3 | Kinesin-associated protein 3, KAP-3, KAP3 |
| Q6ZQ03 | FNBP4_MOUSE | Fnbp4 | Formin-binding protein 4 (Formin-binding protein 30) |
| Q9D483 | RPC3_MOUSE | Polr3c | DNA-directed RNA polymerase III subunit RPC3, RNA polymerase III subunit C3 (DNA-directed RNA polymerase III subunit C) |
| Q922H2 | PDK3_MOUSE | Pdk3 | [Pyruvate dehydrogenase (acetyl-transferring)] kinase isozyme 3, mitochondrial, EC 2.7.11.2 (Pyruvate dehydrogenase kinase isoform 3) |
| Q8R050 | ERF3A_MOUSE | Gspt1 | Eukaryotic peptide chain release factor GTP-binding subunit ERF3A, Eukaryotic peptide chain release factor subunit 3a, eRF3a (G1 to S phase transition protein 1 homolog) |
| O70435 | PSA3_MOUSE | Psma3 | Proteasome subunit alpha type-3 (Macropain subunit C8) (Multicatalytic endopeptidase complex subunit C8) (Proteasome component C8) (Proteasome subunit K) |

| | | | |
|--------|-------------|---------|--|
| Q61735 | CD47_MOUSE | Cd47 | Leukocyte surface antigen CD47 (Integrin-associated protein, IAP) (CD antigen CD47) |
| B1AVZ0 | UPP_MOUSE | Uprt | Uracil phosphoribosyltransferase homolog |
| Q6VGS5 | DAPLE_MOUSE | Ccdc88c | Protein Daple (Coiled-coil domain-containing protein 88C) (Dvl-associating protein with a high frequency of leucine residues) |
| Q8BH69 | SPS1_MOUSE | Sephs1 | Selenide, water dikinase 1, EC 2.7.9.3 (Selenium donor protein 1) (Selenophosphate synthase 1) |
| O88351 | IKKB_MOUSE | Ikbkb | Inhibitor of nuclear factor kappa-B kinase subunit beta, I-kappa-B-kinase beta, IKK-B, IKK-beta, IkbKB, EC 2.7.11.10 (I-kappa-B kinase 2, IKK2) (Nuclear factor NF-kappa-B inhibitor kinase beta, NFKBIB) (Serine/threonine protein kinase IKBKB, EC 2.7.11.1) |
| Q8R2U6 | NUDT4_MOUSE | Nudt4 | Diphosphoinositol polyphosphate phosphohydrolase 2, DIPP-2, EC 3.6.1.52 (Diadenosine 5',5'''-P1,P6-hexaphosphate hydrolase 2, EC 3.6.1.-) (Nucleoside diphosphate-linked moiety X motif 4, Nudix motif 4) |
| P67871 | CSK2B_MOUSE | Csnk2b | Casein kinase II subunit beta, CK II beta (Phosvitin) |
| Q69ZU6 | THS7A_MOUSE | Thsd7a | Thrombospondin type-1 domain-containing protein 7A [Cleaved into: Thrombospondin type-1 domain-containing protein 7A, soluble form] |
| Q8BH60 | GOPC_MOUSE | Gopc | Golgi-associated PDZ and coiled-coil motif-containing protein (CFTR-associated ligand) (PDZ protein interacting specifically with TC10, PIST) |
| Q8K2H2 | OTU6B_MOUSE | Otud6b | Deubiquitinase OTUD6B (OTU domain-containing protein 6B, EC 3.4.19.12) |
| Q99MR1 | GGYF1_MOUSE | Gigyf1 | GRB10-interacting GYF protein 1 (PERQ amino acid-rich with GYF domain-containing protein 1) |
| P70704 | AT8A1_MOUSE | Atp8a1 | Phospholipid-transporting ATPase IA, EC 7.6.2.1 (ATPase class I type 8A member 1) (Chromaffin granule ATPase II) (P4-ATPase flippase complex alpha subunit ATP8A1) |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| P34884 | MIF_MOUSE | Mif | Macrophage migration inhibitory factor, MIF, EC 5.3.2.1 (Delayed early response protein 6, DER6) (Glycosylation-inhibiting factor, GIF) (L-dopachrome isomerase) (L-dopachrome tautomerase, EC 5.3.3.12) (Phenylpyruvate tautomerase) |
| P24457 | CP2DB_MOUSE | Cyp2d11 | Cytochrome P450 2D11, EC 1.14.14.1 (CYPIID11) (Cytochrome P450-16-alpha) (Cytochrome P450CC) (Testosterone 16-alpha hydroxylase) |

| | | | |
|--------|-------------|---------|--|
| Q9WTP9 | VAX2_MOUSE | Vax2 | Ventral anterior homeobox 2 (Ventral retina homeodomain protein) |
| Q9Z329 | ITPR2_MOUSE | Itpr2 | Inositol 1,4,5-trisphosphate receptor type 2 (IP3 receptor isoform 2, IP3R 2, InsP3R2) (Inositol 1,4,5-trisphosphate type V receptor) (Type 2 inositol 1,4,5-trisphosphate receptor, Type 2 InsP3 receptor) |
| Q8JZR0 | ACSL5_MOUSE | Acs15 | Long-chain-fatty-acid--CoA ligase 5, EC 6.2.1.3 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 5, LACS 5) |
| Q80Y17 | L2GL1_MOUSE | Llgl1 | Lethal(2) giant larvae protein homolog 1, LLGL (Mgl-1) (Mlgl) |
| Q9D5V6 | SYAP1_MOUSE | Syap1 | Synapse-associated protein 1 (BSD domain-containing signal transducer and Akt interactor protein, BSTA) |
| Q99M28 | RNPS1_MOUSE | Rnps1 | RNA-binding protein with serine-rich domain 1 |
| P51880 | FABP7_MOUSE | Fabp7 | Fatty acid-binding protein, brain (Brain lipid-binding protein, BLBP) (Brain-type fatty acid-binding protein, B-FABP) (Fatty acid-binding protein 7) |
| Q8CGQ8 | NCKX4_MOUSE | Slc24a4 | Sodium/potassium/calcium exchanger 4 (Na(+)/K(+)/Ca(2+)-exchange protein 4) (Solute carrier family 24 member 4) |
| Q8R4N0 | CLYBL_MOUSE | Clybl | Citramalyl-CoA lyase, mitochondrial, EC 4.1.3.25 ((3S)-malyl-CoA thioesterase, EC 3.1.2.30) (Beta-methylmalate synthase, EC 2.3.3.-) (Citrate lyase subunit beta-like protein, mitochondrial, Citrate lyase beta-like) (Malate synthase, EC 2.3.3.9) |
| Q9D5J6 | SHPK_MOUSE | Shpk | Sedoheptulokinase, SHK, EC 2.7.1.14 (Carbohydrate kinase-like protein) |
| O35972 | RM23_MOUSE | Mrpl23 | 39S ribosomal protein L23, mitochondrial, L23mt, MRP-L23 (L23 mitochondrial-related protein) |
| P61924 | COPZ1_MOUSE | Copz1 | Coatomer subunit zeta-1 (Zeta-1-coat protein, Zeta-1 COP) |
| Q8R2R3 | AAGAB_MOUSE | Aagab | Alpha- and gamma-adaptin-binding protein p34 |
| Q9WTP7 | KAD3_MOUSE | Ak3 | GTP:AMP phosphotransferase AK3, mitochondrial, EC 2.7.4.10 (Adenylate kinase 3, AK 3) (Adenylate kinase 3 alpha-like 1) |
| Q9CWM4 | PFD1_MOUSE | Pfdn1 | Prefoldin subunit 1 |
| Q91V76 | CK054_MOUSE | | Ester hydrolase C11orf54 homolog, EC 3.1.-.- |
| Q9JHN8 | STK19_MOUSE | Stk19 | Serine/threonine-protein kinase 19, EC 2.7.11.1 (Protein RP1) |
| P12658 | CALB1_MOUSE | Calb1 | Calbindin (Calbindin D28) (D-28K) (PCD-29) (Spot 35 protein) (Vitamin D-dependent calcium-binding protein, avian-type) |
| Q8K3I4 | MYRIP_MOUSE | Myrip | Rab effector MyRIP (Exophilin-8) (Myosin-VIIa- and Rab-interacting protein) (Synaptotagmin-like protein lacking C2 domains C, SlaC2-c, Slp homolog lacking C2 domains c) |

| | | | |
|--------|-------------|---------|--|
| Q9CQI3 | GMFB_MOUSE | Gmfb | Glia maturation factor beta, GMF-beta |
| P48318 | DCE1_MOUSE | Gad1 | Glutamate decarboxylase 1, EC 4.1.1.15 (67 kDa glutamic acid decarboxylase, GAD-67) (Glutamate decarboxylase 67 kDa isoform) |
| Q8BVI5 | STX16_MOUSE | Stx16 | Syntaxin-16 |
| Q9D882 | F241B_MOUSE | Fam241b | Protein FAM241B |
| Q923B1 | DBR1_MOUSE | Dbr1 | Lariat debranching enzyme, EC 3.1.-.- |
| P70232 | NCHL1_MOUSE | Chl1 | Neural cell adhesion molecule L1-like protein (Cell adhesion molecule with homology to L1CAM) (Chl1-like protein) (Close homolog of L1) [Cleaved into: Processed neural cell adhesion molecule L1-like protein] |
| Q9QYS9 | QKI_MOUSE | Qki | Protein quaking, MqkI, qkI |
| Q8R164 | BPHL_MOUSE | Bphl | Valacyclovir hydrolase, VACVase, Valacyclovirase, EC 3.1.-.- (Biphenyl hydrolase-like protein) |
| Q9DC40 | TELO2_MOUSE | Telo2 | Telomere length regulation protein TEL2 homolog |
| P61222 | ABCE1_MOUSE | Abce1 | ATP-binding cassette sub-family E member 1 (RNase L inhibitor) (Ribonuclease 4 inhibitor, RNS4I) |
| P97461 | RS5_MOUSE | Rps5 | 40S ribosomal protein S5 [Cleaved into: 40S ribosomal protein S5, N-terminally processed] |
| Q9WUH7 | SEM4G_MOUSE | Sema4g | Semaphorin-4G |
| P99027 | RLA2_MOUSE | Rplp2 | 60S acidic ribosomal protein P2 |
| Q9CYK1 | SYWM_MOUSE | Wars2 | Tryptophan--tRNA ligase, mitochondrial, EC 6.1.1.2 ((Mt)TrpRS) (Tryptophanyl-tRNA synthetase, TrpRS) |
| P54823 | DDX6_MOUSE | Ddx6 | Probable ATP-dependent RNA helicase DDX6, EC 3.6.4.13 (ATP-dependent RNA helicase p54) (DEAD box protein 6) (Oncogene RCK homolog) |
| Q99KY4 | GAK_MOUSE | Gak | Cyclin-G-associated kinase, EC 2.7.11.1 |
| P61406 | EST1A_MOUSE | Smg6 | Telomerase-binding protein EST1A, EC 3.1.-.- (Ever shorter telomeres 1A) (Nonsense mediated mRNA decay factor SMG6) (Smg-6 homolog) |
| Q8C052 | MAP1S_MOUSE | Map1s | Microtubule-associated protein 1S, MAP-1S (BPY2-interacting protein 1) (Microtubule-associated protein 8) [Cleaved into: MAP1S heavy chain; MAP1S light chain] |
| Q9R0P4 | SMAP_MOUSE | Smap | Small acidic protein (Sid 2057) |
| Q8BK67 | RCC2_MOUSE | Rcc2 | Protein RCC2 |

| | | | |
|--------|-------------|---------|--|
| P25976 | UBF1_MOUSE | Ubtf | Nucleolar transcription factor 1 (Upstream-binding factor 1, UBF-1) |
| Q91YD9 | WASL_MOUSE | Wasl | Actin nucleation-promoting factor WASL (Neural Wiskott-Aldrich syndrome protein, N-WASP) |
| O88696 | CLPP_MOUSE | Clpp | ATP-dependent Clp protease proteolytic subunit, mitochondrial, EC 3.4.21.92 (Endopeptidase Clp) |
| Q9CQR4 | ACO13_MOUSE | Acot13 | Acyl-coenzyme A thioesterase 13, Acyl-CoA thioesterase 13, EC 3.1.2.- (Hotdog-fold thioesterase superfamily member 2) (Palmitoyl-CoA hydrolase, EC 3.1.2.2) (Thioesterase superfamily member 2, THEM2) |
| Q3B7Z2 | OSBP1_MOUSE | Osbp | Oxysterol-binding protein 1 |
| P70280 | VAMP7_MOUSE | Vamp7 | Vesicle-associated membrane protein 7, VAMP-7 (Synaptobrevin-like protein 1) |
| P10605 | CATB_MOUSE | Ctsb | Cathepsin B, EC 3.4.22.1 (Cathepsin B1) [Cleaved into: Cathepsin B light chain; Cathepsin B heavy chain] |
| Q00493 | CBPE_MOUSE | Cpe | Carboxypeptidase E, CPE, EC 3.4.17.10 (Carboxypeptidase H, CPH) (Enkephalin convertase) (Prohormone-processing carboxypeptidase) |
| O70194 | EIF3D_MOUSE | Eif3d | Eukaryotic translation initiation factor 3 subunit D, eIF3d (Eukaryotic translation initiation factor 3 subunit 7) (eIF-3-zeta) (eIF3 p66) |
| Q78JN3 | ECI3_MOUSE | Eci3 | Enoyl-CoA delta isomerase 3, peroxisomal, EC 5.3.3.8 (Delta(3),delta(2)-enoyl-CoA isomerase, D3,D2-enoyl-CoA isomerase) (Dodecenoyl-CoA isomerase) |
| Q9DCL2 | CIA2A_MOUSE | Ciao2a | Cytosolic iron-sulfur assembly component 2A (MIP18 family protein FAM96A) |
| Q9DC53 | CPNE8_MOUSE | Cpne8 | Copine-8 (Copine VIII) |
| Q91YT0 | NDUV1_MOUSE | Ndufv1 | NADH dehydrogenase [ubiquinone] flavoprotein 1, mitochondrial, EC 7.1.1.2 (Complex I-51kD, CI-51kD) (NADH-ubiquinone oxidoreductase 51 kDa subunit) |
| Q61464 | ZN638_MOUSE | Znf638 | Zinc finger protein 638 (Nuclear protein 220) (Zinc finger matrin-like protein) |
| Q5DTY9 | KCD16_MOUSE | Kctd16 | BTB/POZ domain-containing protein KCTD16 |
| Q61033 | LAP2A_MOUSE | Tmpo | Lamina-associated polypeptide 2, isoforms alpha/zeta (Thymopoietin isoforms alpha/zeta, TP alpha/zeta) |
| Q9WVT6 | CAH14_MOUSE | Ca14 | Carbonic anhydrase 14, EC 4.2.1.1 (Carbonate dehydratase XIV) (Carbonic anhydrase XIV, CA-XIV) |
| Q8BTZ5 | ANR46_MOUSE | Ankrd46 | Ankyrin repeat domain-containing protein 46 (Ankyrin repeat small protein, ANK-S) |
| Q9DCV4 | RMD1_MOUSE | Rmdn1 | Regulator of microtubule dynamics protein 1, RMD-1, mRMD-1 (Microtubule-associated protein) (Protein FAM82B) |
| Q9CPT4 | MYDGF_MOUSE | Mydgf | Myeloid-derived growth factor, MYDGF |

| | | | |
|--------|-------------|----------|---|
| O35304 | VACHT_MOUSE | Slc18a3 | Vesicular acetylcholine transporter, VACHT (Solute carrier family 18 member 3) |
| Q5SDA5 | GUC2F_MOUSE | Gucy2f | Retinal guanylyl cyclase 2, EC 4.6.1.2 (Guanylate cyclase 2F) |
| Q80TK0 | K1107_MOUSE | Kiaa1107 | AP2-interacting clathrin-endocytosis protein, APache |
| Q8BP92 | RCN2_MOUSE | Rcn2 | Reticulocalbin-2 (Taipoxin-associated calcium-binding protein 49, TCBP-49) |
| P11352 | GPX1_MOUSE | Gpx1 | Glutathione peroxidase 1, GPx-1, GSHPx-1, EC 1.11.1.9 (Cellular glutathione peroxidase) (Selenium-dependent glutathione peroxidase 1) |
| Q8R2Y8 | PTH2_MOUSE | Pthr2 | Peptidyl-tRNA hydrolase 2, mitochondrial, PTH 2, EC 3.1.1.29 |
| Q9ERF3 | WDR61_MOUSE | Wdr61 | WD repeat-containing protein 61 (Meiotic recombination REC14 protein homolog) [Cleaved into: WD repeat-containing protein 61, N-terminally processed] |
| Q99LY9 | NDUS5_MOUSE | Ndufs5 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 5 (Complex I-15 kDa, CI-15 kDa) (NADH-ubiquinone oxidoreductase 15 kDa subunit) |
| Q03517 | SCG2_MOUSE | Scg2 | Secretogranin-2 (Chromogranin-C) (Secretogranin II, SgII) [Cleaved into: Secretoneurin, SN; Manserin] |
| Q8R1K1 | UBAC2_MOUSE | Ubac2 | Ubiquitin-associated domain-containing protein 2, UBA domain-containing protein 2 (Phosphoglycerate dehydrogenase-like protein 1) |
| Q3TAA7 | S11IP_MOUSE | Stk11ip | Serine/threonine-protein kinase 11-interacting protein (LKB1-interacting protein 1) |
| Q9DBS8 | POC5_MOUSE | Poc5 | Centrosomal protein POC5 (Protein of centriole 5) |
| O35218 | CPSF2_MOUSE | Cpsf2 | Cleavage and polyadenylation specificity factor subunit 2 (Cleavage and polyadenylation specificity factor 100 kDa subunit, CPSF 100 kDa subunit) |
| A2AIV2 | VIR_MOUSE | Virma | Protein virilizer homolog |
| P62897 | CYC_MOUSE | Cycs | Cytochrome c, somatic |
| Q8CID0 | CSR2B_MOUSE | Kat14 | Cysteine-rich protein 2-binding protein, CSRP2-binding protein (ADA2A-containing complex subunit 2, ATAC2) (CRP2-binding partner, CRP2BP) (Lysine acetyltransferase 14) |
| Q6NZQ6 | ZN740_MOUSE | Znf740 | Zinc finger protein 740 |
| Q9R160 | ADA24_MOUSE | Adam24 | Disintegrin and metalloproteinase domain-containing protein 24, ADAM 24, EC 3.4.24.- (Testase-1) |
| O35602 | RX_MOUSE | Rax | Retinal homeobox protein Rx (Retina and anterior neural fold homeobox protein) |
| P51863 | VA0D1_MOUSE | Atp6v0d1 | V-type proton ATPase subunit d 1, V-ATPase subunit d 1 (P39) (Physophilin) (V-ATPase 40 kDa accessory protein) (V-ATPase AC39 subunit) (Vacuolar proton pump subunit d 1) |

| | | | |
|--------|-------------|----------|--|
| Q9JL56 | GDE1_MOUSE | Gde1 | Glycerophosphodiester phosphodiesterase 1 (Glycerophosphoinositol glycerophosphodiesterase GDE1, EC 3.1.4.44) (Lysophospholipase D GDE1, EC 3.1.4.-) (Membrane-interacting protein of RGS16) |
| P06537 | GCR_MOUSE | Nr3c1 | Glucocorticoid receptor, GR (Nuclear receptor subfamily 3 group C member 1) |
| P23492 | PNPH_MOUSE | Pnp | Purine nucleoside phosphorylase, PNP, EC 2.4.2.1 (Inosine phosphorylase) (Inosine-guanosine phosphorylase) |
| Q8R0H9 | GGA1_MOUSE | Gga1 | ADP-ribosylation factor-binding protein GGA1 (Gamma-adaptin-related protein 1) (Golgi-localized, gamma ear-containing, ARF-binding protein 1) |
| O35350 | CAN1_MOUSE | Capn1 | Calpain-1 catalytic subunit, EC 3.4.22.52 (Calcium-activated neutral proteinase 1, CANP 1) (Calpain mu-type) (Calpain-1 large subunit) (Micromolar-calpain, muCANP) |
| Q9QZ73 | DCNL1_MOUSE | Dcun1d1 | DCN1-like protein 1, DCNL1 (DCUN1 domain-containing protein 1) (Defective in cullin neddylation protein 1-like protein 1) (Testis-specific protein 3) |
| Q9D0W5 | PPIL1_MOUSE | Ppil1 | Peptidyl-prolyl cis-trans isomerase-like 1, PPIase, EC 5.2.1.8 (Rotamase PPIL1) |
| Q68FL4 | SAHH3_MOUSE | Ahcy12 | Putative adenosylhomocysteinase 3, AdoHcyase 3, EC 3.3.1.1 (Long-IRBIT) (S-adenosyl-L-homocysteine hydrolase 3) (S-adenosylhomocysteine hydrolase-like protein 2) |
| Q4VAE3 | TMM65_MOUSE | Tmem65 | Transmembrane protein 65 |
| P63015 | PAX6_MOUSE | Pax6 | Paired box protein Pax-6 (Oculorhombin) |
| Q9D0A3 | ARPIN_MOUSE | Arpin | Arpin (Arp2/3 inhibition protein) |
| Q9CY97 | SSU72_MOUSE | Ssu72 | RNA polymerase II subunit A C-terminal domain phosphatase SSU72, CTD phosphatase SSU72, EC 3.1.3.16 |
| Q8BJS7 | MAP10_MOUSE | Map10 | Microtubule-associated protein 10 (Microtubule regulator of 120 KDa) |
| A2A5R2 | BIG2_MOUSE | Arfgef2 | Brefeldin A-inhibited guanine nucleotide-exchange protein 2, Brefeldin A-inhibited GEP 2 (ADP-ribosylation factor guanine nucleotide-exchange factor 2) |
| Q9JI78 | NGLY1_MOUSE | Ngly1 | Peptide-N(4)-(N-acetyl-beta-glucosaminyl)asparagine amidase, PNGase, mPNGase, EC 3.5.1.52 (N-glycanase 1) (Peptide:N-glycanase) |
| Q8BPA8 | DPCD_MOUSE | Dpcd | Protein DPCD |
| Q9D903 | EBP2_MOUSE | Ebna1bp2 | Probable rRNA-processing protein EBP2 |
| Q62445 | SP4_MOUSE | Sp4 | Transcription factor Sp4 |

| | | | |
|--------|-------------|----------|---|
| Q3URE1 | ACSF3_MOUSE | Acsf3 | Malonate--CoA ligase ACSF3, mitochondrial, EC 6.2.1.n3 (Acyl-CoA synthetase family member 3) |
| Q8BPM0 | DAAM1_MOUSE | Daam1 | Disheveled-associated activator of morphogenesis 1 |
| Q8K183 | PDXK_MOUSE | Pdxk | Pyridoxal kinase, EC 2.7.1.35 (Pyridoxine kinase) |
| P06797 | CATL1_MOUSE | Ctsl | Procathepsin L, EC 3.4.22.15 (Cathepsin L1) (Major excreted protein, MEP) (p39 cysteine proteinase) [Cleaved into: Cathepsin L; Cathepsin L heavy chain; Cathepsin L light chain] |
| Q05144 | RAC2_MOUSE | Rac2 | Ras-related C3 botulinum toxin substrate 2 (Protein EN-7) (p21-Rac2) |
| Q6PHQ8 | NAA35_MOUSE | Naa35 | N-alpha-acetyltransferase 35, NatC auxiliary subunit (Embryonic growth-associated protein) (Protein MAK10 homolog) |
| Q5SSZ5 | TENS3_MOUSE | Tns3 | Tensin-3 (Tensin-like SH2 domain-containing protein 1) |
| Q5SWT3 | S2535_MOUSE | Slc25a35 | Solute carrier family 25 member 35 |
| Q9CWI3 | BCCIP_MOUSE | Bccip | BRCA2 and CDKN1A-interacting protein |
| Q99P58 | RB27B_MOUSE | Rab27b | Ras-related protein Rab-27B, EC 3.6.5.2 |
| Q9ESZ8 | GTF2I_MOUSE | Gtf2i | General transcription factor II-I, GTFII-I, TFII-I (Bruton tyrosine kinase-associated protein 135, BAP-135, BTK-associated protein 135) |
| Q3UVX5 | GRM5_MOUSE | Grm5 | Metabotropic glutamate receptor 5, mGluR5 |
| P50544 | ACADV_MOUSE | Acadvl | Very long-chain specific acyl-CoA dehydrogenase, mitochondrial, EC 1.3.8.9 (MVLCAD, VLCAD) |
| P12787 | COX5A_MOUSE | Cox5a | Cytochrome c oxidase subunit 5A, mitochondrial (Cytochrome c oxidase polypeptide Va) |
| Q9WUD1 | CHIP_MOUSE | Stub1 | E3 ubiquitin-protein ligase CHIP, EC 2.3.2.27 (Carboxy terminus of Hsp70-interacting protein) (RING-type E3 ubiquitin transferase CHIP) (STIP1 homology and U box-containing protein 1) |
| Q80UW2 | FBX2_MOUSE | Fbxo2 | F-box only protein 2 |
| Q7TMQ7 | WDR91_MOUSE | Wdr91 | WD repeat-containing protein 91 |
| Q8R3I3 | COG6_MOUSE | Cog6 | Conserved oligomeric Golgi complex subunit 6, COG complex subunit 6 (Component of oligomeric Golgi complex 6) |
| Q80TY0 | FNBP1_MOUSE | Fnbp1 | Formin-binding protein 1 (Formin-binding protein 17) |
| Q8C167 | PPCEL_MOUSE | Prepl | Prolyl endopeptidase-like, EC 3.4.21.- (Prolylendopeptidase-like) |

| | | | |
|--------|-------------|---------|---|
| Q35473 | C1D_MOUSE | C1d | Nuclear nucleic acid-binding protein C1D, mC1D (Small unique nuclear receptor corepressor, Sun-CoR, SunCoR) |
| Q80ZK9 | WDTC1_MOUSE | Wdte1 | WD and tetratricopeptide repeats protein 1 |
| Q9CQ54 | NDUC2_MOUSE | Ndufc2 | NADH dehydrogenase [ubiquinone] 1 subunit C2 (Complex I-B14.5b, CI-B14.5b) (NADH-ubiquinone oxidoreductase subunit B14.5b) |
| P62141 | PP1B_MOUSE | Ppp1cb | Serine/threonine-protein phosphatase PP1-beta catalytic subunit, PP-1B, EC 3.1.3.16, EC 3.1.3.53 |
| Q8CJ61 | CKLF4_MOUSE | Cmtm4 | CKLF-like MARVEL transmembrane domain-containing protein 4 (Chemokine-like factor superfamily member 4) |
| O08912 | GALT1_MOUSE | Galnt1 | Polypeptide N-acetylgalactosaminyltransferase 1, EC 2.4.1.41 (Polypeptide GalNAc transferase 1, GalNAc-T1, pp-GaNTase 1) (Protein-UDP acetylgalactosaminyltransferase 1) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase 1) [Cleaved into: Polypeptide N-acetylgalactosaminyltransferase 1 soluble form] |
| Q9CYA0 | CREL2_MOUSE | Creld2 | Protein disulfide isomerase Creld2, EC 5.3.4.1 (Cysteine-rich with EGF-like domain protein 2) |
| Q9CXL1 | TM50A_MOUSE | Tmem50a | Transmembrane protein 50A (Small membrane protein 1) |
| Q6PD19 | ARMD3_MOUSE | Armh3 | Armadillo-like helical domain-containing protein 3 |
| Q9CYH6 | RRS1_MOUSE | Rrs1 | Ribosome biogenesis regulatory protein homolog |
| Q9ERI6 | RDH14_MOUSE | Rdh14 | Retinol dehydrogenase 14, EC 1.1.1.300 (Alcohol dehydrogenase PAN2) |
| Q9DBL2 | GDAP2_MOUSE | Gdap2 | Ganglioside-induced differentiation-associated protein 2 |
| Q9CR02 | TMA16_MOUSE | Tma16 | Translation machinery-associated protein 16 |
| Q04690 | NF1_MOUSE | Nf1 | Neurofibromin (Neurofibromatosis-related protein NF-1) |
| Q60707 | TBX2_MOUSE | Tbx2 | T-box transcription factor TBX2, T-box protein 2 |
| Q04207 | TF65_MOUSE | Rela | Transcription factor p65 (Nuclear factor NF-kappa-B p65 subunit) (Nuclear factor of kappa light polypeptide gene enhancer in B-cells 3) |
| Q8C1Y8 | CCZ1_MOUSE | Ccz1 | Vacuolar fusion protein CCZ1 homolog |
| P60904 | DNJC5_MOUSE | Dnajc5 | DnaJ homolog subfamily C member 5 (Cysteine string protein, CSP) (Cysteine-string protein isoform alpha) |
| Q9CZ28 | SNF8_MOUSE | Snf8 | Vacuolar-sorting protein SNF8 (ESCRT-II complex subunit VPS22) |
| Q6P4T1 | SNX19_MOUSE | Snx19 | Sorting nexin-19 |

| | | | |
|--------|-------------|----------|---|
| Q5RJF7 | CA2D4_MOUSE | Cacna2d4 | Voltage-dependent calcium channel subunit alpha-2/delta-4 (Voltage-gated calcium channel subunit alpha-2/delta-4) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-4; Voltage-dependent calcium channel subunit delta-4] |
| Q80Y84 | KDM5B_MOUSE | Kdm5b | Lysine-specific demethylase 5B, EC 1.14.11.67 (Histone demethylase JARID1B) (Jumonji/ARID domain-containing protein 1B) (PLU-1) ([histone H3]-trimethyl-L-lysine(4) demethylase 5B) |
| Q8R3H7 | HS2ST_MOUSE | Hs2st1 | Heparan sulfate 2-O-sulfotransferase 1, 2-O-sulfotransferase, 2-OST, 2OST, EC 2.8.2.- |
| P97450 | ATP5J_MOUSE | Atp5pf | ATP synthase-coupling factor 6, mitochondrial, ATPase subunit F6 (ATP synthase peripheral stalk subunit F6) |
| Q60737 | CSK21_MOUSE | Csnk2a1 | Casein kinase II subunit alpha, CK II alpha, EC 2.7.11.1 |
| Q3UIL6 | PKHA7_MOUSE | Plekha7 | Pleckstrin homology domain-containing family A member 7, PH domain-containing family A member 7 (Heart adapter protein 1) |
| Q91XU3 | PI42C_MOUSE | Pip4k2c | Phosphatidylinositol 5-phosphate 4-kinase type-2 gamma, EC 2.7.1.149 (Phosphatidylinositol 5-phosphate 4-kinase type II gamma, PI(5)P 4-kinase type II gamma, PIP4KII-gamma) |
| O54825 | BYST_MOUSE | Bysl | Bystin |
| P51150 | RAB7A_MOUSE | Rab7a | Ras-related protein Rab-7a, EC 3.6.5.2 |
| O89112 | LANC1_MOUSE | Lanc11 | Glutathione S-transferase LANCL1, EC 2.5.1.18 (40 kDa erythrocyte membrane protein, p40) (LanC-like protein 1) |
| Q3TJZ6 | FA98A_MOUSE | Fam98a | Protein FAM98A |
| Q8K2I1 | FNTB_MOUSE | Fntb | Protein farnesyltransferase subunit beta, FTase-beta, EC 2.5.1.58 (CAAX farnesyltransferase subunit beta) (Ras proteins prenyltransferase subunit beta) |
| Q8C460 | ERI3_MOUSE | Eri3 | ERI1 exoribonuclease 3, EC 3.1.-.- (Prion interactor 1) (Prion protein-interacting protein) |
| P36552 | HEM6_MOUSE | Cpox | Oxygen-dependent coproporphyrinogen-III oxidase, mitochondrial, COX, Coprogen oxidase, Coproporphyrinogenase, EC 1.3.3.3 |
| Q8BGR6 | ARL15_MOUSE | Arl15 | ADP-ribosylation factor-like protein 15 (ADP-ribosylation factor-related protein 2, ARF-related protein 2) |
| Q9ERB0 | SNP29_MOUSE | Snap29 | Synaptosomal-associated protein 29, SNAP-29 (Golgi SNARE of 32 kDa, Gs32) (Soluble 29 kDa NSF attachment protein) (Vesicle-membrane fusion protein SNAP-29) |
| Q8BZ97 | PRDM8_MOUSE | Prdm8 | PR domain zinc finger protein 8, EC 2.1.1.- (PR domain-containing protein 8) |

| | | | |
|--------|-------------|----------|--|
| Q8R0G9 | NU133_MOUSE | Nup133 | Nuclear pore complex protein Nup133 (133 kDa nucleoporin) (Nucleoporin Nup133) |
| Q9ERG2 | STRN3_MOUSE | Strn3 | Striatin-3 (Cell cycle autoantigen SG2NA) (S/G2 antigen) |
| Q61216 | MRE11_MOUSE | Mre11 | Double-strand break repair protein MRE11, EC 3.1.-.- (Double-strand break repair protein MRE11A, MmMRE11A) (Meiotic recombination 11 homolog 1, MRE11 homolog 1) (Meiotic recombination 11 homolog A, MRE11 homolog A) |
| Q922M7 | ASHWN_MOUSE | | Ashwin |
| P55264 | ADK_MOUSE | Adk | Adenosine kinase, AK, EC 2.7.1.20 (Adenosine 5'-phosphotransferase) |
| Q78PG9 | CCD25_MOUSE | Ccdc25 | Coiled-coil domain-containing protein 25 |
| Q8CAI1 | CC142_MOUSE | Ccdc142 | Coiled-coil domain-containing protein 142 |
| P42230 | STA5A_MOUSE | Stat5a | Signal transducer and activator of transcription 5A (Mammary gland factor) |
| Q6PE15 | ABHDA_MOUSE | Abhd10 | Palmitoyl-protein thioesterase ABHD10, mitochondrial, EC 3.1.2.22 (Acyl-protein thioesterase ABHD10) (Alpha/beta hydrolase domain-containing protein 10, Abhydrolase domain-containing protein 10) (Mycophenolic acid acyl-glucuronide esterase, mitochondrial, EC 3.1.1.93) |
| P97371 | PSME1_MOUSE | Psmel | Proteasome activator complex subunit 1 (11S regulator complex subunit alpha, REG-alpha) (Activator of multicatalytic protease subunit 1) (Proteasome activator 28 subunit alpha, PA28a, PA28alpha) |
| O88693 | CEGT_MOUSE | Ugcg | Ceramide glucosyltransferase, EC 2.4.1.80 (GLCT-1) (Glucosylceramide synthase, GCS) (Glycosylceramide synthase) (UDP-glucose ceramide glucosyltransferase) (UDP-glucose:N-acylsphingosine D-glucosyltransferase) |
| Q9EPU4 | CPSF1_MOUSE | Cpsf1 | Cleavage and polyadenylation specificity factor subunit 1 (Cleavage and polyadenylation specificity factor 160 kDa subunit, CPSF 160 kDa subunit) |
| Q9D8L5 | CCD91_MOUSE | Ccdc91 | Coiled-coil domain-containing protein 91 (GGA-binding partner) |
| Q8VBZ3 | CLPT1_MOUSE | Clptm1 | Putative lipid scramblase CLPTM1 (Cleft lip and palate transmembrane protein 1 homolog) (Thymic epithelial cell surface antigen) |
| A2AAE1 | K1109_MOUSE | Kiaa1109 | Transmembrane protein KIAA1109 (Fragile site-associated protein homolog) |
| Q8C7R4 | UBA6_MOUSE | Uba6 | Ubiquitin-like modifier-activating enzyme 6, Ubiquitin-activating enzyme 6, EC 6.2.1.45 (Ubiquitin-activating enzyme E1-like protein 2, E1-L2) |
| Q91YJ3 | THYN1_MOUSE | Thyn1 | Thymocyte nuclear protein 1 (Thymocyte protein Thy28, mThy28) |
| Q8CHT1 | NGEF_MOUSE | Ngef | Ephexin-1 (Eph-interacting exchange protein) (Neuronal guanine nucleotide exchange factor) |

| | | | |
|--------|-------------|---------|---|
| Q08460 | KCMA1_MOUSE | Kenma1 | Calcium-activated potassium channel subunit alpha-1 (BK channel) (BKCA alpha) (Calcium-activated potassium channel, subfamily M subunit alpha-1) (K(VCA)alpha) (KCa1.1) (Maxi K channel, MaxiK) (Slo-alpha) (Slo1, mSlo1) (Slowpoke homolog, Slo homolog, mSlo) |
| Q3UJK4 | GTPB2_MOUSE | Gtpbp2 | GTP-binding protein 2 (GTP-binding-like protein 2) |
| Q921Q7 | RIN1_MOUSE | Rin1 | Ras and Rab interactor 1 (Ras interaction/interference protein 1) |
| Q99KE1 | MAOM_MOUSE | Me2 | NAD-dependent malic enzyme, mitochondrial, NAD-ME, EC 1.1.1.38 (Malic enzyme 2) |
| Q9ESK4 | ING2_MOUSE | Ing2 | Inhibitor of growth protein 2 (Inhibitor of growth 1-like protein) (p33ING2) |
| A6H5Z3 | EXC6B_MOUSE | Exoc6b | Exocyst complex component 6B (Exocyst complex component Sec15B) (SEC15-like protein 2) |
| Q2KN98 | CYTSA_MOUSE | Specc11 | Cytospin-A (SPECC1-like protein) (Sperm antigen with calponin homology and coiled-coil domains 1-like) |
| P10493 | NID1_MOUSE | Nid1 | Nidogen-1, NID-1 (Entactin) |
| Q60960 | IMA5_MOUSE | Kpna1 | Importin subunit alpha-5 (Importin alpha-S1) (Karyopherin subunit alpha-1) (Nucleoprotein interactor 1, NPI-1) (RAG cohort protein 2) (SRP1-beta) |
| P40630 | TFAM_MOUSE | Tfam | Transcription factor A, mitochondrial, mtTFA (Testis-specific high mobility group protein, TS-HMG) |
| Q9DBC0 | SELO_MOUSE | Selenoo | Protein adenylyltransferase SelO, mitochondrial, EC 2.7.7.-, EC 2.7.7.n1 (Selenoprotein O, SelO) |
| Q8R1R3 | STAR7_MOUSE | Stard7 | StAR-related lipid transfer protein 7, mitochondrial (START domain-containing protein 7, StARD7) |
| Q921X9 | PDIA5_MOUSE | Pdia5 | Protein disulfide-isomerase A5, EC 5.3.4.1 (Protein disulfide isomerase-related protein) |
| Q62240 | KDM5D_MOUSE | Kdm5d | Lysine-specific demethylase 5D, EC 1.14.11.67 (Histocompatibility Y antigen, H-Y) (Histone demethylase JARID1D) (Jumonji/ARID domain-containing protein 1D) (Protein SmcY) ([histone H3]-trimethyl-L-lysine(4) demethylase 5D) |
| Q9QXY6 | EHD3_MOUSE | Ehd3 | EH domain-containing protein 3 |
| Q5XJE5 | LEO1_MOUSE | Leo1 | RNA polymerase-associated protein LEO1 |
| P54276 | MSH6_MOUSE | Msh6 | DNA mismatch repair protein Msh6 (G/T mismatch-binding protein, GTBP, GTMBP) (MutS protein homolog 6) (MutS-alpha 160 kDa subunit, p160) |
| P46061 | RAGP1_MOUSE | Rangap1 | Ran GTPase-activating protein 1, RanGAP1 |

| | | | |
|--------|-------------|---------|--|
| Q8VI75 | IPO4_MOUSE | Ipo4 | Importin-4, Imp4 (Importin-4a, Imp4a) (Ran-binding protein 4, RanBP4) |
| Q9JLM4 | ZMYM3_MOUSE | Zmym3 | Zinc finger MYM-type protein 3 (DXHXS6673E protein) (Zinc finger protein 261) |
| P62340 | TBPL1_MOUSE | Tbpl1 | TATA box-binding protein-like 1, TBP-like 1 (21 kDa TBP-like protein) (TATA box-binding protein-related factor 2, TBP-related factor 2) (TBP-like factor) (TBP-related protein) |
| Q80Z25 | OFD1_MOUSE | Ofd1 | Centriole and centriolar satellite protein OFD1 (Oral-facial-digital syndrome 1 protein homolog) |
| Q08EC4 | CASS4_MOUSE | Cass4 | Cas scaffolding protein family member 4 |
| Q8C8R3 | ANK2_MOUSE | Ank2 | Ankyrin-2, ANK-2 (Ankyrin-B) (Brain ankyrin) |
| P27546 | MAP4_MOUSE | Map4 | Microtubule-associated protein 4, MAP-4 |
| O08599 | STXB1_MOUSE | Stxbp1 | Syntaxin-binding protein 1 (Protein unc-18 homolog 1, Unc18-1) (Protein unc-18 homolog A, Unc-18A) |
| O70133 | DHX9_MOUSE | Dhx9 | ATP-dependent RNA helicase A, EC 3.6.4.13 (DEAH box protein 9, mHEL-5) (Nuclear DNA helicase II, NDH II) (RNA helicase A, RHA) |
| Q9Z2D6 | MECP2_MOUSE | Mecp2 | Methyl-CpG-binding protein 2, MeCp-2 protein, MeCp2 |
| Q61781 | K1C14_MOUSE | Krt14 | Keratin, type I cytoskeletal 14 (Cytokeratin-14, CK-14) (Keratin-14, K14) |
| Q80XI3 | IF4G3_MOUSE | Eif4g3 | Eukaryotic translation initiation factor 4 gamma 3, eIF-4-gamma 3, eIF-4G 3, eIF4G 3 (eIF-4-gamma II, eIF4GII) |
| P47757 | CAPZB_MOUSE | Capzb | F-actin-capping protein subunit beta (CapZ beta) |
| Q3UHJ0 | AAK1_MOUSE | Aak1 | AP2-associated protein kinase 1, EC 2.7.11.1 (Adaptor-associated kinase 1) |
| Q61301 | CTNA2_MOUSE | Ctnna2 | Catenin alpha-2 (Alpha N-catenin) |
| P18872 | GNAO_MOUSE | Gnao1 | Guanine nucleotide-binding protein G(o) subunit alpha |
| Q9D6Y9 | GLGB_MOUSE | Gbe1 | 1,4-alpha-glucan-branching enzyme, EC 2.4.1.18 (Brancher enzyme) (Glycogen-branching enzyme) |
| O35737 | HNRH1_MOUSE | Hnrnph1 | Heterogeneous nuclear ribonucleoprotein H, hnRNP H [Cleaved into: Heterogeneous nuclear ribonucleoprotein H, N-terminally processed] |
| Q91XM9 | DLG2_MOUSE | Dlg2 | Disks large homolog 2 (Channel-associated protein of synapse-110, Chapsyn-110) (Postsynaptic density protein PSD-93) |
| Q60597 | ODO1_MOUSE | Ogdh | 2-oxoglutarate dehydrogenase complex component E1, E1o, OGDC-E1, OGDH-E1, EC 1.2.4.2 (2-oxoglutarate dehydrogenase, mitochondrial) (Alpha-ketoglutarate dehydrogenase, Alpha-KGDH-E1) (Thiamine diphosphate (ThDP)-dependent 2-oxoglutarate dehydrogenase) |

| | | | |
|--------|-------------|---------|--|
| Q9Z204 | HNRPC_MOUSE | Hnrnpc | Heterogeneous nuclear ribonucleoproteins C1/C2, hnRNP C1/C2 |
| P46638 | RB11B_MOUSE | Rab11b | Ras-related protein Rab-11B, EC 3.6.5.2 |
| Q5SWU9 | ACACA_MOUSE | Acaca | Acetyl-CoA carboxylase 1, ACC1, EC 6.4.1.2 (ACC-alpha) (Acetyl-CoA carboxylase 265) |
| Q8C437 | PEX5R_MOUSE | Pex5l | PEX5-related protein (PEX2-related protein) (PEX5-like protein) (Peroxin-5-related protein) (Tetratricopeptide repeat-containing Rab8b-interacting protein, Pex5Rp, TRIP8b) |
| Q61595 | KTN1_MOUSE | Ktn1 | Kinectin |
| P56546 | CTBP2_MOUSE | Ctbp2 | C-terminal-binding protein 2, CtBP2 |
| Q6P8X1 | SNX6_MOUSE | Snx6 | Sorting nexin-6 [Cleaved into: Sorting nexin-6, N-terminally processed] |
| Q99KK2 | NEUA_MOUSE | Cmas | N-acylneuraminate cytidyltransferase, EC 2.7.7.43 (CMP-N-acetylneuraminic acid synthase, CMP-NeuNAc synthase) |
| Q7TMB8 | CYFP1_MOUSE | Cyfp1 | Cytoplasmic FMR1-interacting protein 1 (Specifically Rac1-associated protein 1, Sra-1) |
| P57776 | EF1D_MOUSE | Eef1d | Elongation factor 1-delta, EF-1-delta |
| Q9JJW6 | ALRF2_MOUSE | Alyref2 | Aly/REF export factor 2 (Alyref) (RNA and export factor-binding protein 2) |
| Q8BG81 | PDIP3_MOUSE | Poldip3 | Polymerase delta-interacting protein 3 (S6K1 Aly/REF-like target, SKAR) |
| P62881 | GNB5_MOUSE | Gnb5 | Guanine nucleotide-binding protein subunit beta-5 (Gbeta5) (Transducin beta chain 5) |
| Q9CZY3 | UB2V1_MOUSE | Ube2v1 | Ubiquitin-conjugating enzyme E2 variant 1, UEV-1 (CROC-1) |
| P52293 | IMA1_MOUSE | Kpna2 | Importin subunit alpha-1 (Importin alpha P1) (Karyopherin subunit alpha-2) (Pendulin) (Pore targeting complex 58 kDa subunit, PTAC58) (RAG cohort protein 1) (SRP1-alpha) |
| Q08509 | EPS8_MOUSE | Eps8 | Epidermal growth factor receptor kinase substrate 8 |
| Q8CFW1 | ANO2_MOUSE | Ano2 | Anoctamin-2 (Transmembrane protein 16B) |
| P01027 | CO3_MOUSE | C3 | Complement C3 (HSE-MSF) [Cleaved into: Complement C3 beta chain; C3-beta-c, C3bc; Complement C3 alpha chain; C3a anaphylatoxin; Acylation stimulating protein, ASP (C3adesArg); Complement C3b alpha' chain; Complement C3c alpha' chain fragment 1; Complement C3dg fragment; Complement C3g fragment; Complement C3d fragment; Complement C3f fragment; Complement C3c alpha' chain fragment 2] |
| O35226 | PSMD4_MOUSE | Psm4 | 26S proteasome non-ATPase regulatory subunit 4 (26S proteasome regulatory subunit RPN10) (26S proteasome regulatory subunit S5A) (Multiubiquitin chain-binding protein) |

| | | | |
|--------|-------------|----------|---|
| Q8CGU1 | CACO1_MOUSE | Calcoco1 | Calcium-binding and coiled-coil domain-containing protein 1 (Coiled-coil coactivator protein) |
| Q60605 | MYL6_MOUSE | Myl6 | Myosin light polypeptide 6 (17 kDa myosin light chain, LC17) (Myosin light chain 3, MLC-3) (Myosin light chain alkali 3, Myosin light chain A3) (Smooth muscle and nonmuscle myosin light chain alkali 6) |
| Q7TMK9 | HNRPQ_MOUSE | Syncrip | Heterogeneous nuclear ribonucleoprotein Q, hnRNP Q (Glycine- and tyrosine-rich RNA-binding protein, GRY-RBP) (NS1-associated protein 1) (Synaptotagmin-binding, cytoplasmic RNA-interacting protein) (pp68) |
| Q9CRB6 | TPPP3_MOUSE | Tppp3 | Tubulin polymerization-promoting protein family member 3 |
| Q8VE09 | TT39C_MOUSE | Ttc39c | Tetratricopeptide repeat protein 39C, TPR repeat protein 39C |
| Q6P9Q6 | FKB15_MOUSE | Fkbp15 | FK506-binding protein 15, FKBP-15 (133 kDa FK506-binding protein, 133 kDa FKBP, FKBP-133) (WASP and FKBP-like, WAFL) |
| Q91WJ8 | FUBP1_MOUSE | Fubp1 | Far upstream element-binding protein 1, FBP, FUSE-binding protein 1 |
| Q05BC3 | EMAL1_MOUSE | Eml1 | Echinoderm microtubule-associated protein-like 1, EMAP-1 |
| P55302 | AMRP_MOUSE | Lrpap1 | Alpha-2-macroglobulin receptor-associated protein, Alpha-2-MRAP (Heparin-binding protein 44, HBP-44) (Low density lipoprotein receptor-related protein-associated protein 1, RAP) |
| Q8C0E2 | VP26B_MOUSE | Vps26b | Vacuolar protein sorting-associated protein 26B (Vesicle protein sorting 26B) |
| P47962 | RL5_MOUSE | Rpl5 | 60S ribosomal protein L5 |
| Q8BMG7 | RBGPR_MOUSE | Rab3gap2 | Rab3 GTPase-activating protein non-catalytic subunit (Rab3 GTPase-activating protein 150 kDa subunit) (Rab3-GAP p150, Rab3-GAP150) (Rab3-GAP regulatory subunit) |
| O70325 | GPX4_MOUSE | Gpx4 | Phospholipid hydroperoxide glutathione peroxidase, PHGPx, EC 1.11.1.12 (Glutathione peroxidase 4, GPx-4, GSHPx-4) |
| Q921H8 | THIKA_MOUSE | Acaal1a | 3-ketoacyl-CoA thiolase A, peroxisomal, EC 2.3.1.16 (Acetyl-CoA C-myrystoyltransferase, EC 2.3.1.155) (Acetyl-CoA acyltransferase A, EC 2.3.1.9) (Beta-ketothiolase A) (Peroxisomal 3-oxoacyl-CoA thiolase A) |
| O54786 | DFFA_MOUSE | Dffa | DNA fragmentation factor subunit alpha (DNA fragmentation factor 45 kDa subunit, DFF-45) (Inhibitor of CAD, ICAD) |
| Q148R9 | R9BP_MOUSE | Rgs9bp | Regulator of G-protein signaling 9-binding protein (RGS9-anchoring protein) |
| Q8BMI3 | GGA3_MOUSE | Gga3 | ADP-ribosylation factor-binding protein GGA3 (Golgi-localized, gamma ear-containing, ARF-binding protein 3) |

| | | | |
|--------|-------------|----------|---|
| Q80Y81 | RNZ2_MOUSE | Elac2 | Zinc phosphodiesterase ELAC protein 2, EC 3.1.26.11 (ElaC homolog protein 2) (Ribonuclease Z 2, RNase Z 2) (tRNA 3 endonuclease 2) (tRNase Z 2) |
| Q8BH04 | PCKGM_MOUSE | Pck2 | Phosphoenolpyruvate carboxykinase [GTP], mitochondrial, PEPCK-M, EC 4.1.1.32 |
| Q9EQU5 | SET_MOUSE | Set | Protein SET (Phosphatase 2A inhibitor I2PP2A, I-2PP2A) (Template-activating factor I, TAF-I) |
| P63276 | RS17_MOUSE | Rps17 | 40S ribosomal protein S17 |
| O08532 | CA2D1_MOUSE | Cacna2d1 | Voltage-dependent calcium channel subunit alpha-2/delta-1 (Voltage-gated calcium channel subunit alpha-2/delta-1) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-1; Voltage-dependent calcium channel subunit delta-1] |
| Q99K28 | ARFG2_MOUSE | Arfgap2 | ADP-ribosylation factor GTPase-activating protein 2, ARF GAP 2 (GTPase-activating protein ZNF289) (Zinc finger protein 289) |
| Q8BGT8 | PHIPL_MOUSE | Phyhipl | Phytanoyl-CoA hydroxylase-interacting protein-like |
| Q9CSH3 | RRP44_MOUSE | Dis3 | Exosome complex exonuclease RRP44, EC 3.1.13.-, EC 3.1.26.- (Protein DIS3 homolog) (Ribosomal RNA-processing protein 44) |
| Q9D1H7 | GET4_MOUSE | Get4 | Golgi to ER traffic protein 4 homolog |
| P35803 | GPM6B_MOUSE | Gpm6b | Neuronal membrane glycoprotein M6-b, M6b |
| P35979 | RL12_MOUSE | Rpl12 | 60S ribosomal protein L12 |
| Q9CQ86 | MIEN1_MOUSE | Mien1 | Migration and invasion enhancer 1 |
| P43247 | MSH2_MOUSE | Msh2 | DNA mismatch repair protein Msh2 (MutS protein homolog 2) |
| P29391 | FRIL1_MOUSE | Ftl1 | Ferritin light chain 1 (Ferritin L subunit 1) |
| P02089 | HBB2_MOUSE | Hbb-b2 | Hemoglobin subunit beta-2 (Beta-2-globin) (Hemoglobin beta-2 chain) (Hemoglobin beta-minor chain) |
| Q8K212 | PACS1_MOUSE | Pacs1 | Phosphofurin acidic cluster sorting protein 1, PACS-1 |
| Q811G0 | PTHB1_MOUSE | Bbs9 | Protein PTHB1 (Bardet-Biedl syndrome 9 protein homolog) (Parathyroid hormone-responsive B1 gene protein homolog) |
| Q9QZ06 | TOLIP_MOUSE | Tollip | Toll-interacting protein |
| P57759 | ERP29_MOUSE | Erp29 | Endoplasmic reticulum resident protein 29, ERp29 |
| P63040 | CPLX1_MOUSE | Cplx1 | Complexin-1 (921-S) (Complexin I, CPX I) (Synaphin-2) |
| P62196 | PRS8_MOUSE | Psmc5 | 26S proteasome regulatory subunit 8 (26S proteasome AAA-ATPase subunit RPT6) (Proteasome 26S subunit ATPase 5) (Proteasome subunit p45) (p45/SUG, mSUG1) |

| | | | |
|---------|-------------|----------|--|
| Q9JMG1 | EDF1_MOUSE | Edf1 | Endothelial differentiation-related factor 1, EDF-1 (Multiprotein-bridging factor 1, MBF1) |
| Q9Z2W8 | GRIA4_MOUSE | Gria4 | Glutamate receptor 4, GluR-4, GluR4 (AMPA-selective glutamate receptor 4) (GluR-D) (Glutamate receptor ionotropic, AMPA 4, GluA4) |
| Q8BW96 | KCC1D_MOUSE | Camk1d | Calcium/calmodulin-dependent protein kinase type 1D, EC 2.7.11.17 (CaM kinase I delta, CaM-KI delta, CaMKI delta) (CaM kinase ID) (CaMKI-like protein kinase, CKLiK, mCKLiK) |
| Q9WUL7 | ARL3_MOUSE | Arl3 | ADP-ribosylation factor-like protein 3 |
| Q6NSW3 | SPKAP_MOUSE | Sphkap | A-kinase anchor protein SPHKAP (SPHK1-interactor and AKAP domain-containing protein) |
| Q8QZS1 | HIBCH_MOUSE | Hibch | 3-hydroxyisobutyryl-CoA hydrolase, mitochondrial, EC 3.1.2.4 (3-hydroxyisobutyryl-coenzyme A hydrolase, HIB-CoA hydrolase, HIBYL-CoA-H) |
| Q9JKY0 | CNOT9_MOUSE | Cnot9 | CCR4-NOT transcription complex subunit 9 (Cell differentiation protein RQCD1 homolog, Rcd-1) (EPO-induced protein FL10) |
| P42208 | SEPT2_MOUSE | Septin2 | Septin-2 (Neural precursor cell expressed developmentally down-regulated protein 5, NEDD-5) |
| Q61151 | 2A5E_MOUSE | Ppp2r5e | Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit epsilon isoform (PP2A B subunit isoform B'-epsilon) (PP2A B subunit isoform B56-epsilon) (PP2A B subunit isoform PR61-epsilon) (PP2A B subunit isoform R5-epsilon) |
| Q9D6U8 | F162A_MOUSE | Fam162a | Protein FAM162A (E2-induced gene 5 protein homolog) (Growth and transformation-dependent protein, HGTD-P) |
| Q921T2 | TOIP1_MOUSE | Tor1aip1 | Torsin-1A-interacting protein 1 (Lamina-associated polypeptide 1B, LAP1B) |
| Q99K01 | PDXD1_MOUSE | Pdxdc1 | Pyridoxal-dependent decarboxylase domain-containing protein 1, EC 4.1.1.- |
| Q6Z WV3 | RL10_MOUSE | Rpl10 | 60S ribosomal protein L10 (Protein QM homolog) (Ribosomal protein L10) |
| O70305 | ATX2_MOUSE | Atxn2 | Ataxin-2 (Spinocerebellar ataxia type 2 protein homolog) |
| Q8K2J0 | PLCD3_MOUSE | Plcd3 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase delta-3, EC 3.1.4.11 (Phosphoinositide phospholipase C-delta-3) (Phospholipase C-delta-3, PLC-delta-3) |
| Q8BG51 | MIRO1_MOUSE | Rhot1 | Mitochondrial Rho GTPase 1, MIRO-1, EC 3.6.5.- (Ras homolog gene family member T1) |
| Q8K1X1 | WDR11_MOUSE | Wdr11 | WD repeat-containing protein 11 (Bromodomain and WD repeat-containing protein 2) |
| Q91WV0 | NC2B_MOUSE | Dr1 | Protein Dr1 (Down-regulator of transcription 1) (Negative cofactor 2-beta, NC2-beta) (TATA-binding protein-associated phosphoprotein) |

| | | | |
|--------|-------------|--------|--|
| Q00623 | APOA1_MOUSE | Apoa1 | Apolipoprotein A-I, Apo-AI, ApoA-I (Apolipoprotein A1) [Cleaved into: Proapolipoprotein A-I, ProapoA-I; Truncated apolipoprotein A-I] |
| Q9D1Q6 | ERP44_MOUSE | Erp44 | Endoplasmic reticulum resident protein 44, ER protein 44, ERp44 (Thioredoxin domain-containing protein 4) |
| Q9WUP7 | UCHL5_MOUSE | Uchl5 | Ubiquitin carboxyl-terminal hydrolase isozyme L5, UCH-L5, EC 3.4.19.12 (Ubiquitin C-terminal hydrolase UCH37) (Ubiquitin thioesterase L5) |
| Q9JI44 | DMAP1_MOUSE | Dmap1 | DNA methyltransferase 1-associated protein 1, DNMAP1, DNMT1-associated protein 1 (MAT1-mediated transcriptional repressor) |
| Q6PHZ2 | KCC2D_MOUSE | Camk2d | Calcium/calmodulin-dependent protein kinase type II subunit delta, CaM kinase II subunit delta, CaMK-II subunit delta, EC 2.7.11.17 |
| Q8BXZ1 | TMX3_MOUSE | Tmx3 | Protein disulfide-isomerase TMX3, EC 5.3.4.1 (Thioredoxin domain-containing protein 10) (Thioredoxin-related transmembrane protein 3) |
| Q02357 | ANK1_MOUSE | Ank1 | Ankyrin-1, ANK-1 (Erythrocyte ankyrin) |
| Q9DCS3 | MECR_MOUSE | Mecr | Enoyl-[acyl-carrier-protein] reductase, mitochondrial, EC 1.3.1.104 (2-enoyl thioester reductase) (Nuclear receptor-binding factor 1, NRBF-1) |
| Q9EQQ9 | OGA_MOUSE | Oga | Protein O-GlcNAcase, OGA, EC 3.2.1.169 (Beta-N-acetylhexosaminidase) (Beta-hexosaminidase) (Bifunctional protein NCOAT) (Meningioma-expressed antigen 5) (N-acetyl-beta-D-glucosaminidase) (N-acetyl-beta-glucosaminidase) |
| Q9Z0E0 | NCDN_MOUSE | Ncdn | Neurochondrin (M-Sema F-associating protein of 75 kDa) (Norbin) |
| Q9CPT5 | NOP16_MOUSE | Nop16 | Nucleolar protein 16 |
| Q9CQC7 | NDUB4_MOUSE | Ndufb4 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 4 (Complex I-B15, CI-B15) (NADH-ubiquinone oxidoreductase B15 subunit) |
| O88746 | TOM1_MOUSE | Tom1 | Target of Myb protein 1 |
| P56812 | PDCD5_MOUSE | Pdcd5 | Programmed cell death protein 5 (TF-1 cell apoptosis-related protein 19, Protein TFAR19) |
| O88986 | KBL_MOUSE | Gcat | 2-amino-3-ketobutyrate coenzyme A ligase, mitochondrial, AKB ligase, EC 2.3.1.29 (Aminoacetone synthase) (Glycine acetyltransferase) |
| Q9CR29 | CCD43_MOUSE | Ccdc43 | Coiled-coil domain-containing protein 43 |
| Q9DCL9 | PUR6_MOUSE | Paics | Bifunctional phosphoribosylaminoimidazole carboxylase/phosphoribosylaminoimidazole succinocarboxamide synthetase, PAICS [Includes: Phosphoribosylaminoimidazole carboxylase, EC 4.1.1.21 (AIR carboxylase, |

| | | | |
|--------|-------------|---------|--|
| | | | AIRC); Phosphoribosylaminoimidazole succinocarboxamide synthetase, EC 6.3.2.6 (SAICAR synthetase)] |
| Q64152 | BTF3_MOUSE | Btf3 | Transcription factor BTF3 (Nascent polypeptide-associated complex subunit beta, NAC-beta) (RNA polymerase B transcription factor 3) |
| Q8CG72 | ADPRS_MOUSE | Adprs | ADP-ribosylhydrolase ARH3 (ADP-ribose glycohydrolase ARH3) (ADP-ribosylhydrolase 3) (O-acetyl-ADP-ribose deacetylase ARH3, EC 3.5.1.-) (Poly(ADP-ribose) glycohydrolase ARH3, EC 3.2.1.143) ([Protein ADP-ribosylarginine] hydrolase-like protein 2) ([Protein ADP-ribosylserine] hydrolase, EC 3.2.2.-) |
| O54991 | CNTP1_MOUSE | Cntnap1 | Contactin-associated protein 1, Caspr, Caspr1 (MHDNIV) (NCP1) (Neurexin IV) (Neurexin-4) (Paranodin) |
| Q78JE5 | FBX22_MOUSE | Fbxo22 | F-box only protein 22 |
| P28740 | KIF2A_MOUSE | Kif2a | Kinesin-like protein KIF2A (Kinesin-2) |
| Q99JR1 | SFXN1_MOUSE | Sfxn1 | Sideroflexin-1 |
| Q91Z61 | DIRA1_MOUSE | Diras1 | GTP-binding protein Di-Ras1 (Distinct subgroup of the Ras family member 1) (Small GTP-binding tumor suppressor 1) |
| B1AZI6 | THOC2_MOUSE | Thoc2 | THO complex subunit 2, Tho2 |
| P42669 | PURA_MOUSE | Pura | Transcriptional activator protein Pur-alpha (Purine-rich single-stranded DNA-binding protein alpha) |
| Q9CQ45 | NENF_MOUSE | Nenf | Neudesin (Neuron-derived neurotrophic factor) (Secreted protein of unknown function, SPUF protein) |
| Q9Z2C9 | MTMR7_MOUSE | Mtmr7 | Myotubularin-related protein 7 (Inositol 1,3-bisphosphate phosphatase, EC 3.1.3.-) (Phosphatidylinositol-3-phosphate phosphatase, EC 3.1.3.64) |
| Q99KQ4 | NAMPT_MOUSE | Nampt | Nicotinamide phosphoribosyltransferase, NAMPRTase, Nampt, EC 2.4.2.12 (Pre-B-cell colony-enhancing factor 1 homolog, PBEF) (Visfatin) |
| Q8R3B1 | PLCD1_MOUSE | Plcd1 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase delta-1, EC 3.1.4.11 (Phosphoinositide phospholipase C-delta-1) (Phospholipase C-delta-1, PLC-delta-1) |
| Q6Y7W8 | GGYF2_MOUSE | Gigyf2 | GRB10-interacting GYF protein 2 (PERQ amino acid-rich with GYF domain-containing protein 2) (Trinucleotide repeat-containing gene 15 protein) |
| Q8K268 | ABCF3_MOUSE | Abcf3 | ATP-binding cassette sub-family F member 3 |
| P35293 | RAB18_MOUSE | Rab18 | Ras-related protein Rab-18 |

| | | | |
|--------|-------------|-----------|---|
| O54828 | RGS9_MOUSE | Rgs9 | Regulator of G-protein signaling 9, RGS9 |
| Q99JP7 | GGT7_MOUSE | Ggt7 | Glutathione hydrolase 7, EC 3.4.19.13 (Gamma-glutamyltransferase 7, GGT 7, EC 2.3.2.2) (Gamma-glutamyltransferase-like 3) (Gamma-glutamyltranspeptidase 7) [Cleaved into: Glutathione hydrolase 7 heavy chain; Glutathione hydrolase 7 light chain] |
| Q91VJ5 | PQBP1_MOUSE | Pqbp1 | Polyglutamine-binding protein 1, PQBP-1 (38 kDa nuclear protein containing a WW domain, Npw38) (Polyglutamine tract-binding protein 1) |
| P35278 | RAB5C_MOUSE | Rab5c | Ras-related protein Rab-5C, EC 3.6.5.2 |
| P07759 | SPA3K_MOUSE | Serpina3k | Serine protease inhibitor A3K, Serpin A3K (Contrapsin) (SPI-2) |
| P0C605 | KGP1_MOUSE | Prkg1 | cGMP-dependent protein kinase 1, cGK 1, cGK1, EC 2.7.11.12 (cGMP-dependent protein kinase I, cGKI) |
| P62915 | TF2B_MOUSE | Gtf2b | Transcription initiation factor IIB, EC 2.3.1.48 (General transcription factor TFIIB) (RNA polymerase II alpha initiation factor) |
| Q8K0D5 | EFGM_MOUSE | Gfm1 | Elongation factor G, mitochondrial, EF-Gmt (Elongation factor G 1, mitochondrial, mEF-G 1) (Elongation factor G1) |
| P61087 | UBE2K_MOUSE | Ube2k | Ubiquitin-conjugating enzyme E2 K, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme K) (Huntingtin-interacting protein 2, HIP-2) (Ubiquitin carrier protein) (Ubiquitin-conjugating enzyme E2-25 kDa, Ubiquitin-conjugating enzyme E2(25K), Ubiquitin-conjugating enzyme E2-25K) (Ubiquitin-protein ligase) |
| Q6PEV3 | WIPF2_MOUSE | Wipf2 | WAS/WASL-interacting protein family member 2 (WASP-interacting protein-related protein) (WIP-related protein) |
| P70404 | IDHG1_MOUSE | Idh3g | Isocitrate dehydrogenase [NAD] subunit gamma 1, mitochondrial (Isocitric dehydrogenase subunit gamma) (NAD(+)-specific ICDH subunit gamma) |
| P56960 | EXOSX_MOUSE | Exosc10 | Exosome component 10, EC 3.1.13.- (Autoantigen PM/Scl 2 homolog) (Polymyositis/scleroderma autoantigen 2 homolog) |
| Q80XU3 | NUCKS_MOUSE | Nucks1 | Nuclear ubiquitous casein and cyclin-dependent kinase substrate 1 (JC7) |
| P49442 | INPP_MOUSE | Inpp1 | Inositol polyphosphate 1-phosphatase, IPP, IPPase, EC 3.1.3.57 |
| O70152 | DPM1_MOUSE | Dpm1 | Dolichol-phosphate mannosyltransferase subunit 1, EC 2.4.1.83 (Dolichol-phosphate mannose synthase subunit 1, DPM synthase subunit 1) (Dolichyl-phosphate beta-D-mannosyltransferase subunit 1) (Mannose-P-dolichol synthase subunit 1, MPD synthase) |
| Q8VDW0 | DX39A_MOUSE | Ddx39a | ATP-dependent RNA helicase DDX39A, EC 3.6.4.13 (DEAD box protein 39) |

| | | | |
|--------|-------------|----------|--|
| Q9D0M3 | CY1_MOUSE | Cyc1 | Cytochrome c1, heme protein, mitochondrial, EC 7.1.1.8 (Complex III subunit 4) (Complex III subunit IV) (Cytochrome b-c1 complex subunit 4) (Ubiquinol-cytochrome-c reductase complex cytochrome c1 subunit, Cytochrome c-1) |
| P52785 | GUC2E_MOUSE | Gucy2e | Retinal guanylyl cyclase 1 (Guanylate cyclase 2E) (Guanylyl cyclase GC-E, EC 4.6.1.2) |
| Q9Z108 | STAU1_MOUSE | Stau1 | Double-stranded RNA-binding protein Staufen homolog 1 |
| Q8C5Q4 | GRSF1_MOUSE | Grsf1 | G-rich sequence factor 1, GRSF-1 |
| Q9QZB7 | ARP10_MOUSE | Actr10 | Actin-related protein 10 (Actin-related protein 11) |
| Q9JJV2 | PROF2_MOUSE | Pfn2 | Profilin-2 (Profilin II) |
| Q9DCT2 | NDUS3_MOUSE | Ndufs3 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 3, mitochondrial, EC 7.1.1.2 (Complex I-30kD, CI-30kD) (NADH-ubiquinone oxidoreductase 30 kDa subunit) |
| Q9DCM0 | ETHE1_MOUSE | Ethel | Persulfide dioxygenase ETHE1, mitochondrial, EC 1.13.11.18 (Ethylmalonic encephalopathy protein 1 homolog) (Hepatoma subtracted clone one protein) (Sulfur dioxygenase ETHE1) |
| Q9DC63 | FBX3_MOUSE | Fbxo3 | F-box only protein 3 |
| Q9D3N8 | GRTP1_MOUSE | Grtp1 | Growth hormone-regulated TBC protein 1 (TBC1 domain family member 6) |
| Q9CXS4 | CENPV_MOUSE | Cenpv | Centromere protein V, CENP-V (Proline-rich protein 6) |
| Q9CRA5 | GOLP3_MOUSE | Golph3 | Golgi phosphoprotein 3 (Coat protein GPP34) |
| Q9CQY6 | UQCC2_MOUSE | Uqcc2 | Ubiquinol-cytochrome-c reductase complex assembly factor 2 (Mitochondrial nucleoid factor 1) (Mitochondrial protein M19) |
| Q9CQF3 | CPSF5_MOUSE | Nudt21 | Cleavage and polyadenylation specificity factor subunit 5 (Nucleoside diphosphate-linked moiety X motif 21, Nudix motif 21) (Nudix hydrolase 21) |
| Q8VD12 | Z385A_MOUSE | Znf385a | Zinc finger protein 385A (Hematopoietic zinc finger protein) |
| Q8K297 | GT251_MOUSE | Colgalt1 | Procollagen galactosyltransferase 1, EC 2.4.1.50 (Collagen beta(1-O)galactosyltransferase 1) (Glycosyltransferase 25 family member 1) (Hydroxylysine galactosyltransferase 1) |
| Q8K021 | SCAM1_MOUSE | Scamp1 | Secretory carrier-associated membrane protein 1, Secretory carrier membrane protein 1 |
| Q8CH72 | TRI32_MOUSE | Trim32 | E3 ubiquitin-protein ligase TRIM32, EC 2.3.2.27 (RING-type E3 ubiquitin transferase TRIM32) (Tripartite motif-containing protein 32) |

| | | | |
|--------|-------------|----------|---|
| Q8BGT7 | SPF30_MOUSE | Smndc1 | Survival of motor neuron-related-splicing factor 30 (30 kDa splicing factor SMNrp) (SMN-related protein) (Survival motor neuron domain-containing protein 1) |
| Q71RI9 | KAT3_MOUSE | Kyat3 | Kynurenine--oxoglutarate transaminase 3, EC 2.6.1.7 (Cysteine-S-conjugate beta-lyase 2, EC 4.4.1.13) (Kynurenine aminotransferase 3) (Kynurenine aminotransferase III, KATIII) (Kynurenine--glyoxylate transaminase, EC 2.6.1.63) (Kynurenine--oxoglutarate transaminase III) |
| P99029 | PRDX5_MOUSE | Prdx5 | Peroxiredoxin-5, mitochondrial, EC 1.11.1.24 (Antioxidant enzyme B166, AOEB166) (Liver tissue 2D-page spot 2D-0014IV) (PLP) (Peroxiredoxin V, Prx-V) (Peroxisomal antioxidant enzyme) (Thioredoxin peroxidase PMP20) (Thioredoxin-dependent peroxiredoxin 5) |
| P63054 | PCP4_MOUSE | Pcp4 | Calmodulin regulator protein PCP4 (Brain-specific antigen PCP-4) (Brain-specific polypeptide PEP-19) (Purkinje cell protein 4) |
| P61211 | ARL1_MOUSE | Arl1 | ADP-ribosylation factor-like protein 1 |
| P24472 | GSTA4_MOUSE | Gsta4 | Glutathione S-transferase A4, EC 2.5.1.18 (GST A4-4, GSTA4-4) (GST class-alpha member 4) (Glutathione S-transferase 5.7, GST 5.7) |
| P21956 | MFGM_MOUSE | Mfge8 | Lactadherin (MFGM) (Milk fat globule-EGF factor 8, MFG-E8) (SED1) (Sperm surface protein SP47, MP47) |
| O88935 | SYN1_MOUSE | Syn1 | Synapsin-1 (Synapsin I) |
| P08730 | K1C13_MOUSE | Krt13 | Keratin, type I cytoskeletal 13 (47 kDa cytokeratin) (Cytokeratin-13, CK-13) (Keratin-13, K13) |
| Q99KB8 | GLO2_MOUSE | Hagh | Hydroxyacylglutathione hydrolase, mitochondrial, EC 3.1.2.6 (Glyoxalase II, Glx II) |
| Q8R366 | IGSF8_MOUSE | Igsf8 | Immunoglobulin superfamily member 8, IgSF8 (CD81 partner 3) (Glu-Trp-Ile EWI motif-containing protein 2, EWI-2) (Keratinocyte-associated transmembrane protein 4, KCT-4) (Prostaglandin regulatory-like protein, PGRL) (CD antigen CD316) |
| O55126 | NIPS2_MOUSE | Nipsnap2 | Protein NipSnap homolog 2, NipSnap2 (Glioblastoma-amplified sequence) |
| Q60598 | SRC8_MOUSE | Ctnn | Src substrate cortactin |
| O35144 | TERF2_MOUSE | Terf2 | Telomeric repeat-binding factor 2 (TTAGGG repeat-binding factor 2) (Telomeric DNA-binding protein) |
| A2ALS5 | RPGP1_MOUSE | Rap1gap | Rap1 GTPase-activating protein 1, Rap1GAP, Rap1GAP1 (ARPP-90) |
| Q6P5G6 | UBXN7_MOUSE | Ubxn7 | UBX domain-containing protein 7 |
| Q8BWY3 | ERF1_MOUSE | Etf1 | Eukaryotic peptide chain release factor subunit 1, Eukaryotic release factor 1, eRF1 |
| P70429 | EVL_MOUSE | Evl | Ena/VASP-like protein (Ena/vasodilator-stimulated phosphoprotein-like) |

| | | | |
|--------|-------------|---------|--|
| Q8C804 | SPICE_MOUSE | Spice1 | Spindle and centriole-associated protein 1 (Coiled-coil domain-containing protein 52) |
| Q9D7M8 | RPB4_MOUSE | Polr2d | DNA-directed RNA polymerase II subunit RPB4, RNA polymerase II subunit B4 (DNA-directed RNA polymerase II subunit D) |
| Q45VK7 | DYHC2_MOUSE | Dync2h1 | Cytoplasmic dynein 2 heavy chain 1 (Cytoplasmic dynein 2 heavy chain) (Dynein cytoplasmic heavy chain 2) (Dynein heavy chain 11, mDHC11) (Dynein heavy chain isotype 1B) |
| Q9D6Y7 | MSRA_MOUSE | Msra | Mitochondrial peptide methionine sulfoxide reductase, EC 1.8.4.11 (Peptide-methionine (S)-S-oxide reductase, Peptide Met(O) reductase) (Protein-methionine-S-oxide reductase, PMSR) |
| Q9EPJ9 | ARFG1_MOUSE | Arfgap1 | ADP-ribosylation factor GTPase-activating protein 1, ARF GAP 1 (ADP-ribosylation factor 1 GTPase-activating protein, ARF1 GAP) (ARF1-directed GTPase-activating protein) |
| P35821 | PTN1_MOUSE | Ptpn1 | Tyrosine-protein phosphatase non-receptor type 1, EC 3.1.3.48 (Protein-tyrosine phosphatase 1B, PTP-1B) (Protein-tyrosine phosphatase HA2, PTP-HA2) |
| P50171 | DHB8_MOUSE | Hsd17b8 | (3R)-3-hydroxyacyl-CoA dehydrogenase, EC 1.1.1.n12 (17-beta-hydroxysteroid dehydrogenase 8, 17-beta-HSD 8) (3-ketoacyl-[acyl-carrier-protein] reductase alpha subunit, KAR alpha subunit) (3-oxoacyl-[acyl-carrier-protein] reductase) (Estradiol 17-beta-dehydrogenase 8, EC 1.1.1.62) (Protein Ke6, Ke-6) (Testosterone 17-beta-dehydrogenase 8, EC 1.1.1.239) |
| Q6DIB4 | NOL4L_MOUSE | Nol4l | Nucleolar protein 4-like |
| Q9D7H3 | RTCA_MOUSE | RtcA | RNA 3'-terminal phosphate cyclase, RNA cyclase, RNA-3'-phosphate cyclase, EC 6.5.1.4 (RNA terminal phosphate cyclase domain-containing protein 1) |
| Q9DB15 | RM12_MOUSE | Mrpl12 | 39S ribosomal protein L12, mitochondrial, L12mt, MRP-L12 |
| Q60952 | CP250_MOUSE | Cep250 | Centrosome-associated protein CEP250 (250 kDa centrosomal protein, Cep250) (Centrosomal Nek2-associated protein 1, C-Nap1) (Centrosomal protein 2) (Intranuclear matrix protein) |
| Q80VP1 | EPN1_MOUSE | Epn1 | Epsin-1 (EPS-15-interacting protein 1) (Intersectin-EH-binding protein 1, Ibp1) |
| Q8VDM1 | ZGPAT_MOUSE | Zgpat | Zinc finger CCCH-type with G patch domain-containing protein |
| P46737 | BRCC3_MOUSE | Brcc3 | Lys-63-specific deubiquitinase BRCC36, EC 3.4.19.- (BRCA1-A complex subunit BRCC36) (BRCA1/BRCA2-containing complex subunit 3) (BRCA1/BRCA2-containing complex subunit 36) (BRISC complex subunit BRCC36) |
| Q921M4 | GOGA2_MOUSE | Golga2 | Golgin subfamily A member 2 (130 kDa cis-Golgi matrix protein, GM130) |

| | | | |
|--------|-------------|-----------|---|
| Q60749 | KHDR1_MOUSE | Khdrbs1 | KH domain-containing, RNA-binding, signal transduction-associated protein 1 (GAP-associated tyrosine phosphoprotein p62) (Src-associated in mitosis 68 kDa protein, Sam68) (p21 Ras GTPase-activating protein-associated p62) (p68) |
| Q9CQX2 | CYB5B_MOUSE | Cyb5b | Cytochrome b5 type B (Cytochrome b5 outer mitochondrial membrane isoform) |
| Q8R105 | VP37C_MOUSE | Vps37c | Vacuolar protein sorting-associated protein 37C (ESCRT-I complex subunit VPS37C) |
| Q68EF0 | RAB3I_MOUSE | Rab3ip | Rab-3A-interacting protein, Rab3A-interacting protein (Rabin-3) (SSX2-interacting protein) |
| Q5SSL4 | ABR_MOUSE | Abr | Active breakpoint cluster region-related protein |
| Q60967 | PAPS1_MOUSE | Papss1 | Bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase 1, PAPS synthase 1, PAPSS 1 (Sulfurylase kinase 1, SK 1, SK1) [Includes: Sulfate adenylyltransferase, EC 2.7.7.4 (ATP-sulfurylase) (Sulfate adenylate transferase, SAT); Adenylyl-sulfate kinase, EC 2.7.1.25 (3'-phosphoadenosine-5'-phosphosulfate synthase) (APS kinase) (Adenosine-5'-phosphosulfate 3'-phosphotransferase) (Adenylylsulfate 3'-phosphotransferase)] |
| P62627 | DLRB1_MOUSE | Dynlrb1 | Dynein light chain roadblock-type 1 (Dynein light chain 2A, cytoplasmic) |
| Q8K1M6 | DNM1L_MOUSE | Dnm1l | Dynamamin-1-like protein, EC 3.6.5.5 (Dynamamin family member proline-rich carboxyl-terminal domain less, Dymple) (Dynamamin-related protein 1) |
| Q8BFR4 | GNS_MOUSE | Gns | N-acetylglucosamine-6-sulfatase, EC 3.1.6.14 (Glucosamine-6-sulfatase, G6S) |
| O35658 | C1QBP_MOUSE | C1qbp | Complement component 1 Q subcomponent-binding protein, mitochondrial (GC1q-R protein) (Glycoprotein gC1qBP, C1qBP) |
| P60521 | GBRL2_MOUSE | Gabarapl2 | Gamma-aminobutyric acid receptor-associated protein-like 2 (GABA(A) receptor-associated protein-like 2) (Golgi-associated ATPase enhancer of 16 kDa, GATE-16) |
| Q9EPK7 | XPO7_MOUSE | Xpo7 | Exportin-7, Exp7 (Ran-binding protein 16) |
| Q3TDQ1 | STT3B_MOUSE | Stt3b | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit STT3B, Oligosaccharyl transferase subunit STT3B, STT3-B, EC 2.4.99.18 (B6dom1 antigen) (Source of immunodominant MHC-associated peptides) |
| Q8K2G4 | BBS7_MOUSE | Bbs7 | Bardet-Biedl syndrome 7 protein homolog (BBS2-like protein 1) |
| A2ARP1 | VIP1_MOUSE | Ppip5k1 | Inositol hexakisphosphate and diphosphoinositol-pentakisphosphate kinase 1, EC 2.7.4.24 (Diphosphoinositol pentakisphosphate kinase 1) (Histidine acid phosphatase domain-containing protein 2A) (InsP6 and PP-IP5 kinase 1) (VIP1 homolog) |
| Q9Z2H5 | E41L1_MOUSE | Epb4111 | Band 4.1-like protein 1 (Erythrocyte membrane protein band 4.1-like 1) (Neuronal protein 4.1, 4.1N) |

| | | | |
|--------|-------------|----------|--|
| Q8BTV2 | CPSF7_MOUSE | Cpsf7 | Cleavage and polyadenylation specificity factor subunit 7 |
| Q9CPQ8 | ATP5L_MOUSE | Atp5mg | ATP synthase subunit g, mitochondrial, ATPase subunit g (ATP synthase membrane subunit g) |
| P61750 | ARF4_MOUSE | Arf4 | ADP-ribosylation factor 4 |
| Q9Z172 | SUMO3_MOUSE | Sumo3 | Small ubiquitin-related modifier 3, SUMO-3 (SMT3 homolog 1) (Ubiquitin-like protein SMT3A, Smt3A) |
| Q9CQU3 | RER1_MOUSE | Rer1 | Protein RER1 |
| P70425 | RIT2_MOUSE | Rit2 | GTP-binding protein Rit2, EC 3.6.5.2 (Ras-like protein expressed in neurons) (Ras-like without CAAX protein 2) |
| Q6PAV2 | HERC4_MOUSE | Herc4 | Probable E3 ubiquitin-protein ligase HERC4, EC 2.3.2.26 (HECT domain and RCC1-like domain-containing protein 4) (HECT-type E3 ubiquitin transferase HERC4) |
| Q8VBX6 | MPDZ_MOUSE | Mpdz | Multiple PDZ domain protein (Multi-PDZ domain protein 1) |
| Q3TJ91 | L2GL2_MOUSE | Llg2 | LLGL scribble cell polarity complex component 2 (Lethal giant larvae-like protein 2) (Lethal(2) giant larvae protein homolog 2) |
| Q8R2Y0 | ABHD6_MOUSE | Abhd6 | Monoacylglycerol lipase ABHD6, EC 3.1.1.23 (2-arachidonoylglycerol hydrolase) (Abhydrolase domain-containing protein 6) |
| Q63844 | MK03_MOUSE | Mapk3 | Mitogen-activated protein kinase 3, MAP kinase 3, MAPK 3, EC 2.7.11.24 (ERT2) (Extracellular signal-regulated kinase 1, ERK-1) (Insulin-stimulated MAP2 kinase) (MAP kinase isoform p44, p44-MAPK) (MNK1) (Microtubule-associated protein 2 kinase) (p44-ERK1) |
| Q7TSE6 | ST38L_MOUSE | Stk38l | Serine/threonine-protein kinase 38-like, EC 2.7.11.1 (NDR2 protein kinase) (Nuclear Dbf2-related kinase 2) |
| O54829 | RGS7_MOUSE | Rgs7 | Regulator of G-protein signaling 7, RGS7 |
| P58871 | TB182_MOUSE | Tnks1bp1 | 182 kDa tankyrase-1-binding protein |
| P10852 | 4F2_MOUSE | Slc3a2 | 4F2 cell-surface antigen heavy chain, 4F2hc (Solute carrier family 3 member 2) (CD antigen CD98) |
| O89051 | ITM2B_MOUSE | Itm2b | Integral membrane protein 2B (Immature BRI2, imBRI2) (Protein E25B) (Transmembrane protein BRI, Bri) [Cleaved into: BRI2, membrane form (Mature BRI2, mBRI2); BRI2 intracellular domain, BRI2 ICD; BRI2C, soluble form; Bri23 peptide, Bri2-23 (ABri23) (C-terminal peptide) (P23 peptide)] |
| Q9CYT6 | CAP2_MOUSE | Cap2 | Adenylyl cyclase-associated protein 2, CAP 2 |
| Q8CHU3 | EPN2_MOUSE | Epn2 | Epsin-2 (EPS-15-interacting protein 2) (Intersectin-EH-binding protein 2, Ibp2) |

| | | | |
|--------|-------------|---------|---|
| Q9QY36 | NAA10_MOUSE | Naa10 | N-alpha-acetyltransferase 10, EC 2.3.1.255 (N-terminal acetyltransferase complex ARD1 subunit homolog A) (NatA catalytic subunit Naa10) |
| P62812 | GBRA1_MOUSE | Gabra1 | Gamma-aminobutyric acid receptor subunit alpha-1 (GABA(A) receptor subunit alpha-1) |
| Q8K1J6 | TRNT1_MOUSE | Trnt1 | CCA tRNA nucleotidyltransferase 1, mitochondrial, EC 2.7.7.72 (mitochondrial tRNA nucleotidyl transferase, CCA-adding, mt CCA-adding enzyme, mt tRNA CCA-diphosphorylase, mt tRNA CCA-pyrophosphorylase, mt tRNA adenylyltransferase) |
| Q8CEC0 | NUP88_MOUSE | Nup88 | Nuclear pore complex protein Nup88 (88 kDa nucleoporin) (Nucleoporin Nup88) |
| Q8BX09 | RBBP5_MOUSE | Rbbp5 | Retinoblastoma-binding protein 5, RBBP-5 |
| Q9CQ92 | FIS1_MOUSE | Fis1 | Mitochondrial fission 1 protein (FIS1 homolog) (Tetratricopeptide repeat protein 11, TPR repeat protein 11) |
| Q61189 | ICLN_MOUSE | Clns1a | Methylosome subunit pICln (Chloride channel, nucleotide sensitive 1A) (Chloride conductance regulatory protein ICln, I(Cln)) (Chloride ion current inducer protein, CICI) |
| Q9QZ23 | NFU1_MOUSE | Nfu1 | NFU1 iron-sulfur cluster scaffold homolog, mitochondrial (HIRA-interacting protein 5, mHIRIP5) |
| P58021 | TM9S2_MOUSE | Tm9sf2 | Transmembrane 9 superfamily member 2 |
| Q5SNZ0 | GRDN_MOUSE | Ccdc88a | Girdin (Akt phosphorylation enhancer, APE) (Coiled-coil domain-containing protein 88A) (G alpha-interacting vesicle-associated protein, GIV) (Girders of actin filament) (Hook-related protein 1, HkRP1) |
| Q9QZN4 | FBX6_MOUSE | Fbxo6 | F-box only protein 6 (F-box only protein 6b) (F-box protein that recognizes sugar chains 2) (F-box/G-domain protein 2) |
| Q8CBY8 | DCTN4_MOUSE | Dctn4 | Dynactin subunit 4 (Dynactin subunit p62) |
| Q9WV55 | VAPA_MOUSE | Vapa | Vesicle-associated membrane protein-associated protein A, VAMP-A, VAMP-associated protein A, VAP-A (33 kDa VAMP-associated protein, VAP-33) |
| Q9CYR0 | SSBP_MOUSE | Ssbp1 | Single-stranded DNA-binding protein, mitochondrial, Mt-SSB, MtSSB |
| Q8BK72 | RT27_MOUSE | Mrps27 | 28S ribosomal protein S27, mitochondrial, MRP-S27, S27mt (Mitochondrial ribosomal protein S27) |
| Q9Z1K6 | ARI2_MOUSE | Arih2 | E3 ubiquitin-protein ligase ARIH2, ARI-2, Protein ariadne-2 homolog, EC 2.3.2.31 (RING-type E3 ubiquitin transferase ARIH2) (Triad1 protein) (UbcM4-interacting protein 48) |
| Q9JLI6 | SCLY_MOUSE | Scly | Selenocysteine lyase, mSCL, EC 4.4.1.16 |

| | | | |
|--------|-------------|-----------|---|
| Q9JIY5 | HTRA2_MOUSE | Htra2 | Serine protease HTRA2, mitochondrial, EC 3.4.21.108 (High temperature requirement protein A2, HtrA2) (Omi stress-regulated endoprotease) (Serine protease 25) (Serine proteinase OMI) |
| P11404 | FABPH_MOUSE | Fabp3 | Fatty acid-binding protein, heart (Fatty acid-binding protein 3) (Heart-type fatty acid-binding protein, H-FABP) (Mammary-derived growth inhibitor, MDGI) |
| O35639 | ANXA3_MOUSE | Anxa3 | Annexin A3 (35-alpha calcimedlin) (Annexin III) (Annexin-3) (Lipocortin III) (Placental anticoagulant protein III, PAP-III) |
| P14131 | RS16_MOUSE | Rps16 | 40S ribosomal protein S16 |
| Q9WV60 | GSK3B_MOUSE | Gsk3b | Glycogen synthase kinase-3 beta, GSK-3 beta, EC 2.7.11.26 (Serine/threonine-protein kinase GSK3B, EC 2.7.11.1) |
| Q8VDG3 | PARN_MOUSE | Parn | Poly(A)-specific ribonuclease PARN, EC 3.1.13.4 (Polyadenylate-specific ribonuclease) |
| Q9WTX2 | PRKRA_MOUSE | Prkra | Interferon-inducible double-stranded RNA-dependent protein kinase activator A (PKR-associated protein X) (PKR-associating protein X, RAX) (Protein activator of the interferon-induced protein kinase) (Protein kinase, interferon-inducible double-stranded RNA-dependent activator) |
| Q8BXV2 | BRI3B_MOUSE | Bri3bp | BRI3-binding protein, I3-binding protein |
| Q00896 | A1AT3_MOUSE | Serpina1c | Alpha-1-antitrypsin 1-3 (Alpha-1 protease inhibitor 3) (Alpha-1 protease inhibitor 6) (Alpha-1-antitrypsin 1-6) (Serine protease inhibitor 1-3) (Serine protease inhibitor 1-6) (Serine protease inhibitor A1c, Serpin A1c) |
| P26339 | CMGA_MOUSE | Chga | Chromogranin-A, CgA [Cleaved into: Pancreastatin; Beta-granin; WE-14; Catestatin; GE-25; Serpinin-RRG; Serpinin (AL26); p-Glu serpinin precursor] |
| Q9WUQ2 | PREB_MOUSE | Preb | Prolactin regulatory element-binding protein (Mammalian guanine nucleotide exchange factor mSec12) |
| Q924W5 | SMC6_MOUSE | Smc6 | Structural maintenance of chromosomes protein 6, SMC protein 6, SMC-6, mSMC6 |
| Q3UMC0 | SPAT5_MOUSE | Spata5 | Ribosome biogenesis protein SPATA5, EC 3.6.4.10 (Spermatogenesis-associated factor protein) (Spermatogenesis-associated protein 5) |
| Q8BRF7 | SCFD1_MOUSE | Scfd1 | Sec1 family domain-containing protein 1 (Syntaxin-binding protein 1-like 2) |
| P48193 | EPB41_MOUSE | Epb41 | Protein 4.1, P4.1 (4.1R) (Band 4.1) (Erythrocyte membrane protein band 4.1) |
| Q9Z2M7 | PMM2_MOUSE | Pmm2 | Phosphomannomutase 2, PMM 2, EC 5.4.2.8 |
| Q4V9Z5 | SE6L2_MOUSE | Sez6l2 | Seizure 6-like protein 2 (Brain-specific receptor-like protein A, BSRP-A) |

| | | | |
|--------|-------------|---------|--|
| Q9D6T0 | NOSIP_MOUSE | Nosip | Nitric oxide synthase-interacting protein (E3 ubiquitin-protein ligase NOSIP, EC 2.3.2.27) (RING-type E3 ubiquitin transferase NOSIP) |
| Q6PEB6 | PHOCN_MOUSE | Mob4 | MOB-like protein phocin (Class II mMOB1) (Mob1 homolog 3, Mob3) (Mps one binder kinase activator-like 3) (Preimplantation protein 3) |
| O88712 | CTBP1_MOUSE | Ctbp1 | C-terminal-binding protein 1, CtBP1, EC 1.1.1.- |
| Q9D902 | T2EB_MOUSE | Gtf2e2 | General transcription factor IIE subunit 2 (Transcription initiation factor IIE subunit beta, TFIIE-beta) |
| Q9D164 | FXYD6_MOUSE | Fxyd6 | FXYD domain-containing ion transport regulator 6 (PLM-like protein) (Phosphohippolin) |
| P05132 | KAPCA_MOUSE | Prkaca | cAMP-dependent protein kinase catalytic subunit alpha, PKA C-alpha, EC 2.7.11.11 |
| O88291 | ZN326_MOUSE | Znf326 | DBIRD complex subunit ZNF326 (Zinc finger protein 326) (Zinc finger protein interacting with mRNPs) (Zinc finger protein-associated with nuclear matrix of 75 kDa) |
| P55821 | STMN2_MOUSE | Stmn2 | Stathmin-2 (Superior cervical ganglion-10 protein, Protein SCG10) |
| P52479 | UBP10_MOUSE | Usp10 | Ubiquitin carboxyl-terminal hydrolase 10, EC 3.4.19.12 (Deubiquitinating enzyme 10) (Ubiquitin thioesterase 10) (Ubiquitin-specific-processing protease 10) |
| P24369 | PPIB_MOUSE | Ppib | Peptidyl-prolyl cis-trans isomerase B, PPIase B, EC 5.2.1.8 (CYP-S1) (Cyclophilin B) (Rotamase B) (S-cyclophilin, SCYLP) |
| P50149 | GNAT2_MOUSE | Gnat2 | Guanine nucleotide-binding protein G(t) subunit alpha-2 (Transducin alpha-2 chain) |
| Q9JLM8 | DCLK1_MOUSE | Dclk1 | Serine/threonine-protein kinase DCLK1, EC 2.7.11.1 (Doublecortin-like and CAM kinase-like 1) (Doublecortin-like kinase 1) |
| Q9JJU8 | SH3L1_MOUSE | Sh3bgrl | SH3 domain-binding glutamic acid-rich-like protein |
| Q6VNB8 | WDFY3_MOUSE | Wdfy3 | WD repeat and FYVE domain-containing protein 3 (Beach domain, WD repeat and FYVE domain-containing protein 1, BWF1) |
| Q8BUY5 | TIDC1_MOUSE | Timmdc1 | Complex I assembly factor TIMMDC1, mitochondrial (Translocase of inner mitochondrial membrane domain-containing protein 1, TIMM domain containing-protein 1) |
| Q80XN0 | BDH_MOUSE | Bdh1 | D-beta-hydroxybutyrate dehydrogenase, mitochondrial, EC 1.1.1.30 (3-hydroxybutyrate dehydrogenase, BDH) |
| Q9EPC1 | PARVA_MOUSE | Parva | Alpha-parvin (Actopaxin) |
| Q7TNR6 | IGS21_MOUSE | Igsf21 | Immunoglobulin superfamily member 21, IgSF21 |
| Q8BHI9 | SLU7_MOUSE | Slu7 | Pre-mRNA-splicing factor SLU7 |

| | | | |
|--------|-------------|---------|---|
| Q6ZWY8 | TYB10_MOUSE | Tmsb10 | Thymosin beta-10 |
| Q61503 | 5NTD_MOUSE | Nt5e | 5'-nucleotidase, 5'-NT, EC 3.1.3.5 (Ecto-5'-nucleotidase) (CD antigen CD73) |
| P28481 | CO2A1_MOUSE | Col2a1 | Collagen alpha-1(II) chain (Alpha-1 type II collagen) [Cleaved into: Collagen alpha-1(II) chain; Chondrocalcin] |
| Q91W82 | UB2E2_MOUSE | Ube2e2 | Ubiquitin-conjugating enzyme E2 E2, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme E2) (Ubiquitin carrier protein E2) (Ubiquitin-protein ligase E2) |
| P83887 | TBG1_MOUSE | Tubg1 | Tubulin gamma-1 chain (Gamma-1-tubulin) (Gamma-tubulin complex component 1, GCP-1) |
| Q9D1L0 | CHCH2_MOUSE | Chchd2 | Coiled-coil-helix-coiled-coil-helix domain-containing protein 2 |
| Q80YD1 | SUV3_MOUSE | Supv3l1 | ATP-dependent RNA helicase SUPV3L1, mitochondrial, EC 3.6.4.13 (Suppressor of var1 3-like protein 1, SUV3-like protein 1) |
| Q8K1L5 | PP1RB_MOUSE | Ppp1r11 | E3 ubiquitin-protein ligase PPP1R11, EC 2.3.2.27 (Protein phosphatase 1 regulatory subunit 11) (T-complex testis expressed protein 5, Tctex-5) |
| Q9CYA6 | ZCHC8_MOUSE | Zcchc8 | Zinc finger CCHC domain-containing protein 8 (TRAMP-like complex RNA-binding factor ZCCHC8) |
| Q8R3G1 | PP1R8_MOUSE | Ppp1r8 | Nuclear inhibitor of protein phosphatase 1, NIPP-1 (Protein phosphatase 1 regulatory inhibitor subunit 8) |
| Q8C092 | TAF5_MOUSE | Taf5 | Transcription initiation factor TFIID subunit 5 (Transcription initiation factor TFIID 100 kDa subunit, TAF(II)100, TAFII-100, TAFIII100) |
| Q9D9V3 | ECHD1_MOUSE | Echdc1 | Ethylmalonyl-CoA decarboxylase, EC 4.1.1.94 (Enoyl-CoA hydratase domain-containing protein 1) (Methylmalonyl-CoA decarboxylase, MMCD) |
| Q9DB60 | PXL2B_MOUSE | Prxl2b | Prostamide/prostaglandin F synthase, Prostamide/PGF synthase, Prostamide/PGF synthase, EC 1.11.1.20 (Peroxiredoxin-like 2B) |
| Q9D1D4 | TMEDA_MOUSE | Tmed10 | Transmembrane emp24 domain-containing protein 10, Protein Tmed10 (21 kDa transmembrane-trafficking protein) (Transmembrane protein Tmp21) (p24 family protein delta-1, p24delta1) |
| A2BH40 | ARI1A_MOUSE | Arid1a | AT-rich interactive domain-containing protein 1A, ARID domain-containing protein 1A (BRG1-associated factor 250, BAF250) (BRG1-associated factor 250a, BAF250A) (Osa homolog 1) (SWI-like protein) (SWI/SNF complex protein p270) (SWI/SNF-related, matrix-associated, actin-dependent regulator of chromatin subfamily F member 1) |

| | | | |
|--------|-------------|----------|---|
| P41230 | KDM5C_MOUSE | Kdm5c | Lysine-specific demethylase 5C, EC 1.14.11.67 (Histone demethylase JARID1C) (Jumonji/ARID domain-containing protein 1C) (Protein SmcX) (Protein Xe169) ([histone H3]-trimethyl-L-lysine(4) demethylase 5C) |
| Q91YY4 | ATPF2_MOUSE | Atpaf2 | ATP synthase mitochondrial F1 complex assembly factor 2 |
| Q8C0M9 | ASGL1_MOUSE | Asrgl1 | Isoaspartyl peptidase/L-asparaginase, EC 3.4.19.5, EC 3.5.1.1 (Asparaginase-like protein 1) (Beta-aspartyl-peptidase) (Isoaspartyl dipeptidase) (L-asparagine amidohydrolase) [Cleaved into: Isoaspartyl peptidase/L-asparaginase alpha chain; Isoaspartyl peptidase/L-asparaginase beta chain] |
| Q9QZH6 | ECSIT_MOUSE | Ecsit | Evolutionarily conserved signaling intermediate in Toll pathway, mitochondrial (Protein SITPEC) |
| Q6QD59 | SEC20_MOUSE | Bnip1 | Vesicle transport protein SEC20 |
| Q9Z0W1 | TNR16_MOUSE | Ngfr | Tumor necrosis factor receptor superfamily member 16 (Low affinity neurotrophin receptor p75NTR) (Low-affinity nerve growth factor receptor, NGF receptor) (CD antigen CD271) |
| Q05512 | MARK2_MOUSE | Mark2 | Serine/threonine-protein kinase MARK2, EC 2.7.11.1, EC 2.7.11.26 (ELKL motif kinase 1, EMK-1) (MAP/microtubule affinity-regulating kinase 2) (PAR1 homolog) (PAR1 homolog b, Par-1b, mPar-1b) |
| Q99KH8 | STK24_MOUSE | Stk24 | Serine/threonine-protein kinase 24, EC 2.7.11.1 (Mammalian STE20-like protein kinase 3, MST-3) (STE20-like kinase MST3) [Cleaved into: Serine/threonine-protein kinase 24 35 kDa subunit (Mammalian STE20-like protein kinase 3 N-terminal, MST3/N); Serine/threonine-protein kinase 24 12 kDa subunit (Mammalian STE20-like protein kinase 3 C-terminal, MST3/C)] |
| Q3UHA3 | SPTCS_MOUSE | Spg11 | Spatacsin (Spastic paraplegia 11 protein homolog) |
| Q62465 | VAT1_MOUSE | Vat1 | Synaptic vesicle membrane protein VAT-1 homolog, EC 1.-.-.- |
| Q8R016 | BLMH_MOUSE | Blmh | Bleomycin hydrolase, BH, BLM hydrolase, BMH, EC 3.4.22.40 |
| Q91YJ2 | SNX4_MOUSE | Snx4 | Sorting nexin-4 |
| P84089 | ERH_MOUSE | Erh | Enhancer of rudimentary homolog, Mer |
| O89079 | COPE_MOUSE | Cope | Coatomer subunit epsilon (Epsilon-coat protein, Epsilon-COP) |
| P20065 | TYB4_MOUSE | Tmsb4x | Thymosin beta-4, T beta 4 [Cleaved into: Hemoregulatory peptide AcSDKP (N-acetyl-SDKP, AcSDKP) (Seraspenide)] |
| Q99LM2 | CK5P3_MOUSE | Cdk5rap3 | CDK5 regulatory subunit-associated protein 3 |

| | | | |
|--------|-------------|----------|--|
| P97372 | PSME2_MOUSE | Psme2 | Proteasome activator complex subunit 2 (11S regulator complex subunit beta, REG-beta) (Activator of multicatalytic protease subunit 2) (Proteasome activator 28 subunit beta, PA28b, PA28beta) |
| Q8K274 | KT3K_MOUSE | Fn3krp | Ketosamine-3-kinase, EC 2.7.1.172 (Fructosamine-3-kinase-related protein, FN3K-RP, FN3K-related protein) (Protein-psicosamine 3-kinase FN3KRP, EC 2.7.1.-) |
| Q6ZWY3 | RS27L_MOUSE | Rps27l | 40S ribosomal protein S27-like |
| Q3V3Q7 | PACS2_MOUSE | Pacs2 | Phosphofurin acidic cluster sorting protein 2, PACS-2 (PACS1-like protein) |
| Q3TYA6 | MPP8_MOUSE | Mphosph8 | M-phase phosphoprotein 8 |
| O55135 | IF6_MOUSE | Eif6 | Eukaryotic translation initiation factor 6, eIF-6 (B4 integrin interactor) (CAB) (p27(BBP)) |
| Q6PAK3 | ANM8_MOUSE | Prmt8 | Protein arginine N-methyltransferase 8, EC 2.1.1.319 (Heterogeneous nuclear ribonucleoprotein methyltransferase-like protein 4) |
| Q9DBS1 | TMM43_MOUSE | Tmem43 | Transmembrane protein 43 (Protein LUMA) |
| Q9JI90 | RNF14_MOUSE | Rnf14 | E3 ubiquitin-protein ligase RNF14, EC 2.3.2.31 (Androgen receptor-associated protein 54) (Protein Triad2) (RING finger protein 14) |
| P63330 | PP2AA_MOUSE | Ppp2ca | Serine/threonine-protein phosphatase 2A catalytic subunit alpha isoform, PP2A-alpha, EC 3.1.3.16 |
| O54751 | CRX_MOUSE | Crx | Cone-rod homeobox protein |
| O88735 | MAP7_MOUSE | Map7 | Enscosin (Epithelial microtubule-associated protein of 115 kDa, E-MAP-115) (Microtubule-associated protein 7, MAP-7) |
| Q99JX4 | EIF3M_MOUSE | Eif3m | Eukaryotic translation initiation factor 3 subunit M, eIF3m (PCI domain-containing protein 1) |
| Q8R3Q2 | PP6R2_MOUSE | Ppp6r2 | Serine/threonine-protein phosphatase 6 regulatory subunit 2 (SAPS domain family member 2) |
| Q91WK0 | LRRF2_MOUSE | Lrrfip2 | Leucine-rich repeat flightless-interacting protein 2, LRR FLII-interacting protein 2 |
| Q9DCJ1 | LST8_MOUSE | Mlst8 | Target of rapamycin complex subunit LST8, TORC subunit LST8 (G protein beta subunit-like, Protein GbetaL) (Mammalian lethal with SEC13 protein 8, mLST8) |
| Q61103 | REQU_MOUSE | Dpf2 | Zinc finger protein ubi-d4 (Apoptosis response zinc finger protein) (BRG1-associated factor 45D, BAF45D) (D4, zinc and double PHD fingers family 2) (Protein requiem) |
| Q80X50 | UBP2L_MOUSE | Ubp2l | Ubiquitin-associated protein 2-like |
| P70698 | PYRG1_MOUSE | Ctps1 | CTP synthase 1, EC 6.3.4.2 (CTP synthetase 1) (UTP--ammonia ligase 1) |

| | | | |
|--------|-------------|--------|--|
| P70670 | NACAM_MOUSE | Naca | Nascent polypeptide-associated complex subunit alpha, muscle-specific form (Alpha-NAC, muscle-specific form, skNAC) |
| Q8R4R6 | NUP35_MOUSE | Nup35 | Nucleoporin NUP35 (35 kDa nucleoporin) (Mitotic phosphoprotein 44, MP-44) (Nuclear pore complex protein Nup53) (Nucleoporin NUP53) |
| P69566 | RANB9_MOUSE | Ranbp9 | Ran-binding protein 9, RanBP9 (B-cell antigen receptor Ig beta-associated protein 1, IBAP-1) (Ran-binding protein M, RanBPM) |
| Q8CCS6 | PABP2_MOUSE | Pabpn1 | Polyadenylate-binding protein 2, PABP-2, Poly(A)-binding protein 2 (Nuclear poly(A)-binding protein 1) (Poly(A)-binding protein II, PABII) (Polyadenylate-binding nuclear protein 1) |
| Q8BGA9 | OXA1L_MOUSE | Oxa1l | Mitochondrial inner membrane protein OXA1L (Oxidase assembly 1-like protein, OXA1-like protein) |
| Q9QXZ7 | NR2E3_MOUSE | Nr2e3 | Photoreceptor-specific nuclear receptor (Nuclear receptor subfamily 2 group E member 3) (Retina-specific nuclear receptor) |
| Q8BWT1 | THIM_MOUSE | Acaa2 | 3-ketoacyl-CoA thiolase, mitochondrial, EC 2.3.1.16 (Acetyl-CoA acetyltransferase, EC 2.3.1.9) (Acetyl-CoA acyltransferase) (Acyl-CoA hydrolase, mitochondrial, EC 3.1.2.-, EC 3.1.2.1, EC 3.1.2.2) (Beta-ketothiolase) (Mitochondrial 3-oxoacyl-CoA thiolase) |
| Q80Z38 | SHAN2_MOUSE | Shank2 | SH3 and multiple ankyrin repeat domains protein 2, Shank2 (Cortactin-binding protein 1, CortBP1) |
| O08784 | TCOF_MOUSE | Tcof1 | Treacle protein (Treacher Collins syndrome protein homolog) |
| P70236 | MP2K6_MOUSE | Map2k6 | Dual specificity mitogen-activated protein kinase kinase 6, MAP kinase kinase 6, MAPKK 6, EC 2.7.12.2 (MAPK/ERK kinase 6, MEK 6) (SAPKK3) |
| P62488 | RPB7_MOUSE | Polr2g | DNA-directed RNA polymerase II subunit RPB7, RNA polymerase II subunit B7 (DNA-directed RNA polymerase II subunit G) |
| Q80Y55 | BSDC1_MOUSE | Bsdc1 | BSD domain-containing protein 1 |
| P61327 | MGN_MOUSE | Magoh | Protein mago nashi homolog |
| Q9EPV8 | UBL5_MOUSE | Ubl5 | Ubiquitin-like protein 5 |
| Q8R1V4 | TMED4_MOUSE | Tmed4 | Transmembrane emp24 domain-containing protein 4 (Endoplasmic reticulum stress-response protein 25, ERS25) (p24 family protein alpha-3, p24alpha3) (p26) |
| Q8BFQ8 | GALD1_MOUSE | Gatd1 | Glutamine amidotransferase-like class 1 domain-containing protein 1 (Parkinson disease 7 domain-containing protein 1) |
| Q3UVL4 | VPS51_MOUSE | Vps51 | Vacuolar protein sorting-associated protein 51 homolog (Protein fat-free homolog) |

| | | | |
|--------|-------------|----------|---|
| Q5HZG4 | TAF3_MOUSE | Taf3 | Transcription initiation factor TFIID subunit 3 (140 kDa TATA box-binding protein-associated factor) (TBP-associated factor 3) (Transcription initiation factor TFIID 140 kDa subunit, TAF(II)140, TAF140, TAFII-140, TAFII140) |
| Q9CW46 | RAVR1_MOUSE | Raver1 | Ribonucleoprotein PTB-binding 1 (Protein raver-1) |
| Q8C0G2 | T3JAM_MOUSE | Traf3ip3 | TRAF3-interacting JNK-activating modulator (TRAF3-interacting protein 3) |
| Q6NVF0 | OCRL_MOUSE | Ocrl | Inositol polyphosphate 5-phosphatase OCRL, EC 3.1.3.36, EC 3.1.3.56 (Inositol polyphosphate 5-phosphatase OCRL-1) (Phosphatidylinositol 3,4,5-triphosphate 5-phosphatase, EC 3.1.3.86) |
| E9Q5K9 | YTDC1_MOUSE | Ythdc1 | YTH domain-containing protein 1 |
| Q91VU6 | DCA11_MOUSE | Dcaf11 | DDB1- and CUL4-associated factor 11 (WD repeat-containing protein 23) |
| Q9DBR3 | ARMC8_MOUSE | Armc8 | Armadillo repeat-containing protein 8 |
| Q99JX3 | GORS2_MOUSE | Gorasp2 | Golgi reassembly-stacking protein 2, GRS2 (Golgi reassembly-stacking protein of 55 kDa, GRASP55) |
| Q8BNU0 | ARMC6_MOUSE | Armc6 | Armadillo repeat-containing protein 6 |
| Q61749 | EI2BD_MOUSE | Eif2b4 | Translation initiation factor eIF-2B subunit delta (eIF-2B GDP-GTP exchange factor subunit delta) |
| Q8CIM7 | CP2DQ_MOUSE | Cyp2d26 | Cytochrome P450 2D26, EC 1.14.14.1 (CYPIID26) |
| Q9QX11 | CYH1_MOUSE | Cyth1 | Cytohesin-1 (PH, SEC7 and coiled-coil domain-containing protein 1, CLM1) (SEC7 homolog A, mSec7-1) |
| P26040 | EZRI_MOUSE | Ezr | Ezrin (Cytovillin) (Villin-2) (p81) |
| Q99LC8 | EI2BA_MOUSE | Eif2b1 | Translation initiation factor eIF-2B subunit alpha (eIF-2B GDP-GTP exchange factor subunit alpha) |
| P97792 | CXAR_MOUSE | Cxadr | Coxsackievirus and adenovirus receptor homolog, CAR, mCAR |
| P62315 | SMD1_MOUSE | Snrpd1 | Small nuclear ribonucleoprotein Sm D1, Sm-D1 (Sm-D autoantigen) (snRNP core protein D1) |
| Q8BJZ4 | RT35_MOUSE | Mrps35 | 28S ribosomal protein S35, mitochondrial, MRP-S35, S35mt |
| Q9D2C2 | SAAL1_MOUSE | Saal1 | Protein SAAL1 (Synoviocyte proliferation-associated in collagen-induced arthritis protein 1, SPACIA1) |
| Q6NXJ0 | WWC2_MOUSE | Wwc2 | Protein WWC2 (WW domain-containing protein 2) |
| Q924A2 | CIC_MOUSE | Cic | Protein capicua homolog |
| Q05CL8 | LARP7_MOUSE | Larp7 | La-related protein 7 (La ribonucleoprotein domain family member 7) |

| | | | |
|--------|-------------|-------|--|
| Q9D0D4 | DIM1_MOUSE | Dimt1 | Probable dimethyladenosine transferase, EC 2.1.1.183 (DIM1 dimethyladenosine transferase 1 homolog) (DIM1 dimethyladenosine transferase 1-like) (Probable 18S rRNA (adenine(1779)-N(6)/adenine(1780)-N(6))-dimethyltransferase) (Probable 18S rRNA dimethylase) (Probable S-adenosylmethionine-6-N',N'-adenosyl(rRNA) dimethyltransferase) |
| P70353 | NFYC_MOUSE | Nfyc | Nuclear transcription factor Y subunit gamma (CAAT box DNA-binding protein subunit C) (Nuclear transcription factor Y subunit C, NF-YC) |
| Q8BTS4 | NUP54_MOUSE | Nup54 | Nuclear pore complex protein Nup54 (54 kDa nucleoporin) (Nucleoporin Nup54) |
| Q9D3E6 | STAG1_MOUSE | Stag1 | Cohesin subunit SA-1 (SCC3 homolog 1) (Stromal antigen 1) |
| P13439 | UMPS_MOUSE | Umps | Uridine 5'-monophosphate synthase, UMP synthase [Includes: Orotate phosphoribosyltransferase, OPRTase, EC 2.4.2.10; Orotidine 5'-phosphate decarboxylase, EC 4.1.1.23 (OMPdecase)] |
| O35435 | PYRD_MOUSE | Dhodh | Dihydroorotate dehydrogenase (quinone), mitochondrial, DHODEHase, EC 1.3.5.2 (Dihydroorotate oxidase) |
| Q8K224 | NAT10_MOUSE | Nat10 | RNA cytidine acetyltransferase, EC 2.3.1.- (18S rRNA cytosine acetyltransferase) (N-acetyltransferase 10) |
| P97817 | CDR2_MOUSE | Cdr2 | Cerebellar degeneration-related protein 2 |
| O08586 | PTEN_MOUSE | Pten | Phosphatidylinositol 3,4,5-trisphosphate 3-phosphatase and dual-specificity protein phosphatase PTEN, EC 3.1.3.16, EC 3.1.3.48, EC 3.1.3.67 (Mutated in multiple advanced cancers 1) (Phosphatase and tensin homolog) |
| Q61102 | ABCB7_MOUSE | Abcb7 | Iron-sulfur clusters transporter ABCB7, mitochondrial (ATP-binding cassette sub-family B member 7, mitochondrial) (ATP-binding cassette transporter 7, ABC transporter 7 protein) |
| Q3TDN2 | FAF2_MOUSE | Faf2 | FAS-associated factor 2 (UBX domain-containing protein 8) |
| Q9EQH2 | ERAP1_MOUSE | Erap1 | Endoplasmic reticulum aminopeptidase 1, EC 3.4.11.- (ARTS-1) (Adipocyte-derived leucine aminopeptidase, A-LAP) (Aminopeptidase PILS) (Puromycin-insensitive leucyl-specific aminopeptidase, PILS-AP) (VEGF-induced aminopeptidase) |
| Q9WVQ5 | MTNB_MOUSE | Apip | Methylthioribulose-1-phosphate dehydratase, MTRu-1-P dehydratase, EC 4.2.1.109 (APAF1-interacting protein) (Monocyte/macrophage protein 19) |
| Q571K4 | TAB3_MOUSE | Tab3 | TGF-beta-activated kinase 1 and MAP3K7-binding protein 3 (Mitogen-activated protein kinase kinase kinase 7-interacting protein 3) (TAK1-binding protein 3, TAB-3) (TGF-beta-activated kinase 1-binding protein 3) |

| | | | |
|--------|-------------|---------|--|
| Q80TR8 | DCAF1_MOUSE | Dcaf1 | DDB1- and CUL4-associated factor 1 (Serine/threonine-protein kinase VPRBP, EC 2.7.11.1) |
| Q8CG46 | SMC5_MOUSE | Smc5 | Structural maintenance of chromosomes protein 5, SMC protein 5, SMC-5, mSMC5 (Protein expressed in male leptotene and zygotene spermatocytes 453, MLZ-453) |
| P51174 | ACADL_MOUSE | Acadl | Long-chain specific acyl-CoA dehydrogenase, mitochondrial, LCAD, EC 1.3.8.8 |
| Q9JI19 | FIBP_MOUSE | Fibp | Acidic fibroblast growth factor intracellular-binding protein, aFGF intracellular-binding protein (FGF-1 intracellular-binding protein) |
| Q61333 | TNAP2_MOUSE | Tnfaip2 | Tumor necrosis factor alpha-induced protein 2, TNF alpha-induced protein 2 (Primary response gene B94 protein) |
| P15532 | NDKA_MOUSE | Nme1 | Nucleoside diphosphate kinase A, NDK A, NDP kinase A, EC 2.7.4.6 (Metastasis inhibition factor NM23) (NDPK-A) (Tumor metastatic process-associated protein) (nm23-M1) |
| Q91YE7 | RBM5_MOUSE | Rbm5 | RNA-binding protein 5 (Putative tumor suppressor LUCA15) (RNA-binding motif protein 5) |
| Q8R3V5 | SHLB2_MOUSE | Sh3glb2 | Endophilin-B2 (SH3 domain-containing GRB2-like protein B2) |
| O35326 | SRSF5_MOUSE | Srsf5 | Serine/arginine-rich splicing factor 5 (Delayed-early protein HRS) (Pre-mRNA-splicing factor SRP40) (Splicing factor, arginine/serine-rich 5) |
| Q9D020 | 5NT3A_MOUSE | Nt5c3a | Cytosolic 5'-nucleotidase 3A, EC 3.1.3.5 (7-methylguanosine phosphate-specific 5'-nucleotidase, 7-methylguanosine nucleotidase, EC 3.1.3.91) (Cytosolic 5'-nucleotidase 3) (Cytosolic 5'-nucleotidase III, cN-III) (Lupin) (Pyrimidine 5'-nucleotidase 1, P5'N-1, P5N-1, PN-I) |
| Q00422 | GABPA_MOUSE | Gabpa | GA-binding protein alpha chain, GABP subunit alpha |
| Q922L6 | NELFD_MOUSE | Nelfcd | Negative elongation factor D, NELF-D (TH1-like protein) |
| P22315 | HEMH_MOUSE | Fech | Ferrochelatase, mitochondrial, EC 4.99.1.1 (Heme synthase) (Protoheme ferro-lyase) |
| Q8CHS8 | VP37A_MOUSE | Vps37a | Vacuolar protein sorting-associated protein 37A, Vps37A (ESCRT-I complex subunit VPS37A) |
| Q3UHD6 | SNX27_MOUSE | Snx27 | Sorting nexin-27 |
| P62774 | MTPN_MOUSE | Mtpn | Myotrophin (Granule cell differentiation protein) (Protein V-1) |
| Q9D358 | PPAC_MOUSE | Acp1 | Low molecular weight phosphotyrosine protein phosphatase, LMW-PTP, LMW-PTPase, EC 3.1.3.48 (Low molecular weight cytosolic acid phosphatase, EC 3.1.3.2) |

| | | | |
|--------|-------------|---------|--|
| Q66GT5 | PTPM1_MOUSE | Ptpmt1 | Phosphatidylglycerophosphatase and protein-tyrosine phosphatase 1, EC 3.1.3.27 (PTEN-like phosphatase) (Phosphoinositide lipid phosphatase) (Protein-tyrosine phosphatase mitochondrial 1, EC 3.1.3.16, EC 3.1.3.48) |
| Q9D8B7 | JAM3_MOUSE | Jam3 | Junctional adhesion molecule C, JAM-C (JAM-2) (Junctional adhesion molecule 3, JAM-3) [Cleaved into: Soluble form of JAM-C, sJAM-C] |
| Q99J08 | S14L2_MOUSE | Sec14l2 | SEC14-like protein 2 (Alpha-tocopherol-associated protein, TAP) |
| Q8BK08 | TMM11_MOUSE | Tmem11 | Transmembrane protein 11, mitochondrial (Protein PM1) |
| Q8VHI6 | WASF3_MOUSE | Wasf3 | Actin-binding protein WASF3 (Protein WAVE-3) (Wiskott-Aldrich syndrome protein family member 3, WASP family protein member 3) |
| Q91VH1 | PAQR1_MOUSE | Adipor1 | Adiponectin receptor protein 1 (Progesterin and adipoQ receptor family member 1) (Progesterin and adipoQ receptor family member 1) |
| Q99NE5 | RIMS1_MOUSE | Rims1 | Regulating synaptic membrane exocytosis protein 1 (Rab-3-interacting molecule 1, RIM 1) (Rab-3-interacting protein 1) |
| A2A8U2 | TM201_MOUSE | Tmem201 | Transmembrane protein 201 (Spindle-associated membrane protein 1) |
| Q921J2 | RHEB_MOUSE | Rheb | GTP-binding protein Rheb (Ras homolog enriched in brain) |
| Q3TMH2 | SCRN3_MOUSE | Scrn3 | Secernin-3 |
| P37040 | NCPR_MOUSE | Por | NADPH--cytochrome P450 reductase, CPR, P450R, EC 1.6.2.4 |
| Q9DB96 | NGDN_MOUSE | Ngdn | Neuroguidin (EIF4E-binding protein) |
| Q91ZE0 | TMLH_MOUSE | Tmlhe | Trimethyllysine dioxygenase, mitochondrial, EC 1.14.11.8 (Epsilon-trimethyllysine 2-oxoglutarate dioxygenase) (TML hydroxylase) (TML-alpha-ketoglutarate dioxygenase, TML dioxygenase, TMLD) |
| Q80UU9 | PGRC2_MOUSE | Pgrmc2 | Membrane-associated progesterone receptor component 2 |
| Q8BXR9 | OSBL6_MOUSE | Osbpl6 | Oxysterol-binding protein-related protein 6, ORP-6, OSBP-related protein 6 |
| Q9JI10 | STK3_MOUSE | Stk3 | Serine/threonine-protein kinase 3, EC 2.7.11.1 (Mammalian STE20-like protein kinase 2, MST-2) (STE20-like kinase MST2) [Cleaved into: Serine/threonine-protein kinase 3 36kDa subunit, MST2/N; Serine/threonine-protein kinase 3 20kDa subunit, MST2/C] |
| Q99JP4 | CDC26_MOUSE | Cdc26 | Anaphase-promoting complex subunit CDC26 (Cell division cycle protein 26 homolog) |
| Q8BYN5 | FSD1L_MOUSE | Fsd1l | FSD1-like protein (Coiled-coil domain-containing protein 10) (FSD1 N-terminal-like protein) |
| Q8R4E6 | PURG_MOUSE | Purg | Purine-rich element-binding protein gamma |

| | | | |
|--------|-------------|--------|--|
| P47934 | CACP_MOUSE | Crat | Carnitine O-acetyltransferase, Carnitine acetylase, EC 2.3.1.137, EC 2.3.1.7 (Carnitine acetyltransferase, CAT, CrAT) |
| Q3TPE9 | ANKY2_MOUSE | Ankmy2 | Ankyrin repeat and MYND domain-containing protein 2 |
| Q9JL8 | SYSM_MOUSE | Sars2 | Serine--tRNA ligase, mitochondrial, EC 6.1.1.11 (SerRSmt) (Seryl-tRNA synthetase, SerRS) (Seryl-tRNA(Ser/Sec) synthetase) |
| Q80XK6 | ATG2B_MOUSE | Atg2b | Autophagy-related protein 2 homolog B |
| O70493 | SNX12_MOUSE | Snx12 | Sorting nexin-12 (SDP8 protein) |
| Q9DBB8 | DHDH_MOUSE | Dhdh | Trans-1,2-dihydrobenzene-1,2-diol dehydrogenase, EC 1.3.1.20 (D-xylose 1-dehydrogenase) (D-xylose-NADP dehydrogenase, EC 1.1.1.179) (Dimeric dihydrodiol dehydrogenase) |
| Q9CXU9 | EIF1B_MOUSE | Eif1b | Eukaryotic translation initiation factor 1b, eIF1b |
| Q9CQH7 | BT3L4_MOUSE | Btf3l4 | Transcription factor BTF3 homolog 4 (Basic transcription factor 3-like 4) |
| Q8K400 | STXB5_MOUSE | Stxbp5 | Syntaxin-binding protein 5 (Lethal(2) giant larvae protein homolog 3) (Tomosyn-1) |
| P29319 | EPHA3_MOUSE | Epha3 | Ephrin type-A receptor 3, EC 2.7.10.1 (EPH-like kinase 4, EK4, mEK4) (Tyrosine-protein kinase TYRO4) (Tyrosine-protein kinase receptor ETK1) |
| Q9WV85 | NDK3_MOUSE | Nme3 | Nucleoside diphosphate kinase 3, NDK 3, NDP kinase 3, EC 2.7.4.6 (DR-nm23) (Nucleoside diphosphate kinase C, NDPKC) (nm23-M3) |
| Q80TL1 | ADCY2_MOUSE | Adcy2 | Adenylate cyclase type 2, EC 4.6.1.1 (ATP pyrophosphate-lyase 2) (Adenylate cyclase type II) (Adenylyl cyclase 2) |
| P52623 | UCK1_MOUSE | Uck1 | Uridine-cytidine kinase 1, UCK 1, EC 2.7.1.48 (Cytidine monophosphokinase 1) (Uridine monophosphokinase 1) |
| P28656 | NP1L1_MOUSE | Nap1l1 | Nucleosome assembly protein 1-like 1 (Brain protein DN38) (NAP-1-related protein) |
| O88967 | YME1_MOUSE | Yme1l1 | ATP-dependent zinc metalloprotease YME1L1, EC 3.4.24.- (ATP-dependent metalloprotease FtsH1) (YME1-like protein 1) |
| Q9JM52 | MINK1_MOUSE | Mink1 | Misshapen-like kinase 1, EC 2.7.11.1 (GCK family kinase MiNK) (MAPK/ERK kinase kinase kinase 6, MEK kinase kinase 6, MEKKK 6) (Misshapen/NIK-related kinase) (Mitogen-activated protein kinase kinase kinase kinase 6) |
| Q80TP3 | UBR5_MOUSE | Ubr5 | E3 ubiquitin-protein ligase UBR5, EC 2.3.2.26 (E3 ubiquitin-protein ligase, HECT domain-containing 1) (HECT-type E3 ubiquitin transferase UBR5) (Hyperplastic discs protein homolog) |

| | | | |
|--------|-------------|----------|--|
| Q9Z2I8 | SUCB2_MOUSE | Suclg2 | Succinate--CoA ligase [GDP-forming] subunit beta, mitochondrial, EC 6.2.1.4 (GTP-specific succinyl-CoA synthetase subunit beta, G-SCS, GTPSCS) (Succinyl-CoA synthetase beta-G chain, SCS-betaG) |
| Q9JK81 | MYG1_MOUSE | Myg1 | MYG1 exonuclease, EC 3.1.-.- (Protein Gamm1) |
| Q9JKX6 | NUDT5_MOUSE | Nudt5 | ADP-sugar pyrophosphatase, EC 3.6.1.13 (8-oxo-dGDP phosphatase, EC 3.6.1.58) (Nuclear ATP-synthesis protein NUDIX5, EC 2.7.7.96) (Nucleoside diphosphate-linked moiety X motif 5, Nudix motif 5) |
| Q8VCI5 | PEX19_MOUSE | Pex19 | Peroxisomal biogenesis factor 19 (Peroxin-19) (Peroxisomal farnesylated protein, PxF) |
| Q3UHE1 | PITM3_MOUSE | Pitpnm3 | Membrane-associated phosphatidylinositol transfer protein 3 (Phosphatidylinositol transfer protein, membrane-associated 3, PITPnm 3) (Pyk2 N-terminal domain-interacting receptor 1, NIR-1) |
| P08030 | APT_MOUSE | Aprt | Adenine phosphoribosyltransferase, APRT, EC 2.4.2.7 |
| O70378 | EMC8_MOUSE | Emc8 | ER membrane protein complex subunit 8 (Neighbor of COX4) |
| O55186 | CD59A_MOUSE | Cd59a | CD59A glycoprotein (MAC-inhibitory protein, MAC-IP) (Membrane attack complex inhibition factor, MACIF) (Protectin) (CD antigen CD59) |
| Q9JHJ0 | TMOD3_MOUSE | Tmod3 | Tropomodulin-3 (Ubiquitous tropomodulin, U-Tmod) |
| Q9D0F6 | RFC5_MOUSE | Rfc5 | Replication factor C subunit 5 (Activator 1 36 kDa subunit, A1 36 kDa subunit) (Activator 1 subunit 5) (Replication factor C 36 kDa subunit, RF-C 36 kDa subunit, RFC36) |
| Q8BKS9 | PUM3_MOUSE | Pum3 | Pumilio homolog 3 |
| Q5SVL6 | RPGP2_MOUSE | Rap1gap2 | Rap1 GTPase-activating protein 2, Rap1GAP2 (GTPase-activating Rap/Ran-GAP domain-like protein 4) |
| Q7TPM6 | FSD1_MOUSE | Fsd1 | Fibronectin type III and SPRY domain-containing protein 1 |
| Q3U1F9 | PHAG1_MOUSE | Pag1 | Phosphoprotein associated with glycosphingolipid-enriched microdomains 1 (Csk-binding protein) (Transmembrane phosphoprotein Cbp) |
| P83870 | PHF5A_MOUSE | Phf5a | PHD finger-like domain-containing protein 5A, PHD finger-like domain protein 5A (Splicing factor 3B-associated 14 kDa protein, SF3b14b) |
| P17918 | PCNA_MOUSE | Pcna | Proliferating cell nuclear antigen, PCNA (Cyclin) |
| P46735 | MYO1B_MOUSE | Myo1b | Unconventional myosin-Ib (MIH-L) (Myosin I alpha, MMI-alpha, MMIa) |
| Q9CWK3 | CD2B2_MOUSE | Cd2bp2 | CD2 antigen cytoplasmic tail-binding protein 2, CD2 cytoplasmic domain-binding protein 2, CD2 tail-binding protein 2 |

| | | | |
|--------|-------------|----------|---|
| P45481 | CBP_MOUSE | Crebbp | Histone lysine acetyltransferase CREBBP, EC 2.3.1.48 (Protein-lysine acetyltransferase CREBBP, EC 2.3.1.-) |
| Q8R035 | ICT1_MOUSE | Mrpl58 | Peptidyl-tRNA hydrolase ICT1, mitochondrial, EC 3.1.1.29 (39S ribosomal protein L58, mitochondrial, MRP-L58) (Immature colon carcinoma transcript 1 protein homolog) |
| Q9CQJ8 | NDUB9_MOUSE | Ndufb9 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 9 (Complex I-B22, CI-B22) (NADH-ubiquinone oxidoreductase B22 subunit) |
| Q9CQG2 | MET16_MOUSE | Mettl16 | RNA N6-adenosine-methyltransferase METTL16 (Methyltransferase 10 domain-containing protein) (Methyltransferase-like protein 16) (N6-adenosine-methyltransferase METTL16, EC 2.1.1.348) (U6 small nuclear RNA (adenine-(43)-N(6))-methyltransferase, EC 2.1.1.346) |
| Q8VBT0 | TMX1_MOUSE | Tmx1 | Thioredoxin-related transmembrane protein 1 (Thioredoxin domain-containing protein 1) |
| Q80TI0 | ASTRB_MOUSE | Gramd1b | Protein Aster-B (GRAM domain-containing protein 1B) |
| P63034 | CYH2_MOUSE | Cyth2 | Cytohesin-2 (ARF nucleotide-binding site opener, Protein ARNO) (PH, SEC7 and coiled-coil domain-containing protein 2, CLM2) (SEC7 homolog B, mSec7-2) |
| Q9DCC4 | P5CR3_MOUSE | Pycr3 | Pyrroline-5-carboxylate reductase 3, P5C reductase 3, P5CR 3, EC 1.5.1.2 (Pyrroline-5-carboxylate reductase-like protein) |
| Q8BXN9 | TM87A_MOUSE | Tmem87a | Transmembrane protein 87A |
| O35454 | CLCN6_MOUSE | Clcn6 | H(+)/Cl(-) exchange transporter 6 (Chloride channel protein 6, ClC-6) (Chloride transport protein 6) |
| Q91WK5 | GCSH_MOUSE | Gesh | Glycine cleavage system H protein, mitochondrial (Lipoic acid-containing protein) |
| Q91WA3 | HDA11_MOUSE | Hdac11 | Histone deacetylase 11, HD11, EC 3.5.1.98 |
| Q8R1I1 | QCR9_MOUSE | Uqcr10 | Cytochrome b-c1 complex subunit 9 (Complex III subunit 9) (Complex III subunit X) (Cytochrome c1 non-heme 7 kDa protein) (Ubiquinol-cytochrome c reductase complex 7.2 kDa protein) |
| Q8BXQ3 | LRTM1_MOUSE | Lrtm1 | Leucine-rich repeat and transmembrane domain-containing protein 1 |
| Q8BK35 | NOP53_MOUSE | Nop53 | Ribosome biogenesis protein NOP53 (Glioma tumor suppressor candidate region gene 2 protein) (PreS1-binding protein) |
| Q80W54 | FACE1_MOUSE | Zmpste24 | CAAX prenyl protease 1 homolog, EC 3.4.24.84 (Farnesylated proteins-converting enzyme 1, FACE-1) (Prenyl protein-specific endoprotease 1) (Zinc metalloproteinase Ste24 homolog) |

| | | | |
|--------|-------------|---------|--|
| P62320 | SMD3_MOUSE | Snrpd3 | Small nuclear ribonucleoprotein Sm D3, Sm-D3 (snRNP core protein D3) |
| P58389 | PTPA_MOUSE | Ptpa | Serine/threonine-protein phosphatase 2A activator, EC 5.2.1.8 (PP2A, subunit B', PR53 isoform) (Phosphotyrosyl phosphatase activator, PTPA) (Serine/threonine-protein phosphatase 2A regulatory subunit 4) (Serine/threonine-protein phosphatase 2A regulatory subunit B') |
| Q8CJ40 | CROCC_MOUSE | Crocc | Rootletin (Ciliary rootlet coiled-coil protein) |
| P39053 | DYN1_MOUSE | Dnm1 | Dynamamin-1, EC 3.6.5.5 |
| P63260 | ACTG_MOUSE | Actg1 | Actin, cytoplasmic 2 (Gamma-actin) [Cleaved into: Actin, cytoplasmic 2, N-terminally processed] |
| Q9R1T4 | SEPT6_MOUSE | Septin6 | Septin-6 |
| Q8VED5 | K2C79_MOUSE | Krt79 | Keratin, type II cytoskeletal 79 (Cytokeratin-79, CK-79) (Keratin-79, K79) (Type-II keratin Kb38) |
| O55042 | SYUA_MOUSE | Snca | Alpha-synuclein (Non-A beta component of AD amyloid) (Non-A4 component of amyloid precursor, NACP) |
| P55012 | S12A2_MOUSE | Slc12a2 | Solute carrier family 12 member 2 (Basolateral Na-K-Cl symporter) (Bumetanide-sensitive sodium-(potassium)-chloride cotransporter 2) |
| Q3UA37 | QRIC1_MOUSE | Qrich1 | Transcriptional regulator QRICH1 (Glutamine-rich protein 1) |
| P58710 | GGLO_MOUSE | Gulo | L-gulonolactone oxidase, LGO, EC 1.1.3.8 (L-gulono-gamma-lactone oxidase, GLO) |
| Q61085 | RHPN1_MOUSE | Rhpn1 | Rhopilin-1 (GTP-Rho-binding protein 1) |
| Q61624 | ZN148_MOUSE | Znf148 | Zinc finger protein 148 (Beta enolase repressor factor 1) (G-rich box-binding protein) (Transcription factor BFCOL1) (Transcription factor ZBP-89) (Zinc finger DNA-binding protein 89) |
| Q8BGH2 | SAM50_MOUSE | Samm50 | Sorting and assembly machinery component 50 homolog |
| P48320 | DCE2_MOUSE | Gad2 | Glutamate decarboxylase 2, EC 4.1.1.15 (65 kDa glutamic acid decarboxylase, GAD-65) (Glutamate decarboxylase 65 kDa isoform) |
| Q3UPH1 | PRRC1_MOUSE | Prrc1 | Protein PRRC1 (Proline-rich and coiled-coil-containing protein 1) |
| Q9JLV1 | BAG3_MOUSE | Bag3 | BAG family molecular chaperone regulator 3, BAG-3 (Bcl-2-associated athanogene 3) (Bcl-2-binding protein Bis) |
| Q80TL7 | MON2_MOUSE | Mon2 | Protein MON2 homolog (Protein SF21) |
| P11247 | PERM_MOUSE | Mpo | Myeloperoxidase, MPO, EC 1.11.2.2 [Cleaved into: Myeloperoxidase light chain; Myeloperoxidase heavy chain] |

| | | | |
|--------|-------------|----------|---|
| P46664 | PURA2_MOUSE | Adss2 | Adenylosuccinate synthetase isozyme 2, AMPSase 2, AdSS 2, EC 6.3.4.4 (Adenylosuccinate synthetase, acidic isozyme) (Adenylosuccinate synthetase, liver isozyme, L-type adenylosuccinate synthetase) (IMP--aspartate ligase 2) |
| O35593 | PSDE_MOUSE | Psmid14 | 26S proteasome non-ATPase regulatory subunit 14, EC 3.4.19.- (26S proteasome regulatory subunit RPN11) (MAD1) |
| Q9ESN9 | JIP3_MOUSE | Mapk8ip3 | C-Jun-amino-terminal kinase-interacting protein 3, JIP-3, JNK-interacting protein 3 (JNK MAP kinase scaffold protein 3) (JNK/SAPK-associated protein 1, JSAP1) (Mitogen-activated protein kinase 8-interacting protein 3) (Sunday driver 2) |
| Q9D824 | FIP1_MOUSE | Fip111 | Pre-mRNA 3'-end-processing factor FIP1 (FIP1-like 1 protein) |
| Q920L1 | FADS1_MOUSE | Fads1 | Acyl-CoA (8-3)-desaturase, EC 1.14.19.44 (Delta(5) fatty acid desaturase, D5D, Delta(5) desaturase, Delta-5 desaturase) (Fatty acid desaturase 1) |
| Q8R1J9 | TOR2A_MOUSE | Tor2a | Torsin-2A (Torsin family 2 member A) |
| Q8R059 | GALE_MOUSE | Gale | UDP-glucose 4-epimerase, EC 5.1.3.2 (Galactowaldenase) (UDP-N-acetylglucosamine 4-epimerase, UDP-GlcNAc 4-epimerase, EC 5.1.3.7) (UDP-galactosamine 4-epimerase, UDP-GalNAc 4-epimerase) (UDP-galactose 4-epimerase) |
| Q8CJ19 | MICA3_MOUSE | Mical3 | [F-actin]-monooxygenase MICAL3, EC 1.14.13.225 (Molecule interacting with CasL protein 3, MICAL-3) |
| Q8CI51 | PDLI5_MOUSE | Pdlim5 | PDZ and LIM domain protein 5 (Enigma homolog) (Enigma-like PDZ and LIM domains protein) |
| Q811Q9 | PCY1B_MOUSE | Pcyt1b | Choline-phosphate cytidyltransferase B, EC 2.7.7.15 (CCT-beta) (CTP:phosphocholine cytidyltransferase B, CCT B, CT B) (Phosphorylcholine transferase B) |
| Q80Y56 | RBNS5_MOUSE | Rbsn | Rabenosyn-5 (FYVE finger-containing Rab5 effector protein rabenosyn-5) (RAB effector RBSN) (Zinc finger FYVE domain-containing protein 20) |
| Q6P9S0 | MTSS2_MOUSE | Mtss2 | Protein MTSS 2 (MTSS1-like protein) |
| Q9R0M4 | PODXL_MOUSE | Podxl | Podocalyxin (Podocalyxin-like protein 1, PC, PCLP-1) |
| Q9JJT0 | RCL1_MOUSE | Rcl1 | RNA 3'-terminal phosphate cyclase-like protein |
| Q9ES56 | TPPC4_MOUSE | Trappc4 | Trafficking protein particle complex subunit 4 (Synbindin) (TRS23 homolog) |
| Q9DB16 | CB39L_MOUSE | Cab39l | Calcium-binding protein 39-like (MO25beta) (Mo25-like protein) |
| Q9CU65 | ZMYM2_MOUSE | Zmym2 | Zinc finger MYM-type protein 2 (Zinc finger protein 198) |
| Q9CR26 | VTA1_MOUSE | Vta1 | Vacuolar protein sorting-associated protein VTA1 homolog (SKD1-binding protein 1, SBP1) |

| | | | |
|--------|-------------|---------|---|
| Q9CPW4 | ARPC5_MOUSE | Arpc5 | Actin-related protein 2/3 complex subunit 5 (Arp2/3 complex 16 kDa subunit, p16-ARC) |
| Q920I9 | WDR7_MOUSE | Wdr7 | WD repeat-containing protein 7 (TGF-beta resistance-associated protein TRAG) |
| Q8CI61 | BAG4_MOUSE | Bag4 | BAG family molecular chaperone regulator 4, BAG-4 (Bcl-2-associated athanogene 4) (Silencer of death domains) |
| Q8C078 | KKCC2_MOUSE | Camkk2 | Calcium/calmodulin-dependent protein kinase kinase 2, CaM-KK 2, CaM-kinase kinase 2, CaMKK 2, EC 2.7.11.17 (Calcium/calmodulin-dependent protein kinase kinase beta, CaM-KK beta, CaM-kinase kinase beta, CaMKK beta) |
| Q8BYL4 | SYYM_MOUSE | Yars2 | Tyrosine--tRNA ligase, mitochondrial, EC 6.1.1.1 (Tyrosyl-tRNA synthetase, TyrRS) |
| Q63850 | NUP62_MOUSE | Nup62 | Nuclear pore glycoprotein p62 (62 kDa nucleoporin) (Nucleoporin Nup62) |
| Q4FK66 | PR38A_MOUSE | Prpf38a | Pre-mRNA-splicing factor 38A |
| Q3UY34 | CSTOS_MOUSE | Custos | Protein CUSTOS |
| Q3UFQ8 | CARL3_MOUSE | Carmil3 | Capping protein, Arp2/3 and myosin-I linker protein 3 (Capping protein regulator and myosin 1 linker protein 3) (Leucine-rich repeat-containing protein 16B) |
| P63168 | DYL1_MOUSE | Dynll1 | Dynein light chain 1, cytoplasmic (8 kDa dynein light chain, DLC8) (Dynein light chain LC8-type 1) (Protein inhibitor of neuronal nitric oxide synthase, PIN, mPIN) |
| O88907 | PIAS1_MOUSE | Pias1 | E3 SUMO-protein ligase PIAS1, EC 2.3.2.27 (DEAD/H box-binding protein 1) (Protein inhibitor of activated STAT protein 1) (RING-type E3 ubiquitin transferase PIAS1) |
| Q9Z1X2 | PTSS2_MOUSE | Ptdss2 | Phosphatidylserine synthase 2, PSS-2, PtdSer synthase 2, EC 2.7.8.29 (Serine-exchange enzyme II) |
| Q9WU42 | NCOR2_MOUSE | Ncor2 | Nuclear receptor corepressor 2, N-CoR2 (Silencing mediator of retinoic acid and thyroid hormone receptor, SMRT, SMRTe) (T3 receptor-associating factor, TRAC) (Thyroid-, retinoic-acid-receptor-associated corepressor) |
| Q9R049 | AMFR_MOUSE | Amfr | E3 ubiquitin-protein ligase AMFR, EC 2.3.2.36 (Autocrine motility factor receptor, AMF receptor) (RING-type E3 ubiquitin transferase AMFR) |
| Q9JM13 | RABX5_MOUSE | Rabgef1 | Rab5 GDP/GTP exchange factor (Rabex-5) |
| Q9JKL4 | NDUF3_MOUSE | Ndufaf3 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 3 (Protein 2P1) |
| Q9JKF7 | RM39_MOUSE | Mrpl39 | 39S ribosomal protein L39, mitochondrial, L39mt, MRP-L39 |
| Q9JKD3 | SCAM5_MOUSE | Scamp5 | Secretory carrier-associated membrane protein 5, Secretory carrier membrane protein 5 |

| | | | |
|--------|-------------|---------|--|
| Q9JK42 | PDK2_MOUSE | Pdk2 | [Pyruvate dehydrogenase (acetyl-transferring)] kinase isozyme 2, mitochondrial, EC 2.7.11.2 (Pyruvate dehydrogenase kinase isoform 2, PDH kinase 2) |
| Q9JJZ4 | UB2J1_MOUSE | Ube2j1 | Ubiquitin-conjugating enzyme E2 J1, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme J1) (Non-canonical ubiquitin-conjugating enzyme 1, NCUBE-1) |
| Q9ESJ4 | SPN90_MOUSE | Nckipsd | NCK-interacting protein with SH3 domain (54 kDa VacA-interacting protein, VIP54) (90 kDa N-WASP-interacting protein) (90 kDa SH3 protein interacting with Nck) (SH3 adapter protein SPIN90) (WASP-interacting SH3-domain protein, WISH) (Wiskott-Aldrich syndrome protein-binding protein, N-WASP-binding protein) |
| Q9DCT6 | BAP18_MOUSE | Bap18 | Chromatin complexes subunit BAP18 (BPTF-associated protein of 18 kDa) |
| Q9DCF9 | SSRG_MOUSE | Ssr3 | Translocon-associated protein subunit gamma, TRAP-gamma (Signal sequence receptor subunit gamma, SSR-gamma) |
| Q9DBZ5 | EIF3K_MOUSE | Eif3k | Eukaryotic translation initiation factor 3 subunit K, eIF3k (Eukaryotic translation initiation factor 3 subunit 12) (eIF-3 p25) |
| Q9DBU0 | TM9S1_MOUSE | Tm9sf1 | Transmembrane 9 superfamily member 1 |
| Q9DB29 | IAH1_MOUSE | Iah1 | Isoamyl acetate-hydrolyzing esterase 1 homolog, EC 3.1.-.- |
| Q9DA15 | THEGL_MOUSE | Thegl | Testicular haploid expressed gene protein-like |
| Q9D892 | ITPA_MOUSE | Itpa | Inosine triphosphate pyrophosphatase, ITPase, Inosine triphosphatase, EC 3.6.1.9 (Non-canonical purine NTP pyrophosphatase) (Non-standard purine NTP pyrophosphatase) (Nucleoside-triphosphate diphosphatase) (Nucleoside-triphosphate pyrophosphatase, NTPase) |
| Q9D7N3 | RT09_MOUSE | Mrps9 | 28S ribosomal protein S9, mitochondrial, MRP-S9, S9mt |
| Q9D6K5 | SYJ2B_MOUSE | Synj2bp | Synaptojanin-2-binding protein (Activin receptor-interacting protein 2) (Activin receptor-interacting protein 4) (Mitochondrial outer membrane protein 25) |
| Q9D6J5 | NDUB8_MOUSE | Ndufb8 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 8, mitochondrial (Complex I-ASH1, CI-ASH1) (NADH-ubiquinone oxidoreductase ASH1 subunit) |
| Q9D531 | NXNL2_MOUSE | Nxn12 | Nucleoredoxin-like protein 2 (Rod-derived cone viability factor 2, RdCVF2) |
| Q9D4C9 | CLVS1_MOUSE | Clvs1 | Clavesin-1 (Retinaldehyde-binding protein 1-like 1) |
| Q9D115 | ZN706_MOUSE | Znf706 | Zinc finger protein 706 |
| Q9CZQ9 | BBS5_MOUSE | Bbs5 | Bardet-Biedl syndrome 5 protein homolog |
| Q9CZG9 | PDZ11_MOUSE | Pdzd11 | PDZ domain-containing protein 11 |

| | | | |
|--------|-------------|---------|---|
| Q9CWW6 | PIN4_MOUSE | Pin4 | Peptidyl-prolyl cis-trans isomerase NIMA-interacting 4, EC 5.2.1.8 (Parvulin-14, Par14) (Peptidyl-prolyl cis-trans isomerase Pin4, PPIase Pin4) (Rotamase Pin4) |
| Q9CSV6 | SFT2C_MOUSE | Sft2d3 | Vesicle transport protein SFT2C (SFT2 domain-containing protein 3) |
| Q9CR88 | RT14_MOUSE | Mrps14 | 28S ribosomal protein S14, mitochondrial, MRP-S14, S14mt |
| Q9CR57 | RL14_MOUSE | Rpl14 | 60S ribosomal protein L14 |
| Q9CQX8 | KGD4_MOUSE | Mrps36 | Alpha-ketoglutarate dehydrogenase component 4 |
| Q9CQS8 | SC61B_MOUSE | Sec61b | Protein transport protein Sec61 subunit beta |
| Q9CQL7 | MOFA1_MOUSE | Mrfap1 | MORF4 family-associated protein 1 (Protein associated with MRG of 14 kDa) |
| Q9CQA1 | TPPC5_MOUSE | Trappc5 | Trafficking protein particle complex subunit 5 |
| Q9CPP0 | NPM3_MOUSE | Npm3 | Nucleoplasmin-3 |
| Q99PM3 | TF2AA_MOUSE | Gtf2a1 | Transcription initiation factor IIA subunit 1 (General transcription factor IIA subunit 1) [Cleaved into: Transcription initiation factor IIA alpha chain (TFIIA p35 subunit); Transcription initiation factor IIA beta chain (TFIIA p19 subunit)] |
| Q923D4 | SF3B5_MOUSE | Sf3b5 | Splicing factor 3B subunit 5, SF3b5 (Pre-mRNA-splicing factor SF3b 10 kDa subunit) |
| Q923D2 | BLVRB_MOUSE | Blvrb | Flavin reductase (NADPH), FR, EC 1.5.1.30 (Biliverdin reductase B, BVR-B, EC 1.3.1.24) (Biliverdin-IX beta-reductase) (NADPH-dependent diaphorase) (NADPH-flavin reductase, FLR) |
| Q921Y0 | MOB1A_MOUSE | Mob1a | MOB kinase activator 1A (Mob1 homolog 1B) (Mps one binder kinase activator-like 1B) |
| Q91YN5 | UAP1_MOUSE | Uap1 | UDP-N-acetylhexosamine pyrophosphorylase [Includes: UDP-N-acetylgalactosamine pyrophosphorylase, EC 2.7.7.83; UDP-N-acetylglucosamine pyrophosphorylase, EC 2.7.7.23] |
| Q91W29 | COX42_MOUSE | Cox4i2 | Cytochrome c oxidase subunit 4 isoform 2, mitochondrial (Cytochrome c oxidase subunit IV isoform 2, COX IV-2) |
| Q91VH6 | MEMO1_MOUSE | Memo1 | Protein MEMO1 (Mediator of ErbB2-driven cell motility 1, Memo-1) |
| Q8VEH6 | CBWD1_MOUSE | Cbwd1 | COBW domain-containing protein 1 (Cobalamin synthase W domain-containing protein 1) |
| Q8VE95 | CH082_MOUSE | | UPF0598 protein C8orf82 homolog |
| Q8VDL4 | ADPGK_MOUSE | Adpgk | ADP-dependent glucokinase, ADP-GK, ADPGK, EC 2.7.1.147 |
| Q8VCL2 | SCO2_MOUSE | Sco2 | Protein SCO2 homolog, mitochondrial |
| Q8VBV8 | GUC1B_MOUSE | Guca1b | Guanylyl cyclase-activating protein 2, GCAP 2 (Guanylate cyclase activator 1B) |

| | | | |
|--------|-------------|-----------|---|
| Q8R5F3 | OARD1_MOUSE | Oard1 | ADP-ribose glycohydrolase OARD1 (O-acetyl-ADP-ribose deacetylase 1, EC 3.5.1.-) (Terminal ADP-ribose protein glycohydrolase 1) ([Protein ADP-ribosylglutamate] hydrolase OARD1, EC 3.2.2.-) |
| Q8R464 | CADM4_MOUSE | Cadm4 | Cell adhesion molecule 4 (Immunoglobulin superfamily member 4C, IgSF4C) (Nectin-like protein 4, NECL-4) (TSLC1-like protein 2) |
| Q8R404 | MIC13_MOUSE | Micos13 | MICOS complex subunit MIC13 |
| Q8R361 | RFIP5_MOUSE | Rab11fip5 | Rab11 family-interacting protein 5, Rab11-FIP5 (Rab11-interacting protein Rip11) |
| Q8R0G7 | SPNS1_MOUSE | Spns1 | Protein spinster homolog 1 |
| Q8R010 | AIMP2_MOUSE | Aimp2 | Aminoacyl tRNA synthase complex-interacting multifunctional protein 2 (Multisynthase complex auxiliary component p38) (Protein JTV-1) |
| Q8K448 | ABCA5_MOUSE | Abca5 | Cholesterol transporter ABCA5, EC 7.6.2.- (ATP-binding cassette sub-family A member 5) |
| Q8K3A0 | HSC20_MOUSE | Hscb | Iron-sulfur cluster co-chaperone protein HscB [Cleaved into: Iron-sulfur cluster co-chaperone protein HscB, mitochondrial, C-HSC20; Iron-sulfur cluster co-chaperone protein HscB, cytoplasmic] |
| Q8K2T1 | NMRL1_MOUSE | Nmral1 | NmrA-like family domain-containing protein 1 |
| Q8K2Q5 | CHCH7_MOUSE | Chchd7 | Coiled-coil-helix-coiled-coil-helix domain-containing protein 7 |
| Q8K2C8 | GPAT4_MOUSE | Gpat4 | Glycerol-3-phosphate acyltransferase 4, GPAT4, EC 2.3.1.15 (1-acylglycerol-3-phosphate O-acyltransferase 6, 1-AGP acyltransferase 6, 1-AGPAT 6) (Acyl-CoA:glycerol-3-phosphate acyltransferase 4) (Lysophosphatidic acid acyltransferase zeta, LPAAT-zeta) (Testis spermatogenesis apoptosis-related protein 7) |
| Q8K194 | SNR27_MOUSE | Snrnp27 | U4/U6.U5 small nuclear ribonucleoprotein 27 kDa protein, U4/U6.U5 snRNP 27 kDa protein, U4/U6.U5-27K (U4/U6.U5 tri-snRNP-associated protein 3) |
| Q8K0G5 | EIPR1_MOUSE | Eipr1 | EARP and GARP complex-interacting protein 1 (Endosome-associated recycling protein-interacting protein) (Golgi-associated retrograde protein-interacting protein) (Tumor-suppressing STF cDNA 1 protein) (Tumor-suppressing subchromosomal transferable fragment candidate gene 1 protein) |
| Q8JZV7 | NAGA_MOUSE | Amdhd2 | N-acetylglucosamine-6-phosphate deacetylase, GlcNAc 6-P deacetylase, EC 3.5.1.25 (Amidohydrolase domain-containing protein 2) |
| Q8HW98 | IGLO5_MOUSE | Iglon5 | IgLON family member 5 |
| Q8CEC6 | PPWD1_MOUSE | Ppwd1 | Peptidylprolyl isomerase domain and WD repeat-containing protein 1, EC 5.2.1.8 |

| | | | |
|--------|-------------|----------|---|
| Q8C561 | LMBD2_MOUSE | Lmbrd2 | G-protein coupled receptor-associated protein LMBRD2 (LMBR1 domain-containing protein 2) |
| Q8C163 | EXOG_MOUSE | Exog | Nuclease EXOG, mitochondrial, EC 3.1.30.- (Endonuclease G-like 1, Endo G-like 1) |
| Q8BZW8 | NHLC2_MOUSE | Nhlrc2 | NHL repeat-containing protein 2 |
| Q8BVU5 | NUDT9_MOUSE | Nudt9 | ADP-ribose pyrophosphatase, mitochondrial, EC 3.6.1.13 (ADP-ribose diphosphatase) (ADP-ribose phosphohydrolase) (Adenosine diphosphoribose pyrophosphatase, ADPR-PPase) (Nucleoside diphosphate-linked moiety X motif 9, Nudix motif 9) |
| Q8BTV1 | TUSC3_MOUSE | Tusc3 | Tumor suppressor candidate 3 (Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit TUSC3, Oligosaccharyl transferase subunit TUSC3) (Magnesium uptake/transporter TUSC3) (Protein N33) |
| Q8BTU1 | CFA20_MOUSE | Cfap20 | Cilia- and flagella-associated protein 20 (Gene trap locus 3 protein) |
| Q8BS95 | GPHR_MOUSE | Gpr89 | Golgi pH regulator (Protein GPR89) |
| Q8BR63 | F177A_MOUSE | Fam177a1 | Protein FAM177A1 |
| Q8BP67 | RL24_MOUSE | Rpl24 | 60S ribosomal protein L24 |
| Q8BMI0 | FBX38_MOUSE | Fbxo38 | F-box only protein 38 (Modulator of KLF7 activity, MoKA) |
| Q8BIQ5 | CSTF2_MOUSE | Cstf2 | Cleavage stimulation factor subunit 2 (CF-1 64 kDa subunit) (Cleavage stimulation factor 64 kDa subunit, CSTF 64 kDa subunit, CstF-64) |
| Q8BIG7 | CMTD1_MOUSE | Comtd1 | Catechol O-methyltransferase domain-containing protein 1, EC 2.1.1.- |
| Q8BGC1 | CE022_MOUSE | | UPF0489 protein C5orf22 homolog |
| Q8BG40 | KTNB1_MOUSE | Katnb1 | Katanin p80 WD40 repeat-containing subunit B1, Katanin p80 subunit B1 (p80 katanin) |
| Q80Y14 | GLRX5_MOUSE | Glr5 | Glutaredoxin-related protein 5, mitochondrial (Monothiol glutaredoxin-5) |
| Q80WR5 | CA174_MOUSE | | UPF0688 protein C1orf174 homolog |
| Q80TS3 | AGRL3_MOUSE | Adgrl3 | Adhesion G protein-coupled receptor L3 (Letrophilin-3) (Lectomedin-3) |
| Q7TQD2 | TPPP_MOUSE | Tppp | Tubulin polymerization-promoting protein, TPPP, EC 3.6.5.- (25 kDa brain-specific protein) (TPPP/p25) (p25-alpha) |
| Q7TPS5 | C2CD5_MOUSE | C2cd5 | C2 domain-containing protein 5 (138 kDa C2 domain-containing phosphoprotein) |
| Q7TNG5 | EMAL2_MOUSE | Eml2 | Echinoderm microtubule-associated protein-like 2, EMAP-2 |
| Q78IK2 | ATPMK_MOUSE | Atp5mk | ATP synthase membrane subunit K, mitochondrial (ATP synthase membrane subunit DAPIT, mitochondrial) (Diabetes-associated protein in insulin-sensitive tissues) (Up-regulated during skeletal muscle growth protein 5) |

| | | | |
|--------|-------------|----------|---|
| Q6PCM1 | KDM3A_MOUSE | Kdm3a | Lysine-specific demethylase 3A, EC 1.14.11.65 (JmjC domain-containing histone demethylation protein 2A) (Jumonji domain-containing protein 1A) ([histone H3]-dimethyl-L-lysine(9) demethylase 3A) |
| Q6P5C5 | SMUG1_MOUSE | Smug1 | Single-strand selective monofunctional uracil DNA glycosylase, EC 3.2.2.- |
| Q6NVF9 | CPSF6_MOUSE | Cpsf6 | Cleavage and polyadenylation specificity factor subunit 6 |
| Q6GV12 | KDSR_MOUSE | Kdsr | 3-ketodihydrosphingosine reductase, KDS reductase, EC 1.1.1.102 (3-dehydrosphinganine reductase) (Follicular variant translocation protein 1 homolog, FVT-1) |
| Q62283 | TSN7_MOUSE | Tspan7 | Tetraspanin-7, Tspan-7 (Cell surface glycoprotein A15) (PE31) (TALLA homolog) (Transmembrane 4 superfamily member 2) (CD antigen CD231) |
| Q62193 | RFA2_MOUSE | Rpa2 | Replication protein A 32 kDa subunit, RP-A p32 (Replication factor A protein 2, RF-A protein 2) (Replication protein A 34 kDa subunit, RP-A p34) |
| Q61121 | GPR19_MOUSE | Gpr19 | Probable G-protein coupled receptor 19 |
| Q60809 | CNOT7_MOUSE | Cnot7 | CCR4-NOT transcription complex subunit 7, EC 3.1.13.4 (CCR4-associated factor 1, CAF-1) |
| Q3V1L4 | 5NTC_MOUSE | Nt5c2 | Cytosolic purine 5'-nucleotidase, EC 3.1.3.5, EC 3.1.3.99 (Cytosolic nucleoside phosphotransferase 5'N, EC 2.7.1.77) |
| Q3V038 | TTC9A_MOUSE | Ttc9 | Tetratricopeptide repeat protein 9A, TPR repeat protein 9A |
| Q3UMB5 | SMCR8_MOUSE | Smcr8 | Guanine nucleotide exchange protein SMCR8 (Smith-Magenis syndrome chromosomal region candidate gene 8 protein homolog) |
| Q3UDR8 | YIPF3_MOUSE | Yipf3 | Protein YIPF3 (Killer lineage protein 1) (YIP1 family member 3) [Cleaved into: Protein YIPF3, N-terminally processed] |
| Q3U0L2 | AN33B_MOUSE | Ankrd33b | Ankyrin repeat domain-containing protein 33B |
| Q3TZZ7 | ESYT2_MOUSE | Esyt2 | Extended synaptotagmin-2, E-Syt2 |
| Q3TRM4 | PLPL6_MOUSE | Pnpla6 | Patatin-like phospholipase domain-containing protein 6 (Neuropathy target esterase, EC 3.1.1.5) |
| Q3TQI7 | TLS1_MOUSE | | Telomere length and silencing protein 1 homolog |
| Q14C51 | PTCD3_MOUSE | Ptcd3 | Pentatricopeptide repeat domain-containing protein 3, mitochondrial (28S ribosomal protein S39, mitochondrial, MRP-S39) |
| Q149F1 | RUSD2_MOUSE | Rpusd2 | Pseudouridylate synthase RPUSD2, EC 5.4.99.- (RNA pseudouridylate synthase domain-containing protein 2) |

| | | | |
|--------|-------------|--------|--|
| Q08857 | CD36_MOUSE | Cd36 | Platelet glycoprotein 4 (Glycoprotein IIIb, GPIIIB) (PAS IV) (PAS-4) (Platelet glycoprotein IV, GPIV) (CD antigen CD36) |
| Q08642 | PADI2_MOUSE | Padi2 | Protein-arginine deiminase type-2, EC 3.5.3.15 (Peptidylarginine deiminase II) (Protein-arginine deiminase type II) |
| Q02013 | AQP1_MOUSE | Aqp1 | Aquaporin-1, AQP-1 (Aquaporin-CHIP) (Delayed early response protein 2, DER2) (Water channel protein for red blood cells and kidney proximal tubule) |
| P97765 | WBP2_MOUSE | Wbp2 | WW domain-binding protein 2, WBP-2 |
| P97315 | CSRP1_MOUSE | Csrp1 | Cysteine and glycine-rich protein 1 (Cysteine-rich protein 1, CRP, CRP1) |
| P83877 | TXN4A_MOUSE | Txnl4a | Thioredoxin-like protein 4A (DIM1 protein homolog) (Spliceosomal U5 snRNP-specific 15 kDa protein) (Thioredoxin-like U5 snRNP protein U5-15kD) |
| P70288 | HDAC2_MOUSE | Hdac2 | Histone deacetylase 2, HD2, EC 3.5.1.98 (Protein deacylase HDAC2, EC 3.5.1.-) (YY1 transcription factor-binding protein) |
| P63325 | RS10_MOUSE | Rps10 | 40S ribosomal protein S10 |
| P62855 | RS26_MOUSE | Rps26 | 40S ribosomal protein S26 |
| P61804 | DAD1_MOUSE | Dad1 | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit DAD1, Oligosaccharyl transferase subunit DAD1 (Defender against cell death 1, DAD-1) |
| P61600 | NAA20_MOUSE | Naa20 | N-alpha-acetyltransferase 20, EC 2.3.1.254 (Methionine N-acetyltransferase) (N-acetyltransferase 5) (N-terminal acetyltransferase B complex catalytic subunit NAA20) (N-terminal acetyltransferase B complex catalytic subunit NAT5, NatB complex subunit NAT5) (NatB catalytic subunit) |
| P59708 | SF3B6_MOUSE | Sf3b6 | Splicing factor 3B subunit 6 (Pre-mRNA branch site protein p14) (SF3b 14 kDa subunit) |
| P59279 | RAB2B_MOUSE | Rab2b | Ras-related protein Rab-2B, EC 3.6.5.2 |
| P59240 | NPHP4_MOUSE | Nphp4 | Nephrocystin-4 (Nephroretinin) |
| P50586 | TUB_MOUSE | Tub | Tubby protein |
| P50136 | ODBA_MOUSE | Bckdha | 2-oxoisovalerate dehydrogenase subunit alpha, mitochondrial, EC 1.2.4.4 (Branched-chain alpha-keto acid dehydrogenase E1 component alpha chain, BCKDE1A, BCKDH E1-alpha) |
| P48771 | CX7A2_MOUSE | Cox7a2 | Cytochrome c oxidase subunit 7A2, mitochondrial (Cytochrome c oxidase subunit VIIa-liver/heart, Cytochrome c oxidase subunit VIIa-L) |
| P47199 | QOR_MOUSE | Cryz | Quinone oxidoreductase, EC 1.6.5.5 (NADPH:quinone reductase) (Zeta-crystallin) |

| | | | |
|--------|-------------|--------|---|
| P35762 | CD81_MOUSE | Cd81 | CD81 antigen (26 kDa cell surface protein TAPA-1) (Target of the antiproliferative antibody 1) (CD antigen CD81) |
| P15388 | KCNC1_MOUSE | Kcnc1 | Potassium voltage-gated channel subfamily C member 1 (NGK2) (Voltage-gated potassium channel subunit Kv3.1) (Voltage-gated potassium channel subunit Kv4) |
| P11627 | L1CAM_MOUSE | L1cam | Neural cell adhesion molecule L1, N-CAM-L1, NCAM-L1 (CD antigen CD171) |
| P0DN34 | NDUB1_MOUSE | Ndufb1 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 1 (Complex I-MNLL, CI-MNLL) (NADH-ubiquinone oxidoreductase MNLL subunit) |
| P0C0A3 | CHMP6_MOUSE | Chmp6 | Charged multivesicular body protein 6 (Chromatin-modifying protein 6) |
| P0C028 | NUD11_MOUSE | Nudt11 | Diphosphoinositol polyphosphate phosphohydrolase 3-beta, DIPP-3-beta, DIPP3-beta, EC 3.6.1.52 (Diadenosine 5',5'''-P1,P6-hexaphosphate hydrolase 3-beta) (Diadenosine hexaphosphate hydrolase (AMP-forming), EC 3.6.1.60) (Nucleoside diphosphate-linked moiety X motif 11, Nudix motif 11) |
| P01831 | THY1_MOUSE | Thy1 | Thy-1 membrane glycoprotein (Thy-1 antigen) (CD antigen CD90) |
| O88874 | CCNK_MOUSE | Ccnk | Cyclin-K |
| O88531 | PPT1_MOUSE | Ppt1 | Palmitoyl-protein thioesterase 1, PPT-1, EC 3.1.2.22 (Palmitoyl-protein hydrolase 1) |
| O55060 | TPMT_MOUSE | Tpmt | Thiopurine S-methyltransferase, EC 2.1.1.67 (Thiopurine methyltransferase) |
| O35654 | DPOD2_MOUSE | Pold2 | DNA polymerase delta subunit 2 (DNA polymerase delta subunit p50) |
| O35114 | SCR2_MOUSE | Scarb2 | Lysosome membrane protein 2 (85 kDa lysosomal membrane sialoglycoprotein, LGP85) (Lysosome membrane protein II, LIMP II) (Scavenger receptor class B member 2) |
| D3YZI9 | PGBD5_MOUSE | Pgbd5 | PiggyBac transposable element-derived protein 5, EC 3.1.-.- (PiggyBac transposase 5) |
| B9EJ86 | OSBL8_MOUSE | Osbpl8 | Oxysterol-binding protein-related protein 8, ORP-8, OSBP-related protein 8 |
| A2RT62 | FXL16_MOUSE | Fbxl16 | F-box/LRR-repeat protein 16 (F-box and leucine-rich repeat protein 16) |
| Q9D1G5 | LRC57_MOUSE | Lrrc57 | Leucine-rich repeat-containing protein 57 |
| Q8BSA9 | TYW3_MOUSE | Tyw3 | tRNA wybutosine-synthesizing protein 3 homolog, tRNA-yW-synthesizing protein 3, EC 2.1.1.282 (tRNA(Phe) 7-((3-amino-3-carboxypropyl)-4-demethylwyosine(37)-N(4))-methyltransferase) |
| O35988 | SDC4_MOUSE | Sdc4 | Syndecan-4, SYND4 (Ryudocan core protein) |
| Q9R099 | TBL2_MOUSE | Tbl2 | Transducin beta-like protein 2 |
| Q91XD7 | CREL1_MOUSE | Creld1 | Protein disulfide isomerase Creld1, EC 5.3.4.1 (Cysteine-rich with EGF-like domain protein 1) |

| | | | |
|--------|-------------|----------|---|
| Q9Z2Z6 | MCAT_MOUSE | Slc25a20 | Mitochondrial carnitine/acylcarnitine carrier protein (Carnitine/acylcarnitine translocase, CAC, CACT, mCAC) (Solute carrier family 25 member 20) |
| Q91VX9 | TM168_MOUSE | Tmem168 | Transmembrane protein 168 |
| Q9QXA5 | LSM4_MOUSE | Lsm4 | U6 snRNA-associated Sm-like protein LSm4 |
| Q91VA6 | PDIP2_MOUSE | Poldip2 | Polymerase delta-interacting protein 2 |
| Q8C838 | TARG1_MOUSE | Trarg1 | Trafficking regulator of GLUT4 1 (Dispanin subfamily B member 1, DSPB1) (Tumor suppressor candidate 5 homolog) |
| Q6VH22 | IF172_MOUSE | Ift172 | Intraflagellar transport protein 172 homolog (Protein wimple) |
| Q9WU40 | MAN1_MOUSE | Lemd3 | Inner nuclear membrane protein Man1 (LEM domain-containing protein 3) |
| Q6ZWM4 | LSM8_MOUSE | Lsm8 | U6 snRNA-associated Sm-like protein LSm8 |
| Q9Z266 | SNAPN_MOUSE | Snapin | SNARE-associated protein Snapin (Biogenesis of lysosome-related organelles complex 1 subunit 7, BLOC-1 subunit 7) (Synaptosomal-associated protein 25-binding protein, SNAP-associated protein) |
| Q80V91 | DTX3_MOUSE | Dtx3 | Probable E3 ubiquitin-protein ligase DTX3, EC 2.3.2.27 (Protein deltex-3, Deltex3, mDTX3) (RING-type E3 ubiquitin transferase DTX3) |
| O35153 | BET1L_MOUSE | Bet11 | BET1-like protein (Golgi SNARE with a size of 15 kDa, GOS-15, GS15) (Vesicle transport protein GOS15) |
| Q9QXK3 | COPG2_MOUSE | Copg2 | Coatomer subunit gamma-2 (Gamma-2-coat protein, Gamma-2-COP) |
| Q8BU88 | RM22_MOUSE | Mrpl22 | 39S ribosomal protein L22, mitochondrial, L22mt, MRP-L22 |
| Q3TIU4 | PDE12_MOUSE | Pde12 | 2',5'-phosphodiesterase 12, 2'-PDE, 2-PDE, EC 3.1.4.- (Mitochondrial deadenylase, EC 3.1.13.4) |
| Q9QZI8 | SERC1_MOUSE | Serinc1 | Serine incorporator 1 (Axotomy-induced glyco/Golgi protein 2) (Membrane protein TMS-2) (Tumor differentially expressed protein 1-like) (Tumor differentially expressed protein 2) |
| P70699 | LYAG_MOUSE | Gaa | Lysosomal alpha-glucosidase, EC 3.2.1.20 (Acid maltase) |
| A6H630 | ARMT1_MOUSE | Armt1 | Damage-control phosphatase ARMT1, EC 3.1.3.- (Acidic residue methyltransferase 1) (Protein-glutamate O-methyltransferase, EC 2.1.1.-) (Sugar phosphate phosphatase ARMT1) |
| Q6P1Y8 | INP4B_MOUSE | Inpp4b | Type II inositol 3,4-bisphosphate 4-phosphatase, EC 3.1.3.66 (Inositol polyphosphate 4-phosphatase type II) |

| | | | |
|--------|-------------|---------|---|
| P28063 | PSB8_MOUSE | Psmb8 | Proteasome subunit beta type-8, EC 3.4.25.1 (Low molecular mass protein 7) (Macropain subunit C13) (Multicatalytic endopeptidase complex subunit C13) (Proteasome component C13) (Proteasome subunit beta-5i) |
| Q6PGH1 | BUD31_MOUSE | Bud31 | Protein BUD31 homolog (Protein G10 homolog) |
| Q8CFK2 | TF3B_MOUSE | Brf1 | Transcription factor IIIB 90 kDa subunit, TFIIB90, mTFIIB90 (B-related factor 1, BRF-1) |
| P04627 | ARAF_MOUSE | Araf | Serine/threonine-protein kinase A-Raf, EC 2.7.11.1 (Proto-oncogene A-Raf) |
| P97798 | NEO1_MOUSE | Neo1 | Neogenin |
| Q9JJZ2 | TBA8_MOUSE | Tuba8 | Tubulin alpha-8 chain (Alpha-tubulin 8) |
| Q9DBX2 | PHLP_MOUSE | Pdcl | Phosducin-like protein, PHLP |
| Q8BXX8 | AGAP1_MOUSE | Agap1 | Arf-GAP with GTPase, ANK repeat and PH domain-containing protein 1, AGAP-1 (Centaurin-gamma-2, Cnt-g2) |
| Q80W22 | THNS2_MOUSE | Thns12 | Threonine synthase-like 2, TSH2, mTSH2, EC 4.2.3.- |
| Q8CI71 | VPS50_MOUSE | Vps50 | Syndetin (Bcl2-like protein blm) (Coiled-coil domain-containing protein 132) (EARP/GARPII complex subunit VPS50) |
| Q62393 | TPD52_MOUSE | Tpd52 | Tumor protein D52, mD52 |
| Q3UGY8 | BIG3_MOUSE | Arfgef3 | Brefeldin A-inhibited guanine nucleotide-exchange protein 3 (ARFGEF family member 3) |
| Q01279 | EGFR_MOUSE | Egfr | Epidermal growth factor receptor, EC 2.7.10.1 |
| Q03958 | PFD6_MOUSE | Pfdn6 | Prefoldin subunit 6 (Protein Ke2) |
| Q9EPQ2 | RPGR1_MOUSE | Rpgrip1 | X-linked retinitis pigmentosa GTPase regulator-interacting protein 1, RPGR-interacting protein 1 |
| Q9D4J7 | PHF6_MOUSE | Phf6 | PHD finger protein 6 |
| Q925I1 | ATAD3_MOUSE | Atad3 | ATPase family AAA domain-containing protein 3 (AAA-ATPase TOB3) |
| Q9WTN0 | GGPPS_MOUSE | Ggps1 | Geranylgeranyl pyrophosphate synthase, GGPP synthase, GGPPSase, EC 2.5.1.- ((2E,6E)-farnesyl diphosphate synthase) (Dimethylallyltranstransferase, EC 2.5.1.1) (Farnesyl diphosphate synthase) (Farnesyltranstransferase, EC 2.5.1.29) (Geranylgeranyl diphosphate synthase) (Geranyltranstransferase, EC 2.5.1.10) |
| Q9QZ08 | NAGK_MOUSE | Nagk | N-acetyl-D-glucosamine kinase, N-acetylglucosamine kinase, EC 2.7.1.59 (GlcNAc kinase) |

| | | | |
|--------|-------------|----------|---|
| Q8VCN5 | CGL_MOUSE | Cth | Cystathionine gamma-lyase, CGL, CSE, EC 4.4.1.1 (Cysteine desulfhydrase) (Cysteine-protein sulfhydrase) (Gamma-cystathionase) (Homocysteine desulfhydrase, EC 4.4.1.2) |
| Q80WG5 | LRC8A_MOUSE | Lrrc8a | Volume-regulated anion channel subunit LRRC8A (Leucine-rich repeat-containing protein 8A) (Protein ebouriffe, ebo) |
| O55125 | NIPS1_MOUSE | Nipsnap1 | Protein NipSnap homolog 1, NipSnap1 |
| Q8VCW8 | ACSF2_MOUSE | Acsf2 | Medium-chain acyl-CoA ligase ACSF2, mitochondrial, EC 6.2.1.2 |
| Q922K7 | NOP2_MOUSE | Nop2 | Probable 28S rRNA (cytosine-C(5))-methyltransferase, EC 2.1.1.- (Nucleolar protein 1) (Nucleolar protein 2 homolog) (Proliferating-cell nucleolar antigen p120) (Proliferation-associated nucleolar protein p120) |
| Q9CQQ0 | SMIM8_MOUSE | Smim8 | Small integral membrane protein 8 |
| D3YVF0 | AKAP5_MOUSE | Akap5 | A-kinase anchor protein 5, AKAP-5 (A-kinase anchor protein 150 kDa, AKAP 150, P150) (cAMP-dependent protein kinase regulatory subunit II high affinity-binding protein) |
| Q9QY81 | PO210_MOUSE | Nup210 | Nuclear pore membrane glycoprotein 210, Nuclear pore protein gp210 (Nuclear envelope pore membrane protein POM 210, POM210) (Nucleoporin Nup210) (Pore membrane protein of 210 kDa) |
| Q9Z2E2 | MBD1_MOUSE | Mbd1 | Methyl-CpG-binding domain protein 1 (Methyl-CpG-binding protein MBD1) |
| Q9DCH4 | EIF3F_MOUSE | Eif3f | Eukaryotic translation initiation factor 3 subunit F, eIF3f (Deubiquitinating enzyme eIF3f, EC 3.4.19.12) (Eukaryotic translation initiation factor 3 subunit 5) (eIF-3-epsilon) (eIF3 p47) |
| Q8C2E7 | WASC5_MOUSE | Washc5 | WASH complex subunit 5 (WASH complex subunit strumpellin) |
| Q811U4 | MFN1_MOUSE | Mfn1 | Mitofusin-1, EC 3.6.5.- (Transmembrane GTPase MFN1) |
| Q91VF2 | HNMT_MOUSE | Hnmt | Histamine N-methyltransferase, HMT, EC 2.1.1.8 |
| Q9D3A9 | TTYH1_MOUSE | Ttyh1 | Protein tweety homolog 1, mTTY1 |
| P62830 | RL23_MOUSE | Rpl23 | 60S ribosomal protein L23 |
| P25233 | NECD_MOUSE | Ndn | Necdin |
| Q61235 | SNTB2_MOUSE | Sntb2 | Beta-2-syntrophin (59 kDa dystrophin-associated protein A1 basic component 2) (Syntrophin-3, SNT3) (Syntrophin-like, SNTL) |
| Q99P31 | HPBP1_MOUSE | Hspbp1 | Hsp70-binding protein 1, HspBP1 (Heat shock protein-binding protein 1) (Hsp70-interacting protein 1) |
| P57787 | MOT4_MOUSE | Slc16a3 | Monocarboxylate transporter 4, MCT 4 (Solute carrier family 16 member 3) |

| | | | |
|--------|-------------|----------|--|
| Q9JLT4 | TRXR2_MOUSE | Txnrd2 | Thioredoxin reductase 2, mitochondrial, EC 1.8.1.9 (Thioredoxin reductase TR3) |
| Q9DCG9 | TR112_MOUSE | Trmt112 | Multifunctional methyltransferase subunit TRM112-like protein (tRNA methyltransferase 112 homolog) |
| Q8BLV3 | SL9A7_MOUSE | Slc9a7 | Sodium/hydrogen exchanger 7 (Na ⁽⁺⁾ /H ⁽⁺⁾ exchanger 7, NHE-7) (Solute carrier family 9 member 7) |
| Q8BK58 | HBAP1_MOUSE | Hspbap1 | HSPB1-associated protein 1 (27 kDa heat shock protein-associated protein 1) (Protein associated with small stress protein 1) |
| Q3V0C5 | UBP48_MOUSE | Usp48 | Ubiquitin carboxyl-terminal hydrolase 48, EC 3.4.19.12 (Deubiquitinating enzyme 48) (Ubiquitin thioesterase 48) (Ubiquitin-specific-processing protease 48) |
| Q9R1Z7 | PTPS_MOUSE | Pts | 6-pyruvoyl tetrahydrobiopterin synthase, PTP synthase, PTPS, EC 4.2.3.12 |
| Q6NT99 | DUS23_MOUSE | Dusp23 | Dual specificity protein phosphatase 23, EC 3.1.3.16, EC 3.1.3.48 (Low molecular mass dual specificity phosphatase 3, LDP-3) |
| E9QAT4 | SC16A_MOUSE | Sec16a | Protein transport protein Sec16A (SEC16 homolog A, p250) |
| Q9JJ28 | FLII_MOUSE | Flii | Protein flightless-1 homolog |
| Q921N6 | DDX27_MOUSE | Ddx27 | Probable ATP-dependent RNA helicase DDX27, EC 3.6.4.13 (DEAD box protein 27) |
| Q9JIS7 | CAC1F_MOUSE | Cacna1f | Voltage-dependent L-type calcium channel subunit alpha-1F (Voltage-gated calcium channel subunit alpha Cav1.4) |
| Q3UFS4 | GPT11_MOUSE | Gpatch11 | G patch domain-containing protein 11 (Coiled-coil domain-containing protein 75) |
| Q6S5J6 | KRIT1_MOUSE | Krit1 | Krev interaction trapped protein 1, Krev interaction trapped 1 (Cerebral cavernous malformations 1 protein homolog) |
| Q791T5 | MTCH1_MOUSE | Mtch1 | Mitochondrial carrier homolog 1 (Mitochondrial carrier-like protein 1) |
| Q8CC88 | VWA8_MOUSE | Vwa8 | von Willebrand factor A domain-containing protein 8 |
| Q8C6G8 | WDR26_MOUSE | Wdr26 | WD repeat-containing protein 26 |
| Q9Z0S1 | BPNT1_MOUSE | Bpnt1 | 3'(2'),5'-bisphosphate nucleotidase 1, EC 3.1.3.7 (Bisphosphate 3'-nucleotidase 1) (PAP-inositol 1,4-phosphatase, PIP) |
| Q8C031 | LRC4C_MOUSE | Lrrc4c | Leucine-rich repeat-containing protein 4C (Netrin-G1 ligand, NGL-1) |
| P98084 | APBA2_MOUSE | Apba2 | Amyloid-beta A4 precursor protein-binding family A member 2 (Adapter protein X11beta) (Neuron-specific X11L protein) (Neuronal Munc18-1-interacting protein 2, Mint-2) |
| Q8C9S4 | CC186_MOUSE | Ccdc186 | Coiled-coil domain-containing protein 186 (Oocyte-testis gene 1 protein) |
| P24270 | CATA_MOUSE | Cat | Catalase, EC 1.11.1.6 |

| | | | |
|--------|-------------|----------|---|
| O70228 | ATP9A_MOUSE | Atp9a | Probable phospholipid-transporting ATPase IIA, EC 7.6.2.1 (ATPase class II type 9A) |
| Q80T41 | GABR2_MOUSE | Gabbr2 | Gamma-aminobutyric acid type B receptor subunit 2, GABA-B receptor 2, GABA-B-R2, GABA-BR2, GABABR2, Gb2 (G-protein coupled receptor 51) |
| Q9D014 | STX17_MOUSE | Stx17 | Syntaxin-17 |
| Q9CPZ6 | ORML3_MOUSE | Ormdl3 | ORM1-like protein 3 |
| Q64700 | RBL2_MOUSE | Rbl2 | Retinoblastoma-like protein 2 (130 kDa retinoblastoma-associated protein, p130) (Retinoblastoma-related protein 2, RBR-2) (pRb2) |
| Q99M73 | KRT84_MOUSE | Krt84 | Keratin, type II cuticular Hb4 (65 kDa type II keratin) (Keratin-84, K84) (Type II hair keratin Hb4) (Type-II keratin Kb24) |
| Q9Z120 | TRMB_MOUSE | Mettl1 | tRNA (guanine-N(7)-)-methyltransferase, EC 2.1.1.33 (Methyltransferase-like protein 1) (mRNA (guanine-N(7)-)-methyltransferase, EC 2.1.1.-) (miRNA (guanine-N(7)-)-methyltransferase, EC 2.1.1.-) (tRNA (guanine(46)-N(7))-methyltransferase) (tRNA(m7G46)-methyltransferase) |
| Q922P9 | GLYR1_MOUSE | Glyr1 | Cytokine-like nuclear factor N-PAC, NPAC (Glyoxylate reductase 1 homolog) (Nuclear protein NP60) (Putative oxidoreductase GLYR1) |
| P39054 | DYN2_MOUSE | Dnm2 | Dynamamin-2, EC 3.6.5.5 (Dynamamin UDNM) |
| P49117 | NR2C2_MOUSE | Nr2c2 | Nuclear receptor subfamily 2 group C member 2 (Orphan nuclear receptor TAK1) (Orphan nuclear receptor TR4) (Testicular receptor 4) |
| Q8K0T2 | DC2L1_MOUSE | Dync2li1 | Cytoplasmic dynein 2 light intermediate chain 1, mD2LIC |
| Q3TCN2 | PLBL2_MOUSE | Plbd2 | Putative phospholipase B-like 2, EC 3.1.1.- (66.3 kDa protein) (76 kDa protein, p76) (LAMA-like protein 2) (Lamina ancestor homolog 2) (Phospholipase B domain-containing protein 2) [Cleaved into: Putative phospholipase B-like 2 28 kDa form; Putative phospholipase B-like 2 40 kDa form; Putative phospholipase B-like 2 15 kDa form] |
| Q9EQC5 | SCYL1_MOUSE | Scyl1 | N-terminal kinase-like protein (105 kDa kinase-like protein) (Mitosis-associated kinase-like protein NTKL) (SCY1-like protein 1) |
| Q9D1Q4 | DPM3_MOUSE | Dpm3 | Dolichol-phosphate mannosyltransferase subunit 3 (Dolichol-phosphate mannose synthase subunit 3, DPM synthase subunit 3) (Dolichyl-phosphate beta-D-mannosyltransferase subunit 3) (Mannose-P-dolichol synthase subunit 3, MPD synthase subunit 3) |
| Q8VE19 | MIO_MOUSE | Mios | GATOR complex protein MIOS |
| Q8BGS2 | BOLA2_MOUSE | Bola2 | BolA-like protein 2 |

| | | | |
|--------|-------------|---------|---|
| Q3URV1 | BROMI_MOUSE | Tbc1d32 | Protein broad-minded (TBC1 domain family member 32) |
| Q9QXK7 | CPSF3_MOUSE | Cpsf3 | Cleavage and polyadenylation specificity factor subunit 3, EC 3.1.27.- (Cleavage and polyadenylation specificity factor 73 kDa subunit, CPSF 73 kDa subunit, mRNA 3'-end-processing endonuclease CPSF-73) |
| Q80SW1 | SAHH2_MOUSE | Ahcy11 | S-adenosylhomocysteine hydrolase-like protein 1 (IP3R-binding protein released with inositol 1,4,5-trisphosphate) (Putative adenosylhomocysteinase 2) (S-adenosyl-L-homocysteine hydrolase 2, AdoHcyase 2) |
| Q8BGA5 | KRR1_MOUSE | Krr1 | KRR1 small subunit processome component homolog (HIV-1 Rev-binding protein 2 homolog) (KRR-R motif-containing protein 1) |
| Q9D6W8 | BORC6_MOUSE | Borcs6 | BLOC-1-related complex subunit 6 |
| Q9CWX9 | DDX47_MOUSE | Ddx47 | Probable ATP-dependent RNA helicase DDX47, EC 3.6.4.13 (DEAD box protein 47) |
| Q9CR09 | UFC1_MOUSE | Ufc1 | Ubiquitin-fold modifier-conjugating enzyme 1, Ufm1-conjugating enzyme 1 |
| Q8K009 | AL1L2_MOUSE | Aldh112 | Mitochondrial 10-formyltetrahydrofolate dehydrogenase, Mitochondrial 10-FTHFDH, mtFDH, EC 1.5.1.6 (Aldehyde dehydrogenase family 1 member L2) |
| Q6NS82 | RETR2_MOUSE | Retreg2 | Reticulophagy regulator 2 |
| Q9EST5 | AN32B_MOUSE | Anp32b | Acidic leucine-rich nuclear phosphoprotein 32 family member B (Proliferation-related acidic leucine-rich protein PAL31) |
| Q3TSG4 | ALKB5_MOUSE | Alkbh5 | RNA demethylase ALKBH5, EC 1.14.11.53 (Alkylated DNA repair protein alkB homolog 5) (Alpha-ketoglutarate-dependent dioxygenase alkB homolog 5) |
| Q9EQI8 | RM46_MOUSE | Mrpl46 | 39S ribosomal protein L46, mitochondrial, L46mt, MRP-L46 |
| Q8R1B0 | STAC2_MOUSE | Stac2 | SH3 and cysteine-rich domain-containing protein 2 (24b2/STAC2) (Src homology 3 and cysteine-rich domain-containing protein 2) |
| Q9CY21 | BUD23_MOUSE | Bud23 | Probable 18S rRNA (guanine-N(7))-methyltransferase, EC 2.1.1.- (Bud site selection protein 23 homolog) (Williams-Beuren syndrome chromosomal region 22 protein homolog) (rRNA methyltransferase and ribosome maturation factor) |
| Q6PH08 | ERC2_MOUSE | Erc2 | ERC protein 2 (CAZ-associated structural protein 1, CAST1) |
| Q3TUH1 | TAM41_MOUSE | Tamm41 | Phosphatidate cytidylyltransferase, mitochondrial, EC 2.7.7.41 (CDP-diacylglycerol synthase, CDP-DAG synthase) (Mitochondrial translocator assembly and maintenance protein 41 homolog, TAM41) |
| B9EJ80 | PDZD8_MOUSE | Pdzd8 | PDZ domain-containing protein 8 |
| Q9D0M0 | EXOS7_MOUSE | Exosc7 | Exosome complex exonuclease RRP42 (Exosome component 7) (Ribosomal RNA-processing protein 42) |

| | | | |
|--------|-------------|---------|--|
| Q8BN78 | KAISO_MOUSE | Zbtb33 | Transcriptional regulator Kaiso (Zinc finger and BTB domain-containing protein 33) |
| P13705 | MSH3_MOUSE | Msh3 | DNA mismatch repair protein Msh3 (Protein repair-1, REP-1) (Protein repair-3, REP-3) |
| P54763 | EPHB2_MOUSE | Ephb2 | Ephrin type-B receptor 2, EC 2.7.10.1 (Neural kinase) (Nuk receptor tyrosine kinase) (Tyrosine-protein kinase receptor EPH-3) (Tyrosine-protein kinase receptor SEK-3) [Cleaved into: EphB2/CTF1; EphB2/CTF2] |
| Q9JHE7 | TSSC4_MOUSE | Tssc4 | Protein TSSC4 |
| P52912 | TIA1_MOUSE | Tia1 | Cytotoxic granule associated RNA binding protein TIA1 (Nucleolysin TIA-1) (RNA-binding protein TIA-1) (T-cell-restricted intracellular antigen-1, TIA-1) |
| P40338 | VHL_MOUSE | Vhl | von Hippel-Lindau disease tumor suppressor (pVHL) |
| P52875 | TM165_MOUSE | Tmem165 | Transmembrane protein 165 (TPA-regulated locus protein) (Transmembrane protein PFT27) (Transmembrane protein TPARL) |
| Q9WVK8 | CP46A_MOUSE | Cyp46a1 | Cholesterol 24-hydroxylase, CH24H, EC 1.14.14.25 (Cholesterol 24-monooxygenase) (Cholesterol 24S-hydroxylase) (Cytochrome P450 46A1) |
| O08992 | SDCB1_MOUSE | Sdcbp | Syntenin-1 (Scaffold protein Pbp1) (Syndecan-binding protein 1) |
| Q9D0C4 | TRM5_MOUSE | Trmt5 | tRNA (guanine(37)-N1)-methyltransferase, EC 2.1.1.228 (M1G-methyltransferase) (tRNA [GM37] methyltransferase) (tRNA methyltransferase 5 homolog) |
| Q8K1E0 | STX5_MOUSE | Stx5 | Syntaxin-5 |
| Q64669 | NQO1_MOUSE | Nqo1 | NAD(P)H dehydrogenase [quinone] 1, EC 1.6.5.2 (Azoreductase) (DT-diaphorase, DTD) (Menadione reductase) (NAD(P)H:quinone oxidoreductase 1) (Phylloquinone reductase) (Quinone reductase 1, QR1) |
| Q9CWV6 | PKRI1_MOUSE | Prkrip1 | PRKR-interacting protein 1 (Protein C114) |
| Q8VBY2 | KKCC1_MOUSE | Camkk1 | Calcium/calmodulin-dependent protein kinase kinase 1, CaM-KK 1, CaM-kinase kinase 1, CaMKK 1, EC 2.7.11.17 (CaM-kinase IV kinase) (Calcium/calmodulin-dependent protein kinase kinase alpha, CaM-KK alpha, CaM-kinase kinase alpha, CaMKK alpha) |
| Q8BWM0 | PGES2_MOUSE | Ptges2 | Prostaglandin E synthase 2, EC 5.3.99.3 (GATE-binding factor 1, GBF-1) (Microsomal prostaglandin E synthase 2, mPGES-2) [Cleaved into: Prostaglandin E synthase 2 truncated form] |
| Q99LH2 | PTSS1_MOUSE | Ptdss1 | Phosphatidylserine synthase 1, PSS-1, PtdSer synthase 1, EC 2.7.8.29 (Serine-exchange enzyme I) |
| P55288 | CAD11_MOUSE | Cdh11 | Cadherin-11 (OSF-4) (Osteoblast cadherin, OB-cadherin) |

| | | | |
|--------|-------------|----------|---|
| Q9DBE9 | SPB1_MOUSE | Ftsj3 | pre-rRNA 2'-O-ribose RNA methyltransferase FTSJ3, EC 2.1.1.- (Protein ftsJ homolog 3) (Putative rRNA methyltransferase 3) |
| Q8BTW3 | EXOS6_MOUSE | Exosc6 | Exosome complex component MTR3 (Exosome component 6) (mRNA transport regulator 3 homolog) |
| Q6PB93 | GALT2_MOUSE | Galnt2 | Polypeptide N-acetylgalactosaminyltransferase 2, EC 2.4.1.41 (Polypeptide GalNAc transferase 2, GalNAc-T2, pp-GaNTase 2) (Protein-UDP acetylgalactosaminyltransferase 2) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase 2) [Cleaved into: Polypeptide N-acetylgalactosaminyltransferase 2 soluble form] |
| Q8BJL0 | SMAL1_MOUSE | Smarca11 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A-like protein 1, EC 3.6.4.- (HepA-related protein, mharp) (Sucrose nonfermenting protein 2-like 1) |
| Q6P6J0 | ADAT2_MOUSE | Adat2 | tRNA-specific adenosine deaminase 2, EC 3.5.4.33 (Deaminase domain-containing protein 1) (tRNA-specific adenosine-34 deaminase subunit ADAT2) |
| P31001 | DESM_MOUSE | Des | Desmin |
| Q91WK1 | SPRY4_MOUSE | Spryd4 | SPRY domain-containing protein 4 |
| Q8BHN7 | CL029_MOUSE | | Uncharacterized protein C12orf29 homolog |
| O35449 | PRRT1_MOUSE | Prprt1 | Proline-rich transmembrane protein 1 (Dispanin subfamily D member 1, DSPD1) (Synapse differentiation-induced protein 4, SynDIG4) |
| Q3V0K9 | PLSI_MOUSE | Pls1 | Plastin-1 |
| Q80ST9 | LCA5_MOUSE | Lca5 | Lebercilin (Leber congenital amaurosis 5 protein homolog) |
| Q3UBX0 | TM109_MOUSE | Tmem109 | Transmembrane protein 109 (Mitsugumin-23, Mg23) |
| Q6NWX3 | IF122_MOUSE | Ift122 | Intraflagellar transport protein 122 homolog (WD repeat-containing protein 10) |
| Q9D7M1 | GID8_MOUSE | Gid8 | Glucose-induced degradation protein 8 homolog (Two hybrid-associated protein 1 with RanBPM, Twa1) |
| A2AR02 | PPIG_MOUSE | Ppig | Peptidyl-prolyl cis-trans isomerase G, PPIase G, Peptidyl-prolyl isomerase G, EC 5.2.1.8 (Cyclophilin G) (Rotamase G) |
| P62274 | RS29_MOUSE | Rps29 | 40S ribosomal protein S29 |
| E9PV24 | FIBA_MOUSE | Fga | Fibrinogen alpha chain [Cleaved into: Fibrinopeptide A; Fibrinogen alpha chain] |
| O55187 | CBX4_MOUSE | Cbx4 | E3 SUMO-protein ligase CBX4, EC 2.3.2.- (Chromobox protein homolog 4) (E3 SUMO-protein transferase CBX4) (Polycomb 2 homolog, Pc2, mPc2) |

| | | | |
|--------|-------------|---------|--|
| Q8BT60 | CPNE3_MOUSE | Cpne3 | Copine-3 (Copine III) |
| Q6DID3 | SCAF8_MOUSE | Scaf8 | SR-related and CTD-associated factor 8 (RNA-binding motif protein 16) |
| P97868 | RBBP6_MOUSE | Rbbp6 | E3 ubiquitin-protein ligase RBBP6, EC 2.3.2.27 (Proliferation potential-related protein) (Protein P2P-R) (RING-type E3 ubiquitin transferase RBBP6) (Retinoblastoma-binding protein 6) (p53-associated cellular protein of testis) |
| P83940 | ELOC_MOUSE | Eloc | Elongin-C, EloC (Elongin 15 kDa subunit) (RNA polymerase II transcription factor SIII subunit C) (SIII p15) (Stromal membrane-associated protein SMAP1B homolog) (Transcription elongation factor B polypeptide 1) |
| P56388 | CART_MOUSE | Cartpt | Cocaine- and amphetamine-regulated transcript protein [Cleaved into: CART(1-52); CART(55-102); CART(62-102)] |
| Q6PGN3 | DCLK2_MOUSE | Dclk2 | Serine/threonine-protein kinase DCLK2, EC 2.7.11.1 (CaMK-like CREB regulatory kinase 2, CL2, CLICK-II, CLICK2) (Doublecortin-like and CAM kinase-like 2) (Doublecortin-like kinase 2) |
| P97494 | GSH1_MOUSE | Gclc | Glutamate--cysteine ligase catalytic subunit, EC 6.3.2.2 (GCS heavy chain) (Gamma-ECS) (Gamma-glutamylcysteine synthetase) |
| Q922U1 | PRPF3_MOUSE | Prpf3 | U4/U6 small nuclear ribonucleoprotein Prp3 (Pre-mRNA-splicing factor 3) |
| Q9D5R3 | CEP83_MOUSE | Cep83 | Centrosomal protein of 83 kDa, Cep83 (Coiled-coil domain-containing protein 41) |
| Q8BTG3 | T11L1_MOUSE | Tcp1111 | T-complex protein 11-like protein 1 |
| P70297 | STAM1_MOUSE | Stam | Signal transducing adapter molecule 1, STAM-1 |
| Q9D753 | EXOS8_MOUSE | Exosc8 | Exosome complex component RRP43 (Exosome component 8) (Ribosomal RNA-processing protein 43) |
| Q8BKE6 | CP20A_MOUSE | Cyp20a1 | Cytochrome P450 20A1, EC 1.14.-.- |
| Q8K0D0 | CDK17_MOUSE | Cdk17 | Cyclin-dependent kinase 17, EC 2.7.11.22 (Cell division protein kinase 17) (PCTAIRE-motif protein kinase 2) (Serine/threonine-protein kinase PCTAIRE-2) |
| Q9D2R0 | AACS_MOUSE | Aacs | Acetoacetyl-CoA synthetase, EC 6.2.1.16 |
| Q9R0P3 | ESTD_MOUSE | Esd | S-formylglutathione hydrolase, FGH, EC 3.1.2.12 (Esterase 10) (Esterase D) (Sid 478) |
| Q91VC4 | PLVAP_MOUSE | Plvap | Plasmalemma vesicle-associated protein (MECA-32 antigen) (Plasmalemma vesicle protein 1, PV-1) |
| P47811 | MK14_MOUSE | Mapk14 | Mitogen-activated protein kinase 14, MAP kinase 14, MAPK 14, EC 2.7.11.24 (CRK1) (Mitogen-activated protein kinase p38 alpha, MAP kinase p38 alpha) |

| | | | |
|--------|-------------|----------|--|
| Q922Q1 | MARC2_MOUSE | Mtarc2 | Mitochondrial amidoxime reducing component 2, mARC2, EC 1.7.-.- (Molybdenum cofactor sulfurase C-terminal domain-containing protein 2, MOSC domain-containing protein 2, Moco sulfurase C-terminal domain-containing protein 2) |
| Q9ES97 | RTN3_MOUSE | Rtn3 | Reticulon-3 |
| Q4VBD2 | TAPT1_MOUSE | Tapt1 | Transmembrane anterior posterior transformation protein 1 |
| P97376 | FRG1_MOUSE | Frg1 | Protein FRG1 (FSHD region gene 1 protein) |
| Q6PCP5 | MFF_MOUSE | Mff | Mitochondrial fission factor |
| Q9CY73 | RM44_MOUSE | Mrpl44 | 39S ribosomal protein L44, mitochondrial, L44mt, MRP-L44, EC 3.1.26.- |
| Q9QXV0 | PCS1N_MOUSE | Pcsk1n | ProSAAS (IA-4) (Proprotein convertase subtilisin/kexin type 1 inhibitor, Proprotein convertase 1 inhibitor) (pro-SAAS) [Cleaved into: KEP; Big SAAS, b-SAAS; Little SAAS, l-SAAS; Big PEN-LEN, b-PEN-LEN (SAAS CT(1-49)); PEN; PEN-20; PEN-19; Little LEN, l-LEN; Big LEN, b-LEN (BigLEN) (SAAS CT(25-40))] |
| Q8K2L8 | TPC12_MOUSE | Trappc12 | Trafficking protein particle complex subunit 12 (Tetratricopeptide repeat protein 15, TPR repeat protein 15) |
| Q9D0J4 | ARL2_MOUSE | Arl2 | ADP-ribosylation factor-like protein 2 |
| Q9CY50 | SSRA_MOUSE | Ssr1 | Translocon-associated protein subunit alpha, TRAP-alpha (Signal sequence receptor subunit alpha, SSR-alpha) |
| Q8C569 | F118B_MOUSE | Fam118b | Protein FAM118B |
| P70388 | RAD50_MOUSE | Rad50 | DNA repair protein RAD50, mRad50, EC 3.6.-.- |
| Q9CXJ4 | MITOS_MOUSE | Abcb8 | Mitochondrial potassium channel ATP-binding subunit (ATP-binding cassette sub-family B member 8, mitochondrial, ABCB8) (Mitochondrial sulfonylurea-receptor, MITOSUR) |
| Q3TVI4 | HEXI2_MOUSE | Hexim2 | Protein HEXIM2 |
| Q9R1R2 | TRIM3_MOUSE | Trim3 | Tripartite motif-containing protein 3 (RING finger protein 22) (RING finger protein HAC1) |
| Q4VAA2 | CDV3_MOUSE | Cdv3 | Protein CDV3 (Carnitine deficiency-associated protein 3) (Tyrosine-phosphorylated protein 36, TPP36) |
| P42225 | STAT1_MOUSE | Stat1 | Signal transducer and activator of transcription 1 |
| Q07417 | ACADS_MOUSE | Acads | Short-chain specific acyl-CoA dehydrogenase, mitochondrial, SCAD, EC 1.3.8.1 (Butyryl-CoA dehydrogenase) |
| Q00899 | TYY1_MOUSE | Yy1 | Transcriptional repressor protein YY1 (Delta transcription factor) (NF-E1) (UCR-motif DNA-binding protein) (Yin and yang 1, YY-1) |

| | | | |
|--------|-------------|----------|---|
| B2RRL2 | JERKL_MOUSE | Jrkl | Jerky protein homolog-like |
| Q99KD5 | UN45A_MOUSE | Unc45a | Protein unc-45 homolog A, Unc-45A (Stromal membrane-associated protein 1, SMAP-1) |
| Q8VHN8 | TIRR_MOUSE | Nudt1611 | Tudor-interacting repair regulator protein (NUDT16-like protein 1) (Protein syndesmos) |
| Q8VD63 | TSYL4_MOUSE | Tspyl4 | Testis-specific Y-encoded-like protein 4, TSPY-like protein 4 |
| Q8K4M5 | COMD1_MOUSE | Commd1 | COMM domain-containing protein 1 (Protein Murr1) |
| P61965 | WDR5_MOUSE | Wdr5 | WD repeat-containing protein 5 (BMP2-induced 3-kb gene protein) (WD repeat-containing protein BIG-3) |
| P47739 | AL3A1_MOUSE | Aldh3a1 | Aldehyde dehydrogenase, dimeric NADP-preferring, EC 1.2.1.5 (Aldehyde dehydrogenase 4) (Aldehyde dehydrogenase family 3 member A1) (Dioxin-inducible aldehyde dehydrogenase 3) |
| Q3UHK6 | TEN4_MOUSE | Tenm4 | Teneurin-4, Ten-4 (Downstream of CHOP4) (Protein Odd Oz/ten-m homolog 4) (Tenascin-M4, Ten-m4) (Teneurin transmembrane protein 4) |
| Q8R3L8 | CDK8_MOUSE | Cdk8 | Cyclin-dependent kinase 8, EC 2.7.11.22, EC 2.7.11.23 (Cell division protein kinase 8) (Mediator complex subunit CDK8) (Mediator of RNA polymerase II transcription subunit CDK8) |
| Q99LJ1 | FUCO_MOUSE | Fuca1 | Tissue alpha-L-fucosidase, EC 3.2.1.51 (Alpha-L-fucosidase I) (Alpha-L-fucoside fucohydrolase 1, Alpha-L-fucosidase 1) |
| Q3U0K8 | OGFD1_MOUSE | Ogfod1 | Prolyl 3-hydroxylase OGFOD1, EC 1.14.11.- (2-oxoglutarate and iron-dependent oxygenase domain-containing protein 1) (uS12 prolyl 3-hydroxylase) |
| Q0P5W1 | VPS8_MOUSE | Vps8 | Vacuolar protein sorting-associated protein 8 homolog |
| P47964 | RL36_MOUSE | Rpl36 | 60S ribosomal protein L36 |
| Q80YA3 | DDHD1_MOUSE | Ddhd1 | Phospholipase DDHD1, EC 3.1.1.- (DDHD domain-containing protein 1) (Phosphatidic acid-preferring phospholipase A1 homolog, PA-PLA1) |
| Q9D706 | RPAP3_MOUSE | Rpap3 | RNA polymerase II-associated protein 3 |
| Q924X6 | LRP8_MOUSE | Lrp8 | Low-density lipoprotein receptor-related protein 8, LRP-8 (Apolipoprotein E receptor 2) |
| Q9D8N2 | DEN10_MOUSE | Dennd10 | DENN domain-containing protein 10 (Protein FAM45A) |
| Q91ZS8 | RED1_MOUSE | Adarb1 | Double-stranded RNA-specific editase 1, EC 3.5.4.37 (RNA-editing deaminase 1) (RNA-editing enzyme 1) (dsRNA adenosine deaminase) |
| Q6PIU9 | YJ005_MOUSE | | Uncharacterized protein FLJ45252 homolog |

| | | | |
|--------|-------------|----------|---|
| Q6P9R2 | OXSR1_MOUSE | Oxsr1 | Serine/threonine-protein kinase OSR1, EC 2.7.11.1 (Oxidative stress-responsive 1 protein) |
| Q9QWH1 | PHC2_MOUSE | Phc2 | Polyhomeotic-like protein 2, mPH2 (Early development regulatory protein 2) (p36) |
| Q8R322 | GLE1_MOUSE | Gle1 | mRNA export factor GLE1 (GLE1 RNA export mediator) (GLE1-like protein) (Nucleoporin GLE1) |
| Q99ME2 | WDR6_MOUSE | Wdr6 | WD repeat-containing protein 6, mWDR6 |
| Q921W0 | CHM1A_MOUSE | Chmp1a | Charged multivesicular body protein 1a (Chromatin-modifying protein 1a, CHMP1a) |
| Q04692 | SMRCD_MOUSE | Smarcad1 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A containing DEAD/H box 1, EC 3.6.4.12 (ATP-dependent helicase SMARCAD1) (Enhancer trap locus homolog 1, Etl-1) |
| Q5RJG7 | ISPD_MOUSE | Crppa | D-ribitol-5-phosphate cytidylyltransferase, EC 2.7.7.40 (2-C-methyl-D-erythritol 4-phosphate cytidylyltransferase-like protein) (Isoprenoid synthase domain-containing protein) |
| Q9CXY6 | ILF2_MOUSE | Ilf2 | Interleukin enhancer-binding factor 2 (Nuclear factor of activated T-cells 45 kDa) |
| E9Q6B2 | CC85C_MOUSE | Ccdc85c | Coiled-coil domain-containing protein 85C |
| Q99J45 | NRBP_MOUSE | Nrbp1 | Nuclear receptor-binding protein (HLS7-interacting protein kinase) (MLF1 adapter molecule) |
| O35393 | EFNB3_MOUSE | Efnb3 | Ephrin-B3 |
| Q8BKT7 | THOC5_MOUSE | Thoc5 | THO complex subunit 5 homolog (Fms-interacting protein, FMIP) |
| Q3UKC1 | TAXB1_MOUSE | Tax1bp1 | Tax1-binding protein 1 homolog |
| Q9CQC8 | SPG21_MOUSE | Spg21 | Maspardin (Acid cluster protein 33) (Spastic paraplegia 21 autosomal recessive Mast syndrome protein homolog) |
| Q9QZB1 | RGS20_MOUSE | Rgs20 | Regulator of G-protein signaling 20, RGS20 (Regulator of G-protein signaling Z1) |
| Q9JI39 | ABCBA_MOUSE | Abcb10 | ATP-binding cassette sub-family B member 10, mitochondrial (ABC-mitochondrial erythroid protein, ABC-me protein) (ATP-binding cassette transporter 10, ABC transporter 10 protein) |
| Q9D6L8 | PPIL3_MOUSE | Ppil3 | Peptidyl-prolyl cis-trans isomerase-like 3, PPIase, EC 5.2.1.8 (CYP10L) (Cyclophilin-like protein PPIL3) (Rotamase PPIL3) |
| P18654 | KS6A3_MOUSE | Rps6ka3 | Ribosomal protein S6 kinase alpha-3, S6K-alpha-3, EC 2.7.11.1 (90 kDa ribosomal protein S6 kinase 3, p90-RSK 3, p90RSK3) (MAP kinase-activated protein kinase 1b, MAPK-activated protein kinase 1b, MAPKAP kinase 1b, MAPKAPK-1b) (Ribosomal S6 kinase 2, RSK-2) (pp90RSK2) |

| | | | |
|--------|-------------|--------|--|
| Q68FH0 | PKP4_MOUSE | Pkp4 | Plakophilin-4 (Armadillo-related protein) |
| Q80TR1 | AGRL1_MOUSE | Adgrl1 | Adhesion G protein-coupled receptor L1 (Calcium-independent alpha-latrotoxin receptor 1, CIRL-1) (Latrophilin-1) (Lectomedin-2) |
| P46978 | STT3A_MOUSE | Stt3a | Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit STT3A, Oligosaccharyl transferase subunit STT3A, STT3-A, EC 2.4.99.18 (B5) (Integral membrane protein 1) |
| Q8VD75 | HIP1_MOUSE | Hip1 | Huntingtin-interacting protein 1, HIP-1 (Huntingtin-interacting protein I, HIP-I) |
| P97412 | LYST_MOUSE | Lyst | Lysosomal-trafficking regulator (Beige protein) (CHS1 homolog) |
| Q9D0B5 | TSTD3_MOUSE | Tstd3 | Thiosulfate sulfurtransferase/rhodanese-like domain-containing protein 3 (Rhodanese domain-containing protein 3) |
| Q7TPB0 | PLPR3_MOUSE | Plppr3 | Phospholipid phosphatase-related protein type 3 (Inactive phospholipid phosphatase PLPPR3) (Lipid phosphate phosphatase-related protein type 3) (Plasticity-related gene 2 protein, PRG-2) |
| Q08943 | SSRP1_MOUSE | Ssrp1 | FACT complex subunit SSRP1 (Facilitates chromatin transcription complex subunit SSRP1) (Recombination signal sequence recognition protein 1) (Structure-specific recognition protein 1) (T160) |
| P59672 | ANS1A_MOUSE | Anks1a | Ankyrin repeat and SAM domain-containing protein 1A (Odin) |
| Q91Z46 | DUS7_MOUSE | Dusp7 | Dual specificity protein phosphatase 7, EC 3.1.3.16, EC 3.1.3.48 |
| Q8VDK1 | NIT1_MOUSE | Nit1 | Deaminated glutathione amidase, dGSH amidase, EC 3.5.1.128 (Nitrilase homolog 1) |
| Q3THJ3 | EIF1A_MOUSE | Eif1ad | Probable RNA-binding protein EIF1AD (Eukaryotic translation initiation factor 1A domain-containing protein) |
| Q8BHC1 | RB39B_MOUSE | Rab39b | Ras-related protein Rab-39B |
| Q8K4B0 | MTA1_MOUSE | Mta1 | Metastasis-associated protein MTA1 |
| Q3TPX4 | EXOC5_MOUSE | Exoc5 | Exocyst complex component 5 (Exocyst complex component Sec10) |
| Q8VCE4 | CI040_MOUSE | | Uncharacterized protein C9orf40 homolog |
| Q5U430 | UBR3_MOUSE | Ubr3 | E3 ubiquitin-protein ligase UBR3, EC 2.3.2.27 (N-recognin-3) (RING-type E3 ubiquitin transferase UBR3) (Ubiquitin-protein ligase E3-alpha-3) (Ubiquitin-protein ligase E3-alpha-III) (Zinc finger protein 650) |
| P62737 | ACTA_MOUSE | Acta2 | Actin, aortic smooth muscle (Alpha-actin-2) [Cleaved into: Actin, aortic smooth muscle, intermediate form] |

| | | | |
|--------|-------------|---------|--|
| Q60803 | TRAF3_MOUSE | Traf3 | TNF receptor-associated factor 3, EC 2.3.2.27 (CD40 receptor-associated factor 1, CRAF1) (CD40-binding protein, CD40BP) (RING-type E3 ubiquitin transferase TRAF3) |
| Q9D273 | MMAB_MOUSE | Mmab | Corrinoid adenosyltransferase MMAB, EC 2.5.1.- (ATP:co(I)rrinoid adenosyltransferase MMAB) (Methylmalonic aciduria type B homolog) |
| Q9D8S3 | ARFG3_MOUSE | Arfgap3 | ADP-ribosylation factor GTPase-activating protein 3, ARF GAP 3 |
| Q99KC8 | VMA5A_MOUSE | Vwa5a | von Willebrand factor A domain-containing protein 5A (Loss of heterozygosity 11 chromosomal region 2 gene A protein homolog) |
| Q9JLK7 | CABP1_MOUSE | Cabp1 | Calcium-binding protein 1, CaBP1 |
| Q9Z0H4 | CELF2_MOUSE | Celf2 | CUGBP Elav-like family member 2, CELF-2 (Bruno-like protein 3) (CUG triplet repeat RNA-binding protein 2, CUG-BP2) (CUG-BP- and ETR-3-like factor 2) (ELAV-type RNA-binding protein 3, ETR-3, mETR-3) (Neuroblastoma apoptosis-related RNA-binding protein, mNapor) (RNA-binding protein BRUNOL-3) |
| Q99MS8 | TPGS1_MOUSE | Tpgs1 | Tubulin polyglutamylase complex subunit 1, PGs1 (p32) |
| Q8BP40 | PPA6_MOUSE | Acp6 | Lysophosphatidic acid phosphatase type 6, EC 3.1.3.2 (Acid phosphatase 6, lysophosphatidic) (Acid phosphatase-like protein 1) (PACPL1) |
| P33175 | KIF5A_MOUSE | Kif5a | Kinesin heavy chain isoform 5A (Kinesin heavy chain neuron-specific 1) (Neuronal kinesin heavy chain, NKHC) |
| Q78IS1 | TMED3_MOUSE | Tmed3 | Transmembrane emp24 domain-containing protein 3 (p24 family protein gamma-4, p24gamma4) |
| Q9Z1B3 | PLCB1_MOUSE | Plcb1 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-1, EC 3.1.4.11 (PLC-154) (Phosphoinositide phospholipase C-beta-1) (Phospholipase C-beta-1, PLC-beta-1) |
| Q8BVY0 | RL1D1_MOUSE | Rsl1d1 | Ribosomal L1 domain-containing protein 1 |
| Q61539 | ERR2_MOUSE | Esrrb | Steroid hormone receptor ERR2 (Estrogen receptor-like 2) (Estrogen-related receptor beta, ERR-beta) (Nuclear receptor subfamily 3 group B member 2) |
| Q9JHS3 | LTOR2_MOUSE | Lamtor2 | Ragulator complex protein LAMTOR2 (Endosomal adaptor protein p14) (Late endosomal/lysosomal Mp1-interacting protein) (Late endosomal/lysosomal adaptor and MAPK and MTOR activator 2) (Mitogen-activated protein-binding protein-interacting protein) (Roadblock domain-containing protein 3) |
| Q9D385 | AR2BP_MOUSE | Arl2bp | ADP-ribosylation factor-like protein 2-binding protein, ARF-like 2-binding protein (Binder of ARF2 protein 1) |

| | | | |
|--------|-------------|---------|--|
| Q6IR34 | GPSM1_MOUSE | Gpsm1 | G-protein-signaling modulator 1 (Activator of G-protein signaling 3) |
| Q61739 | ITA6_MOUSE | Itga6 | Integrin alpha-6 (CD49 antigen-like family member F) (VLA-6) (CD antigen CD49f) [Cleaved into: Integrin alpha-6 heavy chain; Integrin alpha-6 light chain; Processed integrin alpha-6, Alpha6p] |
| Q9ERR7 | SEP15_MOUSE | Selenof | Selenoprotein F (15 kDa selenoprotein) |
| Q8BZH4 | POGZ_MOUSE | Pogz | Pogo transposable element with ZNF domain |
| P09174 | CNRG_MOUSE | Pde6g | Retinal rod rhodopsin-sensitive cGMP 3',5'-cyclic phosphodiesterase subunit gamma, GMP-PDE gamma, EC 3.1.4.35 |
| Q9QXJ1 | APBB1_MOUSE | Apbb1 | Amyloid beta precursor protein binding family B member 1 (Amyloid-beta A4 precursor protein-binding family B member 1) (Protein Fe65) |
| Q8K2Q9 | SHOT1_MOUSE | Shtn1 | Shootin-1 (Shootin1) |
| Q80YR4 | ZN598_MOUSE | Znf598 | E3 ubiquitin-protein ligase ZNF598, EC 2.3.2.27 (Zinc finger protein 598) |
| Q99PW4 | PRPKB_MOUSE | Tp53rkb | EKC/KEOPS complex subunit Tp53rkb, EC 3.6.-.- (Atypical serine/threonine protein kinase Tp53rk) (EKC/KEOPS complex subunit Tp53rk) (Nori-2) (TP53-regulating kinase, EC 2.7.11.1) (p53-related protein kinase) |
| Q9CQX5 | CLDN1_MOUSE | Cldnd1 | Claudin domain-containing protein 1 (Claudin-25) |
| Q9CPR7 | SIKE1_MOUSE | Sike1 | Suppressor of IKBKE 1 (Suppressor of IKK-epsilon) |
| O08842 | GFRA2_MOUSE | Gfra2 | GDNF family receptor alpha-2, GDNF receptor alpha-2, GDNFR-alpha-2, GFR-alpha-2 (GDNF receptor beta, GDNFR-beta) (Neurturin receptor alpha, NRTNR-alpha, NTN-alpha) (TGF-beta-related neurotrophic factor receptor 2) |
| Q3UJB9 | EDC4_MOUSE | Edc4 | Enhancer of mRNA-decapping protein 4 |
| P62843 | RS15_MOUSE | Rps15 | 40S ribosomal protein S15 (RIG protein) |
| Q9D8M7 | PHF10_MOUSE | Phf10 | PHD finger protein 10 (BRG1-associated factor 45a, BAF45a) |
| Q8BM39 | PRP18_MOUSE | Prpf18 | Pre-mRNA-splicing factor 18 (PRP18 homolog) |
| P15379 | CD44_MOUSE | Cd44 | CD44 antigen (Extracellular matrix receptor III, ECMR-III) (GP90 lymphocyte homing/adhesion receptor) (HUTCH-I) (Hermes antigen) (Hyaluronate receptor) (Lymphocyte antigen 24, Ly-24) (Phagocytic glycoprotein 1, PGP-1) (Phagocytic glycoprotein I, PGP-I) (CD antigen CD44) |
| O88545 | CSN6_MOUSE | Cops6 | COP9 signalosome complex subunit 6, SGN6, Signalosome subunit 6 (JAB1-containing signalosome subunit 6) |

| | | | |
|--------|-------------|---------|--|
| Q8CB77 | ELOA1_MOUSE | Eloa | Elongin-A, EloA (Elongin 110 kDa subunit) (RNA polymerase II transcription factor SIII subunit A1) (SIII p110) (Transcription elongation factor B polypeptide 3) |
| Q922R1 | PHAF1_MOUSE | Phaf1 | Phagosome assembly factor 1 |
| P17141 | ZFP37_MOUSE | Zfp37 | Zinc finger protein 37, Zfp-37 (Male germ cell-specific zinc finger protein) |
| Q6DID5 | PWP3A_MOUSE | Pwwp3a | PWWP domain-containing DNA repair factor 3A, PWWP3A (Mutated melanoma-associated antigen 1, MUM-1) (PWWP domain-containing protein MUM1) |
| Q9DC70 | NDUS7_MOUSE | Ndufs7 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 7, mitochondrial, EC 7.1.1.2 (Complex I-20kD, CI-20kD) (NADH-ubiquinone oxidoreductase 20 kDa subunit) |
| Q62074 | KPCI_MOUSE | Prkci | Protein kinase C iota type, EC 2.7.11.13 (Atypical protein kinase C-lambda/iota, aPKC-lambda/iota) (nPKC-iota) |
| Q6P8Z1 | MYCB_MOUSE | Mycb | Protein B-Myc |
| A8Y5H7 | S14L1_MOUSE | Sec14l1 | SEC14-like protein 1 |
| Q3TD16 | PACER_MOUSE | Rubcnl | Protein associated with UVRAG as autophagy enhancer, Pacer (Protein Rubicon-like) |
| Q9JL04 | FMN2_MOUSE | Fmn2 | Formin-2 |
| Q99PL6 | UBXN6_MOUSE | Ubxn6 | UBX domain-containing protein 6 (UBX domain-containing protein 1) |
| Q3URS9 | MITOK_MOUSE | Ccdc51 | Mitochondrial potassium channel, MITOK (Coiled-coil domain-containing protein 51) |
| Q9EPL4 | METL9_MOUSE | Mettl9 | Protein-L-histidine N-pros-methyltransferase, EC 2.1.1.- (DORA reverse strand protein, DREV) (Methyltransferase-like protein 9, mMETTL9) |
| P07146 | TRY2_MOUSE | Prss2 | Anionic trypsin-2, EC 3.4.21.4 (Anionic trypsin II) (Pretrypsinogen II) (Serine protease 2) |
| Q8K039 | K1143_MOUSE | | Uncharacterized protein KIAA1143 homolog |
| Q9CX56 | PSMD8_MOUSE | Psm8 | 26S proteasome non-ATPase regulatory subunit 8 (26S proteasome regulatory subunit RPN12) (26S proteasome regulatory subunit S14) |
| Q6ZWZ2 | UB2R2_MOUSE | Ube2r2 | Ubiquitin-conjugating enzyme E2 R2, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme R2) (Ubiquitin carrier protein R2) (Ubiquitin-conjugating enzyme E2-CDC34B) (Ubiquitin-protein ligase R2) |
| Q9R1W5 | CALRL_MOUSE | Calrl | Calcitonin gene-related peptide type 1 receptor, CGRP type 1 receptor (Calcitonin receptor-like receptor) |
| Q8BIW1 | PRUN1_MOUSE | Prune1 | Exopolyphosphatase PRUNE1, EC 3.6.1.1 (PRUNEM1) |
| Q7TME0 | PLPR4_MOUSE | Plppr4 | Phospholipid phosphatase-related protein type 4 (Brain-specific phosphatidic acid phosphatase-like protein 1) (Inactive 2-lysophosphatidate phosphatase PLPPR4) |

| | | | |
|--------|-------------|---------|--|
| | | | (Lipid phosphate phosphatase-related protein type 4) (Plasticity-related gene 1 protein, PRG-1) |
| Q91YE6 | IPO9_MOUSE | Ipo9 | Importin-9, Imp9 (Importin-9a, Imp9a) (Importin-9b, Imp9b) (Ran-binding protein 9, RanBP9) |
| Q9CXF4 | TBC15_MOUSE | Tbc1d15 | TBC1 domain family member 15 (GTPase-activating protein RAB7, GAP for RAB7, Rab7-GAP) |
| Q9D832 | DNJB4_MOUSE | Dnajb4 | DnaJ homolog subfamily B member 4 |
| Q4VBE4 | EGFLA_MOUSE | Egflam | Pikachurin (EGF-like, fibronectin type-III and laminin G-like domain-containing protein) (Nectican) |
| Q9WV18 | GABR1_MOUSE | Gabbr1 | Gamma-aminobutyric acid type B receptor subunit 1, GABA-B receptor 1, GABA-B-R1, GABA-BR1, GABABR1, Gb1 |
| Q3U0M1 | TPPC9_MOUSE | Trappc9 | Trafficking protein particle complex subunit 9 (NIK- and IKBKB-binding protein) |
| O89084 | PDE4A_MOUSE | Pde4a | cAMP-specific 3',5'-cyclic phosphodiesterase 4A, EC 3.1.4.53 |
| Q9Z0S9 | PRAF1_MOUSE | Rabac1 | Prenylated Rab acceptor protein 1 (PRA1 family protein 1) (Prenylin) |
| Q7M6Z0 | R4RL2_MOUSE | Rtn4rl2 | Reticulon-4 receptor-like 2 (Nogo receptor-like 3) (Nogo-66 receptor homolog 1) (Nogo-66 receptor-related protein 2, Ngr2) |
| Q64133 | AOFA_MOUSE | Maoa | Amine oxidase [flavin-containing] A, EC 1.4.3.21, EC 1.4.3.4 (Monoamine oxidase type A, MAO-A) |
| Q8CI04 | COG3_MOUSE | Cog3 | Conserved oligomeric Golgi complex subunit 3, COG complex subunit 3 (Component of oligomeric Golgi complex 3) |
| Q6PHZ8 | KCIP4_MOUSE | Kcnip4 | Kv channel-interacting protein 4, KChIP4 (A-type potassium channel modulatory protein 4) (Calsenilin-like protein) (Potassium channel-interacting protein 4) |
| P61022 | CHP1_MOUSE | Chp1 | Calcineurin B homologous protein 1 (Calcineurin B-like protein) (Calcium-binding protein CHP) (Calcium-binding protein p22) (EF-hand calcium-binding domain-containing protein p22) (Sid 470) (p24) |
| Q60596 | XRCC1_MOUSE | Xrcc1 | DNA repair protein XRCC1 (X-ray repair cross-complementing protein 1) |
| Q8K363 | DDX18_MOUSE | Ddx18 | ATP-dependent RNA helicase DDX18, EC 3.6.4.13 (DEAD box protein 18) |
| Q8VHQ9 | ACO11_MOUSE | Acot11 | Acyl-coenzyme A thioesterase 11, Acyl-CoA thioesterase 11, EC 3.1.2.- (Acyl-CoA thioester hydrolase 11) (Adipose-associated thioesterase) (Brown fat-inducible thioesterase, BFIT) (Palmitoyl-coenzyme A thioesterase, EC 3.1.2.2) |
| Q8BHG1 | NRDC_MOUSE | Nrdc | Nardilysin, EC 3.4.24.61 (N-arginine dibasic convertase, NRD convertase, NRD-C) (Nardilysin convertase) |

| | | | |
|--------|-------------|---------|---|
| Q8BTX9 | HSDL1_MOUSE | Hsd1l | Inactive hydroxysteroid dehydrogenase-like protein 1 |
| Q91VZ6 | SMAP1_MOUSE | Smap1 | Stromal membrane-associated protein 1 |
| Q8VDS4 | RPR1A_MOUSE | Rprd1a | Regulation of nuclear pre-mRNA domain-containing protein 1A (Cyclin-dependent kinase inhibitor 2B-related protein) (p15INK4B-related protein) |
| Q80UK8 | INT2_MOUSE | Ints2 | Integrator complex subunit 2, Int2 |
| Q99MQ1 | BICC1_MOUSE | Bicc1 | Protein bicaudal C homolog 1, Bic-C |
| Q8BKR5 | PPR37_MOUSE | Ppp1r37 | Protein phosphatase 1 regulatory subunit 37 (Leucine-rich repeat-containing protein 68) |
| P97390 | VPS45_MOUSE | Vps45 | Vacuolar protein sorting-associated protein 45, mVps45 |
| Q9D0B0 | SRSF9_MOUSE | Srsf9 | Serine/arginine-rich splicing factor 9 (Splicing factor, arginine/serine-rich 9) |
| Q9D1M0 | SEC13_MOUSE | Sec13 | Protein SEC13 homolog (GATOR complex protein SEC13) (SEC13-like protein 1) (SEC13-related protein) |
| Q9D1M7 | FKB11_MOUSE | Fkbp11 | Peptidyl-prolyl cis-trans isomerase FKBP11, PPIase FKBP11, EC 5.2.1.8 (19 kDa FK506-binding protein, 19 kDa FKBP, FKBP-19) (FK506-binding protein 11, FKBP-11) (Rotamase) |
| Q8R310 | TMCC3_MOUSE | Tmcc3 | Transmembrane and coiled-coil domain protein 3 |
| P25425 | PO2F1_MOUSE | Pou2f1 | POU domain, class 2, transcription factor 1 (NF-A1) (Octamer-binding protein 1, Oct-1) (Octamer-binding transcription factor 1, OTF-1) |
| Q91W89 | MA2C1_MOUSE | Man2c1 | Alpha-mannosidase 2C1, EC 3.2.1.24 (Alpha-D-mannoside mannohydrolase) (Mannosidase alpha class 2C member 1) (Neutral/cytosolic alpha-mannosidase) |
| Q3UQ84 | SYTM_MOUSE | Tars2 | Threonine--tRNA ligase, mitochondrial, EC 6.1.1.3 (Threonyl-tRNA synthetase, ThrRS) (Threonyl-tRNA synthetase-like 1) |
| Q7TQK1 | INT7_MOUSE | Ints7 | Integrator complex subunit 7, Int7 |
| Q8K1S2 | UNC5D_MOUSE | Unc5d | Netrin receptor UNC5D (Protein unc-5 homolog 4) (Protein unc-5 homolog D) |
| Q80T74 | KLH29_MOUSE | Klhl29 | Kelch-like protein 29 (Kelch repeat and BTB domain-containing protein 9) |
| O35678 | MGLL_MOUSE | Mgl1 | Monoglyceride lipase, MGL, EC 3.1.1.23 (Monoacylglycerol lipase, MAGL) |
| P56716 | RP1_MOUSE | Rp1 | Oxygen-regulated protein 1 (Retinitis pigmentosa RP1 protein homolog) |
| P14430 | HA18_MOUSE | H2-Q8 | H-2 class I histocompatibility antigen, Q8 alpha chain |
| Q7TSZ8 | NACC1_MOUSE | Nacc1 | Nucleus accumbens-associated protein 1, NAC-1 (BTB/POZ domain-containing protein 14B) |

| | | | |
|--------|-------------|---------|--|
| P61458 | PHS_MOUSE | Pcbd1 | Pterin-4-alpha-carbinolamine dehydratase, PHS, EC 4.2.1.96 (4-alpha-hydroxy-tetrahydropterin dehydratase) (Dimerization cofactor of hepatocyte nuclear factor 1-alpha, DCoH, Dimerization cofactor of HNF1) (Phenylalanine hydroxylase-stimulating protein) (Pterin carbinolamine dehydratase, PCD) |
| P51569 | AGAL_MOUSE | Gla | Alpha-galactosidase A, EC 3.2.1.22 (Alpha-D-galactosidase A) (Alpha-D-galactoside galactohydrolase) (Galactosylgalactosylglucosylceramidase GLA) (Melibiase) |
| P28843 | DPP4_MOUSE | Dpp4 | Dipeptidyl peptidase 4, EC 3.4.14.5 (Dipeptidyl peptidase IV, DPP IV) (T-cell activation antigen CD26) (Thymocyte-activating molecule, THAM) (CD antigen CD26) [Cleaved into: Dipeptidyl peptidase 4 membrane form (Dipeptidyl peptidase IV membrane form); Dipeptidyl peptidase 4 soluble form (Dipeptidyl peptidase IV soluble form)] |
| Q3TWI9 | CSCL2_MOUSE | Tmem63b | CSC1-like protein 2 (Transmembrane protein 63B) |
| O88441 | MTX2_MOUSE | Mtx2 | Metaxin-2 (Mitochondrial outer membrane import complex protein 2) |
| Q5SXY1 | CYTSB_MOUSE | Specc1 | Cytospin-B (Sperm antigen with calponin homology and coiled-coil domains 1) |
| Q8R3T5 | STXB6_MOUSE | Stxbp6 | Syntaxin-binding protein 6 |
| S4R2P9 | NAC3_MOUSE | Slc8a3 | Sodium/calcium exchanger 3 (Na(+)/Ca(2+)-exchange protein 3) (Solute carrier family 8 member 3) |
| Q9DAI2 | IFT22_MOUSE | Ift22 | Intraflagellar transport protein 22 homolog (Rab-like protein 5) |
| Q8CIB6 | TM230_MOUSE | Tmem230 | Transmembrane protein 230 |
| Q01730 | RSU1_MOUSE | Rsu1 | Ras suppressor protein 1, RSP-1, Rsu-1 |
| Q8BG67 | EFR3A_MOUSE | Efr3a | Protein EFR3 homolog A (Protein EFR3-like) |
| O08832 | GALT4_MOUSE | Galnt4 | Polypeptide N-acetylgalactosaminyltransferase 4, EC 2.4.1.41 (Polypeptide GalNAc transferase 4, GalNAc-T4, pp-GaNTase 4) (Protein-UDP acetylgalactosaminyltransferase 4) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase 4) |
| Q5DU41 | LRC8B_MOUSE | Lrrc8b | Volume-regulated anion channel subunit LRRC8B (Leucine-rich repeat-containing protein 8B) |
| P61620 | S61A1_MOUSE | Sec61a1 | Protein transport protein Sec61 subunit alpha isoform 1, Sec61 alpha-1 |
| A2AJ15 | MA1B1_MOUSE | Man1b1 | Endoplasmic reticulum mannosyl-oligosaccharide 1,2-alpha-mannosidase, EC 3.2.1.113 (ER alpha-1,2-mannosidase) (ER mannosidase 1, ERMan1) (Man9GlcNAc2-specific-processing alpha-mannosidase) (Mannosidase alpha class 1B member 1) |

| | | | |
|--------|-------------|---------|---|
| Q8QZY6 | TSN14_MOUSE | Tspan14 | Tetraspanin-14, Tspan-14 (Transmembrane 4 superfamily member 14) |
| Q5RJH6 | SMG7_MOUSE | Smg7 | Nonsense-mediated mRNA decay factor SMG7 (SMG-7 homolog) |
| O70551 | SRPK1_MOUSE | Srpk1 | SRSF protein kinase 1, EC 2.7.11.1 (SFRS protein kinase 1) (Serine/arginine-rich protein-specific kinase 1, SR-protein-specific kinase 1) |
| P49135 | ERCC3_MOUSE | Ercc3 | General transcription and DNA repair factor IIIH helicase subunit XPB, TFIIH subunit XPB, EC 3.6.4.12 (Basic transcription factor 2 89 kDa subunit, BTF2 p89) (DNA excision repair protein ERCC-3) (DNA repair protein complementing XP-B cells) (TFIIH 89 kDa subunit) (Xeroderma pigmentosum group B-complementing protein) |
| Q8VI33 | TAF9_MOUSE | Taf9 | Transcription initiation factor TFIID subunit 9 (RNA polymerase II TBP-associated factor subunit G) (Transcription initiation factor TFIID 31 kDa subunit, TAFII-31, TAFII31) (Transcription initiation factor TFIID 32 kDa subunit, TAFII-32, TAFII32) |
| Q6P5G3 | MBTD1_MOUSE | Mbtd1 | MBT domain-containing protein 1 |
| Q6ZQ29 | TAOK2_MOUSE | Taok2 | Serine/threonine-protein kinase TAO2, EC 2.7.11.1 (Thousand and one amino acid protein 2) |
| Q91YE5 | BAZ2A_MOUSE | Baz2a | Bromodomain adjacent to zinc finger domain protein 2A (Transcription termination factor I-interacting protein 5, TTF-I-interacting protein 5, Tip5) |
| O70589 | CSKP_MOUSE | Cask | Peripheral plasma membrane protein CASK, EC 2.7.11.1 (Calcium/calmodulin-dependent serine protein kinase) |
| Q91YL2 | RN126_MOUSE | Rnf126 | E3 ubiquitin-protein ligase RNF126, EC 2.3.2.27 (RING finger protein 126) |
| A2AJT4 | PNISR_MOUSE | Pnizr | Arginine/serine-rich protein PNISR (Serine/arginine-rich-splicing regulatory protein 130, SRrp130) (Splicing factor, arginine/serine-rich 130) (Splicing factor, arginine/serine-rich 18) |
| Q9JHU9 | INO1_MOUSE | Isyna1 | Inositol-3-phosphate synthase 1, IPS 1, EC 5.5.1.4 (Myo-inositol 1-phosphate synthase, MI-1-P synthase, MIP synthase) |
| P16283 | B3A3_MOUSE | Slc4a3 | Anion exchange protein 3, AE 3, Anion exchanger 3 (Neuronal band 3-like protein) (Solute carrier family 4 member 3) |
| Q9CWF2 | TBB2B_MOUSE | Tubb2b | Tubulin beta-2B chain |
| Q6NS46 | RRP5_MOUSE | Pdcd11 | Protein RRP5 homolog (Apoptosis-linked gene 4 protein) (Programmed cell death protein 11) |
| Q8R4H9 | ZNT5_MOUSE | Slc30a5 | Zinc transporter 5, ZnT-5 (Solute carrier family 30 member 5) |
| Q99PU8 | DHX30_MOUSE | Dhx30 | ATP-dependent RNA helicase DHX30, EC 3.6.4.13 (DEAH box protein 30) |

| | | | |
|--------|-------------|----------|---|
| E9Q286 | ICE1_MOUSE | Ice1 | Little elongation complex subunit 1 (Interactor of little elongator complex ELL subunit 1) |
| Q80U35 | ARHGH_MOUSE | Arhgef17 | Rho guanine nucleotide exchange factor 17 |
| Q6NS52 | DGKB_MOUSE | Dgkb | Diacylglycerol kinase beta, DAG kinase beta, EC 2.7.1.107 (Diglyceride kinase beta, DGK-beta) |
| Q8JZV9 | BDH2_MOUSE | Bdh2 | 3-hydroxybutyrate dehydrogenase type 2, EC 1.1.1.30 (4-oxo-L-proline reductase, EC 1.1.1.104) (Dehydrogenase/reductase SDR family member 6) (R-beta-hydroxybutyrate dehydrogenase) |
| Q8BZ98 | DYN3_MOUSE | Dnm3 | Dynamamin-3, EC 3.6.5.5 |
| Q8R5J9 | PRAF3_MOUSE | Arl6ip5 | PRA1 family protein 3 (ADP-ribosylation factor-like protein 6-interacting protein 5, ARL-6-interacting protein 5, Aip-5) (Addicisin) (GTRAP3-18) (Glutamate transporter EAAC1-interacting protein) (Prenylated Rab acceptor protein 2) (Protein JWa) |
| Q9Z110 | P5CS_MOUSE | Aldh18a1 | Delta-1-pyrroline-5-carboxylate synthase, P5CS (Aldehyde dehydrogenase family 18 member A1) [Includes: Glutamate 5-kinase, GK, EC 2.7.2.11 (Gamma-glutamyl kinase); Gamma-glutamyl phosphate reductase, GPR, EC 1.2.1.41 (Glutamate-5-semialdehyde dehydrogenase) (Glutamyl-gamma-semialdehyde dehydrogenase)] |
| Q9JMK2 | KC1E_MOUSE | Csnk1e | Casein kinase I isoform epsilon, CKI-epsilon, CKIe, EC 2.7.11.1 |
| Q8BGF6 | ELMD2_MOUSE | Elmod2 | ELMO domain-containing protein 2 |
| Q61490 | CD166_MOUSE | Alcam | CD166 antigen (Activated leukocyte cell adhesion molecule) (BEN) (Protein DM-GRASP) (CD antigen CD166) |
| Q8C7M3 | TRIM9_MOUSE | Trim9 | E3 ubiquitin-protein ligase TRIM9, EC 2.3.2.27 (RING-type E3 ubiquitin transferase TRIM9) (Tripartite motif-containing protein 9) |
| Q99MK8 | ARBK1_MOUSE | Grk2 | Beta-adrenergic receptor kinase 1, Beta-ARK-1, EC 2.7.11.15 (G-protein-coupled receptor kinase 2) |
| A2AJK6 | CHD7_MOUSE | Chd7 | Chromodomain-helicase-DNA-binding protein 7, CHD-7, EC 3.6.4.12 (ATP-dependent helicase CHD7) |
| Q8BH44 | COR2B_MOUSE | Coro2b | Coronin-2B |
| Q60854 | SPB6_MOUSE | Serpinb6 | Serpin B6 (Placental thrombin inhibitor) (Proteinase inhibitor 6, PI-6) |
| A2BE28 | LAS1L_MOUSE | Las1l | Ribosomal biogenesis protein LAS1L (Protein LAS1 homolog) |
| Q69Z23 | DYH17_MOUSE | Dnah17 | Dynein axonemal heavy chain 17 (Axonemal beta dynein heavy chain 17) (Ciliary dynein heavy chain 17) |
| Q6KAR6 | EXOC3_MOUSE | Exoc3 | Exocyst complex component 3 (Exocyst complex component Sec6) |

| | | | |
|--------|-------------|---------|--|
| Q8BKC8 | PI4KB_MOUSE | Pi4kb | Phosphatidylinositol 4-kinase beta, PI4K-beta, PI4Kbeta, PtdIns 4-kinase beta, EC 2.7.1.67 |
| O88396 | GRPE2_MOUSE | Grpel2 | GrpE protein homolog 2, mitochondrial (Mt-GrpE#2) |
| O54785 | LIMK2_MOUSE | Limk2 | LIM domain kinase 2, LIMK-2, EC 2.7.11.1 |
| Q9CQH3 | NDUB5_MOUSE | Ndufb5 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 5, mitochondrial (Complex I-SGDH, CI-SGDH) (NADH-ubiquinone oxidoreductase SGDH subunit) |
| Q8C729 | F126B_MOUSE | Fam126b | Protein FAM126B |
| Q9JKX4 | AATF_MOUSE | Aatf | Protein AATF (Apoptosis-antagonizing transcription factor) (Rb-binding protein Che-1) (Traube protein) |
| Q505D7 | OPA3_MOUSE | Opa3 | Optic atrophy 3 protein homolog |
| P21278 | GNA11_MOUSE | Gna11 | Guanine nucleotide-binding protein subunit alpha-11, G alpha-11, G-protein subunit alpha-11 |
| Q6DVA0 | LEMD2_MOUSE | Lemd2 | LEM domain-containing protein 2 (Nuclear envelope transmembrane protein 25, NET25) |
| P97434 | MPRIP_MOUSE | Mprrip | Myosin phosphatase Rho-interacting protein (Rho-interacting protein 3, RIP3) (p116Rip) |
| Q3U2I3 | FHI1B_MOUSE | Fhip1b | FHF complex subunit HOOK interacting protein 1B, FHIP1B (FTS and Hook-interacting protein, FHIP) |
| Q8K2Y7 | RM47_MOUSE | Mrpl47 | 39S ribosomal protein L47, mitochondrial, L47mt, MRP-L47 |
| Q3TWN3 | CNNM2_MOUSE | Cnnm2 | Metal transporter CNNM2 (Ancient conserved domain-containing protein 2, mACDP2) (Cyclin-M2) |
| Q8VHL1 | SETD7_MOUSE | Setd7 | Histone-lysine N-methyltransferase SETD7, EC 2.1.1.364 (Histone H3-K4 methyltransferase SETD7, H3-K4-HMTase SETD7) (SET domain-containing protein 7) (SET7/9) |
| E9PY46 | IF140_MOUSE | Ift140 | Intraflagellar transport protein 140 homolog (WD and tetratricopeptide repeats protein 2) |
| Q99JY8 | PLPP3_MOUSE | Plpp3 | Phospholipid phosphatase 3, EC 3.1.3.-, EC 3.1.3.4 (Lipid phosphate phosphohydrolase 3) (PAP2-beta) (Phosphatidate phosphohydrolase type 2b) (Phosphatidic acid phosphatase 2b, PAP-2b, PAP2b) |
| Q8C7E9 | CSTFT_MOUSE | Cstf2t | Cleavage stimulation factor subunit 2 tau variant (CF-1 64 kDa subunit tau variant) (Cleavage stimulation factor 64 kDa subunit tau variant, CSTF 64 kDa subunit tau variant) (TauCstF-64) |

| | | | |
|--------|-------------|----------|--|
| Q4VBE8 | WDR18_MOUSE | Wdr18 | WD repeat-containing protein 18 |
| Q8K0E8 | FIBB_MOUSE | Fgb | Fibrinogen beta chain [Cleaved into: Fibrinopeptide B; Fibrinogen beta chain] |
| P52734 | FGD1_MOUSE | Fgd1 | FYVE, RhoGEF and PH domain-containing protein 1 (Faciogenital dysplasia 1 protein homolog) (Rho/Rac guanine nucleotide exchange factor FGD1, Rho/Rac GEF) (Zinc finger FYVE domain-containing protein 3) |
| Q8R2Q4 | RRF2M_MOUSE | Gfm2 | Ribosome-releasing factor 2, mitochondrial, RRF2mt (Elongation factor G 2, mitochondrial, EF-G2mt, mEF-G 2) |
| Q9DBN9 | DDX59_MOUSE | Ddx59 | Probable ATP-dependent RNA helicase DDX59, EC 3.6.4.13 (DEAD box protein 59) (Zinc finger HIT domain-containing protein 5) |
| Q9R226 | KHDR3_MOUSE | Khdrbs3 | KH domain-containing, RNA-binding, signal transduction-associated protein 3 (RNA-binding protein Etoile) (Sam68-like mammalian protein 2, SLM-2) |
| Q9WUU9 | GANP_MOUSE | Mcm3ap | Germinal-center associated nuclear protein, GANP, EC 2.3.1.48 (GC-associated DNA primase) |
| Q5SS80 | DHR13_MOUSE | Dhrs13 | Dehydrogenase/reductase SDR family member 13, EC 1.1.-.- (Short chain dehydrogenase/reductase family 7C member 5, Protein SDR7C5) |
| Q8CBG9 | RN170_MOUSE | Rnf170 | E3 ubiquitin-protein ligase RNF170, EC 2.3.2.27 (RING finger protein 170) (RING-type E3 ubiquitin transferase RNF170) |
| Q6NZB1 | ANM6_MOUSE | Prmt6 | Protein arginine N-methyltransferase 6, EC 2.1.1.319 (Histone-arginine N-methyltransferase PRMT6) |
| Q8BGB7 | ENOPH_MOUSE | Enoph1 | Enolase-phosphatase E1, EC 3.1.3.77 (2,3-diketo-5-methylthio-1-phosphopentane phosphatase) (MASA homolog) |
| P49813 | TMOD1_MOUSE | Tmod1 | Tropomodulin-1 (Erythrocyte tropomodulin, E-Tmod) |
| Q9WTU0 | PHF2_MOUSE | Phf2 | Lysine-specific demethylase PHF2, EC 1.14.11.- (GRC5) (PHD finger protein 2) |
| Q9DC29 | ABCB6_MOUSE | Abcb6 | ATP-binding cassette sub-family B member 6 (ABC-type heme transporter ABCB6, EC 7.6.2.5) |
| Q9D9M5 | PHOP2_MOUSE | Phospho2 | Pyridoxal phosphate phosphatase PHOSPHO2, EC 3.1.3.74 |
| Q69ZC8 | GPAM1_MOUSE | Gpalpp1 | GPALPP motifs-containing protein 1 |
| Q62191 | RO52_MOUSE | Trim21 | E3 ubiquitin-protein ligase TRIM21, EC 2.3.2.27 (52 kDa Ro protein) (52 kDa ribonucleoprotein autoantigen Ro/SS-A) (RING-type E3 ubiquitin transferase TRIM21) (Ro(SS-A)) (Sjogren syndrome type A antigen, SS-A) (Tripartite motif-containing protein 21) |

| | | | |
|--------|-------------|---------|--|
| Q9R0A5 | NEK3_MOUSE | Nek3 | Serine/threonine-protein kinase Nek3, EC 2.7.11.1 (Never in mitosis A-related kinase 3, NimA-related protein kinase 3) |
| O08677 | KNG1_MOUSE | Kng1 | Kininogen-1 [Cleaved into: Kininogen-1 heavy chain; Bradykinin; Kininogen-1 light chain] |
| Q8BJS4 | SUN2_MOUSE | Sun2 | SUN domain-containing protein 2 (Protein unc-84 homolog B) (Sad1/unc-84 protein-like 2) |
| O35874 | SATT_MOUSE | Slc1a4 | Neutral amino acid transporter A (Alanine/serine/cysteine/threonine transporter 1, ASCT-1) (Solute carrier family 1 member 4) |
| O35495 | CDK14_MOUSE | Cdk14 | Cyclin-dependent kinase 14, EC 2.7.11.22 (Cell division protein kinase 14) (Serine/threonine-protein kinase PFTAIRE-1) |
| Q8K0T4 | KATL1_MOUSE | Katnal1 | Katanin p60 ATPase-containing subunit A-like 1, Katanin p60 subunit A-like 1, EC 5.6.1.1 (p60 katanin-like 1) |
| Q6P1E1 | ZMIZ1_MOUSE | Zmiz1 | Zinc finger MIZ domain-containing protein 1 (PIAS-like protein Zimp10) (Retinoic acid-induced protein 17) |
| P50429 | ARSB_MOUSE | Arsb | Arylsulfatase B, ASB, EC 3.1.6.12 (N-acetylgalactosamine-4-sulfatase, G4S) |
| Q7TSG2 | CTDP1_MOUSE | Ctdp1 | RNA polymerase II subunit A C-terminal domain phosphatase, EC 3.1.3.16 (TFIIF-associating CTD phosphatase) |
| Q14AW5 | NSUN7_MOUSE | Nsun7 | Putative methyltransferase NSUN7, EC 2.1.1.- (NOL1/NOP2/Sun domain family member 7) |
| Q3URD3 | SLMAP_MOUSE | Slmap | Sarcolemmal membrane-associated protein, Sarcolemmal-associated protein |
| Q61595 | KTN1_MOUSE | Ktn1 | Kinectin |
| P58281 | OPA1_MOUSE | Opa1 | Dynamin-like 120 kDa protein, mitochondrial, EC 3.6.5.5 (Large GTP-binding protein, LargeG) (Optic atrophy protein 1 homolog) [Cleaved into: Dynamin-like 120 kDa protein, form S1] |
| Q6KCD5 | NIPBL_MOUSE | Nipbl | Nipped-B-like protein (Delangin homolog) (SCC2 homolog) |
| Q6P9Q6 | FKB15_MOUSE | Fkbp15 | FK506-binding protein 15, FKBP-15 (133 kDa FK506-binding protein, 133 kDa FKBP, FKBP-133) (WASP and FKBP-like, WAFL) |
| P43006 | EAA2_MOUSE | Slc1a2 | Excitatory amino acid transporter 2 (GLT-1) (Sodium-dependent glutamate/aspartate transporter 2) (Solute carrier family 1 member 2) |
| Q60668 | HNRPD_MOUSE | Hnrnpd | Heterogeneous nuclear ribonucleoprotein D0, hnRNP D0 (AU-rich element RNA-binding protein 1) |
| Q91WC3 | ACSL6_MOUSE | Acsl6 | Long-chain-fatty-acid--CoA ligase 6, EC 6.2.1.3 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 6, LACS 6) |

| | | | |
|--------|-------------|---------|---|
| Q61597 | CRGC_MOUSE | Crygc | Gamma-crystallin C (Gamma-C-crystallin) |
| Q99JI6 | RAP1B_MOUSE | Rap1b | Ras-related protein Rap-1b, EC 3.6.5.2 (GTP-binding protein smg p21B) |
| Q3V0J1 | TM237_MOUSE | Tmem237 | Transmembrane protein 237 (Amyotrophic lateral sclerosis 2 chromosomal region candidate gene 4 protein homolog) |
| Q9WVJ5 | CRBB1_MOUSE | Crybb1 | Beta-crystallin B1 (Beta-B1 crystallin) [Cleaved into: Beta-crystallin B1B] |
| Q8CBY8 | DCTN4_MOUSE | Dctn4 | Dynactin subunit 4 (Dynactin subunit p62) |
| Q6PH08 | ERC2_MOUSE | Erc2 | ERC protein 2 (CAZ-associated structural protein 1, CAST1) |
| P35922 | FMR1_MOUSE | Fmr1 | Fragile X messenger ribonucleoprotein 1 (Fragile X messenger ribonucleoprotein, FMRP) (Protein FMR-1, mFmr1p) |
| Q9D7A8 | ARMC1_MOUSE | Armc1 | Armadillo repeat-containing protein 1 |
| Q03141 | MARK3_MOUSE | Mark3 | MAP/microtubule affinity-regulating kinase 3, EC 2.7.11.1 (ELKL motif kinase 2, EMK-2) (MPK-10) |
| Q6NXI6 | RPRD2_MOUSE | Rprd2 | Regulation of nuclear pre-mRNA domain-containing protein 2 |
| Q91YL3 | UCKL1_MOUSE | Uckl1 | Uridine-cytidine kinase-like 1, EC 2.7.1.48 |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| Q9EP89 | LACTB_MOUSE | Lactb | Serine beta-lactamase-like protein LACTB, mitochondrial, EC 3.4.-.- |
| Q5SUF2 | LC7L3_MOUSE | Luc7l3 | Luc7-like protein 3 (Cisplatin resistance-associated-overexpressed protein) |
| Q8R1N0 | ZN830_MOUSE | Znf830 | Zinc finger protein 830 (Coiled-coil domain-containing protein 16) (Ovus mutant candidate gene 1 protein) |
| Q6PAM1 | TXLNA_MOUSE | Txlna | Alpha-taxilin |
| Q8CHP5 | PYM1_MOUSE | Pym1 | Partner of Y14 and mago (PYM homolog 1 exon junction complex-associated factor) (Protein wibg homolog) |
| Q9DC63 | FBX3_MOUSE | Fbxo3 | F-box only protein 3 |
| Q8BVL9 | JKIP1_MOUSE | Jakmip1 | Janus kinase and microtubule-interacting protein 1 (GABA-B receptor-binding protein) (Multiple alpha-helices and RNA-linker protein 1, Marlin-1) |
| Q9JII5 | DAZP1_MOUSE | Dazap1 | DAZ-associated protein 1 (Deleted in azoospermia-associated protein 1) |
| Q8R480 | NUP85_MOUSE | Nup85 | Nuclear pore complex protein Nup85 (85 kDa nucleoporin) (FROUNT) (Nucleoporin Nup85) (Pericentrin-1) |
| Q689Z5 | SBNO1_MOUSE | Sbno1 | Protein strawberry notch homolog 1, mSno1 |

| | | | |
|--------|-------------|----------|--|
| Q60751 | IGF1R_MOUSE | Igflr | Insulin-like growth factor 1 receptor, EC 2.7.10.1 (Insulin-like growth factor I receptor, IGF-I receptor) (CD antigen CD221) [Cleaved into: Insulin-like growth factor 1 receptor alpha chain; Insulin-like growth factor 1 receptor beta chain] |
| Q4PJX1 | ODR4_MOUSE | Odr4 | Protein odr-4 homolog, mODR-4 |
| Q2YDW2 | MSTO1_MOUSE | Msto1 | Protein misato homolog 1 |
| P70318 | TIAR_MOUSE | Tial1 | Nucleolysin TIAR (TIA-1-related protein) |
| P23927 | CRYAB_MOUSE | Cryab | Alpha-crystallin B chain (Alpha(B)-crystallin) (P23) |
| Q925B0 | PAWR_MOUSE | Pawr | PRKC apoptosis WT1 regulator protein (Prostate apoptosis response 4 protein, Par-4) |
| Q923E4 | SIR1_MOUSE | Sirt1 | NAD-dependent protein deacetylase sirtuin-1, EC 2.3.1.286 (NAD-dependent protein deacylase sirtuin-1, EC 2.3.1.-) (Regulatory protein SIR2 homolog 1) (SIR2-like protein 1) (SIR2alpha, Sir2, mSIR2a) [Cleaved into: SirtT1 75 kDa fragment, 75SirT1] |
| Q8BW96 | KCC1D_MOUSE | Camk1d | Calcium/calmodulin-dependent protein kinase type 1D, EC 2.7.11.17 (CaM kinase I delta, CaM-KI delta, CaMKI delta) (CaM kinase ID) (CaMKI-like protein kinase, CKLiK, mCKLiK) |
| Q8BX94 | OSBL2_MOUSE | Osbpl2 | Oxysterol-binding protein-related protein 2, ORP-2, OSBP-related protein 2 |
| Q8CGB3 | UACA_MOUSE | Uaca | Uveal autoantigen with coiled-coil domains and ankyrin repeats (Nuclear membrane-binding protein, Nucling) |
| Q99L27 | GMPR2_MOUSE | Gmpr2 | GMP reductase 2, GMPR 2, EC 1.7.1.7 (Guanosine 5'-monophosphate oxidoreductase 2, Guanosine monophosphate reductase 2) |
| Q8R1T1 | CHMP7_MOUSE | Chmp7 | Charged multivesicular body protein 7 (Chromatin-modifying protein 7) |
| O55102 | BL1S1_MOUSE | Bloc1s1 | Biogenesis of lysosome-related organelles complex 1 subunit 1, BLOC-1 subunit 1 (GCN5-like protein 1) |
| Q6ZPE2 | MTMR5_MOUSE | Sbf1 | Myotubularin-related protein 5 (Inactive phosphatidylinositol 3-phosphatase 5) (SET-binding factor 1, Sbf1) |
| Q61037 | TSC2_MOUSE | Tsc2 | Tuberin (Tuberous sclerosis 2 protein homolog) |
| Q8VCD7 | KDM4C_MOUSE | Kdm4c | Lysine-specific demethylase 4C, EC 1.14.11.66 (JmjC domain-containing histone demethylation protein 3C) (Jumonji domain-containing protein 2C) ([histone H3]-trimethyl-L-lysine(9) demethylase 4C) |
| Q8BJL0 | SMAL1_MOUSE | Smarca11 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A-like protein 1, EC 3.6.4.- (HepA-related protein, mharp) (Sucrose nonfermenting protein 2-like 1) |

| | | | |
|--------|-------------|---------|--|
| Q35594 | IFT81_MOUSE | Ift81 | Intraflagellar transport protein 81 homolog (Carnitine deficiency-associated protein expressed in ventricle 1, CDV-1) |
| O70591 | PFD2_MOUSE | Pfdn2 | Prefoldin subunit 2 |
| Q62165 | DAG1_MOUSE | Dag1 | Dystroglycan 1 (Dystroglycan) (Dystrophin-associated glycoprotein 1) [Cleaved into: Alpha-dystroglycan, Alpha-DG; Beta-dystroglycan, Beta-DG] |
| Q8C729 | F126B_MOUSE | Fam126b | Protein FAM126B |
| Q5F2E7 | NUFP2_MOUSE | Nufip2 | FMR1-interacting protein NUFIP2 (82 kDa FMRP-interacting protein, 82-FIP) (FMRP-interacting protein 2) |
| P49586 | PCY1A_MOUSE | Pcyt1a | Choline-phosphate cytidylyltransferase A, EC 2.7.7.15 (CCT-alpha) (CTP:phosphocholine cytidylyltransferase A, CCT A, CT A) (Phosphorylcholine transferase A) |
| Q9EQN3 | T22D4_MOUSE | Tsc22d4 | TSC22 domain family protein 4 (TSC22-related-inducible leucine zipper protein 2) (Thg-1pit) |
| P30999 | CTND1_MOUSE | Ctnnd1 | Catenin delta-1 (Cadherin-associated Src substrate, CAS) (p120 catenin, p120(ctn)) (p120(cas)) |
| Q69ZS7 | HBS1L_MOUSE | Hbs1l | HBS1-like protein |
| Q69ZA1 | CDK13_MOUSE | Cdk13 | Cyclin-dependent kinase 13, EC 2.7.11.22, EC 2.7.11.23 (CDC2-related protein kinase 5) (Cell division cycle 2-like protein kinase 5) (Cell division protein kinase 13) |
| Q3UW53 | NIBA1_MOUSE | Niban1 | Protein Niban 1 (Protein FAM129A) (Protein Niban) |
| Q91WK0 | LRRF2_MOUSE | Lrrfip2 | Leucine-rich repeat flightless-interacting protein 2, LRR FLII-interacting protein 2 |
| Q9EQZ7 | RIMS2_MOUSE | Rims2 | Regulating synaptic membrane exocytosis protein 2 (Rab-3-interacting molecule 2, RIM 2) (Rab-3-interacting protein 2) |
| Q8R2U4 | NTM1A_MOUSE | Ntmt1 | N-terminal Xaa-Pro-Lys N-methyltransferase 1, EC 2.1.1.244 (Alpha N-terminal protein methyltransferase 1A) (Methyltransferase-like protein 11A) (X-Pro-Lys N-terminal protein methyltransferase 1A, NTM1A) [Cleaved into: N-terminal Xaa-Pro-Lys N-methyltransferase 1, N-terminally processed] |
| Q80X32 | CE024_MOUSE | | UPF0461 protein C5orf24 homolog |
| Q9CXV3 | CRGF_MOUSE | Crygf | Gamma-crystallin F (Gamma-F-crystallin) |
| P11881 | ITPR1_MOUSE | Itpr1 | Inositol 1,4,5-trisphosphate receptor type 1 (IP3 receptor isoform 1, IP3R 1, InsP3R1) (Inositol 1,4,5-trisphosphate-binding protein P400) (Protein PCD-6) (Purkinje cell protein 1) (Type 1 inositol 1,4,5-trisphosphate receptor, Type 1 InsP3 receptor) |

| | | | |
|--------|-------------|---------|---|
| Q8BGR9 | UBCP1_MOUSE | Ublcp1 | Ubiquitin-like domain-containing CTD phosphatase 1, EC 3.1.3.16 (Nuclear proteasome inhibitor UBLCP1) |
| Q8R4C2 | RUFY2_MOUSE | Rufy2 | RUN and FYVE domain-containing protein 2 (Leucine zipper FYVE-finger protein, LZ-FYVE) |
| Q8R3N6 | THOC1_MOUSE | Thoc1 | THO complex subunit 1, Tho1 (Nuclear matrix protein p84) |
| Q8VEA4 | MIA40_MOUSE | Chchd4 | Mitochondrial intermembrane space import and assembly protein 40 (Coiled-coil-helix-coiled-coil-helix domain-containing protein 4) |
| Q9CQ48 | NUDC2_MOUSE | Nudcd2 | NudC domain-containing protein 2 |
| Q8BY89 | CTL2_MOUSE | Slc44a2 | Choline transporter-like protein 2 (Solute carrier family 44 member 2) |
| Q80U72 | SCRIB_MOUSE | Scrib | Protein scribble homolog, Scribble (Protein LAP4) |
| Q8VC30 | TKFC_MOUSE | Tkfc | Triokinase/FMN cyclase (Bifunctional ATP-dependent dihydroxyacetone kinase/FAD-AMP lyase (cyclizing)) [Includes: ATP-dependent dihydroxyacetone kinase, DHA kinase, EC 2.7.1.28, EC 2.7.1.29 (Glycerone kinase) (Triokinase) (Triose kinase); FAD-AMP lyase (cyclizing), EC 4.6.1.15 (FAD-AMP lyase (cyclic FMN forming)) (FMN cyclase)] |
| P18052 | PTPRA_MOUSE | Ptpra | Receptor-type tyrosine-protein phosphatase alpha, Protein-tyrosine phosphatase alpha, R-PTP-alpha, EC 3.1.3.48 (LCA-related phosphatase) (PTPTY-28) |
| Q9ES28 | ARHG7_MOUSE | Arhgef7 | Rho guanine nucleotide exchange factor 7 (Beta-Pix) (PAK-interacting exchange factor beta) (p85SPR) |
| Q5SX40 | MYH1_MOUSE | Myh1 | Myosin-1 (Myosin heavy chain 1) (Myosin heavy chain 2x, MyHC-2x) (Myosin heavy chain, skeletal muscle, adult 1) |
| Q8BG92 | CLVS2_MOUSE | Clvs2 | Clavesin-2 (Retinaldehyde-binding protein 1-like 2) |
| Q91VX2 | UBAP2_MOUSE | Ubap2 | Ubiquitin-associated protein 2, UBAP-2 (Protein lingerer homolog 1, mLig-1) |
| Q8CHU3 | EPN2_MOUSE | Epn2 | Epsin-2 (EPS-15-interacting protein 2) (Intersectin-EH-binding protein 2, Ibp2) |
| Q8R3F9 | STPAP_MOUSE | Tut1 | Speckle targeted PIP5K1A-regulated poly(A) polymerase, Star-PAP, EC 2.7.7.19 (RNA-binding motif protein 21, RNA-binding protein 21) (U6 snRNA-specific terminal uridylyltransferase 1, U6-TUTase, EC 2.7.7.52) |
| Q91VN6 | DDX41_MOUSE | Ddx41 | Probable ATP-dependent RNA helicase DDX41, EC 3.6.4.13 (DEAD box protein 41) |
| Q8BHL5 | ELMO2_MOUSE | Elmo2 | Engulfment and cell motility protein 2 (Protein ced-12 homolog A) |
| P70271 | PDLI4_MOUSE | Pdlim4 | PDZ and LIM domain protein 4 (LIM protein RIL) (Reversion-induced LIM protein) |

| | | | |
|--------|-------------|----------|---|
| Q8BRN9 | C2D1B_MOUSE | Cc2d1b | Coiled-coil and C2 domain-containing protein 1B (Five prime repressor element under dual repression-binding protein 2, FRE under dual repression-binding protein 2, Freud-2) |
| Q9WV98 | TIM9_MOUSE | Timm9 | Mitochondrial import inner membrane translocase subunit Tim9 |
| B1AZP2 | DLGP4_MOUSE | Dlgap4 | Disks large-associated protein 4, DAP-4 (PSD-95/SAP90-binding protein 4) (SAP90/PSD-95-associated protein 4, SAPAP-4) |
| Q6PD03 | 2A5A_MOUSE | Ppp2r5a | Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit alpha isoform (PP2A B subunit isoform B'-alpha) (PP2A B subunit isoform B56-alpha) (PP2A B subunit isoform PR61-alpha, PR61alpha) (PP2A B subunit isoform R5-alpha) |
| P36916 | GNL1_MOUSE | Gnl1 | Guanine nucleotide-binding protein-like 1 (GTP-binding protein MMR1) |
| Q8BJ05 | ZC3HE_MOUSE | Zc3h14 | Zinc finger CCCH domain-containing protein 14 |
| Q3U308 | CTU2_MOUSE | Ctu2 | Cytoplasmic tRNA 2-thiolation protein 2 |
| Q8R4H2 | ARHGC_MOUSE | Arhgef12 | Rho guanine nucleotide exchange factor 12 (Leukemia-associated RhoGEF) |
| Q61210 | ARHG1_MOUSE | Arhgef1 | Rho guanine nucleotide exchange factor 1 (Lbc's second cousin) (Lymphoid blast crisis-like 2) |
| Q921L5 | COG2_MOUSE | Cog2 | Conserved oligomeric Golgi complex subunit 2, COG complex subunit 2 (Component of oligomeric Golgi complex 2) (Low density lipoprotein receptor defect C-complementing protein) |
| Q9CQL1 | MGN2_MOUSE | Magohb | Protein mago nashi homolog 2 |
| P58064 | RT06_MOUSE | Mrps6 | 28S ribosomal protein S6, mitochondrial, MRP-S6, S6mt |
| Q9CWU4 | CA052_MOUSE | | UPF0690 protein C1orf52 homolog |
| Q80TZ3 | AUXI_MOUSE | Dnajc6 | Putative tyrosine-protein phosphatase auxilin, EC 3.1.3.48 (DnaJ homolog subfamily C member 6) |
| P38060 | HMGCL_MOUSE | Hmgcl | Hydroxymethylglutaryl-CoA lyase, mitochondrial, HL, HMG-CoA lyase, EC 4.1.3.4 (3-hydroxy-3-methylglutarate-CoA lyase) |
| P11798 | KCC2A_MOUSE | Camk2a | Calcium/calmodulin-dependent protein kinase type II subunit alpha, CaM kinase II subunit alpha, CaMK-II subunit alpha, EC 2.7.11.17 |
| P02525 | CRBA1_MOUSE | Cryba1 | Beta-crystallin A1 (Beta-A1-crystallin) |
| Q8C5L7 | RBM34_MOUSE | Rbm34 | RNA-binding protein 34 (RNA-binding motif protein 34) |
| Q60875 | ARHG2_MOUSE | Arhgef2 | Rho guanine nucleotide exchange factor 2 (Guanine nucleotide exchange factor H1, GEF-H1) (LBC'S first cousin) (Lymphoid blast crisis-like 1) (Oncogene LFC) (Rhobin) |

| | | | |
|--------|-------------|---------|---|
| Q9CQK7 | RWDD1_MOUSE | Rwdd1 | RWD domain-containing protein 1 (DRG family-regulatory protein 2) (IH1) |
| Q99LH9 | 3BP5L_MOUSE | Sh3bp5l | SH3 domain-binding protein 5-like, SH3BP-5-like |
| Q9D868 | PPIH_MOUSE | Ppih | Peptidyl-prolyl cis-trans isomerase H, PPIase H, EC 5.2.1.8 (Rotamase H) |
| P97434 | MPRIP_MOUSE | Mprip | Myosin phosphatase Rho-interacting protein (Rho-interacting protein 3, RIP3) (p116Rip) |
| Q03137 | EPHA4_MOUSE | Epha4 | Ephrin type-A receptor 4, EC 2.7.10.1 (Tyrosine-protein kinase receptor MPK-3) (Tyrosine-protein kinase receptor SEK-1) |
| P15331 | PERI_MOUSE | Prph | Peripherin |
| P24547 | IMDH2_MOUSE | Impdh2 | Inosine-5'-monophosphate dehydrogenase 2, IMP dehydrogenase 2, IMPD 2, IMPDH 2, EC 1.1.1.205 (IMPDH-II) |
| Q587J6 | LITD1_MOUSE | L1td1 | LINE-1 type transposase domain-containing protein 1 (ES cell-associated protein 11) |
| Q8K4Q7 | CERK1_MOUSE | Cerk | Ceramide kinase, mCERK, EC 2.7.1.138 (Acylsphingosine kinase) |
| O55103 | PRAX_MOUSE | Prx | Periaxin |
| Q9CXT7 | TM192_MOUSE | Tmem192 | Transmembrane protein 192 |
| Q3UPY5 | GLBL2_MOUSE | Glb112 | Beta-galactosidase-1-like protein 2, EC 3.2.1.- |
| P42227 | STAT3_MOUSE | Stat3 | Signal transducer and activator of transcription 3 (Acute-phase response factor) |
| O35250 | EXOC7_MOUSE | Exoc7 | Exocyst complex component 7 (Exocyst complex component Exo70) |
| Q9EP82 | WDR4_MOUSE | Wdr4 | tRNA (guanine-N(7)-)-methyltransferase non-catalytic subunit WDR4 (Protein Wuho homolog, mWH) (WD repeat-containing protein 4) |
| O35385 | PPE2_MOUSE | Ppef2 | Serine/threonine-protein phosphatase with EF-hands 2, PPEF-2, EC 3.1.3.16 |
| A2A6Q5 | CDC27_MOUSE | Cdc27 | Cell division cycle protein 27 homolog |
| Q8BJM3 | R3HCL_MOUSE | R3hcc11 | Coiled-coil domain-containing protein R3HCC1L (Growth inhibition and differentiation-related protein 88 homolog) (R3H and coiled-coil domain-containing protein 1-like) |
| P60762 | MO4L1_MOUSE | Morf4l1 | Mortality factor 4-like protein 1 (MORF-related gene 15 protein) (Testis-expressed gene 189 protein) (Transcription factor-like protein MRG15) |
| A2APV2 | FMNL2_MOUSE | Fmnl2 | Formin-like protein 2 (Protein Man) |
| Q9CQ56 | USE1_MOUSE | Use1 | Vesicle transport protein USE1 (Protein D12) (USE1-like protein) |
| Q99NH0 | ANR17_MOUSE | Ankrd17 | Ankyrin repeat domain-containing protein 17 (Ankyrin repeat domain-containing protein FOE) (Gene trap ankyrin repeat protein) |
| Q8CBC4 | CNST_MOUSE | Cnst | Consortin |

| | | | |
|--------|-------------|---------|--|
| Q8BKX1 | BAIP2_MOUSE | Baiap2 | Brain-specific angiogenesis inhibitor 1-associated protein 2, BAI-associated protein 2, BAI1-associated protein 2 (Insulin receptor substrate protein of 53 kDa, IRSp53, Insulin receptor substrate p53) (Insulin receptor tyrosine kinase 53 kDa substrate) |
| Q6ZPL9 | DDX55_MOUSE | Ddx55 | ATP-dependent RNA helicase DDX55, EC 3.6.4.13 (DEAD box protein 55) |
| P97801 | SMN_MOUSE | Smn1 | Survival motor neuron protein |
| P59178 | LMBL2_MOUSE | L3mbtl2 | Lethal(3)malignant brain tumor-like protein 2, L(3)mbt-like protein 2 |
| F8VPZ9 | BICRA_MOUSE | Bicra | BRD4-interacting chromatin-remodeling complex-associated protein (Glioma tumor suppressor candidate region gene 1 protein) |
| Q9D394 | RUFY3_MOUSE | Rufy3 | Protein RUFY3 (Rap2-interacting protein x, RIPx) (Single axon-regulated protein 1, Singar1) |
| P60879 | SNP25_MOUSE | Snap25 | Synaptosomal-associated protein 25, SNAP-25 (Super protein, SUP) (Synaptosomal-associated 25 kDa protein) |
| P97300 | NPTN_MOUSE | Nptn | Neuroplastin (Stromal cell-derived receptor 1, SDR-1) |
| Q61411 | RASH_MOUSE | Hras | GTPase HRas, EC 3.6.5.2 (H-Ras-1) (Transforming protein p21) (c-H-ras) (p21ras) [Cleaved into: GTPase HRas, N-terminally processed] |
| P61021 | RAB5B_MOUSE | Rab5b | Ras-related protein Rab-5B, EC 3.6.5.2 |
| Q9CZT8 | RAB3B_MOUSE | Rab3b | Ras-related protein Rab-3B |
| Q923S9 | RAB30_MOUSE | Rab30 | Ras-related protein Rab-30 |
| P56371 | RAB4A_MOUSE | Rab4a | Ras-related protein Rab-4A, EC 3.6.5.2 |
| P04342 | CRGD_MOUSE | Crygd | Gamma-crystallin D (Gamma-D-crystallin) (Gamma-crystallin 1) |
| Q8CFQ3 | AQR_MOUSE | Aqr | RNA helicase aquarius, EC 3.6.4.13 (Intron-binding protein of 160 kDa) |
| Q8BHZ0 | CYRIA_MOUSE | Cyria | CYFIP-related Rac1 interactor A |
| Q921C5 | BICD2_MOUSE | Bicd2 | Protein bicaudal D homolog 2, Bic-D 2 |
| Q6GQW0 | BTBDB_MOUSE | Btbd11 | Ankyrin repeat and BTB/POZ domain-containing protein BTBD11 (BTB/POZ domain-containing protein 11) |
| Q91YR5 | EFNMT_MOUSE | Mettl13 | eEF1A lysine and N-terminal methyltransferase, eEF1A-KNMT (Methyltransferase-like protein 13) [Includes: eEF1A lysine methyltransferase, EC 2.1.1.-; eEF1A N-terminal methyltransferase, EC 2.1.1.-] |
| Q68ED7 | CRTC1_MOUSE | Crtc1 | CREB-regulated transcription coactivator 1 (Mucoepidermoid carcinoma translocated protein 1 homolog) (Transducer of regulated cAMP response element-binding protein 1, TORC-1, Transducer of CREB protein 1) |

| | | | |
|--------|-------------|---------|--|
| P49446 | PTPRE_MOUSE | Ptpre | Receptor-type tyrosine-protein phosphatase epsilon, Protein-tyrosine phosphatase epsilon, R-PTP-epsilon, EC 3.1.3.48 |
| P58854 | GCP3_MOUSE | Tubgcp3 | Gamma-tubulin complex component 3, GCP-3 |
| Q8BKX6 | SMG1_MOUSE | Smg1 | Serine/threonine-protein kinase SMG1, SMG-1, EC 2.7.11.1 (Lambda/iota protein kinase C-interacting protein, Lambda-interacting protein) (Nonsense mediated mRNA decay-associated PI3K-related kinase SMG1) |
| Q8BIE6 | FRM4A_MOUSE | Frmd4a | FERM domain-containing protein 4A |
| Q91YP2 | NEUL_MOUSE | Nln | Neurolysin, mitochondrial, EC 3.4.24.16 (Microsomal endopeptidase, MEP) (Mitochondrial oligopeptidase M) (Neurotensin endopeptidase) |
| Q91YJ5 | IF2M_MOUSE | Mtif2 | Translation initiation factor IF-2, mitochondrial, IF-2(Mt), IF-2Mt, IF2(mt) |
| Q8BXA1 | GOLI4_MOUSE | Golim4 | Golgi integral membrane protein 4 (Decapacitation factor 10) (Golgi phosphoprotein 4) |
| Q2MV57 | TECT2_MOUSE | Tctn2 | Tectonic-2 |
| P51612 | XPC_MOUSE | Xpc | DNA repair protein complementing XP-C cells homolog (Xeroderma pigmentosum group C-complementing protein homolog) (p125) |
| Q8R1Z9 | RN121_MOUSE | Rnf121 | RING finger protein 121 |
| Q9JL60 | GMEB1_MOUSE | Gmeb1 | Glucocorticoid modulatory element-binding protein 1, GMEB-1 |
| Q8CHE4 | PHLP1_MOUSE | Phlpp1 | PH domain leucine-rich repeat-containing protein phosphatase 1, EC 3.1.3.16 (Pleckstrin homology domain-containing family E member 1, PH domain-containing family E member 1) (Suprachiasmatic nucleus circadian oscillatory protein) |
| Q8CF89 | TAB1_MOUSE | Tab1 | TGF-beta-activated kinase 1 and MAP3K7-binding protein 1 (Mitogen-activated protein kinase kinase kinase 7-interacting protein 1) (TGF-beta-activated kinase 1-binding protein 1, TAK1-binding protein 1) |
| Q6P5E8 | DGKQ_MOUSE | Dgkq | Diacylglycerol kinase theta, DAG kinase theta, EC 2.7.1.107 (Diglyceride kinase theta, DGK-theta) |
| Q5SYD0 | MYO1D_MOUSE | Myo1d | Unconventional myosin-Id |
| Q3U0V2 | TRADD_MOUSE | Tradd | Tumor necrosis factor receptor type 1-associated DEATH domain protein, TNFR1-associated DEATH domain protein (TNFRSF1A-associated via death domain) |
| O88522 | NEMO_MOUSE | Ikkbg | NF-kappa-B essential modulator, NEMO (Ikb kinase-associated protein 1, IKKAP1, mFIP-3) (Inhibitor of nuclear factor kappa-B kinase subunit gamma, I-kappa-B kinase subunit gamma, IKK-gamma, IKKG, Ikb kinase subunit gamma) (NF-kappa-B essential modifier) |

| | | | |
|--------|-------------|-----------|--|
| O70161 | PI51C_MOUSE | Pip5k1c | Phosphatidylinositol 4-phosphate 5-kinase type-1 gamma, PIP5K1-gamma, PtdIns(4)P-5-kinase 1 gamma, EC 2.7.1.68 (Phosphatidylinositol 4-phosphate 5-kinase type I gamma, PIP5KIgamma) |
| O35075 | VP26C_MOUSE | Vps26c | Vacuolar protein sorting-associated protein 26C (Down syndrome critical region protein 3 homolog) (Down syndrome critical region protein A homolog) |
| Q9Z0Z4 | HEPH_MOUSE | Heph | Hephaestin, EC 1.-.-.- |
| Q9Z0V2 | KCND2_MOUSE | Kcnd2 | Potassium voltage-gated channel subfamily D member 2 (Voltage-gated potassium channel subunit Kv4.2) |
| Q9Z0H1 | WDR46_MOUSE | Wdr46 | WD repeat-containing protein 46 (WD repeat-containing protein BING4) |
| Q9WUR9 | KAD4_MOUSE | Ak4 | Adenylate kinase 4, mitochondrial, AK 4, EC 2.7.4.10, EC 2.7.4.6 (Adenylate kinase 3-like) (Adenylate kinase isoenzyme 4) (GTP:AMP phosphotransferase AK4) |
| Q9R155 | S26A4_MOUSE | Slc26a4 | Pendrin (Sodium-independent chloride/iodide transporter) (Solute carrier family 26 member 4) |
| Q9R0M6 | RAB9A_MOUSE | Rab9a | Ras-related protein Rab-9A (Sid 99) |
| Q9JKK0 | RCAN3_MOUSE | Rcan3 | Calcipressin-3 (Down syndrome candidate region 1-like protein 2) (Myocyte-enriched calcineurin-interacting protein 3, MCIP3) (Regulator of calcineurin 3) |
| Q9JJV1 | CRBA2_MOUSE | Cryba2 | Beta-crystallin A2 (Beta-A2 crystallin) |
| Q9JI99 | SGPP1_MOUSE | Sgpp1 | Sphingosine-1-phosphate phosphatase 1, SPP, SPPase1, mSPP1, EC 3.1.3.- (Sphingosine-1-phosphatase 1) |
| Q9EST3 | 4ET_MOUSE | Eif4enif1 | Eukaryotic translation initiation factor 4E transporter, 4E-T, eIF4E transporter (CD40 ligand-activated specific transcript 4) (Eukaryotic translation initiation factor 4E nuclear import factor 1) |
| Q9EQQ2 | YIPF5_MOUSE | Yipf5 | Protein YIPF5 (YIP1 family member 5) (YPT-interacting protein 1 A) |
| Q9DB52 | PBIR1_MOUSE | Pabir1 | P2R1A-PPP2R2A-interacting phosphatase regulator 1 (PABIR family member 1) |
| Q9DAK4 | FBP12_MOUSE | Fabp12 | Fatty acid-binding protein 12 |
| Q9D906 | ATG7_MOUSE | Atg7 | Ubiquitin-like modifier-activating enzyme ATG7 (ATG12-activating enzyme E1 ATG7) (Autophagy-related protein 7, APG7-like, mAGP7) (Ubiquitin-activating enzyme E1-like protein) |
| Q9D6H2 | IFT25_MOUSE | Hspb11 | Intraflagellar transport protein 25 homolog (Heat shock protein beta-11, Hspb11) (Placental protein 25, PP25) |

| | | | |
|--------|-------------|----------|--|
| Q9CWU2 | ZDH13_MOUSE | Zdhhc13 | Palmitoyltransferase ZDHHC13, EC 2.3.1.225 (Huntingtin-interacting protein 14-related protein, HIP14-related protein) (Zinc finger DHHC domain-containing protein 13, DHHC-13) |
| Q99MR0 | ACL6B_MOUSE | Actl6b | Actin-like protein 6B (53 kDa BRG1-associated factor B) (Actin-related protein Baf53b) (ArpN-alpha, ArpNa) (BRG1-associated factor 53B, BAF53B) |
| Q99KU0 | VMP1_MOUSE | Vmp1 | Vacuole membrane protein 1 (NF-E2-inducible protein 2, Protein ni-2) |
| Q99J83 | ATG5_MOUSE | Atg5 | Autophagy protein 5 (APG5-like) |
| Q99J78 | DEFI8_MOUSE | Def8 | Differentially expressed in FDCP 8, DEF-8 |
| Q922R5 | P4R3B_MOUSE | Ppp4r3b | Serine/threonine-protein phosphatase 4 regulatory subunit 3B (SMEK homolog 2) |
| Q91W52 | TMM19_MOUSE | Tmem19 | Transmembrane protein 19 |
| Q8VHE0 | SEC63_MOUSE | Sec63 | Translocation protein SEC63 homolog |
| Q8VDU5 | SNRK_MOUSE | Snrk | SNF-related serine/threonine-protein kinase, EC 2.7.11.1 (SNF1-related kinase) |
| Q8VDU0 | GPSM2_MOUSE | Gpsm2 | G-protein-signaling modulator 2 (Pins homolog) |
| Q8VDG5 | PPCS_MOUSE | Ppcs | Phosphopantothenate--cysteine ligase, EC 6.3.2.51 (Phosphopantothenoylcysteine synthetase, PPC synthetase) |
| Q8N7N5 | DCAF8_MOUSE | Dcaf8 | DDB1- and CUL4-associated factor 8 (WD repeat-containing protein 42A) |
| Q8JZZ7 | AGRL2_MOUSE | Adgrl2 | Adhesion G protein-coupled receptor L2 (Calcium-independent alpha-latrotoxin receptor 2, CIRL-2) (Latrophilin-2) |
| Q8CFN5 | MEF2C_MOUSE | Mef2c | Myocyte-specific enhancer factor 2C (Myocyte enhancer factor 2C) |
| Q8C0D9 | CEP68_MOUSE | Cep68 | Centrosomal protein of 68 kDa, Cep68 |
| Q8BT51 | COA4_MOUSE | COA4 | Cytochrome c oxidase assembly factor 4 homolog, mitochondrial (Coiled-coil-helix-coiled-coil-helix domain-containing protein 8) |
| Q8BP48 | MAP11_MOUSE | Metap1 | Methionine aminopeptidase 1, MAP 1, MetAP 1, EC 3.4.11.18 (Peptidase M 1) |
| Q8BKE5 | FSBP_MOUSE | Fsbp | Fibrinogen silencer-binding protein |
| Q8BJM7 | TYW1_MOUSE | Tyw1 | S-adenosyl-L-methionine-dependent tRNA 4-demethylwyosine synthase TYW1, EC 4.1.3.44 (Radical S-adenosyl methionine and flavodoxin domain-containing protein 1) (tRNA wybutosine-synthesizing protein 1 homolog) (tRNA-yW-synthesizing protein) |
| Q8BHL3 | TB10B_MOUSE | Tbc1d10b | TBC1 domain family member 10B (Protein wz3-85) |
| Q8BHG2 | CZIB_MOUSE | Czib | CXXC motif containing zinc binding protein (UPF0587 protein C1orf123 homolog) |
| Q8BGX2 | TIM29_MOUSE | Timm29 | Mitochondrial import inner membrane translocase subunit Tim29, TIM29 |

| | | | |
|--------|-------------|---------|---|
| Q8BG94 | COMD7_MOUSE | Commd7 | COMM domain-containing protein 7 |
| Q7TSS2 | UB2Q1_MOUSE | Ube2q1 | Ubiquitin-conjugating enzyme E2 Q1, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme Q1) (Galactosyl transferase-associated protein, GTAP) (Ubiquitin carrier protein Q1) (Ubiquitin-protein ligase Q1) |
| Q7TNS2 | MIC10_MOUSE | Micos10 | MICOS complex subunit Mic10 (Mitochondrial inner membrane organizing system protein 1) |
| Q7TMW6 | CIAO3_MOUSE | Ciao3 | Cytosolic iron-sulfur assembly component 3 (Cytosolic Fe-S cluster assembly factor NARFL) (Iron-only hydrogenase-like protein 1, IOP1) (Nuclear prelamin A recognition factor-like protein) |
| Q6ZQ89 | MARH6_MOUSE | Marchf6 | E3 ubiquitin-protein ligase MARCHF6, EC 2.3.2.27 (Membrane-associated RING finger protein 6) (Membrane-associated RING-CH protein VI, MARCH-VI) (RING-type E3 ubiquitin transferase MARCHF6) |
| Q61069 | USF1_MOUSE | Usf1 | Upstream stimulatory factor 1 (Major late transcription factor 1) |
| Q59J78 | NDUF2_MOUSE | Ndufaf2 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 2 (Mimitin) (Myc-induced mitochondrial protein, MMTN) (NDUFA12-like protein) |
| Q501J7 | PHAR4_MOUSE | Phactr4 | Phosphatase and actin regulator 4 (Protein Humpty dumpty, Humdy) |
| Q3UGS4 | MCRI1_MOUSE | Mcrip1 | Mapk-regulated corepressor-interacting protein 1 (Protein FAM195B) |
| Q2YDW7 | KMT5A_MOUSE | Kmt5a | N-lysine methyltransferase KMT5A, EC 2.1.1.- (H4-K20-HMTase KMT5A) (Histone-lysine N-methyltransferase KMT5A, EC 2.1.1.361) (Lysine-specific methylase 5A) (PR/SET domain-containing protein 07, PR-Set7, PR/SET07) (SET domain-containing protein 8) |
| Q08274 | DMWD_MOUSE | Dmwd | Dystrophia myotonica WD repeat-containing protein (Dystrophia myotonica-containing WD repeat motif protein) (Protein DMR-N9) |
| Q08024 | PEBB_MOUSE | Cbfb | Core-binding factor subunit beta, CBF-beta (Polyomavirus enhancer-binding protein 2 beta subunit, PEA2-beta, PEBP2-beta) (SL3-3 enhancer factor 1 subunit beta) (SL3/AKV core-binding factor beta subunit) |
| Q04841 | 3MG_MOUSE | Mpg | DNA-3-methyladenine glycosylase, EC 3.2.2.21 (3-alkyladenine DNA glycosylase) (3-methyladenine DNA glycosidase) (ADPG) (N-methylpurine-DNA glycosylase) |
| Q01341 | ADCY6_MOUSE | Adcy6 | Adenylate cyclase type 6, EC 4.6.1.1 (ATP pyrophosphate-lyase 6) (Adenylate cyclase type VI) (Adenylyl cyclase 6, AC6) (Ca(2+)-inhibitable adenylyl cyclase) |
| P97346 | NXN_MOUSE | Nxn | Nucleoredoxin, EC 1.8.1.8 (Protein Red-1) |
| P84075 | HPCA_MOUSE | Hpca | Neuron-specific calcium-binding protein hippocalcin |

| | | | |
|--------|-------------|----------|---|
| P80560 | PTPR2_MOUSE | Ptprn2 | Receptor-type tyrosine-protein phosphatase N2, R-PTP-N2, EC 3.1.3.-, EC 3.1.3.48 (PTP IA-2beta) (Phogrin) (Protein tyrosine phosphatase-NP, PTP-NP) [Cleaved into: IA-2beta71; IA-2beta64; IA-2beta60] |
| P70295 | AUP1_MOUSE | Aup1 | Lipid droplet-regulating VLDL assembly factor AUP1 (Ancient ubiquitous protein 1) |
| P63137 | GBRB2_MOUSE | Gabrb2 | Gamma-aminobutyric acid receptor subunit beta-2 (GABA(A) receptor subunit beta-2) |
| P58468 | SLX9_MOUSE | Slx9 | Ribosome biogenesis protein SLX9 homolog |
| P56394 | COX17_MOUSE | Cox17 | Cytochrome c oxidase copper chaperone |
| P31649 | S6A13_MOUSE | Slc6a13 | Sodium- and chloride-dependent GABA transporter 2, GAT-2 (Sodium- and chloride-dependent GABA transporter 3, GAT-3) (Solute carrier family 6 member 13) |
| P23780 | BGAL_MOUSE | Glb1 | Beta-galactosidase, EC 3.2.1.23 (Acid beta-galactosidase, Lactase) |
| P22893 | TTP_MOUSE | Zfp36 | mRNA decay activator protein ZFP36 (Growth factor-inducible nuclear protein NUP475) (TPA-induced sequence 11) (Tristetraprolin) (Zinc finger protein 36, Zfp-36) |
| O35448 | PPT2_MOUSE | Ppt2 | Lysosomal thioesterase PPT2, PPT-2, EC 3.1.2.- |
| Q9CZA6 | NDE1_MOUSE | Nde1 | Nuclear distribution protein nudE homolog 1, NudE, mNudE |
| Q9Z1J3 | NFS1_MOUSE | Nfs1 | Cysteine desulfurase, mitochondrial, m-Nfs1, EC 2.8.1.7 |
| P39061 | COIA1_MOUSE | Col18a1 | Collagen alpha-1(XVIII) chain [Cleaved into: Endostatin; Non-collagenous domain 1, NC1] |
| Q8K3X4 | I2BPL_MOUSE | Irf2bpl | Probable E3 ubiquitin-protein ligase IRF2BPL, EC 2.3.2.27 (Enhanced at puberty protein 1) (Interferon regulatory factor 2-binding protein-like) |
| Q61142 | SPIN1_MOUSE | Spin1 | Spindlin-1 (30000 Mr metaphase complex) (SSEC P) (Spindlin1) |
| Q9D842 | APLF_MOUSE | Aplf | Aprataxin and PNK-like factor, EC 3.1.-.- (Apurinic-apyrimidinic endonuclease APLF) |
| Q9CQF0 | RM11_MOUSE | Mrpl11 | 39S ribosomal protein L11, mitochondrial, L11mt, MRP-L11 |
| Q9Z321 | TOP3B_MOUSE | Top3b | DNA topoisomerase 3-beta-1, EC 5.6.2.1 (DNA topoisomerase III beta-1) |
| Q8C3F2 | F120C_MOUSE | Fam120c | Constitutive coactivator of PPAR-gamma-like protein 2 (Protein FAM120C) |
| Q8C6B9 | AROS_MOUSE | Rps19bp1 | Active regulator of SIRT1 (40S ribosomal protein S19-binding protein 1, RPS19-binding protein 1, S19BP) |
| Q8K0H5 | TAF10_MOUSE | Taf10 | Transcription initiation factor TFIID subunit 10 (Transcription initiation factor TFIID 30 kDa subunit, TAF(II)30, TAFII-30, TAFII30, mTAFII30) |

| | | | |
|--------|-------------|---------|---|
| Q8CFW7 | C2D2A_MOUSE | Cc2d2a | Coiled-coil and C2 domain-containing protein 2A |
| Q3UDP0 | WDR41_MOUSE | Wdr41 | WD repeat-containing protein 41 |
| P28705 | RXRG_MOUSE | Rxrg | Retinoic acid receptor RXR-gamma (Nuclear receptor subfamily 2 group B member 3) (Retinoid X receptor gamma) |
| Q80VJ2 | SRA1_MOUSE | Sra1 | Steroid receptor RNA activator 1 (Steroid receptor RNA activator protein, SRAP) |
| Q9QYR9 | ACOT2_MOUSE | Acot2 | Acyl-coenzyme A thioesterase 2, mitochondrial, Acyl-CoA thioesterase 2, EC 3.1.2.2 (Acyl coenzyme A thioester hydrolase) (MTE-I) (Very-long-chain acyl-CoA thioesterase) |
| Q9QYB1 | CLIC4_MOUSE | Clic4 | Chloride intracellular channel protein 4, mc3s5/mtCLIC |
| Q9ESC8 | AFF4_MOUSE | Aff4 | AF4/FMR2 family member 4 |
| O35599 | OPSG_MOUSE | Opn1mw | Medium-wave-sensitive opsin 1 (Green cone photoreceptor pigment) (Green-sensitive opsin, M opsin) (Medium wavelength-sensitive cone opsin) |
| P59242 | CING_MOUSE | Cgn | Cingulin |
| Q5KU39 | VPS41_MOUSE | Vps41 | Vacuolar protein sorting-associated protein 41 homolog (VAM2 homolog, mVAM2) |
| Q8C0T5 | SI1L1_MOUSE | Sipa111 | Signal-induced proliferation-associated 1-like protein 1, SIPA1-like protein 1 |
| Q8CIG8 | ANM5_MOUSE | Prmt5 | Protein arginine N-methyltransferase 5, Prmt5, EC 2.1.1.320 (Histone-arginine N-methyltransferase PRMT5) (Jak-binding protein 1) (Shk1 kinase-binding protein 1 homolog, SKB1 homolog) |
| Q8BGU5 | CCNY_MOUSE | Ccny | Cyclin-Y (Cyclin fold protein 1) |
| Q6NVD9 | BFSP2_MOUSE | Bfsp2 | Phakinin (49 kDa cytoskeletal protein) (Beaded filament structural protein 2) (Lens fiber cell beaded filament protein CP 47, CP47) (Lens fiber cell beaded filament protein CP 49, CP49) (Lens intermediate filament-like light, LIFL-L) |
| Q9WTL7 | LYPA2_MOUSE | Lypla2 | Acyl-protein thioesterase 2, APT-2, EC 3.1.2.- (Lysophospholipase 2) (Lysophospholipase II, LPL-II, LysoPLA II, mLyso II) (Palmitoyl-protein hydrolase, EC 3.1.2.22) |
| Q8BNW9 | KBTBB_MOUSE | Kbtbd11 | Kelch repeat and BTB domain-containing protein 11 |
| Q8BLN5 | LSS_MOUSE | Lss | Lanosterol synthase, EC 5.4.99.7 (2,3-epoxysqualene--lanosterol cyclase) (Oxidosqualene--lanosterol cyclase, OSC) |
| Q8R313 | EXOC6_MOUSE | Exoc6 | Exocyst complex component 6 (Exocyst complex component Sec15A) (SEC15-like protein 1) |

| | | | |
|--------|-------------|----------|--|
| O88939 | ZBT7A_MOUSE | Zbtb7a | Zinc finger and BTB domain-containing protein 7A (Leukemia/lymphoma-related factor) (POZ and Krueppel erythroid myeloid ontogenic factor, POK erythroid myeloid ontogenic factor, Pokemon) |
| P14431 | HA19_MOUSE | H2-Q9 | H-2 class I histocompatibility antigen, Q9 alpha chain |
| Q80TM6 | R3HD2_MOUSE | R3hdm2 | R3H domain-containing protein 2 |
| P56391 | CX6B1_MOUSE | Cox6b1 | Cytochrome c oxidase subunit 6B1 (Cytochrome c oxidase subunit VIb isoform 1, COX VIb-1) |
| P51637 | CAV3_MOUSE | Cav3 | Caveolin-3 (M-caveolin) |
| O88507 | CNTFR_MOUSE | Cntfr | Ciliary neurotrophic factor receptor subunit alpha, CNTF receptor subunit alpha, CNTFR-alpha |
| Q6A065 | CE170_MOUSE | Cep170 | Centrosomal protein of 170 kDa, Cep170 |
| Q9CQR5 | ZMAT5_MOUSE | Zmat5 | Zinc finger matrin-type protein 5 (U11/U12 small nuclear ribonucleoprotein 20 kDa protein, U11/U12 snRNP 20 kDa protein) |
| Q9CRA9 | FGOP2_MOUSE | Fgfr1op2 | FGFR1 oncogene partner 2 homolog |
| Q9CQ80 | VPS25_MOUSE | Vps25 | Vacuolar protein-sorting-associated protein 25 (ESCRT-II complex subunit VPS25) |
| Q8K0B2 | LMBD1_MOUSE | Lmbrd1 | Lysosomal cobalamin transport escort protein LMBD1, LMBD1 (LMBR1 domain-containing protein 1) (Protein N90b) |
| Q6P5H6 | FRMD5_MOUSE | Frmd5 | FERM domain-containing protein 5 |
| Q9Z1N9 | UN13B_MOUSE | Unc13b | Protein unc-13 homolog B (Munc13-2, munc13) |
| O70252 | HMOX2_MOUSE | Hmox2 | Heme oxygenase 2, HO-2, EC 1.14.14.18 [Cleaved into: Heme oxygenase 2 soluble form] |
| Q9EQK5 | MVP_MOUSE | Mvp | Major vault protein, MVP |
| Q8VCH8 | UBXN4_MOUSE | Ubxn4 | UBX domain-containing protein 4 (Erasin) (UBX domain-containing protein 2) |
| Q91VT1 | NSE2_MOUSE | Nsmce2 | E3 SUMO-protein ligase NSE2, EC 2.3.2.- (E3 SUMO-protein transferase NSE2) (MMS21 homolog) (Non-structural maintenance of chromosomes element 2 homolog, Non-SMC element 2 homolog) |
| Q9D404 | OXSM_MOUSE | Oxsm | 3-oxoacyl-[acyl-carrier-protein] synthase, mitochondrial, EC 2.3.1.41 (Beta-ketoacyl-ACP synthase) |
| Q91ZJ5 | UGPA_MOUSE | Ugp2 | UTP--glucose-1-phosphate uridylyltransferase, EC 2.7.7.9 (UDP-glucose pyrophosphorylase, UDPGP, UGPase) |
| Q9Z2Y8 | PLPHP_MOUSE | Plpbp | Pyridoxal phosphate homeostasis protein, PLP homeostasis protein (Proline synthase co-transcribed bacterial homolog protein) (Pyridoxal phosphate-binding protein) |

| | | | |
|--------|-------------|----------|--|
| Q8BYM8 | SYCM_MOUSE | Cars2 | Probable cysteine--tRNA ligase, mitochondrial, EC 6.1.1.16 (Cysteinyl-tRNA synthetase, CysRS) |
| Q8VEG4 | EXD2_MOUSE | Exd2 | Exonuclease 3'-5' domain-containing protein 2, EC 3.1.11.1 (3'-5' exoribonuclease EXD2, EC 3.1.13.-) (Exonuclease 3'-5' domain-like-containing protein 2) |
| P52432 | RPAC1_MOUSE | Polr1c | DNA-directed RNA polymerases I and III subunit RPAC1, DNA-directed RNA polymerase I subunit C, RNA polymerases I and III subunit AC1 (AC40) (DNA-directed RNA polymerases I and III 40 kDa polypeptide, RPA40) (RPC40) |
| P62301 | RS13_MOUSE | Rps13 | 40S ribosomal protein S13 |
| O88811 | STAM2_MOUSE | Stam2 | Signal transducing adapter molecule 2, STAM-2 (Hrs-binding protein) |
| Q80VJ3 | DNPH1_MOUSE | Dnph1 | 2'-deoxynucleoside 5'-phosphate N-hydrolase 1, EC 3.2.2.- (c-Myc-responsive protein Rcl) |
| Q9WVK4 | EHD1_MOUSE | Ehd1 | EH domain-containing protein 1 (PAST homolog 1, mPAST1) |
| Q9JI59 | JAM2_MOUSE | Jam2 | Junctional adhesion molecule B, JAM-B (Junctional adhesion molecule 2, JAM-2) (Vascular endothelial junction-associated molecule, VE-JAM) (CD antigen CD322) |
| Q8BKE9 | IFT74_MOUSE | Ift74 | Intraflagellar transport protein 74 homolog (Capillary morphogenesis gene 1 protein, CMG-1) (Coiled-coil domain-containing protein 2) |
| Q9D8Y1 | T126A_MOUSE | Tmem126a | Transmembrane protein 126A |
| A2AAE1 | K1109_MOUSE | Kiaa1109 | Transmembrane protein KIAA1109 (Fragile site-associated protein homolog) |
| Q9QZC7 | PKHB2_MOUSE | Plekhb2 | Pleckstrin homology domain-containing family B member 2, PH domain-containing family B member 2 (Evectin-2) |
| Q8VEF1 | ASTRA_MOUSE | Gramd1a | Protein Aster-A (GRAM domain-containing protein 1A) |
| P02463 | CO4A1_MOUSE | Col4a1 | Collagen alpha-1(IV) chain [Cleaved into: Arresten] |
| Q8K0S0 | PHYIP_MOUSE | Phyhip | Phytanoyl-CoA hydroxylase-interacting protein (Phytanoyl-CoA hydroxylase-associated protein 1, PAHX-AP1, PAHXAP1) |
| O70209 | PDLI3_MOUSE | Pdlim3 | PDZ and LIM domain protein 3 (Actinin-associated LIM protein) (Alpha-actinin-2-associated LIM protein) |
| Q80XR2 | AT2C1_MOUSE | Atp2c1 | Calcium-transporting ATPase type 2C member 1, ATPase 2C1, EC 7.2.2.10 (ATP-dependent Ca(2+) pump PMR1) (Ca(2+)/Mn(2+)-ATPase 2C1) (Secretory pathway Ca(2+)-transporting ATPase type 1, SPCA1) |
| O88792 | JAM1_MOUSE | F11r | Junctional adhesion molecule A, JAM-A (Junctional adhesion molecule 1, JAM-1) (CD antigen CD321) |
| P53776 | LHX4_MOUSE | Lhx4 | LIM/homeobox protein Lhx4, LIM homeobox protein 4 |

| | | | |
|--------|-------------|-----------|---|
| P19137 | LAMA1_MOUSE | Lama1 | Laminin subunit alpha-1 (Laminin A chain) (Laminin-1 subunit alpha) (Laminin-3 subunit alpha) (S-laminin subunit alpha, S-LAM alpha) |
| Q9D6K8 | FUND2_MOUSE | Fundc2 | FUN14 domain-containing protein 2 (Hepatitis C virus core-binding protein 6) |
| Q60841 | RELN_MOUSE | Reln | Reelin, EC 3.4.21.- (Reeler protein) |
| Q9D0I8 | MRT4_MOUSE | Mrto4 | mRNA turnover protein 4 homolog (Ribosome assembly factor Mrto4) |
| Q80V86 | INT8_MOUSE | Ints8 | Integrator complex subunit 8, Int8 |
| Q00898 | A1AT5_MOUSE | Serpina1e | Alpha-1-antitrypsin 1-5 (Alpha-1 protease inhibitor 5) (Serine protease inhibitor 1-5) (Serine protease inhibitor A1e, Serpin A1e) |
| Q9DC50 | OCTC_MOUSE | Crot | Peroxisomal carnitine O-octanoyltransferase, COT, EC 2.3.1.137 |
| Q7TQE6 | MACOI_MOUSE | Maco1 | Macoilin (Brain-specific adapter protein C61) (Macoilin-1) (Transmembrane protein 57) |
| Q9WV91 | FPRP_MOUSE | Ptgfrn | Prostaglandin F2 receptor negative regulator (CD9 partner 1, CD9P-1) (Glu-Trp-Ile EWI motif-containing protein F, EWI-F) (Prostaglandin F2-alpha receptor regulatory protein) (Prostaglandin F2-alpha receptor-associated protein) (CD antigen CD315) |
| Q9D1I5 | MCEE_MOUSE | Mcee | Methylmalonyl-CoA epimerase, mitochondrial, EC 5.1.99.1 (DL-methylmalonyl-CoA racemase) |
| Q6PAT0 | ADAT3_MOUSE | Adat3 | Probable inactive tRNA-specific adenosine deaminase-like protein 3 (tRNA-specific adenosine-34 deaminase subunit ADAT3) |
| E9Q784 | ZC3HD_MOUSE | Zc3h13 | Zinc finger CCCH domain-containing protein 13 |
| Q8C8Y5 | SAMD7_MOUSE | Samd7 | Sterile alpha motif domain-containing protein 7, SAM domain-containing protein 7 |
| Q9DC23 | DJC10_MOUSE | Dnajc10 | DnaJ homolog subfamily C member 10, EC 1.8.4.- (Endoplasmic reticulum DNA J domain-containing protein 5, ER-resident protein ERdj5, ERdj5) (Endoplasmic reticulum DnaJ-PDI fusion protein 1) (J domain-containing protein disulfide isomerase-like protein, J domain-containing PDI-like protein, JPDI) |
| Q91V64 | ISOC1_MOUSE | Isoc1 | Isochorismatase domain-containing protein 1 |
| Q69ZR2 | HECD1_MOUSE | Hectd1 | E3 ubiquitin-protein ligase HECTD1, EC 2.3.2.26 (HECT domain-containing protein 1) (HECT-type E3 ubiquitin transferase HECTD1) (Protein open mind) |
| Q6ZPS6 | AKIB1_MOUSE | Ankib1 | Ankyrin repeat and IBR domain-containing protein 1, EC 2.3.2.31 |
| Q149L6 | DJB14_MOUSE | Dnajb14 | DnaJ homolog subfamily B member 14 |
| Q05512 | MARK2_MOUSE | Mark2 | Serine/threonine-protein kinase MARK2, EC 2.7.11.1, EC 2.7.11.26 (ELKL motif kinase 1, EMK-1) (MAP/microtubule affinity-regulating kinase 2) (PAR1 homolog) (PAR1 homolog b, Par-1b, mPar-1b) |

| | | | |
|--------|-------------|---------|--|
| Q99J36 | THUM1_MOUSE | Thumpd1 | THUMP domain-containing protein 1 |
| P49070 | CAMLG_MOUSE | Camlg | Guided entry of tail-anchored proteins factor CAMLG (Calcium signal-modulating cyclophilin ligand) |
| Q6NZA9 | TAF9B_MOUSE | Taf9b | Transcription initiation factor TFIID subunit 9B (Transcription initiation factor TFIID subunit 9-like) (Transcription-associated factor TAFII31L) |
| Q9QZN1 | FXL17_MOUSE | Fbxl17 | F-box/LRR-repeat protein 17 (F-box and leucine-rich repeat protein 17) (F-box only protein 13) |
| Q9JJE7 | FADS3_MOUSE | Fads3 | Fatty acid desaturase 3, EC 1.14.19.- (Delta(13) fatty acid desaturase, Delta(13) desaturase) |
| Q8VHI3 | OFUT2_MOUSE | Pofut2 | GDP-fucose protein O-fucosyltransferase 2, EC 2.4.1.221 (Peptide-O-fucosyltransferase 2, O-FucT-2) |
| Q9DD02 | HIKES_MOUSE | Hikeshi | Protein Hikeshi (Lethal gene on chromosome 7 Rinchik 6 protein) |
| Q921G8 | GCP2_MOUSE | Tubgcp2 | Gamma-tubulin complex component 2, GCP-2 |
| P35123 | UBP4_MOUSE | Usp4 | Ubiquitin carboxyl-terminal hydrolase 4, EC 3.4.19.12 (Deubiquitinating enzyme 4) (Ubiquitin thioesterase 4) (Ubiquitin-specific-processing protease 4) (Ubiquitous nuclear protein) |
| Q6ZPV2 | INO80_MOUSE | Ino80 | Chromatin-remodeling ATPase INO80, EC 3.6.4.- (DNA helicase-related INO80 complex homolog 1) (DNA helicase-related protein INO80) |
| P70257 | NFIX_MOUSE | Nfix | Nuclear factor 1 X-type, NF1-X, Nuclear factor 1/X (CCAAT-box-binding transcription factor, CTF) (Nuclear factor I/X, NF-I/X, NFI-X) (TGGCA-binding protein) |
| Q2TV84 | TRPM1_MOUSE | Trpm1 | Transient receptor potential cation channel subfamily M member 1 (Long transient receptor potential channel 1, LTrpC1) (Melastatin-1) |
| Q9QXW9 | LAT2_MOUSE | Slc7a8 | Large neutral amino acids transporter small subunit 2 (L-type amino acid transporter 2, mLAT2) (Solute carrier family 7 member 8) |
| Q3V1V3 | ESF1_MOUSE | Esf1 | ESF1 homolog (ABT1-associated protein) |
| F7BJB9 | MORC3_MOUSE | Morc3 | MORC family CW-type zinc finger protein 3 (Nuclear matrix protein 2) (Zinc finger CW-type coiled-coil domain protein 3) |
| Q61838 | PZP_MOUSE | Pzp | Pregnancy zone protein (Alpha-2-macroglobulin, Alpha-2-M) [Cleaved into: Alpha-2-macroglobulin 165 kDa subunit; Alpha-2-macroglobulin 35 kDa subunit] |
| Q9WTY1 | PDCD7_MOUSE | Pdcd7 | Programmed cell death protein 7 (ES18) |

| | | | |
|--------|-------------|-----------|---|
| Q8K3W0 | BABA2_MOUSE | Babam2 | BRISC and BRCA1-A complex member 2 (BRCA1-A complex subunit BRE) (BRCA1/BRCA2-containing complex subunit 45) (Brain and reproductive organ-expressed protein) |
| Q9JMB0 | GKAP1_MOUSE | Gkap1 | G kinase-anchoring protein 1 (cGMP-dependent protein kinase-anchoring protein of 42 kDa) |
| Q9WVA2 | TIM8A_MOUSE | Timm8a1 | Mitochondrial import inner membrane translocase subunit Tim8 A (Deafness dystonia protein 1 homolog) |
| Q9R0B7 | ZN346_MOUSE | Znf346 | Zinc finger protein 346 (Just another zinc finger protein) |
| Q8BXC6 | COMD2_MOUSE | Commd2 | COMM domain-containing protein 2 |
| Q9CQZ0 | ORML2_MOUSE | Ormdl2 | ORM1-like protein 2 |
| Q9Z1R4 | CF047_MOUSE | D17h6s53e | Uncharacterized protein C6orf47 homolog |
| Q8VE33 | GD1L1_MOUSE | Gdap111 | Ganglioside-induced differentiation-associated protein 1-like 1, GDAP1-L1 |
| Q01755 | TCP11_MOUSE | Tcp11 | T-complex protein 11 (Testis-specific protein PBS13) |
| Q91ZM2 | SH2B1_MOUSE | Sh2b1 | SH2B adapter protein 1 (Pro-rich, PH and SH2 domain-containing signaling mediator, PSM) (SH2 domain-containing protein 1B) (SH2-B PH domain-containing signaling mediator 1) |
| Q810N5 | CL060_MOUSE | | Uncharacterized protein C12orf60 homolog |
| Q9CQ02 | COMD4_MOUSE | Commd4 | COMM domain-containing protein 4 |
| Q6ZPR5 | NSMA3_MOUSE | Smpd4 | Sphingomyelin phosphodiesterase 4, EC 3.1.4.12 (Neutral sphingomyelinase 3, nSMase-3, nSMase3) (Neutral sphingomyelinase III) |
| Q0VGY8 | TANC1_MOUSE | Tanc1 | Protein TANC1 (Tetratricopeptide repeat, ankyrin repeat and coiled-coil domain-containing protein 1) |
| Q8CHT0 | AL4A1_MOUSE | Aldh4a1 | Delta-1-pyrroline-5-carboxylate dehydrogenase, mitochondrial, P5C dehydrogenase, EC 1.2.1.88 (Aldehyde dehydrogenase family 4 member A1) (L-glutamate gamma-semialdehyde dehydrogenase) |
| Q80U56 | AVL9_MOUSE | Avl9 | Late secretory pathway protein AVL9 homolog |
| Q8C0D5 | EFL1_MOUSE | Efl1 | Elongation factor-like GTPase 1 (Elongation factor Tu GTP-binding domain-containing protein 1) (Elongation factor-like 1) (Protein FAM42A) |
| Q9D3W4 | GPN3_MOUSE | Gpn3 | GPN-loop GTPase 3 (ATP-binding domain 1 family member C) |
| Q8BGE6 | ATG4B_MOUSE | Atg4b | Cysteine protease ATG4B, EC 3.4.22.- (AUT-like 1 cysteine endopeptidase) (Autophagy-related cysteine endopeptidase 1, Autophagin-1) (Autophagy-related protein 4 homolog B, MmAPG4B) |

| | | | |
|--------|-------------|----------|---|
| Q69ZQ1 | MYORG_MOUSE | Myorg | Myogenesis-regulating glycosidase, EC 3.2.1.- (Nuclear envelope transmembrane protein 37) (Uncharacterized family 31 glucosidase KIAA1161) |
| Q9JKN6 | NOVA1_MOUSE | Nova1 | RNA-binding protein Nova-1 (Neuro-oncological ventral antigen 1) (Ventral neuron-specific protein 1) |
| O08648 | M3K4_MOUSE | Map3k4 | Mitogen-activated protein kinase kinase kinase 4, EC 2.7.11.25 (MAPK/ERK kinase kinase 4, MEK kinase 4, MEKK 4) |
| O88998 | NOE1_MOUSE | Olfm1 | Noelin (Neuronal olfactomedin-related ER localized protein) (Olfactomedin-1) (Pancortin) |
| Q69ZP3 | PNKD_MOUSE | Pnkd | Probable hydrolase PNKD, EC 3.-.- (Myofibrillogenesis regulator 1, MR-1) (Paroxysmal nonkinesinogenic dyskinesia protein) |
| Q9EQS3 | MYCBP_MOUSE | Mycbp | c-Myc-binding protein (Associate of Myc 1, AMY-1) |
| Q91ZN5 | S35B2_MOUSE | Slc35b2 | Adenosine 3'-phospho 5'-phosphosulfate transporter 1 (PAPS transporter 1) (Solute carrier family 35 member B2) |
| Q571I9 | A16A1_MOUSE | Aldh16a1 | Aldehyde dehydrogenase family 16 member A1 |
| E9Q7E2 | ARID2_MOUSE | Arid2 | AT-rich interactive domain-containing protein 2, ARID domain-containing protein 2 (BRG1-associated factor 200, BAF200) (Zinc finger protein with activation potential) (Zipzap/p200) |
| Q9ES00 | UBE4B_MOUSE | Ube4b | Ubiquitin conjugation factor E4 B, EC 2.3.2.27 (RING-type E3 ubiquitin transferase E4 B) (Ubiquitin fusion degradation protein 2) |
| Q8CCB4 | VPS53_MOUSE | Vps53 | Vacuolar protein sorting-associated protein 53 homolog |
| P17156 | HSP72_MOUSE | Hspa2 | Heat shock-related 70 kDa protein 2, Heat shock protein 70.2 |
| Q8R4F1 | NTNG2_MOUSE | Ntng2 | Netrin-G2 (Laminct-2) |
| Q5SV85 | SYNRG_MOUSE | Synrg | Synergin gamma (AP1 subunit gamma-binding protein 1) (Gamma-synergin) |
| P97797 | SHPS1_MOUSE | Sirpa | Tyrosine-protein phosphatase non-receptor type substrate 1, SHP substrate 1, SHPS-1 (Brain Ig-like molecule with tyrosine-based activation motifs, Bit) (CD172 antigen-like family member A) (Inhibitory receptor SHPS-1) (MyD-1 antigen) (Signal-regulatory protein alpha-1, Sirp-alpha-1, mSIRP-alpha1) (p84) (CD antigen CD172a) |
| Q80X82 | SYMPK_MOUSE | Sympk | Symplekin |
| P55200 | KMT2A_MOUSE | Kmt2a | Histone-lysine N-methyltransferase 2A, Lysine N-methyltransferase 2A, EC 2.1.1.364 (ALL-1) (Cysteine methyltransferase KMT2A, EC 2.1.1.-) (Myeloid/lymphoid or mixed-lineage leukemia) (Myeloid/lymphoid or mixed-lineage leukemia protein 1) (Zinc finger protein HRX) [Cleaved into: MLL cleavage product N320 (N-terminal |

| | | | |
|--------|-------------|---------|--|
| | | | cleavage product of 320 kDa, p320); MLL cleavage product C180 (C-terminal cleavage product of 180 kDa, p180)] |
| P55002 | MFAP2_MOUSE | Mfap2 | Microfibrillar-associated protein 2, MFAP-2 (Microfibril-associated glycoprotein 1, MAGP, MAGP-1) |
| F8VPU2 | FARP1_MOUSE | Farp1 | FERM, ARHGEF and pleckstrin domain-containing protein 1 (FERM, RhoGEF and pleckstrin domain-containing protein 1) |
| Q80YT7 | MYOME_MOUSE | Pde4dip | Myomegalin (Phosphodiesterase 4D-interacting protein) |
| Q921P9 | TCAL1_MOUSE | Tceal1 | Transcription elongation factor A protein-like 1, TCEA-like protein 1 (Transcription elongation factor S-II protein-like 1) |
| Q9JJG0 | TACC2_MOUSE | Tacc2 | Transforming acidic coiled-coil-containing protein 2 |
| Q62172 | RBP1_MOUSE | Ralbp1 | RalA-binding protein 1, RalBP1 (Dinitrophenyl S-glutathione ATPase, DNP-SG ATPase, EC 7.6.2.2, EC 7.6.2.3) (Ral-interacting protein 1) |
| Q9DC22 | DCAF6_MOUSE | Dcaf6 | DDB1- and CUL4-associated factor 6 (IQ motif and WD repeat-containing protein 1) (Nuclear receptor interaction protein, NRIP) |
| Q920Q4 | VPS16_MOUSE | Vps16 | Vacuolar protein sorting-associated protein 16 homolog, mVPS16 |
| Q9CQ00 | DMAC1_MOUSE | Dmac1 | Distal membrane-arm assembly complex protein 1 (Transmembrane protein 261) |
| O09117 | SYPL1_MOUSE | Sypl1 | Synaptophysin-like protein 1 (Pantophysin) |
| O70230 | ZN143_MOUSE | Znf143 | Zinc finger protein 143, Zfp-143 (Selenocysteine tRNA gene transcription-activating factor, mStaf) |
| Q8VHN7 | AGRV1_MOUSE | Adgrv1 | Adhesion G-protein coupled receptor V1, ADGRV1, EC 3.4.-.- (G-protein coupled receptor 98) (Monogenic audiogenic seizure susceptibility protein 1, MASS1) (Neurepin) (Protein rueda) (Very large G-protein coupled receptor 1, VLGR1) [Cleaved into: ADGRV1 subunit alpha; ADGRV1 subunit beta (VLGR1 subunit beta, Vbeta)] |
| Q6Q783 | KMT5C_MOUSE | Kmt5c | Histone-lysine N-methyltransferase KMT5C (Lysine-specific methyltransferase 5C) (Suppressor of variegation 4-20 homolog 2, Su(var)4-20 homolog 2, Suv4-20h2) ([histone H4]-N-methyl-L-lysine20 N-methyltransferase KMT5B, EC 2.1.1.362) ([histone H4]-lysine20 N-methyltransferase KMT5B, EC 2.1.1.361) |
| Q99JT1 | GATB_MOUSE | Gatb | Glutamyl-tRNA(Gln) amidotransferase subunit B, mitochondrial, Glu-AdT subunit B, EC 6.3.5.- (Cytochrome c oxidase assembly factor PET112 homolog) |

| | | | |
|--------|-------------|----------|--|
| Q99J09 | MEP50_MOUSE | Wdr77 | Methylosome protein 50, MEP-50 (WD repeat-containing protein 77) |
| Q9Z1P6 | NDUA7_MOUSE | Ndufa7 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 7 (Complex I-B14.5a, CI-B14.5a) (NADH-ubiquinone oxidoreductase subunit B14.5a) |
| P62835 | RAP1A_MOUSE | Rap1a | Ras-related protein Rap-1A, EC 3.6.5.2 (Ras-related protein Krev-1) |
| Q6ZQ18 | EFR3B_MOUSE | Efr3b | Protein EFR3 homolog B |
| Q8C3X2 | CC90B_MOUSE | Ccdc90b | Coiled-coil domain-containing protein 90B, mitochondrial |
| Q80TE0 | RPAP1_MOUSE | Rpap1 | RNA polymerase II-associated protein 1 |
| Q8R2R6 | MTG1_MOUSE | Mtg1 | Mitochondrial ribosome-associated GTPase 1 (GTP-binding protein 7) (Mitochondrial GTPase 1) |
| Q8K0Q5 | RHG18_MOUSE | Arhgap18 | Rho GTPase-activating protein 18 (Rho-type GTPase-activating protein 18) |
| P50295 | ARY2_MOUSE | Nat2 | Arylamine N-acetyltransferase 2, EC 2.3.1.5 (Arylamide acetylase 2) (N-acetyltransferase type 2, NAT-2) |
| Q8BXG3 | IFT57_MOUSE | Ift57 | Intraflagellar transport protein 57 homolog (HIP1-interacting protein) |
| Q8BQZ4 | RLGPB_MOUSE | Ralgapb | Ral GTPase-activating protein subunit beta (p170) |
| P56376 | ACYP1_MOUSE | Acyp1 | Acylphosphatase-1, EC 3.6.1.7 (Acylphosphatase, organ-common type isozyme) (Acylphosphate phosphohydrolase 1) |
| Q7TT37 | ELP1_MOUSE | Elp1 | Elongator complex protein 1, ELP1 (IkappaB kinase complex-associated protein, IKK complex-associated protein) |
| Q3UIA2 | RHG17_MOUSE | Arhgap17 | Rho GTPase-activating protein 17 (Neuron-associated developmentally-regulated protein, Nadrin) (Rho-type GTPase-activating protein 17) |
| Q9CQ79 | TXND9_MOUSE | Txndc9 | Thioredoxin domain-containing protein 9 (ATP-binding protein associated with cell differentiation) |
| Q3V4B5 | COMD6_MOUSE | Commd6 | COMM domain-containing protein 6 |
| P26450 | P85A_MOUSE | Pik3r1 | Phosphatidylinositol 3-kinase regulatory subunit alpha, PI3-kinase regulatory subunit alpha, PI3K regulatory subunit alpha, PtdIns-3-kinase regulatory subunit alpha (Phosphatidylinositol 3-kinase 85 kDa regulatory subunit alpha, PI3-kinase subunit p85-alpha, PtdIns-3-kinase regulatory subunit p85-alpha) |
| Q3UHD3 | MTUS2_MOUSE | Mtus2 | Microtubule-associated tumor suppressor candidate 2 homolog (Cardiac zipper protein) (Microtubule plus-end tracking protein TIP150, Tracking protein of 150 kDa) |
| Q8VCF0 | MAVS_MOUSE | Mavs | Mitochondrial antiviral-signaling protein, MAVS (CARD adapter inducing interferon beta, Cardif) (Interferon beta promoter stimulator protein 1, IPS-1) (Virus-induced-signaling adapter, VISA) |

| | | | |
|--------|-------------|---------|--|
| Q8R5L3 | VPS39_MOUSE | Vps39 | Vam6/Vps39-like protein |
| Q9R1P3 | PSB2_MOUSE | Psmb2 | Proteasome subunit beta type-2 (Macropain subunit C7-I) (Multicatalytic endopeptidase complex subunit C7-I) (Proteasome component C7-I) |
| Q3UMB9 | WASC4_MOUSE | Washc4 | WASH complex subunit 4 (WASH complex subunit SWIP) |
| Q61625 | GRID2_MOUSE | Grid2 | Glutamate receptor ionotropic, delta-2, GluD2, GluR delta-2 subunit |
| P62717 | RL18A_MOUSE | Rpl18a | 60S ribosomal protein L18a |
| Q8K3E5 | AHI1_MOUSE | Ahi1 | Jouberin (Abelson helper integration site 1 protein, AHI-1) |
| Q60953 | PML_MOUSE | Pml | Protein PML |
| Q6PGF7 | EXOC8_MOUSE | Exoc8 | Exocyst complex component 8 (Exocyst complex 84 kDa subunit) |
| Q8BY02 | NKRF_MOUSE | Nkrf | NF-kappa-B-repressing factor, NFkB-repressing factor (Transcription factor NRF) |
| Q8VDI1 | ESIP1_MOUSE | Epsti1 | Epithelial-stromal interaction protein 1 |
| P70671 | IRF3_MOUSE | Irf3 | Interferon regulatory factor 3, IRF-3 |
| Q8CCI5 | RYBP_MOUSE | Rybp | RING1 and YY1-binding protein (Death effector domain-associated factor, DED-associated factor) |
| Q80UF4 | SDCG8_MOUSE | Sdccag8 | Serologically defined colon cancer antigen 8 homolog (Centrosomal colon cancer autoantigen protein, mCCCAP) |
| Q8BHE3 | ATCAY_MOUSE | Atcay | Caytaxin |
| O54714 | PIAS3_MOUSE | Pias3 | E3 SUMO-protein ligase PIAS3, EC 2.3.2.- (E3 SUMO-protein transferase PIAS3) (Protein inhibitor of activated STAT protein 3) |
| Q9ES34 | UBE3B_MOUSE | Ube3b | Ubiquitin-protein ligase E3B, EC 2.3.2.26 (HECT-type ubiquitin transferase E3B) |
| P47743 | GRM8_MOUSE | Grm8 | Metabotropic glutamate receptor 8, mGluR8 |
| Q9Z2A7 | DGAT1_MOUSE | Dgat1 | Diacylglycerol O-acyltransferase 1, EC 2.3.1.20 (Acyl-CoA retinol O-fatty-acyltransferase, ARAT, Retinol O-fatty-acyltransferase, EC 2.3.1.76) (Diglyceride acyltransferase) |
| Q9D5T0 | ATAD1_MOUSE | Atad1 | Outer mitochondrial transmembrane helix translocase, EC 7.4.2.- (ATPase family AAA domain-containing protein 1) (Thorase) |
| Q9JIM1 | S29A1_MOUSE | Slc29a1 | Equilibrative nucleoside transporter 1 (Equilibrative nitrobenzylmercaptapurine riboside-sensitive nucleoside transporter, Equilibrative NBMPR-sensitive nucleoside transporter) (Nucleoside transporter, es-type) (Solute carrier family 29 member 1) |
| Q9DCL8 | IPP2_MOUSE | Ppp1r2 | Protein phosphatase inhibitor 2, IPP-2 |
| Q80XE1 | RIC8B_MOUSE | Ric8b | Synembryn-B (Protein Ric-8B) |

| | | | |
|--------|-------------|----------|---|
| Q6PA06 | ATLA2_MOUSE | Atl2 | Atlastin-2, EC 3.6.5.- (ADP-ribosylation factor-like protein 6-interacting protein 2, ARL-6-interacting protein 2, Aip-2) |
| Q8K4L3 | SVIL_MOUSE | Svil | Supervillin (Archvillin) (p205/p250) |
| Q9CQV6 | MLP3B_MOUSE | Map1lc3b | Microtubule-associated proteins 1A/1B light chain 3B (Autophagy-related protein LC3 B) (Autophagy-related ubiquitin-like modifier LC3 B) (MAP1 light chain 3-like protein 2) (MAP1A/MAP1B light chain 3 B, MAP1A/MAP1B LC3 B) (Microtubule-associated protein 1 light chain 3 beta) |
| Q9CQ18 | RNH2C_MOUSE | Rnaseh2c | Ribonuclease H2 subunit C, RNase H2 subunit C (Ribonuclease HI subunit C) |
| Q9CRA8 | EXOS5_MOUSE | Exosc5 | Exosome complex component RRP46 (Exosome component 5) (Ribosomal RNA-processing protein 46) |
| Q9QYB2 | DACH1_MOUSE | Dach1 | Dachshund homolog 1, Dach1 |
| Q3TDX8 | NB5R4_MOUSE | Cyb5r4 | Cytochrome b5 reductase 4, EC 1.6.2.2 (Flavoheмоprotein b5/b5R, b5+b5R) (N-terminal cytochrome b5 and cytochrome b5 oxidoreductase domain-containing protein) (cb5/cb5R) |
| Q9QX47 | SON_MOUSE | Son | Protein SON (Negative regulatory element-binding protein, NRE-binding protein) |
| Q8R5C8 | ZMY11_MOUSE | Zmynd11 | Zinc finger MYND domain-containing protein 11 |
| A2AJA9 | AJM1_MOUSE | Ajm1 | Apical junction component 1 homolog |
| Q6P5U8 | CC148_MOUSE | Ccdc148 | Coiled-coil domain-containing protein 148 |
| Q5M8N4 | D39U1_MOUSE | Sdr39u1 | Epimerase family protein SDR39U1, EC 1.1.1.- (Short-chain dehydrogenase/reductase family 39U member 1) |
| Q9DBX3 | SUSD2_MOUSE | Susd2 | Sushi domain-containing protein 2 |
| Q8BG58 | P4HTM_MOUSE | P4htm | Transmembrane prolyl 4-hydroxylase, P4H-TM, EC 1.14.11.29 (Hypoxia-inducible factor prolyl hydroxylase 4, HIF-PH4, HIF-prolyl hydroxylase 4, HPH-4) |
| Q9Z2D3 | GSDME_MOUSE | Gsdme | Gasdermin-E (Non-syndromic hearing impairment protein 5 homolog) [Cleaved into: Gasdermin-E, N-terminal, GSDME-NT; Gasdermin-E, C-terminal, GSDME-CT] |
| Q9CRC3 | CO040_MOUSE | | UPF0235 protein C15orf40 homolog |
| Q0KL01 | UBX2B_MOUSE | Ubxn2b | UBX domain-containing protein 2B (NSFL1 cofactor p37) (p97 cofactor p37) |
| Q99JT2 | STK26_MOUSE | Stk26 | Serine/threonine-protein kinase 26, EC 2.7.11.1 (Mammalian STE20-like protein kinase 4, MST-4) (STE20-like kinase MST4) (Serine/threonine-protein kinase MST4) |

| | | | |
|--------|-------------|---------|--|
| Q60928 | GGT1_MOUSE | Ggt1 | Glutathione hydrolase 1 proenzyme, EC 3.4.19.13 (Gamma-glutamyltransferase 1) (Gamma-glutamyltranspeptidase 1, GGT 1, EC 2.3.2.2) (Leukotriene-C4 hydrolase, EC 3.4.19.14) (CD antigen CD224) [Cleaved into: Glutathione hydrolase 1 heavy chain; Glutathione hydrolase 1 light chain] |
| Q8R418 | DICER_MOUSE | Dicer1 | Endoribonuclease Dicer, EC 3.1.26.3 (Double-strand-specific ribonuclease mDCR-1) |
| Q8R4G6 | MGT5A_MOUSE | Mgat5 | Alpha-1,6-mannosylglycoprotein 6-beta-N-acetylglucosaminyltransferase A, EC 2.4.1.155 (Alpha-mannoside beta-1,6-N-acetylglucosaminyltransferase) (GlcNAc-T V, GNT-V) (Mannoside acetylglucosaminyltransferase 5) (N-acetylglucosaminyltransferase V) [Cleaved into: Secreted alpha-1,6-mannosylglycoprotein 6-beta-N-acetylglucosaminyltransferase A (Secreted beta-1,6-N-acetylglucosaminyltransferase V, Secreted GNT-V)] |
| A6H619 | PHRF1_MOUSE | Phrf1 | PHD and RING finger domain-containing protein 1 |
| Q8R3N1 | NOP14_MOUSE | Nop14 | Nucleolar protein 14 (Nucleolar complex protein 14) |
| P35438 | NMDZ1_MOUSE | Grin1 | Glutamate receptor ionotropic, NMDA 1, GluN1 (Glutamate [NMDA] receptor subunit zeta-1) (N-methyl-D-aspartate receptor subunit NR1, NMD-R1) |
| Q8BZ36 | RINT1_MOUSE | Rint1 | RAD50-interacting protein 1 (RAD50 interactor 1, RINT-1) |
| Q0P5X1 | LRIQ1_MOUSE | Lrriq1 | Leucine-rich repeat and IQ domain-containing protein 1 |
| Q3UBZ5 | MI4GD_MOUSE | Mif4gd | MIF4G domain-containing protein |
| Q9QYK7 | RNF11_MOUSE | Rnf11 | RING finger protein 11 (NEDD4 WW domain-binding protein 2) (Sid 1669) |
| P54775 | PRS6B_MOUSE | Psmc4 | 26S proteasome regulatory subunit 6B (26S proteasome AAA-ATPase subunit RPT3) (CIP21) (MB67-interacting protein) (MIP224) (Proteasome 26S subunit ATPase 4) (Tat-binding protein 7, TBP-7) |
| Q9CX84 | RGS19_MOUSE | Rgs19 | Regulator of G-protein signaling 19, RGS19 |
| Q9CQT2 | RBM7_MOUSE | Rbm7 | RNA-binding protein 7 (RNA-binding motif protein 7) |
| P59999 | ARPC4_MOUSE | Arpc4 | Actin-related protein 2/3 complex subunit 4 (Arp2/3 complex 20 kDa subunit, p20-ARC) |
| Q8R3D1 | TBC13_MOUSE | Tbc1d13 | TBC1 domain family member 13 |
| Q6P549 | SHIP2_MOUSE | Inpp11 | Phosphatidylinositol 3,4,5-trisphosphate 5-phosphatase 2, EC 3.1.3.86 (AblSH3-binding protein) (Inositol polyphosphate phosphatase-like protein 1, INPPL-1) (SH2 domain-containing inositol 5'-phosphatase 2, SH2 domain-containing inositol phosphatase 2, SHIP-2) |
| Q91WK7 | ANR54_MOUSE | Ankrd54 | Ankyrin repeat domain-containing protein 54 (Lyn-interacting ankyrin repeat protein) |

| | | | |
|--------|-------------|----------|--|
| Q3U3W5 | ANM9_MOUSE | Prmt9 | Protein arginine N-methyltransferase 9 (Protein arginine N-methyltransferase 10, EC 2.1.1.320) |
| Q9JI11 | STK4_MOUSE | Stk4 | Serine/threonine-protein kinase 4, EC 2.7.11.1 (Mammalian STE20-like protein kinase 1, MST-1) (STE20-like kinase MST1) [Cleaved into: Serine/threonine-protein kinase 4 37kDa subunit, MST1/N; Serine/threonine-protein kinase 4 18kDa subunit, MST1/C] |
| P97384 | ANX11_MOUSE | Anxa11 | Annexin A11 (Annexin XI) (Annexin-11) (Calcyclin-associated annexin 50, CAP-50) |
| Q8BH55 | THNS1_MOUSE | Thns11 | Threonine synthase-like 1, TSH1 |
| E9Q1P8 | I2BP2_MOUSE | Irf2bp2 | Interferon regulatory factor 2-binding protein 2, IRF-2-binding protein 2, IRF-2BP2 |
| O35613 | DAXX_MOUSE | Daxx | Death domain-associated protein 6 (Daxx) |
| Q9WV89 | STXB4_MOUSE | Stxbp4 | Syntaxin-binding protein 4 (Syntaxin 4-interacting protein, STX4-interacting protein, Synip) |
| Q3UG98 | NAT9_MOUSE | Nat9 | Alpha/beta-tubulin-N-acetyltransferase 9, EC 2.3.1.- |
| P97927 | LAMA4_MOUSE | Lama4 | Laminin subunit alpha-4 (Laminin-14 subunit alpha) (Laminin-8 subunit alpha) (Laminin-9 subunit alpha) |
| Q8K2Z2 | PRP39_MOUSE | Prpf39 | Pre-mRNA-processing factor 39 (PRP39 homolog) |
| Q9Z2B9 | KS6A4_MOUSE | Rps6ka4 | Ribosomal protein S6 kinase alpha-4, S6K-alpha-4, EC 2.7.11.1 (90 kDa ribosomal protein S6 kinase 4) (Nuclear mitogen- and stress-activated protein kinase 2) (RSK-like protein kinase, RLSK) |
| Q5SVR0 | TBC9B_MOUSE | Tbc1d9b | TBC1 domain family member 9B |
| Q922E6 | FAKD2_MOUSE | Fastkd2 | FAST kinase domain-containing protein 2, mitochondrial |
| P14234 | FGR_MOUSE | Fgr | Tyrosine-protein kinase Fgr, EC 2.7.10.2 (Proto-oncogene c-Fgr) (p55-Fgr) |
| Q8CFE3 | RCOR1_MOUSE | Rcor1 | REST corepressor 1 (Protein CoREST) |
| Q8BL48 | UNK_MOUSE | Unk | RING finger protein unkempt homolog (Zinc finger CCCH domain-containing protein 5) |
| Q8BHN1 | TXLNG_MOUSE | Txlng | Gamma-taxilin (Factor inhibiting ATF4-mediated transcription, FIAT) (Lipopolysaccharide-responsive gene protein) |
| Q7TPD3 | ROBO2_MOUSE | Robo2 | Roundabout homolog 2 |
| Q99LJ0 | CT2NL_MOUSE | Ctnbp2nl | CTTNBP2 N-terminal-like protein |
| Q9QXD8 | LIMD1_MOUSE | Limd1 | LIM domain-containing protein 1 |
| Q8R3K3 | PTCD2_MOUSE | Ptcd2 | Pentatricopeptide repeat-containing protein 2, mitochondrial |

| | | | |
|--------|-------------|----------|---|
| P16015 | CAH3_MOUSE | Ca3 | Carbonic anhydrase 3, EC 4.2.1.1 (Carbonate dehydratase III) (Carbonic anhydrase III, CA-III) |
| Q3V3G7 | GRM2A_MOUSE | Gramd2a | GRAM domain-containing protein 2A (GRAM domain-containing protein 2) |
| Q8CIP4 | MARK4_MOUSE | Mark4 | MAP/microtubule affinity-regulating kinase 4, EC 2.7.11.1 |
| Q99KN2 | CIAO1_MOUSE | Ciao1 | Probable cytosolic iron-sulfur protein assembly protein CIAO1 (WD repeat-containing protein 39) |
| Q505F1 | NR2C1_MOUSE | Nr2c1 | Nuclear receptor subfamily 2 group C member 1 (Orphan nuclear receptor TR2) (Testicular receptor 2, mTR2) |
| O88665 | BRD7_MOUSE | Brd7 | Bromodomain-containing protein 7 (75 kDa bromodomain protein) |
| Q3TIX9 | SNUT2_MOUSE | Usp39 | U4/U6.U5 tri-snRNP-associated protein 2 (Inactive ubiquitin-specific peptidase 39) |
| Q8R2Y2 | MUC18_MOUSE | Mcam | Cell surface glycoprotein MUC18 (Gicerin) (Melanoma cell adhesion molecule) (Melanoma-associated antigen MUC18) (CD antigen CD146) |
| P97737 | GDF10_MOUSE | Gdf10 | Growth/differentiation factor 10, GDF-10 (Bone morphogenetic protein 3B, BMP-3B) |
| Q80ZJ7 | SNX32_MOUSE | Snx32 | Sorting nexin-32 (Sorting nexin-6B) |
| Q62384 | ZPR1_MOUSE | Zpr1 | Zinc finger protein ZPR1 (Zinc finger protein 259) |
| P83093 | STIM2_MOUSE | Stim2 | Stromal interaction molecule 2 |
| Q8CGT6 | PIWL4_MOUSE | Piwil4 | Piwi-like protein 4, mAgo5 |
| O70585 | DTNB_MOUSE | Dtnb | Dystrobrevin beta, DTN-B, mDTN-BDTN-B (Beta-dystrobrevin) |
| Q8BG95 | MYPT2_MOUSE | Ppp1r12b | Protein phosphatase 1 regulatory subunit 12B (Myosin phosphatase-targeting subunit 2, Myosin phosphatase target subunit 2) |
| Q9QYJ3 | DNJB1_MOUSE | Dnajb1 | DnaJ homolog subfamily B member 1 (Heat shock 40 kDa protein 1, HSP40, Heat shock protein 40) |
| Q9D938 | TM160_MOUSE | Tmem160 | Transmembrane protein 160 |
| Q80W21 | GSTM7_MOUSE | Gstm7 | Glutathione S-transferase Mu 7, EC 2.5.1.18 (GST class-mu 7, GSTM-7) |
| Q58A65 | JIP4_MOUSE | Spag9 | C-Jun-amino-terminal kinase-interacting protein 4, JIP-4, JNK-interacting protein 4 (JNK-associated leucine-zipper protein, JLP) (JNK/SAPK-associated protein 2, JSAP2) (Mitogen-activated protein kinase 8-interacting protein 4) (Sperm-associated antigen 9) |
| Q4KMM3 | OXR1_MOUSE | Oxr1 | Oxidation resistance protein 1 (Protein C7) |
| Q9CY58 | PAIRB_MOUSE | Serbp1 | Plasminogen activator inhibitor 1 RNA-binding protein (PAI1 RNA-binding protein 1, PAI-RBP1) (SERPINE1 mRNA-binding protein 1) |

| | | | |
|--------|-------------|---------|--|
| Q60902 | EP15R_MOUSE | Eps15l1 | Epidermal growth factor receptor substrate 15-like 1 (Epidermal growth factor receptor pathway substrate 15-related sequence, Eps15-rs) (Eps15-related protein, Eps15R) |
| Q8BGZ7 | K2C75_MOUSE | Krt75 | Keratin, type II cytoskeletal 75 (Cytokeratin-75, CK-75) (Keratin-6 hair follicle, mK6hf) (Keratin-75, K75) (Type II keratin-K6hf) (Type-II keratin Kb18) |
| P28740 | KIF2A_MOUSE | Kif2a | Kinesin-like protein KIF2A (Kinesin-2) |
| Q3V0J1 | TM237_MOUSE | Tmem237 | Transmembrane protein 237 (Amyotrophic lateral sclerosis 2 chromosomal region candidate gene 4 protein homolog) |
| P20065 | TYB4_MOUSE | Tmsb4x | Thymosin beta-4, T beta 4 [Cleaved into: Hemoregulatory peptide AcSDKP (N-acetyl-SDKP, AcSDKP) (Seraspenide)] |
| Q8BG51 | MIRO1_MOUSE | Rhot1 | Mitochondrial Rho GTPase 1, MIRO-1, EC 3.6.5.- (Ras homolog gene family member T1) |
| Q9JJV2 | PROF2_MOUSE | Pfn2 | Profilin-2 (Profilin II) |
| Q8BW96 | KCC1D_MOUSE | Camk1d | Calcium/calmodulin-dependent protein kinase type 1D, EC 2.7.11.17 (CaM kinase I delta, CaM-KI delta, CaMKI delta) (CaM kinase ID) (CaMKI-like protein kinase, CKLiK, mCKLiK) |
| Q3UMU9 | HDGR2_MOUSE | Hdglf2 | Hepatoma-derived growth factor-related protein 2, HRP-2 |
| Q9D2E2 | TOE1_MOUSE | Toe1 | Target of EGR1 protein 1 |
| Q6RHR9 | MAGI1_MOUSE | Magi1 | Membrane-associated guanylate kinase, WW and PDZ domain-containing protein 1 (BAI1-associated protein 1, BAP-1) (Membrane-associated guanylate kinase inverted 1, MAGI-1) |
| O70585 | DTNB_MOUSE | Dtnb | Dystrobrevin beta, DTN-B, mDTN-BDTN-B (Beta-dystrobrevin) |
| Q3UMY5 | EMAL4_MOUSE | Eml4 | Echinoderm microtubule-associated protein-like 4, EMAP-4 |
| Q8K4Q0 | RPTOR_MOUSE | Rptor | Regulatory-associated protein of mTOR, Raptor (p150 target of rapamycin (TOR)-scaffold protein) |
| P60755 | MDGA2_MOUSE | Mdga2 | MAM domain-containing glycosylphosphatidylinositol anchor protein 2 (MAM domain-containing protein 1) |
| Q9QYY0 | GAB1_MOUSE | Gab1 | GRB2-associated-binding protein 1 (GRB2-associated binder 1) (Growth factor receptor bound protein 2-associated protein 1) |
| B7ZMP1 | XPP3_MOUSE | Xpnpep3 | Xaa-Pro aminopeptidase 3, X-Pro aminopeptidase 3, EC 3.4.11.9 (Aminopeptidase P3, APP3) |
| Q8BL97 | SRSF7_MOUSE | Srsf7 | Serine/arginine-rich splicing factor 7 (Splicing factor, arginine/serine-rich 7) |

| | | | |
|--------|-------------|---------|--|
| Q3UTH8 | ARHG9_MOUSE | Arhgef9 | Rho guanine nucleotide exchange factor 9 (Collybistin) (Rac/Cdc42 guanine nucleotide exchange factor 9) |
| Q8BFV2 | PCID2_MOUSE | Pcid2 | PCI domain-containing protein 2 (CSN12-like protein) |
| Q62311 | TAF6_MOUSE | Taf6 | Transcription initiation factor TFIID subunit 6 (Transcription initiation factor TFIID 70 kDa subunit, TAF(II)70, TAFII-70, TAFII70) (Transcription initiation factor TFIID 80 kDa subunit, TAF(II)80, TAFII-80, TAFII80) (p80) |
| Q9QWR8 | NAGAB_MOUSE | Naga | Alpha-N-acetylgalactosaminidase, EC 3.2.1.49 (Alpha-galactosidase B) |
| Q9CZ42 | NNRD_MOUSE | Naxd | ATP-dependent (S)-NAD(P)H-hydrate dehydratase, EC 4.2.1.93 (ATP-dependent NAD(P)HX dehydratase) (Carbohydrate kinase domain-containing protein) (NAD(P)HX dehydratase) |
| Q99KR7 | PPIF_MOUSE | Ppif | Peptidyl-prolyl cis-trans isomerase F, mitochondrial, PPIase F, EC 5.2.1.8 (Cyclophilin D, CyP-D, CypD) (Cyclophilin F) (Rotamase F) |
| Q8R5H6 | WASF1_MOUSE | Wasf1 | Actin-binding protein WASF1 (Protein WAVE-1) (Wiskott-Aldrich syndrome protein family member 1, WASP family protein member 1) |
| Q921U8 | SMTN_MOUSE | Smtn | Smoothelin |
| Q61672 | S29A2_MOUSE | Slc29a2 | Equilibrative nucleoside transporter 2 (36 kDa hydrophobic nucleolar protein) (36 kDa nucleolar protein HNP36) (Delayed-early response protein 12) (Equilibrative nitrobenzylmercaptapurine riboside-insensitive nucleoside transporter, Equilibrative NBMPR-insensitive nucleoside transporter) (Nucleoside transporter, ei-type) (Solute carrier family 29 member 2) |
| Q61818 | RAI1_MOUSE | Rai1 | Retinoic acid-induced protein 1 |
| Q3UDK1 | TRAD1_MOUSE | Trafd1 | TRAF-type zinc finger domain-containing protein 1 (Protein FLN29) |
| Q9CZ91 | SRFB1_MOUSE | Srfbp1 | Serum response factor-binding protein 1 (SRF-dependent transcription regulation-associated protein) (p49/STRAP) |
| A3KFM7 | CHD6_MOUSE | Chd6 | Chromodomain-helicase-DNA-binding protein 6, CHD-6, EC 3.6.4.12 (ATP-dependent helicase CHD6) |
| A6X919 | D19L1_MOUSE | Dpy19l1 | Probable C-mannosyltransferase DPY19L1, EC 2.4.1.- (Dpy-19-like protein 1) (Protein dpy-19 homolog 1) |
| Q8R3Z5 | CACB1_MOUSE | Cacnb1 | Voltage-dependent L-type calcium channel subunit beta-1, CAB1 (Calcium channel voltage-dependent subunit beta 1) |
| Q0GNC1 | INF2_MOUSE | Inf2 | Inverted formin-2 |

| | | | |
|--------|-------------|---------|---|
| Q6ZQ73 | CAND2_MOUSE | Cand2 | Cullin-associated NEDD8-dissociated protein 2 (Cullin-associated and neddylation-dissociated protein 2) (TBP-interacting protein of 120 kDa B, TBP-interacting protein 120B) (p120 CAND2) |
| P58404 | STRN4_MOUSE | Strn4 | Striatin-4 (Zinedin) |
| Q8R0K4 | CC137_MOUSE | Ccdc137 | Coiled-coil domain-containing protein 137 |
| Q5DTT2 | PSD1_MOUSE | Psd | PH and SEC7 domain-containing protein 1 (Exchange factor for ADP-ribosylation factor guanine nucleotide factor 6, Exchange factor for ARF6) (Exchange factor for ARF6 A) (Pleckstrin homology and SEC7 domain-containing protein 1) |
| Q924H7 | WAC_MOUSE | Wac | WW domain-containing adapter protein with coiled-coil |
| Q6P3Y5 | Z280C_MOUSE | Znf280c | Zinc finger protein 280C (Suppressor of hairy wing homolog 3) |
| Q91V57 | CHIN_MOUSE | Chn1 | N-chimaerin (A-chimaerin) (Alpha-chimerin) (N-chimerin, NC) (Rho GTPase-activating protein 2) |
| Q8BG30 | NELFA_MOUSE | Nelfa | Negative elongation factor A, NELF-A (Wolf-Hirschhorn syndrome candidate 2 homolog, mWHSC2) |
| Q7TQK4 | EXOS3_MOUSE | Exosc3 | Exosome complex component RRP40, EC 3.1.13.- (Exosome component 3) (Ribosomal RNA-processing protein 40) |
| Q6PFD5 | DLGP3_MOUSE | Dlgap3 | Disks large-associated protein 3, DAP-3 (PSD-95/SAP90-binding protein 3) (SAP90/PSD-95-associated protein 3, SAPAP3) |
| P52760 | RIDA_MOUSE | Rida | 2-iminobutanoate/2-iminopropanoate deaminase, EC 3.5.99.10 (Heat-responsive protein 12) (Reactive intermediate imine deaminase A homolog) (Translation inhibitor L-PSP ribonuclease) |
| Q9JKP5 | MBNL1_MOUSE | Mbnl1 | Muscleblind-like protein 1 (Triplet-expansion RNA-binding protein) |
| Q9DB85 | RRP8_MOUSE | Rrp8 | Ribosomal RNA-processing protein 8, EC 2.1.1.- (Cerebral protein 1 homolog) |
| Q9D8X1 | CUTC_MOUSE | Cutc | Copper homeostasis protein cutC homolog |
| Q9D7B6 | ACAD8_MOUSE | Acad8 | Isobutyryl-CoA dehydrogenase, mitochondrial, EC 1.3.8.- (Acyl-CoA dehydrogenase family member 8, ACAD-8) |
| Q9D6S7 | RRFM_MOUSE | Mrrf | Ribosome-recycling factor, mitochondrial, RRF (Ribosome-releasing factor, mitochondrial) |
| Q9CR11 | YETS4_MOUSE | Yeats4 | YEATS domain-containing protein 4 (Glioma-amplified sequence 41 homolog, Gas41) |

| | | | |
|--------|-------------|----------|--|
| Q8C5D8 | PIAS2_MOUSE | Pias2 | E3 SUMO-protein ligase PIAS2, EC 2.3.2.27 (Androgen receptor-interacting protein 3, ARIP3) (DAB2-interacting protein, DIP) (Msx-interacting zinc finger protein) (Protein inhibitor of activated STAT x) (Protein inhibitor of activated STAT2) (RING-type E3 ubiquitin transferase PIAS2) |
| Q8BPS4 | GP180_MOUSE | Gpr180 | Integral membrane protein GPR180 |
| Q8BGH4 | REEP1_MOUSE | Reep1 | Receptor expression-enhancing protein 1 |
| Q6ZPY2 | SMG5_MOUSE | Smg5 | Nonsense-mediated mRNA decay factor SMG5 (EST1-like protein B) (LPTS-RP1) (LPTS-interacting protein) (SMG-5 homolog) |
| Q61578 | ADRO_MOUSE | Fdxr | NADPH:adrenodoxin oxidoreductase, mitochondrial, AR, Adrenodoxin reductase, EC 1.18.1.6 (Ferredoxin--NADP(+) reductase, Ferredoxin reductase) |
| P63254 | CRIP1_MOUSE | Crip1 | Cysteine-rich protein 1, CRP-1 (Cysteine-rich intestinal protein, CRIP) |
| P62962 | PROF1_MOUSE | Pfn1 | Profilin-1 (Profilin I) |
| P53690 | MMP14_MOUSE | Mmp14 | Matrix metalloproteinase-14, MMP-14, EC 3.4.24.80 (MMP-X1) (MT-MMP) (Membrane-type matrix metalloproteinase 1, MT-MMP 1, MTMMP1) (Membrane-type-1 matrix metalloproteinase, MT1-MMP, MT1MMP) |
| P29788 | VTNC_MOUSE | Vtn | Vitronectin, VN (S-protein) (Serum-spreading factor) |
| O89023 | TPP1_MOUSE | Tpp1 | Tripeptidyl-peptidase 1, TPP-1, EC 3.4.14.9 (Lysosomal pepstatin-insensitive protease, LPIC) (Tripeptidyl aminopeptidase) (Tripeptidyl-peptidase I, TPP-I) |
| Q8BJ42 | DLGP2_MOUSE | Dlgap2 | Disks large-associated protein 2, DAP-2 (PSD-95/SAP90-binding protein 2) (SAP90/PSD-95-associated protein 2, SAPAP2) |
| Q0VEE6 | ZN800_MOUSE | Znf800 | Zinc finger protein 800 |
| Q9WUA6 | AKT3_MOUSE | Akt3 | RAC-gamma serine/threonine-protein kinase, EC 2.7.11.1 (Protein kinase Akt-3) (Protein kinase B gamma, PKB gamma) (RAC-PK-gamma) |
| Q99LB2 | DHRS4_MOUSE | Dhrs4 | Dehydrogenase/reductase SDR family member 4, EC 1.1.1.184, EC 1.1.1.300 (NADPH-dependent carbonyl reductase, CR) (NADPH-dependent retinol dehydrogenase/reductase, NDRD, mouNRDR) (Peroxisomal short-chain alcohol dehydrogenase, PSCD) (Short chain dehydrogenase/reductase family 25C member 2, Protein SDR25C2) |
| Q99KL7 | RAB28_MOUSE | Rab28 | Ras-related protein Rab-28 |
| Q9DBN4 | P33MX_MOUSE | P33monox | Putative monooxygenase p33MONOX, EC 1.-.-.- |
| Q9WUN2 | TBK1_MOUSE | Tbk1 | Serine/threonine-protein kinase TBK1, EC 2.7.11.1 (T2K) (TANK-binding kinase 1) |

| | | | |
|--------|-------------|----------|---|
| E9Q9D5 | RBL2A_MOUSE | Rabl2 | Rab-like protein 2A |
| P21460 | CYTC_MOUSE | Cst3 | Cystatin-C (Cystatin-3) |
| Q9QXK2 | RAD18_MOUSE | Rad18 | E3 ubiquitin-protein ligase RAD18, EC 2.3.2.27 (Postreplication repair protein RAD18, mRAD18Sc) (RING-type E3 ubiquitin transferase RAD18) |
| Q3U0J8 | TBD2B_MOUSE | Tbc1d2b | TBC1 domain family member 2B |
| Q8BFS6 | CPPED_MOUSE | Cpped1 | Serine/threonine-protein phosphatase CPPED1, EC 3.1.3.16 (Calcineurin-like phosphoesterase domain-containing protein 1) |
| Q99K74 | MED24_MOUSE | Med24 | Mediator of RNA polymerase II transcription subunit 24 (Mediator complex subunit 24) (Thyroid hormone receptor-associated protein 4) (Thyroid hormone receptor-associated protein complex 100 kDa component, Trap100, mTRAP100) |
| Q7TQF2 | FBX10_MOUSE | Fbxo10 | F-box only protein 10 |
| Q9JJK1 | STX6_MOUSE | Stx6 | Syntaxin-6 |
| Q60636 | PRDM1_MOUSE | Prdm1 | PR domain zinc finger protein 1, EC 2.1.1.- (B lymphocyte-induced maturation protein 1, Blimp-1) (Beta-interferon gene positive regulatory domain I-binding factor) (PR domain-containing protein 1) |
| P27048 | RSMB_MOUSE | Snrpb | Small nuclear ribonucleoprotein-associated protein B, snRNP-B, snRPB (Sm protein B, Sm-B, SmB) |
| Q8VCE1 | DJC28_MOUSE | Dnajc28 | DnaJ homolog subfamily C member 28 |
| Q9CQS2 | NOP10_MOUSE | Nop10 | H/ACA ribonucleoprotein complex subunit 3 (Nucleolar protein 10) (Nucleolar protein family A member 3) (snoRNP protein NOP10) |
| P23819 | GRIA2_MOUSE | Gria2 | Glutamate receptor 2, GluR-2 (AMPA-selective glutamate receptor 2) (GluR-B) (GluR-K2) (Glutamate receptor ionotropic, AMPA 2, GluA2) |
| Q91ZM2 | SH2B1_MOUSE | Sh2b1 | SH2B adapter protein 1 (Pro-rich, PH and SH2 domain-containing signaling mediator, PSM) (SH2 domain-containing protein 1B) (SH2-B PH domain-containing signaling mediator 1) |
| Q9D289 | TPC6B_MOUSE | Trappc6b | Trafficking protein particle complex subunit 6B, TRAPP complex subunit 6B |
| Q8BIK4 | DOCK9_MOUSE | Dock9 | Dedicator of cytokinesis protein 9 (Cdc42 guanine nucleotide exchange factor zizimin-1, Zizimin-1) |
| Q922X9 | ANM7_MOUSE | Prmt7 | Protein arginine N-methyltransferase 7, EC 2.1.1.321 (Histone-arginine N-methyltransferase PRMT7) ([Myelin basic protein]-arginine N-methyltransferase PRMT7) |
| Q6V4S5 | SDK2_MOUSE | Sdk2 | Protein sidekick-2 |

| | | | |
|--------|-------------|---------|---|
| Q03059 | CLAT_MOUSE | Chat | Choline O-acetyltransferase, CHOACTase, ChAT, Choline acetylase, EC 2.3.1.6 |
| Q80U78 | PUM1_MOUSE | Pum1 | Pumilio homolog 1 |
| Q8VIM9 | IRGQ_MOUSE | Irgq | Immunity-related GTPase family Q protein |
| P00520 | ABL1_MOUSE | Abl1 | Tyrosine-protein kinase ABL1, EC 2.7.10.2 (Abelson murine leukemia viral oncogene homolog 1) (Abelson tyrosine-protein kinase 1) (Proto-oncogene c-Abl) (p150) |
| Q9DBM0 | ABCG8_MOUSE | Abcg8 | ATP-binding cassette sub-family G member 8, EC 7.6.2.- (Sterolin-2) |
| Q921Z5 | TFIP8_MOUSE | Tnfaip8 | Tumor necrosis factor alpha-induced protein 8, TNF alpha-induced protein 8 |
| Q3UHB1 | NT5D3_MOUSE | Nt5dc3 | 5'-nucleotidase domain-containing protein 3, EC 3.1.3.- (GRP94-neighboring nucleotidase) |
| Q99J21 | MCLN1_MOUSE | Mcoln1 | Mucolipin-1 (Mucolipidin) (Transient receptor potential-mucolipin 1, TRPML1) |
| P68134 | ACTS_MOUSE | Acta1 | Actin, alpha skeletal muscle (Alpha-actin-1) [Cleaved into: Actin, alpha skeletal muscle, intermediate form] |
| P63080 | GBRB3_MOUSE | Gabrb3 | Gamma-aminobutyric acid receptor subunit beta-3 (GABA(A) receptor subunit beta-3) |
| Q80TN5 | ZDH17_MOUSE | Zdhhc17 | Palmitoyltransferase ZDHHC17, EC 2.3.1.225 (Acyltransferase ZDHHC17, EC 2.3.1.-) (DHHC domain-containing cysteine-rich protein 17, DHHC-17) (Huntingtin-interacting protein 14) (Zinc finger DHHC domain-containing protein 17) |
| P97411 | ICA69_MOUSE | Ica1 | Islet cell autoantigen 1 (69 kDa islet cell autoantigen, ICA69) (Islet cell autoantigen p69, ICAp69, p69) |
| Q9ERU3 | ZNF22_MOUSE | Znf22 | Zinc finger protein 22 (Zinc finger protein 422) (Zinc finger protein Krox-25) (Zinc finger protein Krox-26) |
| Q61313 | AP2B_MOUSE | Tfap2b | Transcription factor AP-2-beta, AP2-beta (Activating enhancer-binding protein 2-beta) |
| Q8C176 | TAF2_MOUSE | Taf2 | Transcription initiation factor TFIID subunit 2 (TBP-associated factor 150 kDa) (Transcription initiation factor TFIID 150 kDa subunit, TAF(II)150, TAFII-150, TAFII150) |
| Q8CIM1 | LRC45_MOUSE | Lrrc45 | Leucine-rich repeat-containing protein 45 |
| A2AUC9 | KLH41_MOUSE | Klh41 | Kelch-like protein 41 (Kelch repeat and BTB domain-containing protein 10) |
| B2RX88 | CSPP1_MOUSE | Cspp1 | Centrosome and spindle pole associated protein 1 |
| Q3U5Q7 | CMPK2_MOUSE | Cmpk2 | UMP-CMP kinase 2, mitochondrial, EC 2.7.4.14 (Nucleoside-diphosphate kinase, EC 2.7.4.6) (Thymidylate kinase LPS-inducible member, TYKi) |

| | | | |
|--------|-------------|----------|---|
| Q9QZD4 | XPF_MOUSE | Ercc4 | DNA repair endonuclease XPF, EC 3.1.-.- (DNA excision repair protein ERCC-4) |
| P49817 | CAV1_MOUSE | Cav1 | Caveolin-1 |
| Q80ZS3 | RT26_MOUSE | Mrps26 | 28S ribosomal protein S26, mitochondrial, MRP-S26, S26mt |
| Q9CX83 | ARMX1_MOUSE | Armcx1 | Armadillo repeat-containing X-linked protein 1 |
| Q8BGU5 | CCNY_MOUSE | Ccny | Cyclin-Y (Cyclin fold protein 1) |
| Q8CDM1 | ATAD2_MOUSE | Atad2 | ATPase family AAA domain-containing protein 2, EC 3.6.1.- |
| P97819 | PLPL9_MOUSE | Pla2g6 | 85/88 kDa calcium-independent phospholipase A2, CaI-PLA2, EC 3.1.1.4 (2-lysophosphatidylcholine acylhydrolase, EC 3.1.1.5) (Group VI phospholipase A2, GVI PLA2) (Intracellular membrane-associated calcium-independent phospholipase A2 beta, iPLA2-beta) (Palmitoyl-CoA hydrolase, EC 3.1.2.2) (Patatin-like phospholipase domain-containing protein 9, PNPLA9) |
| Q8R395 | COMD5_MOUSE | Commd5 | COMM domain-containing protein 5 |
| A2AG50 | MA7D2_MOUSE | Map7d2 | MAP7 domain-containing protein 2 |
| Q8BWS5 | GRIN3_MOUSE | Gprin3 | G protein-regulated inducer of neurite outgrowth 3, GRIN3 |
| Q80VC9 | CAMP3_MOUSE | Camsap3 | Calmodulin-regulated spectrin-associated protein 3 (Marshallin) (Protein Nezha) |
| Q91X97 | NCALD_MOUSE | Ncald | Neurocalcin-delta |
| Q6ZQ06 | CE162_MOUSE | Cep162 | Centrosomal protein of 162 kDa, Cep162 (Protein QN1 homolog) |
| Q9ERA0 | TFCP2_MOUSE | Tfcp2 | Alpha-globin transcription factor CP2 |
| Q9DBE0 | CSAD_MOUSE | Csad | Cysteine sulfinic acid decarboxylase, EC 4.1.1.29 (Aspartate 1-decarboxylase, EC 4.1.1.11) (Cysteine-sulfinate decarboxylase) (Sulfinoalanine decarboxylase) |
| Q8CFE4 | SCYL2_MOUSE | Scyl2 | SCY1-like protein 2 (Coated vesicle-associated kinase of 104 kDa) |
| Q8BL03 | MCATL_MOUSE | Slc25a29 | Mitochondrial basic amino acids transporter (Carnitine/acylcarnitine translocase-like, CACT-like) (Mitochondrial carnitine/acylcarnitine carrier protein CACL) (Mitochondrial ornithine transporter 3) (Solute carrier family 25 member 29) |
| Q9EP53 | TSC1_MOUSE | Tsc1 | Hamartin (Tuberous sclerosis 1 protein homolog) |
| Q6P3B9 | RBFA_MOUSE | Rbfa | Putative ribosome-binding factor A, mitochondrial |
| Q8BQM4 | HEAT3_MOUSE | Heatr3 | HEAT repeat-containing protein 3 |
| Q2VPQ9 | EAF6_MOUSE | Meaf6 | Chromatin modification-related protein MEAF6, MYST/Esa1-associated factor 6 (Esa1-associated factor 6 homolog, Protein EAF6 homolog) |

| | | | |
|--------|-------------|--------|--|
| O08808 | DIAP1_MOUSE | Diaph1 | Protein diaphanous homolog 1 (Diaphanous-related formin-1, DRF1) (p140mDIA, mDIA1) |
| Q9CX11 | UTP23_MOUSE | Utp23 | rRNA-processing protein UTP23 homolog |
| P37913 | DNLI1_MOUSE | Lig1 | DNA ligase 1, EC 6.5.1.1 (DNA ligase I) (Polydeoxyribonucleotide synthase [ATP] 1) |
| P70388 | RAD50_MOUSE | Rad50 | DNA repair protein RAD50, mRad50, EC 3.6.-.- |
| Q9QYK9 | KCC1B_MOUSE | Pnck | Calcium/calmodulin-dependent protein kinase type 1B, EC 2.7.11.17 (CaM kinase I beta, CaM kinase IB, CaM-KI beta, CaMKI-beta) (Pregnancy up-regulated non-ubiquitously-expressed CaM kinase homolog) |
| Q8BWQ6 | VP35L_MOUSE | Vps35l | VPS35 endosomal protein-sorting factor-like |
| Q68FF6 | GIT1_MOUSE | Git1 | ARF GTPase-activating protein GIT1, ARF GAP GIT1 (G protein-coupled receptor kinase-interactor 1) (GRK-interacting protein 1) |
| Q6PAR5 | GAPD1_MOUSE | Gapvd1 | GTPase-activating protein and VPS9 domain-containing protein 1 (GAPex-5) (Rab5-activating protein 6) |
| Q61191 | HCFC1_MOUSE | Hcfc1 | Host cell factor 1, HCF, HCF-1 (C1 factor) [Cleaved into: HCF N-terminal chain 1; HCF N-terminal chain 2; HCF N-terminal chain 3; HCF N-terminal chain 4; HCF N-terminal chain 5; HCF N-terminal chain 6; HCF C-terminal chain 1; HCF C-terminal chain 2; HCF C-terminal chain 3; HCF C-terminal chain 4; HCF C-terminal chain 5; HCF C-terminal chain 6] |
| P52503 | NDUS6_MOUSE | Ndufs6 | NADH dehydrogenase [ubiquinone] iron-sulfur protein 6, mitochondrial (Complex I-13kD-A, CI-13kD-A) (NADH-ubiquinone oxidoreductase 13 kDa-A subunit) |
| Q64705 | USF2_MOUSE | Usf2 | Upstream stimulatory factor 2 (Major late transcription factor 2) (Upstream transcription factor 2) |
| Q8C015 | PAK5_MOUSE | Pak5 | Serine/threonine-protein kinase PAK 5, EC 2.7.11.1 (p21-activated kinase 5, PAK-5) (p21-activated kinase 7, PAK-7) |
| Q9R0Y5 | KAD1_MOUSE | Ak1 | Adenylate kinase isoenzyme 1, AK 1, EC 2.7.4.3, EC 2.7.4.6 (ATP-AMP transphosphorylase 1) (ATP:AMP phosphotransferase) (Adenylate monophosphate kinase) (Myokinase) |
| Q8BUR4 | DOCK1_MOUSE | Dock1 | Dedicator of cytokinesis protein 1 (180 kDa protein downstream of CRK, DOCK180) |
| Q9QUR7 | PIN1_MOUSE | Pin1 | Peptidyl-prolyl cis-trans isomerase NIMA-interacting 1, EC 5.2.1.8 (Peptidyl-prolyl cis-trans isomerase Pin1, PPIase Pin1) |
| Q9D8S9 | BOLA1_MOUSE | Bola1 | BolA-like protein 1 |

| | | | |
|--------|-------------|----------|---|
| Q99N84 | RT18B_MOUSE | Mrps18b | 28S ribosomal protein S18b, mitochondrial, MRP-S18-b, Mrps18-b, S18mt-b (28S ribosomal protein S18-2, mitochondrial, MRP-S18-2) |
| P15066 | JUND_MOUSE | Jund | Transcription factor JunD (Transcription factor AP-1 subunit JunD) |
| Q9R1S8 | CAN7_MOUSE | Capn7 | Calpain-7, EC 3.4.22.- (PalB homolog, PalBH) |
| Q80X71 | T106B_MOUSE | Tmem106b | Transmembrane protein 106B |
| Q3ZT31 | SNX25_MOUSE | Snx25 | Sorting nexin-25 |
| Q9D291 | DESI2_MOUSE | Desi2 | Deubiquitinase DESI2, EC 3.4.19.12 (Desumoylating isopeptidase 2, DeSI-2) (PPPDE peptidase domain-containing protein 1) (Protein FAM152A) |
| Q8VE22 | RT23_MOUSE | Mrps23 | 28S ribosomal protein S23, mitochondrial, MRP-S23, S23mt |
| P42232 | STA5B_MOUSE | Stat5b | Signal transducer and activator of transcription 5B |
| P62743 | AP2S1_MOUSE | Ap2s1 | AP-2 complex subunit sigma (Adaptor protein complex AP-2 subunit sigma) (Adaptor-related protein complex 2 subunit sigma) (Clathrin assembly protein 2 sigma small chain) (Clathrin coat assembly protein AP17) (Clathrin coat-associated protein AP17) (Plasma membrane adaptor AP-2 17 kDa protein) (Sigma-adaptin 3b) (Sigma2-adaptin) |
| Q8VD62 | CK068_MOUSE | Bles03 | UPF0696 protein C11orf68 homolog (Basophilic leukemia-expressed protein Bles03) (Protein WF-3) |
| Q8K394 | PLCL2_MOUSE | Plcl2 | Inactive phospholipase C-like protein 2, PLC-L(2), PLC-L2, Phospholipase C-L2 (Phospholipase C-epsilon-2, PLC-epsilon-2) |
| Q3UHX0 | NOL8_MOUSE | Nol8 | Nucleolar protein 8 |
| Q9DAN8 | CST12_MOUSE | Cst12 | Cystatin-12 (Cystatin TE-1) |
| Q9D2G5 | SYNJ2_MOUSE | Synj2 | Synaptojanin-2, EC 3.1.3.36 (Synaptic inositol 1,4,5-trisphosphate 5-phosphatase 2) |
| Q6RI63 | F120B_MOUSE | Fam120b | Constitutive coactivator of peroxisome proliferator-activated receptor gamma, Constitutive coactivator of PPAR-gamma, Constitutive coactivator of PPARG (Protein FAM120B) |
| Q8JZS9 | RM48_MOUSE | Mrpl48 | 39S ribosomal protein L48, mitochondrial, L48mt, MRP-L48 |
| Q8C5W0 | CLMN_MOUSE | Clmn | Calmin (Calponin-like transmembrane domain protein) |
| P41588 | VIPR2_MOUSE | Vipr2 | Vasoactive intestinal polypeptide receptor 2, VIP-R-2 (Pituitary adenylate cyclase-activating polypeptide type III receptor, PACAP type III receptor, PACAP-R-3, PACAP-R3) |

| | | | |
|--------|-------------|----------|--|
| Q9Z148 | EHMT2_MOUSE | Ehmt2 | Histone-lysine N-methyltransferase EHMT2, EC 2.1.1.-, EC 2.1.1.367 (Euchromatic histone-lysine N-methyltransferase 2) (HLA-B-associated transcript 8) (Histone H3-K9 methyltransferase 3, H3-K9-HMTase 3) (Protein G9a) |
| Q80YA8 | CRUM2_MOUSE | Crb2 | Protein crumbs homolog 2, crumbs2 (Crumbs-like protein 2) |
| Q8CJ53 | CIP4_MOUSE | Trip10 | Cdc42-interacting protein 4 (Thyroid receptor-interacting protein 10, TR-interacting protein 10, TRIP-10) |
| P58466 | CTDS1_MOUSE | Ctdsp1 | Carboxy-terminal domain RNA polymerase II polypeptide A small phosphatase 1, EC 3.1.3.16 (Golli-interacting protein, GIP) (Nuclear LIM interactor-interacting factor 3, NLI-interacting factor 3) (Small C-terminal domain phosphatase 1, SCP1, Small CTD phosphatase 1) |
| Q8BKH7 | SIN1_MOUSE | Mapkap1 | Target of rapamycin complex 2 subunit MAPKAP1, TORC2 subunit MAPKAP1 (Mitogen-activated protein kinase 2-associated protein 1) (Stress-activated map kinase-interacting protein 1, SAPK-interacting protein 1) |
| P35918 | VGFR2_MOUSE | Kdr | Vascular endothelial growth factor receptor 2, VEGFR-2, EC 2.7.10.1 (Fetal liver kinase 1, FLK-1) (Kinase NYK) (Protein-tyrosine kinase receptor flk-1) (CD antigen CD309) |
| Q8VC57 | KCTD5_MOUSE | Kctd5 | BTB/POZ domain-containing protein KCTD5 |
| Q60929 | MEF2A_MOUSE | Mef2a | Myocyte-specific enhancer factor 2A |
| Q3TUU5 | TEX30_MOUSE | Tex30 | Testis-expressed protein 30 |
| Q8VDD8 | WASH1_MOUSE | Washc1 | WASH complex subunit 1 (WAS protein family homolog 1) |
| Q9D1R1 | T126B_MOUSE | Tmem126b | Complex I assembly factor TMEM126B, mitochondrial (Transmembrane protein 126B) |
| Q1RNF8 | SAM11_MOUSE | Samd11 | Sterile alpha motif domain-containing protein 11, SAM domain-containing protein 11 (Major retinal SAM domain-containing protein, Mr-s) |
| Q9CY28 | GTPB8_MOUSE | Gtpbp8 | GTP-binding protein 8 |
| Q3THS6 | METK2_MOUSE | Mat2a | S-adenosylmethionine synthase isoform type-2, AdoMet synthase 2, EC 2.5.1.6 (Methionine adenosyltransferase 2, MAT 2) |
| O88455 | DHCR7_MOUSE | Dhcr7 | 7-dehydrocholesterol reductase, 7-DHC reductase, EC 1.3.1.21 (Sterol Delta(7)-reductase) |
| Q8K2Q7 | BROX_MOUSE | Brox | BRO1 domain-containing protein BROX (BRO1 domain- and CAAX motif-containing protein) |

| | | | |
|--------|-------------|---------|---|
| Q3UUI3 | THEM4_MOUSE | Them4 | Acyl-coenzyme A thioesterase THEM4, Acyl-CoA thioesterase THEM4, EC 3.1.2.2 (Carboxyl-terminal modulator protein) (Thioesterase superfamily member 4) |
| O08576 | RUN3A_MOUSE | Rundc3a | RUN domain-containing protein 3A (Rap2-interacting protein 8, RPIP-8) |
| Q8R2R9 | AP3M2_MOUSE | Ap3m2 | AP-3 complex subunit mu-2 (Adaptor-related protein complex 3 subunit mu-2) (Clathrin assembly protein assembly protein complex 3 mu-2 medium chain) (Clathrin coat assembly protein AP47 homolog 2) (Clathrin coat-associated protein AP47 homolog 2) (Golgi adaptor AP-1 47 kDa protein homolog 2) (HA1 47 kDa subunit homolog 2) (Mu3B-adaptin, m3B) (P47B) |
| Q9D168 | INT12_MOUSE | Ints12 | Integrator complex subunit 12, Int12 (PHD finger protein 22) |
| Q9DB30 | PHKG2_MOUSE | Phkg2 | Phosphorylase b kinase gamma catalytic chain, liver/testis isoform, PHK-gamma-LT, PHK-gamma-T, EC 2.7.11.19 (Phosphorylase kinase subunit gamma-2) |
| Q6PGH0 | UBTD2_MOUSE | Ubt2 | Ubiquitin domain-containing protein 2 |
| Q9R0Q7 | TEBP_MOUSE | Ptges3 | Prostaglandin E synthase 3, EC 5.3.99.3 (Cytosolic prostaglandin E2 synthase, cPGES) (Hsp90 co-chaperone) (Progesterone receptor complex p23) (Sid 3177) (Telomerase-binding protein p23) |
| Q9DB42 | ZN593_MOUSE | Znf593 | Zinc finger protein 593 (Zinc finger protein T86) |
| Q8VBV7 | CSN8_MOUSE | Cops8 | COP9 signalosome complex subunit 8, SGN8, Signalosome subunit 8 (COP9 homolog) (JAB1-containing signalosome subunit 8) |
| Q8VDP3 | MICA1_MOUSE | Mical1 | [F-actin]-monooxygenase MICAL1, EC 1.14.13.225, EC 1.6.3.1 (Molecule interacting with CasL protein 1, MICAL-1, mMical1) (NEDD9-interacting protein with calponin homology and LIM domains) |
| Q8BHT6 | B3GLT_MOUSE | B3glct | Beta-1,3-glucosyltransferase, Beta3Glc-T, EC 2.4.1.- (Beta 3-glucosyltransferase) (Beta-3-glycosyltransferase-like) |
| Q63959 | KCNC3_MOUSE | Kcnc3 | Potassium voltage-gated channel subfamily C member 3 (KSHIID) (Voltage-gated potassium channel subunit Kv3.3) |
| Q9D6J3 | YJU2_MOUSE | Yju2 | Splicing factor YJU2 (Coiled-coil domain-containing protein 94) |
| Q5XG73 | ACBD5_MOUSE | Acbd5 | Acyl-CoA-binding domain-containing protein 5 |
| Q9JIY2 | HAKAI_MOUSE | Cbl1 | E3 ubiquitin-protein ligase Hakai, EC 2.3.2.27 (Casitas B-lineage lymphoma-transforming sequence-like protein 1, c-Cbl-like protein 1) (E-cadherin binding protein E7) (RING-type E3 ubiquitin transferase Hakai) |
| Q922M3 | BACD3_MOUSE | Kctd10 | BTB/POZ domain-containing adapter for CUL3-mediated RhoA degradation protein 3, mBACURD3 (BTB/POZ domain-containing protein KCTD10) |

| | | | |
|--------|-------------|---------|--|
| Q61211 | EIF2D_MOUSE | Eif2d | Eukaryotic translation initiation factor 2D, eIF2D (Ligatin) |
| Q3UFK8 | FRMD8_MOUSE | Frmd8 | FERM domain-containing protein 8 (iRhom tail-associated protein, iTAP) |
| Q9DC16 | ERGI1_MOUSE | Ergic1 | Endoplasmic reticulum-Golgi intermediate compartment protein 1 (ER-Golgi intermediate compartment 32 kDa protein, ERGIC-32) |
| P53762 | ARNT_MOUSE | Arnt | Aryl hydrocarbon receptor nuclear translocator, ARNT protein (Dioxin receptor, nuclear translocator) (Hypoxia-inducible factor 1-beta, HIF-1-beta, HIF1-beta) |
| Q91V36 | NRBP2_MOUSE | Nrbp2 | Nuclear receptor-binding protein 2 |
| P08122 | CO4A2_MOUSE | Col4a2 | Collagen alpha-2(IV) chain [Cleaved into: Canstatin] |
| P59024 | FKB14_MOUSE | Fkbp14 | Peptidyl-prolyl cis-trans isomerase FKBP14, PPIase FKBP14, EC 5.2.1.8 (FK506-binding protein 14, FKBP-14) (Rotamase) |
| Q5RJI5 | BRSK1_MOUSE | Brsk1 | Serine/threonine-protein kinase BRSK1, EC 2.7.11.1, EC 2.7.11.26 (Brain-specific serine/threonine-protein kinase 1, BR serine/threonine-protein kinase 1) (Serine/threonine-protein kinase SAD-B) |
| Q9Z280 | PLD1_MOUSE | Pld1 | Phospholipase D1, PLD 1, mPLD1, EC 3.1.4.4 (Choline phosphatase 1) (Phosphatidylcholine-hydrolyzing phospholipase D1) |
| P58742 | AAAS_MOUSE | Aaas | Aladin (Adracalin) |
| P50427 | STS_MOUSE | Sts | Steryl-sulfatase, EC 3.1.6.2 (Arylsulfatase C, ASC) (Steroid sulfatase) (Steryl-sulfate sulfohydrolase) |
| Q8CHG7 | RPGF2_MOUSE | Rapgef2 | Rap guanine nucleotide exchange factor 2 (Cyclic nucleotide ras GEF, CNrasGEF) (Neural RAP guanine nucleotide exchange protein, nRap GEP) (PDZ domain-containing guanine nucleotide exchange factor 1, PDZ-GEF1) (RA-GEF-1) (Ras/Rap1-associating GEF-1) |
| Q9JIK9 | RT34_MOUSE | Mrps34 | 28S ribosomal protein S34, mitochondrial, MRP-S34, S34mt (T-complex expressed gene 2 protein) |
| Q8R5F8 | ES8L1_MOUSE | Eps8l1 | Epidermal growth factor receptor kinase substrate 8-like protein 1, EPS8-like protein 1 (Epidermal growth factor receptor pathway substrate 8-related protein 1, EPS8-related protein 1) |
| Q69Z89 | RADIL_MOUSE | Radil | Ras-associating and dilute domain-containing protein |
| P39053 | DYN1_MOUSE | Dnm1 | Dynamin-1, EC 3.6.5.5 |
| Q80TJ1 | CAPS1_MOUSE | Cadps | Calcium-dependent secretion activator 1 (Calcium-dependent activator protein for secretion 1, CAPS-1) |
| Q8CAQ8 | MIC60_MOUSE | Immt | MICOS complex subunit Mic60 (Mitochondrial inner membrane protein) (Mitofilin) |

| | | | |
|--------|-------------|----------|---|
| Q9Z1G4 | VPP1_MOUSE | Atp6v0a1 | V-type proton ATPase 116 kDa subunit a 1, V-ATPase 116 kDa subunit a 1 (Clathrin-coated vesicle/synaptic vesicle proton pump 116 kDa subunit) (Vacuolar adenosine triphosphatase subunit Ac116) (Vacuolar proton pump subunit 1) (Vacuolar proton translocating ATPase 116 kDa subunit a isoform 1) |
| Q8C5H8 | NAKD2_MOUSE | Nadk2 | NAD kinase 2, mitochondrial, EC 2.7.1.23 (Mitochondrial NAD kinase) (NAD kinase domain-containing protein 1, mitochondrial) |
| P61979 | HNRPK_MOUSE | Hnrnpk | Heterogeneous nuclear ribonucleoprotein K, hnRNP K |
| Q6ZWR6 | SYNE1_MOUSE | Syne1 | Nesprin-1 (Enaptin) (KASH domain-containing protein 1, KASH1) (Myocyte nuclear envelope protein 1, Myne-1) (Nuclear envelope spectrin repeat protein 1) (Synaptic nuclear envelope protein 1, Syne-1) |
| Q61595 | KTN1_MOUSE | Ktn1 | Kinectin |
| Q9Z204 | HNRPC_MOUSE | Hnrnpc | Heterogeneous nuclear ribonucleoproteins C1/C2, hnRNP C1/C2 |
| Q8CGY8 | OGT1_MOUSE | Ogt | UDP-N-acetylglucosamine--peptide N-acetylglucosaminyltransferase 110 kDa subunit, EC 2.4.1.255 (O-GlcNAc transferase subunit p110) (O-linked N-acetylglucosamine transferase 110 kDa subunit, OGT) |
| Q9WUP7 | UCHL5_MOUSE | Uchl5 | Ubiquitin carboxyl-terminal hydrolase isozyme L5, UCH-L5, EC 3.4.19.12 (Ubiquitin C-terminal hydrolase UCH37) (Ubiquitin thioesterase L5) |
| O08795 | GLU2B_MOUSE | Prkesh | Glucosidase 2 subunit beta (80K-H protein) (Glucosidase II subunit beta) (Protein kinase C substrate 60.1 kDa protein heavy chain, PKCSH) |
| P61164 | ACTZ_MOUSE | Actr1a | Alpha-centractin, Centractin (ARP1) (Actin-RPV) (Centrosome-associated actin homolog) |
| Q9Z0P4 | PALM_MOUSE | Palm | Paralemmin-1 (Paralemmin) |
| Q9JLB0 | PALS2_MOUSE | Pals2 | Protein PALS2 (Dlgh4 protein) (MAGUK p55 subfamily member 6) (P55T protein) (Protein associated with Lin-7 2) |
| Q91V12 | BACH_MOUSE | Acot7 | Cytosolic acyl coenzyme A thioester hydrolase, EC 3.1.2.2 (Acyl-CoA thioesterase 7) (Brain acyl-CoA hydrolase, BACH) (CTE-IIa, CTE-II) (Long chain acyl-CoA thioester hydrolase) |
| P28571 | SC6A9_MOUSE | Slc6a9 | Sodium- and chloride-dependent glycine transporter 1, GlyT-1, GlyT1 (Solute carrier family 6 member 9) |
| Q68FD9 | K1549_MOUSE | Kiaa1549 | UPF0606 protein KIAA1549 |
| P62889 | RL30_MOUSE | Rpl30 | 60S ribosomal protein L30 |

| | | | |
|--------|-------------|-----------|--|
| P47857 | PFKAM_MOUSE | Pfkm | ATP-dependent 6-phosphofructokinase, muscle type, ATP-PFK, PFK-M, EC 2.7.1.11 (6-phosphofructokinase type A) (Phosphofructo-1-kinase isozyme A, PFK-A) (Phosphohexokinase) |
| Q6P1B1 | XPP1_MOUSE | Xpnpep1 | Xaa-Pro aminopeptidase 1, EC 3.4.11.9 (Aminoacylproline aminopeptidase) (Cytosolic aminopeptidase P) (Soluble aminopeptidase P, sAmp) (X-Pro aminopeptidase 1) (X-prolyl aminopeptidase 1, soluble) |
| Q9DCB8 | ISCA2_MOUSE | Isca2 | Iron-sulfur cluster assembly 2 homolog, mitochondrial (HESB-like domain-containing protein 1) |
| P35279 | RAB6A_MOUSE | Rab6a | Ras-related protein Rab-6A, Rab-6 |
| Q8BWU5 | OSGEP_MOUSE | Osgep | tRNA N6-adenosine threonylcarbamoyltransferase, EC 2.3.1.234 (N6-L-threonylcarbamoyladenine synthase, t(6)A synthase) (O-sialoglycoprotein endopeptidase) (t(6)A37 threonylcarbamoyladenine biosynthesis protein Osgep) (tRNA threonylcarbamoyladenine biosynthesis protein Osgep) |
| Q9JIF0 | ANM1_MOUSE | Prmt1 | Protein arginine N-methyltransferase 1, EC 2.1.1.319 (Histone-arginine N-methyltransferase PRMT1) |
| A2ASZ8 | SCMC2_MOUSE | Slc25a25 | Calcium-binding mitochondrial carrier protein SCaMC-2 (Small calcium-binding mitochondrial carrier protein 2) (Solute carrier family 25 member 25) |
| P22599 | A1AT2_MOUSE | Serpina1b | Alpha-1-antitrypsin 1-2, AAT (Alpha-1 protease inhibitor 2) (Alpha-1-antiproteinase) (Serine protease inhibitor 1-2) (Serine protease inhibitor A1b, Serpin A1b) |
| Q9DBL1 | ACDSB_MOUSE | Acadsb | Short/branched chain specific acyl-CoA dehydrogenase, mitochondrial, SBCAD, EC 1.3.8.5 (2-methyl branched chain acyl-CoA dehydrogenase, 2-MEBCAD) (2-methylbutyryl-coenzyme A dehydrogenase, 2-methylbutyryl-CoA dehydrogenase) |
| P02088 | HBB1_MOUSE | Hbb-b1 | Hemoglobin subunit beta-1 (Beta-1-globin) (Hemoglobin beta-1 chain) (Hemoglobin beta-major chain) |
| P63321 | RALA_MOUSE | Rala | Ras-related protein Ral-A, EC 3.6.5.2 |
| P47791 | GSHR_MOUSE | Gsr | Glutathione reductase, mitochondrial, GR, GRase, EC 1.8.1.7 |
| Q99LB6 | MAT2B_MOUSE | Mat2b | Methionine adenosyltransferase 2 subunit beta (Methionine adenosyltransferase II beta, MAT II beta) |
| Q99KK9 | SYHM_MOUSE | Hars2 | Histidine--tRNA ligase, mitochondrial, EC 6.1.1.21 (Histidine--tRNA ligase-like) (Histidyl-tRNA synthetase, HisRS) |
| P63001 | RAC1_MOUSE | Rac1 | Ras-related C3 botulinum toxin substrate 1, EC 3.6.5.2 (p21-Rac1) |
| P43081 | GUC1A_MOUSE | Guca1a | Guanylyl cyclase-activating protein 1, GCAP 1 (Guanylate cyclase activator 1A) |

| | | | |
|--------|-------------|---------|--|
| P51410 | RL9_MOUSE | Rpl9 | 60S ribosomal protein L9 |
| Q71M36 | CSPG5_MOUSE | Cspg5 | Chondroitin sulfate proteoglycan 5 (Acidic leucine-rich EGF-like domain-containing brain protein) (Neuroglycan C) |
| Q61011 | GBB3_MOUSE | Gnb3 | Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-3 (Transducin beta chain 3) |
| O70439 | STX7_MOUSE | Stx7 | Syntaxin-7 |
| Q99LD9 | EI2BB_MOUSE | Eif2b2 | Translation initiation factor eIF-2B subunit beta (eIF-2B GDP-GTP exchange factor subunit beta) |
| Q6PGN3 | DCLK2_MOUSE | Dclk2 | Serine/threonine-protein kinase DCLK2, EC 2.7.11.1 (CaMK-like CREB regulatory kinase 2, CL2, CLICK-II, CLICK2) (Doublecortin-like and CAM kinase-like 2) (Doublecortin-like kinase 2) |
| P21447 | MDR1A_MOUSE | Abcb1a | ATP-dependent translocase ABCB1 (ATP-binding cassette sub-family B member 1A) (MDR1A) (Multidrug resistance protein 1A, EC 7.6.2.2) (Multidrug resistance protein 3) (P-glycoprotein 3) (Phospholipid transporter ABCB1, EC 7.6.2.1) |
| P28650 | PURA1_MOUSE | Adss1 | Adenylosuccinate synthetase isozyme 1, AMPSase 1, AdSS 1, EC 6.3.4.4 (Adenylosuccinate synthetase like 1) (Adenylosuccinate synthetase, basic isozyme) (Adenylosuccinate synthetase, muscle isozyme, M-type adenylosuccinate synthetase) (IMP--aspartate ligase 1) |
| O70251 | EF1B_MOUSE | Eef1b | Elongation factor 1-beta, EF-1-beta |
| Q8R2T8 | TF3C5_MOUSE | Gtf3c5 | General transcription factor 3C polypeptide 5 (TF3C-epsilon) (Transcription factor IIIC 63 kDa subunit, TFIIC 63 kDa subunit, TFIIC63) (Transcription factor IIIC subunit epsilon) |
| Q60715 | P4HA1_MOUSE | P4ha1 | Prolyl 4-hydroxylase subunit alpha-1, 4-PH alpha-1, EC 1.14.11.2 (Procollagen-proline,2-oxoglutarate-4-dioxygenase subunit alpha-1) |
| P98203 | ARVC_MOUSE | Arvcf | Splicing regulator ARVCF (Armadillo repeat protein deleted in velo-cardio-facial syndrome homolog) |
| O54833 | CSK22_MOUSE | Csnk2a2 | Casein kinase II subunit alpha', CK II alpha', EC 2.7.11.1 |
| P27601 | GNA13_MOUSE | Gna13 | Guanine nucleotide-binding protein subunit alpha-13, G alpha-13, G-protein subunit alpha-13 |
| Q60900 | ELAV3_MOUSE | Elav13 | ELAV-like protein 3 (Hu-antigen C, HuC) |
| Q922V4 | PLRG1_MOUSE | Plrg1 | Pleiotropic regulator 1 |
| P60670 | NPL4_MOUSE | Nploc4 | Nuclear protein localization protein 4 homolog, Protein NPL4 |

| | | | |
|--------|-------------|----------|---|
| Q99M87 | DNJA3_MOUSE | Dnaja3 | DnaJ homolog subfamily A member 3, mitochondrial (DnaJ protein Tid-1, mTid-1) (Tumorous imaginal discs protein Tid56 homolog) |
| Q9DB00 | GON4L_MOUSE | Gon4l | GON-4-like protein (GON-4 homolog) |
| Q9D067 | MDM1_MOUSE | Mdm1 | Nuclear protein MDM1 (Mdm4 transformed 3T3 cell double minute 1 protein) (Mouse double minute 1) |
| Q6P3D0 | NUD16_MOUSE | Nudt16 | U8 snoRNA-decapping enzyme, EC 3.6.1.62 (IDP phosphatase, IDPase, EC 3.6.1.64) (Inosine diphosphate phosphatase) (Nucleoside diphosphate-linked moiety X motif 16, Nudix motif 16) (m7GpppN-mRNA hydrolase) |
| Q6PDX6 | RN220_MOUSE | Rnf220 | E3 ubiquitin-protein ligase Rnf220, EC 2.3.2.27 (RING finger protein 220) (RING-type E3 ubiquitin transferase Rnf220) |
| Q8VHC5 | CABP4_MOUSE | Cabp4 | Calcium-binding protein 4, CaBP4 |
| P09055 | ITB1_MOUSE | Itgb1 | Integrin beta-1 (Fibronectin receptor subunit beta) (VLA-4 subunit beta) (CD antigen CD29) |
| P45878 | FKBP2_MOUSE | Fkbp2 | Peptidyl-prolyl cis-trans isomerase FKBP2, PPIase FKBP2, EC 5.2.1.8 (13 kDa FK506-binding protein, 13 kDa FKBP, FKBP-13) (FK506-binding protein 2, FKBP-2) (Immunophilin FKBP13) (Rotamase) |
| P32883 | RASK_MOUSE | Kras | GTPase KRas, EC 3.6.5.2 (K-Ras 2) (Ki-Ras) (c-K-ras) (c-Ki-ras) [Cleaved into: GTPase KRas, N-terminally processed] |
| P57716 | NICA_MOUSE | Ncstn | Nicastrin |
| Q8BHF7 | PGPS1_MOUSE | Pgs1 | CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase, mitochondrial, EC 2.7.8.5 (Phosphatidylglycerophosphate synthase 1, PGP synthase 1) (Silencer-associated factor) |
| P62309 | RUXG_MOUSE | Snrpg | Small nuclear ribonucleoprotein G, snRNP-G (Sm protein G, Sm-G, SmG) |
| P10833 | RRAS_MOUSE | Rras | Ras-related protein R-Ras, EC 3.6.5.- (p23) |
| Q9JHL1 | NHRF2_MOUSE | Slc9a3r2 | Na(+)/H(+) exchange regulatory cofactor NHE-RF2, NHERF-2 (NHE3 kinase A regulatory protein E3KARP) (Octs2) (SRY-interacting protein 1, SIP-1) (Sodium-hydrogen exchanger regulatory factor 2) (Solute carrier family 9 isoform A3 regulatory factor 2) (Tyrosine kinase activator protein 1, TKA-1) |
| Q99LC2 | CSTF1_MOUSE | Cstf1 | Cleavage stimulation factor subunit 1 (CF-1 50 kDa subunit) (Cleavage stimulation factor 50 kDa subunit, CSTF 50 kDa subunit, CstF-50) |
| Q91ZP9 | NECA2_MOUSE | Necab2 | N-terminal EF-hand calcium-binding protein 2, EF-hand calcium-binding protein 2 (Neuronal calcium-binding protein 2) |
| Q8K070 | SAM14_MOUSE | Samd14 | Sterile alpha motif domain-containing protein 14, SAM domain-containing protein 14 |

| | | | |
|--------|-------------|---------|---|
| Q9CQY2 | RAMAC_MOUSE | Ramac | RNA guanine-N7 methyltransferase activating subunit (Protein FAM103A1) (RNA guanine-7 methyltransferase activating subunit) (RNMT-activating mRNA cap methylating subunit) (RNMT-activating mRNA cap methyltransferase subunit) (RNMT-activating mini protein, RAM) |
| P62911 | RL32_MOUSE | Rpl32 | 60S ribosomal protein L32 |
| Q7TN99 | CPEB3_MOUSE | Cpeb3 | Cytoplasmic polyadenylation element-binding protein 3, CPE-BP3, CPE-binding protein 3, mCPEB-3 |
| P70365 | NCOA1_MOUSE | Ncoa1 | Nuclear receptor coactivator 1, NCoA-1, EC 2.3.1.48 (Nuclear receptor coactivator protein 1, mNRC-1) (Steroid receptor coactivator 1, SRC-1) |
| Q8VD12 | Z385A_MOUSE | Znf385a | Zinc finger protein 385A (Hematopoietic zinc finger protein) |
| Q91Z49 | UIF_MOUSE | Fyttl1 | UAP56-interacting factor (Forty-two-three domain-containing protein 1, Protein 40-2-3) |
| Q9ER00 | STX12_MOUSE | Stx12 | Syntaxin-12 |
| Q9CZX0 | ELP3_MOUSE | Elp3 | Elongator complex protein 3, EC 2.3.1.- (tRNA uridine(34) acetyltransferase) |
| B2RUJ5 | APBA1_MOUSE | Apba1 | Amyloid-beta A4 precursor protein-binding family A member 1 (Adapter protein X11alpha) (Neuron-specific X11 protein) (Neuronal Munc18-1-interacting protein 1, Mint-1) |
| Q3UH68 | LIMC1_MOUSE | Limch1 | LIM and calponin homology domains-containing protein 1 |
| Q61627 | GRID1_MOUSE | Grid1 | Glutamate receptor ionotropic, delta-1, GluD1, GluR delta-1 subunit |
| Q9JLZ3 | AUHM_MOUSE | Auh | Methylglutaconyl-CoA hydratase, mitochondrial, 3-MG-CoA hydratase, EC 4.2.1.18 (AU-specific RNA-binding enoyl-CoA hydratase, AU-binding enoyl-CoA hydratase, muAUH) (Itaconyl-CoA hydratase, EC 4.2.1.56) |
| Q9CQN7 | RM41_MOUSE | Mrpl41 | 39S ribosomal protein L41, mitochondrial, L41mt, MRP-L41 |
| Q3UGC7 | EI3JA_MOUSE | Eif3j1 | Eukaryotic translation initiation factor 3 subunit J-A, eIF3j-A (Eukaryotic translation initiation factor 3 subunit 1-A) (eIF-3-alpha-A) (eIF3 p35) |
| Q8CJH3 | PLXB1_MOUSE | Plxnb1 | Plexin-B1 |
| Q9CRC8 | LRC40_MOUSE | Lrrc40 | Leucine-rich repeat-containing protein 40 |
| Q9QXE7 | TBL1X_MOUSE | Tbl1x | F-box-like/WD repeat-containing protein TBL1X (Transducin beta-like protein 1X) |
| Q8JZN3 | KCJ14_MOUSE | Kcnj14 | ATP-sensitive inward rectifier potassium channel 14 (Inward rectifier K(+) channel Kir2.4, IRK-4) (Potassium channel, inwardly rectifying subfamily J member 14) |
| Q99M71 | EPDR1_MOUSE | Epdr1 | Mammalian endymin-related protein 1, MERP-1 |

| | | | |
|--------|-------------|----------|--|
| P62821 | RAB1A_MOUSE | Rab1A | Ras-related protein Rab-1A, EC 3.6.5.2 (YPT1-related protein) |
| Q9CXW4 | RL11_MOUSE | Rpl11 | 60S ribosomal protein L11 |
| Q9QYA2 | TOM40_MOUSE | Tomm40 | Mitochondrial import receptor subunit TOM40 homolog (Mitochondrial outer membrane protein of 35 kDa, MOM35) (Protein Haymaker) (Translocase of outer membrane 40 kDa subunit homolog) |
| O70279 | ESS2_MOUSE | Ess2 | Splicing factor ESS-2 homolog (ES2 protein) (Expressed sequence 2 embryonic lethal) |
| P61255 | RL26_MOUSE | Rpl26 | 60S ribosomal protein L26 (Silica-induced gene 20 protein, SIG-20) |
| Q8BTY1 | KAT1_MOUSE | Kyat1 | Kynurenine--oxoglutarate transaminase 1, EC 2.6.1.7 (Cysteine-S-conjugate beta-lyase, EC 4.4.1.13) (Glutamine transaminase K, GTK) (Glutamine--phenylpyruvate transaminase, EC 2.6.1.64) (Kynurenine aminotransferase 1) (Kynurenine aminotransferase I, KATI) (Kynurenine--oxoglutarate transaminase I) |
| Q9D273 | MMAB_MOUSE | Mmab | Corrinoid adenosyltransferase MMAB, EC 2.5.1.- (ATP:co(I)rrinoid adenosyltransferase MMAB) (Methylmalonic aciduria type B homolog) |
| Q9CR67 | TMM33_MOUSE | Tmem33 | Transmembrane protein 33 (Protein DB83) |
| Q9CQ65 | MTAP_MOUSE | Mtap | S-methyl-5'-thioadenosine phosphorylase, EC 2.4.2.28 (5'-methylthioadenosine phosphorylase, MTA phosphorylase, MTAP, MTAPase) |
| Q9EQ28 | DPOD3_MOUSE | Pold3 | DNA polymerase delta subunit 3 (DNA polymerase delta subunit p66) |
| Q9R0L7 | AKP8L_MOUSE | Akap8l | A-kinase anchor protein 8-like, AKAP8-like protein (Neighbor of A-kinase-anchoring protein 95, Neighbor of AKAP95) |
| Q9QYE9 | PKHB1_MOUSE | Plekhhb1 | Pleckstrin homology domain-containing family B member 1, PH domain-containing family B member 1 (Evectin-1) (PH domain-containing protein in retina 1, PHRET1) (Pleckstrin homology domain retinal protein 1) |
| P61226 | RAP2B_MOUSE | Rap2b | Ras-related protein Rap-2b, EC 3.6.5.2 |
| Q91W34 | RUSF1_MOUSE | Rusf1 | RUS family member 1 |
| Q8K0V4 | CNOT3_MOUSE | Cnot3 | CCR4-NOT transcription complex subunit 3 (CCR4-associated factor 3) |
| Q8R1B8 | RORB_MOUSE | Rorb | Nuclear receptor ROR-beta (Nuclear receptor RZR-beta) (Nuclear receptor subfamily 1 group F member 2) (Retinoid-related orphan receptor-beta) |
| Q8VDC0 | SYLM_MOUSE | Lars2 | Probable leucine--tRNA ligase, mitochondrial, EC 6.1.1.4 (Leucyl-tRNA synthetase, LeuRS) |
| Q6ZWV7 | RL35_MOUSE | Rpl35 | 60S ribosomal protein L35 |

| | | | |
|--------|-------------|-----------|--|
| Q9CQ10 | CHMP3_MOUSE | Chmp3 | Charged multivesicular body protein 3 (Chromatin-modifying protein 3) (Vacuolar protein sorting-associated protein 24) |
| Q9Z2V6 | HDAC5_MOUSE | Hdac5 | Histone deacetylase 5, HD5, EC 3.5.1.98 (Histone deacetylase mHDA1) |
| P59481 | LMA2L_MOUSE | Lman2l | VIP36-like protein (Lectin mannose-binding 2-like, LMAN2-like protein) |
| O09174 | AMACR_MOUSE | Amacr | Alpha-methylacyl-CoA racemase, EC 5.1.99.4 (2-methylacyl-CoA racemase) |
| Q8CCJ3 | UFL1_MOUSE | Ufl1 | E3 UFM1-protein ligase 1, EC 2.3.2.- (E3 UFM1-protein transferase 1) (Multiple alpha-helix protein located at ER) (Regulator of C53/LZAP and DDRGK1) |
| Q9CXX9 | CUED2_MOUSE | Cuedc2 | CUE domain-containing protein 2 |
| Q9CQE1 | NPS3B_MOUSE | Nipsnap3b | Protein NipSnap homolog 3B, NipSnap3B (NipSnap-related protein) (Protein NipSnap homolog 3A, NipSnap3A) |
| Q61183 | PAPOA_MOUSE | Papola | Poly(A) polymerase alpha, PAP-alpha, EC 2.7.7.19 (Polynucleotide adenylyltransferase) |
| Q3U2A8 | SYVM_MOUSE | Vars2 | Valine--tRNA ligase, mitochondrial, EC 6.1.1.9 (Valyl-tRNA synthetase, ValRS) |
| O88587 | COMT_MOUSE | Comt | Catechol O-methyltransferase, EC 2.1.1.6 |
| Q91V81 | RBM42_MOUSE | Rbm42 | RNA-binding protein 42 (RNA-binding motif protein 42) |
| O54916 | REPS1_MOUSE | Reps1 | RalBP1-associated Eps domain-containing protein 1 (RalBP1-interacting protein 1) |
| Q8VDN4 | CCD92_MOUSE | Ccdc92 | Coiled-coil domain-containing protein 92 |
| O70274 | TP4A2_MOUSE | Ptp4a2 | Protein tyrosine phosphatase type IVA 2, EC 3.1.3.48 (Protein-tyrosine phosphatase 4a2) (Protein-tyrosine phosphatase of regenerating liver 2, PRL-2) |
| Q9JIW9 | RALB_MOUSE | Ralb | Ras-related protein Ral-B, EC 3.6.5.2 |
| Q8BX09 | RBBP5_MOUSE | Rbbp5 | Retinoblastoma-binding protein 5, RBBP-5 |
| O35855 | BCAT2_MOUSE | Bcat2 | Branched-chain-amino-acid aminotransferase, mitochondrial, BCAT(m), EC 2.6.1.42 |
| P23591 | FCL_MOUSE | Gfus | GDP-L-fucose synthase, EC 1.1.1.271 (GDP-4-keto-6-deoxy-D-mannose-3,5-epimerase-4-reductase) (Protein FX) (Red cell NADP(H)-binding protein) (Transplantation antigen P35B) (Tum-P35B antigen) |
| Q9D1H6 | NDUF4_MOUSE | Ndufaf4 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 4 (Hormone-regulated proliferation-associated protein of 20 kDa homolog) |
| Q9D853 | EFMT2_MOUSE | Eef1akmt2 | EEF1A lysine methyltransferase 2, EC 2.1.1.- (Methyltransferase-like protein 10) (Protein-lysine N-methyltransferase Mettl10) |
| Q8R3Q6 | MIX23_MOUSE | Mix23 | Protein MIX23 (Coiled-coil domain-containing protein 58) |
| Q3UZP4 | SVIP_MOUSE | Svip | Small VCP/p97-interacting protein |

| | | | |
|--------|-------------|-------|---|
| Q6P2L7 | GOLM2_MOUSE | Golm2 | Protein GOLM2 (Cancer susceptibility candidate gene 4 protein homolog, CASC4) (Golgi membrane protein 2) |
| Q8VI36 | PAXI_MOUSE | Pxn | Paxillin |
| O55229 | CHKB_MOUSE | Chkb | Choline/ethanolamine kinase (Choline kinase beta, CK, CKB, EC 2.7.1.32) (Ethanolamine kinase, EK, EC 2.7.1.82) (choline/ethanolamine kinase beta, CKEKB) |
| P52927 | HMGA2_MOUSE | Hmga2 | High mobility group protein HMGI-C (High mobility group AT-hook protein 2) |
| Q8VD72 | TTC8_MOUSE | Ttc8 | Tetratricopeptide repeat protein 8, TPR repeat protein 8 (Bardet-Biedl syndrome 8 protein homolog) |
| Q8BHW2 | OSCP1_MOUSE | Oscp1 | Protein OSCP1 |
| P53702 | CCHL_MOUSE | Hccs | Holocytochrome c-type synthase, EC 4.4.1.17 (Cytochrome c-type heme lyase, CCHL) |
| P70697 | DCUP_MOUSE | Urod | Uroporphyrinogen decarboxylase, UPD, URO-D, EC 4.1.1.37 |
| Q99MU3 | DSRAD_MOUSE | Adar | Double-stranded RNA-specific adenosine deaminase, DRADA, EC 3.5.4.37 (RNA adenosine deaminase 1) |
| P28651 | CAH8_MOUSE | Ca8 | Carbonic anhydrase-related protein, CARP (Carbonic anhydrase VIII, CA-VIII) |
| Q9WVC3 | CAV2_MOUSE | Cav2 | Caveolin-2 |
| Q9DCT8 | CRIP2_MOUSE | Crip2 | Cysteine-rich protein 2, CRP-2 (Heart LIM protein) |
| Q91VJ4 | STK38_MOUSE | Stk38 | Serine/threonine-protein kinase 38, EC 2.7.11.1 (NDR1 protein kinase) (Nuclear Dbf2-related kinase 1) |
| Q8CBW3 | ABI1_MOUSE | Abi1 | Abl interactor 1 (Abelson interactor 1, Abi-1) (Ablphilin-1) (Eps8 SH3 domain-binding protein, Eps8-binding protein) (Spectrin SH3 domain-binding protein 1) (e3B1) |
| Q91WG8 | GLCNE_MOUSE | Gne | Bifunctional UDP-N-acetylglucosamine 2-epimerase/N-acetylmannosamine kinase (UDP-GlcNAc-2-epimerase/ManAc kinase) [Includes: UDP-N-acetylglucosamine 2-epimerase (hydrolyzing), EC 3.2.1.183 (UDP-GlcNAc-2-epimerase) (Uridine diphosphate-N-acetylglucosamine-2-epimerase); N-acetylmannosamine kinase, EC 2.7.1.60 (ManAc kinase)] |
| P40240 | CD9_MOUSE | Cd9 | CD9 antigen (CD antigen CD9) |
| Q9WVG6 | CARM1_MOUSE | Carm1 | Histone-arginine methyltransferase CARM1, EC 2.1.1.319 (Coactivator-associated arginine methyltransferase 1) (Protein arginine N-methyltransferase 4) |
| Q497V5 | SRBD1_MOUSE | Srbdl | S1 RNA-binding domain-containing protein 1 |

| | | | |
|--------|-------------|----------|---|
| Q9CR41 | HYPK_MOUSE | Hypk | Huntingtin-interacting protein K (Huntingtin yeast partner K) |
| P49962 | SRP09_MOUSE | Srp9 | Signal recognition particle 9 kDa protein, SRP9 |
| Q8BVG8 | NAT14_MOUSE | Nat14 | Probable N-acetyltransferase 14, EC 2.3.1.- |
| Q9Z2A5 | ATE1_MOUSE | Ate1 | Arginyl-tRNA--protein transferase 1, Arginyltransferase 1, R-transferase 1, EC 2.3.2.8 (Arginine-tRNA--protein transferase 1) |
| D3YZU1 | SHAN1_MOUSE | Shank1 | SH3 and multiple ankyrin repeat domains protein 1, Shank1 |
| Q9CZN8 | GATA_MOUSE | Qrs1 | Glutamyl-tRNA(Gln) amidotransferase subunit A, mitochondrial, Glu-AdT subunit A, EC 6.3.5.7 (Glutaminyl-tRNA synthase-like protein 1) |
| A2BDX3 | MOCS3_MOUSE | Mocs3 | Adenylyltransferase and sulfurtransferase MOCS3 (Molybdenum cofactor synthesis protein 3) [Includes: Molybdopterin-synthase adenylyltransferase, EC 2.7.7.80 (Adenylyltransferase MOCS3) (Sulfur carrier protein MOCS2A adenylyltransferase); Molybdopterin-synthase sulfurtransferase, EC 2.8.1.11 (Sulfur carrier protein MOCS2A sulfurtransferase) (Sulfurtransferase MOCS3)] |
| Q9CWU6 | UQCC1_MOUSE | Uqcc1 | Ubiquinol-cytochrome-c reductase complex assembly factor 1 (Basic FGF-repressed Zic-binding protein, mbFZb) (Ubiquinol-cytochrome c reductase complex chaperone CBP3 homolog) |
| Q6PHU5 | SORT_MOUSE | Sort1 | Sortilin (Neurotensin receptor 3, NTR3, mNTR3) |
| A2A791 | ZMYM4_MOUSE | Zmym4 | Zinc finger MYM-type protein 4 (Zinc finger protein 262) |
| P34152 | FAK1_MOUSE | Ptk2 | Focal adhesion kinase 1, FADK 1, EC 2.7.10.2 (Focal adhesion kinase-related nonkinase, FRNK) (Protein-tyrosine kinase 2) (p125FAK) (pp125FAK) |
| Q8C4Q6 | AIDA_MOUSE | Aida | Axin interactor, dorsalization-associated protein (Axin interaction partner and dorsalization antagonist) |
| Q5M8N0 | CNRP1_MOUSE | Cnrip1 | CB1 cannabinoid receptor-interacting protein 1, CRIP-1 |
| Q9DAT2 | MRGBP_MOUSE | Mrgbp | MRG/MORF4L-binding protein (MRG-binding protein) |
| Q9JL62 | GLTP_MOUSE | Gltp | Glycolipid transfer protein, GLTP |
| Q3TLI0 | TPC10_MOUSE | Trappc10 | Trafficking protein particle complex subunit 10 (Trafficking protein particle complex subunit TMEM1) (Transport protein particle subunit TMEM1, TRAPP subunit TMEM1) |
| Q8BHE8 | MAIP1_MOUSE | Maip1 | m-AAA protease-interacting protein 1, mitochondrial (Matrix AAA peptidase-interacting protein 1) |
| Q60931 | VDAC3_MOUSE | Vdac3 | Voltage-dependent anion-selective channel protein 3, VDAC-3, mVDAC3 (Outer mitochondrial membrane protein porin 3) |

| | | | |
|--------|-------------|---------|---|
| O55106 | STRN_MOUSE | Strn | Striatin |
| A2A8L5 | PTPRF_MOUSE | Ptpnf | Receptor-type tyrosine-protein phosphatase F, EC 3.1.3.48 (Leukocyte common antigen related, LAR) |
| Q8R0F8 | FAHD1_MOUSE | Fahd1 | Acylpyruvase FAHD1, mitochondrial, EC 3.7.1.5 (Fumarylacetoacetate hydrolase domain-containing protein 1) (Oxaloacetate decarboxylase, OAA decarboxylase, EC 4.1.1.112) |
| Q9CQM5 | TXD17_MOUSE | Txndc17 | Thioredoxin domain-containing protein 17 (14 kDa thioredoxin-related protein, TRP14) (Protein 42-9-9) (Thioredoxin-like protein 5) |
| O35239 | PTN9_MOUSE | Ptpn9 | Tyrosine-protein phosphatase non-receptor type 9, EC 3.1.3.48 (Protein-tyrosine phosphatase MEG2, PTPase MEG2) |
| Q9JK83 | PAR6B_MOUSE | Pard6b | Partitioning defective 6 homolog beta, PAR-6 beta, PAR-6B |
| P39054 | DYN2_MOUSE | Dnm2 | Dynammin-2, EC 3.6.5.5 (Dynammin UDNM) |
| Q9Z160 | COG1_MOUSE | Cog1 | Conserved oligomeric Golgi complex subunit 1, COG complex subunit 1 (Component of oligomeric Golgi complex 1) (Low density lipoprotein receptor defect B-complementing protein) |
| P23708 | NFYA_MOUSE | Nfya | Nuclear transcription factor Y subunit alpha (CAAT box DNA-binding protein subunit A) (Nuclear transcription factor Y subunit A, NF-YA) |
| Q9Z2H1 | RGS11_MOUSE | Rgs11 | Regulator of G-protein signaling 11 |
| Q8R2X8 | GO45_MOUSE | Blzf1 | Golgin-45 (Basic leucine zipper nuclear factor 1) |
| P51432 | PLCB3_MOUSE | Plcb3 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase beta-3, EC 3.1.4.11 (Phosphoinositide phospholipase C-beta-3) (Phospholipase C-beta-3, PLC-beta-3) |
| Q9Z0E6 | GBP2_MOUSE | Gbp2 | Guanylate-binding protein 2, EC 3.6.5.- (GTP-binding protein 2, GBP-2, mGBP-2, mGBP2) (Guanine nucleotide-binding protein 2) (Interferon-induced guanylate-binding protein 2) |
| Q8CH02 | SUGP1_MOUSE | Sugp1 | SURP and G-patch domain-containing protein 1 (Splicing factor 4) |
| Q9CQR6 | PPP6_MOUSE | Ppp6c | Serine/threonine-protein phosphatase 6 catalytic subunit, PP6C, EC 3.1.3.16 |
| P28574 | MAX_MOUSE | Max | Protein max (Myc-associated factor X) (Myc-binding novel HLH/LZ protein) (Protein myn) |
| Q9Z1B8 | PHF1_MOUSE | Phf1 | PHD finger protein 1, Protein PHF1 (Polycomb-like protein 1, mPC11) (T-complex testis-expressed 3) |
| Q9ET22 | DPP2_MOUSE | Dpp7 | Dipeptidyl peptidase 2, EC 3.4.14.2 (Dipeptidyl aminopeptidase II) (Dipeptidyl peptidase 7) (Dipeptidyl peptidase II, DPP II) (Quiescent cell proline dipeptidase) |

| | | | |
|--------|-------------|---------|---|
| Q9D7X3 | DUS3_MOUSE | Dusp3 | Dual specificity protein phosphatase 3, EC 3.1.3.16, EC 3.1.3.48 (T-DSP11) (Vaccinia H1-related phosphatase, VHR) |
| Q924T7 | RNF31_MOUSE | Rnf31 | E3 ubiquitin-protein ligase RNF31, EC 2.3.2.31 (HOIL-1-interacting protein, HOIP) (Putative Ariadne-like ubiquitin ligase, PAUL) (RING finger protein 31) (RING-type E3 ubiquitin transferase RNF31) |
| P63024 | VAMP3_MOUSE | Vamp3 | Vesicle-associated membrane protein 3, VAMP-3 (Cellubrevin, CEB) (Synaptobrevin-3) |
| Q80SY5 | PR38B_MOUSE | Prpf38b | Pre-mRNA-splicing factor 38B |
| Q62018 | CTR9_MOUSE | Ctr9 | RNA polymerase-associated protein CTR9 homolog (SH2 domain-binding protein 1) (Tetratricopeptide repeat-containing, SH2-binding phosphoprotein of 150 kDa, TPR-containing, SH2-binding phosphoprotein of 150 kDa, p150TSP) |
| P42128 | FOXK1_MOUSE | Foxk1 | Forkhead box protein K1 (Myocyte nuclear factor, MNF) |
| Q8K2C6 | SIR5_MOUSE | Sirt5 | NAD-dependent protein deacylase sirtuin-5, mitochondrial, EC 2.3.1.- (Regulatory protein SIR2 homolog 5) (SIR2-like protein 5) |
| P11438 | LAMP1_MOUSE | Lamp1 | Lysosome-associated membrane glycoprotein 1, LAMP-1, Lysosome-associated membrane protein 1 (120 kDa lysosomal membrane glycoprotein) (CD107 antigen-like family member A) (LGP-120) (Lysosomal membrane glycoprotein A, LGP-A) (P2B) (CD antigen CD107a) |
| O70161 | PI51C_MOUSE | Pip5k1c | Phosphatidylinositol 4-phosphate 5-kinase type-1 gamma, PIP5K1-gamma, PtdIns(4)P-5-kinase 1 gamma, EC 2.7.1.68 (Phosphatidylinositol 4-phosphate 5-kinase type I gamma, PIP5KIgamma) |
| Q9CWU9 | NUP37_MOUSE | Nup37 | Nucleoporin Nup37 (Nup107-160 subcomplex subunit Nup37) |
| Q69ZR9 | TASOR_MOUSE | Tasor | Protein TASOR (Transgene activation suppressor protein) |
| P97797 | SHPS1_MOUSE | Sirpa | Tyrosine-protein phosphatase non-receptor type substrate 1, SHP substrate 1, SHPS-1 (Brain Ig-like molecule with tyrosine-based activation motifs, Bit) (CD172 antigen-like family member A) (Inhibitory receptor SHPS-1) (MyD-1 antigen) (Signal-regulatory protein alpha-1, Sirp-alpha-1, mSIRP-alpha1) (p84) (CD antigen CD172a) |
| Q9D2E2 | TOE1_MOUSE | Toe1 | Target of EGR1 protein 1 |
| A6H5Y3 | METH_MOUSE | Mtr | Methionine synthase, MS, EC 2.1.1.13 (5-methyltetrahydrofolate--homocysteine methyltransferase) (Cobalamin-dependent methionine synthase) (Vitamin-B12 dependent methionine synthase) |
| Q8CBY3 | LENG8_MOUSE | Leng8 | Leukocyte receptor cluster member 8 homolog |

| | | | |
|--------|-------------|-----------|---|
| Q02614 | S30BP_MOUSE | Sap30bp | SAP30-binding protein (Transcriptional regulator protein HCNGP) |
| O88322 | NID2_MOUSE | Nid2 | Nidogen-2, NID-2 (Entactin-2) |
| B2RR83 | YTDC2_MOUSE | Ythdc2 | 3'-5' RNA helicase YTHDC2, EC 3.6.4.13 (Keen to exit meiosis leaving testes underpopulated protein, Ketu) (YTH domain-containing protein C2, mYTHDC2) |
| Q6PD28 | 2A5B_MOUSE | Ppp2r5b | Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit beta isoform (PP2A B subunit isoform B'-beta) (PP2A B subunit isoform B56-beta) (PP2A B subunit isoform PR61-beta) (PP2A B subunit isoform R5-beta) |
| Q3ZK22 | VEZA_MOUSE | Vezt | Vezeatin |
| Q9CZR3 | TM40L_MOUSE | Tomm40l | Mitochondrial import receptor subunit TOM40B (Protein TOMM40-like) |
| P51791 | CLCN3_MOUSE | Clcn3 | H(+)/Cl(-) exchange transporter 3 (Chloride channel protein 3, ClC-3) (Chloride transporter ClC-3) |
| O08989 | RASM_MOUSE | Mras | Ras-related protein M-Ras, EC 3.6.5.2 (Muscle and microspikes Ras) (Ras-related protein R-Ras3) (X-Ras) |
| Q8BR90 | RIMC1_MOUSE | Rimoc1 | RAB7A-interacting MON1-CCZ1 complex subunit 1 (UPF0600 protein C5orf51 homolog) |
| P62482 | KCAB2_MOUSE | Kcnab2 | Voltage-gated potassium channel subunit beta-2, EC 1.1.1.- (K(+)) channel subunit beta-2 (Kv-beta-2) (Neuroimmune protein F5) |
| P16546 | SPTN1_MOUSE | Sptan1 | Spectrin alpha chain, non-erythrocytic 1 (Alpha-II spectrin) (Fodrin alpha chain) |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| O08807 | PRDX4_MOUSE | Prdx4 | Peroxiredoxin-4, EC 1.11.1.24 (Antioxidant enzyme AOE372) (Peroxiredoxin IV, Prx-IV) (Thioredoxin peroxidase AO372) (Thioredoxin-dependent peroxide reductase A0372) (Thioredoxin-dependent peroxidoreductase 4) |
| O35317 | PBX3_MOUSE | Pbx3 | Pre-B-cell leukemia transcription factor 3 (Homeobox protein PBX3) |
| Q60872 | IF1A_MOUSE | Eif1a | Eukaryotic translation initiation factor 1A, eIF-1A (Eukaryotic translation initiation factor 4C, eIF-4C) |
| P60766 | CDC42_MOUSE | Cdc42 | Cell division control protein 42 homolog, EC 3.6.5.2 (G25K GTP-binding protein) |
| E9Q7X7 | NRX2A_MOUSE | Nrxn2 | Neurexin-2 (Neurexin II-alpha) (Neurexin-2-alpha) |
| Q9D620 | RFIP1_MOUSE | Rab11fip1 | Rab11 family-interacting protein 1, Rab11-FIP1 (Rab-coupling protein) |
| O08601 | MTP_MOUSE | Mtpp | Microsomal triglyceride transfer protein large subunit |

| | | | |
|--------|-------------|----------|--|
| Q5SSL4 | ABR_MOUSE | Abr | Active breakpoint cluster region-related protein |
| B2RXA1 | PLCX2_MOUSE | Plcx2 | PI-PLC X domain-containing protein 2 |
| Q8CHH5 | BICRL_MOUSE | Bicral | BRD4-interacting chromatin-remodeling complex-associated protein-like |
| Q91WG5 | AAKG2_MOUSE | Prkag2 | 5'-AMP-activated protein kinase subunit gamma-2, AMPK gamma2, AMPK subunit gamma-2 |
| Q9CQU5 | ZWINT_MOUSE | Zwint | ZW10 interactor (ZW10-interacting protein 1, Zwint-1) |
| Q8K0T7 | UN13C_MOUSE | Unc13c | Protein unc-13 homolog C (Munc13-3) |
| Q8BHG2 | CZIB_MOUSE | Czib | CXXC motif containing zinc binding protein (UPF0587 protein C1orf123 homolog) |
| Q9ERT9 | PPR1A_MOUSE | Ppp1r1a | Protein phosphatase 1 regulatory subunit 1A (Protein phosphatase inhibitor 1, I-1, IPP-1) |
| Q9CQE6 | ASF1A_MOUSE | Asf1a | Histone chaperone ASF1A (Anti-silencing function protein 1 homolog A) |
| Q8BRK9 | MA2A2_MOUSE | Man2a2 | Alpha-mannosidase 2x, EC 3.2.1.114 (Alpha-mannosidase IIx, Man IIx) (Mannosidase alpha class 2A member 2) (Mannosyl-oligosaccharide 1,3-1,6-alpha-mannosidase) |
| Q9R0N7 | SYT7_MOUSE | Syt7 | Synaptotagmin-7 (Synaptotagmin VII, SytVII) |
| Q9CQJ2 | PIHD1_MOUSE | Pih1d1 | PIH1 domain-containing protein 1 (Nucleolar protein 17 homolog) |
| Q8BHC4 | DCAKD_MOUSE | Dcakd | Dephospho-CoA kinase domain-containing protein |
| P63166 | SUMO1_MOUSE | Sumo1 | Small ubiquitin-related modifier 1, SUMO-1 (SMT3 homolog 3) (Ubiquitin-homology domain protein PIC1) (Ubiquitin-like protein SMT3C, Smt3C) |
| Q9Z2B2 | UCP5_MOUSE | Slc25a14 | Brain mitochondrial carrier protein 1, BMCP-1 (Mitochondrial uncoupling protein 5, UCP 5) (Solute carrier family 25 member 14) |
| Q9WUM5 | SUCA_MOUSE | Suclg1 | Succinate--CoA ligase [ADP/GDP-forming] subunit alpha, mitochondrial, EC 6.2.1.4, EC 6.2.1.5 (Succinyl-CoA synthetase subunit alpha, SCS-alpha) |
| Q9QX60 | DGUOK_MOUSE | Dguok | Deoxyguanosine kinase, mitochondrial, EC 2.7.1.113 (Deoxyadenosine kinase, mitochondrial, EC 2.7.1.76) |
| Q9CX86 | ROA0_MOUSE | Hnrnpa0 | Heterogeneous nuclear ribonucleoprotein A0, hnRNP A0 |
| Q8R1S4 | MTSS1_MOUSE | Mtss1 | Protein MTSS 1 (Metastasis suppressor protein 1) (Missing in metastasis protein) |
| Q8K4R4 | PITC1_MOUSE | Pitpnc1 | Cytoplasmic phosphatidylinositol transfer protein 1 (Mammalian rdgB homolog beta, M-rdgB beta, MrdgBbeta, mM-rdgBbeta) (Retinal degeneration B homolog beta, RdgBbeta) |
| P97366 | EVI5_MOUSE | Evi5 | Ecotropic viral integration site 5 protein, EVI-5 |

| | | | |
|--------|-------------|----------|---|
| P00375 | DYR_MOUSE | Dhfr | Dihydrofolate reductase, EC 1.5.1.3 |
| O88653 | LTOR3_MOUSE | Lamtor3 | Ragulator complex protein LAMTOR3 (Late endosomal/lysosomal adaptor and MAPK and MTOR activator 3) (MEK-binding partner 1, Mp1) (Mitogen-activated protein kinase kinase 1-interacting protein 1) (Mitogen-activated protein kinase scaffold protein 1) |
| O35099 | M3K5_MOUSE | Map3k5 | Mitogen-activated protein kinase kinase kinase 5, EC 2.7.11.25 (Apoptosis signal-regulating kinase 1, ASK-1) (MAPK/ERK kinase kinase 5, MEK kinase 5, MEKK 5) |
| O09012 | PEX5_MOUSE | Pex5 | Peroxisomal targeting signal 1 receptor, PTS1 receptor, PTS1R (PTS1-BP) (PXR1P) (Peroxin-5) (Peroxisomal C-terminal targeting signal import receptor) (Peroxisome receptor 1) |
| Q9Z0P5 | TWF2_MOUSE | Twf2 | Twinfilin-2 (A6-related protein, mA6RP) (Twinfilin-1-like protein) |
| Q9WTZ1 | RBX2_MOUSE | Rnf7 | RING-box protein 2, Rbx2 (RING finger protein 7) (Sensitive to apoptosis gene protein) |
| Q9R0X4 | ACOT9_MOUSE | Acot9 | Acyl-coenzyme A thioesterase 9, mitochondrial, Acyl-CoA thioesterase 9, EC 3.1.2.- (Acyl coenzyme A thioester hydrolase 2, MTE-2) (Acyl-CoA thioester hydrolase 9) (Mitochondrial 48 kDa acyl-CoA thioester hydrolase 1, Mt-ACT48.1) (Protein U8) (p48) |
| Q9JIZ9 | PLS3_MOUSE | Plscr3 | Phospholipid scramblase 3, PL scramblase 3 (Ca(2+)-dependent phospholipid scramblase 3) |
| Q9JIX0 | ENY2_MOUSE | Eny2 | Transcription and mRNA export factor ENY2 (Enhancer of yellow 2 transcription factor homolog) |
| Q9EQ06 | DHB11_MOUSE | Hsd17b11 | Estradiol 17-beta-dehydrogenase 11, EC 1.1.1.62 (17-beta-hydroxysteroid dehydrogenase 11, 17-beta-HSD 11, 17bHSD11, 17betaHSD11) (17-beta-hydroxysteroid dehydrogenase XI, 17-beta-HSD XI, 17betaHSDXI) (Dehydrogenase/reductase SDR family member 8) |
| Q9DCU6 | RM04_MOUSE | Mrpl4 | 39S ribosomal protein L4, mitochondrial, L4mt, MRP-L4 |
| Q9DB43 | ZFPL1_MOUSE | Zfp11 | Zinc finger protein-like 1 |
| Q9D9M2 | UBP12_MOUSE | Usp12 | Ubiquitin carboxyl-terminal hydrolase 12, EC 3.4.19.12 (Deubiquitinating enzyme 12) (Ubiquitin thioesterase 12) (Ubiquitin-hydrolyzing enzyme 1) (Ubiquitin-specific-processing protease 12) |
| Q9D8V7 | SC11C_MOUSE | Sec11c | Signal peptidase complex catalytic subunit SEC11C, EC 3.4.21.89 (Microsomal signal peptidase 21 kDa subunit, SPase 21 kDa subunit) (SEC11 homolog C) (SEC11-like protein 3) (SPC21) |

| | | | |
|--------|-------------|---------|--|
| Q9D820 | PRXD1_MOUSE | Prorsd1 | Prolyl-tRNA synthetase associated domain-containing protein 1 (PrdX deacylase domain-containing protein 1) |
| Q9D0R8 | LSM12_MOUSE | Lsm12 | Protein LSM12 |
| Q9D0L7 | ARM10_MOUSE | Armc10 | Armadillo repeat-containing protein 10 |
| Q9D032 | SSBP3_MOUSE | Ssbp3 | Single-stranded DNA-binding protein 3 (Lck-associated signal transducer) (Sequence-specific single-stranded-DNA-binding protein) |
| Q9CQN3 | TOM6_MOUSE | Tomm6 | Mitochondrial import receptor subunit TOM6 homolog (Overexpressed breast tumor protein homolog) (Translocase of outer membrane 6 kDa subunit homolog) |
| Q9CQI9 | MED30_MOUSE | Med30 | Mediator of RNA polymerase II transcription subunit 30 (Mediator complex subunit 30) (Thyroid hormone receptor-associated protein 6) (Thyroid hormone receptor-associated protein complex 25 kDa component, Trap25) |
| Q99KW9 | TIP_MOUSE | Itfg1 | T-cell immunomodulatory protein, Protein TIP (Integrin-alpha FG-GAP repeat-containing protein 1) (Linkin) |
| Q99KI3 | EMC3_MOUSE | Emc3 | ER membrane protein complex subunit 3 (Transmembrane protein 111) |
| Q925N1 | SFXN4_MOUSE | Sfxn4 | Sideroflexin-4 |
| Q921W4 | QORL1_MOUSE | Cryz11 | Quinone oxidoreductase-like protein 1, EC 1.-.-.- (Quinone oxidoreductase homolog 1, QOH-1) (Zeta-crystallin homolog) |
| Q91ZW2 | OFUT1_MOUSE | Pofut1 | GDP-fucose protein O-fucosyltransferase 1, EC 2.4.1.221 (Peptide-O-fucosyltransferase 1, O-FucT-1) |
| Q91VU0 | FAM3C_MOUSE | Fam3c | Protein FAM3C (Interleukin-like EMT inducer) |
| Q8R123 | FAD1_MOUSE | Flad1 | FAD synthase, EC 2.7.7.2 (FAD pyrophosphorylase) (FMN adenylyltransferase) (Flavin adenine dinucleotide synthase) [Includes: Molybdenum cofactor biosynthesis protein-like region; FAD synthase region] |
| Q8CHK3 | MBOA7_MOUSE | Mboat7 | Lysophospholipid acyltransferase 7, LPLAT 7, EC 2.3.1.- (1-acylglycerophosphatidylinositol O-acyltransferase) (Bladder and breast carcinoma-overexpressed gene 1 protein) (Leukocyte receptor cluster member 4) (Lysophosphatidylinositol acyltransferase 1, LPIAT1) (Membrane-bound O-acyltransferase domain-containing protein 7, O-acyltransferase domain-containing protein 7, m-mboa-7) |
| Q8CGA0 | PPM1F_MOUSE | Ppm1f | Protein phosphatase 1F, EC 3.1.3.16 (Ca(2+)/calmodulin-dependent protein kinase phosphatase, CaM-kinase phosphatase, CaMKPase) |
| Q8C8T8 | TSR2_MOUSE | Tsr2 | Pre-rRNA-processing protein TSR2 homolog |

| | | | |
|--------|--------------|----------|---|
| Q8C3R1 | BRAT1_MOUSE | Brat1 | BRCA1-associated ATM activator 1 (BRCA1-associated protein required for ATM activation protein 1) |
| Q8BTE5 | CEBOS_MOUSE | Cebpzoz | Protein CEBPZOS |
| Q8BSN5 | PHF23_MOUSE | Phf23 | PHD finger protein 23 (PDH-containing protein JUNE-1) |
| Q8BPT6 | IMP2L_MOUSE | Imp21 | Mitochondrial inner membrane protease subunit 2, EC 3.4.21.- (IMP2-like protein) |
| Q8BL86 | MBLAC2_MOUSE | Mblac2 | Acyl-coenzyme A thioesterase MBLAC2, Acyl-CoA thioesterase MBLAC2, EC 3.1.2.2 (Beta-lactamase MBLAC2, EC 3.5.2.6) (Metallo-beta-lactamase domain-containing protein 2) (Palmitoyl-coenzyme A thioesterase MBLAC2) |
| Q8BHN0 | PPM1L_MOUSE | Ppm1l | Protein phosphatase 1L, EC 3.1.3.16 (Protein phosphatase 1-like) (Protein phosphatase 2C isoform epsilon, PP2C-epsilon) |
| Q8BGS1 | E41L5_MOUSE | Epb4115 | Band 4.1-like protein 5 (Erythrocyte membrane protein band 4.1-like 5) |
| Q8BG73 | SH3L2_MOUSE | Sh3bgrl2 | SH3 domain-binding glutamic acid-rich-like protein 2 |
| Q80UU2 | RPP38_MOUSE | Rpp38 | Ribonuclease P protein subunit p38, RNaseP protein p38 |
| Q76LS9 | MINY1_MOUSE | Mindy1 | Ubiquitin carboxyl-terminal hydrolase MINDY-1, EC 3.4.19.12 (Deubiquitinating enzyme MINDY-1) (NF-E2 inducible protein) (Protein FAM63A) |
| Q6ZPK7 | LST2_MOUSE | Zfyve28 | Lateral signaling target protein 2 homolog (Zinc finger FYVE domain-containing protein 28) |
| Q6PGH2 | JUPI2_MOUSE | Jpt2 | Jupiter microtubule associated homolog 2 (Hematological and neurological expressed 1-like protein, HN1-like protein) |
| Q68FH4 | GALK2_MOUSE | Galk2 | N-acetylgalactosamine kinase, EC 2.7.1.157 (GalNAc kinase) (Galactokinase 2) |
| Q64471 | GSTT1_MOUSE | Gstt1 | Glutathione S-transferase theta-1, EC 2.5.1.18 (GST class-theta-1) |
| Q62241 | RU1C_MOUSE | Snrpc | U1 small nuclear ribonucleoprotein C, U1 snRNP C, U1-C, U1C |
| Q62186 | SSRD_MOUSE | Ssr4 | Translocon-associated protein subunit delta, TRAP-delta (Signal sequence receptor subunit delta, SSR-delta) |
| Q61387 | COX7R_MOUSE | Cox7a2l | Cytochrome c oxidase subunit 7A-related protein, mitochondrial (Cytochrome c oxidase subunit VIIa-related protein) (Silica-induced gene 81 protein, SIG-81) (Supercomplex assembly factor I) |
| Q60870 | REEP5_MOUSE | Reep5 | Receptor expression-enhancing protein 5 (GP106) (Polyposis locus protein 1 homolog) (Protein TB2 homolog) |
| Q60866 | PTER_MOUSE | Pter | Phosphotriesterase-related protein, EC 3.1.-.- (Parathion hydrolase-related protein) |
| Q5U4C3 | SFR19_MOUSE | Scaf1 | Splicing factor, arginine/serine-rich 19 (SR-related and CTD-associated factor 1) |

| | | | |
|--------|-------------|---------|--|
| Q3UFF7 | LYPL1_MOUSE | Lyplal1 | Lysophospholipase-like protein 1, EC 3.1.2.22 |
| P97785 | GFRA1_MOUSE | Gfra1 | GDNF family receptor alpha-1, GDNF receptor alpha-1, GDNFR-alpha-1, GFR-alpha-1 (TGF-beta-related neurotrophic factor receptor 1) |
| P61961 | UFM1_MOUSE | Ufm1 | Ubiquitin-fold modifier 1 |
| P58044 | IDI1_MOUSE | Idi1 | Isopentenyl-diphosphate Delta-isomerase 1, EC 5.3.3.2 (Isopentenyl pyrophosphate isomerase 1, IPP isomerase 1, IPPI1) |
| P03899 | NU3M_MOUSE | mt-Nd3 | NADH-ubiquinone oxidoreductase chain 3, EC 7.1.1.2 (NADH dehydrogenase subunit 3) |
| O89016 | ABCD4_MOUSE | Abcd4 | Lysosomal cobalamin transporter ABCD4, EC 7.6.2.8 (ATP-binding cassette sub-family D member 4) (PMP70-related protein, P70R) (Peroxisomal membrane protein 1-like, PXMP1-L) (Peroxisomal membrane protein 69, PMP69) |
| O70362 | PHLD_MOUSE | Gpld1 | Phosphatidylinositol-glycan-specific phospholipase D, PI-G PLD, EC 3.1.4.50 (Glycoprotein phospholipase D) (Glycosyl-phosphatidylinositol-specific phospholipase D, GPI-PLD, GPI-specific phospholipase D) |
| O09114 | PTGDS_MOUSE | Ptgds | Prostaglandin-H2 D-isomerase, EC 5.3.99.2 (Glutathione-independent PGD synthase) (Lipocalin-type prostaglandin-D synthase) (Prostaglandin-D2 synthase, L-PGDS, PGD2 synthase, PGDS2) |
| C0HK80 | ARXS2_MOUSE | Arxes2 | Adipocyte-related X-chromosome expressed sequence 2 |
| O54901 | OX2G_MOUSE | Cd200 | OX-2 membrane glycoprotein (MRC OX-2 antigen) (CD antigen CD200) |
| Q5EBJ4 | ERMIN_MOUSE | Ernm | Ermin (Juxtandoin, JN) |
| Q9DC28 | KC1D_MOUSE | Csnk1d | Casein kinase I isoform delta, CKI-delta, CKId, EC 2.7.11.1 (Tau-protein kinase CSNK1D, EC 2.7.11.26) |
| Q99PJ1 | PCD15_MOUSE | Pcdh15 | Protocadherin-15 |
| Q91YS8 | KCC1A_MOUSE | Camk1 | Calcium/calmodulin-dependent protein kinase type 1, EC 2.7.11.17 (CaM kinase I, CaM-KI) (CaM kinase I alpha, CaMKI-alpha) |
| Q9JLC4 | SORC1_MOUSE | Sorcs1 | VPS10 domain-containing receptor SorCS1, mSorCS |
| Q9ESG4 | CLTRN_MOUSE | Cltrn | Collectrin (Transmembrane protein 27) |
| Q64338 | PDE1C_MOUSE | Pde1c | Dual specificity calcium/calmodulin-dependent 3',5'-cyclic nucleotide phosphodiesterase 1C, Cam-PDE 1C, EC 3.1.4.17 |
| P70245 | EBP_MOUSE | Ebp | 3-beta-hydroxysteroid-Delta(8),Delta(7)-isomerase, EC 5.3.3.5 (Cholestenol Delta-isomerase) (Delta(8)-Delta(7) sterol isomerase, D8-D7 sterol isomerase) (Emopamil-binding protein) |

| | | | |
|--------|-------------|---------|---|
| P62700 | YPEL5_MOUSE | Ypel5 | Protein yippee-like 5 |
| O54965 | RNF13_MOUSE | Rnf13 | E3 ubiquitin-protein ligase RNF13, EC 2.3.2.27 (RING finger protein 13) |
| O88196 | TTC3_MOUSE | Ttc3 | E3 ubiquitin-protein ligase TTC3, EC 2.3.2.27 (RING-type E3 ubiquitin transferase TTC3) (TPR repeat protein D, Mtpd) |
| Q9WUC3 | LY6H_MOUSE | Ly6h | Lymphocyte antigen 6H, Ly-6H |
| Q4QRL3 | CC88B_MOUSE | Ccdc88b | Coiled-coil domain-containing protein 88B (Gipie) (Hook-related protein 3, HkRP3) |
| Q8CFC7 | CLASR_MOUSE | Clasrp | CLK4-associating serine/arginine rich protein (Clk4-associating SR-related protein) (Serine/arginine-rich splicing factor 16) (Splicing factor, arginine/serine-rich 16) (Suppressor of white-apricot homolog 2) |
| O55098 | STK10_MOUSE | Stk10 | Serine/threonine-protein kinase 10, EC 2.7.11.1 (Lymphocyte-oriented kinase) |
| Q9CPS6 | HINT3_MOUSE | Hint3 | Adenosine 5'-monophosphoramidase HINT3, EC 3.9.1.- (HINT-4) (Histidine triad nucleotide-binding protein 3, HINT-3) |
| P18052 | PTPRA_MOUSE | Ptpra | Receptor-type tyrosine-protein phosphatase alpha, Protein-tyrosine phosphatase alpha, R-PTP-alpha, EC 3.1.3.48 (LCA-related phosphatase) (PTPTY-28) |
| Q8BMB0 | EMSY_MOUSE | Emsy | BRCA2-interacting transcriptional repressor EMSY |
| Q8CHY3 | DYM_MOUSE | Dym | Dymeclin |
| P32848 | PRVA_MOUSE | Pvalb | Parvalbumin alpha |
| Q8R2U0 | SEH1_MOUSE | Seh1l | Nucleoporin SEH1 (GATOR complex protein SEH1) (Nup107-160 subcomplex subunit SEH1) |
| P59016 | VP33B_MOUSE | Vps33b | Vacuolar protein sorting-associated protein 33B |
| Q8K136 | SCNM1_MOUSE | Scnm1 | Sodium channel modifier 1 |
| Q60759 | GCDH_MOUSE | Gcdh | Glutaryl-CoA dehydrogenase, mitochondrial, GCD, EC 1.3.8.6 |
| P03921 | NU5M_MOUSE | Mtnd5 | NADH-ubiquinone oxidoreductase chain 5, EC 7.1.1.2 (NADH dehydrogenase subunit 5) |
| P17439 | GLCM_MOUSE | Gba | Lysosomal acid glucosylceramidase, Lysosomal acid GCCase, EC 3.2.1.45 (Acid beta-glucosidase) (Beta-glucocerebrosidase) (Cholesterol glucosyltransferase, SGTase, EC 2.4.1.-) (Cholesteryl-beta-glucosidase, EC 3.2.1.-) (D-glucosyl-N-acylsphingosine glucohydrolase) (Lysosomal cholesterol glycosyltransferase) (Lysosomal galactosylceramidase, EC 3.2.1.46) (Lysosomal glycosylceramidase) |
| Q8BHA3 | DTD2_MOUSE | Dtd2 | D-aminoacyl-tRNA deacylase 2, EC 3.1.1.96 (Animalia-specific tRNA deacylase, ATD) (D-tyrosyl-tRNA deacylase 2) (L-alanyl-tRNA deacylase) |

| | | | |
|--------|-------------|----------|---|
| Q3TAS6 | EMC10_MOUSE | Emc10 | ER membrane protein complex subunit 10 (Hematopoietic signal peptide-containing membrane domain-containing protein 1) |
| P97930 | KTHY_MOUSE | Dtymk | Thymidylate kinase, EC 2.7.4.9 (dTMP kinase) |
| P56581 | TDG_MOUSE | Tdg | G/T mismatch-specific thymine DNA glycosylase, EC 3.2.2.29 (C-JUN leucine zipper interactive protein JZA-3) (Thymine-DNA glycosylase) |
| Q91XI1 | DUS3L_MOUSE | Dus3l | tRNA-dihydrouridine(47) synthase [NAD(P)(+)]-like, EC 1.3.1.89 (mRNA-dihydrouridine synthase DUS3L, EC 1.3.1.-) (tRNA-dihydrouridine synthase 3-like) |
| Q8BMD6 | TM260_MOUSE | Tmem260 | Transmembrane protein 260 |
| Q50H33 | KCTD8_MOUSE | Kctd8 | BTB/POZ domain-containing protein KCTD8 |
| Q9CQY5 | MAGT1_MOUSE | Magt1 | Magnesium transporter protein 1, MagT1 (Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit MAGT1, Oligosaccharyl transferase subunit MAGT1) (Implantation-associated protein, IAP) |
| Q91X58 | ZFN2B_MOUSE | Zfand2b | AN1-type zinc finger protein 2B (Arsenite-inducible RNA-associated protein-like protein, AIRAP-like protein) |
| Q8R127 | SCPDL_MOUSE | Sccpdh | Saccharopine dehydrogenase-like oxidoreductase, EC 1.-.-.- |
| Q60766 | IRGM1_MOUSE | Irgm1 | Immunity-related GTPase family M protein 1, EC 3.6.5.- (Interferon-inducible GTPase 3) (Interferon-inducible protein 1) (LPS-stimulated RAW 264.7 macrophage protein 47, LRG-47) |
| Q62036 | CP131_MOUSE | Cep131 | Centrosomal protein of 131 kDa (5-azacytidine-induced protein 1) (Pre-acrosome localization protein 1) |
| Q9CR64 | KISHA_MOUSE | Tmem167a | Protein kish-A (Transmembrane protein 167) (Transmembrane protein 167A) |
| Q61072 | ADAM9_MOUSE | Adam9 | Disintegrin and metalloproteinase domain-containing protein 9, ADAM 9, EC 3.4.24.- (Meltrin-gamma) (Metalloprotease/disintegrin/cysteine-rich protein 9) (Myeloma cell metalloproteinase) |
| Q9QXL1 | KI21B_MOUSE | Kif21b | Kinesin-like protein KIF21B (Kinesin-like protein KIF6) |
| P62075 | TIM13_MOUSE | Timm13 | Mitochondrial import inner membrane translocase subunit Tim13 |
| Q8BRK8 | AAPK2_MOUSE | Prkaa2 | 5'-AMP-activated protein kinase catalytic subunit alpha-2, AMPK subunit alpha-2, EC 2.7.11.1 (Acetyl-CoA carboxylase kinase, ACACA kinase, EC 2.7.11.27) (Hydroxymethylglutaryl-CoA reductase kinase, HMGCR kinase, EC 2.7.11.31) |
| P26048 | GBRA2_MOUSE | Gabra2 | Gamma-aminobutyric acid receptor subunit alpha-2 (GABA(A) receptor subunit alpha-2) |
| Q9ET30 | TM9S3_MOUSE | Tm9sf3 | Transmembrane 9 superfamily member 3 |

| | | | |
|--------|-------------|---------|--|
| Q7TQG1 | PKHA6_MOUSE | Plekha6 | Pleckstrin homology domain-containing family A member 6, PH domain-containing family A member 6 (Phosphoinositol 3-phosphate-binding protein 3, PEPP-3) |
| Q9WVM3 | APC7_MOUSE | Anapc7 | Anaphase-promoting complex subunit 7, APC7 (Cyclosome subunit 7) (Prediabetic NOD sera-reactive autoantigen) |
| Q8BM72 | HSP13_MOUSE | Hspa13 | Heat shock 70 kDa protein 13 (Microsomal stress-70 protein ATPase core) (Stress-70 protein chaperone microsome-associated 60 kDa protein) |
| Q8VEJ9 | VPS4A_MOUSE | Vps4a | Vacuolar protein sorting-associated protein 4A, EC 3.6.4.6 |
| Q80ZM7 | T2AG_MOUSE | Gtf2a2 | Transcription initiation factor IIA subunit 2 (General transcription factor IIA subunit 2) (Transcription initiation factor IIA gamma chain, TFIIA-gamma) |
| Q8C079 | STRP1_MOUSE | Strip1 | Striatin-interacting protein 1 (Protein FAM40A) |
| Q9R1C0 | TAF7_MOUSE | Taf7 | Transcription initiation factor TFIID subunit 7 (RNA polymerase II TBP-associated factor subunit F) (Transcription initiation factor TFIID 55 kDa subunit, TAF(II)55, TAFII-55, TAFII55) |
| Q61048 | WBP4_MOUSE | Wbp4 | WW domain-binding protein 4, WBP-4 (Formin-binding protein 21) (WW domain-containing-binding protein 4) |
| Q8K2Q0 | COMD9_MOUSE | Commd9 | COMM domain-containing protein 9 |
| Q570Y9 | DPTOR_MOUSE | Deptor | DEP domain-containing mTOR-interacting protein (DEP domain-containing protein 6) |
| Q9WUZ9 | ENTP5_MOUSE | Entpd5 | Ectonucleoside triphosphate diphosphohydrolase 5, NTPDase 5, EC 3.6.1.6 (CD39 antigen-like 4) (ER-UDPase) (Guanosine-diphosphatase ENTPD5, GDPase ENTPD5) (Nucleoside diphosphatase) (Uridine-diphosphatase ENTPD5, UDPase ENTPD5) |
| P42337 | PK3CA_MOUSE | Pik3ca | Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit alpha isoform, PI3-kinase subunit alpha, PI3K-alpha, PI3Kalpha, PtdIns-3-kinase subunit alpha, EC 2.7.1.137, EC 2.7.1.153 (Phosphatidylinositol 4,5-bisphosphate 3-kinase 110 kDa catalytic subunit alpha, PtdIns-3-kinase subunit p110-alpha, p110alpha) (Phosphoinositide-3-kinase catalytic alpha polypeptide) (Serine/threonine protein kinase PIK3CA, EC 2.7.11.1) |
| Q8BH79 | ANO10_MOUSE | Ano10 | Anoctamin-10 (Transmembrane protein 16K) |
| P63139 | NFYB_MOUSE | Nfyb | Nuclear transcription factor Y subunit beta (CAAT box DNA-binding protein subunit B) (Nuclear transcription factor Y subunit B, NF-YB) |
| Q9Z0V1 | KCND3_MOUSE | Kcnd3 | Potassium voltage-gated channel subfamily D member 3 (Voltage-gated potassium channel subunit Kv4.3) |

| | | | |
|--------|-------------|---------|--|
| Q9R0P6 | SC11A_MOUSE | Sec11a | Signal peptidase complex catalytic subunit SEC11A, EC 3.4.21.89 (Endopeptidase SP18) (Microsomal signal peptidase 18 kDa subunit, SPase 18 kDa subunit) (SEC11 homolog A) (SEC11-like protein 1) (SPC18) (Sid 2895) |
| Q8R332 | NUP58_MOUSE | Nup58 | Nucleoporin p58/p45 (58 kDa nucleoporin) (Nucleoporin-like protein 1) |
| O35216 | CENPA_MOUSE | Cenpa | Histone H3-like centromeric protein A (Centromere protein A, CENP-A) |
| Q9D2V8 | MFS10_MOUSE | Mfsd10 | Major facilitator superfamily domain-containing protein 10 (Tetracycline transporter-like protein) |
| Q3U7U3 | FBX7_MOUSE | Fbxo7 | F-box only protein 7 |
| Q69Z26 | CNTN4_MOUSE | Cntn4 | Contactin-4 (Brain-derived immunoglobulin superfamily protein 2, BIG-2) |
| Q61137 | ASTN1_MOUSE | Astn1 | Astrotactin-1 (Neuronal migration protein GC14) |
| Q9R0N8 | SYT6_MOUSE | Syt6 | Synaptotagmin-6 (Synaptotagmin VI, SytVI) |
| Q9Z2Q5 | RM40_MOUSE | Mrpl40 | 39S ribosomal protein L40, mitochondrial, L40mt, MRP-L40 (Nuclear localization signal-containing protein deleted in velocardiofacial syndrome homolog) |
| P52795 | EFNB1_MOUSE | Efnb1 | Ephrin-B1 (CEK5 receptor ligand, CEK5-L) (EFL-3) (ELK ligand, ELK-L) (EPH-related receptor tyrosine kinase ligand 2, LERK-2) (Stimulated by retinoic acid gene 1 protein) [Cleaved into: Ephrin-B1 C-terminal fragment, Ephrin-B1 CTF; Ephrin-B1 intracellular domain, Ephrin-B1 ICD] |
| O70583 | TRI18_MOUSE | Mid1 | E3 ubiquitin-protein ligase Midline-1, EC 2.3.2.27 (Midin) (RING finger protein Midline-1) (RING-type E3 ubiquitin transferase Midline-1) (Tripartite motif-containing protein 18) |
| Q9ER88 | RT29_MOUSE | Dap3 | 28S ribosomal protein S29, mitochondrial, MRP-S29, S29mt (Death-associated protein 3, DAP-3) |
| P32507 | NECT2_MOUSE | Nectin2 | Nectin-2 (Herpes virus entry mediator B, Herpesvirus entry mediator B, HveB) (Murine herpes virus entry protein B, mHveB) (Nectin cell adhesion molecule 2) (Poliovirus receptor homolog) (Poliovirus receptor-related protein 2) (CD antigen CD112) |
| P97490 | ADCY8_MOUSE | Adcy8 | Adenylate cyclase type 8, EC 4.6.1.1 (ATP pyrophosphate-lyase 8) (Adenylate cyclase type VIII) (Adenylyl cyclase 8) (Ca(2+)/calmodulin-activated adenylyl cyclase) |
| O08739 | AMPD3_MOUSE | Ampd3 | AMP deaminase 3, EC 3.5.4.6 (AMP deaminase H-type) (AMP deaminase isoform E) (Heart-type AMPD) |

| | | | |
|--------|-------------|----------|---|
| P17047 | LAMP2_MOUSE | Lamp2 | Lysosome-associated membrane glycoprotein 2, LAMP-2, Lysosome-associated membrane protein 2 (CD107 antigen-like family member B) (Lysosomal membrane glycoprotein type B, LGP-B) (CD antigen CD107b) |
| Q9CZX9 | EMC4_MOUSE | Emc4 | ER membrane protein complex subunit 4 (Transmembrane protein 85) |
| Q3UXZ9 | KDM5A_MOUSE | Kdm5a | Lysine-specific demethylase 5A, EC 1.14.11.67 (Histone demethylase JARID1A) (Jumonji/ARID domain-containing protein 1A) (Retinoblastoma-binding protein 2, RBBP-2) ([histone H3]-trimethyl-L-lysine(4) demethylase 5A) |
| Q8K0C9 | GMDS_MOUSE | Gmgs | GDP-mannose 4,6 dehydratase, EC 4.2.1.47 (GDP-D-mannose dehydratase, GMD) |
| Q3UGR5 | HDHD2_MOUSE | Hdhd2 | Haloacid dehalogenase-like hydrolase domain-containing protein 2 |
| Q8BGZ2 | F168A_MOUSE | Fam168a | Protein FAM168A |
| Q8K409 | DPOLB_MOUSE | Polb | DNA polymerase beta, EC 2.7.7.7, EC 4.2.99.- |
| Q8BTG7 | NDRG4_MOUSE | Ndr4 | Protein NDRG4 (N-myc downstream-regulated gene 4 protein) (Protein Ndr4) |
| Q9Z2Y3 | HOME1_MOUSE | Homer1 | Homer protein homolog 1, Homer-1 (VASP/Ena-related gene up-regulated during seizure and LTP 1, Vesl-1) |
| Q5QNQ6 | OSBP2_MOUSE | Osbp2 | Oxysterol-binding protein 2 |
| P29533 | VCAM1_MOUSE | Vcam1 | Vascular cell adhesion protein 1, V-CAM 1, VCAM-1 (CD antigen CD106) |
| Q8BYH7 | TBC17_MOUSE | Tbc1d17 | TBC1 domain family member 17 |
| Q8BVW0 | GANC_MOUSE | Ganc | Neutral alpha-glucosidase C, EC 3.2.1.20 |
| Q9Z1L5 | CA2D3_MOUSE | Cacna2d3 | Voltage-dependent calcium channel subunit alpha-2/delta-3 (Voltage-gated calcium channel subunit alpha-2/delta-3) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-3; Voltage-dependent calcium channel subunit delta-3] |
| Q811B1 | XYLT1_MOUSE | Xylt1 | Xylosyltransferase 1, EC 2.4.2.26 (Peptide O-xylosyltransferase 1) (Xylosyltransferase I) |
| Q60936 | COQ8A_MOUSE | Coq8a | Atypical kinase COQ8A, mitochondrial, EC 2.7.-.- (Chaperone activity of bc1 complex-like, Chaperone-ABC1-like) (Coenzyme Q protein 8A) (aarF domain-containing protein kinase 3) |
| Q923B0 | GGACT_MOUSE | Ggact | Gamma-glutamylaminocyclotransferase, GGACT, EC 4.3.2.8 (AIG2-like domain-containing protein 1) (Gamma-glutamylamine cyclotransferase) |
| Q80WS3 | FBLL1_MOUSE | Fbll1 | rRNA/tRNA 2'-O-methyltransferase fibrillar-like protein 1, EC 2.1.1.- (Protein-glutamine methyltransferase) |
| Q80ZW0 | STK35_MOUSE | Stk35 | Serine/threonine-protein kinase 35 (Serine/threonine-protein kinase 35 L1, EC 2.7.11.1) |

| | | | |
|--------|-------------|---------|--|
| Q8BPG6 | SUMF2_MOUSE | Sumf2 | Inactive C-alpha-formylglycine-generating enzyme 2 (Sulfatase-modifying factor 2) |
| Q8C1W1 | VASH1_MOUSE | Vash1 | Tubuliny-Tyr carboxypeptidase 1, EC 3.4.17.17 (Tyrosine carboxypeptidase 1, TTCP 1) (Vasohibin-1) |
| Q99LG4 | TTC5_MOUSE | Ttc5 | Tetratricopeptide repeat protein 5, TPR repeat protein 5 (Stress-responsive activator of p300, Protein Strap) |
| P03930 | ATP8_MOUSE | Mtstp8 | ATP synthase protein 8 (A6L) (F-ATPase subunit 8) |
| Q9DCR2 | AP3S1_MOUSE | Ap3s1 | AP-3 complex subunit sigma-1 (AP-3 complex subunit sigma-3A) (Adaptor-related protein complex 3 subunit sigma-1) (Sigma-3A-adaptin, Sigma3A-adaptin) (Sigma-adaptin 3a) |
| O54851 | CXD2_MOUSE | Gjd2 | Gap junction delta-2 protein (Connexin-36, Cx36) (Gap junction alpha-9 protein) |
| P62748 | HPCL1_MOUSE | Hpcal1 | Hippocalcin-like protein 1 (Neural visinin-like protein 3, NVL-3, NVP-3) (Visinin-like protein 3, VILIP-3) |
| Q05A62 | DNAL1_MOUSE | Dnal1 | Dynein axonemal light chain 1 |
| Q99K23 | UFSP2_MOUSE | Ufsp2 | Ufm1-specific protease 2, UfSP2, EC 3.4.22.- |
| Q8BYN3 | ITPK1_MOUSE | Itpk1 | Inositol-tetrakisphosphate 1-kinase, EC 2.7.1.134 (Inositol 1,3,4-trisphosphate 5/6-kinase, Inositol-triphosphate 5/6-kinase, Ins(1,3,4)P(3) 5/6-kinase, EC 2.7.1.159) |
| Q8R4G0 | NTNG1_MOUSE | Ntng1 | Netrin-G1 (Laminct-1) |
| Q5SRX1 | TM1L2_MOUSE | Tom1l2 | TOM1-like protein 2 (Target of Myb-like protein 2) |
| Q80YT7 | MYOME_MOUSE | Pde4dip | Myomegalin (Phosphodiesterase 4D-interacting protein) |
| Q62086 | PON2_MOUSE | Pon2 | Serum paraoxonase/arylesterase 2, PON 2, EC 3.1.1.2, EC 3.1.1.81 (Aromatic esterase 2, A-esterase 2) (Serum aryldialkylphosphatase 2) |
| Q4VBE4 | EGFLA_MOUSE | Egflam | Pikachurin (EGF-like, fibronectin type-III and laminin G-like domain-containing protein) (Nectican) |
| P53564 | CUX1_MOUSE | Cux1 | Homeobox protein cut-like 1 (CCAAT displacement protein, CDP) (Homeobox protein cux-1) [Cleaved into: CDP/Cux p110] |
| P16045 | LEG1_MOUSE | Lgals1 | Galectin-1, Gal-1 (14 kDa lectin) (Beta-galactoside-binding lectin L-14-I) (Galaptin) (Lactose-binding lectin 1) (Lectin galactoside-binding soluble 1) (S-Lac lectin 1) |
| P58774 | TPM2_MOUSE | Tpm2 | Tropomyosin beta chain (Beta-tropomyosin) (Tropomyosin-2) |
| Q9Z1A9 | TBCD8_MOUSE | Tbc1d8 | TBC1 domain family member 8 (BUB2-like protein 1) (Vascular Rab-GAP/TBC-containing protein) |

| | | | |
|--------|-------------|----------|--|
| Q8BZ21 | KAT6A_MOUSE | Kat6a | Histone acetyltransferase KAT6A, EC 2.3.1.48 (MOZ, YBF2/SAS3, SAS2 and TIP60 protein 3, MYST-3) (Monocytic leukemia zinc finger homolog) (Monocytic leukemia zinc finger protein) |
| Q5SUQ9 | CTC1_MOUSE | Ctc1 | CST complex subunit CTC1 (Alpha-accessory factor of 132 kDa, AAF-132, AAF132) (Conserved telomere maintenance component 1) |
| Q8CIQ7 | DOCK3_MOUSE | Dock3 | Dedicator of cytokinesis protein 3 (Modifier of cell adhesion) (Presenilin-binding protein, PBP) |
| Q3TNH5 | F172A_MOUSE | Fam172a | Cotranscriptional regulator FAM172A |
| Q7TN29 | SMAP2_MOUSE | Smap2 | Stromal membrane-associated protein 2 (Stromal membrane-associated protein 1-like) |
| O88520 | SHOC2_MOUSE | Shoc2 | Leucine-rich repeat protein SHOC-2 (Protein soc-2 homolog) (Protein sur-8 homolog) |
| Q8BRV5 | K1671_MOUSE | Kiaa1671 | Uncharacterized protein KIAA1671 |
| Q8BR07 | BICD1_MOUSE | Bicd1 | Protein bicaudal D homolog 1, Bic-D 1 |
| Q9R0C8 | VAV3_MOUSE | Vav3 | Guanine nucleotide exchange factor VAV3, VAV-3 |
| O88910 | MPP3_MOUSE | Mpp3 | MAGUK p55 subfamily member 3 (Discs large homolog 3) (Protein MPP3) |
| Q8QZS3 | FLCN_MOUSE | Flcn | Folliculin (Birt-Hogg-Dube syndrome protein homolog) |
| Q8BFQ4 | WDR82_MOUSE | Wdr82 | WD repeat-containing protein 82 |
| Q80W71 | PKHA8_MOUSE | Plekha8 | Pleckstrin homology domain-containing family A member 8, PH domain-containing family A member 8 (Phosphatidylinositol-four-phosphate adapter protein 2, FAPP-2, Phosphoinositol 4-phosphate adapter protein 2) |
| Q91YX5 | LGAT1_MOUSE | Lpgat1 | Acyl-CoA:lysophosphatidylglycerol acyltransferase 1 (Acyl-CoA:monoacylglycerol acyltransferase LPGAT1, EC 2.3.1.22) (Lysophospholipid acyltransferase 7, LPLAT7, EC 2.3.1.-) (Stearoyl-CoA:1-lyso-2-acyl-PE acyltransferase) |
| Q9R1Q9 | VAS1_MOUSE | Atp6ap1 | V-type proton ATPase subunit S1, V-ATPase subunit S1 (Protein C7-1) (V-ATPase Ac45 subunit) (V-ATPase S1 accessory protein) (Vacuolar proton pump subunit S1) |
| P15655 | FGF2_MOUSE | Fgf2 | Fibroblast growth factor 2, FGF-2 (Basic fibroblast growth factor, bFGF) (Heparin-binding growth factor 2, HBGF-2) |
| P54726 | RD23A_MOUSE | Rad23a | UV excision repair protein RAD23 homolog A, HR23A, mHR23A |
| Q9D6G9 | CKLF5_MOUSE | Cmtm5 | CKLF-like MARVEL transmembrane domain-containing protein 5 (Chemokine-like factor superfamily member 5) |
| P97370 | AT1B3_MOUSE | Atp1b3 | Sodium/potassium-transporting ATPase subunit beta-3 (Sodium/potassium-dependent ATPase subunit beta-3, ATPB-3) (CD antigen CD298) |

| | | | |
|--------|-------------|---------|---|
| Q8VDZ4 | ZDHC5_MOUSE | Zdhhc5 | Palmitoyltransferase ZDHHC5, EC 2.3.1.225 (Zinc finger DHHC domain-containing protein 5, DHHC-5) |
| Q8R2Y2 | MUC18_MOUSE | Mcam | Cell surface glycoprotein MUC18 (Gicerin) (Melanoma cell adhesion molecule) (Melanoma-associated antigen MUC18) (CD antigen CD146) |
| Q8C0L9 | GPCP1_MOUSE | Gpcpd1 | Glycerophosphocholine phosphodiesterase GPCPD1, EC 3.1.4.2 (Glycerophosphodiester phosphodiesterase 5) (Preimplantation protein 4) |
| Q9EPB5 | SERHL_MOUSE | Serhl | Serine hydrolase-like protein, SHL, EC 3.1.-.- |
| Q80WT5 | AFTIN_MOUSE | Aftph | Aftiphilin |
| Q9R0D8 | WDR54_MOUSE | Wdr54 | WD repeat-containing protein 54 |
| Q9DB25 | ALG5_MOUSE | Alg5 | Dolichyl-phosphate beta-glucosyltransferase, DolP-glucosyltransferase, EC 2.4.1.117 (Asparagine-linked glycosylation protein 5 homolog) |
| Q3U7R1 | ESYT1_MOUSE | Esyt1 | Extended synaptotagmin-1, E-Syt1 (Membrane-bound C2 domain-containing protein) |
| Q810J8 | ZFYV1_MOUSE | Zfyve1 | Zinc finger FYVE domain-containing protein 1 |
| Q8BH48 | UBAP1_MOUSE | Ubap1 | Ubiquitin-associated protein 1, UBAP-1 |
| Q8K0D7 | GET1_MOUSE | Get1 | Guided entry of tail-anchored proteins factor 1 (Tail-anchored protein insertion receptor WRB) (Tryptophan-rich basic protein) |
| P70290 | EM55_MOUSE | Mpp1 | 55 kDa erythrocyte membrane protein, p55 (Membrane protein, palmitoylated 1) |
| O88958 | GNPI1_MOUSE | Gnpda1 | Glucosamine-6-phosphate isomerase 1, EC 3.5.99.6 (Glucosamine-6-phosphate deaminase 1, GNPDA 1, GlcN6P deaminase 1) (Oscillin) |
| Q80YR9 | R12BA_MOUSE | Rbm12b1 | RNA-binding protein 12B-A (RNA-binding motif protein 12B-A) |
| O08734 | BAK_MOUSE | Bak1 | Bcl-2 homologous antagonist/killer (Apoptosis regulator BAK) |
| O35405 | PLD3_MOUSE | Pld3 | 5'-3' exonuclease PLD3, EC 3.1.16.1 (Choline phosphatase 3) (Phosphatidylcholine-hydrolyzing phospholipase D3) (Phospholipase D3, PLD 3) (Schwannoma-associated protein 9, SAM-9) |
| Q9QXA7 | TRI44_MOUSE | Trim44 | Tripartite motif-containing protein 44 (Protein DIPB) (Protein Mc7) |
| Q6AZB0 | BOC_MOUSE | Boc | Brother of CDO, Protein BOC |
| Q8C7Q4 | RBM4_MOUSE | Rbm4 | RNA-binding protein 4 (Lark homolog, mLark) (RNA-binding motif protein 4) (RNA-binding motif protein 4a) |
| Q8CH77 | NAV1_MOUSE | Nav1 | Neuron navigator 1 (Pore membrane and/or filament-interacting-like protein 3) |

| | | | |
|--------|-------------|---------|--|
| Q05816 | FABP5_MOUSE | Fabp5 | Fatty acid-binding protein 5 (Epidermal-type fatty acid-binding protein, E-FABP) (Fatty acid-binding protein, epidermal) (Keratinocyte lipid-binding protein) (Psoriasis-associated fatty acid-binding protein homolog, PA-FABP) |
| O55236 | MCE1_MOUSE | Rngtt | mRNA-capping enzyme (HCE) (MCE1) [Includes: mRNA 5'-triphosphate monophosphatase, EC 3.6.1.74 (mRNA 5'-phosphatase); mRNA guanylyltransferase, EC 2.7.7.50 (GTP--RNA guanylyltransferase, GTase)] |
| Q3UUQ7 | PGAP1_MOUSE | Pgap1 | GPI inositol-deacylase, EC 3.1.-.- (Post-GPI attachment to proteins factor 1) |
| P52800 | EFNB2_MOUSE | Efnb2 | Ephrin-B2 (ELF-2) (EPH-related receptor tyrosine kinase ligand 5, LERK-5) (HTK ligand, HTK-L) |
| O70494 | SP3_MOUSE | Sp3 | Transcription factor Sp3 |
| Q8BWT5 | DIP2A_MOUSE | Dip2a | Disco-interacting protein 2 homolog A, DIP2 homolog A, EC 6.2.1.1 |
| A3KMP2 | TTC38_MOUSE | Ttc38 | Tetratricopeptide repeat protein 38, TPR repeat protein 38 |
| Q8VCR7 | ABHEB_MOUSE | Abhd14b | Putative protein-lysine deacylase ABHD14B, EC 2.3.1.- (Alpha/beta hydrolase domain-containing protein 14B, Abhydrolase domain-containing protein 14B) |
| Q69ZZ6 | TMCC1_MOUSE | Tmcc1 | Transmembrane and coiled-coil domains protein 1 |
| Q9D1P0 | RM13_MOUSE | Mrpl13 | 39S ribosomal protein L13, mitochondrial, L13mt, MRP-L13 |
| Q8R0T2 | ZN768_MOUSE | Znf768 | Zinc finger protein 768 |
| Q8BYH8 | CHD9_MOUSE | Chd9 | Chromodomain-helicase-DNA-binding protein 9, CHD-9, EC 3.6.4.12 (ATP-dependent helicase CHD9) (PPAR-alpha-interacting complex protein 320 kDa) (Peroxisomal proliferator-activated receptor A-interacting complex 320 kDa protein) |
| Q920P3 | BRNP1_MOUSE | Brinp1 | BMP/retinoic acid-inducible neural-specific protein 1 (Deleted in bladder cancer protein 1 homolog) |
| Q8K4Z3 | NNRE_MOUSE | Naxe | NAD(P)H-hydrate epimerase, EC 5.1.99.6 (Apolipoprotein A-I-binding protein, AI-BP) (NAD(P)HX epimerase) |
| Q61923 | KCNA6_MOUSE | Kcna6 | Potassium voltage-gated channel subfamily A member 6 (MK1.6) (Voltage-gated potassium channel subunit Kv1.6) |
| Q7TSI3 | PP6R1_MOUSE | Ppp6r1 | Serine/threonine-protein phosphatase 6 regulatory subunit 1 (SAPS domain family member 1) |
| Q9DBY5 | CBX6_MOUSE | Cbx6 | Chromobox protein homolog 6 |
| Q6PFX8 | RIMKA_MOUSE | Rimkla | N-acetylaspartylglutamate synthase A, NAAG synthetase A, NAAGS, EC 6.3.2.41 (N-acetylaspartylglutamylglutamate synthase A, EC 6.3.2.42) (Ribosomal protein S6 modification-like protein A) |

| | | | |
|--------|-------------|----------|--|
| P24529 | TY3H_MOUSE | Th | Tyrosine 3-monooxygenase, EC 1.14.16.2 (Tyrosine 3-hydroxylase, TH) |
| P17225 | PTBP1_MOUSE | Ptbp1 | Polypyrimidine tract-binding protein 1, PTB (Heterogeneous nuclear ribonucleoprotein I, hnRNP I) |
| O08811 | ERCC2_MOUSE | Ercc2 | General transcription and DNA repair factor III helicase subunit XPD, TFIIH subunit XPD, EC 3.6.4.12 (CXPB) (DNA excision repair protein ERCC-2) (DNA repair protein complementing XP-D cells) (Xeroderma pigmentosum group D-complementing protein) |
| Q6IFZ6 | K2C1B_MOUSE | Krt77 | Keratin, type II cytoskeletal 1b (Cytokeratin-1B, CK-1B) (Embryonic type II keratin-1) (Keratin-77, K77) (Type-II keratin Kb39) |
| Q64512 | PTN13_MOUSE | Ptpn13 | Tyrosine-protein phosphatase non-receptor type 13, EC 3.1.3.48 (PTP36) (Protein tyrosine phosphatase DPZPTP) (Protein tyrosine phosphatase PTP-BL) (Protein-tyrosine phosphatase RIP) |
| Q9DCA2 | RT11_MOUSE | Mrps11 | 28S ribosomal protein S11, mitochondrial, MRP-S11, S11mt |
| P97318 | DAB1_MOUSE | Dab1 | Disabled homolog 1 |
| Q9WTQ8 | TIM23_MOUSE | Timm23 | Mitochondrial import inner membrane translocase subunit Tim23 |
| Q9Z2A0 | PDPK1_MOUSE | Pdk1 | 3-phosphoinositide-dependent protein kinase 1, mPDK1, EC 2.7.11.1 |
| Q9QXG2 | RAE1_MOUSE | Chm | Rab proteins geranylgeranyltransferase component A 1 (Choroideremia protein homolog) (Rab escort protein 1, REP-1) |
| Q8VEK6 | ING3_MOUSE | Ing3 | Inhibitor of growth protein 3 (p47ING3) |
| Q8C0L8 | COG5_MOUSE | Cog5 | Conserved oligomeric Golgi complex subunit 5, COG complex subunit 5 (Component of oligomeric Golgi complex 5) |
| Q4QQM4 | P5111_MOUSE | Trp53i11 | Tumor protein p53-inducible protein 11 (Transformation related protein 53 inducible protein 11) (p53-induced gene 11 protein) |
| Q8VHJ5 | MARK1_MOUSE | Mark1 | Serine/threonine-protein kinase MARK1, EC 2.7.11.1, EC 2.7.11.26 (ELKL motif serine/threonine-protein kinase 3) (MAP/microtubule affinity-regulating kinase 1) (PAR1 homolog c, Par-1c, mPar-1c) |
| Q61733 | RT31_MOUSE | Mrps31 | 28S ribosomal protein S31, mitochondrial, MRP-S31, S31mt (Imogen 38) |
| Q810D6 | GRWD1_MOUSE | Grwd1 | Glutamate-rich WD repeat-containing protein 1 (Protein A301) |
| Q0II04 | NEBL_MOUSE | Nbl | Nebulette (Actin-binding Z-disk protein) |
| Q91X72 | HEMO_MOUSE | Hpx | Hemopexin |
| Q7M759 | AB17B_MOUSE | Abhd17b | Alpha/beta hydrolase domain-containing protein 17B, Abhydrolase domain-containing protein 17B, EC 3.1.2.22 |

| | | | |
|--------|-------------|----------|--|
| Q6ZQ93 | UBP34_MOUSE | Usp34 | Ubiquitin carboxyl-terminal hydrolase 34, EC 3.4.19.12 (Deubiquitinating enzyme 34) (Ubiquitin thioesterase 34) (Ubiquitin-specific-processing protease 34) |
| Q8R3C6 | RBM19_MOUSE | Rbm19 | Probable RNA-binding protein 19 (RNA-binding motif protein 19) |
| P51448 | RORA_MOUSE | Rora | Nuclear receptor ROR-alpha (Nuclear receptor RZR-alpha) (Nuclear receptor subfamily 1 group F member 1) (RAR-related orphan receptor A) (Retinoid-related orphan receptor-alpha) |
| Q80WG7 | TRI36_MOUSE | Trim36 | E3 ubiquitin-protein ligase Trim36, EC 2.3.2.27 (Acrosome RBCC protein) (Haprin) (RING-type E3 ubiquitin transferase TRIM36) (Tripartite motif-containing protein 36) |
| Q99PD7 | NCKX3_MOUSE | Slc24a3 | Sodium/potassium/calcium exchanger 3 (Na(+)/K(+)/Ca(2+)-exchange protein 3) (Solute carrier family 24 member 3) |
| P60603 | ROMO1_MOUSE | Romo1 | Reactive oxygen species modulator 1, ROS modulator 1 (Protein MGR2 homolog) |
| O08600 | NUCG_MOUSE | Endog | Endonuclease G, mitochondrial, Endo G, EC 3.1.30.- |
| Q3UUJ4 | STRAA_MOUSE | Strada | STE20-related kinase adapter protein alpha, STRAD alpha (STE20-related adapter protein) |
| Q80ZF8 | AGRB3_MOUSE | Adgrb3 | Adhesion G protein-coupled receptor B3 (Brain-specific angiogenesis inhibitor 3) |
| Q9ERY9 | ERG28_MOUSE | Erg28 | Ergosterol biosynthetic protein 28 homolog |
| Q6P4T0 | ATG2A_MOUSE | Atg2a | Autophagy-related protein 2 homolog A |
| A2ASZ8 | SCMC2_MOUSE | Slc25a25 | Calcium-binding mitochondrial carrier protein SCaMC-2 (Small calcium-binding mitochondrial carrier protein 2) (Solute carrier family 25 member 25) |
| Q91VW3 | SH3L3_MOUSE | Sh3bgrl3 | SH3 domain-binding glutamic acid-rich-like protein 3 |
| P97789 | XRN1_MOUSE | Xrn1 | 5'-3' exoribonuclease 1, mXRN1, EC 3.1.13.- (Protein Dhm2) (Strand-exchange protein 1 homolog) |
| Q9ESW4 | AGK_MOUSE | Agk | Acylglycerol kinase, mitochondrial, EC 2.7.1.107, EC 2.7.1.138, EC 2.7.1.94 (Multiple substrate lipid kinase, MuLK, Multi-substrate lipid kinase) |
| Q8BZX4 | SREK1_MOUSE | Srek1 | Splicing regulatory glutamine/lysine-rich protein 1 (Serine/arginine-rich-splicing regulatory protein 86, SRrp86) (Splicing factor, arginine/serine-rich 12) |
| Q921I9 | EXOS4_MOUSE | Exosc4 | Exosome complex component RRP41 (Exosome component 4) (Ribosomal RNA-processing protein 41) |
| Q6PDM1 | MSL1_MOUSE | Msl1 | Male-specific lethal 1 homolog, MSL-1 (Hampin) (Male-specific lethal 1-like 1, MSL1-like 1) (Male-specific lethal-1 homolog 1) |

| | | | |
|--------|-------------|----------|--|
| Q6GQS1 | SCMC3_MOUSE | Slc25a23 | Calcium-binding mitochondrial carrier protein SCaMC-3 (Small calcium-binding mitochondrial carrier protein 3) (Solute carrier family 25 member 23) |
| Q8BZS9 | DHX32_MOUSE | Dhx32 | Putative pre-mRNA-splicing factor ATP-dependent RNA helicase DHX32, EC 3.6.4.13 (DEAH box protein 32) (MuDDX32) |
| E1U8D0 | SOGA1_MOUSE | Soga1 | Protein SOGA1 (SOGA family member 1) (Suppressor of glucose by autophagy) (Suppressor of glucose, autophagy-associated protein 1) [Cleaved into: N-terminal form; C-terminal 80 kDa form, 80-kDa SOGA fragment] |
| O88992 | C1QRF_MOUSE | C1ql1 | C1q-related factor (C1q and tumor necrosis factor-related protein 14, C1q/TNF-related protein 14, CTRP14) (Complement component 1 Q subcomponent-like 1) |
| Q91VN1 | ZNF24_MOUSE | Znf24 | Zinc finger protein 24 (Hypomyelinated CNS protein) (Zinc finger protein 191) (Zinc finger protein ZF-12) |
| Q9D011 | MPLKI_MOUSE | Mplkip | M-phase-specific PLK1-interacting protein (TTD non-photosensitive 1 protein homolog) |
| O89001 | CBPD_MOUSE | Cpd | Carboxypeptidase D, EC 3.4.17.22 (Metallo-carboxypeptidase D) (gp180) |
| Q8BX17 | GEMI5_MOUSE | Gemin5 | Gem-associated protein 5, Gemin5 |
| Q8VDG6 | M3K21_MOUSE | Map3k21 | Mitogen-activated protein kinase kinase kinase 21, EC 2.7.11.25 (Mitogen-activated protein kinase kinase kinase MLK4) (Mixed lineage kinase 4) |
| O35609 | SCAM3_MOUSE | Scamp3 | Secretory carrier-associated membrane protein 3, Secretory carrier membrane protein 3 |
| Q80UY1 | CARME_MOUSE | Carnmt1 | Carnosine N-methyltransferase, EC 2.1.1.22 |
| Q8BRG8 | TM209_MOUSE | Tmem209 | Transmembrane protein 209 |
| Q9JKF1 | IQGA1_MOUSE | Iqgap1 | Ras GTPase-activating-like protein IQGAP1 |
| Q6PAL7 | AHDC1_MOUSE | Ahdc1 | AT-hook DNA-binding motif-containing protein 1 |
| P97479 | MYO7A_MOUSE | Myo7a | Unconventional myosin-VIIa |
| Q60780 | GAS7_MOUSE | Gas7 | Growth arrest-specific protein 7, GAS-7 |
| Q8BZ94 | ZMAT4_MOUSE | Zmat4 | Zinc finger matrin-type protein 4 |
| O88951 | LIN7B_MOUSE | Lin7b | Protein lin-7 homolog B, Lin-7B (Mammalian lin-seven protein 2, MALS-2) (Vertebrate lin-7 homolog 2, Veli-2) |
| P48168 | GLRB_MOUSE | Glrb | Glycine receptor subunit beta (Glycine receptor 58 kDa subunit) |

| | | | |
|--------|-------------|-----------|--|
| Q8CFE6 | S38A2_MOUSE | Slc38a2 | Sodium-coupled neutral amino acid transporter 2 (Amino acid transporter A2) (Solute carrier family 38 member 2) (System A amino acid transporter 2) (System A transporter 1) (System N amino acid transporter 2) |
| Q99L85 | ELP5_MOUSE | Elp5 | Elongator complex protein 5 (Dermal papilla-derived protein 6 homolog) (Retinoic acid-induced protein 12) |
| Q8BSZ2 | AP3S2_MOUSE | Ap3s2 | AP-3 complex subunit sigma-2 (AP-3 complex subunit sigma-3B) (Adaptor-related protein complex 3 subunit sigma-2) (Sigma-3B-adaptin, Sigma3B-adaptin) (Sigma-adaptin 3b) |
| Q9D2H6 | SP2_MOUSE | Sp2 | Transcription factor Sp2 |
| Q8K1K4 | CENPI_MOUSE | Cenpi | Centromere protein I, CENP-I (FSH primary response protein 1) (Follicle-stimulating hormone primary response protein) |
| Q8K2A7 | INT10_MOUSE | Ints10 | Integrator complex subunit 10, Int10 |
| Q99JF5 | MVD1_MOUSE | Mvd | Diphosphomevalonate decarboxylase, EC 4.1.1.33 (Mevalonate (diphospho)decarboxylase, MDDase) (Mevalonate pyrophosphate decarboxylase) |
| Q6P9J9 | ANO6_MOUSE | Ano6 | Anoctamin-6 (Small-conductance calcium-activated nonselective cation channel, SCAN channel) (Transmembrane protein 16F) |
| Q8BMC4 | NOP9_MOUSE | Nop9 | Nucleolar protein 9 (Pumilio domain-containing protein NOP9) |
| P62267 | RS23_MOUSE | Rps23 | 40S ribosomal protein S23 |
| P61979 | HNRPK_MOUSE | Hnrnpk | Heterogeneous nuclear ribonucleoprotein K, hnRNP K |
| Q8CGP2 | H2B1P_MOUSE | Hist1h2bp | Histone H2B type 1-P |
| O08583 | THOC4_MOUSE | Alyref | THO complex subunit 4, Tho4 (Ally of AML-1 and LEF-1) (Aly/REF export factor) (REF1-I) (RNA and export factor-binding protein 1) (Transcriptional coactivator Aly/REF) |
| Q9QYG0 | NDRG2_MOUSE | Ndrp2 | Protein NDRG2 (N-myc downstream-regulated gene 2 protein) (Protein Ndr2) |
| Q91V12 | BACH_MOUSE | Acot7 | Cytosolic acyl coenzyme A thioester hydrolase, EC 3.1.2.2 (Acyl-CoA thioesterase 7) (Brain acyl-CoA hydrolase, BACH) (CTE-IIa, CTE-II) (Long chain acyl-CoA thioester hydrolase) |
| P28481 | CO2A1_MOUSE | Col2a1 | Collagen alpha-1(II) chain (Alpha-1 type II collagen) [Cleaved into: Collagen alpha-1(II) chain; Chondrocalcin] |
| Q6A4J8 | UBP7_MOUSE | Usp7 | Ubiquitin carboxyl-terminal hydrolase 7, EC 3.4.19.12 (Deubiquitinating enzyme 7) (Herpesvirus-associated ubiquitin-specific protease, mHAUSP) (Ubiquitin thioesterase 7) (Ubiquitin-specific-processing protease 7) |

| | | | |
|--------|-------------|---------|--|
| Q8BTI8 | SRRM2_MOUSE | Srrm2 | Serine/arginine repetitive matrix protein 2 |
| P11087 | CO1A1_MOUSE | Col1a1 | Collagen alpha-1(I) chain (Alpha-1 type I collagen) |
| Q64487 | PTPRD_MOUSE | Ptprd | Receptor-type tyrosine-protein phosphatase delta, Protein-tyrosine phosphatase delta, R-PTP-delta, EC 3.1.3.48 |
| Q3UIL6 | PKHA7_MOUSE | Plekha7 | Pleckstrin homology domain-containing family A member 7, PH domain-containing family A member 7 (Heart adapter protein 1) |
| Q60715 | P4HA1_MOUSE | P4ha1 | Prolyl 4-hydroxylase subunit alpha-1, 4-PH alpha-1, EC 1.14.11.2 (Procollagen-proline,2-oxoglutarate-4-dioxygenase subunit alpha-1) |
| Q64524 | H2B2E_MOUSE | H2bc21 | Histone H2B type 2-E (H2B-clustered histone 21) (H2b 613) |
| Q9WV03 | FA50A_MOUSE | Fam50a | Protein FAM50A (Protein XAP-5) |
| Q9D646 | KRT34_MOUSE | Krt34 | Keratin, type I cuticular Ha4 (Hair keratin, type I Ha4) (Keratin-34, K34) |
| Q63739 | TP4A1_MOUSE | Ptp4a1 | Protein tyrosine phosphatase type IVA 1, EC 3.1.3.48 (Protein-tyrosine phosphatase 4a1) (Protein-tyrosine phosphatase of regenerating liver 1, PRL-1) |
| P52196 | THTR_MOUSE | Tst | Thiosulfate sulfurtransferase, EC 2.8.1.1 (Rhodanese) |
| Q61239 | FNTA_MOUSE | Fnta | Protein farnesyltransferase/geranylgeranyltransferase type-1 subunit alpha, EC 2.5.1.58, EC 2.5.1.59 (CAAX farnesyltransferase subunit alpha) (FTase-alpha) (Ras proteins prenyltransferase subunit alpha) (Type I protein geranyl-geranyltransferase subunit alpha, GGTase-I-alpha) |
| Q8BGC4 | PTGR3_MOUSE | Ptgr3 | Prostaglandin reductase-3, PTGR-3, EC 1.3.1.48 (15-oxoprostaglandin 13-reductase) (Zinc-binding alcohol dehydrogenase domain-containing protein 2) |
| Q91XF0 | PNPO_MOUSE | Pnpo | Pyridoxine-5'-phosphate oxidase, EC 1.4.3.5 (Pyridoxamine-phosphate oxidase) |
| P56135 | ATPK_MOUSE | Atp5mf | ATP synthase subunit f, mitochondrial (ATP synthase membrane subunit f) |
| Q01149 | CO1A2_MOUSE | Col1a2 | Collagen alpha-2(I) chain (Alpha-2 type I collagen) |
| E9PV24 | FIBA_MOUSE | Fga | Fibrinogen alpha chain [Cleaved into: Fibrinopeptide A; Fibrinogen alpha chain] |
| O54950 | AAKG1_MOUSE | Prkag1 | 5'-AMP-activated protein kinase subunit gamma-1, AMPK gamma1, AMPK subunit gamma-1, AMPKg |
| Q91Z92 | B3GT6_MOUSE | B3galt6 | Beta-1,3-galactosyltransferase 6, Beta-1,3-GalTase 6, Beta3Gal-T6, Beta3GalT6, EC 2.4.1.134 (GAG GalTII) (Galactosyltransferase II) (Galactosylxylosylprotein 3-beta-galactosyltransferase) (UDP-Gal:betaGal beta 1,3-galactosyltransferase polypeptide 6) |
| Q8BIF9 | ZN787_MOUSE | Znf787 | Zinc finger protein 787 |

| | | | |
|--------|-------------|---------|---|
| P59326 | YTHD1_MOUSE | Ythdf1 | YTH domain-containing family protein 1 (Dermatomyositis associated with cancer putative autoantigen 1 homolog, DACA-1 homolog) |
| Q9ES28 | ARHG7_MOUSE | Arhgef7 | Rho guanine nucleotide exchange factor 7 (Beta-Pix) (PAK-interacting exchange factor beta) (p85SPR) |
| O55137 | ACOT1_MOUSE | Acot1 | Acyl-coenzyme A thioesterase 1, Acyl-CoA thioesterase 1, EC 3.1.2.- (CTE-I) (Inducible cytosolic acyl-coenzyme A thioester hydrolase) (Long chain acyl-CoA thioester hydrolase, Long chain acyl-CoA hydrolase) (Palmitoyl-coenzyme A thioesterase, EC 3.1.2.2) |
| P63087 | PP1G_MOUSE | Ppp1cc | Serine/threonine-protein phosphatase PP1-gamma catalytic subunit, PP-1G, EC 3.1.3.16 (Protein phosphatase 1C catalytic subunit) |
| P40237 | CD82_MOUSE | Cd82 | CD82 antigen (C33 antigen) (IA4) (Inducible membrane protein R2) (Metastasis suppressor Kangai-1 homolog) (CD antigen CD82) |
| Q9R0N9 | SYT9_MOUSE | Syt9 | Synaptotagmin-9 (Synaptotagmin IX, SytIX) (Synaptotagmin V) |
| Q9CR70 | LAGE3_MOUSE | Lage3 | EKC/KEOPS complex subunit Lage3 (ITBA2 protein homolog) (L antigen family member 3) |
| Q9JJR8 | TMM9B_MOUSE | Tmem9b | Transmembrane protein 9B |
| O08997 | ATOX1_MOUSE | Atox1 | Copper transport protein ATOX1 (Metal transport protein ATX1) |
| P09055 | ITB1_MOUSE | Itgb1 | Integrin beta-1 (Fibronectin receptor subunit beta) (VLA-4 subunit beta) (CD antigen CD29) |
| Q8K337 | I5P2_MOUSE | Inpp5b | Type II inositol 1,4,5-trisphosphate 5-phosphatase, EC 3.1.3.36 (Inositol polyphosphate-5-phosphatase B) (Phosphoinositide 5-phosphatase, 5PTase) |
| O08908 | P85B_MOUSE | Pik3r2 | Phosphatidylinositol 3-kinase regulatory subunit beta, PI3-kinase regulatory subunit beta, PI3K regulatory subunit beta, PtdIns-3-kinase regulatory subunit beta (Phosphatidylinositol 3-kinase 85 kDa regulatory subunit beta, PI3-kinase subunit p85-beta, PtdIns-3-kinase regulatory subunit p85-beta) |
| E9Q5F9 | SETD2_MOUSE | Setd2 | Histone-lysine N-methyltransferase SETD2, EC 2.1.1.359 (Lysine N-methyltransferase 3A) (Protein-lysine N-methyltransferase SETD2, EC 2.1.1.-) (SET domain-containing protein 2) |
| Q7TN98 | CPEB4_MOUSE | Cpeb4 | Cytoplasmic polyadenylation element-binding protein 4, CPE-BP4, CPE-binding protein 4, mCPEB-4 |
| P62484 | ABI2_MOUSE | Abi2 | Abl interactor 2 (Abelson interactor 2, Abi-2) (Abl-binding protein 3, AblBP3) (Arg-binding protein 1, ArgBP1) |

| | | | |
|--------|-------------|----------|--|
| Q7TPD0 | INT3_MOUSE | Ints3 | Integrator complex subunit 3, Int3 (SOSS complex subunit A) (Sensor of single-strand DNA complex subunit A, SOSS-A, Sensor of ssDNA subunit A) |
| O70481 | UBR1_MOUSE | Ubr1 | E3 ubiquitin-protein ligase UBR1, EC 2.3.2.27 (N-recognin-1) (RING-type E3 ubiquitin transferase UBR1) (Ubiquitin-protein ligase E3-alpha-1) (Ubiquitin-protein ligase E3-alpha-I) |
| Q8BIS8 | CC126_MOUSE | Ccdc126 | Coiled-coil domain-containing protein 126 |
| A6H611 | MIPEP_MOUSE | Mipep | Mitochondrial intermediate peptidase, MIP, EC 3.4.24.59 |
| Q3TXU5 | DHYS_MOUSE | Dhps | Deoxyhypusine synthase, DHS, EC 2.5.1.46 |
| Q8BVU0 | LRCH3_MOUSE | Lrch3 | DISP complex protein LRCH3 (Leucine-rich repeat and calponin homology domain-containing protein 3) |
| F8VQB6 | MYO10_MOUSE | Myo10 | Unconventional myosin-X (Unconventional myosin-10) |
| P70207 | PLXA2_MOUSE | Plxna2 | Plexin-A2, Plex 2, Plexin-2 |
| Q924T3 | XRCC4_MOUSE | Xrcc4 | DNA repair protein XRCC4 (X-ray repair cross-complementing protein 4) [Cleaved into: Protein XRCC4, C-terminus, XRCC4/C] |
| Q9CRC9 | GNPI2_MOUSE | Gnpda2 | Glucosamine-6-phosphate isomerase 2, EC 3.5.99.6 (Glucosamine-6-phosphate deaminase 2, GNPDA 2, GlcN6P deaminase 2) |
| Q62413 | EPHA6_MOUSE | Epha6 | Ephrin type-A receptor 6, EC 2.7.10.1 (EPH homology kinase 2, EHK-2) |
| Q9JJA4 | WDR12_MOUSE | Wdr12 | Ribosome biogenesis protein WDR12 (WD repeat-containing protein 12) |
| Q61160 | FADD_MOUSE | Fadd | FAS-associated death domain protein (FAS-associating death domain-containing protein) (Mediator of receptor induced toxicity) |
| P07903 | ERCC1_MOUSE | Ercc1 | DNA excision repair protein ERCC-1 |
| Q62179 | SEM4B_MOUSE | Sema4b | Semaphorin-4B (Semaphorin-C, Sema C) |
| Q8BMG8 | MFTC_MOUSE | Slc25a32 | Mitochondrial folate transporter/carrier (Solute carrier family 25 member 32) |
| Q9D850 | TMM68_MOUSE | Tmem68 | Transmembrane protein 68 |
| Q99L20 | GSTT3_MOUSE | Gstt3 | Glutathione S-transferase theta-3, EC 2.5.1.18 |
| Q9CWD8 | NUBPL_MOUSE | Nubpl | Iron-sulfur protein NUBPL (Nucleotide-binding protein-like) |
| O89116 | VTI1A_MOUSE | Vti1a | Vesicle transport through interaction with t-SNAREs homolog 1A (Vesicle transport v-SNARE protein Vti1-like 2) (Vti1-rp2) |
| Q9DCZ1 | GMPR1_MOUSE | Gmpr | GMP reductase 1, GMPR 1, EC 1.7.1.7 (Guanosine 5'-monophosphate oxidoreductase 1, Guanosine monophosphate reductase 1) |
| O35459 | ECH1_MOUSE | Ech1 | Delta(3,5)-Delta(2,4)-dienoyl-CoA isomerase, mitochondrial, EC 5.3.3.- |

| | | | |
|--------|-------------|----------|--|
| Q9JME7 | TPC2L_MOUSE | Trappc2l | Trafficking protein particle complex subunit 2-like protein |
| Q9D720 | NSE1_MOUSE | Nsmce1 | Non-structural maintenance of chromosomes element 1 homolog, Non-SMC element 1 homolog, EC 2.3.2.27 |
| Q9CQ22 | LTOR1_MOUSE | Lamtor1 | Ragulator complex protein LAMTOR1 (Late endosomal/lysosomal adaptor and MAPK and MTOR activator 1) (Lipid raft adaptor protein p18) |
| Q91YP3 | DEOC_MOUSE | Dera | Deoxyribose-phosphate aldolase, DERA, EC 4.1.2.4 (2-deoxy-D-ribose 5-phosphate aldolase) (Phosphodeoxyriboaldolase, Deoxyriboaldolase) |
| Q91WE4 | CR032_MOUSE | | UPF0729 protein C18orf32 homolog |
| Q91VS7 | MGST1_MOUSE | Mgst1 | Microsomal glutathione S-transferase 1, Microsomal GST-1, EC 2.5.1.18 (Microsomal GST-I) |
| Q8R3Y8 | I2BP1_MOUSE | Irf2bp1 | Interferon regulatory factor 2-binding protein 1, IRF-2-binding protein 1, IRF-2BP1 (Probable E3 ubiquitin-protein ligase IRF2BP1, EC 2.3.2.27) (Probable RING-type E3 ubiquitin transferase IRF2BP1) |
| Q8K0C1 | IPO13_MOUSE | Ipo13 | Importin-13, Imp13 |
| Q8K078 | SO4A1_MOUSE | Slco4a1 | Solute carrier organic anion transporter family member 4A1 (Organic anion-transporting polypeptide E, OATP-E) (Sodium-independent organic anion transporter E) (Solute carrier family 21 member 12) |
| Q8CDM8 | FHI2A_MOUSE | Fhip2a | FHF complex subunit HOOK interacting protein 2A, FHIP2A |
| Q8BVZ5 | IL33_MOUSE | Il33 | Interleukin-33, IL-33 [Cleaved into: Interleukin-33(102-266); Interleukin-33(109-266)] |
| Q8BMD7 | MORC4_MOUSE | Morc4 | MORC family CW-type zinc finger protein 4 (Zinc finger CW-type coiled-coil domain protein 2) |
| Q8BFY6 | PEF1_MOUSE | Pef1 | Peflin (PEF protein with a long N-terminal hydrophobic domain) (Penta-EF hand domain-containing protein 1) |
| Q64191 | ASPG_MOUSE | Aga | N(4)-(beta-N-acetylglucosaminy)-L-asparaginase, EC 3.5.1.26 (Aspartylglucosaminidase, AGA) (Glycosylasparaginase) (N4-(N-acetyl-beta-glucosaminy)-L-asparagine amidase) [Cleaved into: Glycosylasparaginase alpha chain; Glycosylasparaginase beta chain] |
| Q60829 | PPR1B_MOUSE | Ppp1r1b | Protein phosphatase 1 regulatory subunit 1B (DARPP-32) (Dopamine- and cAMP-regulated neuronal phosphoprotein) |
| Q3UK78 | PCGF5_MOUSE | Pcgf5 | Polycomb group RING finger protein 5 (RING finger protein 159) |
| Q3U1T3 | BRM1L_MOUSE | Brms1l | Breast cancer metastasis-suppressor 1-like protein |

| | | | |
|--------|-------------|--------|---|
| O35682 | MYADM_MOUSE | Myadm | Myeloid-associated differentiation marker (Myeloid up-regulated protein) |
| Q8VD65 | PI3R4_MOUSE | Pik3r4 | Phosphoinositide 3-kinase regulatory subunit 4, PI3-kinase regulatory subunit 4, EC 2.7.11.1 |
| Q0PMG2 | MDGA1_MOUSE | Mdga1 | MAM domain-containing glycosylphosphatidylinositol anchor protein 1 |
| Q8BHL8 | PSMF1_MOUSE | Psmf1 | Proteasome inhibitor PI31 subunit |
| Q9JJI6 | PIGO_MOUSE | Pigo | GPI ethanolamine phosphate transferase 3, EC 2.-.- (Phosphatidylinositol-glycan biosynthesis class O protein, PIG-O) |
| Q91WM2 | HDHD5_MOUSE | Hdhd5 | Haloacid dehalogenase-like hydrolase domain-containing 5 (Cat eye syndrome critical region protein 5 homolog) |
| Q8BH43 | WASF2_MOUSE | Wasf2 | Actin-binding protein WASF2 (Protein WAVE-2) (Wiskott-Aldrich syndrome protein family member 2, WASP family protein member 2) |
| Q9JKB3 | YBOX3_MOUSE | Ybx3 | Y-box-binding protein 3 (Cold shock domain-containing protein A) (DNA-binding protein A) (Y-box protein 3) |
| Q9CWP8 | DPOD4_MOUSE | Pold4 | DNA polymerase delta subunit 4 (DNA polymerase delta subunit p12) |
| P35846 | FOLR1_MOUSE | Folr1 | Folate receptor alpha, FR-alpha (Folate receptor 1) (Folate-binding protein 1) |
| Q9Z1J2 | NEK4_MOUSE | Nek4 | Serine/threonine-protein kinase Nek4, EC 2.7.11.1 (Never in mitosis A-related kinase 4, NimA-related protein kinase 4) (Serine/threonine-protein kinase 2) |
| P56212 | ARP19_MOUSE | Arpp19 | cAMP-regulated phosphoprotein 19, ARPP-19 |
| O70572 | NSMA_MOUSE | Smpd2 | Sphingomyelin phosphodiesterase 2, EC 3.1.4.12 (Lyso-platelet-activating factor-phospholipase C, Lyso-PAF-PLC) (Neutral sphingomyelinase, N-SMase, nSMase) |
| Q99MP8 | BRAP_MOUSE | Brap | BRCA1-associated protein, EC 2.3.2.27 (BRAP2) (Impedes mitogenic signal propagation, IMP) (RING-type E3 ubiquitin transferase BRAP2) |
| P61963 | DCAF7_MOUSE | Dcaf7 | DDB1- and CUL4-associated factor 7 (WD repeat-containing protein 68) (WD repeat-containing protein An11 homolog) |
| Q9D7G4 | EURL_MOUSE | Eurl | Protein EURL homolog |
| Q6NS52 | DGKB_MOUSE | Dgkb | Diacylglycerol kinase beta, DAG kinase beta, EC 2.7.1.107 (Diglyceride kinase beta, DGK-beta) |
| Q9JM05 | PIAS4_MOUSE | Pias4 | E3 SUMO-protein ligase PIAS4, EC 2.3.2.27 (PIASy) (Protein inhibitor of activated STAT protein 4) (Protein inhibitor of activated STAT protein gamma, PIAS-gamma) |
| Q8K301 | DDX52_MOUSE | Ddx52 | Probable ATP-dependent RNA helicase DDX52, EC 3.6.4.13 (ATP-dependent RNA helicase ROK1-like) (DEAD box protein 52) |

| | | | |
|--------|-------------|----------|---|
| Q64096 | MCF2L_MOUSE | Mcf2l | Guanine nucleotide exchange factor DBS (DBL's big sister) (MCF2-transforming sequence-like protein) |
| A2AMT1 | BFSP1_MOUSE | Bfsp1 | Filensin (Beaded filament structural protein 1) (Lens fiber cell beaded-filament structural protein CP 95, CP95) [Cleaved into: Filensin C-terminal fragment; Filensin N-terminal fragment] |
| B1AZA5 | TM245_MOUSE | Tmem245 | Transmembrane protein 245 |
| Q8VC65 | NRM_MOUSE | Nrm | Nurim (Nuclear envelope membrane protein) (Nuclear rim protein) |
| Q9JJV0 | CRBA4_MOUSE | Cryba4 | Beta-crystallin A4 (Beta-A4 crystallin) |
| Q61214 | DYR1A_MOUSE | Dyrk1a | Dual specificity tyrosine-phosphorylation-regulated kinase 1A, EC 2.7.12.1 (Dual specificity YAK1-related kinase) (MP86) (Protein kinase minibrain homolog, MNBH) |
| Q9WVP6 | PAPOB_MOUSE | Papob | Poly(A) polymerase beta, PAP-beta, EC 2.7.7.19 (Polynucleotide adenylyltransferase beta) (Testis-specific poly(A) polymerase) |
| Q8BGU2 | CBLN2_MOUSE | Cbln2 | Cerebellin-2 |
| P97950 | RB33A_MOUSE | Rab33a | Ras-related protein Rab-33A (Small GTP-binding protein S10) |
| Q64362 | AKTIP_MOUSE | Aktip | AKT-interacting protein (FT1) (Fused toes protein) |
| Q8C8U0 | LIPB1_MOUSE | Ppfibp1 | Liprin-beta-1 (Protein tyrosine phosphatase receptor type f polypeptide-interacting protein-binding protein 1, PTPRF-interacting protein-binding protein 1) |
| Q8BXA5 | CLP1L_MOUSE | Clptm1l | Lipid scramblase CLPTM1L (Cisplatin resistance-related protein 9, CRR9p) (Cleft lip and palate transmembrane protein 1-like protein, CLPTM1-like protein) |
| Q8BVW0 | GANC_MOUSE | Ganc | Neutral alpha-glucosidase C, EC 3.2.1.20 |
| Q5HZI9 | S2551_MOUSE | Slc25a51 | Mitochondrial nicotinamide adenine dinucleotide transporter SLC25A51 (Mitochondrial NAD(+) transporter SLC25A51) (Mitochondrial carrier triple repeat protein 1) (Solute carrier family 25 member 51) |
| Q6PG95 | CRML_MOUSE | Cramp1 | Protein cramped-like (Cramped chromatin regulator homolog 1) (Hematological and neurological expressed 1-like protein) |
| Q02956 | KPCZ_MOUSE | Prkcz | Protein kinase C zeta type, EC 2.7.11.13 (nPKC-zeta) |
| Q9D7V2 | LYSM2_MOUSE | Lysmd2 | LysM and putative peptidoglycan-binding domain-containing protein 2 |
| Q9JK23 | PSMG1_MOUSE | Psmg1 | Proteasome assembly chaperone 1 (Down syndrome critical region protein 2 homolog) |
| P48377 | RFX1_MOUSE | Rfx1 | MHC class II regulatory factor RFX1 (Regulatory factor X 1) (Transcription factor RFX1) |

| | | | |
|--------|-------------|--------|--|
| Q80YR2 | FHI2B_MOUSE | Fhip2b | FHF complex subunit HOOK interacting protein 2B, FHIP2B (Retinoic acid-induced protein 16) |
| Q9D8P7 | TF3C6_MOUSE | Gtf3c6 | General transcription factor 3C polypeptide 6 (Transcription factor IIIC 35 kDa subunit, TFIIC 35 kDa subunit, TFIIC35) (Transcription factor IIIC subunit 6) |
| Q9R062 | GLYG_MOUSE | Gyg1 | Glycogenin-1, GN-1, GN1, EC 2.4.1.186 |
| Q9CS84 | NRX1A_MOUSE | Nrxn1 | Neurexin-1 (Neurexin I-alpha) (Neurexin-1-alpha) |
| Q6WVG3 | KCD12_MOUSE | Kctd12 | BTB/POZ domain-containing protein KCTD12 (Pfetin) (Predominantly fetal expressed T1 domain) |
| Q61234 | SNTA1_MOUSE | Snta1 | Alpha-1-syntrophin (59 kDa dystrophin-associated protein A1 acidic component 1) (Syntrophin-1) |
| Q8VEE0 | RPE_MOUSE | Rpe | Ribulose-phosphate 3-epimerase, EC 5.1.3.1 (Ribulose-5-phosphate-epimerase) |
| Q3V384 | AFG1L_MOUSE | Afg1l | AFG1-like ATPase, EC 3.6.-.- (Lactation elevated protein 1) |
| Q9DB26 | PHYD1_MOUSE | Phyhd1 | Phytanoyl-CoA dioxygenase domain-containing protein 1, Protein PHYHD1, EC 1.14.11.- |
| Q99KP3 | CRYL1_MOUSE | Cryl1 | Lambda-crystallin homolog, EC 1.1.1.45 (L-gulonate 3-dehydrogenase, Gul3DH) |
| Q3TGW2 | EED1_MOUSE | Eepd1 | Endonuclease/exonuclease/phosphatase family domain-containing protein 1 |
| Q9Z2Q2 | KNOP1_MOUSE | Knop1 | Lysine-rich nucleolar protein 1 (Testis-specific gene 118 protein) |
| Q61908 | CMC4_MOUSE | Cmc4 | Cx9C motif-containing protein 4 (Mature T-cell proliferation 1 neighbor protein) (Mature T-cell proliferation-1 type A, MTCP-1 type A) (Protein p8 MTCP-1, p8MTCP1) |
| Q0HA38 | TT21B_MOUSE | Ttc21b | Tetratricopeptide repeat protein 21B, TPR repeat protein 21B (Intraflagellar transport 139 homolog) (Tetratricopeptide repeat-containing hedgehog modulator 1) |
| Q9JHD2 | KAT2A_MOUSE | Kat2a | Histone acetyltransferase KAT2A, EC 2.3.1.48 (General control of amino acid synthesis protein 5-like 2) (Histone acetyltransferase GCN5, MmGCN5) (Histone glutaryltransferase KAT2A, EC 2.3.1.-) (Histone succinyltransferase KAT2A, EC 2.3.1.-) (Lysine acetyltransferase 2A) |
| Q3UIU2 | NDUB6_MOUSE | Ndufb6 | NADH dehydrogenase [ubiquinone] 1 beta subcomplex subunit 6 (Complex I-B17, CI-B17) (NADH-ubiquinone oxidoreductase B17 subunit) |
| Q921E6 | EED_MOUSE | Eed | Polycomb protein EED |
| Q7TPH6 | MYCB2_MOUSE | Mycbp2 | E3 ubiquitin-protein ligase MYCBP2, EC 2.3.2.33 (Myc-binding protein 2) (Pam/highwire/rpm-1 protein) (Protein Magellan) (Protein associated with Myc) |

| | | | |
|--------|-------------|---------|---|
| Q922S4 | PDE2A_MOUSE | Pde2a | cGMP-dependent 3',5'-cyclic phosphodiesterase, EC 3.1.4.17 (Cyclic GMP-stimulated phosphodiesterase, CGS-PDE, cGSPDE) |
| O08691 | ARGI2_MOUSE | Arg2 | Arginase-2, mitochondrial, EC 3.5.3.1 (Arginase II) (Kidney-type arginase) (Non-hepatic arginase) (Type II arginase) |
| Q6PDC0 | RUN3B_MOUSE | Rundc3b | RUN domain-containing protein 3B |
| Q91WE6 | CDKAL_MOUSE | Cdkal1 | Threonylcarbamoyladenine tRNA methylthiotransferase, EC 2.8.4.5 (CDK5 regulatory subunit-associated protein 1-like 1) (tRNA-t(6)A37 methylthiotransferase) |
| Q91WD1 | RPC4_MOUSE | Polr3d | DNA-directed RNA polymerase III subunit RPC4, RNA polymerase III subunit C4 (DNA-directed RNA polymerase III subunit D) |
| Q9WTS6 | TEN3_MOUSE | Tenm3 | Teneurin-3, Ten-3 (Protein Odd Oz/ten-m homolog 3) (Tenascin-M3, Ten-m3) (Teneurin transmembrane protein 3) |
| Q8C8T7 | ELFN1_MOUSE | Elfn1 | Protein ELFN1 (Extracellular leucine-rich repeat and fibronectin type-III domain-containing protein 1) (Protein phosphatase 1 regulatory subunit 28) |
| E9Q8I9 | FRY_MOUSE | Fry | Protein furry homolog |
| P22723 | GBRG2_MOUSE | Gabrg2 | Gamma-aminobutyric acid receptor subunit gamma-2 (GABA(A) receptor subunit gamma-2) |
| P23979 | 5HT3A_MOUSE | Htr3a | 5-hydroxytryptamine receptor 3A, 5-HT3-A, 5-HT3A (5-hydroxytryptamine receptor 3, 5-HT-3, 5-HT3R) (Serotonin receptor 3A) (Serotonin-gated ion channel receptor) |
| Q9CZV8 | FXL20_MOUSE | Fbxl20 | F-box/LRR-repeat protein 20 (F-box and leucine-rich repeat protein 20) (F-box/LRR-repeat protein 2-like) |
| Q2TBE6 | P4K2A_MOUSE | Pi4k2a | Phosphatidylinositol 4-kinase type 2-alpha, EC 2.7.1.67 (Phosphatidylinositol 4-kinase type II-alpha) |
| P81122 | IRS2_MOUSE | Irs2 | Insulin receptor substrate 2, IRS-2 (4PS) |
| O54788 | DFFB_MOUSE | Dffb | DNA fragmentation factor subunit beta, EC 3.-.-.- (Caspase-activated deoxyribonuclease, CAD, Caspase-activated DNase) (DNA fragmentation factor 40 kDa subunit, DFF-40) |
| A2A6A1 | GPTC8_MOUSE | Gpatch8 | G patch domain-containing protein 8 |
| Q8BHY8 | SNX14_MOUSE | Snx14 | Sorting nexin-14 |
| Q91WB4 | PKHF2_MOUSE | Plekhf2 | Pleckstrin homology domain-containing family F member 2, PH domain-containing family F member 2 |
| P28867 | KPCD_MOUSE | Prkcd | Protein kinase C delta type, EC 2.7.11.13 (Tyrosine-protein kinase PRKCD, EC 2.7.10.2) (nPKC-delta) [Cleaved into: Protein kinase C delta type regulatory subunit; |

| | | | |
|--------|-------------|----------|--|
| | | | Protein kinase C delta type catalytic subunit (Sphingosine-dependent protein kinase-1, SDK1)] |
| Q8BNY6 | NCS1_MOUSE | Ncs1 | Neuronal calcium sensor 1, NCS-1 (Frequenin homolog) |
| Q925E0 | SNTG2_MOUSE | Sntg2 | Gamma-2-syntrophin, G2SYN (Syntrophin-5, SYN5) |
| Q8BUN5 | SMAD3_MOUSE | Smad3 | Mothers against decapentaplegic homolog 3, MAD homolog 3, Mad3, Mothers against DPP homolog 3, mMad3 (SMAD family member 3, SMAD 3, Smad3) |
| Q8CI08 | SLAI2_MOUSE | Slain2 | SLAIN motif-containing protein 2 |
| Q80TM9 | NISCH_MOUSE | Nisch | Nischarin (Imidazoline receptor 1, I-1, IR1) (Imidazoline receptor I-1-like protein) (Imidazoline-1 receptor, IIR) |
| Q9CWS4 | INT11_MOUSE | Ints11 | Integrator complex subunit 11, Int11, EC 3.1.27.- (Cleavage and polyadenylation-specific factor 3-like protein, CPSF3-like protein) |
| Q6PDK2 | KMT2D_MOUSE | Kmt2d | Histone-lysine N-methyltransferase 2D, Lysine N-methyltransferase 2D, EC 2.1.1.364 (ALL1-related protein) (Myeloid/lymphoid or mixed-lineage leukemia protein 2) |
| P54797 | TNG2_MOUSE | Tango2 | Transport and Golgi organization 2 homolog (Ser/Thr-rich protein T10 in DGCR region) |
| Q8BL65 | ABLM2_MOUSE | Ablim2 | Actin-binding LIM protein 2, abLIM-2 (Actin-binding LIM protein family member 2) |
| Q6P9N1 | HYCCI_MOUSE | Fam126a | Hyccin (Down-regulated by CTNNB1 protein A) (Protein FAM126A) |
| Q8R0Y8 | S2542_MOUSE | Slc25a42 | Mitochondrial coenzyme A transporter SLC25A42 (Solute carrier family 25 member 42) |
| O35738 | KLF12_MOUSE | Klf12 | Krueppel-like factor 12 (Transcriptional repressor AP-2rep) |
| Q9CXC9 | ETV5_MOUSE | Etv5 | ETS translocation variant 5 |
| Q9ER73 | ELP4_MOUSE | Elp4 | Elongator complex protein 4 (PAX6 neighbor gene protein) |
| Q91YN9 | BAG2_MOUSE | Bag2 | BAG family molecular chaperone regulator 2, BAG-2 (Bcl-2-associated athanogene 2) |
| P58501 | PAXB1_MOUSE | Paxbp1 | PAX3- and PAX7-binding protein 1, PAX3/7BP (GC-rich sequence DNA-binding factor 1) |
| Q9CY34 | UB2FA_MOUSE | Ube2f | NEDD8-conjugating enzyme UBE2F, EC 2.3.2.34 (NEDD8 carrier protein UBE2F) (NEDD8 protein ligase UBE2F) (NEDD8-conjugating enzyme 2) (RING-type E3 NEDD8 transferase UBE2F) (Ubiquitin-conjugating enzyme E2 F) |
| P97452 | BOP1_MOUSE | Bop1 | Ribosome biogenesis protein BOP1 (Block of proliferation 1 protein) |

| | | | |
|--------|-------------|----------|--|
| Q9R0H0 | ACOX1_MOUSE | Acox1 | Peroxisomal acyl-coenzyme A oxidase 1, AOX, EC 1.3.3.6 (Palmitoyl-CoA oxidase) (Peroxisomal fatty acyl-CoA oxidase) (Straight-chain acyl-CoA oxidase) [Cleaved into: Peroxisomal acyl-CoA oxidase 1, A chain; Peroxisomal acyl-CoA oxidase 1, B chain; Peroxisomal acyl-CoA oxidase 1, C chain] |
| Q99N92 | RM27_MOUSE | Mrpl27 | 39S ribosomal protein L27, mitochondrial, L27mt, MRP-L27 |
| Q6GYP7 | RGPA1_MOUSE | Ralgapa1 | Ral GTPase-activating protein subunit alpha-1 (GAP-related-interacting partner to E12, GRIPE) (GTPase-activating RapGAP domain-like 1) (Tuberin-like protein 1) (p240) |
| D3Z2R5 | SELN_MOUSE | Selenon | Selenoprotein N, SelN |
| Q8C1D8 | IWS1_MOUSE | Iws1 | Protein IWS1 homolog (IWS1-like protein) |
| Q9D338 | RM19_MOUSE | Mrpl19 | 39S ribosomal protein L19, mitochondrial, L19mt, MRP-L19 |
| P31750 | AKT1_MOUSE | Akt1 | RAC-alpha serine/threonine-protein kinase, EC 2.7.11.1 (AKT1 kinase) (Protein kinase B, PKB) (Protein kinase B alpha, PKB alpha) (Proto-oncogene c-Akt) (RAC-PK-alpha) (Thymoma viral proto-oncogene) |
| Q8BVF2 | PDCL3_MOUSE | Pdcl3 | Phosducin-like protein 3 (Viral IAP-associated factor 1, VIAF-1) |
| Q9Z2F7 | BNI3L_MOUSE | Bnip3l | BCL2/adenovirus E1B 19 kDa protein-interacting protein 3-like (NIP3-like protein X, NIP3L) |
| Q8C147 | DOCK8_MOUSE | Dock8 | Dedicator of cytokinesis protein 8 |
| Q8BUL6 | PKHA1_MOUSE | Plekha1 | Pleckstrin homology domain-containing family A member 1, PH domain-containing family A member 1 (Tandem PH domain-containing protein 1, TAPP-1) |
| Q9DBY1 | SYVN1_MOUSE | Syvn1 | E3 ubiquitin-protein ligase synoviolin, EC 2.3.2.27 (RING-type E3 ubiquitin transferase synoviolin) (Synovial apoptosis inhibitor 1) |
| Q8R0L9 | TADA3_MOUSE | Tada3 | Transcriptional adapter 3 (ADA3 homolog, mADA3) (Transcriptional adapter 3-like, ADA3-like protein) |
| Q5EE38 | ACD_MOUSE | Acd | Adrenocortical dysplasia protein |
| Q07643 | CO9A2_MOUSE | Col9a2 | Collagen alpha-2(IX) chain |
| Q8CHP6 | PHC3_MOUSE | Phc3 | Polyhomeotic-like protein 3 |
| Q8VE52 | OGRL1_MOUSE | Ogfrl1 | Opioid growth factor receptor-like protein 1 |
| A2AWA9 | RBGP1_MOUSE | Rabgap1 | Rab GTPase-activating protein 1 (GAP and centrosome-associated protein) (Rab6 GTPase-activating protein GAPCenA) |
| Q9CR80 | FA32A_MOUSE | Fam32a | Protein FAM32A (Ovarian tumor associated gene 12, OTAG-12) |

| | | | |
|--------|-------------|----------|--|
| Q9CPR5 | RM15_MOUSE | Mrpl15 | 39S ribosomal protein L15, mitochondrial, L15mt, MRP-L15 |
| Q6P9Z1 | SMRD3_MOUSE | Smarcd3 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily D member 3 (60 kDa BRG-1/Brm-associated factor subunit C) (BRG1-associated factor 60C, BAF60C, mBAF60c) |
| Q6PGA0 | RCOR3_MOUSE | Rcor3 | REST corepressor 3 |
| Q91XE8 | TM205_MOUSE | Tmem205 | Transmembrane protein 205 |
| Q9DAZ9 | ANCHR_MOUSE | Zfyve19 | Abscission/NoCut checkpoint regulator, ANCHR (Zinc finger FYVE domain-containing protein 19) |
| Q922C1 | CS044_MOUSE | | Uncharacterized protein C19orf44 homolog |
| Q9JKK8 | ATR_MOUSE | Atr | Serine/threonine-protein kinase ATR, EC 2.7.11.1 (Ataxia telangiectasia and Rad3-related protein) |
| Q8R0Z5 | MFRN2_MOUSE | Slc25a28 | Mitoferrin-2 (Mitochondrial RNA-splicing protein 3/4 homolog, MRS3/4) (Mitochondrial iron transporter 2) (Solute carrier family 25 member 28) |
| Q9DCT5 | SDF2_MOUSE | Sdf2 | Stromal cell-derived factor 2, SDF-2 |
| Q8K2X3 | STN1_MOUSE | Stn1 | CST complex subunit STN1 (Alpha-accessory factor of 44 kDa, AAF-44, AAF44) (Oligonucleotide/oligosaccharide-binding fold-containing protein 1) (Suppressor of cdc thirteen homolog) |
| Q80ZK0 | RT10_MOUSE | Mrps10 | 28S ribosomal protein S10, mitochondrial, MRP-S10, S10mt |
| Q80XH1 | KXDL1_MOUSE | Kxd1 | KxDL motif-containing protein 1 |
| Q69ZP3 | PNKD_MOUSE | Pnkd | Probable hydrolase PNKD, EC 3.-.- (Myofibrillogenesis regulator 1, MR-1) (Paroxysmal nonkinesinogenic dyskinesia protein) |
| Q9JLJ1 | SELK_MOUSE | Selenok | Selenoprotein K, SelK |
| Q3TIR1 | TPC13_MOUSE | Trappc13 | Trafficking protein particle complex subunit 13 |
| Q7TPG7 | TAFA2_MOUSE | Tafa2 | Chemokine-like protein TAFA-2 |
| Q6PDM1 | MSL1_MOUSE | Msl1 | Male-specific lethal 1 homolog, MSL-1 (Hampin) (Male-specific lethal 1-like 1, MSL1-like 1) (Male-specific lethal-1 homolog 1) |
| Q8CD10 | MICU2_MOUSE | Micu2 | Calcium uptake protein 2, mitochondrial (EF-hand domain-containing family member A1) |
| Q6GQT6 | SCAP_MOUSE | Scap | Sterol regulatory element-binding protein cleavage-activating protein, SCAP, SREBP cleavage-activating protein |
| Q8BQR4 | KANL2_MOUSE | Kansl2 | KAT8 regulatory NSL complex subunit 2 (NSL complex protein NSL2) (Non-specific lethal 2 homolog) |

| | | | |
|--------|-------------|---------|--|
| Q80TN4 | DJC16_MOUSE | Dnajc16 | DnaJ homolog subfamily C member 16 |
| Q9D142 | NUD14_MOUSE | Nudt14 | Uridine diphosphate glucose pyrophosphatase NUDT14, UDPG pyrophosphatase, UGPPase, EC 3.6.1.45 (Nucleoside diphosphate-linked moiety X motif 14, Nudix motif 14) |
| Q3UYH7 | ARBK2_MOUSE | Adrbk2 | Beta-adrenergic receptor kinase 2, Beta-ARK-2, EC 2.7.11.15 |
| Q3UJV1 | CCD61_MOUSE | Ccdc61 | Centrosomal protein CCDC61 (Coiled-coil domain-containing protein 61) (VFL3 homolog) |
| P15307 | REL_MOUSE | Rel | Proto-oncogene c-Rel |
| Q8C863 | ITCH_MOUSE | Itch | E3 ubiquitin-protein ligase Itchy, EC 2.3.2.26 (HECT-type E3 ubiquitin transferase Itchy homolog) |
| Q400C8 | AMZ2_MOUSE | Amz2 | Archaeometzincin-2, EC 3.4.-.- (Archeobacterial metalloproteinase-like protein 2) |
| P0CG14 | DERPC_MOUSE | Derpc | Decreased expression in renal and prostate cancer protein |
| Q9D387 | LAMP5_MOUSE | Lamp5 | Lysosome-associated membrane glycoprotein 5 (Brain and dendritic cell-associated LAMP) (Brain-associated LAMP-like protein, BAD-LAMP) (Lysosome-associated membrane protein 5, LAMP-5) |
| Q6NS60 | FBX41_MOUSE | Fbxo41 | F-box only protein 41 |
| Q8BUV8 | GP107_MOUSE | Gpr107 | Protein GPR107 |
| Q8R2Y9 | SOSB1_MOUSE | Nabp2 | SOSS complex subunit B1 (Nucleic acid-binding protein 2) (Oligonucleotide/oligosaccharide-binding fold-containing protein 2B) (Sensor of single-strand DNA complex subunit B1) (Sensor of ssDNA subunit B1, SOSS-B1) (Single-stranded DNA-binding protein 1) |
| Q09XV5 | CHD8_MOUSE | Chd8 | Chromodomain-helicase-DNA-binding protein 8, CHD-8, EC 3.6.4.12 (ATP-dependent helicase CHD8) (Axis duplication inhibitor, Duplin) |
| Q8BRH4 | KMT2C_MOUSE | Kmt2c | Histone-lysine N-methyltransferase 2C, Lysine N-methyltransferase 2C, EC 2.1.1.364 (Myeloid/lymphoid or mixed-lineage leukemia protein 3 homolog) |
| Q3ULF4 | SPG7_MOUSE | Spg7 | Paraplegin, EC 3.4.24.- (Spastic paraplegia 7 protein) |
| Q80W68 | KIRR1_MOUSE | Kirrel1 | Kin of IRRE-like protein 1 (Kin of irregular chiasm-like protein 1) (Nephrin-like protein 1) |
| Q9D7E3 | OVCA2_MOUSE | Ovca2 | Esterase OVCA2, EC 3.1.2.- (Ovarian cancer-associated gene 2 protein homolog) |
| P13634 | CAH1_MOUSE | Ca1 | Carbonic anhydrase 1, EC 4.2.1.1 (Carbonate dehydratase I) (Carbonic anhydrase I, CA-I) |

| | | | |
|--------|-------------|----------|---|
| Q9CQ62 | DECR_MOUSE | Decr1 | 2,4-dienoyl-CoA reductase [(3E)-enoyl-CoA-producing], mitochondrial, EC 1.3.1.124 (2,4-dienoyl-CoA reductase [NADPH], 4-enoyl-CoA reductase [NADPH]) |
| P29416 | HEXA_MOUSE | Hexa | Beta-hexosaminidase subunit alpha, EC 3.2.1.52 (Beta-N-acetylhexosaminidase subunit alpha, Hexosaminidase subunit A) (N-acetyl-beta-glucosaminidase subunit alpha) |
| P52482 | UB2E1_MOUSE | Ube2e1 | Ubiquitin-conjugating enzyme E2 E1, EC 2.3.2.23 ((E3-independent) E2 ubiquitin-conjugating enzyme E1, EC 2.3.2.24) (E2 ubiquitin-conjugating enzyme E1) (UbcM3) (Ubiquitin carrier protein E1) (Ubiquitin-protein ligase E1) |
| Q9CQW0 | EMC6_MOUSE | Emc6 | ER membrane protein complex subunit 6 (Transmembrane protein 93) |
| P09925 | SURF1_MOUSE | Surf1 | Surfeit locus protein 1 |
| Q3V036 | CCD27_MOUSE | Ccdc27 | Coiled-coil domain-containing protein 27 |
| Q9R0Q9 | MPU1_MOUSE | Mpdu1 | Mannose-P-dolichol utilization defect 1 protein (Suppressor of Lec15 and Lec35 glycosylation mutation homolog, SL15) |
| Q91X96 | MSS4_MOUSE | Rabif | Guanine nucleotide exchange factor MSS4 (Rab-interacting factor) |
| Q80U40 | RIMB2_MOUSE | Rimbp2 | RIMS-binding protein 2, RIM-BP2 |
| Q9D2N9 | VP33A_MOUSE | Vps33a | Vacuolar protein sorting-associated protein 33A |
| P27681 | GBRG3_MOUSE | Gabrg3 | Gamma-aminobutyric acid receptor subunit gamma-3 (GABA(A) receptor subunit gamma-3) |
| Q8CGB6 | TNS2_MOUSE | Tns2 | Tensin-2, EC 3.1.3.48 (C1 domain-containing phosphatase and tensin homolog, C1-TEN) (Tensin-like C1 domain-containing phosphatase) |
| Q9QUH0 | GLRX1_MOUSE | Glrx | Glutaredoxin-1 (Thioltransferase-1, TTase-1) |
| Q80TJ1 | CAPS1_MOUSE | Cadps | Calcium-dependent secretion activator 1 (Calcium-dependent activator protein for secretion 1, CAPS-1) |
| G5E8K5 | ANK3_MOUSE | Ank3 | Ankyrin-3, ANK-3 (Ankyrin-G) |
| Q9JIX8 | ACINU_MOUSE | Acin1 | Apoptotic chromatin condensation inducer in the nucleus, Acinus |
| O08532 | CA2D1_MOUSE | Cacna2d1 | Voltage-dependent calcium channel subunit alpha-2/delta-1 (Voltage-gated calcium channel subunit alpha-2/delta-1) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-1; Voltage-dependent calcium channel subunit delta-1] |
| Q80TZ3 | AUXI_MOUSE | Dnajc6 | Putative tyrosine-protein phosphatase auxilin, EC 3.1.3.48 (DnaJ homolog subfamily C member 6) |
| Q8R5M8 | CADM1_MOUSE | Cadm1 | Cell adhesion molecule 1 (Immunoglobulin superfamily member 4, IgSF4) (Nectin-like protein 2, NECL-2) (Spermatogenic immunoglobulin superfamily, SgIgSF) |

| | | | |
|--------|-------------|---------|---|
| | | | (Synaptic cell adhesion molecule, SynCAM) (Tumor suppressor in lung cancer 1, TSLC-1) |
| Q58A65 | JIP4_MOUSE | Spag9 | C-Jun-amino-terminal kinase-interacting protein 4, JIP-4, JNK-interacting protein 4 (JNK-associated leucine-zipper protein, JLP) (JNK/SAPK-associated protein 2, JSAP2) (Mitogen-activated protein kinase 8-interacting protein 4) (Sperm-associated antigen 9) |
| Q8R001 | MARE2_MOUSE | Mapre2 | Microtubule-associated protein RP/EB family member 2 (APC-binding protein EB2) (End-binding protein 2, EB2) |
| Q9QZQ1 | AFAD_MOUSE | Afdn | Afadin (Afadin adherens junction formation factor) (Protein Af-6) |
| Q8BGN8 | SYNPR_MOUSE | Synpr | Synaptoporin |
| P60762 | MO4L1_MOUSE | Morf4l1 | Mortality factor 4-like protein 1 (MORF-related gene 15 protein) (Testis-expressed gene 189 protein) (Transcription factor-like protein MRG15) |
| Q9D2U9 | H2B3A_MOUSE | H2bu2 | H2B.U histone 2 (Histone H2B type 3-A) |
| Q60634 | FLOT2_MOUSE | Flot2 | Flotillin-2 (Epidermal surface antigen, ESA) (Membrane component chromosome 17 surface marker 1 homolog) |
| Q9D1N9 | RM21_MOUSE | Mrpl21 | 39S ribosomal protein L21, mitochondrial, L21mt, MRP-L21 |
| Q9D2D7 | ZN687_MOUSE | Znf687 | Zinc finger protein 687 |
| Q640L3 | CCPG1_MOUSE | Ccpg1 | Cell cycle progression protein 1 |
| P97493 | THIOM_MOUSE | Txn2 | Thioredoxin, mitochondrial, MTRX, Mt-Trx (Thioredoxin-2) |
| P21995 | EMB_MOUSE | Emb | Embigin (Teratocarcinoma glycoprotein Gp-70) |
| O70422 | TF2H4_MOUSE | Gtf2h4 | General transcription factor IIH subunit 4 (Basic transcription factor 2 52 kDa subunit, BTF2 p52) (General transcription factor IIH polypeptide 4) (TFIIH basal transcription factor complex p52 subunit) |
| Q8C5L3 | CNOT2_MOUSE | Cnot2 | CCR4-NOT transcription complex subunit 2 (CCR4-associated factor 2) |
| Q64674 | SPEE_MOUSE | Srm | Spermidine synthase, SPDSY, EC 2.5.1.16 (Putrescine aminopropyltransferase) |
| Q9DAA6 | EXOS1_MOUSE | Exosc1 | Exosome complex component CSL4 (Exosome component 1) |
| E9PZM4 | CHD2_MOUSE | Chd2 | Chromodomain-helicase-DNA-binding protein 2, CHD-2, EC 3.6.4.12 (ATP-dependent helicase CHD2) |
| Q6PDX6 | RN220_MOUSE | Rnf220 | E3 ubiquitin-protein ligase Rnf220, EC 2.3.2.27 (RING finger protein 220) (RING-type E3 ubiquitin transferase Rnf220) |
| Q8BG18 | NECA1_MOUSE | Necab1 | N-terminal EF-hand calcium-binding protein 1, EF-hand calcium-binding protein 1 |

| | | | |
|--------|-------------|----------|--|
| Q8K3Z9 | PO121_MOUSE | Pom121 | Nuclear envelope pore membrane protein POM 121 (Nucleoporin Nup121) (Pore membrane protein of 121 kDa) |
| O54786 | DFFA_MOUSE | Dffa | DNA fragmentation factor subunit alpha (DNA fragmentation factor 45 kDa subunit, DFF-45) (Inhibitor of CAD, ICAD) |
| Q8CHX7 | RFTN2_MOUSE | Rftn2 | Raftlin-2 (Raft-linking protein 2) |
| Q921X6 | RPC6_MOUSE | Polr3f | DNA-directed RNA polymerase III subunit RPC6, RNA polymerase III subunit C6 (DNA-directed RNA polymerase III subunit F) |
| P40336 | VP26A_MOUSE | Vps26a | Vacuolar protein sorting-associated protein 26A (H<beta>58 protein, H beta 58) (Vesicle protein sorting 26A, mVPS26) |
| Q8BRB7 | KAT6B_MOUSE | Kat6b | Histone acetyltransferase KAT6B, EC 2.3.1.48 (MOZ, YBF2/SAS3, SAS2 and TIP60 protein 4, MYST-4) (Protein querkopf) |
| Q61037 | TSC2_MOUSE | Tsc2 | Tuberin (Tuberous sclerosis 2 protein homolog) |
| Q5SSL4 | ABR_MOUSE | Abr | Active breakpoint cluster region-related protein |
| Q8R092 | CA043_MOUSE | | Protein C1orf43 homolog |
| Q8C7V8 | CC134_MOUSE | Ccdc134 | Coiled-coil domain-containing protein 134 |
| P58269 | DPF3_MOUSE | Dpf3 | Zinc finger protein DPF3 (BRG1-associated factor 45C, BAF45C) (Zinc finger protein cer-d4) |
| Q8R502 | LRC8C_MOUSE | Lrrc8c | Volume-regulated anion channel subunit LRRC8C (Factor for adipocyte differentiation 158) (Leucine-rich repeat-containing protein 8C) |
| Q9DA32 | SUN5_MOUSE | Sun5 | SUN domain-containing protein 5 (Sperm-associated antigen 4-like protein) |
| B0V2N1 | PTPRS_MOUSE | Ptprs | Receptor-type tyrosine-protein phosphatase S, R-PTP-S, EC 3.1.3.48 (PTPNU-3) (Receptor-type tyrosine-protein phosphatase sigma, R-PTP-sigma) |
| Q9R0X0 | MED20_MOUSE | Med20 | Mediator of RNA polymerase II transcription subunit 20 (Mediator complex subunit 20) (TRF-proximal protein homolog) |
| Q9JI13 | SAS10_MOUSE | Utp3 | Something about silencing protein 10 (Charged amino acid-rich leucine zipper 1, Crl-1) (Disrupter of silencing SAS10) (UTP3 homolog) |
| Q9DBN4 | P33MX_MOUSE | P33monox | Putative monooxygenase p33MONOX, EC 1.-.-.- |
| Q8VE88 | F1142_MOUSE | Fam114a2 | Protein FAM114A2 |
| P84096 | RHOG_MOUSE | Rhog | Rho-related GTP-binding protein RhoG (Sid 10750) |
| Q8C4Y3 | NELFB_MOUSE | Nelfb | Negative elongation factor B, NELF-B (Cofactor of BRCA1) |
| P25425 | PO2F1_MOUSE | Pou2f1 | POU domain, class 2, transcription factor 1 (NF-A1) (Octamer-binding protein 1, Oct-1) (Octamer-binding transcription factor 1, OTF-1) |

| | | | |
|--------|-------------|----------|---|
| Q3U2V3 | NUD18_MOUSE | Nudt18 | 8-oxo-dGDP phosphatase NUDT18, EC 3.6.1.58 (2-hydroxy-dADP phosphatase) (7,8-dihydro-8-oxoguanine phosphatase) (MutT homolog 3) (Nucleoside diphosphate-linked moiety X motif 18, Nudix motif 18) |
| Q9QZ49 | UBXN8_MOUSE | Ubxn8 | UBX domain-containing protein 8 (Reproduction 8 protein, Rep-8 protein) (UBX domain-containing protein 6) |
| Q8BGF3 | DAA10_MOUSE | Dnaaf10 | Dynein axonemal assembly factor 10 (WD repeat-containing protein 92) (WD repeat-containing protein Monad) |
| P62331 | ARF6_MOUSE | Arf6 | ADP-ribosylation factor 6, EC 3.6.5.2 |
| Q8C4V1 | RHG24_MOUSE | Arhgap24 | Rho GTPase-activating protein 24 (Rho-type GTPase-activating protein 24) |
| Q07802 | COE1_MOUSE | Ebf1 | Transcription factor COE1, O/E-1, OE-1 (Early B-cell factor) |
| Q03147 | CDK7_MOUSE | Cdk7 | Cyclin-dependent kinase 7, EC 2.7.11.22, EC 2.7.11.23 (39 kDa protein kinase, P39 Mo15) (CDK-activating kinase) (CR4 protein kinase, CRK4) (Cell division protein kinase 7) (Protein-tyrosine kinase MPK-7) (TFIIH basal transcription factor complex kinase subunit) |
| P97367 | MEIS2_MOUSE | Meis2 | Homeobox protein Meis2 (Meis1-related protein 1) |
| Q62203 | SF3A2_MOUSE | Sf3a2 | Splicing factor 3A subunit 2 (SF3a66) (Spliceosome-associated protein 62, SAP 62) |
| P61514 | RL37A_MOUSE | Rpl37a | 60S ribosomal protein L37a |
| Q9CQ60 | 6PGL_MOUSE | Pgls | 6-phosphogluconolactonase, 6PGL, EC 3.1.1.31 |
| Q811L6 | MAST4_MOUSE | Mast4 | Microtubule-associated serine/threonine-protein kinase 4, EC 2.7.11.1 |
| Q8BGT1 | FLRT3_MOUSE | Flrt3 | Leucine-rich repeat transmembrane protein FLRT3 (Fibronectin leucine rich transmembrane protein 3) |
| Q6GQU6 | LIGO3_MOUSE | Lingo3 | Leucine-rich repeat and immunoglobulin-like domain-containing nogo receptor-interacting protein 3 (Leucine-rich repeat neuronal protein 6B) |
| Q8R149 | BUD13_MOUSE | Bud13 | BUD13 homolog |
| Q8BQP9 | R7BP_MOUSE | Rgs7bp | Regulator of G-protein signaling 7-binding protein (R7 family-binding protein) |
| Q3UHD1 | AGRB1_MOUSE | Adgrb1 | Adhesion G protein-coupled receptor B1 (Brain-specific angiogenesis inhibitor 1) [Cleaved into: Vasculostatin-120, Vstat120; Vasculostatin-40, Vstat-40] |
| Q9D114 | MESH1_MOUSE | Hddc3 | Guanosine-3',5'-bis(diphosphate) 3'-pyrophosphohydrolase MESH1, EC 3.1.7.2 (HD domain-containing protein 3) (Metazoan SpoT homolog 1, MESH1) (Penta-phosphate guanosine-3'-pyrophosphohydrolase, (ppGpp)ase) |

| | | | |
|--------|-------------|--------|---|
| Q9D7I5 | LHPP_MOUSE | Lhpp | Phospholysine phosphohistidine inorganic pyrophosphate phosphatase, EC 3.1.3.-, EC 3.6.1.1 |
| Q8K2I5 | LYRM4_MOUSE | Lym4 | LYR motif-containing protein 4 |
| P54846 | NRL_MOUSE | Nrl | Neural retina-specific leucine zipper protein, NRL |
| Q7TSQ8 | PDPR_MOUSE | Pdpr | Pyruvate dehydrogenase phosphatase regulatory subunit, mitochondrial, PDPr |
| Q62442 | VAMP1_MOUSE | Vamp1 | Vesicle-associated membrane protein 1, VAMP-1 (Synaptobrevin-1) |
| Q9R0W9 | ACHA6_MOUSE | Chrna6 | Neuronal acetylcholine receptor subunit alpha-6 |
| Q62028 | PLA2R_MOUSE | Pla2r1 | Secretory phospholipase A2 receptor, PLA2-R, PLA2R (180 kDa secretory phospholipase A2 receptor) (M-type receptor) [Cleaved into: Soluble secretory phospholipase A2 receptor, Soluble PLA2-R, Soluble PLA2R] |
| Q99PP7 | TRI33_MOUSE | Trim33 | E3 ubiquitin-protein ligase TRIM33, EC 2.3.2.27 (Ectodermin homolog) (RING-type E3 ubiquitin transferase TRIM33) (Transcription intermediary factor 1-gamma, TIF1-gamma) (Tripartite motif-containing protein 33) |
| P54116 | STOM_MOUSE | Stom | Stomatin (Erythrocyte band 7 integral membrane protein) (Erythrocyte membrane protein band 7.2) (Protein 7.2b) |
| Q8CE33 | KLH11_MOUSE | Klhl11 | Kelch-like protein 11 |
| Q05860 | FMN1_MOUSE | Fmn1 | Formin-1 (Limb deformity protein) |
| Q8CA71 | SHSA4_MOUSE | Shisa4 | Protein shisa-4 (Transmembrane protein 58) |
| Q5DU41 | LRC8B_MOUSE | Lrrc8b | Volume-regulated anion channel subunit LRRC8B (Leucine-rich repeat-containing protein 8B) |
| O35710 | NOCT_MOUSE | Noct | Nocturnin, EC 3.1.3.108 (Carbon catabolite repression 4-like protein) |
| Q8C7D2 | CRBN_MOUSE | Crbn | Protein cereblon, Protein PiL |
| P13808 | B3A2_MOUSE | Slc4a2 | Anion exchange protein 2, AE 2, Anion exchanger 2 (Band 3-related protein, B3RP) (Non-erythroid band 3-like protein) (Solute carrier family 4 member 2) |
| O35607 | BMPR2_MOUSE | Bmpr2 | Bone morphogenetic protein receptor type-2, BMP type-2 receptor, BMPR-2, EC 2.7.11.30 (BRK-3) (Bone morphogenetic protein receptor type II, BMP type II receptor, BMPR-II) |
| Q9JIH2 | NUP50_MOUSE | Nup50 | Nuclear pore complex protein Nup50 (50 kDa nucleoporin) (Nuclear pore-associated protein 60 kDa-like) (Nucleoporin Nup50) |
| Q9CR60 | GOT1B_MOUSE | Golt1b | Vesicle transport protein GOT1B (Golgi transport 1 homolog B) |

| | | | |
|--------|-------------|---------|---|
| Q8R3E3 | WIPI1_MOUSE | Wipi1 | WD repeat domain phosphoinositide-interacting protein 1, WIPI-1 (WD40 repeat protein interacting with phosphoinositides of 49 kDa, WIPI 49 kDa) |
| Q9CYN2 | SPCS2_MOUSE | Spcs2 | Signal peptidase complex subunit 2 (Microsomal signal peptidase 25 kDa subunit, SPase 25 kDa subunit) |
| Q9CPW0 | CNTP2_MOUSE | Cntnap2 | Contactin-associated protein-like 2 (Cell recognition molecule Caspr2) |
| Q8K4P0 | WDR33_MOUSE | Wdr33 | pre-mRNA 3' end processing protein WDR33 (WD repeat-containing protein 33) (WD repeat-containing protein of 146 kDa) |
| Q8BHJ5 | TBL1R_MOUSE | Tbl1xr1 | F-box-like/WD repeat-containing protein TBL1XR1 (Nuclear receptor corepressor/HDAC3 complex subunit TBLR1) (TBL1-related protein 1) (Transducin beta-like 1X-related protein 1) |
| P22907 | HEM3_MOUSE | Hmbs | Porphobilinogen deaminase, PBG-D, EC 2.5.1.61 (Hydroxymethylbilane synthase, HMBS) (Pre-uroporphyrinogen synthase) |
| Q921J4 | UBE2S_MOUSE | Ube2s | Ubiquitin-conjugating enzyme E2 S, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme S) (Ubiquitin carrier protein S) (Ubiquitin-conjugating enzyme E2-24 kDa) (Ubiquitin-conjugating enzyme E2-EPF5) (Ubiquitin-protein ligase S) |
| P15327 | PMGE_MOUSE | Bpgm | Bisphosphoglycerate mutase, BPGM, EC 5.4.2.4 (2,3-bisphosphoglycerate mutase, erythrocyte) (2,3-bisphosphoglycerate synthase, EC 5.4.2.11) (BPG-dependent PGAM) |
| Q62158 | TRI27_MOUSE | Trim27 | Zinc finger protein RFP, EC 2.3.2.27 (RING-type E3 ubiquitin transferase TRIM27) (Ret finger protein) (Tripartite motif-containing protein 27) |
| Q8C5P5 | NT5D1_MOUSE | Nt5dc1 | 5'-nucleotidase domain-containing protein 1, EC 3.1.3.- (Cytosolic 5'-nucleotidase II-like protein 1) |
| Q8VDY9 | CAAP1_MOUSE | Caap1 | Caspase activity and apoptosis inhibitor 1 (Conserved anti-apoptotic protein, CAAP) |
| Q8K441 | ABCA6_MOUSE | Abca6 | ATP-binding cassette sub-family A member 6, EC 7.6.2.- |
| Q9Z1E4 | GYS1_MOUSE | Gys1 | Glycogen [starch] synthase, muscle, EC 2.4.1.11 |
| Q9D975 | SRXN1_MOUSE | Srxn1 | Sulfiredoxin-1, EC 1.8.98.2 (Neoplastic progression protein 3) |
| Q8BW22 | CREST_MOUSE | Ss1811 | Calcium-responsive transactivator (SS18-like protein 1) |
| Q3TBT3 | STING_MOUSE | Sting1 | Stimulator of interferon genes protein, mSTING (Endoplasmic reticulum interferon stimulator, ERIS) (Mediator of IRF3 activation, MMITA) (Transmembrane protein 173) |
| P62342 | SELT_MOUSE | Selenot | Thioredoxin reductase-like selenoprotein T, SelT, EC 1.8.1.9 |

| | | | |
|--------|-------------|----------|---|
| Q8K097 | LFG2_MOUSE | Faim2 | Protein lifeguard 2 (Fas apoptotic inhibitory molecule 2) (Neural membrane protein 35) |
| Q8C1S0 | MED19_MOUSE | Med19 | Mediator of RNA polymerase II transcription subunit 19 (Mediator complex subunit 19) |
| Q5SUC9 | SCO1_MOUSE | Sco1 | Protein SCO1 homolog, mitochondrial |
| Q8CE96 | TRM6_MOUSE | Trmt6 | tRNA (adenine(58)-N(1))-methyltransferase non-catalytic subunit TRM6 (mRNA methyladenosine-N(1)-methyltransferase non-catalytic subunit TRM6) (tRNA(m1A58)-methyltransferase subunit TRM6, tRNA(m1A58)MTase subunit TRM6) |
| Q8BMS4 | COQ3_MOUSE | Coq3 | Ubiquinone biosynthesis O-methyltransferase, mitochondrial (3-demethylubiquinol 3-O-methyltransferase, EC 2.1.1.64) (Polyprenyldihydroxybenzoate methyltransferase, EC 2.1.1.114) |
| Q3TC46 | PATL1_MOUSE | Pat1l | Protein PAT1 homolog 1 (PAT1-like protein 1) (Protein PAT1 homolog b, Pat1b) |
| Q80UP5 | AN13A_MOUSE | Ankrd13a | Ankyrin repeat domain-containing protein 13A |
| Q9JM14 | NT5C_MOUSE | Nt5c | 5'(3')-deoxyribonucleotidase, cytosolic type, EC 3.1.3.- (Cytosolic 5',3'-pyrimidine nucleotidase) (Deoxy-5'-nucleotidase 1, dNT-1) |
| Q32NY4 | CNNM3_MOUSE | Cnm3 | Metal transporter CNNM3 (Ancient conserved domain-containing protein 3, mACDP3) (Cyclin-M3) |
| Q9WVL2 | STAT2_MOUSE | Stat2 | Signal transducer and activator of transcription 2 |
| O35492 | CLK3_MOUSE | Clk3 | Dual specificity protein kinase CLK3, EC 2.7.12.1 (CDC-like kinase 3) |
| Q8CGC4 | LS14B_MOUSE | Lsm14b | Protein LSM14 homolog B (RNA-associated protein 55B, mRAP55B) |
| Q99MB7 | RN141_MOUSE | Rnf141 | RING finger protein 141 (Zinc finger protein 230) |
| Q9WU01 | KHDR2_MOUSE | Khdrbs2 | KH domain-containing, RNA-binding, signal transduction-associated protein 2 (Sam68-like mammalian protein 1, SLM-1, mSLM-1) |
| P19324 | SERPH_MOUSE | Serpinh1 | Serpin H1 (47 kDa heat shock protein) (Collagen-binding protein, Colligin) (Serine protease inhibitor J6) |
| Q5DQR4 | STB5L_MOUSE | Stxbp5l | Syntaxin-binding protein 5-like (Lethal(2) giant larvae protein homolog 4) (Tomosyn-2) |
| Q8BMB3 | IF4E2_MOUSE | Eif4e2 | Eukaryotic translation initiation factor 4E type 2, eIF-4E type 2, eIF4E type 2, eIF4E-2, mRNA cap-binding protein type 2 (Eukaryotic translation initiation factor 4E-like 3) (eIF4E-like protein 4E-LP) |
| Q921T2 | TOIP1_MOUSE | Tor1aip1 | Torsin-1A-interacting protein 1 (Lamina-associated polypeptide 1B, LAP1B) |

| | | | |
|--------|-------------|----------|--|
| Q9CXV1 | DHSD_MOUSE | Sdhd | Succinate dehydrogenase [ubiquinone] cytochrome b small subunit, mitochondrial, CybS (CII-4) (QPs3) (Succinate dehydrogenase complex subunit D) (Succinate-ubiquinone oxidoreductase cytochrome b small subunit) (Succinate-ubiquinone reductase membrane anchor subunit) |
| Q9R088 | KITM_MOUSE | Tk2 | Thymidine kinase 2, mitochondrial, EC 2.7.1.21 (2'-deoxyuridine kinase TK2, EC 2.7.1.74) (Deoxycytidine kinase TK2, EC 2.7.1.-) (Mt-TK) |
| Q6QI06 | RICTR_MOUSE | Rictor | Rapamycin-insensitive companion of mTOR (AVO3 homolog, mAVO3) (Protein pianissimo) |
| Q8BJ03 | COX15_MOUSE | Cox15 | Cytochrome c oxidase assembly protein COX15 homolog |
| Q9WUU7 | CATZ_MOUSE | Ctsz | Cathepsin Z, EC 3.4.18.1 |
| Q8BNA6 | FAT3_MOUSE | Fat3 | Protocadherin Fat 3 (FAT tumor suppressor homolog 3) |
| Q8BGT6 | MILK1_MOUSE | Micall1 | MICAL-like protein 1 (Molecule interacting with Rab13, MIRab13) |
| Q8CFA2 | GCST_MOUSE | Amt | Aminomethyltransferase, mitochondrial, EC 2.1.2.10 (Glycine cleavage system T protein, GCVT) |
| Q6ZQ58 | LARP1_MOUSE | Larp1 | La-related protein 1 (La ribonucleoprotein domain family member 1) |
| O35684 | NEUS_MOUSE | Serpini1 | Neuroserpin (Peptidase inhibitor 12, PI-12) (Serine protease inhibitor 17) (Serpini1) |
| Q925J9 | MED1_MOUSE | Med1 | Mediator of RNA polymerase II transcription subunit 1 (Mediator complex subunit 1) (Peroxisome proliferator-activated receptor-binding protein, PBP, PPAR-binding protein) (Thyroid hormone receptor-associated protein complex 220 kDa component, Trap220) (Thyroid receptor-interacting protein 2, TR-interacting protein 2, TRIP-2) |
| Q8VCB1 | NDC1_MOUSE | Ndc1 | Nucleoporin NDC1 (Transmembrane protein 48) |
| Q8K2P7 | S38A1_MOUSE | Slc38a1 | Sodium-coupled neutral amino acid transporter 1 (Amino acid transporter A1) (Mnat2) (N-system amino acid transporter 2) (Solute carrier family 38 member 1) (System A amino acid transporter 1) (System N amino acid transporter 1) |
| Q924N4 | S12A6_MOUSE | Slc12a6 | Solute carrier family 12 member 6 (Electroneutral potassium-chloride cotransporter 3) (K-Cl cotransporter 3) |
| Q9CWX2 | CIA30_MOUSE | Ndufaf1 | Complex I intermediate-associated protein 30, mitochondrial (NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 1) |
| Q3TLS3 | GDPP1_MOUSE | Gdpgp1 | GDP-D-glucose phosphorylase 1, EC 2.7.7.78 |
| Q9WUE3 | C56D2_MOUSE | Cyb561d2 | Transmembrane reductase CYB561D2, EC 7.2.1.3 (Cytochrome b561 domain-containing protein 2) |
| Q91XB7 | YIF1A_MOUSE | Yif1a | Protein YIF1A (YIP1-interacting factor homolog A) |

| | | | |
|------------|-------------|--------|--|
| P60330 | ESPL1_MOUSE | Espl1 | Separin, EC 3.4.22.49 (Caspase-like protein ESPL1) (Extra spindle poles-like 1 protein) (Separase) |
| Q60670 | SIK1_MOUSE | Sik1 | Serine/threonine-protein kinase SIK1, EC 2.7.11.1 (HRT-20) (Myocardial SNF1-like kinase) (Salt-inducible kinase 1, SIK-1) (Serine/threonine-protein kinase SNF1-like kinase 1, Serine/threonine-protein kinase SNF1LK) |
| P49935 | CATH_MOUSE | Ctsh | Pro-cathepsin H (Cathepsin B3) (Cathepsin BA) [Cleaved into: Cathepsin H mini chain; Cathepsin H, EC 3.4.22.16; Cathepsin H heavy chain; Cathepsin H light chain] |
| Q3UN02 | LCLT1_MOUSE | Lclat1 | Lysocardiolipin acyltransferase 1, EC 2.3.1.- (1-acylglycerol-3-phosphate O-acyltransferase 8, 1-AGP acyltransferase 8, 1-AGPAT 8, EC 2.3.1.51) (Acyl-CoA:lysocardiolipin acyltransferase 1) |
| P28666 | MUG2_MOUSE | Mug2 | Murinoglobulin-2, MuG2 |
| Q80U78 | PUM1_MOUSE | Pum1 | Pumilio homolog 1 |
| Q8BW75 | AOFB_MOUSE | Maob | Amine oxidase [flavin-containing] B, EC 1.4.3.21, EC 1.4.3.4 (Monoamine oxidase type B, MAO-B) |
| P27790 | CENPB_MOUSE | Cenpb | Major centromere autoantigen B (Centromere protein B, CENP-B) |
| Q9CQ69 | QCR8_MOUSE | Uqcrq | Cytochrome b-c1 complex subunit 8 (Complex III subunit 8) (Complex III subunit VIII) (Ubiquinol-cytochrome c reductase complex 9.5 kDa protein) (Ubiquinol-cytochrome c reductase complex ubiquinone-binding protein QP-C) |
| Q3UHF3 | MIER3_MOUSE | Mier3 | Mesoderm induction early response protein 3, Mi-er3 |
| A0A1B0GRQ0 | SIM36_MOUSE | SMIM36 | Small integral membrane protein 36 |
| Q07646 | MEST_MOUSE | Mest | Mesoderm-specific transcript protein, EC 3.-.-.- (Paternally-expressed gene 1 protein) |
| Q3U3R4 | LMF1_MOUSE | Lmf1 | Lipase maturation factor 1 (Transmembrane protein 112) |
| Q9D666 | SUN1_MOUSE | Sun1 | SUN domain-containing protein 1 (Protein unc-84 homolog A) (Sad1/unc-84 protein-like 1) |
| Q9ET78 | JPH2_MOUSE | Jph2 | Junctophilin-2, JP-2 (Junctophilin type 2) [Cleaved into: Junctophilin-2 N-terminal fragment, JP2NT] |
| Q8VCH6 | DHC24_MOUSE | Dhcr24 | Delta(24)-sterol reductase, EC 1.3.1.72 (24-dehydrocholesterol reductase) (3-beta-hydroxysterol Delta-24-reductase) |
| Q99NF3 | CEP41_MOUSE | Cep41 | Centrosomal protein of 41 kDa, Cep41 (Testis-specific gene A14 protein) |
| Q99MJ9 | DDX50_MOUSE | Ddx50 | ATP-dependent RNA helicase DDX50, EC 3.6.4.13 (DEAD box protein 50) (Gu-beta) (Nucleolar protein Gu2) |
| Q9EPK2 | XRP2_MOUSE | Rp2 | Protein XRP2 |

| | | | |
|--------|-------------|----------|---|
| Q91WB7 | UBTD1_MOUSE | Ubt1 | Ubiquitin domain-containing protein 1 |
| Q3UGP8 | AG10B_MOUSE | Alg10b | Putative Dol-P-Glc:Glc(2)Man(9)GlcNAc(2)-PP-Dol alpha-1,2-glucosyltransferase, EC 2.4.1.256 (Alpha-1,2-glucosyltransferase ALG10-A) (Alpha-2-glucosyltransferase ALG10-B) (Asparagine-linked glycosylation protein 10 homolog B) |
| Q68FM6 | PPR29_MOUSE | Elfn2 | Protein phosphatase 1 regulatory subunit 29 (Extracellular leucine-rich repeat and fibronectin type III domain-containing protein 2) (Leucine-rich repeat and fibronectin type-III domain-containing protein 6) (Leucine-rich repeat-containing protein 62) |
| Q8BS40 | CPTP_MOUSE | Cptp | Ceramide-1-phosphate transfer protein, CPTP (Glycolipid transfer protein domain-containing protein 1) |
| P26049 | GBRA3_MOUSE | Gabra3 | Gamma-aminobutyric acid receptor subunit alpha-3 (GABA(A) receptor subunit alpha-3) |
| Q8C166 | CPNE1_MOUSE | Cpne1 | Copine-1 (Copine I) |
| Q5SQM0 | EMAL6_MOUSE | Eml6 | Echinoderm microtubule-associated protein-like 6, EMAP-6 (Echinoderm microtubule-associated protein-like 5-like) |
| P15533 | TR30A_MOUSE | Trim30a | Tripartite motif-containing protein 30A (Down regulatory protein of interleukin-2 receptor) (Tripartite motif-containing protein 30) |
| Q99P91 | GPNMB_MOUSE | Gpnmb | Transmembrane glycoprotein NMB (DC-HIL) (Dendritic cell-associated transmembrane protein) (Osteoactivin) |
| P47239 | PAX7_MOUSE | Pax7 | Paired box protein Pax-7 |
| Q9WV69 | DEMA_MOUSE | Dmtn | Dematin (Dematin actin-binding protein) (Erythrocyte membrane protein band 4.9) |
| Q9JJQ0 | PIGB_MOUSE | Pigb | GPI mannosyltransferase 3, EC 2.4.1.- (GPI mannosyltransferase III, GPI-MT-III) (Phosphatidylinositol-glycan biosynthesis class B protein, PIG-B) |
| Q9D0G0 | RT30_MOUSE | Mrps30 | 28S ribosomal protein S30, mitochondrial, MRP-S30, S30mt |
| Q9CY16 | RT28_MOUSE | Mrps28 | 28S ribosomal protein S28, mitochondrial, MRP-S28, S28mt |
| O54949 | NLK_MOUSE | Nlk | Serine/threonine-protein kinase NLK, EC 2.7.11.24 (Nemo-like kinase) |
| Q9D3R9 | TAF7L_MOUSE | Taf7l | Transcription initiation factor TFIID subunit 7-like (TATA box binding protein-associated factor RNA polymerase II subunit Q) (TATA box-binding protein-associated factor 50 kDa) (Transcription initiation factor TFIID 50 kDa subunit) |
| Q9Z2G6 | SE1L1_MOUSE | Sel1l | Protein sel-1 homolog 1 (Suppressor of lin-12-like protein 1, Sel-1L) |
| Q6DFV3 | RHG21_MOUSE | Arhgap21 | Rho GTPase-activating protein 21 (Rho GTPase-activating protein 10) (Rho-type GTPase-activating protein 21) |
| Q9QXL8 | NDK7_MOUSE | Nme7 | Nucleoside diphosphate kinase 7, NDK 7, NDP kinase 7, EC 2.7.4.6 (nm23-M7) |

| | | | |
|--------|-------------|----------|--|
| Q8BYR8 | S41A2_MOUSE | Slc41a2 | Solute carrier family 41 member 2 |
| P05213 | TBA1B_MOUSE | Tuba1b | Tubulin alpha-1B chain (Alpha-tubulin 2) (Alpha-tubulin isotype M-alpha-2) (Tubulin alpha-2 chain) [Cleaved into: Detyrosinated tubulin alpha-1B chain] |
| Q8BHN3 | GANAB_MOUSE | Ganab | Neutral alpha-glucosidase AB, EC 3.2.1.207 (Alpha-glucosidase 2) (Glucosidase II subunit alpha) |
| Q9Z1X4 | ILF3_MOUSE | Ilf3 | Interleukin enhancer-binding factor 3 |
| P32921 | SYWC_MOUSE | Wars1 | Tryptophan--tRNA ligase, cytoplasmic, EC 6.1.1.2 (Tryptophanyl-tRNA synthetase, TrpRS) [Cleaved into: T1-TrpRS; T2-TrpRS] |
| Q8BG51 | MIRO1_MOUSE | Rhot1 | Mitochondrial Rho GTPase 1, MIRO-1, EC 3.6.5.- (Ras homolog gene family member T1) |
| P08556 | RASN_MOUSE | Nras | GTPase NRas, EC 3.6.5.2 (Transforming protein N-Ras) |
| P61205 | ARF3_MOUSE | Arf3 | ADP-ribosylation factor 3 |
| P61202 | CSN2_MOUSE | Cops2 | COP9 signalosome complex subunit 2, SGN2, Signalosome subunit 2 (Alien homolog) (JAB1-containing signalosome subunit 2) (Thyroid receptor-interacting protein 15, TR-interacting protein 15, TRIP-15) |
| Q9Z0H4 | CELF2_MOUSE | Celf2 | CUGBP Elav-like family member 2, CELF-2 (Bruno-like protein 3) (CUG triplet repeat RNA-binding protein 2, CUG-BP2) (CUG-BP- and ETR-3-like factor 2) (ELAV-type RNA-binding protein 3, ETR-3, mETR-3) (Neuroblastoma apoptosis-related RNA-binding protein, mNapor) (RNA-binding protein BRUNOL-3) |
| O88735 | MAP7_MOUSE | Map7 | Enscosin (Epithelial microtubule-associated protein of 115 kDa, E-MAP-115) (Microtubule-associated protein 7, MAP-7) |
| Q64487 | PTPRD_MOUSE | Ptprd | Receptor-type tyrosine-protein phosphatase delta, Protein-tyrosine phosphatase delta, R-PTP-delta, EC 3.1.3.48 |
| Q9QZD8 | DIC_MOUSE | Slc25a10 | Mitochondrial dicarboxylate carrier, DIC (Solute carrier family 25 member 10) |
| P12815 | PDCD6_MOUSE | Pdcd6 | Programmed cell death protein 6 (ALG-257) (Apoptosis-linked gene 2 protein, ALG-2) (PMP41) |
| O88848 | ARL6_MOUSE | Arl6 | ADP-ribosylation factor-like protein 6 |
| Q8BH86 | GLUCM_MOUSE | Dglucy | D-glutamate cyclase, mitochondrial, EC 4.2.1.48 |
| P61971 | NTF2_MOUSE | Nutf2 | Nuclear transport factor 2, NTF-2 |
| Q810U4 | NRCAM_MOUSE | Nrcam | Neuronal cell adhesion molecule, Nr-CAM (Neuronal surface protein Bravo, mBravo) (NgCAM-related cell adhesion molecule, Ng-CAM-related) |
| Q8C570 | RAE1L_MOUSE | Rae1 | mRNA export factor (Rae1 protein homolog) (mRNA-associated protein mrnp 41) |

| | | | |
|--------|-------------|-----------|--|
| Q8BWD8 | CDK19_MOUSE | Cdk19 | Cyclin-dependent kinase 19, EC 2.7.11.22 (CDC2-related protein kinase 6) (Cell division cycle 2-like protein kinase 6) (Cell division protein kinase 19) |
| Q62523 | ZYX_MOUSE | Zyx | Zyxin |
| Q8K2K6 | AGFG1_MOUSE | Agfg1 | Arf-GAP domain and FG repeat-containing protein 1 (HIV-1 Rev-binding protein homolog) (Nucleoporin-like protein RIP) |
| Q61831 | MK10_MOUSE | Mapk10 | Mitogen-activated protein kinase 10, MAP kinase 10, MAPK 10, EC 2.7.11.24 (MAP kinase p49 3F12) (Stress-activated protein kinase JNK3) (c-Jun N-terminal kinase 3) |
| Q9CYW4 | HDHD3_MOUSE | Hdhd3 | Haloacid dehalogenase-like hydrolase domain-containing protein 3 |
| Q9WVL0 | MAAI_MOUSE | Gstz1 | Maleylacetoacetate isomerase, MAAI, EC 5.2.1.2 (GSTZ1-1) (Glutathione S-transferase zeta 1, EC 2.5.1.18) |
| Q8C1B7 | SEP11_MOUSE | Septin11 | Septin-11 |
| G3XA57 | RFIP2_MOUSE | Rab11fip2 | Rab11 family-interacting protein 2, Rab11-FIP2 |
| Q61133 | GSTT2_MOUSE | Gstt2 | Glutathione S-transferase theta-2, EC 2.5.1.18 (GST class-theta-2) |
| Q9CX30 | YIF1B_MOUSE | Yif1b | Protein YIF1B (YIP1-interacting factor homolog B) |
| Q8R1S0 | COQ6_MOUSE | Coq6 | Ubiquinone biosynthesis monooxygenase COQ6, mitochondrial, EC 1.14.13.- (Coenzyme Q10 monooxygenase 6) |
| Q9DCS2 | MTL26_MOUSE | Mettl26 | Methyltransferase-like 26 |
| Q9CPU4 | MGST3_MOUSE | Mgst3 | Microsomal glutathione S-transferase 3, Microsomal GST-3 (Glutathione peroxidase MGST3, EC 1.11.1.-) (Microsomal glutathione S-transferase III, Microsomal GST-III) |
| Q8BXJ8 | Z385B_MOUSE | Znf385b | Zinc finger protein 385B (Zinc finger protein 533) |
| Q80V26 | IMPA3_MOUSE | Bpnt2 | Golgi-resident adenosine 3',5'-bisphosphate 3'-phosphatase, Golgi-resident PAP phosphatase, gPAPP, EC 3.1.3.7 (3'(2'), 5'-bisphosphate nucleotidase 2) (Inositol monophosphatase domain-containing protein 1) (Myo-inositol monophosphatase A3) (Phosphoadenosine phosphate 3'-nucleotidase) |
| Q6NVE9 | PPTC7_MOUSE | Pptc7 | Protein phosphatase PTC7 homolog, EC 3.1.3.16 (T-cell activation protein phosphatase 2C, TA-PP2C) |
| Q9CQ40 | RM49_MOUSE | Mrpl49 | 39S ribosomal protein L49, mitochondrial, L49mt, MRP-L49 |
| Q9ES74 | NEK7_MOUSE | Nek7 | Serine/threonine-protein kinase Nek7, EC 2.7.11.1 (Never in mitosis A-related kinase 7, NimA-related protein kinase 7) |
| Q9D023 | MPC2_MOUSE | Mpc2 | Mitochondrial pyruvate carrier 2 (Brain protein 44) |

| | | | |
|--------|-------------|----------|--|
| Q8JZR6 | S4A8_MOUSE | Slc4a8 | Electroneutral sodium bicarbonate exchanger 1 (Electroneutral Na ⁺ -driven Cl-HCO ₃ exchanger) (Solute carrier family 4 member 8) (k-NBC3) |
| Q9D0S9 | HINT2_MOUSE | Hint2 | Adenosine 5'-monophosphoramidase HINT2, EC 3.9.1.- (HINT-3) (Histidine triad nucleotide-binding protein 2, mitochondrial, HINT-2) |
| P70704 | AT8A1_MOUSE | Atp8a1 | Phospholipid-transporting ATPase IA, EC 7.6.2.1 (ATPase class I type 8A member 1) (Chromaffin granule ATPase II) (P4-ATPase flippase complex alpha subunit ATP8A1) |
| A2AJI0 | MA7D1_MOUSE | Map7d1 | MAP7 domain-containing protein 1 |
| Q9WTK7 | STK11_MOUSE | Stk11 | Serine/threonine-protein kinase STK11, EC 2.7.11.1 (Liver kinase B1 homolog, LKB1, mLKB1) |
| Q8VHC3 | SELM_MOUSE | Selenom | Selenoprotein M, SelM |
| Q8C7K6 | PCYXL_MOUSE | Pcyox11 | Prenylcysteine oxidase-like, EC 1.8.3.- |
| Q8C5L3 | CNOT2_MOUSE | Cnot2 | CCR4-NOT transcription complex subunit 2 (CCR4-associated factor 2) |
| O09106 | HDAC1_MOUSE | Hdac1 | Histone deacetylase 1, HD1, EC 3.5.1.98 (Protein deacetylase HDAC1, EC 3.5.1.-) (Protein decrotonylase HDAC1, EC 3.5.1.-) |
| Q9D8B4 | NDUAB_MOUSE | Ndufa11 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 11 (Complex I-B14.7, CI-B14.7) (NADH-ubiquinone oxidoreductase subunit B14.7) |
| Q5NCF2 | TPPC1_MOUSE | Trappc1 | Trafficking protein particle complex subunit 1 |
| P62849 | RS24_MOUSE | Rps24 | 40S ribosomal protein S24 |
| Q9EPA7 | NMNA1_MOUSE | Nmnat1 | Nicotinamide/nicotinic acid mononucleotide adenylyltransferase 1, NMN/NaMN adenylyltransferase 1, EC 2.7.7.1, EC 2.7.7.18 (Nicotinamide mononucleotide adenylyltransferase 1, NMN adenylyltransferase 1) (Nicotinate-nucleotide adenylyltransferase 1, NaMN adenylyltransferase 1) |
| Q8BIH0 | SP130_MOUSE | Sap130 | Histone deacetylase complex subunit SAP130 (130 kDa Sin3-associated polypeptide) (Sin3-associated polypeptide p130) |
| Q5RJF7 | CA2D4_MOUSE | Cacna2d4 | Voltage-dependent calcium channel subunit alpha-2/delta-4 (Voltage-gated calcium channel subunit alpha-2/delta-4) [Cleaved into: Voltage-dependent calcium channel subunit alpha-2-4; Voltage-dependent calcium channel subunit delta-4] |
| Q921S7 | RM37_MOUSE | Mrpl37 | 39S ribosomal protein L37, mitochondrial, L37mt, MRP-L37 |
| Q9WU28 | PFD5_MOUSE | Pfdn5 | Prefoldin subunit 5 (EIG-1) (Myc modulator 1) (c-Myc-binding protein Mm-1) |
| Q9JJI8 | RL38_MOUSE | Rpl38 | 60S ribosomal protein L38 |

| | | | |
|--------|-------------|---------|---|
| O88286 | WIZ_MOUSE | Wiz | Protein Wiz (Widely-interspaced zinc finger-containing protein) |
| Q00558 | HAP40_MOUSE | F8a1 | 40-kDa huntingtin-associated protein (CpG island protein) (Factor VIII intron 22 protein) |
| Q8BP00 | IQCB1_MOUSE | Iqcb1 | IQ calmodulin-binding motif-containing protein 1 |
| Q505B7 | ARCH_MOUSE | Zbtb8os | Protein archease (Protein ZBTB8OS) |
| Q64310 | SURF4_MOUSE | Surf4 | Surfeit locus protein 4 |
| Q8C4X2 | KC1G3_MOUSE | Csnk1g3 | Casein kinase I isoform gamma-3, CKI-gamma 3, EC 2.7.11.1 |
| O09172 | GSH0_MOUSE | Gclm | Glutamate--cysteine ligase regulatory subunit (GCS light chain) (Gamma-ECS regulatory subunit) (Gamma-glutamylcysteine synthetase regulatory subunit) (Glutamate--cysteine ligase modifier subunit) |
| Q9Z255 | UBE2A_MOUSE | Ube2a | Ubiquitin-conjugating enzyme E2 A, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme A) (RAD6 homolog A, HR6A, mHR6A) (Ubiquitin carrier protein A) (Ubiquitin-protein ligase A) |
| Q80ZJ1 | RAP2A_MOUSE | Rap2a | Ras-related protein Rap-2a, EC 3.6.5.2 |
| Q9EQZ6 | RPGF4_MOUSE | Rapgef4 | Rap guanine nucleotide exchange factor 4 (Exchange factor directly activated by cAMP 2) (Exchange protein directly activated by cAMP 2, EPAC 2) (cAMP-dependent Rap1 guanine-nucleotide exchange factor) (cAMP-regulated guanine nucleotide exchange factor II, cAMP-GEFII) |
| P02816 | PIP_MOUSE | Pip | Prolactin-inducible protein homolog (14 kDa submandibular gland protein, SMGP) (Gross cystic disease fluid protein 15, GCDFP-15) (Prolactin-induced protein) |
| Q9JJ43 | RFOX1_MOUSE | Rbfox1 | RNA binding protein fox-1 homolog 1 (Ataxin-2-binding protein 1) (Fox-1 homolog A) |
| Q9CXA2 | T3HPD_MOUSE | L3hypdh | Trans-L-3-hydroxyproline dehydratase, EC 4.2.1.77 (Trans-3-hydroxy-L-proline dehydratase) |
| Q62422 | OSTF1_MOUSE | Ostf1 | Osteoclast-stimulating factor 1 (SH3 domain protein 3) |
| Q8CHI8 | EP400_MOUSE | Ep400 | E1A-binding protein p400, EC 3.6.4.- (Domino homolog, mDomino) (p400 kDa SWI2/SNF2-related protein) |
| Q9EST4 | PSMG2_MOUSE | Psmg2 | Proteasome assembly chaperone 2 (CD40 ligand-activated specific transcript 3) (Tumor necrosis factor superfamily member 5-induced protein 1) |
| Q64127 | TIF1A_MOUSE | Trim24 | Transcription intermediary factor 1-alpha, TIF1-alpha, EC 2.3.2.27 (E3 ubiquitin-protein ligase Trim24) (RING-type E3 ubiquitin transferase TIF1-alpha) (Tripartite motif-containing protein 24) |

| | | | |
|--------|-------------|---------|---|
| P68033 | ACTC_MOUSE | Actc1 | Actin, alpha cardiac muscle 1 (Alpha-cardiac actin) [Cleaved into: Actin, alpha cardiac muscle 1, intermediate form] |
| P97364 | SPS2_MOUSE | Seps2 | Selenide, water dikinase 2, EC 2.7.9.3 (Selenium donor protein 2) (Selenophosphate synthase 2) |
| Q9DBS2 | TPRGL_MOUSE | Tprg11 | Tumor protein p63-regulated gene 1-like protein (Mossy fiber terminal-associated vertebrate-specific presynaptic protein) (Protein FAM79A) |
| P59235 | NUP43_MOUSE | Nup43 | Nucleoporin Nup43 (Nup107-160 subcomplex subunit Nup43) |
| P14602 | HSPB1_MOUSE | Hspb1 | Heat shock protein beta-1, HspB1 (Growth-related 25 kDa protein) (Heat shock 25 kDa protein, HSP 25) (Heat shock 27 kDa protein, HSP 27) (p25) |
| Q9R1J0 | NSDHL_MOUSE | Nsdhl | Sterol-4-alpha-carboxylate 3-dehydrogenase, decarboxylating, EC 1.1.1.170 |
| O09005 | DEGS1_MOUSE | Degs1 | Sphingolipid delta(4)-desaturase DES1, EC 1.14.19.17 (Degenerative spermatocyte homolog 1) (Dihydroceramide desaturase-1) (Retinol isomerase, EC 5.2.1.-) |
| P39061 | COIA1_MOUSE | Col18a1 | Collagen alpha-1(XVIII) chain [Cleaved into: Endostatin; Non-collagenous domain 1, NC1] |
| Q8C5N3 | CWC22_MOUSE | Cwc22 | Pre-mRNA-splicing factor CWC22 homolog (Nucampholin homolog) |
| O88895 | HDAC3_MOUSE | Hdac3 | Histone deacetylase 3, HD3, EC 3.5.1.98 (Protein deacetylase HDAC3, EC 3.5.1.-) (Protein deacylase HDAC3, EC 3.5.1.-) |
| Q9DBU6 | RSRC1_MOUSE | Rsrc1 | Serine/Arginine-related protein 53, SRp53 (Arginine/serine-rich coiled-coil protein 1) |
| Q8BSK8 | KS6B1_MOUSE | Rps6kb1 | Ribosomal protein S6 kinase beta-1, S6K-beta-1, S6K1, EC 2.7.11.1 (70 kDa ribosomal protein S6 kinase 1, P70S6K1, p70-S6K 1) (Ribosomal protein S6 kinase I, S6K) (p70 ribosomal S6 kinase alpha, p70 S6 kinase alpha, p70 S6K-alpha, p70 S6KA) |
| Q9CQV7 | TIM14_MOUSE | Dnajc19 | Mitochondrial import inner membrane translocase subunit TIM14 (DnaJ homolog subfamily C member 19) |
| Q9CZJ2 | HS12B_MOUSE | Hspa12b | Heat shock 70 kDa protein 12B |
| Q8BZA9 | TIGAR_MOUSE | Tigar | Fructose-2,6-bisphosphatase TIGAR, EC 3.1.3.46 (TP53-induced glycolysis and apoptosis regulator) (TP53-induced glycolysis regulatory phosphatase) |
| Q8VE80 | THOC3_MOUSE | Thoc3 | THO complex subunit 3, Tho3 |
| Q8BXR1 | S7A14_MOUSE | Slc7a14 | Probable cationic amino acid transporter (Solute carrier family 7 member 14) |
| Q8CCG1 | ZC21C_MOUSE | Zc2hc1c | Zinc finger C2HC domain-containing protein 1C |

| | | | |
|--------|-------------|----------|---|
| Q9WTK3 | GPAA1_MOUSE | Gpaa1 | Glycosylphosphatidylinositol anchor attachment 1 protein, GPI anchor attachment protein 1 (GAA1 protein homolog, mGAA1) |
| Q924L1 | LTMD1_MOUSE | Letmd1 | LETM1 domain-containing protein 1 (Cervical cancer receptor) (MCC-32) |
| Q3UDW8 | HGNAT_MOUSE | Hgsnat | Heparan-alpha-glucosaminide N-acetyltransferase, EC 2.3.1.78 (Transmembrane protein 76) |
| Q9D0F1 | NDC80_MOUSE | Ndc80 | Kinetochore protein NDC80 homolog (Kinetochore protein Hec1) (Kinetochore-associated protein 2) |
| Q9CQS4 | S2546_MOUSE | Slc25a46 | Mitochondrial outer membrane protein SLC25A46 (Solute carrier family 25 member 46) |
| Q91WD4 | CG025_MOUSE | | UPF0415 protein C7orf25 homolog |
| Q6ZQK5 | ACAP2_MOUSE | Acap2 | Arf-GAP with coiled-coil, ANK repeat and PH domain-containing protein 2 (Centaurin-beta-2, Cnt-b2) |
| Q63912 | OMGP_MOUSE | Omg | Oligodendrocyte-myelin glycoprotein |
| Q61016 | GBG7_MOUSE | Gng7 | Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-7 |
| P58269 | DPF3_MOUSE | Dpf3 | Zinc finger protein DPF3 (BRG1-associated factor 45C, BAF45C) (Zinc finger protein cer-d4) |
| O35945 | AL1A7_MOUSE | Aldh1a7 | Aldehyde dehydrogenase, cytosolic 1, EC 1.2.1.3 (ALDH class 1) (ALDH-E1) (ALHDII) (Aldehyde dehydrogenase family 1 member A7) (Aldehyde dehydrogenase phenobarbital-inducible) |
| P21440 | MDR3_MOUSE | Abcb4 | Phosphatidylcholine translocator ABCB4, EC 7.6.2.1 (ATP-binding cassette sub-family B member 4) (Multidrug resistance protein 2) (Multidrug resistance protein 3) (P-glycoprotein 2) (P-glycoprotein 3) |
| Q8JZW4 | CPNE5_MOUSE | Cpne5 | Copine-5 (Copine V) |
| Q6VWV5 | ANPRB_MOUSE | Npr2 | Atrial natriuretic peptide receptor 2, EC 4.6.1.2 (Atrial natriuretic peptide receptor type B, ANP-B, ANPR-B, NPR-B) (Guanylate cyclase B, GC-B) |
| O55134 | PCD12_MOUSE | Pcdh12 | Protocadherin-12 (Vascular cadherin-2) (Vascular endothelial cadherin-2, VE-cad-2, VE-cadherin-2) [Cleaved into: Protocadherin-12, secreted form] |
| Q80U58 | PUM2_MOUSE | Pum2 | Pumilio homolog 2 |
| Q07968 | F13B_MOUSE | F13b | Coagulation factor XIII B chain (Protein-glutamine gamma-glutamyltransferase B chain) (Transglutaminase B chain) |
| Q9D7J7 | CPNS2_MOUSE | Capns2 | Calpain small subunit 2, CSS2 (Calcium-dependent protease small subunit 2) |
| Q80TH2 | ERBIN_MOUSE | Erbin | Erbin (Densin-180-like protein) (ErbB2-interacting protein) (Protein LAP2) |

| | | | |
|--------|-------------|---------|---|
| Q5BKP2 | UBP13_MOUSE | Usp13 | Ubiquitin carboxyl-terminal hydrolase 13, EC 3.4.19.12 (Deubiquitinating enzyme 13) (Ubiquitin thioesterase 13) (Ubiquitin-specific-processing protease 13) |
| Q99NG0 | ARIP4_MOUSE | Rad54l2 | Helicase ARIP4, EC 3.6.4.12 (Androgen receptor-interacting protein 4) (RAD54-like protein 2) (Steroid receptor-interacting SNF2 domain-containing protein-like) |
| Q9QZ28 | SIX6_MOUSE | Six6 | Homeobox protein SIX6 (Optic homeobox 2) (Sine oculis homeobox homolog 6) (Six9 protein) |
| Q9JJD0 | THA11_MOUSE | Thap11 | THAP domain-containing protein 11 (Ronin) |
| Q9D4V7 | RABL3_MOUSE | Rabl3 | Rab-like protein 3 |
| Q9CR13 | FMC1_MOUSE | Fmc1 | Protein FMC1 homolog (Formation of mitochondrial complex V assembly factor 1) |
| Q8VC42 | RMC1_MOUSE | Rmc1 | Regulator of MON1-CCZ1 complex (Colon cancer-associated protein Mic1, Mic-1) |
| Q8CGQ8 | NCKX4_MOUSE | Slc24a4 | Sodium/potassium/calcium exchanger 4 (Na(+)/K(+)/Ca(2+)-exchange protein 4) (Solute carrier family 24 member 4) |
| Q8BLR9 | HIF1N_MOUSE | Hif1an | Hypoxia-inducible factor 1-alpha inhibitor, EC 1.14.11.30, EC 1.14.11.n4 (Hypoxia-inducible factor asparagine hydroxylase) |
| P28665 | MUG1_MOUSE | Mug1 | Murinoglobulin-1, MuG1 |
| Q9Z2P8 | VAMP5_MOUSE | Vamp5 | Vesicle-associated membrane protein 5, VAMP-5 (Myobrevin) |
| Q9Z0L0 | TPBG_MOUSE | Tpbg | Trophoblast glycoprotein (5T4 oncofetal trophoblast glycoprotein, 5T4 oncotrophoblast glycoprotein) (Wnt-activated inhibitory factor 1, WAIF1) |
| Q9DA03 | LYRM7_MOUSE | Lym7 | Complex III assembly factor LYRM7 (LYR motif-containing protein 7) |
| Q9D9H8 | CB069_MOUSE | | Mitochondrial protein C2orf69 homolog |
| Q9D7A6 | SRP19_MOUSE | Srp19 | Signal recognition particle 19 kDa protein, SRP19 |
| Q9CZX7 | PP4P2_MOUSE | Pip4p2 | Type 2 phosphatidylinositol 4,5-bisphosphate 4-phosphatase, Type 2 PtdIns-4,5-P2 4-Ptase, EC 3.1.3.78 (PtdIns-4,5-P2 4-Ptase II) (Transmembrane protein 55A) |
| Q9CZ62 | CEP97_MOUSE | Cep97 | Centrosomal protein of 97 kDa, Cep97 (Leucine-rich repeat and IQ domain-containing protein 2) |
| Q9CQT7 | DESI1_MOUSE | Desi1 | Desumoylating isopeptidase 1, DeSI-1, EC 3.4.-.- (PPPDE peptidase domain-containing protein 2) |
| Q9CQN6 | TM14C_MOUSE | Tmem14c | Transmembrane protein 14C |
| Q91ZK4 | DMBX1_MOUSE | Dmbx1 | Diencephalon/mesencephalon homeobox protein 1 (Diencephalon/mesencephalon-expressed brain homeobox gene 1 protein) (Orthodenticle homolog 3) (Paired-like homeobox protein DMBOX1) (Paired-type homeobox Atx) |

| | | | |
|--------|-------------|---------|--|
| Q8VHL0 | UT1_MOUSE | Slc14a1 | Urea transporter 1 (Solute carrier family 14 member 1) (Urea transporter B, UT-B) (Urea transporter, erythrocyte) |
| Q8VEB4 | PAG15_MOUSE | Pla2g15 | Phospholipase A2 group XV (1-O-acylceramide synthase, ACS) (LCAT-like lysophospholipase, LLPL, EC 3.1.1.5) (Lysophospholipase 3) (Lysosomal phospholipase A and acyltransferase, EC 2.3.1.-, EC 3.1.1.32, EC 3.1.1.4) (Lysosomal phospholipase A2, LPLA2) |
| Q8BZX4 | SREK1_MOUSE | Srek1 | Splicing regulatory glutamine/lysine-rich protein 1 (Serine/arginine-rich-splicing regulatory protein 86, SRrp86) (Splicing factor, arginine/serine-rich 12) |
| Q8BVL3 | SNX17_MOUSE | Snx17 | Sorting nexin-17 |
| Q8BTZ7 | GMPPB_MOUSE | Gmppb | Mannose-1-phosphate guanyltransferase beta, EC 2.7.7.13 (GDP-mannose pyrophosphorylase B) (GTP-mannose-1-phosphate guanylyltransferase beta) |
| Q8BGS0 | MAK16_MOUSE | Mak16 | Protein MAK16 homolog (Protein RBM13) |
| Q78HU3 | MB12A_MOUSE | Mvb12a | Multivesicular body subunit 12A (ESCRT-I complex subunit MVB12A) (Protein FAM125A) |
| Q69ZQ2 | ISY1_MOUSE | Isy1 | Pre-mRNA-splicing factor ISY1 homolog |
| Q62559 | IFT52_MOUSE | Ift52 | Intraflagellar transport protein 52 homolog (Protein NGD5) |
| Q61070 | EI24_MOUSE | Ei24 | Etoposide-induced protein 2.4 (p53-induced gene 8 protein) |
| Q3U4H6 | HEXD_MOUSE | Hexd | Hexosaminidase D, EC 3.2.1.52 (Beta-N-acetylhexosaminidase) (Beta-hexosaminidase D) (Hexosaminidase domain-containing protein) (N-acetyl-beta-galactosaminidase) |
| Q3TNA1 | XYLB_MOUSE | Xylb | Xylulose kinase, Xylulokinase, EC 2.7.1.17 |
| P70345 | B2CL2_MOUSE | Bcl2l2 | Bcl-2-like protein 2, Bcl2-L-2 (Apoptosis regulator Bcl-W) (c98) |
| P58059 | RT21_MOUSE | Mrps21 | 28S ribosomal protein S21, mitochondrial, MRP-S21, S21mt |
| P57791 | FACE2_MOUSE | Rce1 | CAAX prenyl protease 2, EC 3.4.-.- (Farnesylated proteins-converting enzyme 2, FACE-2) (Prenyl protein-specific endoprotease 2) (RCE1 homolog) |
| P50153 | GBG4_MOUSE | Gng4 | Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-4 |
| P28659 | CELF1_MOUSE | Celf1 | CUGBP Elav-like family member 1, CELF-1 (50 kDa nuclear polyadenylated RNA-binding protein) (Brain protein F41) (Bruno-like protein 2) (CUG triplet repeat RNA-binding protein 1, CUG-BP1) (CUG-BP- and ETR-3-like factor 1) (Deadenylation factor CUG-BP) (Deadenylation factor EDEN-BP) (Embryo deadenylation element-binding protein homolog, EDEN-BP homolog) (RNA-binding protein BRUNOL-2) |

| | | | |
|--------|-------------|----------|--|
| P18761 | CAH6_MOUSE | Ca6 | Carbonic anhydrase 6, EC 4.2.1.1 (Carbonate dehydratase VI) (Carbonic anhydrase VI, CA-VI) (Salivary carbonic anhydrase) (Secreted carbonic anhydrase) |
| O88843 | CRADD_MOUSE | Cradd | Death domain-containing protein CRADD (Caspase and RIP adapter with death domain) (RIP-associated protein with a death domain) |
| O09130 | NF2IP_MOUSE | Nfatc2ip | NFATC2-interacting protein (45 kDa NF-AT-interacting protein, 45 kDa NFAT-interacting protein) (Nuclear factor of activated T-cells, cytoplasmic 2-interacting protein) |
| Q8VCK3 | TBG2_MOUSE | Tubg2 | Tubulin gamma-2 chain (Gamma-2-tubulin) |
| Q8BTY8 | SCFD2_MOUSE | Scfd2 | Sec1 family domain-containing protein 2 (Neuronal Sec1) (Syntaxin-binding protein 1-like 1) |
| Q8K4I3 | ARHG6_MOUSE | Arhgef6 | Rho guanine nucleotide exchange factor 6 (Alpha-PIX) (Rac/Cdc42 guanine nucleotide exchange factor 6) |
| Q925T6 | GRIP1_MOUSE | Grip1 | Glutamate receptor-interacting protein 1, GRIP-1 |
| P70213 | FV1_MOUSE | Fv1 | Friend virus susceptibility protein 1 |
| Q9CPW2 | FDX2_MOUSE | Fdx2 | Ferredoxin-2, mitochondrial (Adrenodoxin-like protein) (Ferredoxin-1-like protein) |
| Q9D967 | MGDP1_MOUSE | Mdp1 | Magnesium-dependent phosphatase 1, MDP-1, EC 3.1.3.-, EC 3.1.3.48 |
| O35166 | GOSR2_MOUSE | Gosr2 | Golgi SNAP receptor complex member 2 (27 kDa Golgi SNARE protein) (Membrin) |
| Q9Z2D1 | MTMR2_MOUSE | Mtmr2 | Myotubularin-related protein 2 (Phosphatidylinositol-3,5-bisphosphate 3-phosphatase, EC 3.1.3.95) (Phosphatidylinositol-3-phosphate phosphatase, EC 3.1.3.64) |
| P00158 | CYB_MOUSE | Mt-Cyb | Cytochrome b (Complex III subunit 3) (Complex III subunit III) (Cytochrome b-c1 complex subunit 3) (Ubiquinol-cytochrome-c reductase complex cytochrome b subunit) |
| O35683 | NDUA1_MOUSE | Ndufa1 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 1 (Complex I-MWFE, CI-MWFE) (NADH-ubiquinone oxidoreductase MWFE subunit) |
| Q9R0H0 | ACOX1_MOUSE | Acox1 | Peroxisomal acyl-coenzyme A oxidase 1, AOX, EC 1.3.3.6 (Palmitoyl-CoA oxidase) (Peroxisomal fatty acyl-CoA oxidase) (Straight-chain acyl-CoA oxidase) [Cleaved into: Peroxisomal acyl-CoA oxidase 1, A chain; Peroxisomal acyl-CoA oxidase 1, B chain; Peroxisomal acyl-CoA oxidase 1, C chain] |
| Q920A7 | AFG31_MOUSE | Afg31l | AFG3-like protein 1, EC 3.4.24.- |
| P20352 | TF_MOUSE | F3 | Tissue factor, TF (Coagulation factor III) (CD antigen CD142) |

| | | | |
|--------|-------------|---------|--|
| Q9CRA7 | ATP5S_MOUSE | Dmac21 | ATP synthase subunit s, mitochondrial (ATP synthase-coupling factor B) (Distal membrane arm assembly complex 2-like protein) (Mitochondrial ATP synthase regulatory component factor B) |
| Q8QZZ7 | TPRKB_MOUSE | Tprkb | EKC/KEOPS complex subunit Tprkb (PRPK-binding protein) (TP53RK-binding protein) |
| Q9QZR0 | RNF25_MOUSE | Rnf25 | E3 ubiquitin-protein ligase RNF25, EC 2.3.2.27 (RING finger protein 25) (RING finger protein AO7) (RING-type E3 ubiquitin transferase RNF25) |
| Q14AI6 | RUSD3_MOUSE | Rpusd3 | Mitochondrial mRNA pseudouridine synthase Rpusd3, EC 5.4.99.- (RNA pseudouridylate synthase domain-containing protein 3) |
| Q80XQ2 | TBCD5_MOUSE | Tbc1d5 | TBC1 domain family member 5 |
| P24452 | CAPG_MOUSE | Capg | Macrophage-capping protein (Actin regulatory protein CAP-G) (Actin-capping protein GCAP39) (Myc basic motif homolog 1) |
| P63046 | ST4A1_MOUSE | Sult4a1 | Sulfotransferase 4A1, ST4A1, EC 2.8.2.- (Brain sulfotransferase-like protein, mBR-STL) (Nervous system sulfotransferase, NST) |
| Q9CPZ8 | COXM1_MOUSE | Cmc1 | COX assembly mitochondrial protein homolog, Cmc1p |
| O08581 | KCNK1_MOUSE | Kenk1 | Potassium channel subfamily K member 1 (Inward rectifying potassium channel protein TWIK-1) |
| Q3UIK4 | MET14_MOUSE | Mettl14 | N6-adenosine-methyltransferase non-catalytic subunit (Methyltransferase-like protein 14) |
| O35943 | FRDA_MOUSE | Fxn | Fraxin, mitochondrial, Fxn, EC 1.16.3.1 [Cleaved into: Frataxin intermediate form; Frataxin mature form] |
| Q8CJ67 | STAU2_MOUSE | Stau2 | Double-stranded RNA-binding protein Staufen homolog 2 |
| O88845 | AKA10_MOUSE | Akap10 | A-kinase anchor protein 10, mitochondrial, AKAP-10 (Dual specificity A kinase-anchoring protein 2, D-AKAP-2) (Protein kinase A-anchoring protein 10, PRKA10) |
| Q9CXW2 | RT22_MOUSE | Mrps22 | 28S ribosomal protein S22, mitochondrial, MRP-S22, S22mt |
| Q9JJA2 | COG8_MOUSE | Cog8 | Conserved oligomeric Golgi complex subunit 8, COG complex subunit 8 (Component of oligomeric Golgi complex 8) |
| Q8K1C0 | ANGE2_MOUSE | Angel2 | Protein angel homolog 2 |
| Q6ZPQ6 | PITM2_MOUSE | Pitpnm2 | Membrane-associated phosphatidylinositol transfer protein 2 (Drosophila retinal degeneration B homolog 2, RdgB2) (Phosphatidylinositol transfer protein, membrane-associated 2, PITPnm 2) (Pyk2 N-terminal domain-interacting receptor 3, NIR-3) |

| | | | |
|--------|-------------|----------|--|
| Q99NB8 | UBQL4_MOUSE | Ubqln4 | Ubiquilin-4 (Ataxin-1 interacting ubiquitin-like protein, A1Up) (Ataxin-1 ubiquitin-like-interacting protein A1U) (Connexin43-interacting protein of 75 kDa, CIP75) |
| Q80W47 | WIPI2_MOUSE | Wipi2 | WD repeat domain phosphoinositide-interacting protein 2, WIPI-2 |
| O54962 | BAF_MOUSE | Banf1 | Barrier-to-autointegration factor (LAP2-binding protein 1) [Cleaved into: Barrier-to-autointegration factor, N-terminally processed] |
| G5E8Z2 | TAF4B_MOUSE | Taf4b | Transcription initiation factor TFIID subunit 4B (Transcription initiation factor TFIID 105 kDa subunit, TAF(II)105, TAFII-105, TAFII105) |
| Q6NXK7 | DPP10_MOUSE | Dpp10 | Inactive dipeptidyl peptidase 10 (Dipeptidyl peptidase X, DPP X) |
| Q8K057 | IFT80_MOUSE | Ift80 | Intraflagellar transport protein 80 homolog (WD repeat-containing protein 56) |
| Q9EPK2 | XRP2_MOUSE | Rp2 | Protein XRP2 |
| Q8BX57 | PXK_MOUSE | Pxk | PX domain-containing protein kinase-like protein (Modulator of Na,K-ATPase, MONaKA) |
| P16675 | PPGB_MOUSE | Ctsa | Lysosomal protective protein, EC 3.4.16.5 (Carboxypeptidase C) (Carboxypeptidase L) (Cathepsin A) (Protective protein cathepsin A, PPCA) (Protective protein for beta-galactosidase) [Cleaved into: Lysosomal protective protein 32 kDa chain; Lysosomal protective protein 20 kDa chain] |
| Q80VQ1 | LRRC1_MOUSE | Lrrc1 | Leucine-rich repeat-containing protein 1 |
| Q9CPX7 | RT16_MOUSE | Mrps16 | 28S ribosomal protein S16, mitochondrial, MRP-S16, S16mt |
| A2AJK6 | CHD7_MOUSE | Chd7 | Chromodomain-helicase-DNA-binding protein 7, CHD-7, EC 3.6.4.12 (ATP-dependent helicase CHD7) |
| Q80ZV0 | RNH2B_MOUSE | Rnaseh2b | Ribonuclease H2 subunit B, RNase H2 subunit B (Deleted in lymphocytic leukemia 8 homolog) (Ribonuclease HI subunit B) |
| P63141 | KCNA2_MOUSE | Kcna2 | Potassium voltage-gated channel subfamily A member 2 (MK2) (Voltage-gated potassium channel subunit Kv1.2) |
| P97783 | AF1Q_MOUSE | Mllt11 | Protein AF1q |
| Q5XPI3 | RN123_MOUSE | Rnf123 | E3 ubiquitin-protein ligase RNF123, EC 2.3.2.27 (Kip1 ubiquitination-promoting complex protein 1) (RING finger protein 123) (RING-type E3 ubiquitin transferase RNF123) |
| Q0VBD0 | ITB8_MOUSE | Itgb8 | Integrin beta-8 |
| O88708 | ORC4_MOUSE | Orc4 | Origin recognition complex subunit 4 |
| Q9D486 | CMIP_MOUSE | Cmip | C-Maf-inducing protein, c-Mip |

| | | | |
|--------|-------------|------------|--|
| Q924H2 | MED15_MOUSE | Med15 | Mediator of RNA polymerase II transcription subunit 15 (Mediator complex subunit 15) (Positive cofactor 2 glutamine/Q-rich-associated protein, PC2 glutamine/Q-rich-associated protein, mPcqp) |
| Q8K0Z7 | TACO1_MOUSE | Taco1 | Translational activator of cytochrome c oxidase 1 (Coiled-coil domain-containing protein 44) (Translational activator of mitochondrially-encoded cytochrome c oxidase 1) |
| Q9WTI7 | MYO1C_MOUSE | Myo1c | Unconventional myosin-1c (Myosin I beta, MMI-beta, MMIb) |
| Q9D074 | MGRN1_MOUSE | Mgrn1 | E3 ubiquitin-protein ligase MGRN1, EC 2.3.2.27 (Mahogunin RING finger protein 1) (RING-type E3 ubiquitin transferase MGRN1) |
| P60898 | RPB9_MOUSE | Polr2i | DNA-directed RNA polymerase II subunit RPB9, RNA polymerase II subunit B9 (DNA-directed RNA polymerase II subunit I) (RNA polymerase II 14.5 kDa subunit, RPB14.5) |
| Q62101 | KPCD1_MOUSE | Prkd1 | Serine/threonine-protein kinase D1, EC 2.7.11.13 (Protein kinase C mu type) (Protein kinase D) (nPKC-D1) (nPKC-mu) |
| Q9Z0V7 | TI17B_MOUSE | Timm17b | Mitochondrial import inner membrane translocase subunit Tim17-B |
| Q5SSH8 | NEUFC_MOUSE | Cyb5d2 | Neuferricin (Cytochrome b5 domain-containing protein 2) |
| P86174 | BEND4_MOUSE | Bend4 | BEN domain-containing protein 4 |
| Q923T9 | KCC2G_MOUSE | Camk2g | Calcium/calmodulin-dependent protein kinase type II subunit gamma, CaM kinase II subunit gamma, CaMK-II subunit gamma, EC 2.7.11.17 |
| P32261 | ANT3_MOUSE | Serpinc1 | Antithrombin-III, ATIII (Serpine C1) |
| Q9CR59 | G45IP_MOUSE | Gadd45gip1 | Growth arrest and DNA damage-inducible proteins-interacting protein 1 (39S ribosomal protein L59, mitochondrial, MRP-L59) |
| Q9WV27 | AT1A4_MOUSE | Atp1a4 | Sodium/potassium-transporting ATPase subunit alpha-4, Na(+)/K(+) ATPase alpha-4 subunit, EC 7.2.2.13 (Sodium pump subunit alpha-4) |
| Q9QUJ7 | ACSL4_MOUSE | Acs14 | Long-chain-fatty-acid--CoA ligase 4, EC 6.2.1.3 (Arachidonate--CoA ligase, EC 6.2.1.15) (Long-chain acyl-CoA synthetase 4, LACS 4, mACS4) |
| Q9CQA5 | MED4_MOUSE | Med4 | Mediator of RNA polymerase II transcription subunit 4 (Mediator complex subunit 4) |
| Q8BGB8 | COQ4_MOUSE | Coq4 | Ubiquinone biosynthesis protein COQ4 homolog, mitochondrial (Coenzyme Q biosynthesis protein 4 homolog) |
| Q8BHI4 | KBTB3_MOUSE | Kbtbd3 | Kelch repeat and BTB domain-containing protein 3 (BTB and kelch domain-containing protein 3) |

| | | | |
|--------|-------------|---------|---|
| Q5U5M8 | BL1S3_MOUSE | Bloc1s3 | Biogenesis of lysosome-related organelles complex 1 subunit 3, BLOC-1 subunit 3 (Reduced pigmentation protein) |
| Q4KUS2 | UN13A_MOUSE | Unc13a | Protein unc-13 homolog A (Munc13-1) |
| Q05A62 | DNAL1_MOUSE | Dnal1 | Dynein axonemal light chain 1 |
| Q3TTI8 | TEX52_MOUSE | Tex52 | Testis-expressed protein 52 |
| Q9D945 | LLPH_MOUSE | Llph | Protein LLP homolog (Protein LAPS18-like) |
| Q9ET47 | ESPN_MOUSE | Espn | Espin (Ectoplasmic specialization protein) |
| Q8CG79 | ASPP2_MOUSE | Tp53bp2 | Apoptosis-stimulating of p53 protein 2 (Tumor suppressor p53-binding protein 2, 53BP2, p53-binding protein 2, p53BP2) |
| Q5H8C4 | VP13A_MOUSE | Vps13a | Intermembrane lipid transfer protein VPS13A (Chorea-acanthocytosis protein homolog) (Chorein) (Vacuolar protein sorting-associated protein 13A) |
| Q8K370 | ACD10_MOUSE | Acad10 | Acyl-CoA dehydrogenase family member 10, ACAD-10, EC 1.3.99.- |
| Q9CZH3 | PSMG3_MOUSE | Psmg3 | Proteasome assembly chaperone 3, PAC-3, mPAC3 |
| Q9CQL4 | RM20_MOUSE | Mrpl20 | 39S ribosomal protein L20, mitochondrial, L20mt, MRP-L20 |
| Q8BM55 | TM214_MOUSE | Tmem214 | Transmembrane protein 214 |
| Q9CPR1 | RWDD4_MOUSE | Rwdd4 | RWD domain-containing protein 4 |
| P97821 | CATC_MOUSE | Ctsc | Dipeptidyl peptidase 1, EC 3.4.14.1 (Cathepsin C) (Cathepsin J) (Dipeptidyl peptidase I, DPP-I, DPPI) (Dipeptidyl transferase) [Cleaved into: Dipeptidyl peptidase 1 exclusion domain chain (Dipeptidyl peptidase I exclusion domain chain); Dipeptidyl peptidase 1 heavy chain (Dipeptidyl peptidase I heavy chain); Dipeptidyl peptidase 1 light chain (Dipeptidyl peptidase I light chain)] |
| Q9QXM1 | JMY_MOUSE | Jmy | Junction-mediating and -regulatory protein |
| Q62245 | SOS1_MOUSE | Sos1 | Son of sevenless homolog 1, SOS-1, mSOS-1 |
| Q9R078 | AAKB1_MOUSE | Prkab1 | 5'-AMP-activated protein kinase subunit beta-1, AMPK subunit beta-1, AMPKb |
| Q8C407 | YIPF4_MOUSE | Yipf4 | Protein YIPF4 (YIP1 family member 4) |
| Q9JJY4 | DDX20_MOUSE | Ddx20 | Probable ATP-dependent RNA helicase DDX20, EC 3.6.1.15, EC 3.6.4.13 (Component of gems 3) (DEAD box protein 20) (DEAD box protein DP 103) (Gemin-3) (Regulator of steroidogenic factor 1, ROSF-1) |
| O09126 | SEM4D_MOUSE | Sema4d | Semaphorin-4D (M-Sema G) (Semaphorin-C-like 2) (Semaphorin-J, Sema J) (CD antigen CD100) |

| | | | |
|--------|-------------|---------|--|
| Q91ZT5 | FGD4_MOUSE | Fgd4 | FYVE, RhoGEF and PH domain-containing protein 4 (Actin filament-binding protein frabin) (FGD1-related F-actin-binding protein) |
| Q6PCM2 | INT6_MOUSE | Ints6 | Integrator complex subunit 6, Int6 (DBI-1) (Protein DDX26) |
| Q61418 | CLCN4_MOUSE | Cln4 | H(+)/Cl(-) exchange transporter 4 (Chloride channel protein 4, ClC-4) (Chloride transporter ClC-4) |
| Q7TMS5 | ABCG2_MOUSE | Abcg2 | Broad substrate specificity ATP-binding cassette transporter ABCG2, EC 7.6.2.2 (ATP-binding cassette sub-family G member 2) (Breast cancer resistance protein 1 homolog) (Urate exporter) (CD antigen CD338) |
| Q5S006 | LRRK2_MOUSE | Lrrk2 | Leucine-rich repeat serine/threonine-protein kinase 2, EC 2.7.11.1, EC 3.6.5.- |
| Q3UHH1 | ZSWM8_MOUSE | Zswim8 | Zinc finger SWIM domain-containing protein 8 |
| Q9D1K7 | CT027_MOUSE | | UPF0687 protein C20orf27 homolog |
| Q5XJY4 | PARL_MOUSE | Parl | Presenilins-associated rhomboid-like protein, mitochondrial, EC 3.4.21.105 (Mitochondrial intramembrane-cleaving protease PARL) [Cleaved into: P-beta, Pbeta] |
| O55026 | ENTP2_MOUSE | Entpd2 | Ectonucleoside triphosphate diphosphohydrolase 2, NTPDase 2, EC 3.6.1.- (CD39 antigen-like 1) (Ecto-ATP diphosphohydrolase 2, Ecto-ATPDase 2, Ecto-ATPase 2) |
| Q5FWI3 | CEIP2_MOUSE | Cemip2 | Cell surface hyaluronidase, EC 3.2.1.35 (Cell migration-inducing hyaluronidase 2) (Transmembrane protein 2) |
| Q8BIP0 | SYDM_MOUSE | Dars2 | Aspartate--tRNA ligase, mitochondrial, EC 6.1.1.12 (Aspartyl-tRNA synthetase, AspRS) |
| P60605 | UB2G2_MOUSE | Ube2g2 | Ubiquitin-conjugating enzyme E2 G2, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme G2) (Ubiquitin carrier protein G2) (Ubiquitin-protein ligase G2) |
| P97820 | M4K4_MOUSE | Map4k4 | Mitogen-activated protein kinase kinase kinase kinase 4, EC 2.7.11.1 (HPK/GCK-like kinase HGK) (MAPK/ERK kinase kinase kinase 4, MEK kinase kinase 4, MEKKK 4) (Nck-interacting kinase) |
| Q99KR3 | LACB2_MOUSE | Lactb2 | Endoribonuclease LACTB2 (Beta-lactamase-like protein 2, EC 3.1.27.-) |
| Q711T7 | NADE_MOUSE | Nadsyn1 | Glutamine-dependent NAD(+) synthetase, EC 6.3.5.1 (NAD(+) synthase [glutamine-hydrolyzing]) (NAD(+) synthetase) (NH3-dependent NAD(+) synthetase-like protein) |
| Q9DB70 | FUND1_MOUSE | Fundc1 | FUN14 domain-containing protein 1 |
| O70293 | GRK6_MOUSE | Grk6 | G protein-coupled receptor kinase 6, EC 2.7.11.16 (G protein-coupled receptor kinase GRK6) |

| | | | |
|--------|-------------|-----------|---|
| Q9DCQ7 | A1AT6_MOUSE | Serpina1f | Alpha-1-antitrypsin 1-6 (Alpha-1 protease inhibitor 6) (Alpha-1-antiproteinase) (Serine protease inhibitor 1-6) (Serine protease inhibitor A1f, Serpin A1f) |
| Q01063 | PDE4D_MOUSE | Pde4d | cAMP-specific 3',5'-cyclic phosphodiesterase 4D, EC 3.1.4.53 (DPDE3) |
| Q569E4 | MENT_MOUSE | Ment | Protein MENT (Methylated in normal thymocytes protein) |
| Q9Z331 | K2C6B_MOUSE | Krt6b | Keratin, type II cytoskeletal 6B (Cytokeratin-6B, CK-6B) (Keratin-6-beta, mK6-beta) (Keratin-6B, K6B) |
| P51175 | PPOX_MOUSE | Ppox | Protoporphyrinogen oxidase, PPO, EC 1.3.3.4 |
| P23607 | ZFA_MOUSE | Zfa | Zinc finger autosomal protein |
| Q99PJ1 | PCD15_MOUSE | Pcdh15 | Protocadherin-15 |
| Q80XG9 | LRRT4_MOUSE | Lrrtm4 | Leucine-rich repeat transmembrane neuronal protein 4 |
| Q62141 | SIN3B_MOUSE | Sin3b | Paired amphipathic helix protein Sin3b (Histone deacetylase complex subunit Sin3b) (Transcriptional corepressor Sin3b) |
| Q91XP5 | GLRA3_MOUSE | Glra3 | Glycine receptor subunit alpha-3 |
| Q9D1Y9 | SHL2B_MOUSE | Shisal2b | Protein shisa-like-2B |
| Q9R1V6 | ADA22_MOUSE | Adam22 | Disintegrin and metalloproteinase domain-containing protein 22, ADAM 22 |
| Q9D9E0 | S22AH_MOUSE | Slc22a17 | Solute carrier family 22 member 17 (24p3 receptor, 24p3R) (Brain-type organic cation transporter) (Lipocalin-2 receptor) |
| Q91YQ3 | CSDC2_MOUSE | Csdc2 | Cold shock domain-containing protein C2 (RNA-binding protein PIPPin) |
| Q80W00 | PP1RA_MOUSE | Ppp1r10 | Serine/threonine-protein phosphatase 1 regulatory subunit 10 (MHC class I region proline-rich protein CAT53) |
| Q04519 | ASM_MOUSE | Smpd1 | Sphingomyelin phosphodiesterase, EC 3.1.4.12, EC 3.1.4.3 (Acid sphingomyelinase, ASMase) |
| Q3U155 | CC174_MOUSE | Ccdc174 | Coiled-coil domain-containing protein 174 |
| Q06649 | 3BP2_MOUSE | Sh3bp2 | SH3 domain-binding protein 2, 3BP-2 |
| Q9WU20 | MTHR_MOUSE | Mthfr | Methylenetetrahydrofolate reductase, EC 1.5.1.20 |
| Q00897 | A1AT4_MOUSE | Serpina1d | Alpha-1-antitrypsin 1-4 (Alpha-1 protease inhibitor 4) (Serine protease inhibitor 1-4) (Serine protease inhibitor A1d, Serpin A1d) |
| Q3TZX8 | NOL9_MOUSE | Nol9 | Polynucleotide 5'-hydroxyl-kinase NOL9, EC 2.7.1.- (Nucleolar protein 9) |
| Q3TW96 | UAP1L_MOUSE | Uap1l1 | UDP-N-acetylhexosamine pyrophosphorylase-like protein 1, EC 2.7.7.- |
| Q0VDN7 | RUND1_MOUSE | Rundc1 | RUN domain-containing protein 1 |

| | | | |
|--------|-------------|---------|---|
| Q0GGX2 | ZN541_MOUSE | Znf541 | Zinc finger protein 541 (Spermatogenic cell HDAC-interacting protein 1) |
| Q8R3S6 | EXOC1_MOUSE | Exoc1 | Exocyst complex component 1 (Exocyst complex component Sec3) |
| Q8BWH9 | CIP2A_MOUSE | Cip2a | Protein CIP2A (Cancerous inhibitor of PP2A) (p90 autoantigen homolog) |
| Q99LX5 | MMTA2_MOUSE | Mmtag2 | Multiple myeloma tumor-associated protein 2 homolog |
| Q9ERS5 | PKHA2_MOUSE | Plekha2 | Pleckstrin homology domain-containing family A member 2, PH domain-containing family A member 2 (PH domain-containing adaptor PHAD47) (Tandem PH domain-containing protein 2, TAPP-2) |
| Q9JJ89 | CCD86_MOUSE | Ccdc86 | Coiled-coil domain-containing protein 86 (Cytokine-induced protein with coiled-coil domain, mCyclon) |
| Q9CR39 | WIPI3_MOUSE | Wdr45b | WD repeat domain phosphoinositide-interacting protein 3, WIPI-3 (WD repeat-containing protein 45-like, WDR45-like protein) (WD repeat-containing protein 45B) |
| Q80XC3 | US6NL_MOUSE | Usp6nl | USP6 N-terminal-like protein |
| Q5RJ54 | ZSC26_MOUSE | Zscan26 | Zinc finger and SCAN domain-containing protein 26 (Zinc finger protein 187) |
| Q8K3D3 | SWI5_MOUSE | Swi5 | DNA repair protein SWI5 homolog (Protein SAE3 homolog) |
| E9Q612 | PTPRO_MOUSE | Ptpro | Receptor-type tyrosine-protein phosphatase O, R-PTP-O, EC 3.1.3.48 (Glomerular epithelial protein 1) (Protein tyrosine phosphatase U2, PTP-U2, PTPase U2) |
| D3YXK1 | SAMD1_MOUSE | Samd1 | Sterile alpha motif domain-containing protein 1, SAM domain-containing protein 1 (Atherin) |
| Q9D7J4 | COX20_MOUSE | Cox20 | Cytochrome c oxidase assembly protein COX20, mitochondrial |
| P86046 | KCJ13_MOUSE | Kcnj13 | Inward rectifier potassium channel 13 (Inward rectifier K(+) channel Kir7.1) (Potassium channel, inwardly rectifying subfamily J member 13) |
| Q3UV70 | PDP1_MOUSE | Pdp1 | [Pyruvate dehydrogenase [acetyl-transferring]]-phosphatase 1, mitochondrial, PDP 1, EC 3.1.3.43 (Protein phosphatase 2C) (Pyruvate dehydrogenase phosphatase catalytic subunit 1, PDPC 1) |
| Q5EBG6 | HSPB6_MOUSE | Hspb6 | Heat shock protein beta-6, HspB6 |
| P03995 | GFAP_MOUSE | Gfap | Glial fibrillary acidic protein, GFAP |
| Q9QXS6 | DREB_MOUSE | Dbn1 | Drebrin (Developmentally-regulated brain protein) |
| P84104 | SRSF3_MOUSE | Srsf3 | Serine/arginine-rich splicing factor 3 (Pre-mRNA-splicing factor SRP20) (Protein X16) (Splicing factor, arginine/serine-rich 3) |
| P63137 | GBRB2_MOUSE | Gabrb2 | Gamma-aminobutyric acid receptor subunit beta-2 (GABA(A) receptor subunit beta-2) |

| | | | |
|--------|-------------|---------|---|
| Q8BPP1 | MB212_MOUSE | Mab2112 | Protein mab-21-like 2 |
| O70325 | GPX4_MOUSE | Gpx4 | Phospholipid hydroperoxide glutathione peroxidase, PHGPx, EC 1.11.1.12 (Glutathione peroxidase 4, GPx-4, GSHPx-4) |
| Q8BGW1 | FTO_MOUSE | Fto | Alpha-ketoglutarate-dependent dioxygenase FTO (Fat mass and obesity-associated protein) (Protein fatso) (U6 small nuclear RNA (2'-O-methyladenosine-N(6)-)-demethylase FTO, EC 1.14.11.-) (U6 small nuclear RNA N(6)-methyladenosine-demethylase FTO, EC 1.14.11.-) (mRNA (2'-O-methyladenosine-N(6)-)-demethylase FTO, m6A(m)-demethylase FTO, EC 1.14.11.-) (mRNA N(6)-methyladenosine demethylase FTO, EC 1.14.11.53) (tRNA N1-methyl adenine demethylase FTO, EC 1.14.11.-) |
| Q7TQH0 | ATX2L_MOUSE | Atxn2l | Ataxin-2-like protein |
| Q3UHE1 | PITM3_MOUSE | Pitpnm3 | Membrane-associated phosphatidylinositol transfer protein 3 (Phosphatidylinositol transfer protein, membrane-associated 3, PITPnm 3) (Pyk2 N-terminal domain-interacting receptor 1, NIR-1) |
| O70172 | PI42A_MOUSE | Pip4k2a | Phosphatidylinositol 5-phosphate 4-kinase type-2 alpha, EC 2.7.1.149 (1-phosphatidylinositol 5-phosphate 4-kinase 2-alpha) (Diphosphoinositide kinase 2-alpha) (Phosphatidylinositol 5-Phosphate 4-Kinase, PI5P4Kalpha) (Phosphatidylinositol 5-phosphate 4-kinase type II alpha, PI(5)P 4-kinase type II alpha, PIP4KII-alpha) (PtdIns(5)P-4-kinase isoform 2-alpha) |
| Q9JK48 | SHLB1_MOUSE | Sh3glb1 | Endophilin-B1 (SH3 domain-containing GRB2-like protein B1) |
| Q3UVK0 | ERMP1_MOUSE | Ermp1 | Endoplasmic reticulum metallopeptidase 1, EC 3.4.-.- (Felix-ina) |
| Q6P2L6 | NSD3_MOUSE | Nsd3 | Histone-lysine N-methyltransferase NSD3, EC 2.1.1.370, EC 2.1.1.371 (Nuclear SET domain-containing protein 3) (Wolf-Hirschhorn syndrome candidate 1-like protein 1 homolog, WHSC1-like protein 1) |
| Q9D868 | PPIH_MOUSE | Ppnh | Peptidyl-prolyl cis-trans isomerase H, PPIase H, EC 5.2.1.8 (Rotamase H) |
| P52483 | UB2E3_MOUSE | Ube2e3 | Ubiquitin-conjugating enzyme E2 E3, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme E3) (UbcM2) (Ubiquitin carrier protein E3) (Ubiquitin-conjugating enzyme E2-23 kDa) (Ubiquitin-protein ligase E3) |
| Q8K1N1 | PLPL8_MOUSE | Pnpla8 | Calcium-independent phospholipase A2-gamma, EC 3.1.1.-, EC 3.1.1.5 (Intracellular membrane-associated calcium-independent phospholipase A2 gamma, iPLA2-gamma) (Patatin-like phospholipase domain-containing protein 8) |
| Q812E0 | CPEB2_MOUSE | Cpeb2 | Cytoplasmic polyadenylation element-binding protein 2, CPE-BP2, CPE-binding protein 2, mCPEB-2 |

| | | | |
|--------|-------------|----------|--|
| Q3SXD3 | HDDC2_MOUSE | Hddc2 | 5'-deoxynucleotidase HDDC2, EC 3.1.3.89 (HD domain-containing protein 2) |
| P56387 | DYLT3_MOUSE | Dynlt3 | Dynein light chain Tctex-type 3 (Protein 91/23) (T-complex-associated testis-expressed 1-like) |
| Q61233 | PLSL_MOUSE | Lcp1 | Plastin-2 (65 kDa macrophage protein) (L-plastin) (Lymphocyte cytosolic protein 1, LCP-1) (pp65) |
| Q7TSH3 | ZN516_MOUSE | Znf516 | Zinc finger protein 516 |
| Q8BLN6 | UNC80_MOUSE | Unc80 | Protein unc-80 homolog, mUNC-80 |
| O08914 | FAAH1_MOUSE | Faah | Fatty-acid amide hydrolase 1, EC 3.5.1.99 (Anandamide amidohydrolase 1) (Fatty acid ester hydrolase, EC 3.1.1.-) (Oleamide hydrolase 1) |
| Q8CCJ9 | P20L1_MOUSE | Phf2011 | PHD finger protein 20-like protein 1 |
| Q8VCH7 | RDH10_MOUSE | Rdh10 | Retinol dehydrogenase 10, EC 1.1.1.300 |
| Q3UE37 | UBE2Z_MOUSE | Ube2z | Ubiquitin-conjugating enzyme E2 Z, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme Z) (Uba6-specific E2 conjugating enzyme 1, Use1) (Ubiquitin carrier protein Z) (Ubiquitin-protein ligase Z) |
| Q924L1 | LTMD1_MOUSE | Letmd1 | LETM1 domain-containing protein 1 (Cervical cancer receptor) (MCC-32) |
| Q9CYG7 | TOM34_MOUSE | Tomm34 | Mitochondrial import receptor subunit TOM34 (Translocase of outer membrane 34 kDa subunit) |
| Q923X4 | GLRX2_MOUSE | Glx2 | Glutaredoxin-2, mitochondrial |
| Q8BXR5 | NALCN_MOUSE | Nalcn | Sodium leak channel NALCN (Sodium leak channel non-selective protein) (Voltage gated channel-like protein 1) |
| Q60899 | ELAV2_MOUSE | Elavl2 | ELAV-like protein 2 (ELAV-like neuronal protein 1) (Hu-antigen B, HuB) (Nervous system-specific RNA-binding protein Mel-N1) |
| Q9Z2W1 | STK25_MOUSE | Stk25 | Serine/threonine-protein kinase 25, EC 2.7.11.1 (Ste20-like kinase) (Sterile 20/oxidant stress-response kinase 1, SOK-1, Ste20/oxidant stress response kinase 1) |
| Q62415 | ASPP1_MOUSE | Ppp1r13b | Apoptosis-stimulating of p53 protein 1 (Protein phosphatase 1 regulatory subunit 13B) |
| Q8BFU8 | VGLU3_MOUSE | Slc17a8 | Vesicular glutamate transporter 3, VGluT3 (Solute carrier family 17 member 8) |
| Q8BPU7 | ELMO1_MOUSE | Elmo1 | Engulfment and cell motility protein 1 (Protein ced-12 homolog) |
| Q8C0K5 | GDC_MOUSE | Slc25a16 | Solute carrier family 25 member 16 (Graves disease carrier protein homolog, GDC) (Mitochondrial solute carrier protein homolog) |
| Q5HZI1 | MTUS1_MOUSE | Mtus1 | Microtubule-associated tumor suppressor 1 homolog (AT2 receptor-binding protein) (Angiotensin-II type 2 receptor-interacting protein) (Coiled-coiled tumor suppressor gene 1 protein) (Mitochondrial tumor suppressor 1 homolog) |

| | | | |
|--------|-------------|----------|--|
| Q3UHC7 | DAB2P_MOUSE | Dab2ip | Disabled homolog 2-interacting protein, DAB2-interacting protein (ASK-interacting protein 1) (DOC-2/DAB-2 interactive protein) |
| E9Q4S1 | PDE8B_MOUSE | Pde8b | High affinity cAMP-specific and IBMX-insensitive 3',5'-cyclic phosphodiesterase 8B, PDE8B, EC 3.1.4.53 (Cell proliferation-inducing gene 22 protein) |
| Q9D0L4 | ADCK1_MOUSE | Adck1 | AarF domain-containing protein kinase 1, EC 2.7.-.- |
| Q8BGK5 | S35F1_MOUSE | Slc35f1 | Solute carrier family 35 member F1 |
| Q9JJ80 | RPF2_MOUSE | Rpf2 | Ribosome production factor 2 homolog (Brix domain-containing protein 1) (Ribosome biogenesis protein RPF2 homolog) |
| Q9ES18 | FOXJ2_MOUSE | Foxj2 | Forkhead box protein J2 (Fork head homologous X) |
| Q9D1J1 | NECP2_MOUSE | Necap2 | Adaptin ear-binding coat-associated protein 2 (NECAP endocytosis-associated protein 2, NECAP-2) |
| Q9CZ96 | ZCRB1_MOUSE | Zcrb1 | Zinc finger CCHC-type and RNA-binding motif-containing protein 1 (MADP-1) (U11/U12 small nuclear ribonucleoprotein 31 kDa protein, U11/U12 snRNP 31 kDa protein) |
| Q9CXE7 | TMED5_MOUSE | Tmed5 | Transmembrane emp24 domain-containing protein 5 (p24 family protein gamma-2, p24gamma2) |
| Q9CR23 | TMEM9_MOUSE | Tmem9 | Proton-transporting V-type ATPase complex assembly regulator TMEM9, v-ATPase assembly regulator TMEM9 (Transmembrane protein 9, Protein TMEM9) |
| Q921L3 | TMCO1_MOUSE | Tmco1 | Calcium load-activated calcium channel, CLAC channel (Transmembrane and coiled-coil domain-containing protein 1) |
| Q8K3W3 | CASC3_MOUSE | Casc3 | Protein CASC3 (Cancer susceptibility candidate gene 3 protein homolog) (Metastatic lymph node gene 51 protein homolog, MLN 51 homolog) (Protein barentsz, Btz, mBtz) |
| Q8K3C0 | RNK_MOUSE | Rnasek | Ribonuclease kappa, RNase K, RNase kappa, EC 3.1.-.- (V-type proton ATPase subunit f, V-ATPase subunit f) |
| Q8C1E7 | TACAN_MOUSE | Tmem120a | Ion channel TACAN (Transmembrane protein 120A) |
| Q8BGY7 | F210A_MOUSE | Fam210a | Protein FAM210A |
| Q6ZWY6 | U2D2B_MOUSE | Ube2d2b | Ubiquitin-conjugating enzyme E2 D2B, EC 2.3.2.23 (E2 ubiquitin-conjugating enzyme D2B) (Ubiquitin carrier protein D2B) (Ubiquitin-protein ligase D2B) |
| Q6P1J0 | MANEL_MOUSE | Maneal | Glycoprotein endo-alpha-1,2-mannosidase-like protein, EC 3.2.1.- |
| Q6AW69 | CGNL1_MOUSE | Cgnl1 | Cingulin-like protein 1 (Junction-associated coiled-coil protein) |
| Q62178 | SEM4A_MOUSE | Sema4a | Semaphorin-4A (Semaphorin-B, Sema B) |

| | | | |
|--------|-------------|---------|---|
| Q3TA59 | JMJD8_MOUSE | Jmjd8 | JmjC domain-containing protein 8 (Jumonji domain-containing protein 8) |
| P61237 | YPEL3_MOUSE | Ypel3 | Protein yippee-like 3 (Small ubiquitinated apoptotic protein) |
| P51125 | ICAL_MOUSE | Cast | Calpastatin (Calpain inhibitor) |
| A2APY7 | NDUF5_MOUSE | Ndufaf5 | Arginine-hydroxylase NDUF5, mitochondrial, EC 1.-.- (NADH dehydrogenase [ubiquinone] 1 alpha subcomplex assembly factor 5) (Putative methyltransferase NDUF5, EC 2.1.1.-) |
| Q8BUY9 | PGTB1_MOUSE | Pggt1b | Geranylgeranyl transferase type-1 subunit beta, EC 2.5.1.59 (Geranylgeranyl transferase type I subunit beta, GGTase-I-beta) (Type I protein geranylgeranyltransferase subunit beta) |
| Q9CR56 | KBR2_MOUSE | Nkiras2 | NF-kappa-B inhibitor-interacting Ras-like protein 2 (I-kappa-B-interacting Ras-like protein 2, Kappa B-Ras protein 2, KappaB-Ras2) |
| Q9ERI5 | JMJD6_MOUSE | Jmjd6 | Bifunctional arginine demethylase and lysyl-hydroxylase JMJD6, EC 1.14.11.- (Histone arginine demethylase JMJD6) (JmjC domain-containing protein 6) (Jumonji domain-containing protein 6) (Lysyl-hydroxylase JMJD6) (Peptide-lysine 5-dioxygenase JMJD6) (Phosphatidylserine receptor, Protein PTDSR) |
| Q8CHP0 | ZC3H3_MOUSE | Zc3h3 | Zinc finger CCCH domain-containing protein 3 (Smad-interacting CPSF-like factor) |
| Q5SSZ5 | TENS3_MOUSE | Tns3 | Tensin-3 (Tensin-like SH2 domain-containing protein 1) |
| Q8C7H1 | MMAA_MOUSE | Mmaa | Methylmalonic aciduria type A homolog, mitochondrial, EC 3.6.-.- |
| E9PYH6 | SET1A_MOUSE | Setd1a | Histone-lysine N-methyltransferase SETD1A, EC 2.1.1.364 (SET domain-containing protein 1A) |
| Q8R086 | SUOX_MOUSE | Suox | Sulfite oxidase, mitochondrial, EC 1.8.3.1 |
| Q8BL95 | CF298_MOUSE | Cfap298 | Cilia- and flagella-associated protein 298 (Protein curly homolog) |
| Q8BVG4 | DPP9_MOUSE | Dpp9 | Dipeptidyl peptidase 9, DP9, EC 3.4.14.5 (Dipeptidyl peptidase IX, DPP IX) (Dipeptidyl peptidase-like protein 9, DPLP9) |
| O35219 | KCNH2_MOUSE | Kcnh2 | Potassium voltage-gated channel subfamily H member 2 (Ether-a-go-go-related gene potassium channel 1, ERG-1, Eag-related protein 1, Ether-a-go-go-related protein 1, MERG) (Voltage-gated potassium channel subunit Kv11.1) |
| O08792 | COE2_MOUSE | Ebf2 | Transcription factor COE2 (Early B-cell factor 2, EBF-2) (Metencephalon-mesencephalon-olfactory transcription factor 1, MET-mesencephalon-olfactory TF1, MET-mesencephalon-olfactory transcription factor 1) (Olf-1/EBF-like 3, O/E-3, OE-3) |
| Q9D0R9 | WDR89_MOUSE | Wdr89 | WD repeat-containing protein 89 |

| | | | |
|--------|-------------|----------|--|
| Q3USZ8 | DIK2A_MOUSE | Dipk2a | Divergent protein kinase domain 2A (Deleted in autism protein 1 homolog) (Golgi Protein of 49 kDa, GoPro49) (Hypoxia and AKT-induced stem cell factor, HASF) |
| P29812 | TYRP2_MOUSE | Dct | L-dopachrome tautomerase, DCT, DT, EC 5.3.3.12 (DOPachrome conversion factor) (DOPachrome isomerase) (DOPachrome oxidoreductase) (L-dopachrome Delta-isomerase) (SLATY locus protein) (Tyrosinase-related protein 2, TRP-2, TRP2) |
| Q920A0 | OPT_MOUSE | Optc | Opticin (Oculoglycan) |
| Q00196 | PO2F2_MOUSE | Pou2f2 | POU domain, class 2, transcription factor 2 (Lymphoid-restricted immunoglobulin octamer-binding protein NF-A2) (Octamer-binding protein 2, Oct-2) (Octamer-binding transcription factor 2, OTF-2) |
| Q9WV32 | ARC1B_MOUSE | Arpc1b | Actin-related protein 2/3 complex subunit 1B (Arp2/3 complex 41 kDa subunit) (p41-ARC) |
| Q9WVD5 | ORNT1_MOUSE | Slc25a15 | Mitochondrial ornithine transporter 1 (Solute carrier family 25 member 15) |
| Q9DB90 | SMG9_MOUSE | Smg9 | Nonsense-mediated mRNA decay factor SMG9 |
| Q6P1G2 | KDM2B_MOUSE | Kdm2b | Lysine-specific demethylase 2B, EC 1.14.11.27 (F-box and leucine-rich repeat protein 10) (F-box protein FBL10) (F-box/LRR-repeat protein 10) (JmjC domain-containing histone demethylation protein 1B) ([Histone-H3]-lysine-36 demethylase 1B) |
| Q7TSY6 | CELF4_MOUSE | Celf4 | CUGBP Elav-like family member 4, CELF-4 (Bruno-like protein 4) (CUG-BP- and ETR-3-like factor 4) (RNA-binding protein BRUNOL-4) |
| P98192 | GNPAT_MOUSE | Gnpat | Dihydroxyacetone phosphate acyltransferase, DAP-AT, DHAP-AT, EC 2.3.1.42 (Acyl-CoA:dihydroxyacetonephosphateacyltransferase) (Glycerone-phosphate O-acyltransferase) |
| Q9QZK2 | BCAR3_MOUSE | Bcar3 | Breast cancer anti-estrogen resistance protein 3 homolog (p130Cas-binding protein AND-34) |
| Q9R1V6 | ADA22_MOUSE | Adam22 | Disintegrin and metalloproteinase domain-containing protein 22, ADAM 22 |
| Q8BXQ2 | PIGT_MOUSE | Pigt | GPI transamidase component PIG-T (Neuronal development-associated protein 7) (Phosphatidylinositol-glycan biosynthesis class T protein) |
| Q8BTH8 | KC1G1_MOUSE | Csnk1g1 | Casein kinase I isoform gamma-1, CKI-gamma 1, EC 2.7.11.1 |
| Q6PCZ4 | MAGE1_MOUSE | Magee1 | Melanoma-associated antigen E1 (Alpha-dystrobrevin-associated MAGE Protein, DAMAGE) (MAGE-E1 antigen) |
| E9Q956 | MCMD2_MOUSE | Mcmdc2 | Minichromosome maintenance domain-containing protein 2, MCM domain-containing protein 2 |

| | | | |
|--------|-------------|----------|--|
| Q9ESN4 | C1QL3_MOUSE | C1ql3 | Complement C1q-like protein 3 (C1q and tumor necrosis factor-related protein 13, C1q/TNF-related protein 13, CTRP13) (Gliacolin) |
| Q8BGR2 | LRC8D_MOUSE | Lrrc8d | Volume-regulated anion channel subunit LRRC8D (Leucine-rich repeat-containing protein 5) (Leucine-rich repeat-containing protein 8D) |
| Q9DAM5 | TPC_MOUSE | Slc25a19 | Mitochondrial thiamine pyrophosphate carrier (Solute carrier family 25 member 19) |
| Q8CEI1 | BOLA3_MOUSE | Bola3 | BolA-like protein 3 |
| P59598 | ASXL1_MOUSE | Asxl1 | Polycomb group protein ASXL1 (Additional sex combs-like protein 1) |
| Q8K1Y2 | KPCD3_MOUSE | Prkd3 | Serine/threonine-protein kinase D3, EC 2.7.11.13 (Protein kinase C nu type) (nPKC-nu) |
| Q91XY4 | PCDG4_MOUSE | Pcdhga4 | Protocadherin gamma-A4, PCDH-gamma-A4 |
| O35723 | DNJB3_MOUSE | Dnajb3 | DnaJ homolog subfamily B member 3, DnaJ protein homolog 3 (Heat shock protein J3, HSJ-3) (MSJ-1) |
| Q9JHE4 | G3ST1_MOUSE | Gal3st1 | Galactosylceramide sulfotransferase, GalCer sulfotransferase, EC 2.8.2.11 (3'-phosphoadenosine-5'-phosphosulfate:GalCer sulfotransferase) (3'-phosphoadenylylsulfate:galactosylceramide 3'-sulfotransferase) (Cerebroside sulfotransferase) |
| Q6SJ95 | TBPL2_MOUSE | Tbpl2 | TATA box-binding protein-like 2, TBP-like 2 (TATA box-binding protein-related factor 3, TBP-related factor 3) |
| Q921H9 | COA7_MOUSE | Coa7 | Cytochrome c oxidase assembly factor 7 (Beta-lactamase hcp-like protein) (Respiratory chain assembly factor 1) (Sell repeat-containing protein 1) |
| Q9DD03 | RAB13_MOUSE | Rab13 | Ras-related protein Rab-13 |
| Q80XL6 | ACD11_MOUSE | Acad11 | Acyl-CoA dehydrogenase family member 11, ACAD-11, EC 1.3.8.- |
| Q2HXL6 | EDEM3_MOUSE | Edem3 | ER degradation-enhancing alpha-mannosidase-like protein 3, EC 3.2.1.113 (Alpha-1,2-mannosidase EDEM3) |
| Q3UTB7 | FOXR1_MOUSE | Foxr1 | Forkhead box protein R1 (Forkhead box protein N5) |
| Q9Z1M4 | KS6B2_MOUSE | Rps6kb2 | Ribosomal protein S6 kinase beta-2, S6K-beta-2, S6K2, EC 2.7.11.1 (70 kDa ribosomal protein S6 kinase 2) (p70 ribosomal S6 kinase beta, p70 S6 kinase beta, p70 S6K-beta, p70 S6KB) |
| P32507 | NECT2_MOUSE | Nectin2 | Nectin-2 (Herpes virus entry mediator B, Herpesvirus entry mediator B, HveB) (Murine herpes virus entry protein B, mHveB) (Nectin cell adhesion molecule 2) (Poliovirus receptor homolog) (Poliovirus receptor-related protein 2) (CD antigen CD112) |

| | | | |
|--------|-------------|----------|--|
| Q9EPQ7 | STAR5_MOUSE | Stard5 | StAR-related lipid transfer protein 5 (START domain-containing protein 5, StARD5) |
| Q8BG92 | CLVS2_MOUSE | Clvs2 | Clavesin-2 (Retinaldehyde-binding protein 1-like 2) |
| O35892 | SP100_MOUSE | Sp100 | Nuclear autoantigen Sp-100 (Nuclear dot-associated Sp100 protein) (Speckled 100 kDa) |
| Q9Z199 | SPT4B_MOUSE | Supt4h1b | Transcription elongation factor SPT4-B (DRB sensitivity-inducing factor small subunit 2, DSIF small subunit 2) (Transcription elongation factor SPT4 2) |
| Q8VDI9 | ALG9_MOUSE | Alg9 | Alpha-1,2-mannosyltransferase ALG9, EC 2.4.1.259, EC 2.4.1.261 (Dol-P-Man:Man(6)GlcNAc(2)-PP-Dol alpha-1,2-mannosyltransferase) (Dol-P-Man:Man(8)GlcNAc(2)-PP-Dol alpha-1,2-mannosyltransferase) |
| Q8K2P1 | LUR1L_MOUSE | Lurap1l | Leucine rich adaptor protein 1-like |
| Q8VCX6 | KPTN_MOUSE | Kptn | KICSTOR complex protein kaptin |
| Q6PDH0 | PHLB1_MOUSE | Phldb1 | Pleckstrin homology-like domain family B member 1 (Protein LL5-alpha) |
| P56671 | MAZ_MOUSE | Maz | Myc-associated zinc finger protein, MAZI (Pur-1) (Purine-binding transcription factor) |
| Q5SPL2 | PHF12_MOUSE | Phf12 | PHD finger protein 12 (PHD factor 1, Pf1) |
| Q9JJG9 | NOA1_MOUSE | Noa1 | Nitric oxide-associated protein 1 |
| Q8VCM5 | MUL1_MOUSE | Mul1 | Mitochondrial ubiquitin ligase activator of NFKB 1, EC 2.3.2.27 (E3 ubiquitin-protein ligase MUL1) (Growth inhibition and death E3 ligase) (Protein Hades) (RING-type E3 ubiquitin transferase NFKB 1) |
| Q8R007 | NECT4_MOUSE | Nectin4 | Nectin-4 (Ig superfamily receptor LNIR) (Nectin cell adhesion molecule 4) (Poliovirus receptor-related protein 4) |
| P27040 | AVR2B_MOUSE | Acvr2b | Activin receptor type-2B, EC 2.7.11.30 (Activin receptor type IIB, ACTR-IIB) |
| Q5SUA5 | MYO1G_MOUSE | Myo1g | Unconventional myosin-Ig |
| O70311 | NMT2_MOUSE | Nmt2 | Glycylpeptide N-tetradecanoyltransferase 2, EC 2.3.1.97 (Myristoyl-CoA:protein N-myristoyltransferase 2, NMT 2) (Peptide N-myristoyltransferase 2) (Type II N-myristoyltransferase) |
| Q9DBD5 | PELP1_MOUSE | Pelp1 | Proline-, glutamic acid- and leucine-rich protein 1 (Modulator of non-genomic activity of estrogen receptor) |
| Q9DCH6 | ZFAN6_MOUSE | Zfand6 | AN1-type zinc finger protein 6 (Associated with PRK1 protein) (Zinc finger A20 domain-containing protein 3) |
| Q99M51 | NCK1_MOUSE | Nck1 | Cytoplasmic protein NCK1 (NCK adaptor protein 1, Nck-1) |

| | | | |
|--------|-------------|---------|---|
| Q62233 | SIX3_MOUSE | Six3 | Homeobox protein SIX3 (Sine oculis homeobox homolog 3) |
| Q9CQV4 | RETR3_MOUSE | Retreg3 | Reticulophagy regulator 3 |
| Q8K2U2 | ALKB6_MOUSE | Alkbh6 | Alpha-ketoglutarate-dependent dioxygenase alkB homolog 6, EC 1.14.11.- (Alkylated DNA repair protein alkB homolog 6) |
| P11276 | FINC_MOUSE | Fn1 | Fibronectin, FN [Cleaved into: Anastellin] |
| Q9DB98 | LENG1_MOUSE | Leng1 | Leukocyte receptor cluster member 1 homolog |
| Q3UPR9 | SBSPO_MOUSE | Sbspon | Somatomedin-B and thrombospondin type-1 domain-containing protein (RPE-spondin) |
| Q6P1Z5 | PED1A_MOUSE | Pced1a | PC-esterase domain-containing protein 1A (Protein FAM113A) |
| Q8BMD5 | CDAC1_MOUSE | Cdadcl1 | Cytidine and dCMP deaminase domain-containing protein 1, EC 3.5.4.5 (Cytidine deaminase) |
| Q8BH64 | EHD2_MOUSE | Ehd2 | EH domain-containing protein 2 |
| Q9EPQ8 | TCF20_MOUSE | Tcf20 | Transcription factor 20, TCF-20 (Nuclear factor SPBP) (Stromelysin-1 PDGF-responsive element-binding protein, SPRE-binding protein) |
| Q8K4F5 | ABHDB_MOUSE | Abhd11 | Protein ABHD11, EC 3.-.-.- (Alpha/beta hydrolase domain-containing protein 11, Abhydrolase domain-containing protein 11) (Williams-Beuren syndrome chromosomal region 21 protein homolog) |
| Q8BHS6 | ARMX3_MOUSE | Armex3 | Armadillo repeat-containing X-linked protein 3 |
| Q9CQL5 | RM18_MOUSE | Mrpl18 | 39S ribosomal protein L18, mitochondrial, L18mt, MRP-L18 |
| Q9CZJ9 | DJC18_MOUSE | Dnajc18 | DnaJ homolog subfamily C member 18 |
| Q80US4 | ARP5_MOUSE | Actr5 | Actin-related protein 5 |
| Q8C8R3 | ANK2_MOUSE | Ank2 | Ankyrin-2, ANK-2 (Ankyrin-B) (Brain ankyrin) |
| Q91XM9 | DLG2_MOUSE | Dlg2 | Disks large homolog 2 (Channel-associated protein of synapse-110, Chapsyn-110) (Postsynaptic density protein PSD-93) |
| Q8K1M6 | DNM1L_MOUSE | Dnm11 | Dynamamin-1-like protein, EC 3.6.5.5 (Dynamamin family member proline-rich carboxyl-terminal domain less, Dymple) (Dynamamin-related protein 1) |
| Q5IRJ6 | ZNT9_MOUSE | Slc30a9 | Zinc transporter 9, ZnT-9 (GRIP1-associated coactivator 63, GAC63) (Solute carrier family 30 member 9) |
| Q9CQV8 | 1433B_MOUSE | Ywhab | 14-3-3 protein beta/alpha (Protein kinase C inhibitor protein 1, KCIP-1) [Cleaved into: 14-3-3 protein beta/alpha, N-terminally processed] |
| Q9QX47 | SON_MOUSE | Son | Protein SON (Negative regulatory element-binding protein, NRE-binding protein) |

| | | | |
|--------|-------------|----------|--|
| O35465 | FKBP8_MOUSE | Fkbp8 | Peptidyl-prolyl cis-trans isomerase FKBP8, PPIase FKBP8, EC 5.2.1.8 (38 kDa FK506-binding protein, 38 kDa FKBP, FKBP-38, mFKBP38) (FK506-binding protein 8, FKBP-8) (FKBPR38) (Rotamase) |
| P12815 | PDCD6_MOUSE | Pdcd6 | Programmed cell death protein 6 (ALG-257) (Apoptosis-linked gene 2 protein, ALG-2) (PMP41) |
| Q80U63 | MFN2_MOUSE | Mfn2 | Mitofusin-2, EC 3.6.5.- (Hypertension-related protein 1) (Mitochondrial assembly regulatory factor, HSG protein) (Transmembrane GTPase MFN2) |
| P48024 | EIF1_MOUSE | Eif1 | Eukaryotic translation initiation factor 1, eIF1 (Protein translation factor SUI1 homolog) |
| Q4KML4 | ABRAL_MOUSE | Abracl | Costars family protein ABRACL (ABRA C-terminal-like protein) |
| Q01097 | NMDE2_MOUSE | Grin2b | Glutamate receptor ionotropic, NMDA 2B, GluN2B (Glutamate [NMDA] receptor subunit epsilon-2) (N-methyl D-aspartate receptor subtype 2B, NMDAR2B, NR2B) |
| Q8R4G0 | NTNG1_MOUSE | Ntn1 | Netrin-G1 (Laminct-1) |
| Q8VHN8 | TIRR_MOUSE | Nudt16l1 | Tudor-interacting repair regulator protein (NUDT16-like protein 1) (Protein syndesmos) |
| Q80YV4 | PANK4_MOUSE | Pank4 | 4'-phosphopantetheine phosphatase, EC 3.1.3.- (Inactive pantothenic acid kinase 4, mPank4) |
| Q69ZX6 | MOR2A_MOUSE | Morc2a | ATPase MORC2A, EC 3.6.1.- (MORC family CW-type zinc finger protein 2A) (Zinc finger CW-type coiled-coil domain protein 1) |
| Q6PAQ4 | REXO4_MOUSE | Rexo4 | RNA exonuclease 4, EC 3.1.-.- (Exonuclease XPMC2) (Prevents mitotic catastrophe 2 protein homolog) |
| Q80TY0 | FNBP1_MOUSE | Fnbp1 | Formin-binding protein 1 (Formin-binding protein 17) |
| Q9JHC9 | ELF2_MOUSE | Elf2 | ETS-related transcription factor Elf-2 (E74-like factor 2) (New ETS-related factor) |
| Q99L90 | MCRS1_MOUSE | Mcrs1 | Microspherule protein 1 (58 kDa microspherule protein) |
| Q99JX3 | GORS2_MOUSE | Gorasp2 | Golgi reassembly-stacking protein 2, GRS2 (Golgi reassembly-stacking protein of 55 kDa, GRASP55) |
| Q6NTA4 | RRAGB_MOUSE | Rragb | Ras-related GTP-binding protein B, Rag B, RagB, EC 3.6.5.- |
| P58069 | RASA2_MOUSE | Rasa2 | Ras GTPase-activating protein 2 (GAP1m) |
| P54254 | ATX1_MOUSE | Atxn1 | Ataxin-1 (Spinocerebellar ataxia type 1 protein homolog) |
| Q66L44 | CBARP_MOUSE | Cbarp | Voltage-dependent calcium channel beta subunit-associated regulatory protein (Downstream of Stk11 protein) |

| | | | |
|--------|-------------|----------|--|
| O88554 | PARP2_MOUSE | Parp2 | Poly [ADP-ribose] polymerase 2, PARP-2, mPARP-2, EC 2.4.2.30 (ADP-ribosyltransferase diphtheria toxin-like 2, ARTD2) (DNA ADP-ribosyltransferase PARP2, EC 2.4.2.-) (NAD(+) ADP-ribosyltransferase 2, ADPRT-2) (Poly[ADP-ribose] synthase 2, pADPRT-2) (Protein poly-ADP-ribosyltransferase PARP2, EC 2.4.2.-) |
| Q9DB27 | MCTS1_MOUSE | Mcts1 | Malignant T-cell-amplified sequence 1, MCT-1 (Multiple copies T-cell malignancies 1) |
| P24622 | CRYAA_MOUSE | Cryaa | Alpha-crystallin A chain |
| Q3UPC7 | K0825_MOUSE | | Uncharacterized protein KIAA0825 homolog |
| Q8BGF9 | S2544_MOUSE | Slc25a44 | Solute carrier family 25 member 44 |
| O54692 | ZW10_MOUSE | Zw10 | Centromere/kinetochore protein zw10 homolog |
| Q8CFP6 | DJC27_MOUSE | Dnajc27 | DnaJ homolog subfamily C member 27 (Rab and DnaJ domain-containing protein) |
| Q9JLB4 | CUBN_MOUSE | Cubn | Cubilin (Intrinsic factor-cobalamin receptor) |
| Q3V300 | KIF22_MOUSE | Kif22 | Kinesin-like protein KIF22 |
| Q9QYI8 | DNJB7_MOUSE | Dnajb7 | DnaJ homolog subfamily B member 7 (mDj5) |
| Q62511 | ZFP91_MOUSE | Zfp91 | E3 ubiquitin-protein ligase ZFP91, EC 2.3.2.27 (Penta Zf protein) (RING-type E3 ubiquitin transferase ZFP91) (Zinc finger protein 91 homolog, Zfp-91) (Zinc finger protein PZF) |
| Q3UHI4 | TMED8_MOUSE | Tmed8 | Protein TMED8 |
| W8DXL4 | LRIT3_MOUSE | Lrit3 | Leucine-rich repeat, immunoglobulin-like domain and transmembrane domain-containing protein 3 |
| Q9ES89 | EXTL2_MOUSE | Extl2 | Exostosin-like 2, EC 2.4.1.223 (Alpha-1,4-N-acetylhexosaminyltransferase EXTL2) (Alpha-GalNAcT EXTL2) (EXT-related protein 2) (Glucuronyl-galactosyl-proteoglycan 4-alpha-N-acetylglucosaminyltransferase) |
| Q8VDB2 | ALG12_MOUSE | Alg12 | Dol-P-Man:Man(7)GlcNAc(2)-PP-Dol alpha-1,6-mannosyltransferase, EC 2.4.1.260 (Asparagine-linked glycosylation protein 12 homolog) (Dolichyl-P-Man:Man(7)GlcNAc(2)-PP-dolichyl-alpha-1,6-mannosyltransferase) (Mannosyltransferase ALG12 homolog) |
| Q8BLX7 | COGA1_MOUSE | Col16a1 | Collagen alpha-1(XVI) chain |
| Q8BIK4 | DOCK9_MOUSE | Dock9 | Dedicator of cytokinesis protein 9 (Cdc42 guanine nucleotide exchange factor zizimin-1, Zizimin-1) |

| | | | |
|--------|-------------|---------|---|
| Q6ZWQ7 | SPCS3_MOUSE | Spcs3 | Signal peptidase complex subunit 3 (Microsomal signal peptidase 22/23 kDa subunit, SPC22/23, SPase 22/23 kDa subunit) |
| Q9WVK0 | ATRAP_MOUSE | Agtrap | Type-1 angiotensin II receptor-associated protein (AT1 receptor-associated protein) |
| P70196 | TRAF6_MOUSE | Traf6 | TNF receptor-associated factor 6, EC 2.3.2.27 (E3 ubiquitin-protein ligase TRAF6) (RING-type E3 ubiquitin transferase TRAF6) |
| Q3U487 | HECD3_MOUSE | Hectd3 | E3 ubiquitin-protein ligase HECTD3, EC 2.3.2.26 (HECT domain-containing protein 3) (HECT-type E3 ubiquitin transferase HECTD3) |
| Q9EQZ6 | RPGF4_MOUSE | Rapgef4 | Rap guanine nucleotide exchange factor 4 (Exchange factor directly activated by cAMP 2) (Exchange protein directly activated by cAMP 2, EPAC 2) (cAMP-dependent Rap1 guanine-nucleotide exchange factor) (cAMP-regulated guanine nucleotide exchange factor II, cAMP-GEFII) |
| Q60954 | MEIS1_MOUSE | Meis1 | Homeobox protein Meis1 (Myeloid ecotropic viral integration site 1) |
| Q9ET43 | CLD12_MOUSE | Cldn12 | Claudin-12 |
| Q91WE1 | SNX15_MOUSE | Snx15 | Sorting nexin-15 |
| Q8CD15 | RIOX2_MOUSE | Riox2 | Ribosomal oxygenase 2 (Bifunctional lysine-specific demethylase and histidyl-hydroxylase MINA, EC 1.14.11.-) (Histone lysine demethylase MINA) (MYC-induced nuclear antigen) |
| Q8VBU8 | BANP_MOUSE | Banp | Protein BANP (Btg3-associated nuclear protein) (Scaffold/matrix-associated region-1-binding protein) |
| Q8BU31 | RAP2C_MOUSE | Rap2c | Ras-related protein Rap-2c, EC 3.6.5.2 |
| O70176 | PACA_MOUSE | Adcyap1 | Pituitary adenylate cyclase-activating polypeptide, PACAP [Cleaved into: PACAP-related peptide (PRP-48); Pituitary adenylate cyclase-activating polypeptide 27, PACAP-27, PACAP27; Pituitary adenylate cyclase-activating polypeptide 38, PACAP-38, PACAP38] |
| Q9QZ67 | PPM1D_MOUSE | Ppm1d | Protein phosphatase 1D, EC 3.1.3.16 (Protein phosphatase 2C isoform delta, PP2C-delta) (Protein phosphatase magnesium-dependent 1 delta) (p53-induced protein phosphatase 1) |
| Q8BTF8 | RALYL_MOUSE | Raly1 | RNA-binding Raly-like protein |
| Q9JKK1 | STX6_MOUSE | Stx6 | Syntaxin-6 |
| Q8C3X4 | GUF1_MOUSE | Guf1 | Translation factor Guf1, mitochondrial, EC 3.6.5.- (Elongation factor 4 homolog, EF-4) (GTPase Guf1) (Ribosomal back-translocase) |
| Q8CIP4 | MARK4_MOUSE | Mark4 | MAP/microtubule affinity-regulating kinase 4, EC 2.7.11.1 |

| | | | |
|--------|-------------|----------|--|
| Q91Z83 | MYH7_MOUSE | Myh7 | Myosin-7 (Myosin heavy chain 7) (Myosin heavy chain slow isoform, MyHC-slow) (Myosin heavy chain, cardiac muscle beta isoform, MyHC-beta) |
| P53995 | APC1_MOUSE | Anapc1 | Anaphase-promoting complex subunit 1, APC1 (Cyclosome subunit 1) (Mitotic checkpoint regulator) (Testis-specific gene 24 protein) |
| P59048 | PDRG1_MOUSE | Pdrg1 | p53 and DNA damage-regulated protein 1 |
| Q9Z210 | PX11B_MOUSE | Pex11b | Peroxisomal membrane protein 11B (Peroxin-11B) (Peroxisomal biogenesis factor 11B) (Protein PEX11 homolog beta, PEX11-beta) |
| A2AAJ9 | OBSCN_MOUSE | Obscn | Obscurin, EC 2.7.11.1 (Obscurin-RhoGEF) (Obscurin-myosin light chain kinase, Obscurin-MLCK) |
| Q6P2B1 | TNPO3_MOUSE | Tnpo3 | Transportin-3 |
| Q6P1D7 | SLX4_MOUSE | Slx4 | Structure-specific endonuclease subunit SLX4 (BTB/POZ domain-containing protein 12) |
| Q3UE31 | K0930_MOUSE | | Uncharacterized protein KIAA0930 homolog |
| Q60760 | GRB10_MOUSE | Grb10 | Growth factor receptor-bound protein 10 (GRB10 adapter protein) (Maternally expressed gene 1 protein) |
| Q7TQ65 | TMC4_MOUSE | Tmc4 | Transmembrane channel-like protein 4 |
| A2A8L1 | CHD5_MOUSE | Chd5 | Chromodomain-helicase-DNA-binding protein 5, CHD-5, EC 3.6.4.12 (ATP-dependent helicase CHD5) |
| P70362 | UFD1_MOUSE | Ufd1 | Ubiquitin recognition factor in ER-associated degradation protein 1 (Ubiquitin fusion degradation protein 1 homolog, UB fusion protein 1) |
| Q80Y44 | DDX10_MOUSE | Ddx10 | Probable ATP-dependent RNA helicase DDX10, EC 3.6.4.13 (DEAD box protein 10) |
| Q62077 | PLCG1_MOUSE | Plcg1 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase gamma-1, EC 3.1.4.11 (Phosphoinositide phospholipase C-gamma-1) (Phospholipase C-gamma-1, PLC-gamma-1) |
| Q9JKV5 | SCAM4_MOUSE | Scamp4 | Secretory carrier-associated membrane protein 4, SC4, Secretory carrier membrane protein 4 |
| Q91VR7 | MLP3A_MOUSE | Map1lc3a | Microtubule-associated proteins 1A/1B light chain 3A (Autophagy-related protein LC3 A) (Autophagy-related ubiquitin-like modifier LC3 A) (MAP1 light chain 3-like protein 1) (MAP1A/MAP1B light chain 3 A, MAP1A/MAP1B LC3 A) (Microtubule-associated protein 1 light chain 3 alpha) |
| Q9JIB4 | TF2H2_MOUSE | Gtf2h2 | General transcription factor IIH subunit 2 (Basic transcription factor 2 44 kDa subunit, BTF2 p44) (General transcription factor IIH polypeptide 2) (TFIIH basal transcription factor complex p44 subunit) |

| | | | |
|--------|-------------|----------|---|
| Q7TT15 | GLT17_MOUSE | Galnt17 | Polypeptide N-acetylgalactosaminyltransferase 17, EC 2.4.1.41 (Polypeptide GalNAc transferase-like protein 3, GalNAc-T-like protein 3, pp-GaNTase-like protein 3) (Protein-UDP acetylgalactosaminyltransferase-like protein 3) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase-like protein 3) (Williams-Beuren syndrome chromosomal region 17 protein homolog) |
| Q9ESP1 | SDF2L_MOUSE | Sdf2l1 | Stromal cell-derived factor 2-like protein 1, SDF2-like protein 1 |
| Q9CYI0 | NJMU_MOUSE | | Protein Njmu-R1 |
| Q8BR76 | MKS3_MOUSE | Tmem67 | Meckelin (Meckel syndrome type 3 protein homolog) (Transmembrane protein 67) |
| Q9Z1Y4 | TRIP6_MOUSE | Trip6 | Thyroid receptor-interacting protein 6, TR-interacting protein 6, TRIP-6 (Zyxin-related protein 1, ZRP-1) |
| Q3U1Y4 | DEN4B_MOUSE | Dennd4b | DENN domain-containing protein 4B (Brain-specific gene 4 protein, Brain specific protein 4) |
| Q60963 | PAFA_MOUSE | Pla2g7 | Platelet-activating factor acetylhydrolase, PAF acetylhydrolase, EC 3.1.1.47 (1-alkyl-2-acetyl-glycerophosphocholine esterase) (2-acetyl-1-alkyl-glycerophosphocholine esterase) (LDL-associated phospholipase A2, LDL-PLA(2)) (PAF 2-acylhydrolase) |
| Q8BLS7 | SWAHA_MOUSE | Sowaha | Ankyrin repeat domain-containing protein SOWAHA (Ankyrin repeat domain-containing protein 43) (Protein sosondowah homolog A) |
| Q9EQG7 | ENPP5_MOUSE | Enpp5 | Ectonucleotide pyrophosphatase/phosphodiesterase family member 5, E-NPP 5, NPP-5, EC 3.1.-.- |
| P22682 | CBL_MOUSE | Cbl | E3 ubiquitin-protein ligase CBL, EC 2.3.2.27 (Casitas B-lineage lymphoma proto-oncogene) (Proto-oncogene c-Cbl) (RING-type E3 ubiquitin transferase CBL) (Signal transduction protein CBL) |
| P13675 | SSTY1_MOUSE | Ssty1 | Y-linked testis-specific protein 1 |
| Q9CR27 | WASC3_MOUSE | Washc3 | WASH complex subunit 3 (Coiled-coil domain-containing protein 53) |
| Q6TEK5 | VKORL_MOUSE | Vkorc1l1 | Vitamin K epoxide reductase complex subunit 1-like protein 1, VKORC1-like protein 1, EC 1.17.4.4 |
| P23578 | ACRO_MOUSE | Acr | Acrosin, EC 3.4.21.10 [Cleaved into: Acrosin light chain; Acrosin heavy chain] |
| P97863 | NFIB_MOUSE | Nfib | Nuclear factor 1 B-type, NF1-B, Nuclear factor 1/B (CCAAT-box-binding transcription factor, CTF) (Nuclear factor I/B, NF-I/B, NFI-B) (TGGCA-binding protein) |
| Q99JW4 | LIMS1_MOUSE | Lims1 | LIM and senescent cell antigen-like-containing domain protein 1 (Particularly interesting new Cys-His protein 1, PINCH-1) |

| | | | |
|--------|-------------|---------|--|
| O54834 | RHG06_MOUSE | Arhgap6 | Rho GTPase-activating protein 6 (Rho-type GTPase-activating protein 6) (Rho-type GTPase-activating protein RhoGAPX-1) |
| O55033 | NCK2_MOUSE | Nck2 | Cytoplasmic protein NCK2 (Growth factor receptor-bound protein 4) (NCK adaptor protein 2, Nck-2) (SH2/SH3 adaptor protein NCK-beta) |
| Q8BI69 | ZN784_MOUSE | Znf784 | Zinc finger protein 784 |
| B9EJR8 | DAAF5_MOUSE | Dnaaf5 | Dynein axonemal assembly factor 5 (HEAT repeat-containing protein 2) |
| Q3U3C9 | GSE1_MOUSE | Gse1 | Genetic suppressor element 1 |
| P15626 | GSTM2_MOUSE | Gstm2 | Glutathione S-transferase Mu 2, EC 2.5.1.18 (GST 5-5) (GST class-mu 2) (Glutathione S-transferase pmGT2) |
| A2ADZ8 | IQCC_MOUSE | Iqcc | IQ domain-containing protein C |
| P70211 | DCC_MOUSE | Dcc | Netrin receptor DCC (Tumor suppressor protein DCC) |
| Q9CQ91 | NDUA3_MOUSE | Ndufa3 | NADH dehydrogenase [ubiquinone] 1 alpha subcomplex subunit 3 (Complex I-B9, CI-B9) (NADH-ubiquinone oxidoreductase B9 subunit) |
| Q3URF8 | KCD21_MOUSE | Kctd21 | BTB/POZ domain-containing protein KCTD21 (KCASH2 protein) (Potassium channel tetramerization domain-containing protein 21) |
| Q3UEB3 | PUF60_MOUSE | Puf60 | Poly(U)-binding-splicing factor PUF60 (60 kDa poly(U)-binding-splicing factor) |
| P47791 | GSHR_MOUSE | Gsr | Glutathione reductase, mitochondrial, GR, GRase, EC 1.8.1.7 |
| P84228 | H32_MOUSE | H3c2 | Histone H3.2 (H3-clustered histone 13) (H3-clustered histone 14) (H3-clustered histone 15) (H3-clustered histone 2) (H3-clustered histone 3) (H3-clustered histone 4) (H3-clustered histone 6) (H3-clustered histone 7) |
| Q8K2G4 | BBS7_MOUSE | Bbs7 | Bardet-Biedl syndrome 7 protein homolog (BBS2-like protein 1) |
| Q9CY57 | CHTOP_MOUSE | Chtop | Chromatin target of PRMT1 protein (Friend of PRMT1 protein) (Small arginine- and glycine-rich protein, SRAG) |
| P43006 | EAA2_MOUSE | Slc1a2 | Excitatory amino acid transporter 2 (GLT-1) (Sodium-dependent glutamate/aspartate transporter 2) (Solute carrier family 1 member 2) |
| P35922 | FMR1_MOUSE | Fmr1 | Fragile X messenger ribonucleoprotein 1 (Fragile X messenger ribonucleoprotein, FMRP) (Protein FMR-1, mFmr1p) |
| Q60996 | 2A5G_MOUSE | Ppp2r5c | Serine/threonine-protein phosphatase 2A 56 kDa regulatory subunit gamma isoform (PP2A B subunit isoform B'-alpha-3) (PP2A B subunit isoform B'-gamma) (PP2A B subunit isoform B56-gamma) (PP2A B subunit isoform PR61-gamma) (PP2A B subunit isoform R5-gamma) |

| | | | |
|--------|-------------|---------|---|
| P62838 | UB2D2_MOUSE | Ube2d2 | Ubiquitin-conjugating enzyme E2 D2, EC 2.3.2.23 ((E3-independent) E2 ubiquitin-conjugating enzyme D2, EC 2.3.2.24) (E2 ubiquitin-conjugating enzyme D2) (Ubiquitin carrier protein D2) (Ubiquitin-conjugating enzyme E2(17)KB 2) (Ubiquitin-conjugating enzyme E2-17 kDa 2) (Ubiquitin-protein ligase D2) |
| P29037 | TBP_MOUSE | Tbp | TATA-box-binding protein (TATA sequence-binding protein) (TATA-binding factor) (TATA-box factor) (Transcription initiation factor TFIID TBP subunit) |
| Q9ES97 | RTN3_MOUSE | Rtn3 | Reticulon-3 |
| P39688 | FYN_MOUSE | Fyn | Tyrosine-protein kinase Fyn, EC 2.7.10.2 (Proto-oncogene c-Fyn) (p59-Fyn) |
| Q9D358 | PPAC_MOUSE | Acp1 | Low molecular weight phosphotyrosine protein phosphatase, LMW-PTP, LMW-PTPase, EC 3.1.3.48 (Low molecular weight cytosolic acid phosphatase, EC 3.1.3.2) |
| P70662 | LDB1_MOUSE | Ldb1 | LIM domain-binding protein 1, LDB-1 (Carboxyl-terminal LIM domain-binding protein 2, CLIM-2) (LIM domain-binding factor CLIM2, mLdb1) (Nuclear LIM interactor) |
| Q62432 | SMAD2_MOUSE | Smad2 | Mothers against decapentaplegic homolog 2, MAD homolog 2, Mothers against DPP homolog 2 (Mad-related protein 2, mMad2) (SMAD family member 2, SMAD 2, Smad2) |
| Q99MR3 | S12A9_MOUSE | Slc12a9 | Solute carrier family 12 member 9 (Cation-chloride cotransporter-interacting protein 1) (Potassium-chloride transporter 9) |
| Q91ZU6 | DYST_MOUSE | Dst | Dystonin (Bullous pemphigoid antigen 1, BPA) (Dystonia musculorum protein) (Hemidesmosomal plaque protein) (Microtubule actin cross-linking factor 2) |
| Q8C7X2 | EMC1_MOUSE | Emc1 | ER membrane protein complex subunit 1 |
| Q3U4G3 | XXLT1_MOUSE | Xxylt1 | Xyloside xylosyltransferase 1, EC 2.4.2.62 (UDP-xylose:alpha-xyloside alpha-1,3-xylosyltransferase) |
| A2ALS5 | RPGP1_MOUSE | Rap1gap | Rap1 GTPase-activating protein 1, Rap1GAP, Rap1GAP1 (ARPP-90) |
| Q3TFQ1 | SPRY7_MOUSE | Spryd7 | SPRY domain-containing protein 7 (Chronic lymphocytic leukemia deletion region gene 6 protein homolog, CLL deletion region gene 6 protein homolog) |
| Q8VD37 | SGIP1_MOUSE | Sgip1 | SH3-containing GRB2-like protein 3-interacting protein 1 (Endophilin-3-interacting protein) |
| Q78T54 | VMA21_MOUSE | Vma21 | Vacuolar ATPase assembly integral membrane protein Vma21 |
| Q8K358 | PIGU_MOUSE | Pigu | Phosphatidylinositol glycan anchor biosynthesis class U protein (Cell division cycle protein 91-like 1, Protein CDC91-like 1) (GPI transamidase component PIG-U) |

| | | | |
|--------|-------------|----------|---|
| Q9Z1T1 | AP3B1_MOUSE | Ap3b1 | AP-3 complex subunit beta-1 (Adaptor protein complex AP-3 subunit beta-1) (Adaptor-related protein complex 3 subunit beta-1) (Beta-3A-adaptin) (Clathrin assembly protein complex 3 beta-1 large chain) |
| Q9Z172 | SUMO3_MOUSE | Sumo3 | Small ubiquitin-related modifier 3, SUMO-3 (SMT3 homolog 1) (Ubiquitin-like protein SMT3A, Smt3A) |
| Q9DBF7 | CWC25_MOUSE | Cwc25 | Pre-mRNA-splicing factor CWC25 homolog (Coiled-coil domain-containing protein 49) (Spliceosome-associated protein homolog CWC25) |
| Q9WV35 | ABEC2_MOUSE | Apobec2 | C->U-editing enzyme APOBEC-2, EC 3.5.4.36 (mRNA(cytosine(6666)) deaminase 2) |
| Q8CJF9 | AGO3_MOUSE | Ago3 | Protein argonaute-3, Argonaute3, mAgo3, EC 3.1.26.n2 (Argonaute RISC catalytic component 3) (Eukaryotic translation initiation factor 2C 3, eIF-2C 3, eIF2C 3) (Piwi/argonaute family protein meIF2C3) |
| Q69ZH9 | RHG23_MOUSE | Arhgap23 | Rho GTPase-activating protein 23 (Rho-type GTPase-activating protein 23) |
| P29699 | FETUA_MOUSE | Ahsg | Alpha-2-HS-glycoprotein (Countertrypsin) (Fetuin-A) |
| Q9DB32 | HAGHL_MOUSE | Haghl | Hydroxyacylglutathione hydrolase-like protein, EC 3.1.2.- |
| Q9D1L9 | LTOR5_MOUSE | Lamtor5 | Ragulator complex protein LAMTOR5 (Late endosomal/lysosomal adaptor and MAPK and MTOR activator 5) |
| Q9D1I6 | RM14_MOUSE | Mrpl14 | 39S ribosomal protein L14, mitochondrial, L14mt, MRP-L14 |
| Q80X73 | PELO_MOUSE | Pelo | Protein pelota homolog, EC 3.1.-.- |
| Q7TPD6 | RAVR2_MOUSE | Raver2 | Ribonucleoprotein PTB-binding 2 (Protein raver-2) |
| Q62083 | PICK1_MOUSE | Pick1 | PRKCA-binding protein (Protein interacting with C kinase 1) (Protein kinase C-alpha-binding protein) |
| Q61599 | GDIR2_MOUSE | Arhgdib | Rho GDP-dissociation inhibitor 2, Rho GDI 2 (D4) (Rho-GDI beta) |
| P62257 | UBE2H_MOUSE | Ube2h | Ubiquitin-conjugating enzyme E2 H, EC 2.3.2.23 ((E3-independent) E2 ubiquitin-conjugating enzyme H, EC 2.3.2.24) (E2 ubiquitin-conjugating enzyme H) (UBCH2) (Ubiquitin carrier protein H) (Ubiquitin-conjugating enzyme E2-20K) (Ubiquitin-protein ligase H) |
| P47915 | RL29_MOUSE | Rpl29 | 60S ribosomal protein L29 |
| P21614 | VTDB_MOUSE | Gc | Vitamin D-binding protein, DBP, VDB (Gc-globulin) (Group-specific component) |
| P19258 | MPV17_MOUSE | Mpv17 | Protein Mpv17, Mpv-17 |
| O88736 | DHB7_MOUSE | Hsd17b7 | 3-keto-steroid reductase/17-beta-hydroxysteroid dehydrogenase 7 (17-beta-hydroxysteroid dehydrogenase 7, 17-beta-HSD 7) (3-keto-steroid reductase, EC |

| | | | |
|--------|-------------|---------|---|
| | | | 1.1.1.270) (Dihydrotestosterone oxidoreductase, EC 1.1.1.210) (Estradiol 17-beta-dehydrogenase 7, EC 1.1.1.62) |
| Q9JLR1 | S61A2_MOUSE | Sec61a2 | Protein transport protein Sec61 subunit alpha isoform 2, Sec61 alpha-2 |
| Q8K1R3 | PNPT1_MOUSE | Pnpt1 | Polyribonucleotide nucleotidyltransferase 1, mitochondrial, EC 2.7.7.8 (3'-5' RNA exonuclease OLD35) (PNPase old-35) (Polynucleotide phosphorylase 1, PNPase 1) (Polynucleotide phosphorylase-like protein) |
| Q9D081 | ALG14_MOUSE | Alg14 | UDP-N-acetylglucosamine transferase subunit ALG14 homolog |
| Q8BGV8 | MID51_MOUSE | Mief1 | Mitochondrial dynamics protein MID51 (Mitochondrial dynamics protein of 51 kDa homolog) (Mitochondrial elongation factor 1) (Smith-Magenis syndrome chromosomal region candidate gene 7 protein-like) |
| Q9Z2L6 | MINP1_MOUSE | Minpp1 | Multiple inositol polyphosphate phosphatase 1, EC 3.1.3.62 (2,3-bisphosphoglycerate 3-phosphatase, 2,3-BPG phosphatase, EC 3.1.3.80) (Inositol (1,3,4,5)-tetrakisphosphate 3-phosphatase, Ins(1,3,4,5)P(4) 3-phosphatase) |
| Q9EQK7 | ICMT_MOUSE | Icmt | Protein-S-isoprenylcysteine O-methyltransferase, EC 2.1.1.100 (Isoprenylcysteine carboxymethyltransferase) (Prenylated protein carboxyl methyltransferase, PPMT) (Prenylcysteine carboxyl methyltransferase, pcCMT) |
| Q9QZA0 | CAH5B_MOUSE | Ca5b | Carbonic anhydrase 5B, mitochondrial, EC 4.2.1.1 (Carbonate dehydratase VB) (Carbonic anhydrase VB, CA-VB) |
| Q3UHD9 | AGAP2_MOUSE | Agap2 | Arf-GAP with GTPase, ANK repeat and PH domain-containing protein 2, AGAP-2 (Centaurin-gamma-1, Cnt-g1) (Phosphatidylinositol 3-kinase enhancer, PIKE) |
| Q8VD26 | TM143_MOUSE | Tmem143 | Transmembrane protein 143 |
| Q8BJU2 | TSN9_MOUSE | Tspan9 | Tetraspanin-9, Tspan-9 (Tetraspan NET-5) |
| Q9D6L8 | PPIL3_MOUSE | Ppil3 | Peptidyl-prolyl cis-trans isomerase-like 3, PPIase, EC 5.2.1.8 (CYP10L) (Cyclophilin-like protein PPIL3) (Rotamase PPIL3) |
| Q63829 | COMD3_MOUSE | Commd3 | COMM domain-containing protein 3 (Bmi-1 upstream gene protein, Bup protein) |
| B8ZXI1 | QTRT2_MOUSE | Qtrt2 | Queuine tRNA-ribosyltransferase accessory subunit 2 (Queuine tRNA-ribosyltransferase domain-containing protein 1) |
| Q8R179 | KBTB4_MOUSE | Kbtbd4 | Kelch repeat and BTB domain-containing protein 4 (BTB and kelch domain-containing protein 4) |
| Q8BGD8 | COA6_MOUSE | Coa6 | Cytochrome c oxidase assembly factor 6 homolog |
| P00329 | ADH1_MOUSE | Adh1 | Alcohol dehydrogenase 1, EC 1.1.1.1 (ADH-A2) (Alcohol dehydrogenase A subunit) |
| Q80WC3 | TNC18_MOUSE | Tnrc18 | Trinucleotide repeat-containing gene 18 protein (Zinc finger protein 469) |

| | | | |
|--------|-------------|---------|---|
| Q8BGX3 | LRTM2_MOUSE | Lrtm2 | Leucine-rich repeat and transmembrane domain-containing protein 2 |
| P60003 | ELOF1_MOUSE | Elof1 | Transcription elongation factor 1 homolog |
| Q8BHA1 | LRC24_MOUSE | Lrrc24 | Leucine-rich repeat-containing protein 24 |
| Q9R008 | KIME_MOUSE | Mvk | Mevalonate kinase, MK, EC 2.7.1.36 |
| Q8C4W3 | NRN1L_MOUSE | Nrn1l | Neuritin-like protein (Candidate plasticity gene 15-2 protein) |
| Q9D3X9 | MFA3L_MOUSE | Mfap3l | Microfibrillar-associated protein 3-like |
| A2RSX7 | TYW5_MOUSE | Tyw5 | tRNA wybutosine-synthesizing protein 5, EC 1.14.11.42 (tRNA(Phe) (7-(3-amino-3-carboxypropyl)wyosine(37)-C(2))-hydroxylase) |
| Q8CFI0 | NED4L_MOUSE | Nedd4l | E3 ubiquitin-protein ligase NEDD4-like, EC 2.3.2.26, EC 2.3.2.36 (HECT-type E3 ubiquitin transferase NED4L) (NEDD4.2) (Nedd4-2) |
| Q3TC93 | H1BP3_MOUSE | Hs1bp3 | HCLS1-binding protein 3 (HS1-binding protein 3, HSP1BP-3) |
| Q7TNU7 | LETM2_MOUSE | Letm2 | LETM1 domain-containing protein LETM2, mitochondrial (LETM1 and EF-hand domain-containing protein 2) (Leucine zipper-EF-hand-containing transmembrane protein 1-like) |
| Q8VDS8 | STX18_MOUSE | Stx18 | Syntaxin-18 |
| Q920A5 | RISC_MOUSE | Scpep1 | Retinoid-inducible serine carboxypeptidase, EC 3.4.16.- (Serine carboxypeptidase 1) |
| Q3UX61 | NAA11_MOUSE | Naa11 | N-alpha-acetyltransferase 11, EC 2.3.1.255 (N-terminal acetyltransferase complex ARD1 subunit homolog B) (NatA catalytic subunit Naa11) |
| P03911 | NU4M_MOUSE | Mtnd4 | NADH-ubiquinone oxidoreductase chain 4, EC 7.1.1.2 (NADH dehydrogenase subunit 4) |
| Q8BWU8 | AT2L1_MOUSE | Etnppl | Ethanolamine-phosphate phospho-lyase, EC 4.2.3.2 (Alanine--glyoxylate aminotransferase 2-like 1) |
| Q8BU33 | HACL2_MOUSE | Ilvbl | 2-hydroxyacyl-CoA lyase 2, EC 4.1.2.- (Acetolactate synthase-like protein) (IlvB-like protein) |
| Q6PAL8 | DEN5A_MOUSE | Dennd5a | DENN domain-containing protein 5A (Rab6-interacting protein 1, Rab6IP1) |
| P63143 | KCAB1_MOUSE | Kcnab1 | Voltage-gated potassium channel subunit beta-1, EC 1.1.1.- (K(+)) channel subunit beta-1) (Kv-beta-1) |
| Q8C0I1 | ADAS_MOUSE | Agps | Alkyldihydroxyacetonephosphate synthase, peroxisomal, Alkyl-DHAP synthase, EC 2.5.1.26 (Alkylglycerone-phosphate synthase) |
| Q5F293 | ZBTB4_MOUSE | Zbtb4 | Zinc finger and BTB domain-containing protein 4 |
| A8C756 | THADA_MOUSE | Thada | Thyroid adenoma-associated protein homolog |

| | | | |
|--------|-------------|----------|---|
| Q9CPT3 | NANP_MOUSE | Nanp | N-acylneuraminate-9-phosphatase, EC 3.1.3.29 (Haloacid dehalogenase-like hydrolase domain-containing protein 4) (Neu5Ac-9-Pase) |
| O88559 | MEN1_MOUSE | Men1 | Menin |
| Q9Z2E9 | BSCL2_MOUSE | Bscl2 | Seipin (Bernardinelli-Seip congenital lipodystrophy type 2 protein homolog) |
| Q8VD46 | ASZ1_MOUSE | Asz1 | Ankyrin repeat, SAM and basic leucine zipper domain-containing protein 1 (Germ cell-specific ankyrin, SAM and basic leucine zipper domain-containing protein) |
| Q9D173 | TOM7_MOUSE | Tomm7 | Mitochondrial import receptor subunit TOM7 homolog (Translocase of outer membrane 7 kDa subunit homolog) |
| Q9D2V5 | AAR2_MOUSE | Aar2 | Protein AAR2 homolog (AAR2 splicing factor homolog) |
| Q9CZB0 | C560_MOUSE | Sdhc | Succinate dehydrogenase cytochrome b560 subunit, mitochondrial (Integral membrane protein CII-3) (QPs-1, QPs1) |
| P39087 | GRIK2_MOUSE | Grik2 | Glutamate receptor ionotropic, kainate 2, GluK2 (Glutamate receptor 6, GluR-6, GluR6) (Glutamate receptor beta-2, GluR beta-2) |
| Q8BUL6 | PKHA1_MOUSE | Plekha1 | Pleckstrin homology domain-containing family A member 1, PH domain-containing family A member 1 (Tandem PH domain-containing protein 1, TAPP-1) |
| Q61140 | BCAR1_MOUSE | Bcar1 | Breast cancer anti-estrogen resistance protein 1 (CRK-associated substrate) (p130cas) |
| P03888 | NU1M_MOUSE | Mtnd1 | NADH-ubiquinone oxidoreductase chain 1, EC 7.1.1.2 (NADH dehydrogenase subunit 1) |
| Q62441 | TLE4_MOUSE | Tle4 | Transducin-like enhancer protein 4 (Grg-4) (Groucho-related protein 4) |
| Q7TSK7 | ATL2_MOUSE | Adamtsl2 | ADAMTS-like protein 2, ADAMTSL-2 (TSP1-repeat-containing protein 1, TCP-1) |
| P79621 | C2TA_MOUSE | Ciita | MHC class II transactivator, CIITA, EC 2.3.1.-, EC 2.7.11.1 |
| Q9WTR5 | CAD13_MOUSE | Cdh13 | Cadherin-13 (Heart cadherin, H-cadherin) (Truncated cadherin, T-cad, T-cadherin) |
| Q6PHZ5 | RB15B_MOUSE | Rbm15b | Putative RNA-binding protein 15B (RNA-binding motif protein 15B) |
| P56379 | ATP68_MOUSE | Atp5mj | ATP synthase subunit ATP5MJ, mitochondrial (6.8 kDa mitochondrial proteolipid protein, MLQ) |
| Q8BK03 | MIGA2_MOUSE | Miga2 | Mitoguardin 2 (Protein FAM73B) |
| Q8BJ64 | CHDH_MOUSE | Chdh | Choline dehydrogenase, mitochondrial, CDH, CHD, EC 1.1.99.1 |
| B1AR13 | CISD3_MOUSE | Cisd3 | CDGSH iron-sulfur domain-containing protein 3, mitochondrial (Melanoma nuclear protein 13) |
| Q9CQ85 | TIM22_MOUSE | Timm22 | Mitochondrial import inner membrane translocase subunit Tim22 |
| Q9JMF3 | GBG13_MOUSE | Gng13 | Guanine nucleotide-binding protein G(I)/G(S)/G(O) subunit gamma-13 |

| | | | |
|--------|-------------|---------|---|
| Q8VC52 | RBPS2_MOUSE | Rbpms2 | RNA-binding protein with multiple splicing 2 |
| Q9D394 | RUFY3_MOUSE | Rufy3 | Protein RUFY3 (Rap2-interacting protein x, RIPx) (Single axon-regulated protein 1, Singar1) |
| Q9ERL7 | GMFG_MOUSE | Gmfg | Glia maturation factor gamma, GMF-gamma |
| Q9D711 | PIR_MOUSE | Pir | Pirin, EC 1.13.11.24 (Probable quercetin 2,3-dioxygenase PIR, Probable quercetinase) |
| Q8K341 | ATAT_MOUSE | Atat1 | Alpha-tubulin N-acetyltransferase 1, Alpha-TAT, Alpha-TAT1, TAT, EC 2.3.1.108 (Acetyltransferase mec-17 homolog) |
| O08664 | BCL7C_MOUSE | Bcl7c | B-cell CLL/lymphoma 7 protein family member C (B-cell chronic lymphocytic leukemia/lymphoma 7C protein) |
| P35545 | UBIM_MOUSE | Fau | Ubiquitin-like protein FUBI (Monoclonal non-specific suppressor factor beta, MNSF-beta) |
| Q6DFV5 | HELZ_MOUSE | Helz | Probable helicase with zinc finger domain, EC 3.6.4.- |
| O88343 | S4A4_MOUSE | Slc4a4 | Electrogenic sodium bicarbonate cotransporter 1, Sodium bicarbonate cotransporter (Na(+)/HCO3(-) cotransporter) (Solute carrier family 4 member 4) |
| P62876 | RPAB5_MOUSE | Polr2l | DNA-directed RNA polymerases I, II, and III subunit RPABC5, RNA polymerases I, II, and III subunit ABC5 (DNA-directed RNA polymerase III subunit L) (RPB10 homolog) |
| P83503 | NYX_MOUSE | Nyx | Nyctalopin |
| Q8N9S3 | AHSA2_MOUSE | Ahsa2 | Activator of 90 kDa heat shock protein ATPase homolog 2 |
| Q9Z0L4 | BMP15_MOUSE | Bmp15 | Bone morphogenetic protein 15, BMP-15 (Growth/differentiation factor 9B, GDF-9B) |
| Q60934 | GRIK1_MOUSE | Grik1 | Glutamate receptor ionotropic, kainate 1, GluK1 (Glutamate receptor 5, GluR-5, GluR5) |
| Q5XKN4 | JAGN1_MOUSE | Jagn1 | Protein jagunal homolog 1 |
| Q99LU0 | CH1B1_MOUSE | Chmp1b1 | Charged multivesicular body protein 1b-1 (Chromatin-modifying protein 1b-1, CHMP1b-1) |
| Q7TNC8 | GLRA2_MOUSE | Gla2 | Glycine receptor subunit alpha-2 |
| Q5DTM8 | BRE1A_MOUSE | Rnf20 | E3 ubiquitin-protein ligase BRE1A, BRE1-A, EC 2.3.2.27 (RING finger protein 20) (RING-type E3 ubiquitin transferase BRE1A) |
| Q9QXZ0 | MACF1_MOUSE | Macf1 | Microtubule-actin cross-linking factor 1, isoforms 1/2/3/4 (Actin cross-linking family 7) |

| | | | |
|--------|-------------|---------|--|
| Q91V12 | BACH_MOUSE | Acot7 | Cytosolic acyl coenzyme A thioester hydrolase, EC 3.1.2.2 (Acyl-CoA thioesterase 7) (Brain acyl-CoA hydrolase, BACH) (CTE-IIa, CTE-II) (Long chain acyl-CoA thioester hydrolase) |
| Q61301 | CTNA2_MOUSE | Ctnna2 | Catenin alpha-2 (Alpha N-catenin) |
| Q61029 | LAP2B_MOUSE | Tmpo | Lamina-associated polypeptide 2, isoforms beta/delta/epsilon/gamma (Thymopoietin isoforms beta/delta/epsilon/gamma, TP beta/delta/epsilon/gamma) |
| Q7M6Y3 | PICAL_MOUSE | Picalm | Phosphatidylinositol-binding clathrin assembly protein (Clathrin assembly lymphoid myeloid leukemia, CALM) |
| O55240 | RDH5_MOUSE | Rdh5 | Retinol dehydrogenase 5, EC 1.1.1.209, EC 1.1.1.315, EC 1.1.1.53 (11-cis retinol dehydrogenase, 11-cis RDH, 11-cis RoDH) (9-cis retinol dehydrogenase) (Cis-retinol dehydrogenase) |
| Q80XE1 | RIC8B_MOUSE | Ric8b | Synembryn-B (Protein Ric-8B) |
| Q9R0N7 | SYT7_MOUSE | Syt7 | Synaptotagmin-7 (Synaptotagmin VII, SytVII) |
| P97471 | SMAD4_MOUSE | Smad4 | Mothers against decapentaplegic homolog 4, MAD homolog 4, Mothers against DPP homolog 4 (Deletion target in pancreatic carcinoma 4 homolog) (SMAD family member 4, SMAD 4, Smad4) |
| P53798 | FDFT_MOUSE | Fdft1 | Squalene synthase, SQS, SS, EC 2.5.1.21 (FPP:FPP farnesyltransferase) (Farnesyl-diphosphate farnesyltransferase) |
| P28704 | RXRB_MOUSE | Rxrb | Retinoic acid receptor RXR-beta (MHC class I regulatory element-binding protein H-2RIIBP) (Nuclear receptor subfamily 2 group B member 2) (Retinoid X receptor beta) |
| Q9Z188 | DYR1B_MOUSE | Dyrk1b | Dual specificity tyrosine-phosphorylation-regulated kinase 1B, EC 2.7.12.1 |
| Q61165 | SL9A1_MOUSE | Slc9a1 | Sodium/hydrogen exchanger 1 (Na ⁺)/H ⁺ exchanger 1, NHE-1) (Solute carrier family 9 member 1) |
| F7A4A7 | OTOGL_MOUSE | Otogl | Otogelin-like protein |
| Q8BHD0 | RB39A_MOUSE | Rab39a | Ras-related protein Rab-39A, Rab-39 |
| P63046 | ST4A1_MOUSE | Sult4a1 | Sulfotransferase 4A1, ST4A1, EC 2.8.2.- (Brain sulfotransferase-like protein, mBR-STL) (Nervous system sulfotransferase, NST) |
| Q9CQD4 | CH1B2_MOUSE | Chmp1b2 | Charged multivesicular body protein 1b-2 (Chromatin-modifying protein 1b-2, CHMP1b-2) |
| Q9D2R8 | RT33_MOUSE | Mrps33 | 28S ribosomal protein S33, mitochondrial, MRP-S33, S33mt (Ganglioside-induced differentiation-associated-protein 3) |

| | | | |
|--------|-------------|----------|--|
| Q9D1I2 | CAR19_MOUSE | Card19 | Caspase recruitment domain-containing protein 19 (Bcl10-interacting CARD protein, BinCARD) |
| Q9CXE2 | BCL7A_MOUSE | Bcl7a | B-cell CLL/lymphoma 7 protein family member A |
| Q9CWG8 | NDUF7_MOUSE | Ndufaf7 | Protein arginine methyltransferase NDUF7, mitochondrial, EC 2.1.1.320 (NADH dehydrogenase [ubiquinone] complex I, assembly factor 7) (Protein midA homolog) |
| Q8C0D4 | RHG12_MOUSE | Arhgap12 | Rho GTPase-activating protein 12 (Rho-type GTPase-activating protein 12) |
| Q3UVG3 | F91A1_MOUSE | Fam91a1 | Protein FAM91A1 |
| Q3U284 | TM231_MOUSE | Tmem231 | Transmembrane protein 231 |
| Q3TMP8 | TM38A_MOUSE | Tmem38a | Trimeric intracellular cation channel type A, TRIC-A, TRICA (27 kDa sarcoplasmic reticulum protein) (Mitsugumin-33A) (SPR-27) (Transmembrane protein 38A) |
| P54869 | HMCS2_MOUSE | Hmgcs2 | Hydroxymethylglutaryl-CoA synthase, mitochondrial, HMG-CoA synthase, EC 2.3.3.10 (3-hydroxy-3-methylglutaryl coenzyme A synthase) |
| Q8K0U3 | TMM17_MOUSE | Tmem17 | Transmembrane protein 17 |
| Q9D9I4 | TBC20_MOUSE | Tbc1d20 | TBC1 domain family member 20 |
| Q9CQ89 | CUTA_MOUSE | Cuta | Protein CutA (Brain acetylcholinesterase putative membrane anchor) |
| Q9JJE4 | PAQR4_MOUSE | Paqr4 | Progesterin and adipoQ receptor family member 4 (Progesterin and adipoQ receptor family member IV) |
| Q62470 | ITA3_MOUSE | Itga3 | Integrin alpha-3 (CD49 antigen-like family member C) (Galactoprotein B3, GAPB3) (VLA-3 subunit alpha) (CD antigen CD49c) [Cleaved into: Integrin alpha-3 heavy chain; Integrin alpha-3 light chain] |
| Q66JX5 | CEP43_MOUSE | Cep43 | Centrosomal protein 43 (FGFR1 oncogene partner) |
| Q99N57 | RAF1_MOUSE | Raf1 | RAF proto-oncogene serine/threonine-protein kinase, EC 2.7.11.1 (Proto-oncogene c-RAF, cRaf) (Raf-1) |
| Q3URQ0 | TEX10_MOUSE | Tex10 | Testis-expressed protein 10 |
| Q91VU7 | PUS7_MOUSE | Pus7 | Pseudouridylylase 7 homolog, EC 5.4.99.- |
| Q9QXX4 | S2513_MOUSE | Slc25a13 | Electrogenic aspartate/glutamate antiporter SLC25A13, mitochondrial (Citrin) (Solute carrier family 25 member 13) |
| Q99N94 | RM09_MOUSE | Mrpl9 | 39S ribosomal protein L9, mitochondrial, L9mt, MRP-L9 |
| Q80TQ2 | CYLD_MOUSE | Cyld | Ubiquitin carboxyl-terminal hydrolase CYLD, EC 3.4.19.12 (Deubiquitinating enzyme CYLD) (Ubiquitin thioesterase CYLD) (Ubiquitin-specific-processing protease CYLD) |

| | | | |
|--------|-------------|---------|--|
| Q8C8B0 | ALX1_MOUSE | Alx1 | ALX homeobox protein 1 (Cartilage homeoprotein 1, CART-1) |
| Q03249 | GALT_MOUSE | Galt | Galactose-1-phosphate uridylyltransferase, Gal-1-P uridylyltransferase, EC 2.7.7.12 (UDP-glucose--hexose-1-phosphate uridylyltransferase) |
| Q9QX66 | DPF1_MOUSE | Dpfl | Zinc finger protein neuro-d4 (BRG1-associated factor 45B, BAF45B) (D4, zinc and double PHD fingers family 1) |
| Q9Z2C5 | MTM1_MOUSE | Mtm1 | Myotubularin (Phosphatidylinositol-3,5-bisphosphate 3-phosphatase, EC 3.1.3.95) (Phosphatidylinositol-3-phosphate phosphatase, EC 3.1.3.64) |
| Q8BI08 | MAL2_MOUSE | Mal2 | Protein MAL2 |
| Q80YX1 | TENA_MOUSE | Tnc | Tenascin, TN (Hexabrachion) (Tenascin-C, TN-C) |
| Q99JN2 | KLH22_MOUSE | Klhl22 | Kelch-like protein 22 |
| Q5QD16 | TAAR3_MOUSE | Taar3 | Trace amine-associated receptor 3, TaR-3, Trace amine receptor 3, mTaar3 |
| Q91YI4 | ARRB2_MOUSE | Arrb2 | Beta-arrestin-2 (Arrestin beta-2) |
| Q3USH1 | INSY2_MOUSE | Insyn2a | Inhibitory synaptic factor 2A, InSyn2 |
| Q9D6Z0 | ALKB7_MOUSE | Alkbh7 | Alpha-ketoglutarate-dependent dioxygenase alkB homolog 7, mitochondrial, EC 1.14.11.- (Alkylated DNA repair protein alkB homolog 7) |
| Q9D306 | MGT4C_MOUSE | Mgat4c | Alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase C, EC 2.4.1.145 (N-glycosyl-oligosaccharide-glycoprotein N-acetylglucosaminyltransferase IVc, GnT-IVc, N-acetylglucosaminyltransferase IVc) (UDP-N-acetylglucosamine: alpha-1,3-D-mannoside beta-1,4-N-acetylglucosaminyltransferase IVc) |
| Q6ZPT1 | KLHL9_MOUSE | Klhl9 | Kelch-like protein 9 |
| Q8QZZ8 | RAB38_MOUSE | Rab38 | Ras-related protein Rab-38 |
| Q5DU14 | MYO16_MOUSE | Myo16 | Unconventional myosin-XVI (Neuronal tyrosine-phosphorylated phosphoinositide-3-kinase adapter 3) (Unconventional myosin-16) |
| Q5SW19 | CLU_MOUSE | Cluh | Clustered mitochondria protein homolog |
| P28700 | RXRA_MOUSE | Rxra | Retinoic acid receptor RXR-alpha (Nuclear receptor subfamily 2 group B member 1) (Retinoid X receptor alpha) |
| Q9Z129 | RECQ1_MOUSE | Recql | ATP-dependent DNA helicase Q1, EC 3.6.4.12 (DNA-dependent ATPase Q1) (RecQ protein-like 1) |
| O88485 | DC1I1_MOUSE | Dync1i1 | Cytoplasmic dynein 1 intermediate chain 1 (Cytoplasmic dynein intermediate chain 1) (Dynein intermediate chain 1, cytosolic, DH IC-1) |

| | | | |
|--------|-------------|----------|---|
| Q8R1C0 | KCNC4_MOUSE | Kcnc4 | Potassium voltage-gated channel subfamily C member 4 (Voltage-gated potassium channel subunit Kv3.4) |
| Q6NSR3 | ADCK2_MOUSE | Adck2 | Uncharacterized aarF domain-containing protein kinase 2, EC 2.7.11.- |
| Q8BLK9 | KS6C1_MOUSE | Rps6kc1 | Ribosomal protein S6 kinase delta-1, S6K-delta-1, EC 2.7.11.1 (52 kDa ribosomal protein S6 kinase) |
| Q3TYX3 | SMYD5_MOUSE | Smyd5 | Histone-lysine N-trimethyltransferase SMYD5, EC 2.1.1.372 (Protein NN8-4AG) (Retinoic acid-induced protein 15) (SET and MYND domain-containing protein 5) ([histone H4]-lysine20 N-trimethyltransferase SMYD5) |
| Q61510 | TRI25_MOUSE | Trim25 | E3 ubiquitin/ISG15 ligase TRIM25, EC 6.3.2.n3 (Estrogen-responsive finger protein) (RING-type E3 ubiquitin transferase, EC 2.3.2.27) (RING-type E3 ubiquitin transferase TRIM25) (Tripartite motif-containing protein 25) (Ubiquitin/ISG15-conjugating enzyme TRIM25) (Zinc finger protein 147) |
| Q8BPZ8 | ABRX1_MOUSE | Abraxas1 | BRCA1-A complex subunit Abraxas 1 (Coiled-coil domain-containing protein 98) (Protein FAM175A) |
| Q9CQE3 | RT17_MOUSE | Mrps17 | 28S ribosomal protein S17, mitochondrial, MRP-S17, S17mt |
| Q69ZX8 | ABLM3_MOUSE | Ablim3 | Actin-binding LIM protein 3, abLIM-3 (Actin-binding LIM protein family member 3) |
| Q99M04 | LIAS_MOUSE | Lias | Lipoyl synthase, mitochondrial, EC 2.8.1.8 (Lipoate synthase, LS, Lip-syn, mLIP1) (Lipoic acid synthase) |
| O55028 | BCKD_MOUSE | Bckdk | [3-methyl-2-oxobutanoate dehydrogenase [lipoamide]] kinase, mitochondrial, EC 2.7.11.4 (Branched-chain alpha-ketoacid dehydrogenase kinase, BCKD-kinase, BCKDHKIN) |
| Q80TH2 | ERBIN_MOUSE | Erbin | Erbin (Densin-180-like protein) (ErbB2-interacting protein) (Protein LAP2) |
| P00397 | COX1_MOUSE | Mtco1 | Cytochrome c oxidase subunit 1, EC 7.1.1.9 (Cytochrome c oxidase polypeptide I) |
| Q3U3E2 | F117B_MOUSE | Fam117b | Protein FAM117B (Amyotrophic lateral sclerosis 2 chromosomal region candidate gene 13 protein homolog) |
| Q810C0 | SLIK2_MOUSE | Slitrk2 | SLIT and NTRK-like protein 2 |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| Q64523 | H2A2C_MOUSE | H2ac20 | Histone H2A type 2-C (H2A-clustered histone 20) (H2a-613B) |
| P60469 | LIPA3_MOUSE | Ppfia3 | Liprin-alpha-3 (Protein tyrosine phosphatase receptor type f polypeptide-interacting protein alpha-3, PTPRF-interacting protein alpha-3) |
| Q3UHC7 | DAB2P_MOUSE | Dab2ip | Disabled homolog 2-interacting protein, DAB2-interacting protein (ASK-interacting protein 1) (DOC-2/DAB-2 interactive protein) |

| | | | |
|--------|-------------|--------|--|
| P25976 | UBF1_MOUSE | Ubtf | Nucleolar transcription factor 1 (Upstream-binding factor 1, UBF-1) |
| O70507 | HCN4_MOUSE | Hcn4 | Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 4 (Brain cyclic nucleotide-gated channel 3, BCNG-3) |
| Q3UTJ2 | SRBS2_MOUSE | Sorbs2 | Sorbin and SH3 domain-containing protein 2 (Arg-binding protein 2, ArgBP2) (Arg/Abl-interacting protein 2) |
| Q91YH5 | ATLA3_MOUSE | Atl3 | Atlastin-3, EC 3.6.5.- |
| Q8K245 | UVRAG_MOUSE | Uvrag | UV radiation resistance-associated protein |
| Q8BYJ6 | TBCD4_MOUSE | Tbc1d4 | TBC1 domain family member 4 (Akt substrate of 160 kDa, AS160) |
| Q3UM29 | COG7_MOUSE | Cog7 | Conserved oligomeric Golgi complex subunit 7, COG complex subunit 7 (Component of oligomeric Golgi complex 7) |
| Q9WVF8 | TUSC2_MOUSE | Tusc2 | Tumor suppressor candidate 2 (Fusion 1 protein, Fus-1 protein) (PDGFA-associated protein 2) |
| Q8BSF4 | PISD_MOUSE | Pisd | Phosphatidylserine decarboxylase proenzyme, mitochondrial, EC 4.1.1.65 [Cleaved into: Phosphatidylserine decarboxylase beta chain; Phosphatidylserine decarboxylase alpha chain] |
| Q7TN29 | SMAP2_MOUSE | Smap2 | Stromal membrane-associated protein 2 (Stromal membrane-associated protein 1-like) |
| Q62470 | ITA3_MOUSE | Itga3 | Integrin alpha-3 (CD49 antigen-like family member C) (Galactoprotein B3, GAPB3) (VLA-3 subunit alpha) (CD antigen CD49c) [Cleaved into: Integrin alpha-3 heavy chain; Integrin alpha-3 light chain] |
| Q6PFC5 | LRIT2_MOUSE | Lrit2 | Leucine-rich repeat, immunoglobulin-like domain and transmembrane domain-containing protein 2 (Leucine-rich repeat-containing protein 22) |
| Q3TL44 | NLRX1_MOUSE | Nlr1 | NLR family member X1 |
| Q80ZD9 | AMGO2_MOUSE | Amigo2 | Amphoterin-induced protein 2 (AMIGO-2) (Alivin-1) |
| Q6PGG6 | GNL3L_MOUSE | Gnl3l | Guanine nucleotide-binding protein-like 3-like protein |
| Q9JM63 | KCJ10_MOUSE | Kcnj10 | ATP-sensitive inward rectifier potassium channel 10 (Inward rectifier K(+) channel Kir4.1) (Potassium channel, inwardly rectifying subfamily J member 10) |
| Q9ERN0 | SCAM2_MOUSE | Scamp2 | Secretory carrier-associated membrane protein 2, Secretory carrier membrane protein 2 |

| | | | |
|--------|-------------|---------|---|
| Q8R3I2 | MBOA2_MOUSE | Mboat2 | Lysophospholipid acyltransferase 2, LPLAT 2, EC 2.3.1.- (1-acylglycerophosphocholine O-acyltransferase, EC 2.3.1.23) (1-acylglycerophosphoethanolamine O-acyltransferase, EC 2.3.1.n7) (Lysophosphatidylcholine acyltransferase, LPCAT, Lyso-PC acyltransferase) (Lysophosphatidylcholine acyltransferase 4, Lyso-PC acyltransferase 4, mLPCAT4) (Lysophosphatidylethanolamine acyltransferase, LPEAT, Lyso-PE acyltransferase) (Membrane-bound O-acyltransferase domain-containing protein 2, O-acyltransferase domain-containing protein 2) |
| Q8CGY6 | UN45B_MOUSE | Unc45b | Protein unc-45 homolog B, Unc-45B |
| Q8BXA7 | PHLP2_MOUSE | Phlpp2 | PH domain leucine-rich repeat-containing protein phosphatase 2, EC 3.1.3.16 (PH domain leucine-rich repeat-containing protein phosphatase-like, PHLPP-like) |
| Q8BGB2 | TTC7A_MOUSE | Ttc7a | Tetratricopeptide repeat protein 7A, TPR repeat protein 7A |
| Q80XA6 | REPS2_MOUSE | Reps2 | RalBP1-associated Eps domain-containing protein 2 (Partner of RalBP1) (RalBP1-interacting protein 2) |
| P45377 | ALD2_MOUSE | Akr1b8 | Aldose reductase-related protein 2, AR, EC 1.1.1.21 (Aldehyde reductase) (Fibroblast growth factor-regulated protein) (Protein FR-1) |
| Q8R3P6 | INT14_MOUSE | Ints14 | Integrator complex subunit 14 (von Willebrand factor A domain-containing protein 9) |
| P63058 | THA_MOUSE | Thra | Thyroid hormone receptor alpha (Nuclear receptor subfamily 1 group A member 1) (c-erbA-1) (c-erbA-alpha) |
| Q8R332 | NUP58_MOUSE | Nup58 | Nucleoporin p58/p45 (58 kDa nucleoporin) (Nucleoporin-like protein 1) |
| Q9D7Z3 | NOL7_MOUSE | Nol7 | Nucleolar protein 7 |
| Q8VEB3 | MACIR_MOUSE | MACIR | Macrophage immunometabolism regulator |
| Q9QXY9 | PEX3_MOUSE | Pex3 | Peroxisomal biogenesis factor 3 (Peroxin-3) (Peroxisomal assembly protein PEX3) |
| Q9CQG1 | CHAC2_MOUSE | Chac2 | Putative glutathione-specific gamma-glutamylcyclotransferase 2, Gamma-GCG 2, EC 4.3.2.7 (Cation transport regulator-like protein 2) |
| Q80TF4 | KLH13_MOUSE | Klh13 | Kelch-like protein 13 (BTB and kelch domain-containing protein 2) |
| Q9DAM7 | TM263_MOUSE | Tmem263 | Transmembrane protein 263 |
| Q80XC6 | NRDE2_MOUSE | Nrde2 | Nuclear exosome regulator NRDE2 (Protein NRDE2 homolog) |
| Q3UNZ8 | QORL2_MOUSE | Cryzl2 | Quinone oxidoreductase-like protein 2, EC 1.-.-.- (Zeta-crystallin homolog 2) |
| Q6VUP9 | AP2E_MOUSE | Tfap2e | Transcription factor AP-2-epsilon, AP2-epsilon (Activating enhancer-binding protein 2-epsilon) |

| | | | |
|--------|-------------|---------|--|
| Q9D708 | S10AG_MOUSE | S100a16 | Protein S100-A16 (Protein S100F) (S100 calcium binding protein A16) |
| Q6ZQ18 | EFR3B_MOUSE | Efr3b | Protein EFR3 homolog B |
| Q8VD66 | ABHD4_MOUSE | Abhd4 | (Lyso)-N-acylphosphatidylethanolamine lipase, EC 3.1.1.- (Alpha/beta hydrolase domain-containing protein 4, Abhydrolase domain-containing protein 4) (Alpha/beta-hydrolase 4) |
| Q5U430 | UBR3_MOUSE | Ubr3 | E3 ubiquitin-protein ligase UBR3, EC 2.3.2.27 (N-recognin-3) (RING-type E3 ubiquitin transferase UBR3) (Ubiquitin-protein ligase E3-alpha-3) (Ubiquitin-protein ligase E3-alpha-III) (Zinc finger protein 650) |
| Q5SUE8 | ANR40_MOUSE | Ankrd40 | Ankyrin repeat domain-containing protein 40 |
| Q9JHG6 | RCAN1_MOUSE | Rcan1 | Calcipressin-1 (Down syndrome critical region protein 1 homolog) (Myocyte-enriched calcineurin-interacting protein 1, MCIP1) (Regulator of calcineurin 1) |
| Q9QXV3 | ING1_MOUSE | Ing1 | Inhibitor of growth protein 1 |
| Q9D8T0 | FAM3A_MOUSE | Fam3a | Protein FAM3A |
| Q8QZY4 | RTBDN_MOUSE | Rtbdn | Retbindin |
| Q8R4U1 | MYPOP_MOUSE | Mypop | Myb-related transcription factor, partner of profilin (Myb-related protein p42POP) (Partner of profilin) |
| Q3UFY7 | 5NT3B_MOUSE | Nt5c3b | 7-methylguanosine phosphate-specific 5'-nucleotidase, 7-methylguanosine nucleotidase, EC 3.1.3.91 (Cytosolic 5'-nucleotidase 3B) (Cytosolic 5'-nucleotidase III-like protein, cN-III-like protein, EC 3.1.3.5) (N(7)-methylguanylate 5'-phosphatase) |
| O70250 | PGAM2_MOUSE | Pgam2 | Phosphoglycerate mutase 2, EC 5.4.2.11, EC 5.4.2.4 (BPG-dependent PGAM 2) (Muscle-specific phosphoglycerate mutase) (Phosphoglycerate mutase isozyme M, PGAM-M) |
| Q9CXV9 | DCNL5_MOUSE | Dcun1d5 | DCN1-like protein 5, DCNL5 (DCUN1 domain-containing protein 5) (Defective in cullin neddylation protein 1-like protein 5) (Squamous cell carcinoma-related oncogene 5) |
| Q3UHD2 | GFOD1_MOUSE | Gfod1 | Glucose-fructose oxidoreductase domain-containing protein 1, EC 1.-.-.- |
| Q8CIV8 | TBCE_MOUSE | Tbce | Tubulin-specific chaperone E (Tubulin-folding cofactor E) |
| O35681 | SYT3_MOUSE | Syt3 | Synaptotagmin-3 (Synaptotagmin III, SytIII) |
| Q9CPX8 | QCR10_MOUSE | Uqcr11 | Cytochrome b-c1 complex subunit 10 (Complex III subunit 10) (Complex III subunit XI) (Ubiquinol-cytochrome c reductase complex 6.4 kDa protein) |
| Q61501 | E2F1_MOUSE | E2f1 | Transcription factor E2F1, E2F-1 |

| | | | |
|--------|-------------|---------|--|
| Q9JI91 | ACTN2_MOUSE | Actn2 | Alpha-actinin-2 (Alpha-actinin skeletal muscle isoform 2) (F-actin cross-linking protein) |
| Q8R2Y3 | DOLK_MOUSE | Dolk | Dolichol kinase, EC 2.7.1.108 (Transmembrane protein 15) |
| Q8R4P9 | MRP7_MOUSE | Abcc10 | ATP-binding cassette sub-family C member 10, EC 7.6.2.2, EC 7.6.2.3 (Multidrug resistance-associated protein 7) |
| Q8BQZ5 | CPSF4_MOUSE | Cpsf4 | Cleavage and polyadenylation specificity factor subunit 4 (Cleavage and polyadenylation specificity factor 30 kDa subunit, CPSF 30 kDa subunit) (Clipper homolog) (Clipper/CPSF 30K) |
| Q8K382 | DEN1A_MOUSE | Dennd1a | DENN domain-containing protein 1A (Connecdenn 1, Connecdenn) |
| P70268 | PKN1_MOUSE | Pkn1 | Serine/threonine-protein kinase N1, EC 2.7.11.13 (Protein kinase C-like 1) (Protein kinase C-like PKN) (Protein-kinase C-related kinase 1) (Serine-threonine protein kinase N) |
| Q8BXL7 | ARFRP_MOUSE | Arfrp1 | ADP-ribosylation factor-related protein 1, ARF-related protein 1 |
| Q6TDP3 | KLH17_MOUSE | Klh17 | Kelch-like protein 17 (Actinfilin) |
| Q5SV80 | MYO19_MOUSE | Myo19 | Unconventional myosin-XIX (Myosin head domain-containing protein 1) |
| Q9D2D9 | KLD8B_MOUSE | Klhdc8b | Kelch domain-containing protein 8B |
| Q9CY52 | THG1_MOUSE | Thg11 | Probable tRNA(His) guanylyltransferase, EC 2.7.7.79 (tRNA-histidine guanylyltransferase) |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| P50580 | PA2G4_MOUSE | Pa2g4 | Proliferation-associated protein 2G4 (IRES-specific cellular trans-acting factor 45 kDa, ITAF45) (Mpp1) (Proliferation-associated protein 1) (Protein p38-2G4) |
| Q61990 | PCBP2_MOUSE | Pcbp2 | Poly(rC)-binding protein 2 (Alpha-CP2) (CTBP, CBP) (Putative heterogeneous nuclear ribonucleoprotein X, hnRNP X) |
| Q9Z2W9 | GRIA3_MOUSE | Gria3 | Glutamate receptor 3, GluR-3 (AMPA-selective glutamate receptor 3) (GluR-C) (GluR-K3) (Glutamate receptor ionotropic, AMPA 3, GluA3) |
| Q8BMZ5 | SEN34_MOUSE | Tsen34 | tRNA-splicing endonuclease subunit Sen34, EC 4.6.1.16 (Leukocyte receptor cluster member 5 homolog) (tRNA-intron endonuclease Sen34) |
| P85094 | ISC2A_MOUSE | Isoc2a | Isochorismatase domain-containing protein 2A |
| Q6ZPE2 | MTMR5_MOUSE | Sbf1 | Myotubularin-related protein 5 (Inactive phosphatidylinositol 3-phosphatase 5) (SET-binding factor 1, Sbf1) |
| P47757 | CAPZB_MOUSE | Capzb | F-actin-capping protein subunit beta (CapZ beta) |

| | | | |
|--------|-------------|---------|---|
| Q8VBT9 | ASPC1_MOUSE | Aspscr1 | Tether containing UBX domain for GLUT4 (Alveolar soft part sarcoma chromosomal region candidate gene 1 protein homolog) |
| O88796 | RPP30_MOUSE | Rpp30 | Ribonuclease P protein subunit p30, RNaseP protein p30 (RNase P subunit 2) |
| Q921E2 | RAB31_MOUSE | Rab31 | Ras-related protein Rab-31 |
| P06795 | MDR1B_MOUSE | Abcb1b | ATP-dependent translocase ABCB1 (ATP-binding cassette sub-family B member 1B) (Multidrug resistance protein 1B, EC 7.6.2.2) (P-glycoprotein 1) (Phospholipid transporter ABCB1, EC 7.6.2.1) (CD antigen CD243) |
| Q8BXT1 | RGS8_MOUSE | Rgs8 | Regulator of G-protein signaling 8, RGS8 |
| Q99P72 | RTN4_MOUSE | Rtn4 | Reticulon-4 (Neurite outgrowth inhibitor, Nogo protein) |
| P60764 | RAC3_MOUSE | Rac3 | Ras-related C3 botulinum toxin substrate 3, EC 3.6.5.2 (p21-Rac3) |
| Q9JHR9 | NRIP2_MOUSE | Nrip2 | Nuclear receptor-interacting protein 2 (Neuronal-interacting factor X 1) |
| Q9R233 | TPSN_MOUSE | Tapbp | Tapasin, TPN, TPSN (TAP-associated protein) (TAP-binding protein) |
| Q8CGI1 | F193A_MOUSE | Fam193a | Protein FAM193A |
| Q64343 | ABCG1_MOUSE | Abcg1 | ATP-binding cassette sub-family G member 1, EC 7.6.2.- (ATP-binding cassette transporter 8) (White protein homolog) |
| Q9WVJ3 | CBPQ_MOUSE | Cpq | Carboxypeptidase Q, EC 3.4.17.- (Hematopoietic lineage switch 2) (Plasma glutamate carboxypeptidase) |
| Q9QZM2 | DPOG2_MOUSE | Polg2 | DNA polymerase subunit gamma-2, mitochondrial (DNA polymerase gamma accessory 55 kDa subunit, p55) (Mitochondrial DNA polymerase accessory subunit) (MtPolB) (PolG-beta) |
| Q9EQC4 | ELOV4_MOUSE | Elov14 | Elongation of very long chain fatty acids protein 4, EC 2.3.1.199 (3-keto acyl-CoA synthase Elov14) (ELOVL fatty acid elongase 4, ELOVL FA elongase 4) (Very long chain 3-ketoacyl-CoA synthase 4) (Very long chain 3-oxoacyl-CoA synthase 4) |
| Q9D8V0 | HM13_MOUSE | Hm13 | Minor histocompatibility antigen H13, EC 3.4.23.- (Presenilin-like protein 3) (Signal peptide peptidase) |
| Q9CQV1 | TIM16_MOUSE | Pam16 | Mitochondrial import inner membrane translocase subunit TIM16 (Mitochondria-associated granulocyte macrophage CSF-signaling molecule) (Presequence translocated-associated motor subunit PAM16) |
| Q91WT9 | CBS_MOUSE | Cbs | Cystathionine beta-synthase, EC 4.2.1.22 (Beta-thionase) (Serine sulfhydrase) |
| Q91W61 | FXL15_MOUSE | Fbxl15 | F-box/LRR-repeat protein 15 (F-box only protein 37) |
| Q8R2K1 | FUCM_MOUSE | Fuom | Fucose mutarotase, EC 5.1.3.29 |

| | | | |
|--------|-------------|----------|--|
| Q8BP78 | F10C1_MOUSE | Fra10ac1 | Protein FRA10AC1 homolog |
| Q78XF5 | OSTC_MOUSE | Ostc | Oligosaccharyltransferase complex subunit OSTC |
| Q6NSQ9 | G6PC3_MOUSE | G6pc3 | Glucose-6-phosphatase 3, G-6-Pase 3, G6Pase 3, EC 3.1.3.9 (Ubiquitous glucose-6-phosphatase catalytic subunit-related protein) (glucose-6-phosphatase-beta, Glc-6-Pase-beta) |
| P63082 | VATL_MOUSE | Atp6v0c | V-type proton ATPase 16 kDa proteolipid subunit c, V-ATPase 16 kDa proteolipid subunit c (PL16) (Vacuolar proton pump 16 kDa proteolipid subunit c) |
| P62862 | RS30_MOUSE | Fau | 40S ribosomal protein S30 |
| P0C673 | IGS11_MOUSE | Igsf11 | Immunoglobulin superfamily member 11, IgSF11 (Brain and testis-specific immunoglobulin superfamily protein, Bt-IGSF) |
| Q91VK4 | ITM2C_MOUSE | Itm2c | Integral membrane protein 2C (Transmembrane protein BRI3) [Cleaved into: CT-BRI3] |
| Q8R0K9 | E2F4_MOUSE | E2f4 | Transcription factor E2F4, E2F-4 |
| Q9CR86 | CHSP1_MOUSE | Carhsp1 | Calcium-regulated heat stable protein 1 (Calcium-regulated heat-stable protein of 24 kDa, CRHSP-24) |
| Q9CXK8 | NIP7_MOUSE | Nip7 | 60S ribosome subunit biogenesis protein NIP7 homolog (Nucleolar pre-rRNA processing protein NIP7) (PEachy) (kDa93) |
| Q566J8 | COQ8B_MOUSE | Coq8b | Atypical kinase COQ8B, mitochondrial, EC 2.7.-.- (AarF domain-containing protein kinase 4) (Coenzyme Q protein 8B) |
| Q8K596 | NAC2_MOUSE | Slc8a2 | Sodium/calcium exchanger 2 (Na(+)/Ca(2+)-exchange protein 2) (Solute carrier family 8 member 2) |
| Q9EPK6 | SIL1_MOUSE | Sil1 | Nucleotide exchange factor SIL1 |
| Q810U4 | NRCAM_MOUSE | Nrcam | Neuronal cell adhesion molecule, Nr-CAM (Neuronal surface protein Bravo, mBravo) (NgCAM-related cell adhesion molecule, Ng-CAM-related) |
| Q78YZ6 | SCOC_MOUSE | Scoc | Short coiled-coil protein |
| Q80XH2 | IMPG2_MOUSE | Impg2 | Interphotoreceptor matrix proteoglycan 2 (Sialoprotein associated with cones and rods proteoglycan, Spacrcan) |
| Q8BJH1 | ZC21A_MOUSE | Zc2hc1a | Zinc finger C2HC domain-containing protein 1A |
| Q8VC88 | GRAN_MOUSE | Gca | Grancalcin |
| Q80WC7 | AGFG2_MOUSE | Agfg2 | Arf-GAP domain and FG repeat-containing protein 2 (HIV-1 Rev-binding protein-like protein) (Rev/Rex activation domain-binding protein related, RAB-R) |

| | | | |
|--------|-------------|---------|---|
| Q14B80 | KCNC2_MOUSE | Kcnc2 | Potassium voltage-gated channel subfamily C member 2 (Shaw-like potassium channel) (Voltage-gated potassium channel Kv3.2) |
| Q8JZL3 | THTPA_MOUSE | Thtpa | Thiamine-triphosphatase, ThTPase, EC 3.6.1.28 |
| Q8CC27 | CACB2_MOUSE | Cacnb2 | Voltage-dependent L-type calcium channel subunit beta-2, CAB2 (Calcium channel voltage-dependent subunit beta 2) |
| Q9D6K7 | TTC33_MOUSE | Ttc33 | Tetratricopeptide repeat protein 33, TPR repeat protein 33 |
| Q9CQP2 | TPPC2_MOUSE | Trappc2 | Trafficking protein particle complex subunit 2 (Sedlin) |
| Q8VDT9 | RM50_MOUSE | Mrpl50 | 39S ribosomal protein L50, mitochondrial, L50mt, MRP-L50 |
| Q8VC85 | LSM1_MOUSE | Lsm1 | U6 snRNA-associated Sm-like protein LSm1 |
| Q4KWH5 | PLCH1_MOUSE | Plch1 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase eta-1, EC 3.1.4.11 (Phosphoinositide phospholipase C-eta-1) (Phospholipase C-eta-1, PLC-eta-1) (Phospholipase C-like protein 3, PLC-L3) |
| P27661 | H2AX_MOUSE | H2ax | Histone H2AX, H2a/x (Histone H2A.X) |
| Q924T2 | RT02_MOUSE | Mrps2 | 28S ribosomal protein S2, mitochondrial, MRP-S2, S2mt |
| P35803 | GPM6B_MOUSE | Gpm6b | Neuronal membrane glycoprotein M6-b, M6b |
| Q8CF93 | GLT13_MOUSE | Galnt13 | Polypeptide N-acetylgalactosaminyltransferase 13, EC 2.4.1.41 (Polypeptide GalNAc transferase 13, GalNAc-T13, pp-GaNTase 13) (Protein-UDP acetylgalactosaminyltransferase 13) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase 13) |
| Q91X84 | CRTC3_MOUSE | Crtc3 | CREB-regulated transcription coactivator 3 (Transducer of regulated cAMP response element-binding protein 3, TORC-3, Transducer of CREB protein 3) |
| Q91X51 | GORS1_MOUSE | Gorasp1 | Golgi reassembly-stacking protein 1 (Golgi peripheral membrane protein p65) (Golgi reassembly-stacking protein of 65 kDa, GRASP65) |
| Q8CEG5 | CC28B_MOUSE | Ccdc28b | Coiled-coil domain-containing protein 28B |
| Q91XL3 | UXS1_MOUSE | Uxs1 | UDP-glucuronic acid decarboxylase 1, EC 4.1.1.35 (UDP-glucuronate decarboxylase 1, UGD, UXS-1) |
| Q8CHT3 | INT5_MOUSE | Ints5 | Integrator complex subunit 5, Int5 |
| O35668 | HAP1_MOUSE | Hap1 | Huntingtin-associated protein 1, HAP-1 |
| Q91WA4 | CXXC5_MOUSE | Cxxc5 | CXXC-type zinc finger protein 5 |
| Q8C0L6 | PAOX_MOUSE | Paox | Peroxisomal N(1)-acetyl-spermine/spermidine oxidase, EC 1.5.3.13 (Polyamine oxidase) |

| | | | |
|--------|-------------|----------|--|
| Q8BP71 | RFOX2_MOUSE | Rbfox2 | RNA binding protein fox-1 homolog 2 (Fox-1 homolog B) (Fox-1 homolog Fxh) (Hexaribonucleotide-binding protein 2) (RNA-binding motif protein 9) (RNA-binding protein 9) |
| P47955 | RLA1_MOUSE | Rplp1 | 60S acidic ribosomal protein P1 |
| Q6PCP5 | MFF_MOUSE | Mff | Mitochondrial fission factor |
| Q9CQ26 | STABP_MOUSE | Stambp | STAM-binding protein, EC 3.4.19.- (Associated molecule with the SH3 domain of STAM) |
| Q9CXJ1 | SYEM_MOUSE | Ears2 | Probable glutamate--tRNA ligase, mitochondrial, EC 6.1.1.17 (Glutamyl-tRNA synthetase, GluRS) |
| Q9ESJ0 | XPO4_MOUSE | Xpo4 | Exportin-4, Exp4 |
| Q9JHG7 | PK3CG_MOUSE | Pik3cg | Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit gamma isoform, PI3-kinase subunit gamma, PI3K-gamma, PI3Kgamma, PtdIns-3-kinase subunit gamma, EC 2.7.1.137, EC 2.7.1.153, EC 2.7.1.154 (Phosphatidylinositol 4,5-bisphosphate 3-kinase 110 kDa catalytic subunit gamma, PtdIns-3-kinase subunit p110-gamma, p110gamma) (Phosphoinositide-3-kinase catalytic gamma polypeptide) (Serine/threonine protein kinase PIK3CG, EC 2.7.11.1) (p120-PI3K) |
| Q3UI43 | BABA1_MOUSE | Babam1 | BRISC and BRCA1-A complex member 1 (Mediator of RAP80 interactions and targeting subunit of 40 kDa) (New component of the BRCA1-A complex) |
| P59913 | PCMD1_MOUSE | Pcmt1 | Protein-L-isoaspartate O-methyltransferase domain-containing protein 1 |
| Q8VBW5 | BBX_MOUSE | Bbx | HMG box transcription factor BBX (Bobby sox homolog) (HMG box-containing protein 2) |
| O08760 | OGG1_MOUSE | Ogg1 | N-glycosylase/DNA lyase [Includes: 8-oxoguanine DNA glycosylase, EC 3.2.2.-; DNA-(apurinic or apyrimidinic site) lyase, AP lyase, EC 4.2.99.18] |
| Q9CYZ8 | SSBP2_MOUSE | Ssbp2 | Single-stranded DNA-binding protein 2 (Sequence-specific single-stranded-DNA-binding protein 2) |
| Q9ESN9 | JIP3_MOUSE | Mapk8ip3 | C-Jun-amino-terminal kinase-interacting protein 3, JIP-3, JNK-interacting protein 3 (JNK MAP kinase scaffold protein 3) (JNK/SAPK-associated protein 1, JSAP1) (Mitogen-activated protein kinase 8-interacting protein 3) (Sunday driver 2) |
| Q80T85 | DCAF5_MOUSE | Dcaf5 | DDB1- and CUL4-associated factor 5 (WD repeat-containing protein 22) |
| E9Q7F2 | RN169_MOUSE | Rnf169 | E3 ubiquitin-protein ligase RNF169, EC 2.3.2.27 (RING finger protein 169) (RING-type E3 ubiquitin transferase RNF169) |

| | | | |
|--------|-------------|---------|--|
| Q67BJ4 | A4GAT_MOUSE | A4galt | Lactosylceramide 4-alpha-galactosyltransferase, EC 2.4.1.228 (Alpha-1,4-N-acetylglucosaminyltransferase) (Alpha-1,4-galactosyltransferase) (Alpha4Gal-T1) (Globotriaosylceramide synthase, Gb3 synthase) (UDP-galactose:beta-D-galactosyl-beta1-R 4-alpha-D-galactosyltransferase) |
| Q8CI95 | OSB11_MOUSE | Osbp11 | Oxysterol-binding protein-related protein 11, ORP-11, OSBP-related protein 11 |
| Q9R013 | CATF_MOUSE | Ctsf | Cathepsin F, EC 3.4.22.41 |
| Q3UR32 | P2RX3_MOUSE | P2rx3 | P2X purinoceptor 3, P2X3 (ATP receptor) (Purinergic receptor) |
| Q52KF3 | SPIR1_MOUSE | Spire1 | Protein spire homolog 1 |
| Q9Z223 | MOC2B_MOUSE | Mocs2 | Molybdopterin synthase catalytic subunit, EC 2.8.1.12 (Molybdenum cofactor synthesis protein 2 large subunit) (Molybdenum cofactor synthesis protein 2B, MOCS2B) |
| Q9CXY9 | GPI8_MOUSE | Pigk | GPI-anchor transamidase, GPI transamidase, EC 3.-.-.- (Phosphatidylinositol-glycan biosynthesis class K protein, PIG-K) |
| E9PVB3 | CC175_MOUSE | Ccdc175 | Coiled-coil domain-containing protein 175 |
| P16014 | SCG1_MOUSE | Chgb | Secretogranin-1 (Chromogranin-B, CgB) (Secretogranin I, SgI) [Cleaved into: CCB peptide; PE-11] |
| Q8R1F9 | RPP40_MOUSE | Rpp40 | Ribonuclease P protein subunit p40, RNaseP protein p40 |
| Q9D658 | TP4A3_MOUSE | Ptp4a3 | Protein tyrosine phosphatase type IVA 3, EC 3.1.3.48 (Protein-tyrosine phosphatase 4a3) (Protein-tyrosine phosphatase of regenerating liver 3, PRL-3) |
| Q8K3J5 | ZN131_MOUSE | Znf131 | Zinc finger protein 131 |
| Q8CEC5 | KBR1_MOUSE | Nkiras1 | NF-kappa-B inhibitor-interacting Ras-like protein 1 (I-kappa-B-interacting Ras-like protein 1, Kappa B-Ras protein 1, KappaB-Ras1) |
| Q9CS42 | PRPS2_MOUSE | Prps2 | Ribose-phosphate pyrophosphokinase 2, EC 2.7.6.1 (Phosphoribosyl pyrophosphate synthase II, PRS-II) |
| Q3U7R1 | ESYT1_MOUSE | Esyt1 | Extended synaptotagmin-1, E-Syt1 (Membrane-bound C2 domain-containing protein) |
| A2ASQ1 | AGRIN_MOUSE | Agrn | Agrin [Cleaved into: Agrin N-terminal 110 kDa subunit; Agrin C-terminal 110 kDa subunit; Agrin C-terminal 90 kDa fragment, C90; Agrin C-terminal 22 kDa fragment, C22] |
| Q811D0 | DLG1_MOUSE | Dlg1 | Disks large homolog 1 (Embryo-dlg/synapse-associated protein 97, E-dlg/SAP97) (Synapse-associated protein 97, SAP-97, SAP97) |
| Q8BTV2 | CPSF7_MOUSE | Cpsf7 | Cleavage and polyadenylation specificity factor subunit 7 |
| Q8VCH5 | RABEK_MOUSE | Rabepk | Rab9 effector protein with kelch motifs |

| | | | |
|--------|-------------|----------|--|
| Q3V132 | ADT4_MOUSE | Slc25a31 | ADP/ATP translocase 4 (ADP,ATP carrier protein 4) (Adenine nucleotide translocator 4, ANT 4) (Solute carrier family 25 member 31) (Sperm flagellar energy carrier protein) |
| Q9CPY7 | AMPL_MOUSE | Lap3 | Cytosol aminopeptidase, EC 3.4.11.1 (Cysteinylglycine-S-conjugate dipeptidase, EC 3.4.13.23) (Leucine aminopeptidase 3, LAP-3) (Leucyl aminopeptidase) (Peptidase S) (Proline aminopeptidase, EC 3.4.11.5) (Prolyl aminopeptidase) |
| Q9Z0R9 | FADS2_MOUSE | Fads2 | Acyl-CoA 6-desaturase, EC 1.14.19.3 (Delta(6) fatty acid desaturase, D6D, Delta(6) desaturase, Delta-6 desaturase) (Fatty acid desaturase 2) |
| Q8R2Z5 | VWA1_MOUSE | Vwa1 | von Willebrand factor A domain-containing protein 1 (von Willebrand factor A domain-related protein) |
| P56389 | CDD_MOUSE | Cda | Cytidine deaminase, EC 3.5.4.5 (Cytidine aminohydrolase) |
| Q5RL79 | KTAP2_MOUSE | Krtcap2 | Keratinocyte-associated protein 2, KCP-2 (Dolichyl-diphosphooligosaccharide--protein glycosyltransferase subunit KCP2, Oligosaccharyl transferase subunit KCP2) |
| Q501J2 | ANKMT_MOUSE | Antkmt | Adenine nucleotide translocase lysine N-methyltransferase, ANT-KMT, EC 2.1.1.- |
| Q499X9 | SYMM_MOUSE | Mars2 | Methionine--tRNA ligase, mitochondrial, EC 6.1.1.10 (Methionyl-tRNA synthetase 2) (Mitochondrial methionyl-tRNA synthetase, MtMetRS) |
| P97328 | KHK_MOUSE | Khk | Ketohexokinase, EC 2.7.1.3 (Hepatic fructokinase) |
| O35604 | NPC1_MOUSE | Npc1 | NPC intracellular cholesterol transporter 1 (Niemann-Pick C1 protein) |
| Q9WVB2 | TLE2_MOUSE | Tle2 | Transducin-like enhancer protein 2 |
| Q8BJ37 | TYDP1_MOUSE | Tdp1 | Tyrosyl-DNA phosphodiesterase 1, Tyr-DNA phosphodiesterase 1, EC 3.1.4.- (Protein expressed in male leptotene and zygotene spermatocytes 501, MLZ-501) |
| Q99JH8 | ERD21_MOUSE | Kdelr1 | ER lumen protein-retaining receptor 1 (KDEL endoplasmic reticulum protein retention receptor 1, KDEL receptor 1) |
| Q3U1G5 | I20L2_MOUSE | Isg20l2 | Interferon-stimulated 20 kDa exonuclease-like 2, EC 3.1.-.- |
| P62892 | RL39_MOUSE | Rpl39 | 60S ribosomal protein L39 |
| Q6NXX8 | ASIC1_MOUSE | Asic1 | Acid-sensing ion channel 1, ASIC1 (Acid-sensing ion channel) (Amiloride-sensitive cation channel 2, neuronal) (Brain sodium channel 2, BNaC2) |
| Q99MY8 | ASH1L_MOUSE | Ash1l | Histone-lysine N-methyltransferase ASH1L, EC 2.1.1.359, EC 2.1.1.367 (ASH1-like protein) (Absent small and homeotic disks protein 1 homolog) |
| Q9D1U0 | GRIFN_MOUSE | Grifin | Grifin (Galactin-related inter-fiber protein) |
| Q9D6G5 | TM138_MOUSE | Tmem138 | Transmembrane protein 138 |

| | | | |
|--------|-------------|----------|---|
| D3Z4S3 | PTRD1_MOUSE | Ptrhd1 | Putative peptidyl-tRNA hydrolase PTRHD1, EC 3.1.1.29 (Peptidyl-tRNA hydrolase domain-containing protein 1) |
| O08791 | COE3_MOUSE | Ebf3 | Transcription factor COE3 (Early B-cell factor 3, EBF-3) (Olf-1/EBF-like 2, O/E-2, OE-2) |
| Q6A009 | LTN1_MOUSE | Ltn1 | E3 ubiquitin-protein ligase listerin, EC 2.3.2.27 (RING finger protein 160) (RING-type E3 ubiquitin transferase listerin) (Zinc finger protein 294, Zfp-294) |
| Q8K2D3 | EDC3_MOUSE | Edc3 | Enhancer of mRNA-decapping protein 3 (YjeF domain-containing protein 1) |
| Q8JZM0 | TFB1M_MOUSE | Tfb1m | Dimethyladenosine transferase 1, mitochondrial, EC 2.1.1.- (Mitochondrial 12S rRNA dimethylase 1) (Mitochondrial transcription factor B1, mtTFB1) (S-adenosylmethionine-6-N', N'-adenosyl(rRNA) dimethyltransferase 1) |
| Q920H4 | ACM5_MOUSE | Chrm5 | Muscarinic acetylcholine receptor M5 |
| Q8BMF3 | MAON_MOUSE | Me3 | NADP-dependent malic enzyme, mitochondrial, NADP-ME, EC 1.1.1.40 (Malic enzyme 3) |
| Q8R2E9 | ERO1B_MOUSE | Ero1b | ERO1-like protein beta, ERO1-L-beta, EC 1.8.4.- (Endoplasmic reticulum oxidoreductase beta) (Endoplasmic reticulum oxidoreductin-1-like protein B) (Oxidoreductin-1-L-beta) |
| Q9D1T0 | LIGO1_MOUSE | Lingo1 | Leucine-rich repeat and immunoglobulin-like domain-containing nogo receptor-interacting protein 1 (Leucine-rich repeat neuronal protein 1) (Leucine-rich repeat neuronal protein 6A) |
| Q9DCZ4 | MIC26_MOUSE | Apoo | MICOS complex subunit Mic26 (Apolipoprotein O) (MICOS complex subunit Mic23) (Protein FAM121B) |
| Q6P5F6 | S39AA_MOUSE | Slc39a10 | Zinc transporter ZIP10 (Solute carrier family 39 member 10) (Zrt- and Irt-like protein 10, ZIP-10) |
| Q03347 | RUNX1_MOUSE | Runx1 | Runt-related transcription factor 1 (Acute myeloid leukemia 1 protein) (Core-binding factor subunit alpha-2, CBF-alpha-2) (Oncogene AML-1) (Polyomavirus enhancer-binding protein 2 alpha B subunit, PEA2-alpha B, PEBP2-alpha B) (SL3-3 enhancer factor 1 alpha B subunit) (SL3/AKV core-binding factor alpha B subunit) |
| E9Q2Z1 | CECR2_MOUSE | Cecr2 | Chromatin remodeling regulator CECR2 (Cat eye syndrome critical region protein 2 homolog) |
| Q9DC33 | HM20A_MOUSE | Hmg20a | High mobility group protein 20A (HMG box-containing protein 20A) (HMG domain-containing protein HMGX1) (Inhibitor of BRAF35, iBRAF) |
| Q9CZU4 | ERAL1_MOUSE | Eral1 | GTPase Era, mitochondrial, M-ERA (Conserved ERA-like GTPase, CEGA) (ERA-W) (ERA-like protein 1) |

| | | | |
|--------|-------------|---------|---|
| Q9JKW0 | AR6P1_MOUSE | Arl6ip1 | ADP-ribosylation factor-like protein 6-interacting protein 1, ARL-6-interacting protein 1, Aip-1 (Protein TBX2) |
| Q6PNC0 | DMXL1_MOUSE | Dmx11 | DmX-like protein 1, X-like 1 protein |
| O55047 | TLK2_MOUSE | Tlk2 | Serine/threonine-protein kinase tousled-like 2, EC 2.7.11.1 (PKU-alpha) (Tousled-like kinase 2) |
| Q9D6I9 | LURA1_MOUSE | Lurap1 | Leucine rich adaptor protein 1 (Leucine repeat adapter protein 35A) |
| Q8BHD7 | PTBP3_MOUSE | Ptbp3 | Polypyrimidine tract-binding protein 3 (Regulator of differentiation 1, Rod1) |
| Q7TNS7 | ASIC4_MOUSE | Asic4 | Acid-sensing ion channel 4, ASIC4 (Amiloride-sensitive cation channel 4) |
| P51180 | MIP_MOUSE | Mip | Lens fiber major intrinsic protein (Aquaporin-0) (MIP26, MP26) |
| Q8R5F7 | IFIH1_MOUSE | Ifih1 | Interferon-induced helicase C domain-containing protein 1, EC 3.6.4.13 (Helicase with 2 CARD domains, Helicard) (Interferon induced with helicase C domain protein 1) (Melanoma differentiation-associated protein 5, MDA-5) (RIG-I-like receptor 2, RLR-2) |
| Q8R0P8 | ABHD8_MOUSE | Abhd8 | Protein ABHD8, EC 3.-.-.- (Alpha/beta hydrolase domain-containing protein 8, Abhydrolase domain-containing protein 8) |
| Q3UN16 | GP162_MOUSE | Gpr162 | Probable G-protein coupled receptor 162 |
| P61315 | G3ST3_MOUSE | Gal3st3 | Galactose-3-O-sulfotransferase 3, Gal3ST-3, EC 2.8.2.- (Beta-galactose-3-O-sulfotransferase 3) (Gal-beta-1, 3-GalNAc 3'-sulfotransferase 3) |
| Q80TE4 | SI1L2_MOUSE | Sipa1l2 | Signal-induced proliferation-associated 1-like protein 2, SIPA1-like protein 2 |
| Q91WD7 | KI18A_MOUSE | Kif18a | Kinesin-like protein KIF18A |
| Q64522 | H2A2B_MOUSE | H2ac21 | Histone H2A type 2-B (H2A-clustered histone 21) (H2a-613A) |
| Q6NVG1 | LPCT4_MOUSE | Lpcat4 | Lysophospholipid acyltransferase LPCAT4 (1-acylglycerol-3-phosphate O-acyltransferase 7, 1-AGP acyltransferase 7, 1-AGPAT 7) (1-acylglycerophosphocholine O-acyltransferase, EC 2.3.1.23) (1-acylglycerophosphoserine O-acyltransferase, EC 2.3.1.n6) (1-alkenylglycerophosphoethanolamine O-acyltransferase, EC 2.3.1.121) (1-alkylglycerophosphocholine O-acetyltransferase, EC 2.3.1.67) (Acyltransferase-like 3) (Lysophosphatidylcholine acyltransferase 4) (Lysophosphatidylethanolamine acyltransferase 2, EC 2.3.1.n7) (Plasmalogen synthase) |
| Q91VM3 | WIPI4_MOUSE | Wdr45 | WD repeat domain phosphoinositide-interacting protein 4, WIPI-4 (WD repeat domain X-linked 1) (WD repeat-containing protein 45) |
| Q9DAA3 | CD036_MOUSE | | Uncharacterized protein C4orf36 homolog |

| | | | |
|--------|-------------|---------|--|
| Q8BTZ4 | APC5_MOUSE | Anapc5 | Anaphase-promoting complex subunit 5, APC5 (Cyclosome subunit 5) |
| Q5SWU9 | ACACA_MOUSE | Acaca | Acetyl-CoA carboxylase 1, ACC1, EC 6.4.1.2 (ACC-alpha) (Acetyl-CoA carboxylase 265) |
| Q9Z0H4 | CELF2_MOUSE | Celf2 | CUGBP Elav-like family member 2, CELF-2 (Bruno-like protein 3) (CUG triplet repeat RNA-binding protein 2, CUG-BP2) (CUG-BP- and ETR-3-like factor 2) (ELAV-type RNA-binding protein 3, ETR-3, mETR-3) (Neuroblastoma apoptosis-related RNA-binding protein, mNapor) (RNA-binding protein BRUNOL-3) |
| Q3UH60 | DIP2B_MOUSE | Dip2b | Disco-interacting protein 2 homolog B, DIP2 homolog B |
| Q99K28 | ARFG2_MOUSE | Arfgap2 | ADP-ribosylation factor GTPase-activating protein 2, ARF GAP 2 (GTPase-activating protein ZNF289) (Zinc finger protein 289) |
| Q78JW9 | UBFD1_MOUSE | Ubfd1 | Ubiquitin domain-containing protein UBFD1 |
| Q64514 | TPP2_MOUSE | Tpp2 | Tripeptidyl-peptidase 2, TPP-2, EC 3.4.14.10 (Tripeptidyl aminopeptidase) (Tripeptidyl-peptidase II, TPP-II) |
| Q9Z0H3 | SNF5_MOUSE | Smarb1 | SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily B member 1 (BRG1-associated factor 47, BAF47) (Integrase interactor 1 protein) (SNF5 homolog, mSNF5) |
| Q7TNV1 | TLC3B_MOUSE | Tlcd3b | Ceramide synthase, EC 2.3.1.- (Protein FAM57B) (TLC domain-containing protein 3B) |
| Q6ZQL4 | WDR43_MOUSE | Wdr43 | WD repeat-containing protein 43 |
| Q9WTX8 | MD1L1_MOUSE | Mad111 | Mitotic spindle assembly checkpoint protein MAD1 (Mitotic arrest deficient 1-like protein 1, MAD1-like protein 1) |
| E9PXF8 | MTMRD_MOUSE | Sbf2 | Myotubularin-related protein 13 (Inactive phosphatidylinositol 3-phosphatase 13) (SET-binding factor 2) |
| P35803 | GPM6B_MOUSE | Gpm6b | Neuronal membrane glycoprotein M6-b, M6b |
| Q9DBR3 | ARMC8_MOUSE | Armc8 | Armadillo repeat-containing protein 8 |
| Q8R3F5 | FABD_MOUSE | Mcat | Malonyl-CoA-acyl carrier protein transacylase, mitochondrial, MCT, EC 2.3.1.39 (Mitochondrial malonyltransferase) ([Acyl-carrier-protein] malonyltransferase) |
| Q99N87 | RT05_MOUSE | Mrps5 | 28S ribosomal protein S5, mitochondrial, MRP-S5, S5mt |
| Q921I0 | ORML1_MOUSE | Ormdl1 | ORM1-like protein 1 |
| Q61271 | ACV1B_MOUSE | Acvr1b | Activin receptor type-1B, EC 2.7.11.30 (Activin receptor type IB, ACTR-IB) (Activin receptor-like kinase 4, ALK-4) (Serine/threonine-protein kinase receptor R2, SKR2) |
| P48379 | RFX2_MOUSE | Rfx2 | DNA-binding protein RFX2 (Regulatory factor X 2) |

| | | | |
|--------|-------------|---------|---|
| Q8VCE6 | NT5M_MOUSE | Nt5m | 5'(3')-deoxyribonucleotidase, mitochondrial, 5',3'-nucleotidase, mitochondrial, EC 3.1.3.- (Deoxy-5'-nucleotidase 2, dNT-2) |
| Q8R079 | BFAR_MOUSE | Bfar | Bifunctional apoptosis regulator |
| Q6ZQA6 | IGSF3_MOUSE | Igsf3 | Immunoglobulin superfamily member 3, IgSF3 |
| P61148 | FGF1_MOUSE | Fgf1 | Fibroblast growth factor 1, FGF-1 (Acidic fibroblast growth factor, aFGF) (Heparin-binding growth factor 1, HBGF-1) |
| O35207 | CDKA1_MOUSE | Cdk2ap1 | Cyclin-dependent kinase 2-associated protein 1, CDK2-associated protein 1 (Deleted in oral cancer 1, DOC-1) (Putative oral cancer suppressor) |
| Q52KR3 | PRUN2_MOUSE | Prune2 | Protein prune homolog 2 (BNIP2 motif-containing molecule at the C-terminal region 1) |
| Q9JMG7 | HDGR3_MOUSE | Hdgrf3 | Hepatoma-derived growth factor-related protein 3, HRP-3 |
| O08919 | NUMBL_MOUSE | Numbl | Numb-like protein |
| Q9JM62 | REEP6_MOUSE | Reep6 | Receptor expression-enhancing protein 6 (Polyposis locus protein 1-like 1) (TB2 protein-like 1) |
| Q91ZQ5 | RPE65_MOUSE | Rpe65 | Retinoid isomerohydrolase, EC 3.1.1.64 (All-trans-retinyl-palmitate hydrolase) (Lutein isomerase) (Meso-zeaxanthin isomerase, EC 5.3.3.22) (Retinal pigment epithelium-specific 65 kDa protein) (Retinol isomerase) |
| Q3TTC2 | TYY2_MOUSE | Yy2 | Transcription factor YY2 (Yin and yang 2, YY-2) |
| Q3UHX9 | CI114_MOUSE | Spout1 | Putative methyltransferase C9orf114 homolog, EC 2.1.1.- (Centromere protein 32, CENP-32) (Kinetochores-associated protein) (SPOUT domain-containing methyltransferase 1) |
| P34056 | AP2A_MOUSE | Tfap2a | Transcription factor AP-2-alpha, AP2-alpha (AP-2 transcription factor) (Activating enhancer-binding protein 2-alpha) (Activator protein 2, AP-2) |
| Q99LV7 | PIGX_MOUSE | Pigx | Phosphatidylinositol-glycan biosynthesis class X protein, PIG-X |
| P62077 | TIM8B_MOUSE | Timm8b | Mitochondrial import inner membrane translocase subunit Tim8 B (Deafness dystonia protein 2 homolog) |
| B2RX12 | MRP3_MOUSE | Abcc3 | ATP-binding cassette sub-family C member 3, EC 7.6.2.-, EC 7.6.2.2, EC 7.6.2.3 (Canalicular multispecific organic anion transporter 2) (Multidrug resistance-associated protein 3) |
| Q8BK30 | NDUV3_MOUSE | Ndufv3 | NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial (Complex I-9kD, CI-9kD) (NADH-ubiquinone oxidoreductase 9 kDa subunit) |

| | | | |
|--------|-------------|---------|---|
| Q9CYK2 | QPCT_MOUSE | Qpct | Glutaminyl-peptide cyclotransferase, EC 2.3.2.5 (Glutaminyl cyclase, QC) (Glutaminyl-tRNA cyclotransferase) |
| Q91YK0 | LRC49_MOUSE | Lrrc49 | Leucine-rich repeat-containing protein 49 (Tubulin polyglutamylase complex subunit 4, PGs4) (p79) |
| Q9CZT5 | VASN_MOUSE | Vasn | Vasorin (Protein slit-like 2) |
| P68433 | H31_MOUSE | H3c1 | Histone H3.1 |
| Q505D1 | ANR28_MOUSE | Ankrd28 | Serine/threonine-protein phosphatase 6 regulatory ankyrin repeat subunit A, PP6-ARS-A, Serine/threonine-protein phosphatase 6 regulatory subunit ARS-A (Ankyrin repeat domain-containing protein 28) (Phosphatase interactor targeting protein hnRNP K, PITK) |
| P25916 | BMI1_MOUSE | Bmi1 | Polycomb complex protein BMI-1 (Polycomb group RING finger protein 4) |
| Q9D0I6 | WSDU1_MOUSE | Wdsub1 | WD repeat, SAM and U-box domain-containing protein 1 |
| Q8VEJ4 | NLE1_MOUSE | Nle1 | Notchless protein homolog 1 |
| Q62219 | TGFI1_MOUSE | Tgfbli1 | Transforming growth factor beta-1-induced transcript 1 protein (Androgen receptor-associated protein of 55 kDa) (Hydrogen peroxide-inducible clone 5 protein, Hic-5) (TGF beta-stimulated clone 5, TSC-5) |
| Q80VC9 | CAMP3_MOUSE | Camsap3 | Calmodulin-regulated spectrin-associated protein 3 (Marshallin) (Protein Nezha) |
| Q3UNN8 | PLD5_MOUSE | Pld5 | Inactive phospholipase D5, Inactive PLD 5 (Inactive choline phosphatase 5) (Inactive phosphatidylcholine-hydrolyzing phospholipase D5) |
| Q5U4F6 | DC2I2_MOUSE | Dync2i2 | Cytoplasmic dynein 2 intermediate chain 2 (Dynein 2 intermediate chain 2) (WD repeat-containing protein 34) |
| P35505 | FAAA_MOUSE | Fah | Fumarylacetoacetase, FAA, EC 3.7.1.2 (Beta-diketonase) (Fumarylacetoacetate hydrolase) |
| Q62504 | MINT_MOUSE | Spen | Msx2-interacting protein (SMART/HDAC1-associated repressor protein) (SPEN homolog) |
| Q9QWW1 | HOME2_MOUSE | Homer2 | Homer protein homolog 2, Homer-2 (Cupidin) (VASP/Ena-related gene up-regulated during seizure and LTP 2, Vesl-2) |
| Q8BW10 | NOB1_MOUSE | Nob1 | RNA-binding protein NOB1, EC 3.1.-.- |
| E9Q3C1 | C2CD2_MOUSE | C2cd2 | C2 domain-containing protein 2 |
| Q9Z2C4 | MTMR1_MOUSE | Mtmr1 | Myotubularin-related protein 1 (Phosphatidylinositol-3,5-bisphosphate 3-phosphatase, EC 3.1.3.95) (Phosphatidylinositol-3-phosphate phosphatase, EC 3.1.3.64) |
| Q3UK10 | B9D2_MOUSE | B9d2 | B9 domain-containing protein 2 (Stumpy) |

| | | | |
|--------|-------------|---------|--|
| Q66JV4 | R12BB_MOUSE | Rbm12b2 | RNA-binding protein 12B-B (RNA-binding motif protein 12B-B) |
| Q8BUI3 | LRWD1_MOUSE | LRWD1 | Leucine-rich repeat and WD repeat-containing protein 1 (ORC-associated protein, ORCA) (Origin recognition complex-associated protein) |
| Q7TNP2 | 2AAB_MOUSE | Ppp2r1b | Serine/threonine-protein phosphatase 2A 65 kDa regulatory subunit A beta isoform (PP2A subunit A isoform PR65-beta) (PP2A subunit A isoform R1-beta) |
| O88987 | AKAP3_MOUSE | Akap3 | A-kinase anchor protein 3, AKAP-3 (A-kinase anchor protein 110 kDa, AKAP 110) (Protein kinase A-anchoring protein 3, PRKA3) |
| A6H8H5 | KCNB2_MOUSE | Kcnb2 | Potassium voltage-gated channel subfamily B member 2 (Voltage-gated potassium channel subunit Kv2.2) |
| P68373 | TBA1C_MOUSE | Tuba1c | Tubulin alpha-1C chain (Alpha-tubulin 6) (Alpha-tubulin isotype M-alpha-6) (Tubulin alpha-6 chain) [Cleaved into: Detyrosinated tubulin alpha-1C chain] |
| G5E861 | SCLT1_MOUSE | Sc1t1 | Sodium channel and clathrin linker 1 (Sodium channel-associated protein 1) |
| P46425 | GSTP2_MOUSE | Gstp2 | Glutathione S-transferase P 2, Gst P2, EC 2.5.1.18 (GST YF-YF) (GST class-pi) (GST-piA) |
| P97313 | PRKDC_MOUSE | Prkdc | DNA-dependent protein kinase catalytic subunit, DNA-PK catalytic subunit, DNA-PKcs, EC 2.7.11.1 (p460) |
| Q9DCV7 | K2C7_MOUSE | Krt7 | Keratin, type II cytoskeletal 7 (Cytokeratin-7, CK-7) (Keratin-7, K7) (Type-II keratin Kb7) |
| D3YY23 | LONF1_MOUSE | Lonrf1 | LON peptidase N-terminal domain and RING finger protein 1 |
| P16277 | BLK_MOUSE | Blk | Tyrosine-protein kinase Blk, EC 2.7.10.2 (B lymphocyte kinase) (p55-Blk) |
| Q62261 | SPTB2_MOUSE | Sptbn1 | Spectrin beta chain, non-erythrocytic 1 (Beta-II spectrin) (Embryonic liver fodrin) (Fodrin beta chain) |
| Q9QXE2 | DPOLL_MOUSE | Poll | DNA polymerase lambda, Pol Lambda, EC 2.7.7.7, EC 4.2.99.- (DNA polymerase kappa) |
| Q8BJF9 | CHM2B_MOUSE | Chmp2b | Charged multivesicular body protein 2b (Chromatin-modifying protein 2b, CHMP2b) |
| Q8C341 | SUCO_MOUSE | Suco | SUN domain-containing ossification factor (Membrane protein CH1) (Protein osteopotential) (SUN-like protein 1) |
| P58774 | TPM2_MOUSE | Tpm2 | Tropomyosin beta chain (Beta-tropomyosin) (Tropomyosin-2) |
| B1AXV0 | FRS1L_MOUSE | Frrs11 | DOMON domain-containing protein FRRS1L (Ferric-chelate reductase 1-like protein) |
| P70255 | NFIC_MOUSE | Nfic | Nuclear factor 1 C-type, NF1-C, Nuclear factor 1/C (CCAAT-box-binding transcription factor, CTF) (Nuclear factor I/C, NF-I/C, NFI-C) (TGGCA-binding protein) |

| | | | |
|--------|-------------|----------|---|
| Q9Z1B5 | MD2L1_MOUSE | Mad211 | Mitotic spindle assembly checkpoint protein MAD2A (Mitotic arrest deficient 2-like protein 1, MAD2-like protein 1) |
| Q62504 | MINT_MOUSE | Spen | Msx2-interacting protein (SMART/HDAC1-associated repressor protein) (SPEN homolog) |
| P61079 | UB2D3_MOUSE | Ube2d3 | Ubiquitin-conjugating enzyme E2 D3, EC 2.3.2.23 ((E3-independent) E2 ubiquitin-conjugating enzyme D3, EC 2.3.2.24) (E2 ubiquitin-conjugating enzyme D3) (Ubiquitin carrier protein D3) (Ubiquitin-conjugating enzyme E2(17)KB 3) (Ubiquitin-conjugating enzyme E2-17 kDa 3) (Ubiquitin-protein ligase D3) |
| Q8BHW6 | SPT21_MOUSE | Spata21 | Spermatogenesis-associated protein 21 |
| Q6PDI6 | MINY2_MOUSE | Mindy2 | Ubiquitin carboxyl-terminal hydrolase MINDY-2, EC 3.4.19.12 (Deubiquitinating enzyme MINDY-2) (Protein FAM63B) |
| P28184 | MT3_MOUSE | Mt3 | Metallothionein-3, MT-3 (Growth inhibitory factor, GIF) (Metallothionein-III, MT-III) |
| Q8BHS8 | SYBU_MOUSE | Sybu | Syntabulin (Golgi-localized syntaphilin-related protein, m-Golsyn) (Syntaxin-1-binding protein) |
| O88974 | SETB1_MOUSE | Setdb1 | Histone-lysine N-methyltransferase SETDB1, EC 2.1.1.366 (ERG-associated protein with SET domain, ESET) (SET domain bifurcated 1) |
| P29387 | GBB4_MOUSE | Gnb4 | Guanine nucleotide-binding protein subunit beta-4 (Transducin beta chain 4) |
| Q9DB41 | GHC2_MOUSE | Slc25a18 | Mitochondrial glutamate carrier 2, GC-2 (Glutamate/H(+) symporter 2) (Solute carrier family 25 member 18) |
| Q80Y61 | BI2L2_MOUSE | Baiap2l2 | Brain-specific angiogenesis inhibitor 1-associated protein 2-like protein 2, BAI1-associated protein 2-like protein 2 (Planar intestinal- and kidney-specific BAR domain protein, Pinkbar) |
| P70460 | VASP_MOUSE | Vasp | Vasodilator-stimulated phosphoprotein, VASP |
| A6H6A9 | RBG1L_MOUSE | Rabgap11 | Rab GTPase-activating protein 1-like |
| P09926 | SURF2_MOUSE | Surf2 | Surfeit locus protein 2, Surf-2 |
| Q5NBX1 | COBL_MOUSE | Cobl | Protein cordon-bleu |
| Q9CZB3 | THUM2_MOUSE | Thumpd2 | THUMP domain-containing protein 2 |
| Q80VW5 | WHRN_MOUSE | Whrn | Whirlin |
| Q6WKZ7 | NOSTN_MOUSE | Nostrin | Nostrin (Disabled homolog 2-interacting protein 2, Dab2-interacting protein 2) (Nitric oxide synthase trafficker) (eNOS-trafficking inducer) |

| | | | |
|--------|-------------|-----------|---|
| Q5XJV6 | LMTK3_MOUSE | Lmtk3 | Serine/threonine-protein kinase LMTK3, EC 2.7.11.1 (Apoptosis-associated tyrosine kinase 3) (Lemur tyrosine kinase 3) |
| Q64707 | U2AFL_MOUSE | Zrsr1 | U2 small nuclear ribonucleoprotein auxiliary factor 35 kDa subunit-related protein 1 (CCCH type zinc finger, RNA-binding motif and serine/arginine rich protein 1) (SP2) (U2(RNU2) small nuclear RNA auxiliary factor 1-like 1) |
| Q9BCZ4 | SELS_MOUSE | Selenos | Selenoprotein S, SelS (Minor histocompatibility antigen H47) |
| Q99LG0 | UBP16_MOUSE | Usp16 | Ubiquitin carboxyl-terminal hydrolase 16, EC 3.4.19.12 (Deubiquitinating enzyme 16) (Ubiquitin thioesterase 16) (Ubiquitin-specific-processing protease 16) |
| Q921R8 | S41A3_MOUSE | Slc41a3 | Solute carrier family 41 member 3 |
| P31362 | PO2F3_MOUSE | Pou2f3 | POU domain, class 2, transcription factor 3 (EpoC-1) (Octamer-binding protein 11, Oct-11) (Octamer-binding transcription factor 11, OTF-11) |
| Q8CJ70 | IL19_MOUSE | Il19 | Interleukin-19, IL-19 |
| Q91Z69 | SRGP1_MOUSE | Srgap1 | SLIT-ROBO Rho GTPase-activating protein 1, srGAP1 (Rho GTPase-activating protein 13) |
| O88705 | HCN3_MOUSE | Hcn3 | Potassium/sodium hyperpolarization-activated cyclic nucleotide-gated channel 3 (Hyperpolarization-activated cation channel 3, HAC-3) |
| P0C871 | PA24B_MOUSE | Pla2g4b | Cytosolic phospholipase A2 beta, cPLA2-beta, EC 3.1.1.4 (Lysophospholipase A1 group IVB, EC 3.1.1.5) (Phospholipase A2 group IVB) |
| P43688 | NKX26_MOUSE | Nkx2-6 | Homeobox protein Nkx-2.6 (Homeobox protein NK-2 homolog F) |
| Q64525 | H2B2B_MOUSE | Hist2h2bb | Histone H2B type 2-B (H2b 616) |
| Q9EPN1 | NBEA_MOUSE | Nbea | Neurobeachin (Lysosomal-trafficking regulator 2) |
| Q58A65 | JIP4_MOUSE | Spag9 | C-Jun-amino-terminal kinase-interacting protein 4, JIP-4, JNK-interacting protein 4 (JNK-associated leucine-zipper protein, JLP) (JNK/SAPK-associated protein 2, JSAP2) (Mitogen-activated protein kinase 8-interacting protein 4) (Sperm-associated antigen 9) |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| Q52KI8 | SRRM1_MOUSE | Srrm1 | Serine/arginine repetitive matrix protein 1 (Plenty-of-prolines 101) |
| Q91XU0 | WRIP1_MOUSE | Wrnip1 | ATPase WRNIP1, EC 3.6.1.- (Werner helicase-interacting protein 1) |
| Q60949 | TBCD1_MOUSE | Tbc1d1 | TBC1 domain family member 1 |

| | | | |
|--------|-------------|----------|---|
| Q9D1C9 | RRP7A_MOUSE | Rrp7a | Ribosomal RNA-processing protein 7 homolog A (Gastric cancer antigen Zg14 homolog) |
| Q9QYC1 | PCX1_MOUSE | Pcnx1 | Pecanex-like protein 1 (Pecanex homolog protein 1) |
| Q9Z212 | FKB1B_MOUSE | Fkbp1b | Peptidyl-prolyl cis-trans isomerase FKBP1B, PPIase FKBP1B, EC 5.2.1.8 (12.6 kDa FK506-binding protein, 12.6 kDa FKBP, FKBP-12.6) (FK506-binding protein 1B, FKBP-1B) (Immunophilin FKBP12.6) (Rotamase) |
| Q9CX53 | GEMI6_MOUSE | Gemin6 | Gem-associated protein 6, Gemin-6 |
| Q80Z38 | SHAN2_MOUSE | Shank2 | SH3 and multiple ankyrin repeat domains protein 2, Shank2 (Cortactin-binding protein 1, CortBP1) |
| Q60779 | DRC4_MOUSE | Gas8 | Dynein regulatory complex subunit 4 (Growth arrest-specific protein 11, GAS-11) (Growth arrest-specific protein 8, GAS-8) |
| Q08297 | RAD51_MOUSE | Rad51 | DNA repair protein RAD51 homolog 1 (RAD51 homolog A) |
| Q3U0S6 | RAIN_MOUSE | Rasip1 | Ras-interacting protein 1, Rain |
| Q80U59 | K0232_MOUSE | Kiaa0232 | Uncharacterized protein KIAA0232 |
| Q3UVL4 | VPS51_MOUSE | Vps51 | Vacuolar protein sorting-associated protein 51 homolog (Protein fat-free homolog) |
| Q8K1R7 | NEK9_MOUSE | Nek9 | Serine/threonine-protein kinase Nek9, EC 2.7.11.1 (Nercc1 kinase) (Never in mitosis A-related kinase 9, NimA-related protein kinase 9) |
| O35598 | ADA10_MOUSE | Adam10 | Disintegrin and metalloproteinase domain-containing protein 10, ADAM 10, EC 3.4.24.81 (Kuzbanian protein homolog) (Mammalian disintegrin-metalloprotease) (CD antigen CD156c) |
| Q8CE93 | CAHM4_MOUSE | Calhm4 | Calcium homeostasis modulator protein 4 (Protein FAM26D) |
| Q62481 | VPS72_MOUSE | Vps72 | Vacuolar protein sorting-associated protein 72 homolog (Protein YL-1) (Transcription factor-like 1) |
| Q5SPW0 | VPS54_MOUSE | Vps54 | Vacuolar protein sorting-associated protein 54 (Tumor antigen SLP-8p homolog) |
| P83510 | TNIK_MOUSE | Tnik | Traf2 and NCK-interacting protein kinase, EC 2.7.11.1 |
| Q8BP56 | PGGHG_MOUSE | Pgghg | Protein-glucosylgalactosylhydroxylysine glucosidase, EC 3.2.1.107 (Acid trehalase-like protein 1) |
| Q60644 | NR1H2_MOUSE | Nr1h2 | Oxysterols receptor LXR-beta (Liver X receptor beta) (Nuclear receptor subfamily 1 group H member 2) (Retinoid X receptor-interacting protein No.15) (Ubiquitously-expressed nuclear receptor) |
| A2ACJ2 | FP100_MOUSE | Faap100 | Fanconi anemia core complex-associated protein 100 (Fanconi anemia-associated protein of 100 kDa) |

| | | | |
|--------|-------------|---------|--|
| E0CZ16 | KLHL3_MOUSE | Klhl3 | Kelch-like protein 3 |
| Q9WTI7 | MYO1C_MOUSE | Myo1c | Unconventional myosin-Ic (Myosin I beta, MMI-beta, MM1b) |
| Q91XS1 | MTMR4_MOUSE | Mtmr4 | Myotubularin-related protein 4, EC 3.1.3.48 |
| Q9D0P8 | IFT27_MOUSE | Ift27 | Intraflagellar transport protein 27 homolog (Putative GTP-binding protein RAY-like) (Rab-like protein 4) |
| Q9D0U9 | ARV1_MOUSE | Arv1 | Protein ARV1 |
| Q6DG52 | CHUR_MOUSE | Churc1 | Protein Churchill |
| Q8BKY8 | MTEF2_MOUSE | Mterf2 | Transcription termination factor 2, mitochondrial (Mitochondrial transcription termination factor 2, mTERF2) (mTERF domain-containing protein 3, mitochondrial) |
| Q99PU8 | DHX30_MOUSE | Dhx30 | ATP-dependent RNA helicase DHX30, EC 3.6.4.13 (DEAH box protein 30) |
| Q99MD6 | TRXR3_MOUSE | Txnrd3 | Thioredoxin reductase 3, EC 1.8.1.9 (Thioredoxin and glutathione reductase) (Thioredoxin reductase TR2) |
| Q8VHF2 | CDHR5_MOUSE | Cdhr5 | Cadherin-related family member 5 (Mu-protocadherin) |
| Q80U28 | MADD_MOUSE | Madd | MAP kinase-activating death domain protein (Rab3 GDP/GTP exchange factor, RabGEF) (Rab3 GDP/GTP exchange protein, Rab3GEP) |
| Q61595 | KTN1_MOUSE | Ktn1 | Kinectin |
| Q60902 | EP15R_MOUSE | Eps1511 | Epidermal growth factor receptor substrate 15-like 1 (Epidermal growth factor receptor pathway substrate 15-related sequence, Eps15-rs) (Eps15-related protein, Eps15R) |
| O35098 | DPYL4_MOUSE | Dpysl4 | Dihydropyrimidinase-related protein 4, DRP-4 (Collapsin response mediator protein 3, CRMP-3) (UNC33-like phosphoprotein 4, ULIP-4) |
| P50171 | DHB8_MOUSE | Hsd17b8 | (3R)-3-hydroxyacyl-CoA dehydrogenase, EC 1.1.1.n12 (17-beta-hydroxysteroid dehydrogenase 8, 17-beta-HSD 8) (3-ketoacyl-[acyl-carrier-protein] reductase alpha subunit, KAR alpha subunit) (3-oxoacyl-[acyl-carrier-protein] reductase) (Estradiol 17-beta-dehydrogenase 8, EC 1.1.1.62) (Protein Ke6, Ke-6) (Testosterone 17-beta-dehydrogenase 8, EC 1.1.1.239) |
| Q9JL26 | FMNL1_MOUSE | Fmnl1 | Formin-like protein 1 (Formin-related protein) |
| Q91W69 | EPN3_MOUSE | Epn3 | Epsin-3 (EPS-15-interacting protein 3) |
| P14429 | HA17_MOUSE | H2-Q7 | H-2 class I histocompatibility antigen, Q7 alpha chain (QA-2 antigen) |
| Q924A2 | CIC_MOUSE | Cic | Protein capicua homolog |
| Q9QYS9 | QKI_MOUSE | Qki | Protein quaking, MqkI, qkI |

| | | | |
|--------|-------------|----------|--|
| Q8BYU6 | TOIP2_MOUSE | Tor1aip2 | Torsin-1A-interacting protein 2 |
| Q8BW72 | KDM4A_MOUSE | Kdm4a | Lysine-specific demethylase 4A, EC 1.14.11.66, EC 1.14.11.69 (JmjC domain-containing histone demethylation protein 3A) (Jumonji domain-containing protein 2A) ([histone H3]-trimethyl-L-lysine(36) demethylase 4A) ([histone H3]-trimethyl-L-lysine(9) demethylase 4A) |
| Q3V3V9 | CARL2_MOUSE | Carmil2 | Capping protein, Arp2/3 and myosin-I linker protein 2 (Capping protein regulator and myosin 1 linker 2) (F-actin-uncapping protein RLTPR) (Leucine-rich repeat-containing protein 16C) (RGD, leucine-rich repeat, tropomodulin and proline-rich-containing protein) |
| Q8N7N5 | DCAF8_MOUSE | Dcaf8 | DDDB1- and CUL4-associated factor 8 (WD repeat-containing protein 42A) |
| Q91WM6 | EVA1A_MOUSE | Eva1a | Protein eva-1 homolog A (Protein FAM176A) (Transmembrane protein 166) |
| Q8K045 | PKN3_MOUSE | Pkn3 | Serine/threonine-protein kinase N3, EC 2.7.11.13 (Protein kinase PKN-beta) (Protein-kinase C-related kinase 3) |
| Q3UI66 | CCD34_MOUSE | Ccdc34 | Coiled-coil domain-containing protein 34 |
| Q3U6K5 | SPAT6_MOUSE | Spata6 | Spermatogenesis-associated protein 6 (Kinesin-related protein) |
| P97473 | TRBP2_MOUSE | Tarbp2 | RISC-loading complex subunit TARBP2 (Protamine-1 RNA-binding protein, PRM-1 RNA-binding protein) (TAR RNA-binding protein 2) |
| Q6P9R4 | ARHGI_MOUSE | Arhgef18 | Rho guanine nucleotide exchange factor 18 |
| Q9D1Z3 | ACKMT_MOUSE | Atpcskmt | ATP synthase subunit C lysine N-methyltransferase, EC 2.1.1.- (Protein N-lysine methyltransferase FAM173B, mFam173b) |
| Q99MD8 | MYNN_MOUSE | Mynn | Myoneurin |
| Q8K2R5 | ZN668_MOUSE | Znf668 | Zinc finger protein 668 |
| Q8K337 | I5P2_MOUSE | Inpp5b | Type II inositol 1,4,5-trisphosphate 5-phosphatase, EC 3.1.3.36 (Inositol polyphosphate-5-phosphatase B) (Phosphoinositide 5-phosphatase, 5PTase) |
| E9PYL2 | PRR12_MOUSE | Prr12 | Proline-rich protein 12 |
| Q67BT3 | S13A5_MOUSE | Slc13a5 | Solute carrier family 13 member 5 (Na ⁺ /citrate cotransporter, NaCT) (Sodium-coupled citrate transporter) (Sodium-dependent citrate transporter) |
| Q80XJ3 | TTC28_MOUSE | Ttc28 | Tetratricopeptide repeat protein 28, TPR repeat protein 28 |
| Q8R1X6 | SPART_MOUSE | Spart | Spartin |
| B9EHT4 | CLIP3_MOUSE | Clip3 | CAP-Gly domain-containing linker protein 3 (Cytoplasmic linker protein 170-related 59 kDa protein, CLIP-170-related 59 kDa protein, CLIPR-59) |

| | | | |
|--------|-------------|---------|--|
| Q9Z2G6 | SE1L1_MOUSE | Sel1l | Protein sel-1 homolog 1 (Suppressor of lin-12-like protein 1, Sel-1L) |
| Q9DBX1 | RGCC_MOUSE | Rgcc | Regulator of cell cycle RGCC (Response gene to complement 32 protein, RGC-32) |
| Q9Z0H4 | CELF2_MOUSE | Celf2 | CUGBP Elav-like family member 2, CELF-2 (Bruno-like protein 3) (CUG triplet repeat RNA-binding protein 2, CUG-BP2) (CUG-BP- and ETR-3-like factor 2) (ELAV-type RNA-binding protein 3, ETR-3, mETR-3) (Neuroblastoma apoptosis-related RNA-binding protein, mNapor) (RNA-binding protein BRUNOL-3) |
| Q8CH18 | CCAR1_MOUSE | Ccar1 | Cell division cycle and apoptosis regulator protein 1 (Cell cycle and apoptosis regulatory protein 1, CARP-1) |
| Q8VED2 | BL1S4_MOUSE | Bloc1s4 | Biogenesis of lysosome-related organelles complex 1 subunit 4, BLOC-1 subunit 4 (Protein cappuccino homolog) |
| P50571 | GBRB1_MOUSE | Gabrb1 | Gamma-aminobutyric acid receptor subunit beta-1 (GABA(A) receptor subunit beta-1) |
| Q99LI5 | ZN281_MOUSE | Znf281 | Zinc finger protein 281 |
| O08999 | LTBP2_MOUSE | Ltbp2 | Latent-transforming growth factor beta-binding protein 2, LTBP-2 |
| Q9ERE2 | KRT81_MOUSE | Krt81 | Keratin, type II cuticular Hb1 (Keratin-81, K81) (Type II hair keratin Hb1) |
| Q99P65 | S29A3_MOUSE | Slc29a3 | Equilibrative nucleoside transporter 3, mENT3 (Solute carrier family 29 member 3) |
| Q5SSH7 | ZZEF1_MOUSE | Zzef1 | Zinc finger ZZ-type and EF-hand domain-containing protein 1 |
| Q6R5N8 | TLR13_MOUSE | Tlr13 | Toll-like receptor 13 |
| Q04735 | CDK16_MOUSE | Cdk16 | Cyclin-dependent kinase 16, EC 2.7.11.22 (CRK5) (Cell division protein kinase 16) (PCTAIRE-motif protein kinase 1) (Serine/threonine-protein kinase PCTAIRE-1) |
| Q9D9I1 | TEX43_MOUSE | Tex43 | Testis-expressed protein 43 |
| P51162 | FABP6_MOUSE | Fabp6 | Gastrotropin, GT (Fatty acid-binding protein 6) (Ileal lipid-binding protein, ILBP) |
| Q8K2J7 | RELL1_MOUSE | Rell1 | RELT-like protein 1 |
| Q78DX7 | ROS1_MOUSE | Ros1 | Proto-oncogene tyrosine-protein kinase ROS, EC 2.7.10.1 (Proto-oncogene c-Ros) (Proto-oncogene c-Ros-1) (Receptor tyrosine kinase c-ros oncogene 1) (c-Ros receptor tyrosine kinase) |
| A2AU72 | ARMC3_MOUSE | Armc3 | Armadillo repeat-containing protein 3 |
| Q2MH31 | SMRP1_MOUSE | Smrp1 | Spermatid-specific manchette-related protein 1 (Ciliated bronchial epithelial protein 1) |
| O89013 | OBRG_MOUSE | Leprot | Leptin receptor gene-related protein (Endospanin-1) (OB-R gene-related protein, OB-RGRP) |

| | | | |
|--------|-------------|---------|---|
| Q91ZS8 | RED1_MOUSE | Adarb1 | Double-stranded RNA-specific editase 1, EC 3.5.4.37 (RNA-editing deaminase 1) (RNA-editing enzyme 1) (dsRNA adenosine deaminase) |
| Q62095 | DDX3Y_MOUSE | Ddx3y | ATP-dependent RNA helicase DDX3Y, EC 3.6.4.13 (D1Pas1-related sequence 1) (DEAD box protein 3, Y-chromosomal) (DEAD-box RNA helicase DEAD2, mDEAD2) |
| Q9WUK2 | IF4H_MOUSE | Eif4h | Eukaryotic translation initiation factor 4H, eIF-4H (Williams-Beuren syndrome chromosomal region 1 protein homolog) |
| Q69Z98 | BRSK2_MOUSE | Brsk2 | Serine/threonine-protein kinase BRSK2, EC 2.7.11.1, EC 2.7.11.26 (Brain-specific serine/threonine-protein kinase 2, BR serine/threonine-protein kinase 2) (Serine/threonine-protein kinase SAD-A) |
| Q61315 | APC_MOUSE | Apc | Adenomatous polyposis coli protein, Protein APC, mAPC |
| Q9D6K5 | SYJ2B_MOUSE | Synj2bp | Synaptojanin-2-binding protein (Activin receptor-interacting protein 2) (Activin receptor-interacting protein 4) (Mitochondrial outer membrane protein 25) |
| P98203 | ARVC_MOUSE | Arvcf | Splicing regulator ARVCF (Armadillo repeat protein deleted in velo-cardio-facial syndrome homolog) |
| Q9QWT9 | KIFC1_MOUSE | Kifc1 | Kinesin-like protein KIFC1 |
| Q8BZW2 | SWAHB_MOUSE | Sowahb | Ankyrin repeat domain-containing protein SOWAHB (Ankyrin repeat domain-containing protein 56) (Protein sosondowah homolog B) |
| Q9QUQ5 | TRPC4_MOUSE | Trpc4 | Short transient receptor potential channel 4, TrpC4 (Capacitative calcium entry channel Trp4) (Receptor-activated cation channel TRP4) |
| Q8K5B2 | MCFD2_MOUSE | Mefd2 | Multiple coagulation factor deficiency protein 2 homolog (Neural stem cell-derived neuronal survival protein) |
| P50404 | SFTPD_MOUSE | Sftpd | Pulmonary surfactant-associated protein D, PSP-D, SP-D (Lung surfactant protein D) |
| Q9CQW7 | COA8_MOUSE | Coa8 | Cytochrome c oxidase assembly factor 8, COA8 (Apoptogenic protein 1, mitochondrial, APOP-1) |
| Q99N89 | RM43_MOUSE | Mrpl43 | 39S ribosomal protein L43, mitochondrial, L43mt, MRP-L43 (Mitochondrial ribosomal protein bMRP36a) |
| Q5DW34 | EHMT1_MOUSE | Ehmt1 | Histone-lysine N-methyltransferase EHMT1, EC 2.1.1.-, EC 2.1.1.367 (Euchromatic histone-lysine N-methyltransferase 1, Eu-HMTase1) (G9a-like protein 1, GLP, GLP1) (Lysine N-methyltransferase 1D) |
| P58321 | UCHL4_MOUSE | Uchl4 | Ubiquitin carboxyl-terminal hydrolase isozyme L4, UCH-L4, EC 3.4.19.12 (Ubiquitin thioesterase L4) |
| Q8BG15 | CTSL2_MOUSE | Ctdspl2 | CTD small phosphatase-like protein 2, CTDSP-like 2, EC 3.1.3.- |

| | | | |
|--------|-------------|---------|---|
| P70169 | DOC2B_MOUSE | Doc2b | Double C2-like domain-containing protein beta, Doc2-beta |
| A3FIN4 | AT8B5_MOUSE | Atp8b5 | Phospholipid-transporting ATPase FetA, EC 7.6.2.1 (ATPase class I type 8B member 2-like protein) (ATPase class I type 8B member 5) (Flippase expressed in testis A) |
| P52332 | JAK1_MOUSE | Jak1 | Tyrosine-protein kinase JAK1, EC 2.7.10.2 (Janus kinase 1, JAK-1) |
| Q8K4X7 | PLCD_MOUSE | Agpat4 | 1-acyl-sn-glycerol-3-phosphate acyltransferase delta, EC 2.3.1.51 (1-acylglycerol-3-phosphate O-acyltransferase 4, 1-AGP acyltransferase 4, 1-AGPAT 4) (Lysophosphatidic acid acyltransferase delta, LPAAT-delta) |
| Q6P2L6 | NSD3_MOUSE | Nsd3 | Histone-lysine N-methyltransferase NSD3, EC 2.1.1.370, EC 2.1.1.371 (Nuclear SET domain-containing protein 3) (Wolf-Hirschhorn syndrome candidate 1-like protein 1 homolog, WHSC1-like protein 1) |
| O89017 | LGMN_MOUSE | Lgmn | Legumain, EC 3.4.22.34 (Asparaginyl endopeptidase) (Protease, cysteine 1) |
| Q9ESN3 | PGAP6_MOUSE | Pgap6 | Post-GPI attachment to proteins factor 6, EC 3.1.1.4 (GPI processing phospholipase A2, GPI-PLA2) (M83 protein) (Transmembrane protein 8) (Transmembrane protein 8A) |
| Q5SRY7 | FBW1B_MOUSE | Fbxw11 | F-box/WD repeat-containing protein 11 (F-box and WD repeats protein beta-TrCP2) (F-box/WD repeat-containing protein 1B) (Homologous to Slimb protein, HOS) |
| B5X0E4 | ABCB5_MOUSE | Abcb5 | ATP-binding cassette sub-family B member 5 (ABCB5 P-gp) (P-glycoprotein ABCB5, EC 7.6.2.2) |
| Q61062 | DVL3_MOUSE | Dvl3 | Segment polarity protein dishevelled homolog DVL-3, Dishevelled-3 (DSH homolog 3) |
| Q9QYS1 | WNT16_MOUSE | Wnt16 | Protein Wnt-16 |
| Q9D0F4 | NKAP_MOUSE | Nkap | NF-kappa-B-activating protein |
| Q6P6M7 | SPCS_MOUSE | Sepsecs | O-phosphoseryl-tRNA(Sec) selenium transferase, EC 2.9.1.2 (Selenocysteine synthase, Sec synthase) (Selenocysteinyl-tRNA(Sec) synthase) (Sep-tRNA:Sec-tRNA synthase, SepSecS) (UGA suppressor tRNA-associated protein) |
| Q80UP3 | DGKZ_MOUSE | Dgkz | Diacylglycerol kinase zeta, DAG kinase zeta, EC 2.7.1.107 (Diglyceride kinase zeta, DGK-zeta) |
| P62500 | T22D1_MOUSE | Tsc22d1 | TSC22 domain family protein 1 (Regulatory protein TSC-22) (TGFB-stimulated clone 22 homolog) (TSC22-related inducible leucine zipper 1b) (Transforming growth factor beta-1-induced transcript 4 protein) |
| Q9D1X9 | TM50B_MOUSE | Tmem50b | Transmembrane protein 50B |

| | | | |
|--------|-------------|-----------|--|
| P97329 | KI20A_MOUSE | Kif20a | Kinesin-like protein KIF20A (Kinesin-like protein 174) (Rab6-interacting kinesin-like protein) (Rabkinesin-6) |
| Q80U28 | MADD_MOUSE | Madd | MAP kinase-activating death domain protein (Rab3 GDP/GTP exchange factor, RabGEF) (Rab3 GDP/GTP exchange protein, Rab3GEP) |
| P02535 | K1C10_MOUSE | Krt10 | Keratin, type I cytoskeletal 10 (56 kDa cytokeratin) (Cytokeratin-10, CK-10) (Keratin, type I cytoskeletal 59 kDa) (Keratin-10, K10) |
| P02301 | H3C_MOUSE | H3-5 | Histone H3.3C (Embryonic) |
| Q8BFS6 | CPPED_MOUSE | Cpped1 | Serine/threonine-protein phosphatase CPPED1, EC 3.1.3.16 (Calcineurin-like phosphoesterase domain-containing protein 1) |
| Q6A037 | N4BP1_MOUSE | N4bp1 | NEDD4-binding protein 1, N4BP1, EC 3.1.-.- |
| Q8VDH1 | FBX21_MOUSE | Fbxo21 | F-box only protein 21 |
| Q9QZ05 | E2AK4_MOUSE | Eif2ak4 | eIF-2-alpha kinase GCN2 (Eukaryotic translation initiation factor 2-alpha kinase 4, EC 2.7.11.1) (GCN2-like protein, mGCN2) |
| Q80TL7 | MON2_MOUSE | Mon2 | Protein MON2 homolog (Protein SF21) |
| Q9QUG2 | POLK_MOUSE | Polk | DNA polymerase kappa, EC 2.7.7.7 (DINB protein, DINP) |
| P15388 | KCNC1_MOUSE | Kcnc1 | Potassium voltage-gated channel subfamily C member 1 (NGK2) (Voltage-gated potassium channel subunit Kv3.1) (Voltage-gated potassium channel subunit Kv4) |
| Q80UW5 | MRCKG_MOUSE | Cdc42bpg | Serine/threonine-protein kinase MRCK gamma, EC 2.7.11.1 (CDC42-binding protein kinase gamma) (DMPK-like gamma) (Myotonic dystrophy kinase-related CDC42-binding kinase gamma, MRCK gamma, Myotonic dystrophy protein kinase-like gamma) (Myotonic dystrophy protein kinase-like alpha) |
| Q9D428 | GOG7B_MOUSE | GOLGA7B | Golgin subfamily A member 7B |
| Q8CJI4 | H1FNT_MOUSE | H1-7 | Testis-specific H1 histone (Haploid germ cell-specific nuclear protein 1) (Histone H1.7) (Histone H1t2) |
| Q8CHD8 | RFIP3_MOUSE | Rab11fip3 | Rab11 family-interacting protein 3, FIP3-Rab11, Rab11-FIP3 |
| Q99LM9 | TADA1_MOUSE | Tada1 | Transcriptional adapter 1 (Transcriptional adapter 1-like protein) |
| Q8BJW5 | NOL11_MOUSE | Nol11 | Nucleolar protein 11 |
| P70232 | NCHL1_MOUSE | Chl1 | Neural cell adhesion molecule L1-like protein (Cell adhesion molecule with homology to L1CAM) (Chl1-like protein) (Close homolog of L1) [Cleaved into: Processed neural cell adhesion molecule L1-like protein] |
| Q8BFX1 | RN187_MOUSE | Rnf187 | E3 ubiquitin-protein ligase RNF187, EC 2.3.2.27 (RING domain AP1 coactivator 1, RACO-1) (RING finger protein 187) (RING-type E3 ubiquitin transferase RNF187) |

| | | | |
|--------|-------------|----------|---|
| P12388 | PAI2_MOUSE | Serpinb2 | Plasminogen activator inhibitor 2, macrophage, PAI-2 (Serpin B2) |
| Q8BT14 | CNOT4_MOUSE | Cnot4 | CCR4-NOT transcription complex subunit 4, EC 2.3.2.27 (CCR4-associated factor 4) (E3 ubiquitin-protein ligase CNOT4) (Potential transcriptional repressor NOT4Hp) (RING-type E3 ubiquitin transferase CNOT4) |
| P56388 | CART_MOUSE | Cartpt | Cocaine- and amphetamine-regulated transcript protein [Cleaved into: CART(1-52); CART(55-102); CART(62-102)] |
| Q9DCD6 | GBRAP_MOUSE | Gabarap | Gamma-aminobutyric acid receptor-associated protein (GABA(A) receptor-associated protein) |
| Q80UG2 | PLXA4_MOUSE | Plxna4 | Plexin-A4 |
| Q8K083 | ZN536_MOUSE | Znf536 | Zinc finger protein 536 |
| Q9D7S7 | RL22L_MOUSE | Rpl22l1 | 60S ribosomal protein L22-like 1 |
| O88428 | PAPS2_MOUSE | Papss2 | Bifunctional 3'-phosphoadenosine 5'-phosphosulfate synthase 2, PAPS synthase 2, PAPSS 2 (Sulfurylase kinase 2, SK 2, SK2) [Includes: Sulfate adenylyltransferase, EC 2.7.7.4 (ATP-sulfurylase) (Sulfate adenylate transferase, SAT); Adenylyl-sulfate kinase, EC 2.7.1.25 (3'-phosphoadenosine-5'-phosphosulfate synthase) (APS kinase) (Adenosine-5'-phosphosulfate 3'-phosphotransferase) (Adenylylsulfate 3'-phosphotransferase)] |
| Q8CIE2 | ZMIZ2_MOUSE | Zmiz2 | Zinc finger MIZ domain-containing protein 2 (PIAS-like protein Zimp7) |
| P24638 | PPAL_MOUSE | Acp2 | Lysosomal acid phosphatase, LAP, EC 3.1.3.2 |
| Q80VY2 | INKA2_MOUSE | Inka2 | PAK4-inhibitor INKA2 (Induced in neural crest by AP2-alpha protein-related homolog, MInca-r) |
| Q8BIE6 | FRM4A_MOUSE | Frmd4a | FERM domain-containing protein 4A |
| Q3TMX7 | QSOX2_MOUSE | Qsox2 | Sulfhydryl oxidase 2, EC 1.8.3.2 (Quiescin Q6-like protein 1) |
| O35066 | KIF3C_MOUSE | Kif3c | Kinesin-like protein KIF3C |
| Q10738 | MMP7_MOUSE | Mmp7 | Matrilysin, EC 3.4.24.23 (Matrin) (Matrix metalloproteinase-7, MMP-7) (Pump-1 protease) (Uterine metalloproteinase) |
| Q03740 | CRGE_MOUSE | Cryge | Gamma-crystallin E (Gamma-E-crystallin) |
| Q810A7 | DDX42_MOUSE | Ddx42 | ATP-dependent RNA helicase DDX42, EC 3.6.4.13 (DEAD box protein 42) |
| Q62418 | DBNL_MOUSE | Dbnl | Drebrin-like protein (Actin-binding protein 1) (SH3 domain-containing protein 7) |
| Q924H7 | WAC_MOUSE | Wac | WW domain-containing adapter protein with coiled-coil |

| | | | |
|--------|-------------|---------|---|
| P46938 | YAP1_MOUSE | Yap1 | Transcriptional coactivator YAP1, Yes-associated protein 1 (Protein yorkie homolog) (Yes-associated protein YAP65 homolog) |
| Q8BUY8 | GASP2_MOUSE | Gprasp2 | G-protein coupled receptor-associated sorting protein 2, GASP-2 |
| Q7TNB8 | SBNO2_MOUSE | Sbno2 | Protein strawberry notch homolog 2 |
| Q9WU60 | ATRN_MOUSE | Atrn | Attractin (Protein mahogany) |
| Q8CIM3 | D2HDH_MOUSE | D2hgdh | D-2-hydroxyglutarate dehydrogenase, mitochondrial, EC 1.1.99.39 |
| Q60738 | ZNT1_MOUSE | Slc30a1 | Zinc transporter 1, ZnT-1 (Solute carrier family 30 member 1) |
| Q5BL07 | PEX1_MOUSE | Pex1 | Peroxisome biogenesis factor 1 (Peroxin-1) |
| Q3ULW8 | PARP3_MOUSE | Parp3 | Protein mono-ADP-ribosyltransferase PARP3, EC 2.4.2.- (ADP-ribosyltransferase diphtheria toxin-like 3, ARTD3) (DNA ADP-ribosyltransferase PARP3, EC 2.4.2.-) (NAD(+) ADP-ribosyltransferase 3, ADPRT-3) (Poly [ADP-ribose] polymerase 3, PARP-3) (Poly[ADP-ribose] synthase 3, pADPRT-3) |
| Q08122 | TLE3_MOUSE | Tle3 | Transducin-like enhancer protein 3 (ESG) (Grg-3) |
| F7BWT7 | TSN15_MOUSE | Tspan15 | Tetraspanin-15, Tspan-15 (Transmembrane 4 superfamily member 15) |
| Q9JMG3 | TMUB1_MOUSE | Tmub1 | Transmembrane and ubiquitin-like domain-containing protein 1 (Hepatocyte odd protein shuttling protein) [Cleaved into: iHOPS] |
| Q5BU09 | EAPP_MOUSE | Eapp | E2F-associated phosphoprotein, EAPP |
| Q9Z2E2 | MBD1_MOUSE | Mbd1 | Methyl-CpG-binding domain protein 1 (Methyl-CpG-binding protein MBD1) |
| Q9Z1X2 | PTSS2_MOUSE | Ptdss2 | Phosphatidylserine synthase 2, PSS-2, PtdSer synthase 2, EC 2.7.8.29 (Serine-exchange enzyme II) |
| Q8C3W1 | CA198_MOUSE | | Uncharacterized protein C1orf198 homolog |
| Q9JJ69 | KCIP2_MOUSE | Kcnip2 | Kv channel-interacting protein 2, KChIP2 (A-type potassium channel modulatory protein 2) (Potassium channel-interacting protein 2) |
| Q80WC1 | UBN2_MOUSE | Ubn2 | Ubinuclein-2 |
| Q0VBF8 | STUM_MOUSE | Stum | Protein stum homolog |
| A2A884 | ZEP3_MOUSE | Hivep3 | Transcription factor HIVEP3 (Human immunodeficiency virus type I enhancer-binding protein 3 homolog) (KB-binding and recognition component) (Kappa-B and V(D)J recombination signal sequences-binding protein) (Kappa-binding protein 1, KBP-1) (Recombinant component) (Schnurri-3) (Zinc finger protein ZAS3) |
| Q3U4I7 | PYRD2_MOUSE | Pyroxd2 | Pyridine nucleotide-disulfide oxidoreductase domain-containing protein 2, EC 1.-.-.- |
| Q3V0C1 | ZMAT1_MOUSE | Zmat1 | Zinc finger matrin-type protein 1 |

| | | | |
|--------|-------------|----------|---|
| Q8CGS6 | DPOLQ_MOUSE | Polq | DNA polymerase theta, EC 2.7.7.7 (Chromosome aberrations occurring spontaneously protein 1) (DNA polymerase eta) |
| Q70IV5 | SYNEM_MOUSE | Synm | Synemin (Desmuslin) |
| Q5SP85 | CC85A_MOUSE | Ccdc85a | Coiled-coil domain-containing protein 85A |
| Q8QZR7 | PDK1L_MOUSE | Pdik1l | Serine/threonine-protein kinase PDIK1L, EC 2.7.11.1 (PDLIM1-interacting kinase 1-like) |
| Q9CQA6 | CHCH1_MOUSE | Chchd1 | Coiled-coil-helix-coiled-coil-helix domain-containing protein 1 (28S ribosomal protein S37, mitochondrial, MRP-S37) |
| Q9DBR7 | MYPT1_MOUSE | Ppp1r12a | Protein phosphatase 1 regulatory subunit 12A (Myosin phosphatase-targeting subunit 1, Myosin phosphatase target subunit 1) |
| B1AVH7 | TBD2A_MOUSE | Tbc1d2 | TBC1 domain family member 2A |
| Q99MV7 | RNF17_MOUSE | Rnf17 | RING finger protein 17 (Mad member-interacting protein 2, Mmip-2) |
| P04345 | CRGA_MOUSE | Cryga | Gamma-crystallin A (Gamma-A-crystallin) (Gamma-crystallin 4) |
| Q9R1Z8 | VINEX_MOUSE | Sorbs3 | Vinexin (SH3 domain-containing protein SH3P3) (SH3-containing adapter molecule 1, SCAM-1) (Sorbin and SH3 domain-containing protein 3) |
| Q8VI63 | MOB2_MOUSE | Mob2 | MOB kinase activator 2 (Mob2 homolog) (Mps one binder kinase activator-like 2) (Ovary-specific MOB-like protein) |
| P51448 | RORA_MOUSE | Rora | Nuclear receptor ROR-alpha (Nuclear receptor RZR-alpha) (Nuclear receptor subfamily 1 group F member 1) (RAR-related orphan receptor A) (Retinoid-related orphan receptor-alpha) |
| Q8BYK6 | YTHD3_MOUSE | Ythdf3 | YTH domain-containing family protein 3 |
| O35231 | KIFC3_MOUSE | Kifc3 | Kinesin-like protein KIFC3 |
| Q9WTJ8 | FA50B_MOUSE | Fam50b | Protein FAM50B (Protein XAP-5-like) |
| Q08460 | KCMA1_MOUSE | Kenma1 | Calcium-activated potassium channel subunit alpha-1 (BK channel) (BKCA alpha) (Calcium-activated potassium channel, subfamily M subunit alpha-1) (K(VCA)alpha) (KCa1.1) (Maxi K channel, MaxiK) (Slo-alpha) (Slo1, mSlo1) (Slowpoke homolog, Slo homolog, mSlo) |
| Q8BPB0 | MOB1B_MOUSE | Mob1b | MOB kinase activator 1B (Mob1 homolog 1A) (Mps one binder kinase activator-like 1A) |
| Q9QXH4 | ITAX_MOUSE | Itgax | Integrin alpha-X (CD11 antigen-like family member C) (Leukocyte adhesion glycoprotein p150,95 alpha chain) (Leukocyte adhesion receptor p150,95) (CD antigen CD11c) |

| | | | |
|--------|-------------|----------|---|
| Q8K2M0 | RM38_MOUSE | Mrpl38 | 39S ribosomal protein L38, mitochondrial, L38mt, MRP-L38 |
| Q8BTF7 | DNLI4_MOUSE | Lig4 | DNA ligase 4, EC 6.5.1.1 (DNA ligase IV) (Polydeoxyribonucleotide synthase [ATP] 4) |
| Q9DCM7 | NACC2_MOUSE | Nacc2 | Nucleus accumbens-associated protein 2, NAC-2 (BTB/POZ domain-containing protein 14A) |
| Q80VW5 | WHRN_MOUSE | Whrn | Whirlin |
| Q8BRG8 | TM209_MOUSE | Tmem209 | Transmembrane protein 209 |
| Q921N7 | TMM70_MOUSE | Tmem70 | Transmembrane protein 70, mitochondrial |
| Q9Z0J0 | NPC2_MOUSE | Npc2 | NPC intracellular cholesterol transporter 2 (Epididymal secretory protein E1, mE1) (Niemann Pick type C2 protein homolog) |
| Q8C1Q6 | SMIM4_MOUSE | Smim4 | Small integral membrane protein 4 (Small nucleolar RNA host gene 8) |
| Q9ER47 | KCNH7_MOUSE | Kcnh7 | Potassium voltage-gated channel subfamily H member 7 (Ether-a-go-go-related gene potassium channel 3, ERG-3, Eag-related protein 3, Ether-a-go-go-related protein 3) (Voltage-gated potassium channel subunit Kv11.3) |
| Q6P2L7 | GOLM2_MOUSE | Golm2 | Protein GOLM2 (Cancer susceptibility candidate gene 4 protein homolog, CASC4) (Golgi membrane protein 2) |
| O08715 | AKAP1_MOUSE | Akap1 | A-kinase anchor protein 1, mitochondrial (Dual specificity A-kinase-anchoring protein 1, D-AKAP-1) (Protein kinase A-anchoring protein 1, PRKA1) (Spermatid A-kinase anchor protein, S-AKAP) |
| Q9JK91 | MLH1_MOUSE | Mlh1 | DNA mismatch repair protein Mlh1 (MutL protein homolog 1) |
| Q9DCX1 | MD2BP_MOUSE | Mad211bp | MAD2L1-binding protein |
| Q3U182 | CRTC2_MOUSE | Crtc2 | CREB-regulated transcription coactivator 2 (Transducer of regulated cAMP response element-binding protein 2, TORC-2, Transducer of CREB protein 2) |
| Q8JZP9 | GA2L1_MOUSE | Gas211 | GAS2-like protein 1 (Growth arrest-specific protein 2-like 1) |
| P97929 | BRCA2_MOUSE | Breca2 | Breast cancer type 2 susceptibility protein homolog (Fanconi anemia group D1 protein homolog) |
| Q80TY5 | VP13B_MOUSE | Vps13b | Intermembrane lipid transfer protein VPS13B (Cohen syndrome protein 1 homolog) (Vacuolar protein sorting-associated protein 13B) |
| Q923A2 | SPDLY_MOUSE | Spdl1 | Protein Spindly (Coiled-coil domain-containing protein 99) (Spindle apparatus coiled-coil domain-containing protein 1) |
| Q8K1Z0 | COQ9_MOUSE | Coq9 | Ubiquinone biosynthesis protein COQ9, mitochondrial |
| Q8C014 | EPC2_MOUSE | Epc2 | Enhancer of polycomb homolog 2 (EPC-like) |

| | | | |
|--------|-------------|-----------|---|
| Q9ET35 | TR13B_MOUSE | Tnfrsf13b | Tumor necrosis factor receptor superfamily member 13B (Transmembrane activator and CAML interactor) (CD antigen CD267) |
| Q9JL18 | BACE2_MOUSE | Bace2 | Beta-secretase 2, EC 3.4.23.45 (Aspartyl protease 1, ASP1, Asp 1) (Beta-site amyloid precursor protein cleaving enzyme 2, Beta-site APP cleaving enzyme 2) (Memapsin-1) (Membrane-associated aspartic protease 1) (Theta-secretase) |
| Q9R0N7 | SYT7_MOUSE | Syt7 | Synaptotagmin-7 (Synaptotagmin VII, SytVII) |
| D3YU81 | RFX8_MOUSE | Rfx8 | DNA-binding protein RFX8 (Regulatory factor X 8) |
| Q9JJX7 | TYDP2_MOUSE | Tdp2 | Tyrosyl-DNA phosphodiesterase 2, Tyr-DNA phosphodiesterase 2, EC 3.1.4.- (5'-tyrosyl-DNA phosphodiesterase, 5'-Tyr-DNA phosphodiesterase) (TRAF and TNF receptor-associated protein) |
| Q6ZPI0 | JADE1_MOUSE | Jade1 | Protein Jade-1 (Jade family PHD finger protein 1) (PHD finger protein 17) |
| Q99J85 | NPTXR_MOUSE | Nptxr | Neuronal pentraxin receptor |
| Q9EQ32 | BCAP_MOUSE | Pik3ap1 | Phosphoinositide 3-kinase adapter protein 1 (B-cell adapter for phosphoinositide 3-kinase) (B-cell phosphoinositide 3-kinase adapter protein 1) |
| Q9JHD1 | KAT2B_MOUSE | Kat2b | Histone acetyltransferase KAT2B, EC 2.3.1.48 (Histone acetyltransferase PCAF, Histone acetylase PCAF) (Lysine acetyltransferase 2B) (P300/CBP-associated factor, P/CAF) (Spermidine acetyltransferase KAT2B, EC 2.3.1.57) |
| Q6PR54 | RIF1_MOUSE | Rif1 | Telomere-associated protein RIF1 (Rap1-interacting factor 1 homolog, mRif1) |
| Q3TRM8 | HXK3_MOUSE | Hk3 | Hexokinase-3, EC 2.7.1.1 (Hexokinase type III, HK III) (Hexokinase-C) |
| Q8CCJ3 | UFL1_MOUSE | Ufl1 | E3 UFM1-protein ligase 1, EC 2.3.2.- (E3 UFM1-protein transferase 1) (Multiple alpha-helix protein located at ER) (Regulator of C53/LZAP and DDRGK1) |
| Q920Q6 | MSI2H_MOUSE | Msi2 | RNA-binding protein Musashi homolog 2, Musashi-2 |
| Q9JJW6 | ALRF2_MOUSE | Alyref2 | Aly/REF export factor 2 (Alyref) (RNA and export factor-binding protein 2) |
| Q8BG75 | TM198_MOUSE | Tmem198 | Transmembrane protein 198 |
| Q9JIA1 | LGI1_MOUSE | Lgi1 | Leucine-rich glioma-inactivated protein 1 |
| D3YVE8 | S35G2_MOUSE | Slc35g2 | Solute carrier family 35 member G2 (Transmembrane protein 22) |
| Q91YD3 | DCP1A_MOUSE | Dcp1a | mRNA-decapping enzyme 1A, EC 3.6.1.62 (MAD homolog 4-interacting transcription coactivator 1) (Smad4-interacting transcriptional co-activator) (Transcription factor SMIF) |

| | | | |
|--------|-------------|---------|---|
| Q8CFC7 | CLASR_MOUSE | Clasrp | CLK4-associating serine/arginine rich protein (Clk4-associating SR-related protein) (Serine/arginine-rich splicing factor 16) (Splicing factor, arginine/serine-rich 16) (Suppressor of white-apricot homolog 2) |
| Q9ER64 | OSBL5_MOUSE | Osbp15 | Oxysterol-binding protein-related protein 5, ORP-5, OSBP-related protein 5 (Oxysterol-binding protein homolog 1) |
| Q9R087 | GPC6_MOUSE | Gpc6 | Glypican-6 [Cleaved into: Secreted glypican-6] |
| Q921Q3 | ALG1_MOUSE | Alg1 | Chitobiosyldiphosphodolichol beta-mannosyltransferase, EC 2.4.1.142 (Asparagine-linked glycosylation protein 1 homolog) (Beta-1,4-mannosyltransferase) (GDP-Man:GlcNAc2-PP-dolichol mannosyltransferase) (GDP-mannose-dolichol diphosphochitobiose mannosyltransferase) |
| Q66K08 | CILP1_MOUSE | Cilp | Cartilage intermediate layer protein 1, CILP-1 [Cleaved into: Cartilage intermediate layer protein 1 C1; Cartilage intermediate layer protein 1 C2] |
| Q61817 | CREB3_MOUSE | Creb3 | Cyclic AMP-responsive element-binding protein 3, CREB-3, cAMP-responsive element-binding protein 3 (Transcription factor LZIP) [Cleaved into: Processed cyclic AMP-responsive element-binding protein 3] |
| P01887 | B2MG_MOUSE | B2m | Beta-2-microglobulin |
| P10166 | MYCL_MOUSE | Mycl | Protein L-Myc |
| E5FYH1 | TOPZ1_MOUSE | Topaz1 | Protein TOPAZ1 (Testis- and ovary-specific PAZ domain-containing protein 1) |
| Q5SUQ9 | CTC1_MOUSE | Ctc1 | CST complex subunit CTC1 (Alpha-accessory factor of 132 kDa, AAF-132, AAF132) (Conserved telomere maintenance component 1) |
| J3QNX5 | SHSA8_MOUSE | Shisa8 | Protein shisa-8 (Cystine-knot AMPAR modulating protein of 39 kDa, CKAMP39) (Shisa family member 8) |
| Q8BR86 | KIRR3_MOUSE | Kirrel3 | Kin of IRRE-like protein 3 (Kin of irregular chiasm-like protein 3) (Nephrin-like protein 2) (mKirre) [Cleaved into: Processed kin of IRRE-like protein 3] |
| Q99LI9 | CLP1_MOUSE | Clp1 | Polyribonucleotide 5'-hydroxyl-kinase Clp1, EC 2.7.1.78 (Polyadenylation factor Clp1) (Polynucleotide kinase Clp1) (Pre-mRNA cleavage complex II protein Clp1) |
| Q9QZF2 | GPC1_MOUSE | Gpc1 | Glypican-1 [Cleaved into: Secreted glypican-1] |
| Q924D0 | RT4I1_MOUSE | Rtn4ip1 | Reticulon-4-interacting protein 1, mitochondrial (NOGO-interacting mitochondrial protein) |
| Q8R420 | ABCA3_MOUSE | Abca3 | Phospholipid-transporting ATPase ABCA3, EC 7.6.2.1 (ATP-binding cassette sub-family A member 3) (Xenobiotic-transporting ATPase ABCA3, EC 7.6.2.2) [Cleaved into: 150 Kda mature form] |

| | | | |
|--------|-------------|----------|--|
| Q641K5 | NUAK1_MOUSE | Nuak1 | NUAK family SNF1-like kinase 1, EC 2.7.11.1 (AMPK-related protein kinase 5) (Omphalocele kinase 1) |
| Q8R5G7 | ARAP3_MOUSE | Arap3 | Arf-GAP with Rho-GAP domain, ANK repeat and PH domain-containing protein 3 (Centaurin-delta-3, Cnt-d3) (Dual specificity Rho- and Arf-GTPase-activating protein 1) |
| Q920Q2 | REV1_MOUSE | Rev1 | DNA repair protein REV1, EC 2.7.7.- (Rev1-like terminal deoxycytidyl transferase) |
| Q80U35 | ARHGH_MOUSE | Arhgef17 | Rho guanine nucleotide exchange factor 17 |
| Q8BTI9 | PK3CB_MOUSE | Pik3cb | Phosphatidylinositol 4,5-bisphosphate 3-kinase catalytic subunit beta isoform, PI3-kinase subunit beta, PI3K-beta, PI3Kbeta, PtdIns-3-kinase subunit beta, EC 2.7.1.153 (Phosphatidylinositol 4,5-bisphosphate 3-kinase 110 kDa catalytic subunit beta, PtdIns-3-kinase subunit p110-beta, p110beta) (Serine/threonine protein kinase PIK3CB, EC 2.7.11.1) |
| P0C7M9 | CLC2L_MOUSE | Clec2l | C-type lectin domain family 2 member L |
| Q9CR08 | RPP29_MOUSE | Pop4 | Ribonuclease P protein subunit p29 |
| Q61749 | EI2BD_MOUSE | Eif2b4 | Translation initiation factor eIF-2B subunit delta (eIF-2B GDP-GTP exchange factor subunit delta) |
| Q02357 | ANK1_MOUSE | Ank1 | Ankyrin-1, ANK-1 (Erythrocyte ankyrin) |
| Q5SUS0 | FBW10_MOUSE | Fbxw10 | F-box/WD repeat-containing protein 10 (F-box and WD-40 domain-containing protein 10) |
| Q3V0Q1 | DYH12_MOUSE | Dnah12 | Dynein axonemal heavy chain 12 (Axonemal beta dynein heavy chain 12) (Axonemal dynein heavy chain 12-like protein) (Axonemal dynein heavy chain 7-like protein) (Ciliary dynein heavy chain 12) |
| P97449 | AMPN_MOUSE | Anpep | Aminopeptidase N, AP-N, mAPN, EC 3.4.11.2 (Alanyl aminopeptidase) (Aminopeptidase M, AP-M) (Membrane protein p161) (Microsomal aminopeptidase) (CD antigen CD13) |
| Q9D1H7 | GET4_MOUSE | Get4 | Golgi to ER traffic protein 4 homolog |
| Q924W7 | DEN2B_MOUSE | Dennd2b | DENN domain-containing protein 2B (HeLa tumor suppression 1) (Suppression of tumorigenicity 5 protein) |
| Q99LJ2 | ABTB1_MOUSE | Abtb1 | Ankyrin repeat and BTB/POZ domain-containing protein 1 |
| Q8VCX5 | MICU1_MOUSE | Micu1 | Calcium uptake protein 1, mitochondrial (Calcium-binding atopy-related autoantigen 1 homolog) |

| | | | |
|--------|-------------|----------|--|
| Q7TPV2 | DZIP3_MOUSE | Dzip3 | E3 ubiquitin-protein ligase DZIP3, EC 2.3.2.27 (DAZ-interacting protein 3 homolog) (RING-type E3 ubiquitin transferase DZIP3) |
| Q9JHE3 | ASAH2_MOUSE | Asah2 | Neutral ceramidase, N-CDase, NCDase, EC 3.5.1.-, EC 3.5.1.23 (Acylsphingosine deacylase 2) (N-acylsphingosine amidohydrolase 2) [Cleaved into: Neutral ceramidase soluble form] |
| Q80UP8 | S20A2_MOUSE | Slc20a2 | Sodium-dependent phosphate transporter 2 (Phosphate transporter 2, PiT-2) (Solute carrier family 20 member 2) (Type III sodium-dependent phosphate transporter) |
| Q925Q8 | DACH2_MOUSE | Dach2 | Dachshund homolog 2, Dach2 |
| Q8R5A6 | TB22A_MOUSE | Tbc1d22a | TBC1 domain family member 22A |
| Q8R5M0 | GIPC3_MOUSE | Gipc3 | PDZ domain-containing protein GIPC3 (Regulator of G-protein signaling 19-interacting protein 3) |
| Q8R323 | RFC3_MOUSE | Rfc3 | Replication factor C subunit 3 (Activator 1 38 kDa subunit, A1 38 kDa subunit) (Activator 1 subunit 3) (Replication factor C 38 kDa subunit, RF-C 38 kDa subunit, RFC38) |
| Q6X893 | CTL1_MOUSE | Slc44a1 | Choline transporter-like protein 1 (Solute carrier family 44 member 1) (CD antigen CD92) |
| Q8K2A8 | ALG3_MOUSE | Alg3 | Dol-P-Man:Man(5)GlcNAc(2)-PP-Dol alpha-1,3-mannosyltransferase, EC 2.4.1.258 (Asparagine-linked glycosylation protein 3 homolog) (Dol-P-Man-dependent alpha(1-3)-mannosyltransferase) (Dolichyl-P-Man:Man(5)GlcNAc(2)-PP-dolichyl mannosyltransferase) (Dolichyl-phosphate-mannose--glycolipid alpha-mannosyltransferase) (Not56-like protein) |
| Q64018 | GLRA1_MOUSE | Gla1 | Glycine receptor subunit alpha-1 (Glycine receptor 48 kDa subunit) (Glycine receptor strychnine-binding subunit) |
| Q3UYI5 | RGL3_MOUSE | Rgl3 | Ral guanine nucleotide dissociation stimulator-like 3, RalGDS-like 3 (RalGDS-related effector protein of M-Ras) (Ras pathway modulator, RPM) |
| P48964 | MPIP1_MOUSE | Cdc25a | M-phase inducer phosphatase 1, EC 3.1.3.48 (Dual specificity phosphatase Cdc25A) |
| Q8BX13 | UBE3D_MOUSE | Ube3d | E3 ubiquitin-protein ligase E3D, EC 2.3.2.26 (HECT-type E3 ubiquitin transferase E3D) (UbcH10-binding protein with a HECT-like domain) (Ubiquitin-conjugating enzyme E2C-binding protein) |
| Q8CDI7 | CC150_MOUSE | Ccdc150 | Coiled-coil domain-containing protein 150 |
| Q9CZT4 | RPC5_MOUSE | Polr3e | DNA-directed RNA polymerase III subunit RPC5, RNA polymerase III subunit 5, RNA polymerase III subunit C5 (Sex-lethal interactor homolog, Sxl interactor) |

| | | | |
|--------|-------------|----------|--|
| Q99388 | CSPRS_MOUSE | Csprs | Component of Sp100-rs |
| P0CC03 | ST6B1_MOUSE | Sult6b1 | Sulfotransferase 6B1, ST6B1 (Thyroxine sulfotransferase, EC 2.8.2.n2) |
| Q9DAV9 | TM38B_MOUSE | Tmem38b | Trimeric intracellular cation channel type B, TRIC-B, TRICB (Mitsugumin-33B) (Transmembrane protein 38B) |
| Q6P9R4 | ARHGI_MOUSE | Arhgef18 | Rho guanine nucleotide exchange factor 18 |
| Q6NY15 | TSG10_MOUSE | Tsga10 | Testis-specific gene 10 protein |
| Q62440 | TLE1_MOUSE | Tle1 | Transducin-like enhancer protein 1 (Groucho-related protein 1, Grg-1) |
| Q9JII1 | INP5E_MOUSE | Inpp5e | Phosphatidylinositol polyphosphate 5-phosphatase type IV (72 kDa inositol polyphosphate 5-phosphatase) (Inositol polyphosphate-5-phosphatase E) (Phosphatidylinositol 4,5-bisphosphate 5-phosphatase, EC 3.1.3.36) (Phosphatidylinositol-3,4,5-trisphosphate 5-phosphatase, EC 3.1.3.86) |
| Q3UQ28 | PXDN_MOUSE | Pxdn | Peroxidasin homolog, EC 1.11.2.- [Cleaved into: PXDN active fragment] |
| A2ASS6 | TITIN_MOUSE | Ttn | Titin, EC 2.7.11.1 (Connectin) |
| Q8BGA3 | LRRT2_MOUSE | Lrrtm2 | Leucine-rich repeat transmembrane neuronal protein 2 |
| Q6PDM2 | SRSF1_MOUSE | Srsf1 | Serine/arginine-rich splicing factor 1 (ASF/SF2) (Pre-mRNA-splicing factor SRp30a) (Splicing factor, arginine/serine-rich 1) |
| P48453 | PP2BB_MOUSE | Ppp3cb | Serine/threonine-protein phosphatase 2B catalytic subunit beta isoform, EC 3.1.3.16 (CAM-PRP catalytic subunit) (Calmodulin-dependent calcineurin A subunit beta isoform, CNA beta) |
| Q4VA53 | PDS5B_MOUSE | Pds5b | Sister chromatid cohesion protein PDS5 homolog B (Androgen-induced proliferation inhibitor) (Androgen-induced prostate proliferative shutoff-associated protein AS3) |
| Q02357 | ANK1_MOUSE | Ank1 | Ankyrin-1, ANK-1 (Erythrocyte ankyrin) |
| Q91XQ0 | DYH8_MOUSE | Dnah8 | Dynein axonemal heavy chain 8 (Axonemal beta dynein heavy chain 8) (Ciliary dynein heavy chain 8) |
| Q80X50 | UBP2L_MOUSE | Ubp2l | Ubiquitin-associated protein 2-like |
| Q61193 | RGL2_MOUSE | Rgl2 | Ral guanine nucleotide dissociation stimulator-like 2, RalGDS-like 2 (RalGDS-like factor) (Ras-associated protein RAB2L) |
| Q05BC3 | EMAL1_MOUSE | Eml1 | Echinoderm microtubule-associated protein-like 1, EMAP-1 |
| Q922W5 | P5CR1_MOUSE | Pycr1 | Pyrroline-5-carboxylate reductase 1, mitochondrial, P5C reductase 1, P5CR 1, EC 1.5.1.2 |

| | | | |
|--------|-------------|-----------|--|
| Q8K4S1 | PLCE1_MOUSE | Plce1 | 1-phosphatidylinositol 4,5-bisphosphate phosphodiesterase epsilon-1, EC 3.1.4.11 (Phosphoinositide phospholipase C-epsilon-1) (Phospholipase C-epsilon-1, PLC-epsilon-1) |
| B1AY13 | UBP24_MOUSE | Usp24 | Ubiquitin carboxyl-terminal hydrolase 24, EC 3.4.19.12 (Deubiquitinating enzyme 24) (Ubiquitin thioesterase 24) (Ubiquitin-specific-processing protease 24) |
| A2AWP8 | ARGAL_MOUSE | Arhgef10l | Rho guanine nucleotide exchange factor 10-like protein (GrinchGEF) |
| Q9R1V6 | ADA22_MOUSE | Adam22 | Disintegrin and metalloproteinase domain-containing protein 22, ADAM 22 |
| Q9D2I5 | ARMC9_MOUSE | Armc9 | LisH domain-containing protein ARMC9 |
| Q09LZ8 | CBPC6_MOUSE | Agbl4 | Cytosolic carboxypeptidase 6, EC 3.4.17.-, EC 3.4.17.24 (ATP/GTP-binding protein-like 4) (Protein deglutamylase CCP6) |
| Q8R0N6 | HOT_MOUSE | Adhfe1 | Hydroxyacid-oxoacid transhydrogenase, mitochondrial, HOT, EC 1.1.99.24 (Alcohol dehydrogenase iron-containing protein 1, ADHFe1) |
| Q6NSV7 | F149B_MOUSE | Fam149b1 | Primary cilium assembly protein FAM149B1 |
| Q60862 | ORC2_MOUSE | Orc2 | Origin recognition complex subunit 2 |
| Q8BG60 | TXNIP_MOUSE | Txnip | Thioredoxin-interacting protein (Vitamin D3 up-regulated protein 1) |
| Q9D1H8 | RM53_MOUSE | Mrpl53 | 39S ribosomal protein L53, mitochondrial, L53mt, MRP-L53 |
| Q9CZJ0 | MPPD2_MOUSE | Mpped2 | Metallophosphoesterase MPPED2, EC 3.1.-.- (Metallophosphoesterase domain-containing protein 2) |
| Q8CG50 | RAB43_MOUSE | Rab43 | Ras-related protein Rab-43 |
| Q9ER41 | TOR1B_MOUSE | Tor1b | Torsin-1B (Torsin ATPase-1B, EC 3.6.4.-) (Torsin family 1 member B) |
| P61215 | CAH10_MOUSE | Ca10 | Carbonic anhydrase-related protein 10 (Carbonic anhydrase-related protein X, CA-RP X, CARP X) |
| P70208 | PLXA3_MOUSE | Plxna3 | Plexin-A3 |
| Q3TWL2 | PP4P1_MOUSE | Pip4p1 | Type 1 phosphatidylinositol 4,5-bisphosphate 4-phosphatase, Type 1 PtdIns-4,5-P2 4-Ptase, EC 3.1.3.78 (PtdIns-4,5-P2 4-Ptase I) (Transmembrane protein 55B) |
| P0DP60 | LYNX1_MOUSE | Lynx1 | Ly-6/neurotoxin-like protein 1 (GC26) |
| Q14BB9 | MA6D1_MOUSE | Map6d1 | MAP6 domain-containing protein 1 (21 kDa STOP-like protein, SL21) |
| Q920B0 | FRM4B_MOUSE | Frmd4b | FERM domain-containing protein 4B (GRP1-binding protein GRSP1) (Golgi-associated band 4.1-like protein, GOBLIN) |
| P53657 | KPYR_MOUSE | Pklr | Pyruvate kinase PKLR, EC 2.7.1.40 (L-PK) (Pyruvate kinase isozymes L/R) |
| Q9JJS7 | P2RY4_MOUSE | P2ry4 | P2Y purinoceptor 4, P2Y4 |

| | | | |
|--------|-------------|--------|--|
| Q9CRC0 | VKOR1_MOUSE | Vkorc1 | Vitamin K epoxide reductase complex subunit 1, EC 1.17.4.4 (Vitamin K1 2,3-epoxide reductase subunit 1) |
| P59672 | ANS1A_MOUSE | Anks1a | Ankyrin repeat and SAM domain-containing protein 1A (Odin) |
| Q8VBX6 | MPDZ_MOUSE | Mpdz | Multiple PDZ domain protein (Multi-PDZ domain protein 1) |
| Q91Z49 | UIF_MOUSE | Fyttl1 | UAP56-interacting factor (Forty-two-three domain-containing protein 1, Protein 40-2-3) |
| Q99JY4 | TRABD_MOUSE | Trabd | TraB domain-containing protein |
| Q99JH1 | RP25L_MOUSE | Rpp25l | Ribonuclease P protein subunit p25-like protein, RNase P protein subunit-like p25 (Rpp25-like protein) |
| Q6NVG5 | MREG_MOUSE | Mreg | Melanoregulin (Dilute suppressor protein) (Whn-dependent transcript 2) |
| Q5FW85 | ECM2_MOUSE | Ecm2 | Extracellular matrix protein 2 (Tenonectin) |
| Q3V3A1 | CDK15_MOUSE | Cdk15 | Cyclin-dependent kinase 15, EC 2.7.11.22 (Amyotrophic lateral sclerosis 2 chromosomal region candidate gene 7 protein homolog) (Cell division protein kinase 15) (Serine/threonine-protein kinase ALS2CR7) (Serine/threonine-protein kinase PFTAIRE-2) |
| Q8BL06 | UBP54_MOUSE | Usp54 | Inactive ubiquitin carboxyl-terminal hydrolase 54 (Inactive ubiquitin-specific peptidase 54) |
| Q8R4V4 | CBPZ_MOUSE | Cpz | Carboxypeptidase Z, CPZ, EC 3.4.17.- |
| Q0VEJ0 | CEP76_MOUSE | Cep76 | Centrosomal protein of 76 kDa, Cep76 |
| P06728 | APOA4_MOUSE | Apoa4 | Apolipoprotein A-IV, Apo-AIV, ApoA-IV (Apolipoprotein A4) |
| Q91WD0 | GP108_MOUSE | Gpr108 | Protein GPR108 (Lung seven transmembrane receptor 2) |
| Q922J9 | FACR1_MOUSE | Far1 | Fatty acyl-CoA reductase 1, EC 1.2.1.84 |
| Q3U1N2 | SRBP2_MOUSE | Srebf2 | Sterol regulatory element-binding protein 2, SREBP-2 (Sterol regulatory element-binding transcription factor 2) [Cleaved into: Processed sterol regulatory element-binding protein 2 (Transcription factor SREBF2)] |
| P62069 | UBP46_MOUSE | Usp46 | Ubiquitin carboxyl-terminal hydrolase 46, EC 3.4.19.12 (Deubiquitinating enzyme 46) (Ubiquitin thioesterase 46) (Ubiquitin-specific-processing protease 46) |
| P01657 | KV3A5_MOUSE | | Ig kappa chain V-III region PC 2413 |
| Q91W67 | UBL7_MOUSE | Ubl7 | Ubiquitin-like protein 7 |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| P0CG50 | UBC_MOUSE | Ubc | Polyubiquitin-C [Cleaved into: Ubiquitin; Ubiquitin-related 1; Ubiquitin-related 2] |

| | | | |
|--------|-------------|---------|---|
| A2AGT5 | CKAP5_MOUSE | Ckap5 | Cytoskeleton-associated protein 5 |
| Q9QXL2 | KI21A_MOUSE | Kif21a | Kinesin-like protein KIF21A |
| Q3UTH8 | ARHG9_MOUSE | Arhgef9 | Rho guanine nucleotide exchange factor 9 (Collybistin) (Rac/Cdc42 guanine nucleotide exchange factor 9) |
| Q80WT0 | JPH4_MOUSE | Jph4 | Junctophilin-4, JP-4 (Junctophilin-like 1 protein) |
| P34056 | AP2A_MOUSE | Tfap2a | Transcription factor AP-2-alpha, AP2-alpha (AP-2 transcription factor) (Activating enhancer-binding protein 2-alpha) (Activator protein 2, AP-2) |
| Q8BMA5 | NPAT_MOUSE | Npat | Protein NPAT |
| Q4VC33 | MAEA_MOUSE | Maea | E3 ubiquitin-protein transferase MAEA, EC 2.3.2.27 (Erythroblast macrophage protein) (Macrophage erythroblast attacher) |
| P20181 | NTF3_MOUSE | Ntf3 | Neurotrophin-3, NT-3 (HDNF) (Nerve growth factor 2, NGF-2) (Neurotrophic factor) |
| Q05909 | PTPRG_MOUSE | Ptprg | Receptor-type tyrosine-protein phosphatase gamma, Protein-tyrosine phosphatase gamma, R-PTP-gamma, EC 3.1.3.48 |
| Q91VU6 | DCA11_MOUSE | Dcaf11 | DDB1- and CUL4-associated factor 11 (WD repeat-containing protein 23) |
| Q4U2R1 | HERC2_MOUSE | Herc2 | E3 ubiquitin-protein ligase HERC2, EC 2.3.2.26 (HECT domain and RCC1-like domain-containing protein 2) (HECT-type E3 ubiquitin transferase HERC2) |
| Q3UV55 | NR1D1_MOUSE | Nr1d1 | Nuclear receptor subfamily 1 group D member 1 (Rev-erbA-alpha) (V-erbA-related protein 1, EAR-1) |
| Q8VHL5 | CRGN_MOUSE | Crygn | Gamma-crystallin N (Gamma-N-crystallin) |
| P55249 | LX12E_MOUSE | Alox12e | Polyunsaturated fatty acid (12S)/(13S)-lipoxygenase, epidermal-type, EC 1.13.11.- (Arachidonate (12S)-lipoxygenase, epidermal-type, 12-LOX-e, e(12S)-LOX, EC 1.13.11.31) (Linoleate (13S)-lipoxygenase) |
| Q8CIA5 | S35B4_MOUSE | Slc35b4 | UDP-xylose and UDP-N-acetylglucosamine transporter (Solute carrier family 35 member B4) |
| A2AU37 | RD21L_MOUSE | Rad2111 | Double-strand-break repair protein rad21-like protein 1 |
| P46412 | GPX3_MOUSE | Gpx3 | Glutathione peroxidase 3, GPx-3, GSHPx-3, EC 1.11.1.9 (Plasma glutathione peroxidase, GPx-P, GSHPx-P) |
| Q8C170 | MYO9A_MOUSE | Myo9a | Unconventional myosin-IXa (Unconventional myosin-9a) |
| P47857 | PFKAM_MOUSE | Pfkm | ATP-dependent 6-phosphofructokinase, muscle type, ATP-PFK, PFK-M, EC 2.7.1.11 (6-phosphofructokinase type A) (Phosphofructo-1-kinase isozyme A, PFK-A) (Phosphohexokinase) |

| | | | |
|--------|-------------|-----------|--|
| Q99K01 | PDXD1_MOUSE | Pdxdc1 | Pyridoxal-dependent decarboxylase domain-containing protein 1, EC 4.1.1.- |
| Q9CZV8 | FXL20_MOUSE | Fbxl20 | F-box/LRR-repeat protein 20 (F-box and leucine-rich repeat protein 20) (F-box/LRR-repeat protein 2-like) |
| Q9JIS8 | S12A4_MOUSE | Slc12a4 | Solute carrier family 12 member 4 (Electroneutral potassium-chloride cotransporter 1) (Erythroid K-Cl cotransporter 1, mKCC1) |
| O54785 | LIMK2_MOUSE | Limk2 | LIM domain kinase 2, LIMK-2, EC 2.7.11.1 |
| P29121 | PCSK4_MOUSE | Pcsk4 | Proprotein convertase subtilisin/kexin type 4, EC 3.4.21.- (KEX2-like endoprotease 3) (Neuroendocrine convertase 3, NEC 3) (Prohormone convertase 3) |
| Q9ERI2 | RB27A_MOUSE | Rab27a | Ras-related protein Rab-27A, EC 3.6.5.2 |
| Q8BZB2 | COAC_MOUSE | Ppcdc | Phosphopantothenoylcysteine decarboxylase, PPC-DC, EC 4.1.1.36 (CoaC) |
| Q60838 | DVL2_MOUSE | Dvl2 | Segment polarity protein dishevelled homolog DVL-2, Dishevelled-2 (DSH homolog 2) |
| Q5IBH6 | SPE4A_MOUSE | Spdye4a | Speedy protein E4A (Rapid inducer of G2/M progression in oocytes E4A, RINGO E4A, mSpy/Ringo E4A) |
| Q9D0E1 | HNRPM_MOUSE | Hnrnrm | Heterogeneous nuclear ribonucleoprotein M, hnRNP M |
| Q9JHR9 | NRIP2_MOUSE | Nrip2 | Nuclear receptor-interacting protein 2 (Neuronal-interacting factor X 1) |
| Q14BA6 | MEDAG_MOUSE | Medag | Mesenteric estrogen-dependent adipogenesis protein (Activated in W/Wv mouse stomach 3, mAWMS3) (Mesenteric estrogen-dependent adipose 4, MEDA-4) |
| Q9DCB1 | HMG3_MOUSE | Hmgn3 | High mobility group nucleosome-binding domain-containing protein 3 |
| Q9CR89 | ERGI2_MOUSE | Ergic2 | Endoplasmic reticulum-Golgi intermediate compartment protein 2 |
| Q8BW86 | ARG33_MOUSE | Arhgef33 | Rho guanine nucleotide exchange factor 33 |
| Q0VBM2 | FA83B_MOUSE | Fam83b | Protein FAM83B |
| Q02526 | ZFP41_MOUSE | Zfp41 | Zinc finger protein 41, Zfp-41 (CtFIN92) |
| Q3US41 | ESRP1_MOUSE | Esrp1 | Epithelial splicing regulatory protein 1 (RNA-binding motif protein 35A) (RNA-binding protein 35A) |
| Q8K135 | K319L_MOUSE | Kiaa0319l | Dyslexia-associated protein KIAA0319-like protein (Adeno-associated virus receptor, AAVR) |
| Q9CQE5 | RGS10_MOUSE | Rgs10 | Regulator of G-protein signaling 10, RGS10 |
| Q61410 | KGP2_MOUSE | Prkg2 | cGMP-dependent protein kinase 2, cGK 2, cGK2, EC 2.7.11.12 (cGMP-dependent protein kinase II, cGKII) |

| | | | |
|--------|-------------|---------|---|
| Q923W1 | TGS1_MOUSE | Tgs1 | Trimethylguanosine synthase, EC 2.1.1.- (Nuclear receptor coactivator 6-interacting protein) (PRIP-interacting protein with methyltransferase motif, PIMT, PIPMT) |
| O35387 | HAX1_MOUSE | Hax1 | HCLS1-associated protein X-1 (HS1-associating protein X-1, HAX-1) (HS1-binding protein 1, HSP1BP-1) |
| Q99PN0 | SC5A5_MOUSE | Slc5a5 | Sodium/iodide cotransporter, Na(+)/I(-) cotransporter (Sodium-iodide symporter, Na(+)/I(-) symporter) (Solute carrier family 5 member 5) |
| Q8BHZ4 | ZN592_MOUSE | Znf592 | Zinc finger protein 592, Zfp-592 |
| Q91WQ5 | TAF5L_MOUSE | Taf5l | TAF5-like RNA polymerase II p300/CBP-associated factor-associated factor 65 kDa subunit 5L, TAF5L (PCAF-associated factor 65 beta, PAF65-beta) |
| B1AY10 | NFX1_MOUSE | Nfx1 | Transcriptional repressor NF-X1, m-Nfx.1, EC 2.3.2.- (Nuclear transcription factor, X box-binding protein 1) |
| P70338 | GFI1_MOUSE | Gfi1 | Zinc finger protein Gfi-1 (Growth factor independent protein 1) |
| Q9CWH5 | TRM11_MOUSE | Trmt11 | tRNA (guanine(10)-N2)-methyltransferase homolog, EC 2.1.1.- (tRNA guanosine-2'-O-methyltransferase TRM11 homolog) |
| P23819 | GRIA2_MOUSE | Gria2 | Glutamate receptor 2, GluR-2 (AMPA-selective glutamate receptor 2) (GluR-B) (GluR-K2) (Glutamate receptor ionotropic, AMPA 2, GluA2) |
| Q8CCC3 | CL056_MOUSE | | Uncharacterized protein C12orf56 homolog |
| P63318 | KPCG_MOUSE | Prkcg | Protein kinase C gamma type, PKC-gamma, EC 2.7.11.13 |
| A2ALS5 | RPGP1_MOUSE | Rap1gap | Rap1 GTPase-activating protein 1, Rap1GAP, Rap1GAP1 (ARPP-90) |
| Q9DBB4 | NAA16_MOUSE | Naa16 | N-alpha-acetyltransferase 16, NatA auxiliary subunit (NMDA receptor-regulated 1-like protein, NARG1-like protein) |
| P49945 | FRIL2_MOUSE | Ftl2 | Ferritin light chain 2 (Ferritin L subunit 2) (Ferritin subunit LG) |
| Q8BG89 | ZN365_MOUSE | Znf365 | Protein ZNF365 (DISC1-binding zinc-finger protein) (Su48) |
| Q2QI47 | USH2A_MOUSE | Ush2A | Usherin (Usher syndrome type IIa protein homolog) (Usher syndrome type-2A protein homolog) |
| Q9ES28 | ARHG7_MOUSE | Arhgef7 | Rho guanine nucleotide exchange factor 7 (Beta-Pix) (PAK-interacting exchange factor beta) (p85SPR) |
| Q8K449 | ABCA9_MOUSE | Abca9 | ATP-binding cassette sub-family A member 9, EC 7.6.2.- |
| Q641P0 | ARP3B_MOUSE | Actr3b | Actin-related protein 3B (ARP3-beta) (Actin-like protein 3B) |
| Q9WTK2 | CDYL_MOUSE | Cdyl | Chromodomain Y-like protein, CDY-like (Crotonyl-CoA hydratase, EC 4.2.1.-) (Putative histone acetyltransferase Cdyl, EC 2.3.1.48) |

| | | | |
|--------|-------------|------------|--|
| Q8BGD6 | S38A9_MOUSE | Slc38a9 | Sodium-coupled neutral amino acid transporter 9 (Solute carrier family 38 member 9) |
| P97825 | JUPI1_MOUSE | Jpt1 | Jupiter microtubule associated homolog 1 (Hematological and neurological expressed 1 protein) [Cleaved into: Jupiter microtubule associated homolog 1, N-terminally processed] |
| D2J0Y4 | CJ090_MOUSE | D7Ertd443e | (E2-independent) E3 ubiquitin-conjugating enzyme FATS, EC 2.3.2.- (Centrosomal protein C10orf90 homolog) (E2/E3 hybrid ubiquitin-protein ligase FATS) (Fragile-site associated tumor suppressor homolog, FATS) |
| Q9D125 | RT25_MOUSE | Mrps25 | 28S ribosomal protein S25, mitochondrial, MRP-S25, S25mt |
| P16627 | HS71L_MOUSE | Hspa11 | Heat shock 70 kDa protein 1-like, Heat shock 70 kDa protein 1L (Heat shock 70 kDa-like protein 1) (Spermatid-specific heat shock protein 70) |
| Q9D0Q7 | RM45_MOUSE | Mrpl45 | 39S ribosomal protein L45, mitochondrial, L45mt, MRP-L45 |
| Q61458 | CCNH_MOUSE | Ccnh | Cyclin-H |
| Q80VM4 | ZN579_MOUSE | Znf579 | Zinc finger protein 579 |
| Q9D5R2 | WDR20_MOUSE | Wdr20 | WD repeat-containing protein 20 |
| Q3V0M2 | LRC36_MOUSE | Lrrc36 | Leucine-rich repeat-containing protein 36 |
| Q925H0 | ASIC2_MOUSE | Asic2 | Acid-sensing ion channel 2, ASIC2 (Amiloride-sensitive brain sodium channel) (Amiloride-sensitive cation channel 1, neuronal) (Brain sodium channel 1, BNC1, BNaC1) |
| Q8BWQ5 | DCLK3_MOUSE | Dclk3 | Serine/threonine-protein kinase DCLK3, EC 2.7.11.1 (CLICK-I and II-related, CLr) (Doublecortin-like and CAM kinase-like 3) (Doublecortin-like kinase 3) |
| Q9DBN5 | LONP2_MOUSE | Lonp2 | Lon protease homolog 2, peroxisomal, EC 3.4.21.53 (Lon protease-like protein 2, Lon protease 2) (Peroxisomal Lon protease) |
| Q91YN0 | CL004_MOUSE | D6Wsu163e | Protein C12orf4 homolog |
| Q8K0G8 | ESRP2_MOUSE | Esrp2 | Epithelial splicing regulatory protein 2 (RNA-binding motif protein 35B) (RNA-binding protein 35B) |
| Q9D8M4 | RL7L_MOUSE | Rpl7l1 | 60S ribosomal protein L7-like 1 |
| Q6PDJ6 | FBX42_MOUSE | Fbxo42 | F-box only protein 42 |
| Q6NZK5 | K1328_MOUSE | Kiaa1328 | Protein hinderin |
| Q6PAR0 | KLD10_MOUSE | Klhdcl0 | Kelch domain-containing protein 10 |
| Q8R317 | UBQL1_MOUSE | Ubqln1 | Ubiquilin-1 (Protein linking IAP with cytoskeleton 1, PLIC-1) |
| P17879 | HS71B_MOUSE | Hspa1b | Heat shock 70 kDa protein 1B (Heat shock 70 kDa protein 1, HSP70.1) |

| | | | |
|--------|-------------|--------|---|
| Q62443 | NPTX1_MOUSE | Nptx1 | Neuronal pentraxin-1, NP1 (Neuronal pentraxin I, NP-I) |
| Q61337 | BAD_MOUSE | Bad | Bcl2-associated agonist of cell death, BAD (Bcl-2-binding component 6) (Bcl-xL/Bcl-2-associated death promoter) (Bcl2 antagonist of cell death) |
| Q62136 | PTN21_MOUSE | Ptpn21 | Tyrosine-protein phosphatase non-receptor type 21, EC 3.1.3.48 (Protein-tyrosine phosphatase PTP-RL10) |
| P18581 | CTR2_MOUSE | Slc7a2 | Cationic amino acid transporter 2, CAT-2, CAT2 (20.5) (Low affinity cationic amino acid transporter 2) (Solute carrier family 7 member 2) (T-cell early activation protein, TEA) |
| A1Z198 | NL1B2_MOUSE | Nlrp1b | NACHT, LRR and PYD domains-containing protein 1b allele 2, EC 3.4.-.- [Cleaved into: NACHT, LRR and PYD domains-containing protein 1b, C-terminus, Nlrp1b1-CT; NACHT, LRR and PYD domains-containing protein 1b, N-terminus, Nlrp1b1-NT] |
| Q9CQ71 | RFA3_MOUSE | Rpa3 | Replication protein A 14 kDa subunit, RP-A p14 (Replication factor A protein 3, RF-A protein 3) |
| P52624 | UPP1_MOUSE | Upp1 | Uridine phosphorylase 1, UPase 1, UrdPase 1, EC 2.4.2.3 |
| Q8BG51 | MIRO1_MOUSE | Rhot1 | Mitochondrial Rho GTPase 1, MIRO-1, EC 3.6.5.- (Ras homolog gene family member T1) |
| Q9QXS1 | PLEC_MOUSE | Plec | Plectin, PCN, PLTN (Plectin-1) (Plectin-6) |
| Q6P5H6 | FRMD5_MOUSE | Frmd5 | FERM domain-containing protein 5 |
| Q9Z320 | K1C27_MOUSE | Krt27 | Keratin, type I cytoskeletal 27 (Cytokeratin-27, CK-27) (Keratin complex-1, acidic, gene C29) (Keratin-27, K27) (Type I inner root sheath-specific keratin-K25irs3) |
| Q60696 | PMEL_MOUSE | Pmel | Melanocyte protein PMEL (Melanocyte protein Pmel 17) (Premelanosome protein) (Silver locus protein) [Cleaved into: M-alpha; M-beta] |
| Q3TYD4 | ARSG_MOUSE | Arsg | Arylsulfatase G, ASG, EC 3.1.6.1 (N-sulfoglucosamine-3-sulfatase, EC 3.1.6.15) |
| Q9D4Q1 | RIBC2_MOUSE | Ribc2 | RIB43A-like with coiled-coils protein 2 |
| Q69ZJ7 | RIC1_MOUSE | Ric1 | Guanine nucleotide exchange factor subunit RIC1 (Protein RIC1 homolog) (RAB6A-GEF complex partner protein 1) |
| P70335 | ROCK1_MOUSE | Rock1 | Rho-associated protein kinase 1, EC 2.7.11.1 (Rho-associated, coiled-coil-containing protein kinase 1) (Rho-associated, coiled-coil-containing protein kinase I, ROCK-I) (p160 ROCK-1, p160ROCK) |
| Q8BJK1 | KCTD7_MOUSE | Kctd7 | BTB/POZ domain-containing protein KCTD7 |

| | | | |
|--------|-------------|-----------|--|
| Q9JMG2 | C1GLC_MOUSE | C1galt1c1 | C1GALT1-specific chaperone 1 (Core 1 beta1,3-galactosyltransferase 2, C1Gal-T2, C1GalT2, Core 1 beta3-Gal-T2, mC1Gal-T2) (Core 1 beta3-galactosyltransferase-specific molecular chaperone) |
| Q62371 | DDR2_MOUSE | Ddr2 | Discoidin domain-containing receptor 2, Discoidin domain receptor 2, EC 2.7.10.1 (CD167 antigen-like family member B) (Neurotrophic tyrosine kinase, receptor-related 3) (Receptor protein-tyrosine kinase TKT) (Tyrosine-protein kinase TYRO10) (CD antigen CD167b) |
| Q8CC36 | CDNF_MOUSE | Cdnf | Cerebral dopamine neurotrophic factor (ARMET-like protein 1) (Conserved dopamine neurotrophic factor) |
| Q9DBG9 | TX1B3_MOUSE | Tax1bp3 | Tax1-binding protein 3 (Tax interaction protein 1, TIP-1) |
| Q8BGQ4 | POMT2_MOUSE | Pomt2 | Protein O-mannosyl-transferase 2, EC 2.4.1.109 (Dolichyl-phosphate-mannose--protein mannosyltransferase 2) |
| Q3UQN2 | FCHO2_MOUSE | Fcho2 | F-BAR domain only protein 2 |
| Q3V3I2 | GNAT3_MOUSE | Gnat3 | Guanine nucleotide-binding protein G(t) subunit alpha-3 (Gustducin alpha-3 chain) |
| Q8BGY2 | IF5A2_MOUSE | Eif5a2 | Eukaryotic translation initiation factor 5A-2, eIF-5A-2, eIF-5A2 (Eukaryotic initiation factor 5A isoform 2) |
| Q8CI43 | MYL6B_MOUSE | Myl6b | Myosin light chain 6B (Smooth muscle and nonmuscle myosin light chain alkali 6B) |
| Q99LW6 | YAF2_MOUSE | Yaf2 | YY1-associated factor 2 |
| Q8CC35 | SYNPO_MOUSE | Synpo | Synaptopodin |
| P62878 | RBX1_MOUSE | Rbx1 | E3 ubiquitin-protein ligase RBX1, EC 2.3.2.27, EC 2.3.2.32 (E3 ubiquitin-protein transferase RBX1) (RING finger protein 75) (RING-box protein 1, Rbx1) [Cleaved into: E3 ubiquitin-protein ligase RBX1, N-terminally processed] |
| Q9WV92 | E41L3_MOUSE | Epb4113 | Band 4.1-like protein 3 (4.1B) (Differentially expressed in adenocarcinoma of the lung protein 1, DAL-1, DAL1P, mDAL-1) (Erythrocyte membrane protein band 4.1-like 3) [Cleaved into: Band 4.1-like protein 3, N-terminally processed] |
| O88935 | SYN1_MOUSE | Syn1 | Synapsin-1 (Synapsin I) |
| Q62108 | DLG4_MOUSE | Dlg4 | Disks large homolog 4 (Postsynaptic density protein 95, PSD-95) (Synapse-associated protein 90, SAP-90, SAP90) |
| Q4KMM3 | OXR1_MOUSE | Oxr1 | Oxidation resistance protein 1 (Protein C7) |
| Q80TZ3 | AUXI_MOUSE | Dnajc6 | Putative tyrosine-protein phosphatase auxilin, EC 3.1.3.48 (DnaJ homolog subfamily C member 6) |
| Q8BGT8 | PHIPL_MOUSE | Phyhipl | Phytanoyl-CoA hydroxylase-interacting protein-like |

| | | | |
|--------|-------------|---------|--|
| Q9QXL2 | KI21A_MOUSE | Kif21a | Kinesin-like protein KIF21A |
| O35226 | PSMD4_MOUSE | Psmc4 | 26S proteasome non-ATPase regulatory subunit 4 (26S proteasome regulatory subunit RPN10) (26S proteasome regulatory subunit S5A) (Multiubiquitin chain-binding protein) |
| P68181 | KAPCB_MOUSE | Prkacb | cAMP-dependent protein kinase catalytic subunit beta, PKA C-beta, EC 2.7.11.11 |
| P60060 | SC61G_MOUSE | Sec61g | Protein transport protein Sec61 subunit gamma |
| Q8C6S9 | CFA54_MOUSE | Cfap54 | Cilia- and flagella-associated protein 54 |
| Q64337 | SQSTM_MOUSE | Sqstm1 | Sequestosome-1 (STONE14) (Ubiquitin-binding protein p62) |
| Q6KAQ7 | ZZZ3_MOUSE | Zzz3 | ZZ-type zinc finger-containing protein 3 |
| Q9QZ10 | ANX10_MOUSE | Anxa10 | Annexin A10 (Annexin-10) |
| Q8C963 | CC159_MOUSE | Ccdc159 | Coiled-coil domain-containing protein 159 |
| Q5XG71 | UTP20_MOUSE | Utp20 | Small subunit processome component 20 homolog (Down-regulated in metastasis protein) |
| Q8BFU3 | RN214_MOUSE | Rnf214 | RING finger protein 214 |
| Q9JKX3 | TFR2_MOUSE | Tfr2 | Transferrin receptor protein 2, Tfr2 |
| Q8R554 | OTU7A_MOUSE | Otu7a | OTU domain-containing protein 7A, EC 3.4.19.12 (Zinc finger protein Cezanne 2) |
| P68254 | 1433T_MOUSE | Ywhaq | 14-3-3 protein theta (14-3-3 protein tau) |
| Q9DBF1 | AL7A1_MOUSE | Aldh7a1 | Alpha-aminoadipic semialdehyde dehydrogenase, Alpha-AASA dehydrogenase, EC 1.2.1.31 (Aldehyde dehydrogenase family 7 member A1, EC 1.2.1.3) (Antiquitin-1) (Betaine aldehyde dehydrogenase, EC 1.2.1.8) (Delta1-piperidine-6-carboxylate dehydrogenase, P6c dehydrogenase) |
| B0F2B4 | NLGN4_MOUSE | Nlgn4l | Neuroigin 4-like (Neuroigin-4, NL-4) |
| P08103 | HCK_MOUSE | Hck | Tyrosine-protein kinase HCK, EC 2.7.10.2 (B-cell/myeloid kinase, BMK) (Hematopoietic cell kinase) (Hemopoietic cell kinase) (p56-HCK/p59-HCK) |
| A6H8H2 | DEN4C_MOUSE | Dennd4c | DENN domain-containing protein 4C |
| Q8C1R0 | TSSK5_MOUSE | Tssk5 | Testis-specific serine/threonine-protein kinase 5, TSK-5, TSSK-5, Testis-specific kinase 5, EC 2.7.11.1 |
| O70494 | SP3_MOUSE | Sp3 | Transcription factor Sp3 |
| Q6NV72 | WDCP_MOUSE | Wdcp | WD repeat and coiled-coil-containing protein |
| Q811D2 | ANR26_MOUSE | Ankrd26 | Ankyrin repeat domain-containing protein 26 |

| | | | |
|--------|-------------|---------|---|
| Q7TR96 | O1013_MOUSE | Olf1013 | Olfactory receptor 1013 (Olfactory receptor 213-2) |
| A2A9C3 | SZT2_MOUSE | Szt2 | KICSTOR complex protein SZT2 (Seizure threshold 2 protein) (Transcript increased in glutamate resistance, TIGR) |
| Q9CX13 | CNIH4_MOUSE | Cnih4 | Protein cornichon homolog 4, CNIH-4 (Cornichon family AMPA receptor auxiliary protein 4) |
| Q9WU78 | PDC6I_MOUSE | Pdcd6ip | Programmed cell death 6-interacting protein (ALG-2-interacting protein 1) (ALG-2-interacting protein X) (E2F1-inducible protein) (Eig2) |
| Q61301 | CTNA2_MOUSE | Ctnna2 | Catenin alpha-2 (Alpha N-catenin) |
| Q8CGV9 | TSH3_MOUSE | Tshz3 | Teashirt homolog 3 (Zinc finger protein 537) |
| Q6URW6 | MYH14_MOUSE | Myh14 | Myosin-14 (Myosin heavy chain 14) (Myosin heavy chain, non-muscle IIc) (Non-muscle myosin heavy chain IIc, NMHC II-C) |
| Q9QYR6 | MAP1A_MOUSE | Map1a | Microtubule-associated protein 1A, MAP-1A [Cleaved into: MAP1A heavy chain; MAP1 light chain LC2] |
| Q6PDS3 | SARM1_MOUSE | Sarm1 | NAD(+) hydrolase SARM1, NADase SARM1, EC 3.2.2.6 (NADP(+) hydrolase SARM1, EC 3.2.2.-) (Sterile alpha and TIR motif-containing protein 1) |
| Q80X13 | IF4G3_MOUSE | Eif4g3 | Eukaryotic translation initiation factor 4 gamma 3, eIF-4-gamma 3, eIF-4G 3, eIF4G 3 (eIF-4-gamma II, eIF4GII) |
| Q3UEB3 | PUF60_MOUSE | Puf60 | Poly(U)-binding-splicing factor PUF60 (60 kDa poly(U)-binding-splicing factor) |
| Q9Z204 | HNRPC_MOUSE | Hnrnpc | Heterogeneous nuclear ribonucleoproteins C1/C2, hnRNP C1/C2 |
| Q80X41 | VRK1_MOUSE | Vrk1 | Serine/threonine-protein kinase VRK1, EC 2.7.11.1 (Serine/threonine-protein kinase 51PK) (Vaccinia-related kinase 1) |
| P35922 | FMR1_MOUSE | Fmr1 | Fragile X messenger ribonucleoprotein 1 (Fragile X messenger ribonucleoprotein, FMRP) (Protein FMR-1, mFmr1p) |
| Q80U72 | SCRIB_MOUSE | Scrib | Protein scribble homolog, Scribble (Protein LAP4) |
| Q922D4 | PP6R3_MOUSE | Ppp6r3 | Serine/threonine-protein phosphatase 6 regulatory subunit 3 (SAPS domain family member 3) |
| Q3UJD6 | UBP19_MOUSE | Usp19 | Ubiquitin carboxyl-terminal hydrolase 19, EC 3.4.19.12 (Deubiquitinating enzyme 19) (Ubiquitin thioesterase 19) (Ubiquitin-specific-processing protease 19) |
| Q80W14 | PR40B_MOUSE | Prpf40b | Pre-mRNA-processing factor 40 homolog B (Huntingtin yeast partner C) (Huntingtin-interacting protein C) |
| Q8C5W3 | TBCEL_MOUSE | Tbcel | Tubulin-specific chaperone cofactor E-like protein (Leucine-rich repeat-containing protein 35) |

| | | | |
|--------|-------------|---------|--|
| Q9CY66 | GAR1_MOUSE | Gar1 | H/ACA ribonucleoprotein complex subunit 1 (Nucleolar protein family A member 1) (snoRNP protein GAR1) |
| Q6WKZ8 | UBR2_MOUSE | Ubr2 | E3 ubiquitin-protein ligase UBR2, EC 2.3.2.27 (N-recognin-2) (RING-type E3 ubiquitin transferase UBR2) (Ubiquitin-protein ligase E3-alpha-2) (Ubiquitin-protein ligase E3-alpha-II) |
| O08576 | RUN3A_MOUSE | Rundc3a | RUN domain-containing protein 3A (Rap2-interacting protein 8, RPIP-8) |
| Q6ZPR5 | NSMA3_MOUSE | Smpd4 | Sphingomyelin phosphodiesterase 4, EC 3.1.4.12 (Neutral sphingomyelinase 3, nSMase-3, nSMase3) (Neutral sphingomyelinase III) |
| P58269 | DPF3_MOUSE | Dpf3 | Zinc finger protein DPF3 (BRG1-associated factor 45C, BAF45C) (Zinc finger protein cer-d4) |
| Q0GNC1 | INF2_MOUSE | Inf2 | Inverted formin-2 |
| Q6NWX3 | IF122_MOUSE | Ift122 | Intraflagellar transport protein 122 homolog (WD repeat-containing protein 10) |
| Q80TS3 | AGRL3_MOUSE | Adgrl3 | Adhesion G protein-coupled receptor L3 (Letrophilin-3) (Lectomedin-3) |
| Q8R123 | FAD1_MOUSE | Flad1 | FAD synthase, EC 2.7.7.2 (FAD pyrophosphorylase) (FMN adenylyltransferase) (Flavin adenine dinucleotide synthase) [Includes: Molybdenum cofactor biosynthesis protein-like region; FAD synthase region] |
| Q8BKC8 | PI4KB_MOUSE | Pi4kb | Phosphatidylinositol 4-kinase beta, PI4K-beta, PI4Kbeta, PtdIns 4-kinase beta, EC 2.7.1.67 |
| Q921E6 | EED_MOUSE | Eed | Polycomb protein EED |
| P83741 | WNK1_MOUSE | Wnk1 | Serine/threonine-protein kinase WNK1, EC 2.7.11.1 (Protein kinase lysine-deficient 1) (Protein kinase with no lysine 1) |
| Q99M31 | HSP7E_MOUSE | Hspa14 | Heat shock 70 kDa protein 14 (NST-1) (hsr.1) |
| P12023 | A4_MOUSE | App | Amyloid-beta precursor protein (ABPP, APP) (Alzheimer disease amyloid A4 protein homolog) (Alzheimer disease amyloid protein) (Amyloid precursor protein) (Amyloid-beta (A4) precursor protein) (Amyloid-beta A4 protein) (Amyloidogenic glycoprotein, AG) [Cleaved into: N-APP; Soluble APP-alpha, S-APP-alpha; Soluble APP-beta, S-APP-beta; C99 (APP-C99) (Beta-secretase C-terminal fragment, Beta-CTF); Amyloid-beta protein 42, Abeta42 (Beta-APP42); Amyloid-beta protein 40, Abeta40 (Beta-APP40); C83 (Alpha-secretase C-terminal fragment, Alpha-CTF); P3(42); P3(40); C80; Gamma-secretase C-terminal fragment 59 (APP-C59) (Amyloid intracellular domain 59, AID(59)) (Gamma-CTF(59)); Gamma-secretase C-terminal fragment 57 (APP-C57) (Amyloid intracellular domain 57, AID(57)) (Gamma- |

| | | | |
|--------|-------------|---------|---|
| | | | CTF(57)); Gamma-secretase C-terminal fragment 50 (Amyloid intracellular domain 50, AID(50)) (Gamma-CTF(50)); C31] |
| Q9WVB0 | RBPMS_MOUSE | Rbpms | RNA-binding protein with multiple splicing, RBP-MS (Heart and RRM expressed sequence, Hermes) |
| Q8CFC2 | MYT1_MOUSE | Myt1 | Myelin transcription factor 1, MyT1 (Neural zinc finger factor 2, NZF-2) |
| P54285 | CACB3_MOUSE | Cacnb3 | Voltage-dependent L-type calcium channel subunit beta-3, CAB3 (Calcium channel voltage-dependent subunit beta 3, CCHB3) |
| Q9DC63 | FBX3_MOUSE | Fbxo3 | F-box only protein 3 |
| Q9Z0Z4 | HEPH_MOUSE | Heph | Hephaestin, EC 1.-.-.- |
| Q80TI0 | ASTRB_MOUSE | Gramd1b | Protein Aster-B (GRAM domain-containing protein 1B) |
| Q9R1V6 | ADA22_MOUSE | Adam22 | Disintegrin and metalloproteinase domain-containing protein 22, ADAM 22 |
| Q6PGB8 | SMCA1_MOUSE | Smarca1 | Probable global transcription activator SNF2L1, EC 3.6.4.- (ATP-dependent helicase SMARCA1) (DNA-dependent ATPase SNF2L) (Nucleosome-remodeling factor subunit SNF2L) (SWI/SNF-related matrix-associated actin-dependent regulator of chromatin subfamily A member 1) |
| Q8BMB0 | EMSY_MOUSE | Emsy | BRCA2-interacting transcriptional repressor EMSY |
| P97434 | MPRIP_MOUSE | Mprrip | Myosin phosphatase Rho-interacting protein (Rho-interacting protein 3, RIP3) (p116Rip) |
| Q8R310 | TMCC3_MOUSE | Tmcc3 | Transmembrane and coiled-coil domain protein 3 |
| Q8CGB3 | UACA_MOUSE | Uaca | Uveal autoantigen with coiled-coil domains and ankyrin repeats (Nuclear membrane-binding protein, Nucling) |
| Q91ZS8 | RED1_MOUSE | Adarb1 | Double-stranded RNA-specific editase 1, EC 3.5.4.37 (RNA-editing deaminase 1) (RNA-editing enzyme 1) (dsRNA adenosine deaminase) |
| Q640L3 | CCPG1_MOUSE | Ccpg1 | Cell cycle progression protein 1 |

| | | | |
|--------|-------------|---------|---|
| P28867 | KPCD_MOUSE | Prkcd | Protein kinase C delta type, EC 2.7.11.13 (Tyrosine-protein kinase PRKCD, EC 2.7.10.2) (nPKC-delta) [Cleaved into: Protein kinase C delta type regulatory subunit; Protein kinase C delta type catalytic subunit (Sphingosine-dependent protein kinase-1, SDK1)] |
| Q61818 | RAI1_MOUSE | Rai1 | Retinoic acid-induced protein 1 |
| P01899 | HA11_MOUSE | H2-D1 | H-2 class I histocompatibility antigen, D-B alpha chain, H-2D(B) |
| P31266 | SUH_MOUSE | Rbpj | Recombining binding protein suppressor of hairless (J kappa-recombination signal-binding protein) (RBP-J kappa) |
| Q61210 | ARHG1_MOUSE | Arhgef1 | Rho guanine nucleotide exchange factor 1 (Lbc's second cousin) (Lymphoid blast crisis-like 2) |
| Q8C8U0 | LIPB1_MOUSE | Ppfibp1 | Liprin-beta-1 (Protein tyrosine phosphatase receptor type f polypeptide-interacting protein-binding protein 1, PTPRF-interacting protein-binding protein 1) |
| Q9JLC4 | SORC1_MOUSE | Sorcs1 | VPS10 domain-containing receptor SorCS1, mSorCS |
| P21550 | ENOB_MOUSE | Eno3 | Beta-enolase, EC 4.2.1.11 (2-phospho-D-glycerate hydro-lyase) (Enolase 3) (Muscle-specific enolase, MSE) (Skeletal muscle enolase) |
| Q6AW69 | CGNL1_MOUSE | Cgnl1 | Cingulin-like protein 1 (Junction-associated coiled-coil protein) |
| P70227 | ITPR3_MOUSE | Itpr3 | Inositol 1,4,5-trisphosphate receptor type 3 (IP3 receptor isoform 3, IP3R 3, InsP3R3) (Type 3 inositol 1,4,5-trisphosphate receptor, Type 3 InsP3 receptor) |
| Q69ZR9 | TASOR_MOUSE | Tasor | Protein TASOR (Transgene activation suppressor protein) |
| Q99KW3 | TARA_MOUSE | Triobp | TRIO and F-actin-binding protein (Protein Tara) (Trio-associated repeat on actin) |
| Q9QX11 | CYH1_MOUSE | Cyth1 | Cytohesin-1 (PH, SEC7 and coiled-coil domain-containing protein 1, CLM1) (SEC7 homolog A, mSec7-1) |
| P35285 | RB22A_MOUSE | Rab22a | Ras-related protein Rab-22A, Rab-22 (Rab-14) |
| P0C872 | JMJD7_MOUSE | Jmjd7 | Bifunctional peptidase and (3S)-lysyl hydroxylase Jmjd7, EC 1.14.11.63, EC 3.4.-.- (JmjC domain-containing protein 7) (Jumonji domain-containing protein 7) (L-lysine (3S)-hydroxylase Jmjd7) |
| Q3V0C5 | UBP48_MOUSE | Usp48 | Ubiquitin carboxyl-terminal hydrolase 48, EC 3.4.19.12 (Deubiquitinating enzyme 48) (Ubiquitin thioesterase 48) (Ubiquitin-specific-processing protease 48) |
| A3KFM7 | CHD6_MOUSE | Chd6 | Chromodomain-helicase-DNA-binding protein 6, CHD-6, EC 3.6.4.12 (ATP-dependent helicase CHD6) |

| | | | |
|--------|-------------|---------|---|
| Q9Z1T6 | FYV1_MOUSE | Pikfyve | 1-phosphatidylinositol 3-phosphate 5-kinase, Phosphatidylinositol 3-phosphate 5-kinase, EC 2.7.1.150 (FYVE finger-containing phosphoinositide kinase) (PIKfyve) (Phosphatidylinositol 3-phosphate 5-kinase type III, PIPkin-III, Type III PIP kinase) (Serine-protein kinase PIKFYVE, EC 2.7.11.1) (p235) |
| Q80YQ2 | MED23_MOUSE | Med23 | Mediator of RNA polymerase II transcription subunit 23 (Cofactor required for Sp1 transcriptional activation subunit 3, CRSP complex subunit 3) (Mediator complex subunit 23) (Protein sur-2 homolog, mSur-2) |
| Q921K9 | BCL7B_MOUSE | Bcl7b | B-cell CLL/lymphoma 7 protein family member B |
| Q921U8 | SMTN_MOUSE | Smtn | Smoothelin |
| Q91VM3 | WIPI4_MOUSE | Wdr45 | WD repeat domain phosphoinositide-interacting protein 4, WIPI-4 (WD repeat domain X-linked 1) (WD repeat-containing protein 45) |
| Q8R2K1 | FUCM_MOUSE | Fuom | Fucose mutarotase, EC 5.1.3.29 |
| Q0GGX2 | ZN541_MOUSE | Znf541 | Zinc finger protein 541 (Spermatogenic cell HDAC-interacting protein 1) |
| Q80U58 | PUM2_MOUSE | Pum2 | Pumilio homolog 2 |
| P48379 | RFX2_MOUSE | Rfx2 | DNA-binding protein RFX2 (Regulatory factor X 2) |
| Q8R035 | ICT1_MOUSE | Mrpl58 | Peptidyl-tRNA hydrolase ICT1, mitochondrial, EC 3.1.1.29 (39S ribosomal protein L58, mitochondrial, MRP-L58) (Immature colon carcinoma transcript 1 protein homolog) |
| Q61500 | ITM2A_MOUSE | Itm2a | Integral membrane protein 2A (Protein E25) |
| Q8C407 | YIPF4_MOUSE | Yipf4 | Protein YIPF4 (YIP1 family member 4) |
| Q9D258 | ACBD7_MOUSE | Acbd7 | Acyl-CoA-binding domain-containing protein 7 |
| P16390 | KCNA3_MOUSE | Kcna3 | Potassium voltage-gated channel subfamily A member 3 (MK3) (Voltage-gated potassium channel subunit Kv1.3) |
| Q4QRL3 | CC88B_MOUSE | Ccdc88b | Coiled-coil domain-containing protein 88B (Gipie) (Hook-related protein 3, HkRP3) |
| Q8R079 | BFAR_MOUSE | Bfar | Bifunctional apoptosis regulator |
| Q80XC3 | US6NL_MOUSE | Usp6nl | USP6 N-terminal-like protein |
| Q8CJ67 | STAU2_MOUSE | Stau2 | Double-stranded RNA-binding protein Staufen homolog 2 |
| Q8K3D3 | SWI5_MOUSE | Swi5 | DNA repair protein SWI5 homolog (Protein SAE3 homolog) |
| Q6Q899 | DDX58_MOUSE | Ddx58 | Antiviral innate immune response receptor RIG-I (ATP-dependent RNA helicase DDX58, EC 3.6.4.13) (DEAD box protein 58) (RIG-I-like receptor 1, RLR-1) |

| | | | |
|--------|-------------|---------|---|
| | | | (Retinoic acid-inducible gene 1 protein, RIG-1) (Retinoic acid-inducible gene I protein, RIG-I) |
| Q8K1C0 | ANGE2_MOUSE | Angel2 | Protein angel homolog 2 |
| Q61739 | ITA6_MOUSE | Itga6 | Integrin alpha-6 (CD49 antigen-like family member F) (VLA-6) (CD antigen CD49f) [Cleaved into: Integrin alpha-6 heavy chain; Integrin alpha-6 light chain; Processed integrin alpha-6, Alpha6p] |
| Q7TT15 | GLT17_MOUSE | Galnt17 | Polypeptide N-acetylgalactosaminyltransferase 17, EC 2.4.1.41 (Polypeptide GalNAc transferase-like protein 3, GalNAc-T-like protein 3, pp-GaNTase-like protein 3) (Protein-UDP acetylgalactosaminyltransferase-like protein 3) (UDP-GalNAc:polypeptide N-acetylgalactosaminyltransferase-like protein 3) (Williams-Beuren syndrome chromosomal region 17 protein homolog) |
| Q02566 | MYH6_MOUSE | Myh6 | Myosin-6 (Myosin heavy chain 6) (Myosin heavy chain, cardiac muscle alpha isoform, MyHC-alpha) |
| Q922J9 | FACR1_MOUSE | Far1 | Fatty acyl-CoA reductase 1, EC 1.2.1.84 |
| P50481 | LHX3_MOUSE | Lhx3 | LIM/homeobox protein Lhx3, LIM homeobox protein 3 (Homeobox protein LIM-3) (Homeobox protein P-LIM) |
| Q80WC7 | AGFG2_MOUSE | Agfg2 | Arf-GAP domain and FG repeat-containing protein 2 (HIV-1 Rev-binding protein-like protein) (Rev/Rex activation domain-binding protein related, RAB-R) |
| Q80TM6 | R3HD2_MOUSE | R3hdm2 | R3H domain-containing protein 2 |
| Q80YR2 | FHI2B_MOUSE | Fhip2b | FHF complex subunit HOOK interacting protein 2B, FHIP2B (Retinoic acid-induced protein 16) |
| Q8K4Z0 | LGI2_MOUSE | Lgi2 | Leucine-rich repeat LGI family member 2 (Leucine-rich glioma-inactivated protein 2) |
| Q922T2 | MFAP3_MOUSE | Mfap3 | Microfibril-associated glycoprotein 3 |
| Q922S4 | PDE2A_MOUSE | Pde2a | cGMP-dependent 3',5'-cyclic phosphodiesterase, EC 3.1.4.17 (Cyclic GMP-stimulated phosphodiesterase, CGS-PDE, cGSPDE) |
| D3YZG8 | MTD2L_MOUSE | Mthfd21 | Bifunctional methylenetetrahydrofolate dehydrogenase/cyclohydrolase 2, mitochondrial (NADP-dependent methylenetetrahydrofolate dehydrogenase 2-like protein, MTHFD2-like) [Includes: NAD-dependent methylenetetrahydrofolate dehydrogenase, EC 1.5.1.15, EC 1.5.1.5; Methenyltetrahydrofolate cyclohydrolase, EC 3.5.4.9] |
| Q8BXG3 | IFT57_MOUSE | Ift57 | Intraflagellar transport protein 57 homolog (HIP1-interacting protein) |
| Q5RJH6 | SMG7_MOUSE | Smg7 | Nonsense-mediated mRNA decay factor SMG7 (SMG-7 homolog) |

| | | | |
|--------|-------------|----------|---|
| Q9WV34 | MPP2_MOUSE | Mpp2 | MAGUK p55 subfamily member 2 (Discs large homolog 2) (Protein MPP2) |
| Q3URD3 | SLMAP_MOUSE | Slmap | Sarcolemmal membrane-associated protein, Sarcolemmal-associated protein |
| Q9QXK3 | COPG2_MOUSE | Copg2 | Coatomer subunit gamma-2 (Gamma-2-coat protein, Gamma-2-COP) |
| Q9JII5 | DAZP1_MOUSE | Dazap1 | DAZ-associated protein 1 (Deleted in azoospermia-associated protein 1) |
| O35144 | TERF2_MOUSE | Terf2 | Telomeric repeat-binding factor 2 (TTAGGG repeat-binding factor 2) (Telomeric DNA-binding protein) |
| Q6IR34 | GPSM1_MOUSE | Gpsm1 | G-protein-signaling modulator 1 (Activator of G-protein signaling 3) |
| Q9QX60 | DGUOK_MOUSE | Dguok | Deoxyguanosine kinase, mitochondrial, EC 2.7.1.113 (Deoxyadenosine kinase, mitochondrial, EC 2.7.1.76) |
| O88587 | COMT_MOUSE | Comt | Catechol O-methyltransferase, EC 2.1.1.6 |
| Q8R1A4 | DOCK7_MOUSE | Dock7 | Dedicator of cytokinesis protein 7 (Protein moonlight) |
| Q03137 | EPHA4_MOUSE | Epha4 | Ephrin type-A receptor 4, EC 2.7.10.1 (Tyrosine-protein kinase receptor MPK-3) (Tyrosine-protein kinase receptor SEK-1) |
| Q6PEE2 | CTIF_MOUSE | Ctif | CBP80/20-dependent translation initiation factor |
| Q9R1V6 | ADA22_MOUSE | Adam22 | Disintegrin and metalloproteinase domain-containing protein 22, ADAM 22 |
| Q9D4H9 | PHF14_MOUSE | Phf14 | PHD finger protein 14 |
| Q80TR8 | DCAF1_MOUSE | Dcaf1 | DDB1- and CUL4-associated factor 1 (Serine/threonine-protein kinase VPRBP, EC 2.7.11.1) |
| Q71RI9 | KAT3_MOUSE | Kyat3 | Kynurenine--oxoglutarate transaminase 3, EC 2.6.1.7 (Cysteine-S-conjugate beta-lyase 2, EC 4.4.1.13) (Kynurenine aminotransferase 3) (Kynurenine aminotransferase III, KATIII) (Kynurenine--glyoxylate transaminase, EC 2.6.1.63) (Kynurenine--oxoglutarate transaminase III) |
| P34152 | FAK1_MOUSE | Ptk2 | Focal adhesion kinase 1, FADK 1, EC 2.7.10.2 (Focal adhesion kinase-related nonkinase, FRNK) (Protein-tyrosine kinase 2) (p125FAK) (pp125FAK) |
| Q9WTK2 | CDYL_MOUSE | Cdyl | Chromodomain Y-like protein, CDY-like (Crotonyl-CoA hydratase, EC 4.2.1.-) (Putative histone acetyltransferase Cdyl, EC 2.3.1.48) |
| Q924H7 | WAC_MOUSE | Wac | WW domain-containing adapter protein with coiled-coil |
| Q3UIK4 | MET14_MOUSE | Mettl14 | N6-adenosine-methyltransferase non-catalytic subunit (Methyltransferase-like protein 14) |
| Q8C4V1 | RHG24_MOUSE | Arhgap24 | Rho GTPase-activating protein 24 (Rho-type GTPase-activating protein 24) |
| Q08122 | TLE3_MOUSE | Tle3 | Transducin-like enhancer protein 3 (ESG) (Grg-3) |

| | | | |
|--------|-------------|-----------|--|
| Q91ZS8 | RED1_MOUSE | Adarb1 | Double-stranded RNA-specific editase 1, EC 3.5.4.37 (RNA-editing deaminase 1) (RNA-editing enzyme 1) (dsRNA adenosine deaminase) |
| Q64373 | B2CL1_MOUSE | Bcl2l1 | Bcl-2-like protein 1, Bcl2-L-1 (Apoptosis regulator Bcl-X) |
| E9Q5F9 | SETD2_MOUSE | Setd2 | Histone-lysine N-methyltransferase SETD2, EC 2.1.1.359 (Lysine N-methyltransferase 3A) (Protein-lysine N-methyltransferase SETD2, EC 2.1.1.-) (SET domain-containing protein 2) |
| Q01063 | PDE4D_MOUSE | Pde4d | cAMP-specific 3',5'-cyclic phosphodiesterase 4D, EC 3.1.4.53 (DPDE3) |
| Q8BUR4 | DOCK1_MOUSE | Dock1 | Dedicator of cytokinesis protein 1 (180 kDa protein downstream of CRK, DOCK180) |
| O08550 | KMT2B_MOUSE | Kmt2b | Histone-lysine N-methyltransferase 2B, Lysine N-methyltransferase 2B, EC 2.1.1.364 (Myeloid/lymphoid or mixed-lineage leukemia protein 4 homolog) (Trithorax homolog 2) (WW domain-binding protein 7, WBP-7) |
| Q8C175 | DI3L2_MOUSE | Dis3l2 | DIS3-like exonuclease 2, EC 3.1.13.- |
| A2AWP8 | ARGAL_MOUSE | Arhgef10l | Rho guanine nucleotide exchange factor 10-like protein (GrinchGEF) |
| Q8CC35 | SYNPO_MOUSE | Synpo | Synaptopodin |
| Q8R2X8 | GO45_MOUSE | Blzf1 | Golgin-45 (Basic leucine zipper nuclear factor 1) |
| Q52KF3 | SPIR1_MOUSE | Spire1 | Protein spire homolog 1 |
| Q7TN02 | MED26_MOUSE | Med26 | Mediator of RNA polymerase II transcription subunit 26 (Cofactor required for Sp1 transcriptional activation subunit 7, CRSP complex subunit 7) (Mediator complex subunit 26) |
| O70333 | CRIP1_MOUSE | Cript | Cysteine-rich PDZ-binding protein (Cysteine-rich interactor of PDZ three, Cysteine-rich interactor of PDZ3) |
| Q8CHD8 | RFIP3_MOUSE | Rab11fip3 | Rab11 family-interacting protein 3, FIP3-Rab11, Rab11-FIP3 |
| Q99J56 | DERL1_MOUSE | Derl1 | Derlin-1 (Degradation in endoplasmic reticulum protein 1) (Der1-like protein 1) |
| Q9DBL2 | GDAP2_MOUSE | Gdap2 | Ganglioside-induced differentiation-associated protein 2 |
| Q8BHS8 | SYBU_MOUSE | Sybu | Syntabulin (Golgi-localized syntaphilin-related protein, m-Golsyn) (Syntaxin-1-binding protein) |
| Q9CR89 | ERGI2_MOUSE | Ergic2 | Endoplasmic reticulum-Golgi intermediate compartment protein 2 |
| P07310 | KCRM_MOUSE | Ckm | Creatine kinase M-type, EC 2.7.3.2 (Creatine kinase M chain) (Creatine phosphokinase M-type, CPK-M) (M-CK) |
| Q80WC1 | UBN2_MOUSE | Ubn2 | Ubinuclein-2 |
| Q9ET54 | PALLD_MOUSE | Palld | Palladin |

| | | | |
|--------|-------------|-----------|--|
| Q6X893 | CTL1_MOUSE | Slc44a1 | Choline transporter-like protein 1 (Solute carrier family 44 member 1) (CD antigen CD92) |
| P15331 | PERI_MOUSE | Prph | Peripherin |
| Q3V0T4 | ITAD_MOUSE | Itgad | Integrin alpha-D (CD antigen CD11d) |
| O88632 | SEM3F_MOUSE | Sema3f | Semaphorin-3F (Semaphorin IV, Sema IV) |
| P48381 | RFX3_MOUSE | Rfx3 | Transcription factor RFX3 (Regulatory factor X 3) |
| Q8K2Y3 | EVA1B_MOUSE | Eva1b | Protein eva-1 homolog B (Protein FAM176B) |
| P17665 | COX7C_MOUSE | Cox7c | Cytochrome c oxidase subunit 7C, mitochondrial (Cytochrome c oxidase polypeptide VIIc) |
| P07758 | A1AT1_MOUSE | Serpina1a | Alpha-1-antitrypsin 1-1, AAT (Alpha-1 protease inhibitor 1) (Alpha-1-antiproteinase) (Serine protease inhibitor 1-1) (Serine protease inhibitor A1a, Serpin A1a) |
| Q8BVE8 | NSD2_MOUSE | Nsd2 | Histone-lysine N-methyltransferase NSD2, EC 2.1.1.357 (Multiple myeloma SET domain-containing protein, MMSET) (Nuclear SET domain-containing protein 2) (Wolf-Hirschhorn syndrome candidate 1 protein homolog) |
| Q8BY46 | ZN574_MOUSE | Znf574 | Zinc finger protein 574 |
| Q3TVC7 | CCDB1_MOUSE | Ccndbp1 | Cyclin-D1-binding protein 1 (Grap2 and cyclin-D-interacting protein) (Maternal Id-like protein) (Stage specific embryonic cDNA-8 protein, SSEC-8) |
| Q14BA6 | MEDAG_MOUSE | Medag | Mesenteric estrogen-dependent adipogenesis protein (Activated in W/W ^v mouse stomach 3, mAWMS3) (Mesenteric estrogen-dependent adipose 4, MEDA-4) |
| O88855 | LT4R1_MOUSE | Ltb4r | Leukotriene B4 receptor 1, LTB4-R 1, LTB4-R1 |
| Q8C170 | MYO9A_MOUSE | Myo9a | Unconventional myosin-IXa (Unconventional myosin-9a) |
| P46938 | YAP1_MOUSE | Yap1 | Transcriptional coactivator YAP1, Yes-associated protein 1 (Protein yorkie homolog) (Yes-associated protein YAP65 homolog) |
| Q3URV1 | BROMI_MOUSE | Tbc1d32 | Protein broad-minded (TBC1 domain family member 32) |
| A2ARZ3 | FSIP2_MOUSE | Fsip2 | Fibrous sheath-interacting protein 2 |
| Q8BH47 | SC22A_MOUSE | Sec22a | Vesicle-trafficking protein SEC22a (SEC22 vesicle-trafficking protein homolog A) (SEC22 vesicle-trafficking protein-like 2) |
| Q8R0N6 | HOT_MOUSE | Adhfe1 | Hydroxyacid-oxoacid transhydrogenase, mitochondrial, HOT, EC 1.1.99.24 (Alcohol dehydrogenase iron-containing protein 1, ADHFe1) |

Appendix 2. Table of variable window parameters for SWATH-MS acquisition.

Start (Da) refers to the precursor ion start mass, and the stop (Da) refers to the precursor ion stop mass, with the unit of daltons (Da). Declustering potential (DP), collision energy (CE), and collision energy spread (CES) are measured in volts (V).

| No. | Start (Da) | Stop (Da) | DP (V) | CE (V) | CES (V) |
|-----|------------|-----------|--------|--------|---------|
| 1 | 349.5 | 390.4 | 80 | 16 | 5 |
| 2 | 389.4 | 412.1 | 80 | 18 | 5 |
| 3 | 411.1 | 423.7 | 80 | 19 | 5 |
| 4 | 422.7 | 433.2 | 80 | 20 | 5 |
| 5 | 432.2 | 440.4 | 80 | 20 | 5 |
| 6 | 439.4 | 447.7 | 80 | 21 | 5 |
| 7 | 446.7 | 454.2 | 80 | 21 | 5 |
| 8 | 453.2 | 460.0 | 80 | 21 | 5 |
| 9 | 459.0 | 465.8 | 80 | 22 | 5 |
| 10 | 464.8 | 471.6 | 80 | 22 | 5 |
| 11 | 470.6 | 477.4 | 80 | 22 | 5 |
| 12 | 476.4 | 482.5 | 80 | 22 | 5 |
| 13 | 481.5 | 487.5 | 80 | 23 | 5 |
| 14 | 486.5 | 492.6 | 80 | 23 | 5 |
| 15 | 491.6 | 497.0 | 80 | 23 | 5 |
| 16 | 496.0 | 502.0 | 80 | 23 | 5 |
| 17 | 501.0 | 506.4 | 80 | 24 | 5 |
| 18 | 505.4 | 511.5 | 80 | 24 | 5 |
| 19 | 510.5 | 515.8 | 80 | 24 | 5 |
| 20 | 514.8 | 520.2 | 80 | 24 | 5 |
| 21 | 519.2 | 525.2 | 80 | 24 | 5 |
| 22 | 524.2 | 529.6 | 80 | 25 | 5 |
| 23 | 528.6 | 533.9 | 80 | 25 | 5 |
| 24 | 532.9 | 539.0 | 80 | 25 | 5 |
| 25 | 538.0 | 544.1 | 80 | 25 | 5 |
| 26 | 543.1 | 548.4 | 80 | 26 | 5 |

| | | | | | |
|----|-------|-------|----|----|---|
| 27 | 547.4 | 553.5 | 80 | 26 | 5 |
| 28 | 552.5 | 557.9 | 80 | 26 | 5 |
| 29 | 556.9 | 562.9 | 80 | 26 | 5 |
| 30 | 561.9 | 568.0 | 80 | 27 | 5 |
| 31 | 567.0 | 572.4 | 80 | 27 | 5 |
| 32 | 571.4 | 577.4 | 80 | 27 | 5 |
| 33 | 576.4 | 581.8 | 80 | 27 | 5 |
| 34 | 580.8 | 586.9 | 80 | 28 | 5 |
| 35 | 585.9 | 591.2 | 80 | 28 | 5 |
| 36 | 590.2 | 596.3 | 80 | 28 | 5 |
| 37 | 595.3 | 600.6 | 80 | 28 | 5 |
| 38 | 599.6 | 605.7 | 80 | 28 | 5 |
| 39 | 604.7 | 610.1 | 80 | 29 | 5 |
| 40 | 609.1 | 615.1 | 80 | 29 | 5 |
| 41 | 614.1 | 619.5 | 80 | 29 | 5 |
| 42 | 618.5 | 623.8 | 80 | 29 | 5 |
| 43 | 622.8 | 628.9 | 80 | 30 | 5 |
| 44 | 627.9 | 633.3 | 80 | 30 | 5 |
| 45 | 632.3 | 638.3 | 80 | 30 | 5 |
| 46 | 637.3 | 642.7 | 80 | 30 | 5 |
| 47 | 641.7 | 647.8 | 80 | 30 | 5 |
| 48 | 646.8 | 652.8 | 80 | 31 | 5 |
| 49 | 651.8 | 657.9 | 80 | 31 | 5 |
| 50 | 656.9 | 663.0 | 80 | 31 | 5 |
| 51 | 662.0 | 668.1 | 80 | 31 | 5 |
| 52 | 667.1 | 673.1 | 80 | 32 | 5 |
| 53 | 672.1 | 678.2 | 80 | 32 | 5 |
| 54 | 677.2 | 684.0 | 80 | 32 | 5 |
| 55 | 683.0 | 689.1 | 80 | 33 | 5 |
| 56 | 688.1 | 694.9 | 80 | 33 | 5 |
| 57 | 693.9 | 700.0 | 80 | 33 | 5 |
| 58 | 699.0 | 705.8 | 80 | 33 | 5 |

| | | | | | |
|----|-------|--------|----|----|---|
| 59 | 704.8 | 711.6 | 80 | 34 | 5 |
| 60 | 710.6 | 717.4 | 80 | 34 | 5 |
| 61 | 716.4 | 723.9 | 80 | 34 | 5 |
| 62 | 722.9 | 729.7 | 80 | 34 | 5 |
| 63 | 728.7 | 736.2 | 80 | 35 | 5 |
| 64 | 735.2 | 743.5 | 80 | 35 | 5 |
| 65 | 742.5 | 750.0 | 80 | 35 | 5 |
| 66 | 749.0 | 757.2 | 80 | 36 | 5 |
| 67 | 756.2 | 764.5 | 80 | 36 | 5 |
| 68 | 763.5 | 771.7 | 80 | 36 | 5 |
| 69 | 770.7 | 779.0 | 80 | 37 | 5 |
| 70 | 778.0 | 787.0 | 80 | 37 | 5 |
| 71 | 786.0 | 794.9 | 80 | 38 | 5 |
| 72 | 793.9 | 802.9 | 80 | 38 | 5 |
| 73 | 801.9 | 811.6 | 80 | 38 | 5 |
| 74 | 810.6 | 821.0 | 80 | 39 | 5 |
| 75 | 820.0 | 829.7 | 80 | 39 | 5 |
| 76 | 828.7 | 839.2 | 80 | 40 | 5 |
| 77 | 838.2 | 848.6 | 80 | 40 | 5 |
| 78 | 847.6 | 858.7 | 80 | 41 | 5 |
| 79 | 857.7 | 868.2 | 80 | 41 | 5 |
| 80 | 867.2 | 879.0 | 80 | 42 | 5 |
| 81 | 878.0 | 889.9 | 80 | 42 | 5 |
| 82 | 888.9 | 901.5 | 80 | 43 | 5 |
| 83 | 900.5 | 913.8 | 80 | 43 | 5 |
| 84 | 912.8 | 925.4 | 80 | 44 | 5 |
| 85 | 924.4 | 937.8 | 80 | 44 | 5 |
| 86 | 936.8 | 951.5 | 80 | 45 | 5 |
| 87 | 950.5 | 966.8 | 80 | 46 | 5 |
| 88 | 965.8 | 982.7 | 80 | 46 | 5 |
| 89 | 981.7 | 1000.1 | 80 | 47 | 5 |
| 90 | 999.1 | 1020.4 | 80 | 48 | 5 |

| | | | | | |
|-----|--------|--------|----|----|---|
| 91 | 1019.4 | 1045.1 | 80 | 49 | 5 |
| 92 | 1044.1 | 1073.3 | 80 | 50 | 5 |
| 93 | 1072.3 | 1106.0 | 80 | 52 | 5 |
| 94 | 1105.0 | 1140.8 | 80 | 53 | 5 |
| 95 | 1139.8 | 1181.4 | 80 | 55 | 5 |
| 96 | 1180.4 | 1234.3 | 80 | 57 | 5 |
| 97 | 1233.3 | 1303.1 | 80 | 60 | 5 |
| 98 | 1302.1 | 1385.8 | 80 | 64 | 5 |
| 99 | 1384.8 | 1523.5 | 80 | 68 | 5 |
| 100 | 1522.5 | 1799.8 | 80 | 76 | 5 |

Appendix 3. Python script for managing extensive refractive error measurements from raw data.

```
{
  "cells": [
    {
      "cell_type": "code",
      "execution_count": 26,
      "metadata": {},
      "outputs": [
        {
          "name": "stdout",
          "output_type": "stream",
          "text": [
            "./Rx/20200924_192_OD_1\n",
            "./Rx/20200924_192_OD_2\n",
            "./Rx/20200924_192_OS_1\n",
            ]
          }
        ],
      "source": [
        "import os\n",
        "import pandas as pd\n",
        "#open text file\n",
        "FOLDER_NAME='Rx'\n",
        "FOLDER_DIR = './'\n",
        "file_list = os.listdir(os.path.join(FOLDER_NAME))\n",
        "\n",
        "def read_file(file):\n",
        " file1 = os.path.join(FOLDER_DIR,FOLDER_NAME,file)\n",
        " with open(file1,'r') as f:\n",
        " data = f.readlines()\n",
        " data = data[9:]\n",
        "\n",
        " # import dataframe for handling\n",
        " df1 = pd.DataFrame(data)\n",
        " df1.drop(df1.loc[99:99999].index,inplace=True)\n",
        " #rename the column to 'data'\n",
        " ds1 = df1.rename(columns={0:'data'})\n",
        " #split column\n",
        " ds_split1 = ds1.data.str.split(expand=True)\n",
        " header1 = ds_split1.columns=['#,\n",
        " 'AVG [mm]','SD',\n",
        " file1,'SD',\n",
        " 'AVG Brx','SD']\n",
        " #print(ds_split)\n",
        " ds_split1.drop(['#','AVG [mm]','SD','AVG Brx'],axis=1)\n",
        " rx_only1 = ds_split1.drop(['#','AVG [mm]','SD','AVG Brx'],axis=1)\n",
        " file_name = file1.split('/')\n",
        "\n",
        " w1, x1, y1, z1 = file_name[-1].split('_')\n",

```

```

" df1 = pd.DataFrame([[w1],[x1],[y1],[z1],'\n'],columns=[file1])\n",
" print(file1)\n",
" fl_result = pd.concat([df1,rx_only1])\n",
" return fl_result\n",
"\n",
"#Output concatenate of results\n",
"\n",
"# output.to_csv(File)\n",
"if __name__ == \"__main__\":\n",
" output=pd.DataFrame([])\n",
" file_list.sort(key=lambda x:x[-7:])\n",
" for file in file_list:\n",
" if '.' not in file:\n",
" file_data=read_file(file)\n",
" output = pd.concat([output,file_data],axis=1)\n",
" output.to_csv(FOLDER_NAME+'.csv')
]
},
{
"cell_type": "code",
"execution_count": null,
"metadata": {},
"outputs": [],
"source": []
},
{
"cell_type": "code",
"execution_count": null,
"metadata": {},
"outputs": [],
"source": []
}
],
"metadata": {
"kernel_spec": {
"display_name": "Python 3",
"language": "python",
"name": "python3"
},
"language_info": {
"codemirror_mode": {
"name": "ipython",
"version": 3
},
"file_extension": ".py",
"mimetype": "text/x-python",
"name": "python",
"nbconvert_exporter": "python",
"pygments_lexer": "ipython3",
"version": "3.7.8"
}
}

```

```
}  
},  
"nbformat": 4,  
"nbformat_minor": 4  
}
```

References

- 1 Flitcroft, D. I. *et al.* IMI - Defining and Classifying Myopia: A Proposed Set of Standards for Clinical and Epidemiologic Studies. *Invest Ophthalmol Vis Sci* **60**, M20-M30 (2019). <https://doi.org/10.1167/iovs.18-25957>
- 2 Holden, B. A. *et al.* Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. *Ophthalmology* **123**, 1036-1042 (2016). <https://doi.org/10.1016/j.ophtha.2016.01.006>
- 3 Holden, B. A. *et al.* Myopia: a growing global problem with sight-threatening complications. *Community Eye Health* **28**, 35 (2015).
- 4 Choy, B. N. K. *et al.* Prevalence and associations of myopia in Hong Kong primary school students. *Jpn J Ophthalmol* **64**, 437-449 (2020). <https://doi.org/10.1007/s10384-020-00733-4>
- 5 Fisher, K. & Funke, J. Sexual science beyond the medical. *Lancet* **387**, 840-841 (2016). [https://doi.org/10.1016/s0140-6736\(16\)00517-1](https://doi.org/10.1016/s0140-6736(16)00517-1)
- 6 Troilo, D. *et al.* IMI - Report on Experimental Models of Emmetropization and Myopia. *Invest Ophthalmol Vis Sci* **60**, M31-M88 (2019). <https://doi.org/10.1167/iovs.18-25967>
- 7 Wildsoet, C. F. Active emmetropization--evidence for its existence and ramifications for clinical practice. *Ophthalmic Physiol Opt* **17**, 279-290 (1997).
- 8 Siegart, J. T., Jr. & Norton, T. T. The susceptible period for deprivation-induced myopia in tree shrew. *Vision Res* **38**, 3505-3515 (1998). [https://doi.org/10.1016/s0042-6989\(98\)00053-4](https://doi.org/10.1016/s0042-6989(98)00053-4)
- 9 Wallman, J. & Adams, J. I. Developmental aspects of experimental myopia in chicks: susceptibility, recovery and relation to emmetropization. *Vision Res* **27**, 1139-1163 (1987). [https://doi.org/10.1016/0042-6989\(87\)90027-7](https://doi.org/10.1016/0042-6989(87)90027-7)
- 10 Howlett, M. H. & McFadden, S. A. Form-deprivation myopia in the guinea pig (*Cavia porcellus*). *Vision Res* **46**, 267-283 (2006). <https://doi.org/10.1016/j.visres.2005.06.036>
- 11 Pardue, M. T. *et al.* High susceptibility to experimental myopia in a mouse model with a retinal on pathway defect. *Invest Ophthalmol Vis Sci* **49**, 706-712 (2008). <https://doi.org/10.1167/iovs.07-0643>
- 12 Brown, N. P., Koretz, J. F. & Bron, A. J. The development and maintenance of emmetropia. *Eye (Lond)* **13** (Pt 1), 83-92 (1999). <https://doi.org/10.1038/eye.1999.16>
- 13 Gordon, R. A. & Donzis, P. B. Refractive development of the human eye. *Arch Ophthalmol* **103**, 785-789 (1985). <https://doi.org/10.1001/archophth.1985.01050060045020>
- 14 Flitcroft, D. I. Emmetropisation and the aetiology of refractive errors. *Eye (Lond)* **28**, 169-179 (2014). <https://doi.org/10.1038/eye.2013.276>
- 15 Young, T. L. Molecular genetics of human myopia: an update. *Optom Vis Sci* **86**, E8-E22 (2009). <https://doi.org/10.1097/OPX.0b013e3181940655>
- 16 Tedja, M. S. *et al.* Genome-wide association meta-analysis highlights light-induced signaling as a driver for refractive error. *Nat Genet* **50**, 834-848 (2018). <https://doi.org/10.1038/s41588-018-0127-7>
- 17 Tedja, M. S. *et al.* IMI - Myopia Genetics Report. *Invest Ophthalmol Vis Sci* **60**, M89-M105 (2019). <https://doi.org/10.1167/iovs.18-25965>
- 18 Morgan, I. & Rose, K. How genetic is school myopia? *Prog Retin Eye Res* **24**, 1-38 (2005). <https://doi.org/10.1016/j.preteyeres.2004.06.004>

- 19 Dhakal, R., Shah, R., Huntjens, B., Verkicharla, P. K. & Lawrenson, J. G. Time spent outdoors as an intervention for myopia prevention and control in children: an overview of systematic reviews. *Ophthalmic Physiol Opt* **42**, 545-558 (2022). <https://doi.org/10.1111/opo.12945>
- 20 Loughheed, T. Myopia: the evidence for environmental factors. *Environ Health Perspect* **122**, A12-19 (2014). <https://doi.org/10.1289/ehp.122-A12>
- 21 Ashby, R. S. & Schaeffel, F. The effect of bright light on lens compensation in chicks. *Invest Ophthalmol Vis Sci* **51**, 5247-5253 (2010). <https://doi.org/10.1167/iovs.09-4689>
- 22 Rose, K. A. *et al.* Outdoor activity reduces the prevalence of myopia in children. *Ophthalmology* **115**, 1279-1285 (2008). <https://doi.org/10.1016/j.ophtha.2007.12.019>
- 23 Fulk, G. W., Cyert, L. A. & Parker, D. A. Seasonal variation in myopia progression and ocular elongation. *Optom Vis Sci* **79**, 46-51 (2002). <https://doi.org/10.1097/00006324-200201000-00012>
- 24 Jiang, Y. *et al.* Effect of Repeated Low-Level Red-Light Therapy for Myopia Control in Children: A Multicenter Randomized Controlled Trial. *Ophthalmology* **129**, 509-519 (2022). <https://doi.org/10.1016/j.ophtha.2021.11.023>
- 25 She, Z., Hung, L. F., Arumugam, B., Beach, K. M. & Smith, E. L., 3rd. The development of and recovery from form-deprivation myopia in infant rhesus monkeys reared under reduced ambient lighting. *Vision Res* **183**, 106-117 (2021). <https://doi.org/10.1016/j.visres.2021.02.004>
- 26 Muralidharan, A. R. *et al.* Light and myopia: from epidemiological studies to neurobiological mechanisms. *Ther Adv Ophthalmol* **13**, 25158414211059246 (2021). <https://doi.org/10.1177/25158414211059246>
- 27 Torii, H. *et al.* Violet Light Exposure Can Be a Preventive Strategy Against Myopia Progression. *EBioMedicine* **15**, 210-219 (2017). <https://doi.org/10.1016/j.ebiom.2016.12.007>
- 28 Sliney, D. H. What is light? The visible spectrum and beyond. *Eye (Lond)* **30**, 222-229 (2016). <https://doi.org/10.1038/eye.2015.252>
- 29 Jiang, L. *et al.* Interactions of chromatic and lens-induced defocus during visual control of eye growth in guinea pigs (*Cavia porcellus*). *Vision Res* **94**, 24-32 (2014). <https://doi.org/10.1016/j.visres.2013.10.020>
- 30 Schaeffel, F., Burkhardt, E., Howland, H. C. & Williams, R. W. Measurement of refractive state and deprivation myopia in two strains of mice. *Optom Vis Sci* **81**, 99-110 (2004). <https://doi.org/10.1097/00006324-200402000-00008>
- 31 Barathi, V. A., Boopathi, V. G., Yap, E. P. & Beuerman, R. W. Two models of experimental myopia in the mouse. *Vision Res* **48**, 904-916 (2008). <https://doi.org/10.1016/j.visres.2008.01.004>
- 32 Tkatchenko, T. V., Shen, Y. & Tkatchenko, A. V. Mouse experimental myopia has features of primate myopia. *Invest Ophthalmol Vis Sci* **51**, 1297-1303 (2010). <https://doi.org/10.1167/iovs.09-4153>
- 33 Pardue, M. T., Stone, R. A. & Iuvone, P. M. Investigating mechanisms of myopia in mice. *Exp Eye Res* **114**, 96-105 (2013). <https://doi.org/10.1016/j.exer.2012.12.014>
- 34 Jeon, C. J., Strettoi, E. & Masland, R. H. The major cell populations of the mouse retina. *J Neurosci* **18**, 8936-8946 (1998).
- 35 Macosko, E. Z. *et al.* Highly Parallel Genome-wide Expression Profiling of Individual Cells Using Nanoliter Droplets. *Cell* **161**, 1202-1214 (2015). <https://doi.org/10.1016/j.cell.2015.05.002>
- 36 Gargini, C., Terzibasi, E., Mazzoni, F. & Strettoi, E. Retinal organization in the retinal degeneration 10 (rd10) mutant mouse: a morphological and ERG study. *J Comp Neurol* **500**, 222-238 (2007). <https://doi.org/10.1002/cne.21144>

- 37 Barber, A. J. *et al.* The Ins2Akita mouse as a model of early retinal complications in diabetes. *Invest Ophthalmol Vis Sci* **46**, 2210-2218 (2005). <https://doi.org/10.1167/iovs.04-1340>
- 38 Carr, A. J. *et al.* The expression of retinal cell markers in human retinal pigment epithelial cells and their augmentation by the synthetic retinoid fenretinide. *Mol Vis* **17**, 1701-1715 (2011).
- 39 Dunn, K. C., Aotaki-Keen, A. E., Putkey, F. R. & Hjelmeland, L. M. ARPE-19, a human retinal pigment epithelial cell line with differentiated properties. *Exp Eye Res* **62**, 155-169 (1996). <https://doi.org/10.1006/exer.1996.0020>
- 40 Van Bergen, N. J. *et al.* Recharacterization of the RGC-5 retinal ganglion cell line. *Invest Ophthalmol Vis Sci* **50**, 4267-4272 (2009). <https://doi.org/10.1167/iovs.09-3484>
- 41 Shan, S. W. *et al.* Integrated SWATH-based and targeted-based proteomics provide insights into the retinal emmetropization process in guinea pig. *J Proteomics* **181**, 1-15 (2018). <https://doi.org/10.1016/j.jprot.2018.03.023>
- 42 Blattmann, P. *et al.* Generation of a zebrafish SWATH-MS spectral library to quantify 10,000 proteins. *Sci Data* **6**, 190011 (2019). <https://doi.org/10.1038/sdata.2019.11>
- 43 Rosenberger, G. *et al.* A repository of assays to quantify 10,000 human proteins by SWATH-MS. *Sci Data* **1**, 140031 (2014). <https://doi.org/10.1038/sdata.2014.31>
- 44 Wallman, J. & Winawer, J. Homeostasis of eye growth and the question of myopia. *Neuron* **43**, 447-468 (2004). <https://doi.org/10.1016/j.neuron.2004.08.008>
- 45 Ghazi, N. G. & Green, W. R. Pathology and pathogenesis of retinal detachment. *Eye (Lond)* **16**, 411-421 (2002). <https://doi.org/10.1038/sj.eye.6700197>
- 46 Feit-Leichman, R. A. *et al.* Vascular damage in a mouse model of diabetic retinopathy: relation to neuronal and glial changes. *Invest Ophthalmol Vis Sci* **46**, 4281-4287 (2005). <https://doi.org/10.1167/iovs.04-1361>
- 47 Ethen, C. M., Reilly, C., Feng, X., Olsen, T. W. & Ferrington, D. A. The proteome of central and peripheral retina with progression of age-related macular degeneration. *Invest Ophthalmol Vis Sci* **47**, 2280-2290 (2006). <https://doi.org/10.1167/iovs.05-1395>
- 48 Tezel, G. A proteomics view of the molecular mechanisms and biomarkers of glaucomatous neurodegeneration. *Prog Retin Eye Res* **35**, 18-43 (2013). <https://doi.org/10.1016/j.preteyeres.2013.01.004>
- 49 Yu, F. J. *et al.* Alteration of retinal metabolism and oxidative stress may implicate myopic eye growth: Evidence from discovery and targeted proteomics in an animal model. *J Proteomics*, 103684 (2020). <https://doi.org/10.1016/j.jprot.2020.103684>
- 50 Willermain, F. *et al.* Origins and consequences of hyperosmolar stress in retinal pigmented epithelial cells. *Front Physiol* **5**, 199 (2014). <https://doi.org/10.3389/fphys.2014.00199>
- 51 Ferrara, M. *et al.* Biomechanical properties of retina and choroid: a comprehensive review of techniques and translational relevance. *Eye (Lond)* **35**, 1818-1832 (2021). <https://doi.org/10.1038/s41433-021-01437-w>
- 52 Chia, A., Lu, Q. S. & Tan, D. Five-Year Clinical Trial on Atropine for the Treatment of Myopia 2: Myopia Control with Atropine 0.01% Eyedrops. *Ophthalmology* **123**, 391-399 (2016). <https://doi.org/10.1016/j.ophtha.2015.07.004>
- 53 Siatkowski, R. M. *et al.* Safety and efficacy of 2% pirenzepine ophthalmic gel in children with myopia: a 1-year, multicenter, double-masked, placebo-controlled parallel study. *Arch Ophthalmol* **122**, 1667-1674 (2004). <https://doi.org/10.1001/archophth.122.11.1667>
- 54 Trier, K., Munk Ribel-Madsen, S., Cui, D. & Brogger Christensen, S. Systemic 7-methylxanthine in retarding axial eye growth and myopia progression: a 36-month pilot study. *J Ocul Biol Dis Infor* **1**, 85-93 (2008). <https://doi.org/10.1007/s12177-008-9013-3>
- 55 Ganesan, P. & Wildsoet, C. F. Pharmaceutical intervention for myopia control. *Expert Rev Ophthalmol* **5**, 759-787 (2010). <https://doi.org/10.1586/eop.10.67>

- 56 Pan, M. *et al.* Opposing Effects of PPARalpha Agonism and Antagonism on Refractive Development and Form Deprivation Myopia in Guinea Pigs. *Invest Ophthalmol Vis Sci* **59**, 5803-5815 (2018). <https://doi.org/10.1167/iovs.17-22297>
- 57 Srinivasalu, N. *et al.* Crosstalk between EP2 and PPARalpha Modulates Hypoxic Signaling and Myopia Development in Guinea Pigs. *Invest Ophthalmol Vis Sci* **61**, 44 (2020). <https://doi.org/10.1167/iovs.61.8.44>
- 58 Pan, M. *et al.* PPARgamma modulates refractive development and form deprivation myopia in Guinea pigs. *Exp Eye Res* **202**, 108332 (2021). <https://doi.org/10.1016/j.exer.2020.108332>
- 59 Liu, Z. *et al.* Canonical Wnt Signaling Drives Myopia Development and Can Be Pharmacologically Modulated. *Invest Ophthalmol Vis Sci* **62**, 21 (2021). <https://doi.org/10.1167/iovs.62.9.21>
- 60 Liu, S. *et al.* Lrpap1 deficiency leads to myopia through TGF-beta-induced apoptosis in zebrafish. *Cell Commun Signal* **20**, 162 (2022). <https://doi.org/10.1186/s12964-022-00970-9>
- 61 Chen, M., Qian, Y., Dai, J. & Chu, R. The sonic hedgehog signaling pathway induces myopic development by activating matrix metalloproteinase (MMP)-2 in Guinea pigs. *PLoS One* **9**, e96952 (2014). <https://doi.org/10.1371/journal.pone.0096952>
- 62 Jobling, A. I., Wan, R., Gentle, A., Bui, B. V. & McBrien, N. A. Retinal and choroidal TGF-beta in the tree shrew model of myopia: isoform expression, activation and effects on function. *Exp Eye Res* **88**, 458-466 (2009). <https://doi.org/10.1016/j.exer.2008.10.022>
- 63 Seko, Y., Shimokawa, H. & Tokoro, T. Expression of bFGF and TGF-beta 2 in experimental myopia in chicks. *Invest Ophthalmol Vis Sci* **36**, 1183-1187 (1995).
- 64 Zhu, X. *et al.* Aberrant TGF-beta1 signaling activation by MAF underlies pathological lens growth in high myopia. *Nat Commun* **12**, 2102 (2021). <https://doi.org/10.1038/s41467-021-22041-2>
- 65 Altelaar, A. F., Munoz, J. & Heck, A. J. Next-generation proteomics: towards an integrative view of proteome dynamics. *Nat Rev Genet* **14**, 35-48 (2013). <https://doi.org/10.1038/nrg3356>
- 66 Schubert, O. T., Rost, H. L., Collins, B. C., Rosenberger, G. & Aebersold, R. Quantitative proteomics: challenges and opportunities in basic and applied research. *Nat Protoc* **12**, 1289-1294 (2017). <https://doi.org/10.1038/nprot.2017.040>
- 67 Zhao, Y. & Jensen, O. N. Modification-specific proteomics: strategies for characterization of post-translational modifications using enrichment techniques. *Proteomics* **9**, 4632-4641 (2009). <https://doi.org/10.1002/pmic.200900398>
- 68 Li, N. *et al.* Characterization of human tear proteome using multiple proteomic analysis techniques. *J Proteome Res* **4**, 2052-2061 (2005). <https://doi.org/10.1021/pr0501970>
- 69 Gillet, L. C. *et al.* Targeted data extraction of the MS/MS spectra generated by data-independent acquisition: a new concept for consistent and accurate proteome analysis. *Mol Cell Proteomics* **11**, O111 016717 (2012). <https://doi.org/10.1074/mcp.O111.016717>
- 70 Collins, B. C. *et al.* Multi-laboratory assessment of reproducibility, qualitative and quantitative performance of SWATH-mass spectrometry. *Nat Commun* **8**, 291 (2017). <https://doi.org/10.1038/s41467-017-00249-5>
- 71 Molloy, M. P. The challenge of industrializing proteomics. *Nat Biotechnol* **21**, 597 (2003). <https://doi.org/10.1038/nbt0603-597a>
- 72 Zecha, J. *et al.* TMT Labeling for the Masses: A Robust and Cost-efficient, In-solution Labeling Approach. *Mol Cell Proteomics* **18**, 1468-1478 (2019). <https://doi.org/10.1074/mcp.TIR119.001385>
- 73 Mertins, P. *et al.* iTRAQ labeling is superior to mTRAQ for quantitative global proteomics and phosphoproteomics. *Mol Cell Proteomics* **11**, M111 014423 (2012). <https://doi.org/10.1074/mcp.M111.014423>

- 74 Lam, T. C., Li, K. K., Lo, S. C., Guggenheim, J. A. & To, C. H. A chick retinal proteome database and differential retinal protein expressions during early ocular development. *J Proteome Res* **5**, 771-784 (2006). <https://doi.org/10.1021/pr050280n>
- 75 Bertrand, E. *et al.* Identification of apolipoprotein A-I as a "STOP" signal for myopia. *Mol Cell Proteomics* **5**, 2158-2166 (2006). <https://doi.org/10.1074/mcp.M600073-MCP200>
- 76 Lam, T. C., Li, K. K., Lo, S. C., Guggenheim, J. A. & To, C. H. Application of fluorescence difference gel electrophoresis technology in searching for protein biomarkers in chick myopia. *J Proteome Res* **6**, 4135-4149 (2007). <https://doi.org/10.1021/pr0701097>
- 77 Sze, Y. H. *et al.* High-pH reversed-phase fractionated neural retina proteome of normal growing C57BL/6 mouse. *Sci Data* **8**, 27 (2021). <https://doi.org/10.1038/s41597-021-00813-1>
- 78 Barathi, V. A. *et al.* Involvement of GABA transporters in atropine-treated myopic retina as revealed by iTRAQ quantitative proteomics. *J Proteome Res* **13**, 4647-4658 (2014). <https://doi.org/10.1021/pr500558y>
- 79 Yu, F. J. *et al.* Isotope-coded protein label based quantitative proteomic analysis reveals significant up-regulation of apolipoprotein A1 and ovotransferrin in the myopic chick vitreous. *Sci Rep* **7**, 12649 (2017). <https://doi.org/10.1038/s41598-017-12650-7>
- 80 Kang, B. S., Lam, T. C., Cheung, J. K., Li, K. K. & Kee, C. S. Corneal proteome and differentially expressed corneal proteins in highly myopic chicks using a label-free SWATH-MS quantification approach. *Sci Rep* **11**, 5495 (2021). <https://doi.org/10.1038/s41598-021-84904-4>
- 81 Chen, J. *et al.* Novel Corneal Protein Biomarker Candidates Reveal Iron Metabolic Disturbance in High Myopia Eyes. *Front Cell Dev Biol* **9**, 689917 (2021). <https://doi.org/10.3389/fcell.2021.689917>
- 82 Huang, T. *et al.* Complement-mediated inflammation and mitochondrial energy metabolism in the proteomic profile of myopic human corneas. *J Proteomics* **285**, 104949 (2023). <https://doi.org/10.1016/j.jprot.2023.104949>
- 83 Tsai, C. Y. *et al.* Proteomic analysis of Exosomes derived from the Aqueous Humor of Myopia Patients. *Int J Med Sci* **18**, 2023-2029 (2021). <https://doi.org/10.7150/ijms.51735>
- 84 Cheung, J. K., Li, K. K., Zhou, L., To, C. H. & Lam, T. C. Data on protein changes of chick vitreous during normal eye growth using data-independent acquisition (SWATH-MS). *Data Brief* **30**, 105576 (2020). <https://doi.org/10.1016/j.dib.2020.105576>
- 85 Bian, J. *et al.* SWATH Based Quantitative Proteomics Reveals Significant Lipid Metabolism in Early Myopic Guinea Pig Retina. *Int J Mol Sci* **22** (2021). <https://doi.org/10.3390/ijms22094721>
- 86 Riddell, N. *et al.* The retina/RPE proteome in chick myopia and hyperopia models: Commonalities with inherited and age-related ocular pathologies. *Mol Vis* **23**, 872-888 (2017).
- 87 Wei, P., Han, G. & Wang, Y. Effects of dopamine D2 receptor antagonists on retinal pigment epithelial/choroid complex metabolism in form-deprived myopic guinea pigs. *Proteomics* **23**, e2200325 (2023). <https://doi.org/10.1002/pmic.202200325>
- 88 Frost, M. R. & Norton, T. T. Differential protein expression in tree shrew sclera during development of lens-induced myopia and recovery. *Mol Vis* **13**, 1580-1588 (2007).
- 89 Wen, Y. *et al.* Quantitative proteomic analysis of scleras in guinea pig exposed to wavelength defocus. *J Proteomics* **243**, 104248 (2021). <https://doi.org/10.1016/j.jprot.2021.104248>
- 90 Jiang, X. *et al.* A highly efficient murine model of experimental myopia. *Sci Rep* **8**, 2026 (2018). <https://doi.org/10.1038/s41598-018-20272-w>
- 91 Schaeffel, F. Test systems for measuring ocular parameters and visual function in mice. *Front Biosci* **13**, 4904-4911 (2008). <https://doi.org/10.2741/3049>

- 92 Walker, J. M. The bicinchoninic acid (BCA) assay for protein quantitation. *Methods Mol Biol* **32**, 5-8 (1994). <https://doi.org/10.1385/0-89603-268-X:5>
- 93 Waterborg, J. H. & Matthews, H. R. The lowry method for protein quantitation. *Methods Mol Biol* **1**, 1-3 (1984). <https://doi.org/10.1385/0-89603-062-8:1>
- 94 Bradford, M. M. A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Anal Biochem* **72**, 248-254 (1976). <https://doi.org/10.1006/abio.1976.9999>
- 95 Noble, J. E., Knight, A. E., Reason, A. J., Di Matola, A. & Bailey, M. J. A comparison of protein quantitation assays for biopharmaceutical applications. *Mol Biotechnol* **37**, 99-111 (2007). <https://doi.org/10.1007/s12033-007-0038-9>
- 96 Rossi, O. *et al.* Comparison of colorimetric assays with quantitative amino acid analysis for protein quantification of Generalized Modules for Membrane Antigens (GMMA). *Mol Biotechnol* **57**, 84-93 (2015). <https://doi.org/10.1007/s12033-014-9804-7>
- 97 Wisniewski, J. R. & Gaugaz, F. Z. Fast and sensitive total protein and Peptide assays for proteomic analysis. *Anal Chem* **87**, 4110-4116 (2015). <https://doi.org/10.1021/ac504689z>
- 98 Scopes, R. K. Measurement of protein by spectrophotometry at 205 nm. *Anal Biochem* **59**, 277-282 (1974). [https://doi.org/10.1016/0003-2697\(74\)90034-7](https://doi.org/10.1016/0003-2697(74)90034-7)
- 99 Zougman, A., Selby, P. J. & Banks, R. E. Suspension trapping (STrap) sample preparation method for bottom-up proteomics analysis. *Proteomics* **14**, 1006-1000 (2014). <https://doi.org/10.1002/pmic.201300553>
- 100 Ludwig, K. R., Schroll, M. M. & Hummon, A. B. Comparison of In-Solution, FASP, and S-Trap Based Digestion Methods for Bottom-Up Proteomic Studies. *J Proteome Res* **17**, 2480-2490 (2018). <https://doi.org/10.1021/acs.jproteome.8b00235>
- 101 Zhong, C. Q. *et al.* Generation of a murine SWATH-MS spectral library to quantify more than 11,000 proteins. *Sci Data* **7**, 104 (2020). <https://doi.org/10.1038/s41597-020-0449-z>
- 102 Palmowski, P. *et al.* The Generation of a Comprehensive Spectral Library for the Analysis of the Guinea Pig Proteome by SWATH-MS. *Proteomics* **19**, e1900156 (2019). <https://doi.org/10.1002/pmic.201900156>
- 103 HaileMariam, M. *et al.* S-Trap, an Ultrafast Sample-Preparation Approach for Shotgun Proteomics. *J Proteome Res* **17**, 2917-2924 (2018). <https://doi.org/10.1021/acs.jproteome.8b00505>
- 104 Perez-Riverol, Y. *et al.* The PRIDE database and related tools and resources in 2019: improving support for quantification data. *Nucleic Acids Res* **47**, D442-D450 (2019). <https://doi.org/10.1093/nar/gky1106>
- 105 Zhou, X. *et al.* Biometric measurement of the mouse eye using optical coherence tomography with focal plane advancement. *Vision Res* **48**, 1137-1143 (2008). <https://doi.org/10.1016/j.visres.2008.01.030>
- 106 Zhou, G. & Williams, R. W. Mouse models for the analysis of myopia: an analysis of variation in eye size of adult mice. *Optom Vis Sci* **76**, 408-418 (1999). <https://doi.org/10.1097/00006324-199906000-00021>
- 107 Schmucker, C. & Schaeffel, F. A paraxial schematic eye model for the growing C57BL/6 mouse. *Vision Res* **44**, 1857-1867 (2004). <https://doi.org/10.1016/j.visres.2004.03.011>
- 108 Deutsch, E. W. *et al.* Expanding the Use of Spectral Libraries in Proteomics. *J Proteome Res* **17**, 4051-4060 (2018). <https://doi.org/10.1021/acs.jproteome.8b00485>
- 109 Searle, B. C. *et al.* Generating high quality libraries for DIA MS with empirically corrected peptide predictions. *Nat Commun* **11**, 1548 (2020). <https://doi.org/10.1038/s41467-020-15346-1>
- 110 Edelman, M. J. Strong cation exchange chromatography in analysis of posttranslational modifications: innovations and perspectives. *J Biomed Biotechnol* **2011**, 936508 (2011). <https://doi.org/10.1155/2011/936508>

- 111 Yang, F., Shen, Y., Camp, D. G., 2nd & Smith, R. D. High-pH reversed-phase chromatography with fraction concatenation for 2D proteomic analysis. *Expert Rev Proteomics* **9**, 129-134 (2012). <https://doi.org/10.1586/epr.12.15>
- 112 Dowell, J. A., Frost, D. C., Zhang, J. & Li, L. Comparison of two-dimensional fractionation techniques for shotgun proteomics. *Anal Chem* **80**, 6715-6723 (2008). <https://doi.org/10.1021/ac8007994>
- 113 Kulak, N. A., Geyer, P. E. & Mann, M. Loss-less Nano-fractionator for High Sensitivity, High Coverage Proteomics. *Mol Cell Proteomics* **16**, 694-705 (2017). <https://doi.org/10.1074/mcp.O116.065136>
- 114 Siyal, A. A. *et al.* Sample Size-Comparable Spectral Library Enhances Data-Independent Acquisition-Based Proteome Coverage of Low-Input Cells. *Anal Chem* **93**, 17003-17011 (2021). <https://doi.org/10.1021/acs.analchem.1c03477>
- 115 Deutsch, E. W. The PeptideAtlas Project. *Methods Mol Biol* **604**, 285-296 (2010). https://doi.org/10.1007/978-1-60761-444-9_19
- 116 Stabio, M. E. *et al.* A novel map of the mouse eye for orienting retinal topography in anatomical space. *J Comp Neurol* **526**, 1749-1759 (2018). <https://doi.org/10.1002/cne.24446>
- 117 Wang, T., Chen, H., Li, N., Zhang, B. & Min, H. Aqueous humor proteomics analyzed by bioinformatics and machine learning in PDR cases versus controls. *Clin Proteomics* **21**, 36 (2024). <https://doi.org/10.1186/s12014-024-09481-w>
- 118 Qin, G., Zhang, P., Sun, M., Fu, W. & Cai, C. Comprehensive spectral libraries for various rabbit eye tissue proteomes. *Sci Data* **9**, 111 (2022). <https://doi.org/10.1038/s41597-022-01241-5>
- 119 Sze, Y. H. *et al.* Deep Spectral Library of Mice Retina for Myopia Research: Proteomics Dataset generated by SWATH and DIA-NN. *Sci Data* **11**, 1115 (2024). <https://doi.org/10.1038/s41597-024-03958-x>
- 120 Choi, J. *et al.* Spatial organization of the mouse retina at single cell resolution by MERFISH. *Nat Commun* **14**, 4929 (2023). <https://doi.org/10.1038/s41467-023-40674-3>
- 121 Zhang, D. *et al.* All-trans retinoic acid stimulates the secretion of TGF-beta2 via the phospholipase C but not the adenylyl cyclase signaling pathway in retinal pigment epithelium cells. *BMC Ophthalmol* **19**, 23 (2019). <https://doi.org/10.1186/s12886-018-1017-6>
- 122 Li, Y. *et al.* PI3K/AKT/mTOR signaling participates in insulin-mediated regulation of pathological myopia-related factors in retinal pigment epithelial cells. *BMC Ophthalmol* **21**, 218 (2021). <https://doi.org/10.1186/s12886-021-01946-y>
- 123 Li, J. *et al.* Hypoxia induces beta-amyloid in association with death of RGC-5 cells in culture. *Biochem Biophys Res Commun* **410**, 40-44 (2011). <https://doi.org/10.1016/j.bbrc.2011.05.101>
- 124 Wang, Q. *et al.* The Effect of Low-Dose Atropine on Alpha Ganglion Cell Signaling in the Mouse Retina. *Front Cell Neurosci* **15**, 664491 (2021). <https://doi.org/10.3389/fncel.2021.664491>
- 125 Liu, Y., Wang, X., Gong, R., Xu, G. & Zhu, M. Overexpression of Rhodopsin or Its Mutants Leads to Energy Metabolism Dysfunction in 661w Cells. *Invest Ophthalmol Vis Sci* **63**, 2 (2022). <https://doi.org/10.1167/iovs.63.13.2>
- 126 Senabouth, A. *et al.* Transcriptomic and proteomic retinal pigment epithelium signatures of age-related macular degeneration. *Nat Commun* **13**, 4233 (2022). <https://doi.org/10.1038/s41467-022-31707-4>
- 127 Pan, L. *et al.* Baicalein-A Potent Pro-Homeostatic Regulator of Microglia in Retinal Ischemic Injury. *Front Immunol* **13**, 837497 (2022). <https://doi.org/10.3389/fimmu.2022.837497>
- 128 Kwong, J. M. K. *et al.* Differential Retinal Protein Expression in Primary and Secondary Retinal Ganglion Cell Degeneration Identified by Integrated SWATH and Target-Based Proteomics. *Int J Mol Sci* **22** (2021). <https://doi.org/10.3390/ijms22168592>

- 129 Cheung, C. Y. *et al.* A deep learning model for detection of Alzheimer's disease based on retinal photographs: a retrospective, multicentre case-control study. *Lancet Digit Health* **4**, e806-e815 (2022). [https://doi.org/10.1016/S2589-7500\(22\)00169-8](https://doi.org/10.1016/S2589-7500(22)00169-8)
- 130 Lopez-Cuenca, I. *et al.* The relationship between retinal layers and brain areas in asymptomatic first-degree relatives of sporadic forms of Alzheimer's disease: an exploratory analysis. *Alzheimers Res Ther* **14**, 79 (2022). <https://doi.org/10.1186/s13195-022-01008-5>
- 131 Alber, J. *et al.* Retina pathology as a target for biomarkers for Alzheimer's disease: Current status, ophthalmopathological background, challenges, and future directions. *Alzheimers Dement* (2023). <https://doi.org/10.1002/alz.13529>
- 132 Javitt, D. C. *et al.* Disruption of early visual processing in amyloid-positive healthy individuals and mild cognitive impairment. *Alzheimers Res Ther* **15**, 42 (2023). <https://doi.org/10.1186/s13195-023-01189-7>
- 133 Remy, I. *et al.* Association between retinal and cortical visual electrophysiological impairments in schizophrenia. *J Psychiatry Neurosci* **48**, E171-E178 (2023). <https://doi.org/10.1503/jpn.220224>
- 134 Wagner, S. K. *et al.* Association Between Retinal Features From Multimodal Imaging and Schizophrenia. *JAMA Psychiatry* **80**, 478-487 (2023). <https://doi.org/10.1001/jamapsychiatry.2023.0171>
- 135 Chen, J., Chen, D. F. & Cho, K. S. The Role of Gut Microbiota in Glaucoma Progression and Other Retinal Diseases. *Am J Pathol* **193**, 1662-1668 (2023). <https://doi.org/10.1016/j.ajpath.2023.06.015>
- 136 Wolf, J. *et al.* Liquid-biopsy proteomics combined with AI identifies cellular drivers of eye aging and disease in vivo. *Cell* **186**, 4868-4884 e4812 (2023). <https://doi.org/10.1016/j.cell.2023.09.012>
- 137 Ludwig, C. *et al.* Data-independent acquisition-based SWATH-MS for quantitative proteomics: a tutorial. *Mol Syst Biol* **14**, e8126 (2018). <https://doi.org/10.15252/msb.20178126>
- 138 Batth, T. S., Francavilla, C. & Olsen, J. V. Off-line high-pH reversed-phase fractionation for in-depth phosphoproteomics. *J Proteome Res* **13**, 6176-6186 (2014). <https://doi.org/10.1021/pr500893m>
- 139 Chan, K. C. & Issaq, H. J. Fractionation of peptides by strong cation-exchange liquid chromatography. *Methods Mol Biol* **1002**, 311-315 (2013). https://doi.org/10.1007/978-1-62703-360-2_23
- 140 Searle, B. C. *et al.* Chromatogram libraries improve peptide detection and quantification by data independent acquisition mass spectrometry. *Nat Commun* **9**, 5128 (2018). <https://doi.org/10.1038/s41467-018-07454-w>
- 141 Van Puyvelde, B. *et al.* Removing the Hidden Data Dependency of DIA with Predicted Spectral Libraries. *Proteomics* **20**, e1900306 (2020). <https://doi.org/10.1002/pmic.201900306>
- 142 Yang, Y. *et al.* In silico spectral libraries by deep learning facilitate data-independent acquisition proteomics. *Nat Commun* **11**, 146 (2020). <https://doi.org/10.1038/s41467-019-13866-z>
- 143 Demichev, V., Messner, C. B., Vernardis, S. I., Lilley, K. S. & Ralser, M. DIA-NN: neural networks and interference correction enable deep proteome coverage in high throughput. *Nat Methods* **17**, 41-44 (2020). <https://doi.org/10.1038/s41592-019-0638-x>
- 144 Zhang, F. *et al.* A Comparative Analysis of Data Analysis Tools for Data-Independent Acquisition Mass Spectrometry. *Mol Cell Proteomics* **22**, 100623 (2023). <https://doi.org/10.1016/j.mcpro.2023.100623>
- 145 Cox, J. *et al.* Accurate proteome-wide label-free quantification by delayed normalization and maximal peptide ratio extraction, termed MaxLFQ. *Mol Cell Proteomics* **13**, 2513-2526 (2014). <https://doi.org/10.1074/mcp.M113.031591>

- 146 Perez-Riverol, Y. *et al.* The PRIDE database resources in 2022: a hub for mass spectrometry-based proteomics evidences. *Nucleic Acids Res* **50**, D543-D552 (2022). <https://doi.org/10.1093/nar/gkab1038>
- 147 Sze, Y. H., Tse, Y. Y., Zuo B., Li K. K., Zhao Q., Jiang, X., Kurihara T., Tsubota, K. & Lam, C. Deep Quantitative Spectral Library of Normal and Myopic Mice Retinas: Proteomics Data from SWATH-MS and DIA-NN. *PRIDE* (2024). <https://doi.org/https://identifiers.org/pride.project:PXD046983>
- 148 Ting, Y. S. *et al.* Peptide-Centric Proteome Analysis: An Alternative Strategy for the Analysis of Tandem Mass Spectrometry Data. *Mol Cell Proteomics* **14**, 2301-2307 (2015). <https://doi.org/10.1074/mcp.O114.047035>
- 149 Sinitcyn, P. *et al.* MaxDIA enables library-based and library-free data-independent acquisition proteomics. *Nat Biotechnol* **39**, 1563-1573 (2021). <https://doi.org/10.1038/s41587-021-00968-7>
- 150 Wen, C. *et al.* Evaluation of DDA Library-Free Strategies for Phosphoproteomics and Ubiquitinomics Data-Independent Acquisition Data. *J Proteome Res* **22**, 2232-2245 (2023). <https://doi.org/10.1021/acs.jproteome.2c00735>
- 151 Govaert, E. *et al.* Comparison of fractionation proteomics for local SWATH library building. *Proteomics* **17** (2017). <https://doi.org/10.1002/pmic.201700052>
- 152 Messner, C. B. *et al.* Ultra-fast proteomics with Scanning SWATH. *Nat Biotechnol* **39**, 846-854 (2021). <https://doi.org/10.1038/s41587-021-00860-4>
- 153 Messner, C. B. *et al.* Ultra-High-Throughput Clinical Proteomics Reveals Classifiers of COVID-19 Infection. *Cell Syst* **11**, 11-24 e14 (2020). <https://doi.org/10.1016/j.cels.2020.05.012>
- 154 Wang, Z. *et al.* High-throughput proteomics of nanogram-scale samples with Zeno SWATH MS. *Elife* **11** (2022). <https://doi.org/10.7554/eLife.83947>
- 155 Kawashima, Y. *et al.* Single-Shot 10K Proteome Approach: Over 10,000 Protein Identifications by Data-Independent Acquisition-Based Single-Shot Proteomics with Ion Mobility Spectrometry. *J Proteome Res* **21**, 1418-1427 (2022). <https://doi.org/10.1021/acs.jproteome.2c00023>
- 156 Yu, F. *et al.* Analysis of DIA proteomics data using MSFragger-DIA and FragPipe computational platform. *Nat Commun* **14**, 4154 (2023). <https://doi.org/10.1038/s41467-023-39869-5>
- 157 Li, Q. *et al.* Form-deprivation myopia downregulates calcium levels in retinal horizontal cells in mice. *Exp Eye Res* **218**, 109018 (2022). <https://doi.org/10.1016/j.exer.2022.109018>
- 158 Zhang, P. & Zhu, H. Light Signaling and Myopia Development: A Review. *Ophthalmol Ther* **11**, 939-957 (2022). <https://doi.org/10.1007/s40123-022-00490-2>
- 159 Schaeffel, F. & Feldkaemper, M. Animal models in myopia research. *Clin Exp Optom* **98**, 507-517 (2015). <https://doi.org/10.1111/exo.12312>
- 160 Cameron, M. A. *et al.* Electroretinography of wild-type and Cry mutant mice reveals circadian tuning of photopic and mesopic retinal responses. *J Biol Rhythms* **23**, 489-501 (2008). <https://doi.org/10.1177/0748730408325874>
- 161 Park, H. *et al.* Assessment of axial length measurements in mouse eyes. *Optom Vis Sci* **89**, 296-303 (2012). <https://doi.org/10.1097/OPX.0b013e31824529e5>
- 162 Lenhart, P. D., Hutchinson, A. K., Lynn, M. J. & Lambert, S. R. Partial coherence interferometry versus immersion ultrasonography for axial length measurement in children. *J Cataract Refract Surg* **36**, 2100-2104 (2010). <https://doi.org/10.1016/j.jcrs.2010.07.013>
- 163 Lou, L., Hall, K. M. & Pardue, M. T. Effect of OCT Alignment on Ocular Parameters in the Mouse Eye. *Investigative Ophthalmology & Visual Science* **64**, 847-847 (2023).
- 164 Tkatchenko, T. V. *et al.* Photopic visual input is necessary for emmetropization in mice. *Exp Eye Res* **115**, 87-95 (2013). <https://doi.org/10.1016/j.exer.2013.06.025>

- 165 Jiang, M. *et al.* Single-shot dimension measurements of the mouse eye using SD-OCT. *Ophthalmic Surg Lasers Imaging* **43**, 252-256 (2012). <https://doi.org/10.3928/15428877-20120308-04>
- 166 Geng, Y. *et al.* Optical properties of the mouse eye. *Biomed Opt Express* **2**, 717-738 (2011). <https://doi.org/10.1364/BOE.2.000717>
- 167 Ashton, J. R., West, J. L. & Badea, C. T. In vivo small animal micro-CT using nanoparticle contrast agents. *Front Pharmacol* **6**, 256 (2015). <https://doi.org/10.3389/fphar.2015.00256>
- 168 Tkatchenko, T. V., Shen, Y. & Tkatchenko, A. V. Analysis of postnatal eye development in the mouse with high-resolution small animal magnetic resonance imaging. *Invest Ophthalmol Vis Sci* **51**, 21-27 (2010). <https://doi.org/10.1167/iovs.08-2767>
- 169 Drager, U. C. & Olsen, J. F. Ganglion cell distribution in the retina of the mouse. *Invest Ophthalmol Vis Sci* **20**, 285-293 (1981).
- 170 Sterratt, D. C., Lyngholm, D., Willshaw, D. J. & Thompson, I. D. Standard anatomical and visual space for the mouse retina: computational reconstruction and transformation of flattened retinæ with the Retistruct package. *PLoS Comput Biol* **9**, e1002921 (2013). <https://doi.org/10.1371/journal.pcbi.1002921>
- 171 Hunt, O. A., Wolffsohn, J. S. & Gilmartin, B. Evaluation of the measurement of refractive error by the PowerRefractor: a remote, continuous and binocular measurement system of oculomotor function. *Br J Ophthalmol* **87**, 1504-1508 (2003). <https://doi.org/10.1136/bjo.87.12.1504>
- 172 Perez-Merino, P. *et al.* Three-dimensional OCT based guinea pig eye model: relating morphology and optics. *Biomed Opt Express* **8**, 2173-2184 (2017). <https://doi.org/10.1364/BOE.8.002173>
- 173 Batista, A. *et al.* Normative mice retinal thickness: 16-month longitudinal characterization of wild-type mice and changes in a model of Alzheimer's disease. *Front Aging Neurosci* **15**, 1161847 (2023). <https://doi.org/10.3389/fnagi.2023.1161847>
- 174 Chen, Y. *et al.* Association of Myopia With Risk of Incident Metabolic Syndrome: Findings From the UK Biobank Study Cohort of 91,591 Participants. *Front Med (Lausanne)* **9**, 872013 (2022). <https://doi.org/10.3389/fmed.2022.872013>
- 175 Yu, F. J. *et al.* Alteration of retinal metabolism and oxidative stress may implicate myopic eye growth: Evidence from discovery and targeted proteomics in an animal model. *J Proteomics* **221**, 103684 (2020). <https://doi.org/10.1016/j.jprot.2020.103684>
- 176 Li, F. F. *et al.* Causal Relationships Between Glycemic Traits and Myopia. *Invest Ophthalmol Vis Sci* **64**, 7 (2023). <https://doi.org/10.1167/iovs.64.3.7>
- 177 Kahn, B. B. *et al.* Expression of GLUT1 and GLUT4 glucose transporters in skeletal muscle of humans with insulin-dependent diabetes mellitus: regulatory effects of metabolic factors. *J Clin Endocrinol Metab* **74**, 1101-1109 (1992). <https://doi.org/10.1210/jcem.74.5.1569156>
- 178 Ebeling, P., Koistinen, H. A. & Koivisto, V. A. Insulin-independent glucose transport regulates insulin sensitivity. *FEBS Lett* **436**, 301-303 (1998). [https://doi.org/10.1016/s0014-5793\(98\)01149-1](https://doi.org/10.1016/s0014-5793(98)01149-1)
- 179 Feng, J. *et al.* Lactylome analysis reveals potential target modified proteins in the retina of form-deprivation myopia. *iScience* **27**, 110606 (2024). <https://doi.org/10.1016/j.isci.2024.110606>
- 180 Wu, J. X. *et al.* SWATH Mass Spectrometry Performance Using Extended Peptide MS/MS Assay Libraries. *Mol Cell Proteomics* **15**, 2501-2514 (2016). <https://doi.org/10.1074/mcp.M115.055558>
- 181 Gessulat, S. *et al.* Prosit: proteome-wide prediction of peptide tandem mass spectra by deep learning. *Nat Methods* **16**, 509-518 (2019). <https://doi.org/10.1038/s41592-019-0426-7>

- 182 Dowell, J. A., Wright, L. J., Armstrong, E. A. & Denu, J. M. Benchmarking Quantitative Performance in Label-Free Proteomics. *ACS Omega* **6**, 2494-2504 (2021). <https://doi.org/10.1021/acsomega.0c04030>
- 183 Kanehisa, M., Sato, Y., Kawashima, M., Furumichi, M. & Tanabe, M. KEGG as a reference resource for gene and protein annotation. *Nucleic Acids Res* **44**, D457-462 (2016). <https://doi.org/10.1093/nar/gkv1070>
- 184 Szklarczyk, D. *et al.* The STRING database in 2023: protein-protein association networks and functional enrichment analyses for any sequenced genome of interest. *Nucleic Acids Res* **51**, D638-D646 (2023). <https://doi.org/10.1093/nar/gkac1000>
- 185 van der Sande, E. *et al.* The Role of GJD2(Cx36) in Refractive Error Development. *Invest Ophthalmol Vis Sci* **63**, 5 (2022). <https://doi.org/10.1167/iovs.63.3.5>
- 186 Tkatchenko, T. V. & Tkatchenko, A. V. Genome-wide analysis of retinal transcriptome reveals common genetic network underlying perception of contrast and optical defocus detection. *BMC Med Genomics* **14**, 153 (2021). <https://doi.org/10.1186/s12920-021-01005-x>
- 187 Zhou, X., Pardue, M. T., Iuvone, P. M. & Qu, J. Dopamine signaling and myopia development: What are the key challenges. *Prog Retin Eye Res* **61**, 60-71 (2017). <https://doi.org/10.1016/j.preteyeres.2017.06.003>
- 188 Stone, R. A., Lin, T., Laties, A. M. & Iuvone, P. M. Retinal dopamine and form-deprivation myopia. *Proc Natl Acad Sci U S A* **86**, 704-706 (1989). <https://doi.org/10.1073/pnas.86.2.704>
- 189 Lauber, J. K. & Oishi, T. Lid suture myopia in chicks. *Invest Ophthalmol Vis Sci* **28**, 1851-1858 (1987).
- 190 Jiang, X. *et al.* Violet light suppresses lens-induced myopia via neuropsin (OPN5) in mice. *Proc Natl Acad Sci U S A* **118** (2021). <https://doi.org/10.1073/pnas.2018840118>
- 191 Wu, H. *et al.* Scleral hypoxia is a target for myopia control. *Proc Natl Acad Sci U S A* **115**, E7091-E7100 (2018). <https://doi.org/10.1073/pnas.1721443115>
- 192 Pickett-Seltner, R. L., Sivak, J. G. & Pasternak, J. J. Experimentally induced myopia in chicks: morphometric and biochemical analysis during the first 14 days after hatching. *Vision Res* **28**, 323-328 (1988). [https://doi.org/10.1016/0042-6989\(88\)90160-5](https://doi.org/10.1016/0042-6989(88)90160-5)
- 193 Muralidharan, A. R. *et al.* Recovery From Form-Deprivation Myopia in Chicks Is Dependent Upon the Fullness and Correlated Color Temperature of the Light Spectrum. *Invest Ophthalmol Vis Sci* **63**, 16 (2022). <https://doi.org/10.1167/iovs.63.2.16>
- 194 Mori, K. *et al.* Oral crocetin administration suppressed refractive shift and axial elongation in a murine model of lens-induced myopia. *Sci Rep* **9**, 295 (2019). <https://doi.org/10.1038/s41598-018-36576-w>
- 195 Ohno-Matsui, K. *et al.* IMI Pathologic Myopia. *Invest Ophthalmol Vis Sci* **62**, 5 (2021). <https://doi.org/10.1167/iovs.62.5.5>
- 196 van Bentum, M. & Selbach, M. An Introduction to Advanced Targeted Acquisition Methods. *Mol Cell Proteomics* **20**, 100165 (2021). <https://doi.org/10.1016/j.mcpro.2021.100165>
- 197 Yocum, A. K. & Chinnaiyan, A. M. Current affairs in quantitative targeted proteomics: multiple reaction monitoring-mass spectrometry. *Brief Funct Genomic Proteomic* **8**, 145-157 (2009). <https://doi.org/10.1093/bfgp/eln056>
- 198 Daniele, L. L. *et al.* Glucose uptake by GLUT1 in photoreceptors is essential for outer segment renewal and rod photoreceptor survival. *FASEB J* **36**, e22428 (2022). <https://doi.org/10.1096/fj.202200369R>
- 199 Morgello, S., Uson, R. R., Schwartz, E. J. & Haber, R. S. The human blood-brain barrier glucose transporter (GLUT1) is a glucose transporter of gray matter astrocytes. *Glia* **14**, 43-54 (1995). <https://doi.org/10.1002/glia.440140107>
- 200 Swarup, A. *et al.* Modulating GLUT1 expression in retinal pigment epithelium decreases glucose levels in the retina: impact on photoreceptors and Muller glial cells. *Am J Physiol Cell Physiol* **316**, C121-C133 (2019). <https://doi.org/10.1152/ajpcell.00410.2018>

- 201 Badr, G. A., Tang, J., Ismail-Beigi, F. & Kern, T. S. Diabetes downregulates GLUT1
expression in the retina and its microvessels but not in the cerebral cortex or its microvessels.
Diabetes **49**, 1016-1021 (2000). <https://doi.org/10.2337/diabetes.49.6.1016>
- 202 Gospe, S. M., 3rd, Baker, S. A. & Arshavsky, V. Y. Facilitative glucose transporter Glut1 is
actively excluded from rod outer segments. *J Cell Sci* **123**, 3639-3644 (2010).
<https://doi.org/10.1242/jcs.072389>
- 203 Petit, L. *et al.* Aerobic Glycolysis Is Essential for Normal Rod Function and Controls
Secondary Cone Death in Retinitis Pigmentosa. *Cell Rep* **23**, 2629-2642 (2018).
<https://doi.org/10.1016/j.celrep.2018.04.111>
- 204 Warburg, O. On the origin of cancer cells. *Science* **123**, 309-314 (1956).
<https://doi.org/10.1126/science.123.3191.309>
- 205 Ait-Ali, N. *et al.* Rod-derived cone viability factor promotes cone survival by stimulating
aerobic glycolysis. *Cell* **161**, 817-832 (2015). <https://doi.org/10.1016/j.cell.2015.03.023>
- 206 Jin, Z. B. *et al.* Trio-based exome sequencing arrests de novo mutations in early-onset high
myopia. *Proc Natl Acad Sci U S A* **114**, 4219-4224 (2017).
<https://doi.org/10.1073/pnas.1615970114>
- 207 Tserentsoodol, N., Shin, B. C., Suzuki, T. & Takata, K. Colocalization of tight junction
proteins, occludin and ZO-1, and glucose transporter GLUT1 in cells of the blood-ocular
barrier in the mouse eye. *Histochem Cell Biol* **110**, 543-551 (1998).
<https://doi.org/10.1007/s004180050316>
- 208 Zhu, X. *et al.* CCL2-mediated inflammatory pathogenesis underlies high myopia-related
anxiety. *Cell Discov* **9**, 94 (2023). <https://doi.org/10.1038/s41421-023-00588-2>
- 209 Cox, A. G. *et al.* Yap regulates glucose utilization and sustains nucleotide synthesis to enable
organ growth. *EMBO J* **37** (2018). <https://doi.org/10.15252/emj.2018100294>
- 210 Lin, S. C. & Hardie, D. G. AMPK: Sensing Glucose as well as Cellular Energy Status. *Cell
Metab* **27**, 299-313 (2018). <https://doi.org/10.1016/j.cmet.2017.10.009>
- 211 Ibar, C. & Irvine, K. D. Integration of Hippo-YAP Signaling with Metabolism. *Dev Cell* **54**,
256-267 (2020). <https://doi.org/10.1016/j.devcel.2020.06.025>
- 212 Ahsan, M., Garneau, L. & Aguer, C. The bidirectional relationship between AMPK pathway
activation and myokine secretion in skeletal muscle: How it affects energy metabolism. *Front
Physiol* **13**, 1040809 (2022). <https://doi.org/10.3389/fphys.2022.1040809>
- 213 Desvergne, B. & Wahli, W. Peroxisome proliferator-activated receptors: nuclear control of
metabolism. *Endocr Rev* **20**, 649-688 (1999). <https://doi.org/10.1210/edrv.20.5.0380>
- 214 Neels, J. G. & Grimaldi, P. A. Physiological functions of peroxisome proliferator-activated
receptor beta. *Physiol Rev* **94**, 795-858 (2014). <https://doi.org/10.1152/physrev.00027.2013>
- 215 Varga, T., Czimmerer, Z. & Nagy, L. PPARs are a unique set of fatty acid regulated
transcription factors controlling both lipid metabolism and inflammation. *Biochim Biophys
Acta* **1812**, 1007-1022 (2011). <https://doi.org/10.1016/j.bbadis.2011.02.014>
- 216 Croasdell, A. *et al.* PPARgamma and the Innate Immune System Mediate the Resolution of
Inflammation. *PPAR Res* **2015**, 549691 (2015). <https://doi.org/10.1155/2015/549691>
- 217 Peters, J. M., Shah, Y. M. & Gonzalez, F. J. The role of peroxisome proliferator-activated
receptors in carcinogenesis and chemoprevention. *Nat Rev Cancer* **12**, 181-195 (2012).
<https://doi.org/10.1038/nrc3214>
- 218 Ahmadian, M. *et al.* PPARgamma signaling and metabolism: the good, the bad and the
future. *Nat Med* **19**, 557-566 (2013). <https://doi.org/10.1038/nm.3159>
- 219 Lebovitz, H. E. *et al.* Rosiglitazone monotherapy is effective in patients with type 2 diabetes.
J Clin Endocrinol Metab **86**, 280-288 (2001). <https://doi.org/10.1210/jcem.86.1.7157>
- 220 Jay, M. A. & Ren, J. Peroxisome proliferator-activated receptor (PPAR) in metabolic
syndrome and type 2 diabetes mellitus. *Curr Diabetes Rev* **3**, 33-39 (2007).
<https://doi.org/10.2174/157339907779802067>

- 221 Lu, L. *et al.* Suppression of GLUT1; a new strategy to prevent diabetic complications. *J Cell Physiol* **228**, 251-257 (2013). <https://doi.org/10.1002/jcp.24133>
- 222 Grygiel-Gorniak, B. Peroxisome proliferator-activated receptors and their ligands: nutritional and clinical implications--a review. *Nutr J* **13**, 17 (2014). <https://doi.org/10.1186/1475-2891-13-17>
- 223 Rosen, C. J. Revisiting the rosiglitazone story--lessons learned. *N Engl J Med* **363**, 803-806 (2010). <https://doi.org/10.1056/NEJMp1008233>
- 224 Chinchore, Y., Begaj, T., Wu, D., Drokhlyansky, E. & Cepko, C. L. Glycolytic reliance promotes anabolism in photoreceptors. *Elife* **6** (2017). <https://doi.org/10.7554/eLife.25946>
- 225 LeGates, T. A., Fernandez, D. C. & Hattar, S. Light as a central modulator of circadian rhythms, sleep and affect. *Nat Rev Neurosci* **15**, 443-454 (2014). <https://doi.org/10.1038/nrn3743>
- 226 Ohta, H., Yamazaki, S. & McMahan, D. G. Constant light desynchronizes mammalian clock neurons. *Nat Neurosci* **8**, 267-269 (2005). <https://doi.org/10.1038/nn1395>
- 227 Wu, Y. *et al.* Reciprocal Regulation between the Circadian Clock and Hypoxia Signaling at the Genome Level in Mammals. *Cell Metab* **25**, 73-85 (2017). <https://doi.org/10.1016/j.cmet.2016.09.009>
- 228 Manella, G. *et al.* Hypoxia induces a time- and tissue-specific response that elicits intertissue circadian clock misalignment. *Proc Natl Acad Sci U S A* **117**, 779-786 (2020). <https://doi.org/10.1073/pnas.1914112117>
- 229 Peng, F., Li, X., Xiao, F., Zhao, R. & Sun, Z. Circadian clock, diurnal glucose metabolic rhythm, and dawn phenomenon. *Trends Neurosci* **45**, 471-482 (2022). <https://doi.org/10.1016/j.tins.2022.03.010>
- 230 Rodriguez-Cortes, B. *et al.* Suprachiasmatic nucleus-mediated glucose entry into the arcuate nucleus determines the daily rhythm in blood glycemia. *Curr Biol* **32**, 796-805 e794 (2022). <https://doi.org/10.1016/j.cub.2021.12.039>
- 231 Chen, C., Pore, N., Behrooz, A., Ismail-Beigi, F. & Maity, A. Regulation of glut1 mRNA by hypoxia-inducible factor-1. Interaction between H-ras and hypoxia. *J Biol Chem* **276**, 9519-9525 (2001). <https://doi.org/10.1074/jbc.M010144200>
- 232 Ding, G. *et al.* REV-ERB in GABAergic neurons controls diurnal hepatic insulin sensitivity. *Nature* **592**, 763-767 (2021). <https://doi.org/10.1038/s41586-021-03358-w>
- 233 Furuse, T. *et al.* A new mouse model of GLUT1 deficiency syndrome exhibits abnormal sleep-wake patterns and alterations of glucose kinetics in the brain. *Dis Model Mech* **12** (2019). <https://doi.org/10.1242/dmm.038828>
- 234 Meng, J. J. *et al.* Light modulates glucose metabolism by a retina-hypothalamus-brown adipose tissue axis. *Cell* **186**, 398-412 e317 (2023). <https://doi.org/10.1016/j.cell.2022.12.024>
- 235 Swiatczak, B. & Schaeffel, F. Myopia: why the retina stops inhibiting eye growth. *Sci Rep* **12**, 21704 (2022). <https://doi.org/10.1038/s41598-022-26323-7>
- 236 Raji, A., Seely, E. W., Bekins, S. A., Williams, G. H. & Simonson, D. C. Rosiglitazone improves insulin sensitivity and lowers blood pressure in hypertensive patients. *Diabetes Care* **26**, 172-178 (2003). <https://doi.org/10.2337/diacare.26.1.172>
- 237 Cox, P. J. *et al.* Absorption, disposition, and metabolism of rosiglitazone, a potent thiazolidinedione insulin sensitizer, in humans. *Drug Metab Dispos* **28**, 772-780 (2000).
- 238 Majmundar, A. J., Wong, W. J. & Simon, M. C. Hypoxia-inducible factors and the response to hypoxic stress. *Mol Cell* **40**, 294-309 (2010). <https://doi.org/10.1016/j.molcel.2010.09.022>
- 239 Zhang, J. Z., Behrooz, A. & Ismail-Beigi, F. Regulation of glucose transport by hypoxia. *Am J Kidney Dis* **34**, 189-202 (1999). [https://doi.org/10.1016/s0272-6386\(99\)70131-9](https://doi.org/10.1016/s0272-6386(99)70131-9)
- 240 Narravula, S. & Colgan, S. P. Hypoxia-inducible factor 1-mediated inhibition of peroxisome proliferator-activated receptor alpha expression during hypoxia. *J Immunol* **166**, 7543-7548 (2001). <https://doi.org/10.4049/jimmunol.166.12.7543>

- 241 Krishnan, J. *et al.* Activation of a HIF1alpha-PPARgamma axis underlies the integration of glycolytic and lipid anabolic pathways in pathologic cardiac hypertrophy. *Cell Metab* **9**, 512-524 (2009). <https://doi.org/10.1016/j.cmet.2009.05.005>
- 242 Henry, M., Kitchens, J., Pascual, J. M. & Maldonado, R. S. GLUT1 deficiency: Retinal detrimental effects of gliovascular modulation. *Neurol Genet* **6**, e472 (2020). <https://doi.org/10.1212/NXG.0000000000000472>
- 243 Pan, M. *et al.* Dietary omega-3 polyunsaturated fatty acids are protective for myopia. *Proc Natl Acad Sci U S A* **118** (2021). <https://doi.org/10.1073/pnas.2104689118>
- 244 Ma, J. *et al.* Peroxisome Proliferator-Activated Receptor-Gamma Reduces ER Stress and Inflammation via Targeting NGBR Expression. *Front Pharmacol* **12**, 817784 (2021). <https://doi.org/10.3389/fphar.2021.817784>
- 245 Ikeda, S. I. *et al.* Scleral PERK and ATF6 as targets of myopic axial elongation of mouse eyes. *Nat Commun* **13**, 5859 (2022). <https://doi.org/10.1038/s41467-022-33605-1>
- 246 Li, P. *et al.* Protective effects of rosiglitazone on retinal neuronal damage in diabetic rats. *Curr Eye Res* **36**, 673-679 (2011). <https://doi.org/10.3109/02713683.2011.572220>
- 247 Bosco, A. A., Lerario, A. C., Santos, R. F. & Wajchenberg, B. L. Effect of thalidomide and rosiglitazone on the prevention of diabetic retinopathy in streptozotocin-induced diabetic rats. *Diabetologia* **46**, 1669-1675 (2003). <https://doi.org/10.1007/s00125-003-1234-1>
- 248 Ardito, F., Giuliani, M., Perrone, D., Troiano, G. & Lo Muzio, L. The crucial role of protein phosphorylation in cell signaling and its use as targeted therapy (Review). *Int J Mol Med* **40**, 271-280 (2017). <https://doi.org/10.3892/ijmm.2017.3036>
- 249 Giambalvo, C. T. Protein kinase C and dopamine release--II. Effect of dopamine acting drugs in vivo. *Biochem Pharmacol* **37**, 4009-4017 (1988). [https://doi.org/10.1016/0006-2952\(88\)90087-1](https://doi.org/10.1016/0006-2952(88)90087-1)
- 250 Thomson, K., Morgan, I., Karouta, C. & Ashby, R. Author Correction: Levodopa inhibits the development of lens-induced myopia in chicks. *Sci Rep* **11**, 15635 (2021). <https://doi.org/10.1038/s41598-021-94667-7>
- 251 Pawson, T. & Scott, J. D. Protein phosphorylation in signaling--50 years and counting. *Trends Biochem Sci* **30**, 286-290 (2005). <https://doi.org/10.1016/j.tibs.2005.04.013>
- 252 Kato, S., Ishita, S., Mawatari, K., Matsukawa, T. & Negishi, K. Dopamine release via protein kinase C activation in the fish retina. *J Neurochem* **54**, 2082-2090 (1990). <https://doi.org/10.1111/j.1471-4159.1990.tb04914.x>
- 253 Hardie, R. C. *et al.* Protein kinase C is required for light adaptation in Drosophila photoreceptors. *Nature* **363**, 634-637 (1993). <https://doi.org/10.1038/363634a0>
- 254 Ruether, K. *et al.* PKCalpha is essential for the proper activation and termination of rod bipolar cell response. *Invest Ophthalmol Vis Sci* **51**, 6051-6058 (2010). <https://doi.org/10.1167/iovs.09-4704>
- 255 Zhou, Y. Y. *et al.* Proteomic analysis of chick retina during early recovery from lens-induced myopia. *Mol Med Rep* **18**, 59-66 (2018). <https://doi.org/10.3892/mmr.2018.8954>
- 256 Banerjee, S. *et al.* Increased Connexin36 Phosphorylation in AII Amacrine Cell Coupling of the Mouse Myopic Retina. *Front Cell Neurosci* **14**, 124 (2020). <https://doi.org/10.3389/fncel.2020.00124>
- 257 Zhou, H. *et al.* Robust phosphoproteome enrichment using monodisperse microsphere-based immobilized titanium (IV) ion affinity chromatography. *Nature Protocols* **8**, 461-480 (2013). <https://doi.org/10.1038/nprot.2013.010>
- 258 Zhou, H. *et al.* Specific Phosphopeptide Enrichment with Immobilized Titanium Ion Affinity Chromatography Adsorbent for Phosphoproteome Analysis. *Journal of Proteome Research* **7**, 3957-3967 (2008). <https://doi.org/10.1021/pr800223m>
- 259 Johnson, J. L. *et al.* An atlas of substrate specificities for the human serine/threonine kinome. *Nature* **613**, 759-766 (2023). <https://doi.org/10.1038/s41586-022-05575-3>

- 260 Eid, S., Turk, S., Volkamer, A., Rippmann, F. & Fulle, S. KinMap: a web-based tool for interactive navigation through human kinome data. *BMC Bioinformatics* **18**, 16 (2017). <https://doi.org/10.1186/s12859-016-1433-7>
- 261 Vlastaridis, P. *et al.* Estimating the total number of phosphoproteins and phosphorylation sites in eukaryotic proteomes. *Gigascience* **6**, 1-11 (2017). <https://doi.org/10.1093/gigascience/giw015>
- 262 Qin, Y. *et al.* Scleral remodeling in early adulthood: the role of FGF-2. *Sci Rep* **13**, 20779 (2023). <https://doi.org/10.1038/s41598-023-48264-5>
- 263 Bhullar, K. S. *et al.* Kinase-targeted cancer therapies: progress, challenges and future directions. *Mol Cancer* **17**, 48 (2018). <https://doi.org/10.1186/s12943-018-0804-2>
- 264 Chowdhury, I., Dashi, G. & Keskitalo, S. CMGC Kinases in Health and Cancer. *Cancers (Basel)* **15** (2023). <https://doi.org/10.3390/cancers15153838>
- 265 Yu, J. H. *et al.* CDK10 functions as a tumor suppressor gene and regulates survivability of biliary tract cancer cells. *Oncol Rep* **27**, 1266-1276 (2012). <https://doi.org/10.3892/or.2011.1617>
- 266 Guen, V. J., Gamble, C., Lees, J. A. & Colas, P. The awakening of the CDK10/Cyclin M protein kinase. *Oncotarget* **8**, 50174-50186 (2017). <https://doi.org/10.18632/oncotarget.15024>
- 267 Li, A., Zhu, X., Brown, B. & Craft, C. M. Gene expression networks underlying retinoic acid-induced differentiation of human retinoblastoma cells. *Invest Ophthalmol Vis Sci* **44**, 996-1007 (2003). <https://doi.org/10.1167/iovs.02-0434>
- 268 Brown, D. M. *et al.* Exogenous All-Trans Retinoic Acid Induces Myopia and Alters Scleral Biomechanics in Mice. *Invest Ophthalmol Vis Sci* **64**, 22 (2023). <https://doi.org/10.1167/iovs.64.5.22>
- 269 McFadden, S. A., Howlett, M. H. & Mertz, J. R. Retinoic acid signals the direction of ocular elongation in the guinea pig eye. *Vision Res* **44**, 643-653 (2004). <https://doi.org/10.1016/j.visres.2003.11.002>
- 270 Wang, X., Shen, X., Yan, Y. & Li, H. Pyruvate dehydrogenase kinases (PDKs): an overview toward clinical applications. *Biosci Rep* **41** (2021). <https://doi.org/10.1042/BSR20204402>
- 271 Li, Z. *et al.* A global transcriptional regulatory role for c-Myc in Burkitt's lymphoma cells. *Proc Natl Acad Sci U S A* **100**, 8164-8169 (2003). <https://doi.org/10.1073/pnas.1332764100>
- 272 Zhao, F. *et al.* Scleral HIF-1alpha is a prominent regulatory candidate for genetic and environmental interactions in human myopia pathogenesis. *EBioMedicine* **57**, 102878 (2020). <https://doi.org/10.1016/j.ebiom.2020.102878>
- 273 Yin, Y. *et al.* 3-phosphoinositide-dependent protein kinase-1 activates the peroxisome proliferator-activated receptor-gamma and promotes adipocyte differentiation. *Mol Endocrinol* **20**, 268-278 (2006). <https://doi.org/10.1210/me.2005-0197>
- 274 Brower, V. Proteomics: biology in the post-genomic era. Companies all over the world rush to lead the way in the new post-genomics race. *EMBO Rep* **2**, 558-560 (2001). <https://doi.org/10.1093/embo-reports/kve144>
- 275 Yao, Y. *et al.* Single-cell RNA sequencing of retina revealed novel transcriptional landscape in high myopia and underlying cell-type-specific mechanisms. *MedComm (2020)* **4**, e372 (2023). <https://doi.org/10.1002/mco2.372>
- 276 Arnold, C. Inside the nascent industry of AI-designed drugs. *Nat Med* **29**, 1292-1295 (2023). <https://doi.org/10.1038/s41591-023-02361-0>