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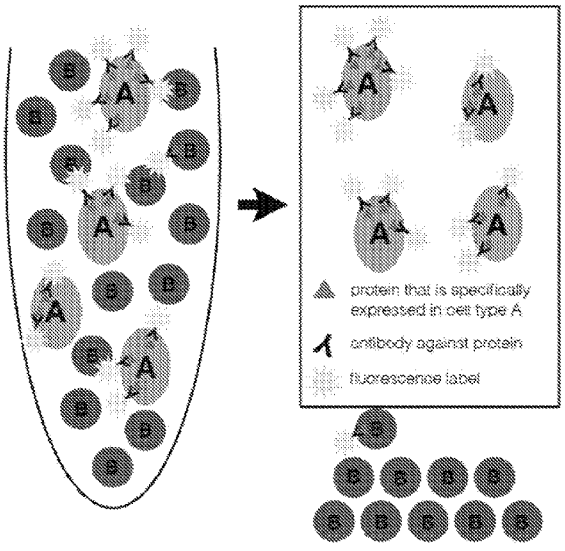
(54) Title: METHODS FOR CELL-TYPE SPECIFIC PROFILING TO IDENTIFY DRUG TARGETS

FIG. 1



(57) Abstract: The present invention provides methods of profiling gene and protein expression of a plurality of nuclei from a single cell type and comparing the profiles to determine variability among cell populations, samples from different subjects, and cells expressing a disease phenotype.

[Continued on next page]

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METHODS FOR CELL-TYPE SPECIFIC PROFILING TO IDENTIFY DRUG TARGETS

CROSS REFERENCE TO RELATED APPLICATIONS

[001] This application claims priority to U.S. provisional patent application 62/457,420, filed February 10, 2017 and U.S. provisional patent application 62/558,396, filed September 14, 2017, each of which is hereby incoporated by reference in its entirety.

SEQUENCE LISTING

[002] The instant application contains a "lengthy" Sequence Listing which has been submitted via CD-R in lieu of a printed paper copy and is hereby incorporated by reference in its entirety. This contains a sequence listing text file as part of the originally filed subject matter as follows: File name: 2111_1000PCT_SL.txt; File size: 123,473,920 Bytes; Date created: February 9, 2018. These CD-Rs are labeled "CRF," "Copy 1," and "Copy 2," respectively, and each contain only one identical file, as identified immediately above. The machine-readable format of each CD-R is IBM-PC and the operating system of each compact disc is MS-Windows.

FIELD OF THE INVENTION

[003] The invention relates to profiling gene and protein expression of a plurality of nuclei from a single cell type to identify a drug target.

BACKGROUND OF THE INVENTION

[004] The mammalian central nervous system (CNS) is a complex organ that comprises hundreds of different, intermingled cell types. The ability to genetically target (Gong, et al. (2003) Nature 425, 917–925) and molecularly profile specific cell types (Heiman, et al. (2008) Cell 135, 738–748) has begun to provide insight into essential features of the mammalian brain that were discovered in the founding studies of Ramon y Cajal over a century ago (Ramon y Cajal, S., et al. (1899). Texture of the Nervous System of Man and the Vertebrates (Wein New York: Springer). Each anatomically distinct, classically defined cell type expresses a set of genes that is characteristic (Dougherty, et al. (2010) Nucleic Acids Res 38, 4218–4230 and Doyle, et al. (2008) Cell 135, 749–762), and these genes confer properties that are essential for specialized cellular functions (Kim, I.-J., et al. (2008) Nature 452, 478–482; Nakajima, M., et al. (2014) Cell 159, 295–305). Expression of these genes is dependent on maintenance of cell specific epigenetic states that organize nuclear function (Kriaucionis, et al. (2009) Science 324, 929–930; Mellén, et al. (2012) Cell 151, 1417–1430). Application of present profiling technologies in mouse models has led also to the realization that environmental influences (Heiman, et al. (2008) Cell 135, 738–

748; Shrestha, et al. (2015) eLife 4, 289), internal physiological cues (Schmidt, et al. (2012) Cell 149, 1152–1163), and disease causing genetic lesions (Fyffe, et al. (2008) Neuron 59, 947–958; Ingram, et al. (2016) Neuron 89, 1194–1207) alter gene expression in affected cell types. Despite the pace of advances in experimental systems, fundamental issues of human brain complexity remain unsolved. It is not known, for instance, how many distinct cell types exist in the human brain, how these cell types vary between individuals or across species, whether the process of brain aging is equivalent between cell types, and why mutations in broadly expressed genes can have devastating consequences in one or a few select cell types.

[005] Although there is abundant information on the circuits affected in psychiatric and neurodegenerative diseases, the ability to specifically modulate these circuits requires knowledge of targets that are found exclusively in the neurons in the circuit.

[006] A method called Translating Ribosomal Affinity Purification (TRAP) was previously developed to enable the identification of all genes expressed in a cell type of interest. TRAP profiling studies have led to development of several drugs that have entered clinical studies. Although TRAP technology has enabled some drug development, a main limitation of TRAP is that target identification is initially done using transgenic mice. While mice and humans are similar, there are known differences in the CNS circuitry of the two species, and there may also be differences in gene expression across orthologous cell types. Furthermore, it is unknown how much gene expression in specific cells varies across individual subjects and whether these differences affect pathogenesis or response to treatment. In TRAP, BAC vectors are used to create transgenic mice lines. See, Doyle et al., *Cell*, 135:749-762 (2008) and Heiman et al., *Cell*, 135:738-748 (2008), which are hereby incorporated by reference in their entireties. The method is then called bacTRAP.

[007] In this method, the EGFP-L10a ribosomal fusion protein is targeted to the desired cell type, e.g., Purkinje cells. Affinity purification is performed for cell-specific polysomal RNAs using anti-EGFP coated magnetic beads as shown in Heiman et al. Microarrays may be used to analyze the purified samples. BACs are frequently selected from the gene expression nervous system atlas (GENSAT) project (www.gensat.org) developed by Dr. Nathaniel Heintz at The Rockefeller University. In some cases, the transgene may be expressed in more than one cell type. For example, immunofluorescence in Doyle et al. showed EGFP-L10a expressed in both Pvalb-positive and NeuN-negative interneurons of the cerebellar molecular layer, which is evidence that both stellate and basket cells were targeted. mRNA is immunoprecipitated, and genome-wide transcriptional profiling is performed on the mRNA sample. These results were compared to profiling of non-immunoprecipitated samples to identify markers specific for the cell type.

[008] To develop more effective and specific drugs, candidate targets need to be identified directly from humans and human tissues instead of transgenic mice, and the extent that these targets vary across individuals needs to be determined. Therefore, there is a long-felt need to develop a generalizable method that enables molecular studies of defined cell types in wild-type animals and humans. In addition, non-genetic technologies are needed to complement the discovery of specific characteristics of neural cell types and circuits in model systems and provide insight into potentially unique properties of the human nervous system.

SUMMARY OF THE INVENTION

[009] Various embodiments of the invention herein provide method profiling the gene expression of a nucleus, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; labeling at least one nucleus from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein unique to the nucleus of at least one cell type contained in the tissue sample, wherein the nucleic acid transcript or protein is encoded by a gene selected from Tables 19-24; purifying at least one labeled nucleus; and collecting nucleic acid transcript and/or protein expression data for the labeled nucleus, thereby profiling the gene expression of the nucleus.

[0010] In some embodiments, the cell type originates in cerebellar tissue, and is selected from the group consisting of: granule cells, Purkinje cells, glia, Bergmann glia, dopaminergic neurons, basket/stellate cells, astrocytes, brainstem motor neurons, oligodendrocytes, upper motor neurons, lower motor neurons, and cerebellar deep nuclei. In some embodiments, the protein is a transcription factor localized within the nuclei. In some embodiments, the cell type originates in basal ganglia tissue, and is selected from the group consisting of: striatonigral medium-sized spiny neurons (MSNs), striatopallidal MSNs, striatal cholinergic interneurons, subthalamic nucleus, dopaminergic neurons, and bed nucleus of the stria terminalis (BNST) neurons. In some embodiments, the cell type originates in thalamus tissue, and is selected from the group consisting of: thalamocortical neurons, thalamostriatal neurons, and thalamic reticular nucleus neurons. In some embodiments, the cell type originates in cortex tissue, and is selected from the group consisting of corticostriatal neurons, entorhinal cortex layer 2/3 neurons, fast-spiking cortical interneurons, and layer 2/3 pyramidal cells from pre-frontal cortex tissue. the cell type is cholinergic projection neurons from medial habenula tissue of a pineal gland. In some embodiments, the cell type originates in hippocampus tissue, and is selected from the group consisting of: cornu ammonis region 1 (CA1), cornu ammonis region 2 (CA2), cornu ammonis region 3 (CA3), and dentate gyrus cells. In some embodiments, the cell type originates in at least

one tissue selected from the group consisting of: brain tissue, brain stem tissue, and spinal cord tissue.

[0011] Various embodiments of the invention herein provide a method of isolating granule cells, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by one of genes Itpr, NeuN, Cdh15, Calb2, Rbfox3, Neurod1, and Reln, wherein the nucleic acid transcript or protein is unique to the nuclei of granule cells; and purifying at least one labeled nucleus. In some embodiments, the at least one labeled nucleus does not include a nucleic acid transcript encoded by Olig2.

[0012] Various embodiments of the invention herein provide a method of isolating Purkinje cells, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Pcp2, Pvalb, Cabl1, and Itpr1; and purifying at least one labeled nucleus.

[0013] Various embodiments of the invention herein provide a method of isolating Purkinje cells, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Lypd6, Pvalb, Kit, NeuN, Itpr, and Sorcs3; and purifying at least one labeled nucleus.

[0014] Various embodiments of the invention herein provide a method of isolating astrocytes and oligodendrocytes, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Olig2, Pdga, Cspg4, Mag, Mbp, and Mog; and purifying at least one labeled nucleus.

[0015] Various embodiments of the invention herein provide a method of isolating astrocytes, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Aldh1a1, Gfap, S110b, and Slc1a3; and purifying at least one labeled nucleus.

[0016] Various embodiments of the invention herein provide a method of isolating basket cells, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein

encoded by Sorcs3 and NeuN, wherein the combination of the nucleic acid transcript or protein encoded by Sorcs3 and is unique to the nuclei of basket cells; and purifying at least one labeled nucleus.

[0017] Various embodiments of the invention herein provide a method of isolating dopaminergic neurons, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by FoxA1, Slc6a3, TH, FoxA2, or Drd2, wherein nucleic acid transcript or protein is unique to the nuclei of dopaminergic neurons; and purifying at least one labeled nucleus.

[0018] Various embodiments of the invention herein provide a method of isolating brainstem motor neurons, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by VaChT or ErrB, wherein nucleic acid transcript or protein is unique to the nuclei of brainstem motor neurons; and purifying at least one labeled nucleus.

[0019] In some embodiments, the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe. In some embodiments, the method further comprises collecting nucleic acid transcript and/or protein transcript data for the labeled nucleus, thereby profiling the gene expression of the nucleus. In some embodiments, the method further comprises: comparing gene expression of the nucleus to gene expression in at least one nucleus of the cell type from a different tissue sample to identify variability in gene expression, thereby obtaining a drug target. Alternatively, in some embodiments, the method further comprises comparing gene expression of the nucleus to gene expression in at least one nucleus of a different cell type to identify variability in gene expression, thereby obtaining a drug target.

[0020] In some embodiments, the affinity label further comprising a fluorescent tag. In some embodiments, purifying of the nucleus is performed by fluorescence-activated cell sorting (FACS). In some embodiments, the tissue sample is derived from a mammal. In some embodiments, the mammal is selected from the group consisting of: a mouse, a human, a rat, and another non-human primate. In some embodiments, the tissue sample or the different tissue sample was frozen prior to isolation of the nucleus. In some embodiments, the tissue sample or the different tissue sample was fresh prior to isolation of the nuclei. In some embodiments, the tissue sample or the different tissue sample is derived from a female. In some embodiments, the tissue sample or the different tissue sample is derived from a male. In some embodiments, the nuclei are contiguous to an endoplasmic reticulum. In some embodiments, the protein is a

membrane protein. In some embodiments, the membrane protein is synthesized in the endoplasmic reticulum. In some embodiments, the protein is localized in the endoplasmic reticulum. In some embodiments, the nucleic acid transcript is localized in the nuclei. In some embodiments, the RNA probe specifically binds a chromosomal associated transcript (CAT) or a polyA transcript. In some embodiments, the DNA probe specifically binds a transporter gene. In some embodiments, the affinity label is more than one antibody, RNA probe, or DNA probe. In some embodiments, each affinity label binds a different factor. In some embodiments, the more than one antibody, RNA probe, or DNA probe bind to the same factor.

[0021] In some embodiments, the tissue sample is post-mortem. In some embodiments, the tissue sample or the different tissue sample originates from a diseased subject. In some embodiments, the tissue sample or the different tissue sample originates in a healthy subject. In some embodiments, the diseased subject is affected by at least one condition selected from the group consisting of: ataxia, Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis (ALS), and Huntington's disease. In some embodiments, the cell type is associated with ataxia, and is selected from the group consisting of: Purkinje cells, granule cells, Bergmann glia, basket/stellate cells, astrocytes, oligodendrocytes, and cerebellar deep nuclei. In some embodiments, the cell type is associated with Parkinson's Disease, and is selected from the group consisting of: substantia nigra and VTA dopaminergic neurons. In some embodiments, the cell type is associated with Alzheimer's Disease, and is selected from: layer 2/3 entorhincortex, CA1 hippocampus, and CA2/3 hippocampus. In some embodiments, the cell type is associated with ALS, and is selected from the group consisting of: brain stem, cortical motor neurons, and spinal cord motor neurons. In some embodiments, the diseased subject is expressing a disease phenotype. In some embodiments, the diseased subject is not expressing a disease phenotype. In some embodiments, the method further comprises comparing profiling for a tissue sample originating from a diseased subject and a tissue sample from a healthy subject. In some embodiments, the method further comprises comparing profiling for a tissue sample originating from at least two different healthy subjects. In some embodiments, the method further comprises identifying variability between disease stages by comparing profiling for a tissue sample from a diseased subject expressing a disease phenotype with profiling for a tissue sample from a diseased subject not expressing a disease phenotype.

[0022] In some embodiments, the method further comprises profiling the gene expression is performed for a plurality of nuclei from a single cell type. In some embodiments, the method further comprises profiling the gene expression is performed for a plurality of nuclei from different cell types. In some embodiments, the method further comprises identifying variability among different subjects by comparing profiling for more than one tissue sample, wherein each

tissue sample is from a different subject. In some embodiments, the drug target is encoded by a gene selected from Tables 19-24.

[0023] Various embodiments of the invention herein provide a method of profiling epigenetic expression of a nucleus, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe; purifying at least one labeled nucleus; and collecting information regarding histone modifications, binding of transcription factors, and DNA modifications for the nucleus, thereby profiling the epigenetic expression.

[0024] Various embodiments of the invention herein provide a method of profiling nuclear architecture of a nucleus, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe; purifying at least one labeled nucleus; and collecting information regarding chromosome conformation for the labeled nucleus, thereby profiling the nuclear architecture.

[0025] Various embodiments of the invention herein provide a method of profiling nuclear architecture of a nucleus, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is an antibody; isolating gDNA from the nuclei; performing oxidative bisulfite sequencing; and collecting chromosome conformation for the labeled nucleus, thereby profiling the nuclear architecture.

[0026] Various embodiments of the invention herein provide a method of isolating a nucleus from a single cell type, the method comprising: processing a tissue sample containing a plurality of cell types to expose nuclei; isolating nuclei from the processed tissue sample by contacting the processed tissue sample with more than two affinity labels specific to a unique combination of nucleic acid transcripts and/or proteins for the cell type, wherein each affinity label specifically binds a nucleic acid transcript comprising a sequence selected from SEQ ID NO: 1-28,815 or the affinity label specifically binds a protein comprising an amino acid sequence selected from 28,816-38,643; and purifying at least one labeled nucleus, thereby isolating the nucleus from the cell type.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] FIG. 1 shows an embodiment of a sorting method that may be used in the cellular profiling technique described herein. "A" represents nuclei of the cell type of interest, and "B" represents nuclei of another cell type.

[0028] FIG. 2A shows flow cytometry sorting results for 3 cell types from the cerebellum using Itpr1 and NeuN. A combination of Itpr1 and NeuN was used to isolate 3 populations: Purkinje cells, granules cells, and glia. Itpr1 is on the x-axis, and NeuN is on the y-axis. The Itpr1+ population was the nuclei of Purkinje cells, and the NeuN+ population was the nuclei of glia. The NeuN+/Itpr1- nuclei (largest group) represent granule cells. FIG. 2B shows gene expression profiling from RNAseq data comparing sorting of Purkinje nuclear RNA from transgenic animals (GFP sort) to Itpr1+ nuclei. Pcp4 is a Purkinje marker (enriched in sorted Purkinje nuclei compared to cerebellar unsorted nuclei), and Calb2 is a granule cell marker (enriched in unsorted compared to Purkinje).

[0029] FIG. 3A shows flow cytometry sorting results from nuclei staining and sorting for dopaminergic neurons nuclei. FIG. 3B compares RNAseq tracks from unsorted midbrain nuclei and sorted dopaminergic nuclei.

[0030] FIG. 4 provides a genome browser view showing three tracks – nuclear RNA levels from granule cells, cytoplasmic RNA levels from total cerebellum, and ATACseq DNA accessibility from total cerebellum – for mouse, rat, and human to reveal species specific and cell-type specific differences.

[0031] FIG. 5A and FIG. 5B show flow cytometry sorting results for nuclei from two different human subjects.

[0032] FIG. 6 shows flow cytometry sorting results to approximate the size of the nuclei with the combination of forward-scattered light (FSC) and side-scattered light (SSC).

[0033] FIG. 7A, FIG. 7B, FIG. 7C, and FIG. 7D show flow cytometry results for 4 different staining strategies for human cerebellar nuclei.

[0034] FIG. 8 provides a boxplot showing pairwise Pearson's correlation coefficient within cell types and between cell types for different individuals.

[0035] FIG. 9 provides a dot plot showing pairwise Pearson's correlation coefficient for each sample, broken down by cell type and species.

[0036] FIG. 10 is a graph showing changes in expression of FosB in granule, basket, and glial cells for an autolysis time of 5 to about 25 hours.

[0037] Figure 11A, Figure 11B, and Figure 11C provide scatterplots showing gene expression across age for three cell-type specific aging down-regulated genes. Figure 11A shows results for Aqp7. Figure 11B shows results for Asic1, and Figure 11C shows results for Robo2.

[0038] FIG. 12 provides the expression of stress response and immediate early genes in three individuals across three cell types in Fos+ and Fos- individuals. The gene tracks show merged expression from three Fos+ and three age- and gender-matched Fos- individuals.

[0039] FIG. 13A shows gene expression of fos genes and immediate early genes in granule cells, stellate cells, and glia. FIG. 13B shows gene expression of long-term stress response genes in these cells. FIG. 13C shows expression of stress-associated genes, such as the activated astrocyte markers GFAP, S100B, Exportin 1 (Xpo1, also known as leucine-rich nuclear export signal (Nes)), and Musashi RNA Binding Protein 1 (Msi1) in glia, separate from markers of more long-term stress.

[0040] FIG. 14 shows RNAseq data of cell-type specific Chromosomal Associated Transcripts (CATs).

DETAILED DESCRIPTION OF THE INVENTION

I. INTRODUCTION

[0041] Complex tissue is made of many cell types. The translating ribosomal affinity purification (TRAP) method has been used previously to define the molecular signature of diverse cell types in a single tissue. The TRAP method requires the use of transgenic animals, which creates numerous challenges. For example, some disease models are difficult to breed in animals, and animal models do not necessarily recapitulate all aspects of human disease, such as effects on human neurons. Further, a study of aging would require maintaining a specific transgenic strain for years. Additionally, the TRAP method requires fresh samples containing high quality RNA for accurate analysis.

[0042] Determination of the molecular properties of genetically targeted cell types has led to fundamental insights into mouse brain function and dysfunction. Embodiments of the cellular profiling technique described herein provide a strategy for exploration of gene expression events in specific cell types in a broad range of species for in-depth and reproducible studies of gene expression to identify markers for each cell type or condition. Results are shown herein for mouse, rat, and human neurons and glia, and features of homologous human cell types have been revealed. Classically defined, homologous neuronal and glial cell types are shown to differ between rodents and humans by the expression of hundreds of orthologous, cell specific genes. Evidence that these genes are differentially active was obtained using the combination of epigenetic mapping, RNAseq, quantitative PCR, and immunofluorescence localization. Studies of sixteen human postmortem brains showed cell-specific molecular responses to aging. The responses of human neurons and glia to aging were observed to be cell-type specific, and that analysis of postmortem human brain tissue also revealed the induction of a shared, robust response to an unknown external event experienced by three of sixteen donors. The compositions

and methods herein establish a comprehensive approach for analysis of unique molecular events associated with specific pathways and cell types in a wide variety of human conditions.

[0043] Recent advances in technologies for human genome sequencing and analysis have led to an increase in knowledge of the complex genetic causes of human psychiatric and neurological disease (Burguière, et al. (2015) Curr Opin Neurobiol 30, 59–65; Hinz, F.I., et al. (2017). Molecular Genetics of Neurodegenerative Dementias. PubMed - NCBI. Cold Spring Harb Perspect Biol 9, a023705; Vorstman, et al. (2017) Nat Rev Genet 18, 362–376, each of which are hereby incorporated by reference herein in its entirety). In some cases, recreation of the causative mutations in the mouse genome has resulted in experimental models that are sufficiently accurate for investigation of the molecular basis of the disorder (Lombardi, et al. (2015) J. Clin. Invest. 125, 2914–2923; Lyst, et al. (2015). Nat Rev Genet 16, 261–275; Orr, H.T. (2012) J. Cell Biol. 197, 167–177, each of which is hereby incorporated by reference herein in its entirety), and they have led to the discovery of unexpected features of the disease (Guy, al. (2007) Science 315, 1143–1147, which is hereby incorporated by reference herein in its entirety). In other cases, informative animal models remain elusive (Lavin, M.F. (2013). DNA Repair 12, 612–619, which is hereby incorporated by reference herein in its entirety), and investigation of molecular mechanisms of disease remains difficult (Biton, et al. (2008) DNA Repair 7, 1028–1038; Medina, M., et al. (2014) Front. Pharmacol. 5, 270, which is hereby incorporated by reference herein in its entirety).

[0044] Technologies used previous to the development of the cellular profiling technique described herein to attempt genome wide profiling of specific cell types in human tissues include laser capture microdissection and single cell sequencing technologies. Neither technology can produce reliable deep profiles of identified cell types. Laser capture microdissection requires specialized equipment and training, and results are heavily dependent on the precise dissection methodology and tissue anatomy; therefore, there is tremendous variability in results across samples.

[0045] The data from single cell RNAseq is also highly variable between individual cells. Single cell RNAseq is also problematic in the nervous system because it is difficult to dissociate neurons away from each other. In studies that dissociate neurons, only the cell body is captured, and the neuronal processes (axons and dendrites) are lost. It is well known in the art that the processes in neurons are very large compared to the size of the cell body and also have their own local translation machinery. Therefore, gene expression analysis of only cell bodies is depleted for genes that are expressed in neuronal processes, which some of the most important genes for determining neuronal identity. By profiling gene expression in the nucleus, which synthesizes all RNA for the cell, this bias can be avoided. The depth of data from any individual cell is not

sufficient to establish a comprehensive profile, thus this method is not accepted by many in the art of cellular profiling.

[0046] Human disease is a problem that is experienced across an entire population of cells. Cell types from single-cell analysis must be defined post-hoc, and this analysis may be obscured by disease state. Additionally, sequencing results from single cell RNAseq are not deep enough to detect subtle changes that may occur with disease. For these reasons, the cell type should be considered as a population. To do so using single cell methods would require sequencing thousands of individual cells, and some cell types are so rare that enrichment is required to study a disease that only affects these rare cell types. Distinguishing technical and biological variability would be nearly impossible without enrichment.

[0047] To enable the identification of human specific targets, the cellular profiling technique described herein has been developed for molecular profiling of specific cell types post-mortem human tissue. The cellular profiling technique described herein has a broad range of applications including studying gene expression and epigenetic changes to identify targets drugs or other therapeutic modalities.

[0048] Because cells in the CNS have complex morphologies and cannot be effectively dissociated from each other, the cellular profiling technique described herein sorts for nuclei rather than whole cells. In some embodiments of the method, after isolating nuclei from a brain region of interest, the nuclei may be immunostained with antibodies specific to transcription factors or transcripts that specifically label the cell type of interest. Immunofluorescence establishes whether nuclei can be labeled using an antibody against a membrane protein. Staining was observed in the endoplasmic reticulum (ER) around the nucleus. Alternatively, RNA probes or DNA probes may be used to label the cell type of interest.

[0049] In some embodiments, after purifying the labeled population using fluorescent activated cell sorting (FACS), the isolated nuclei may be used for gene expression profiling. FIG. 1 provides an embodiment of a sorting method that may be used with the cellular profiling technique described herein. "A" represents nuclei of the cell type of interest, and "B" represents nuclei from another cell type.

[0050] In certain embodiments, an algorithm may be used to identify cell-specific and enriched gene expression for a single cell type. For example, one analytical method for identifying and quantifying cell-specific and enriched mRNAs across multiple cell populations is referred to as specificity index (SI), as described in Dougherty et al., *Nucleic Acids Research*, 38(13):4218-4230, which is hereby incorporated by reference in its entirety. Gene expression was measured in multiple cell types. These values were first normalized within replicates and then globally normalized across cell types. Non-specific background was filtered out using

negative controls. The filtered values were iteratively compared to other unfiltered samples in the dataset and a ratio was calculated for each set of samples. The sets were ranked from highest to lowest to prevent extreme outliers from skewing the subsequent analysis and to make analysis more robust for difficult to normalize data sets. These ranks are averaged to provide the SI. Permutation testing was used to assign a p-value to each SI value to provide a list of genes significantly enriched in the cell type of interest. The lower the SI value the more specific that the gene is to the cell type.

[0051] The cellular profiling technique described herein has a range of applications including: identifying human targets for therapeutics, understanding how variability between people leads to the variable penetrance of therapeutics, investigating the early changes that occur in human degenerative disorders, identifying drug targets, and developing therapies based on comparative analysis of vulnerable and spared cell populations. The cellular profiling technique described herein can be used to profile any cell type of interest. For example, gene expression may be compared for different cell types to identify genes that are uniquely expressed in the cell type of interest to identify putative drug targets. By comparing heterogeneity among different patients may also reveal biomarkers of disease that could be used to identify patients before symptoms appear or to select subsets of patients in whom a therapeutic intervention would be more effective.

[0052] In other embodiments, gene expression between species (e.g. mouse and human) is compared using the cellular profiling technique described herein to identify shared and species-specific genes. This information also informs drug discovery because mouse specific targets are less commercially valuable. Additionally, species-shared targets allow for basic studies in mice that are more likely to translate to humans. Finally, the human-specific targets may be the reason humans develop some diseases but it's difficult to make a mouse to develop the same disease. Following up on shared targets may offer novel drug targets that could not be identified in mice only.

[0053] Another application of the cellular profiling technique described herein is comparing gene expression between the same cell type in the same tissue across different individuals to identify variability across individuals. Presently, genome-wide association studies (GWAS) are used to look at variability between individuals at the DNA level, but these techniques do not show whether variability in DNA impacts gene expression and function. Data generated by the cellular profiling technique described herein can be used for patient stratification and combined with GWAS data to determine why there is variability in response to treatments across individuals.

[0054] In contrast to the TRAP method, the cellular profiling technique described herein does not require use of transgenic animals. The cellular profiling technique described herein can be used with postmortem tissue from any species including non-model organisms such as humans and other primates.

[0055] In certain embodiments of the invention, a tissue sample was processed, and an antibody specific to a protein that is expressed in a cell type of interest was added to the sample. A fluorescent label for the antibody was then added to the sample. Nuclei from the cell type of interest were isolated from the tissue sample by fluorescence. For example, FACS was used to isolate the nuclei based on fluorescence intensity. Sorting may be performed using antibodies specific to transcription factors that are localized in the nucleus (e.g., Matevossian et al., J. Vis. Exp. (13), e717, doi:10.3791/717, (2008), which is hereby incorporated by reference in its entirety) or using antibodies specific to proteins that that are localized in the endoplasmic reticulum (ER). Since many neurons have been identified based on membrane markers, antibodies specific to membrane proteins that are synthesized in the ER may be used to study the nervous system. Additionally, a portion of the endoplasmic reticulum was observed to remain attached to the isolated nuclei.

[0056] The antibodies used for labeling and sorting nuclei from specific cell types may be selected from previous TRAP method studies to identify factors that are specifically expressed in our cell types of interest. Alternative to antibodies, RNA or DNA probes that are specific to nucleic acid transcripts localized in the nucleus or the ER of the cell type(s) of interest are used. For example, Mo et al., *Neuron*, 86:1364-1384 (2015), which is hereby incorporated by reference in its entirety, analyzed excitatory neuron, PV interneurons, and VIP neurons in transgenic mice using Camk2a, PV, and VIP as targets, respectively. In Mo, about 50% of the cortical nuclei were Camk2a positive, about 3% were PV positive, and about 2% were VIP positive.

[0057] The methods herein provide studies of cellular vulnerability in human neurodegenerative disease, and circuit based molecular characterization of cell types involved in obsessive compulsive disorder, drug addiction, autism spectrum disorder, and age dependent cognitive loss. In some embodiments, the goal of the cellular profiling technique described herein is to obtain human CNS cell type data to establish a characterization of brain circuits or pathways implicated in important human neurological disorders and neurodegenerative diseases. For example, cell specific data from mice were obtained using antibodies specific to proteins identified from nuclear enriched, fully processed, polyA+ RNA and chromosomal associated transcripts (CATs). RNA/DNA probes against these may be designed for additional labeling and sorting. Specifically, purified GFP+ nuclei from transgenic animals developed for the TRAP method and isolated RNA was analyzed using PolyDT beads to capture the PolyA+ RNA, which

are mature RNAs. An enrichment was observed for RNAs in the ER, which is contiguous with the nuclear membrane. These data provide details about transcripts that are enriched in the ER close to the nucleus and that are putative targets for antibodies and RNA/DNA probes that may be used to perform the sorting step in the cellular profiling technique described herein. The methods herein result in production of highly reproducible cell type specific data, and confirmation of cell specific expression profiles by *in situ* hybridization or immunofluorescence of newly discovered cell specific markers in human tissue samples. This data provides confirmation that transcript profiles from bulk tissue, such as from the brain, can be used to identify new cell specific probes.

II. GENE NOMENCLATURE

[0058] Gene symbols are used herein, along with ENSEMBL Gene IDs, to refer to genes from mice, rats, and humans. Unless otherwise noted, the gene names corresponding to each gene symbol are shown in Table 1.

Table 1. Gene symbols and names

Symbol	Name	Symbol	Name
1700025G04Rik	RIKEN cDNA 1700025G04 gene	LINGO2	leucine rich repeat and Ig domain containing 2
1700047M11Rik	RIKEN cDNA 1700047M11 gene	LIPG	lipase G, endothelial type
1810041L15Rik	RIKEN cDNA 1810041L15 gene	LITAF	lipopolysaccharide induced TNF factor
2410124H12Rik	RIKEN cDNA 2410124H12 gene	LMCD1	LIM and cysteine rich domains 1
2410131K14Rik	RIKEN cDNA 2410131K14 gene	LMNTD2	lamin tail domain containing 2
2810459M11Rik	RIKEN cDNA 2810459M11 gene	LMO2	LIM domain only 2
3110035E14Rik	RIKEN cDNA 3110035E14 gene	LOC100506990	N/A
3110039M20Rik	RIKEN cDNA 3110039M20 gene	LONRF2	LON peptidase N-terminal domain and ring finger 2
3110043O21Rik	RIKEN cDNA 3110043O21 gene	LOXL2	lysyl oxidase like 2
3632451O06Rik	RIKEN cDNA 3632451O06 gene	LPAR1	lysophosphatidic acid receptor 1
4930578C19Rik	RIKEN cDNA 4930578C19 gene	LPCAT2	lysophosphatidylcholine acyltransferase 2
5730559C18Rik	RIKEN cDNA 5730559C18 gene	LPCAT4	lysophosphatidylcholine acyltransferase 4
8030451O07Rik	N/A	LPL	lipoprotein lipase
9530059O14Rik	RIKEN cDNA 9530059O14 gene	LPP	LIM domain containing prefered translocation partner in lipoma
9530077C05Rik	RIKEN cDNA 9530077C05 gene	LRCH1	leucine rich repeats and calponin homology domain containing 1
A230077H06Rik	RIKEN cDNA A230077H06 gene	LRIG1	leucine rich repeats and immunoglobulin like domains 1
A2M	alpha-2-macroglobulin	LRP1	LDL receptor related protein 1
A730036I17Rik	RIKEN cDNA A730036I17 gene	LRP1B	LDL receptor related protein 1B
A830018L16Rik	RIKEN cDNA A830018L16 gene	LRP2	LDL receptor related protein 2
AASS	aminoadipate-semialdehyde synthase	LRPAP1	LDL receptor related protein associated protein 1
AATK	apoptosis associated tyrosine kinase	LRRC1	leucine rich repeat containing 1
ABAT	4-aminobutyrate aminotransferase	LRRC2	leucine rich repeat containing 2
ABCA1	ATP binding cassette subfamily A member 1	LRRC20	leucine rich repeat containing 20
ABCA17P	ATP binding cassette subfamily A member 17, pseudogene	LRRC38	leucine rich repeat containing 38
ABCA8	ATP binding cassette subfamily A member 8	LRRC3B	leucine rich repeat containing 3B
ABCC10	ATP binding cassette subfamily C member 10	LRRC4C	leucine rich repeat containing 4C
ABCC8	ATP binding cassette subfamily C member 8	LRRC69	leucine rich repeat containing 69
ABCG2	ATP binding cassette subfamily G member 2 (Junior blood group)	LRRC7	leucine rich repeat containing 7
ABHD2	abhydrolase domain containing 2	LRRK2	leucine rich repeat kinase 2

ABHD3	abhydrolase domain containing 3	LRRTM4	leucine rich repeat transmembrane neuronal 4
ABHD5	abhydrolase domain containing 5	LRTM1	leucine rich repeats and transmembrane domains 1
ABI3	ABI family member 3	LSM5	LSM5 homolog, U6 small nuclear RNA and mRNA degradation associated
ABI3BP	ABI family member 3 binding protein	LTBP2	latent transforming growth factor beta binding protein 2
ABL1	ABL proto-oncogene 1, non-receptor tyrosine kinase	LTK	leukocyte receptor tyrosine kinase
ABLIM1	actin binding LIM protein 1	LURAP1	leucine rich adaptor protein 1
ABLIM2	actin binding LIM protein family member 2	LURAP1L	leucine rich adaptor protein 1 like
ABLIM3	actin binding LIM protein family member 3	LY6E	lymphocyte antigen 6 family member E
ABRA	actin binding Rho activating protein	LYPD1	LY6/PLAUR domain containing 1
ABTB2	ankyrin repeat and BTB domain containing 2	LYPD6	LY6/PLAUR domain containing 6
ACAD8	acyl-CoA dehydrogenase family member 8	LYPD6B	LY6/PLAUR domain containing 6B
ACAP3	ArfGAP with coiled-coil, ankyrin repeat and PH domains 3	LYRM1	LYR motif containing 1
ACE	angiotensin I converting enzyme	LYZL4	lysozyme like 4
ACER3	alkaline ceramidase 3	MAATS1	MYCBP associated and testis expressed 1
ACHE	acetylcholinesterase (Cartwright blood group)	MAF	MAF bZIP transcription factor
ACO2	aconitase 2	MAFF	MAF bZIP transcription factor F
ACOT11	acyl-CoA thioesterase 11	MAG	myelin associated glycoprotein
ACOT7	acyl-CoA thioesterase 7	MAGI3	membrane associated guanylate kinase, WW and PDZ domain containing 3
ACSBG1	acyl-CoA synthetase bubblegum family member 1	MAGT1	magnesium transporter 1
ACSM5	acyl-CoA synthetase medium chain family member 5	MAK	male germ cell associated kinase
ACSS1	acyl-CoA synthetase short chain family member 1	MAL	mal, T-cell differentiation protein
ACSS3	acyl-CoA synthetase short chain family member 3	MAL2	mal, T-cell differentiation protein 2 (gene/pseudogene)
ACTB	actin beta	MAMSTR	MEF2 activating motif and SAP domain containing transcriptional regulator
ACTBL2	actin, beta like 2	Man1a	mannosidase 1, alpha
ACTC1	actin, alpha, cardiac muscle 1	MAN1A1	mannosidase alpha class 1A member 1
ACTL6B	actin like 6B	MAN1C1	mannosidase alpha class 1C member 1
ACTN2	actinin alpha 2	MAN2A1	mannosidase alpha class 2A member 1
ACTR3B	ARP3 actin related protein 3 homolog B	MAP2K6	mitogen-activated protein kinase 6
ADAM11	ADAM metallopeptidase domain 11	MAP6D1	MAP6 domain containing 1
ADAM12	ADAM metallopeptidase domain 12	MAP7	microtubule associated protein 7
ADAM19	ADAM metallopeptidase domain 19	MAPK12	mitogen-activated protein kinase 12
ADAMTS10	ADAM metallopeptidase with thrombospondin type 1 motif 10	MAPK4	mitogen-activated protein kinase 4
ADAMTS15	ADAM metallopeptidase with thrombospondin type 1 motif 15	MAPRE2	microtubule associated protein RP/EB family member 2
ADAMTS16	ADAM metallopeptidase with thrombospondin type 1 motif 16	MARC2	mitochondrial amidoxime reducing component 2
ADAMTS17	ADAM metallopeptidase with thrombospondin type 1 motif 17	MARCH1	membrane associated ring-CH-type finger 1
ADAMTS18	ADAM metallopeptidase with thrombospondin type 1 motif 18	MARCH11	membrane associated ring-CH-type finger 11
ADAMTS2	ADAM metallopeptidase with thrombospondin type 1 motif 2	MARCKS	myristoylated alanine rich protein kinase C substrate
ADAMTS6	ADAM metallopeptidase with thrombospondin type 1 motif 6	MARCKSL1	MARCKS like 1
ADAMTS7	ADAM metallopeptidase with thrombospondin type 1 motif 7	MARVELD2	MARVEL domain containing 2
ADAMTS9	ADAM metallopeptidase with thrombospondin type 1 motif 9	MASP1	mannan binding lectin serine peptidase 1
ADAMTSL3	ADAMTS like 3	MATN1	matrilin 1, cartilage matrix protein
ADAMTSL4	ADAMTS like 4	MATN4	matrilin 4
ADARB1	adenosine deaminase, RNA specific B1	MBOAT1	membrane bound O-acyltransferase domain containing 1

ADARB2	adenosine deaminase, RNA specific B2 (inactive)	MBOAT2	membrane bound O-acyltransferase domain containing 2
ADCY1	aderylate cyclase 1	MBOAT7	membrane bound O-acyltransferase domain containing 7
ADCYAP1R1	ADCYAP receptor type I	MBP	myelin basic protein
ADD2	adducin 2	MCAM	melanoma cell adhesion molecule
ADGRA1	adhesion G protein-coupled receptor A1	MCC	mutated in colorectal cancers
ADGRA3	adhesion G protein-coupled receptor A3	MCL1	MCL1, BCL2 family apoptosis regulator
ADGRG1	adhesion G protein-coupled receptor G1	MCTP1	multiple C2 and transmembrane domain containing 1
ADGRL3	adhesion G protein-coupled receptor L3	MDFI	MyoD family inhibitor
ADGRV1	adhesion G protein-coupled receptor V1	MDGA1	MAM domain containing glycosylphosphatidylinositol anchor 1
ADM	adrenomedullin	MDGA2	MAM domain containing glycosylphosphatidylinositol anchor 2
ADORA1	adenosine A1 receptor	MED12L	mediator complex subunit 12 like
ADORA2B	adenosine A2b receptor	MEF2C	myocyte enhancer factor 2C
ADRA1A	adrenoceptor alpha 1A	MEF2C-AS1	MEF2C antisense RNA 1
ADRA1B	adrenoceptor alpha 1B	MEG8	maternally expressed 8, small nucleolar RNA host gene
ADRA1D	adrenoceptor alpha 1D	MEGF10	multiple EGF like domains 10
ADRA2B	adrenoceptor alpha 2B	MEGF11	multiple EGF like domains 11
ADRB2	adrenoceptor beta 2	MEI4	meiotic double-stranded break formation protein 4
AF529169	cDNA sequence AF529169	MEIS1	Meis homeobox 1
AFAP1	actin filament associated protein 1	MEIS2	Meis homeobox 2
AFAP1L1	actin filament associated protein 1 like 1	MEIS3	Meis homeobox 3
AFAP1L2	actin filament associated protein 1 like 2	MERTK	MER proto-oncogene, tyrosine kinase
AFF2	AF4/FMR2 family member 2	METRN	meteorin, glial cell differentiation regulator
AFP	alpha fetoprotein	METTL7A	methyltransferase like 7A
AGAP1	ArfGAP with GTPase domain, ankyrin repeat and PH domain 1	METTL9	methyltransferase like 9
AGBL2	ATP/GTP binding protein like 2	MFAP3L	microfibril associated protein 3 like
AGPAT3	1-acylglycerol-3-phosphate O-acyltransferase 3	MFF	mitochondrial fission factor
AGPAT4	1-acylglycerol-3-phosphate O-acyltransferase 4	MFGE8	milk fat globule-EGF factor 8 protein
AGRN	agrin	MFHAS1	malignant fibrous histiocytoma amplified sequence 1
AGT	angiotensinogen	MFSD2A	major facilitator superfamily domain containing 2A
AHNAK	AHNAK nucleoprotein	MFSD9	major facilitator superfamily domain containing 9
AHRR	aryl-hydrocarbon receptor repressor	MGAT3	mannosyl (beta-1,4-)-glycoprotein beta-1,4-N-acetylglucosaminyltransferase
AHSA1	activator of HSP90 ATPase activity 1	MGAT4C	MGAT4 family member C
AI464131	expressed sequence AI464131	MGAT5B	mannosyl (alpha-1,6-)-glycoprotein beta-1,6-N-acetyl-glucosaminyltransferase, isozyme B
AI593442	expressed sequence AI593442	MGLL	monoglyceride lipase
AK4	aderylate kinase 4	MGP	matrix Gla protein
AKAIN1	A-kinase anchor inhibitor 1	MGST1	microsomal glutathione S-transferase 1
AKAP13	A-kinase anchoring protein 13	MIAT	myocardial infarction associated transcript (non-protein coding)
AKNA	AT-hook transcription factor	MICAL2	microtubule associated monooxygenase, calponin and LIM domain containing 2
AKR1C1	aldo-keto reductase family 1 member C1	MICALCL	MICAL C-terminal like
AKR1C2	aldo-keto reductase family 1 member C2	MID1	midline 1
AKR1C3	aldo-keto reductase family 1 member C3	MID2	midline 2
AKR1C4	aldo-keto reductase family 1 member C4	MIDN	midnolin
ALAS2	5'-aminolevulinate synthase 2	MIR136	microRNA 136
ALCAM	activated leukocyte cell adhesion molecule	MIR31HG	MIR31 host gene
ALDH1A1	aldehyde dehydrogenase 1 family member A1	MIR346	microRNA 346
ALDH1A3	aldehyde dehydrogenase 1 family member A3	MIR34C	microRNA 34c
ALDH1L1	aldehyde dehydrogenase 1 family member L1	MIR3671	microRNA 3671
ALDH1L2	aldehyde dehydrogenase 1 family member L2	MIR384	microRNA 384

ALDH6A1	aldehyde dehydrogenase 6 family member A1	MIR646HG	MIR646 host gene
ALDOC	aldolase, fructose-bisphosphate C	MIR6723	microRNA 6723
ALK	ALK receptor tyrosine kinase	MIR7-3HG	MIR7-3 host gene
ALOX5	arachidonate 5-lipoxygenase	MIR9-3HG	MIR9-3 host gene
ALS2	ALS2, alsin Rho guanine nucleotide exchange factor	MKX	mohawk homeobox
ALS2CR12	amyotrophic lateral sclerosis 2 chromosome region 12	MLC1	megalencephalic leukoencephalopathy with subcortical cysts 1
AMPD3	adenosine monophosphate deaminase 3	MLLT11	MLLT11, transcription factor 7 cofactor
AMZ1	archaelysin family metallopeptidase 1	MLYCD	malonyl-CoA decarboxylase
ANGPT1	angiopoietin 1	MMD2	monocyte to macrophage differentiation associated 2
ANGPTL3	angiopoietin like 3	MMP14	matrix metallopeptidase 14
ANKRD33B	ankyrin repeat domain 33B	MMP15	matrix metallopeptidase 15
ANKRD37	ankyrin repeat domain 37	MMP16	matrix metallopeptidase 16
ANKRD42	ankyrin repeat domain 42	MMP2	matrix metallopeptidase 2
ANLN	anillin actin binding protein	MMP24	matrix metallopeptidase 24
ANO4	anoctamin 4	MNS1	meiosis specific nuclear structural 1
ANO6	anoctamin 6	MOBP	myelin-associated oligodendrocyte basic protein
ANXA3	annexin A3	MOG	myelin oligodendrocyte glycoprotein
AOX1	aldehyde oxidase 1	MORF4L2	mortality factor 4 like 2
AP1S3	adaptor related protein complex 1 sigma 3 subunit	MPND	MPN domain containing
APBA2	amyloid beta precursor protein binding family A member 2	MPP6	membrane palmitoylated protein 6
APBB2	amyloid beta precursor protein binding family B member 2	MPP7	membrane palmitoylated protein 7
APCDD1	APC down-regulated 1	MPPED1	metallophosphoesterase domain containing 1
APEX2	apurinic/apyrimidinic endodeoxyribonuclease 2	MPZ	myelin protein zero
APH1B	aph-1 homolog B, gamma-secretase subunit	MRAP2	melanocortin 2 receptor accessory protein 2
APLNR	apelin receptor	MRGPRF	MAS related GPR family member F
APLP1	amyloid beta precursor like protein 1	MRLN	myoregulin
APOD	apolipoprotein D	MRM2	mitochondrial rRNA methyltransferase 2
APPL2	adaptor protein, phosphotyrosine interacting with PH domain and leucine zipper 2	MRPL18	mitochondrial ribosomal protein L18
AQP4	aquaporin 4	MSI1	musashi RNA binding protein 1
AQP7	aquaporin 7	MSMO1	methylsterol monooxygenase 1
AQP9	aquaporin 9	MSRA	methionine sulfoxide reductase A
AR	androgen receptor	MSX2	msh homeobox 2
ARAP3	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 3	MT2A	metallothionein 2A
ARC	activity regulated cytoskeleton associated protein	MT3	metallothionein 3
ARF4	ADP ribosylation factor 4	MTCH1	mitochondrial carrier 1
ARG2	arginase 2	MTCH2	mitochondrial carrier 2
ARHGAP10	Rho GTPase activating protein 10	MT-CO1	mitochondrially encoded cytochrome c oxidase I
ARHGAP15	Rho GTPase activating protein 15	MTFP1	mitochondrial fission process 1
ARHGAP20	Rho GTPase activating protein 20	MTHFD1L	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 1 like
ARHGAP22	Rho GTPase activating protein 22	MTHFD2L	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 2 like
ARHGAP23	Rho GTPase activating protein 23	MTHFSD	methenyltetrahydrofolate synthetase domain containing
ARHGAP24	Rho GTPase activating protein 24	MT-ND4	mitochondrially encoded NADH:ubiquinone oxidoreductase core subunit 4
ARHGAP25	Rho GTPase activating protein 25	MTRF1	mitochondrial translation release factor 1
ARHGAP26	Rho GTPase activating protein 26	MTRNR2L6	MT-RNR2-like 6
ARHGAP29	Rho GTPase activating protein 29	MTRNR2L8	MT-RNR2-like 8
ARHGAP32	Rho GTPase activating protein 32	MTSS1	MTSS I-BAR domain containing
ARHGEF10L	Rho guanine nucleotide exchange factor 10 like	MTTP	microsomal triglyceride transfer protein
ARHGEF2	Rho/Rac guanine nucleotide exchange factor 2	MVP	major vault protein
ARHGEF26	Rho guanine nucleotide exchange factor 26	MXD1	MAX dimerization protein 1
ARHGEF28	Rho guanine nucleotide exchange factor 28	MXD4	MAX dimerization protein 4

ARHGEF3	Rho guanine nucleotide exchange factor 3	MXRA8	matrix remodeling associated 8
ARHGEF33	Rho guanine nucleotide exchange factor 33	MYBPC1	myosin binding protein C, slow type
ARHGEF37	Rho guanine nucleotide exchange factor 37	MYCL	MYCL proto-oncogene, bHLH transcription factor
ARHGEF4	Rho guanine nucleotide exchange factor 4	MYH11	myosin heavy chain 11
ARHGEF6	Rac/Cdc42 guanine nucleotide exchange factor 6	MYH14	myosin heavy chain 14
ARIH1	ariadne RBR E3 ubiquitin protein ligase 1	MYH6	myosin heavy chain 6
ARL4A	ADP ribosylation factor like GTPase 4A	MYLIP	myosin regulatory light chain interacting protein
ARL5B	ADP ribosylation factor like GTPase 5B	MYO10	myosin X
ARMCX1	armadillo repeat containing, X-linked 1	MYO16	myosin XVI
ARNT2	aryl hydrocarbon receptor nuclear translocator 2	MYO1D	myosin ID
ARPP21	cAMP regulated phosphoprotein 21	MYO7A	myosin VIIA
ARRB1	arrestin beta 1	MYORG	myogenesis regulating glycosidase (putative)
ARRDC3	arrestin domain containing 3	MYOT	myotilin
ARSDP1	arylsulfatase D pseudogene 1	MYRF	myelin regulatory factor
ARSG	arylsulfatase G	MYRIP	myosin VIIA and Rab interacting protein
ARX	aristaless related homeobox	MYT1	myelin transcription factor 1
ASAP3	ArfGAP with SH3 domain, ankyrin repeat and PH domain 3	MYT1L	myelin transcription factor 1 like
ASCL1	achaete-scute family bHLH transcription factor 1	N/A	N/A
ASGR1	asialoglycoprotein receptor 1	NAA20	N(alpha)-acetyltransferase 20, NatB catalytic subunit
ASIC1	acid sensing ion channel subunit 1	NAB2	NGFI-A binding protein 2
ASIC2	acid sensing ion channel subunit 2	NAF1	nuclear assembly factor 1 ribonucleoprotein
ASIC4	acid sensing ion channel subunit family member 4	NAMA	non-protein coding RNA, associated with MAP kinase pathway and growth arrest
ASNS	asparagine synthetase (glutamine-hydrolyzing)	NAMPT	nicotinamide phosphoribosyltransferase
ASPA	aspartoacylase	NAPA	NSF attachment protein alpha
ASPG	asparaginase	NARS2	asparaginyl-tRNA synthetase 2, mitochondrial
ASTN2	astrotactin 2	NAT8	N-acetyltransferase 8 (putative)
ATAD2	ATPase family, AAA domain containing 2	Nat8f5	N-acetyltransferase 8 (GCN5-related) family member 5
ATF3	activating transcription factor 3	NAV2	neuron navigator 2
ATF6B	activating transcription factor 6 beta	NCALD	neurocalcin delta
ATL2	atlastin GTPase 2	NCAM2	neural cell adhesion molecule 2
ATL3	atlastin GTPase 3	NCAN	neurocan
ATOH8	atonal bHLH transcription factor 8	NCEH1	neutral cholesterol ester hydrolase 1
ATP13A4	ATPase 13A4	NCKAP5	NCK associated protein 5
ATP1A1	ATPase Na+/K+ transporting subunit alpha 1	NDEL1	nudE neurodevelopment protein 1 like 1
ATP1A2	ATPase Na+/K+ transporting subunit alpha 2	NDNF	neuron derived neurotrophic factor
ATP1A3	ATPase Na+/K+ transporting subunit alpha 3	NDRG1	N-myc downstream regulated 1
ATP1B1	ATPase Na+/K+ transporting subunit beta 1	NDRG2	NDRG family member 2
ATP1B2	ATPase Na+/K+ transporting subunit beta 2	NDST3	N-deacetylase and N-sulfotransferase 3
ATP1B3	ATPase Na+/K+ transporting subunit beta 3	NDST4	N-deacetylase and N-sulfotransferase 4
ATP2A3	ATPase sarcoplasmic/endoplasmic reticulum Ca2+ transporting 3	NEAT1	nuclear paraspeckle assembly transcript 1 (non-protein coding)
ATP2B2	ATPase plasma membrane Ca2+ transporting 2	NECAB1	N-terminal EF-hand calcium binding protein 1
ATP2B3	ATPase plasma membrane Ca2+ transporting 3	NECTIN3	nectin cell adhesion molecule 3
ATP2C2	ATPase secretory pathway Ca2+ transporting 2	NEDD4	neural precursor cell expressed, developmentally down-regulated 4, E3 ubiquitin protein ligase
ATP6V0B	ATPase H+ transporting V0 subunit b	NEDD4L	neural precursor cell expressed, developmentally down-regulated 4-like, E3 ubiquitin protein ligase
ATP8A1	ATPase phospholipid transporting 8A1	NEFH	neurofilament heavy
ATP8B1	ATPase phospholipid transporting 8B1	NEFL	neurofilament light
ATRNL1	attractin like 1	NEFM	neurofilament medium
ATXN1	ataxin 1	NEGR1	neuronal growth regulator 1
ATXN7L2	ataxin 7 like 2	NEK2	NIMA related kinase 2
AVPI1	arginine vasopressin induced 1	NEK4	NIMA related kinase 4
AXL	AXL receptor tyrosine kinase	NELL1	neural EGFL like 1
AZGP1	alpha-2-glycoprotein 1, zinc-binding	NEO1	neogenin 1
AZIN1	antizyme inhibitor 1	NES	nestin

B230209E15Rik	RIKEN cDNA B230209E15 gene	NETO1	neuropilin and tolloid like 1
B3GALT4	beta-1,3-galactosyltransferase 4	NEU4	neuraminidase 4
B3GAT2	beta-1,3-glucuronyltransferase 2	NEURL1	neuralized E3 ubiquitin protein ligase 1
B3GLCT	beta 3-glucosyltransferase	Neurl1a	neuralized E3 ubiquitin protein ligase 1A
B3GNT5	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 5	NEUROD1	neuronal differentiation 1
B3GNT7	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 7	NEUROD6	neuronal differentiation 6
B4GALT6	beta-1,4-galactosyltransferase 6	NEXN	nexilin F-actin binding protein
BACH2	BTB domain and CNC homolog 2	NFAM1	NFAT activating protein with ITAM motif 1
BAD	BCL2 associated agonist of cell death	NFATC2	nuclear factor of activated T-cells 2
BAG3	BCL2 associated athanogene 3	NFATC4	nuclear factor of activated T-cells 4
BAIAP2	BAI1 associated protein 2	NFIL3	nuclear factor, interleukin 3 regulated
BAMBI	BMP and activin membrane bound inhibitor	NFKBID	NFKB inhibitor delta
BARHL1	BarH like homeobox 1	NHS	NHS actin remodeling regulator
BARHL2	BarH like homeobox 2	NHSL1	NHS like 1
BASP1	brain abundant membrane attached signal protein 1	NHSL2	NHS like 2
BBS2	Bardet-Biedl syndrome 2	NID1	nidogen 1
BC052040	N/A	NINJ2	ninjurin 2
BCAR1	BCAR1, Cas family scaffolding protein	NIPAL4	NIPA like domain containing 4
BCAS1	breast carcinoma amplified sequence 1	NKAIN2	sodium/potassium transporting ATPase interacting 2
BCAS2	BCAS2, pre-mRNA processing factor	NKAIN3	sodium/potassium transporting ATPase interacting 3
BCHE	butyrylcholinesterase	NKAIN4	sodium/potassium transporting ATPase interacting 4
BCL11A	B-cell CLL/lymphoma 11A	NKD1	naked cuticle homolog 1
BCL11B	B-cell CLL/lymphoma 11B	NKIRAS2	NFKB inhibitor interacting Ras like 2
BDNF	brain derived neurotrophic factor	NKRF	NFKB repressing factor
BEAN1	brain expressed associated with NEDD4 1	NKX2-2	NK2 homeobox 2
BEGAIN	brain enriched guanylate kinase associated	NLGN3	neuroligin 3
BEST3	bestrophin 3	NLGN4Y	neuroligin 4, Y-linked
BGN	biglycan	NLN	neurolysin
BHLHE22	basic helix-loop-helix family member e22	NNT	nicotinamide nucleotide transhydrogenase
BHLHE40	basic helix-loop-helix family member e40	NOL3	nucleolar protein 3
BHLHE40-AS1	BHLHE40 antisense RNA 1	NOS1	nitric oxide synthase 1
BICD1	BICD cargo adaptor 1	NOTCH1	notch 1
BICD2	BICD cargo adaptor 2	NOTCH3	notch 3
BLM	Bloom syndrome RecQ like helicase	NPAS4	neuronal PAS domain protein 4
BLNK	B-cell linker	NPL	N-acetylneuraminate pyruvate lyase
BMP2K	BMP2 inducible kinase	NPR1	natriuretic peptide receptor 1
BMP3	bone morphogenetic protein 3	NPR3	natriuretic peptide receptor 3
BMPER	BMP binding endothelial regulator	NPY1R	neuropeptide Y receptor Y1
BMS1P21	BMS1, ribosome biogenesis factor pseudogene 21	NPY6R	neuropeptide Y receptor Y6 (pseudogene)
BNC2	basonuclin 2	NR3C2	nuclear receptor subfamily 3 group C member 2
BOC	BOC cell adhesion associated, oncogene regulated	NR4A1	nuclear receptor subfamily 4 group A member 1
BRINP2	BMP/retinoic acid inducible neural specific 2	NR4A2	nuclear receptor subfamily 4 group A member 2
BRINP3	BMP/retinoic acid inducible neural specific 3	NR4A3	nuclear receptor subfamily 4 group A member 3
BSG	basigin (Ok blood group)	NRBF2	nuclear receptor binding factor 2
BSN	bassoon presynaptic cytomatrix protein	NRCAM	neuronal cell adhesion molecule
BTAF1	B-TFIID TATA-box binding protein associated factor 1	NREP	neuronal regeneration related protein
BTBD1	BTB domain containing 1	NRG1	neuregulin 1
BTBD11	BTB domain containing 11	NRG2	neuregulin 2
BTBD17	BTB domain containing 17	NRG3	neuregulin 3
BTG1	BTG anti-proliferation factor 1	NRGN	neurogranin
BTG2	BTG anti-proliferation factor 2	NRIP3	nuclear receptor interacting protein 3
BTN1A1	butyrophilin subfamily 1 member A1	NRK	Nik related kinase
BUB1B	BUB1 mitotic checkpoint serine/threonine kinase B	NRXN1	neurexin 1
BZW1	basic leucine zipper and W2 domains 1	NRXN2	neurexin 2

C10orf90	chromosome 10 open reading frame 90	NRXN3	neurexin 3
C11orf87	chromosome 11 open reading frame 87	NT5DC2	5'-nucleotidase domain containing 2
C12orf49	chromosome 12 open reading frame 49	NT5E	5'-nucleotidase ecto
C14orf132	chromosome 14 open reading frame 132	NTF3	neurotrophin 3
C14orf37	chromosome 14 open reading frame 37	NTM	neurotrimin
C1orf146	chromosome 1 open reading frame 146	NTN1	netrin 1
C1orf21	chromosome 1 open reading frame 21	NTN4	netrin 4
C1orf61	chromosome 1 open reading frame 61	NTNG1	netrin G1
C1QA	complement C1q A chain	NTNG2	netrin G2
C1QB	complement C1q B chain	NTSR1	neurotensin receptor 1
C1QL1	complement C1q like 1	NTSR2	neurotensin receptor 2
C1QL2	complement C1q like 2	NUDC	nuclear distribution C, dynein complex regulator
C1QTNF4	C1q and TNF related 4	NUDCD3	NudC domain containing 3
C1RL	complement C1r subcomponent like	NUDT4	nudix hydrolase 4
C21orf91	chromosome 21 open reading frame 91	NUMBL	NUMB like, endocytic adaptor protein
C2orf27A	chromosome 2 open reading frame 27A	NUP58	nucleoporin 58
C2orf69	chromosome 2 open reading frame 69	NUP62CL	nucleoporin 62 C-terminal like
C2orf72	chromosome 2 open reading frame 72	NUP93	nucleoporin 93
C2orf73	chromosome 2 open reading frame 73	NWD1	NACHT and WD repeat domain containing 1
C2orf80	chromosome 2 open reading frame 80	NXN	nucleoredoxin
C3	complement C3	NXNL2	nucleoredoxin like 2
C3orf67	chromosome 3 open reading frame 67	NXPE3	neurexophilin and PC-esterase domain family member 3
C4orf22	chromosome 4 open reading frame 22	NYAP2	neuronal tyrosine-phosphorylated phosphoinositide-3-kinase adaptor 2
C4orf33	chromosome 4 open reading frame 33	NYX	nyctalopin
C6orf106	chromosome 6 open reading frame 106	OAT	ornithine aminotransferase
C6orf163	chromosome 6 open reading frame 163	OGDHL	oxoglutarate dehydrogenase like
C8orf34	chromosome 8 open reading frame 34	OLFM1	olfactomedin 1
C8orf46	chromosome 8 open reading frame 46	OLFM2	olfactomedin 2
C9orf135	chromosome 9 open reading frame 135	OLFM3	olfactomedin 3
C9orf72	chromosome 9 open reading frame 72	OLIG1	oligodendrocyte transcription factor 1
CA12	carbonic anhydrase 12	OLIG2	oligodendrocyte transcription factor 2
CA14	carbonic anhydrase 14	ONECUT1	one cut homeobox 1
CA2	carbonic anhydrase 2	ONECUT2	one cut homeobox 2
CA4	carbonic anhydrase 4	OPALIN	oligodendrocytic myelin paranodal and inner loop protein
CA7	carbonic anhydrase 7	OPHN1	oligophrenin 1
CA8	carbonic anhydrase 8	OPLAH	5-oxoprolinase, ATP-hydrolysing
CAB39L	calcium binding protein 39 like	OPRD1	opioid receptor delta 1
CABIN1	calcineurin binding protein 1	OPTC	opticin
CABLES1	Cdk5 and Abl enzyme substrate 1	OSBP	oxysterol binding protein
CABP1	calcium binding protein 1	OSBPL10	oxysterol binding protein like 10
CACHD1	cache domain containing 1	OSBPL3	oxysterol binding protein like 3
CACNA1A	calcium voltage-gated channel subunit alpha1 A	OTUD6B	OTU domain containing 6B
CACNA1B	calcium voltage-gated channel subunit alpha1 B	OTUD6B-AS1	OTUD6B antisense RNA 1 (head to head)
CACNA1D	calcium voltage-gated channel subunit alpha1 D	OXSR1	oxidative stress responsive 1
CACNA1E	calcium voltage-gated channel subunit alpha1 E	P2RY1	purinergic receptor P2Y1
CACNA1G	calcium voltage-gated channel subunit alpha1 G	P2RY12	purinergic receptor P2Y12
CACNA2D1	calcium voltage-gated channel auxiliary subunit alpha2delta 1	P4HA1	prolyl 4-hydroxylase subunit alpha 1
CACNA2D2	calcium voltage-gated channel auxiliary subunit alpha2delta 2	P4HA2	prolyl 4-hydroxylase subunit alpha 2
CACNA2D3	calcium voltage-gated channel auxiliary subunit alpha2delta 3	P4HA2-AS1	P4HA2 antisense RNA 1
CACNB3	calcium voltage-gated channel auxiliary subunit beta 3	PACS2	phosphofurin acidic cluster sorting protein 2
CACNB4	calcium voltage-gated channel auxiliary subunit beta 4	PAFAH1B1	platelet activating factor acetylhydrolase 1b regulatory subunit 1

CACNG3	calcium voltage-gated channel auxiliary subunit gamma 3	PAGR1	PAXIP1 associated glutamate rich protein 1
CACNG4	calcium voltage-gated channel auxiliary subunit gamma 4	PAK5	p21 (RAC1) activated kinase 5
CACNG5	calcium voltage-gated channel auxiliary subunit gamma 5	Pak7	p21 protein (Cdc42/Rac)-activated kinase 7
CACNG8	calcium voltage-gated channel auxiliary subunit gamma 8	PALM2	paralemmin 2
CACYBP	calcyclin binding protein	PAM	peptidylglycine alpha-amidating monooxygenase
CADM3	cell adhesion molecule 3	PANX2	pannexin 2
CADPS	calcium dependent secretion activator	PAQR4	progestin and adipoQ receptor family member 4
CADPS2	calcium dependent secretion activator 2	PAQR6	progestin and adipoQ receptor family member 6
CALB1	calbindin 1	PARD3	par-3 family cell polarity regulator
CALB2	calbindin 2	PARD3B	par-3 family cell polarity regulator beta
CALCRL	calcitonin receptor like receptor	PARD6G	par-6 family cell polarity regulator gamma
CALHM3	calcium homeostasis modulator 3	PARD6G-AS1	PARD6G antisense RNA 1
CALN1	calneuron 1	PARM1	prostate androgen-regulated mucin-like protein 1
CALR	calreticulin	PATJ	PATJ, crumbs cell polarity complex component
CALY	calcyon neuron specific vesicular protein	PAX2	paired box 2
CAMK1G	calcium/calmodulin dependent protein kinase IG	PAX3	paired box 3
CAMK2A	calcium/calmodulin dependent protein kinase II alpha	PAX6	paired box 6
CAMK2G	calcium/calmodulin dependent protein kinase II gamma	PAXBP1	PAX3 and PAX7 binding protein 1
CAMK4	calcium/calmodulin dependent protein kinase IV	PBX3	PBX homeobox 3
CAMKK2	calcium/calmodulin dependent protein kinase kinase 2	PBXIP1	PBX homeobox interacting protein 1
CAMKV	CaM kinase like vesicle associated	PC	pyruvate carboxylase
CAP2	cyclase associated actin cytoskeleton regulatory protein 2	PCBP1	poly(rC) binding protein 1
CAPN1	calpain 1	PCDH1	protocadherin 1
CAPN3	calpain 3	PCDH15	protocadherin related 15
CAPN5	calpain 5	PCDH17	protocadherin 17
CAPN9	calpain 9	PCDH9	protocadherin 9
CAPZB	capping actin protein of muscle Z-line beta subunit	PCDHA1	protocadherin alpha 1
Car12	carbonic anhydrase 12	PCDHA3	protocadherin alpha 3
Car14	carbonic anhydrase 14	PCGF5	polycomb group ring finger 5
Car2	carbonic anhydrase 2	PCK1	phosphoenolpyruvate carboxykinase 1
Car4	carbonic anhydrase 4	PCP2	Purkinje cell protein 2
Car7	carbonic anhydrase 7	PCP4	Purkinje cell protein 4
Car8	carbonic anhydrase 8	Pcsk1	proprotein convertase subtilisin/kexin type 1
CARMIL1	capping protein regulator and myosin 1 linker 1	PCSK5	proprotein convertase subtilisin/kexin type 5
CARNS1	carnosine synthase 1	PCSK6	proprotein convertase subtilisin/kexin type 6
CASP12	caspase 12 (gene/pseudogene)	PCSK7	proprotein convertase subtilisin/kexin type 7
CASP3	caspase 3	Pcx	pyruvate carboxylase
CASP4	caspase 4	PCYT1B	phosphate cytidylyltransferase 1, choline, beta
CASP9	caspase 9	PDC	phosducin
CASQ2	calsequestrin 2	PDE1A	phosphodiesterase 1A
CASTOR1	cytosolic arginine sensor for mTORC1 subunit 1	PDE1B	phosphodiesterase 1B
CASTOR2	cytosolic arginine sensor for mTORC1 subunit 2	PDE1C	phosphodiesterase 1C
CATSPERG	cation channel sperm associated auxiliary subunit gamma	PDE3A	phosphodiesterase 3A
CAV1	caveolin 1	PDE3B	phosphodiesterase 3B
CAV2	caveolin 2	PDE4D	phosphodiesterase 4D
CBFA2T3	CBFA2/RUNX1 translocation partner 3	PDE5A	phosphodiesterase 5A
CBFB	core-binding factor beta subunit	PDE7A	phosphodiesterase 7A
CBLB	Cbl proto-oncogene B	PDE7B	phosphodiesterase 7B
CBLN1	cerebellin 1 precursor	PDE8A	phosphodiesterase 8A
CBLN2	cerebellin 2 precursor	PDE8B	phosphodiesterase 8B
CBLN3	cerebellin 3 precursor	PDE9A	phosphodiesterase 9A

CBS	cystathionine-beta-synthase	PDGFC	platelet derived growth factor C
CBWD6	COBW domain containing 6	PDGFD	platelet derived growth factor D
CCBE1	collagen and calcium binding EGF domains 1	PDGFRA	platelet derived growth factor receptor alpha
CCDC13	coiled-coil domain containing 13	PDGFRB	platelet derived growth factor receptor beta
CCDC146	coiled-coil domain containing 146	PDK3	pyruvate dehydrogenase kinase 3
CCDC152	coiled-coil domain containing 152	PDLIM3	PDZ and LIM domain 3
CCDC155	coiled-coil domain containing 155	PDLIM4	PDZ and LIM domain 4
CCDC175	coiled-coil domain containing 175	PDZD3	PDZ domain containing 3
CCDC180	coiled-coil domain containing 180	PDZD7	PDZ domain containing 7
CCDC61	coiled-coil domain containing 61	Pdzph1	PDZ and pleckstrin homology domains 1
CCDC80	coiled-coil domain containing 80	PDZRN4	PDZ domain containing ring finger 4
CCDC85A	coiled-coil domain containing 85A	PEA15	proliferation and apoptosis adaptor protein 15
CCDC88A	coiled-coil domain containing 88A	Pea15a	phosphoprotein enriched in astrocytes 15A
CCK	cholecystokinin	PEBP4	phosphatidylethanolamine binding protein 4
CCKBR	cholecystokinin B receptor	PEG3	paternally expressed 3
CCM2L	CCM2 like scaffolding protein	PENK	proenkephalin
CCND1	cyclin D1	PER1	period circadian regulator 1
CCND2	cyclin D2	PET100	PET100 homolog
CCNH	cyclin H	PEX5L	peroxisomal biogenesis factor 5 like
CD101	CD101 molecule	PFKFB4	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4
CD27	CD27 molecule	PFKM	phosphofructokinase, muscle
CD33	CD33 molecule	PFKP	phosphofructokinase, platelet
CD70	CD70 molecule	PGGHG	protein-glucosylgalactosylhydroxylysine glucosidase
CD74	CD74 molecule	PGM2L1	phosphoglucomutase 2 like 1
CD82	CD82 molecule	PGM5	phosphoglucomutase 5
CD83	CD83 molecule	PGR	progesterone receptor
CD9	CD9 molecule	PHACTR2-AS1	PHACTR2 antisense RNA 1
CDADC1	cytidine and dCMP deaminase domain containing 1	PHF10	PHD finger protein 10
CDC14B	cell division cycle 14B	PHF21B	PHD finger protein 21B
CDC42EP1	CDC42 effector protein 1	PHF24	PHD finger protein 24
CDC42EP3	CDC42 effector protein 3	PHKA1	phosphorylase kinase regulatory subunit alpha 1
CDC42EP4	CDC42 effector protein 4	PHKA2	phosphorylase kinase regulatory subunit alpha 2
CDH1	cadherin 1	PHKG1	phosphorylase kinase catalytic subunit gamma 1
CDH10	cadherin 10	PHOX2A	paired like homeobox 2a
CDH11	cadherin 11	PHYHIP	phytanoyl-CoA 2-hydroxylase interacting protein
CDH13	cadherin 13	PI16	peptidase inhibitor 16
CDH15	cadherin 15	PID1	phosphotyrosine interaction domain containing 1
CDH19	cadherin 19	PIEZO2	piezo type mechanosensitive ion channel component 2
CDH2	cadherin 2	PIGA	phosphatidylinositol glycan anchor biosynthesis class A
CDH23	cadherin related 23	PIGH	phosphatidylinositol glycan anchor biosynthesis class H
CDH26	cadherin 26	PIGS	phosphatidylinositol glycan anchor biosynthesis class S
CDH4	cadherin 4	PIGZ	phosphatidylinositol glycan anchor biosynthesis class Z
CDH7	cadherin 7	PIH1D3	PIH1 domain containing 3
CDH8	cadherin 8	Pih1h3b	PIH1 domain containing 3B
CDHR1	cadherin related family member 1	PIK3C2B	phosphatidylinositol-4-phosphate 3-kinase catalytic subunit type 2 beta
CDK14	cyclin dependent kinase 14	PIK3R1	phosphoinositide-3-kinase regulatory subunit 1
CDK15	cyclin dependent kinase 15	PILRA	paired immunoglobin like type 2 receptor alpha
CDK16	cyclin dependent kinase 16	PIM3	Pim-3 proto-oncogene, serine/threonine kinase
CDK18	cyclin dependent kinase 18	PIN4	peptidylprolyl cis/trans isomerase, NIMA-interacting 4
CDK2	cyclin dependent kinase 2	PIP4K2A	phosphatidylinositol-5-phosphate 4-kinase type 2 alpha

CDK5R2	cyclin dependent kinase 5 regulatory subunit 2	PIP5K1C	phosphatidylinositol-4-phosphate 5-kinase type 1 gamma
CDK5RAP2	CDK5 regulatory subunit associated protein 2	PIPOX	pipecolic acid and sarcosine oxidase
CDKL1	cyclin dependent kinase like 1	PITPNM3	PITPNM family member 3
CDKN1A	cyclin dependent kinase inhibitor 1A	PIWIL1	piwi like RNA-mediated gene silencing 1
CDO1	cysteine dioxygenase type 1	PKD1	polycystin 1, transient receptor potential channel interacting
CDYL	chromodomain Y like	PKD2	polycystin 2, transient receptor potential cation channel
CDYL2	chromodomain Y like 2	PKD2L1	polycystin 2 like 1, transient receptor potential cation channel
CEBPB	CCAAT/enhancer binding protein beta	PKDCC	protein kinase domain containing, cytoplasmic
CEMIP	cell migration inducing hyaluronan binding protein	PKIA	cAMP-dependent protein kinase inhibitor alpha
CEP126	centrosomal protein 126	PKMYT1	protein kinase, membrane associated tyrosine/threonine 1
CEP76	centrosomal protein 76	PKNOX2	PBX/knotted 1 homeobox 2
CEPT1	choline/ethanolamine phosphotransferase 1	PKP3	plakophilin 3
CERCAM	cerebral endothelial cell adhesion molecule	PLA2G16	phospholipase A2 group XVI
CERKL	ceramide kinase like	PLA2G3	phospholipase A2 group III
CERS4	ceramide synthase 4	PLA2G4A	phospholipase A2 group IVA
CFAP161	cilia and flagella associated protein 161	PLA2G4E	phospholipase A2 group IVE
CFAP20	cilia and flagella associated protein 20	PLA2G5	phospholipase A2 group V
CFAP221	cilia and flagella associated protein 221	PLA2G7	phospholipase A2 group VII
CFAP43	cilia and flagella associated protein 43	PLAG1	PLAG1 zinc finger
CFAP46	cilia and flagella associated protein 46	PLAT	plasminogen activator, tissue type
CFAP53	cilia and flagella associated protein 53	PLCB1	phospholipase C beta 1
CFAP70	cilia and flagella associated protein 70	PLCE1	phospholipase C epsilon 1
CFAP74	cilia and flagella associated protein 74	PLCH1	phospholipase C eta 1
CGN	cingulin	PLCH2	phospholipase C eta 2
CGNL1	cingulin like 1	PLCL1	phospholipase C like 1 (inactive)
CHAC1	ChaC glutathione specific gamma-glutamylcyclotransferase 1	PLCXD3	phosphatidylinositol specific phospholipase C X domain containing 3
CHD7	chromodomain helicase DNA binding protein 7	PLD1	phospholipase D1
CHDH	choline dehydrogenase	PLD4	phospholipase D family member 4
CHGB	chromogranin B	PLD5	phospholipase D family member 5
CHID1	chitinase domain containing 1	PLEKHD1	pleckstrin homology and coiled-coil domain containing D1
CHL1	cell adhesion molecule L1 like	PLEKHG3	pleckstrin homology and RhoGEF domain containing G3
CHN2	chimerin 2	PLEKHG5	pleckstrin homology and RhoGEF domain containing G5
CHODL	chondrolectin	PLEKHH1	pleckstrin homology, MyTH4 and FERM domain containing H1
CHORDC1	cysteine and histidine rich domain containing 1	PLEKHH2	pleckstrin homology, MyTH4 and FERM domain containing H2
CHRD	chordin	PLEKHO2	pleckstrin homology domain containing O2
CHRM1	cholinergic receptor muscarinic 1	PLK2	polo like kinase 2
CHRM3	cholinergic receptor muscarinic 3	PLK5	polo like kinase 5
CHRNA3	cholinergic receptor nicotinic alpha 3 subunit	PLLP	plasmolipin
CHST1	carbohydrate sulfotransferase 1	PLOD2	procollagen-lysine,2-oxoglutarate 5-dioxygenase 2
CHST10	carbohydrate sulfotransferase 10	PLP1	proteolipid protein 1
CHST11	carbohydrate sulfotransferase 11	PLPP2	phospholipid phosphatase 2
CHST12	carbohydrate sulfotransferase 12	PLPP3	phospholipid phosphatase 3
CHST15	carbohydrate sulfotransferase 15	PLPP4	phospholipid phosphatase 4
CHST5	carbohydrate sulfotransferase 5	PLPPR1	phospholipid phosphatase related 1
CHST8	carbohydrate sulfotransferase 8	PLPPR4	phospholipid phosphatase related 4
CHST9	carbohydrate sulfotransferase 9	PLS1	plastin 1
CHSY1	chondroitin sulfate synthase 1	PLSCR1	phospholipid scramblase 1
CHSY3	chondroitin sulfate synthase 3	PLSCR4	phospholipid scramblase 4
CHTF18	chromosome transmission fidelity factor 18	PLTP	phospholipid transfer protein

CIPC	CLOCK interacting pacemaker	PLXDC1	plexin domain containing 1
CIT	citron rho-interacting serine/threonine kinase	PLXDC2	plexin domain containing 2
CKMT1B	creatine kinase, mitochondrial 1B	PLXNA1	plexin A1
CLASRP	CLK4 associating serine/arginine rich protein	PLXNA4	plexin A4
CLCN1	chloride voltage-gated channel 1	PLXNB1	plexin B1
CLCN3	chloride voltage-gated channel 3	PLXNB3	plexin B3
CLCN5	chloride voltage-gated channel 5	PLXNC1	plexin C1
CLDN1	claudin 1	PMEL	premelanosome protein
CLDN11	claudin 11	PMEPA1	prostate transmembrane protein, androgen induced 1
CLEC2L	C-type lectin domain family 2 member L	PMP2	peripheral myelin protein 2
CLEC7A	C-type lectin domain containing 7A	PMP22	peripheral myelin protein 22
CLIC5	chloride intracellular channel 5	PMVK	phosphomevalonate kinase
CLIC6	chloride intracellular channel 6	PNLIP	pancreatic lipase
CLK1	CDC like kinase 1	PNMA2	PNMA family member 2
CLMN	calmin	PNP	purine nucleoside phosphorylase
CLMP	CXADR like membrane protein	PNPLA3	patatin like phospholipase domain containing 3
CLSTN2	calsyntenin 2	PNPLA8	patatin like phospholipase domain containing 8
CLSTN3	calsyntenin 3	POLR2A	RNA polymerase II subunit A
CLVS2	clavesin 2	POLR2J3	RNA polymerase II subunit J3
CMTM5	CKLF like MARVEL transmembrane domain containing 5	PON2	paraoxonase 2
CMTM8	CKLF like MARVEL transmembrane domain containing 8	POR	cytochrome p450 oxidoreductase
CNDP1	carnosine dipeptidase 1	POU3F2	POU class 3 homeobox 2
CNIH3	cornichon family AMPA receptor auxiliary protein 3	PPARG	peroxisome proliferator activated receptor gamma
CNKSR3	CNKSR family member 3	PPFIA4	PTPRF interacting protein alpha 4
CNMD	chondromodulin	PPFIBP1	PPFIA binding protein 1
CNP	2',3'-cyclic nucleotide 3' phosphodiesterase	PPFIBP2	PPFIA binding protein 2
CNPY1	canopy FGF signaling regulator 1	PPM1E	protein phosphatase, Mg2+/Mn2+ dependent 1E
CNR1	cannabinoid receptor 1	PPM1H	protein phosphatase, Mg2+/Mn2+ dependent 1H
CNTFR	ciliary neurotrophic factor receptor	PPM1J	protein phosphatase, Mg2+/Mn2+ dependent 1J
CNTN2	contactin 2	PPP1R11	protein phosphatase 1 regulatory inhibitor subunit 11
CNTN3	contactin 3	PPP1R14A	protein phosphatase 1 regulatory inhibitor subunit 14A
CNTN4	contactin 4	PPP1R15A	protein phosphatase 1 regulatory subunit 15A
CNTN5	contactin 5	PPP1R16B	protein phosphatase 1 regulatory subunit 16B
CNTNAP4	contactin associated protein like 4	PPP1R17	protein phosphatase 1 regulatory subunit 17
CNTNAP5	contactin associated protein like 5	PPP1R1C	protein phosphatase 1 regulatory inhibitor subunit 1C
Cntnap5a	contactin associated protein-like 5A	PPP1R36	protein phosphatase 1 regulatory subunit 36
COBL	cordon-bleu WH2 repeat protein	PPP2CA	protein phosphatase 2 catalytic subunit alpha
COL11A1	collagen type XI alpha 1 chain	PPP2R2C	protein phosphatase 2 regulatory subunit Bgamma
COL11A2	collagen type XI alpha 2 chain	PPP4R4	protein phosphatase 4 regulatory subunit 4
COL12A1	collagen type XII alpha 1 chain	PPP6R2	protein phosphatase 6 regulatory subunit 2
COL13A1	collagen type XIII alpha 1 chain	PRAG1	PEAK1 related, kinase-activating pseudokinase 1
COL15A1	collagen type XV alpha 1 chain	PRDM1	PR/SET domain 1
COL18A1	collagen type XVIII alpha 1 chain	PRDM8	PR/SET domain 8
COL1A1	collagen type I alpha 1 chain	PRELP	proline and arginine rich end leucine rich repeat protein
COL1A2	collagen type I alpha 2 chain	PREX1	phosphatidylinositol-3,4,5-trisphosphate dependent Rac exchange factor 1
COL20A1	collagen type XX alpha 1 chain	PREX2	phosphatidylinositol-3,4,5-trisphosphate dependent Rac exchange factor 2
COL22A1	collagen type XXII alpha 1 chain	PRICKLE1	prickle planar cell polarity protein 1
COL23A1	collagen type XXIII alpha 1 chain	PRIMA1	proline rich membrane anchor 1
COL25A1	collagen type XXV alpha 1 chain	PRKAG2	protein kinase AMP-activated non-catalytic subunit gamma 2

COL4A1	collagen type IV alpha 1 chain	PRKAG3	protein kinase AMP-activated non-catalytic subunit gamma 3
COL4A5	collagen type IV alpha 5 chain	PRKCB	protein kinase C beta
COL5A1	collagen type V alpha 1 chain	PRKCD	protein kinase C delta
COL5A3	collagen type V alpha 3 chain	PRKCG	protein kinase C gamma
COL6A1	collagen type VI alpha 1 chain	PRKCQ	protein kinase C theta
COL9A1	collagen type IX alpha 1 chain	PRKD3	protein kinase D3
COLEC12	collectin subfamily member 12	PRKG1	protein kinase, cGMP-dependent, type I
COLGALT2	collagen beta(1-O)galactosyltransferase 2	PRKG2	protein kinase, cGMP-dependent, type II
COQ10B	coenzyme Q10B	PRKY	protein kinase, Y-linked, pseudogene
CORIN	corin, serine peptidase	PRMT8	protein arginine methyltransferase 8
CORO1C	coronin 1C	PRMT9	protein arginine methyltransferase 9
CORO2A	coronin 2A	PRNP	prion protein
CORO2B	coronin 2B	PROCR	protein C receptor
CORO6	coronin 6	PRODH	proline dehydrogenase 1
COTL1	coactosin like F-actin binding protein 1	PROX1	prospero homeobox 1
COX6B2	cytochrome c oxidase subunit 6B2	PRR5	proline rich 5
CPE	carboxypeptidase E	PRR5L	proline rich 5 like
CPLX2	complexin 2	PRRC1	proline rich coiled-coil 1
CPLX3	complexin 3	PRRG3	proline rich and Gla domain 3
CPM	carboxypeptidase M	PRRT2	proline rich transmembrane protein 2
CPNE4	copine 4	PRRT4	proline rich transmembrane protein 4
CPNE7	copine 7	PRRX1	paired related homeobox 1
CPNE8	copine 8	PRSS51	protease, serine 51
CPNE9	copine family member 9	PRSS55	protease, serine 55
CPVL	carboxypeptidase, vitellogenic like	PSD2	pleckstrin and Sec7 domain containing 2
CREB3L1	cAMP responsive element binding protein 3 like 1	PSRC1	proline and serine rich coiled-coil 1
CREB3L2	cAMP responsive element binding protein 3 like 2	PSTPIP2	proline-serine-threonine phosphatase interacting protein 2
CRIM1	cysteine rich transmembrane BMP regulator 1	PTCH2	patched 2
CRIPT	CXXC repeat containing interactor of PDZ3 domain	PTCHD1	patched domain containing 1
CRISPLD1	cysteine rich secretory protein LCCL domain containing 1	PTCHD4	patched domain containing 4
CRISPLD2	cysteine rich secretory protein LCCL domain containing 2	PTER	phosphotriesterase related
CRLF1	cytokine receptor like factor 1	PTGES3	prostaglandin E synthase 3
CRTAC1	cartilage acidic protein 1	PTGFRN	prostaglandin F2 receptor inhibitor
CRY1	cryptochrome circadian regulator 1	PTK2B	protein tyrosine kinase 2 beta
CRYAB	crystallin alpha B	PTK7	protein tyrosine kinase 7 (inactive)
CRYBA2	crystallin beta A2	PTMS	parathymosin
CRYBG3	crystallin beta-gamma domain containing 3	PTN	pleiotrophin
CRYL1	crystallin lambda 1	PTP4A1	protein tyrosine phosphatase type IVA, member 1
CRYM	crystallin mu	PTP4A3	protein tyrosine phosphatase type IVA, member 3
CRYM-AS1	CRYM antisense RNA 1	PTPN14	protein tyrosine phosphatase, non-receptor type 14
CSF1R	colony stimulating factor 1 receptor	PTPN22	protein tyrosine phosphatase, non-receptor type 22
CSMD1	CUB and Sushi multiple domains 1	PTPN3	protein tyrosine phosphatase, non-receptor type 3
CSMD2	CUB and Sushi multiple domains 2	PTPN5	protein tyrosine phosphatase, non-receptor type 5
CSPG4	chondroitin sulfate proteoglycan 4	PTPRB	protein tyrosine phosphatase, receptor type B
CSPG5	chondroitin sulfate proteoglycan 5	PTPRE	protein tyrosine phosphatase, receptor type E
CSRNP1	cysteine and serine rich nuclear protein 1	PTPRJ	protein tyrosine phosphatase, receptor type J
CSRNP3	cysteine and serine rich nuclear protein 3	PTPRK	protein tyrosine phosphatase, receptor type K
CSRP1	cysteine and glycine rich protein 1	PTPRM	protein tyrosine phosphatase, receptor type M
CSTA	cystatin A	PTPRN	protein tyrosine phosphatase, receptor type N
Csta1	cystatin A1	PTPRO	protein tyrosine phosphatase, receptor type O
CSTF2T	cleavage stimulation factor subunit 2 tau variant	PTPRR	protein tyrosine phosphatase, receptor type R
CTH	cystathionine gamma-lyase	PTPRT	protein tyrosine phosphatase, receptor type T
CTNNA3	catenin alpha 3	PTPRZ1	protein tyrosine phosphatase, receptor type Z1
CTSL	cathepsin L	PTTG1	pituitary tumor-transforming 1
CTSS	cathepsin S	PUDP	pseudouridine 5'-phosphatase
CTTNBP2	cortactin binding protein 2	PURB	purine rich element binding protein B

CTXN1	cortexin 1	PVALB	parvalbumin
CTXN3	cortexin 3	PXDC1	PX domain containing 1
CUL7	cullin 7	PXDN	peroxidasin
CX3CL1	C-X3-C motif chemokine ligand 1	PXDNL	peroxidasin like
CX3CR1	C-X3-C motif chemokine receptor 1	PXK	PX domain containing serine/threonine kinase like
CXCL12	C-X-C motif chemokine ligand 12	PXN	paxillin
CXCL14	C-X-C motif chemokine ligand 14	PXYLP1	2-phosphoxylose phosphatase 1
CXCL5	C-X-C motif chemokine ligand 5	PYGM	glycogen phosphorylase, muscle associated
CXCR4	C-X-C motif chemokine receptor 4	PYROXD2	pyridine nucleotide-disulphide oxidoreductase domain 2
CXorf36	chromosome X open reading frame 36	QDPR	quinoid dihydropteridine reductase
CXXC4	CXXC finger protein 4	Qk	quaking
CYB5A	cytochrome b5 type A	QKI	QKI, KH domain containing RNA binding
CYCS	cytochrome c, somatic	QPRT	quinolinate phosphoribosyltransferase
CYFIP2	cytoplasmic FMR1 interacting protein 2	RAB11FIP1	RAB11 family interacting protein 1
CYGB	cytoglobin	RAB15	RAB15, member RAS oncogene family
CYP27A1	cytochrome P450 family 27 subfamily A member 1	RAB27A	RAB27A, member RAS oncogene family
CYP2D6	cytochrome P450 family 2 subfamily D member 6	RAB27B	RAB27B, member RAS oncogene family
CYP2J2	cytochrome P450 family 2 subfamily J member 2	RAB31	RAB31, member RAS oncogene family
Cyp2j9	cytochrome P450, family 2, subfamily j, polypeptide 9	RAB33A	RAB33A, member RAS oncogene family
CYP7B1	cytochrome P450 family 7 subfamily B member 1	RAB34	RAB34, member RAS oncogene family
CYR61	cysteine rich angiogenic inducer 61	RAB37	RAB37, member RAS oncogene family
CYSTM1	cysteine rich transmembrane module containing 1	RAB3A	RAB3A, member RAS oncogene family
CYYR1	cysteine and tyrosine rich 1	RAB3B	RAB3B, member RAS oncogene family
D430019H16Rik	RIKEN cDNA D430019H16 gene	RAB3C	RAB3C, member RAS oncogene family
D430041D05Rik	RIKEN cDNA D430041D05 gene	RAB6B	RAB6B, member RAS oncogene family
D4300420O9Rik	RIKEN cDNA D4300420O9 gene	RAI2	retinoic acid induced 2
D630003M21Rik	RIKEN cDNA D630003M21 gene	RALGPS2	Ral GEF with PH domain and SH3 binding motif 2
D7Ertd443e	DNA segment, Chr 7, ERATO Doi 443, expressed	RALYL	RALY RNA binding protein like
DAB1	DAB1, reelin adaptor protein	RAMP1	receptor activity modifying protein 1
DACH1	dachshund family transcription factor 1	RAMP2	receptor activity modifying protein 2
DACT2	dishevelled binding antagonist of beta catenin 2	RANBP2	RAN binding protein 2
DAGLA	diacylglycerol lipase alpha	RANBP3L	RAN binding protein 3 like
DAO	D-amino acid oxidase	RAPGEF3	Rap guanine nucleotide exchange factor 3
DAPK1	death associated protein kinase 1	RAPGEF4	Rap guanine nucleotide exchange factor 4
DAPK2	death associated protein kinase 2	RARB	retinoic acid receptor beta
DBH	dopamine beta-hydroxylase	RASAL1	RAS protein activator like 1
DCBLD1	discoidin, CUB and LCCL domain containing 1	RASAL2	RAS protein activator like 2
DCC	DCC netrin 1 receptor	RASGEF1B	RasGEF domain family member 1B
DCLK1	doublecortin like kinase 1	RASGRF1	Ras protein specific guanine nucleotide releasing factor 1
DCUN1D3	defective in cullin neddylation 1 domain containing 3	RASGRP1	RAS guanyl releasing protein 1
DCX	doublecortin	RASGRP3	RAS guanyl releasing protein 3
DDHD1	DDHD domain containing 1	RASIP1	Ras interacting protein 1
DDIT3	DNA damage inducible transcript 3	RASL11B	RAS like family 11 member B
DDIT4	DNA damage inducible transcript 4	RASL12	RAS like family 12
DDIT4L	DNA damage inducible transcript 4 like	RASSF2	Ras association domain family member 2
DDN	dendrin	RBFOX3	RNA binding fox-1 homolog 3
DDO	D-aspartate oxidase	RBKS	ribokinase
DDR2	discoidin domain receptor tyrosine kinase 2	RBM22	RNA binding motif protein 22
DDX3Y	DEAD-box helicase 3, Y-linked	RBM24	RNA binding motif protein 24
DDX49	DEAD-box helicase 49	RBM25	RNA binding motif protein 25
DEDD2	death effector domain containing 2	RBM7	RNA binding motif protein 7
DEPDC1B	DEP domain containing 1B	RBMS3	RNA binding motif single stranded interacting protein 3
DEPDC7	DEP domain containing 7	RBP2	retinol binding protein 2
DES	desmin	RBPJL	recombination signal binding protein for immunoglobulin kappa J region like

DGCR5	DiGeorge syndrome critical region gene 5 (non-protein coding)	RBPMS2	RNA binding protein with multiple splicing 2
DGKA	diacylglycerol kinase alpha	RCAN2	regulator of calcineurin 2
DGKB	diacylglycerol kinase beta	RCN1	reticulocalbin 1
DGKH	diacylglycerol kinase eta	RCN2	reticulocalbin 2
DGKI	diacylglycerol kinase iota	RECK	reversion inducing cysteine rich protein with kazal motifs
DHDDS	dehydrodolichyl diphosphate synthase subunit	REEP1	receptor accessory protein 1
DHFR	dihydrofolate reductase	RELN	reelin
DIRAS2	DIRAS family GTPase 2	REP15	RAB15 effector protein
DISP2	dispatched RND transporter family member 2	REPIN1	replication initiator 1
DISP3	dispatched RND transporter family member 3	RERG	RAS like estrogen regulated growth inhibitor
DIXDC1	DIX domain containing 1	RET	ret proto-oncogene
DKK4	dickkopf WNT signaling pathway inhibitor 4	RETREG1	reticulophagy regulator 1
DLC1	DLC1 Rho GTPase activating protein	RFTN1	raftlin, lipid raft linker 1
DLG1	discs large MAGUK scaffold protein 1	RFX4	regulatory factor X4
DLG4	discs large MAGUK scaffold protein 4	RGCC	regulator of cell cycle
DLGAP2	DLG associated protein 2	RGL3	ral guanine nucleotide dissociation stimulator like 3
DLGAP4	DLG associated protein 4	RGMA	repulsive guidance molecule family member a
Dlx4os	distal-less homeobox 4, opposite strand	RGMB	repulsive guidance molecule family member b
Dlx6os1	distal-less homeobox 6, opposite strand 1	RGS16	regulator of G protein signaling 16
DMD	dystrophin	RGS2	regulator of G protein signaling 2
DMGDH	dimethylglycine dehydrogenase	RGS20	regulator of G protein signaling 20
DMP1	dentin matrix acidic phosphoprotein 1	RGS4	regulator of G protein signaling 4
DNAH5	dynein axonemal heavy chain 5	RGS6	regulator of G protein signaling 6
DNAH6	dynein axonemal heavy chain 6	RGS7BP	regulator of G protein signaling 7 binding protein
DNAJA1	DnaJ heat shock protein family (Hsp40) member A1	RGS8	regulator of G protein signaling 8
DNAJA4	DnaJ heat shock protein family (Hsp40) member A4	RGS9	regulator of G protein signaling 9
DNAJB1	DnaJ heat shock protein family (Hsp40) member B1	RHBG	Rh family B glycoprotein (gene/pseudogene)
DNAJB4	DnaJ heat shock protein family (Hsp40) member B4	RHCG	Rh family C glycoprotein
DNAJB5	DnaJ heat shock protein family (Hsp40) member B5	RHEB	Ras homolog, mTORC1 binding
DNAJB6	DnaJ heat shock protein family (Hsp40) member B6	RHOB	ras homolog family member B
DNAJC27	DnaJ heat shock protein family (Hsp40) member C27	RHOBTB1	Rho related BTB domain containing 1
DNAJC7	DnaJ heat shock protein family (Hsp40) member C7	RHOBTB3	Rho related BTB domain containing 3
DNER	delta/notch like EGF repeat containing	RHOD	ras homolog family member D
DNMBP	dynamin binding protein	RHOJ	ras homolog family member J
DOC2B	double C2 domain beta	RHOU	ras homolog family member U
DOCK1	dedicator of cytokinesis 1	RHPN2	rhophilin Rho GTPase binding protein 2
DOCK5	dedicator of cytokinesis 5	RIMBP2	RIMS binding protein 2
DOCK6	dedicator of cytokinesis 6	RIMS1	regulating synaptic membrane exocytosis 1
DOCK7	dedicator of cytokinesis 7	RIMS3	regulating synaptic membrane exocytosis 3
DOCK8	dedicator of cytokinesis 8	RIMS4	regulating synaptic membrane exocytosis 4
DOK6	docking protein 6	RIN2	Ras and Rab interactor 2
DOPEY2	dopey family member 2	RIT2	Ras like without CAAX 2
DPF3	double PHD fingers 3	RLBP1	retinaldehyde binding protein 1
DPP10	dipeptidyl peptidase like 10	RLF	rearranged L-myc fusion
DPY19L1	dpy-19 like C-mannosyltransferase 1	RNF112	ring finger protein 112
DPY19L2	dpy-19 like 2	RNF122	ring finger protein 122
DPY19L4	dpy-19 like 4	RNF139	ring finger protein 139
DPYD	dihydropyrimidine dehydrogenase	RNF152	ring finger protein 152
DPYSL3	dihydropyrimidinase like 3	RNF17	ring finger protein 17
DPYSL4	dihydropyrimidinase like 4	RNF182	ring finger protein 182
DRD1	dopamine receptor D1	RNF207	ring finger protein 207
DRD2	dopamine receptor D2	RNF212	ring finger protein 212
DSCAML1	DS cell adhesion molecule like 1	RNF215	ring finger protein 215
DTX4	deltex E3 ubiquitin ligase 4	RNF217	ring finger protein 217
DUS3L	dihydrouridine synthase 3 like	RNF220	ring finger protein 220
DUSP1	dual specificity phosphatase 1	RNF39	ring finger protein 39
DUSP16	dual specificity phosphatase 16	RNF43	ring finger protein 43

DUSP22	dual specificity phosphatase 22	ROBO2	roundabout guidance receptor 2
DUSP26	dual specificity phosphatase 26	ROBO3	roundabout guidance receptor 3
DUSP5	dual specificity phosphatase 5	RORA	RAR related orphan receptor A
DYNLT3	dynein light chain Tctex-type 3	RPA1	replication protein A1
DYRK1B	dual specificity tyrosine phosphorylation regulated kinase 1B	RPH3A	rabphilin 3A
DYRK4	dual specificity tyrosine phosphorylation regulated kinase 4	RPL10	ribosomal protein L10
DYSF	dysferlin	RPL13	ribosomal protein L13
DZANK1	double zinc ribbon and ankyrin repeat domains 1	RPRM	reprimo, TP53 dependent G2 arrest mediator homolog
DZIP1L	DAZ interacting zinc finger protein 1 like	RPS4Y1	ribosomal protein S4, Y-linked 1
E2F3	E2F transcription factor 3	RPS6KA1	ribosomal protein S6 kinase A1
EBF1	early B-cell factor 1	RPS6KA5	ribosomal protein S6 kinase A5
EBF2	early B-cell factor 2	RPUSD3	RNA pseudouridylate synthase domain containing 3
EBF3	early B-cell factor 3	RRNAD1	ribosomal RNA adenine dimethylase domain containing 1
EBF4	early B-cell factor 4	RSPO1	R-spondin 1
ECD	ecdysoneless cell cycle regulator	RSPO2	R-spondin 2
ECE1	endothelin converting enzyme 1	RSPO4	R-spondin 4
ECHDC2	enoyl-CoA hydratase domain containing 2	RTL4	retrotransposon Gag like 4
EDEM1	ER degradation enhancing alpha-mannosidase like protein 1	RTN1	reticulon 1
EDIL3	EGF like repeats and discoidin domains 3	RTN4R	reticulon 4 receptor
EDNRB	endothelin receptor type B	RTN4RL1	reticulon 4 receptor like 1
EFEMP1	EGF containing fibulin like extracellular matrix protein 1	RTN4RL2	reticulon 4 receptor like 2
EFHC2	EF-hand domain containing 2	RUBCNL	RUN and cysteine rich domain containing beclin 1 interacting protein like
EFHD1	EF-hand domain family member D1	RUNX1T1	RUNX1 translocation partner 1
EFHD2	EF-hand domain family member D2	RUVBL2	RuvB like AAA ATPase 2
EFNA5	ephrin A5	RXFP1	relaxin/insulin like family peptide receptor 1
EFNB3	ephrin B3	RYR1	ryanodine receptor 1
EFR3B	EFR3 homolog B	RYR2	ryanodine receptor 2
EGF	epidermal growth factor	RYR3	ryanodine receptor 3
EGFR	epidermal growth factor receptor	S100A4	S100 calcium binding protein A4
EGLN3	egl-9 family hypoxia inducible factor 3	S100B	S100 calcium binding protein B
EGR1	early growth response 1	S1PR1	sphingosine-1-phosphate receptor 1
EGR3	early growth response 3	S1PR5	sphingosine-1-phosphate receptor 5
EHD3	EH domain containing 3	SALL1	spalt like transcription factor 1
EIF2AK3	eukaryotic translation initiation factor 2 alpha kinase 3	SAMD12	sterile alpha motif domain containing 12
EIF2S3	eukaryotic translation initiation factor 2 subunit gamma	SAMD9L	sterile alpha motif domain containing 9 like
Eif2s3y	eukaryotic translation initiation factor 2, subunit 3, structural gene Y-linked	SAPCD2	suppressor APC domain containing 2
EIF4A3	eukaryotic translation initiation factor 4A3	SAT1	spermidine/spermine N1-acetyltransferase 1
ELAVL2	ELAV like RNA binding protein 2	SBDS	SBDS, ribosome maturation factor
ELAVL3	ELAV like RNA binding protein 3	SBNO2	strawberry notch homolog 2
ELAVL4	ELAV like RNA binding protein 4	SCAMP5	secretory carrier membrane protein 5
ELF2	E74 like ETS transcription factor 2	SCARA3	scavenger receptor class A member 3
ELFN1	extracellular leucine rich repeat and fibronectin type III domain containing 1	SCEL	sciellin
ELMO1	engulfment and cell motility 1	SCG3	secretogranin III
ELMO2	engulfment and cell motility 2	SCGN	secretagogin, EF-hand calcium binding protein
ELMOD1	ELMO domain containing 1	SCHLAP1	SWI/SNF complex antagonist associated with prostate cancer 1 (non-protein coding)
ELN	elastin	SCN1A	sodium voltage-gated channel alpha subunit 1
ELOVL1	ELOVL fatty acid elongase 1	SCN2A	sodium voltage-gated channel alpha subunit 2
ELOVL2	ELOVL fatty acid elongase 2	SCN2B	sodium voltage-gated channel beta subunit 2

ELOVL5	ELOVL fatty acid elongase 5	SCN4B	sodium voltage-gated channel beta subunit 4
ELOVL7	ELOVL fatty acid elongase 7	SCN9A	sodium voltage-gated channel alpha subunit 9
ELP1	elongator complex protein 1	SCNN1G	sodium channel epithelial 1 gamma subunit
EME2	essential meiotic structure-specific endonuclease subunit 2	SCRT1	scratch family transcriptional repressor 1
EMILIN2	elastin microfibril interfacer 2	SCUBE1	signal peptide, CUB domain and EGF like domain containing 1
EML5	echinoderm microtubule associated protein like 5	SDC1	syndecan 1
EMP2	epithelial membrane protein 2	SDC3	syndecan 3
EN2	engrailed homeobox 2	SDC4	syndecan 4
ENAH	ENAH, actin regulator	SDK1	sidekick cell adhesion molecule 1
ENC1	ectodermal-neural cortex 1	SEC14L5	SEC14 like lipid binding 5
ENOX1	ecto-NOX disulfide-thiol exchanger 1	SEC24D	SEC24 homolog D, COPII coat complex component
ENPP1	ectonucleotide pyrophosphatase/phosphodiesterase 1	SEL1L3	SEL1L family member 3
ENPP2	ectonucleotide pyrophosphatase/phosphodiesterase 2	SELENOK	selenoprotein K
ENPP4	ectonucleotide pyrophosphatase/phosphodiesterase 4	SELENOM	selenoprotein M
ENPP6	ectonucleotide pyrophosphatase/phosphodiesterase 6	SELPLG	selectin P ligand
ENTPD2	ectonucleoside triphosphate diphosphohydrolase 2	SEMA3B	semaphorin 3B
EPB41L1	erythrocyte membrane protein band 4.1 like 1	SEMA3C	semaphorin 3C
EPB41L4B	erythrocyte membrane protein band 4.1 like 4B	SEMA3D	semaphorin 3D
EPHA3	EPH receptor A3	SEMA3E	semaphorin 3E
EPHA4	EPH receptor A4	SEMA3G	semaphorin 3G
EPHA6	EPH receptor A6	SEMA4D	semaphorin 4D
EPHB1	EPH receptor B1	SEMA4G	semaphorin 4G
EPHB4	EPH receptor B4	SEMA5A	semaphorin 5A
EPN1	epsin 1	SEMA5B	semaphorin 5B
EPS15	epidermal growth factor receptor pathway substrate 15	SEMA6A	semaphorin 6A
ERBB3	erb-b2 receptor tyrosine kinase 3	SEMA6D	semaphorin 6D
ERBB4	erb-b2 receptor tyrosine kinase 4	SEPSECS	Sep (O-phosphoserine) tRNA:Sec (selenocysteine) tRNA synthase
ERBIN	erbb2 interacting protein	SEPT4	septin 4
ERC2	ELKS/RAB6-interacting/CAST family member 2	SEPT7	septin 7
ERG28	ergosterol biosynthesis 28 homolog	SERINC2	serine incorporator 2
ERGIC1	endoplasmic reticulum-golgi intermediate compartment 1	SERP1	stress associated endoplasmic reticulum protein 1
ERICH5	glutamate rich 5	SERPINB1	serpin family B member 1
ERMN	ermin	Serpinb1a	serine (or cysteine) peptidase inhibitor, clade B, member 1a
ERRFI1	ERBB receptor feedback inhibitor 1	SERPINE2	serpin family E member 2
ESRRB	estrogen related receptor beta	SERPINH1	serpin family H member 1
ESRRG	estrogen related receptor gamma	SERPINI1	serpin family I member 1
ESYT2	extended synaptotagmin 2	SERPINI2	serpin family I member 2
ETF1	eukaryotic translation termination factor 1	SERTM1	serine rich and transmembrane domain containing 1
Eti4	enhancer trap locus 4	SESTD1	SEC14 and spectrin domain containing 1
ETNPPL	ethanolamine-phosphate phospho-lyase	SETBP1	SET binding protein 1
ETS1	ETS proto-oncogene 1, transcription factor	SEZ6L2	seizure related 6 homolog like 2
ETV1	ETS variant 1	SF3B4	splicing factor 3b subunit 4
ETV3	ETS variant 3	SFXN5	sideroflexin 5
ETV4	ETS variant 4	SGCA	sarcoglycan alpha
ETV5	ETS variant 5	SGCD	sarcoglycan delta
EVA1A	eva-1 homolog A, regulator of programmed cell death	SGK2	SGK2, serine/threonine kinase 2
EVF2_5P	N/A	SGMS2	sphingomyelin synthase 2
EXOSC4	exosome component 4	SH2B2	SH2B adaptor protein 2
EXPH5	exophilin 5	SH2D1A	SH2 domain containing 1A
EXTL2	exostosin like glycosyltransferase 2	SH2D4B	SH2 domain containing 4B
EYA1	EYA transcriptional coactivator and phosphatase 1	SH3BGRL2	SH3 domain binding glutamate rich protein like 2
EYS	eyes shut homolog (Drosophila)	SH3BP2	SH3 domain binding protein 2

F3	coagulation factor III, tissue factor	SH3BP4	SH3 domain binding protein 4
FA2H	fatty acid 2-hydroxylase	SH3D19	SH3 domain containing 19
FAM102A	family with sequence similarity 102 member A	SH3GL3	SH3 domain containing GRB2 like 3, endophilin A3
FAM102B	family with sequence similarity 102 member B	SH3RF1	SH3 domain containing ring finger 1
FAM107A	family with sequence similarity 107 member A	SH3RF3	SH3 domain containing ring finger 3
FAM107B	family with sequence similarity 107 member B	SH3TC2	SH3 domain and tetratricopeptide repeats 2
FAM114A1	family with sequence similarity 114 member A1	SHANK1	SH3 and multiple ankyrin repeat domains 1
FAM117A	family with sequence similarity 117 member A	SHANK2	SH3 and multiple ankyrin repeat domains 2
FAM122C	family with sequence similarity 122C	SHANK3	SH3 and multiple ankyrin repeat domains 3
FAM124A	family with sequence similarity 124 member A	SHC3	SHC adaptor protein 3
FAM131A	family with sequence similarity 131 member A	SHC4	SHC adaptor protein 4
FAM135B	family with sequence similarity 135 member B	SHF	Src homology 2 domain containing F
FAM167A	family with sequence similarity 167 member A	SHISA6	shisa family member 6
FAM171B	family with sequence similarity 171 member B	SHISA7	shisa family member 7
FAM196A	family with sequence similarity 196 member A	SHISA8	shisa family member 8
FAM198B	family with sequence similarity 198 member B	SHROOM2	shroom family member 2
FAM19A1	family with sequence similarity 19 member A1, C-C motif chemokine like	SHROOM3	shroom family member 3
FAM19A4	family with sequence similarity 19 member A4, C-C motif chemokine like	SHROOM4	shroom family member 4
FAM20A	FAM20A, golgi associated secretory pathway pseudokinase	SHTN1	shootin 1
FAM212B	family with sequence similarity 212 member B	SIAH2	siah E3 ubiquitin protein ligase 2
FAM222B	family with sequence similarity 222 member B	SIAH3	siah E3 ubiquitin protein ligase family member 3
FAM43A	family with sequence similarity 43 member A	SIDT1	SID1 transmembrane family member 1
FAM46A	family with sequence similarity 46 member A	SIK3	SIK family kinase 3
FAM46C	family with sequence similarity 46 member C	SIPA1L1	signal induced proliferation associated 1 like 1
FAM49B	family with sequence similarity 49 member B	SIPA1L2	signal induced proliferation associated 1 like 2
FAM53A	family with sequence similarity 53 member A	SIPA1L3	signal induced proliferation associated 1 like 3
FAM69A	family with sequence similarity 69 member A	SIRPA	signal regulatory protein alpha
FAM83D	family with sequence similarity 83 member D	SIX4	SIX homeobox 4
FAM84A	family with sequence similarity 84 member A	SKAP2	src kinase associated phosphoprotein 2
FAM89A	family with sequence similarity 89 member A	SKOR1	SKI family transcriptional corepressor 1
FAM8A4P	family with sequence similarity 8 member A4, pseudogene	SKOR2	SKI family transcriptional corepressor 2
FAM92B	family with sequence similarity 92 member B	SLC12A2	solute carrier family 12 member 2
FAR2	fatty acyl-CoA reductase 2	SLC12A3	solute carrier family 12 member 3
FARP1	FERM, ARH/RhoGEF and pleckstrin domain protein 1	SLC12A4	solute carrier family 12 member 4
FAT1	FAT atypical cadherin 1	SLC12A5	solute carrier family 12 member 5
FAT2	FAT atypical cadherin 2	SLC12A8	solute carrier family 12 member 8
FAT3	FAT atypical cadherin 3	SLC13A1	solute carrier family 13 member 1
FBLN2	fibulin 2	SLC13A5	solute carrier family 13 member 5
FBN1	fibrillin 1	SLC14A1	solute carrier family 14 member 1 (Kidd blood group)
FBN2	fibrillin 2	SLC14A2	solute carrier family 14 member 2
FBXL21	F-box and leucine rich repeat protein 21 (gene/pseudogene)	SLC15A2	solute carrier family 15 member 2
FBXO24	F-box protein 24	SLC16A10	solute carrier family 16 member 10
FBXO32	F-box protein 32	SLC17A4	solute carrier family 17 member 4
FBXW5	F-box and WD repeat domain containing 5	SLC17A7	solute carrier family 17 member 7
FBXW9	F-box and WD repeat domain containing 9	SLC18A3	solute carrier family 18 member A3
FCER2	Fc fragment of IgE receptor II	SLC19A1	solute carrier family 19 member 1
FCHSD2	FCH and double SH3 domains 2	SLC19A2	solute carrier family 19 member 2
FDFT1	farnesyl-diphosphate farnesyltransferase 1	SLC1A1	solute carrier family 1 member 1
FEM1C	fem-1 homolog C	SLC1A3	solute carrier family 1 member 3
FERMT1	fermitin family member 1	SLC1A4	solute carrier family 1 member 4
FEZF2	FEZ family zinc finger 2	SLC1A6	solute carrier family 1 member 6
FGD3	FYVE, RhoGEF and PH domain containing 3	SLC20A1	solute carrier family 20 member 1

FGD4	FYVE, RhoGEF and PH domain containing 4	SLC22A15	solute carrier family 22 member 15
FGD6	FYVE, RhoGEF and PH domain containing 6	SLC22A23	solute carrier family 22 member 23
FGF13	fibroblast growth factor 13	SLC22A4	solute carrier family 22 member 4
FGF3	fibroblast growth factor 3	SLC22A6	solute carrier family 22 member 6
FGF5	fibroblast growth factor 5	SLC22A8	solute carrier family 22 member 8
FGFBP3	fibroblast growth factor binding protein 3	SLC24A3	solute carrier family 24 member 3
FGFR1	fibroblast growth factor receptor 1	SLC24A4	solute carrier family 24 member 4
FGFR2	fibroblast growth factor receptor 2	SLC25A18	solute carrier family 25 member 18
FGFR3	fibroblast growth factor receptor 3	SLC25A29	solute carrier family 25 member 29
FGGY	FGGY carbohydrate kinase domain containing	SLC25A3	solute carrier family 25 member 3
FHDC1	FH2 domain containing 1	SLC25A33	solute carrier family 25 member 33
FHL3	four and a half LIM domains 3	SLC25A6	solute carrier family 25 member 6
FHL5	four and a half LIM domains 5	SLC26A3	solute carrier family 26 member 3
FHOD3	formin homology 2 domain containing 3	SLC26A5	solute carrier family 26 member 5
FIBIN	fin bud initiation factor homolog (zebrafish)	SLC26A8	solute carrier family 26 member 8
FIGN	fidgetin, microtubule severing factor	SLC27A6	solute carrier family 27 member 6
FILIP1L	filamin A interacting protein 1 like	SLC2A10	solute carrier family 2 member 10
FJX1	four jointed box 1	SLC2A13	solute carrier family 2 member 13
FKBP4	FK506 binding protein 4	SLC2A3	solute carrier family 2 member 3
FKBP5	FK506 binding protein 5	SLC2A4	solute carrier family 2 member 4
FLI1	Fli-1 proto-oncogene, ETS transcription factor	SLC30A3	solute carrier family 30 member 3
FLNB	filamin B	SLC31A2	solute carrier family 31 member 2
FLRT2	fibronectin leucine rich transmembrane protein 2	SLC32A1	solute carrier family 32 member 1
FLT3	fms related tyrosine kinase 3	SLC35D1	solute carrier family 35 member D1
FMNL1	formin like 1	SLC35F1	solute carrier family 35 member F1
FMNL3	formin like 3	SLC35F4	solute carrier family 35 member F4
FMO3	flavin containing monooxygenase 3	SLC38A1	solute carrier family 38 member 1
FNDC3B	fibronectin type III domain containing 3B	SLC38A10	solute carrier family 38 member 10
FOLH1	folate hydrolase 1	SLC38A5	solute carrier family 38 member 5
FOS	Fos proto-oncogene, AP-1 transcription factor subunit	SLC38A7	solute carrier family 38 member 7
FOSB	FosB proto-oncogene, AP-1 transcription factor subunit	SLC39A12	solute carrier family 39 member 12
FOSL2	FOS like 2, AP-1 transcription factor subunit	SLC41A1	solute carrier family 41 member 1
FOXA1	forkhead box A1	SLC43A2	solute carrier family 43 member 2
FOXA2	forkhead box A2	SLC43A3	solute carrier family 43 member 3
FOXG1	forkhead box G1	SLC44A5	solute carrier family 44 member 5
FOXH1	forkhead box H1	SLC45A1	solute carrier family 45 member 1
FOXP4	forkhead box P4	SLC45A3	solute carrier family 45 member 3
FRAS1	Fraser extracellular matrix complex subunit 1	SLC4A4	solute carrier family 4 member 4
FREM1	FRAS1 related extracellular matrix 1	SLC4A7	solute carrier family 4 member 7
FRMD1	FERM domain containing 1	SLC5A11	solute carrier family 5 member 11
FRMD3	FERM domain containing 3	SLC5A4	solute carrier family 5 member 4
FRMD4A	FERM domain containing 4A	SLC5A7	solute carrier family 5 member 7
FRMD4B	FERM domain containing 4B	SLC5A8	solute carrier family 5 member 8
FRMPD1	FERM and PDZ domain containing 1	SLC6A12	solute carrier family 6 member 12
FRMPD2	FERM and PDZ domain containing 2	SLC6A13	solute carrier family 6 member 13
FRMPD4	FERM and PDZ domain containing 4	SLC6A3	solute carrier family 6 member 3
FRRS1	ferric chelate reductase 1	SLC6A7	solute carrier family 6 member 7
FRRS1L	ferric chelate reductase 1 like	SLC7A1	solute carrier family 7 member 1
FRY	FRY microtubule binding protein	SLC7A10	solute carrier family 7 member 10
FSD2	fibronectin type III and SPRY domain containing 2	SLC7A11	solute carrier family 7 member 11
FSIP2	fibrous sheath interacting protein 2	SLC7A14	solute carrier family 7 member 14
FSTL4	follistatin like 4	SLC7A3	solute carrier family 7 member 3
FSTL5	follistatin like 5	SLC7A5	solute carrier family 7 member 5
FTH1	ferritin heavy chain 1	SLC8A1	solute carrier family 8 member A1
FTL	ferritin light chain	SLC8A1-AS1	SLC8A1 antisense RNA 1
FXYD1	FXYD domain containing ion transport regulator 1	SLC8A2	solute carrier family 8 member A2
FXYD7	FXYD domain containing ion transport regulator 7	SLC8A3	solute carrier family 8 member A3
FZD7	frizzled class receptor 7	SLC8B1	solute carrier family 8 member B1

FZD8	frizzled class receptor 8	SLC9A3	solute carrier family 9 member A3
FZD9	frizzled class receptor 9	SLC9A9	solute carrier family 9 member A9
FZR1	fizzy and cell division cycle 20 related 1	SLCO2B1	solute carrier organic anion transporter family member 2B1
GAB1	GRB2 associated binding protein 1	SLCO4A1	solute carrier organic anion transporter family member 4A1
GAB2	GRB2 associated binding protein 2	SLCO4C1	solute carrier organic anion transporter family member 4C1
GABARAPL1	GABA type A receptor associated protein like 1	SLFN11	schlafen family member 11
GABBR1	gamma-aminobutyric acid type B receptor subunit 1	SLIT2	slit guidance ligand 2
GABBR2	gamma-aminobutyric acid type B receptor subunit 2	SLIT3	slit guidance ligand 3
GABRA2	gamma-aminobutyric acid type A receptor alpha2 subunit	SLITRK1	SLIT and NTRK like family member 1
GABRA4	gamma-aminobutyric acid type A receptor alpha4 subunit	SLITRK6	SLIT and NTRK like family member 6
GABRA6	gamma-aminobutyric acid type A receptor alpha6 subunit	SMAD3	SMAD family member 3
GABRB1	gamma-aminobutyric acid type A receptor beta1 subunit	SMAD7	SMAD family member 7
GABRD	gamma-aminobutyric acid type A receptor delta subunit	SMIM17	small integral membrane protein 17
GABRG2	gamma-aminobutyric acid type A receptor gamma2 subunit	SMOC1	SPARC related modular calcium binding 1
GABRG3	gamma-aminobutyric acid type A receptor gamma3 subunit	SMPX	small muscle protein, X-linked
GACAT2	gastric cancer associated transcript 2 (non-protein coding)	SNAI2	snail family transcriptional repressor 2
GAD	N/A	SNAI3-AS1	SNAI3 antisense RNA 1
Gad1	glutamate decarboxylase 1	SNAPC1	small nuclear RNA activating complex polypeptide 1
GAD2	glutamate decarboxylase 2	SNCAIP	synuclein alpha interacting protein
GADD45A	growth arrest and DNA damage inducible alpha	SNED1	sushi, nidogen and EGF like domains 1
GAL3ST1	galactose-3-O-sulfotransferase 1	SNHG5	small nucleolar RNA host gene 5
GAL3ST4	galactose-3-O-sulfotransferase 4	SNTB1	syntrophin beta 1
GALNT14	polypeptide N-acetylgalactosaminyltransferase 14	SNX22	sorting nexin 22
GALNT15	polypeptide N-acetylgalactosaminyltransferase 15	SNX33	sorting nexin 33
GALNT16	polypeptide N-acetylgalactosaminyltransferase 16	SOAT1	sterol O-acyltransferase 1
GALNT17	polypeptide N-acetylgalactosaminyltransferase 17	SOBP	sine oculis binding protein homolog
GALNT18	polypeptide N-acetylgalactosaminyltransferase 18	SOCS2	suppressor of cytokine signaling 2
GALNT3	polypeptide N-acetylgalactosaminyltransferase 3	SOD1	superoxide dismutase 1
GALNT5	polypeptide N-acetylgalactosaminyltransferase 5	SOD3	superoxide dismutase 3
GALNT6	polypeptide N-acetylgalactosaminyltransferase 6	SORBS2	sorbin and SH3 domain containing 2
GALNTL6	polypeptide N-acetylgalactosaminyltransferase like 6	SORBS3	sorbin and SH3 domain containing 3
GALR1	galanin receptor 1	SORCS3	sortilin related VPS10 domain containing receptor 3
GAP43	growth associated protein 43	SOS1	SOS Ras/Rac guanine nucleotide exchange factor 1
GAPDH	glyceraldehyde-3-phosphate dehydrogenase	SOX10	SRY-box 10
GAREM2	GRB2 associated regulator of MAPK1 subtype 2	SOX13	SRY-box 13
GARNL3	GTPase activating Rap/RanGAP domain like 3	Sox1ot	Sox1 overlapping transcript
GAS1	growth arrest specific 1	SOX2	SRY-box 2
GATM	glycine amidinotransferase	SOX6	SRY-box 6
Gatsl2	GATS protein-like 2	SOX8	SRY-box 8
GBAP1	glucosylceramidase beta pseudogene 1	SOX9	SRY-box 9
GCA	grancalcin	SP5	Sp5 transcription factor
GCH1	GTP cyclohydrolase 1	SPAG5	sperm associated antigen 5
GCK	glucokinase	SPAG9	sperm associated antigen 9
GDA	guanine deaminase	SPARC	secreted protein acidic and cysteine rich
GDF10	growth differentiation factor 10	SPARCL1	SPARC like 1
GDF11	growth differentiation factor 11	SPATA13	spermatogenesis associated 13
GDPD4	glycerophosphodiester phosphodiesterase domain containing 4	SPATA9	spermatogenesis associated 9

GDPD5	glycerophosphodiester phosphodiesterase domain containing 5	SPATC1	spermatogenesis and centriole associated 1
GEM	GTP binding protein overexpressed in skeletal muscle	SPECC1	sperm antigen with calponin homology and coiled-coil domains 1
GFAP	glial fibrillary acidic protein	SPEG	SPEG complex locus
GFRA2	GDNF family receptor alpha 2	SPHK2	sphingosine kinase 2
GHITM	growth hormone inducible transmembrane protein	SPHKAP	SPHK1 interactor, AKAP domain containing
GHR	growth hormone receptor	SPOCK3	SPARC/osteonectin, cwcv and kazal like domains proteoglycan 3
GIPC2	GIPC PDZ domain containing family member 2	SPON1	spondin 1
GIPR	gastric inhibitory polypeptide receptor	SPON2	spondin 2
GJA1	gap junction protein alpha 1	SPP1	secreted phosphoprotein 1
GJB1	gap junction protein beta 1	SPRED3	sprouty related EVH1 domain containing 3
GJB4	gap junction protein beta 4	SPRY4-AS1	SPRY4 antisense RNA 1
GJB6	gap junction protein beta 6	SPSB4	splA/ryanodine receptor domain and SOCS box containing 4
GJC2	gap junction protein gamma 2	SPTB	spectrin beta, erythrocytic
GJC3	gap junction protein gamma 3	SPTBN2	spectrin beta, non-erythrocytic 2
GJD2	gap junction protein delta 2	SPTY2D1	SPT2 chromatin protein domain containing 1
GLB1L3	galactosidase beta 1 like 3	SRC	SRC proto-oncogene, non-receptor tyrosine kinase
GLDC	glycine decarboxylase	SRCIN1	SRC kinase signaling inhibitor 1
GLDN	gliomedin	SRGAP1	SLIT-ROBO Rho GTPase activating protein 1
GLI1	GLI family zinc finger 1	SRGN	serglycin
GLI2	GLI family zinc finger 2	SRPX	sushi repeat containing protein, X-linked
GLI3	GLI family zinc finger 3	SRRM4	serine/arginine repetitive matrix 4
GLIPR1	GLI pathogenesis related 1	SRSF3	serine and arginine rich splicing factor 3
GLIPR2	GLI pathogenesis related 2	SSH1	slingshot protein phosphatase 1
GLIS1	GLIS family zinc finger 1	SSTR1	somatostatin receptor 1
GLIS3	GLIS family zinc finger 3	SSTR2	somatostatin receptor 2
GLP2R	glucagon like peptide 2 receptor	ST13	ST13, Hsp70 interacting protein
GLRA1	glycine receptor alpha 1	ST18	ST18, C2H2C-type zinc finger
GLUD1	glutamate dehydrogenase 1	ST3GAL2	ST3 beta-galactoside alpha-2,3-sialyltransferase 2
GLUL	glutamate-ammonia ligase	ST3GAL5	ST3 beta-galactoside alpha-2,3-sialyltransferase 5
Gm11549	predicted gene 11549	ST5	suppression of tumorigenicity 5
Gm136	predicted gene 136	ST6GAL2	ST6 beta-galactoside alpha-2,6-sialyltransferase 2
Gm20425	predicted gene 20425	ST6GALNAC3	ST6 N-acetylgalactosaminide alpha-2,6-sialyltransferase 3
Gm266	predicted gene 266	ST6GALNAC5	ST6 N-acetylgalactosaminide alpha-2,6-sialyltransferase 5
Gm28653	predicted gene 28653	STAB2	stabilin 2
Gm5083	predicted gene 5083	STAC	SH3 and cysteine rich domain
Gm5089	predicted gene 5089	STAC2	SH3 and cysteine rich domain 2
Gm5468	predicted gene 5468	STAG3	stromal antigen 3
Gm8179	N/A	STAMBPL1	STAM binding protein like 1
GNA12	G protein subunit alpha 12	STARD13	StAR related lipid transfer domain containing 13
GNAL	G protein subunit alpha L	STARD8	StAR related lipid transfer domain containing 8
GNAO1	G protein subunit alpha o1	STAT2	signal transducer and activator of transcription 2
GNB3	G protein subunit beta 3	STAT5A	signal transducer and activator of transcription 5A
GNG11	G protein subunit gamma 11	STC2	stanniocalcin 2
GNG12	G protein subunit gamma 12	STEAP3	STEAP3 metalloreductase
GNG13	G protein subunit gamma 13	STIP1	stress induced phosphoprotein 1
GNG2	G protein subunit gamma 2	STK17B	serine/threonine kinase 17b
GNL3	G protein nucleolar 3	STK19	serine/threonine kinase 19
GOLGA7B	golgin A7 family member B	STK3	serine/threonine kinase 3
GOT1	glutamic-oxaloacetic transaminase 1	STK32A	serine/threonine kinase 32A
GPATCH4	G-patch domain containing 4	STK32B	serine/threonine kinase 32B
GPC2	glypican 2	STK33	serine/threonine kinase 33
GPC6	glypican 6	STK38L	serine/threonine kinase 38 like
GPCPD1	glycerophosphocholine phosphodiesterase 1	STMN4	stathmin 4
GPHN	gephyrin	STON1	stonin 1

GPNMB	glycoprotein nmb	STON2	stonin 2
GPR107	G protein-coupled receptor 107	STOX2	storkhead box 2
GPR135	G protein-coupled receptor 135	STRAP	serine/threonine kinase receptor associated protein
GPR153	G protein-coupled receptor 153	STRC	stereocilin
GPR161	G protein-coupled receptor 161	STRIP2	striatin interacting protein 2
GPR22	G protein-coupled receptor 22	STRN	striatin
GPR34	G protein-coupled receptor 34	STUM	stum, mechanosensory transduction mediator homolog
GPR37	G protein-coupled receptor 37	STX17	syntaxin 17
GPR37L1	G protein-coupled receptor 37 like 1	STXBP2	syntaxin binding protein 2
GPR63	G protein-coupled receptor 63	STXBP3	syntaxin binding protein 3
GPR84	G protein-coupled receptor 84	SULF2	sulfatase 2
GPRASP2	G protein-coupled receptor associated sorting protein 2	SURF2	surfeit 2
GPRC5C	G protein-coupled receptor class C group 5 member C	SUSD5	sushi domain containing 5
GPSM2	G protein signaling modulator 2	SUSD6	sushi domain containing 6
GPX2	glutathione peroxidase 2	SV2B	synaptic vesicle glycoprotein 2B
GRAMD2B	GRAM domain containing 2B	SV2C	synaptic vesicle glycoprotein 2C
Gramd3	GRAM domain containing 3	SVEP1	sushi, von Willebrand factor type A, EGF and pentraxin domain containing 1
GRAMD4	GRAM domain containing 4	SVIL	supervillin
GRB10	growth factor receptor bound protein 10	SVOP	SV2 related protein
GRB14	growth factor receptor bound protein 14	SWAP70	switching B-cell complex subunit SWAP70
GRB7	growth factor receptor bound protein 7	SYAP1	synapse associated protein 1
GREB1	growth regulation by estrogen in breast cancer 1	SYCP1	synaptonemal complex protein 1
GREB1L	growth regulation by estrogen in breast cancer 1 like	SYN3	synapsin III
GRHL1	grainyhead like transcription factor 1	SYNDIG1	synapse differentiation inducing 1
GRIA1	glutamate ionotropic receptor AMPA type subunit 1	SYNDIG1L	synapse differentiation inducing 1 like
GRIA3	glutamate ionotropic receptor AMPA type subunit 3	SYNJ2	synaptojanin 2
GRID1	glutamate ionotropic receptor delta type subunit 1	SYNPR	synaptoporin
GRID2	glutamate ionotropic receptor delta type subunit 2	SYT10	synaptotagmin 10
GRID2IP	Grid2 interacting protein	SYT12	synaptotagmin 12
GRIK1	glutamate ionotropic receptor kainate type subunit 1	SYT14	synaptotagmin 14
GRIK2	glutamate ionotropic receptor kainate type subunit 2	SYT16	synaptotagmin 16
GRIK3	glutamate ionotropic receptor kainate type subunit 3	SYT17	synaptotagmin 17
GRIN2A	glutamate ionotropic receptor NMDA type subunit 2A	SYT2	synaptotagmin 2
GRIN2B	glutamate ionotropic receptor NMDA type subunit 2B	SYT3	synaptotagmin 3
GRIN2C	glutamate ionotropic receptor NMDA type subunit 2C	SYT4	synaptotagmin 4
GRIN2D	glutamate ionotropic receptor NMDA type subunit 2D	SYT7	synaptotagmin 7
GRIP1	glutamate receptor interacting protein 1	TANC1	tetratricopeptide repeat, ankyrin repeat and coiled-coil containing 1
GRK3	G protein-coupled receptor kinase 3	TAOK2	TAO kinase 2
GRK4	G protein-coupled receptor kinase 4	TAOK3	TAO kinase 3
GRK5	G protein-coupled receptor kinase 5	TBC1D1	TBC1 domain family member 1
GRM1	glutamate metabotropic receptor 1	TBC1D4	TBC1 domain family member 4
GRM4	glutamate metabotropic receptor 4	TBC1D5	TBC1 domain family member 5
GRM5	glutamate metabotropic receptor 5	TBCEL	tubulin folding cofactor E like
GRM7	glutamate metabotropic receptor 7	TBL1X	transducin beta like 1X-linked
GRM8	glutamate metabotropic receptor 8	TBR1	T-box, brain 1
GSAP	gamma-secretase activating protein	TBXAS1	thromboxane A synthase 1
GSDME	gasdermin E	TCEAL2	transcription elongation factor A like 2
GSN	gelsolin	TCEAL5	transcription elongation factor A like 5
GSTM1	glutathione S-transferase mu 1	TCEAL6	transcription elongation factor A like 6
GSTO2	glutathione S-transferase omega 2	TCEAL7	transcription elongation factor A like 7
GSX1	GS homeobox 1	TCEAL9	transcription elongation factor A like 9

GTF2A1L	general transcription factor IIA subunit 1 like	TCERG1L	transcription elongation regulator 1 like
GTF2B	general transcription factor IIB	TCF7L1	transcription factor 7 like 1
GTPBP2	GTP binding protein 2	TCP1	t-complex 1
GTSCR1	Gilles de la Tourette syndrome chromosome region, candidate 1	TCP11L2	t-complex 11 like 2
GUCY1A3	guanylate cyclase 1 soluble subunit alpha	TCTE1	t-complex-associated-testis-expressed 1
GYG2	glycogenin 2	TCTEX1D1	Tctex1 domain containing 1
GYG2P1	glycogenin 2 pseudogene 1	TDP1	tyrosyl-DNA phosphodiesterase 1
GYS1	glycogen synthase 1	TEAD1	TEA domain transcription factor 1
GZF1	GDNF inducible zinc finger protein 1	TEAD4	TEA domain transcription factor 4
HAMP	hepcidin antimicrobial peptide	TEC	tec protein tyrosine kinase
HAPLN2	hyaluronan and proteoglycan link protein 2	TEK	TEK receptor tyrosine kinase
HAS2	hyaluronan synthase 2	TES	testin LIM domain protein
HCN1	hyperpolarization activated cyclic nucleotide gated potassium channel 1	TESC	tescalcin
HCN2	hyperpolarization activated cyclic nucleotide gated potassium and sodium channel 2	TEX14	testis expressed 14, intercellular bridge forming factor
HCN4	hyperpolarization activated cyclic nucleotide gated potassium channel 4	TEX2	testis expressed 2
HDAC8	histone deacetylase 8	TEX36	testis expressed 36
HDHD2	haloacid dehalogenase like hydrolase domain containing 2	TEX52	testis expressed 52
HEBP1	heme binding protein 1	TEX9	testis expressed 9
HECA	hdc homolog, cell cycle regulator	TF	transferrin
HECTD2-AS1	N/A	TFAP2A	transcription factor AP-2 alpha
HECW1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1	TFAP2B	transcription factor AP-2 beta
HEG1	heart development protein with EGF like domains 1	TFRC	transferrin receptor
HEPACAM	hepatic and glial cell adhesion molecule	TG	thyroglobulin
HERPUD1	homocysteine inducible ER protein with ubiquitin like domain 1	TGFB2	transforming growth factor beta 2
HES1	hes family bHLH transcription factor 1	TGFB3	transforming growth factor beta 3
HES3	hes family bHLH transcription factor 3	TGFBR2	transforming growth factor beta receptor 2
HEY2	hes related family bHLH transcription factor with YRPW motif 2	TH	tyrosine hydroxylase
HGF	hepatocyte growth factor	THBS2	thrombospondin 2
HHATL	hedgehog acyltransferase like	THBS4	thrombospondin 4
HHIP	hedgehog interacting protein	THSD7B	thrombospondin type 1 domain containing 7B
HIF3A	hypoxia inducible factor 3 alpha subunit	THYN1	thymocyte nuclear protein 1
HIGD1A	HIG1 hypoxia inducible domain family member 1A	TIMP3	TIMP metallopeptidase inhibitor 3
HIP1	huntingtin interacting protein 1	TIPARP	TCDD inducible poly(ADP-ribose) polymerase
HIP1R	huntingtin interacting protein 1 related	TLCD1	TLC domain containing 1
HIPK4	homeodomain interacting protein kinase 4	TLE4	transducin like enhancer of split 4
HIST1H2BD	histone cluster 1 H2B family member d	TLE6	transducin like enhancer of split 6
HIST2H2BA	histone cluster 2 H2B family member a (pseudogene)	TLL1	tolloid like 1
HIST2H2BE	histone cluster 2 H2B family member e	TLR3	toll like receptor 3
HIST2H2BF	histone cluster 2 H2B family member f	TLR4	toll like receptor 4
HK2	hexokinase 2	TM2D2	TM2 domain containing 2
HMCES	5-hydroxymethylcytosine binding, ES cell specific	TM4SF1	transmembrane 4 L six family member 1
HMGCLL1	3-hydroxymethyl-3-methylglutaryl-CoA lyase like 1	TMC1	transmembrane channel like 1
HMGCR	3-hydroxy-3-methylglutaryl-CoA reductase	TMC3-AS1	TMC3 antisense RNA 1
HMGCS1	3-hydroxy-3-methylglutaryl-CoA synthase 1	TMC7	transmembrane channel like 7
HMGN1	high mobility group nucleosome binding domain 1	TMEM100	transmembrane protein 100
HOMER1	homer scaffolding protein 1	TMEM108	transmembrane protein 108
HOMER3	homer scaffolding protein 3	TMEM123	transmembrane protein 123
HOXD1	homeobox D1	TMEM125	transmembrane protein 125
HPCAL1	hippocalcin like 1	TMEM130	transmembrane protein 130
HPCAL4	hippocalcin like 4	Tmem131	transmembrane protein 131
HPN	hepsin	TMEM131L	transmembrane 131 like

HPSE2	heparanase 2 (inactive)	TMEM132B	transmembrane protein 132B
HRASLS	HRAS like suppressor	TMEM132C	transmembrane protein 132C
HRH2	histamine receptor H2	TMEM132D	transmembrane protein 132D
HRH3	histamine receptor H3	TMEM132E	transmembrane protein 132E
HS3ST1	heparan sulfate-glucosamine 3-sulfotransferase 1	TMEM144	transmembrane protein 144
HS3ST2	heparan sulfate-glucosamine 3-sulfotransferase 2	TMEM150C	transmembrane protein 150C
HS3ST4	heparan sulfate-glucosamine 3-sulfotransferase 4	TMEM163	transmembrane protein 163
HS6ST2	heparan sulfate 6-O-sulfotransferase 2	TMEM175	transmembrane protein 175
HSD17B11	hydroxysteroid 17-beta dehydrogenase 11	TMEM176A	transmembrane protein 176A
HSD17B12	hydroxysteroid 17-beta dehydrogenase 12	TMEM176B	transmembrane protein 176B
HSP90AA1	heat shock protein 90 alpha family class A member 1	Tmem178	transmembrane protein 178
HSP90AB1	heat shock protein 90 alpha family class B member 1	TMEM178A	transmembrane protein 178A
HSPA1A	heat shock protein family A (Hsp70) member 1A	TMEM178B	transmembrane protein 178B
HSPA1B	heat shock protein family A (Hsp70) member 1B	TMEM179	transmembrane protein 179
HSPA4	heat shock protein family A (Hsp70) member 4	TMEM184C	transmembrane protein 184C
HSPA4L	heat shock protein family A (Hsp70) member 4 like	TMEM198	transmembrane protein 198
HSPA8	heat shock protein family A (Hsp70) member 8	TMEM2	transmembrane protein 2
HSPA9	heat shock protein family A (Hsp70) member 9	TMEM200A	transmembrane protein 200A
HSPB1	heat shock protein family B (small) member 1	TMEM252	transmembrane protein 252
HSPD1	heat shock protein family D (Hsp60) member 1	TMEM254	transmembrane protein 254
HSPE1-MOB4	HSPE1-MOB4 readthrough	TMEM255A	transmembrane protein 255A
HSPH1	heat shock protein family H (Hsp110) member 1	TMEM255B	transmembrane protein 255B
HTR1B	5-hydroxytryptamine receptor 1B	TMEM266	transmembrane protein 266
HTR2A	5-hydroxytryptamine receptor 2A	TMEM270	transmembrane protein 270
HTR2C	5-hydroxytryptamine receptor 2C	TMEM44	transmembrane protein 44
HTR5A	5-hydroxytryptamine receptor 5A	TMEM51	transmembrane protein 51
HTR5A-AS1	HTR5A antisense RNA 1	TMEM63A	transmembrane protein 63A
HTRA1	HtrA serine peptidase 1	TMEM88B	transmembrane protein 88B
HUNK	hormonally up-regulated Neu-associated kinase	TMEM98	transmembrane protein 98
ICAM5	intercellular adhesion molecule 5	TMOD1	tropomodulin 1
ICMT	isoprenylcysteine carboxyl methyltransferase	TMPRSS5	transmembrane protease, serine 5
Icosl	icos ligand	TMTC1	transmembrane and tetratricopeptide repeat containing 1
ICOSLG	inducible T-cell costimulator ligand	TMTC4	transmembrane and tetratricopeptide repeat containing 4
ID2	inhibitor of DNA binding 2	TNC	tenascin C
ID4	inhibitor of DNA binding 4, HLH protein	TNFAIP6	TNF alpha induced protein 6
IDI1	isopentenyl-diphosphate delta isomerase 1	TNFRSF13C	TNF receptor superfamily member 13C
IFFO1	intermediate filament family orphan 1	TNFRSF19	TNF receptor superfamily member 19
IFNLR1	interferon lambda receptor 1	TNFSF9	TNF superfamily member 9
IFRD1	interferon related developmental regulator 1	TNK2	tyrosine kinase non receptor 2
IFT43	intraflagellar transport 43	TNNI1	troponin I1, slow skeletal type
IGDCC3	immunoglobulin superfamily DCC subclass member 3	TNR	tenascin R
IGDCC4	immunoglobulin superfamily DCC subclass member 4	TNS1	tensin 1
IGF2	insulin like growth factor 2	TNS3	tensin 3
IGFBP3	insulin like growth factor binding protein 3	TOB1	transducer of ERBB2, 1
IGFBP5	insulin like growth factor binding protein 5	TOGARAM2	TOG array regulator of axonemal microtubules 2
IGSF11	immunoglobulin superfamily member 11	TOM1L1	target of myb1 like 1 membrane trafficking protein
IGSF3	immunoglobulin superfamily member 3	TOP1	DNA topoisomerase I
IL15	interleukin 15	TOX2	TOX high mobility group box family member 2
IL16	interleukin 16	TOX3	TOX high mobility group box family member 3
IL18	interleukin 18	TP53I11	tumor protein p53 inducible protein 11
IL20RB	interleukin 20 receptor subunit beta	TP53INP2	tumor protein p53 inducible nuclear protein 2
IL22	interleukin 22	TP73	tumor protein p73
IL33	interleukin 33	TPCN1	two pore segment channel 1
ILDR2	immunoglobulin like domain containing receptor 2	TPM3	tropomyosin 3
Il1f0	interleukin 10-related T cell-derived inducible factor beta	TPM4	tropomyosin 4

IMPA2	inositol monophosphatase 2	TPPP	tubulin polymerization promoting protein
IMPG1	interphotoreceptor matrix proteoglycan 1	TPT1	tumor protein, translationally-controlled 1
INAVA	innate immunity activator	TRA2B	transformer 2 beta homolog
INF2	inverted formin, FH2 and WH2 domain containing	TRABD2B	TraB domain containing 2B
INHBA	inhibin beta A subunit	TRAF1	TNF receptor associated factor 1
INPP1	inositol polyphosphate-1-phosphatase	TRAF4	TNF receptor associated factor 4
INPP4B	inositol polyphosphate-4-phosphatase type II B	TRAF5	TNF receptor associated factor 5
INPP5A	inositol polyphosphate-5-phosphatase A	TRDN	triadin
INPP5D	inositol polyphosphate-5-phosphatase D	TREH	trehalase
INSC	INSC, spindle orientation adaptor protein	TREM2	triggering receptor expressed on myeloid cells 2
INSIG1	insulin induced gene 1	TRHDE	thyrotropin releasing hormone degrading enzyme
IPCEF1	interaction protein for cytohesin exchange factors 1	TRIL	TLR4 interactor with leucine rich repeats
IQCH	IQ motif containing H	TRIM15	tripartite motif containing 15
IQGAP1	IQ motif containing GTPase activating protein 1	TRIM2	tripartite motif containing 2
IQSEC1	IQ motif and Sec7 domain 1	TRIM26	tripartite motif containing 26
IQSEC3	IQ motif and Sec7 domain 3	Trim30a	tripartite motif-containing 30A
IRAK2	interleukin 1 receptor associated kinase 2	TRIM36	tripartite motif containing 36
IRX1	iroquois homeobox 1	TRIM5	tripartite motif containing 5
IRX2	iroquois homeobox 2	TRIM59	tripartite motif containing 59
IRX5	iroquois homeobox 5	TRIM62	tripartite motif containing 62
ISYNA1	inositol-3-phosphate synthase 1	TRIM67	tripartite motif containing 67
ITGA11	integrin subunit alpha 11	Trp53cor1	tumor protein p53 pathway corepressor 1
ITGA2	integrin subunit alpha 2	TRPC3	transient receptor potential cation channel subfamily C member 3
ITGA4	integrin subunit alpha 4	TRPC5	transient receptor potential cation channel subfamily C member 5
ITGA5	integrin subunit alpha 5	TRPC6	transient receptor potential cation channel subfamily C member 6
ITGA7	integrin subunit alpha 7	TRPC7	transient receptor potential cation channel subfamily C member 7
ITGA8	integrin subunit alpha 8	TRPM2	transient receptor potential cation channel subfamily M member 2
ITGA9	integrin subunit alpha 9	TRPV3	transient receptor potential cation channel subfamily V member 3
ITGAV	integrin subunit alpha V	TRPV6	transient receptor potential cation channel subfamily V member 6
ITGB4	integrin subunit beta 4	TSC22D2	TSC22 domain family member 2
ITGB5	integrin subunit beta 5	TSC22D3	TSC22 domain family member 3
ITGB8	integrin subunit beta 8	TSG1	N/A
ITIH3	inter-alpha-trypsin inhibitor heavy chain 3	TSHB	thyroid stimulating hormone beta
ITM2A	integral membrane protein 2A	TSHZ2	teashirt zinc finger homeobox 2
ITPKA	inositol-trisphosphate 3-kinase A	TSIX	TSIX transcript, XIST antisense RNA
ITPKB	inositol-trisphosphate 3-kinase B	TSPAN11	tetraspanin 11
ITPR1	inositol 1,4,5-trisphosphate receptor type 1	TSPAN14	tetraspanin 14
ITPRIPL2	ITPRIP like 2	TSPAN15	tetraspanin 15
ITSN2	intersectin 2	TSPAN18	tetraspanin 18
JAG1	jagged 1	TSPAN2	tetraspanin 2
JAM2	junctional adhesion molecule 2	TSPAN5	tetraspanin 5
JAM3	junctional adhesion molecule 3	TSPAN6	tetraspanin 6
JAML	junction adhesion molecule like	TSPOAP1	TSPO associated protein 1
JAZF1	JAZF zinc finger 1	TSTD2	thiosulfate sulfurtransferase like domain containing 2
JDP2	Jun dimerization protein 2	TTC23L	tetratricopeptide repeat domain 23 like
JKAMP	JNK1/MAPK8 associated membrane protein	TTC28	tetratricopeptide repeat domain 28
JMY	junction mediating and regulatory protein, p53 cofactor	TTC32	tetratricopeptide repeat domain 32
JOSD1	Josephin domain containing 1	TTLL3	tubulin tyrosine ligase like 3
JPH1	junctophilin 1	TTLL5	tubulin tyrosine ligase like 5
JPH3	junctophilin 3	TTPA	alpha tocopherol transfer protein

JUN	Jun proto-oncogene, AP-1 transcription factor subunit	TTTY10	testis-specific transcript, Y-linked 10 (non-protein coding)
JUNB	JunB proto-oncogene, AP-1 transcription factor subunit	TTTY14	testis-specific transcript, Y-linked 14 (non-protein coding)
JUND	JunD proto-oncogene, AP-1 transcription factor subunit	TTTY15	testis-specific transcript, Y-linked 15 (non-protein coding)
KANK1	KN motif and ankyrin repeat domains 1	TTYH3	tweety family member 3
KANK2	KN motif and ankyrin repeat domains 2	TUBA8	tubulin alpha 8
KANK4	KN motif and ankyrin repeat domains 4	TUBB2B	tubulin beta 2B class IIb
KCNA1	potassium voltage-gated channel subfamily A member 1	TUBB4A	tubulin beta 4A class IVa
KCNA2	potassium voltage-gated channel subfamily A member 2	TULP3	tubby like protein 3
KCNA3	potassium voltage-gated channel subfamily A member 3	TUNAR	TCL1 upstream neural differentiation-associated RNA
KCNA4	potassium voltage-gated channel subfamily A member 4	TUSC3	tumor suppressor candidate 3
KCNAB1	potassium voltage-gated channel subfamily A member regulatory beta subunit 1	TWISTNB	TWIST neighbor
KCNAB2	potassium voltage-gated channel subfamily A regulatory beta subunit 2	TXLNGY	taxilin gamma pseudogene, Y-linked
KCNAB3	potassium voltage-gated channel subfamily A regulatory beta subunit 3	TXNIP	thioredoxin interacting protein
KCNC1	potassium voltage-gated channel subfamily C member 1	TXNL4A	thioredoxin like 4A
KCNC2	potassium voltage-gated channel subfamily C member 2	TYMS	thymidylate synthetase
KCNC3	potassium voltage-gated channel subfamily C member 3	U2AF1	U2 small nuclear RNA auxiliary factor 1
KCND3	potassium voltage-gated channel subfamily D member 3	UAP1	UDP-N-acetylglucosamine pyrophosphorylase 1
KCNF1	potassium voltage-gated channel modifier subfamily F member 1	UBASH3B	ubiquitin associated and SH3 domain containing B
KCNG4	potassium voltage-gated channel modifier subfamily G member 4	UBB	ubiquitin B
KCNH1	potassium voltage-gated channel subfamily H member 1	UBC	ubiquitin C
KCNH5	potassium voltage-gated channel subfamily H member 5	UBE2B	ubiquitin conjugating enzyme E2 B
KCNH7	potassium voltage-gated channel subfamily H member 7	UBE2QL1	ubiquitin conjugating enzyme E2 Q family like 1
KCNH8	potassium voltage-gated channel subfamily H member 8	UBE4A	ubiquitination factor E4A
KCNIP1	potassium voltage-gated channel interacting protein 1	UCP2	uncoupling protein 2
KCNIP2	potassium voltage-gated channel interacting protein 2	UFL1	UFM1 specific ligase 1
KCNIP4	potassium voltage-gated channel interacting protein 4	UFSP2	UFM1 specific peptidase 2
KCNJ10	potassium voltage-gated channel subfamily J member 10	UGGT2	UDP-glucose glycoprotein glucosyltransferase 2
KCNJ12	potassium voltage-gated channel subfamily J member 12	UGT8	UDP glycosyltransferase 8
KCNJ16	potassium voltage-gated channel subfamily J member 16	Ugt8a	UDP galactosyltransferase 8A
KCNJ3	potassium voltage-gated channel subfamily J member 3	UNC13C	unc-13 homolog C
KCNJ4	potassium voltage-gated channel subfamily J member 4	UNC5B	unc-5 netrin receptor B
KCNJ6	potassium voltage-gated channel subfamily J member 6	UNC5D	unc-5 netrin receptor D
KCNK1	potassium two pore domain channel subfamily K member 1	UNC80	unc-80 homolog, NALCN channel complex subunit

KCNK10	potassium two pore domain channel subfamily K member 10	UNCX	UNC homeobox
KCNK12	potassium two pore domain channel subfamily K member 12	UPP1	uridine phosphorylase 1
KCNK13	potassium two pore domain channel subfamily K member 13	USP11	ubiquitin specific peptidase 11
KCNK3	potassium two pore domain channel subfamily K member 3	USP28	ubiquitin specific peptidase 28
KCNMA1	potassium calcium-activated channel subfamily M alpha 1	USP37	ubiquitin specific peptidase 37
KCNN3	potassium calcium-activated channel subfamily N member 3	USP4	ubiquitin specific peptidase 4
KCNQ3	potassium voltage-gated channel subfamily Q member 3	USP43	ubiquitin specific peptidase 43
KCNQ5	potassium voltage-gated channel subfamily Q member 5	USP9Y	ubiquitin specific peptidase 9, Y-linked
KCNT2	potassium sodium-activated channel subfamily T member 2	USPL1	ubiquitin specific peptidase like 1
KCNV1	potassium voltage-gated channel modifier subfamily V member 1	UTY	ubiquitously transcribed tetratricopeptide repeat containing, Y-linked
Kctd12b	potassium channel tetramerisation domain containing 12b	VAMP1	vesicle associated membrane protein 1
KCTD13	potassium channel tetramerization domain containing 13	VAT1L	vesicle amine transport 1 like
KCTD21-AS1	KCTD21 antisense RNA 1	VAV2	vav guanine nucleotide exchange factor 2
KCTD3	potassium channel tetramerization domain containing 3	VAX2	ventral anterior homeobox 2
KDELR3	KDEL endoplasmic reticulum protein retention receptor 3	VCAN	versican
KDM5C	lysine demethylase 5C	VGLL4	vestigial like family member 4
KDM5D	lysine demethylase 5D	VIM	vimentin
KEL	Kell blood group, metallo-endopeptidase	VIP	vasoactive intestinal peptide
KHDRBS3	KH RNA binding domain containing, signal transduction associated 3	VIPR2	vasoactive intestinal peptide receptor 2
KIA1755	N/A	VIT	vitrin
KIAA0513	KIAA0513	VMP1	vacuole membrane protein 1
KIAA0556	KIAA0556	VPS37B	VPS37B, ESCRT-I subunit
KIAA0895	KIAA0895	VSIG2	V-set and immunoglobulin domain containing 2
KIAA0895L	KIAA0895 like	VSIG8	V-set and immunoglobulin domain containing 8
KIAA1024	KIAA1024	VSNL1	visinin like 1
KIAA1217	KIAA1217	VSTM2B	V-set and transmembrane domain containing 2B
KIAA1456	KIAA1456	VTN	vitronectin
KIAA1549L	KIAA1549 like	VWA5A	von Willebrand factor A domain containing 5A
KIAA1644	KIAA1644	VWA5B2	von Willebrand factor A domain containing 5B2
KIF13A	kinesin family member 13A	VWC2	von Willebrand factor C domain containing 2
KIF13B	kinesin family member 13B	WASH7P	WAS protein family homolog 7 pseudogene
KIF19	kinesin family member 19	WDR17	WD repeat domain 17
Kif19a	kinesin family member 19A	WDR45B	WD repeat domain 45B
KIF21B	kinesin family member 21B	WDR49	WD repeat domain 49
KIF26B	kinesin family member 26B	WDR66	WD repeat domain 66
KIF3B	kinesin family member 3B	WFDC1	WAP four-disulfide core domain 1
KIF6	kinesin family member 6	WFS1	wolframin ER transmembrane glycoprotein
Kirrel	kin of IRRE like (Drosophila)	WIF1	WNT inhibitory factor 1
KIRREL1	kirre like nephrin family adhesion molecule 1	WIPI1	WD repeat domain, phosphoinositide interacting 1
KIT	KIT proto-oncogene receptor tyrosine kinase	WLS	wntless Wnt ligand secretion mediator
Kitl	kit ligand	WNT6	Wnt family member 6
KITLG	KIT ligand	WNT7A	Wnt family member 7A
KLHDC4	kelch domain containing 4	WNT7B	Wnt family member 7B
KLHL13	kelch like family member 13	WSCD1	WSC domain containing 1
KLHL15	kelch like family member 15	WSCD2	WSC domain containing 2

KLHL22	kelch like family member 22	WWC1	WW and C2 domain containing 1
KLHL5	kelch like family member 5	WWC2	WW and C2 domain containing 2
KLK6	kallikrein related peptidase 6	XIST	X inactive specific transcript (non-protein coding)
KNDC1	kinase non-catalytic C-lobe domain containing 1	XKR7	XK related 7
KNOP1	lysine rich nucleolar protein 1	XRRA1	X-ray radiation resistance associated 1
KNTC1	kinetochore associated 1	XYLT1	xylosyltransferase 1
KRT222	keratin 222	YBX2	Y-box binding protein 2
KRT24	keratin 24	YES1	YES proto-oncogene 1, Src family tyrosine kinase
KRTAP10-1	keratin associated protein 10-1	YIPF5	Yip1 domain family member 5
KRTAP10-10	keratin associated protein 10-10	YIPF7	Yip1 domain family member 7
KRTAP10-11	keratin associated protein 10-11	ZBTB16	zinc finger and BTB domain containing 16
KRTAP10-12	keratin associated protein 10-12	ZBTB21	zinc finger and BTB domain containing 21
KRTAP10-2	keratin associated protein 10-2	ZBTB46	zinc finger and BTB domain containing 46
KRTAP10-3	keratin associated protein 10-3	ZCCHC24	zinc finger CCHC-type containing 24
KRTAP10-4	keratin associated protein 10-4	ZDHHC14	zinc finger DHHC-type containing 14
KRTAP10-5	keratin associated protein 10-5	ZDHHC2	zinc finger DHHC-type containing 2
KRTAP10-6	keratin associated protein 10-6	ZDHHC23	zinc finger DHHC-type containing 23
KRTAP10-7	keratin associated protein 10-7	ZEB2	zinc finger E-box binding homeobox 2
KRTAP10-8	keratin associated protein 10-8	ZFAND2A	zinc finger AN1-type containing 2A
KRTAP10-9	keratin associated protein 10-9	ZFAND5	zinc finger AN1-type containing 5
KRTAP12-2	keratin associated protein 12-2	ZFAND6	zinc finger AN1-type containing 6
KSR2	kinase suppressor of ras 2	ZFHX4	zinc finger homeobox 4
L1CAM	L1 cell adhesion molecule	ZFP36L1	ZFP36 ring finger protein like 1
L3HYPDH	trans-L-3-hydroxyproline dehydratase	Zfp385c	zinc finger protein 385C
L3MBTL2	L3MBTL2, polycomb repressive complex 1 subunit	Zfp395	zinc finger protein 395
LACTB2-AS1	LACTB2 antisense RNA 1	Zfp423	zinc finger protein 423
LAMA1	laminin subunit alpha 1	Zfp462	zinc finger protein 462
LAMA2	laminin subunit alpha 2	Zfp521	zinc finger protein 521
LAMA3	laminin subunit alpha 3	Zfp608	zinc finger protein 608
LAMA4	laminin subunit alpha 4	Zfp804b	zinc finger protein 804B
LAMB1	laminin subunit beta 1	Zfp831	zinc finger protein 831
LAMB2	laminin subunit beta 2	ZFPM1	zinc finger protein, FOG family member 1
LAMP5	lysosomal associated membrane protein family member 5	ZFPM2	zinc finger protein, FOG family member 2
LAPTM4B	lysosomal protein transmembrane 4 beta	ZFX	zinc finger protein, X-linked
LARP6	La ribonucleoprotein domain family member 6	ZFY	zinc finger protein, Y-linked
LARS2	leucyl-tRNA synthetase 2, mitochondrial	ZIC1	Zic family member 1
LBH	limb bud and heart development	ZIC2	Zic family member 2
LBX1	ladybird homeobox 1	ZIC3	Zic family member 3
LCAT	lecithin-cholesterol acyltransferase	ZIC4	Zic family member 4
LCN8	lipocalin 8	ZIC5	Zic family member 5
LCORL	ligand dependent nuclear receptor corepressor like	ZKSCAN1	zinc finger with KRAB and SCAN domains 1
LDAH	lipid droplet associated hydrolase	ZMAT4	zinc finger matrin-type 4
LDB2	LIM domain binding 2	ZNF10	zinc finger protein 10
LDB3	LIM domain binding 3	ZNF124	zinc finger protein 124
LECT2	leukocyte cell derived chemotaxin 2	ZNF131	zinc finger protein 131
LENG9	leukocyte receptor cluster member 9	ZNF141	zinc finger protein 141
LFNG	LFNG O-fucosylpeptide 3-beta-N-acetylglucosaminyltransferase	ZNF184	zinc finger protein 184
LGALS3	galectin 3	ZNF212	zinc finger protein 212
LGI2	leucine rich repeat LGI family member 2	ZNF219	zinc finger protein 219
LGI4	leucine rich repeat LGI family member 4	ZNF253	zinc finger protein 253
LGR5	leucine rich repeat containing G protein-coupled receptor 5	ZNF304	zinc finger protein 304
LGR6	leucine rich repeat containing G protein-coupled receptor 6	ZNF331	zinc finger protein 331
Lhfp	lipoma HMGIC fusion partner	ZNF385C	zinc finger protein 385C
LHFPL2	LHFPL tetraspan subfamily member 2	ZNF395	zinc finger protein 395
LHFPL3	LHFPL tetraspan subfamily member 3	ZNF404	zinc finger protein 404
LHFPL6	LHFPL tetraspan subfamily member 6	ZNF423	zinc finger protein 423

LHX1	LIM homeobox 1	ZNF462	zinc finger protein 462
Lhx1os	LIM homeobox 1, opposite strand	ZNF496	zinc finger protein 496
LHX5	LIM homeobox 5	ZNF521	zinc finger protein 521
LIMD1	LIM domains containing 1	ZNF546	zinc finger protein 546
LIMS2	LIM zinc finger domain containing 2	ZNF580	zinc finger protein 580
LIN28B	lin-28 homolog B	ZNF585A	zinc finger protein 585A
LIN7A	lin-7 homolog A, crumbs cell polarity complex component	ZNF607	zinc finger protein 607
LINC00278	long intergenic non-protein coding RNA 278	ZNF608	zinc finger protein 608
LINC00457	long intergenic non-protein coding RNA 457	ZNF703	zinc finger protein 703
LINC00499	long intergenic non-protein coding RNA 499	ZNF711	zinc finger protein 711
LINC00844	long intergenic non-protein coding RNA 844	ZNF736	zinc finger protein 736
LINC00963	long intergenic non-protein coding RNA 963	ZNF804B	zinc finger protein 804B
LINC01032	long intergenic non-protein coding RNA 1032	ZNF831	zinc finger protein 831
LINC01158	long intergenic non-protein coding RNA 1158	ZNF84	zinc finger protein 84
LINC01208	long intergenic non-protein coding RNA 1208	ZNF891	zinc finger protein 891
LINC01515	long intergenic non-protein coding RNA 1515	ZNHIT1	zinc finger HIT-type containing 1
LINC01544	long intergenic non-protein coding RNA 1544	ZNRD1	zinc ribbon domain containing 1
LINC01933	long intergenic non-protein coding RNA 1933	ZNRF1	zinc and ring finger 1
LINC02112	long intergenic non-protein coding RNA 2112	ZP2	zona pellucida glycoprotein 2
LINC02125	long intergenic non-protein coding RNA 2125	ZSCAN29	zinc finger and SCAN domain containing 29
LINC02398	long intergenic non-protein coding RNA 2398	ZSCAN30	zinc finger and SCAN domain containing 30
LINC02405	long intergenic non-protein coding RNA 2405	ZSWIM6	zinc finger SWIM-type containing 6
LINCMD1	long intergenic non-protein coding RNA, muscle differentiation 1	ZYG11A	zyg-11 family member A, cell cycle regulator
LINGO1	leucine rich repeat and Ig domain containing 1	ZYX	zyxin
1700063D05Rik	RIKEN cDNA 1700063D05 gene	Hpcal1	hippocalcin-like 1
1700086L19Rik	RIKEN cDNA 1700086L19 gene	Icmt	isoprenylcysteine carboxyl methyltransferase
1700124L16Rik	RIKEN cDNA 1700124L16 gene	Id2	inhibitor of DNA binding 2
2510003B16Rik	N/A	Ifitm7	interferon induced transmembrane protein 7
4930449E18Rik	N/A	Kalm	kalirin, RhoGEF kinase
6330403K07Rik	RIKEN cDNA 6330403K07 gene	Kcnd2	potassium voltage-gated channel, Shal-related family, member 2
9330117O12Rik	N/A	Kcnj6	potassium inwardly-rectifying channel, subfamily J, member 6
9330188P03Rik	N/A	Kcnk12	potassium channel, subfamily K, member 12
9530026P05Rik	RIKEN cDNA 9530026P05 gene	Kcnk9	potassium channel, subfamily K, member 9
A230001M10Rik	RIKEN cDNA A230001M10 gene	Kcns2	K+ voltage-gated channel, subfamily S, 2
A330049N07Rik	RIKEN cDNA A330049N07 gene	Kirrel3	kin of IRRE like 3 (Drosophila)
A530058N18Rik	RIKEN cDNA A530058N18 gene	Lhfpl3	lipoma HMGIC fusion partner-like 3
A730017C20Rik	RIKEN cDNA A730017C20 gene	Lhfpl3	lipoma HMGIC fusion partner-like 3
Ackr1	atypical chemokine receptor 1 (Duffy blood group)	Limd1	LIM domains containing 1
Adarb2	adenosine deaminase, RNA-specific, B2	Lrp8	low density lipoprotein receptor-related protein 8, apolipoprotein e receptor
Adipor2	adiponectin receptor 2	Mbp	myelin basic protein
AI504432	expressed sequence AI504432	Mir124a-1hg	Mir124-1 host gene (non-protein coding)
Alms1-ps2	ALMS1, centrosome and basal body associated, pseudogene 2	Mir6390	microRNA 6390
Anks1b	ankyrin repeat and sterile alpha motif domain containing 1B	Mmp16	matrix metallopeptidase 16
Apoe	apolipoprotein E	Mt1	metallothionein 1
Arhgap26	Rho GTPase activating protein 26	Mt2	metallothionein 2
Arl4c	ADP-ribosylation factor-like 4C	Mthfd2	methylenetetrahydrofolate dehydrogenase (NAD+ dependent), methenyltetrahydrofolate cyclohydrolase
Arrdc2	arrestin domain containing 2	Myrip	myosin VIIA and Rab interacting protein
Asphd1	aspartate beta-hydroxylase domain containing 1	Myt1l	myelin transcription factor 1-like
Atp6ap1l	ATPase, H+ transporting, lysosomal accessory protein 1-like	Nat8	N-acetyltransferase 8 (GCN5-related)

AU022751	expressed sequence AU022751	Neat1	nuclear paraspeckle assembly transcript 1 (non-protein coding)
B3galt5	UDP-Gal:betaGlcNAc beta 1,3-galactosyltransferase, polypeptide 5	Nhlrc4	NHL repeat containing 4
Bcl2l15	BCL2-like 15	Nhsl2	NHS-like 2
Bmp4	bone morphogenetic protein 4	Nos1	nitric oxide synthase 1, neuronal
Btg1-ps1	B cell translocation gene 1, anti-proliferative, pseudogene 1	Nrep	neuronal regeneration related protein
Bzrap1	N/A	Nrn1	neuritin 1
C030029H02Rik	RIKEN cDNA C030029H02 gene	Nxph1	neurexophilin 1
C130030K03Rik	N/A	Olfm2	olfactomedin 2
Cacna1d	calcium channel, voltage-dependent, L type, alpha 1D subunit	Opcml	opioid binding protein/cell adhesion molecule-like
Calcrl	calcitonin receptor-like	Pagr1a	PAXIP1 associated glutamate rich protein 1A
Ccdc190	coiled-coil domain containing 190	Patj	PATJ, crumbs cell polarity complex component
Ccdc78	coiled-coil domain containing 78	Pcdh7	protocadherin 7
Ccp110	centriolar coiled coil protein 110	Phlda1	pleckstrin homology like domain, family A, member 1
Cdh22	cadherin 22	Pkib	protein kinase inhibitor beta, cAMP dependent, testis specific
Celrr	cerebellum expressed regulatory RNA	Plcxd3	phosphatidylinositol-specific phospholipase C, X domain containing 3
Chadl	chondroadherin-like	Pnpla7	patatin-like phospholipase domain containing 7
Chd3os	chromodomain helicase DNA binding protein 3, opposite strand	Prdm8	PR domain containing 8
Cntn2	contactin 2	Proca1	protein interacting with cyclin A1
Cntnap5b	contactin associated protein-like 5B	Prodh	proline dehydrogenase
Cntnap5c	contactin associated protein-like 5C	Prr18	proline rich 18
Col18a1	collagen, type XVIII, alpha 1	Prr36	proline rich 36
Cplx2	complexin 2	Ptch2	patched 2
Cpne2	copine II	Ptgds	prostaglandin D2 synthase (brain)
Cyp2j12	cytochrome P450, family 2, subfamily j, polypeptide 12	Rab34	RAB34, member RAS oncogene family
D430036J16Rik	RIKEN cDNA D430036J16 gene	Rasgrp3	RAS, guanyl releasing protein 3
Dbpht2	DNA binding protein with his-thr domain	Rgs8	regulator of G-protein signaling 8
Defb23	defensin beta 23	Ror1	receptor tyrosine kinase-like orphan receptor 1
Diras2	DIRAS family, GTP-binding RAS-like 2	Rora	RAR-related orphan receptor alpha
Dnah11	dynein, axonemal, heavy chain 11	Rtl4	retrotransposon Gag like 4
Dock10	dedicator of cytokinesis 10	S100a3	S100 calcium binding protein A3
Dscam	DS cell adhesion molecule	S1pr5	sphingosine-1-phosphate receptor 5
Elfn2	leucine rich repeat and fibronectin type III, extracellular 2	Scn2a	sodium channel, voltage-gated, type II, alpha
Epb41l2	erythrocyte membrane protein band 4.1 like 2	Sema5b	sema domain, seven thrombospondin repeats (type 1 and type 1-like), transmembrane domain (TM) and short cytoplasmic domain, (semaphorin) 5B
Epn2	epsin 2	Sh3pxd2b	SH3 and PX domains 2B
Erbin	Erbb2 interacting protein	Shf	Src homology 2 domain containing F
Fam173a	family with sequence similarity 173, member A	Slain1	SLAIN motif family, member 1
Fam21	N/A	Slc1a2	solute carrier family 1 (glial high affinity glutamate transporter), member 2
Fam3c	family with sequence similarity 3, member C	Slc38a3	solute carrier family 38, member 3
Far2	fatty acyl CoA reductase 2	Slitrk4	SLIT and NTRK-like family, member 4
Far2	fatty acyl CoA reductase 3	Snx22	sorting nexin 22
Far2	fatty acyl CoA reductase 4	Speer4a	spermatogenesis associated glutamate (E)-rich protein 4A
Fbxw15	F-box and WD-40 domain protein 15	Sstr1	somatostatin receptor 1
Frmpd3	FERM and PDZ domain containing 3	Stxbp5l	syntaxin binding protein 5-like
Fzd7	frizzled class receptor 7	Sv2b	synaptic vesicle glycoprotein 2 b
G0s2	G0/G1 switch gene 2	Syt1	synaptotagmin I
Gap43	growth associated protein 43	Tbata	thymus, brain and testes associated

Gbp11	guanylate binding protein 11	Tenm1	teneurin transmembrane protein 1
Gdpd5	glycerophosphodiester phosphodiesterase domain containing 5	Tmem100	transmembrane protein 100
Gfra1	glial cell line derived neurotrophic factor family receptor alpha 1	Tmem151b	transmembrane protein 151B
Glce	glucuronyl C5-epimerase	Tmem176b	transmembrane protein 176B
Gm10471	predicted gene 10471	Tmem229a	transmembrane protein 229A
Gm11780	predicted gene 11780	Tmem88b	transmembrane protein 88B
Gm14204	predicted gene 14204	Trf	transferrin
Gm1979	predicted gene 1979	Tspyl4	TSPY-like 4
Gm21671	predicted gene, 21671	Ttyh1	tweety family member 1
Gm2694	predicted gene 2694	Unc5d	unc-5 netrin receptor D
Gm30731	predicted gene, 30731	Usp54	ubiquitin specific peptidase 54
Gm5803	N/A	Wscd2	WSC domain containing 2
Gm5862	predicted gene 5862	Xylt1	xylosyltransferase 1
Gm6277	predicted gene 6277	Zdhhc23	zinc finger, DHHC domain containing 23
Gm6277	predicted gene 6277	Zfand4	zinc finger, AN1-type domain 4
Gm9895	N/A	Zfp488	zinc finger protein 488
Gpr12	G-protein coupled receptor 12		
Grm4	glutamate receptor, metabotropic 4		
H2-Bl	histocompatibility 2, blastocyst		
Hecw1			

[0059] For mice, Table 2 and Table 2b provide the unique ENSEMBL identifiers corresponding to the mouse genes (MUSG), transcripts (MUST), and proteins (if available) (MUSP) analyzed in the experiments herein. The unique identifiers for each ENSEMBL entry has been modified to remove the first five leading zeros (0) of the identifier after the ENSMUSG, ENSMUST, and ENSMUSP label. Where an ENSEMBL transcript or protein identifer was not available, GenBank transcripts (nucleic acid or protein) are included.

Table 2. ENSEMBL IDs for mice

Symbol	MUSG	MUST	MUSP	Symbol	MUSG	MUST	MUSP	Symbol	MUSG	MUST	MUSP
1700047M11Rik	100147	189594	N/A	Frem1	059049	170248	125809	Pitpnm3	040543	132781	N/A
1700047M11Rik	100147	185216	N/A	Fmd3	049122	084474	081514	Pitpnm3	040543	142471	N/A
2410124H12Rik	051297	160494	N/A	Fmd3	049122	098006	095615	Pitpnm3	040543	108508	104148
3110039M20Rik	104861	127041	N/A	Fmd3	049122	154134	N/A	Pkd2l1	037578	042026	045675
3110039M20Rik	104861	145291	N/A	Fmd4a	026657	138735	N/A	Pkd2l1	037578	161357	N/A
8030451O07Rik	N/A	N/A	N/A	Fmd4a	026657	137809	N/A	Pkia	027499	192468	142120
9530059O14Rik	097736	181682	N/A	Fmd4a	026657	177457	134788	Pkia	027499	028999	028999
9530059O14Rik	097736	181107	N/A	Fmd4a	026657	132710	N/A	Pkia	027499	193330	141466
9530059O14Rik	097736	215759	N/A	Fmd4a	026657	091497	089079	Pknox2	035934	177218	135581
9530059O14Rik	097736	181719	N/A	Fmd4a	026657	175669	135306	Pknox2	035934	039674	035806
A230077H06Rik	100600	189574	N/A	Fmd4a	026657	147156	N/A	Pknox2	035934	175938	138866
A230077H06Rik	100600	188579	N/A	Fmd4a	026657	176803	135432	Pknox2	035934	177080	N/A
A230077H06Rik	100600	189855	N/A	Fmd4a	026657	175944	135686	Pknox2	035934	176562	N/A
A230077H06Rik	100600	205953	N/A	Fmd4a	026657	115037	110689	Pknox2	035934	176622	N/A
A2m	030111	204850	144862	Fmd4a	026657	141746	N/A	Pknox2	035934	177444	135641
A2m	030111	032203	032203	Fmd4a	026657	075767	075172	Pknox2	035934	188348	139976
A2m	030111	203413	N/A	Fmd4a	026657	176962	N/A	Pknox2	035934	188057	140793
A730036I17Rik	056738	143346	N/A	Fmd4a	026657	115039	N/A	Pknox2	035934	189294	139728
A730036I17Rik	056738	148548	N/A	Fmd4a	026657	123919	N/A	Pknox2	035934	188433	N/A
A730036I17Rik	056738	165505	N/A	Fmd4a	026657	153160	N/A	Pknox2	035934	213653	N/A
Aass	029695	031707	031707	Fmd4a	026657	176828	134803	Pknox2	035934	215175	N/A
Aass	029695	138063	N/A	Fmd4a	026657	142452	N/A	Pknox2	035934	080754	079578
Aass	029695	149864	115079	Fmd4a	026657	176864	135057	Pkp3	054065	106039	101654

Aass	029695	152280	N/A	Frmd4b	030064	113355	108982	Pkp3	054065	159375	124572
Aatk	025375	103020	099309	Frmd4b	030064	203486	N/A	Pkp3	054065	066873	069961
Aatk	025375	064307	067181	Frmd4b	030064	143698	N/A	Pkp3	054065	163041	124434
Aatk	025375	103019	099308	Frmd4b	030064	113359	108986	Pkp3	054065	160869	124013
Aatk	025375	150730	N/A	Frmd4b	030064	032146	032146	Pkp3	054065	160615	N/A
Aatk	025375	142959	N/A	Frmd4b	030064	146191	N/A	Pkp3	054065	160403	N/A
Aatk	025375	134319	N/A	Frmd4b	030064	155326	N/A	Pkp3	054065	159253	N/A
Aatk	025375	132575	N/A	Frmd4b	030064	138301	N/A	Pkp3	054065	161142	N/A
Aatk	025375	136386	N/A	Frmd4b	030064	152385	N/A	Pla2g16	060675	025925	025925
Aatk	025375	128836	N/A	Frmd4b	030064	113353	N/A	Pla2g16	060675	136756	115151
Abat	057880	065987	063548	Frmd4b	030064	142589	N/A	Pla2g16	060675	136465	119403
Abat	057880	140795	N/A	Frmd4b	030064	126899	N/A	Pla2g16	060675	141887	123524
Abat	057880	115838	111504	Frmd4b	030064	124050	145240	Pla2g4a	056220	070200	070868
Abat	057880	144444	121881	Frmpd1	035615	107804	103434	Pla2g4a	056220	111926	107557
Abat	057880	115839	111505	Frmpd1	035615	134280	118757	Pla2g4a	056220	190507	139851
Abat	057880	128459	N/A	Frmpd1	035615	044773	047232	Pla2g4a	056220	155438	N/A
Abat	057880	138987	116686	Frmpd2	108841	208853	146522	Pla2g4a	056220	142040	N/A
Abca1	015243	030010	030010	Frmpd2	108841	208577	146693	Pla2g4a	056220	134676	N/A
Abca1	015243	149127	N/A	Frmpd2	108841	207581	N/A	Pla2g4e	050211	090071	087525
Abcc8	040136	210655	148169	Frmpd2	108841	208380	N/A	Pla2g4e	050211	127009	N/A
Abcc8	040136	209432	147431	Frmpd4	049176	112149	107777	Pla2g4e	050211	136845	N/A
Abcc8	040136	210770	147925	Frmpd4	049176	112146	107774	Pla2g4e	050211	152263	N/A
Abcc8	040136	210637	N/A	Frmpd4	049176	112147	107775	Pla2g5	041193	102512	099570
Abcc8	040136	033123	033123	Frmpd4	049176	112145	107773	Pla2g5	041193	102513	099571
Abcc8	040136	210110	147479	Frrs1	033386	040260	039487	Pla2g5	041193	102511	099569
Abcc8	040136	210986	N/A	Frrs1	033386	199626	143546	Pla2g5	041193	127183	N/A
Abcc8	040136	210511	148198	Frrs1	033386	195905	143255	Pla2g5	041193	136393	N/A
Abcg2	029802	147213	120940	Frrs1	033386	199584	N/A	Pla2g5	041193	140117	N/A
Abcg2	029802	204924	N/A	Frrs1	033386	197323	N/A	Pla2g5	041193	154844	N/A
Abcg2	029802	148008	114454	Frrs1	033386	199030	142793	Pla2g5	041193	140100	N/A
Abcg2	029802	031822	031822	Frrs1l	045589	053681	052507	Pla2g5	041193	030524	030524
Abcg2	029802	124542	N/A	Frrs1l	045589	128276	121657	Pla2g7	023913	167214	130404
Abcg2	029802	145161	122924	Fry	056602	200960	144674	Pla2g7	023913	024706	024706
Abcg2	029802	143752	138608	Fry	056602	202530	144277	Pla2g7	023913	167418	131898
Abcg2	029802	203146	145435	Fry	056602	203000	N/A	Pla2g7	023913	165706	N/A
Abcg2	029802	114294	109933	Fry	056602	202600	144317	Pla2g7	023913	169694	132027
Abcg2	029802	204948	144876	Fry	056602	201854	N/A	Pla2g7	023913	163489	N/A
Abcg2	029802	143447	N/A	Fry	056602	087204	084454	Plag1	003282	003369	003369
Abcg2	029802	145685	138703	Fry	056602	202841	N/A	Plag1	003282	137439	117532
Abcg2	029802	134426	N/A	Fry	056602	200964	N/A	Plag1	003282	151543	119937
Abhd2	039202	037315	038361	Fry	056602	202630	N/A	Plag1	003282	147035	N/A
Abhd2	039202	135333	N/A	Fry	056602	201634	N/A	Plat	031538	210960	N/A
Abhd5	032540	156520	122274	Fry	056602	202566	144657	Plat	031538	033941	033941
Abhd5	032540	035128	135538	Fry	056602	200863	143845	Plat	031538	211033	N/A
Abhd5	032540	111497	107123	Fry	056602	201196	N/A	Plcb1	051177	131552	118756
Abhd5	032540	176005	N/A	Fry	056602	202070	N/A	Plcb1	051177	110116	105743
Abhd5	032540	175973	135807	Fry	056602	200750	N/A	Plcb1	051177	130524	N/A
Abhd5	032540	214061	N/A	Fry	056602	202571	N/A	Plcb1	051177	202531	N/A
Abhd5	032540	216775	N/A	Fry	056602	201628	N/A	Plcb1	051177	070724	064844
Abhd5	032540	154161	122939	Fsip2	075249	143764	120314	Plcb1	051177	129382	N/A
Abi3bp	035258	048471	036257	Fsip2	075249	136202	114196	Plcb1	051177	201485	144399
Abi3bp	035258	096013	093712	Fsip2	075249	132967	122350	Plcb1	051177	201524	N/A
Abi3bp	035258	096012	093711	Fstl5	034098	038364	038506	Plce1	024998	181994	N/A
Abi3bp	035258	171000	128818	Fstl5	034098	159686	N/A	Plce1	024998	182481	138360
Ablim1	025085	079360	078336	Fstl5	034098	160261	125393	Plce1	024998	169713	130604
Ablim1	025085	111529	107154	Fstl5	034098	191664	N/A	Plce1	024998	182267	138330
Ablim1	025085	099294	096897	Fstl5	034098	162471	125688	Plce1	024998	182999	138098
Ablim1	025085	111559	107184	Fth1	024661	025563	025563	Plce1	024998	182589	N/A
Ablim1	025085	111528	107153	Fxyd1	036570	206328	145712	Plce1	024998	183131	N/A

Ablim1	025085	111526	107151	Fxyd1	036570	205807	145990	Plch1	036834	048134	047693
Ablim1	025085	111550	107175	Fxyd1	036570	205917	N/A	Plch1	036834	159374	N/A
Ablim1	025085	111558	107183	Fxyd1	036570	206012	146295	Plch1	036834	159982	N/A
Ablim1	025085	111555	107180	Fxyd1	036570	206305	145589	Plch1	036834	084105	081122
Ablim1	025085	111546	107172	Fxyd1	036570	206030	146129	Plch1	036834	162269	124463
Ablim1	025085	111544	107169	Fxyd1	036570	206317	N/A	Plch1	036834	159676	124632
Ablim1	025085	156316	N/A	Fxyd1	036570	205778	145818	Plch1	036834	059973	058524
Ablim1	025085	137389	N/A	Fxyd1	036570	108110	103745	Plch1	036834	177143	135424
Ablim1	025085	127198	N/A	Fxyd1	036570	206860	146288	Plch1	036834	176861	135562
Ablim1	025085	133782	N/A	Fxyd1	036570	206474	145920	Plch1	036834	175947	135353
Ablim1	025085	134430	N/A	Fxyd1	036570	071697	071617	Plch1	036834	159188	124491
Ablim1	025085	150425	N/A	Fxyd1	036570	205439	146064	Plch1	036834	161052	125581
Ablim1	025085	128212	N/A	Fxyd1	036570	205542	N/A	Plch1	036834	160638	123921
Ablim1	025085	111524	107149	Fxyd1	036570	206522	N/A	Plcl1	038349	042986	037854
Ablim1	025085	133369	117798	Fxyd1	036570	205392	N/A	Plcl1	038349	187059	N/A
Ablim1	025085	104902	127818	Fxyd1	036570	039909	048460	Pld5	055214	125404	121428
Ablim2	029095	101280	098838	Fxyd7	036578	206341	146171	Pld5	055214	065967	069326
Ablim2	029095	054598	050571	Fxyd7	036578	073892	073555	Pld5	055214	156184	N/A
Ablim2	029095	114205	109843	Fzd9	049551	062572	053551	Pld5	055214	144340	N/A
Ablim2	029095	114210	109848	Gab2	004508	004622	004622	Pld5	055214	111166	106796
Ablim2	029095	114206	109844	Gab2	004508	206791	146200	Pld5	055214	111167	106797
Ablim2	029095	114204	109842	Gabra2	000560	197284	142892	Plekhd1	066438	153762	N/A
Ablim2	029095	129347	123525	Gabra2	000560	198625	143645	Plekhd1	066438	142760	121812
Ablim2	029095	130233	118159	Gabra2	000560	197124	N/A	Plekhd1	066438	152465	N/A
Ablim2	029095	114203	109841	Gabra2	000560	000572	000572	Plekhd1	066438	140770	119711
Ablim2	029095	150146	144134	Gabra2	000560	199861	N/A	Plekhg3	052609	217730	151564
Ablim2	029095	151636	123616	Gabra2	000560	199012	N/A	Plekhg3	052609	075249	074729
Ablim2	029095	135885	N/A	Gabra4	029211	031121	031121	Plekhg3	052609	218461	N/A
Ablim2	029095	151322	114616	Gabra4	029211	199357	143675	Plekhg3	052609	219063	151851
Ablim2	029095	125378	115931	Gabra4	029211	197994	143063	Plekhg3	052609	218380	151867
Ablim2	029095	153025	N/A	Gabra4	029211	198138	142466	Plekhg3	052609	219751	151704
Ablim2	029095	130209	N/A	Gabra4	029211	199150	N/A	Plekhg3	052609	218357	N/A
Ablim2	029095	153529	118019	Gabra6	020428	020703	020703	Plekhg3	052609	219426	N/A
Ablim3	032735	049378	041243	Gabra6	020428	155218	126114	Plekhg3	052609	218427	N/A
Ablim3	032735	166783	125836	Gabra6	020428	109286	104909	Plekhh1	060716	039928	049460
Abtb2	032724	076212	075566	Gabrb1	029212	199967	143682	Plekhh1	060716	217954	151944
Abtb2	032724	131122	N/A	Gabrb1	029212	031122	031122	Plekhh1	060716	219956	151747
Abtb2	032724	138580	N/A	Gabrd	029054	150423	N/A	Plekhh1	060716	219946	N/A
Acad8	031969	129490	N/A	Gabrd	029054	030925	030925	Plekhh2	040852	047206	039628
Acad8	031969	120367	112908	Gabrd	029054	129892	N/A	Plekho2	050721	214740	N/A
Acad8	031969	151075	N/A	Gabrg2	020436	070725	064739	Plekho2	050721	213554	N/A
Acad8	031969	215693	150728	Gabrg2	020436	070735	063812	Plekho2	050721	068944	063677
Acad8	031969	128923	122444	Gabrg2	020436	146198	N/A	Plekho2	050721	213652	N/A
Acad8	031969	132293	123012	Gabrg2	020436	109290	104913	Pllp	031775	034227	034227
Acad8	031969	138102	N/A	Gabrg3	055026	068911	067632	Pllp	031775	212555	N/A
Acad8	031969	060513	054370	Gabrg3	055026	068394	065255	Pllp	031775	213043	148729
Acer3	030760	033020	033020	Gabrg3	055026	171965	N/A	Plp1	031425	033800	033800
Acer3	030760	120520	112884	Gad1	070880	094934	092539	Plp1	031425	113085	108708
Acer3	030760	151258	116127	Gad1	070880	130604	117721	Plp1	031425	125644	N/A
Acer3	030760	206182	N/A	Gad1	070880	148210	119733	Plp1	031425	144880	N/A
Acer3	030760	137899	120334	Gad1	070880	130998	119379	Plpp3	028517	064139	065719
Aco2	022477	023116	023116	Gad1	070880	155979	N/A	Plpp4	070366	094018	091557
Aco2	022477	157003	N/A	Gad1	070880	140478	N/A	Plpp4	070366	206551	N/A
Aco2	022477	135198	N/A	Gad1	070880	130618	117521	Plpp4	070366	206918	N/A
Aco2	022477	126352	N/A	Gad1	070880	123330	116301	Plpp4	070366	205630	145851
Aco2	022477	155704	N/A	Gad2	026787	028123	028123	Plpp4	070366	205896	145944
Aco2	022477	144324	N/A	Gad2	026787	156728	N/A	Plppr4	044667	061071	052306
Acot11	034853	102762	099823	Gal3st1	049721	078757	077815	Plppr4	044667	125664	N/A
Acot11	034853	065253	069636	Gal3st1	049721	063004	058348	Plppr4	044667	197743	143753

Acot11	034853	140541	124567	Gal3st1	049721	109981	105608	Pls1	049493	093800	091317
Acot11	034853	144809	N/A	Galnt14	024064	024858	024858	Pls1	049493	119760	113200
Acot11	034853	156567	123942	Galnt14	024064	146565	N/A	Pls1	049493	135816	N/A
Acot11	034853	145061	125123	Galnt14	024064	112591	108210	Plscr1	032369	093801	091318
Acot11	034853	148688	124385	Galnt15	021903	022460	022460	Plscr1	032369	186364	139479
Acsbg1	032281	034822	034822	Galnt15	021903	164208	131978	Plscr1	032369	187952	N/A
Acsbg1	032281	138315	118133	Galnt16	021130	219993	151829	Plscr4	032377	034941	034941
Acsbg1	032281	128163	119551	Galnt16	021130	218943	151619	Plscr4	032377	143866	N/A
Acsbg1	032281	128624	121622	Galnt16	021130	021558	021558	Pltp	017754	109316	104939
Acsbg1	032281	132914	N/A	Galnt16	021130	218648	N/A	Pltp	017754	109317	104940
Acsm5	030972	207796	146520	Galnt16	021130	217926	151370	Pltp	017754	059954	061519
Acsm5	030972	066465	063416	Galnt16	021130	219267	151800	Pltp	017754	142603	N/A
Acsm5	030972	207307	146737	Galnt18	038296	049430	043636	Pltp	017754	148912	N/A
Acsm5	030972	207440	146938	Galnt18	038296	106663	102274	Pltp	017754	156255	119955
Acsm5	030972	207381	146715	Galnt3	026994	028378	028378	Pltp	017754	128110	122760
Acsm5	030972	207387	146357	Galnt3	026994	153563	N/A	Plxdc1	017417	017561	017561
Acsm5	030972	207813	147176	Galnt3	026994	150793	N/A	Plxdc1	017417	107565	103191
Actb	029580	100497	098066	Galnt3	026994	155453	N/A	Plxdc1	017417	141708	N/A
Actb	029580	196997	N/A	Galnt5	026828	112616	108235	Plxdc1	017417	107564	103190
Actb	029580	167721	127663	Galnt5	026828	144671	N/A	Plxna4	029765	115096	110748
Actb	029580	171419	130611	Galnt5	026828	166729	131362	Plxna4	029765	200732	N/A
Actb	029580	167386	N/A	Galnt6	037280	159715	123848	Plxnb1	053646	072093	071966
Actb	029580	163829	132135	Galnt6	037280	052069	056705	Plxnb1	053646	131462	115265
Actb	029580	106216	101823	Galnt6	037280	161514	124793	Plxnb1	053646	130366	114358
Actb	029580	165629	N/A	Galntl6	096914	204128	145321	Plxnb1	053646	192988	142431
Actb	029580	164765	N/A	Galntl6	096914	204067	145016	Plxnb1	053646	195364	N/A
Actbl2	055194	054716	052086	Galntl6	096914	204937	N/A	Plxnb1	053646	192117	N/A
Actr3b	056367	128727	121629	Galntl6	096914	077447	N/A	Plxnb1	053646	194734	N/A
Actr3b	056367	088244	085578	Galntl6	096914	146513	118306	Plxnb3	031385	149478	N/A
Actr3b	056367	198693	N/A	Galntl6	096914	125865	N/A	Plxnb3	031385	146812	N/A
Adam11	020926	103081	099370	Galntl6	096914	203398	145298	Plxnb3	031385	147127	N/A
Adam11	020926	068150	069466	Galntl6	096914	188531	139677	Plxnb3	031385	002079	002079
Adam11	020926	124879	N/A	Galntl6	096914	098757	096353	Plxnb3	031385	155096	N/A
Adam11	020926	141563	N/A	Galr1	024553	065224	066381	Plxnc1	074785	099337	096939
Adam11	020926	142912	N/A	Gapdh	057666	192506	N/A	Plxnc1	074785	218839	N/A
Adam11	020926	126024	N/A	Gapdh	057666	147954	N/A	Plxnc1	074785	180514	N/A
Adam11	020926	134296	N/A	Gapdh	057666	117757	113942	Plxnc1	074785	181244	138038
Adam11	020926	143269	N/A	Gapdh	057666	118875	113213	Plxnc1	074785	180573	N/A
Adam11	020926	135513	N/A	Gapdh	057666	183272	138508	Pmepa1	038400	124124	N/A
Adam12	054555	067680	065213	Gapdh	057666	182464	N/A	Pmepa1	038400	139306	115534
Adam12	054555	138363	114874	Gapdh	057666	144205	N/A	Pmepa1	038400	036248	039950
Adam12	054555	134504	123161	Gapdh	057666	182115	N/A	Pmp2	052468	029034	029034
Adam12	054555	127524	120094	Gapdh	057666	182052	138403	Pmp22	018217	018361	018361
Adam12	054555	206313	N/A	Gapdh	057666	182277	138295	Pmp22	018217	108702	104342
Adam12	054555	206426	N/A	Gapdh	057666	182670	N/A	Pmp22	018217	108701	104341
Adam12	054555	154144	N/A	Gapdh	057666	144588	N/A	Pmp22	018217	140648	N/A
Adamts10	024299	174666	N/A	Gapdh	057666	073605	073289	Pmp22	018217	108700	104340
Adamts10	024299	173972	N/A	Garem2	044576	058045	054208	Polr2a	005198	058470	050771
Adamts10	024299	174104	N/A	Garnl3	038860	102810	099874	Polr2a	005198	156588	N/A
Adamts10	024299	173813	N/A	Garnl3	038860	049618	057582	Polr2a	005198	151586	N/A
Adamts10	024299	174348	133856	Garnl3	038860	137381	122576	Polr2a	005198	071213	071200
Adamts10	024299	172922	133891	Garnl3	038860	153717	N/A	Pon2	032667	057792	062670
Adamts10	024299	173013	134181	Garnl3	038860	139778	N/A	Pon2	032667	123838	N/A
Adamts10	024299	173030	134549	Garnl3	038860	193171	142077	Pon2	032667	135342	N/A
Adamts10	024299	174170	N/A	Garnl3	038860	150242	N/A	Pon2	032667	203882	N/A
Adamts10	024299	173241	134298	Garnl3	038860	135296	N/A	Por	005514	153500	121531
Adamts10	024299	087623	084905	Garnl3	038860	148043	N/A	Por	005514	150058	N/A
Adamts10	024299	173931	133434	Garnl3	038860	133135	119973	Por	005514	153515	121022
Adamts15	033453	065112	067022	Garnl3	038860	127509	141523	Por	005514	005651	005651

Adamts15	033453	217070	N/A	Gaml3	038860	124000	123601	Por	005514	122113	112924
Adamts15	033453	216215	150677	Gas1	052957	065086	064555	Por	005514	147515	N/A
Adamts16	049538	080145	079041	Gas1	052957	223933	153311	Por	005514	127096	119138
Adamts16	049538	123552	122031	Gatm	027199	028624	028624	Por	005514	149684	N/A
Adamts16	049538	109694	105316	Gatm	027199	154598	N/A	Por	005514	132084	N/A
Adamts16	049538	130726	N/A	Gatm	027199	140808	N/A	Pparg	000440	171644	131962
Adamts18	053399	093113	090801	Gatm	111138	215775	150264	Pparg	000440	203732	145525
Adamts18	053399	212665	148330	Gatm	111138	214872	N/A	Pparg	000440	204305	145083
Adamts18	053399	212437	148288	Gatm	111138	214402	N/A	Pparg	000440	203308	N/A
Adamts18	053399	213076	N/A	Gatsl2	015944	016088	016088	Pparg	000440	205213	144975
Adamts18	053399	213061	N/A	Gatsl2	015944	201013	N/A	Pparg	000440	000450	000450
Adamts18	053399	213078	N/A	Gatsl2	015944	140240	N/A	Pparg	000440	203896	N/A
Adamts18	053399	212527	N/A	Gca	026893	028257	028257	Ppfia4	026458	168515	128314
Adamts2	036545	040523	040171	Gca	026893	148083	N/A	Ppfia4	026458	186730	139800
Adamts2	036545	142118	N/A	Gda	058624	087600	084882	Ppfia4	026458	186964	N/A
Adamts2	036545	125988	N/A	Gda	058624	136258	N/A	Ppfia4	026458	189862	N/A
Adamts2	036545	127534	N/A	Gda	058624	121725	112758	Ppfia4	026458	189361	139833
Adamts6	046169	224784	153665	Gdf10	021943	168727	128621	Ppfia4	026458	186553	N/A
Adamts6	046169	223562	153504	Gfap	020932	067444	064691	Ppfibp1	016487	133825	N/A
Adamts6	046169	224742	152936	Gfap	020932	127909	N/A	Ppfibp1	016487	155415	121270
Adamts6	046169	224208	153359	Gfap	020932	077902	077061	Ppfibp1	016487	204028	N/A
Adamts6	046169	224303	153431	Gfra2	022103	022699	022699	Ppfibp1	016487	136837	114340
Adamts6	046169	224504	153194	Gfra2	022103	227697	154391	Ppfibp1	016487	123902	N/A
Adamts6	046169	065766	064570	Gfra2	022103	227633	153937	Ppfibp1	016487	149203	N/A
Adamts9	030022	113438	109065	Ghitm	041028	165649	129712	Ppfibp1	016487	126774	N/A
Adamts9	030022	125490	N/A	Ghitm	041028	042564	046212	Ppfibp1	016487	203730	145088
Adamts9	030022	130314	N/A	Ghitm	041028	224769	153458	Ppfibp1	016487	111623	107250
Adamts9	030022	203690	N/A	Ghitm	041028	223921	N/A	Ppfibp1	016487	204660	144887
Adamts9	030022	136751	N/A	Ghr	055737	069451	069457	Ppfibp1	016487	154221	122515
Adamts9	030022	167391	126498	Ghr	055737	161561	124064	Ppfibp1	016487	016631	016631
Adamtsl4	015850	117782	113424	Ghr	055737	110698	106326	Ppfibp2	036528	207852	N/A
Adamtsl4	015850	015994	015994	Ghr	055737	110697	106325	Ppfibp2	036528	040056	042574
Adamtsl4	015850	151054	N/A	Ghr	055737	161770	125044	Ppfibp2	036528	208504	N/A
Adamtsl4	015850	124410	N/A	Ghr	055737	160343	N/A	Ppfibp2	036528	208956	146889
Adamtsl4	015850	148854	120844	Ghr	055737	162993	N/A	Ppfibp2	036528	098134	095738
Adcy1	020431	020706	020706	Ghr	055737	159508	N/A	Ppfibp2	036528	208159	147038
Adcy1	020431	135398	N/A	Ghr	055737	161180	N/A	Ppm1e	046442	055438	061278
Adcyap1r1	029778	070736	063784	Ghr	055737	159912	N/A	Ppm1e	046442	155154	N/A
Adcyap1r1	029778	070756	066902	Gipc2	039131	152283	N/A	Ppm1h	034613	162853	N/A
Adcyap1r1	029778	166962	130742	Gipc2	039131	046614	037328	Ppm1h	034613	161487	124982
Adcyap1r1	029778	167484	131641	Gipc2	039131	128741	N/A	Ppm1h	034613	067918	066561
Adcyap1r1	029778	172084	127319	Gipc2	039131	130196	N/A	Ppm1h	034613	160315	N/A
Adcyap1r1	029778	165857	129614	Gipc2	039131	152680	N/A	Ppm1h	034613	159885	N/A
Adcyap1r1	029778	167234	126994	Gipc2	039131	200501	N/A	Ppm1h	034613	161065	N/A
Adcyap1r1	029778	165786	130923	Gipc2	039131	133672	N/A	Ppm1h	034613	161371	N/A
Add2	030000	203529	N/A	Gipc2	039131	197813	N/A	Ppm1h	034613	162969	124006
Add2	030000	204059	145160	Gipc2	039131	133102	N/A	Ppp1r14a	037166	207714	146684
Add2	030000	203366	144849	Gipr	030406	094790	092384	Ppp1r14a	037166	048187	035642
Add2	030000	203445	145494	Gipr	030406	206857	N/A	Ppp1r16b	037754	052927	062615
Add2	030000	205034	145034	Gipr	030406	206971	145860	Ppp1r16b	037754	045503	039540
Add2	030000	203724	145296	Gipr	030406	206137	N/A	Ppp1r16b	037754	129902	N/A
Add2	030000	203196	145104	Gja1	050953	068581	064536	Ppp1r16b	037754	145073	117310
Add2	030000	203786	144694	Gja1	050953	218760	N/A	Ppp1r16b	037754	103116	099405
Add2	030000	203279	145452	Gja1	050953	217789	151596	Ppp1r17	002930	052827	059708
Add2	030000	032069	032069	Gja1	050953	220204	N/A	Ppp4r4	021209	021631	021631
Adgra1	025475	026548	026548	Gja1	050953	220194	151603	Ppp4r4	021209	189871	139786
Adgra1	025475	137584	N/A	Gja1	050953	218834	151647	Ppp4r4	021209	187155	140874
Adgra1	025475	129454	N/A	Gja1	050953	218444	151974	Ppp4r4	021209	190664	140295
Adgra3	029090	030971	030971	Gja1	050953	220069	151620	Ppp4r4	021209	190151	139815

Adgra3	029090	196177	N/A	Gjb1	047797	119080	113904	Prag1	050271	110492	106118
Adgra3	029090	198818	N/A	Gjb1	047797	052130	062723	Prag1	050271	145386	N/A
Adgra3	029090	196229	N/A	Gjb1	047797	119190	113516	Prag1	050271	150295	N/A
Adgra3	029090	198868	N/A	Gjb6	040055	039380	035630	Prex1	039621	036719	037180
Adgra3	029090	196915	N/A	Gjb6	040055	224544	N/A	Prex1	039621	127553	N/A
Adgra3	029090	199132	N/A	Gjb6	040055	160703	124927	Prex1	039621	099080	096679
Adgrg1	031785	211850	N/A	Gjb6	040055	162931	N/A	Prex1	039621	109246	104869
Adgrg1	031785	212581	148742	Gjc2	043448	108793	104421	Prex1	039621	140624	N/A
Adgrg1	031785	179619	137520	Gjc2	043448	108790	104418	Prex1	039621	152238	N/A
Adgrg1	031785	212660	148644	Gjc3	056966	077119	076367	Prex1	039621	136564	N/A
Adgrg1	031785	093271	090959	Gjc3	056966	199083	N/A	Prex1	039621	136974	N/A
Adgrg1	031785	211944	148386	Gjd2	068615	090275	087742	Prex2	048960	027056	027056
Adgrg1	031785	212799	148349	Slc1a3	005360	005493	005493	Prex2	048960	190935	N/A
Adgrg1	031785	212141	148331	Slc1a3	005360	125997	N/A	Prex2	048960	189822	N/A
Adgrg1	031785	212976	148439	Slc1a3	005360	128879	N/A	Prex2	048960	187694	N/A
Adgrg1	031785	212995	148309	Slc1a3	005360	153455	N/A	Prex2	048960	188189	140621
Adgrg1	031785	212956	148374	Slc1a3	005360	157065	118902	Prex2	048960	187745	140788
Adgrg1	031785	212531	148650	Slc1a3	005360	129325	N/A	Prex2	048960	189385	140863
Adgrg1	031785	211984	148412	Slc1a3	005360	133309	N/A	Prex2	048960	188154	140580
Adgrg1	031785	212118	148304	Slc1a3	005360	126747	N/A	Prickle1	036158	048982	049204
Adgrg1	031785	211806	N/A	Slc1a3	005360	005493	005493	Prickle1	036158	109255	104878
Adgrg1	031785	211911	N/A	Slc1a3	005360	125997	N/A	Primal	041669	123655	N/A
Adgrv1	069170	128120	122358	Slc1a3	005360	128879	N/A	Primal	041669	127843	114309
Adgrv1	069170	095585	093245	Slc1a3	005360	153455	N/A	Primal	041669	074416	074017
Adgrv1	069170	224088	153419	Slc1a3	005360	157065	118902	Primal	041669	156176	123331
Adgrv1	069170	125698	120136	Slc1a3	005360	129325	N/A	Primal	041669	155547	N/A
Adgrv1	069170	156631	N/A	Slc1a3	005360	133309	N/A	Prkag3	006542	160732	125344
Adgrv1	069170	109565	105193	Slc1a3	005360	126747	N/A	Prkag3	006542	113672	109302
Adgrv1	069170	129725	N/A	Gldc	024827	025778	025778	Prkag3	006542	081636	080342
Adgrv1	069170	156627	N/A	Gldn	046167	056740	056080	Prkag3	006542	162093	125242
Adgrv1	069170	146141	N/A	Gli1	025407	026474	026474	Prkag3	006542	159728	124979
Adgrv1	069170	125663	N/A	Gli1	025407	219808	N/A	Prkag3	006542	188073	139909
Adgrv1	069170	126444	123552	Gli1	025407	218236	151718	Prkcb	052889	143692	138788
Adgrv1	069170	128585	121899	Gli1	025407	219671	151749	Prkcb	052889	064989	070019
Adgrv1	069170	146749	114579	Gli1	025407	218451	N/A	Prkcb	052889	064921	064812
Adgrv1	069170	132045	N/A	Gli2	048402	062483	054837	Prkcb	052889	131167	N/A
Adm	030790	033054	033054	Gli2	048402	161301	125342	Prkcb	052889	149583	N/A
Adm	030790	185766	N/A	Gli2	048402	162552	125059	Prkcb	052889	205550	N/A
Adora1	042429	086465	083656	Gli2	048402	161056	124768	Prkcb	052889	127910	N/A
Adora1	042429	038191	043522	Gli2	048402	160991	125634	Prkcb	052889	206495	N/A
Adora1	042429	187631	140801	Gli2	048402	159839	125661	Prkcd	021948	112210	107829
Adora1	042429	169927	132105	Gli2	048402	161451	124132	Prkcd	021948	022521	022521
Adra1a	045875	159365	124322	Gli2	048402	162607	123808	Prkcd	021948	112207	107826
Adra1a	045875	054661	053703	Gli2	048402	159678	N/A	Prkcd	021948	112206	107825
Adra1a	045875	160647	N/A	Gli3	021318	130065	115989	Prkcd	021948	140701	N/A
Adra1a	045875	225182	153103	Gli3	021318	141194	152092	Prkcd	021948	112202	107821
Adra1a	045875	159068	124570	Gli3	021318	130535	N/A	Prkcd	021948	112203	107822
Adra1a	045875	161339	125354	Gli3	021318	110510	106137	Prkcd	021948	130736	N/A
Adra1b	050541	067258	070200	Glipr2	028480	030202	030202	Prkcd	021948	135714	N/A
Adra1b	050541	139906	123435	Glipr2	028480	107855	103487	Prkcd	021948	145806	N/A
Adra1b	050541	124306	N/A	Glis1	034762	046005	035650	Prkcd	021948	112208	N/A
Adra1b	050541	167574	129200	Glis1	034762	106738	102349	Prkcd	021948	227078	N/A
Adra2b	058620	104934	100539	Glis1	034762	130573	N/A	Prkcd	021948	112211	107830
Adra2b	058620	071902	071798	Glis1	034762	135835	118600	Prkcg	078816	203600	N/A
Adrb2	045730	053640	062256	Glis1	034762	138211	N/A	Prkcg	078816	100301	097874
AF529169	039313	044491	046111	Glis1	034762	125573	N/A	Prkcg	078816	172109	131351
AF529169	039313	191465	140942	Glp2r	049928	021289	021289	Prkcg	078816	203081	145498
Afap1	029094	064571	067779	Glp2r	049928	051765	061560	Prkcg	078816	203454	N/A
Afap1	029094	146300	N/A	Glul	026473	086199	083375	Prkcg	097449	181455	137923

Afap1	029094	141824	119364	Glul	026473	139476	114377	Prkcg	097449	181221	137836
Afap1	029094	212374	148414	Glul	026473	140685	123157	Prkcq	026778	028118	028118
Afap1	029094	201482	N/A	Glul	026473	153134	N/A	Prkcq	026778	114853	N/A
Afap1l1	033032	154876	121278	Glul	026473	154576	N/A	Prkcq	026778	195207	N/A
Afap1l1	033032	120472	113286	Gm11549	085007	124606	153318	Prkcq	026778	102970	100035
Afap1l1	033032	147278	N/A	Gm136	071015	095129	092748	Prkcq	026778	192461	N/A
Aff2	031189	033532	033532	Gm20425	090639	166836	127808	Prkcq	026778	195628	N/A
Aff2	031189	143097	N/A	Gm266	010529	010673	010673	Prkd3	024070	003191	003191
Aff2	031189	151662	N/A	Gm5083	089815	163056	N/A	Prkd3	024070	119284	113395
Aff2	031189	139977	N/A	Gm5083	089815	159595	N/A	Prkd3	024070	146917	N/A
Afp	054932	042755	041006	Gm5089	064052	081580	080290	Prkd3	024070	118768	113232
Afp	054932	200693	144019	Gm5468	056089	227851	N/A	Prkd3	024070	118991	112775
Afp	054932	201061	N/A	Gm5468	056089	069992	N/A	Prkd3	024070	124229	N/A
Afp	054932	200728	N/A	Sox1ot	047935	186174	N/A	Prkd3	024070	130070	N/A
Afp	054932	202209	N/A	Sox1ot	047935	080795	N/A	Prkd3	024070	168887	132004
Agap1	055013	027521	027521	Gm8179	N/A	N/A	N/A	Prkg2	029334	161490	124963
Agap1	055013	190096	140599	Gna12	000149	000153	000153	Prkg2	029334	162619	142743
Agap1	055013	185417	N/A	Gna12	000149	198447	143414	Prkg2	029334	162147	143708
Agap1	055013	074945	074478	Gnal	024524	025402	025402	Prkg2	029334	031277	031277
Agap1	055013	212721	148732	Gnal	024524	076605	075908	Prkg2	029334	160765	N/A
Agap1	055013	212924	148317	Gnb3	023439	024206	024206	Prmt8	030350	032500	032500
Agpat3	001211	001240	001240	Gnb3	023439	129251	N/A	Procr	027611	029140	029140
Agpat3	001211	105389	101028	Gnb3	023439	140233	N/A	Procr	027611	143493	N/A
Agpat3	001211	105390	101029	Gnb3	023439	135996	N/A	Procr	027611	155095	N/A
Agpat3	001211	105388	101027	Gng11	032766	031670	031670	Procr	027611	132608	114567
Agpat3	001211	105387	101026	Gng13	025739	172002	131648	Prr5	036106	171460	127890
Agpat3	001211	146296	N/A	Gng13	025739	115108	110760	Prr5	036106	065499	066396
Agpat3	001211	219907	N/A	Gng2	043004	161247	124725	Prr5l	032841	043845	042167
Agpat3	001211	219932	151528	Gng2	043004	162425	124153	Prr5l	032841	141814	118537
Agpat3	001211	139282	119713	Gng2	043004	159028	125141	Prr5l	032841	125985	122996
Agpat3	001211	150828	114885	Gng2	043004	159073	125000	Prr5l	032841	154525	120192
Agpat3	001211	138035	121052	Gng2	043004	160013	125697	Prr5l	032841	124802	118502
Agpat3	001211	146899	114657	Gng2	043004	055100	055256	Prr5l	032841	144549	116266
Agpat3	001211	166360	132954	Gpc6	058571	123239	N/A	Prr5l	032841	140387	N/A
Agpat4	023827	164143	128085	Gpc6	058571	088483	085835	Prr5l	032841	127358	N/A
Agpat4	023827	024594	024594	Gpc6	058571	125435	120362	Prr5l	032841	163762	127530
Agpat4	023827	172259	N/A	Gpc6	058571	078849	077893	Prr5l	032841	171088	130152
Agpat4	023827	167792	127477	Gpcpd1	027346	127712	N/A	Prrc1	024594	025490	025490
Agpat4	023827	170858	127417	Gpcpd1	027346	148833	116156	Prrg3	033361	126362	118155
Agpat4	023827	167905	N/A	Gpcpd1	027346	110136	105763	Prrg3	033361	048790	038947
Agrn	041936	154494	N/A	Gpcpd1	027346	060955	062221	Prrg3	033361	170096	128073
Agrn	041936	105574	101199	Gpcpd1	027346	149854	116949	Prrx1	026586	075805	075203
Agrn	041936	071248	071229	Gpcpd1	027346	145694	116457	Prrx1	026586	027878	027878
Agrn	041936	105575	101200	Gpcpd1	027346	028822	028822	Prrx1	026586	183691	N/A
Agrn	041936	181062	N/A	Gpcpd1	027346	124632	117217	Prrx1	026586	174397	134338
Agrn	041936	180572	137931	Gpcpd1	027346	124107	122751	Prrx1	026586	174098	N/A
Agrn	041936	144749	N/A	Gpcpd1	027346	110135	105762	Psd2	024347	115716	111381
AI464131	046312	054920	059038	Gpcpd1	027346	140867	N/A	Psd2	024347	176873	135616
AI464131	046312	149596	122357	Gpcpd1	027346	131617	N/A	Psd2	024347	177432	135431
AI593442	078307	213937	149532	Gpcpd1	027346	110142	105769	Psd2	024347	176472	135285
AI593442	078307	213843	149128	Gphn	047454	052472	054064	Psd2	024347	175734	135795
AI593442	078307	098768	096365	Gphn	047454	110388	106018	Psd2	024347	175720	N/A
Ak4	028527	102780	099841	Gphn	047454	219629	N/A	Pstpip2	025429	114741	110389
Ak4	028527	106946	102559	Gpr135	043398	050649	058762	Ptchd1	041552	038665	039443
Ak4	028527	106945	102558	Gpr153	042804	105650	101275	Ptchd1	041552	170236	132293
Ak4	028527	131397	115456	Gpr153	042804	055754	052742	Ptchd1	041552	141356	N/A
Ak4	028527	133055	115454	Gpr153	042804	144035	N/A	Ptchd4	042256	048691	047640
Ak4	028527	151561	N/A	Gpr153	042804	105651	101276	Pter	026730	154269	118645
Ak4	028527	155749	121112	Gpr22	044067	057783	056125	Pter	026730	150283	N/A

Akain1	091636	169935	131134	Gpr22	044067	176710	134839	Pter	026730	114796	110444
Akna	039158	035724	041614	Gpr22	044067	174480	134674	Pter	026730	134794	117009
Akna	039158	140586	N/A	Gpr37	039904	200812	144683	Pter	026730	028063	028063
Aldh1a1	053279	224807	N/A	Gpr37	039904	054867	052185	Pter	026730	193742	N/A
Aldh1a1	053279	225337	153410	Gpr37l1	026424	027682	027682	Pter	026730	195521	N/A
Aldh1a1	053279	224358	N/A	Gpr63	040372	151006	N/A	Ptgfrn	027864	102694	099755
Aldh1a1	053279	225313	153011	Gpr63	040372	038920	039312	Ptgfrn	027864	198037	N/A
Aldh1a1	053279	225249	N/A	Gprasp2	072966	134986	N/A	Ptgfrn	027864	200065	N/A
Aldh1a1	053279	087638	084918	Gprasp2	072966	113136	108761	Ptk2b	059456	022622	022622
Aldh1a1	053279	224807	N/A	Gprasp2	072966	150797	N/A	Ptk2b	059456	154865	122683
Aldh1a1	053279	225337	153410	Gprasp2	072966	132798	N/A	Ptk2b	059456	089250	086661
Aldh1a1	053279	224358	N/A	Gprasp2	072966	141953	N/A	Ptk2b	059456	136216	N/A
Aldh1a1	053279	225313	153011	Gprasp2	072966	142034	N/A	Ptk2b	059456	111121	106750
Aldh1a1	053279	225249	N/A	Gprasp2	072966	137392	N/A	Ptk2b	059456	148104	N/A
Aldh1a1	053279	087638	084918	Gprasp2	072966	130034	N/A	Ptk2b	059456	127083	N/A
Aldh1l1	030088	127199	N/A	Gprasp2	072966	148658	N/A	Ptk2b	059456	178730	137008
Aldh1l1	030088	130418	114304	Gprasp2	072966	138251	N/A	Ptn	029838	101534	099073
Aldh1l1	030088	032175	032175	Gprasp2	072966	173804	134666	Ptn	029838	201321	144184
Aldh1l1	030088	203111	145233	Gprc5c	051043	133245	121572	Ptpn14	026604	097442	095051
Aldh1l1	030088	204796	145380	Gprc5c	051043	122967	114335	Ptpn14	026604	194127	N/A
Aldh1l1	030088	152436	N/A	Gprc5c	051043	053361	061760	Ptpn14	026604	128275	N/A
Aldh1l1	030088	137669	N/A	Gprc5c	051043	021071	021071	Ptpn14	026604	027898	027898
Aldh1l2	020256	020497	020497	Gprc5c	051043	136785	116786	Ptpn14	026604	195038	N/A
Aldh1l2	020256	146640	117076	Gprc5c	051043	142262	121524	Ptpn14	026604	148129	N/A
Aldh1l2	020256	147381	N/A	Gprc5c	051043	152314	118667	Ptpn22	027843	146071	122307
Aldh1l2	020256	141184	N/A	Gprc5c	051043	177952	136702	Ptpn22	027843	029433	029433
Aldh1l2	020256	138858	N/A	Gpx2	042808	221421	N/A	Ptpn22	027843	198530	N/A
Aldh1l2	020256	143793	N/A	Gpx2	042808	220569	N/A	Ptpn22	027843	197997	N/A
Aldh1l2	020256	125193	N/A	Gpx2	042808	082431	081012	Ptpn22	027843	196385	N/A
Aldoc	017390	102478	099536	Gramd3	001700	070166	068453	Ptpn22	027843	198701	N/A
Aldoc	017390	128032	N/A	Grb14	026888	134020	N/A	Ptpn22	027843	134373	N/A
Aldoc	017390	124090	N/A	Grb14	026888	149193	118115	Ptpn22	027843	126548	N/A
Aldoc	017390	156039	N/A	Grb14	026888	150643	121571	Ptpn5	030854	102626	099686
Aldoc	017390	148689	N/A	Grb14	026888	028252	028252	Ptpn5	030854	209161	N/A
Aldoc	017390	017534	017534	Grb14	026888	137085	N/A	Ptpn5	030854	033142	033142
Als2	026024	027178	027178	Grb14	026888	156765	121001	Ptpn5	030854	208324	N/A
Als2	026024	163058	125753	Grb14	026888	145603	N/A	Ptpn5	030854	208531	N/A
Als2	026024	159166	N/A	Grb14	026888	146807	N/A	Ptpn5	030854	207172	N/A
Als2	026024	160945	140990	Greb1l	042942	173356	N/A	Ptpn5	030854	208437	N/A
Als2	026024	188469	N/A	Greb1l	042942	048977	049003	Ptpn5	030854	209179	N/A
Amz1	050022	126975	N/A	Greb1l	042942	172532	134090	Ptpn5	030854	209184	N/A
Amz1	050022	060918	053110	Greb1l	042942	224958	N/A	Ptpn5	030854	207344	N/A
Amz1	050022	177057	N/A	Greb1l	042942	174553	N/A	Ptpn5	030854	209057	N/A
Amz1	050022	120630	113911	Greb1l	042942	172680	134314	Ptprk	019889	166468	126279
Amz1	050022	156006	N/A	Greb1l	042942	173261	N/A	Ptprk	019889	218359	151986
Amz1	050022	155644	N/A	Grhl1	020656	085553	082689	Ptprk	019889	218276	151866
Amz1	050022	176035	135504	Grhl1	020656	221426	N/A	Ptprk	019889	219478	N/A
Angptl1	022309	022921	022921	Grhl1	020656	223442	N/A	Ptprk	019889	218633	N/A
Angptl1	022309	227738	N/A	Grhl1	020656	020985	020985	Ptprk	019889	219107	N/A
Angptl3	028553	030280	030280	Gria1	020524	125292	133439	Ptprk	019889	218584	N/A
Angptl3	028553	136091	N/A	Gria1	020524	036315	044494	Ptprk	019889	219761	N/A
Angptl3	028553	125546	N/A	Gria1	020524	094179	091731	Ptprk	019889	219621	151294
Ankrd33b	022237	123325	118984	Gria1	020524	151045	117746	Ptprk	019889	220357	151493
Ankrd33b	022237	156679	117974	Gria1	020524	173531	N/A	Ptprk	019889	220404	N/A
Ankrd33b	022237	044324	037918	Gria3	001986	128197	N/A	Ptprn	033278	037974	045603
Ankrd33b	022237	110410	106040	Gria3	001986	115103	110755	Ptprn	033278	223982	153662
Ankrd33b	022237	227867	N/A	Gria3	001986	076349	075687	Ptprn	033278	225074	N/A
Ankrd33b	022237	076942	076209	Gria3	001986	156721	N/A	Ptprn	033278	224091	153463
Ankrd33b	022237	227391	N/A	Gria3	001986	139965	116381	Ptprn	033278	225554	153042

Anln	036777	040912	045873	Gria3	001986	148212	N/A	Ptprm	033278	225688	N/A
Anln	036777	215006	149721	Gria3	001986	124169	117766	Ptprm	033278	224862	153179
Anln	036777	217010	N/A	Gria3	001986	126843	N/A	Ptpro	030223	203010	N/A
Anln	036777	216897	N/A	Gria3	001986	165288	131523	Ptpro	030223	167679	127112
Anln	036777	216793	149740	Grid1	041078	043349	044009	Ptpro	030223	077115	076364
Anln	036777	215486	N/A	Grid1	041078	227253	N/A	Ptpro	030223	167002	131764
Ano4	035189	182462	138440	Grid1	041078	173307	N/A	Ptpro	030223	203914	144870
Ano4	035189	182341	138193	Grid2	071424	159319	N/A	Ptpro	030223	204780	N/A
Ano4	035189	182613	138268	Grid2	071424	159561	N/A	Ptpro	030223	203255	N/A
Ano4	035189	182790	138325	Grid2	071424	095852	093536	Ptpro	030223	203127	N/A
Ano4	035189	182598	138174	Grid2	071424	160408	N/A	Ptprr	020151	063470	064392
Ano4	035189	182888	N/A	Grid2	071424	161105	N/A	Ptprr	020151	142617	N/A
Ano4	035189	182041	N/A	Grid2	071424	162968	N/A	Ptprr	020151	105271	100907
Ano4	035189	182419	138435	Grid2	071424	210324	147707	Ptprr	020151	148731	120965
Ano4	035189	183268	138627	Grid2ip	010825	110733	106361	Ptprr	020151	155606	122259
Ano4	035189	181976	138792	Grid2ip	010825	010969	010969	Ptprr	020151	128399	114455
Ano4	035189	182624	138525	Grid2ip	010825	120825	113443	Ptprr	020151	124369	N/A
Ano4	035189	180843	N/A	Grid2ip	010825	196148	N/A	Ptprt	053141	109445	105071
Ano6	064210	071874	071770	Grid2ip	010825	138948	N/A	Ptprt	053141	109443	105069
Ano6	064210	226936	N/A	Grik1	022935	228188	154130	Ptprt	053141	109442	105068
Ano6	064210	227791	153954	Grik1	022935	023652	023652	Ptprt	053141	109441	105067
Ano6	064210	226682	N/A	Grik1	022935	072256	072107	Ptprt	053141	153770	N/A
Ano6	064210	227151	153853	Grik1	022935	227986	153786	Ptprt	053141	129015	N/A
Ano6	064210	226932	N/A	Grik1	022935	228034	154596	Ptprz1	068748	090568	088056
Ano6	064210	226793	154532	Grik1	022935	211444	147948	Ptprz1	068748	202579	144605
Ano6	064210	226761	N/A	Grik1	022935	210700	N/A	Ptprz1	068748	202102	143902
Aox1	063558	001027	001027	Grik1	022935	211635	N/A	Ptprz1	068748	202341	N/A
Aox1	063558	160168	N/A	Grik1	022935	226447	N/A	Ptprz1	068748	201827	N/A
Apba2	030519	032732	032732	Grik1	022935	210910	N/A	Ptprz1	068748	200769	N/A
Apba2	030519	205613	146269	Grik1	022935	114137	109773	Pttg1	020415	020687	020687
Apba2	030519	205604	146279	Grik2	056073	218823	151921	Pttg1	020415	117446	112841
Apba2	030519	206246	146038	Grik2	056073	217673	N/A	Pttg1	020415	140434	122019
Apba2	030519	205551	N/A	Grik2	056073	218598	151389	Pttg1	020415	101340	098894
Apba2	030519	206061	N/A	Grik2	056073	219509	151982	Pttg1	020415	118368	112834
Apba2	030519	206630	146108	Grik2	056073	218441	151671	Pttg1	020415	121638	112815
Apbb2	029207	162955	N/A	Grik2	056073	220330	N/A	Pttg1	020415	152115	119554
Apbb2	029207	162366	125116	Grik2	056073	219051	N/A	Pttg1	020415	020685	020685
Apbb2	029207	160870	123978	Grik2	056073	218669	152029	Pttg1	020415	150726	N/A
Apbb2	029207	159512	124807	Grik2	056073	220263	151372	Pttg1	020415	148130	N/A
Apbb2	029207	159786	125211	Grik2	056073	079751	078687	Purb	094483	179343	136957
Apbb2	029207	201776	N/A	Grik2	056073	105484	101124	Pvalb	005716	005860	005860
Apbb2	029207	160775	N/A	Grik3	001985	030676	030676	Pvalb	005716	120592	112598
Apbb2	029207	162349	123752	Grin2a	059003	199708	142900	Pxdc1	021411	053459	051246
Apbb2	029207	160063	123778	Grin2a	059003	115835	111501	Pxdc1	021411	021847	021847
Apbb2	029207	161771	N/A	Grin2a	059003	199267	N/A	Pxdc1	021411	125037	117791
Apbb2	029207	162401	N/A	Grin2a	059003	156482	N/A	Pxdc1	021411	152392	N/A
Apbb2	029207	160185	N/A	Grin2a	059003	197242	N/A	Pxdn	020674	220271	151320
Apbb2	029207	162382	124139	Grin2a	059003	032331	032331	Pxdn	020674	122328	113703
Apbb2	029207	161879	125550	Grin2b	030209	053880	062284	Pxdn	020674	118321	113477
Apbb2	029207	160103	123766	Grin2b	030209	152012	142696	Pxdn	020674	155318	N/A
Apbb2	029207	162994	125603	Grin2b	030209	188999	140452	Pxdn	020674	155190	N/A
Apbb2	029207	159357	124127	Grin2b	030209	143943	140710	Pxdn	020674	126233	N/A
Apbb2	029207	161716	124350	Grin2b	030209	125905	139706	Pxdn	020674	137316	N/A
Apbb2	029207	161936	N/A	Grin2b	030209	198283	N/A	Pxdn	020674	218620	N/A
Apbb2	029207	159847	N/A	Grin2b	030209	111905	107536	Pxk	033885	036682	035265
Apbb2	029207	087256	084511	Grin2c	020734	003351	003351	Pxk	033885	225827	N/A
Apcdd1	071847	096554	094302	Grin2c	020734	106554	102164	Pxk	033885	225616	N/A
Apcdd1	071847	163716	125868	Grin2d	002771	002848	002848	Pxk	033885	225653	152987
Aplp1	006651	006828	006828	Grin2d	002771	211713	147663	Pxk	033885	224462	N/A

Aplp1	006651	208792	N/A	Grin2d	002771	211250	147506	Pxk	033885	112689	108309
Aplp1	006651	208404	N/A	Grip1	034813	077871	077033	Pxylp1	043587	112951	108574
Aplp1	006651	207514	N/A	Grip1	034813	041962	042436	Pxylp1	043587	078478	077571
Aplp1	006651	209054	N/A	Grip1	034813	147356	115478	Pxylp1	043587	120101	113210
Apod	022548	130560	119827	Grip1	034813	105262	100897	Pxylp1	043587	119141	113489
Apod	022548	115230	110885	Grip1	034813	147454	118073	Pxylp1	043587	126411	121537
Apod	022548	023207	N/A	Grip1	034813	147598	N/A	Pxylp1	043587	121077	113059
Apod	022548	156456	N/A	Grip1	034813	138410	123234	Pxylp1	043587	135834	N/A
Apod	022548	155682	N/A	Grip1	034813	144825	121670	Pxylp1	043587	154146	114946
Apod	022548	145837	N/A	Grip1	034813	148954	118397	Pxylp1	043587	137770	N/A
Appl2	020263	020500	020500	Grip1	034813	144959	122323	Pxylp1	043587	124923	120377
Appl2	020263	177187	135157	Grip1	034813	139352	N/A	Pxylp1	043587	141127	N/A
Appl2	020263	176675	135672	Grip1	034813	127787	N/A	Pxylp1	043587	136987	N/A
Appl2	020263	141048	N/A	Grip1	034813	130387	123288	Pxylp1	043587	185561	N/A
Appl2	020263	130285	N/A	Grip1	034813	105261	100896	Pyroxd2	060224	076505	075825
Appl2	020263	148096	N/A	Grip1	034813	154238	122349	Qdpr	015806	198258	143741
Appl2	020263	147582	N/A	Grip1	034813	081260	080016	Qdpr	015806	197946	143584
Appl2	020263	150351	N/A	Grk4	052783	074651	074223	Qdpr	015806	117425	112469
Appl2	020263	127788	N/A	Grk4	052783	001112	001112	Qdpr	015806	120867	113203
Appl2	020263	147118	N/A	Grk4	052783	148588	122826	Qdpr	015806	118097	113958
Appl2	020263	146876	121336	Grk4	052783	153323	N/A	Qdpr	015806	015950	015950
Appl2	020263	150685	115903	Grk4	052783	134217	N/A	Qdpr	015806	200259	N/A
Appl2	020263	133719	N/A	Grm1	019828	105561	101190	Qdpr	015806	149290	N/A
Appl2	020263	176294	135645	Grm1	019828	044306	037255	Qdpr	015806	154962	122081
Aqp4	024411	079081	078088	Grm1	019828	135120	N/A	Qdpr	015806	127562	115453
Aqp7	028427	030136	030136	Grm1	019828	155772	N/A	Qk	062078	042296	046740
Aqp7	028427	054945	093007	Grm1	019828	156826	N/A	Qk	062078	097414	095025
Aqp7	028427	144201	N/A	Grm1	019828	105560	101189	Rab11fip1	031488	054212	058042
Aqp7	028427	149517	N/A	Grm5	049583	208791	N/A	Rab11fip1	031488	033878	033878
Ar	046532	052837	052648	Grm5	049583	208878	N/A	Rab11fip1	031488	209377	147543
Arhgap10	037148	076316	075658	Grm5	049583	125009	118393	Rab11fip1	031488	210187	N/A
Arhgap10	037148	210922	147485	Grm5	049583	208776	N/A	Rab11fip1	031488	210919	N/A
Arhgap10	037148	210519	147493	Grm5	049583	155358	114927	Rab11fip1	031488	211646	N/A
Arhgap15	049744	055776	056461	Grm5	049583	138732	N/A	Rab15	021062	021459	021459
Arhgap15	049744	112824	108443	Grm5	049583	107263	102884	Rab15	021062	143863	N/A
Arhgap15	049744	112822	108441	Grm7	056755	174018	134635	Rab15	021062	122419	112457
Arhgap15	049744	140528	N/A	Grm7	056755	071076	064404	Rab15	021062	121716	113299
Arhgap15	049744	128630	N/A	Grm7	056755	172951	133957	Rab15	021062	118604	112789
Arhgap20	053199	130405	120124	Grm7	056755	173001	134233	Rab15	021062	154765	122067
Arhgap20	053199	065496	065633	Grm7	056755	174310	133897	Rab15	021062	141622	115720
Arhgap20	053199	146509	N/A	Grm8	024211	115323	110978	Rab15	021062	134124	N/A
Arhgap20	053199	124907	N/A	Grm8	024211	090512	087998	Rab27a	032202	184146	139310
Arhgap20	053199	126567	N/A	Grm8	024211	131897	120394	Rab27a	032202	034722	034722
Arhgap20	053199	149754	N/A	Grm8	024211	146727	N/A	Rab27a	032202	184575	N/A
Arhgap22	063506	165792	153801	Grm8	024211	132755	118098	Rab27a	032202	184032	N/A
Arhgap22	063506	111956	107587	Grm8	024211	202861	N/A	Rab27b	024511	121693	114094
Arhgap22	063506	131086	154002	Grm8	024211	115324	110979	Rab27b	024511	127217	N/A
Arhgap22	063506	137590	N/A	Gsap	039934	197522	N/A	Rab27b	024511	117692	112807
Arhgap22	063506	111955	107586	Gsap	039934	198014	143739	Rab27b	024511	069749	068349
Arhgap22	063506	140711	154670	Gsap	039934	036031	043679	Rab31	056515	070673	068195
Arhgap22	063506	140166	N/A	Gsap	039934	197404	N/A	Rab3a	031840	110093	105720
Arhgap22	063506	132659	N/A	Gsap	039934	198071	142407	Rab3a	031840	143118	123384
Arhgap23	049807	121799	112999	Gsap	039934	195969	142560	Rab3a	031840	034301	034301
Arhgap23	049807	152933	N/A	Gsap	039934	198937	142986	Rab3a	031840	110090	105717
Arhgap23	049807	142465	123191	Gsap	039934	196035	N/A	Rab3a	031840	110092	105719
Arhgap23	049807	093940	091472	Gsap	039934	198930	142596	Rab3a	031840	130468	N/A
Arhgap23	049807	107601	103227	Gsap	039934	199553	N/A	Rab3a	111277	217185	150125
Arhgap24	057315	094559	092138	Gsn	026879	201185	144561	Rab3b	003411	106650	102261
Arhgap24	057315	126125	N/A	Gsn	026879	202990	144296	Rab3b	003411	106651	102262

Arhgap24	057315	112854	108475	Gsn	026879	202899	144470	Rab3b	003411	003502	003502
Arhgap24	057315	112853	108474	Gsn	026879	142324	118120	Rab3b	003411	157062	N/A
Arhgap24	057315	112852	108473	Gsn	026879	139867	144217	Rab3c	021700	167824	132945
Arhgap24	057315	130222	N/A	Gsn	026879	028239	028239	Rab3c	021700	223922	153347
Arhgap24	057315	070000	070048	Gsn	026879	124323	N/A	Rab3c	021700	224180	153136
Arhgap24	057315	073302	073028	Gstm1	058135	004140	004140	Rab3c	021700	224287	N/A
Arhgap25	030047	145128	N/A	Gstm1	058135	198532	N/A	Rab3c	021700	226040	N/A
Arhgap25	030047	113637	109267	Gstm1	058135	153314	123481	Rai2	043518	112338	107957
Arhgap25	030047	101197	098758	Gstm1	058135	126593	118874	Rai2	043518	061514	051618
Arhgap25	030047	071024	068964	Gsx1	053129	065382	069728	Ralgps2	026594	172057	132533
Arhgap25	030047	203559	N/A	Gtf2a1l	024154	024970	024970	Ralgps2	026594	027886	027886
Arhgef10l	040964	069623	066249	Gtf2a1l	024154	161481	124286	Ralgps2	026594	192343	142004
Arhgef10l	040964	097820	095431	Gucy1a3	033910	193924	142138	Ralgps2	026594	171292	130581
Arhgef10l	040964	105799	101425	Gucy1a3	033910	048976	048918	Ralgps2	026594	063199	063872
Arhgef10l	040964	105798	101424	Gucy1a3	033910	192289	141478	Ralgps2	026594	191605	139645
Arhgef10l	040964	105797	101423	Gucy1a3	033910	191942	N/A	Ralgps2	026594	189208	N/A
Arhgef10l	040964	138493	119471	Gucy1a3	033910	194788	N/A	Ralgps2	026594	185198	139618
Arhgef10l	040964	039204	040531	N/A	N/A	N/A	N/A	Ralgps2	026594	189316	140230
Arhgef10l	040964	154979	122667	Hapln2	004894	160737	N/A	Ralgps2	026594	190648	140055
Arhgef10l	040964	147426	123642	Hapln2	004894	005014	005014	Ralgps2	026594	188656	140342
Arhgef10l	040964	140403	117038	Hapln2	004894	162352	N/A	Ralgps2	026594	191503	N/A
Arhgef10l	040964	125045	N/A	Hapln2	004894	160150	125271	Ralgps2	026594	185970	N/A
Arhgef10l	040964	143614	120437	Has2	022367	050544	062212	Ralgps2	026594	190762	139822
Arhgef2	028059	212392	N/A	Hcn1	021730	207599	N/A	Ralgps2	026594	189648	140108
Arhgef2	028059	176226	N/A	Hcn1	021730	006991	006991	Raly1	039717	191806	148406
Arhgef2	028059	175749	N/A	Hcn2	020331	099513	097113	Raly1	039717	193117	148795
Arhgef2	028059	175903	135168	Hcn2	020331	020581	020581	Raly1	039717	211860	148430
Arhgef2	028059	176514	N/A	Hdac8	067567	087916	085226	Raly1	039717	192209	142094
Arhgef2	028059	177023	134859	Hdac8	067567	154872	138805	Raly1	039717	171075	125848
Arhgef2	028059	176539	135612	Hdac8	067567	148481	N/A	Raly1	039717	108372	104009
Arhgef2	028059	177498	134840	Hdac8	067567	137785	N/A	Raly1	039717	108373	148751
Arhgef2	028059	176500	134834	Hdac8	067567	154024	N/A	Ramp2	001240	129680	122072
Arhgef2	028059	175779	135177	Hebp1	042770	045855	042232	Ramp2	001240	149006	N/A
Arhgef2	028059	029694	029694	Hebp1	042770	204000	N/A	Ramp2	001240	128260	127718
Arhgef2	028059	176804	135397	Hebp1	042770	204730	N/A	Ramp2	001240	122006	114061
Arhgef2	028059	177418	N/A	Hebp1	042770	205232	N/A	Ramp2	001240	149585	116331
Arhgef2	028059	107510	103134	Heg1	075254	152832	N/A	Ramp2	001240	151830	123150
Arhgef2	028059	170653	127843	Heg1	075254	152782	123686	Ramp2	001240	138229	N/A
Arhgef2	028059	176401	N/A	Heg1	075254	132797	N/A	Ramp2	001240	107282	102903
Arhgef2	028059	176400	N/A	Heg1	075254	128105	N/A	Rapgef3	022469	126854	116426
Arhgef2	028059	177303	135131	Heg1	075254	146518	N/A	Rapgef3	022469	129223	118148
Arhgef2	028059	176307	134843	Heg1	075254	126532	119790	Rapgef3	022469	128775	120126
Arhgef2	028059	175911	135428	Heg1	075254	154863	N/A	Rapgef3	022469	177352	135238
Arhgef2	028059	176243	135771	Hepacam	046240	051839	054105	Rapgef3	022469	134885	135317
Arhgef2	028059	176316	135808	Hepacam	046240	215951	150856	Rapgef3	022469	175894	135194
Arhgef2	028059	177120	N/A	Hes3	028946	094438	092006	Rapgef3	022469	125002	N/A
Arhgef2	028059	176879	134766	Hes3	028946	218045	151815	Rapgef3	022469	123397	N/A
Arhgef2	028059	175745	135044	Hhatl	032523	035110	035110	Rapgef3	022469	155810	N/A
Arhgef2	028059	176528	N/A	Hhatl	032523	163981	131971	Rapgef3	022469	146214	N/A
Arhgef2	028059	176079	N/A	Hhatl	032523	214768	149486	Rapgef3	022469	134371	122746
Arhgef2	028059	176123	N/A	Hhatl	032523	215910	149350	Rapgef3	022469	153241	N/A
Arhgef2	028059	177091	N/A	Hhatl	032523	215477	150866	Rapgef3	022469	149419	122285
Arhgef2	028059	176301	N/A	Hhatl	032523	217652	150721	Rapgef3	022469	153464	N/A
Arhgef2	028059	177099	N/A	Hif3a	004328	108492	104132	Rapgef3	022469	146620	116673
Arhgef2	028059	176272	N/A	Hif3a	004328	037762	048248	Rapgef3	022469	142196	N/A
Arhgef26	036885	079300	078281	Hif3a	004328	139224	146258	Rapgef3	022469	135080	117337
Arhgef26	036885	163008	N/A	Hif3a	004328	153833	117728	Rapgef4	049044	090826	088336
Arhgef26	036885	161493	N/A	Hip1	039959	060311	059033	Rapgef4	049044	150234	N/A
Arhgef26	036885	159746	N/A	Hip1	039959	202643	144086	Rapgef4	049044	102698	099759

Arhgef26	036885	161057	124392	Hip1	039959	201479	N/A	Rapgef4	049044	151236	N/A
Arhgef26	036885	192138	N/A	Hip1	039959	200808	144429	Rapgef4	049044	028525	028525
Arhgef28	021662	109426	105053	Hip1	039959	200898	N/A	Rapgef4	049044	153887	N/A
Arhgef28	021662	225884	153423	Hip1	039959	212301	148842	Rapgef4	049044	149421	N/A
Arhgef28	021662	225663	N/A	Hip1	039959	202236	N/A	Rapgef4	049044	124004	N/A
Arhgef28	021662	225269	N/A	Hip1	039959	201998	144392	Rapgef4	049044	122975	N/A
Arhgef28	021662	223849	153000	Hip1	039959	202095	N/A	Rapgef4	049044	156031	N/A
Arhgef28	021662	224926	N/A	Hip1	039959	202044	N/A	Rapgef4	049044	146970	N/A
Arhgef28	021662	224866	153114	Hip1r	000915	000939	000939	Ratb	017491	063750	067694
Arhgef33	054901	223878	153224	Hip1r	000915	167879	127361	Ratb	017491	225921	152980
Arhgef33	054901	224391	153551	Hip1r	000915	166258	130766	Ratb	017491	223576	153098
Arhgef33	054901	225018	N/A	Hip1r	000915	171407	N/A	Ratb	017491	225594	153178
Arhgef33	054901	224631	N/A	Hip1r	000915	198664	143309	Ratb	017491	223976	153519
Arhgef33	054901	224676	N/A	Hip1r	000915	167325	N/A	Ratb	017491	225356	N/A
Arhgef33	054901	224002	N/A	Hip1r	000915	166684	N/A	Ratb	017491	225245	153454
Arhgef33	054901	225658	153062	Hk2	000628	000642	000642	Rasal2	070565	078308	077423
Arhgef33	054901	224966	153018	Hk2	000628	168725	N/A	Rasal2	070565	132699	114964
Arhgef33	054901	225223	153484	Hk2	000628	170833	125986	Rasal2	070565	129880	118367
Arhgef33	054901	225548	153111	Hk2	000628	169270	128572	Rasal2	070565	134543	119623
Arhgef33	054901	226013	N/A	Hmgcll1	007908	008052	008052	Rasal2	070565	128538	N/A
Arhgef33	054901	068175	063284	Hmgcll1	007908	183425	139094	Rasal2	070565	143358	116974
Arhgef37	045094	171629	130560	Hmgcll1	007908	183979	138914	Rasal2	070565	143080	N/A
Arhgef4	037509	159747	124213	Hmgcll1	007908	121592	N/A	Rasgef1b	089809	031276	031276
Arhgef4	037509	162599	124906	Hmgcll1	007908	183505	N/A	Rasgef1b	089809	168092	129652
Arhgef4	037509	159021	124467	Hmgcll1	007908	126321	N/A	Rasgef1b	089809	209346	147997
Arhgef4	037509	047664	035980	Hmgcll1	007908	117981	114045	Rasgef1b	089809	166484	128947
Arhgef4	037509	162760	N/A	Hmgn1	040681	050884	061012	Rasgef1b	089809	166632	N/A
Arhgef4	037509	159059	N/A	Hmgn1	040681	145713	N/A	Rasgef1b	089809	146396	125723
Arhgef4	037509	160855	124207	Hmgn1	040681	133885	122427	Rasgef1b	089809	161516	125057
Arhgef4	037509	211073	148067	Hmgn1	040681	142179	N/A	Rasgef1b	089809	142639	N/A
Arl4a	047446	101472	099013	Homer3	003573	087467	084735	Rasgef1b	089809	160803	N/A
Arl4a	047446	136441	122987	Homer3	003573	140212	117033	Rasgef1b	089809	161148	125009
Arl4a	047446	144910	122126	Homer3	003573	155711	N/A	Rasgrf1	032356	189545	140921
Arl4a	047446	138572	N/A	Homer3	003573	003669	003669	Rasgrf1	032356	034909	034909
Arl4a	047446	146905	114458	Homer3	003573	143528	N/A	Rasgrf1	032356	034912	034912
Amt2	015709	085077	082154	Homer3	003573	135692	N/A	Rasgrf1	032356	190073	N/A
Amt2	015709	209133	147129	Homer3	003573	135368	137560	Rasgrp1	027347	102534	099593
Amt2	015709	208232	146413	Homer3	003573	110124	105751	Rasgrp1	027347	174770	134167
Amt2	015709	208564	146989	Hpcal4	046093	059667	051487	Rasgrp1	027347	173541	134027
Amt2	015709	207459	N/A	Hpcal4	046093	106246	101853	Rasgrp1	027347	172901	133449
Amt2	015709	208129	146614	Hpcal4	046093	126995	122104	Rasgrp1	027347	173252	134592
Amt2	015709	208936	N/A	Hpcal4	046093	136619	N/A	Rasgrp1	027347	110898	N/A
Amt2	015709	207759	N/A	Hpcal4	046093	152194	120066	Rasgrp1	027347	178884	136423
Amt2	015709	208204	146781	Hpse2	074852	099428	097026	Rassf2	027339	028814	028814
Amt2	015709	208995	146599	Hrh2	034987	038101	038170	Rassf2	027339	103182	099471
Amt2	015709	207769	146414	Hrh2	034987	209846	148117	Rassf2	027339	155829	N/A
Amt2	015709	208392	146776	Hrh2	034987	211742	147413	Rassf2	027339	139047	120194
Amt2	015709	208863	146868	Hs3st1	051022	117944	113919	Rassf2	027339	140791	117619
Anb1	018909	098266	095866	Hs3st1	051022	053116	051055	Rbks	029136	201744	N/A
Anb1	018909	032995	032995	Hs3st1	051022	137142	114997	Rbks	029136	031018	031018
Anb1	018909	162404	124351	Hs3st1	051022	152057	118060	Rbks	029136	202036	N/A
Anb1	018909	161525	124483	Hs3st2	046321	206880	146027	Rbm24	038132	037923	043120
Anb1	018909	161268	N/A	Hs3st2	046321	084628	081678	Rbm24	038132	225221	N/A
Anb1	018909	162043	N/A	Hs3st4	078591	106437	102045	Rbm24	038132	225727	N/A
Anb1	018909	159642	N/A	Hs6st2	062184	088172	085497	Rbm24	038132	224638	N/A
Anb1	018909	162933	N/A	Hs6st2	062184	114871	110521	Rbm24	038132	225890	N/A
Anb1	018909	162290	125056	Hs6st2	062184	142738	N/A	Rbm25	010608	181983	138572
Anb1	018909	179755	136963	Hs6st2	062184	140145	N/A	Rbm25	010608	182004	138573
Amdc3	074794	159090	N/A	Hs6st2	062184	142983	N/A	Rbm25	010608	048155	048470

Arrdc3	074794	159690	124418	Hsd17b11	029311	031251	031251	Rbm25	010608	182618	138665
Arrdc3	074794	099356	096957	Hsd17b11	029311	119025	113455	Rbm25	010608	183154	138669
Arrdc3	074794	161441	125455	Hspa1b	090877	172753	133815	Rbm25	010608	182036	138565
Arrdc3	074794	159856	N/A	Htr1b	049511	183482	139389	Rbm25	010608	182347	138410
Arrdc3	074794	162904	N/A	Htr1b	049511	051005	050898	Rbm25	010608	182633	138625
Arsg	020604	106697	102308	Htr2a	034997	036653	047774	Rbm25	010608	182881	N/A
Arsg	020604	106696	102307	Htr2c	041380	149260	N/A	Rbm25	010608	183128	N/A
Arsg	020604	152252	N/A	Htr2c	041380	131999	N/A	Rbm25	010608	182450	138416
Arsg	020604	136336	N/A	Htr2c	041380	036303	043936	Rbm25	010608	182255	N/A
Arsg	020604	020928	020928	Htr2c	041380	096299	094021	Rbm25	010608	183039	N/A
Arx	035277	187010	N/A	Htr2c	041380	156697	138772	Rbm25	010608	182032	N/A
Arx	035277	046565	049039	Htr2c	041380	134368	N/A	Rbm25	010608	183242	N/A
Arx	035277	113947	109580	Htr2c	041380	112831	108450	Rbm25	010608	183282	N/A
Asap3	036995	047526	041899	Htra1	006205	150717	N/A	Rbm25	010608	182840	N/A
Ascl1	020052	020243	020243	Htra1	006205	006367	006367	Rbm25	010608	183181	N/A
Asgr1	020884	146411	121842	Htra1	006205	153290	N/A	Rbms3	039607	111773	107403
Asgr1	020884	108585	104226	Htra1	006205	140741	N/A	Rbms3	039607	068962	066735
Asgr1	020884	018699	018699	Htra1	006205	150905	N/A	Rbms3	039607	173429	133900
Asgr1	020884	092959	090637	Hunk	053414	065856	068007	Rbms3	039607	174868	133621
Asgr1	020884	123369	137469	Icam5	032174	019616	019616	Rbms3	039607	164018	131371
Asic1	023017	023758	023758	Icosl	000732	105393	101032	Rbms3	039607	111772	107402
Asic1	023017	226291	N/A	Icosl	000732	217675	N/A	Rbms3	039607	044901	039706
Asic1	023017	228012	N/A	Icosl	000732	219038	151346	Rbms3	039607	172469	134172
Asic1	023017	228185	154379	Icosl	000732	219633	N/A	Rbms3	039607	069095	N/A
Asic1	023017	228610	N/A	Id4	021379	021810	021810	Rbms3	039607	172564	134528
Asic1	023017	227670	N/A	Ift43	007867	221194	N/A	Rbms3	039607	174276	N/A
Asic2	020704	021045	021045	Ift43	007867	054565	061891	Rbms3	039607	084824	N/A
Asic2	020704	066197	067095	Ift43	007867	222821	152079	Rbp2	032454	189446	140676
Asns	029752	115542	111204	Ift43	007867	222905	152281	Rbp2	032454	187905	140630
Asns	029752	031766	031766	Ift43	007867	223269	N/A	Rbp2	032454	188779	N/A
Asns	029752	140097	N/A	Ift43	007867	221161	N/A	Rbp2	032454	035029	035029
Asns	029752	133972	N/A	Ift43	007867	220711	N/A	Rbpjl	017007	137427	N/A
Asns	029752	126303	115415	Igdcc3	032394	034961	034961	Rbpjl	017007	017151	017151
Asns	029752	139596	120489	Igdcc3	032394	217371	149084	Rbpjl	017007	109356	N/A
Asns	029752	148349	118003	Igdcc3	032394	217135	N/A	Rbpms2	032387	169003	131076
Aspa	020774	021119	021119	Igdcc4	032816	213533	150272	Rbpms2	032387	055844	057600
Aspa	020774	184572	139318	Igdcc4	032816	035499	045387	Rbpms2	032387	213927	N/A
Aspa	020774	155630	139131	Igdcc4	032816	216542	N/A	Rbpms2	032387	216342	149535
Aspa	020774	132774	N/A	Igdcc4	032816	213423	N/A	Rbpms2	032387	216382	151192
Aspa	020774	134079	121135	Igdcc4	032816	214978	N/A	Rbpms2	032387	216769	N/A
Aspa	020774	141898	118109	Igdcc4	032816	077696	076878	Rcn1	005973	006128	006128
Astn2	028373	068214	065786	Igdcc4	032816	166273	132576	Rcn1	005973	127019	N/A
Astn2	028373	084496	081540	Igfbp3	020427	020702	020702	Rcn2	032320	147842	120953
Atl2	059811	068282	064758	Igfbp3	020427	135887	131670	Rcn2	032320	114276	109915
Atl2	059811	223273	N/A	Igfbp5	026185	027377	027377	Rcn2	032320	151585	N/A
Atl2	059811	221286	N/A	Igfbp5	026185	137339	N/A	Rcn2	032320	144869	N/A
Atl2	059811	222193	152340	Igsf11	022790	210186	N/A	Reck	028476	030198	030198
Atl2	059811	222415	152866	Igsf11	022790	114706	110354	Reck	028476	128463	N/A
Atl2	059811	221666	N/A	Igsf11	022790	209958	N/A	Reck	028476	130415	N/A
Atl2	059811	222243	N/A	Igsf11	022790	023478	023478	Reln	042453	161356	124052
Atl2	059811	112437	108056	Igsf11	022790	210471	N/A	Reln	042453	160791	N/A
Atl3	024759	170373	132619	Igsf3	042035	198995	N/A	Reln	042453	062372	058025
Atl3	024759	025668	025668	Igsf3	042035	043983	048900	Reln	042453	200318	N/A
Atp13a4	038094	182573	138700	Igsf3	042035	195164	141823	Reln	042453	200667	N/A
Atp13a4	038094	182627	138479	Il15	031712	209363	147848	Reln	042453	199034	N/A
Atp13a4	038094	057018	060987	Il15	031712	209573	148256	Reln	042453	159768	N/A
Atp13a4	038094	182676	N/A	Il15	031712	034148	034148	Reln	042453	161353	N/A
Atp13a4	038094	182013	138583	Il15	031712	211565	147319	Reln	042453	162427	N/A
Atp13a4	038094	182094	N/A	Il15	031712	209687	N/A	Reln	042453	159741	N/A

Atp13a4	038094	182357	N/A	Il15	031712	211722	N/A	Reln	042453	162876	124077
Atp13a4	038094	182168	138515	Il15	031712	210094	147312	Reln	042453	162637	N/A
Atp13a4	038094	039090	048753	Il15	031712	211282	N/A	Reln	042453	162622	N/A
Atp13a4	038094	182824	N/A	Il15	031712	210885	N/A	Reln	042453	160707	N/A
Atp13a4	038094	182694	N/A	Il15	031712	210472	N/A	Reln	042453	161782	N/A
Atp1a1	033161	036493	039657	Il16	001741	001792	001792	Rep15	040121	036194	037503
Atp1a1	033161	130649	N/A	Il16	001741	145610	146496	Rerg	030222	032347	032347
Atp1a1	033161	136340	N/A	Il16	001741	151047	N/A	Rerg	030222	117919	113105
Atp1a2	007097	085913	083077	Il16	001741	153560	118516	Rerg	030222	119610	113702
Atp1a2	007097	131751	N/A	Il16	001741	131916	122022	Rerg	030222	203003	144823
Atp1a2	007097	191781	N/A	Il16	001741	156553	122813	Rerg	030222	149100	144902
Atp1a2	007097	097464	095072	Il18	039217	213916	150305	Ret	030110	032201	032201
Atp1a2	007097	137679	N/A	Il18	039217	214117	151002	Ret	030110	088790	086169
Atp1a3	040907	102858	099922	Il18	039217	180021	137193	Rftn1	039316	044503	046524
Atp1a3	040907	080882	079691	Il18	039217	059081	054591	Rftn1	039316	113195	108820
Atp1a3	040907	196684	143735	Il20rb	044244	098458	096057	Rftn1	039316	156094	N/A
Atp1a3	040907	146595	N/A	Il20rb	044244	136606	N/A	Rfx4	020037	060397	051107
Atp1a3	040907	125444	N/A	Il20rb	044244	136856	N/A	Rfx4	020037	173479	N/A
Atp1b1	026576	027863	027863	Il20rb	044244	125259	N/A	Rfx4	020037	165868	N/A
Atp1b1	026576	193980	N/A	Il20rb	044244	152756	N/A	Rfx4	020037	166696	128690
Atp1b1	026576	193367	141777	Il20rb	044244	122880	N/A	Rfx4	020037	020226	N/A
Atp1b1	026576	192522	N/A	Il22	074695	096691	094449	Rfx4	020037	095388	093035
Atp1b2	041329	047889	047353	Il33	024810	120388	113829	Rgcc	022018	022595	022595
Atp1b2	041329	130394	N/A	Il33	024810	144528	122319	Rgma	070509	119206	112599
Atp1b2	041329	138694	116290	Il33	024810	177518	135854	Rgma	070509	094312	091870
Atp1b2	041329	144425	N/A	Il33	024810	025724	025724	Rgma	070509	128471	116552
Atp1b2	041329	153198	N/A	Il33	024810	136850	135324	Rgma	070509	139780	145758
Atp2a3	020788	108486	104126	Iltifb	090461	163808	128415	Rgma	070509	206253	N/A
Atp2a3	020788	108484	104124	Iltifb	090461	179123	N/A	Rgs6	021219	201602	144044
Atp2a3	020788	149493	N/A	5730559C18Rik	041605	120339	113785	Rgs6	021219	186848	141044
Atp2a3	020788	135234	N/A	5730559C18Rik	041605	150163	118074	Rgs6	021219	161801	125256
Atp2a3	020788	163326	127036	5730559C18Rik	041605	144464	115554	Rgs6	021219	185665	139566
Atp2a3	020788	108485	104125	5730559C18Rik	041605	194374	N/A	Rgs6	021219	200911	143801
Atp2a3	020788	021142	021142	5730559C18Rik	041605	153910	120263	Rgs6	021219	202210	143961
Atp2b2	030302	101045	098606	5730559C18Rik	041605	195177	141506	Rgs6	021219	186458	139735
Atp2b2	030302	089003	086398	Inhba	041324	164993	132085	Rgs6	021219	186081	140188
Atp2b2	030302	152831	138165	Inhba	041324	042603	047894	Rgs6	021219	201271	144139
Atp2b2	030302	205052	145174	Inpp1	026102	027271	027271	Rgs6	021219	200861	144118
Atp2b2	030302	101044	098605	Inpp1	026102	177279	135225	Rgs6	021219	186309	140701
Atp2b2	030302	135199	N/A	Inpp1	026102	159607	N/A	Rgs6	021219	201861	144395
Atp2b2	030302	144507	N/A	Inpp1	026102	162576	124890	Rgs6	021219	193448	N/A
Atp2b2	030302	154738	N/A	Inpp1	026102	162351	N/A	Rgs6	021219	191311	140723
Atp2b3	031376	033744	033744	Inpp1	026102	159725	123977	Rgs6	021219	191352	139718
Atp2b3	031376	088429	085775	Inpp4b	037940	172167	N/A	Rgs6	021219	191107	139725
Atp2b3	031376	114479	110123	Inpp4b	037940	213285	150520	Rgs6	021219	186323	141079
Atp8a1	037685	135930	118379	Inpp4b	037940	217122	150541	Rgs6	021219	185674	139940
Atp8a1	037685	037380	042215	Inpp4b	037940	169387	130104	Rgs6	021219	190964	N/A
Atp8a1	037685	072971	072738	Inpp4b	037940	215332	148972	Rgs6	021219	201767	143829
Atp8a1	037685	200955	144465	Inpp4b	037940	042529	044466	Rgs6	021219	201512	N/A
Atp8a1	037685	149501	N/A	Inpp4b	037940	169116	131947	Rgs6	021219	101234	098793
Atp8a1	037685	155911	N/A	Inpp4b	037940	109852	105478	Rgs7bp	021719	063551	066614
Atp8a1	037685	152433	N/A	Inpp4b	037940	172031	131324	Rgs9	020599	020920	020920
Atp8a1	037685	130652	N/A	Inpp4b	037940	164870	N/A	Rgs9	020599	103062	099351
Atp8a1	037685	113652	109282	Inpp4b	037940	216036	N/A	Rgs9	020599	106706	102317

Atp8a1	037685	113651	109281	Inpp4b	037940	170160	132156	Rgs9	020599	156785	N/A
Atp8a1	037685	143013	N/A	Inpp4b	037940	216387	N/A	Rgs9	020599	106704	102315
Atp8a1	037685	202248	N/A	Inpp4b	037940	109851	105477	Rhpn2	030494	032705	032705
Atp8a1	037685	128726	N/A	Inpp4b	037940	165821	N/A	Rhpn2	030494	155140	N/A
Atp8a1	037685	141443	121630	Inpp5a	025477	106098	101704	Rhpn2	030494	187997	N/A
Atp8b1	039529	025482	025482	Inpp5a	025477	026550	026550	Rhpn2	030494	085556	082692
Atml1	054843	077282	076514	Inpp5a	025477	097975	095589	Rimbp2	029420	199537	143276
Atxn1	046876	091628	089217	Inpp5a	025477	138183	N/A	Rimbp2	029420	198941	142455
Atxn1	046876	167708	129890	Inpp5a	025477	131781	N/A	Rimbp2	029420	196085	143725
Atxn1	046876	180110	137439	Inpp5a	025477	210320	N/A	Rimbp2	029420	200470	143099
Atxn1	046876	221082	N/A	Inpp5a	025477	152475	N/A	Rimbp2	029420	199737	142712
Atxn1	046876	222943	N/A	Insc	048782	161800	125061	Rimbp2	029420	196569	N/A
Atxn1	046876	222610	N/A	Insc	048782	136645	119459	Rimbp2	029420	111346	106978
Axl	002602	002677	002677	Insc	048782	139670	N/A	Rims1	041670	185942	140963
Axl	002602	085948	083110	Insc	048782	117543	112682	Rims1	041670	097808	095417
Axl	002602	124442	N/A	Insc	048782	151464	117296	Rims1	041670	081544	080259
Axl	002602	137211	N/A	Insc	048782	136347	N/A	Rims1	041670	115273	110928
Axl	002602	132989	N/A	Insc	048782	150991	N/A	Rims1	041670	218140	151404
Axl	002602	132038	114907	Insc	048782	206274	145636	Rims1	041670	097811	095420
Axl	002602	147680	N/A	Insc	048782	169913	129505	Rims1	041670	097810	095419
Axl	002602	137383	N/A	Ipcef1	064065	086896	084110	Rims1	041670	097809	095418
B230209E15Rik	109006	209115	N/A	Ipcef1	064065	145156	114267	Rims1	041670	164877	131808
B230209E15Rik	109006	211785	N/A	Ipcef1	064065	151960	118510	Rims3	032890	132895	N/A
B3gat2	026156	144602	115870	Ipcef1	064065	149708	N/A	Rims3	032890	071093	068178
B3gat2	026156	063663	066582	Ipcef1	064065	144622	N/A	Rims3	032890	106283	101890
B3gat2	026156	140583	117089	Ipcef1	064065	105617	101242	Rims3	032890	171363	130295
B3glct	051950	100404	097972	Ipcef1	064065	154998	N/A	Rims4	035226	044734	045637
B3glct	051950	202302	N/A	Ipcef1	064065	078070	077215	Rin2	001768	147976	124206
B3glct	051950	201088	N/A	Ipcef1	064065	170680	128131	Rin2	001768	110005	105632
B3gnt5	022686	121344	112624	Iqch	037801	042322	047953	Rin2	001768	142847	125476
B3gnt5	022686	079780	078712	Iqch	037801	163982	126546	Rin2	001768	150449	124078
B3gnt5	022686	152845	N/A	Iqch	037801	163624	128482	Rin2	001768	145874	N/A
B3gnt5	022686	131557	N/A	Iqch	037801	080527	079370	Rin2	001768	149269	N/A
B3gnt5	022686	155780	N/A	Iqch	037801	171243	131828	Rin2	001768	144278	N/A
B3gnt5	022686	119468	113145	Iqch	037801	170960	N/A	Rin2	001768	094480	092053
B3gnt5	022686	164397	126157	Iqgap1	030536	167377	128278	Rit2	057455	153060	114323
B3gnt7	079445	189618	N/A	Iqgap1	030536	205606	145991	Rit2	057455	139924	122938
B3gnt7	079445	113306	108931	Iqgap1	030536	205383	N/A	Rit2	057455	082070	080724
B3gnt7	079445	188695	140392	Iqgap1	030536	206149	N/A	Rit2	057455	153196	N/A
B4galt6	056124	070080	066515	Iqgap1	030536	205824	N/A	Ribp1	039194	179243	137143
Bach2	040270	108180	103815	Iqgap1	030536	205813	145556	Ribp1	039194	053718	054545
Bach2	040270	037416	043693	Iqgap1	030536	205304	146126	Ribp1	039194	206624	N/A
Bach2	040270	149201	N/A	Iqgap1	030536	205540	N/A	Ribp1	039194	206162	146196
Bach2	040270	156430	N/A	Iqsec1	034312	101153	098712	Ribp1	039194	206320	145611
Bach2	040270	146748	N/A	Iqsec1	034312	204983	N/A	Ribp1	039194	205442	145850
Bach2	040270	125263	N/A	Iqsec1	034312	212100	148669	Ribp1	039194	205638	146144
Bach2	040270	171600	131592	Iqsec1	034312	154198	N/A	Ribp1	039194	206695	146075
Baiap2	025372	026436	026436	Iqsec1	034312	141434	N/A	Rnf112	010086	060255	059903
Baiap2	025372	106231	101838	Iqsec1	034312	205068	N/A	Rnf112	010086	054927	056464
Baiap2	025372	075180	074674	Iqsec1	034312	156834	118802	Rnf112	010086	102661	099722
Baiap2	025372	103021	099310	Iqsec1	034312	133492	N/A	Rnf112	010086	152137	N/A
Baiap2	025372	106233	101840	Iqsec1	034312	146977	N/A	Rnf112	010086	126859	N/A
Baiap2	025372	146566	N/A	Iqsec1	034312	101151	098710	Rnf112	010086	136966	N/A
Baiap2	025372	146960	N/A	Irak2	060477	059286	055073	Rnf112	010086	130648	N/A
Baiap2	025372	152523	N/A	Irak2	060477	089023	086417	Rnf207	058498	076183	075540
Baiap2	025372	131580	N/A	Irak2	060477	204091	N/A	Rnf207	058498	108688	N/A
Barhl2	034384	086795	084005	Irak2	060477	089022	086416	Rnf207	058498	170820	129400
Basp1	045763	058845	053943	Irak2	060477	204744	144848	Rnf207	058498	135837	N/A
Basp1	045763	228597	154675	Irak2	060477	155554	N/A	Rnf207	058498	127565	N/A

Bbs2	031755	034206	034206	Irak2	060477	113024	N/A	Rnf207	058498	142427	N/A
Bbs2	031755	170208	N/A	Irak2	060477	203381	N/A	Rnf207	058498	130008	127196
Bbs2	031755	172347	N/A	Irak2	060477	143948	N/A	Rnf207	058498	143968	N/A
BC052040	040282	110918	106543	Irx1	060969	077337	076562	Rnf207	058498	134269	N/A
BC052040	040282	147968	N/A	Irx1	060969	223379	152247	Rnf207	058498	145311	N/A
BC052040	040282	166472	126772	Irx1	060969	223460	152128	Rnf207	058498	123133	N/A
Bcar1	031955	166232	129584	Irx2	001504	074372	073976	Rnf207	058498	146496	N/A
Bcar1	031955	212349	148364	Irx2	001504	169028	N/A	Rnf217	063760	081989	080650
Bcar1	031955	212147	N/A	Irx2	001504	167067	127963	Rnf220	028677	030439	030439
Bche	027792	029367	029367	Irx2	001504	163393	N/A	Rnf220	028677	102690	099751
Bche	027792	133690	N/A	Irx2	001504	172353	126691	Rnf220	028677	221654	152367
Bche	027792	138216	141329	Irx5	031737	210246	147339	Rnf220	028677	094853	092449
Bche	027792	153917	N/A	Irx5	031737	034184	034184	Rnf220	028677	128122	N/A
Bcl11a	000861	118955	112948	Itga2	015533	056117	053891	Rnf220	028677	223371	N/A
Bcl11a	000861	127494	N/A	Itga2	015533	224204	153056	Rnf220	028677	221157	N/A
Bcl11a	000861	000881	000881	Itga9	039115	044165	044227	Rnf220	028677	151829	152638
Bcl11a	000861	124148	N/A	Itga9	039115	125021	N/A	Rnf220	028677	223182	N/A
Bcl11a	000861	109516	105142	Itga9	039115	124360	122417	Rnf220	028677	154974	N/A
Bcl11a	000861	109514	105140	Itga9	039115	149150	122408	Rnf220	028677	133971	N/A
Bcl11b	048251	066060	068258	Itga9	039115	124422	N/A	Rnf220	028677	150148	N/A
Bcl11b	048251	109887	105513	Itga9	039115	155437	N/A	Rnf220	028677	138435	N/A
Bcl11b	048251	109891	105517	Itgav	027087	028499	028499	Rnf220	028677	123222	N/A
Bcl11b	048251	066060	068258	Itgav	027087	125360	N/A	Rnf43	034177	134684	N/A
Bcl11b	048251	109887	105513	Itgav	027087	151463	N/A	Rnf43	034177	123658	N/A
Bcl11b	048251	109891	105517	Itgav	027087	148256	N/A	Rnf43	034177	092800	090476
Beanl	031872	164076	132056	Itgav	027087	111740	107369	Rnf43	034177	121782	112748
Beanl	031872	093245	090931	Itgav	027087	141725	122730	Rnf43	034177	040089	044241
Beanl	031872	212979	148571	Itgav	027087	155521	N/A	Rnf43	034177	162740	N/A
Beanl	031872	213077	148283	Itgav	027087	125402	118016	Rnf43	034177	124625	N/A
Beanl	031872	171018	129403	Itgav	027087	131192	121295	Rnf43	034177	150866	N/A
Beanl	031872	167633	131530	Itgb4	020758	021107	021107	Rnf43	034177	165679	130685
Bhlhe22	025128	026120	026120	Itgb4	020758	068981	070811	Robo2	052516	226478	154353
Bicd1	003452	203502	N/A	Itgb4	020758	106460	102068	Robo2	052516	117785	112776
Bicd1	003452	086829	084039	Itgb4	020758	106458	102066	Robo2	052516	117200	113795
Bicd1	003452	111513	107138	Itgb4	020758	151691	N/A	Robo2	052516	149114	N/A
Bicd1	003452	130270	N/A	Itgb4	020758	150129	N/A	Robo2	052516	137420	N/A
Bicd1	003452	003544	003544	Itgb4	020758	127523	N/A	Robo2	052516	116586	112285
Bicd1	003452	173408	133727	Itgb4	020758	130286	N/A	Robo2	052516	138852	N/A
Bicd1	003452	174886	N/A	Itgb4	020758	169928	127604	Robo2	052516	227347	154010
Bicd1	003452	172926	133986	Itgb4	020758	106461	102069	Robo2	052516	147408	N/A
Bicd1	003452	140759	N/A	Itgb8	025321	026360	026360	Robo2	052516	140062	N/A
Bicd2	037933	048544	039394	Itgb8	025321	137804	N/A	Robo2	052516	156010	N/A
Bicd2	037933	110084	105711	Itgb8	025321	151023	N/A	Robo3	032128	167089	N/A
Bicd2	037933	110085	105712	Itih3	006522	006697	006697	Robo3	032128	171467	N/A
Bicd2	037933	220723	152090	Itih3	006522	227181	N/A	Robo3	032128	034643	034643
Blm	030528	206901	146062	Itih3	006522	227995	154659	Robo3	032128	115038	110690
Blm	030528	081314	080062	Itih3	006522	226547	154256	Robo3	032128	170512	150639
Blm	030528	170315	127995	Itih3	006522	226179	N/A	Robo3	032128	167216	N/A
Blm	030528	206518	N/A	Itih3	006522	228114	154720	Rpa1	000751	092907	090585
Blm	030528	206948	N/A	Itpka	027296	028758	028758	Rpa1	000751	000767	000767
Blm	030528	206989	146098	Itpkb	038855	070181	069851	Rpa1	000751	149365	N/A
Blm	030528	205730	145573	Itpkb	038855	195043	N/A	Rpa1	000751	154894	N/A
Blm	030528	205263	N/A	Itpr1	030102	032192	032192	Rpa1	000751	135770	N/A
Blm	030528	205713	N/A	Itpr1	030102	203615	144880	Rph3a	029608	079204	078198
Blm	030528	205584	N/A	Itpr1	030102	203995	N/A	Rph3a	029608	202406	143917
Bmp2k	034663	112974	108598	Itpr1	030102	203936	145526	Rph3a	029608	202326	144291
Bmp2k	034663	035635	037970	Itpr1	030102	212125	148284	Rph3a	029608	200792	144437
Bnc2	028487	102820	099884	Itpr1	030102	205053	N/A	Rprm	075334	100089	097667
Bnc2	028487	107198	102816	Itpr1	030102	203262	145177	Rps6ka1	003644	105894	101514

Bnc2	028487	176612	135778	Itpr1	030102	203638	145522	Rps6ka1	003644	168974	126774
Bnc2	028487	176971	135607	Itpr1	030102	203687	145339	Rps6ka1	003644	003741	003741
Bnc2	028487	176691	135375	Itpr1	030102	205048	N/A	Rps6ka1	003644	157067	121341
Bnc2	028487	177277	135580	Itpr1	030102	203530	N/A	Rps6ka1	003644	174481	134507
Bnc2	028487	176702	134774	Itpr1	030102	203288	N/A	Rps6ka1	003644	137486	119328
Bnc2	028487	176998	135283	Itpr1	030102	205005	N/A	Rps6ka1	003644	173989	N/A
Bnc2	028487	176601	135480	Itpripl2	095115	178344	136409	Rps6ka1	003644	129636	N/A
Bnc2	028487	175800	134795	Jam2	053062	114195	109833	Rps6ka1	003644	173961	N/A
Bnc2	028487	176418	135569	Jam2	053062	098407	096007	Rpusd3	051169	113092	108715
Bnc2	028487	175757	N/A	Jam2	053062	138054	N/A	Rpusd3	051169	060634	059057
Bnc2	028487	176947	135411	Jam3	031990	034472	034472	Rpusd3	051169	203758	N/A
Bnc2	028487	175969	135656	Jam3	031990	215446	N/A	Rpusd3	051169	129047	120380
Bnc2	028487	176476	N/A	Jam3	031990	213170	N/A	Rpusd3	051169	147726	120250
Bnc2	028487	123276	N/A	Jam3	031990	167074	N/A	Rpusd3	051169	124078	N/A
Bnc2	028487	176346	134942	Jam3	031990	213682	N/A	Rpusd3	051169	151618	115950
Bnc2	028487	177256	N/A	Jazf1	063568	128282	N/A	Rpusd3	051169	134853	N/A
Bnc2	028487	175756	135499	Jazf1	063568	136250	N/A	Rpusd3	051169	129560	114511
Bnc2	028487	177040	135089	Jazf1	063568	074541	074129	Rpusd3	051169	150452	N/A
Bnc2	028487	176264	N/A	Jkamp	005078	117449	113744	Rspo2	051920	226810	154600
Bnc2	028487	176370	134953	Jkamp	005078	057257	061370	Rspo2	051920	063492	067325
Boc	022687	114634	110281	Jkamp	005078	125764	117251	Rspo2	051920	226402	N/A
Brinp2	004031	195271	141709	Jkamp	005078	132371	N/A	Rtn1	021087	150156	N/A
Brinp2	004031	004133	004133	Jkamp	005078	134041	N/A	Rtn1	021087	078505	077594
Brinp2	004031	194578	N/A	Jkamp	005078	152381	N/A	Rtn1	021087	137990	120033
Brinp2	004031	192709	N/A	Jkamp	005078	145752	N/A	Rtn1	021087	144181	N/A
Brinp3	035131	074622	074201	Jph1	042686	186024	140705	Rtn1	021087	221756	N/A
Brinp3	035131	132847	118552	Jph1	042686	038382	039072	Rtn1	021087	021497	021497
Brinp3	035131	128345	116763	Kank1	032702	049400	042177	Rtn1	021087	150156	N/A
Brinp3	035131	125331	N/A	Kank1	032702	146647	116660	Rtn1	021087	078505	077594
Brinp3	035131	166814	126074	Kank1	032702	137260	N/A	Rtn1	021087	137990	120033
Bsg	023175	179781	136487	Kank1	032702	155788	N/A	Rtn1	021087	144181	N/A
Bsg	023175	067036	070751	Kank4	035407	102790	099851	Rtn1	021087	221756	N/A
Bsg	023175	179201	N/A	Kank4	035407	137270	N/A	Rtn1	021087	021497	021497
Bsg	023175	178383	137126	Kcna1	047976	055168	055225	Rtn4r	043811	059589	062924
Bsg	023175	105381	101020	Kcna1	047976	203094	144947	Rtn4r	111113	213627	149817
Bsg	023175	180235	N/A	Kcna1	047976	205171	N/A	Rtn4rl1	045287	102514	099572
Bsn	032589	035208	035208	Kcna2	040724	197470	143798	Rtn4rl2	050896	151799	118362
Bsn	032589	124763	139053	Kcna2	040724	038695	041702	Rtn4rl2	050896	151759	N/A
Btbd1	025103	026093	026093	Kcna2	040724	196403	142873	Rtn4rl2	050896	054514	057725
Btbd1	025103	208114	N/A	Kcnab2	028931	159840	124156	Rubcnl	034959	036072	045566
Btbd1	025103	208178	N/A	Kcnab2	028931	160884	125058	Rubcnl	034959	228689	N/A
Btbd1	025103	208566	N/A	Kcnab2	028931	030768	030768	Rxfp1	034009	078527	077611
Btbd11	020042	105307	100944	Kcnab2	028931	159186	124588	Rxfp1	034009	182491	138578
Btbd11	020042	020231	020231	Kcnab2	028931	105648	101273	Rxfp1	034009	183199	N/A
Btbd11	020042	105306	100943	Kcnab2	028931	159844	N/A	Rxfp1	034009	183040	N/A
Btbd11	020042	135235	N/A	Kcnab2	028931	161496	N/A	Ryr1	030592	214374	149042
Btbd11	020042	145323	N/A	Kcnab2	028931	161236	125270	Ryr1	030592	179893	137123
Btbd11	020042	128338	N/A	Kcnab2	028931	159435	N/A	Ryr1	030592	208318	N/A
Btbd11	020042	156123	N/A	Kcnab2	028931	162200	N/A	Ryr1	030592	208010	N/A
Btbd11	020042	145433	N/A	Kcnab2	028931	162165	N/A	Ryr1	030592	207764	N/A
Btbd17	000202	156053	N/A	Kcnab2	028931	161844	N/A	Ryr1	030592	207783	N/A
Btbd17	000202	000206	000206	Kcnab2	028931	162518	N/A	Ryr1	030592	208922	N/A
Btbd17	000202	156192	N/A	Kcnab2	028931	162017	123939	Ryr1	030592	032813	032813
Btbd17	000202	141481	N/A	Kcnab3	018470	018614	018614	Ryr2	021313	021750	021750
Btbd17	000202	146853	N/A	Kcnab3	018470	142328	N/A	Ryr2	021313	222113	N/A
Btbd17	000202	141386	N/A	Kcnab3	018470	134561	N/A	Ryr2	021313	222788	N/A
Btbd17	000202	137965	N/A	Kcnc1	058975	025202	025202	Ryr2	021313	221527	152510
2410131K14Rik	032840	049138	043410	Kcnc1	058975	160433	124938	Ryr2	021313	221916	N/A
3632451O06Rik	036242	036972	036220	Kcnc1	058975	160234	N/A	Ryr2	021313	220712	152669

3632451O06Rik	036242	118129	113609	Kcnc2	035681	219301	151579	Ryr2	021313	221941	N/A
3632451O06Rik	036242	177321	N/A	Kcnc2	035681	092175	089814	Ryr2	021313	221890	N/A
1700025G04Rik	032666	187603	140950	Kcnc2	035681	218445	151560	Ryr2	021313	221609	N/A
1700025G04Rik	032666	044581	036406	Kcnc2	035681	219607	151870	Ryr2	021313	222386	N/A
1700025G04Rik	032666	128433	N/A	Kcnc2	035681	218827	151995	Ryr2	021313	220597	152051
1700025G04Rik	032666	121533	113971	Kcnc3	062785	209177	146535	Ryr2	021313	221018	N/A
C1ql1	045532	057849	050469	Kcnc3	062785	207493	146425	Ryr2	021313	221341	N/A
C1ql2	036907	037286	037257	Kcnc3	062785	208651	146988	Ryr2	021313	170156	127991
C1qtnf4	040794	111466	107091	Kcnc3	062785	107907	103540	Ryr3	057378	091818	089426
C1qtnf4	110961	214937	150588	Kcnc3	062785	107906	103539	Ryr3	057378	208135	146719
2810459M11Rik	026227	027429	027429	Kcnc3	062785	208412	N/A	Ryr3	057378	128192	N/A
2810459M11Rik	026227	165824	131459	Kcnc3	062785	207497	146479	Ryr3	057378	207603	N/A
C3	024164	024988	024988	Kcnf1	051726	170580	131480	Ryr3	057378	156757	N/A
C3	024164	177425	135663	Kcnh1	058248	078470	077563	Ryr3	057378	146187	N/A
C3	024164	177046	135560	Kcnh1	058248	110844	106468	Ryr3	057378	208574	N/A
C3	024164	176457	N/A	Kcnh1	058248	151152	141247	Ryr3	057378	134358	147196
A830018L16Rik	057715	048613	043857	Kcnh5	034402	042299	046864	Ryr3	057378	142537	N/A
A830018L16Rik	057715	150870	N/A	Kcnh7	059742	075052	074563	Ryr3	057378	080673	079503
A830018L16Rik	057715	142117	N/A	Kcnh7	059742	112454	108073	Ryr3	057378	208290	147250
A830018L16Rik	057715	141512	139635	Kcnh7	059742	112452	108071	Ryr3	057378	208151	146449
A830018L16Rik	057715	135014	119143	Kcnh7	059742	131799	N/A	S100a4	001020	001046	001046
A830018L16Rik	057715	137824	117421	Kcnh8	035580	039366	049206	S100a4	001020	142476	143522
A830018L16Rik	057715	179089	137287	Kcnh8	035580	184279	N/A	S100b	033208	036387	047968
A830018L16Rik	057715	141339	121311	Kcnip1	053519	109340	104964	S1pr1	045092	055676	050897
A830018L16Rik	057715	191437	N/A	Kcnip1	053519	065970	069063	Sall1	031665	034090	034090
A830018L16Rik	057715	171690	132334	Kcnip1	053519	101368	098919	Samd12	058656	078673	077741
3110035E14Rik	067879	088666	086041	Kcnip1	053519	135034	N/A	Samd12	058656	154119	N/A
3110043O21Rik	028300	084724	081775	Kcnip1	053519	154760	N/A	Samd12	058656	132059	123446
3110043O21Rik	028300	108126	103761	Kcnip4	029088	166924	131276	Samd12	058656	132362	N/A
3110043O21Rik	028300	108127	103762	Kcnip4	029088	172363	N/A	Sapcd2	026955	114293	109932
3110043O21Rik	028300	142628	N/A	Kcnip4	029088	176978	134758	Sapcd2	026955	100323	097898
3110043O21Rik	028300	156472	N/A	Kcnip4	029088	087395	084656	Sapcd2	026955	155310	N/A
3110043O21Rik	028300	130538	N/A	Kcnip4	029088	101215	N/A	Sapcd2	026955	129214	N/A
3110043O21Rik	028300	149138	N/A	Kcnip4	029088	176191	135071	Sapcd2	026955	137171	N/A
Cab39l	021981	225149	N/A	Kcnip4	029088	175660	135799	Sapcd2	026955	132539	N/A
Cab39l	021981	224281	N/A	Kcnip4	029088	101214	N/A	Sapcd2	026955	028329	028329
Cab39l	021981	022553	022553	Kcnj10	044708	056136	054356	Scamp5	040722	046587	035898
Cab39l	021981	225595	153643	Kcnj12	042529	089184	086588	Scamp5	040722	215208	N/A
Cab39l	021981	223678	153281	Kcnj12	042529	041944	041696	Scamp5	040722	214256	150867
Cab39l	021981	224893	153449	Kcnj12	042529	108717	104357	Scamp5	040722	215734	151197
Abl1	026842	146537	N/A	Kcnj16	051497	106636	102247	Scamp5	040722	213771	149622
Abl1	026842	156736	N/A	Kcnj16	051497	106635	102246	Scamp5	040722	215059	150248
Abl1	026842	075759	075167	Kcnj16	051497	125692	119921	Scel	022123	227322	154402
Abl1	026842	142554	142123	Kcnj16	051497	150902	121758	Scel	022123	095576	093233
Abl1	026842	123471	142297	Kcnj16	051497	180023	136382	Scg3	032181	034699	034699
Abl1	026842	135233	141320	Kcnj16	051497	178798	137414	Scg3	032181	213324	149561
Abl1	026842	028190	028190	Kcnj3	026824	067101	063329	Scg3	032181	215603	152480
Abl1	026842	124089	117748	Kcnj3	026824	112632	108251	Scg3	032181	213637	N/A
Abl1	026842	127714	N/A	Kcnj3	026824	112633	108252	Scg3	032181	214244	151074
Abl1	026842	124726	N/A	Kcnj4	044216	057801	094075	Scg3	032181	214176	N/A
Cables1	040957	171109	129463	Kcnk10	033854	221240	152473	Scg3	032181	215722	N/A
Cables1	040957	046948	040639	Kcnk10	033854	110113	105740	Scn1a	064329	200839	144214
Cables1	040957	225430	N/A	Kcnk10	033854	221305	152656	Scn1a	064329	112366	107985
Cabp1	029544	031519	031519	Kcnk10	033854	221906	N/A	Scn1a	064329	077489	076697
Cabp1	029544	112113	107741	Kcnk13	045404	160413	123916	Scn1a	064329	094951	092558
Cabp1	029544	112109	N/A	Kcnk13	045404	162221	N/A	Scn1a	064329	156865	144633
Cabp1	029544	112112	107740	Kcnk13	045404	049788	051846	Scn1a	064329	138910	116881
Cabp1	029544	145197	138183	Kcnk13	045404	177549	136882	Scn1a	064329	129508	N/A
Cabp1	029544	151775	N/A	Kcnk3	049265	066295	098987	Scn1a	064329	112371	107990

Cabp1	029544	201900	N/A	Kcnk3	049265	197428	N/A	Scn2a	075318	144254	117955
Cachd1	028532	030257	030257	Kcnma1	063142	145596	153247	Scn2a	075318	028377	028377
Cachd1	028532	097955	095568	Kcnma1	063142	188285	140275	Scn2a	075318	201378	N/A
Cachd1	028532	123475	N/A	Kcnma1	063142	225431	153670	Scn2a	075318	202653	N/A
Cachd1	028532	136430	N/A	Kcnma1	063142	188210	141069	Scn2a	075318	200829	143882
Cacna1a	034656	135382	N/A	Kcnma1	063142	224787	152999	Scn2a	075318	138368	N/A
Cacna1a	034656	121390	112436	Kcnma1	063142	224025	153078	Scn2a	075318	202508	143958
Cacna1a	034656	122053	114055	Kcnma1	063142	190044	140033	Scn2a	075318	202162	143888
Cacna1a	034656	215756	149242	Kcnma1	063142	225315	153584	Scn2a	075318	100067	097645
Cacna1a	034656	129620	N/A	Kcnma1	063142	225794	153254	Scn2b	070304	093855	091377
Cacna1a	034656	126302	N/A	Kcnma1	063142	225556	152959	Scn2b	070304	170998	126826
Cacna1a	034656	143215	N/A	Kcnma1	063142	190985	140154	Scn4b	046480	060125	062507
Cacna1a	034656	141981	N/A	Kcnma1	063142	223727	153158	Scn9a	075316	100064	097642
Cacna1a	034656	144879	N/A	Kcnma1	063142	223655	153362	Scn9a	075316	112354	107973
Cacna1a	034656	153691	N/A	Kcnma1	063142	224077	153214	Scn9a	075316	151234	N/A
Cacna1a	034656	130507	N/A	Kcnma1	063142	188991	140751	Scn9a	075316	141603	N/A
Cacna1b	004113	070864	063236	Kcnma1	063142	224468	153312	Scn9a	075316	164384	126528
Cacna1b	004113	102939	100003	Kcnma1	063142	224812	153527	Scn9a	075316	100063	097641
Cacna1b	004113	131861	141653	Kcnma1	063142	224285	153316	Scn9a	075316	169900	131711
Cacna1b	004113	041342	037416	Kcnma1	063142	225471	153083	Scnn1g	000216	000221	000221
Cacna1b	004113	114447	110090	Kcnma1	063142	224232	153291	Scube1	016763	144773	N/A
Cacna1b	004113	133892	115285	Kcnma1	063142	223749	153216	Scube1	016763	043634	044835
Cacna1b	004113	125798	141767	Kcnma1	063142	212542	N/A	Scube1	016763	076060	075434
Cacna1b	004113	155356	116674	Kcnma1	063142	226051	153356	Scube1	016763	016907	016907
Cacna1b	004113	124183	114605	Kcnma1	063142	224933	N/A	Scube1	016763	171496	130131
Cacna1b	004113	100348	097920	Kcnma1	063142	212576	148692	Sdc3	025743	070478	065877
Cacna1e	004110	187541	140937	Kcnma1	063142	223847	N/A	Sdc3	025743	146093	N/A
Cacna1e	004110	211821	148507	Kcnma1	063142	225305	N/A	Sdc3	025743	152591	118685
Cacna1e	004110	226546	153897	Kcnma1	063142	224465	N/A	Sdc3	025743	141297	123608
Cacna1e	004110	188384	N/A	Kcnma1	063142	190339	141143	Sdc3	025743	140623	N/A
Cacna1e	004110	188965	N/A	Kcnma1	063142	065788	065293	Sdc4	017009	017153	017153
Cacna1e	004110	188321	N/A	Kcnma1	063142	100831	098393	Sdc4	017009	142909	N/A
Cacna1e	004110	186256	N/A	Kcnma1	063142	074983	074511	Sec14l5	091712	165810	128063
Cacna1e	004110	004214	004214	Kcnma1	063142	112423	108042	Sec24d	039234	047923	035823
Cacna1g	020866	107786	103415	Kcnma1	063142	172099	132204	Sec24d	039234	198210	N/A
Cacna1g	020866	107791	103420	Kcnma1	063142	177634	136447	Sec24d	039234	200333	143588
Cacna1g	020866	103166	099455	Kcnma1	063142	163322	128553	Sec24d	039234	197291	N/A
Cacna1g	020866	107792	103421	Kcnma1	063142	179836	137141	Sec24d	039234	196167	N/A
Cacna1g	020866	100561	098127	Kcnma1	063142	179097	136568	Sec24d	039234	196631	N/A
Cacna1g	020866	107793	103422	Kcnn3	000794	000811	000811	Sec24d	039234	200309	N/A
Cacna1g	020866	107788	103417	Kcnn3	000794	124584	N/A	Sec24d	039234	196482	N/A
Cacna1g	020866	107790	103419	Kcnq5	028033	029667	029667	Sel1l3	029189	031090	031090
Cacna1g	020866	107789	103418	Kcnq5	028033	115300	110955	Sel1l3	029189	196435	N/A
Cacna1g	020866	107785	103414	Kcnq5	028033	173058	134166	Sel1l3	029189	196516	N/A
Cacna1g	020866	133331	N/A	Kcnq5	028033	174183	134389	Sel1l3	029189	196550	N/A
Cacna1g	020866	146160	N/A	Kcnq5	028033	173404	134076	Sel1l3	029189	199919	N/A
Cacna1g	020866	142190	N/A	Kcnq5	028033	115299	N/A	Sema3c	028780	030568	030568
Cacna1g	020866	133000	N/A	Kcnq5	028033	134505	N/A	Sema3c	028780	170181	126614
Cacna1g	020866	152811	N/A	Kcnt2	052726	120709	112887	Sema3c	028780	170348	N/A
Cacna1g	020866	021234	021234	Kcnt2	052726	120796	113333	Sema3c	028780	169603	132330
Cacna2d1	040118	101581	099117	Kcnt2	052726	119786	113535	Sema3c	028780	115271	N/A
Cacna2d1	040118	039370	049457	Kcnt2	052726	192840	N/A	Sema3d	040254	030868	030868
Cacna2d1	040118	199704	142881	Kcnt2	052726	145077	N/A	Sema3d	040254	196618	N/A
Cacna2d1	040118	180204	136260	Kcnt2	052726	193606	141947	Sema3d	040254	197927	142453
Cacna2d1	040118	078272	077391	Kcnv1	022342	022967	022967	Sema3d	040254	196093	N/A
Cacna2d1	040118	196750	143082	Kcnv1	022342	228536	N/A	Sema3d	040254	195923	N/A
Cacna2d1	040118	200270	N/A	Kctd12b	041633	039424	037539	Sema4d	021451	110040	105667
Cacna2d1	040118	200158	N/A	Kctd12b	041633	112572	108191	Sema4d	021451	021900	021900
Cacna2d1	040118	200294	N/A	Kctd13	030685	032924	032924	Sema4d	021451	110039	105666

Cacna2d1	040118	199236	N/A	Kctd13	030685	141369	N/A	Sema4d	021451	125511	N/A
Cacna2d1	040118	115281	110936	Kctd13	030685	139233	N/A	Sema4d	021451	138228	N/A
Cacna2d1	040118	167946	131507	Kctd3	026608	193143	141861	Sema4d	021451	139865	N/A
Cacna2d2	010066	010210	010210	Kctd3	026608	085678	082821	Sema4d	021451	150662	N/A
Cacna2d2	010066	168532	132512	Kctd3	026608	192200	N/A	Sema4d	021451	139018	N/A
Cacna2d2	010066	085092	082173	Kctd3	026608	195745	N/A	Sema4d	021451	146238	N/A
Cacna2d2	010066	166799	126029	Kctd3	026608	195658	141863	Sema4d	021451	146922	N/A
Cacna2d2	010066	170737	125943	Kctd3	026608	195488	N/A	Sema4d	021451	143396	N/A
Cacna2d2	010066	169354	N/A	Kctd3	026608	192458	N/A	Sema4d	021451	139858	N/A
Cacna2d2	010066	171809	N/A	Kctd3	026608	193590	N/A	Sema4d	021451	155896	N/A
Cacna2d2	010066	194842	N/A	Kctd3	026608	195787	N/A	Sema5a	022231	226876	N/A
Cacna2d2	010066	168959	N/A	Kctd3	026608	193273	N/A	Sema5a	022231	067458	069024
Cacna2d2	010066	164988	130451	Kdm5d	056673	189069	139636	Sema5a	022231	228442	N/A
Cacna2d3	021991	022567	022567	Kdm5d	056673	055032	061095	Sema5a	022231	228103	N/A
Cacna2d3	021991	225985	152967	Kdm5d	056673	188910	N/A	Sema5a	022231	228555	N/A
Cacna2d3	021991	225668	153037	Kdm5d	056673	186696	140663	Sema5a	022231	228015	N/A
Cacna2d3	021991	225733	153143	Kdm5d	056673	186726	140462	Sema5a	022231	227802	N/A
Cacna2d3	021991	225863	153444	Kdm5d	056673	189626	N/A	Sema5a	022231	227976	N/A
Cacna2d3	021991	224950	N/A	Kdm5d	056673	185542	N/A	Sema5a	022231	227429	N/A
Cacna2d3	021991	226048	N/A	Kdm5d	056673	187296	N/A	Sema6a	019647	019791	019791
Cacna2d3	021991	225953	N/A	Kdm5d	056673	189955	N/A	Sema6a	019647	076043	075420
Cacna2d3	021991	224128	N/A	Khdrbs3	022332	022954	022954	Sema6a	019647	135790	120011
Cacnb4	017412	102760	099821	9530077C05Rik	036411	058868	062120	Sema6a	019647	141224	N/A
Cacnb4	017412	102761	099822	9530077C05Rik	036411	213598	N/A	Sema6a	019647	151382	N/A
Cacnb4	017412	078324	077438	9530077C05Rik	036411	214436	149413	Sema6a	019647	156422	121442
Cacnb4	017412	132322	N/A	9530077C05Rik	036411	213133	N/A	Sema6a	019647	126684	118655
Cacnb4	017412	148837	N/A	1810041L15Rik	062760	080751	079575	Sema6a	019647	144223	N/A
Cacnb4	017412	178799	136811	1810041L15Rik	062760	189248	141117	Sema6a	019647	123228	120249
Cacng3	066189	084615	081664	1810041L15Rik	062760	189994	140712	Sema6a	019647	115449	111109
Cacng3	066189	182563	138495	1810041L15Rik	062760	186527	140964	Sema6d	027200	103241	099531
Cacng3	066189	182095	138755	Kif13a	021375	056978	055304	Sema6d	027200	137172	N/A
Cacng4	020723	021066	021066	Kif13a	021375	223881	153657	Sema6d	027200	151199	N/A
Cacng4	020723	134076	N/A	Kif13a	021375	225836	153536	Sema6d	027200	103240	099530
Cacng5	040373	039071	047888	Kif13a	021375	224756	153385	Sema6d	027200	132088	N/A
Cacng5	040373	106742	102353	Kif13a	021375	225591	153614	Sema6d	027200	051419	061123
Cadm3	005338	111220	106851	Kif13a	021375	223856	152982	Sema6d	027200	103238	099528
Cadm3	005338	005470	005470	Kif13a	021375	225904	N/A	Sema6d	027200	103239	099529
Cadm3	005338	136540	N/A	Kif13a	021375	224457	N/A	Sema6d	027200	076335	075674
Cadm3	005338	157032	N/A	Kif13a	021375	224923	N/A	Sema6d	027200	078621	077691
Cadm3	005338	126963	N/A	Kif13b	060012	224126	153252	Sema6d	027200	077847	077014
Cadps2	017978	115358	111015	Kif13b	060012	224507	N/A	Sept4	020486	122945	115682
Cadps2	017978	018122	018122	Kif13b	060012	224503	153168	Sept4	020486	107962	103596
Cadps2	017978	142913	138167	Kif13b	060012	224677	N/A	Sept4	020486	140398	N/A
Cadps2	017978	115361	111018	Kif13b	060012	100473	098041	Sept4	020486	122067	112960
Cadps2	017978	156986	N/A	Kif19a	010021	126555	N/A	Sept4	020486	132723	N/A
Cadps2	017978	125350	115866	Kif19a	010021	137326	N/A	Sept4	020486	123081	N/A
Cadps2	017978	069074	064876	Kif19a	010021	138804	115663	Sept4	020486	133638	N/A
Cadps2	017978	152131	N/A	Kif19a	010021	084368	081398	Sept4	020486	135175	N/A
Cadps2	017978	115356	111013	Kif19a	010021	131782	N/A	Sept4	020486	107961	103595
Cadps2	017978	136279	N/A	Kif19a	010021	138340	122743	Sept4	020486	018544	018544
Cadps2	017978	115355	N/A	Kif19a	010021	134165	N/A	Sept4	020486	063156	060127
Cadps2	017978	166458	125972	Kif21b	041642	075164	074661	Sept4	020486	107960	103594

Cadps2	017978	163871	128905	Kif21b	041642	130864	114297	Sept4	020486	136229	N/A
Calb1	028222	029876	029876	Kif21b	041642	122892	N/A	Sept4	020486	134923	N/A
Calb1	028222	136266	N/A	Kif21b	041642	171381	131815	Sept4	020486	133202	115790
Calb1	028222	141336	N/A	Kif21b	041642	127624	N/A	Sept4	020486	148216	N/A
Calb2	003657	212297	148680	Kif21b	041642	165333	N/A	Sept4	020486	127414	N/A
Calb2	003657	003754	003754	Kif26b	026494	193931	N/A	Sept4	020486	143950	N/A
Caln1	060371	086029	083193	Kif26b	026494	161017	124462	Sept7	001833	165594	127641
Caln1	060371	202728	143823	Kif26b	026494	160789	124608	Sept7	001833	215692	N/A
Caln1	060371	141131	144225	Kif6	023999	162854	124674	Sept7	001833	215721	N/A
Caln1	060371	111287	106918	Kif6	023999	159354	N/A	Sept7	001833	213980	N/A
Caln1	060371	111288	106919	Kif6	023999	162029	125227	Sept7	001833	217598	N/A
Camk1g	016179	169907	128143	Kif6	023999	024798	N/A	Sept7	001833	214911	N/A
Camk1g	016179	016323	016323	Kif6	023999	159396	N/A	Sept7	001833	214520	N/A
Camk1g	016179	163202	131451	Kif6	023999	160049	N/A	Sept7	001833	213435	N/A
Camk1g	016179	165718	N/A	Kif6	023999	162419	N/A	Sept7	001833	214360	N/A
Camk2a	024617	102888	099952	Kirrel	041734	159976	125525	Sept7	001833	115272	110927
Camk2a	024617	134496	N/A	Kirrel	041734	041732	043756	Serinc2	023232	122374	112535
Camk2a	024617	025519	025519	Kirrel	041734	107618	103243	Serinc2	023232	105996	101618
Camk2a	024617	115297	110952	Kit	005672	144270	116465	Serinc2	023232	120126	113044
Camk2a	024617	137805	123480	Kit	005672	005815	005815	Serinc2	023232	146478	115198
Camk2a	024617	115295	110950	Kit	005672	143221	N/A	Serinc2	023232	154846	116586
Camk2a	024617	039904	048325	Kit	005672	151357	N/A	Serpinb1a	044734	076352	075690
Camk2g	021820	100837	098398	Kit	005672	136002	N/A	Serpinb1a	044734	223016	N/A
Camk2g	021820	071816	071720	Kit	005672	148993	N/A	Serpinb1a	044734	091668	089257
Camk2g	021820	080440	079298	Kit	005672	202167	N/A	Serpinb1a	044734	221967	N/A
Camk2g	021820	223863	153007	Kit	005672	201240	N/A	Serpine2	026249	027467	027467
Camk2g	021820	226630	154158	Kitl	019966	105283	100920	Serpine2	026249	189793	140065
Camk2g	021820	225328	152992	Kitl	019966	219050	N/A	Serpine2	026249	190724	140255
Camk2g	021820	224887	153165	Kitl	019966	130190	123360	Serpine2	026249	153862	N/A
Camk2g	021820	223712	153471	Kitl	019966	218200	151554	Serpine2	026249	191529	N/A
Camk2g	021820	225609	152903	Kitl	019966	020129	020129	Serpine2	026249	191026	N/A
Camk2g	021820	225463	153453	Kitl	019966	219881	N/A	Serpinh1	070436	169437	126390
Camk2g	021820	225660	N/A	Klhl13	036782	115313	110968	Serpinh1	070436	094154	091706
Camk2g	021820	225958	N/A	Klhl13	036782	115319	110974	Serpinh1	070436	208119	146969
Camk2g	021820	224245	N/A	Klhl13	036782	115316	110971	Serpinh1	070436	207849	147064
Camk2g	021820	225800	N/A	Klhl13	036782	115317	110972	Serpinh1	070436	208749	146515
Camk2g	021820	224566	N/A	Klhl13	036782	144360	N/A	Serpinh1	070436	207989	146444
Camk2g	021820	224804	N/A	Klhl13	036782	153345	N/A	Serpinh1	070436	208292	146373
Camk2g	021820	225635	N/A	Klhl13	036782	035973	041190	Serpini1	027834	161776	123845
Camk4	038128	042868	046539	Klhl5	054920	204097	144976	Serpini1	027834	029423	029423
Camkv	032936	035700	040430	Klhl5	054920	101191	098752	Serpini1	027834	195285	N/A
Camkv	032936	192318	N/A	Klhl5	054920	204348	144732	Serpini1	027834	161695	N/A
Camkv	032936	193533	141347	Klhl5	054920	204829	N/A	Serpini2	034139	039047	046943
Camkv	032936	195219	142005	Klhl5	054920	204479	N/A	Sertm1	056306	162201	124102
Camkv	032936	194206	141444	Klhl5	054920	203561	N/A	Sertm1	056306	070342	064870
Cap2	021373	021802	021802	Klhl5	054920	203538	145269	Sestd1	042272	102660	099721
Cap2	021373	119341	112952	Klk6	050063	107968	103602	Sestd1	042272	102659	099720
Cap2	021373	225824	153125	Klk6	050063	107966	103600	Sestd1	042272	145366	N/A
Cap2	021373	225444	N/A	Klk6	050063	177514	135591	Sestd1	042272	139021	N/A
Cap2	021373	126687	153072	Klk6	050063	107967	103601	Setbp1	024548	025430	025430
Capn5	035547	040971	048183	Kndc1	066129	154782	N/A	Sez6l2	030683	106335	101942
Capn5	035547	107112	102729	Kndc1	066129	121839	113856	Sez6l2	030683	146017	115905
Capn5	035547	134638	N/A	Kndc1	066129	156941	N/A	Sez6l2	030683	106333	101940
Capn5	035547	155056	116697	Kndc1	066129	210154	N/A	Sez6l2	030683	106332	101939
Capn5	035547	129430	121200	Kndc1	066129	053445	050586	Sez6l2	030683	125669	145667
Capzb	028745	102508	099566	Krt24	020913	017255	017255	Sez6l2	030683	134471	N/A
Capzb	028745	131912	114973	Ksr2	061578	073347	N/A	Sez6l2	030683	155138	146086
Capzb	028745	102507	099565	Ksr2	061578	180430	137670	Sgcd	020354	154578	N/A
Capzb	028745	131793	N/A	L3hypdh	019718	138029	N/A	Sgcd	020354	077221	076459

Capzb	028745	150077	N/A	L3hypdh	019718	124405	N/A	Sgcd	020354	109220	104843
Capzb	028745	030518	030518	L3hypdh	019718	019862	019862	Sgcd	020354	128558	N/A
Capzb	028745	156760	N/A	L3mbtl2	022394	023029	023029	Sgms2	050931	090246	087713
Capzb	028745	145368	119252	L3mbtl2	022394	174229	133967	Sgms2	050931	126569	114192
Capzb	028745	138045	122077	L3mbtl2	022394	172620	N/A	Sgms2	050931	197057	143170
Capzb	028745	042675	038011	L3mbtl2	022394	172568	N/A	Sgms2	050931	200431	N/A
Capzb	028745	132385	N/A	L3mbtl2	022394	172748	134333	Sh2d1a	005696	129855	N/A
Car12	032373	071889	071786	L3mbtl2	022394	174274	N/A	Sh2d1a	005696	189753	141070
Car12	032373	152011	N/A	L3mbtl2	022394	173105	N/A	Sh2d1a	005696	005839	005839
Car12	032373	123195	N/A	L3mbtl2	022394	173607	N/A	Sh2d1a	005696	115070	110722
Car12	032373	217394	N/A	L3mbtl2	022394	174497	133549	Sh2d1a	005696	153948	138624
Car12	032373	085420	082541	L3mbtl2	022394	174401	N/A	Sh2d1a	005696	128393	N/A
Car12	032373	134829	118030	L3mbtl2	022394	173761	N/A	Sh2d1a	005696	101619	N/A
Car14	038526	036181	036983	Lama1	032796	035471	043957	Sh2d4b	037833	070328	064708
Car14	038526	147962	117464	Lama2	019899	186279	N/A	Sh2d4b	037833	096000	093699
Car14	038526	149202	N/A	Lama2	019899	092639	090304	Sh2d4b	037833	225854	N/A
Car14	038526	126722	N/A	Lama2	019899	219763	151741	Sh3bgrl2	032261	188241	140951
Car2	027562	192609	141876	Lama2	019899	189575	140716	Sh3bgrl2	032261	113215	108841
Car2	027562	029078	029078	Lama2	019899	185839	N/A	Sh3bgrl2	032261	188617	N/A
Car2	027562	195520	N/A	Lama2	019899	186965	N/A	Sh3bgrl2	032261	188030	140348
Car4	000805	139416	N/A	Lama2	019899	188963	N/A	Sh3bgrl2	032261	185664	N/A
Car4	000805	103194	099483	Lama2	019899	187535	N/A	Sh3bp4	036206	066279	067581
Car4	000805	138331	N/A	Lama4	019846	159506	N/A	Sh3bp4	036206	123745	N/A
Car4	000805	150596	121381	Lama4	019846	019992	019992	Sh3d19	028082	182969	N/A
Car4	000805	127827	115878	Lama4	019846	162211	N/A	Sh3d19	028082	182723	N/A
Car4	000805	108076	103711	Lama4	019846	161303	N/A	Sh3d19	028082	183119	N/A
Car7	031883	212942	N/A	Lama4	019846	159580	N/A	Sh3d19	028082	182399	N/A
Car7	031883	159416	125112	Lama4	019846	161992	N/A	Sh3d19	028082	182666	138320
Car7	031883	056051	052136	Lama4	019846	163036	N/A	Sh3d19	028082	183202	N/A
Car7	031883	162761	125404	Lamb1	002900	169088	132778	Sh3d19	028082	107664	103291
Car7	031883	162399	N/A	Lamb1	002900	002979	002979	Sh3rf1	031642	034060	034060
Car8	041261	066674	063511	Lamb1	002900	164228	N/A	Sh3rf1	031642	209611	148118
Carmil1	021338	125901	126522	Lamb1	002900	170495	132001	Sh3rf1	031642	210210	N/A
Carmil1	021338	151566	120971	Lamb1	002900	169065	N/A	Sh3rf3	037990	135526	114368
Carmil1	021338	072889	072662	Lamb1	002900	164009	N/A	Sh3rf3	037990	153031	120938
Carmil1	021338	110398	106028	Lamb1	002900	172134	N/A	Sh3rf3	037990	133151	N/A
Carmil1	021338	147261	N/A	Lamp5	027270	144403	120703	Sh3rf3	037990	148267	N/A
Carmil1	021338	142171	N/A	Lamp5	027270	057503	061180	Sh3rf3	037990	152924	N/A
Carmil1	021338	128416	N/A	Lamp5	027270	154674	N/A	Sh3tc2	045629	051720	055094
Carmil1	021338	125420	N/A	Lamp5	027270	143777	N/A	Shank1	038738	107938	103571
Carmil1	021338	144159	N/A	Lamp5	027270	123436	N/A	Shank1	038738	107935	103568
Carmil1	021338	140042	127121	Laptm4b	022257	022867	022867	Shank1	038738	107934	103567
Carmil1	021338	123076	130100	Laptm4b	022257	226437	154241	Shank1	038738	134470	N/A
Carmil1	021338	136517	N/A	Laptm4b	022257	226627	153935	Shank1	038738	154776	N/A
Cams1	075289	167055	131624	Laptm4b	022257	228547	154118	Shank1	038738	127164	N/A
Casp12	025887	027009	027009	Lars2	035202	038863	036710	Shank3	022623	109309	104932
Casp12	025887	151788	121565	Lars2	035202	215674	N/A	Shank3	022623	135214	N/A
Casp12	025887	149520	N/A	Lars2	035202	214074	N/A	Shank3	022623	066545	064477
Casp12	025887	138308	N/A	Lars2	035202	217116	150083	Shank3	022623	154240	N/A
Casp12	025887	151332	122201	Lars2	035202	216843	150895	Shank3	022623	123799	N/A
Casq2	027861	029454	029454	Lars2	035202	215464	149082	Shank3	022623	167173	132229
Casq2	027861	165540	130482	Lars2	035202	214557	N/A	Shank3	022623	039074	048062
Casq2	027861	164123	131232	Lars2	035202	213711	N/A	Shc3	021448	021898	021898
Casq2	027861	159521	N/A	Lars2	035202	215087	N/A	Shc3	021448	223543	152080
Casq2	027861	159833	N/A	Lbh	024063	024857	024857	Shc3	021448	221850	N/A
Cav1	007655	007799	007799	Lbh	024063	148556	123062	Shc4	035109	042246	043146
Cav1	007655	115456	111116	Lcat	035237	038896	038232	Shc4	035109	110480	106106
Cav1	007655	115455	111115	Lcorl	015882	045586	042677	Shc4	035109	110477	106103
Cav1	007655	130505	N/A	Lcorl	015882	190036	140503	Shc4	035109	157002	N/A

Cav1	007655	177234	135875	Lcorl	015882	121573	112416	Shisa6	053930	134562	N/A
Cav1	007655	150901	135374	Lcorl	015882	199744	N/A	Shisa6	053930	123454	120862
Cav1	007655	123439	120252	Lcorl	015882	200142	N/A	Shisa6	053930	066679	071025
Cav1	007655	115454	111114	Lcorl	015882	087164	084408	Shisa7	053550	117452	112405
Cav1	007655	115453	111113	Lcorl	015882	016026	016026	Shisa7	053550	119433	112423
Cav1	007655	133065	N/A	Lcorl	015882	189859	139996	Shisa7	053550	157068	N/A
Cav2	000058	000058	000058	Lcorl	015882	187615	139466	Shisa7	053550	132806	N/A
Cav2	000058	115459	111119	Lcorl	015882	067997	N/A	Shisa7	053550	066041	064886
Cav2	000058	115462	111122	Lcorl	015882	156295	N/A	Shroom3	029381	113055	108678
Cbfb	031885	052209	059382	Lcorl	015882	186633	141174	Shroom3	029381	168878	130419
Cbfb	031885	109392	105019	Ldah	037669	037383	042285	Shroom3	029381	202767	N/A
Cbfb	031885	109395	105022	Ldah	037669	218883	151802	Shroom3	029381	113054	108677
Cbfb	031885	109394	105021	Ldah	037669	218305	151881	Shroom3	029381	172849	N/A
Cbfb	031885	186070	N/A	Ldah	037669	219043	151289	Shroom3	029381	225438	153516
Cbfb	031885	190915	N/A	Ldah	037669	218086	151612	Shroom3	029381	113051	108674
Cbfb	031885	187323	N/A	Ldah	037669	169104	129424	Shroom3	029381	172706	133690
Cbln1	031654	034076	034076	Ldah	037669	220345	151631	Shroom3	029381	201800	N/A
Cbln1	031654	211279	N/A	Ldah	037669	217763	N/A	Shroom3	029381	200869	N/A
Cbln1	031654	169693	126575	Ldah	037669	217999	151852	Shroom3	029381	172752	N/A
Cbln2	024647	068423	068863	Ldah	037669	219357	151362	Shroom4	068270	103005	100070
Cbln2	024647	122464	113996	Ldah	037669	219058	151541	Shroom4	068270	143641	131806
Cbln2	024647	122079	113695	Ldah	037669	220274	151309	Shroom4	068270	089520	086949
Cbln2	024647	169470	126810	Ldah	037669	217872	151257	Shtn1	041362	047511	041378
Cbln3	040380	063871	070494	Ldah	037669	219532	151941	Shtn1	041362	163821	126227
Cbln3	040380	172378	127798	Ldb2	039706	199534	142442	Siah3	091722	164848	130827
Cdc13	079235	135986	114787	Ldb2	039706	070748	067737	Sidt1	022696	127567	116201
Cdc13	079235	155511	128061	Ldb2	039706	199256	143775	Sidt1	022696	136381	115372
Cdc13	079235	126851	N/A	Ldb2	039706	199261	143289	Sidt1	022696	047446	038433
Cdc13	079235	142783	130887	Ldb2	039706	199471	N/A	Sidt1	022696	127124	N/A
Cdc13	079235	140929	N/A	Ldb2	039706	198356	N/A	Sidt1	022696	147032	114424
Cdc13	079235	146716	N/A	Ldb2	039706	198894	N/A	Sidt1	022696	124651	N/A
Cdc152	091119	226261	153730	Leng9	043432	058358	061079	Sipa1l1	042700	220550	N/A
Cdc152	091119	228405	153740	Lfng	029570	031555	031555	Sipa1l1	042700	166429	131030
Cdc152	091119	165386	129305	Lfng	029570	200626	N/A	Sipa1l1	042700	220963	152681
Cdc175	021086	021494	021494	Lfng	029570	199848	N/A	Sipa1l1	042700	222312	N/A
Cdc180	035539	127261	N/A	Lgi4	036560	039775	041579	Sipa1l1	042700	222849	N/A
Cdc180	035539	149903	119784	Lgi4	036560	169785	145660	Sipa1l1	042700	222298	152356
Cdc180	035539	151024	122332	Lgi4	036560	164725	146008	Sipa1l1	042700	222714	152212
Cdc180	035539	178561	136714	Lgi4	036560	172001	125865	Sipa1l1	042700	220766	N/A
Cdc80	022665	139509	N/A	Lgr5	020140	020350	020350	Sipa1l1	042700	221169	152485
Cdc80	022665	138048	N/A	Lgr5	020140	172806	133860	Sipa1l1	042700	221327	N/A
Cdc80	022665	155800	N/A	Lgr5	020140	173740	133707	Sipa1l1	042700	053969	061014
Cdc80	022665	099498	097097	Lgr5	020140	173619	N/A	Sipa1l3	030583	183330	138345
Cdc80	022665	134924	N/A	Lgr5	020140	144732	N/A	Sipa1l3	030583	182223	N/A
Cdc80	022665	061050	058752	Lgr5	020140	105272	N/A	Sipa1l3	030583	183096	138171
Cdc85a	032878	160016	125648	Lgr5	020140	149008	N/A	Sipa1l3	030583	182009	N/A
Cdc85a	032878	140601	124184	Lgr5	020140	129309	N/A	Sipa1l3	030583	182780	138311
Cdc85a	032878	093253	090941	Lgr6	042793	044828	035444	Sipa1l3	030583	182484	138714
Cdc85a	032878	146385	124972	Lgr6	042793	137968	122334	Sipa1l3	030583	182829	N/A
Cdc85a	032878	042534	044649	Lgr6	042793	139369	N/A	Sipa1l3	030583	183164	N/A
Cdc85a	032878	109501	N/A	Lhfp	048332	059562	056364	Sipa1l3	030583	182911	N/A
Cdc85a	032878	109502	105128	Lhfp	048332	137954	N/A	Sipa1l3	030583	183275	138381
Cdc88a	032740	040182	048978	Lhfp	048332	147139	119019	Sipa1l3	030583	182529	N/A
Cdc88a	032740	123561	119173	Lhfp	048332	196913	N/A	Sipa1l3	030583	182011	N/A
Cdc88a	032740	155854	115117	Lhfpl2	045312	054274	062239	Sipa1l3	030583	181975	138592
Cdc88a	032740	140194	114942	Lhfpl2	045312	144838	N/A	Sipa1l3	030583	182702	N/A
Cdc88a	032740	137227	N/A	Lhfpl2	045312	156071	117113	Sipa1l3	030583	182236	N/A
Cdc88a	032740	144450	N/A	Lhfpl2	045312	221096	152453	Sipa1l3	030583	183081	N/A
Cdc88a	032740	109477	105103	Lhfpl2	045312	223423	152241	Sipa1l3	030583	183085	N/A

Cck	032532	216176	149163	Lhfpl2	045312	120051	113786	Sipa1l3	030583	085809	082965
Cck	032532	216138	150080	Lhfpl2	045312	118195	112655	Sirpa	037902	127751	N/A
Cck	032532	035120	035120	Lhfpl2	045312	131595	N/A	Sirpa	037902	136153	N/A
Cck	032532	215228	149679	Lhfpl2	045312	121618	113468	Sirpa	037902	153491	120324
Cck	032532	213106	149410	Lhx1	018698	018842	018842	Sirpa	037902	161620	124048
Cck	032532	217581	150557	Lhx1	018698	184646	138899	Sirpa	037902	136554	N/A
Cckbr	030898	033189	033189	Lhx1	018698	176503	N/A	Sirpa	037902	103203	099492
Cckbr	030898	181339	138052	Lhx1	018698	092827	090503	Sirpa	037902	103202	099491
Ccnd1	070348	093962	091495	Lhx1os	087211	134800	N/A	Sirpa	037902	049262	049022
Ccnd1	070348	208193	N/A	Lhx1os	087211	126072	N/A	Sirpa	037902	160952	N/A
Ccnd1	070348	135985	N/A	Lhx1os	087211	128121	N/A	Sirpa	037902	163034	124888
Ccnd2	000184	000188	000188	Lhx5	029595	031591	031591	Sirpa	037902	160276	125004
Ccnd2	000184	201564	N/A	Lims2	024395	025254	025254	Sirpa	037902	162764	N/A
Ccnd2	000184	201985	N/A	Lims2	024395	225404	153218	Sirpa	037902	099113	096713
Ccnd2	000184	201902	144006	Lims2	024395	225470	N/A	Sirpa	037902	179001	137611
Ccnd2	000184	202363	N/A	Lims2	024395	224383	152960	Skap2	059182	204778	145462
Ccnd2	000184	201066	144095	Lims2	024395	226112	N/A	Skap2	059182	205174	N/A
Ccnd2	000184	201637	144245	Lims2	024395	225400	N/A	Skap2	059182	078214	077342
Ccnd2	000184	201857	N/A	Lims2	024395	223753	153122	Skap2	059182	203948	145275
Cd70	019489	019633	019633	Lims2	024395	225125	N/A	Skap2	059182	205112	N/A
Cd82	027215	099696	097287	Lims2	024395	224328	153433	Skap2	059182	204178	N/A
Cd82	027215	028644	028644	Lin28b	063804	079390	078361	Skap2	059182	203313	N/A
Cd82	027215	126772	N/A	Lin28b	063804	215708	N/A	Skor1	022245	119146	113924
Cd82	027215	111257	106888	Lin28b	063804	214555	N/A	Skor1	022245	116613	112312
Cd82	027215	123565	114762	Lin7a	019906	020057	020057	Skor1	022245	055281	055037
Cd82	027215	145553	115310	Lin7a	019906	105280	100916	Skor2	091519	166956	132338
Cd82	027215	150508	120183	Lin7a	019906	218031	151715	Slc12a2	024597	115366	111023
Cd82	027215	111256	106887	Gm28653	099906	227082	N/A	Slc12a8	035506	121925	112439
Cd82	027215	144168	N/A	Gm28653	099906	185494	N/A	Slc12a8	035506	119173	113633
Cd82	027215	124804	115349	Lingo1	049556	210032	148179	Slc12a8	035506	122314	113901
Cd82	027215	116457	112158	Lingo1	049556	114256	109894	Slc12a8	035506	122427	113164
Cd9	030342	032492	032492	Lingo1	049556	114247	109885	Slc12a8	035506	117134	112925
Cd9	030342	130132	N/A	Lingo1	049556	209596	N/A	Slc12a8	035506	149291	N/A
Cd9	030342	140024	N/A	Lingo1	049556	210332	N/A	Slc12a8	035506	059056	062337
Cdc14b	033102	221634	152388	Lingo1	049556	209332	N/A	Slc14a1	059336	091813	089421
Cdc14b	033102	039318	046003	Lingo1	049556	210995	N/A	Slc14a1	059336	160292	125114
Cdc14b	033102	221139	152843	Lingo1	049556	053568	059050	Slc14a1	059336	160639	125367
Cdc14b	033102	109769	105391	Lingo2	045083	065173	069772	Slc14a2	024552	025434	025434
Cdc14b	033102	221788	N/A	Lingo2	045083	098151	095754	Slc14a2	024552	163367	126416
Cdc14b	033102	222713	152246	Lingo2	045083	108122	103757	Slc16a10	019838	092566	090227
Cdc14b	033102	221217	152736	Lingo2	045083	124999	N/A	Slc16a10	019838	213827	151126
Cdc14b	033102	222766	152870	Lingo2	045083	145615	N/A	Slc16a10	019838	213488	150416
Cdc14b	033102	223116	N/A	Lingo2	045083	127372	N/A	Slc16a10	019838	217252	N/A
Cdc14b	033102	221437	N/A	Lingo2	045083	144170	N/A	Slc17a7	070570	085374	082489
Cdc14b	033102	109770	105392	Lingo2	045083	125128	N/A	Slc17a7	070570	209634	147661
Cdc42ep1	049521	059619	060930	Lingo2	045083	108124	103759	Slc17a7	070570	210498	N/A
Cdc42ep4	041598	106616	102227	Lingo2	045083	164772	130423	Slc17a7	070570	210540	N/A
Cdc42ep4	041598	053536	060227	Litaf	022500	023143	023143	Slc17a7	070570	211652	N/A
Cdc42ep4	041598	131488	114599	Litaf	022500	117360	112667	Slc19a1	001436	136150	121237
Cdc42ep4	041598	153453	120316	Litaf	022500	162323	123948	Slc19a1	001436	133059	120266
Cdh1	000303	000312	000312	Litaf	022500	140170	N/A	Slc19a1	001436	144234	116784
Cdh1	000303	136580	N/A	Lmcd1	057604	032376	032376	Slc19a1	001436	105410	101050
Cdh1	000303	167688	132112	Lmo2	032698	111143	106773	Slc19a1	001436	136925	119382
Cdh10	022321	166873	128782	Lmo2	032698	111140	106770	Slc19a1	001436	130703	115658
Cdh10	022321	176801	N/A	Lmo2	032698	133210	N/A	Slc19a1	001436	132984	116657
Cdh10	022321	176593	N/A	Lmo2	032698	111139	106769	Slc19a1	001436	127249	N/A
Cdh10	022321	040562	042199	Lmo2	032698	123437	117703	Slc19a1	001436	131031	114884
Cdh10	022321	176146	135546	Lmo2	032698	138815	121927	Slc1a1	024935	161340	N/A
Cdh10	022321	176409	N/A	Lmo2	032698	156813	122369	Slc1a1	024935	025875	025875

Cdh11	031673	075190	074681	Lmo2	032698	170926	128317	Slc1a1	024935	161119	N/A
Cdh11	031673	210578	N/A	Lonrf2	048814	147695	117600	Slc1a1	024935	160702	N/A
Cdh11	031673	210425	N/A	Lonrf2	048814	191724	N/A	Slc1a1	024935	162189	N/A
Cdh13	031841	117160	113527	Lonrf2	048814	039612	047372	Slc1a4	020142	004634	004634
Cdh13	031841	145849	N/A	Lpcat2	033192	046290	049252	Slc1a4	020142	109594	105223
Cdh13	031841	142551	N/A	Lpcat2	033192	210099	147941	Slc1a6	005357	005490	005490
Cdh13	031841	129548	N/A	Lpcat2	033192	209265	148089	Slc1a6	005357	217717	151544
Cdh13	031841	148836	N/A	Lpcat2	033192	130471	N/A	Slc20a1	027397	028880	028880
Cdh13	031841	123567	N/A	Lpcat2	033192	151106	N/A	Slc20a1	027397	140907	N/A
Cdh13	031841	212476	N/A	Lpp	033306	115314	110969	Slc20a1	027397	144744	N/A
Cdh13	031841	151842	N/A	Lpp	033306	078988	078005	Slc20a1	027397	141285	N/A
Cdh15	031962	034443	034443	Lpp	033306	038053	036304	Slc20a1	027397	148988	121074
Cdh19	047216	094626	092210	Lrch1	068015	088970	086363	Slc20a1	027397	110315	105944
Cdh19	047216	187555	N/A	Lrch1	068015	228134	N/A	Slc20a1	027397	125714	N/A
Cdh2	024304	025166	025166	Lrch1	068015	228252	154004	Slc20a1	027397	144025	N/A
Cdh2	024304	152779	N/A	Lrch1	068015	226799	N/A	Slc22a15	033147	106928	102541
Cdh2	024304	115850	111516	Lrch1	068015	227433	N/A	Slc22a15	033147	190824	139518
Cdh4	000305	000314	000314	Lrig1	030029	204645	144963	Slc22a15	033147	182130	N/A
Cdh4	000305	108911	104539	Lrig1	030029	101126	098686	Slc22a15	033147	183293	N/A
Cdh4	000305	124708	N/A	Lrig1	030029	203876	N/A	Slc22a15	033147	183255	138357
Cdh4	000305	136411	N/A	Lrig1	030029	141014	N/A	Slc22a15	033147	183098	N/A
Cdh4	000305	129659	N/A	Lrig1	030029	150811	N/A	Slc22a15	033147	182040	N/A
Cdh4	000305	098996	096594	Lrig1	030029	124165	N/A	Slc22a23	038267	148390	122283
Cdh8	036510	155527	123619	Lrig1	030029	032105	032105	Slc22a23	038267	040336	042742
Cdh8	036510	142129	114507	Lrp1	040249	049149	044004	Slc22a23	038267	128392	N/A
Cdh8	036510	093249	090935	Lrp1	040249	125480	N/A	Slc22a23	038267	145038	122376
Cdh8	036510	145601	122493	Lrp1	040249	121829	113584	Slc22a23	038267	143353	N/A
Cdh8	036510	128860	117326	Lrp1	040249	133620	115305	Slc22a4	020334	020586	020586
Cdh8	036510	126895	N/A	Lrp1	040249	129877	N/A	Slc22a4	020334	146351	N/A
Cdh8	036510	142475	115977	Lrp1	040249	129727	120567	Slc22a4	020334	154369	N/A
Cdhr1	021803	022337	022337	Lrp1	040249	145947	N/A	Slc24a3	063873	153249	N/A
Cdk14	028926	115451	111111	Lrp1	040249	140269	N/A	Slc24a3	063873	131123	N/A
Cdk14	028926	030763	030763	Lrp1	040249	135188	N/A	Slc24a3	063873	110007	105634
Cdk14	028926	115450	111110	Lrp1	040249	118455	113497	Slc24a3	063873	137908	N/A
Cdk14	028926	115452	111112	Lrp1b	049252	129974	N/A	Slc24a3	063873	081121	079897
Cdk14	028926	199623	N/A	Lrp1b	049252	052550	054275	Slc24a4	041771	159329	124513
Cdk14	028926	133465	N/A	Lrp1b	049252	142546	117212	Slc24a4	041771	079020	078030
Cdk14	028926	156660	N/A	Lrp1b	049252	203015	145066	Slc24a4	041771	161325	125012
Cdk14	028926	134867	N/A	Lrp1b	049252	134032	N/A	Slc25a18	004902	112682	108302
Cdk14	028926	132390	N/A	Lrp1b	049252	203080	145278	Slc25a33	028982	105686	101311
Cdk14	028926	153331	N/A	Lrp1b	049252	138700	N/A	Slc26a3	001225	167432	130676
Cdk14	028926	171119	N/A	Lrp1b	049252	204204	145045	Slc26a3	001225	171616	128722
Cdk14	028926	131392	114741	Lrp1b	049252	133104	N/A	Slc26a3	001225	110854	106478
Cdk14	028926	167567	130895	Lrp1b	049252	142688	144957	Slc26a3	001225	001254	001254
Cdk14	028926	137554	N/A	Lrp1b	049252	185258	139874	Slc26a3	001225	168209	N/A
Cdk14	028926	200637	N/A	Lrp1b	049252	167270	129192	Slc26a3	001225	165816	N/A
Cdk18	026437	027697	027697	Lrrc2	032495	035076	035076	Slc26a3	001225	109275	N/A
Cdk18	026437	188387	N/A	Lrrc2	032495	196834	142360	Slc27a6	024600	025500	025500
Cdk18	026437	185601	140034	Lrrc2	032495	196598	143319	Slc2a10	027661	029196	029196
Cdk18	026437	189733	N/A	Lrrc20	037151	049242	048042	Slc2a10	027661	148463	N/A
Cdk18	026437	112362	107981	Lrrc38	028584	052458	053597	Slc2a4	018566	178809	N/A
Cdk5rap2	039298	124251	N/A	Lrrc38	097351	181564	137856	Slc2a4	018566	018710	018710
Cdk5rap2	039298	144099	119891	Lrrc3b	045201	055211	059463	Slc2a4	018566	141837	136806
Cdk5rap2	039298	076541	075856	Lrrc3b	045201	223700	153616	Slc2a4	018566	152487	136504
Cdk5rap2	039298	126416	N/A	Lrrc3b	045201	163937	128624	Slc2a4	018566	178363	136455
Cdk5rap2	039298	138561	116928	Lrrc4c	050587	135431	130984	Slc2a4	018566	179298	136726
Cdk5rap2	039298	140108	119151	Lrrc4c	050587	162807	125218	Slc2a4	018566	142500	137463
Cdkl1	020990	021377	021377	Lrrc4c	050587	059049	131795	Slc2a4	018566	135437	137092
Cdkl1	020990	221646	152086	Lrrc4c	050587	170144	128490	Slc30a3	029151	031037	031037

Cdo1	033022	035804	046517	Lrrc7	028176	200196	143365	Slc30a3	029151	202740	144566
Cdyl	059288	075220	074707	Lrrc7	028176	200137	142498	Slc30a3	029151	201783	144353
Cdyl	059288	225602	153274	Lrrc7	028176	199890	142440	Slc30a3	029151	202731	144574
Cdyl	059288	163595	131784	Lrrc7	028176	197866	N/A	Slc30a3	029151	200906	144098
Cdyl	059288	226071	N/A	Lrrc7	028176	198284	N/A	Slc30a3	029151	201396	144295
Cebpb	056501	070642	069850	Lrrc7	028176	106044	101659	Slc31a2	066152	107468	103092
Cep126	040729	037397	042904	Lrrk2	036273	060642	052584	Slc31a2	066152	084530	081578
Cep126	040729	217241	N/A	Lrrk2	036273	140734	N/A	Slc31a2	066152	107467	103091
Cep126	040729	214150	N/A	Lrrk2	036273	156900	N/A	Slc32a1	037771	045738	036299
Cep76	073542	097542	095149	Lrrk2	036273	133743	N/A	Slc35d1	028521	150285	122124
Cept1	040774	068301	065743	Lrrk2	036273	137657	N/A	Slc35d1	028521	036195	037617
Cept1	040774	121231	112509	Lrrk2	036273	172797	N/A	Slc35d1	028521	183432	138926
Cept1	040774	039153	037277	Lrrtm4	052581	147663	117263	Slc35d1	028521	094947	N/A
Cept1	040774	192438	142097	Lrrtm4	052581	128718	114425	Slc35d1	028521	154845	N/A
Cept1	040774	148269	118343	Lrrtm4	052581	126005	117445	Slc35f1	038602	105473	101113
Cept1	040774	137530	115898	Lrrtm4	052581	133918	115016	Slc38a1	023169	088452	085799
Cept1	040774	141525	122460	Lrrtm4	052581	126399	121124	Slc38a1	023169	088454	085801
Cercam	039787	154464	119476	Lrrtm4	052581	136421	121621	Slc38a1	023169	100262	097833
Cercam	039787	047521	041622	Lrrtm4	052581	145407	114465	Slc39a12	036949	114731	110379
Cercam	039787	134152	115902	Lrrtm4	052581	074662	074232	Slc39a12	036949	082290	080911
Cercam	039787	153863	N/A	Lrtm1	045776	055662	061828	Slc39a12	036949	133258	122795
Cercam	039787	155355	N/A	Lrtm1	045776	224760	153372	Slc41a1	013275	132585	N/A
Cerkl	075256	156731	121353	Lrtm1	045776	224708	153518	Slc41a1	013275	086559	083747
Cerkl	075256	099974	N/A	Ltbp2	002020	002073	002073	Slc41a1	013275	146360	N/A
Cerkl	075256	147402	N/A	Ltbp2	002020	163189	127693	Slc43a2	038178	042561	046074
Cerkl	075256	143974	114325	Ltbp2	002020	166383	127255	Slc43a2	038178	108433	104071
Cerkl	075256	152549	N/A	Ltbp2	002020	163214	132067	Slc43a2	038178	151891	N/A
Cerkl	075256	143602	N/A	Ltbp2	002020	165141	132690	Slc43a2	038178	145901	N/A
Cerkl	075256	123859	N/A	Ltbp2	002020	168699	N/A	Slc43a2	038178	134112	N/A
Cerkl	075256	153602	N/A	Ltbp2	002020	110254	105883	Slc43a2	038178	155981	N/A
Cerkl	075256	156830	N/A	Lurap1	028701	030469	030469	Slc43a2	038178	127226	117264
Cerkl	075256	130499	N/A	Lurap1	028701	135982	N/A	Slc43a2	038178	143035	123101
Cerkl	075256	145766	N/A	Lurap1l	048706	055922	062628	Slc43a2	038178	149727	116255
Cerkl	075256	152413	N/A	Ly6e	022587	188866	140145	Slc43a2	038178	152775	N/A
Cers4	008206	177010	N/A	Ly6e	022587	187606	139471	Slc43a2	038178	169547	126838
Cers4	008206	176042	135594	Ly6e	022587	189186	139477	Slc44a5	028360	089948	087394
Cers4	008206	008350	008350	Ly6e	022587	187284	140553	Slc44a5	028360	128362	N/A
Cers4	008206	176267	N/A	Ly6e	022587	190810	139482	Slc44a5	028360	144677	N/A
Cers4	008206	175781	N/A	Ly6e	022587	185861	141145	Slc45a1	039838	037827	036774
Cers4	008206	176837	N/A	Ly6e	022587	185863	140060	Slc45a1	039838	117997	112737
Cers4	008206	176932	N/A	Ly6e	022587	191127	139966	Slc45a1	039838	147706	N/A
Cers4	008206	176705	N/A	Ly6e	022587	191436	139549	Slc4a4	060961	148750	119325
Cers4	008206	176130	135652	Ly6e	022587	186927	N/A	Slc4a4	060961	135283	N/A
Cfap161	011154	119134	114051	Ly6e	022587	188503	N/A	Slc4a4	060961	113218	108844
Cfap161	011154	011298	011298	Ly6e	022587	191145	140829	Slc4a4	060961	156238	121744
Cfap161	011154	208785	N/A	Ly6e	022587	191439	N/A	Slc4a4	060961	144713	122975
Cfap161	011154	149671	115281	Ly6e	022587	188042	141059	Slc4a4	060961	130041	118413
Cfap20	031796	212731	N/A	Ly6e	022587	051698	056703	Slc4a4	060961	113216	108842
Cfap20	031796	034249	034249	Ly6e	022587	169343	132081	Slc4a4	060961	134303	119976
Cfap20	031796	213086	148651	Lypd1	026344	159417	125149	Slc4a7	021733	057015	058313
Cfap20	031796	212579	N/A	Lypd1	026344	162899	125158	Slc4a7	021733	225496	N/A
Cfap20	031796	212684	148527	Lypd1	026344	027582	027582	Slc4a7	021733	225232	153280
Cfap20	031796	211908	148668	Lypd1	026344	159529	123824	Slc4a7	021733	224197	N/A
Cfap20	031796	212807	N/A	Lypd1	026344	161361	124265	Slc4a7	021733	223981	153084
Cfap20	031796	212131	148415	Lypd6	050447	053208	061578	Slc4a7	021733	223607	153180
Cgn	068876	107272	102893	Lypd6	050447	128451	116803	Slc4a7	021733	225238	152984
Cgn	068876	107273	102894	Lypd6	050447	126337	119755	Slc4a7	021733	223761	153045
Cgn	068876	153263	143156	Lypd6	050447	112712	108332	Slc4a7	021733	225175	153166
Cgn	068876	155485	142809	Lypd6	050447	169232	131002	Slc4a7	021733	224222	153116

Cgnl1	032232	121322	113917	Lypd6b	026765	028103	028103	Slc4a7	021733	225630	153597
Cgnl1	032232	152224	N/A	Lypd6b	026765	153422	N/A	Slc4a7	021733	225979	153690
Cgnl1	032232	122065	112479	Lypd6b	026765	129867	N/A	Slc4a7	021733	226079	153323
Cgnl1	032232	136044	N/A	Lyzl4	032530	077706	076887	Slc4a7	021733	224952	153345
Cgnl1	032232	146567	N/A	Lyzl4	032530	120918	113034	Slc4a7	021733	223695	153648
Cgnl1	032232	072899	072672	Lyzl4	032530	213757	151031	Slc4a7	021733	224333	153470
Chac1	027313	028780	028780	Lyzl4	032530	125075	115284	Slc4a7	021733	223740	152933
Chd7	041235	170457	N/A	Lyzl4	032530	214592	150807	Slc4a7	021733	224672	152950
Chd7	041235	127476	118711	Mag	036634	187137	139564	Slc4a7	021733	224049	153093
Chd7	041235	051558	059079	Mag	036634	191081	139881	Slc4a7	021733	224752	153185
Chd7	041235	129655	123241	Mag	036634	188569	140526	Slc4a7	021733	225078	N/A
Chd7	041235	170391	127007	Mag	036634	186422	N/A	Slc4a7	021733	223771	153532
Chd7	041235	130709	N/A	Mag	036634	190638	140578	Slc4a7	021733	225508	N/A
Chd7	041235	222546	152166	Mag	036634	190950	139861	Slc4a7	021733	224750	N/A
Chd7	041235	039267	043903	Mag	036634	191486	N/A	Slc4a7	021733	225613	N/A
Chdh	015970	067620	065542	Mag	036634	040548	041464	Slc5a11	030769	131933	121459
Chdh	015970	125796	N/A	Magi3	052539	064371	067932	Slc5a11	030769	140721	N/A
Chdh	015970	118917	112916	Magi3	052539	121198	112934	Slc5a11	030769	033035	033035
Chgb	027350	028826	028826	Magi3	052539	122303	113713	Slc5a11	030769	131461	123027
Chid1	025512	153191	114693	Magi3	052539	199201	N/A	Slc5a11	030769	127655	117956
Chid1	025512	118694	112891	Mak	021363	225084	152946	Slc5a11	030769	131209	120678
Chid1	025512	209452	147938	Mak	021363	225789	N/A	Slc5a11	030769	206180	N/A
Chid1	025512	147610	N/A	Mak	021363	070193	064750	Slc5a11	030769	167299	127977
Chid1	025512	064642	065953	Mak	021363	224740	153314	Slc5a7	023945	095712	093379
Chid1	025512	155305	N/A	Mak	021363	225906	153176	Slc6a7	052026	025520	025520
Chid1	025512	143561	115174	Mak	021363	224423	152961	Slc7a1	041313	048116	046714
Chid1	025512	133359	N/A	Mak	021363	165087	129615	Slc7a1	041313	138257	117781
Chid1	025512	166082	130360	Mak	021363	021792	021792	Slc7a1	041313	201860	N/A
Chid1	025512	026586	026586	Mal	027375	028854	028854	Slc7a1	041313	202457	144000
Chl1	030077	203912	145026	Mal	027375	028853	028853	Slc7a1	041313	138596	122914
Chl1	030077	203489	N/A	Mal2	024479	025356	025356	Slc7a1	041313	201348	N/A
Chl1	030077	066905	063933	Manla	003746	003843	003843	Slc7a10	030495	135452	127577
Chl1	030077	203830	144758	Manla	003746	105470	101110	Slc7a10	030495	001854	001854
Chl1	030077	204321	144725	Manla	003746	218317	151328	Slc7a10	030495	131048	118331
Chl1	030077	205098	144739	Manla	003746	220088	151568	Slc7a10	030495	167441	129954
Chn2	004633	138930	N/A	Manla	003746	219234	N/A	Slc7a10	030495	146959	127311
Chn2	004633	046856	035908	Manla	003746	146483	N/A	Slc7a11	027737	194462	141988
Chn2	004633	133315	145072	Manla	003746	105469	N/A	Slc7a11	027737	029297	029297
Chn2	004633	114403	N/A	Manla	003746	133330	N/A	Slc7a11	027737	192564	N/A
Chn2	004633	127323	118990	Manlc1	037306	054096	050979	Slc7a11	027737	142932	N/A
Chn2	004633	204410	N/A	Manlc1	037306	176606	N/A	Slc7a11	027737	193838	N/A
Chn2	004633	146114	114476	Manlc1	037306	038628	037949	Slc7a14	069072	091259	088803
Chn2	004633	114402	110044	Man2a1	024085	086723	083928	Slc7a14	069072	108245	103880
Chn2	004633	114401	110043	Man2a1	024085	169239	N/A	Slc7a3	031297	138162	N/A
Chn2	004633	067741	066078	Man2a1	024085	169668	130529	Slc7a3	031297	101362	098914
Chn2	004633	204921	145231	Map2k6	020623	020949	020949	Slc7a3	031297	113710	109339
Chn2	004633	203091	145008	Map2k6	020623	146084	N/A	Slc7a3	031297	126282	N/A
Chn2	004633	204115	145507	Map2k6	020623	100260	097831	Slc7a3	031297	144410	N/A
Chn2	004633	203941	145314	Map2k6	020623	133920	N/A	Slc7a3	031297	151922	N/A
Chn2	004633	204746	144983	Map2k6	020623	146540	N/A	Slc7a3	031297	073927	073582
Chodl	022860	023568	023568	Map6d1	041205	040880	043332	Slc8a1	054640	163680	126373
Chodl	022860	069148	063961	Map7	019996	020173	020173	Slc8a1	054640	086538	083725
Chodl	022860	114216	109854	Map7	019996	116259	111963	Slc8a1	054640	163123	132809
Chrm1	032773	177197	135356	Map7	019996	214231	149367	Slc8a2	030376	211649	147497
Chrm1	032773	035444	042632	Map7	019996	214823	N/A	Slc8a2	030376	168693	128926
Chrm1	032773	163785	126103	Map7	019996	216909	N/A	Slc8a3	079055	085238	082334
Chrm3	046159	187510	140131	Map7	019996	217251	N/A	Slc8a3	079055	064594	063258
Chrm3	046159	223242	N/A	Map7	019996	215924	150818	Slc8a3	079055	182208	138735
Chrm3	046159	190395	N/A	Map7	019996	216065	N/A	Slc8a3	079055	182366	138803

Chrm3	046159	063093	055579	Map7	019996	213386	N/A	Slc8a3	079055	183102	N/A
Chst1	027221	065797	064246	Map7	019996	213312	151101	Slc8b1	032754	068326	064714
Chst10	026080	027249	027249	Map7	019996	215812	N/A	Slc8b1	032754	111890	107521
Chst10	026080	193441	142028	Map7	019996	216474	N/A	Slc8b1	032754	076051	075428
Chst10	026080	192948	141470	Map7	019996	216308	N/A	Slc8b1	032754	147496	120947
Chst10	026080	194361	141295	Mapk12	022610	088827	086207	Slc8b1	032754	140329	117260
Chst10	026080	194657	141481	Mapk4	024558	159162	123922	Slc8b1	032754	111889	107520
Chst10	026080	193435	141604	Mapk4	024558	091851	089462	Slc8b1	032754	123326	N/A
Chst10	026080	192175	N/A	Mapk4	024558	162863	124408	Slc9a3	036123	221410	N/A
Chst10	026080	195731	N/A	Mapk4	024558	160601	N/A	Slc9a3	036123	225423	153255
Chst11	034612	040110	045349	March11	022269	126304	153852	Slc9a3	036123	221703	152682
Chst15	030930	077472	076682	March11	022269	140840	118729	Slc9a3	036123	036208	038142
Chst15	030930	080215	079105	March11	022269	152841	120622	Slc9a9	031129	033463	033463
Chst15	030930	132508	N/A	March11	022269	155819	N/A	Slc9a9	031129	162870	N/A
Chst15	030930	207068	N/A	Marcks	069662	092584	090245	Slc9a9	031129	162329	N/A
Chst8	060402	078686	077752	Marcksl1	047945	062356	055637	Slco4a1	038963	038259	046502
Chst8	060402	205259	145646	Marveld2	021636	225754	153294	Slco4a1	038963	139902	N/A
Chst8	060402	154629	123498	Marveld2	021636	163163	129990	Slco4a1	038963	038225	045023
Chst8	060402	135295	N/A	Marveld2	021636	168772	126438	Slco4a1	038963	138446	N/A
Chst8	060402	206207	N/A	Marveld2	021636	022137	022137	Slco4a1	038963	128367	N/A
Chst8	060402	205390	N/A	Masp1	022887	089883	087327	Slco4c1	040693	071985	071875
Chst9	047161	053017	049975	Matn1	040533	102576	099636	Slit3	056427	069837	066857
Chst9	047161	130553	121484	Matn4	016995	109359	104983	Slit3	056427	156571	N/A
Chsy1	032640	036372	047487	Matn4	016995	109358	104982	Slit3	056427	153098	N/A
Chsy3	058152	080721	079546	Matn4	016995	103103	099392	Slit3	056427	124438	N/A
Chtf18	019214	170575	131366	Matn4	016995	103104	099393	Slitrk1	075478	100322	097897
Chtf18	019214	048054	043896	Matn4	016995	154940	N/A	Slitrk6	045871	078386	077492
Chtf18	019214	168914	N/A	Mboat1	038732	153269	N/A	Smad3	032402	034973	034973
Chtf18	019214	167940	131349	Mboat1	038732	152798	N/A	Smad3	032402	154323	116790
Chtf18	019214	169767	129694	Mboat1	038732	047311	045441	Smad3	032402	137065	N/A
Chtf18	019214	168060	N/A	Mboat1	038732	220870	N/A	Smad3	032402	133108	122217
Chtf18	019214	170070	131768	Mboat1	038732	222095	N/A	Smad3	032402	137713	121671
Cipc	034157	189246	140266	Mboat2	020646	222198	152150	Smad7	025880	026999	026999
Cipc	034157	185434	140769	Mboat2	020646	221952	152348	Smad7	025880	174843	133544
Cipc	034157	191032	140097	Mboat2	020646	220497	N/A	Smad7	025880	174411	133696
Cipc	034157	187814	141049	Mboat2	020646	078902	077937	Smad7	025880	172718	N/A
Cipc	034157	188901	N/A	Mboat2	020646	110942	106567	Smad7	025880	168918	129322
Cipc	034157	188046	139742	Mboat2	020646	222994	152712	Smpx	041476	038007	048522
Cipc	034157	185783	140830	Mcam	032135	149241	121090	Smpx	041476	136141	119573
Cipc	034157	186499	139553	Mcam	032135	034650	034650	Smpx	041476	112520	108139
Cipc	034157	190588	140595	Mcam	032135	098852	096451	Smpx	041476	147283	120412
Cipc	034157	191463	140683	Mcam	032135	216002	149002	Smpx	041476	112521	108140
Cipc	034157	038369	038630	Mcam	032135	147836	117924	Smpx	041476	132805	N/A
Cit	029516	147330	N/A	Mcam	032135	132490	N/A	Smpx	041476	126418	N/A
Cit	029516	137952	122745	Mcc	071856	089874	087318	Smpx	041476	190091	140268
Cit	029516	148245	119769	Mcc	071856	164666	128032	Sned1	047793	062202	050832
Cit	029516	146387	N/A	Mcc	071856	202090	N/A	Sned1	047793	172289	N/A
Cit	029516	141101	115802	Mcc	071856	202845	N/A	Sned1	047793	165843	N/A
Cit	029516	051704	062049	Mcc	071856	201270	N/A	Sned1	047793	163688	132455
Cit	029516	112008	107639	Mctp1	021596	125209	118958	Sned1	047793	168122	N/A
Cit	029516	102560	099620	Mctp1	021596	126960	120673	Sned1	047793	165883	N/A
Cit	029516	153407	N/A	Mctp1	021596	109589	105218	Sntb1	060429	039769	041294
Cit	029516	127976	N/A	Mctp1	021596	137052	N/A	Sntb1	060429	110200	105829
Cit	029516	202734	N/A	Mctp1	021596	155275	N/A	Sntb1	060429	140574	N/A
Cit	029516	128702	N/A	Mctp1	021596	122843	N/A	Snx33	032733	050916	060225
Cit	029516	145363	N/A	Mctp1	021596	149028	N/A	Soat1	026600	187987	N/A
Cit	029516	147479	N/A	Mctp1	021596	109583	105212	Soat1	026600	191379	N/A
Cit	029516	139881	N/A	Mdfi	032717	113280	108905	Soat1	026600	187507	139431
Cit	029516	122877	N/A	Mdfi	032717	066368	069915	Soat1	026600	187073	N/A

Cit	029516	136780	N/A	Mdfi	032717	035375	037888	Soat1	026600	188027	141074
Cit	029516	123736	134875	Mdfi	032717	125745	N/A	Soat1	026600	186420	N/A
Cit	029516	134609	N/A	Mdfi	032717	131971	120454	Soat1	026600	189661	140721
Clasrp	061028	086041	083205	Mdfi	032717	140234	N/A	Soat1	026600	051396	058344
Clasrp	061028	208427	N/A	Mdfi	032717	152455	117665	Sobp	038248	040275	040072
Clasrp	061028	208464	N/A	Mdfi	032717	132125	114581	Sobp	038248	189987	N/A
Clasrp	061028	208716	N/A	Mdfi	032717	129360	114930	Socs2	020027	139210	121305
Clasrp	061028	207253	N/A	Mdga2	034912	037181	046761	Socs2	020027	130784	N/A
Clasrp	061028	207907	146982	Mdga2	034912	222987	152049	Socs2	020027	128854	N/A
Clasrp	061028	207663	147069	Mdga2	034912	222623	152548	Socs2	020027	155148	N/A
Clasrp	061028	208068	147103	Mdga2	034912	178814	137608	Socs2	020027	020215	020215
Clasrp	061028	207447	N/A	Mdga2	034912	101379	098930	Socs2	020027	134918	N/A
Clasrp	061028	207524	146794	Mdga2	034912	178724	N/A	Socs2	020027	119917	113378
Clasrp	061028	207264	N/A	Mdga2	034912	223289	N/A	Socs2	020027	135822	118720
Clasrp	061028	209059	N/A	Mdga2	034912	179729	N/A	Socs2	020027	150432	117785
Clasrp	061028	207325	N/A	Mdga2	034912	177690	N/A	Socs2	020027	129942	117576
Clcn1	029862	031894	031894	Mdga2	034912	179577	N/A	Socs2	020027	128363	N/A
Clcn1	029862	164091	131354	Mdga2	034912	179025	N/A	Socs2	020027	145847	N/A
Clcn1	029862	170028	132154	Mdga2	034912	223141	152613	Socs2	020027	170690	129331
Clcn1	029862	163936	130148	Mdga2	034912	222167	152112	Socs2	020027	172070	131875
Clcn1	029862	165780	130550	Mdga2	034912	113942	109575	Sod3	072941	101208	098768
Clcn1	029862	169024	130968	Med12l	056476	040846	041859	Sorbs2	031626	209534	N/A
Clcn1	029862	168660	126045	Med12l	056476	199659	142903	Sorbs2	031626	124544	147462
Clcn1	029862	114684	N/A	Med12l	056476	197374	143419	Sorbs2	031626	138049	123503
Clcn1	029862	163235	132387	Med12l	056476	029393	029393	Sorbs2	031626	132139	123250
Clcn1	029862	169902	N/A	Med12l	056476	040325	042269	Sorbs2	031626	141039	117544
Clcn5	004317	004428	004428	Med12l	056476	164225	127038	Sorbs2	031626	171337	128000
Clcn5	004317	154382	N/A	Mef2c	005583	198199	143742	Sorbs2	031626	067107	067641
Clcn5	004317	128319	122555	Mef2c	005583	199450	143315	Sorbs2	031626	145458	116536
Clcn5	004317	115746	111412	Mef2c	005583	198916	143235	Sorbs2	031626	134321	115842
Clcn5	004317	132126	N/A	Mef2c	005583	200123	142833	Sorbs2	031626	135336	114286
Cldn11	037625	046174	042181	Mef2c	005583	005722	005722	Sorbs2	031626	127395	N/A
Clec2l	079598	114874	110524	Mef2c	005583	163888	132547	Sorbs2	031626	130850	123195
Clec7a	079293	195589	141234	Mef2c	005583	196493	142897	Sorbs2	031626	153798	118353
Clec7a	079293	184581	139167	Mef2c	005583	200394	143598	Sorbs2	031626	210946	147573
Clec7a	079293	184861	N/A	Mef2c	005583	199019	143401	Sorbs2	031626	134675	118160
Clec7a	079293	112076	107707	Mef2c	005583	199105	143212	Sorbs2	031626	139869	121235
Clic6	022949	023670	023670	Mef2c	005583	196832	N/A	Sorbs2	031626	133864	N/A
Clic6	022949	162181	124498	Mef2c	005583	199432	142714	Sorbs2	031626	211095	148072
Clmn	021097	109936	105562	Mef2c	005583	198069	143286	Sorbs2	031626	126067	118562
Clmn	021097	109937	105563	Mef2c	005583	197681	143420	Sorbs2	031626	136119	N/A
Clmn	021097	223103	152228	Mef2c	005583	197722	142456	Sorbs2	031626	143820	119539
Clmn	021097	223342	152070	Mef2c	005583	197938	143187	Sorbs2	031626	149752	121073
Clmn	021097	223177	152097	Mef2c	005583	199262	N/A	Sorbs2	031626	130011	121619
Clmn	021097	222323	152467	Mef2c	005583	198064	142399	Sorbs2	031626	150102	114951
Clmn	021097	222412	N/A	Mef2c	005583	196730	143338	Sorbs2	031626	139103	119380
Clmp	032024	139577	N/A	Mef2c	005583	196207	143221	Sorbs2	031626	211442	N/A
Clmp	032024	034522	034522	Mef2c	005583	197146	143227	Sorbs2	031626	125295	116768
Clmp	032024	141759	N/A	Mef2c	005583	197022	N/A	Sorbs2	031626	132767	N/A
Clmp	032024	134153	N/A	Mef2c	005583	185052	138826	Sorbs2	031626	140088	114158
Clstn2	032452	035027	035027	Mef2c	005583	195984	143611	Sorbs2	031626	155858	122820
Clstn2	032452	162295	124081	Mef2c	005583	199167	142884	Sorbs2	031626	132730	N/A
Clvs2	019785	019920	019920	Mef2c	005583	195904	143339	Sorbs2	031626	146627	120487
Clvs2	019785	159533	N/A	Mef2c	005583	198217	142487	Sorbs2	031626	211721	N/A
Clvs2	019785	161692	151805	Mef2c	005583	199210	142595	Sorbs2	031626	136344	N/A
Clvs2	019785	160299	125100	Mef2c	005583	200138	142715	Sorbs2	031626	156549	N/A
Nat8l5	079494	032074	032074	Mef2c	005583	198360	143058	Sorbs2	031626	067065	070720
Cmtm5	040759	037814	036138	Mef2c	005583	197145	142619	Sorbs3	022091	227653	154195
Cmtm5	040759	227441	153874	Megf10	024593	075770	075174	Sorbs3	022091	022682	022682

Cnntm5	040759	226807	N/A	Megf10	024593	139892	116814	Sorbs3	022091	227259	153715
Cnih3	026514	161880	124611	Mei4	043289	057067	061341	Sorbs3	022091	227929	154773
Cnih3	026514	027795	027795	Mei4	043289	189832	140647	Sorcs3	063434	078880	077919
Cnih3	026514	162685	124247	Mei4	043289	189391	139589	Sox10	033006	040019	039466
Cnih3	026514	209607	148015	Meis1	020160	144988	134969	Sox13	070643	144386	122980
Cnksr3	015202	015346	015346	Meis1	020160	102878	099942	Sox13	070643	153799	119729
Cnksr3	015202	150282	115863	Meis1	020160	068264	069277	Sox13	070643	145922	N/A
Cnp	006782	103120	099409	Meis1	020160	118661	N/A	Sox13	070643	126530	N/A
Cnp	006782	148034	N/A	Meis1	020160	177417	135726	Sox13	070643	094551	092130
Cnp	006782	150414	N/A	Meis1	020160	177357	139074	Sox2	074637	099151	096755
Cnp	006782	147403	N/A	Meis1	020160	125722	N/A	Sox6	051910	206034	145919
Cnpy1	044681	141601	122171	Meis1	020160	137300	N/A	Sox6	051910	169129	126404
Cnpy1	044681	118882	113944	Meis1	020160	185131	139219	Sox6	051910	206369	145931
Cnpy1	044681	120068	112773	Meis2	027210	028639	028639	Sox6	051910	205405	145732
Cnpy1	044681	117098	113956	Meis2	027210	102538	099597	Sox6	051910	205980	N/A
Cnpy1	044681	141196	116024	Meis2	027210	110907	106532	Sox6	051910	206775	N/A
Cnr1	044288	057188	055797	Meis2	027210	110908	106533	Sox6	051910	206573	N/A
Cnr1	044288	133462	N/A	Meis2	027210	110906	106531	Sox6	051910	205479	145561
Cnr1	044288	084736	081787	Meis2	027210	074285	073898	Sox6	051910	206427	N/A
Cntfr	028444	102961	100026	Meis2	027210	120995	N/A	Sox6	051910	206123	145576
Cntfr	028444	102962	100027	Meis2	027210	189640	N/A	Sox6	051910	205818	N/A
Cntfr	028444	151181	N/A	Meis2	027210	151279	N/A	Sox6	051910	206912	N/A
Cntfr	028444	064443	N/A	Meis2	027210	177493	N/A	Sox6	051910	072804	072583
Cntfr	028444	084701	N/A	Meis2	027210	149217	N/A	Sox6	051910	166877	129512
Cntfr	028444	145379	115631	Meis2	027210	118654	N/A	Sox6	051910	106612	102223
Cntn3	030075	204990	N/A	Meis2	027210	150477	N/A	Sox6	051910	166207	129027
Cntn3	030075	203619	145176	Meis2	027210	154671	N/A	Sox8	024176	025003	025003
Cntn3	030075	032159	032159	Meis2	027210	140461	N/A	Sox8	024176	174560	133742
Cntn4	064293	132044	N/A	Meis2	027210	135543	N/A	Sox8	024176	173447	133403
Cntn4	064293	113261	108886	Meis2	027210	134314	N/A	Sox9	000567	000579	000579
Cntn4	064293	089208	086616	Meis2	027210	133990	N/A	Sp5	075304	100043	097620
Cntn4	064293	113260	108885	Meis2	027210	138526	N/A	Spag5	002055	045026	045286
Cntn4	064293	113258	108883	Mertk	014361	014505	014505	Spag5	002055	133579	N/A
Cntn4	064293	125904	N/A	Mertk	014361	140221	N/A	Spag5	002055	146068	N/A
Cntn4	064293	079416	078385	Metm	002274	165838	127275	Spag5	002055	141026	N/A
Cntn4	064293	130040	N/A	Metm	002274	002344	002344	Spag5	002055	150016	N/A
Cntn4	064293	132395	N/A	Mfap3l	031647	161421	124136	Spag5	002055	149711	N/A
Cntn4	064293	204621	N/A	Mfap3l	031647	160719	125139	Spag5	002055	128359	N/A
Cntn4	064293	123596	N/A	Mfap3l	031647	161702	124330	Spag5	002055	125477	N/A
Cntn4	064293	142626	N/A	Mfap3l	031647	034066	034066	Sparc	018593	108858	104486
Cntn4	064293	113264	108889	Mff	026150	078332	077446	Sparc	018593	018737	018737
Cntn5	039488	160216	124327	Mff	026150	161572	N/A	Sparc	018593	123775	N/A
Cntn5	039488	162484	124214	Mff	026150	073025	072784	Sparc	018593	213866	149604
Cntn5	039488	160358	N/A	Mff	026150	161648	124164	Sparc	018593	216313	149918
Cntn5	039488	074133	073769	Mff	026150	162056	N/A	Sparc	018593	214685	151000
Cntn5	039488	179049	135903	Mff	026150	160786	125230	Sparc	018593	130642	N/A
Cntnap4	031772	125976	N/A	Mff	026150	162003	124334	Sparc	018593	141530	119475
Cntnap4	031772	118171	112511	Mff	026150	160972	124200	Sparc	018593	125787	N/A
Cntnap4	031772	125196	N/A	Mff	026150	160750	125223	Sparcl1	029309	031249	031249
Cntnap4	031772	127636	N/A	Mff	026150	159279	123713	Sparcl1	029309	199947	143177
Cntnap4	031772	140753	N/A	Mff	026150	160044	125005	Specc1	042331	201866	N/A
Cntnap4	031772	034225	034225	Mff	026150	160744	125629	Specc1	042331	202178	144161
Cntnap5a	070695	043725	035732	Mff	026150	160632	N/A	Specc1	042331	136971	N/A
Cobl	020173	172919	133669	Mff	026150	188333	N/A	Specc1	042331	202389	144055
Cobl	020173	109650	105277	Mff	026150	162794	N/A	Specc1	042331	202869	N/A
Cobl	020173	046755	045693	Mff	026150	162573	N/A	Specc1	042331	201624	144659
Cobl	020173	174874	133470	Mfge8	030605	206338	N/A	Specc1	042331	049836	063102
Cobl	020173	109651	105278	Mfge8	030605	107409	103032	Specc1	042331	202905	144311
Cobl	020173	172956	134372	Mfge8	030605	032825	032825	Specc1	042331	201364	143853

Cobl	020173	172827	133368	Mfge8	030605	205563	145720	Specc1	042331	092415	090071
Cobl	020173	136549	114779	Mfge8	030605	205649	N/A	Specc1	042331	201015	144174
Cobl	020173	130572	N/A	Mfge8	030605	205494	N/A	Specc1	042331	200742	N/A
Cobl	020173	146067	119008	Mfge8	030605	205929	N/A	Specc1	042331	202744	144483
Col11a1	027966	092155	089793	Mfge8	030605	205688	N/A	Specc1	042331	201723	144542
Col11a1	027966	196345	N/A	Mfge8	030605	205526	N/A	Specc1	042331	202179	144300
Col11a1	027966	196654	N/A	Mfge8	030605	206844	N/A	Specc1	042331	108709	104349
Col11a1	027966	211802	148798	Mfhas1	070056	037666	044135	Specc1	042331	201671	144030
Col11a1	027966	138680	N/A	Mfhas1	070056	209953	147927	Speg	026207	087122	084361
Col11a1	027966	184978	138879	Mfhas1	070056	154989	N/A	Speg	026207	148515	116953
Col11a1	027966	123619	121027	Mfsd2a	028655	152308	N/A	Speg	026207	113590	109220
Col11a2	024330	131134	122082	Mfsd2a	028655	030408	030408	Speg	026207	187214	N/A
Col11a2	024330	087497	084772	Mfsd2a	028655	138964	N/A	Speg	026207	125306	119969
Col11a2	024330	143354	115026	Mfsd2a	028655	127047	116782	Speg	026207	146705	N/A
Col11a2	024330	173749	N/A	Mgat4c	019888	146230	N/A	Speg	026207	125118	N/A
Col11a2	024330	137374	N/A	Mgat4c	019888	219195	151859	Speg	026207	132228	121825
Col11a2	024330	144927	N/A	Mgat4c	019888	134930	N/A	Speg	026207	132222	N/A
Col11a2	024330	114252	109890	Mgat4c	019888	127504	117148	Speg	026207	137868	141009
Col11a2	024330	114255	109893	Mgat4c	019888	156751	116216	Speg	026207	113589	109219
Col13a1	058806	145469	117248	Mgat4c	019888	138522	118056	Speg	026207	113588	109218
Col13a1	058806	105451	N/A	Mgat4c	019888	130580	N/A	Speg	026207	113587	109217
Col13a1	058806	105453	101093	Mgat4c	019888	138016	116902	Speg	026207	122266	113646
Col13a1	058806	105452	101092	Mgat4c	019888	219683	N/A	Speg	026207	143679	N/A
Col13a1	058806	105454	101094	Mgat4c	019888	218554	N/A	Sphkap	026163	160953	124872
Col13a1	058806	051826	N/A	Mgat4c	019888	143640	N/A	Sphkap	026163	159078	124384
Col13a1	058806	153120	N/A	Mgat4c	019888	020039	020039	Sphkap	026163	053075	N/A
Col15a1	028339	082303	080921	Mgat4c	019888	218984	N/A	Sphkap	026163	160237	N/A
Col15a1	028339	102917	099981	Mgat4c	019888	120748	114010	Sphkap	026163	160567	N/A
Col15a1	028339	124105	N/A	Mgat4c	019888	163753	131551	Spock3	054162	117377	113797
Col15a1	028339	148103	N/A	Mgat4c	019888	179929	135959	Spock3	054162	118003	113683
Col15a1	028339	140094	N/A	Mgat5b	043857	103027	099316	Spock3	054162	138398	N/A
Col15a1	028339	140413	119292	Mgat5b	043857	139905	N/A	Spock3	054162	119068	112930
Col15a1	028339	107731	103359	Mgat5b	043857	136584	122276	Spock3	054162	141513	N/A
Col15a1	028339	146967	118637	Mgat5b	043857	126757	N/A	Spock3	054162	093480	091192
Col15a1	028339	107730	103358	Mgll	033174	113585	109215	Spon1	038156	046687	041157
Col1a2	029661	141483	125275	Mgll	033174	151699	N/A	Spon1	038156	084696	081746
Col1a2	029661	031668	031668	Mgll	033174	113582	109212	Spp1	029304	086833	084043
Col1a2	029661	138511	N/A	Mgll	033174	203608	144883	Spp1	029304	031243	031243
Col1a2	029661	132029	N/A	Mgll	033174	113581	109211	Spp1	029304	112748	108368
Col1a2	029661	148864	N/A	Mgll	033174	150180	145068	Spp1	029304	112746	108366
Col1a2	029661	155687	N/A	Mgll	033174	089449	086872	Spp1	029304	145084	117338
Col1a2	029661	124686	N/A	Mgll	033174	203824	145364	Spp1	029304	132457	123163
Col1a2	029661	203346	N/A	Mgll	033174	205045	N/A	Spp1	029304	112747	108367
Col20a1	016356	149179	115291	Mgll	033174	163271	127374	Spsb4	046997	055433	057849
Col20a1	016356	108856	104484	Mgst1	008540	008684	008684	Spsb4	046997	162307	N/A
Col20a1	016356	228434	153871	Mgst1	008540	120939	112646	Spsb4	046997	159298	N/A
Col20a1	016356	152473	117514	Mgst1	008540	204628	144912	Spsb4	046997	064445	N/A
Col20a1	016356	155425	114654	Mgst1	008540	140932	145306	Sptb	021061	021458	021458
Col22a1	079022	159410	124182	Mgst1	008540	120302	113257	Sptb	021061	170532	N/A
Col22a1	079022	162081	N/A	Mgst1	008540	120230	113859	Sptb	021061	166101	129782
Col22a1	079022	159993	125069	Mgst1	008540	118091	112923	Sptbn2	067889	008991	008991
Col22a1	079022	160513	124270	Mgst1	008540	125810	114222	Src	027646	109533	105159
Col23a1	063564	102765	099826	Miat	097767	182953	N/A	Src	027646	145715	N/A
Col23a1	063564	151098	119825	Miat	097767	181535	N/A	Src	027646	029175	029175
Col4a5	031274	112931	108553	Miat	097767	182258	N/A	Src	027646	133900	N/A
Col4a5	031274	112930	108552	Miat	097767	182509	N/A	Src	027646	129770	N/A
Col4a5	031274	130732	116610	Miat	097767	183036	N/A	Src	027646	109531	105157
Col4a5	031274	128669	N/A	Miat	097767	182699	N/A	Src	027646	109529	105155
Col5a1	026837	028280	028280	Mical2	038244	050149	051163	Src	027646	092576	090237

Col5a1	026837	145423	123532	Mical2	038244	106647	N/A	Srgap1	020121	020322	020322
Col5a3	004098	004201	004201	Mical2	038244	106648	N/A	Srgap1	020121	161996	N/A
Col5a3	004098	145974	N/A	Mical2	038244	037991	047639	Srgap1	020121	161156	125109
Col6a1	001119	001147	001147	Mical2	038244	150428	N/A	Srgap1	020121	162710	N/A
Col6a1	001119	137599	N/A	Mical2	038244	144509	123341	Srgap1	020121	081688	080389
Colgalt2	032649	127586	119210	Micalcl	030771	051308	062443	Sshl	042121	159592	124312
Colgalt2	032649	044311	037532	Micalcl	030771	033033	033033	Sshl	042121	112298	107917
Colgalt2	032649	127586	119210	Micalcl	030771	106645	102256	Sshl	042121	077689	076873
Colgalt2	032649	044311	037532	Micalcl	030771	213108	150200	Sshl	042121	159510	125025
Corin	005220	167460	127389	Micalcl	030771	140202	N/A	Sshl	042121	162396	125388
Corin	005220	005352	005352	Mid1	035299	112104	107732	Sshl	042121	162322	N/A
Corin	005220	175766	135889	Mid1	035299	036753	038765	St18	033740	140079	118322
Corin	005220	177290	135511	Mid1	035299	078947	077974	St18	033740	131494	117789
Corin	005220	176974	135722	Mid1	035299	149258	N/A	St18	033740	043578	042056
Corin	005220	176320	N/A	Mid1	035299	133857	N/A	St18	033740	139756	142063
Corin	005220	176439	N/A	Mid1	035299	146073	N/A	St18	033740	131467	120134
Coro1c	004530	164980	129314	Mid1	035299	152163	N/A	St18	033740	150761	120298
Coro1c	004530	004646	004646	Mid1	035299	129642	N/A	St18	033740	151281	122055
Coro1c	004530	163995	N/A	Mid1	035299	151722	N/A	St18	033740	139838	118129
Coro1c	004530	168634	N/A	Mid1	035299	112107	107735	St18	033740	132207	142317
Coro1c	004530	172016	N/A	Mid1	035299	079443	078412	St18	033740	142304	N/A
Coro1c	004530	111283	N/A	Mid1	035299	143815	N/A	St18	033740	151015	N/A
Coro1c	004530	166647	N/A	Mid1	035299	171433	126746	St18	033740	130338	141266
Coro1c	004530	168493	N/A	Mid1	035299	163810	128176	St18	033740	163727	131417
Coro1c	004530	163264	129457	Mid1	035299	112105	107733	St3gal5	056091	069994	070414
Coro1c	004530	168399	132504	Mid2	000266	112990	108614	St3gal5	056091	114112	109747
Coro1c	004530	171630	N/A	Mid2	000266	112988	108612	St3gal5	056091	187007	146063
Coro2b	041729	048043	041826	Mid2	000266	140144	N/A	St3gal5	056091	188366	145599
Coro2b	041729	131981	133481	Mid2	000266	128809	123221	St5	031024	084738	081789
Coro2b	041729	164246	128441	Mid2	000266	112993	108617	St5	031024	077909	077067
Coro2b	041729	151604	N/A	Midn	035621	099492	097091	St5	031024	207664	N/A
Coro2b	041729	174439	134079	Midn	035621	042057	046967	St5	031024	208557	N/A
Coro2b	041729	173171	134709	Midn	035621	151202	115717	St5	031024	207745	146934
Coro2b	041729	123379	N/A	Midn	035621	124179	N/A	St5	031024	208981	N/A
Coro6	020836	102493	099551	Midn	035621	153477	119787	St5	031024	208583	146747
Coro6	020836	130255	120232	Midn	035621	146516	119962	St5	031024	207394	146549
Coro6	020836	021190	021190	Midn	035621	144526	120988	St5	031024	208734	146829
Coro6	020836	079770	078703	Mkx	061013	176586	N/A	St5	031024	079282	078264
Coro6	020836	108391	104028	Mkx	061013	079788	078718	St5	031024	168005	130119
Coro6	020836	052515	056862	Mkx	061013	188926	N/A	St6galnac3	052544	200397	143747
Cotl1	031827	034285	034285	Mkx	061013	176608	N/A	St6galnac3	052544	199707	143030
Cotl1	031827	211873	148448	Mkx	061013	176757	N/A	St6galnac3	052544	064460	068598
Cotl1	031827	212676	N/A	Mlc1	035805	042594	047667	St6galnac3	052544	200576	N/A
Cotl1	031827	168698	126329	Mlc1	035805	109368	104993	St6galnac3	052544	198775	N/A
Cpe	037852	048967	048555	Mlycd	074064	098367	095970	Stac	032502	161995	125182
Cpe	037852	210783	N/A	Mlycd	074064	145121	N/A	Stac	032502	035083	035083
Cpe	037852	210680	N/A	Mmd2	039533	037048	039357	Stac	032502	162345	N/A
Cpe	037852	211312	N/A	Mmd2	039533	195947	N/A	Stac2	017400	017544	017544
Cpm	020183	138020	N/A	Mmd2	039533	196972	N/A	Stac2	017400	131519	118164
Cpm	020183	123374	N/A	Mmp14	000957	089688	087119	Stag3	036928	160729	124170
Cpm	020183	020399	020399	Mmp14	000957	197874	142665	Stag3	036928	161113	N/A
Cpm	020183	141991	N/A	Mmp14	000957	225641	153679	Stag3	036928	159483	N/A
Cpne4	032564	098443	096042	Mmp14	000957	197947	N/A	Stag3	036928	048028	040945
Cpne4	032564	157006	117155	Mmp14	000957	198679	N/A	Stag3	036928	162245	125523
Cpne4	032564	057742	049663	Mmp14	000957	196155	143012	Stag3	036928	161691	125290
Cpne4	032564	077190	076432	Mmp14	000957	226710	N/A	Stag3	036928	161615	N/A
Cpne4	032564	213120	150096	Mmp2	031740	034187	034187	Stag3	036928	160849	125376
Cpne4	032564	213452	150551	Mmp2	031740	211691	N/A	Stag3	036928	159189	124959
Cpne7	034796	134235	N/A	Mmp2	031740	211308	N/A	Stambpl1	024776	054956	059927

Cpne7	034796	037900	042159	Mmp2	031740	211567	147838	Stambpl1	024776	125232	N/A
Cpne7	034796	131659	N/A	Mmp24	027612	029141	029141	Stambpl1	024776	119603	112938
Cpne7	034796	123191	N/A	Mmp24	027612	135945	N/A	Stambpl1	024776	129535	115333
Cpne7	034796	127431	N/A	Mns1	032221	183809	139105	Stambpl1	024776	130756	N/A
Cpne9	030270	041203	044416	Mns1	032221	184604	139232	Stard13	016128	110483	106109
Cpne9	030270	132372	N/A	Mns1	032221	034746	034746	Stard13	016128	062015	053232
Cpne9	030270	130191	138786	Mobp	032517	068698	071084	Stard13	016128	202111	144056
Cpne9	030270	124574	N/A	Mobp	032517	215512	149831	Stard13	016128	201680	N/A
Cpne9	030270	204050	N/A	Mobp	032517	111627	107254	Stard13	016128	202385	N/A
Cpne9	030270	128148	N/A	Mobp	032517	093773	091287	Stard13	016128	129088	116705
Cpne9	030270	155779	N/A	Mobp	032517	174193	134410	Stard13	016128	141117	N/A
Cpne9	030270	138388	N/A	Mobp	032517	214943	149285	Stard13	016128	146814	N/A
Cpne9	030270	134523	N/A	Mobp	032517	214008	N/A	Stard13	016128	126770	122468
Cpne9	030270	136728	N/A	Mog	076439	102665	099726	Stard13	016128	202866	N/A
Creb3l1	027230	028663	028663	Mog	076439	167275	129489	Stard8	031216	036606	044491
Ctim1	024074	112498	108117	Mpp6	038388	166318	125880	Stard8	031216	149999	114897
Crispld1	025776	159958	124095	Mpp6	038388	036236	039314	Stard8	031216	145820	N/A
Crispld1	025776	160305	123800	Mpp6	038388	204545	144737	Stard8	031216	127361	N/A
Crispld1	025776	095075	092686	Mpp6	038388	203415	N/A	Stat2	040033	218863	N/A
Cryab	032060	217475	149803	Mpp6	038388	036225	038772	Stat2	040033	085708	082855
Cryab	032060	214609	149454	Mpp6	038388	171601	129004	Stat2	040033	217852	N/A
Cryab	032060	034562	034562	Mpp6	038388	167628	129355	Stat2	040033	220142	N/A
Cryab	032060	214962	149759	Mpp6	038388	167063	N/A	Stat2	040033	217727	N/A
Cryab	032060	216755	150669	Mpp6	038388	167319	N/A	Stat2	040033	218862	N/A
Cryab	032060	216393	N/A	Mpp7	057440	115869	111535	Stat2	040033	220277	N/A
Cryba2	006546	133833	140298	Mpped1	041708	109470	105096	Stat2	040033	105238	100872
Cryba2	006546	006721	006721	Mpped1	041708	123387	123230	Stc2	020303	020546	020546
Cryl1	021947	022517	022517	Mpped1	041708	046168	041981	Stc2	020303	152094	N/A
Cryl1	021947	223986	N/A	Mpped1	041708	109469	105095	Stc2	020303	134199	N/A
Cryl1	021947	224292	N/A	Mpped1	041708	150489	128786	Stc2	020303	139991	N/A
Cryl1	021947	225765	N/A	Mpped1	041708	125739	131463	Stc2	020303	149467	N/A
Crym	030905	134067	N/A	Mpped1	041708	148868	131679	Stk17b	026094	027263	027263
Crym	030905	033198	033198	Mpped1	041708	163723	126242	Stk17b	026094	187066	N/A
Csmd1	060924	082104	080751	Mpped1	041708	172115	132518	Stk17b	026094	185920	139880
Csmd1	060924	125551	N/A	Mpped1	041708	171560	125835	Stk3	022329	018476	018476
Csmd1	060924	131778	N/A	Mpped1	041708	172398	131333	Stk3	022329	226555	154154
Csmd1	060924	138348	N/A	Mrm2	029557	031536	031536	Stk3	022329	067033	064225
Csmd1	060924	137947	N/A	Msi1	054256	150779	120516	Stk3	022329	226730	N/A
Csmd1	060924	133933	N/A	Msi1	054256	151444	N/A	Stk3	022329	128425	N/A
Csmd1	060924	122983	N/A	Msi1	054256	067168	070415	Stk3	022329	138841	116310
Csmd2	028804	129619	N/A	Msi1	054256	131079	144032	Stk32a	039954	045477	038471
Csmd2	028804	144298	N/A	Msi1	054256	145005	N/A	Stmn4	022044	152093	117000
Csmd2	028804	184063	138958	Msi1	054256	139918	N/A	Stmn4	022044	074523	074113
Csmd2	028804	148247	N/A	Msi1	054256	145840	N/A	Stmn4	022044	136192	N/A
Csmd2	028804	139561	N/A	Msi1	054256	136586	143900	Stmn4	022044	123435	N/A
Csmd2	028804	221199	152795	Msi1	054256	130849	N/A	Stmn4	022044	118426	113629
Cspg4	032911	214057	N/A	Msra	054733	067927	065754	Stmn4	022044	121955	113788
Cspg4	032911	035661	038909	Msra	054733	210428	147689	Stmn4	022044	120229	113759
Cspg4	032911	215666	N/A	Msra	054733	210363	148189	Stmn4	022044	134440	123092
Cspg4	032911	217052	N/A	Msra	054733	209392	N/A	Stmn4	022044	147477	N/A
Cspg5	032482	035058	035058	Msra	054733	209513	N/A	Ston1	033855	137138	118522
Cspg5	032482	196060	143164	Msx2	021469	021922	021922	Ston1	033855	153613	N/A
Cspg5	032482	196176	N/A	Msx2	021469	188606	N/A	Ston1	033855	064035	067027
Cspg5	032482	197850	143005	mt-Co1	064351	082402	080993	Ston1	033855	150023	122928
Cspg5	032482	199736	142845	mt-Nd4	064363	082414	081000	Ston1	033855	132384	N/A
Csmp3	044647	122912	117533	Mt3	031760	034211	034211	Ston1	033855	112216	N/A
Csmp3	044647	053910	055719	Mt3	031760	211930	148345	Ston1	033855	163588	131703
Csmp3	044647	139896	N/A	Mt3	031760	211915	148383	Ston2	020961	052969	053908
Csmp3	044647	112397	135151	Mtch2	027282	136872	121851	Ston2	020961	164713	131098

Csmp3	044647	129133	N/A	Mtch2	027282	150232	118566	Ston2	020961	111609	N/A
Csmp3	044647	176109	135019	Mtch2	027282	111467	107092	Ston2	020961	170077	126429
Csmp3	044647	145598	135605	Mtch2	027282	111468	107093	Ston2	020961	170984	N/A
Csmp3	044647	112394	108013	Mtch2	027282	057216	N/A	Ston2	020961	166967	128561
Csrp1	026421	097561	095169	Mtch2	027282	148936	N/A	Ston2	020961	166008	N/A
Csrp1	026421	027677	027677	Mtch2	027282	146392	N/A	Stox2	038143	079195	078190
Csta1	034362	096090	093795	Mtch2	027282	143773	N/A	Stox2	038143	211882	148776
Csta1	034362	161638	125577	Mtch2	027282	142350	N/A	Stox2	038143	110367	105996
Ctnna3	060843	105441	101081	Mtch2	027282	144696	N/A	Stox2	038143	211737	147477
Ctnna3	060843	105440	101080	Mtch2	027282	135026	N/A	Stox2	038143	210030	147281
Ctnna3	060843	133190	N/A	Mtch2	111714	214148	149233	Stox2	038143	209337	148231
Ctnna3	060843	135474	N/A	Mtch2	111714	213376	149651	Stox2	038143	210153	147670
Ctnna3	060843	075099	074606	Mtch2	111714	217470	N/A	Stox2	038143	209941	N/A
Ctnbp2	000416	152499	N/A	Mtch2	111714	214378	150912	Stox2	038143	181417	N/A
Ctnbp2	000416	146775	119383	Mtch2	111714	215609	N/A	Strip2	039629	046028	036477
Ctnbp2	000416	148602	118432	Mtch2	111714	216454	151033	Strip2	039629	130969	N/A
Ctnbp2	000416	090601	088089	Mtch2	111714	216814	N/A	Strip2	039629	115224	110879
Ctnbp2	000416	141581	123162	Mtch2	111714	215750	N/A	Strip2	039629	137068	N/A
Ctnbp2	000416	139557	N/A	Mtch2	111714	214987	N/A	Strip2	039629	151738	119506
Ctnbp2	000416	129669	116878	Mtch2	111714	216471	N/A	Strn	024077	145910	120830
Ctnbp2	000416	142963	122590	Mtch2	111714	217168	N/A	Strn	024077	024881	024881
Ctnbp2	000416	140416	N/A	Mtfp1	004748	004868	004868	Strn	024077	145480	117663
Ctxn1	048644	053252	057115	Mtfp1	004748	123607	N/A	Stx17	061455	107721	103349
Ctxn3	069372	091892	089507	Mtss1	022353	080371	079239	Stx17	061455	153502	117512
Ctxn3	069372	209782	147740	Mtss1	022353	226393	N/A	Stx17	061455	107720	103348
Ctxn3	069372	209786	147982	Mtss1	022353	226976	N/A	Stx17	061455	064765	068087
Cxcl14	021508	224801	153440	Mtss1	022353	227045	154093	Stxbp3	027882	102621	099681
Cxcl14	021508	021970	021970	Mtss1	022353	227196	154064	Stxbp3	027882	124782	N/A
Cxcl5	029371	202380	N/A	Mtss1	022353	228067	153850	Stxbp3	027882	124903	N/A
Cxcl5	029371	031318	031318	Mtss1	022353	227290	N/A	Stxbp3	027882	150010	N/A
Cxcr4	045382	052172	053489	Mtss1	022353	227238	N/A	Stxbp3	027882	196679	142785
Cxcr4	045382	142893	120153	Mtss1	022353	228365	N/A	Stxbp3	027882	200035	N/A
4930578C19Rik	037358	044188	046567	Mtss1	022353	228655	N/A	Stxbp3	027882	138552	142860
4930578C19Rik	037358	147039	N/A	Mtss1	022353	226923	N/A	Stxbp3	027882	106596	102206
Cxxc4	044365	197151	N/A	Mtss1	022353	227797	N/A	Sulf2	006800	109249	104872
Cxxc4	044365	181904	138000	Mxd4	037235	201189	N/A	Sulf2	006800	146497	154557
Cxxc4	044365	181597	N/A	Mxd4	037235	042701	039071	Sulf2	006800	088086	085405
Cxxc4	044365	199134	N/A	Mxd4	037235	119171	113300	Sulf2	006800	125503	N/A
Cxxc4	044365	166288	128574	Mxd4	037235	201763	N/A	Sulf2	006800	143996	N/A
Cyb5a	024646	160180	124480	Mxra8	029070	141883	114929	Sulf2	006800	139266	154315
Cyb5a	024646	025549	025549	Mxra8	029070	030947	030947	Sulf2	006800	133395	154724
Cyb5a	024646	159846	N/A	Mxra8	029070	133592	N/A	Susd5	086596	135338	128826
Cyb5a	024646	163083	124412	Mxra8	029070	143886	N/A	Svep1	028369	042850	045856
Cyb5a	024646	159837	N/A	Mxra8	029070	141766	N/A	Svep1	028369	128783	N/A
Cyfip2	020340	093166	090854	Mxra8	029070	126487	N/A	Svep1	028369	146329	N/A
Cyfip2	020340	142017	119801	Mxra8	029070	132142	N/A	Svep1	028369	149152	N/A
Cyfip2	020340	129474	116715	Mybpc1	020061	121629	112615	Svil	024236	126977	115078
Cyfip2	020340	165599	127586	Mybpc1	020061	124144	N/A	Svil	024236	131210	N/A
Cyfip2	020340	093165	090853	Mybpc1	020061	119185	112699	Svil	024236	138258	N/A
Cyp27a1	026170	027356	027356	Mybpc1	020061	153964	122472	Svil	024236	143254	119287
Cyp27a1	026170	190781	N/A	Mybpc1	020061	148205	N/A	Svil	024236	153016	121497
Cyp27a1	026170	189083	N/A	Mybpc1	020061	156573	119024	Svil	024236	140448	119803
Cyp2j9	015224	055693	050464	Mycl	028654	144998	117232	Svil	024236	148564	N/A
Cyp2j9	015224	126509	N/A	Mycl	028654	106252	101859	Svil	024236	210707	147843
Cyp7b1	039519	035625	037487	Mycl	028654	030407	030407	Svil	024236	127297	115223
D430019H16Rik	094910	178224	137376	Mycl	028654	135925	N/A	Svil	024236	131609	122242
D430041D05Rik	068373	136156	N/A	Mycl	028654	147259	N/A	Svil	024236	125512	121972
D430041D05Rik	068373	141159	117041	Myh14	030739	107899	103531	Svil	024236	139761	N/A
D430041D05Rik	068373	156278	N/A	Myh14	030739	048102	046059	Svil	024236	146723	115591

D430041D05Rik	068373	149165	N/A	Myh14	030739	208200	146686	Svil	024236	129543	N/A
D430041D05Rik	068373	155458	N/A	Myh14	030739	208044	N/A	Svil	024236	025079	025079
D430041D05Rik	068373	139015	124519	Myh14	030739	207775	147115	Swap70	031015	033325	033325
D430041D05Rik	068373	149466	124980	Myh14	030739	209024	N/A	Swap70	031015	209261	N/A
D430041D05Rik	068373	089726	106756	Myh14	030739	208085	N/A	Swap70	031015	210743	N/A
D430042O09Rik	032743	124223	118668	Myh14	030739	208131	146584	Swap70	031015	210513	N/A
D430042O09Rik	032743	069660	065744	Myh14	030739	107900	103532	Sycp1	027855	029448	029448
D430042O09Rik	032743	205723	N/A	Myh6	040752	081857	080538	Sycp1	027855	198651	N/A
D430042O09Rik	032743	148701	119527	Myh6	040752	226297	154634	Sycp1	027855	196988	143651
D430042O09Rik	032743	122337	N/A	Myh6	040752	228731	153961	Sycp1	027855	199930	143493
D430042O09Rik	032743	205462	N/A	Myh6	040752	227905	N/A	Syn3	059602	120638	113720
D430042O09Rik	032743	132204	115955	Myh6	040752	131892	N/A	Syn3	059602	145864	N/A
D430042O09Rik	032743	155059	N/A	Myh6	040752	124930	115615	Syn3	059602	123783	N/A
D630003M21Rik	037813	103121	099410	Myh6	040752	111456	107083	Syn3	059602	139197	N/A
D630003M21Rik	037813	046944	040546	Mylip	038175	038275	047403	Syn3	059602	121789	113408
D630003M21Rik	037813	169335	130623	Mylip	038175	222178	152597	Syn3	059602	143319	N/A
D7Ertd443e	030994	094002	091539	Myo10	022272	110457	106087	Syndig1	074736	109935	105561
D7Ertd443e	030994	172947	134479	Myo10	022272	137601	118280	Syndig1	074736	144179	116877
D7Ertd443e	030994	106129	101735	Myo10	022272	127486	N/A	Syndig1	074736	109934	105560
D7Ertd443e	030994	206005	N/A	Myo10	022272	130517	N/A	Syndig1	074736	137280	122838
D7Ertd443e	030994	174700	134411	Myo10	022272	126076	N/A	Syndig1	074736	149705	122327
D7Ertd443e	030994	173195	134585	Myo10	022272	135981	123057	Syndig1	074736	140870	114499
D7Ertd443e	030994	173754	133963	Myo10	022272	022882	022882	Syndig1l	071234	095550	093206
D7Ertd443e	030994	174271	N/A	Myo10	022272	135173	118744	Syndig1l	071234	222422	152374
Tmem131	026116	194563	142307	Myo10	022272	131834	119200	Syndig1l	071234	221905	152304
Tmem131	026116	191381	N/A	Myo10	022272	124966	120817	Syndig1l	071234	221793	N/A
Tmem131	026116	187917	N/A	Myo10	022272	151360	119367	Synj2	023805	146009	122381
Tmem131	026116	189470	140620	Myo10	022272	125667	120566	Synj2	023805	134767	138449
Tmem131	026116	190442	140187	Myo10	022272	145587	N/A	Synj2	023805	080283	079164
Tmem131	026116	186486	142080	Myo1d	035441	041065	037819	Synj2	023805	142409	120006
Tmem131	026116	185964	141413	Myo1d	035441	070997	066948	Synj2	023805	061091	060382
Tmem131	026116	027290	027290	Myo1d	035441	125944	N/A	Synj2	023805	115790	111456
Dagla	035735	039327	046358	Myo7a	030761	107128	102745	Synj2	023805	115789	111455
Dagla	035735	125567	138702	Myo7a	030761	156992	146114	Synj2	023805	115788	111454
Dagla	035735	156361	N/A	Myo7a	030761	084979	082046	Synj2	023805	115787	111453
Dao	042096	112292	107911	Myo7a	030761	107122	102739	Synj2	023805	115786	111452
Dao	042096	086599	083792	Myo7a	030761	205746	146165	Synj2	023805	115784	111450
Dao	042096	161610	125588	Myo7a	030761	107127	102744	Synj2	023805	115785	111451
Dao	042096	199175	143337	Myo7a	030761	124787	N/A	Synj2	023805	130661	N/A
Dao	042096	162214	N/A	Myo7a	030761	152975	N/A	Synj2	023805	154114	122316
Dapk1	021559	226059	153607	Myo7a	030761	153657	N/A	Synj2	023805	126881	115371
Dapk1	021559	077453	076666	Myo7a	030761	155637	N/A	Synj2	023805	115791	111457
Dapk1	021559	224340	N/A	Myo7a	030761	149079	N/A	Synpr	056296	070323	064986
Dapk1	021559	044083	040825	Myo7a	030761	138627	114944	Synpr	056296	223580	N/A
Dapk1	021559	225632	N/A	Myo7a	030761	131632	N/A	Synpr	056296	225636	N/A
Dapk1	021559	224789	153205	Myot	024471	025349	025349	Synpr	056296	226094	N/A
Dapk1	021559	225952	N/A	Myot	024471	115498	111160	Synpr	056296	223583	153361
Slc6a3	021609	022100	022100	Myrf	036098	088013	085329	Synpr	056296	153954	116342
Dcc	060534	114943	110593	Myrf	036098	190922	N/A	Synpr	056296	145700	N/A
Dcc	060534	073379	073094	Myrf	036098	186056	140871	Synpr	056296	147677	N/A
Dcc	060534	126030	N/A	Myrf	036098	186854	140838	Synpr	056296	112656	108275
Ddhd1	037697	111828	107459	Myrf	036098	189897	139601	Syt10	063260	029441	029441
Ddhd1	037697	087320	084577	Myrf	036098	189439	N/A	Syt12	049303	059295	055237
Ddhd1	037697	051310	050088	Ncald	051359	090150	087611	Syt12	049303	128114	N/A
Ddhd1	037697	152110	N/A	Ncald	051359	120746	112898	Syt12	049303	166191	130418
Ddhd1	037697	129599	N/A	Ncald	051359	119730	113858	Syt12	049303	133222	N/A
Ddhd1	037697	149286	118848	Ncald	051359	116445	112146	Syt14	016200	215093	151129

Ddhd1	037697	156758	121837	Ncald	051359	153775	114576	Syt14	016200	195354	142190
Ddhd1	037697	141487	133358	Ncald	051359	148652	121460	Syt14	016200	195530	141563
Ddhd1	037697	126428	N/A	Ncald	051359	132423	N/A	Syt14	016200	016344	016344
Ddhd1	037697	226301	154065	Ncald	051359	150453	119726	Syt14	016200	191907	N/A
Ddhd1	037697	147551	N/A	Ncald	051359	226924	N/A	Syt17	058420	081574	080284
Ddhd1	037697	153547	N/A	Ncald	051359	137944	N/A	Syt17	058420	203465	147122
Ddhd1	037697	226559	N/A	Ncald	051359	123317	N/A	Syt17	058420	203796	145087
Ddn	059213	075444	074895	Ncald	051359	168992	130126	Syt17	058420	203485	144987
Ddr2	026674	194690	141443	Ncam2	022762	037785	049390	Syt17	058420	207034	146460
Ddr2	026674	192312	142191	Ncam2	022762	067602	063468	Syt17	058420	207650	N/A
Ddr2	026674	195867	N/A	Ncan	002341	002412	002412	Syt4	024261	025110	025110
Ddr2	026674	194619	N/A	Nceh1	027698	046515	045864	Tanc1	035168	112568	108187
Ddr2	026674	027985	027985	Nceh1	027698	138947	115209	Tanc1	035168	142573	N/A
Ddr2	026674	170800	129624	Nceh1	027698	129412	N/A	Tanc1	035168	128030	N/A
Ddx3y	069045	091190	088729	Nceh1	027698	091284	088829	Tanc1	035168	139863	123345
Ddx3y	069045	188182	N/A	Nceh1	027698	140872	N/A	Tanc1	035168	127013	N/A
Ddx3y	069045	188484	140361	Nckap5	049690	161954	125624	Tanc1	035168	056900	N/A
Ddx3y	069045	187596	N/A	Nckap5	049690	162877	124748	Tanc1	035168	126271	N/A
Depdc1b	021697	051594	059291	Nckap5	049690	160736	N/A	Tanc1	035168	136248	N/A
Depdc1b	021697	168037	N/A	Nckap5	049690	057846	062229	Tanc1	035168	162857	N/A
Depdc1b	021697	163307	131707	Nckap5	049690	094610	092193	Tanc1	035168	147650	N/A
Depdc1b	021697	171178	132972	Nckap5	049690	159934	N/A	Tanc1	035168	037526	036003
Depdc1b	021697	167413	N/A	Nckap5	049690	162646	123936	Taok3	061288	111978	107609
Depdc1b	021697	172402	N/A	Nckap5	049690	160693	123975	Taok3	061288	125738	117841
Depdc7	027173	028595	028595	Nckap5	049690	162664	N/A	Taok3	061288	128720	N/A
Depdc7	027173	144133	N/A	Nckap5	049690	162647	N/A	Taok3	061288	092889	090565
Des	026208	027409	027409	Nckap5	049690	112583	108202	Taok3	061288	126813	N/A
Des	026208	144894	N/A	Nckap5	049690	094609	092192	Taok3	061288	145640	116920
Des	026208	125948	N/A	Ndrg1	005125	005256	005256	Taok3	061288	153709	N/A
Gsdme	029821	204417	N/A	Ndrg1	005125	165966	N/A	Taok3	061288	127814	119998
Gsdme	029821	165099	130522	Ndrg1	005125	166420	127099	Taok3	061288	111975	107606
Gsdme	029821	101405	098952	Ndrg1	005125	171569	N/A	Taok3	061288	179276	136750
Gsdme	029821	031845	031845	Ndrg1	005125	164675	130150	Tbc1d1	029174	199270	143451
Gsdme	029821	167893	132062	Ndrg1	005125	168542	127940	Tbc1d1	029174	043893	044577
Gsdme	029821	204700	N/A	Ndrg1	005125	167817	127075	Tbc1d1	029174	121370	112493
Gsdme	029821	170142	126759	Ndrg1	005125	168979	126985	Tbc1d1	029174	129389	N/A
Dgkb	036095	222337	152460	Ndrg1	005125	172447	130281	Tbc1d1	029174	119756	113643
Dgkb	036095	221176	152446	Ndrg1	005125	171266	129093	Tbc1d1	029174	147348	119710
Dgkb	036095	220990	152378	Ndrg1	005125	170903	127302	Tbc1d1	029174	140960	N/A
Dgkb	036095	221540	N/A	Ndrg1	005125	163496	130584	Tbc1d1	029174	101195	098756
Dgkb	036095	040500	037900	Ndrg1	005125	164070	126091	Tbc1d4	033083	161991	125509
Dgkb	036095	221098	N/A	Ndrg2	004558	004673	004673	Tbc1d4	033083	161304	N/A
Dgkb	036095	221686	N/A	Ndrg2	004558	111632	107259	Tbc1d4	033083	159951	124511
Dgkb	036095	220606	N/A	Ndrg2	004558	226698	N/A	Tbc1d4	033083	162617	124909
Dgkh	034731	226342	154036	Ndrg2	004558	227237	153938	Tbc1d4	033083	160297	N/A
Dgkh	034731	227537	154107	Ndrg2	004558	226122	N/A	Tbc1d4	033083	159484	N/A
Dgkh	034731	228362	154554	Ndrg2	004558	227402	154279	Tbc1d4	033083	159668	N/A
Dgkh	034731	227767	154031	Ndrg2	004558	228164	153830	Tbc1d4	033083	159664	124734
Dgkh	034731	227820	N/A	Ndrg2	004558	226366	N/A	Tbc1d4	033083	100340	097913
Dgkh	034731	074729	074290	Ndrg2	004558	226528	154716	Tbc1d4	033083	160473	N/A
Dgki	038665	101532	099071	Ndrg2	004558	226184	154135	Tbc1d5	023923	024717	024717
Dgki	038665	150300	138457	Ndrg2	004558	228620	N/A	Tbc1d5	023923	224977	N/A
Dgki	038665	138286	138628	Ndrg2	004558	226364	N/A	Tbc1d5	023923	224528	153172
Dgki	038665	090314	087788	Ndrg2	004558	228173	N/A	Tbc1d5	023923	225252	N/A
Dgki	038665	042075	047858	Ndst3	027977	137404	118796	Tbc1d5	023923	223979	N/A
Dgki	038665	143046	N/A	Ndst3	027977	132112	120623	Tbc1d5	023923	223758	N/A
Dgki	038665	146656	N/A	Ndst3	027977	154668	118207	Tbc1d5	023923	224547	N/A
Dgki	038665	136457	N/A	Ndst3	027977	124803	122617	Tbc1d5	023923	224123	N/A
Disp3	041544	047720	038490	Ndst3	027977	172537	133657	Tbc1d5	023923	225473	N/A

Disp3	041544	143851	N/A	Ndst3	027977	199046	N/A	Tbcel	037287	125995	114721
Disp3	041544	129734	N/A	Ndst3	027977	199825	N/A	Tbcel	037287	066148	067882
Dixdc1	032064	034566	034566	Ndst3	027977	132896	N/A	Tbcel	037287	066179	065125
Dixdc1	032064	141919	N/A	Ndst3	027977	029602	029602	Tbcel	037287	142775	N/A
Dixdc1	032064	117646	112431	Ndst4	027971	173932	133341	Tbcel	037287	138506	116616
Dixdc1	032064	119449	N/A	Ndst4	027971	147016	N/A	Tbcel	037287	128959	121164
Dixdc1	032064	121634	113089	Ndst4	027971	144344	120687	Tbcel	037287	134374	114275
Dixdc1	032064	124424	N/A	Ndst4	027971	174648	133575	Tbcel	037287	213428	N/A
Dixdc1	032064	120622	113934	Ndst4	027971	172632	N/A	Tbr1	035033	048934	046787
Dixdc1	032064	151109	N/A	Ndst4	027971	198101	142414	Tbr1	035033	102737	099798
Dixdc1	032064	149717	N/A	Nectin3	022656	023335	023335	Tbr1	035033	131538	N/A
Dixdc1	032064	154315	N/A	Nectin3	022656	023334	023334	Tbr1	035033	136867	N/A
Dixdc1	032064	117093	112654	Nectin3	022656	096052	093757	Tbxas1	029925	162521	125406
Dixdc1	032064	118707	113907	Nectin3	022656	133935	N/A	Tbxas1	029925	003017	003017
Dlc1	031523	033923	033923	Nectin3	022656	149901	117479	Tbxas1	029925	159226	N/A
Dlc1	031523	098826	096425	Nectin3	022656	121245	113146	Tbxas1	029925	161781	N/A
Dlc1	031523	163663	132812	Nectin3	022656	132089	N/A	Tbxas1	029925	160963	124640
Dlc1	031523	156312	N/A	Nectin3	022656	119941	113301	Tbxas1	029925	162656	N/A
Dlc1	031523	145245	N/A	Nectin3	022656	121803	112567	Tbxas1	029925	161360	N/A
Dlc1	031523	036104	N/A	Nectin3	022656	124602	115927	Tceal7	079428	126811	122260
Dlc1	031523	178717	N/A	Nedd4l	024589	225057	153537	Tceal7	079428	113116	108741
Dlc1	031523	179652	N/A	Nedd4l	024589	225261	153107	Tcerg1l	091002	162222	N/A
Dlc1	031523	179501	137498	Nedd4l	024589	224385	153594	Tcerg1l	091002	161213	N/A
Dlgap2	047495	152652	123078	Nedd4l	024589	223959	N/A	Tcerg1l	091002	160436	124476
Dlgap2	047495	133298	119613	Nedd4l	024589	224347	153052	Tcf7l1	055799	069536	069403
Dlgap2	047495	150247	123104	Nedd4l	024589	224516	N/A	Tcf7l1	055799	114053	109687
Dlgap2	047495	141155	N/A	Nedd4l	024589	224890	N/A	Tcf7l1	055799	141743	N/A
Dlgap2	047495	136000	N/A	Nedd4l	024589	080418	079280	Tcf7l1	055799	149446	115060
Dlgap2	047495	141214	N/A	Nedd4l	024589	226058	153526	Tcf7l1	055799	182651	N/A
Dlgap2	047495	137130	N/A	Nedd4l	024589	224663	N/A	Tcp11l2	020034	020223	020223
Dlgap2	047495	129119	N/A	Nedd4l	024589	163516	132838	Tcp11l2	020034	162874	N/A
Dlgap2	047495	043279	039647	Nefh	020396	093369	091061	Tcp11l2	020034	160057	N/A
Dlgap4	061689	169464	126980	Negr1	040037	074015	073664	Tcte1	023949	113547	109175
Dlgap4	061689	109568	105196	Negr1	040037	041425	041132	Tctex1d1	028523	220547	152803
Dlgap4	061689	070782	068745	Negr1	040037	106065	101680	Tctex1d1	028523	223169	152761
Dlgap4	061689	137356	135698	Negr1	040037	197246	N/A	Tctex1d1	028523	030248	030248
Dlgap4	061689	131157	134941	Negr1	040037	175773	135531	Tctex1d1	028523	125417	117319
Dlgap4	061689	109566	105194	Nek2	026622	027931	027931	Tctex1d1	028523	169211	128228
Dlgap4	061689	127944	N/A	Nek2	026622	126446	N/A	Tctex1d1	028523	140654	116692
Dlgap4	061689	146412	135156	Nek2	026622	150839	N/A	Tctex1d1	028523	139883	N/A
Dlgap4	061689	177013	135409	Nek2	026622	136733	N/A	Tctex1d1	028523	116317	112019
Dlgap4	061689	171030	129756	Nek2	110797	213394	149034	Tdp1	021177	151019	N/A
Dlgap4	061689	000094	000094	Nek2	110797	216945	N/A	Tdp1	021177	125639	N/A
Dlgap4	061689	099145	096749	Nek2	110797	217216	N/A	Tdp1	021177	153627	118656
Dlgap4	061689	123730	N/A	Nek2	110797	215890	N/A	Tdp1	021177	221396	N/A
Dlgap4	061689	109567	105195	Nek4	021918	226551	154678	Tdp1	021177	137653	123269
Dlx4os	086552	156477	N/A	Nek4	021918	228328	154090	Tdp1	021177	126424	N/A
Dlx6os1	098326	184182	N/A	Nek4	021918	228392	N/A	Tdp1	021177	128739	N/A
Dlx6os1	090063	159827	N/A	Nek4	021918	050171	057915	Tdp1	021177	220685	N/A
Dlx6os1	090063	159568	N/A	Nek4	021918	226833	154606	Tdp1	021177	021594	021594
Dlx6os1	090063	210702	N/A	Nek4	021918	227602	N/A	Tead1	055320	084705	081755
Dmd	045103	114000	109633	Nek4	021918	227199	N/A	Tead1	055320	059768	060671
Dmd	045103	128983	N/A	Nek4	021918	226146	153710	Tead1	055320	106638	102249
Dmd	045103	113991	109624	Nell1	055409	151721	114706	Tead1	055320	172065	N/A
Dmd	045103	132333	N/A	Nell1	055409	081872	080550	Tead1	055320	171373	131765
Dmd	045103	146331	N/A	Nell1	055409	145096	N/A	Tead1	055320	164363	127574
Dmd	045103	149433	N/A	Nell1	055409	107603	103229	Tead1	055320	163593	N/A
Dmd	045103	113992	109625	Nell1	055409	154410	N/A	Tead1	055320	170352	129798
Dmd	045103	156107	N/A	Neo1	032340	068664	063656	Tead1	055320	168981	133025

Dmd	045103	147740	N/A	Neo1	032340	214547	150600	Tead1	055320	171197	128439
Dmd	045103	141778	N/A	Neo1	032340	215165	N/A	Tead1	055320	165036	131221
Dmd	045103	141261	N/A	Neo1	032340	217545	N/A	Tead1	055320	167060	130564
Dmd	045103	139998	N/A	Neo1	032340	215026	N/A	Tead1	055320	168328	N/A
Dmd	045103	123308	N/A	Neo1	032340	216964	149424	Tead1	055320	210510	N/A
Dmd	045103	127295	N/A	Nes	004891	159830	N/A	Tead1	055320	069256	130459
Dmp1	029307	066708	068053	Nes	004891	090973	088493	Tead4	030353	130454	118083
Dnah5	022262	067048	069751	Nes	004891	160694	125571	Tead4	030353	006311	006311
Dnah6	052861	114040	109674	Neto1	050321	058829	057340	Tead4	030353	112157	107784
Dnah6	052861	204053	144791	Neu4	034000	050890	051151	Tead4	030353	133118	120941
Dnah6	052861	114038	N/A	Neu4	034000	190212	140127	Tead4	030353	143004	118606
Dnah6	052861	064948	068758	Rbfox3	025576	117731	113636	Tec	029217	071944	071836
Dner	036766	049126	042927	Rbfox3	025576	103023	099312	Tec	029217	113594	109224
Dner	036766	191306	N/A	Rbfox3	025576	017576	017576	Tec	029217	126481	123606
Dner	036766	185606	140986	Rbfox3	025576	069343	069598	Tec	029217	155342	118980
Dner	036766	191546	140662	Rbfox3	025576	106278	101885	Tec	029217	073843	073509
Dnmbp	025195	212396	148582	Rbfox3	025576	120061	113987	Tec	029217	138842	120155
Dnmbp	025195	212592	148421	Rbfox3	025576	154746	118332	Tec	029217	149533	123258
Dnmbp	025195	212048	148546	Rbfox3	025576	136551	119255	Tec	029217	150193	N/A
Dumbp	025195	212032	148708	Rbfox3	025576	128863	N/A	Tec	029217	202547	144458
Dnmbp	025195	212157	N/A	Rbfox3	025576	134774	N/A	Tek	006386	073939	073595
Dnmbp	025195	026209	026209	Rbfox3	025576	117731	113636	Tek	006386	102798	099862
Doc2b	020848	021209	021209	Rbfox3	025576	103023	099312	Tek	006386	071168	071162
Dock1	058325	211570	N/A	Rbfox3	025576	017576	017576	Tek	006386	131958	N/A
Dock1	058325	211593	147945	Rbfox3	025576	069343	069598	Tes	029552	115467	111127
Dock1	058325	084488	081531	Rbfox3	025576	106278	101885	Tes	029552	200690	N/A
Dock1	058325	210617	N/A	Rbfox3	025576	120061	113987	Tes	029552	154266	118791
Dock1	058325	210464	N/A	Rbfox3	025576	154746	118332	Tes	029552	121170	N/A
Dock1	058325	210121	147797	Rbfox3	025576	136551	119255	Tes	029552	076654	075950
Dock5	044447	039135	036674	Rbfox3	025576	128863	N/A	Tesc	029359	031304	031304
Dock5	044447	226033	N/A	Rbfox3	025576	134774	N/A	Tesc	029359	124648	138436
Dock5	044447	224823	N/A	Neurl1a	006435	111808	107439	Tesc	029359	135540	N/A
Dock6	032198	217336	149156	Neurl1a	006435	111807	107438	Tesc	029359	151792	N/A
Dock6	032198	215729	150250	Neurod1	034701	041099	040364	Tesc	029359	148777	N/A
Dock6	032198	034728	034728	Neurod6	037984	044767	047016	Tesc	029359	145526	N/A
Dock6	032198	217310	N/A	Nfatc2	027544	074618	074198	Tex36	030976	033275	033275
Dock6	032198	216626	150347	Nfatc2	027544	109184	104812	Tex52	079304	130785	145112
Dock6	032198	217515	N/A	Nfatc2	027544	151292	N/A	Tex52	079304	100926	098486
Dock6	032198	213296	N/A	Nfatc2	027544	099067	N/A	Tex9	090626	184312	138844
Dock6	032198	213775	N/A	Nfatc2	027544	029057	029057	Tex9	090626	085358	082467
Dock7	028556	030286	030286	Nfatc2	027544	137451	118329	Tex9	090626	184125	139026
Dock7	028556	206128	N/A	Nfatc2	027544	140137	N/A	Tex9	090626	183399	N/A
Dock7	028556	127417	117797	Nfatc2	027544	138546	N/A	Tex9	090626	184831	138999
Dock7	028556	124466	145749	Nfatc2	027544	171689	130875	Tex9	090626	183574	139386
Dock7	028556	075836	075233	Nhsl1	039835	207038	147021	Tex9	090626	183856	139247
Dock7	028556	205650	145604	Nhsl1	039835	159299	N/A	Tex9	090626	184557	139212
Dock7	028556	140225	N/A	Nhsl1	039835	161510	N/A	Tex9	090626	184066	N/A
Dock7	028556	205484	N/A	Nhsl1	039835	160602	N/A	Tex9	090626	184734	N/A
Dock7	028556	124040	N/A	Nhsl1	039835	037341	040799	Tex9	090626	183428	139326
Dock7	028556	205652	145833	Nhsl1	039835	160547	N/A	Tex9	090626	183551	N/A
Dock7	028556	139152	N/A	Nhsl1	039835	160600	N/A	Tex9	090626	183501	138882
Dock7	028556	140848	N/A	Nhsl1	039835	162891	124072	Tex9	090626	185151	138929
Dock7	028556	150254	114204	Nhsl1	039835	100054	097631	Tex9	090626	185106	N/A
Dock7	028556	127946	119103	Nid1	005397	005532	005532	Tex9	090626	184624	N/A
Dock7	028556	205783	N/A	Nid1	005397	222142	N/A	Tfap2a	021359	021787	021787
Dock7	028556	153362	N/A	Nid1	005397	222436	N/A	Tfap2a	021359	224319	N/A
Dock7	028556	131386	145985	Ninj2	041377	112711	108331	Tfap2a	021359	223869	153149
Dock7	028556	206604	N/A	Ninj2	041377	035244	046306	Tfap2a	021359	225180	153271
Dock8	052085	025831	025831	Nipal4	020411	020679	020679	Tfap2a	021359	224999	153522

Dok6	073514	097495	095103	Nkain2	069670	191234	140463	Tfap2a	021359	224665	153667
Dok6	073514	160328	N/A	Nkain2	069670	218645	151255	Tfap2a	021359	223908	N/A
Dopey2	022946	045004	044437	Nkain2	069670	219125	151959	Tfap2a	021359	224700	N/A
Dopey2	022946	226335	N/A	Nkain2	069670	219306	N/A	Tfap2a	021359	110193	105822
Dopey2	022946	226418	N/A	Nkain2	069670	092602	090264	Tfap2b	025927	027059	027059
Dopey2	022946	228846	154446	Nkain2	069670	092603	090265	Tfap2b	025927	187754	140213
Dopey2	022946	227156	154771	Nkx2-2	027434	109970	105596	Tfap2b	025927	064976	064488
Dopey2	022946	226836	154636	Nkx2-2	027434	067075	069666	Tfap2b	025927	191068	N/A
Dopey2	022946	226215	154229	Nkx2-2	027434	109969	N/A	Tfap2b	025927	186972	N/A
Dopey2	022946	226535	N/A	Nkx2-2	027434	172627	N/A	Tg	053469	065916	070239
Dopey2	022946	227939	N/A	Nlgn3	031302	118111	113863	Tg	053469	163495	129868
Dopey2	022946	228261	N/A	Nlgn3	031302	130555	122213	Tg	053469	167512	N/A
Dopey2	022946	227278	N/A	Nlgn3	031302	151528	123283	Tg	053469	171045	126454
Dopey2	022946	228423	N/A	Nlgn3	031302	065858	066304	Tg	053469	166906	N/A
Dpf3	021221	147469	122598	Nlgn3	031302	147443	N/A	Tg	053469	167344	N/A
Dpf3	021221	144237	122004	Nlgn3	031302	144860	N/A	Tg	053469	172153	128410
Dpf3	021221	133282	121199	Nln	021710	109315	104938	Tg	053469	166403	N/A
Dpf3	021221	140327	120700	Nln	021710	225324	153299	Tgfb2	039239	045288	043849
Dpf3	021221	178756	136280	Nln	021710	224058	N/A	Tgfb2	039239	195201	142149
Dpf3	021221	177959	137477	Nln	021710	225704	N/A	Tgfb2	039239	191766	N/A
Dpf3	021221	177801	136740	Nln	021710	224945	153227	Tgfb2	039239	194960	N/A
Dpp10	036815	112606	108225	Nln	021710	224475	N/A	Tgfb2	039239	194593	N/A
Dpp10	036815	112603	108222	Nln	021710	225478	N/A	Tgfb2	039239	193640	N/A
Dpp10	036815	187202	N/A	Nln	021710	224086	N/A	Tgfb3	021253	003687	003687
Dpp10	036815	140361	N/A	Nrt	025453	069902	070564	Th	000214	000219	000219
Dpy19l1	043067	115277	110932	Nrt	025453	099149	096753	Th	000214	105929	101549
Dpy19l1	043067	142064	119986	Nrt	025453	109204	104827	Th	000214	124951	122876
Dpy19l1	043067	152480	N/A	Nrt	025453	133627	N/A	Th	000214	138482	123661
Dpy19l1	043067	149001	N/A	Nrt	025453	144599	N/A	Th	000214	123057	122162
Dpy19l1	043067	129048	N/A	Nrt	025453	223268	152868	Th	000214	140344	115434
Dpy19l1	043067	170356	129575	Notch1	026923	028288	028288	Thbs2	023885	170872	128308
Dpy19l2	085576	133010	132092	Notch1	026923	132941	N/A	Thsd7b	042581	148051	N/A
Dpyd	033308	039177	039429	Notch1	026923	148948	N/A	Thsd7b	042581	073527	073220
Dpyd	033308	126254	N/A	Notch1	026923	138034	N/A	Thsd7b	042581	040311	041716
Dpyd	033308	150950	N/A	Notch1	026923	126872	N/A	Thsd7b	042581	140629	N/A
Dpyd	033308	149101	143022	Notch1	026923	140082	N/A	Thsd7b	042581	152305	117750
Dpyd	033308	200178	N/A	Notch1	026923	147481	N/A	Thsd7b	042581	190870	N/A
Dpyd	033308	129148	N/A	Notch1	026923	123873	N/A	Thsd7b	042581	151700	N/A
Dpysl3	024501	121805	112928	Notch1	026923	129506	N/A	Thsd7b	042581	140834	N/A
Dpysl3	024501	135547	N/A	Notch1	026923	132820	115258	Thsd7b	042581	143130	N/A
Dpysl3	024501	118043	113711	Notch1	026923	131393	N/A	Thyn1	035443	214910	N/A
Dpysl3	024501	025379	025379	Npr3	022206	066529	066737	Thyn1	035443	213770	151200
Dpysl3	024501	124207	114981	Npr3	022206	226139	N/A	Thyn1	035443	213683	150823
Dpysl3	024501	118071	113604	Npr3	022206	228603	154180	Thyn1	035443	039161	037614
Dpysl4	025478	026551	026551	Npr3	022206	228489	153895	Thyn1	035443	214458	N/A
Dpysl4	025478	139364	N/A	Npr3	022206	226878	N/A	Thyn1	035443	217143	N/A
Dpysl4	025478	154273	N/A	Npy1r	036437	212588	148417	Thyn1	035443	215024	N/A
Dpysl4	025478	122844	N/A	Npy1r	036437	039303	045530	Thyn1	035443	216361	N/A
Dpysl4	025478	145499	117764	Nrcam	020598	218940	N/A	Timp3	020044	020234	020234
Dpysl4	025478	121184	112896	Nrcam	020598	110748	106376	Timp3	020044	151134	N/A
Dtd1	021478	221470	152768	Nrcam	020598	219592	N/A	Timp3	020044	136045	N/A
Dtd1	021478	222706	N/A	Nrcam	020598	220130	N/A	Timp3	020044	132307	133236
Dtd1	021478	021932	021932	Nrcam	020598	020939	020939	Tlcd1	019437	098545	096145
Dtd2	032259	075764	075170	Nrcam	020598	220126	151296	Tlcd1	019437	147819	126593
Dscaml1	032087	217335	N/A	Nrcam	020598	217907	151419	Tlcd1	019437	145507	N/A
Dscaml1	032087	217538	149771	Nrcam	020598	218540	151732	Tlcd1	019437	092880	090556
Dscaml1	032087	213919	150245	Nrcam	020598	219928	N/A	Tlcd1	019437	127587	114202
Dscaml1	032087	216340	N/A	Nrcam	020598	218805	N/A	Tlcd1	019437	141578	N/A
Dscaml1	032087	034592	034592	Nrcam	020598	220123	151844	Tlcd1	019437	108338	103975

Dscaml1	032087	216078	148905	Ntcam	020598	218431	151873	Tlcd1	019437	140379	N/A
Dscaml1	032087	216685	149247	Ntcam	020598	219939	152002	Tle4	024642	052011	057527
Dscaml1	032087	215027	N/A	Ntcam	020598	219906	151243	Tle4	024642	167776	126249
Dscaml1	032087	214151	N/A	Ntcam	020598	220082	151824	Tll1	053626	066166	070560
Dusp16	030203	129433	115925	Ntcam	020598	217796	N/A	Tll1	053626	209451	N/A
Dusp16	030203	100857	098419	Ntcam	020598	218062	151475	Tll1	053626	211755	N/A
Dusp16	030203	204083	144834	Nrg1	062991	207470	146456	Tll1	053626	210256	147695
Dusp16	030203	203651	N/A	Nrg1	062991	207417	146905	Tlr3	031639	034056	034056
Dusp16	030203	203452	N/A	Nrg1	062991	209107	146617	Tlr3	031639	167106	126556
Dusp16	030203	148926	144917	Nrg1	062991	208617	146857	Tlr3	031639	210013	147783
Dusp16	030203	149776	144784	Nrg1	062991	208205	147156	Tlr3	031639	209772	147738
Dusp22	069255	091672	089260	Nrg1	062991	073884	073546	Tlr3	031639	211370	148127
Dusp22	069255	110310	105939	Nrg1	062991	208488	147121	Tlr3	031639	210996	148263
Dusp22	069255	220748	N/A	Nrg1	062991	208819	146403	Tlr3	031639	209651	147961
Dusp22	069255	221725	152283	Nrg1	062991	208335	146375	Tlr3	031639	209269	N/A
Dusp22	069255	095914	093603	Nrg1	062991	208598	146478	Tlr3	031639	210354	N/A
Dusp26	039661	036631	046794	Nrg1	062991	208497	146816	Tmc1	024749	039500	040859
Dusp26	039661	170204	126397	Nrg1	062991	207678	N/A	Tmc7	042246	044195	046927
Dusp26	039661	162551	N/A	Nrg1	062991	208355	N/A	Tmc7	042246	153635	N/A
Dusp26	039661	161713	124949	Nrg1	062991	208931	146507	Tmc7	042246	145989	N/A
Dusp26	039661	160700	N/A	Nrg1	062991	209022	146842	Tmc7	042246	139693	N/A
Dusp5	034765	038287	047900	Nrg1	062991	207584	N/A	N/A	N/A	N/A	N/A
Dzank1	037259	081982	080643	Nrg1	062991	208820	N/A	Tmem108	042757	049452	046021
Dzank1	037259	124823	N/A	Nrg1	062991	208206	N/A	Tmem108	042757	189588	140027
Dzank1	037259	150816	N/A	Nrg2	060275	115713	111378	Tmem108	042757	189066	141160
Dzank1	037259	163701	133177	Nrg2	060275	115712	111377	Tmem108	042757	191069	N/A
Dzip1l	037784	131095	116647	Nrg2	060275	115705	N/A	Tmem108	042757	215136	149890
Dzip1l	037784	078367	077475	Nrg2	060275	225173	N/A	Tmem108	042757	186455	N/A
Dzip1l	037784	112885	108506	Nrg3	041014	166968	136884	Tmem125	050854	060214	063157
Dzip1l	037784	112886	108507	Nrg3	041014	168810	129783	Tmem125	050854	128098	115304
Dzip1l	037784	112884	108505	Nrg3	041014	173780	134727	Tmem125	050854	150044	117871
Dzip1l	037784	134969	N/A	Nrg3	041014	176122	N/A	Tmem125	050854	156191	117286
Dzip1l	037784	190893	N/A	Nrgn	053310	065668	070113	Tmem125	050854	154025	N/A
Ebf1	057098	081265	080020	Nrgn	053310	182070	N/A	Tmem132b	070498	185104	139013
Ebf1	057098	101326	099857	Ntk	052854	113052	108675	Tmem132b	070498	031446	031446
Ebf1	057098	109268	104891	Ntk	052854	131829	115962	Tmem132b	070498	184422	N/A
Ebf1	057098	140822	N/A	Ntk	052854	155201	N/A	Tmem132c	034324	119026	113090
Ebf1	057098	149997	N/A	Ntk	052854	142132	N/A	Tmem132c	034324	134780	N/A
Ebf1	057098	135993	N/A	Ntk	052854	064937	063397	Tmem132c	034324	128068	N/A
Ebf1	057098	138452	N/A	Nrxn1	024109	072671	072458	Tmem132c	034324	132592	N/A
Ebf2	022053	022637	022637	Nrxn1	024109	160844	125407	Tmem132c	034324	145748	121783
Ebf2	022053	176161	135500	Nrxn1	024109	197268	142815	Tmem132e	020701	092852	090528
Ebf2	022053	177231	N/A	Nrxn1	024109	174331	133491	Tmem132e	020701	054245	052484
Ebf2	022053	176029	135782	Nrxn1	024109	159778	125561	Tmem132e	020701	132477	N/A
Ebf3	010476	033378	033378	Nrxn1	024109	173917	133389	Tmem132e	020701	202598	N/A
Ebf3	010476	106118	101724	Nrxn1	024109	174337	133724	Tmem150c	050640	124145	N/A
Ebf3	010476	210774	147829	Nrxn1	024109	161402	124116	Tmem150c	050640	165548	N/A
Ebf3	010476	209578	147512	Nrxn1	024109	173222	146701	Tmem150c	050640	139520	114464
Ebf3	010476	209905	N/A	Nrxn1	024109	054059	057294	Tmem150c	050640	063192	057116
Ebf3	010476	209864	N/A	Nrxn1	024109	172466	134402	Tmem150c	050640	146731	N/A
Ebf3	010476	168203	130334	Nrxn1	024109	160800	124561	Tmem163	026347	027585	027585
Ebf3	010476	169486	132563	Nrxn1	024109	197104	142621	Tmem163	026347	185560	140828
Ebf4	053552	110288	105917	Nrxn1	024109	176918	N/A	Tmem163	026347	160111	N/A
Ebf4	053552	110286	105915	Nrxn1	024109	196269	N/A	Tmem163	026347	162406	N/A
Ebf4	053552	134728	N/A	Nrxn1	024109	161102	N/A	Tmem163	026347	160616	124307
Ebf4	053552	126740	133528	Nrxn1	024109	196559	142891	Tmem178	024245	025092	025092
Ebf4	053552	140169	134520	Nrxn1	024109	176118	135241	Tmem179	054013	066791	068004
Ebf4	053552	110287	105916	Nrxn1	024109	198899	N/A	Tmem179	054013	222836	152792
Ece1	057530	102518	099576	Nrxn1	024109	161637	N/A	Tmem200a	049420	217910	N/A

Ece1	057530	130407	125529	Nrxn1	024109	177342	135301	Tmem200a	049420	218232	151861
Ece1	057530	151110	114671	Nrxn1	024109	197224	142650	Tmem200a	049420	066049	064080
Ece1	057530	129607	N/A	Nrxn1	024109	162227	N/A	Tmem200a	049420	219651	151832
Echdc2	028601	052999	051268	Nrxn1	024109	160467	N/A	Tmem200a	049420	219338	151494
Echdc2	028601	130942	124746	Nrxn1	024109	159419	N/A	Tmem200a	049420	219872	151559
Echdc2	028601	125647	123913	Nrxn1	024109	162002	N/A	Tmem255a	036502	089056	086457
Echdc2	028601	116307	112009	Ntf3	049107	204542	144828	Tmem255a	036502	089054	086455
Echdc2	028601	135718	114371	Ntf3	049107	112244	107863	Tmem255a	036502	155848	N/A
Echdc2	028601	138701	N/A	Ntf3	049107	050484	052302	Tmem255a	036502	066498	064511
Echdc2	028601	133049	N/A	Ntm	059974	075069	074578	Tmem255a	036502	139358	N/A
Echdc2	028601	123280	N/A	Ntm	059974	124119	N/A	Tmem266	032313	085754	082906
Echdc2	028601	126900	123734	Ntm	059974	151977	N/A	Tmem266	032313	034862	034862
Echdc2	028601	150487	N/A	Ntm	059974	115237	110892	Tmem266	032313	130465	N/A
Echdc2	028601	127392	N/A	Ntm	059974	152513	N/A	Tmem63a	026519	161847	124937
Echdc2	028601	106691	102302	Ntm	059974	140118	114810	Tmem63a	026519	162283	125287
Echdc2	028601	116309	112011	Ntm	059974	155308	119030	Tmem63a	026519	027800	027800
Edem1	030104	204804	144901	Ntm	059974	115236	110891	Tmem63a	026519	159436	125192
Edem1	030104	089162	086565	Ntm	059974	148606	N/A	Tmem63a	026519	161523	124021
Edem1	030104	203469	N/A	Ntm	059974	126044	N/A	Tmem63a	026519	160508	124973
Edem1	030104	204524	N/A	Ntm	059974	146651	N/A	Tmem63a	026519	160536	124860
Edem1	030104	203302	N/A	Ntn1	020902	108674	104314	Tmem63a	026519	161942	N/A
Edil3	034488	118731	112829	Ntn1	020902	135141	121193	Tmem98	035413	040865	042825
Edil3	034488	153974	N/A	Ntn1	020902	021284	021284	Tmod1	028328	107773	103402
Edil3	034488	081769	080462	Ntn4	020019	147080	123306	Tmod1	028328	156200	134075
Edil3	034488	134241	N/A	Ntn4	020019	020204	020204	Tmod1	028328	128689	N/A
Edil3	034488	133761	N/A	Ntsr1	027568	029084	029084	Tmod1	028328	136553	N/A
Edil3	034488	137921	N/A	Ntsr1	027568	170448	127548	Tmod1	028328	155730	N/A
Edil3	034488	140625	N/A	Ntsr2	020591	221596	152110	Tmprss5	032268	165088	132181
Edil3	034488	043111	044652	Ntsr2	020591	111064	106693	Tmprss5	032268	171217	N/A
Ednrb	022122	022718	022718	Ntsr2	020591	220892	152290	Tmprss5	032268	166272	130069
Ednrb	022122	227824	154806	Ntsr2	020591	222957	N/A	Tmprss5	032268	070390	064527
Ednrb	022122	172237	126057	Ntsr2	020591	221049	152592	Tmprss5	032268	167095	131650
Slc13a1	029700	031713	031713	Nudt4	020029	020217	020217	Tmprss5	032268	170246	129482
Slc13a1	029700	174594	N/A	Nup62cl	072944	101212	098772	Tmprss5	032268	170426	128662
Slc13a1	029700	177412	N/A	Nup62cl	072944	154385	121310	Tmtc4	041594	037726	046368
Slc13a1	029700	176692	N/A	Nup62cl	072944	133780	116491	Tmtc4	041594	143189	116480
Efemp1	020467	020759	020759	Nup62cl	072944	125678	116128	Tmtc4	041594	126867	116379
Efemp1	020467	139713	114757	Nup62cl	072944	124075	122713	Tmtc4	041594	148661	121523
Efemp1	020467	124103	N/A	Nwd1	048148	161386	N/A	Tmtc4	041594	126494	N/A
Efhc2	025038	026014	026014	Nwd1	048148	161557	125470	Tmtc4	041594	228661	N/A
Efhd1	026255	118687	112980	Nwd1	048148	161254	124804	Tmtc4	041594	125900	N/A
Efhd1	026255	027472	027472	Nwd1	048148	228312	154488	Tmtc4	041594	135917	N/A
Efhd1	026255	150831	N/A	Nwd1	048148	160443	124446	Tmtc4	041594	227430	N/A
Efhd2	040659	036854	044502	Nwd1	048148	163026	N/A	Tmtc4	041594	128969	118814
Efna5	048915	076840	076115	Nwd1	048148	160912	N/A	Tmtc4	041594	228552	N/A
Efna5	048915	078839	077883	Nwd1	048148	162248	N/A	Tmtc4	041594	153496	N/A
Efnb3	003934	004036	004036	Nwd1	048148	093427	091135	Tmtc4	041594	141478	N/A
Egft	020122	020329	020329	Nxn	020844	021204	021204	Tnc	028364	030056	030056
Egfr	020122	102884	099948	Nxn	020844	131472	N/A	Tnc	028364	107372	102995
Egfr	020122	125984	122632	Nxpe3	075033	099705	097296	Tnc	028364	107371	102994
Egfr	020122	138518	N/A	Ogdhl	021913	228529	154185	Tnc	028364	107377	103000
Egfr	020122	139722	N/A	Ogdhl	021913	228286	N/A	Tnfaip6	053475	065927	069231
Egln3	035105	039516	041874	Ogdhl	021913	022480	022480	Tnfrsf13c	068105	089161	086564
Egr3	033730	035908	037042	Olfm1	026833	028177	028177	Tnfrsf13c	068105	109535	105161
Egr3	033730	225200	153491	Olfm1	026833	113920	109553	Tnfrsf19	060548	111236	106867
Egr3	033730	223809	N/A	Olfm1	026833	102879	099943	Tnfrsf19	060548	111234	106865
Egr3	033730	223747	N/A	Olfm1	026833	152415	N/A	Tnfrsf19	060548	225501	N/A
Ehd3	024065	024860	024860	Olfm1	026833	100244	097815	Tnfrsf19	060548	224371	153577
Eif2s3y	069049	091197	088736	Olfm3	027965	081752	080448	Tnfrsf19	060548	225730	152920

Eif2s3y	069049	137006	N/A	Olfm3	027965	149158	121097	Tnk2	022791	145627	152338
Eif2s3y	069049	148961	N/A	Olfm3	027965	051309	060985	Tnk2	022791	124585	152549
Eif2s3y	069049	154556	N/A	Olig1	046160	056882	061408	Tnk2	022791	115126	110779
Eif2s3y	069049	139083	N/A	Olig2	039830	035608	036797	Tnk2	022791	115125	110778
Eif2s3y	069049	134820	N/A	Onecut2	045991	175965	135692	Tnk2	022791	115124	110777
Elavl2	008489	107110	102727	Onecut2	045991	115145	110798	Tnk2	022791	115123	110776
Elavl2	008489	008633	008633	Opalin	050121	087176	084422	Tnk2	022791	164358	N/A
Elavl2	008489	107118	102735	Ophn1	031214	033560	033560	Tnk2	022791	150383	N/A
Elavl2	008489	107120	102737	Ophn1	031214	142267	119361	Tnk2	022791	156614	N/A
Elavl2	008489	102799	099863	Ophn1	031214	156634	N/A	Tnk2	022791	137044	N/A
Elavl2	008489	128599	N/A	Ophn1	031214	113826	109457	Tnk2	022791	115122	110775
Elavl2	008489	107116	102733	Ophn1	031214	125150	N/A	Tnk2	022791	115120	110773
Elavl2	008489	107109	102726	Ophn1	031214	147805	N/A	Tnk2	022791	131238	129382
Elavl2	008489	107111	102728	Ophn1	031214	156917	N/A	Tnk2	022791	115121	110774
Elavl2	008489	176469	N/A	Ophn1	031214	140598	N/A	Tnk2	022791	168506	N/A
Elavl2	008489	177109	135780	Ophn1	031214	147529	121723	Tnk2	022791	152361	125905
Elavl2	008489	147611	117770	Ophn1	031214	154920	N/A	Tnni1	026418	187830	N/A
Elavl2	008489	176362	135038	Oplah	022562	171340	129100	Tnni1	026418	132795	121122
Elavl2	008489	144769	N/A	Oplah	022562	170261	N/A	Tnni1	026418	152208	121966
Elavl2	008489	176151	N/A	Oplah	022562	169664	N/A	Tnni1	026418	137331	N/A
Elavl2	008489	107124	102741	Oplah	022562	170063	N/A	Tnni1	026418	152075	121343
Elavl4	028546	106603	102214	Oplah	022562	163127	N/A	Tnni1	026418	154463	122925
Elavl4	028546	102723	099784	Oplah	022562	164189	131967	Tnni1	026418	139986	123049
Elavl4	028546	106598	102208	Oplah	022562	163977	N/A	Tnni1	026418	148201	123509
Elavl4	028546	106597	102207	Oplah	022562	210024	148028	Tnni1	026418	129217	119848
Elavl4	028546	102722	099783	Oplah	022562	165279	127955	Tnr	015829	192069	141553
Elavl4	028546	106600	102210	Oplah	022562	023222	023222	Tnr	015829	195199	N/A
Elavl4	028546	106601	102212	Oprd1	050511	056336	050077	Tnr	015829	193325	141752
Elavl4	028546	142722	121828	Optc	010311	124051	120568	Tnr	015829	192457	141509
Elavl4	028546	153200	N/A	Optc	010311	153617	123262	Tnr	015829	111669	107298
Elavl4	028546	144554	N/A	Optc	010311	149380	115661	Tns1	055322	187584	140254
Elavl4	028546	153906	120942	Optc	010311	126123	117086	Tns1	055322	191104	140317
Elavl4	028546	138972	123014	Optc	010311	124245	N/A	Tns1	055322	187691	139844
Elf2	037174	194641	141197	Osbp	024687	025590	025590	Tns1	055322	185702	140094
Elf2	037174	183463	139360	Osbpl10	040875	183104	138287	Tns1	055322	185331	140771
Elf2	037174	062009	061076	Osbpl10	040875	182384	138552	Tns1	055322	212888	148638
Elf2	037174	091144	088678	Osbpl10	040875	183141	138760	Tns1	055322	189228	139721
Elf2	037174	108051	103686	Osbpl10	040875	182199	138206	Tns1	055322	191527	N/A
Elf2	037174	108053	103688	Osbpl10	040875	182920	138266	Tns1	055322	185264	N/A
Elf2	037174	193909	N/A	Osbpl10	040875	182363	N/A	Tns1	055322	185529	N/A
Elf2	037174	195432	142300	Osbpl10	040875	182413	N/A	Tns1	055322	191367	140991
Elf2	037174	183338	139358	Osbpl10	040875	046627	038013	Tns1	055322	188942	N/A
Elf2	037174	184677	139199	Osbpl3	029822	114468	110112	Tns1	055322	191264	N/A
Elf2	037174	194209	N/A	Osbpl3	029822	141466	N/A	Tns1	055322	186381	N/A
Elf2	037174	156983	141525	Osbpl3	029822	090019	087473	Tns1	055322	189571	N/A
Elf2	037174	163748	126871	Osbpl3	029822	071728	071643	Tns1	055322	190389	140448
Elfn1	048988	050519	053869	Osbpl3	029822	114466	110110	Tns1	055322	187281	139616
Elfn1	048988	198608	N/A	Osbpl3	029822	133141	N/A	Tns1	055322	188436	N/A
Elmo2	017670	103091	099380	Osbpl3	029822	203907	145249	Tns1	055322	191204	140878
Elmo2	017670	148643	117124	Osbpl3	029822	146341	114472	Tns1	055322	188208	140837
Elmo2	017670	074046	073691	Osbpl3	029822	136926	144934	Tns1	055322	190599	N/A
Elmo2	017670	094329	091887	Osbpl3	029822	154333	N/A	Tns1	055322	169786	127715
Elmo2	017670	103088	099377	P2ry1	027765	029331	029331	Tns3	020422	020695	020695
Elmo2	017670	071699	071619	P2ry1	027765	193201	142006	Tns3	020422	131941	N/A
Elmo2	017670	127496	N/A	P2ry1	027765	193943	141371	Tns3	020422	134823	N/A
Elmo2	017670	137188	123232	P2ry12	036353	196583	143036	Tns3	020422	129074	N/A
Elmo2	017670	149844	N/A	P2ry12	036353	050360	051353	Tox2	074607	109428	105055
Elmo2	017670	126318	116124	P2ry12	036353	199609	143521	Tox2	074607	128999	122344
Elmo2	017670	133205	119682	P2ry12	036353	199675	143706	Tox2	074607	099110	096710

Elmo2	017670	128690	114303	P2ry12	036353	170388	126819	Tox2	074607	148599	118219
Elmod1	041986	215313	N/A	Pak7	039913	035264	047285	Tox2	074607	165937	126243
Elmod1	041986	048409	046191	Pak7	039913	077200	076440	Tox3	043668	109621	105250
Elmod1	041986	216880	N/A	Pak7	039913	143329	N/A	Tox3	043668	176616	135697
Elmod1	041986	213111	N/A	Palm2	090053	102905	099969	Tox3	043668	176034	134931
Elmod1	041986	166580	129082	Palm2	090053	102904	099968	Tpcn1	032741	046426	042188
Elovl2	021364	021793	021793	Palm2	090053	142556	129817	Tpcn1	032741	200708	N/A
Elovl2	021364	117096	114112	Palm2	090053	131201	N/A	Tpcn1	032741	202072	N/A
Elovl7	021696	022207	022207	Pam	026335	159041	124284	Tpcn1	032741	201601	N/A
Elovl7	021696	225550	152997	Pam	026335	058762	057112	Tppp	021573	140217	N/A
Emilin2	024053	024849	024849	Pam	026335	161567	125418	Tppp	021573	022057	022057
Eml5	051166	065716	065643	Pam	026335	162681	125133	Trabd2b	070867	094894	092494
Eml5	051166	223282	152709	Pam	026335	159585	N/A	Traf1	026875	172159	130759
Eml5	051166	222717	N/A	Pam	026335	160210	N/A	Traf1	026875	028234	028234
Eml5	051166	220848	N/A	Pam	026335	162803	N/A	Traf1	026875	113064	108687
Eml5	051166	221107	N/A	Pam	026335	159131	N/A	Traf1	026875	129131	N/A
Eml5	051166	222097	152624	Pam	026335	161071	N/A	Traf1	026875	201690	144189
Eml5	051166	222593	N/A	Pam	026335	159841	124479	Traf1	026875	201335	N/A
Eml5	051166	221511	N/A	Pam	026335	159428	N/A	Traf1	026875	141238	N/A
Eml5	051166	220676	N/A	Pam	026335	162426	N/A	Traf1	026875	156479	N/A
Eml5	051166	222128	152401	Pam	026335	186731	N/A	Traf1	026875	135870	N/A
Emp2	022505	078357	077466	Pam	026335	163007	N/A	Trhde	050663	061632	057449
En2	039095	036177	036761	Pam	026335	097625	095228	Trhde	050663	152702	N/A
Enah	022995	193703	141462	Panx2	058441	161372	125514	Trhde	050663	152282	N/A
Enah	022995	111024	106653	Panx2	058441	162424	124354	Tril	043496	127748	116056
Enah	022995	195703	N/A	Panx2	058441	159960	124928	Trim30a	030921	076922	076189
Enah	022995	191649	N/A	Paqr6	041423	147948	119656	Trim30a	030921	125762	N/A
Enah	022995	193074	141936	Paqr6	041423	147991	114166	Trim30a	030921	142124	N/A
Enah	022995	078719	077781	Paqr6	041423	149640	N/A	Trim36	033949	167364	129771
Enah	022995	195059	141344	Paqr6	041423	123200	N/A	Trim36	033949	037011	037978
Enah	022995	111030	106659	Paqr6	041423	147818	N/A	Trim59	034317	107802	103432
Enah	022995	195788	N/A	Pard3	025812	162309	124282	Trim59	034317	136512	120270
Enah	022995	192768	N/A	Pard3	025812	160272	125453	Trim59	034317	142560	N/A
Enah	022995	192967	141330	Pard3	025812	162907	124319	Trim59	034317	153259	N/A
Enah	022995	195840	N/A	Pard3	025812	160717	125612	Trim62	041000	147852	123646
Enah	022995	195461	N/A	Pard3	025812	160593	N/A	Trim62	041000	035667	039121
Enah	022995	192497	N/A	Pard3	025812	026921	026921	Trim67	036913	167588	130343
Enah	022995	177811	136863	Pard3	025812	162456	124162	Trim67	036913	211867	148625
Enah	022995	111025	106654	Pard3	025812	162665	124718	Trim67	036913	041106	040601
Enc1	041773	041623	038783	Pard3	025812	161348	123951	Trp53cor1	085912	133221	N/A
Enox1	022012	022589	022589	Pard3	025812	162035	N/A	Trpc3	027716	029271	029271
Enox1	022012	226576	N/A	Pard3	025812	162176	123944	Trpc3	027716	129322	N/A
Enox1	022012	228148	N/A	Pard3	025812	159537	124934	Trpc3	027716	123220	N/A
Enox1	022012	228102	N/A	Pard3	025812	161277	124789	Trpc3	027716	133542	N/A
Enox1	022012	227831	154296	Pard3	025812	160766	124533	Trpc3	027716	146475	N/A
Enox1	022012	227662	154512	Pard3	025812	162602	125450	Trpc5	041710	040184	049063
Enox1	022012	228845	N/A	Pard3	025812	162531	125610	Trpc5	041710	148240	N/A
Enpp1	037370	105520	101159	Pard3	025812	160581	124141	Trpc7	021541	022023	022023
Enpp1	037370	039882	046090	Pard3	025812	162536	125212	Trpc7	021541	109871	105497
Enpp1	037370	135846	114273	Pard3	025812	161355	125064	Trpc7	021541	151918	119809
Enpp1	037370	150570	N/A	Pard3	025812	159141	124733	Trpc7	021541	174457	133305
Enpp1	037370	142974	N/A	Pard3	025812	159818	124339	Trpc7	021541	173067	134481
Enpp2	022425	041591	036180	Pard3	025812	163021	N/A	Trpc7	021541	173817	133411
Enpp2	022425	173516	133877	Pard3	025812	162727	124359	Trpc7	021541	173513	134662
Enpp2	022425	167541	132640	Pard3	025812	163002	N/A	Trpc7	021541	173466	134285
Enpp2	022425	171545	128941	Pard3	025812	159511	124441	Trpm2	009292	105401	101040
Enpp2	022425	228823	N/A	Pard3	025812	159940	N/A	Trpm2	009292	105400	N/A
Enpp2	022425	227483	N/A	Pard3	025812	079777	078710	Trpm2	009292	140471	N/A
Enpp2	022425	228222	154470	Pard3	025812	108752	104383	Trpm2	009292	153842	N/A

Enpp2	022425	227057	N/A	Pard3b	052062	138768	N/A	Trpm2	009292	138238	N/A
Enpp2	022425	226339	154729	Pard3b	052062	075374	074837	Trpm2	009292	126206	N/A
Enpp4	023961	024757	024757	Pard3b	052062	129030	N/A	Trpm2	009292	217806	N/A
Enpp4	023961	143137	114429	Pard3b	052062	188325	N/A	Trpm2	009292	219997	151231
Enpp6	038173	039840	044608	Pard3b	052062	046673	040439	Trpm2	009292	105399	101038
Enpp6	038173	140149	N/A	Pard3b	052062	094906	092510	Trpm2	009292	154996	N/A
Enpp6	038173	123066	147811	Pard6g	056214	070219	069182	Trpv3	043029	049676	053755
Enpp6	038173	119686	112633	Parm1	034981	040576	042844	Tsc22d3	031431	112995	N/A
Enpp6	038173	149593	121470	Patj	061859	141796	N/A	Tsc22d3	031431	055738	062589
Enpp6	038173	210466	N/A	Patj	061859	041284	049176	Tsc22d3	031431	133023	N/A
Epb41l4b	028434	030142	030142	Patj	061859	107033	102648	Tsc22d3	031431	112996	108620
Epb41l4b	028434	095076	092687	Patj	061859	107034	102649	Tsc22d3	031431	123898	123569
Epb41l4b	028434	044022	037625	Patj	061859	107030	102645	Tsc22d3	031431	152048	N/A
Epb41l4b	028434	136337	N/A	Patj	061859	136675	N/A	Tshb	027857	196958	N/A
Epb41l4b	028434	133859	N/A	Patj	061859	141965	N/A	Tshb	027857	029450	029450
Epb41l4b	028434	149109	N/A	Patj	061859	142103	116021	Tshb	027857	170856	127165
Epb41l4b	028434	150665	N/A	Patj	061859	107029	102644	Tshb	027857	200041	142782
Epha3	052504	064405	066554	Patj	061859	135606	N/A	Tshb	027857	197322	142670
Epha4	026235	188952	139640	Patj	061859	134901	115936	Tshb	027857	172026	128440
Epha4	026235	188797	140954	Patj	061859	102792	099854	Tshz2	047907	109159	104787
Epha4	026235	187346	140631	Patj	061859	030290	030290	Tshz2	047907	109157	104785
Epha4	026235	190149	140408	Pax2	004231	174490	134661	Tshz2	047907	185239	140884
Epha4	026235	189934	N/A	Pax2	004231	173346	134311	Tshz2	047907	123300	118550
Epha4	026235	186930	140370	Pax2	004231	004340	004340	Tshz2	047907	140699	120013
Epha4	026235	027451	027451	Pax3	004872	004994	004994	Tspan11	030351	032501	032501
Ephb1	032537	035129	035129	Pax3	004872	087086	084320	Tspan11	030351	149801	N/A
Ephb1	032537	085169	082261	Pax3	004872	172555	N/A	Tspan14	037824	224209	153208
Ephb1	032537	217014	N/A	Paxbp1	022974	118522	113835	Tspan14	037824	224349	N/A
Ephb1	032537	217184	N/A	Paxbp1	022974	023698	023698	Tspan14	037824	047652	035263
Ephb1	032537	215514	N/A	Paxbp1	022974	150397	N/A	Tspan15	037031	047883	047029
Ephb1	032537	149800	139470	Paxbp1	022974	146281	N/A	Tspan15	037031	218394	N/A
Eps15	028552	102729	099790	Paxbp1	022974	145136	117142	Tspan15	037031	219106	N/A
Eps15	028552	176251	135034	Paxbp1	022974	128922	N/A	Tspan15	037031	218824	N/A
Eps15	028552	177089	134922	Paxbp1	022974	124653	N/A	Tspan15	037031	220143	N/A
Eps15	028552	175776	135270	Paxbp1	022974	127002	N/A	Tspan18	027217	111265	106896
Eps15	028552	132165	118949	Pbx3	038718	113132	108757	Tspan18	027217	028646	028646
Eps15	028552	150755	N/A	Pbx3	038718	040638	045281	Tspan18	027217	154951	N/A
Eps15	028552	141751	N/A	Pbx3	038718	176213	N/A	Tspan18	027217	181716	N/A
Eps15	028552	030281	030281	Pbx3	038718	153278	123567	Tspan18	027217	152141	N/A
Eps15	028552	126015	N/A	Pbx3	038718	143776	119914	Tspan2	027858	029451	029451
Eps15	028552	177192	135755	Pbx3	038718	175855	135838	Tspan2	027858	196611	142964
Eps15	028552	177140	N/A	Pbx3	038718	138021	135226	Tspan2	027858	119902	113803
Erbb3	018166	082059	080716	Pbx3	038718	141653	115710	Tspan2	027858	197345	142543
Erbb4	062209	119142	112713	Pbx3	038718	127353	114695	Tspan5	028152	029800	029800
Erbb4	062209	121473	114123	Pbx3	038718	155423	N/A	Tspan5	028152	142890	120969
Erbb4	062209	153432	115373	Pkd1	032855	228550	154062	Tspan5	028152	127772	122500
Erbb4	062209	131148	N/A	Pkd1	032855	035565	049296	Tspan5	028152	153336	122120
Erbb4	062209	126682	N/A	Pkd1	032855	228745	153873	Tspan5	028152	142001	117857
Erich5	044726	060894	058182	Pkd1	032855	227107	154792	Tspan5	028152	135629	120961
Esrn	026830	090940	088458	Pkd1	032855	226883	154668	Tspan5	028152	146356	114663
Esrrb	021255	116402	112103	Pkd1	032855	226178	N/A	Tspan5	028152	119993	113230
Esrrb	021255	110203	105832	Pkd1	032855	227836	154626	Tspan5	028152	121826	113359
Esrrb	021255	110204	105833	Pkd1	032855	228750	N/A	Tspan6	067377	087557	084838
Esrrb	021255	021680	021680	Pkd1	032855	227058	153867	Tspan6	067377	176718	135005
Esrrb	021255	167891	131335	Pkd1	032855	228581	154141	Tspan6	067377	176641	135626
Esrrb	021255	136464	N/A	Pkd2	034462	086831	084041	Tspan6	067377	177468	N/A
Esrrg	026610	127489	119286	Pkd2	034462	130931	N/A	Tspoap1	034156	039627	048063
Esrrg	026610	110939	106564	Pkd2	034462	133540	N/A	Tspoap1	034156	100644	098209
Esrrg	026610	152927	N/A	Pcsk1	021587	022075	022075	Tspoap1	034156	148422	N/A

Esrrg	026610	027906	027906	Pcsk1	021587	135349	N/A	Tspoap1	034156	144502	122665
Esrrg	026610	110938	106563	Pcsk1	021587	222727	152702	Tspoap1	034156	142329	118819
Etl4	036617	114610	110257	Ifrd1	001627	001672	001672	Tspoap1	034156	153578	N/A
Etl4	036617	146881	119778	Ifrd1	001627	164047	127553	Tspoap1	034156	148814	N/A
Etl4	036617	131714	116637	Ifrd1	001627	170119	N/A	Tspoap1	034156	135957	N/A
Etl4	036617	045555	041431	Ifrd1	001627	165027	133028	Tspoap1	034156	133645	117356
Etl4	036617	114614	110261	Ifrd1	001627	171530	128635	Tspoap1	034156	154758	N/A
Etl4	036617	114604	110251	Ifrd1	001627	169926	127673	Tstd2	035495	107772	103401
Etl4	036617	146613	N/A	Ifrd1	001627	169319	130824	Tstd2	035495	107770	103399
Etl4	036617	066509	066170	Ifrd1	001627	170752	N/A	Tstd2	035495	160008	N/A
Etl4	036617	129278	N/A	Ifrd1	001627	164354	130846	Tstd2	035495	137399	N/A
Etl4	036617	123383	N/A	Ifrd1	001627	171553	N/A	Tstd2	035495	147837	115473
Etl4	036617	136870	N/A	Pcsk5	024713	025618	025618	Tstd2	035495	144495	117990
Etl4	036617	125556	N/A	Pcsk5	024713	050715	050272	Tstd2	035495	129929	125707
Etl4	036617	146488	N/A	Pcsk5	024713	025618	025618	Tstd2	035495	156021	117865
Etl4	036617	125772	N/A	Pcsk5	024713	050715	050272	Ttc28	033209	156290	137609
Etl4	036617	114607	110254	Pcsk7	035382	039059	047508	Ttc28	033209	143505	N/A
Etl4	036617	114606	110253	Pcsk7	035382	215535	N/A	Ttc28	033209	125470	N/A
Etl4	036617	114608	110255	Pcsk7	035382	215189	150500	Ttc28	033209	128584	N/A
Etl4	036617	139531	N/A	Pcsk7	035382	216672	150393	Ttc28	033209	129017	N/A
Etl4	036617	156587	N/A	Pcsk7	035382	213854	150379	Ttc28	033209	040111	136116
Etl4	036617	114627	110274	Pcsk7	035382	216614	N/A	Ttll3	030276	204026	145049
Etnppl	019232	166187	131294	Pcsk7	035382	216504	N/A	Ttll3	030276	204683	N/A
Etnppl	019232	072271	072121	Pcsk7	035382	216514	N/A	Ttll3	030276	032414	032414
Etnppl	019232	199940	N/A	Pcsk7	035382	214425	N/A	Ttll3	030276	203524	145329
Etnppl	019232	172432	N/A	Pcdh1	051375	160721	124732	Ttll3	030276	205017	145044
Etnppl	019232	163620	129120	Pcdh1	051375	161701	125576	Ttll3	030276	203925	N/A
Etnppl	019232	170664	128425	Pcdh1	051375	057185	055199	Ttll3	030276	204255	N/A
Etv1	004151	160244	125733	Pcdh1	051375	159405	125309	Ttll3	030276	203880	N/A
Etv1	004151	095767	093442	Pcdh1	051375	194312	141877	Ttll3	030276	038889	037870
Etv1	004151	162563	125157	Pcdh1	051375	193828	142328	Ttpa	073988	125799	117031
Etv1	004151	161164	124650	Pcdh15	052613	123398	N/A	Ttpa	073988	121491	113966
Etv1	004151	160996	124705	Pcdh15	052613	148572	N/A	Ttpa	073988	117632	113026
Etv1	004151	160856	125692	Pcdh15	052613	156999	N/A	Ttpa	073988	098244	095845
Etv1	004151	162730	N/A	Pcdh15	052613	193174	142238	Tuba8	030137	032233	032233
Etv1	004151	161513	124166	Pcdh15	052613	105426	101066	Tubb2b	045136	075774	075178
Etv1	004151	161980	124736	Pcdh15	052613	129404	117731	Tubb2b	045136	220744	N/A
Etv1	004151	160701	124019	Pcdh15	052613	131321	122911	Tubb4a	062591	071135	071135
Etv1	004151	159334	125676	Pcdh15	052613	126920	121939	Tulp3	001521	001562	001562
Etv1	004151	220492	N/A	Pcdh15	052613	147189	122940	Tulp3	001521	128708	N/A
Etv1	004151	161591	N/A	Pcdh15	052613	105424	101064	Tulp3	001521	138313	N/A
Etv4	017724	107176	102794	Pcdh15	052613	092420	090076	Tulp3	001521	133134	145180
Etv4	017724	017868	017868	Pcdh15	052613	136096	121534	Tulp3	001521	203625	N/A
Etv4	017724	132040	N/A	Pcdh15	052613	105429	101069	Tulp3	001521	157005	145361
Etv4	017724	129160	N/A	Pcdh15	052613	125055	114326	Tusc3	039530	209440	148134
Etv4	017724	131862	N/A	Pcdh15	052613	193361	141792	Tusc3	039530	211241	148022
Etv4	017724	129995	N/A	Pcdh15	052613	131724	122466	Tusc3	039530	209970	N/A
Etv4	017724	140970	N/A	Pcdh15	052613	152655	118201	Tusc3	039530	210890	147691
Etv4	017724	131117	N/A	Pcdh15	052613	144302	122606	Tusc3	039530	167992	126080
Etv4	017724	149099	N/A	Pcdh15	052613	151116	119662	Tusc3	039530	169034	129916
Etv4	017724	137179	N/A	Pcdh15	052613	155701	135495	Txnip	038393	074519	102710
Etv4	017724	154512	N/A	Pcdh15	052613	152819	123647	Txnip	038393	049093	041467
Etv4	017724	164750	129261	Pcdh15	052613	125517	115399	Txnip	038393	151832	N/A
Etv5	013089	079601	078551	Pcdh15	052613	124046	121130	Txnip	038393	196871	N/A
Etv5	013089	168774	131791	Pcdh15	052613	146682	134863	Txnip	038393	144639	N/A
Etv5	013089	170803	128338	Pcdh15	052613	177107	135501	Txnip	038393	128221	N/A
Etv5	013089	165506	N/A	Pcdh15	052613	149977	118833	Ubash3b	032020	044155	043865
Etv5	013089	170393	132210	Pcdh15	052613	191854	141973	Ubash3b	032020	151485	116038
Evala	035104	150976	122674	Pcdh15	052613	134009	120618	Ubash3b	032020	124819	N/A

Evala	035104	042974	037422	Pcdh15	052613	177420	135849	Ubash3b	032020	136530	114176
Evala	035104	150691	N/A	Pcdh15	052613	125006	120056	Ubash3b	032020	129906	134923
Evala	035104	149023	117345	Pcdh15	052613	191709	142313	Ubash3b	032020	132996	N/A
Exph5	034584	051014	062632	Pcdh15	052613	193739	142173	Ube2b	020390	020657	020657
Exph5	034584	139096	N/A	Pcdh15	052613	195531	141920	Ube2b	020390	109086	104714
Exph5	034584	132410	N/A	Pcdh15	052613	147455	N/A	Ube2b	020390	124699	N/A
Extl2	027963	029575	029575	Pcdh15	052613	194315	141594	Ube2b	020390	147833	N/A
Extl2	027963	106501	102110	Pcdh15	052613	139106	N/A	Ube2ql1	052981	065118	070906
Extl2	027963	128228	N/A	Pcdh15	052613	128843	N/A	Ucp2	033685	126534	120967
Extl2	027963	145945	N/A	Pcdh15	052613	127928	N/A	Ucp2	033685	207890	N/A
Extl2	027963	149920	N/A	Pcdh15	052613	194729	N/A	Ucp2	033685	126381	N/A
Extl2	027963	106502	102111	Pcdh15	052613	192370	N/A	Ucp2	033685	207748	146337
Eya1	025932	168081	126383	Pcdh15	052613	064562	068561	Ucp2	033685	129324	115648
Eya1	025932	080664	079493	Pcdh17	035566	071370	071325	Ucp2	033685	153287	115953
Eya1	025932	190337	141112	Pcdh17	035566	226362	N/A	Ucp2	033685	133044	115598
Eya1	025932	189526	140619	Pcdh9	055421	195826	141396	Ucp2	033685	151221	N/A
Eya1	025932	188857	140171	Pcdh9	055421	193901	141759	Ucp2	033685	133498	N/A
Eya1	025932	185453	141072	Pcdh9	055421	192221	142260	Ucp2	033685	138673	N/A
Eya1	025932	187790	139542	Pcdh9	055421	195376	142224	Ucp2	033685	149808	N/A
Eya1	025932	185329	N/A	Pcdh9	055421	194129	141205	Ugt8a	032854	057944	050852
Eya1	025932	027066	027066	Pcdh9	055421	192817	N/A	Ugt8a	032854	198610	143605
F3	028128	029771	029771	Pcdh9	055421	194056	141602	Ugt8a	032854	196481	N/A
F3	028128	196746	N/A	Pcdh9	055421	068992	070935	Unc13c	062151	184666	139027
F3	028128	197731	N/A	Pcdha1	103442	193839	142308	Unc13c	062151	075245	074726
F3	028128	199997	143678	Pcdha1	103442	070797	068828	Unc80	055567	061620	053692
Fa2h	033579	038475	043597	Pcdha3	102312	192503	141989	Unc80	055567	114008	109641
Fa2h	033579	162463	N/A	Pcp2	004630	136105	121079	Unc80	055567	136727	N/A
Fa2h	033579	159336	N/A	Pcp2	004630	145855	N/A	Unc80	055567	212557	148517
Fa2h	033579	162216	N/A	Pcp2	004630	142431	121403	Unc80	055567	187179	N/A
Fam102a	039157	136816	N/A	Pcp2	004630	133459	122902	Unc80	055567	152844	117070
Fam102a	039157	133512	116809	Pcp2	004630	004749	004749	Uncx	029546	172997	134067
Fam102a	039157	048375	044731	Pcp2	004630	128566	146683	Uncx	029546	174792	139081
Fam102a	039157	133366	118624	Pcp2	004630	144977	146399	Upp1	020407	020677	020677
Fam102a	039157	147723	N/A	Pcp4	090223	061739	062539	Upp1	020407	101525	099063
Fam107b	026655	226435	154419	Pcsk6	030513	176199	135851	Upp1	020407	170444	125934
Fam107b	026655	115052	110704	Pcsk6	030513	055576	053742	Upp1	020407	130522	123285
Fam107b	026655	115055	110707	Pcsk6	030513	098391	095992	Upp1	020407	168121	N/A
Fam107b	026655	115054	110706	Pcsk6	030513	176209	135033	Upp1	020407	172452	129787
Fam107b	026655	027965	027965	Pcsk6	030513	177369	N/A	Upp1	020407	166455	129276
Fam107b	026655	115053	110705	Pcsk6	030513	177272	N/A	Upp1	020407	146696	N/A
Fam107b	026655	177125	135757	Pcx	024892	224726	153479	Upp1	020407	164791	127473
Fam107b	026655	177037	135325	Pcx	024892	223659	N/A	Usp11	031066	033383	033383
Fam107b	026655	176254	135846	Pcx	024892	225189	152918	Usp11	031066	127294	N/A
Fam114a1	029185	031080	031080	Pcx	024892	113825	109456	Usp11	031066	137101	N/A
Fam114a1	029185	139366	119284	Pcx	024892	068004	063825	Usp11	031066	149960	N/A
Fam117a	038893	037502	049162	Pdc	006007	191228	141136	Uty	068457	143286	115113
Fam117a	038893	129553	N/A	Pdc	006007	186572	140843	Uty	068457	154666	122818
Fam117a	038893	143482	N/A	Pdc	006007	185698	140669	Uty	068457	069309	070012
Fam117a	038893	129290	N/A	Pdc	006007	165062	131631	Uty	068457	139365	114752
Fam117a	038893	155999	N/A	Pdela	059173	102655	099715	Uty	068457	154004	114910
Fam117a	038893	132357	N/A	Pdela	059173	183775	139327	Uty	068457	185837	N/A
Fam124a	035184	162987	N/A	Pdela	059173	102653	099713	Uty	068457	143958	120069
Fam124a	035184	161899	N/A	Pdela	059173	090756	088260	Uty	068457	137048	119406
Fam124a	035184	039064	047681	Pdela	059173	102652	099712	Uty	068457	133976	N/A
Fam124a	035184	160745	N/A	Pdela	059173	102651	099711	Uty	068457	157073	N/A
Retreg1	022270	022881	022881	Pdela	059173	134739	120188	Uty	068457	150715	116372
Retreg1	022270	228600	154407	Pdela	059173	146076	N/A	Uty	068457	154527	N/A
Retreg1	022270	228327	154377	Pdela	059173	125887	N/A	Slc18a3	100241	191501	139829
Retreg1	022270	227275	154471	Pdela	059173	102654	099714	Vamp1	030337	032487	032487

Retreg1	022270	226750	154791	Pde1b	022489	226468	153865	Vamp1	030337	100942	098503
Retreg1	022270	226438	154765	Pde1b	022489	023132	023132	Vamp1	030337	063588	063466
Retreg1	022270	110438	106068	Pde1b	022489	226493	154483	Vamp1	030337	205223	144835
Retreg1	022270	228306	154070	Pde1b	022489	227955	153722	Vamp1	030337	160523	N/A
Fam171b	048388	051454	062702	Pde1b	022489	227925	N/A	Vamp1	030337	159547	N/A
Fam171b	048388	148184	N/A	Pde1c	004347	044505	046601	Vat1l	046844	142591	N/A
Fam196a	073805	210055	N/A	Pde1c	004347	203372	145508	Vat1l	046844	049509	053431
Fam196a	073805	171394	129222	Pde1c	004347	203967	N/A	Vat1l	046844	150963	116680
Fam196a	073805	210826	N/A	Pde1c	004347	114327	109966	Vat1l	046844	124143	N/A
Fam198b	027955	118853	114093	Pde1c	004347	170774	133170	Vav2	009621	185188	138964
Fam198b	027955	145992	120603	Pde1c	004347	203462	145419	Vav2	009621	056176	062782
Fam198b	027955	135021	117199	Pde1c	004347	168944	128364	Vav2	009621	149758	N/A
Fam198b	027955	193204	N/A	Pde1c	004347	166102	131350	Vav2	009621	148067	N/A
Fam198b	027955	029567	029567	Pde1c	004347	166890	131892	Vav2	009621	146843	N/A
Fam19a1	059187	122120	113152	Pde1c	004347	164752	129185	Vav2	009621	135584	N/A
Fam19a1	059187	075080	074589	Pde1c	004347	164037	130139	Vav2	009621	132642	N/A
Fam19a1	059187	129844	N/A	Pde1c	004347	204821	N/A	Vax2	034777	037807	035976
Fam19a1	059187	125951	N/A	Pde1c	004347	203492	N/A	Vcan	021614	159910	125446
Fam19a4	046500	089295	086710	Pde1c	004347	203689	N/A	Vcan	021614	159337	125432
Fam19a4	046500	203930	N/A	Pde3b	030671	032909	032909	Vcan	021614	160029	N/A
Fam20a	020614	155559	116687	Pde3b	030671	140007	N/A	Vcan	021614	109546	105173
Fam20a	020614	020938	020938	Pde3b	030671	210411	N/A	Vcan	021614	109543	105170
Fam20a	020614	146408	N/A	Pde3b	030671	149455	N/A	Vcan	021614	109544	105171
Fam20a	020614	144972	N/A	Pde4d	021699	133929	N/A	Vcan	021614	162715	125521
Fam222b	037750	073705	073384	Pde4d	021699	151111	N/A	Vcan	021614	160740	125694
Fam222b	037750	100782	126620	Pde4d	021699	122041	113488	Vcan	021614	159285	125674
Fam222b	037750	155571	121832	Pde4d	021699	129374	N/A	Vgll4	030315	152710	N/A
Fam46a	032265	034802	034802	Pde4d	021699	138938	N/A	Vgll4	030315	032459	032459
Fam46a	032265	187711	140869	Pde4d	021699	120671	112991	Vgll4	030315	123478	N/A
Fam49b	022378	063838	066359	Pde4d	021699	153234	121592	Vgll4	030315	155620	N/A
Fam49b	022378	164532	132486	Pde4d	021699	119507	114089	Vgll4	030315	147639	123139
Fam49b	022378	228226	154320	Pde4d	021699	079975	078891	Vgll4	030315	139640	118618
Fam49b	022378	228908	154547	Pde4d	021699	135275	119583	Vgll4	030315	204693	N/A
Fam49b	022378	227024	153790	Pde4d	021699	074103	073742	Vim	026728	141365	114742
Fam49b	022378	226675	154205	Pde4d	021699	134973	N/A	Vim	026728	028062	028062
Fam49b	022378	227118	N/A	Pde4d	021699	152630	N/A	Vim	026728	193675	141494
Fam49b	022378	226129	N/A	Pde4d	021699	119672	113567	Vim	026728	155605	N/A
Fam69a	029270	031198	031198	Pde4d	021699	120664	113024	Vim	026728	191615	N/A
Fam69a	029270	145239	117801	Pde4d	021699	151429	N/A	Vim	026728	148248	N/A
Fam69a	029270	153172	114892	Pde4d	021699	117879	112774	Vip	019772	019906	019906
Fam84a	020607	020926	020926	Pde4d	021699	117420	113610	Vip	019772	217331	N/A
Fam84a	020607	221405	152642	Pde4d	021699	155459	114945	Vipr2	011171	176078	N/A
Fam89a	043068	055257	058156	Pde4d	021699	177907	136485	Vipr2	011171	011315	011315
Fam92b	042269	048786	038825	Pde5a	053965	066728	069011	Vipr2	011171	100988	N/A
Fam92b	042269	153177	N/A	Pde5a	053965	200389	143042	Vipr2	011171	175785	N/A
Fam92b	042269	135567	134033	Pde5a	053965	198314	N/A	Vipr2	011171	177199	N/A
Fam92b	042269	142478	N/A	Pde5a	053965	199253	N/A	Vipr2	011171	176433	135149
Fat1	070047	191428	140596	Pde7b	019990	020165	020165	Vit	024076	024880	024880
Fat1	070047	189017	140765	Pde7b	019990	169016	130596	Vmp1	018171	018315	018315
Fat1	070047	215588	149194	Pde7b	019990	169404	132378	Vmp1	018171	123590	N/A
Fat1	070047	186342	139921	Pde7b	019990	170265	126324	Vmp1	018171	145846	N/A
Fat1	070047	189367	N/A	Pde7b	019990	164195	126913	Vmp1	018171	150176	N/A
Fat1	070047	098796	096394	Pde7b	019990	217240	N/A	Vmp1	018171	153971	N/A
Fat2	055333	068853	067556	Pde7b	019990	170683	N/A	Vmp1	018171	127267	N/A
Fat2	055333	108864	104492	Pde7b	019990	166147	N/A	Vmp1	018171	139040	N/A
Fbln2	064080	113498	109126	Pde8a	025584	026672	026672	Vmp1	018171	143991	118302
Fbln2	064080	041544	048334	Pde8a	025584	128154	N/A	Vsig2	001943	002008	002008
Fbln2	064080	153364	120101	Pde8a	025584	130494	N/A	Vsig2	001943	215957	149703
Fbln2	064080	132021	116456	Pde8b	021684	162412	124409	Vsig2	001943	215271	150115

Fbln2	064080	203406	N/A	Pde8b	021684	162670	125237	Vsig2	001943	213502	N/A
Fbln2	064080	134974	116302	Pde8b	021684	162292	124068	Vsig2	001943	213699	149098
Fbln2	064080	147371	N/A	Pde8b	021684	162882	N/A	Vsig2	001943	215710	N/A
Fbln2	064080	134286	N/A	Pde8b	021684	162153	124704	Vsnl1	054459	220506	152711
Fbln2	064080	137029	N/A	Pde8b	021684	172104	128987	Vsnl1	054459	072299	072145
Fbn1	027204	028633	028633	Pde8b	021684	067082	070465	Vstm2b	039257	044705	044002
Fbn1	027204	148272	N/A	Pde8b	021684	022192	022192	Vstm2b	039257	206223	145703
Fbn1	027204	103234	099524	Pde8b	021684	159608	125191	Vstm2b	039257	186352	140241
Fbn2	024598	025497	025497	Pde8b	021684	160957	125115	Vstm2b	039257	205845	146231
Fchsd2	030691	208439	146962	Pde8b	021684	160412	N/A	Vwc2	050830	109681	105303
Fchsd2	030691	032931	032931	Pde8b	021684	162328	N/A	Vwc2	050830	129670	128761
Fchsd2	030691	098250	095850	Pde8b	021684	159598	124447	Vwc2	050830	154155	N/A
Fchsd2	030691	137196	N/A	Pde8b	021684	162716	N/A	Vwc2	050830	056344	049692
Fchsd2	030691	145802	N/A	Pde9a	041119	047168	038005	Galnt17	034040	086023	083187
Fchsd2	030691	142727	N/A	Pde9a	041119	143549	117911	Galnt17	034040	160609	125395
Fchsd2	030691	130426	N/A	Pde9a	041119	131417	115188	Galnt17	034040	160807	N/A
Fchsd2	030691	208063	N/A	Pde9a	041119	134525	121003	Galnt17	034040	161228	N/A
Fchsd2	030691	151693	N/A	Pde9a	041119	127929	117611	Galnt17	034040	162966	N/A
Fchsd2	030691	208638	N/A	Pde9a	041119	137927	121126	Wdr17	039375	144711	117710
Fchsd2	030691	208917	N/A	Pde9a	041119	124902	118869	Wdr17	039375	127511	115550
Fezf2	021743	224714	153090	Pde9a	041119	154567	N/A	Wdr17	039375	175915	135805
Fezf2	021743	022262	022262	Pde9a	041119	141314	117364	Wdr17	039375	128850	N/A
Fezf2	021743	224023	153647	Pde9a	041119	136384	116724	Wdr17	039375	150488	122326
Fgd3	037946	110087	105714	Pde9a	041119	130547	N/A	Wdr17	039375	153074	N/A
Fgd3	037946	048716	048692	Pde9a	041119	155395	N/A	Wdr17	039375	144482	134950
Fgd3	037946	110086	105713	Pde9a	041119	154392	117065	Wdr17	039375	126316	N/A
Fgd4	022788	161861	125174	Pde9a	041119	155113	N/A	Wdr17	039375	129132	134935
Fgd4	022788	162671	125736	Pdgfc	028019	029652	029652	Wdr17	039375	148806	N/A
Fgd4	022788	069284	069573	Pdgfc	028019	129285	118970	Wdr17	039375	176866	134978
Fgd4	022788	172181	N/A	Pdgfc	028019	143721	122047	Wdr17	039375	148408	135523
Fgd4	022788	162045	N/A	Pdgfd	032006	058692	056240	Wdr17	039375	176180	N/A
Fgd4	022788	162124	N/A	Pdgfd	032006	168039	128388	Wdr49	104301	193989	144721
Fgd4	022788	159542	125649	Pdgfd	032006	214892	149162	Wdr49	104301	203169	144789
Fgd4	022788	159058	N/A	Pdgfra	029231	202681	143906	Wdr49	104301	204982	N/A
Fgd4	022788	162414	N/A	Pdgfra	029231	000476	000476	Wdr49	104301	204341	145379
Fgd4	022788	162542	N/A	Pdgfra	029231	202186	144543	Wfdc1	023336	212901	148437
Fgd4	022788	161624	N/A	Pdgfra	029231	201711	143891	Wfdc1	023336	024107	024107
Fgd4	022788	161188	123763	Pdgfra	029231	201241	N/A	Wfs1	039474	043964	048053
Fgd6	020021	020208	020208	Pdgfra	029231	202161	144485	Wfs1	039474	166339	132404
Fgd6	020021	141143	N/A	Pdgfra	029231	168162	127173	Wfs1	039474	167937	125779
Fgd6	020021	125535	N/A	Pdgfra	029231	202992	144132	Wif1	020218	020439	020439
Fgf13	031137	033473	033473	Pdgfra	029231	200822	144634	Wif1	020218	175867	135486
Fgf13	031137	138503	N/A	Pdk3	035232	045748	036604	Wif1	020218	145691	N/A
Fgf13	031137	123660	N/A	Pdk3	035232	134502	N/A	Wipi1	041895	103060	099349
Fgf13	031137	124402	114905	Pdk3	035232	154717	N/A	Wipi1	041895	047186	038635
Fgf13	031137	145767	119897	Pdlim4	020388	018755	018755	Wipi1	041895	106689	102300
Fgf13	031137	119833	113639	Pdlim4	020388	093109	090797	Wipi1	041895	153738	N/A
Fgf13	031137	131319	115765	Pdlim4	020388	144477	121248	Wls	028173	068952	067898
Fgf13	031137	119306	113206	Pdlim4	020388	127271	N/A	Wls	028173	198878	143475
Fgf13	031137	150413	N/A	Pdlim4	020388	151948	N/A	Wls	028173	200571	N/A
Fgfr1	031565	155564	117884	Pdzd3	032105	034618	034618	Wls	028173	197328	N/A
Fgfr1	031565	084027	081041	Pdzd3	032105	213186	N/A	Wls	028173	200191	142774
Fgfr1	031565	119398	113855	Pdzph1	024227	177108	N/A	Wls	028173	196276	N/A
Fgfr1	031565	117179	113909	Pdzph1	024227	025064	025064	Wls	028173	196782	N/A
Fgfr1	031565	148322	N/A	Pdzph1	024227	177360	135180	Wnt6	033227	006716	006716
Fgfr1	031565	210778	N/A	Pdzrn4	036218	169942	133159	Wnt6	033227	189544	N/A
Fgfr1	031565	124228	116564	Pdzrn4	036218	035399	040456	Wnt7a	030093	032180	032180
Fgfr1	031565	210846	148032	Pea15a	013698	013842	013842	Wnt7a	030093	133092	N/A
Fgfr1	031565	167764	131343	Pea15a	013698	111247	106878	Wnt7a	030093	132936	N/A

Fgfr1	031565	138104	148135	Pea15a	013698	125361	N/A	Wscd1	020811	150531	123659
Fgfr1	031565	138455	147898	Pea15a	013698	155109	117735	Wscd1	020811	021168	021168
Fgfr1	031565	126118	N/A	Pea15a	013698	152432	N/A	Wscd1	020811	108511	104151
Fgfr1	031565	210504	N/A	Peg3	002265	051209	050750	Wscd1	020811	138339	N/A
Fgfr1	031565	120106	N/A	Peg3	002265	150182	116161	Wscd1	020811	108510	104150
Fgfr1	031565	211419	N/A	Peg3	002265	143703	122423	Wscd1	020811	132095	N/A
Fgfr1	031565	145218	N/A	Peg3	002265	155910	N/A	Wwc1	018849	018993	018993
Fgfr1	031565	133936	N/A	Penk	045573	070375	066822	Wwc1	018849	131001	N/A
Fgfr1	031565	179592	136640	Penk	045573	133567	122389	Wwc1	018849	127086	N/A
Fgfr1	031565	178276	137515	Pet100	087687	208950	146433	Xist	086503	153883	N/A
Fgfr2	030849	120187	113248	Pet100	087687	208185	N/A	Xist	086503	127786	N/A
Fgfr2	030849	124096	130971	Pet100	087687	156380	137626	Xist	086503	185876	N/A
Fgfr2	030849	153166	120100	Pet100	087687	207257	N/A	Xrra1	035211	036155	035929
Fgfr2	030849	117872	113994	Pet100	087687	207428	146950	Xrra1	035211	208354	146815
Fgfr2	030849	130557	N/A	Pet100	087687	207389	146942	Xrra1	035211	207855	147177
Fgfr2	030849	122054	112430	Pex5l	027674	194016	142196	Xrra1	035211	208270	N/A
Fgfr2	030849	136264	N/A	Pex5l	027674	193681	141454	Xrra1	035211	208449	N/A
Fgfr2	030849	121064	113452	Pex5l	027674	192093	141387	Yes1	014932	202543	144001
Fgfr2	030849	117754	113187	Pex5l	027674	193289	142008	Yes1	014932	072311	072154
Fgfr2	030849	120715	113474	Pex5l	027674	078226	077353	Yes1	014932	200779	N/A
Fgfr2	030849	119260	113010	Pex5l	027674	108224	103859	Yes1	014932	168707	132161
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Fgfr2	030849	117691	113180	Pex5l	027674	108221	103856	Zbtb16	066687	093852	091374
Fgfr2	030849	117858	112623	Pex5l	027674	108219	N/A	Zbtb16	066687	216150	150887
Fgfr2	030849	120141	113415	Pex5l	027674	155264	N/A	Zcchc24	055538	069180	068677
Fgfr2	030849	117357	112580	Pex5l	027674	194627	N/A	Zcchc24	055538	184642	N/A
Fgfr2	030849	122448	113993	Pex5l	027674	108225	103860	Zdhhc14	034265	089185	086589
Fgfr2	030849	118296	112471	Pfkfb4	025648	198140	142378	Zdhhc2	039470	049389	041727
Fgfr2	030849	121080	112585	Pfkfb4	025648	051873	057197	Zdhhc2	039470	131672	N/A
Fgfr2	030849	117073	112672	Pfkfb4	025648	198277	N/A	Zdhhc2	039470	128166	123070
Fgfr2	030849	129542	N/A	Pfkfb4	025648	199620	N/A	Zdhhc2	039470	164934	N/A
Fgfr2	030849	147859	N/A	Pfkfb4	025648	196249	143249	Zdhhc2	039470	168799	N/A
Fgfr2	030849	133806	N/A	Pfkfb4	025648	199591	142992	Zdhhc2	039470	167766	129996
Fgfr2	030849	148675	N/A	Pfkfb4	025648	199184	N/A	Zeb2	026872	176438	134849
Fgfr2	030849	127091	122856	Pfkfb4	025648	200229	N/A	Zeb2	026872	176732	135393
Fgfr2	030849	129103	N/A	Pfkfb4	025648	200015	142339	Zeb2	026872	028229	028229
Fgfr2	030849	208844	N/A	Pfkfb4	025648	198763	N/A	Zeb2	026872	068415	069685
Fgfr3	054252	201437	144379	Pfkm	033065	163507	132803	Zeb2	026872	200844	144421
Fgfr3	054252	067150	070998	Pfkm	033065	051226	059801	Zeb2	026872	177302	134747
Fgfr3	054252	164207	133064	Pfkp	021196	131648	N/A	Zeb2	026872	076836	076111
Fgfr3	054252	087820	085122	Pfkp	021196	138703	117030	Zeb2	026872	201804	144637
Fgfr3	054252	202182	143936	Pfkp	021196	021614	021614	Zeb2	026872	201623	144075
Fgfr3	054252	134610	N/A	Pfkp	021196	142972	114439	Zeb2	026872	202432	144197
Fgfr3	054252	155002	119941	Pfkp	021196	154100	116523	Zeb2	026872	201211	144406
Fgfr3	054252	181298	143963	Pfkp	021196	133041	123662	Zeb2	026872	209076	N/A
Fgfr3	054252	132724	N/A	Pfkp	021196	142372	N/A	Zeb2	026872	201413	N/A
Fgfr3	054252	201295	144104	Pfkp	021196	151894	N/A	Zeb2	026872	201969	144141
Fgfr3	054252	202791	143797	Pfkp	021196	144053	N/A	Zeb2	026872	131635	N/A
Fgfr3	054252	152661	N/A	Pfkp	021196	148999	N/A	Zeb2	026872	202935	143841
Fgfr3	054252	142860	N/A	Pfkp	021196	135761	N/A	Zeb2	026872	202371	N/A
Fgfr3	054252	202138	143945	Pfkp	021196	137327	N/A	Zeb2	026872	145529	N/A
Fgfr3	054252	169212	130856	Pfkp	021196	136585	115313	Zeb2	026872	202187	144552
Fgfr3	054252	114411	110053	Pgghg	062031	164337	N/A	Zeb2	026872	127520	120130
Fgfr3	054252	171509	131845	Pgghg	062031	164580	128214	Zeb2	026872	201490	143976
Fggy	028573	079223	078216	Pgghg	062031	169736	N/A	Zeb2	026872	153561	135491
Fggy	028573	176162	N/A	Pgghg	062031	168084	N/A	Zeb2	026872	152232	N/A
Fggy	028573	141248	N/A	Pgghg	062031	079403	078372	Zeb2	026872	124942	N/A
Fggy	028573	177394	134881	Pgghg	062031	163094	128478	Zeb2	026872	201982	N/A
Fggy	028573	043335	043460	Pgm2l1	030729	084935	081998	Zeb2	026872	201298	N/A

Fggy	028573	147783	N/A	Pgm2l1	030729	208158	N/A	Zeb2	026872	202345	N/A
Fggy	028573	150830	115546	Pgm2l1	030729	162108	124851	Zeb2	026872	123037	N/A
Fggy	028573	134012	115859	Pgm2l1	030729	054436	054782	Zeb2	026872	126743	N/A
Fggy	028573	131654	116264	Pgr	031870	070463	063562	Zfand6	030629	209117	146518
Fggy	028573	107091	102706	Pgr	031870	098986	096584	Zfand6	030629	069537	069228
Fggy	028573	176840	N/A	Pgr	031870	151080	N/A	Zfand6	030629	178385	135968
Fggy	028573	147766	N/A	Pgr	031870	189181	140124	Zfand6	030629	209140	N/A
Fggy	028573	143742	117386	Phf21b	016624	016768	016768	Zfand6	030629	209165	146878
Fggy	028573	125742	N/A	Phf21b	016624	162996	N/A	Zfand6	030629	207865	146682
Fggy	028573	153119	N/A	Phf21b	016624	159939	125355	Zfand6	030629	208782	147192
Fggy	028573	130541	115688	Phf21b	016624	162044	124941	Zfand6	030629	208519	N/A
Fggy	028573	156223	118147	Phf21b	016624	159502	N/A	Zfand6	030629	208831	N/A
Fggy	028573	142384	123407	Phf21b	016624	160389	N/A	Zfand6	030629	207975	146559
Fhl3	032643	106199	101805	Phf24	036062	151824	N/A	Zfhx4	025255	175866	135827
Fhl3	032643	145942	121702	Phf24	036062	132173	138443	Zfhx4	025255	175641	N/A
Fhl3	032643	038684	040150	Phf24	036062	107975	103609	Zfhx4	025255	176175	139253
Fhl5	028259	029922	029922	Phf24	036062	107976	103610	Zfhx4	025255	176383	135289
Fhl5	028259	108204	103839	Phf24	036062	069184	071011	Zfhx4	025255	026284	026284
Fign	075324	131615	122855	Phf24	036062	124380	138593	Zfp36l1	021127	021552	021552
Fign	075324	102728	124338	Phf24	036062	139100	138130	Zfp36l1	021127	219642	151682
Fign	075324	153538	N/A	Phf24	036062	138425	115816	Zfp36l1	021127	218835	151269
Fign	075324	126042	N/A	Phf24	036062	131234	138332	Zfp36l1	021127	165114	127522
Filip1l	043336	159816	124179	Phkg1	025537	026617	026617	Zfp385c	014198	103119	099408
Filip1l	043336	099667	133252	Phkg1	025537	154932	122040	Zfp385c	014198	148560	N/A
Filip1l	043336	159414	124069	Phkg1	025537	140667	117510	Zfp385c	014198	151589	119259
Fli1	016087	016231	016231	Phkg1	025537	154495	N/A	Zfp385c	014198	153494	115268
Fli1	016087	183767	138984	Phkg1	025537	200832	N/A	Zfp395	034522	224623	153350
Flrt2	047414	057324	062171	Phkg1	025537	200922	N/A	Zfp395	034522	225865	N/A
Flrt2	047414	110117	105744	Phox2a	007946	008090	008090	Zfp395	034522	066994	064422
Flt3	042817	049324	039041	Phox2a	007946	209878	N/A	Zfp395	034522	224687	153406
Flt3	042817	110549	N/A	Phyhip	003469	003561	003561	Zfp395	034522	225512	N/A
Fmnl1	055805	042286	046296	Phyhip	003469	159180	125254	Zfp423	045333	165770	129724
Fmnl1	055805	218163	151439	Pid1	045658	168574	127716	Zfp423	045333	109655	105282
Fmnl1	055805	107027	102642	Pid1	045658	176559	135164	Zfp423	045333	052250	052379
Fmnl1	055805	126425	N/A	Pid1	045658	175948	N/A	Zfp423	045333	174764	134575
Fmnl1	055805	154871	N/A	Pid1	045658	176720	134961	Zfp423	045333	174249	134103
Fmnl1	055805	021322	N/A	Pid1	045658	175996	134979	Zfp423	045333	173725	N/A
Fmnl1	055805	129726	133299	Pid1	045658	176822	135425	Zfp423	045333	173092	N/A
Fmo3	026691	028010	028010	Pid1	045658	177458	135120	Zfp462	060206	133895	122775
Fmo3	026691	142759	N/A	Pid1	045658	187992	N/A	Zfp462	060206	098070	095677
Fndc3b	039286	195008	141620	Piezo2	041482	047480	040019	Zfp462	060206	030131	030131
Fndc3b	039286	046157	041495	Piezo2	041482	137141	117107	Zfp462	060206	079605	078555
Fndc3b	039286	191684	N/A	Piezo2	041482	132576	N/A	Zfp521	024420	025288	025288
Fndc3b	039286	193779	141888	Piezo2	041482	123322	N/A	Zfp608	052713	064763	068192
Folh1	001773	001824	001824	Piezo2	041482	183217	138758	Zfp804b	092094	200317	143568
Folh1	001773	107271	102892	Piezo2	041482	182233	138170	Zfp804b	092094	164784	130571
Folh1	001773	209082	N/A	Piezo2	041482	182166	138754	Zfp831	050600	059452	060255
Fosb	003545	003640	003640	Piezo2	041482	182177	N/A	Zic1	032368	034927	034927
Fosb	003545	207334	147210	Piezo2	041482	046860	036099	Zic1	032368	065360	068858
Fosb	003545	208505	146525	Piga	031381	208741	147146	Zic1	032368	173121	N/A
Fosb	003545	207716	146949	Piga	031381	112257	137831	Zic2	061524	075888	075283
Fosb	003545	208326	146569	Piga	031381	033754	033754	Zic2	061524	137059	N/A
Fosb	003545	208446	146789	Piga	031381	151911	138077	Zic3	067860	137687	116383
Fosb	003545	208230	N/A	Piga	031381	208697	146731	Zic3	067860	088627	085999
Foxa1	035451	044380	041118	Piga	031381	208261	146808	Zic3	067860	088631	086003
Foxa1	035451	218398	N/A	Piga	031381	112255	107874	Zic3	067860	088629	086001
Foxa2	037025	109964	105590	Piga	031381	133813	122176	Zic4	036972	173342	133974
Foxa2	037025	047315	045918	Piga	031381	155849	N/A	Zic4	036972	172978	N/A
Foxa2	037025	172928	134081	Pigh	021120	072154	072018	Zic4	036972	173054	134364

Foxa2	037025	146242	N/A	Pigh	021120	217998	151930	Zic4	036972	174611	N/A
Foxg1	020950	135006	N/A	Pigh	021120	217979	N/A	Zic4	036972	172646	134053
Foxg1	020950	154930	N/A	Pigs	041958	048073	044871	Zic4	036972	170572	N/A
Foxg1	020950	179669	136372	Pigz	045625	052174	057509	Zic4	036972	174212	133808
Foxg1	020950	021333	021333	Pigz	045625	151412	N/A	Zic4	036972	173933	133958
Foxh1	033837	037824	036591	Pigz	045625	134928	N/A	Zic4	036972	174802	N/A
Foxp4	023991	113265	108890	Pigz	045625	134666	N/A	Zic4	036972	172858	N/A
Foxp4	023991	113263	108888	Pih1h3b	042433	044806	048754	Zic4	036972	066384	069568
Foxp4	023991	097311	094916	Pik3c2b	026447	153707	115469	Zic4	036972	085242	N/A
Foxp4	023991	113262	108887	Pik3c2b	026447	145153	N/A	Zic5	041703	039118	035754
Foxp4	023991	136314	N/A	Pik3c2b	026447	124934	N/A	Zic5	041703	143084	N/A
Foxp4	023991	154108	N/A	Pik3c2b	026447	077730	076911	Zkscan1	029729	019660	019660
Foxp4	023991	137039	N/A	Pik3r1	041417	055518	056774	Zkscan1	029729	110963	106588
Foxp4	023991	153752	N/A	Pik3r1	041417	035532	047004	Zkscan1	029729	110962	106587
Frem1	059049	107230	102849	Pik3r1	041417	187009	140256	Zkscan1	029729	066617	068480
Frem1	059049	127886	122467	Pik3r1	041417	185795	140312	Zmat4	037492	131410	115719
Frem1	059049	131102	N/A	Pik3r1	041417	190171	N/A	Zmat4	037492	042352	049430
Frem1	059049	130889	N/A	Pik3r1	041417	185701	N/A	Zmat4	037492	123412	121626
Frem1	059049	141841	N/A	Pik3r1	041417	189426	N/A	Zmat4	037492	208021	N/A
Frem1	059049	133610	N/A	Pitpnm3	040543	075258	074737	Zmat4	037492	207301	146734
Frem1	059049	071708	071627	Pitpnm3	040543	134210	N/A	Zmat4	037492	135747	121337
								Zmat4	037492	146774	N/A

[0060] Table 2b contains further genes in mice. The table identifies unique ENSEMBL identifiers corresponding to the mouse genes (MUSG), transcripts (MUST), and proteins (if available) (MUSP) analyzed in the experiments herein. The unique identifiers for each ENSEMBL entry has been modified to remove the first five leading zeros (0) of the identifier after the ENSMUSG, ENSMUST, and ENSMUSP label. Where an ENSEMBL transcript or protein identifer was not available, GenBank transcripts (nucleic acid or protein) are included.

Table 2b. ENSEMBLand GenBank IDs for mice

Symbol	MUSG	MUST	MUSP	Symbol	MUSG	MUST	MUSP
1700063D05Rik	100837	213914.1	N/A	Lrp8	28613	143601	115854
1700063D05Rik	100837	214568.1	N/A	Lrp8	28613	106732	102343
1700063D05Rik	100837	191461.6	N/A	Lrp8	28613	106731	102342
1700063D05Rik	100837	185590.6	N/A	Lrp8	28613	123140	N/A
1700063D05Rik	100837	188499.1	N/A	Lrp8	28613	145832	N/A
1700086L19Rik	71265	185822.6	N/A	Lrp8	28613	30356	30356
1700086L19Rik	71265	186463.6	N/A	Lrp8	28613	106733	102344
1700086L19Rik	71265	95617.2	N/A	Lrp8	28613	126573	118020
1700124L16Rik	99354	190077.1	N/A	Lrp8	28613	146552	N/A
1700124L16Rik	99354	189308.2	N/A	Lrp8	28613	147319	N/A
1700124L16Rik	99354	189129.5	N/A	Lrp8	28613	135591	N/A
2510003B16Rik	N/A	NR_131048.1.1	N/A	Lrp8	28613	135022	N/A
4930449E18Rik	N/A	NR_045319.1.1	N/A	Mbp	41607	91789	89393
6330403K07Rik	18451	156068.2	N/A	Mbp	41607	114676	110324
9330117O12Rik	N/A	NR_045400.1.1	N/A	Mbp	41607	47865	46185
9330188P03Rik	N/A	XR_105640.1.1	N/A	Mbp	41607	143506	138313
9530026P05Rik	97462	181145.7	N/A	Mbp	41607	152071	115409
9530026P05Rik	97462	181121.7	N/A	Mbp	41607	142850	115082
9530026P05Rik	97462	204449.2	N/A	Mbp	41607	133193	116019
9530026P05Rik	97462	204609.1	N/A	Mbp	41607	123251	121855
9530026P05Rik	97462	181840.3	N/A	Mbp	41607	153478	114630
9530026P05Rik	97462	205093.2	N/A	Mbp	41607	132369	114230

A230001M10Rik	105891	198712.4	N/A	Mbp	41607	150952	N/A
A230001M10Rik	105891	196720.4	N/A	Mbp	41607	62446	53495
A230001M10Rik	105891	196659.1	N/A	Mbp	41607	102812	99876
A330049N07Rik	111994	220010.1	N/A	Mbp	41607	75372	74836
A330049N07Rik	111994	219920.1	N/A	Mbp	41607	80658	79488
A330049N07Rik	111994	219536.1	N/A	Mbp	41607	114674	110322
A530058N18Rik	87694	147411.1	N/A	Mir124a-1hg	97545	185812	N/A
A530058N18Rik	87694	135729.7	N/A	Mir124a-1hg	97545	180610	N/A
A530058N18Rik	87694	152254.7	N/A	Mir124a-1hg	97545	181808	N/A
A530058N18Rik	87694	141209.7	N/A	Mir124a-1hg	97545	186703	N/A
A530058N18Rik	87694	128469.7	N/A	Mir6390	98780	184405	N/A
A530058N18Rik	87694	143993.1	N/A	Mmp16	28226	183662	139102
A530058N18Rik	87694	134129.1	N/A	Mmp16	28226	142434	121087
A730017C20Rik	50875	165666.8	125952	Mmp16	28226	29881	29881
A730017C20Rik	50875	58633.8	56379	Mmp16	28226	133416	N/A
A730017C20Rik	50875	118510.7	113023	Mmp16	28226	149353	116930
A730017C20Rik	50875	175830.1	135330	Mmp16	28226	139418	N/A
A730017C20Rik	50875	175897.7	135020	Mt1	31765	34215	34215
A730017C20Rik	50875	117064.7	113487	Mt1	31765	212291	148443
A730017C20Rik	50875	154125.1	N/A	Mt1	31765	211807	148764
Ackr1	37872	38227.5	45134	Mt2	31762	34214	34214
Ackr1	37872	194046.1	141765	Mt2	31762	212806	148308
Ackr1	37872	194298.1	N/A	Mthfd2	5667	5810	5810
Adarb2	52551	64473.12	64775	Mthfd2	5667	203847	145266
Adarb2	52551	123187.1	120757	Mthfd2	5667	141044	N/A
Adarb2	52551	135574.7	115148	Mthfd2	5667	139802	N/A
Adarb2	52551	139438.1	N/A	Mthfd2	5667	141193	N/A
Adarb2	52551	223148.1	N/A	Mthfd2	5667	203375	N/A
Adarb2	52551	223223.1	N/A	Mthfd2	5667	204472	145222
Adipor2	30168	32272.12	32272	Myrip	41794	133173	122046
Adipor2	30168	169744.7	126138	Myrip	41794	48121	46891
Adipor2	30168	189710.1	139895	Myrip	41794	214784	149149
Adipor2	30168	187699.6	139703	Myrip	41794	139665	N/A
Adipor2	30168	188851.1	N/A	Myrip	41794	129168	N/A
AI504432	56145	70085.5	N/A	Myt1l	61911	218583	151588
Alms1-ps2	90098	160606.1	N/A	Myt1l	61911	49784	58264
Alms1-ps2	90098	161983.7	N/A	Myt1l	61911	219060	N/A
Anks1b	58589	182356.7	138234	Myt1l	61911	219899	N/A
Anks1b	58589	182113.7	138655	Myt1l	61911	219231	N/A
Anks1b	58589	182430.7	138660	Myt1l	61911	21009	21009
Anks1b	58589	179337.8	136410	Myt1l	61911	219463	N/A
Anks1b	58589	179694.8	136146	Myt1l	61911	217961	N/A
Anks1b	58589	182284.7	138794	Myt1l	61911	218198	151919
Anks1b	58589	99366.1	96967	Myt1l	61911	220072	N/A
Anks1b	58589	183156.7	138539	Myt1l	61911	219744	151977
Anks1b	58589	182595.7	138314	Nat8	30004	32073	32073
Anks1b	58589	182960.7	138222	Neat1	92274	173672	N/A
Anks1b	58589	182786.7	138720	Neat1	92274	174287	N/A
Anks1b	58589	99368.1	96968	Neat1	92274	174829	N/A
Anks1b	58589	183136.7	138738	Nhlrc4	90113	85027	82102
Anks1b	58589	183109.1	138667	Nhlrc4	90113	159540	N/A
Anks1b	58589	182550.7	138643	Nhlrc4	90113	162078	N/A
Anks1b	58589	182936.7	138209	Nhsl2	79481	125115	N/A
Anks1b	58589	182600.7	138650	Nhsl2	79481	124279	116112
Anks1b	58589	182053.7	138644	Nhsl2	79481	101339	98893
Anks1b	58589	182966.7	138610	Nhsl2	79481	155477	N/A
Anks1b	58589	99364.11	96965	Nhsl2	79481	144753	143176
Anks1b	58589	182427.7	138480	Nhsl2	79481	144397	N/A
Anks1b	58589	182202.7	138398	Nhsl2	79481	129185	N/A

Anks1b	58589	183024.1	138256	Nos1	29361	171055	127432
Anks1b	58589	182045.1	138679	Nos1	29361	138554	N/A
Anks1b	58589	182192.7	138701	Nos1	29361	102557	99617
Anks1b	58589	182083.1	138576	Nos1	29361	86451	138506
Anks1b	58589	182907.7	138614	Nos1	29361	142742	120421
Anks1b	58589	182003.1	N/A	Nos1	29361	138579	138176
Anks1b	58589	182632.7	N/A	Nos1	29361	124194	N/A
Anks1b	58589	183012.1	N/A	Ntrp	42834	51087	58132
Anks1b	58589	183145.1	N/A	Ntrp	42834	171533	127787
Anks1b	58589	183051.7	N/A	Ntrp	42834	168890	130297
Anks1b	58589	183002.1	N/A	Nrn1	39114	224323	153099
Apoe	2985	174064.8	133302	Nrn1	39114	37623	40900
Apoe	2985	173739.7	133371	Nrn1	39114	223611	153395
Apoe	2985	3066.15	3066	Nrn1	39114	122286	113721
Apoe	2985	174355.7	134160	Nrn1	39114	224960	153173
Apoe	2985	172983.7	133359	Nxph1	46178	162942	N/A
Apoe	2985	174144.7	134622	Nxph1	46178	160300	125274
Apoe	2985	174710.1	134429	Nxph1	46178	60369	60926
Apoe	2985	174191.1	133447	Olfm2	32172	34692	34692
Apoe	2985	172808.1	134558	Olfm2	32172	215999	149231
Apoe	2985	167646.8	N/A	Olfm2	32172	217198	151018
Apoe	2985	207525.1	N/A	Olfm2	32172	215039	N/A
Arhgap26	36452	97593.8	95200	Opcml	62257	134002	N/A
Arhgap26	36452	137497.7	121197	Opcml	62257	115243	110898
Arhgap26	36452	154551.7	123145	Opcml	62257	214395	N/A
Arhgap26	36452	155576.7	122371	Opcml	62257	123779	N/A
Arhgap26	36452	141058.7	119865	Opcml	62257	133142	N/A
Arhgap26	36452	148850.7	121894	Opcml	62257	73822	73493
Arhgap26	36452	187912.1	141188	Opcml	62257	126673	N/A
Arhgap26	36452	151757.7	122448	Opcml	62257	150098	N/A
Arhgap26	36452	145090.7	N/A	Opcml	62257	126845	N/A
Arhgap26	36452	115580.1	N/A	Pagr1a	30680	200948	144469
Arhgap26	36452	148399.1	N/A	Pagr1a	30680	162069	123889
Arhgap26	36452	123820.1	N/A	Pagr1a	30680	206416	146318
Arhgap26	36452	127448.7	N/A	Patj	61859	141796	N/A
Arhgap26	36452	149112.1	N/A	Patj	61859	41284	49176
Arhgap26	36452	156167.1	N/A	Patj	61859	107033	102648
Arhgap26	36452	134388.1	N/A	Patj	61859	107034	102649
Arhgap26	36452	133247.1	N/A	Patj	61859	107030	102645
Arhgap26	36452	115574.1	N/A	Patj	61859	136675	N/A
Arl4c	49866	159814.1	124344	Patj	61859	141965	N/A
Arl4c	49866	187810.1	139499	Patj	61859	142103	116021
Arl4c	49866	51236.1	57085	Patj	61859	107029	102644
Arrdc2	2910	2989.1	2989	Patj	61859	135606	N/A
Arrdc2	2910	212405.1	148405	Patj	61859	134901	115936
Arrdc2	2910	212855.1	N/A	Patj	61859	102792	99854
Arrdc2	2910	212898.1	N/A	Patj	61859	30290	30290
Arrdc2	2910	213095.1	N/A	Pcdh7	29108	191837	142319
Arrdc2	2910	212770.1	N/A	Pcdh7	29108	68110	66306
Arrdc2	2910	212508.1	N/A	Pcdh7	29108	94783	92376
Asphd1	46378	106340.7	101947	Pcdh7	29108	192287	142276
Asphd1	46378	52937.11	49848	Pcdh7	29108	195156	141378
Asphd1	46378	106339.1	101946	Pcdh7	29108	199310	143387
Atp6ap1l	78958	109541.3	105168	Pcdh7	29108	192048	141505
Atp6ap1l	78958	183162.7	138517	Phlda1	20205	164773	132815
Atp6ap1l	78958	182104.1	138331	Phlda1	20205	186359	N/A
Atp6ap1l	78958	182446.1	138791	Pkib	19876	95668	93329
Atp6ap1l	78958	182932.1	N/A	Pkib	19876	75992	75374
AU022751	73294	117544.1	114041	Pkib	19876	177299	N/A

AU022751	73294	101698.3	99222	Pkib	19876	176225	N/A
B3galt5	74892	113800.8	109431	Pkib	19876	177438	135774
B3galt5	74892	99497.3	97096	Pkib	19876	176741	N/A
B3galt5	74892	134058.7	N/A	Pkib	19876	177325	135280
B3galt5	74892	153586.1	N/A	Pkib	19876	177473	135835
Bcl2l15	44165	106822.1	102435	Pkib	19876	66028	67532
Bcl2l15	44165	62945.11	52210	Pkib	19876	175852	135666
Bcl2l15	44165	196184.1	N/A	Pkib	19876	176354	N/A
Bcl2l15	44165	199772.1	N/A	Plcxd3	49148	130332	N/A
Bmp4	21835	74077.11	73720	Plcxd3	49148	61925	53553
Bmp4	21835	100676.2	98242	Pnpla7	36833	45295	44078
Bmp4	21835	135408.1	N/A	Pnpla7	36833	137913	141577
Bmp4	21835	226759.1	N/A	Pnpla7	36833	153618	117428
Btg1-ps1	68173	184432.2	139062	Pnpla7	36833	152777	122394
Btg1-ps1	68173	89286.11	N/A	Pnpla7	36833	139031	N/A
Bzrap1	N/A	NM_172449.2.1	NP_766037.2	Pnpla7	36833	139643	N/A
C030029H02Rik	110027	210356.1	N/A	Pnpla7	36833	142139	N/A
C030029H02Rik	110027	210438.1	N/A	Pnpla7	36833	145508	N/A
C030029H02Rik	110027	210209.1	N/A	Pnpla7	36833	146153	117907
C130030K03Rik	N/A	NR_046212.1.1	N/A	Pnpla7	36833	132082	N/A
Cacna1d	15968	112250.4	107869	Pnpla7	36833	154359	N/A
Cacna1d	15968	223803.1	153586	Pnpla7	36833	155601	115952
Cacna1d	15968	112249.8	107868	Pnpla7	36833	128517	N/A
Cacna1d	15968	224785.1	153293	Pnpla7	36833	138536	N/A
Cacna1d	15968	224198.1	153250	Pnpla7	36833	141584	N/A
Cacna1d	15968	224395.1	152953	Prdm8	35456	210477	147333
Cacna1d	15968	224912.1	153689	Prdm8	35456	112959	108583
Cacna1d	15968	224073.1	N/A	Ptoca1	44122	78099	86022
Cacna1d	15968	225717.1	N/A	Ptoca1	44122	60539	50319
Cacna1d	15968	223573.1	N/A	Ptoca1	44122	108317	103953
Cacna1d	15968	223985.1	N/A	Ptoca1	44122	124772	N/A
Cacna1d	15968	225353.1	N/A	Prodh	3526	139861	123223
Calcrl	59588	74262.8	73875	Prodh	3526	3620	3620
Calcrl	59588	99944.3	97527	Prodh	3526	136776	117597
Calcrl	59588	151295.1	N/A	Prodh	3526	141635	122889
Cdc190	70532	94348.3	91908	Prodh	3526	126087	121736
Cdc190	70532	175731.2	135819	Prodh	3526	123969	N/A
Cdc78	71202	95500.4	93155	Prodh	3526	132241	118264
Ccp110	33904	106557.7	102167	Prodh	111321	217439	149450
Ccp110	33904	38650.8	38881	Prodh	111321	216391	149861
Ccp110	33904	123178.7	147070	Prodh	111321	214498	149004
Ccp110	33904	208766.1	146903	Ptodh	111321	215115	149538
Ccp110	33904	149056.7	N/A	Prodh	111321	215314	150544
Ccp110	33904	140831.1	N/A	Prodh	111321	216479	N/A
Cdh22	53166	65438.12	66864	Ptodh	111321	216846	151119
Cdh22	53166	138643.1	120785	Prr18	55945	163887	127393
Celrr	97881	181433.7	N/A	Prr18	55945	69742	69019
Celrr	97881	181183.2	N/A	Prr36	64125	168386	133114
Celrr	97881	185678.1	N/A	Prr36	64125	177491	135130
Celrr	97881	190612.1	N/A	Prr36	64125	175906	135713
Chadl	63765	72910.5	72682	Prr36	64125	176227	135166
Chadl	63765	173598.7	133834	Ptch2	28681	30443	30443
Chadl	63765	173898.1	133981	Ptch2	28681	144620	122548
Chd3os	43419	129321.1	146712	Ptch2	28681	156989	N/A
Chd3os	43419	218008.1	151352	Ptch2	28681	137209	114461
Chd3os	43419	151617.2	147159	Ptch2	28681	135133	N/A
Cntn2	53024	86521.1	83707	Ptch2	28681	123226	N/A
Cntn2	53024	188943.1	139795	Ptgds	15090	114251	109889
Cntn2	53024	186530.2	139897	Ptgds	15090	144016	N/A

Cntn2	53024	188065.6	140306	Ptgds	15090	137417	N/A
Cntn2	53024	189528.6	141179	Ptgds	15090	15234	15234
Cntn2	53024	186487.6	N/A	Ptgds	15090	114259	109897
Cntn2	53024	190601.6	N/A	Rab34	2059	2128	2128
Cntn2	53024	188143.1	N/A	Rab34	2059	150941	123033
Cntnap5b	67028	86738.9	83944	Rab34	2059	108322	103958
Cntnap5b	67028	188735.1	139877	Rab34	2059	56241	59769
Cntnap5b	67028	185484.1	N/A	Rab34	2059	207728	146997
Cntnap5c	38048	76038.6	75416	Rab34	2059	148603	N/A
Col18a1	1435	81654.12	80358	Rab34	2059	126864	N/A
Col18a1	1435	105409.7	101049	Rab34	2059	156435	122848
Col18a1	1435	72755.11	72538	Rab34	2059	154542	N/A
Col18a1	1435	156009.1	122580	Rasgrp3	71042	164192	129393
Col18a1	1435	218407.1	151291	Rasgrp3	71042	95204	92828
Cplx2	25867	26985.8	26985	Rgs8	42671	41776	45715
Cpne2	34361	48653.9	45755	Rgs8	42671	124500	122518
Cpne2	34361	109537.1	105163	Rgs8	42671	111815	107446
Cpne2	34361	212550.1	148447	Rgs8	42671	152114	121910
Cpne2	34361	136550.7	N/A	Rgs8	42671	111812	107443
Cpne2	34361	156377.1	N/A	Rgs8	42671	147700	123565
Cpne2	34361	156894.1	N/A	Rgs8	42671	147482	118365
Cyp2j12	81225	97972.4	133811	Rgs8	42671	111814	107445
Cyp2j12	81225	121694.2	134394	Rgs8	42671	111810	107441
D430036J16Rik	97466	181447.7	N/A	Rgs8	42671	147794	N/A
D430036J16Rik	97466	181893.7	N/A	Ror1	35305	39630	48171
D430036J16Rik	97466	180663.7	N/A	Rora	32238	140351	N/A
D430036J16Rik	97466	183536.7	N/A	Rora	32238	34766	34766
D430036J16Rik	97466	183781.1	N/A	Rora	32238	174296	134291
Dbpht2	29878	221311.1	N/A	Rora	32238	143507	N/A
Dbpht2	29878	72100.3	N/A	Rora	32238	132355	N/A
Defb23	74681	99206.2	96812	Rora	32238	113624	109254
Diras2	47842	57442.7	55416	Rtl4	71679	112843	108462
Dnah11	18581	84806.6	81867	Rtl4	71679	96301	108463
Dnah11	18581	176756.8	135748	S100a3	1021	199225	N/A
Dnah11	18581	176239.1	N/A	S100a3	1021	200508	142747
Dnah11	18581	175662.7	N/A	S100a3	1021	200290	142334
Dock10	38608	77946.11	77099	S100a3	1021	1047	1047
Dock10	38608	187774.6	140085	S100a3	1021	196635	N/A
Dock10	38608	190983.6	140719	S1pr5	45087	122088	113843
Dock10	38608	190595.6	139567	Scn2a	75318	144254	117955
Dock10	38608	189486.6	140868	Scn2a	75318	28377	28377
Dock10	38608	186087.6	140102	Scn2a	75318	201378	N/A
Dock10	38608	191449.1	140513	Scn2a	75318	202653	N/A
Dock10	38608	191505.1	N/A	Scn2a	75318	200829	143882
Dock10	38608	186835.1	N/A	Scn2a	75318	138368	N/A
Dock10	38608	187698.1	N/A	Scn2a	75318	202508	143958
Dock10	38608	187885.1	N/A	Scn2a	75318	202162	143888
Dscam	50272	56102.7	56040	Scn2a	75318	100067	97645
Elfn2	43460	88592.4	85960	Sema5b	52133	50625	57494
Epb41l2	19978	53748.15	55122	Sema5b	52133	133554	N/A
Epb41l2	19978	92645.6	90314	Sema5b	52133	120756	112536
Epb41l2	19978	220290.1	151707	Sema5b	52133	149097	N/A
Epb41l2	19978	218903.1	151685	Sema5b	52133	128966	N/A
Epb41l2	19978	217929.1	151875	Sema5b	52133	128347	121703
Epb41l2	19978	219900.1	151332	Sema5b	52133	149855	115969
Epb41l2	19978	219805.1	151233	Sema5b	52133	139805	N/A
Epb41l2	19978	219967.1	151632	Sh3pxd2b	40711	38753	44276
Epb41l2	19978	219166.1	151702	Sh3pxd2b	40711	138771	N/A
Epb41l2	19978	217943.1	152003	Shf	33256	48635	45135

Epb41l2	19978	219224.1	151926	Shf	33256	151130	114524
Epb41l2	19978	219372.1	151258	Shf	33256	125826	117099
Epb41l2	19978	220121.1	N/A	Shf	33256	110532	106161
Epb41l2	19978	219138.1	N/A	Shf	33256	139819	119980
Epb41l2	19978	217844.1	N/A	Shf	33256	135848	N/A
Epb41l2	19978	220335.1	N/A	Shf	33256	110530	106159
Epb41l2	19978	219201.1	N/A	Shf	33256	121237	113923
Epb41l2	19978	219941.1	N/A	Shf	33256	143484	120732
Epb41l2	19978	218345.1	N/A	Shf	33256	110531	106160
Epb41l2	19978	219390.1	N/A	Slain1	55717	69443	70592
Epn2	1036	179936.7	136950	Slain1	55717	160805	125128
Epn2	1036	178202.7	136553	Slain1	55717	159456	125685
Epn2	1036	1063.14	1063	Slain1	55717	162818	123742
Epn2	1036	108713.7	104353	Slc1a2	5089	80210	79100
Epn2	1036	108712.7	104352	Slc1a2	5089	111212	106843
Epn2	1036	108711.7	104351	Slc1a2	5089	5220	5220
Epn2	1036	148956.7	122514	Slc1a2	5089	111213	106844
Epn2	1036	147501.7	117389	Slc1a2	5089	125085	N/A
Epn2	1036	146455.7	123675	Slc1a2	5089	137466	N/A
Epn2	1036	153984.1	122666	Slc1a2	5089	136221	N/A
Epn2	1036	137525.1	N/A	Slc1a2	5089	145921	N/A
Epn2	1036	141335.1	N/A	Slc1a2	5089	128622	N/A
Epn2	1036	151545.1	N/A	Slc1a2	5089	154446	117549
Erbin	21709	91269.1	88813	Slc1a2	5089	123759	115129
Erbin	21709	191275.6	140536	Slc1a2	5089	136488	122094
Erbin	21709	169083.7	127607	Slc38a3	10064	167868	130414
Erbin	21709	188997.6	140931	Slc38a3	10064	10208	10208
Erbin	21709	22222.11	22222	Slc38a3	10064	194895	N/A
Erbin	21709	53927.11	57956	Slc38a3	10064	193932	142087
Erbin	21709	189323.1	N/A	Slc38a3	10064	177567	137561
Fam107a	21750	121887.7	114015	Slc38a3	10064	195739	141484
Fam107a	21750	36070.14	45513	Slc38a3	10064	192211	141569
Fam107a	21750	120411.7	112769	Slc38a3	10064	194230	N/A
Fam107a	21750	137133.1	120854	Slc38a3	10064	195033	N/A
Fam173a	57411	72735.7	72518	Slc38a3	10064	191923	N/A
Fam21	N/A	NM_026585.3,1	NP_080861.2	Slc38a3	10064	192323	141850
Fam3c	29672	165576.7	127709	Slc38a3	10064	192990	141528
Fam3c	29672	163963.7	127559	Slc38a3	10064	195843	141552
Fam3c	29672	81288.13	80040	Slc38a3	10064	193495	N/A
Fam3c	29672	168965.2	128135	Slitrk4	46699	69926	64443
Fam3c	29672	163371.7	128855	Slitrk4	46699	114679	110327
Fam3c	29672	164669.3	N/A	Slitrk4	46699	156121	122648
Far2	30303	32443.13	32443	Snx22	39452	44711	44389
Far2	30303	111607.3	107234	Snx22	39452	214332	N/A
Far2	30303	203278.1	N/A	Speer4a	73119	79447	78415
Fbxw15	74060	56745.11	58175	Sstr1	35431	110671	106299
Fbxw15	74060	198397.4	143385	Sstr1	35431	44299	37045
Fbxw15	74060	198112.1	142894	Stxbp5l	22829	114782	110430
Fmnd3	42425	208130.1	146983	Stxbp5l	22829	149790	N/A
Fmnd3	42425	44702.6	42515	Stxbp5l	22829	123629	N/A
Fmnd3	42425	141660.7	119016	Stxbp5l	22829	114780	110428
Fzd7	41075	114246.3	109884	Stxbp5l	22829	114781	110429
G0s2	9633	9777.3	9777	Stxbp5l	22829	149984	N/A
Gap43	47261	102817.4	99881	Stxbp5l	22829	114775	110423
Gap43	47261	125187.1	N/A	Stxbp5l	22829	151910	N/A
Gbp11	92021	171587.1	132552	Stxbp5l	22829	23526	23526
Gbp11	92021	100960.1	98520	Stxbp5l	22829	114787	110435
Gdpd5	35314	37528.9	36175	Sv2b	53025	165175	127245
Gdpd5	35314	213887.1	150361	Sv2b	53025	85164	82254

Gdpd5	35314	208800.1	146372	Sv2b	53025	206344	146049
Gdpd5	35314	207617.1	147184	Sv2b	53025	207001	146277
Gdpd5	35314	207530.1	146887	Sv2b	53025	206845	N/A
Gdpd5	35314	208947.1	N/A	Sv2b	53025	206675	N/A
Gdpd5	35314	208061.1	N/A	Sv2b	53025	206236	N/A
Gdpd5	35314	207238.1	N/A	Syt1	35864	105276	100912
Gfra1	25089	26076.13	26076	Syt1	35864	64054	63293
Gfra1	25089	129100.7	117196	Syt1	35864	147593	N/A
Gfra1	25089	169850.7	130128	Syt1	35864	156979	N/A
Gfra1	25089	152507.7	120333	Syt1	35864	146618	N/A
Gfra1	25089	131877.1	122810	Syt1	35864	126278	N/A
Gfra1	25089	138530.7	115239	Tbata	20096	122261	113902
Gfra1	25089	135730.1	121447	Tbata	20096	121297	113253
Gfra1	25089	123957.1	120058	Tbata	20096	35894	36422
Gfra1	25089	140141.7	123022	Tbata	20096	131879	118942
Glce	32252	185675.6	139949	Tbata	20096	143207	151724
Glce	32252	34785.7	34785	Tbata	20096	148181	151940
Glce	32252	185873.1	140671	Tbata	20096	151886	151775
Glce	32252	185510.1	N/A	Tbata	20096	140456	151410
Glce	32252	186514.1	N/A	Tbata	20096	126831	119957
Gm10471	73116	94946.4	92553	Tbata	20096	79235	78227
Gm11780	85155	136880.1	N/A	Tenm1	16150	126161	N/A
Gm14204	86496	123944.1	N/A	Tenm1	16150	115059	110711
Gm14204	86496	145773.1	N/A	Tenm1	16150	125231	N/A
Gm14204	86496	155319.1	N/A	Tenm1	16150	154433	N/A
Gm14204	86496	123016.1	N/A	Tenm1	16150	115058	110710
Gm1979	91049	168875.7	130718	Tenm1	16150	16294	16294
Gm1979	91049	170224.2	130782	Tmem100	69763	92788	90464
Gm21671	95550	162387.5	133924	Tmem151b	96847	180252	136337
Gm2694	97248	180700.8	N/A	Tmem176b	29810	166247	131064
Gm2694	97248	180806.8	N/A	Tmem176b	29810	164733	128705
Gm2694	97248	211631.1	N/A	Tmem176b	29810	101429	98972
Gm2694	97248	181898.1	N/A	Tmem176b	29810	203355	145395
Gm2694	97248	210935.1	N/A	Tmem176b	29810	204073	144864
Gm2694	97248	181159.7	N/A	Tmem176b	29810	204783	144810
Gm2694	97248	182174.7	N/A	Tmem176b	29810	205159	144949
Gm2694	97248	211487.1	N/A	Tmem176b	29810	203229	144865
Gm2694	97248	182758.1	N/A	Tmem176b	29810	205147	145235
Gm2694	97248	182650.7	N/A	Tmem176b	29810	203265	144869
Gm2694	97248	210170.1	N/A	Tmem176b	29810	203501	144742
Gm30731	107859	203909	N/A	Tmem176b	29810	203618	N/A
Gm5803	N/A	NM_001165971.1.1	N/A	Tmem229a	48022	127247	116234
Gm5862	67700	72286.6	72133	Tmem88b	73680	97742	95349
Gm6277	97440	224036.1	N/A	Trf	32554	112645	108264
Gm6277	97440	180860.2	N/A	Trf	32554	35158	35158
Gm9895	N/A	NR_045687.1.1	N/A	Trf	32554	190051	N/A
Gpr12	41468	36211.7	38245	Trf	32554	168142	128609
Gpr12	41468	197431.1	142889	Trf	32554	170904	128390
Gpr12	41468	197825.1	143415	Trf	32554	164377	128647
Gpr12	41468	200112.1	143653	Trf	32554	112503	N/A
Gpr12	41468	196096.1	N/A	Trf	32554	165296	129013
Grm4	63239	118161.1	113819	Trf	32554	126359	120472
Grm4	63239	118489.7	112578	Tspyl4	39485	47935	36360
Grm4	63239	146277.7	N/A	Tspyl4	39485	213791	N/A
Grm4	63239	147865.1	N/A	Ttyh1	30428	130150	N/A
H2-Bl	73406	173080.9	134155	Ttyh1	30428	126971	N/A
H2-Bl	73406	183560.7	138812	Ttyh1	30428	119661	113937
H2-Bl	73406	183999.7	139165	Ttyh1	30428	129423	120182

H2-Bl	73406	184502.7	139275	Ttyh1	30428	148760	N/A
H2-Bl	73406	184850.7	N/A	Ttyh1	30428	79415	78384
H2-Bl	73406	185087.7	139166	Ttyh1	30428	206987	146170
H2-Bl	73406	185167.7	139373	Ttyh1	30428	153673	115623
H2-Bl	73406	192532.1	142113	Ttyh1	30428	32594	32594
H2-Bl	73406	194244.5	141809	Ttyh1	30428	151959	N/A
H2-Bl	73406	195833.5	141271	Ttyh1	30428	134536	N/A
H2-Bl	73406	195838.5	141253	Ttyh1	30428	206869	146131
Hecw1	21301	110516.2	106145	Ttyh1	30428	205971	N/A
Hecw1	21301	220718.1	152215	Ttyh1	30428	132400	N/A
Hecw1	N/A	221274.1	152351	Ttyh1	30428	148951	N/A
Hecw1	N/A	221863.1	N/A	Ttyh1	30428	128317	N/A
Hecw1	N/A	222241.1	N/A	Ttyh1	30428	139789	N/A
Hecw1	N/A	222904.1	N/A	Ttyh1	30428	140637	N/A
Hecw1	N/A	223189.1	152279	Unc5d	63626	168630	128521
Hecw1	N/A	223283.1	N/A	Unc5d	63626	210785	147721
Hecw1	N/A	223317.1	N/A	Unc5d	63626	211448	147306
Hecw1	N/A	223550.1	152688	Unc5d	63626	210298	148236
Hpcal1	71379	71858	71756	Unc5d	63626	209401	148043
Hpcal1	71379	222944	152772	Usp54	34235	22356	22356
Icmt	39662	48892	43390	Usp54	34235	123287	117503
Icmt	39662	151372	133950	Usp54	34235	143267	N/A
Icmt	39662	125617	N/A	Usp54	34235	127342	N/A
Icmt	39662	134242	N/A	Usp54	34235	35340	36214
Id2	20644	221761	152052	Wscd2	63430	138757	N/A
Id2	20644	222667	152069	Wscd2	63430	94452	92021
Id2	20644	20974	20974	Wscd2	63430	181650	N/A
Ifitm7	65968	117803	113641	Wscd2	63430	180565	N/A
Ifitm7	65968	178021	136512	Wscd2	63430	181294	N/A
Kalm	61751	114960	110611	Wscd2	63430	198673	N/A
Kalm	61751	151491	123416	Xylt1	30657	160035	N/A
Kalm	61751	114949	110599	Xylt1	30657	32892	32892
Kalm	61751	89655	87084	Xylt1	30657	161889	N/A
Kalm	61751	114953	110603	Zdhhc23	36304	36321	44744
Kalm	61751	137216	N/A	Zdhhc23	36304	165648	128650
Kalm	61751	114954	110604	Zfand4	42213	222819	152213
Kalm	61751	132569	N/A	Zfand4	42213	220845	152078
Kalm	61751	142817	116188	Zfand4	42213	36503	40057
Kalm	61751	114963	110614	Zfand4	42213	223495	152064
Kalm	61751	76810	76088	Zfand4	42213	222494	152710
Kalm	61751	114961	110612	Zfand4	42213	221239	N/A
Kalm	61751	114966	110617	Zfand4	42213	222144	N/A
Kalm	61751	114964	110615	Zfand4	42213	221069	152313
Kalm	61751	114973	110624	Zfand4	42213	221824	N/A
Kalm	61751	132002	N/A	Zfand4	42213	112900	108521
Kalm	61751	156668	N/A	Zfp488	44519	166737	132436
Kalm	61751	114947	110597				
Kalm	61751	124430	N/A				
Kcnd2	60882	81542	80257				
Kcnj6	43301	95873	93558				
Kcnj6	43301	99508	97108				
Kcnj6	43301	165538	130321				
Kcnk12	50138	55221	53595				
Kcnk9	36760	44624	38729				
Kcns2	50963	72868	72645				
Kcns2	50963	228725	153984				
Kirrel3	32036	184203	139393				
Kirrel3	32036	183580	N/A				
Kirrel3	32036	187625	139951				

Kirrel3	32036	190549	139714				
Kirrel3	32036	45091	48863				
Kirrel3	32036	188933	139418				
Kirrel3	32036	187182	140219				
Kirrel3	32036	188658	140086				
Kirrel3	32036	115148	110801				
Lhfpl3	106379	197992	143576				
Lhfpl3	106379	196406	142837				
Limd1	25239	26269	26269				
Limd1	25239	216352	N/A				
Limd1	25239	217639	150888				
Limd1	25239	213278	N/A				
Limd1	25239	214309	N/A				

[0061] For rats, Table 3 provides the unique ENSEMBL identifiers corresponding to the rat genes (MUSG), transcripts (MUST), and proteins (if available) (MUSP) analyzed in the experiments herein. The unique identifiers for each ENSEMBL entry has been modified to remove the first five leading zeros (0) of the identifier after the ENSMUSG, ENSMUST, and ENSMUSP label.

Table 3. ENSEMBL IDs for rats

Symbol	MUSG	MUST	MUSP	Symbol	MUSG	MUST	MUSP	Symbol	MUSG	MUST	MUSP
1700047M11Rik	100147	189594	N/A	Frem1	059049	170248	125809	Pitpnm3	040543	132781	N/A
1700047M11Rik	100147	185216	N/A	Frmd3	049122	084474	081514	Pitpnm3	040543	142471	N/A
2410124H12Rik	051297	160494	N/A	Frmd3	049122	098006	095615	Pitpnm3	040543	108508	104148
3110039M20Rik	104861	127041	N/A	Frmd3	049122	154134	N/A	Pkd2l1	037578	042026	045675
3110039M20Rik	104861	145291	N/A	Frmd4a	026657	138735	N/A	Pkd2l1	037578	161357	N/A
8030451O07Rik	N/A	N/A	N/A	Frmd4a	026657	137809	N/A	Pkia	027499	192468	142120
9530059O14Rik	097736	181682	N/A	Frmd4a	026657	177457	134788	Pkia	027499	028999	028999
9530059O14Rik	097736	181107	N/A	Frmd4a	026657	132710	N/A	Pkia	027499	193330	141466
9530059O14Rik	097736	215759	N/A	Frmd4a	026657	091497	089079	Pknox2	035934	177218	135581
9530059O14Rik	097736	181719	N/A	Frmd4a	026657	175669	135306	Pknox2	035934	039674	035806
A230077H06Rik	100600	189574	N/A	Frmd4a	026657	147156	N/A	Pknox2	035934	175938	138866
A230077H06Rik	100600	188579	N/A	Frmd4a	026657	176803	135432	Pknox2	035934	177080	N/A
A230077H06Rik	100600	189855	N/A	Frmd4a	026657	175944	135686	Pknox2	035934	176562	N/A
A230077H06Rik	100600	205953	N/A	Frmd4a	026657	115037	110689	Pknox2	035934	176622	N/A
A2m	030111	204850	144862	Frmd4a	026657	141746	N/A	Pknox2	035934	177444	135641
A2m	030111	032203	032203	Frmd4a	026657	075767	075172	Pknox2	035934	188348	139976
A2m	030111	203413	N/A	Frmd4a	026657	176962	N/A	Pknox2	035934	188057	140793
A730036I17Rik	056738	143346	N/A	Frmd4a	026657	115039	N/A	Pknox2	035934	189294	139728
A730036I17Rik	056738	148548	N/A	Frmd4a	026657	123919	N/A	Pknox2	035934	188433	N/A
A730036I17Rik	056738	165505	N/A	Frmd4a	026657	153160	N/A	Pknox2	035934	213653	N/A
Aass	029695	031707	031707	Frmd4a	026657	176828	134803	Pknox2	035934	215175	N/A
Aass	029695	138063	N/A	Frmd4a	026657	142452	N/A	Pknox2	035934	080754	079578
Aass	029695	149864	115079	Frmd4a	026657	176864	135057	Pkp3	054065	106039	101654
Aass	029695	152280	N/A	Frmd4b	030064	113355	108982	Pkp3	054065	159375	124572
Aatk	025375	103020	099309	Frmd4b	030064	203486	N/A	Pkp3	054065	066873	069961
Aatk	025375	064307	067181	Frmd4b	030064	143698	N/A	Pkp3	054065	163041	124434
Aatk	025375	103019	099308	Frmd4b	030064	113359	108986	Pkp3	054065	160869	124013
Aatk	025375	150730	N/A	Frmd4b	030064	032146	032146	Pkp3	054065	160615	N/A
Aatk	025375	142959	N/A	Frmd4b	030064	146191	N/A	Pkp3	054065	160403	N/A
Aatk	025375	134319	N/A	Frmd4b	030064	155326	N/A	Pkp3	054065	159253	N/A
Aatk	025375	132575	N/A	Frmd4b	030064	138301	N/A	Pkp3	054065	161142	N/A
Aatk	025375	136386	N/A	Frmd4b	030064	152385	N/A	Pla2g16	060675	025925	025925

Aatk	025375	128836	N/A	Frmd4b	030064	113353	N/A	Pla2g16	060675	136756	115151
Abat	057880	065987	063548	Frmd4b	030064	142589	N/A	Pla2g16	060675	136465	119403
Abat	057880	140795	N/A	Frmd4b	030064	126899	N/A	Pla2g16	060675	141887	123524
Abat	057880	115838	111504	Frmd4b	030064	124050	145240	Pla2g4a	056220	070200	070868
Abat	057880	144444	121881	Frmpd1	035615	107804	103434	Pla2g4a	056220	111926	107557
Abat	057880	115839	111505	Frmpd1	035615	134280	118757	Pla2g4a	056220	190507	139851
Abat	057880	128459	N/A	Frmpd1	035615	044773	047232	Pla2g4a	056220	155438	N/A
Abat	057880	138987	116686	Frmpd2	108841	208853	146522	Pla2g4a	056220	142040	N/A
Abca1	015243	030010	030010	Frmpd2	108841	208577	146693	Pla2g4a	056220	134676	N/A
Abca1	015243	149127	N/A	Frmpd2	108841	207581	N/A	Pla2g4e	050211	090071	087525
Abcc8	040136	210655	148169	Frmpd2	108841	208380	N/A	Pla2g4e	050211	127009	N/A
Abcc8	040136	209432	147431	Frmpd4	049176	112149	107777	Pla2g4e	050211	136845	N/A
Abcc8	040136	210770	147925	Frmpd4	049176	112146	107774	Pla2g4e	050211	152263	N/A
Abcc8	040136	210637	N/A	Frmpd4	049176	112147	107775	Pla2g5	041193	102512	099570
Abcc8	040136	033123	033123	Frmpd4	049176	112145	107773	Pla2g5	041193	102513	099571
Abcc8	040136	210110	147479	Frrs1	033386	040260	039487	Pla2g5	041193	102511	099569
Abcc8	040136	210986	N/A	Frrs1	033386	199626	143546	Pla2g5	041193	127183	N/A
Abcc8	040136	210511	148198	Frrs1	033386	195905	143255	Pla2g5	041193	136393	N/A
Abcg2	029802	147213	120940	Frrs1	033386	199584	N/A	Pla2g5	041193	140117	N/A
Abcg2	029802	204924	N/A	Frrs1	033386	197323	N/A	Pla2g5	041193	154844	N/A
Abcg2	029802	148008	114454	Frrs1	033386	199030	142793	Pla2g5	041193	140100	N/A
Abcg2	029802	031822	031822	Frrs11	045589	053681	052507	Pla2g5	041193	030524	030524
Abcg2	029802	124542	N/A	Frrs11	045589	128276	121657	Pla2g7	023913	167214	130404
Abcg2	029802	145161	122924	Fry	056602	200960	144674	Pla2g7	023913	024706	024706
Abcg2	029802	143752	138608	Fry	056602	202530	144277	Pla2g7	023913	167418	131898
Abcg2	029802	203146	145435	Fry	056602	203000	N/A	Pla2g7	023913	165706	N/A
Abcg2	029802	114294	109933	Fry	056602	202600	144317	Pla2g7	023913	169694	132027
Abcg2	029802	204948	144876	Fry	056602	201854	N/A	Pla2g7	023913	163489	N/A
Abcg2	029802	143447	N/A	Fry	056602	087204	084454	Plag1	003282	003369	003369
Abcg2	029802	145685	138703	Fry	056602	202841	N/A	Plag1	003282	137439	117532
Abcg2	029802	134426	N/A	Fry	056602	200964	N/A	Plag1	003282	151543	119937
Abhd2	039202	037315	038361	Fry	056602	202630	N/A	Plag1	003282	147035	N/A
Abhd2	039202	135333	N/A	Fry	056602	201634	N/A	Plat	031538	210960	N/A
Abhd5	032540	156520	122274	Fry	056602	202566	144657	Plat	031538	033941	033941
Abhd5	032540	035128	135538	Fry	056602	200863	143845	Plat	031538	211033	N/A
Abhd5	032540	111497	107123	Fry	056602	201196	N/A	Plcb1	051177	131552	118756
Abhd5	032540	176005	N/A	Fry	056602	202070	N/A	Plcb1	051177	110116	105743
Abhd5	032540	175973	135807	Fry	056602	200750	N/A	Plcb1	051177	130524	N/A
Abhd5	032540	214061	N/A	Fry	056602	202571	N/A	Plcb1	051177	202531	N/A
Abhd5	032540	216775	N/A	Fry	056602	201628	N/A	Plcb1	051177	070724	064844
Abhd5	032540	154161	122939	Fsip2	075249	143764	120314	Plcb1	051177	129382	N/A
Abi3bp	035258	048471	036257	Fsip2	075249	136202	114196	Plcb1	051177	201485	144399
Abi3bp	035258	096013	093712	Fsip2	075249	132967	122350	Plcb1	051177	201524	N/A
Abi3bp	035258	096012	093711	Fstl5	034098	038364	038506	Plce1	024998	181994	N/A
Abi3bp	035258	171000	128818	Fstl5	034098	159686	N/A	Plce1	024998	182481	138360
Ablim1	025085	079360	078336	Fstl5	034098	160261	125393	Plce1	024998	169713	130604
Ablim1	025085	111529	107154	Fstl5	034098	191664	N/A	Plce1	024998	182267	138330
Ablim1	025085	099294	096897	Fstl5	034098	162471	125688	Plce1	024998	182999	138098
Ablim1	025085	111559	107184	Fth1	024661	025563	025563	Plce1	024998	182589	N/A
Ablim1	025085	111528	107153	Fxyd1	036570	206328	145712	Plce1	024998	183131	N/A
Ablim1	025085	111526	107151	Fxyd1	036570	205807	145990	Plch1	036834	048134	047693
Ablim1	025085	111550	107175	Fxyd1	036570	205917	N/A	Plch1	036834	159374	N/A
Ablim1	025085	111558	107183	Fxyd1	036570	206012	146295	Plch1	036834	159982	N/A
Ablim1	025085	111555	107180	Fxyd1	036570	206305	145589	Plch1	036834	084105	081122
Ablim1	025085	111546	107172	Fxyd1	036570	206030	146129	Plch1	036834	162269	124463
Ablim1	025085	111544	107169	Fxyd1	036570	206317	N/A	Plch1	036834	159676	124632
Ablim1	025085	156316	N/A	Fxyd1	036570	205778	145818	Plch1	036834	059973	058524
Ablim1	025085	137389	N/A	Fxyd1	036570	108110	103745	Plch1	036834	177143	135424
Ablim1	025085	127198	N/A	Fxyd1	036570	206860	146288	Plch1	036834	176861	135562

Ablim1	025085	133782	N/A	Fxyd1	036570	206474	145920	Plch1	036834	175947	135353
Ablim1	025085	134430	N/A	Fxyd1	036570	071697	071617	Plch1	036834	159188	124491
Ablim1	025085	150425	N/A	Fxyd1	036570	205439	146064	Plch1	036834	161052	125581
Ablim1	025085	128212	N/A	Fxyd1	036570	205542	N/A	Plch1	036834	160638	123921
Ablim1	025085	111524	107149	Fxyd1	036570	206522	N/A	Plcl1	038349	042986	037854
Ablim1	025085	133369	117798	Fxyd1	036570	205392	N/A	Plcl1	038349	187059	N/A
Ablim1	025085	104902	127818	Fxyd1	036570	039909	048460	Pld5	055214	125404	121428
Ablim2	029095	101280	098838	Fxyd7	036578	206341	146171	Pld5	055214	065967	069326
Ablim2	029095	054598	050571	Fxyd7	036578	073892	073555	Pld5	055214	156184	N/A
Ablim2	029095	114205	109843	Fzd9	049551	062572	053551	Pld5	055214	144340	N/A
Ablim2	029095	114210	109848	Gab2	004508	004622	004622	Pld5	055214	111166	106796
Ablim2	029095	114206	109844	Gab2	004508	206791	146200	Pld5	055214	111167	106797
Ablim2	029095	114204	109842	Gabra2	000560	197284	142892	Plekhd1	066438	153762	N/A
Ablim2	029095	129347	123525	Gabra2	000560	198625	143645	Plekhd1	066438	142760	121812
Ablim2	029095	130233	118159	Gabra2	000560	197124	N/A	Plekhd1	066438	152465	N/A
Ablim2	029095	114203	109841	Gabra2	000560	000572	000572	Plekhd1	066438	140770	119711
Ablim2	029095	150146	144134	Gabra2	000560	199861	N/A	Plekhg3	052609	217730	151564
Ablim2	029095	151636	123616	Gabra2	000560	199012	N/A	Plekhg3	052609	075249	074729
Ablim2	029095	135885	N/A	Gabra4	029211	031121	031121	Plekhg3	052609	218461	N/A
Ablim2	029095	151322	114616	Gabra4	029211	199357	143675	Plekhg3	052609	219063	151851
Ablim2	029095	125378	115931	Gabra4	029211	197994	143063	Plekhg3	052609	218380	151867
Ablim2	029095	153025	N/A	Gabra4	029211	198138	142466	Plekhg3	052609	219751	151704
Ablim2	029095	130209	N/A	Gabra4	029211	199150	N/A	Plekhg3	052609	218357	N/A
Ablim2	029095	153529	118019	Gabra6	020428	020703	020703	Plekhg3	052609	219426	N/A
Ablim3	032735	049378	041243	Gabra6	020428	155218	126114	Plekhg3	052609	218427	N/A
Ablim3	032735	166783	125836	Gabra6	020428	109286	104909	Plekhh1	060716	039928	049460
Abtb2	032724	076212	075566	Gabrb1	029212	199967	143682	Plekhh1	060716	217954	151944
Abtb2	032724	131122	N/A	Gabrb1	029212	031122	031122	Plekhh1	060716	219956	151747
Abtb2	032724	138580	N/A	Gabrd	029054	150423	N/A	Plekhh1	060716	219946	N/A
Acad8	031969	129490	N/A	Gabrd	029054	030925	030925	Plekhh2	040852	047206	039628
Acad8	031969	120367	112908	Gabrd	029054	129892	N/A	Plekho2	050721	214740	N/A
Acad8	031969	151075	N/A	Gabrg2	020436	070725	064739	Plekho2	050721	213554	N/A
Acad8	031969	215693	150728	Gabrg2	020436	070735	063812	Plekho2	050721	068944	063677
Acad8	031969	128923	122444	Gabrg2	020436	146198	N/A	Plekho2	050721	213652	N/A
Acad8	031969	132293	123012	Gabrg2	020436	109290	104913	Pllp	031775	034227	034227
Acad8	031969	138102	N/A	Gabrg3	055026	068911	067632	Pllp	031775	212555	N/A
Acad8	031969	060513	054370	Gabrg3	055026	068394	065255	Pllp	031775	213043	148729
Acer3	030760	033020	033020	Gabrg3	055026	171965	N/A	Plp1	031425	033800	033800
Acer3	030760	120520	112884	Gad1	070880	094934	092539	Plp1	031425	113085	108708
Acer3	030760	151258	116127	Gad1	070880	130604	117721	Plp1	031425	125644	N/A
Acer3	030760	206182	N/A	Gad1	070880	148210	119733	Plp1	031425	144880	N/A
Acer3	030760	137899	120334	Gad1	070880	130998	119379	Plpp3	028517	064139	065719
Aco2	022477	023116	023116	Gad1	070880	155979	N/A	Plpp4	070366	094018	091557
Aco2	022477	157003	N/A	Gad1	070880	140478	N/A	Plpp4	070366	206551	N/A
Aco2	022477	135198	N/A	Gad1	070880	130618	117521	Plpp4	070366	206918	N/A
Aco2	022477	126352	N/A	Gad1	070880	123330	116301	Plpp4	070366	205630	145851
Aco2	022477	155704	N/A	Gad2	026787	028123	028123	Plpp4	070366	205896	145944
Aco2	022477	144324	N/A	Gad2	026787	156728	N/A	Plppr4	044667	061071	052306
Acot11	034853	102762	099823	Gal3st1	049721	078757	077815	Plppr4	044667	125664	N/A
Acot11	034853	065253	069636	Gal3st1	049721	063004	058348	Plppr4	044667	197743	143753
Acot11	034853	140541	124567	Gal3st1	049721	109981	105608	Pls1	049493	093800	091317
Acot11	034853	144809	N/A	Galnt14	024064	024858	024858	Pls1	049493	119760	113200
Acot11	034853	156567	123942	Galnt14	024064	146565	N/A	Pls1	049493	135816	N/A
Acot11	034853	145061	125123	Galnt14	024064	112591	108210	Plscr1	032369	093801	091318
Acot11	034853	148688	124385	Galnt15	021903	022460	022460	Plscr1	032369	186364	139479
Acsbg1	032281	034822	034822	Galnt15	021903	164208	131978	Plscr1	032369	187952	N/A
Acsbg1	032281	138315	118133	Galnt16	021130	219993	151829	Plscr4	032377	034941	034941
Acsbg1	032281	128163	119551	Galnt16	021130	218943	151619	Plscr4	032377	143866	N/A
Acsbg1	032281	128624	121622	Galnt16	021130	021558	021558	Pltp	017754	109316	104939

Acsbg1	032281	132914	N/A	Galnt16	021130	218648	N/A	Pltp	017754	109317	104940
Acsm5	030972	207796	146520	Galnt16	021130	217926	151370	Pltp	017754	059954	061519
Acsm5	030972	066465	063416	Galnt16	021130	219267	151800	Pltp	017754	142603	N/A
Acsm5	030972	207307	146737	Galnt18	038296	049430	043636	Pltp	017754	148912	N/A
Acsm5	030972	207440	146938	Galnt18	038296	106663	102274	Pltp	017754	156255	119955
Acsm5	030972	207381	146715	Galnt3	026994	028378	028378	Pltp	017754	128110	122760
Acsm5	030972	207387	146357	Galnt3	026994	153563	N/A	Plxdc1	017417	017561	017561
Acsm5	030972	207813	147176	Galnt3	026994	150793	N/A	Plxdc1	017417	107565	103191
Actb	029580	100497	098066	Galnt3	026994	155453	N/A	Plxdc1	017417	141708	N/A
Actb	029580	196997	N/A	Galnt5	026828	112616	108235	Plxdc1	017417	107564	103190
Actb	029580	167721	127663	Galnt5	026828	144671	N/A	Plxna4	029765	115096	110748
Actb	029580	171419	130611	Galnt5	026828	166729	131362	Plxna4	029765	200732	N/A
Actb	029580	167386	N/A	Galnt6	037280	159715	123848	Plxnb1	053646	072093	071966
Actb	029580	163829	132135	Galnt6	037280	052069	056705	Plxnb1	053646	131462	115265
Actb	029580	106216	101823	Galnt6	037280	161514	124793	Plxnb1	053646	130366	114358
Actb	029580	165629	N/A	Galntl6	096914	204128	145321	Plxnb1	053646	192988	142431
Actb	029580	164765	N/A	Galntl6	096914	204067	145016	Plxnb1	053646	195364	N/A
Actbl2	055194	054716	052086	Galntl6	096914	204937	N/A	Plxnb1	053646	192117	N/A
Actr3b	056367	128727	121629	Galntl6	096914	077447	N/A	Plxnb1	053646	194734	N/A
Actr3b	056367	088244	085578	Galntl6	096914	146513	118306	Plxnb3	031385	149478	N/A
Actr3b	056367	198693	N/A	Galntl6	096914	125865	N/A	Plxnb3	031385	146812	N/A
Adam11	020926	103081	099370	Galntl6	096914	203398	145298	Plxnb3	031385	147127	N/A
Adam11	020926	068150	069466	Galntl6	096914	188531	139677	Plxnb3	031385	002079	002079
Adam11	020926	124879	N/A	Galntl6	096914	098757	096353	Plxnb3	031385	155096	N/A
Adam11	020926	141563	N/A	Galr1	024553	065224	066381	Plxnc1	074785	099337	096939
Adam11	020926	142912	N/A	Gapdh	057666	192506	N/A	Plxnc1	074785	218839	N/A
Adam11	020926	126024	N/A	Gapdh	057666	147954	N/A	Plxnc1	074785	180514	N/A
Adam11	020926	134296	N/A	Gapdh	057666	117757	113942	Plxnc1	074785	181244	138038
Adam11	020926	143269	N/A	Gapdh	057666	118875	113213	Plxnc1	074785	180573	N/A
Adam11	020926	135513	N/A	Gapdh	057666	183272	138508	Pmepa1	038400	124124	N/A
Adam12	054555	067680	065213	Gapdh	057666	182464	N/A	Pmepa1	038400	139306	115534
Adam12	054555	138363	114874	Gapdh	057666	144205	N/A	Pmepa1	038400	036248	039950
Adam12	054555	134504	123161	Gapdh	057666	182115	N/A	Pmp2	052468	029034	029034
Adam12	054555	127524	120094	Gapdh	057666	182052	138403	Pmp22	018217	018361	018361
Adam12	054555	206313	N/A	Gapdh	057666	182277	138295	Pmp22	018217	108702	104342
Adam12	054555	206426	N/A	Gapdh	057666	182670	N/A	Pmp22	018217	108701	104341
Adam12	054555	154144	N/A	Gapdh	057666	144588	N/A	Pmp22	018217	140648	N/A
Adamts10	024299	174666	N/A	Gapdh	057666	073605	073289	Pmp22	018217	108700	104340
Adamts10	024299	173972	N/A	Garem2	044576	058045	054208	Polr2a	005198	058470	050771
Adamts10	024299	174104	N/A	Gaml3	038860	102810	099874	Polr2a	005198	156588	N/A
Adamts10	024299	173813	N/A	Gaml3	038860	049618	057582	Polr2a	005198	151586	N/A
Adamts10	024299	174348	133856	Gaml3	038860	137381	122576	Polr2a	005198	071213	071200
Adamts10	024299	172922	133891	Gaml3	038860	153717	N/A	Pon2	032667	057792	062670
Adamts10	024299	173013	134181	Gaml3	038860	139778	N/A	Pon2	032667	123838	N/A
Adamts10	024299	173030	134549	Gaml3	038860	193171	142077	Pon2	032667	135342	N/A
Adamts10	024299	174170	N/A	Gaml3	038860	150242	N/A	Pon2	032667	203882	N/A
Adamts10	024299	173241	134298	Gaml3	038860	135296	N/A	Por	005514	153500	121531
Adamts10	024299	087623	084905	Gaml3	038860	148043	N/A	Por	005514	150058	N/A
Adamts10	024299	173931	133434	Gaml3	038860	133135	119973	Por	005514	153515	121022
Adamts15	033453	065112	067022	Gaml3	038860	127509	141523	Por	005514	005651	005651
Adamts15	033453	217070	N/A	Gaml3	038860	124000	123601	Por	005514	122113	112924
Adamts15	033453	216215	150677	Gas1	052957	065086	064555	Por	005514	147515	N/A
Adamts16	049538	080145	079041	Gas1	052957	223933	153311	Por	005514	127096	119138
Adamts16	049538	123552	122031	Gatm	027199	028624	028624	Por	005514	149684	N/A
Adamts16	049538	109694	105316	Gatm	027199	154598	N/A	Por	005514	132084	N/A
Adamts16	049538	130726	N/A	Gatm	027199	140808	N/A	Pparg	000440	171644	131962
Adamts18	053399	093113	090801	Gatm	111138	215775	150264	Pparg	000440	203732	145525
Adamts18	053399	212665	148330	Gatm	111138	214872	N/A	Pparg	000440	204305	145083
Adamts18	053399	212437	148288	Gatm	111138	214402	N/A	Pparg	000440	203308	N/A

Adamts18	053399	213076	N/A	Gatsl2	015944	016088	016088	Pparg	000440	205213	144975
Adamts18	053399	213061	N/A	Gatsl2	015944	201013	N/A	Pparg	000440	000450	000450
Adamts18	053399	213078	N/A	Gatsl2	015944	140240	N/A	Pparg	000440	203896	N/A
Adamts18	053399	212527	N/A	Gca	026893	028257	028257	Ppfia4	026458	168515	128314
Adamts2	036545	040523	040171	Gca	026893	148083	N/A	Ppfia4	026458	186730	139800
Adamts2	036545	142118	N/A	Gda	058624	087600	084882	Ppfia4	026458	186964	N/A
Adamts2	036545	125988	N/A	Gda	058624	136258	N/A	Ppfia4	026458	189862	N/A
Adamts2	036545	127534	N/A	Gda	058624	121725	112758	Ppfia4	026458	189361	139833
Adamts6	046169	224784	153665	Gdf10	021943	168727	128621	Ppfia4	026458	186553	N/A
Adamts6	046169	223562	153504	Gfap	020932	067444	064691	Ppfibp1	016487	133825	N/A
Adamts6	046169	224742	152936	Gfap	020932	127909	N/A	Ppfibp1	016487	155415	121270
Adamts6	046169	224208	153359	Gfap	020932	077902	077061	Ppfibp1	016487	204028	N/A
Adamts6	046169	224303	153431	Gfra2	022103	022699	022699	Ppfibp1	016487	136837	114340
Adamts6	046169	224504	153194	Gfra2	022103	227697	154391	Ppfibp1	016487	123902	N/A
Adamts6	046169	065766	064570	Gfra2	022103	227633	153937	Ppfibp1	016487	149203	N/A
Adamts9	030022	113438	109065	Ghitm	041028	165649	129712	Ppfibp1	016487	126774	N/A
Adamts9	030022	125490	N/A	Ghitm	041028	042564	046212	Ppfibp1	016487	203730	145088
Adamts9	030022	130314	N/A	Ghitm	041028	224769	153458	Ppfibp1	016487	111623	107250
Adamts9	030022	203690	N/A	Ghitm	041028	223921	N/A	Ppfibp1	016487	204660	144887
Adamts9	030022	136751	N/A	Ghr	055737	069451	069457	Ppfibp1	016487	154221	122515
Adamts9	030022	167391	126498	Ghr	055737	161561	124064	Ppfibp1	016487	016631	016631
Adamtsl4	015850	117782	113424	Ghr	055737	110698	106326	Ppfibp2	036528	207852	N/A
Adamtsl4	015850	015994	015994	Ghr	055737	110697	106325	Ppfibp2	036528	040056	042574
Adamtsl4	015850	151054	N/A	Ghr	055737	161770	125044	Ppfibp2	036528	208504	N/A
Adamtsl4	015850	124410	N/A	Ghr	055737	160343	N/A	Ppfibp2	036528	208956	146889
Adamtsl4	015850	148854	120844	Ghr	055737	162993	N/A	Ppfibp2	036528	098134	095738
Adcy1	020431	020706	020706	Ghr	055737	159508	N/A	Ppfibp2	036528	208159	147038
Adcy1	020431	135398	N/A	Ghr	055737	161180	N/A	Ppm1e	046442	055438	061278
Adcyap1r1	029778	070736	063784	Ghr	055737	159912	N/A	Ppm1e	046442	155154	N/A
Adcyap1r1	029778	070756	066902	Gipc2	039131	152283	N/A	Ppm1h	034613	162853	N/A
Adcyap1r1	029778	166962	130742	Gipc2	039131	046614	037328	Ppm1h	034613	161487	124982
Adcyap1r1	029778	167484	131641	Gipc2	039131	128741	N/A	Ppm1h	034613	067918	066561
Adcyap1r1	029778	172084	127319	Gipc2	039131	130196	N/A	Ppm1h	034613	160315	N/A
Adcyap1r1	029778	165857	129614	Gipc2	039131	152680	N/A	Ppm1h	034613	159885	N/A
Adcyap1r1	029778	167234	126994	Gipc2	039131	200501	N/A	Ppm1h	034613	161065	N/A
Adcyap1r1	029778	165786	130923	Gipc2	039131	133672	N/A	Ppm1h	034613	161371	N/A
Add2	030000	203529	N/A	Gipc2	039131	197813	N/A	Ppm1h	034613	162969	124006
Add2	030000	204059	145160	Gipc2	039131	133102	N/A	Ppp1r14a	037166	207714	146684
Add2	030000	203366	144849	Gipr	030406	094790	092384	Ppp1r14a	037166	048187	035642
Add2	030000	203445	145494	Gipr	030406	206857	N/A	Ppp1r16b	037754	052927	062615
Add2	030000	205034	145034	Gipr	030406	206971	145860	Ppp1r16b	037754	045503	039540
Add2	030000	203724	145296	Gipr	030406	206137	N/A	Ppp1r16b	037754	129902	N/A
Add2	030000	203196	145104	Gja1	050953	068581	064536	Ppp1r16b	037754	145073	117310
Add2	030000	203786	144694	Gja1	050953	218760	N/A	Ppp1r16b	037754	103116	099405
Add2	030000	203279	145452	Gja1	050953	217789	151596	Ppp1r17	002930	052827	059708
Add2	030000	032069	032069	Gja1	050953	220204	N/A	Ppp4r4	021209	021631	021631
Adgra1	025475	026548	026548	Gja1	050953	220194	151603	Ppp4r4	021209	189871	139786
Adgra1	025475	137584	N/A	Gja1	050953	218834	151647	Ppp4r4	021209	187155	140874
Adgra1	025475	129454	N/A	Gja1	050953	218444	151974	Ppp4r4	021209	190664	140295
Adgra3	029090	030971	030971	Gja1	050953	220069	151620	Ppp4r4	021209	190151	139815
Adgra3	029090	196177	N/A	Gjb1	047797	119080	113904	Prag1	050271	110492	106118
Adgra3	029090	198818	N/A	Gjb1	047797	052130	062723	Prag1	050271	145386	N/A
Adgra3	029090	196229	N/A	Gjb1	047797	119190	113516	Prag1	050271	150295	N/A
Adgra3	029090	198868	N/A	Gjb6	040055	039380	035630	Ptex1	039621	036719	037180
Adgra3	029090	196915	N/A	Gjb6	040055	224544	N/A	Ptex1	039621	127553	N/A
Adgra3	029090	199132	N/A	Gjb6	040055	160703	124927	Ptex1	039621	099080	096679
Adgrg1	031785	211850	N/A	Gjb6	040055	162931	N/A	Ptex1	039621	109246	104869
Adgrg1	031785	212581	148742	Gjc2	043448	108793	104421	Ptex1	039621	140624	N/A
Adgrg1	031785	179619	137520	Gjc2	043448	108790	104418	Ptex1	039621	152238	N/A

Adgrg1	031785	212660	148644	Gjc3	056966	077119	076367	Prex1	039621	136564	N/A
Adgrg1	031785	093271	090959	Gjc3	056966	199083	N/A	Prex1	039621	136974	N/A
Adgrg1	031785	211944	148386	Gjd2	068615	090275	087742	Prex2	048960	027056	027056
Adgrg1	031785	212799	148349	Slc1a3	005360	005493	005493	Prex2	048960	190935	N/A
Adgrg1	031785	212141	148331	Slc1a3	005360	125997	N/A	Prex2	048960	189822	N/A
Adgrg1	031785	212976	148439	Slc1a3	005360	128879	N/A	Prex2	048960	187694	N/A
Adgrg1	031785	212995	148309	Slc1a3	005360	153455	N/A	Prex2	048960	188189	140621
Adgrg1	031785	212956	148374	Slc1a3	005360	157065	118902	Prex2	048960	187745	140788
Adgrg1	031785	212531	148650	Slc1a3	005360	129325	N/A	Prex2	048960	189385	140863
Adgrg1	031785	211984	148412	Slc1a3	005360	133309	N/A	Prex2	048960	188154	140580
Adgrg1	031785	212118	148304	Slc1a3	005360	126747	N/A	Prickle1	036158	048982	049204
Adgrg1	031785	211806	N/A	Slc1a3	005360	005493	005493	Prickle1	036158	109255	104878
Adgrg1	031785	211911	N/A	Slc1a3	005360	125997	N/A	Primal	041669	123655	N/A
Adgrv1	069170	128120	122358	Slc1a3	005360	128879	N/A	Primal	041669	127843	114309
Adgrv1	069170	095585	093245	Slc1a3	005360	153455	N/A	Primal	041669	074416	074017
Adgrv1	069170	224088	153419	Slc1a3	005360	157065	118902	Primal	041669	156176	123331
Adgrv1	069170	125698	120136	Slc1a3	005360	129325	N/A	Primal	041669	155547	N/A
Adgrv1	069170	156631	N/A	Slc1a3	005360	133309	N/A	Prkag3	006542	160732	125344
Adgrv1	069170	109565	105193	Slc1a3	005360	126747	N/A	Prkag3	006542	113672	109302
Adgrv1	069170	129725	N/A	Gldc	024827	025778	025778	Prkag3	006542	081636	080342
Adgrv1	069170	156627	N/A	Gldn	046167	056740	056080	Prkag3	006542	162093	125242
Adgrv1	069170	146141	N/A	Gli1	025407	026474	026474	Prkag3	006542	159728	124979
Adgrv1	069170	125663	N/A	Gli1	025407	219808	N/A	Prkag3	006542	188073	139909
Adgrv1	069170	126444	123552	Gli1	025407	218236	151718	Prkcb	052889	143692	138788
Adgrv1	069170	128585	121899	Gli1	025407	219671	151749	Prkcb	052889	064989	070019
Adgrv1	069170	146749	114579	Gli1	025407	218451	N/A	Prkcb	052889	064921	064812
Adgrv1	069170	132045	N/A	Gli2	048402	062483	054837	Prkcb	052889	131167	N/A
Adm	030790	033054	033054	Gli2	048402	161301	125342	Prkcb	052889	149583	N/A
Adm	030790	185766	N/A	Gli2	048402	162552	125059	Prkcb	052889	205550	N/A
Adora1	042429	086465	083656	Gli2	048402	161056	124768	Prkcb	052889	127910	N/A
Adora1	042429	038191	043522	Gli2	048402	160991	125634	Prkcb	052889	206495	N/A
Adora1	042429	187631	140801	Gli2	048402	159839	125661	Prkcd	021948	112210	107829
Adora1	042429	169927	132105	Gli2	048402	161451	124132	Prkcd	021948	022521	022521
Adra1a	045875	159365	124322	Gli2	048402	162607	123808	Prkcd	021948	112207	107826
Adra1a	045875	054661	053703	Gli2	048402	159678	N/A	Prkcd	021948	112206	107825
Adra1a	045875	160647	N/A	Gli3	021318	130065	115989	Prkcd	021948	140701	N/A
Adra1a	045875	225182	153103	Gli3	021318	141194	152092	Prkcd	021948	112202	107821
Adra1a	045875	159068	124570	Gli3	021318	130535	N/A	Prkcd	021948	112203	107822
Adra1a	045875	161339	125354	Gli3	021318	110510	106137	Prkcd	021948	130736	N/A
Adra1b	050541	067258	070200	Glipr2	028480	030202	030202	Prkcd	021948	135714	N/A
Adra1b	050541	139906	123435	Glipr2	028480	107855	103487	Prkcd	021948	145806	N/A
Adra1b	050541	124306	N/A	Glis1	034762	046005	035650	Prkcd	021948	112208	N/A
Adra1b	050541	167574	129200	Glis1	034762	106738	102349	Prkcd	021948	227078	N/A
Adra2b	058620	104934	100539	Glis1	034762	130573	N/A	Prkcd	021948	112211	107830
Adra2b	058620	071902	071798	Glis1	034762	135835	118600	Prkcg	078816	203600	N/A
Adrb2	045730	053640	062256	Glis1	034762	138211	N/A	Prkcg	078816	100301	097874
AF529169	039313	044491	046111	Glis1	034762	125573	N/A	Prkcg	078816	172109	131351
AF529169	039313	191465	140942	Glp2r	049928	021289	021289	Prkcg	078816	203081	145498
Afap1	029094	064571	067779	Glp2r	049928	051765	061560	Prkcg	078816	203454	N/A
Afap1	029094	146300	N/A	Glul	026473	086199	083375	Prkcg	097449	181455	137923
Afap1	029094	141824	119364	Glul	026473	139476	114377	Prkcg	097449	181221	137836
Afap1	029094	212374	148414	Glul	026473	140685	123157	Prkcq	026778	028118	028118
Afap1	029094	201482	N/A	Glul	026473	153134	N/A	Prkcq	026778	114853	N/A
Afap1l1	033032	154876	121278	Glul	026473	154576	N/A	Prkcq	026778	195207	N/A
Afap1l1	033032	120472	113286	Gm11549	085007	124606	153318	Prkcq	026778	102970	100035
Afap1l1	033032	147278	N/A	Gm136	071015	095129	092748	Prkcq	026778	192461	N/A
Aff2	031189	033532	033532	Gm20425	090639	166836	127808	Prkcq	026778	195628	N/A
Aff2	031189	143097	N/A	Gm266	010529	010673	010673	Prkd3	024070	003191	003191
Aff2	031189	151662	N/A	Gm5083	089815	163056	N/A	Prkd3	024070	119284	113395

Aff2	031189	139977	N/A	Gm5083	089815	159595	N/A	Prkd3	024070	146917	N/A
Afp	054932	042755	041006	Gm5089	064052	081580	080290	Prkd3	024070	118768	113232
Afp	054932	200693	144019	Gm5468	056089	227851	N/A	Prkd3	024070	118991	112775
Afp	054932	201061	N/A	Gm5468	056089	069992	N/A	Prkd3	024070	124229	N/A
Afp	054932	200728	N/A	Sox1ot	047935	186174	N/A	Prkd3	024070	130070	N/A
Afp	054932	202209	N/A	Sox1ot	047935	080795	N/A	Prkd3	024070	168887	132004
Agap1	055013	027521	027521	Gm8179	N/A	N/A	N/A	Prkg2	029334	161490	124963
Agap1	055013	190096	140599	Gna12	000149	000153	000153	Prkg2	029334	162619	142743
Agap1	055013	185417	N/A	Gna12	000149	198447	143414	Prkg2	029334	162147	143708
Agap1	055013	074945	074478	Gnal	024524	025402	025402	Prkg2	029334	031277	031277
Agap1	055013	212721	148732	Gnal	024524	076605	075908	Prkg2	029334	160765	N/A
Agap1	055013	212924	148317	Gnb3	023439	024206	024206	Prmt8	030350	032500	032500
Agpat3	001211	001240	001240	Gnb3	023439	129251	N/A	Procr	027611	029140	029140
Agpat3	001211	105389	101028	Gnb3	023439	140233	N/A	Procr	027611	143493	N/A
Agpat3	001211	105390	101029	Gnb3	023439	135996	N/A	Procr	027611	155095	N/A
Agpat3	001211	105388	101027	Gng11	032766	031670	031670	Procr	027611	132608	114567
Agpat3	001211	105387	101026	Gng13	025739	172002	131648	Prr5	036106	171460	127890
Agpat3	001211	146296	N/A	Gng13	025739	115108	110760	Prr5	036106	065499	066396
Agpat3	001211	219907	N/A	Gng2	043004	161247	124725	Prr5l	032841	043845	042167
Agpat3	001211	219932	151528	Gng2	043004	162425	124153	Prr5l	032841	141814	118537
Agpat3	001211	139282	119713	Gng2	043004	159028	125141	Prr5l	032841	125985	122996
Agpat3	001211	150828	114885	Gng2	043004	159073	125000	Prr5l	032841	154525	120192
Agpat3	001211	138035	121052	Gng2	043004	160013	125697	Prr5l	032841	124802	118502
Agpat3	001211	146899	114657	Gng2	043004	055100	055256	Prr5l	032841	144549	116266
Agpat3	001211	166360	132954	Gpc6	058571	123239	N/A	Prr5l	032841	140387	N/A
Agpat4	023827	164143	128085	Gpc6	058571	088483	085835	Prr5l	032841	127358	N/A
Agpat4	023827	024594	024594	Gpc6	058571	125435	120362	Prr5l	032841	163762	127530
Agpat4	023827	172259	N/A	Gpc6	058571	078849	077893	Prr5l	032841	171088	130152
Agpat4	023827	167792	127477	Gpcpd1	027346	127712	N/A	Prrc1	024594	025490	025490
Agpat4	023827	170858	127417	Gpcpd1	027346	148833	116156	Prrg3	033361	126362	118155
Agpat4	023827	167905	N/A	Gpcpd1	027346	110136	105763	Prrg3	033361	048790	038947
Agrn	041936	154494	N/A	Gpcpd1	027346	060955	062221	Prrg3	033361	170096	128073
Agrn	041936	105574	101199	Gpcpd1	027346	149854	116949	Prrx1	026586	075805	075203
Agrn	041936	071248	071229	Gpcpd1	027346	145694	116457	Prrx1	026586	027878	027878
Agrn	041936	105575	101200	Gpcpd1	027346	028822	028822	Prrx1	026586	183691	N/A
Agrn	041936	181062	N/A	Gpcpd1	027346	124632	117217	Prrx1	026586	174397	134338
Agrn	041936	180572	137931	Gpcpd1	027346	124107	122751	Prrx1	026586	174098	N/A
Agrn	041936	144749	N/A	Gpcpd1	027346	110135	105762	Psd2	024347	115716	111381
AI464131	046312	054920	059038	Gpcpd1	027346	140867	N/A	Psd2	024347	176873	135616
AI464131	046312	149596	122357	Gpcpd1	027346	131617	N/A	Psd2	024347	177432	135431
AI593442	078307	213937	149532	Gpcpd1	027346	110142	105769	Psd2	024347	176472	135285
AI593442	078307	213843	149128	Gphn	047454	052472	054064	Psd2	024347	175734	135795
AI593442	078307	098768	096365	Gphn	047454	110388	106018	Psd2	024347	175720	N/A
Ak4	028527	102780	099841	Gphn	047454	219629	N/A	Pstpip2	025429	114741	110389
Ak4	028527	106946	102559	Gpr135	043398	050649	058762	Ptchd1	041552	038665	039443
Ak4	028527	106945	102558	Gpr153	042804	105650	101275	Ptchd1	041552	170236	132293
Ak4	028527	131397	115456	Gpr153	042804	055754	052742	Ptchd1	041552	141356	N/A
Ak4	028527	133055	115454	Gpr153	042804	144035	N/A	Ptchd4	042256	048691	047640
Ak4	028527	151561	N/A	Gpr153	042804	105651	101276	Pter	026730	154269	118645
Ak4	028527	155749	121112	Gpr22	044067	057783	056125	Pter	026730	150283	N/A
Akain1	091636	169935	131134	Gpr22	044067	176710	134839	Pter	026730	114796	110444
Akna	039158	035724	041614	Gpr22	044067	174480	134674	Pter	026730	134794	117009
Akna	039158	140586	N/A	Gpr37	039904	200812	144683	Pter	026730	028063	028063
Aldh1a1	053279	224807	N/A	Gpr37	039904	054867	052185	Pter	026730	193742	N/A
Aldh1a1	053279	225337	153410	Gpr37l1	026424	027682	027682	Pter	026730	195521	N/A
Aldh1a1	053279	224358	N/A	Gpr63	040372	151006	N/A	Ptgfrn	027864	102694	099755
Aldh1a1	053279	225313	153011	Gpr63	040372	038920	039312	Ptgfrn	027864	198037	N/A
Aldh1a1	053279	225249	N/A	Gprasp2	072966	134986	N/A	Ptgfrn	027864	200065	N/A
Aldh1a1	053279	087638	084918	Gprasp2	072966	113136	108761	Ptk2b	059456	022622	022622

Aldh1a1	053279	224807	N/A	Gprasp2	072966	150797	N/A	Ptk2b	059456	154865	122683
Aldh1a1	053279	225337	153410	Gprasp2	072966	132798	N/A	Ptk2b	059456	089250	086661
Aldh1a1	053279	224358	N/A	Gprasp2	072966	141953	N/A	Ptk2b	059456	136216	N/A
Aldh1a1	053279	225313	153011	Gprasp2	072966	142034	N/A	Ptk2b	059456	111121	106750
Aldh1a1	053279	225249	N/A	Gprasp2	072966	137392	N/A	Ptk2b	059456	148104	N/A
Aldh1a1	053279	087638	084918	Gprasp2	072966	130034	N/A	Ptk2b	059456	127083	N/A
Aldh1l1	030088	127199	N/A	Gprasp2	072966	148658	N/A	Ptk2b	059456	178730	137008
Aldh1l1	030088	130418	114304	Gprasp2	072966	138251	N/A	Ptn	029838	101534	099073
Aldh1l1	030088	032175	032175	Gprasp2	072966	173804	134666	Ptn	029838	201321	144184
Aldh1l1	030088	203111	145233	Gprc5c	051043	133245	121572	Ptpn14	026604	097442	095051
Aldh1l1	030088	204796	145380	Gprc5c	051043	122967	114335	Ptpn14	026604	194127	N/A
Aldh1l1	030088	152436	N/A	Gprc5c	051043	053361	061760	Ptpn14	026604	128275	N/A
Aldh1l1	030088	137669	N/A	Gprc5c	051043	021071	021071	Ptpn14	026604	027898	027898
Aldh1l2	020256	020497	020497	Gprc5c	051043	136785	116786	Ptpn14	026604	195038	N/A
Aldh1l2	020256	146640	117076	Gprc5c	051043	142262	121524	Ptpn14	026604	148129	N/A
Aldh1l2	020256	147381	N/A	Gprc5c	051043	152314	118667	Ptpn22	027843	146071	122307
Aldh1l2	020256	141184	N/A	Gprc5c	051043	177952	136702	Ptpn22	027843	029433	029433
Aldh1l2	020256	138858	N/A	Gpx2	042808	221421	N/A	Ptpn22	027843	198530	N/A
Aldh1l2	020256	143793	N/A	Gpx2	042808	220569	N/A	Ptpn22	027843	197997	N/A
Aldh1l2	020256	125193	N/A	Gpx2	042808	082431	081012	Ptpn22	027843	196385	N/A
Aldoc	017390	102478	099536	Gramd3	001700	070166	068453	Ptpn22	027843	198701	N/A
Aldoc	017390	128032	N/A	Grb14	026888	134020	N/A	Ptpn22	027843	134373	N/A
Aldoc	017390	124090	N/A	Grb14	026888	149193	118115	Ptpn22	027843	126548	N/A
Aldoc	017390	156039	N/A	Grb14	026888	150643	121571	Ptpn5	030854	102626	099686
Aldoc	017390	148689	N/A	Grb14	026888	028252	028252	Ptpn5	030854	209161	N/A
Aldoc	017390	017534	017534	Grb14	026888	137085	N/A	Ptpn5	030854	033142	033142
Als2	026024	027178	027178	Grb14	026888	156765	121001	Ptpn5	030854	208324	N/A
Als2	026024	163058	125753	Grb14	026888	145603	N/A	Ptpn5	030854	208531	N/A
Als2	026024	159166	N/A	Grb14	026888	146807	N/A	Ptpn5	030854	207172	N/A
Als2	026024	160945	140990	Greb1l	042942	173356	N/A	Ptpn5	030854	208437	N/A
Als2	026024	188469	N/A	Greb1l	042942	048977	049003	Ptpn5	030854	209179	N/A
Amz1	050022	126975	N/A	Greb1l	042942	172532	134090	Ptpn5	030854	209184	N/A
Amz1	050022	060918	053110	Greb1l	042942	224958	N/A	Ptpn5	030854	207344	N/A
Amz1	050022	177057	N/A	Greb1l	042942	174553	N/A	Ptpn5	030854	209057	N/A
Amz1	050022	120630	113911	Greb1l	042942	172680	134314	Ptprk	019889	166468	126279
Amz1	050022	156006	N/A	Greb1l	042942	173261	N/A	Ptprk	019889	218359	151986
Amz1	050022	155644	N/A	Grhl1	020656	085553	082689	Ptprk	019889	218276	151866
Amz1	050022	176035	135504	Grhl1	020656	221426	N/A	Ptprk	019889	219478	N/A
Angptl	022309	022921	022921	Grhl1	020656	223442	N/A	Ptprk	019889	218633	N/A
Angptl	022309	227738	N/A	Grhl1	020656	020985	020985	Ptprk	019889	219107	N/A
Angptl3	028553	030280	030280	Gria1	020524	125292	133439	Ptprk	019889	218584	N/A
Angptl3	028553	136091	N/A	Gria1	020524	036315	044494	Ptprk	019889	219761	N/A
Angptl3	028553	125546	N/A	Gria1	020524	094179	091731	Ptprk	019889	219621	151294
Ankrd33b	022237	123325	118984	Gria1	020524	151045	117746	Ptprk	019889	220357	151493
Ankrd33b	022237	156679	117974	Gria1	020524	173531	N/A	Ptprk	019889	220404	N/A
Ankrd33b	022237	044324	037918	Gria3	001986	128197	N/A	Ptprm	033278	037974	045603
Ankrd33b	022237	110410	106040	Gria3	001986	115103	110755	Ptprm	033278	223982	153662
Ankrd33b	022237	227867	N/A	Gria3	001986	076349	075687	Ptprm	033278	225074	N/A
Ankrd33b	022237	076942	076209	Gria3	001986	156721	N/A	Ptprm	033278	224091	153463
Ankrd33b	022237	227391	N/A	Gria3	001986	139965	116381	Ptprm	033278	225554	153042
Anln	036777	040912	045873	Gria3	001986	148212	N/A	Ptprm	033278	225688	N/A
Anln	036777	215006	149721	Gria3	001986	124169	117766	Ptprm	033278	224862	153179
Anln	036777	217010	N/A	Gria3	001986	126843	N/A	Ptpro	030223	203010	N/A
Anln	036777	216897	N/A	Gria3	001986	165288	131523	Ptpro	030223	167679	127112
Anln	036777	216793	149740	Grid1	041078	043349	044009	Ptpro	030223	077115	076364
Anln	036777	215486	N/A	Grid1	041078	227253	N/A	Ptpro	030223	167002	131764
Ano4	035189	182462	138440	Grid1	041078	173307	N/A	Ptpro	030223	203914	144870
Ano4	035189	182341	138193	Grid2	071424	159319	N/A	Ptpro	030223	204780	N/A
Ano4	035189	182613	138268	Grid2	071424	159561	N/A	Ptpro	030223	203255	N/A

Ano4	035189	182790	138325	Grid2	071424	095852	093536	Ptpro	030223	203127	N/A
Ano4	035189	182598	138174	Grid2	071424	160408	N/A	Ptprr	020151	063470	064392
Ano4	035189	182888	N/A	Grid2	071424	161105	N/A	Ptprr	020151	142617	N/A
Ano4	035189	182041	N/A	Grid2	071424	162968	N/A	Ptprr	020151	105271	100907
Ano4	035189	182419	138435	Grid2	071424	210324	147707	Ptprr	020151	148731	120965
Ano4	035189	183268	138627	Grid2ip	010825	110733	106361	Ptprr	020151	155606	122259
Ano4	035189	181976	138792	Grid2ip	010825	010969	010969	Ptprr	020151	128399	114455
Ano4	035189	182624	138525	Grid2ip	010825	120825	113443	Ptprr	020151	124369	N/A
Ano4	035189	180843	N/A	Grid2ip	010825	196148	N/A	Ptprt	053141	109445	105071
Ano6	064210	071874	071770	Grid2ip	010825	138948	N/A	Ptprt	053141	109443	105069
Ano6	064210	226936	N/A	Grik1	022935	228188	154130	Ptprt	053141	109442	105068
Ano6	064210	227791	153954	Grik1	022935	023652	023652	Ptprt	053141	109441	105067
Ano6	064210	226682	N/A	Grik1	022935	072256	072107	Ptprt	053141	153770	N/A
Ano6	064210	227151	153853	Grik1	022935	227986	153786	Ptprt	053141	129015	N/A
Ano6	064210	226932	N/A	Grik1	022935	228034	154596	Ptprz1	068748	090568	088056
Ano6	064210	226793	154532	Grik1	022935	211444	147948	Ptprz1	068748	202579	144605
Ano6	064210	226761	N/A	Grik1	022935	210700	N/A	Ptprz1	068748	202102	143902
Aox1	063558	001027	001027	Grik1	022935	211635	N/A	Ptprz1	068748	202341	N/A
Aox1	063558	160168	N/A	Grik1	022935	226447	N/A	Ptprz1	068748	201827	N/A
Apba2	030519	032732	032732	Grik1	022935	210910	N/A	Ptprz1	068748	200769	N/A
Apba2	030519	205613	146269	Grik1	022935	114137	109773	Pttg1	020415	020687	020687
Apba2	030519	205604	146279	Grik2	056073	218823	151921	Pttg1	020415	117446	112841
Apba2	030519	206246	146038	Grik2	056073	217673	N/A	Pttg1	020415	140434	122019
Apba2	030519	205551	N/A	Grik2	056073	218598	151389	Pttg1	020415	101340	098894
Apba2	030519	206061	N/A	Grik2	056073	219509	151982	Pttg1	020415	118368	112834
Apba2	030519	206630	146108	Grik2	056073	218441	151671	Pttg1	020415	121638	112815
Apbb2	029207	162955	N/A	Grik2	056073	220330	N/A	Pttg1	020415	152115	119554
Apbb2	029207	162366	125116	Grik2	056073	219051	N/A	Pttg1	020415	020685	020685
Apbb2	029207	160870	123978	Grik2	056073	218669	152029	Pttg1	020415	150726	N/A
Apbb2	029207	159512	124807	Grik2	056073	220263	151372	Pttg1	020415	148130	N/A
Apbb2	029207	159786	125211	Grik2	056073	079751	078687	Putb	094483	179343	136957
Apbb2	029207	201776	N/A	Grik2	056073	105484	101124	Pvalb	005716	005860	005860
Apbb2	029207	160775	N/A	Grik3	001985	030676	030676	Pvalb	005716	120592	112598
Apbb2	029207	162349	123752	Grin2a	059003	199708	142900	Pxdc1	021411	053459	051246
Apbb2	029207	160063	123778	Grin2a	059003	115835	111501	Pxdc1	021411	021847	021847
Apbb2	029207	161771	N/A	Grin2a	059003	199267	N/A	Pxdc1	021411	125037	117791
Apbb2	029207	162401	N/A	Grin2a	059003	156482	N/A	Pxdc1	021411	152392	N/A
Apbb2	029207	160185	N/A	Grin2a	059003	197242	N/A	Pxdn	020674	220271	151320
Apbb2	029207	162382	124139	Grin2a	059003	032331	032331	Pxdn	020674	122328	113703
Apbb2	029207	161879	125550	Grin2b	030209	053880	062284	Pxdn	020674	118321	113477
Apbb2	029207	160103	123766	Grin2b	030209	152012	142696	Pxdn	020674	155318	N/A
Apbb2	029207	162994	125603	Grin2b	030209	188999	140452	Pxdn	020674	155190	N/A
Apbb2	029207	159357	124127	Grin2b	030209	143943	140710	Pxdn	020674	126233	N/A
Apbb2	029207	161716	124350	Grin2b	030209	125905	139706	Pxdn	020674	137316	N/A
Apbb2	029207	161936	N/A	Grin2b	030209	198283	N/A	Pxdn	020674	218620	N/A
Apbb2	029207	159847	N/A	Grin2b	030209	111905	107536	Pxk	033885	036682	035265
Apbb2	029207	087256	084511	Grin2c	020734	003351	003351	Pxk	033885	225827	N/A
Apcdd1	071847	096554	094302	Grin2c	020734	106554	102164	Pxk	033885	225616	N/A
Apcdd1	071847	163716	125868	Grin2d	002771	002848	002848	Pxk	033885	225653	152987
Aplp1	006651	006828	006828	Grin2d	002771	211713	147663	Pxk	033885	224462	N/A
Aplp1	006651	208792	N/A	Grin2d	002771	211250	147506	Pxk	033885	112689	108309
Aplp1	006651	208404	N/A	Grip1	034813	077871	077033	Pxylp1	043587	112951	108574
Aplp1	006651	207514	N/A	Grip1	034813	041962	042436	Pxylp1	043587	078478	077571
Aplp1	006651	209054	N/A	Grip1	034813	147356	115478	Pxylp1	043587	120101	113210
Apod	022548	130560	119827	Grip1	034813	105262	100897	Pxylp1	043587	119141	113489
Apod	022548	115230	110885	Grip1	034813	147454	118073	Pxylp1	043587	126411	121537
Apod	022548	023207	N/A	Grip1	034813	147598	N/A	Pxylp1	043587	121077	113059
Apod	022548	156456	N/A	Grip1	034813	138410	123234	Pxylp1	043587	135834	N/A
Apod	022548	155682	N/A	Grip1	034813	144825	121670	Pxylp1	043587	154146	114946

Apod	022548	145837	N/A	Grip1	034813	148954	118397	Pxylp1	043587	137770	N/A
Appl2	020263	020500	020500	Grip1	034813	144959	122323	Pxylp1	043587	124923	120377
Appl2	020263	177187	135157	Grip1	034813	139352	N/A	Pxylp1	043587	141127	N/A
Appl2	020263	176675	135672	Grip1	034813	127787	N/A	Pxylp1	043587	136987	N/A
Appl2	020263	141048	N/A	Grip1	034813	130387	123288	Pxylp1	043587	185561	N/A
Appl2	020263	130285	N/A	Grip1	034813	105261	100896	Pyroxd2	060224	076505	075825
Appl2	020263	148096	N/A	Grip1	034813	154238	122349	Qdpr	015806	198258	143741
Appl2	020263	147582	N/A	Grip1	034813	081260	080016	Qdpr	015806	197946	143584
Appl2	020263	150351	N/A	Grk4	052783	074651	074223	Qdpr	015806	117425	112469
Appl2	020263	127788	N/A	Grk4	052783	001112	001112	Qdpr	015806	120867	113203
Appl2	020263	147118	N/A	Grk4	052783	148588	122826	Qdpr	015806	118097	113958
Appl2	020263	146876	121336	Grk4	052783	153323	N/A	Qdpr	015806	015950	015950
Appl2	020263	150685	115903	Grk4	052783	134217	N/A	Qdpr	015806	200259	N/A
Appl2	020263	133719	N/A	Grm1	019828	105561	101190	Qdpr	015806	149290	N/A
Appl2	020263	176294	135645	Grm1	019828	044306	037255	Qdpr	015806	154962	122081
Aqp4	024411	079081	078088	Grm1	019828	135120	N/A	Qdpr	015806	127562	115453
Aqp7	028427	030136	030136	Grm1	019828	155772	N/A	Qk	062078	042296	046740
Aqp7	028427	054945	093007	Grm1	019828	156826	N/A	Qk	062078	097414	095025
Aqp7	028427	144201	N/A	Grm1	019828	105560	101189	Rab11fip1	031488	054212	058042
Aqp7	028427	149517	N/A	Grm5	049583	208791	N/A	Rab11fip1	031488	033878	033878
Ar	046532	052837	052648	Grm5	049583	208878	N/A	Rab11fip1	031488	209377	147543
Arhgap10	037148	076316	075658	Grm5	049583	125009	118393	Rab11fip1	031488	210187	N/A
Arhgap10	037148	210922	147485	Grm5	049583	208776	N/A	Rab11fip1	031488	210919	N/A
Arhgap10	037148	210519	147493	Grm5	049583	155358	114927	Rab11fip1	031488	211646	N/A
Arhgap15	049744	055776	056461	Grm5	049583	138732	N/A	Rab15	021062	021459	021459
Arhgap15	049744	112824	108443	Grm5	049583	107263	102884	Rab15	021062	143863	N/A
Arhgap15	049744	112822	108441	Grm7	056755	174018	134635	Rab15	021062	122419	112457
Arhgap15	049744	140528	N/A	Grm7	056755	071076	064404	Rab15	021062	121716	113299
Arhgap15	049744	128630	N/A	Grm7	056755	172951	133957	Rab15	021062	118604	112789
Arhgap20	053199	130405	120124	Grm7	056755	173001	134233	Rab15	021062	154765	122067
Arhgap20	053199	065496	065633	Grm7	056755	174310	133897	Rab15	021062	141622	115720
Arhgap20	053199	146509	N/A	Grm8	024211	115323	110978	Rab15	021062	134124	N/A
Arhgap20	053199	124907	N/A	Grm8	024211	090512	087998	Rab27a	032202	184146	139310
Arhgap20	053199	126567	N/A	Grm8	024211	131897	120394	Rab27a	032202	034722	034722
Arhgap20	053199	149754	N/A	Grm8	024211	146727	N/A	Rab27a	032202	184575	N/A
Arhgap22	063506	165792	153801	Grm8	024211	132755	118098	Rab27a	032202	184032	N/A
Arhgap22	063506	111956	107587	Grm8	024211	202861	N/A	Rab27b	024511	121693	114094
Arhgap22	063506	131086	154002	Grm8	024211	115324	110979	Rab27b	024511	127217	N/A
Arhgap22	063506	137590	N/A	Gsap	039934	197522	N/A	Rab27b	024511	117692	112807
Arhgap22	063506	111955	107586	Gsap	039934	198014	143739	Rab27b	024511	069749	068349
Arhgap22	063506	140711	154670	Gsap	039934	036031	043679	Rab31	056515	070673	068195
Arhgap22	063506	140166	N/A	Gsap	039934	197404	N/A	Rab3a	031840	110093	105720
Arhgap22	063506	132659	N/A	Gsap	039934	198071	142407	Rab3a	031840	143118	123384
Arhgap23	049807	121799	112999	Gsap	039934	195969	142560	Rab3a	031840	034301	034301
Arhgap23	049807	152933	N/A	Gsap	039934	198937	142986	Rab3a	031840	110090	105717
Arhgap23	049807	142465	123191	Gsap	039934	196035	N/A	Rab3a	031840	110092	105719
Arhgap23	049807	093940	091472	Gsap	039934	198930	142596	Rab3a	031840	130468	N/A
Arhgap23	049807	107601	103227	Gsap	039934	199553	N/A	Rab3a	111277	217185	150125
Arhgap24	057315	094559	092138	Gsn	026879	201185	144561	Rab3b	003411	106650	102261
Arhgap24	057315	126125	N/A	Gsn	026879	202990	144296	Rab3b	003411	106651	102262
Arhgap24	057315	112854	108475	Gsn	026879	202899	144470	Rab3b	003411	003502	003502
Arhgap24	057315	112853	108474	Gsn	026879	142324	118120	Rab3b	003411	157062	N/A
Arhgap24	057315	112852	108473	Gsn	026879	139867	144217	Rab3c	021700	167824	132945
Arhgap24	057315	130222	N/A	Gsn	026879	028239	028239	Rab3c	021700	223922	153347
Arhgap24	057315	070000	070048	Gsn	026879	124323	N/A	Rab3c	021700	224180	153136
Arhgap24	057315	073302	073028	Gstm1	058135	004140	004140	Rab3c	021700	224287	N/A
Arhgap25	030047	145128	N/A	Gstm1	058135	198532	N/A	Rab3c	021700	226040	N/A
Arhgap25	030047	113637	109267	Gstm1	058135	153314	123481	Rai2	043518	112338	107957
Arhgap25	030047	101197	098758	Gstm1	058135	126593	118874	Rai2	043518	061514	051618

Arhgap25	030047	071024	068964	Gsx1	053129	065382	069728	Ralgps2	026594	172057	132533
Arhgap25	030047	203559	N/A	Gtf2a1l	024154	024970	024970	Ralgps2	026594	027886	027886
Arhgef10l	040964	069623	066249	Gtf2a1l	024154	161481	124286	Ralgps2	026594	192343	142004
Arhgef10l	040964	097820	095431	Gucy1a3	033910	193924	142138	Ralgps2	026594	171292	130581
Arhgef10l	040964	105799	101425	Gucy1a3	033910	048976	048918	Ralgps2	026594	063199	063872
Arhgef10l	040964	105798	101424	Gucy1a3	033910	192289	141478	Ralgps2	026594	191605	139645
Arhgef10l	040964	105797	101423	Gucy1a3	033910	191942	N/A	Ralgps2	026594	189208	N/A
Arhgef10l	040964	138493	119471	Gucy1a3	033910	194788	N/A	Ralgps2	026594	185198	139618
Arhgef10l	040964	039204	040531	N/A	N/A	N/A	N/A	Ralgps2	026594	189316	140230
Arhgef10l	040964	154979	122667	Hapln2	004894	160737	N/A	Ralgps2	026594	190648	140055
Arhgef10l	040964	147426	123642	Hapln2	004894	005014	005014	Ralgps2	026594	188656	140342
Arhgef10l	040964	140403	117038	Hapln2	004894	162352	N/A	Ralgps2	026594	191503	N/A
Arhgef10l	040964	125045	N/A	Hapln2	004894	160150	125271	Ralgps2	026594	185970	N/A
Arhgef10l	040964	143614	120437	Has2	022367	050544	062212	Ralgps2	026594	190762	139822
Arhgef2	028059	212392	N/A	Hcn1	021730	207599	N/A	Ralgps2	026594	189648	140108
Arhgef2	028059	176226	N/A	Hcn1	021730	006991	006991	Raly1	039717	191806	148406
Arhgef2	028059	175749	N/A	Hcn2	020331	099513	097113	Raly1	039717	193117	148795
Arhgef2	028059	175903	135168	Hcn2	020331	020581	020581	Raly1	039717	211860	148430
Arhgef2	028059	176514	N/A	Hdac8	067567	087916	085226	Raly1	039717	192209	142094
Arhgef2	028059	177023	134859	Hdac8	067567	154872	138805	Raly1	039717	171075	125848
Arhgef2	028059	176539	135612	Hdac8	067567	148481	N/A	Raly1	039717	108372	104009
Arhgef2	028059	177498	134840	Hdac8	067567	137785	N/A	Raly1	039717	108373	148751
Arhgef2	028059	176500	134834	Hdac8	067567	154024	N/A	Ramp2	001240	129680	122072
Arhgef2	028059	175779	135177	Hebp1	042770	045855	042232	Ramp2	001240	149006	N/A
Arhgef2	028059	029694	029694	Hebp1	042770	204000	N/A	Ramp2	001240	128260	127718
Arhgef2	028059	176804	135397	Hebp1	042770	204730	N/A	Ramp2	001240	122006	114061
Arhgef2	028059	177418	N/A	Hebp1	042770	205232	N/A	Ramp2	001240	149585	116331
Arhgef2	028059	107510	103134	Heg1	075254	152832	N/A	Ramp2	001240	151830	123150
Arhgef2	028059	170653	127843	Heg1	075254	152782	123686	Ramp2	001240	138229	N/A
Arhgef2	028059	176401	N/A	Heg1	075254	132797	N/A	Ramp2	001240	107282	102903
Arhgef2	028059	176400	N/A	Heg1	075254	128105	N/A	Rapgef3	022469	126854	116426
Arhgef2	028059	177303	135131	Heg1	075254	146518	N/A	Rapgef3	022469	129223	118148
Arhgef2	028059	176307	134843	Heg1	075254	126532	119790	Rapgef3	022469	128775	120126
Arhgef2	028059	175911	135428	Heg1	075254	154863	N/A	Rapgef3	022469	177352	135238
Arhgef2	028059	176243	135771	Hepacam	046240	051839	054105	Rapgef3	022469	134885	135317
Arhgef2	028059	176316	135808	Hepacam	046240	215951	150856	Rapgef3	022469	175894	135194
Arhgef2	028059	177120	N/A	Hes3	028946	094438	092006	Rapgef3	022469	125002	N/A
Arhgef2	028059	176879	134766	Hes3	028946	218045	151815	Rapgef3	022469	123397	N/A
Arhgef2	028059	175745	135044	Hhatl	032523	035110	035110	Rapgef3	022469	155810	N/A
Arhgef2	028059	176528	N/A	Hhatl	032523	163981	131971	Rapgef3	022469	146214	N/A
Arhgef2	028059	176079	N/A	Hhatl	032523	214768	149486	Rapgef3	022469	134371	122746
Arhgef2	028059	176123	N/A	Hhatl	032523	215910	149350	Rapgef3	022469	153241	N/A
Arhgef2	028059	177091	N/A	Hhatl	032523	215477	150866	Rapgef3	022469	149419	122285
Arhgef2	028059	176301	N/A	Hhatl	032523	217652	150721	Rapgef3	022469	153464	N/A
Arhgef2	028059	177099	N/A	Hif3a	004328	108492	104132	Rapgef3	022469	146620	116673
Arhgef2	028059	176272	N/A	Hif3a	004328	037762	048248	Rapgef3	022469	142196	N/A
Arhgef26	036885	079300	078281	Hif3a	004328	139224	146258	Rapgef3	022469	135080	117337
Arhgef26	036885	163008	N/A	Hif3a	004328	153833	117728	Rapgef4	049044	090826	088336
Arhgef26	036885	161493	N/A	Hip1	039959	060311	059033	Rapgef4	049044	150234	N/A
Arhgef26	036885	159746	N/A	Hip1	039959	202643	144086	Rapgef4	049044	102698	099759
Arhgef26	036885	161057	124392	Hip1	039959	201479	N/A	Rapgef4	049044	151236	N/A
Arhgef26	036885	192138	N/A	Hip1	039959	200808	144429	Rapgef4	049044	028525	028525
Arhgef28	021662	109426	105053	Hip1	039959	200898	N/A	Rapgef4	049044	153887	N/A
Arhgef28	021662	225884	153423	Hip1	039959	212301	148842	Rapgef4	049044	149421	N/A
Arhgef28	021662	225663	N/A	Hip1	039959	202236	N/A	Rapgef4	049044	124004	N/A
Arhgef28	021662	225269	N/A	Hip1	039959	201998	144392	Rapgef4	049044	122975	N/A
Arhgef28	021662	223849	153000	Hip1	039959	202095	N/A	Rapgef4	049044	156031	N/A
Arhgef28	021662	224926	N/A	Hip1	039959	202044	N/A	Rapgef4	049044	146970	N/A
Arhgef28	021662	224866	153114	Hip1r	000915	000939	000939	Rarb	017491	063750	067694

Arhgef33	054901	223878	153224	Hip1r	000915	167879	127361	Rarb	017491	225921	152980
Arhgef33	054901	224391	153551	Hip1r	000915	166258	130766	Rarb	017491	223576	153098
Arhgef33	054901	225018	N/A	Hip1r	000915	171407	N/A	Rarb	017491	225594	153178
Arhgef33	054901	224631	N/A	Hip1r	000915	198664	143309	Rarb	017491	223976	153519
Arhgef33	054901	224676	N/A	Hip1r	000915	167325	N/A	Rarb	017491	225356	N/A
Arhgef33	054901	224002	N/A	Hip1r	000915	166684	N/A	Rarb	017491	225245	153454
Arhgef33	054901	225658	153062	Hk2	000628	000642	000642	Rasal2	070565	078308	077423
Arhgef33	054901	224966	153018	Hk2	000628	168725	N/A	Rasal2	070565	132699	114964
Arhgef33	054901	225223	153484	Hk2	000628	170833	125986	Rasal2	070565	129880	118367
Arhgef33	054901	225548	153111	Hk2	000628	169270	128572	Rasal2	070565	134543	119623
Arhgef33	054901	226013	N/A	Hmgcll1	007908	008052	008052	Rasal2	070565	128538	N/A
Arhgef33	054901	068175	063284	Hmgcll1	007908	183425	139094	Rasal2	070565	143358	116974
Arhgef37	045094	171629	130560	Hmgcll1	007908	183979	138914	Rasal2	070565	143080	N/A
Arhgef4	037509	159747	124213	Hmgcll1	007908	121592	N/A	Rasgef1b	089809	031276	031276
Arhgef4	037509	162599	124906	Hmgcll1	007908	183505	N/A	Rasgef1b	089809	168092	129652
Arhgef4	037509	159021	124467	Hmgcll1	007908	126321	N/A	Rasgef1b	089809	209346	147997
Arhgef4	037509	047664	035980	Hmgcll1	007908	117981	114045	Rasgef1b	089809	166484	128947
Arhgef4	037509	162760	N/A	Hmgn1	040681	050884	061012	Rasgef1b	089809	166632	N/A
Arhgef4	037509	159059	N/A	Hmgn1	040681	145713	N/A	Rasgef1b	089809	146396	125723
Arhgef4	037509	160855	124207	Hmgn1	040681	133885	122427	Rasgef1b	089809	161516	125057
Arhgef4	037509	211073	148067	Hmgn1	040681	142179	N/A	Rasgef1b	089809	142639	N/A
Arl4a	047446	101472	099013	Homer3	003573	087467	084735	Rasgef1b	089809	160803	N/A
Arl4a	047446	136441	122987	Homer3	003573	140212	117033	Rasgef1b	089809	161148	125009
Arl4a	047446	144910	122126	Homer3	003573	155711	N/A	Rasgrf1	032356	189545	140921
Arl4a	047446	138572	N/A	Homer3	003573	003669	003669	Rasgrf1	032356	034909	034909
Arl4a	047446	146905	114458	Homer3	003573	143528	N/A	Rasgrf1	032356	034912	034912
Amt2	015709	085077	082154	Homer3	003573	135692	N/A	Rasgrf1	032356	190073	N/A
Amt2	015709	209133	147129	Homer3	003573	135368	137560	Rasgrp1	027347	102534	099593
Amt2	015709	208232	146413	Homer3	003573	110124	105751	Rasgrp1	027347	174770	134167
Amt2	015709	208564	146989	Hpcal4	046093	059667	051487	Rasgrp1	027347	173541	134027
Amt2	015709	207459	N/A	Hpcal4	046093	106246	101853	Rasgrp1	027347	172901	133449
Amt2	015709	208129	146614	Hpcal4	046093	126995	122104	Rasgrp1	027347	173252	134592
Amt2	015709	208936	N/A	Hpcal4	046093	136619	N/A	Rasgrp1	027347	110898	N/A
Amt2	015709	207759	N/A	Hpcal4	046093	152194	120066	Rasgrp1	027347	178884	136423
Amt2	015709	208204	146781	Hpse2	074852	099428	097026	Rassf2	027339	028814	028814
Amt2	015709	208995	146599	Hrh2	034987	038101	038170	Rassf2	027339	103182	099471
Amt2	015709	207769	146414	Hrh2	034987	209846	148117	Rassf2	027339	155829	N/A
Amt2	015709	208392	146776	Hrh2	034987	211742	147413	Rassf2	027339	139047	120194
Amt2	015709	208863	146868	Hs3st1	051022	117944	113919	Rassf2	027339	140791	117619
Anb1	018909	098266	095866	Hs3st1	051022	053116	051055	Rbks	029136	201744	N/A
Anb1	018909	032995	032995	Hs3st1	051022	137142	114997	Rbks	029136	031018	031018
Anb1	018909	162404	124351	Hs3st1	051022	152057	118060	Rbks	029136	202036	N/A
Anb1	018909	161525	124483	Hs3st2	046321	206880	146027	Rbm24	038132	037923	043120
Anb1	018909	161268	N/A	Hs3st2	046321	084628	081678	Rbm24	038132	225221	N/A
Anb1	018909	162043	N/A	Hs3st4	078591	106437	102045	Rbm24	038132	225727	N/A
Anb1	018909	159642	N/A	Hs6st2	062184	088172	085497	Rbm24	038132	224638	N/A
Anb1	018909	162933	N/A	Hs6st2	062184	114871	110521	Rbm24	038132	225890	N/A
Anb1	018909	162290	125056	Hs6st2	062184	142738	N/A	Rbm25	010608	181983	138572
Anb1	018909	179755	136963	Hs6st2	062184	140145	N/A	Rbm25	010608	182004	138573
Amdc3	074794	159090	N/A	Hs6st2	062184	142983	N/A	Rbm25	010608	048155	048470
Amdc3	074794	159690	124418	Hsd17b11	029311	031251	031251	Rbm25	010608	182618	138665
Amdc3	074794	099356	096957	Hsd17b11	029311	119025	113455	Rbm25	010608	183154	138669
Amdc3	074794	161441	125455	Hspa1b	090877	172753	133815	Rbm25	010608	182036	138565
Amdc3	074794	159856	N/A	Htr1b	049511	183482	139389	Rbm25	010608	182347	138410
Amdc3	074794	162904	N/A	Htr1b	049511	051005	050898	Rbm25	010608	182633	138625
Arsg	020604	106697	102308	Htr2a	034997	036653	047774	Rbm25	010608	182881	N/A
Arsg	020604	106696	102307	Htr2c	041380	149260	N/A	Rbm25	010608	183128	N/A
Arsg	020604	152252	N/A	Htr2c	041380	131999	N/A	Rbm25	010608	182450	138416
Arsg	020604	136336	N/A	Htr2c	041380	036303	043936	Rbm25	010608	182255	N/A

Arsg	020604	020928	020928	Htr2c	041380	096299	094021	Rbm25	010608	183039	N/A
Arx	035277	187010	N/A	Htr2c	041380	156697	138772	Rbm25	010608	182032	N/A
Arx	035277	046565	049039	Htr2c	041380	134368	N/A	Rbm25	010608	183242	N/A
Arx	035277	113947	109580	Htr2c	041380	112831	108450	Rbm25	010608	183282	N/A
Asap3	036995	047526	041899	Htra1	006205	150717	N/A	Rbm25	010608	182840	N/A
Ascl1	020052	020243	020243	Htra1	006205	006367	006367	Rbm25	010608	183181	N/A
Asgr1	020884	146411	121842	Htra1	006205	153290	N/A	Rbms3	039607	111773	107403
Asgr1	020884	108585	104226	Htra1	006205	140741	N/A	Rbms3	039607	068962	066735
Asgr1	020884	018699	018699	Htra1	006205	150905	N/A	Rbms3	039607	173429	133900
Asgr1	020884	092959	090637	Hunk	053414	065856	068007	Rbms3	039607	174868	133621
Asgr1	020884	123369	137469	Icam5	032174	019616	019616	Rbms3	039607	164018	131371
Asic1	023017	023758	023758	Icosl	000732	105393	101032	Rbms3	039607	111772	107402
Asic1	023017	226291	N/A	Icosl	000732	217675	N/A	Rbms3	039607	044901	039706
Asic1	023017	228012	N/A	Icosl	000732	219038	151346	Rbms3	039607	172469	134172
Asic1	023017	228185	154379	Icosl	000732	219633	N/A	Rbms3	039607	069095	N/A
Asic1	023017	228610	N/A	Id4	021379	021810	021810	Rbms3	039607	172564	134528
Asic1	023017	227670	N/A	Ifi43	007867	221194	N/A	Rbms3	039607	174276	N/A
Asic2	020704	021045	021045	Ifi43	007867	054565	061891	Rbms3	039607	084824	N/A
Asic2	020704	066197	067095	Ifi43	007867	222821	152079	Rbp2	032454	189446	140676
Asns	029752	115542	111204	Ifi43	007867	222905	152281	Rbp2	032454	187905	140630
Asns	029752	031766	031766	Ifi43	007867	223269	N/A	Rbp2	032454	188779	N/A
Asns	029752	140097	N/A	Ifi43	007867	221161	N/A	Rbp2	032454	035029	035029
Asns	029752	133972	N/A	Ifi43	007867	220711	N/A	Rbpjl	017007	137427	N/A
Asns	029752	126303	115415	Igdcc3	032394	034961	034961	Rbpjl	017007	017151	017151
Asns	029752	139596	120489	Igdcc3	032394	217371	149084	Rbpjl	017007	109356	N/A
Asns	029752	148349	118003	Igdcc3	032394	217135	N/A	Rbpms2	032387	169003	131076
Aspa	020774	021119	021119	Igdcc4	032816	213533	150272	Rbpms2	032387	055844	057600
Aspa	020774	184572	139318	Igdcc4	032816	035499	045387	Rbpms2	032387	213927	N/A
Aspa	020774	155630	139131	Igdcc4	032816	216542	N/A	Rbpms2	032387	216342	149535
Aspa	020774	132774	N/A	Igdcc4	032816	213423	N/A	Rbpms2	032387	216382	151192
Aspa	020774	134079	121135	Igdcc4	032816	214978	N/A	Rbpms2	032387	216769	N/A
Aspa	020774	141898	118109	Igdcc4	032816	077696	076878	Rcn1	005973	006128	006128
Astn2	028373	068214	065786	Igdcc4	032816	166273	132576	Rcn1	005973	127019	N/A
Astn2	028373	084496	081540	Igfbp3	020427	020702	020702	Rcn2	032320	147842	120953
Atl2	059811	068282	064758	Igfbp3	020427	135887	131670	Rcn2	032320	114276	109915
Atl2	059811	223273	N/A	Igfbp5	026185	027377	027377	Rcn2	032320	151585	N/A
Atl2	059811	221286	N/A	Igfbp5	026185	137339	N/A	Rcn2	032320	144869	N/A
Atl2	059811	222193	152340	Igsf11	022790	210186	N/A	Reck	028476	030198	030198
Atl2	059811	222415	152866	Igsf11	022790	114706	110354	Reck	028476	128463	N/A
Atl2	059811	221666	N/A	Igsf11	022790	209958	N/A	Reck	028476	130415	N/A
Atl2	059811	222243	N/A	Igsf11	022790	023478	023478	Reln	042453	161356	124052
Atl2	059811	112437	108056	Igsf11	022790	210471	N/A	Reln	042453	160791	N/A
Atl3	024759	170373	132619	Igsf3	042035	198995	N/A	Reln	042453	062372	058025
Atl3	024759	025668	025668	Igsf3	042035	043983	048900	Reln	042453	200318	N/A
Atp13a4	038094	182573	138700	Igsf3	042035	195164	141823	Reln	042453	200667	N/A
Atp13a4	038094	182627	138479	Il15	031712	209363	147848	Reln	042453	199034	N/A
Atp13a4	038094	057018	060987	Il15	031712	209573	148256	Reln	042453	159768	N/A
Atp13a4	038094	182676	N/A	Il15	031712	034148	034148	Reln	042453	161353	N/A
Atp13a4	038094	182013	138583	Il15	031712	211565	147319	Reln	042453	162427	N/A
Atp13a4	038094	182094	N/A	Il15	031712	209687	N/A	Reln	042453	159741	N/A
Atp13a4	038094	182357	N/A	Il15	031712	211722	N/A	Reln	042453	162876	124077
Atp13a4	038094	182168	138515	Il15	031712	210094	147312	Reln	042453	162637	N/A
Atp13a4	038094	039090	048753	Il15	031712	211282	N/A	Reln	042453	162622	N/A
Atp13a4	038094	182824	N/A	Il15	031712	210885	N/A	Reln	042453	160707	N/A
Atp13a4	038094	182694	N/A	Il15	031712	210472	N/A	Reln	042453	161782	N/A
Atp1a1	033161	036493	039657	Il16	001741	001792	001792	Rep15	040121	036194	037503
Atp1a1	033161	130649	N/A	Il16	001741	145610	146496	Rerg	030222	032347	032347
Atp1a1	033161	136340	N/A	Il16	001741	151047	N/A	Rerg	030222	117919	113105
Atp1a2	007097	085913	083077	Il16	001741	153560	118516	Rerg	030222	119610	113702

Atp1a2	007097	131751	N/A	Il16	001741	131916	122022	Rerg	030222	203003	144823
Atp1a2	007097	191781	N/A	Il16	001741	156553	122813	Rerg	030222	149100	144902
Atp1a2	007097	097464	095072	Il18	039217	213916	150305	Ret	030110	032201	032201
Atp1a2	007097	137679	N/A	Il18	039217	214117	151002	Ret	030110	088790	086169
Atp1a3	040907	102858	099922	Il18	039217	180021	137193	Rftn1	039316	044503	046524
Atp1a3	040907	080882	079691	Il18	039217	059081	054591	Rftn1	039316	113195	108820
Atp1a3	040907	196684	143735	Il20rb	044244	098458	096057	Rftn1	039316	156094	N/A
Atp1a3	040907	146595	N/A	Il20rb	044244	136606	N/A	Rfx4	020037	060397	051107
Atp1a3	040907	125444	N/A	Il20rb	044244	136856	N/A	Rfx4	020037	173479	N/A
Atp1b1	026576	027863	027863	Il20rb	044244	125259	N/A	Rfx4	020037	165868	N/A
Atp1b1	026576	193980	N/A	Il20rb	044244	152756	N/A	Rfx4	020037	166696	128690
Atp1b1	026576	193367	141777	Il20rb	044244	122880	N/A	Rfx4	020037	020226	N/A
Atp1b1	026576	192522	N/A	Il22	074695	096691	094449	Rfx4	020037	095388	093035
Atp1b2	041329	047889	047353	Il33	024810	120388	113829	Rgcc	022018	022595	022595
Atp1b2	041329	130394	N/A	Il33	024810	144528	122319	Rgma	070509	119206	112599
Atp1b2	041329	138694	116290	Il33	024810	177518	135854	Rgma	070509	094312	091870
Atp1b2	041329	144425	N/A	Il33	024810	025724	025724	Rgma	070509	128471	116552
Atp1b2	041329	153198	N/A	Il33	024810	136850	135324	Rgma	070509	139780	145758
Atp2a3	020788	108486	104126	Iltifb	090461	163808	128415	Rgma	070509	206253	N/A
Atp2a3	020788	108484	104124	Iltifb	090461	179123	N/A	Rgs6	021219	201602	144044
Atp2a3	020788	149493	N/A	5730559C18Rik	041605	120339	113785	Rgs6	021219	186848	141044
Atp2a3	020788	135234	N/A	5730559C18Rik	041605	150163	118074	Rgs6	021219	161801	125256
Atp2a3	020788	163326	127036	5730559C18Rik	041605	144464	115554	Rgs6	021219	185665	139566
Atp2a3	020788	108485	104125	5730559C18Rik	041605	194374	N/A	Rgs6	021219	200911	143801
Atp2a3	020788	021142	021142	5730559C18Rik	041605	153910	120263	Rgs6	021219	202210	143961
Atp2b2	030302	101045	098606	5730559C18Rik	041605	195177	141506	Rgs6	021219	186458	139735
Atp2b2	030302	089003	086398	Inhba	041324	164993	132085	Rgs6	021219	186081	140188
Atp2b2	030302	152831	138165	Inhba	041324	042603	047894	Rgs6	021219	201271	144139
Atp2b2	030302	205052	145174	Inpp1	026102	027271	027271	Rgs6	021219	200861	144118
Atp2b2	030302	101044	098605	Inpp1	026102	177279	135225	Rgs6	021219	186309	140701
Atp2b2	030302	135199	N/A	Inpp1	026102	159607	N/A	Rgs6	021219	201861	144395
Atp2b2	030302	144507	N/A	Inpp1	026102	162576	124890	Rgs6	021219	193448	N/A
Atp2b2	030302	154738	N/A	Inpp1	026102	162351	N/A	Rgs6	021219	191311	140723
Atp2b3	031376	033744	033744	Inpp1	026102	159725	123977	Rgs6	021219	191352	139718
Atp2b3	031376	088429	085775	Inpp4b	037940	172167	N/A	Rgs6	021219	191107	139725
Atp2b3	031376	114479	110123	Inpp4b	037940	213285	150520	Rgs6	021219	186323	141079
Atp8a1	037685	135930	118379	Inpp4b	037940	217122	150541	Rgs6	021219	185674	139940
Atp8a1	037685	037380	042215	Inpp4b	037940	169387	130104	Rgs6	021219	190964	N/A
Atp8a1	037685	072971	072738	Inpp4b	037940	215332	148972	Rgs6	021219	201767	143829
Atp8a1	037685	200955	144465	Inpp4b	037940	042529	044466	Rgs6	021219	201512	N/A
Atp8a1	037685	149501	N/A	Inpp4b	037940	169116	131947	Rgs6	021219	101234	098793
Atp8a1	037685	155911	N/A	Inpp4b	037940	109852	105478	Rgs7bp	021719	063551	066614
Atp8a1	037685	152433	N/A	Inpp4b	037940	172031	131324	Rgs9	020599	020920	020920
Atp8a1	037685	130652	N/A	Inpp4b	037940	164870	N/A	Rgs9	020599	103062	099351
Atp8a1	037685	113652	109282	Inpp4b	037940	216036	N/A	Rgs9	020599	106706	102317
Atp8a1	037685	113651	109281	Inpp4b	037940	170160	132156	Rgs9	020599	156785	N/A
Atp8a1	037685	143013	N/A	Inpp4b	037940	216387	N/A	Rgs9	020599	106704	102315
Atp8a1	037685	202248	N/A	Inpp4b	037940	109851	105477	Rhpn2	030494	032705	032705
Atp8a1	037685	128726	N/A	Inpp4b	037940	165821	N/A	Rhpn2	030494	155140	N/A
Atp8a1	037685	141443	121630	Inpp5a	025477	106098	101704	Rhpn2	030494	187997	N/A
Atp8b1	039529	025482	025482	Inpp5a	025477	026550	026550	Rhpn2	030494	085556	082692
Atml1	054843	077282	076514	Inpp5a	025477	097975	095589	Rimbp2	029420	199537	143276
Atxn1	046876	091628	089217	Inpp5a	025477	138183	N/A	Rimbp2	029420	198941	142455
Atxn1	046876	167708	129890	Inpp5a	025477	131781	N/A	Rimbp2	029420	196085	143725
Atxn1	046876	180110	137439	Inpp5a	025477	210320	N/A	Rimbp2	029420	200470	143099
Atxn1	046876	221082	N/A	Inpp5a	025477	152475	N/A	Rimbp2	029420	199737	142712
Atxn1	046876	222943	N/A	Insc	048782	161800	125061	Rimbp2	029420	196569	N/A
Atxn1	046876	222610	N/A	Insc	048782	136645	119459	Rimbp2	029420	111346	106978
Axl	002602	002677	002677	Insc	048782	139670	N/A	Rims1	041670	185942	140963

Axl	002602	085948	083110	Insc	048782	117543	112682	Rims1	041670	097808	095417
Axl	002602	124442	N/A	Insc	048782	151464	117296	Rims1	041670	081544	080259
Axl	002602	137211	N/A	Insc	048782	136347	N/A	Rims1	041670	115273	110928
Axl	002602	132989	N/A	Insc	048782	150991	N/A	Rims1	041670	218140	151404
Axl	002602	132038	114907	Insc	048782	206274	145636	Rims1	041670	097811	095420
Axl	002602	147680	N/A	Insc	048782	169913	129505	Rims1	041670	097810	095419
Axl	002602	137383	N/A	Ipcef1	064065	086896	084110	Rims1	041670	097809	095418
B230209E15Rik	109006	209115	N/A	Ipcef1	064065	145156	114267	Rims1	041670	164877	131808
B230209E15Rik	109006	211785	N/A	Ipcef1	064065	151960	118510	Rims3	032890	132895	N/A
B3gat2	026156	144602	115870	Ipcef1	064065	149708	N/A	Rims3	032890	071093	068178
B3gat2	026156	063663	066582	Ipcef1	064065	144622	N/A	Rims3	032890	106283	101890
B3gat2	026156	140583	117089	Ipcef1	064065	105617	101242	Rims3	032890	171363	130295
B3glct	051950	100404	097972	Ipcef1	064065	154998	N/A	Rims4	035226	044734	045637
B3glct	051950	202302	N/A	Ipcef1	064065	078070	077215	Rin2	001768	147976	124206
B3glct	051950	201088	N/A	Ipcef1	064065	170680	128131	Rin2	001768	110005	105632
B3gnt5	022686	121344	112624	Iqch	037801	042322	047953	Rin2	001768	142847	125476
B3gnt5	022686	079780	078712	Iqch	037801	163982	126546	Rin2	001768	150449	124078
B3gnt5	022686	152845	N/A	Iqch	037801	163624	128482	Rin2	001768	145874	N/A
B3gnt5	022686	131557	N/A	Iqch	037801	080527	079370	Rin2	001768	149269	N/A
B3gnt5	022686	155780	N/A	Iqch	037801	171243	131828	Rin2	001768	144278	N/A
B3gnt5	022686	119468	113145	Iqch	037801	170960	N/A	Rin2	001768	094480	092053
B3gnt5	022686	164397	126157	Iqgap1	030536	167377	128278	Rit2	057455	153060	114323
B3gnt7	079445	189618	N/A	Iqgap1	030536	205606	145991	Rit2	057455	139924	122938
B3gnt7	079445	113306	108931	Iqgap1	030536	205383	N/A	Rit2	057455	082070	080724
B3gnt7	079445	188695	140392	Iqgap1	030536	206149	N/A	Rit2	057455	153196	N/A
B4galt6	056124	070080	066515	Iqgap1	030536	205824	N/A	Rlbp1	039194	179243	137143
Bach2	040270	108180	103815	Iqgap1	030536	205813	145556	Rlbp1	039194	053718	054545
Bach2	040270	037416	043693	Iqgap1	030536	205304	146126	Rlbp1	039194	206624	N/A
Bach2	040270	149201	N/A	Iqgap1	030536	205540	N/A	Rlbp1	039194	206162	146196
Bach2	040270	156430	N/A	Iqsec1	034312	101153	098712	Rlbp1	039194	206320	145611
Bach2	040270	146748	N/A	Iqsec1	034312	204983	N/A	Rlbp1	039194	205442	145850
Bach2	040270	125263	N/A	Iqsec1	034312	212100	148669	Rlbp1	039194	205638	146144
Bach2	040270	171600	131592	Iqsec1	034312	154198	N/A	Rlbp1	039194	206695	146075
Baiap2	025372	026436	026436	Iqsec1	034312	141434	N/A	Rnf112	010086	060255	059903
Baiap2	025372	106231	101838	Iqsec1	034312	205068	N/A	Rnf112	010086	054927	056464
Baiap2	025372	075180	074674	Iqsec1	034312	156834	118802	Rnf112	010086	102661	099722
Baiap2	025372	103021	099310	Iqsec1	034312	133492	N/A	Rnf112	010086	152137	N/A
Baiap2	025372	106233	101840	Iqsec1	034312	146977	N/A	Rnf112	010086	126859	N/A
Baiap2	025372	146566	N/A	Iqsec1	034312	101151	098710	Rnf112	010086	136966	N/A
Baiap2	025372	146960	N/A	Irak2	060477	059286	055073	Rnf112	010086	130648	N/A
Baiap2	025372	152523	N/A	Irak2	060477	089023	086417	Rnf207	058498	076183	075540
Baiap2	025372	131580	N/A	Irak2	060477	204091	N/A	Rnf207	058498	108688	N/A
Barhl2	034384	086795	084005	Irak2	060477	089022	086416	Rnf207	058498	170820	129400
Basp1	045763	058845	053943	Irak2	060477	204744	144848	Rnf207	058498	135837	N/A
Basp1	045763	228597	154675	Irak2	060477	155554	N/A	Rnf207	058498	127565	N/A
Bbs2	031755	034206	034206	Irak2	060477	113024	N/A	Rnf207	058498	142427	N/A
Bbs2	031755	170208	N/A	Irak2	060477	203381	N/A	Rnf207	058498	130008	127196
Bbs2	031755	172347	N/A	Irak2	060477	143948	N/A	Rnf207	058498	143968	N/A
BC052040	040282	110918	106543	Irx1	060969	077337	076562	Rnf207	058498	134269	N/A
BC052040	040282	147968	N/A	Irx1	060969	223379	152247	Rnf207	058498	145311	N/A
BC052040	040282	166472	126772	Irx1	060969	223460	152128	Rnf207	058498	123133	N/A
Bcar1	031955	166232	129584	Irx2	001504	074372	073976	Rnf207	058498	146496	N/A
Bcar1	031955	212349	148364	Irx2	001504	169028	N/A	Rnf217	063760	081989	080650
Bcar1	031955	212147	N/A	Irx2	001504	167067	127963	Rnf220	028677	030439	030439
Bche	027792	029367	029367	Irx2	001504	163393	N/A	Rnf220	028677	102690	099751
Bche	027792	133690	N/A	Irx2	001504	172353	126691	Rnf220	028677	221654	152367
Bche	027792	138216	141329	Irx5	031737	210246	147339	Rnf220	028677	094853	092449
Bche	027792	153917	N/A	Irx5	031737	034184	034184	Rnf220	028677	128122	N/A
Bcl11a	000861	118955	112948	Itga2	015533	056117	053891	Rnf220	028677	223371	N/A

Bcl11a	000861	127494	N/A	Itga2	015533	224204	153056	Rnf220	028677	221157	N/A
Bcl11a	000861	000881	000881	Itga9	039115	044165	044227	Rnf220	028677	151829	152638
Bcl11a	000861	124148	N/A	Itga9	039115	125021	N/A	Rnf220	028677	223182	N/A
Bcl11a	000861	109516	105142	Itga9	039115	124360	122417	Rnf220	028677	154974	N/A
Bcl11a	000861	109514	105140	Itga9	039115	149150	122408	Rnf220	028677	133971	N/A
Bcl11b	048251	066060	068258	Itga9	039115	124422	N/A	Rnf220	028677	150148	N/A
Bcl11b	048251	109887	105513	Itga9	039115	155437	N/A	Rnf220	028677	138435	N/A
Bcl11b	048251	109891	105517	Itgav	027087	028499	028499	Rnf220	028677	123222	N/A
Bcl11b	048251	066060	068258	Itgav	027087	125360	N/A	Rnf43	034177	134684	N/A
Bcl11b	048251	109887	105513	Itgav	027087	151463	N/A	Rnf43	034177	123658	N/A
Bcl11b	048251	109891	105517	Itgav	027087	148256	N/A	Rnf43	034177	092800	090476
Bean1	031872	164076	132056	Itgav	027087	111740	107369	Rnf43	034177	121782	112748
Bean1	031872	093245	090931	Itgav	027087	141725	122730	Rnf43	034177	040089	044241
Bean1	031872	212979	148571	Itgav	027087	155521	N/A	Rnf43	034177	162740	N/A
Bean1	031872	213077	148283	Itgav	027087	125402	118016	Rnf43	034177	124625	N/A
Bean1	031872	171018	129403	Itgav	027087	131192	121295	Rnf43	034177	150866	N/A
Bean1	031872	167633	131530	Itgb4	020758	021107	021107	Rnf43	034177	165679	130685
Bhlhe22	025128	026120	026120	Itgb4	020758	068981	070811	Robo2	052516	226478	154353
Bicd1	003452	203502	N/A	Itgb4	020758	106460	102068	Robo2	052516	117785	112776
Bicd1	003452	086829	084039	Itgb4	020758	106458	102066	Robo2	052516	117200	113795
Bicd1	003452	111513	107138	Itgb4	020758	151691	N/A	Robo2	052516	149114	N/A
Bicd1	003452	130270	N/A	Itgb4	020758	150129	N/A	Robo2	052516	137420	N/A
Bicd1	003452	003544	003544	Itgb4	020758	127523	N/A	Robo2	052516	116586	112285
Bicd1	003452	173408	133727	Itgb4	020758	130286	N/A	Robo2	052516	138852	N/A
Bicd1	003452	174886	N/A	Itgb4	020758	169928	127604	Robo2	052516	227347	154010
Bicd1	003452	172926	133986	Itgb4	020758	106461	102069	Robo2	052516	147408	N/A
Bicd1	003452	140759	N/A	Itgb8	025321	026360	026360	Robo2	052516	140062	N/A
Bicd2	037933	048544	039394	Itgb8	025321	137804	N/A	Robo2	052516	156010	N/A
Bicd2	037933	110084	105711	Itgb8	025321	151023	N/A	Robo3	032128	167089	N/A
Bicd2	037933	110085	105712	Itih3	006522	006697	006697	Robo3	032128	171467	N/A
Bicd2	037933	220723	152090	Itih3	006522	227181	N/A	Robo3	032128	034643	034643
Blm	030528	206901	146062	Itih3	006522	227995	154659	Robo3	032128	115038	110690
Blm	030528	081314	080062	Itih3	006522	226547	154256	Robo3	032128	170512	150639
Blm	030528	170315	127995	Itih3	006522	226179	N/A	Robo3	032128	167216	N/A
Blm	030528	206518	N/A	Itih3	006522	228114	154720	Rpa1	000751	092907	090585
Blm	030528	206948	N/A	Itpka	027296	028758	028758	Rpa1	000751	000767	000767
Blm	030528	206989	146098	Itpkb	038855	070181	069851	Rpa1	000751	149365	N/A
Blm	030528	205730	145573	Itpkb	038855	195043	N/A	Rpa1	000751	154894	N/A
Blm	030528	205263	N/A	Itpr1	030102	032192	032192	Rpa1	000751	135770	N/A
Blm	030528	205713	N/A	Itpr1	030102	203615	144880	Rph3a	029608	079204	078198
Blm	030528	205584	N/A	Itpr1	030102	203995	N/A	Rph3a	029608	202406	143917
Bmp2k	034663	112974	108598	Itpr1	030102	203936	145526	Rph3a	029608	202326	144291
Bmp2k	034663	035635	037970	Itpr1	030102	212125	148284	Rph3a	029608	200792	144437
Bnc2	028487	102820	099884	Itpr1	030102	205053	N/A	Rprm	075334	100089	097667
Bnc2	028487	107198	102816	Itpr1	030102	203262	145177	Rps6ka1	003644	105894	101514
Bnc2	028487	176612	135778	Itpr1	030102	203638	145522	Rps6ka1	003644	168974	126774
Bnc2	028487	176971	135607	Itpr1	030102	203687	145339	Rps6ka1	003644	003741	003741
Bnc2	028487	176691	135375	Itpr1	030102	205048	N/A	Rps6ka1	003644	157067	121341
Bnc2	028487	177277	135580	Itpr1	030102	203530	N/A	Rps6ka1	003644	174481	134507
Bnc2	028487	176702	134774	Itpr1	030102	203288	N/A	Rps6ka1	003644	137486	119328
Bnc2	028487	176998	135283	Itpr1	030102	205005	N/A	Rps6ka1	003644	173989	N/A
Bnc2	028487	176601	135480	Itpripl2	095115	178344	136409	Rps6ka1	003644	129636	N/A
Bnc2	028487	175800	134795	Jam2	053062	114195	109833	Rps6ka1	003644	173961	N/A
Bnc2	028487	176418	135569	Jam2	053062	098407	096007	Rpusd3	051169	113092	108715
Bnc2	028487	175757	N/A	Jam2	053062	138054	N/A	Rpusd3	051169	060634	059057
Bnc2	028487	176947	135411	Jam3	031990	034472	034472	Rpusd3	051169	203758	N/A
Bnc2	028487	175969	135656	Jam3	031990	215446	N/A	Rpusd3	051169	129047	120380
Bnc2	028487	176476	N/A	Jam3	031990	213170	N/A	Rpusd3	051169	147726	120250
Bnc2	028487	123276	N/A	Jam3	031990	167074	N/A	Rpusd3	051169	124078	N/A

Bnc2	028487	176346	134942	Jam3	031990	213682	N/A	Rpusd3	051169	151618	115950
Bnc2	028487	177256	N/A	Jazf1	063568	128282	N/A	Rpusd3	051169	134853	N/A
Bnc2	028487	175756	135499	Jazf1	063568	136250	N/A	Rpusd3	051169	129560	114511
Bnc2	028487	177040	135089	Jazf1	063568	074541	074129	Rpusd3	051169	150452	N/A
Bnc2	028487	176264	N/A	Jkamp	005078	117449	113744	Rspo2	051920	226810	154600
Bnc2	028487	176370	134953	Jkamp	005078	057257	061370	Rspo2	051920	063492	067325
Boc	022687	114634	110281	Jkamp	005078	125764	117251	Rspo2	051920	226402	N/A
Brinp2	004031	195271	141709	Jkamp	005078	132371	N/A	Rtn1	021087	150156	N/A
Brinp2	004031	004133	004133	Jkamp	005078	134041	N/A	Rtn1	021087	078505	077594
Brinp2	004031	194578	N/A	Jkamp	005078	152381	N/A	Rtn1	021087	137990	120033
Brinp2	004031	192709	N/A	Jkamp	005078	145752	N/A	Rtn1	021087	144181	N/A
Brinp3	035131	074622	074201	Jph1	042686	186024	140705	Rtn1	021087	221756	N/A
Brinp3	035131	132847	118552	Jph1	042686	038382	039072	Rtn1	021087	021497	021497
Brinp3	035131	128345	116763	Kank1	032702	049400	042177	Rtn1	021087	150156	N/A
Brinp3	035131	125331	N/A	Kank1	032702	146647	116660	Rtn1	021087	078505	077594
Brinp3	035131	166814	126074	Kank1	032702	137260	N/A	Rtn1	021087	137990	120033
Bsg	023175	179781	136487	Kank1	032702	155788	N/A	Rtn1	021087	144181	N/A
Bsg	023175	067036	070751	Kank4	035407	102790	099851	Rtn1	021087	221756	N/A
Bsg	023175	179201	N/A	Kank4	035407	137270	N/A	Rtn1	021087	021497	021497
Bsg	023175	178383	137126	Kcna1	047976	055168	055225	Rtn4r	043811	059589	062924
Bsg	023175	105381	101020	Kcna1	047976	203094	144947	Rtn4r	111113	213627	149817
Bsg	023175	180235	N/A	Kcna1	047976	205171	N/A	Rtn4rl1	045287	102514	099572
Bsn	032589	035208	035208	Kcna2	040724	197470	143798	Rtn4rl2	050896	151799	118362
Bsn	032589	124763	139053	Kcna2	040724	038695	041702	Rtn4rl2	050896	151759	N/A
Btbd1	025103	026093	026093	Kcna2	040724	196403	142873	Rtn4rl2	050896	054514	057725
Btbd1	025103	208114	N/A	Kcnab2	028931	159840	124156	Rubcnl	034959	036072	045566
Btbd1	025103	208178	N/A	Kcnab2	028931	160884	125058	Rubcnl	034959	228689	N/A
Btbd1	025103	208566	N/A	Kcnab2	028931	030768	030768	Rxfp1	034009	078527	077611
Btbd11	020042	105307	100944	Kcnab2	028931	159186	124588	Rxfp1	034009	182491	138578
Btbd11	020042	020231	020231	Kcnab2	028931	105648	101273	Rxfp1	034009	183199	N/A
Btbd11	020042	105306	100943	Kcnab2	028931	159844	N/A	Rxfp1	034009	183040	N/A
Btbd11	020042	135235	N/A	Kcnab2	028931	161496	N/A	Ryr1	030592	214374	149042
Btbd11	020042	145323	N/A	Kcnab2	028931	161236	125270	Ryr1	030592	179893	137123
Btbd11	020042	128338	N/A	Kcnab2	028931	159435	N/A	Ryr1	030592	208318	N/A
Btbd11	020042	156123	N/A	Kcnab2	028931	162200	N/A	Ryr1	030592	208010	N/A
Btbd11	020042	145433	N/A	Kcnab2	028931	162165	N/A	Ryr1	030592	207764	N/A
Btbd17	000202	156053	N/A	Kcnab2	028931	161844	N/A	Ryr1	030592	207783	N/A
Btbd17	000202	000206	000206	Kcnab2	028931	162518	N/A	Ryr1	030592	208922	N/A
Btbd17	000202	156192	N/A	Kcnab2	028931	162017	123939	Ryr1	030592	032813	032813
Btbd17	000202	141481	N/A	Kcnab3	018470	018614	018614	Ryr2	021313	021750	021750
Btbd17	000202	146853	N/A	Kcnab3	018470	142328	N/A	Ryr2	021313	222113	N/A
Btbd17	000202	141386	N/A	Kcnab3	018470	134561	N/A	Ryr2	021313	222788	N/A
Btbd17	000202	137965	N/A	Kcnc1	058975	025202	025202	Ryr2	021313	221527	152510
2410131K14Rik	032840	049138	043410	Kcnc1	058975	160433	124938	Ryr2	021313	221916	N/A
3632451O06Rik	036242	036972	036220	Kcnc1	058975	160234	N/A	Ryr2	021313	220712	152669
3632451O06Rik	036242	118129	113609	Kcnc2	035681	219301	151579	Ryr2	021313	221941	N/A
3632451O06Rik	036242	177321	N/A	Kcnc2	035681	092175	089814	Ryr2	021313	221890	N/A
1700025G04Rik	032666	187603	140950	Kcnc2	035681	218445	151560	Ryr2	021313	221609	N/A
1700025G04Rik	032666	044581	036406	Kcnc2	035681	219607	151870	Ryr2	021313	222386	N/A
1700025G04Rik	032666	128433	N/A	Kcnc2	035681	218827	151995	Ryr2	021313	220597	152051
1700025G04Rik	032666	121533	113971	Kcnc3	062785	209177	146535	Ryr2	021313	221018	N/A
C1ql1	045532	057849	050469	Kcnc3	062785	207493	146425	Ryr2	021313	221341	N/A
C1ql2	036907	037286	037257	Kcnc3	062785	208651	146988	Ryr2	021313	170156	127991
C1qtnf4	040794	111466	107091	Kcnc3	062785	107907	103540	Ryr3	057378	091818	089426
C1qtnf4	110961	214937	150588	Kcnc3	062785	107906	103539	Ryr3	057378	208135	146719
2810459M11Rik	026227	027429	027429	Kcnc3	062785	208412	N/A	Ryr3	057378	128192	N/A
2810459M11Rik	026227	165824	131459	Kcnc3	062785	207497	146479	Ryr3	057378	207603	N/A
C3	024164	024988	024988	Kcnf1	051726	170580	131480	Ryr3	057378	156757	N/A
C3	024164	177425	135663	Kcnh1	058248	078470	077563	Ryr3	057378	146187	N/A

C3	024164	177046	135560	Kcnh1	058248	110844	106468	Ryr3	057378	208574	N/A
C3	024164	176457	N/A	Kcnh1	058248	151152	141247	Ryr3	057378	134358	147196
A830018L16Rik	057715	048613	043857	Kcnh5	034402	042299	046864	Ryr3	057378	142537	N/A
A830018L16Rik	057715	150870	N/A	Kcnh7	059742	075052	074563	Ryr3	057378	080673	079503
A830018L16Rik	057715	142117	N/A	Kcnh7	059742	112454	108073	Ryr3	057378	208290	147250
A830018L16Rik	057715	141512	139635	Kcnh7	059742	112452	108071	Ryr3	057378	208151	146449
A830018L16Rik	057715	135014	119143	Kcnh7	059742	131799	N/A	S100a4	001020	001046	001046
A830018L16Rik	057715	137824	117421	Kcnh8	035580	039366	049206	S100a4	001020	142476	143522
A830018L16Rik	057715	179089	137287	Kcnh8	035580	184279	N/A	S100b	033208	036387	047968
A830018L16Rik	057715	141339	121311	Kcnip1	053519	109340	104964	S1pr1	045092	055676	050897
A830018L16Rik	057715	191437	N/A	Kcnip1	053519	065970	069063	Sall1	031665	034090	034090
A830018L16Rik	057715	171690	132334	Kcnip1	053519	101368	098919	Samd12	058656	078673	077741
3110035E14Rik	067879	088666	086041	Kcnip1	053519	135034	N/A	Samd12	058656	154119	N/A
3110043O21Rik	028300	084724	081775	Kcnip1	053519	154760	N/A	Samd12	058656	132059	123446
3110043O21Rik	028300	108126	103761	Kcnip4	029088	166924	131276	Samd12	058656	132362	N/A
3110043O21Rik	028300	108127	103762	Kcnip4	029088	172363	N/A	Sapcd2	026955	114293	109932
3110043O21Rik	028300	142628	N/A	Kcnip4	029088	176978	134758	Sapcd2	026955	100323	097898
3110043O21Rik	028300	156472	N/A	Kcnip4	029088	087395	084656	Sapcd2	026955	155310	N/A
3110043O21Rik	028300	130538	N/A	Kcnip4	029088	101215	N/A	Sapcd2	026955	129214	N/A
3110043O21Rik	028300	149138	N/A	Kcnip4	029088	176191	135071	Sapcd2	026955	137171	N/A
Cab39l	021981	225149	N/A	Kcnip4	029088	175660	135799	Sapcd2	026955	132539	N/A
Cab39l	021981	224281	N/A	Kcnip4	029088	101214	N/A	Sapcd2	026955	028329	028329
Cab39l	021981	022553	022553	Kcnj10	044708	056136	054356	Scamp5	040722	046587	035898
Cab39l	021981	225595	153643	Kcnj12	042529	089184	086588	Scamp5	040722	215208	N/A
Cab39l	021981	223678	153281	Kcnj12	042529	041944	041696	Scamp5	040722	214256	150867
Cab39l	021981	224893	153449	Kcnj12	042529	108717	104357	Scamp5	040722	215734	151197
Abl1	026842	146537	N/A	Kcnj16	051497	106636	102247	Scamp5	040722	213771	149622
Abl1	026842	156736	N/A	Kcnj16	051497	106635	102246	Scamp5	040722	215059	150248
Abl1	026842	075759	075167	Kcnj16	051497	125692	119921	Scel	022123	227322	154402
Abl1	026842	142554	142123	Kcnj16	051497	150902	121758	Scel	022123	095576	093233
Abl1	026842	123471	142297	Kcnj16	051497	180023	136382	Scg3	032181	034699	034699
Abl1	026842	135233	141320	Kcnj16	051497	178798	137414	Scg3	032181	213324	149561
Abl1	026842	028190	028190	Kcnj3	026824	067101	063329	Scg3	032181	215603	152480
Abl1	026842	124089	117748	Kcnj3	026824	112632	108251	Scg3	032181	213637	N/A
Abl1	026842	127714	N/A	Kcnj3	026824	112633	108252	Scg3	032181	214244	151074
Abl1	026842	124726	N/A	Kcnj4	044216	057801	094075	Scg3	032181	214176	N/A
Cables1	040957	171109	129463	Kcnk10	033854	221240	152473	Scg3	032181	215722	N/A
Cables1	040957	046948	040639	Kcnk10	033854	110113	105740	Scn1a	064329	200839	144214
Cables1	040957	225430	N/A	Kcnk10	033854	221305	152656	Scn1a	064329	112366	107985
Cabp1	029544	031519	031519	Kcnk10	033854	221906	N/A	Scn1a	064329	077489	076697
Cabp1	029544	112113	107741	Kcnk13	045404	160413	123916	Scn1a	064329	094951	092558
Cabp1	029544	112109	N/A	Kcnk13	045404	162221	N/A	Scn1a	064329	156865	144633
Cabp1	029544	112112	107740	Kcnk13	045404	049788	051846	Scn1a	064329	138910	116881
Cabp1	029544	145197	138183	Kcnk13	045404	177549	136882	Scn1a	064329	129508	N/A
Cabp1	029544	151775	N/A	Kcnk3	049265	066295	098987	Scn1a	064329	112371	107990
Cabp1	029544	201900	N/A	Kcnk3	049265	197428	N/A	Scn2a	075318	144254	117955
Cachd1	028532	030257	030257	Kcnma1	063142	145596	153247	Scn2a	075318	028377	028377
Cachd1	028532	097955	095568	Kcnma1	063142	188285	140275	Scn2a	075318	201378	N/A
Cachd1	028532	123475	N/A	Kcnma1	063142	225431	153670	Scn2a	075318	202653	N/A
Cachd1	028532	136430	N/A	Kcnma1	063142	188210	141069	Scn2a	075318	200829	143882
Cacna1a	034656	135382	N/A	Kcnma1	063142	224787	152999	Scn2a	075318	138368	N/A
Cacna1a	034656	121390	112436	Kcnma1	063142	224025	153078	Scn2a	075318	202508	143958
Cacna1a	034656	122053	114055	Kcnma1	063142	190044	140033	Scn2a	075318	202162	143888
Cacna1a	034656	215756	149242	Kcnma1	063142	225315	153584	Scn2a	075318	100067	097645
Cacna1a	034656	129620	N/A	Kcnma1	063142	225794	153254	Scn2b	070304	093855	091377
Cacna1a	034656	126302	N/A	Kcnma1	063142	225556	152959	Scn2b	070304	170998	126826
Cacna1a	034656	143215	N/A	Kcnma1	063142	190985	140154	Scn4b	046480	060125	062507
Cacna1a	034656	141981	N/A	Kcnma1	063142	223727	153158	Scn9a	075316	100064	097642
Cacna1a	034656	144879	N/A	Kcnma1	063142	223655	153362	Scn9a	075316	112354	107973

Cacna1a	034656	153691	N/A	Kcnma1	063142	224077	153214	Scn9a	075316	151234	N/A
Cacna1a	034656	130507	N/A	Kcnma1	063142	188991	140751	Scn9a	075316	141603	N/A
Cacna1b	004113	070864	063236	Kcnma1	063142	224468	153312	Scn9a	075316	164384	126528
Cacna1b	004113	102939	100003	Kcnma1	063142	224812	153527	Scn9a	075316	100063	097641
Cacna1b	004113	131861	141653	Kcnma1	063142	224285	153316	Scn9a	075316	169900	131711
Cacna1b	004113	041342	037416	Kcnma1	063142	225471	153083	Scn1g	000216	000221	000221
Cacna1b	004113	114447	110090	Kcnma1	063142	224232	153291	Scube1	016763	144773	N/A
Cacna1b	004113	133892	115285	Kcnma1	063142	223749	153216	Scube1	016763	043634	044835
Cacna1b	004113	125798	141767	Kcnma1	063142	212542	N/A	Scube1	016763	076060	075434
Cacna1b	004113	155356	116674	Kcnma1	063142	226051	153356	Scube1	016763	016907	016907
Cacna1b	004113	124183	114605	Kcnma1	063142	224933	N/A	Scube1	016763	171496	130131
Cacna1b	004113	100348	097920	Kcnma1	063142	212576	148692	Sdc3	025743	070478	065877
Cacna1e	004110	187541	140937	Kcnma1	063142	223847	N/A	Sdc3	025743	146093	N/A
Cacna1e	004110	211821	148507	Kcnma1	063142	225305	N/A	Sdc3	025743	152591	118685
Cacna1e	004110	226546	153897	Kcnma1	063142	224465	N/A	Sdc3	025743	141297	123608
Cacna1e	004110	188384	N/A	Kcnma1	063142	190339	141143	Sdc3	025743	140623	N/A
Cacna1e	004110	188965	N/A	Kcnma1	063142	065788	065293	Sdc4	017009	017153	017153
Cacna1e	004110	188321	N/A	Kcnma1	063142	100831	098393	Sdc4	017009	142909	N/A
Cacna1e	004110	186256	N/A	Kcnma1	063142	074983	074511	Sec14l5	091712	165810	128063
Cacna1e	004110	004214	004214	Kcnma1	063142	112423	108042	Sec24d	039234	047923	035823
Cacna1g	020866	107786	103415	Kcnma1	063142	172099	132204	Sec24d	039234	198210	N/A
Cacna1g	020866	107791	103420	Kcnma1	063142	177634	136447	Sec24d	039234	200333	143588
Cacna1g	020866	103166	099455	Kcnma1	063142	163322	128553	Sec24d	039234	197291	N/A
Cacna1g	020866	107792	103421	Kcnma1	063142	179836	137141	Sec24d	039234	196167	N/A
Cacna1g	020866	100561	098127	Kcnma1	063142	179097	136568	Sec24d	039234	196631	N/A
Cacna1g	020866	107793	103422	Kcnn3	000794	000811	000811	Sec24d	039234	200309	N/A
Cacna1g	020866	107788	103417	Kcnn3	000794	124584	N/A	Sec24d	039234	196482	N/A
Cacna1g	020866	107790	103419	Kcnq5	028033	029667	029667	Sel1l3	029189	031090	031090
Cacna1g	020866	107789	103418	Kcnq5	028033	115300	110955	Sel1l3	029189	196435	N/A
Cacna1g	020866	107785	103414	Kcnq5	028033	173058	134166	Sel1l3	029189	196516	N/A
Cacna1g	020866	133331	N/A	Kcnq5	028033	174183	134389	Sel1l3	029189	196550	N/A
Cacna1g	020866	146160	N/A	Kcnq5	028033	173404	134076	Sel1l3	029189	199919	N/A
Cacna1g	020866	142190	N/A	Kcnq5	028033	115299	N/A	Sema3c	028780	030568	030568
Cacna1g	020866	133000	N/A	Kcnq5	028033	134505	N/A	Sema3c	028780	170181	126614
Cacna1g	020866	152811	N/A	Kcnt2	052726	120709	112887	Sema3c	028780	170348	N/A
Cacna1g	020866	021234	021234	Kcnt2	052726	120796	113333	Sema3c	028780	169603	132330
Cacna2d1	040118	101581	099117	Kcnt2	052726	119786	113535	Sema3c	028780	115271	N/A
Cacna2d1	040118	039370	049457	Kcnt2	052726	192840	N/A	Sema3d	040254	030868	030868
Cacna2d1	040118	199704	142881	Kcnt2	052726	145077	N/A	Sema3d	040254	196618	N/A
Cacna2d1	040118	180204	136260	Kcnt2	052726	193606	141947	Sema3d	040254	197927	142453
Cacna2d1	040118	078272	077391	Kcnv1	022342	022967	022967	Sema3d	040254	196093	N/A
Cacna2d1	040118	196750	143082	Kcnv1	022342	228536	N/A	Sema3d	040254	195923	N/A
Cacna2d1	040118	200270	N/A	Kctd12b	041633	039424	037539	Sema4d	021451	110040	105667
Cacna2d1	040118	200158	N/A	Kctd12b	041633	112572	108191	Sema4d	021451	021900	021900
Cacna2d1	040118	200294	N/A	Kctd13	030685	032924	032924	Sema4d	021451	110039	105666
Cacna2d1	040118	199236	N/A	Kctd13	030685	141369	N/A	Sema4d	021451	125511	N/A
Cacna2d1	040118	115281	110936	Kctd13	030685	139233	N/A	Sema4d	021451	138228	N/A
Cacna2d1	040118	167946	131507	Kctd3	026608	193143	141861	Sema4d	021451	139865	N/A
Cacna2d2	010066	010210	010210	Kctd3	026608	085678	082821	Sema4d	021451	150662	N/A
Cacna2d2	010066	168532	132512	Kctd3	026608	192200	N/A	Sema4d	021451	139018	N/A
Cacna2d2	010066	085092	082173	Kctd3	026608	195745	N/A	Sema4d	021451	146238	N/A
Cacna2d2	010066	166799	126029	Kctd3	026608	195658	141863	Sema4d	021451	146922	N/A
Cacna2d2	010066	170737	125943	Kctd3	026608	195488	N/A	Sema4d	021451	143396	N/A
Cacna2d2	010066	169354	N/A	Kctd3	026608	192458	N/A	Sema4d	021451	139858	N/A
Cacna2d2	010066	171809	N/A	Kctd3	026608	193590	N/A	Sema4d	021451	155896	N/A
Cacna2d2	010066	194842	N/A	Kctd3	026608	195787	N/A	Sema5a	022231	226876	N/A
Cacna2d2	010066	168959	N/A	Kctd3	026608	193273	N/A	Sema5a	022231	067458	069024
Cacna2d2	010066	164988	130451	Kdm5d	056673	189069	139636	Sema5a	022231	228442	N/A
Cacna2d3	021991	022567	022567	Kdm5d	056673	055032	061095	Sema5a	022231	228103	N/A

Cacna2d3	021991	225985	152967	Kdm5d	056673	188910	N/A	Sema5a	022231	228555	N/A
Cacna2d3	021991	225668	153037	Kdm5d	056673	186696	140663	Sema5a	022231	228015	N/A
Cacna2d3	021991	225733	153143	Kdm5d	056673	186726	140462	Sema5a	022231	227802	N/A
Cacna2d3	021991	225863	153444	Kdm5d	056673	189626	N/A	Sema5a	022231	227976	N/A
Cacna2d3	021991	224950	N/A	Kdm5d	056673	185542	N/A	Sema5a	022231	227429	N/A
Cacna2d3	021991	226048	N/A	Kdm5d	056673	187296	N/A	Sema6a	019647	019791	019791
Cacna2d3	021991	225953	N/A	Kdm5d	056673	189955	N/A	Sema6a	019647	076043	075420
Cacna2d3	021991	224128	N/A	Khdrbs3	022332	022954	022954	Sema6a	019647	135790	120011
Cacnb4	017412	102760	099821	9530077C05Rik	036411	058868	062120	Sema6a	019647	141224	N/A
Cacnb4	017412	102761	099822	9530077C05Rik	036411	213598	N/A	Sema6a	019647	151382	N/A
Cacnb4	017412	078324	077438	9530077C05Rik	036411	214436	149413	Sema6a	019647	156422	121442
Cacnb4	017412	132322	N/A	9530077C05Rik	036411	213133	N/A	Sema6a	019647	126684	118655
Cacnb4	017412	148837	N/A	1810041L15Rik	062760	080751	079575	Sema6a	019647	144223	N/A
Cacnb4	017412	178799	136811	1810041L15Rik	062760	189248	141117	Sema6a	019647	123228	120249
Cacng3	066189	084615	081664	1810041L15Rik	062760	189994	140712	Sema6a	019647	115449	111109
Cacng3	066189	182563	138495	1810041L15Rik	062760	186527	140964	Sema6d	027200	103241	099531
Cacng3	066189	182095	138755	Kif13a	021375	056978	055304	Sema6d	027200	137172	N/A
Cacng4	020723	021066	021066	Kif13a	021375	223881	153657	Sema6d	027200	151199	N/A
Cacng4	020723	134076	N/A	Kif13a	021375	225836	153536	Sema6d	027200	103240	099530
Cacng5	040373	039071	047888	Kif13a	021375	224756	153385	Sema6d	027200	132088	N/A
Cacng5	040373	106742	102353	Kif13a	021375	225591	153614	Sema6d	027200	051419	061123
Cadm3	005338	111220	106851	Kif13a	021375	223856	152982	Sema6d	027200	103238	099528
Cadm3	005338	005470	005470	Kif13a	021375	225904	N/A	Sema6d	027200	103239	099529
Cadm3	005338	136540	N/A	Kif13a	021375	224457	N/A	Sema6d	027200	076335	075674
Cadm3	005338	157032	N/A	Kif13a	021375	224923	N/A	Sema6d	027200	078621	077691
Cadm3	005338	126963	N/A	Kif13b	060012	224126	153252	Sema6d	027200	077847	077014
Cadps2	017978	115358	111015	Kif13b	060012	224507	N/A	Sept4	020486	122945	115682
Cadps2	017978	018122	018122	Kif13b	060012	224503	153168	Sept4	020486	107962	103596
Cadps2	017978	142913	138167	Kif13b	060012	224677	N/A	Sept4	020486	140398	N/A
Cadps2	017978	115361	111018	Kif13b	060012	100473	098041	Sept4	020486	122067	112960
Cadps2	017978	156986	N/A	Kif19a	010021	126555	N/A	Sept4	020486	132723	N/A
Cadps2	017978	125350	115866	Kif19a	010021	137326	N/A	Sept4	020486	123081	N/A
Cadps2	017978	069074	064876	Kif19a	010021	138804	115663	Sept4	020486	133638	N/A
Cadps2	017978	152131	N/A	Kif19a	010021	084368	081398	Sept4	020486	135175	N/A
Cadps2	017978	115356	111013	Kif19a	010021	131782	N/A	Sept4	020486	107961	103595
Cadps2	017978	136279	N/A	Kif19a	010021	138340	122743	Sept4	020486	018544	018544
Cadps2	017978	115355	N/A	Kif19a	010021	134165	N/A	Sept4	020486	063156	060127
Cadps2	017978	166458	125972	Kif21b	041642	075164	074661	Sept4	020486	107960	103594
Cadps2	017978	163871	128905	Kif21b	041642	130864	114297	Sept4	020486	136229	N/A
Calb1	028222	029876	029876	Kif21b	041642	122892	N/A	Sept4	020486	134923	N/A
Calb1	028222	136266	N/A	Kif21b	041642	171381	131815	Sept4	020486	133202	115790
Calb1	028222	141336	N/A	Kif21b	041642	127624	N/A	Sept4	020486	148216	N/A
Calb2	003657	212297	148680	Kif21b	041642	165333	N/A	Sept4	020486	127414	N/A
Calb2	003657	003754	003754	Kif26b	026494	193931	N/A	Sept4	020486	143950	N/A
Caln1	060371	086029	083193	Kif26b	026494	161017	124462	Sept7	001833	165594	127641
Caln1	060371	202728	143823	Kif26b	026494	160789	124608	Sept7	001833	215692	N/A
Caln1	060371	141131	144225	Kif6	023999	162854	124674	Sept7	001833	215721	N/A
Caln1	060371	111287	106918	Kif6	023999	159354	N/A	Sept7	001833	213980	N/A
Caln1	060371	111288	106919	Kif6	023999	162029	125227	Sept7	001833	217598	N/A
Camk1g	016179	169907	128143	Kif6	023999	024798	N/A	Sept7	001833	214911	N/A
Camk1g	016179	016323	016323	Kif6	023999	159396	N/A	Sept7	001833	214520	N/A
Camk1g	016179	163202	131451	Kif6	023999	160049	N/A	Sept7	001833	213435	N/A
Camk1g	016179	165718	N/A	Kif6	023999	162419	N/A	Sept7	001833	214360	N/A
Camk2a	024617	102888	099952	Kirrel	041734	159976	125525	Sept7	001833	115272	110927
Camk2a	024617	134496	N/A	Kirrel	041734	041732	043756	Serinc2	023232	122374	112535
Camk2a	024617	025519	025519	Kirrel	041734	107618	103243	Serinc2	023232	105996	101618
Camk2a	024617	115297	110952	Kit	005672	144270	116465	Serinc2	023232	120126	113044
Camk2a	024617	137805	123480	Kit	005672	005815	005815	Serinc2	023232	146478	115198
Camk2a	024617	115295	110950	Kit	005672	143221	N/A	Serinc2	023232	154846	116586

Camk2a	024617	039904	048325	Kit	005672	151357	N/A	Serpinb1a	044734	076352	075690
Camk2g	021820	100837	098398	Kit	005672	136002	N/A	Serpinb1a	044734	223016	N/A
Camk2g	021820	071816	071720	Kit	005672	148993	N/A	Serpinb1a	044734	091668	089257
Camk2g	021820	080440	079298	Kit	005672	202167	N/A	Serpinb1a	044734	221967	N/A
Camk2g	021820	223863	153007	Kit	005672	201240	N/A	Serpine2	026249	027467	027467
Camk2g	021820	226630	154158	Kitl	019966	105283	100920	Serpine2	026249	189793	140065
Camk2g	021820	225328	152992	Kitl	019966	219050	N/A	Serpine2	026249	190724	140255
Camk2g	021820	224887	153165	Kitl	019966	130190	123360	Serpine2	026249	153862	N/A
Camk2g	021820	223712	153471	Kitl	019966	218200	151554	Serpine2	026249	191529	N/A
Camk2g	021820	225609	152903	Kitl	019966	020129	020129	Serpine2	026249	191026	N/A
Camk2g	021820	225463	153453	Kitl	019966	219881	N/A	Serpinh1	070436	169437	126390
Camk2g	021820	225660	N/A	Klhl13	036782	115313	110968	Serpinh1	070436	094154	091706
Camk2g	021820	225958	N/A	Klhl13	036782	115319	110974	Serpinh1	070436	208119	146969
Camk2g	021820	224245	N/A	Klhl13	036782	115316	110971	Serpinh1	070436	207849	147064
Camk2g	021820	225800	N/A	Klhl13	036782	115317	110972	Serpinh1	070436	208749	146515
Camk2g	021820	224566	N/A	Klhl13	036782	144360	N/A	Serpinh1	070436	207989	146444
Camk2g	021820	224804	N/A	Klhl13	036782	153345	N/A	Serpinh1	070436	208292	146373
Camk2g	021820	225635	N/A	Klhl13	036782	035973	041190	Serpini1	027834	161776	123845
Camk4	038128	042868	046539	Klhl5	054920	204097	144976	Serpini1	027834	029423	029423
Camkv	032936	035700	040430	Klhl5	054920	101191	098752	Serpini1	027834	195285	N/A
Camkv	032936	192318	N/A	Klhl5	054920	204348	144732	Serpini1	027834	161695	N/A
Camkv	032936	193533	141347	Klhl5	054920	204829	N/A	Serpini2	034139	039047	046943
Camkv	032936	195219	142005	Klhl5	054920	204479	N/A	Sertm1	056306	162201	124102
Camkv	032936	194206	141444	Klhl5	054920	203561	N/A	Sertm1	056306	070342	064870
Cap2	021373	021802	021802	Klhl5	054920	203538	145269	Sestd1	042272	102660	099721
Cap2	021373	119341	112952	Klk6	050063	107968	103602	Sestd1	042272	102659	099720
Cap2	021373	225824	153125	Klk6	050063	107966	103600	Sestd1	042272	145366	N/A
Cap2	021373	225444	N/A	Klk6	050063	177514	135591	Sestd1	042272	139021	N/A
Cap2	021373	126687	153072	Klk6	050063	107967	103601	Setbp1	024548	025430	025430
Capn5	035547	040971	048183	Kndc1	066129	154782	N/A	Sez6l2	030683	106335	101942
Capn5	035547	107112	102729	Kndc1	066129	121839	113856	Sez6l2	030683	146017	115905
Capn5	035547	134638	N/A	Kndc1	066129	156941	N/A	Sez6l2	030683	106333	101940
Capn5	035547	155056	116697	Kndc1	066129	210154	N/A	Sez6l2	030683	106332	101939
Capn5	035547	129430	121200	Kndc1	066129	053445	050586	Sez6l2	030683	125669	145667
Capzb	028745	102508	099566	Krt24	020913	017255	017255	Sez6l2	030683	134471	N/A
Capzb	028745	131912	114973	Ksr2	061578	073347	N/A	Sez6l2	030683	155138	146086
Capzb	028745	102507	099565	Ksr2	061578	180430	137670	Sgcd	020354	154578	N/A
Capzb	028745	131793	N/A	L3hypdh	019718	138029	N/A	Sgcd	020354	077221	076459
Capzb	028745	150077	N/A	L3hypdh	019718	124405	N/A	Sgcd	020354	109220	104843
Capzb	028745	030518	030518	L3hypdh	019718	019862	019862	Sgcd	020354	128558	N/A
Capzb	028745	156760	N/A	L3mbtl2	022394	023029	023029	Sgms2	050931	090246	087713
Capzb	028745	145368	119252	L3mbtl2	022394	174229	133967	Sgms2	050931	126569	114192
Capzb	028745	138045	122077	L3mbtl2	022394	172620	N/A	Sgms2	050931	197057	143170
Capzb	028745	042675	038011	L3mbtl2	022394	172568	N/A	Sgms2	050931	200431	N/A
Capzb	028745	132385	N/A	L3mbtl2	022394	172748	134333	Sh2d1a	005696	129855	N/A
Car12	032373	071889	071786	L3mbtl2	022394	174274	N/A	Sh2d1a	005696	189753	141070
Car12	032373	152011	N/A	L3mbtl2	022394	173105	N/A	Sh2d1a	005696	005839	005839
Car12	032373	123195	N/A	L3mbtl2	022394	173607	N/A	Sh2d1a	005696	115070	110722
Car12	032373	217394	N/A	L3mbtl2	022394	174497	133549	Sh2d1a	005696	153948	138624
Car12	032373	085420	082541	L3mbtl2	022394	174401	N/A	Sh2d1a	005696	128393	N/A
Car12	032373	134829	118030	L3mbtl2	022394	173761	N/A	Sh2d1a	005696	101619	N/A
Car14	038526	036181	036983	Lama1	032796	035471	043957	Sh2d4b	037833	070328	064708
Car14	038526	147962	117464	Lama2	019899	186279	N/A	Sh2d4b	037833	096000	093699
Car14	038526	149202	N/A	Lama2	019899	092639	090304	Sh2d4b	037833	225854	N/A
Car14	038526	126722	N/A	Lama2	019899	219763	151741	Sh3bgrl2	032261	188241	140951
Car2	027562	192609	141876	Lama2	019899	189575	140716	Sh3bgrl2	032261	113215	108841
Car2	027562	029078	029078	Lama2	019899	185839	N/A	Sh3bgrl2	032261	188617	N/A
Car2	027562	195520	N/A	Lama2	019899	186965	N/A	Sh3bgrl2	032261	188030	140348
Car4	000805	139416	N/A	Lama2	019899	188963	N/A	Sh3bgrl2	032261	185664	N/A

Car4	000805	103194	099483	Lama2	019899	187535	N/A	Sh3bp4	036206	066279	067581
Car4	000805	138331	N/A	Lama4	019846	159506	N/A	Sh3bp4	036206	123745	N/A
Car4	000805	150596	121381	Lama4	019846	019992	019992	Sh3d19	028082	182969	N/A
Car4	000805	127827	115878	Lama4	019846	162211	N/A	Sh3d19	028082	182723	N/A
Car4	000805	108076	103711	Lama4	019846	161303	N/A	Sh3d19	028082	183119	N/A
Car7	031883	212942	N/A	Lama4	019846	159580	N/A	Sh3d19	028082	182399	N/A
Car7	031883	159416	125112	Lama4	019846	161992	N/A	Sh3d19	028082	182666	138320
Car7	031883	056051	052136	Lama4	019846	163036	N/A	Sh3d19	028082	183202	N/A
Car7	031883	162761	125404	Lamb1	002900	169088	132778	Sh3d19	028082	107664	103291
Car7	031883	162399	N/A	Lamb1	002900	002979	002979	Sh3rf1	031642	034060	034060
Car8	041261	066674	063511	Lamb1	002900	164228	N/A	Sh3rf1	031642	209611	148118
Carmil1	021338	125901	126522	Lamb1	002900	170495	132001	Sh3rf1	031642	210210	N/A
Carmil1	021338	151566	120971	Lamb1	002900	169065	N/A	Sh3rf3	037990	135526	114368
Carmil1	021338	072889	072662	Lamb1	002900	164009	N/A	Sh3rf3	037990	153031	120938
Carmil1	021338	110398	106028	Lamb1	002900	172134	N/A	Sh3rf3	037990	133151	N/A
Carmil1	021338	147261	N/A	Lamp5	027270	144403	120703	Sh3rf3	037990	148267	N/A
Carmil1	021338	142171	N/A	Lamp5	027270	057503	061180	Sh3rf3	037990	152924	N/A
Carmil1	021338	128416	N/A	Lamp5	027270	154674	N/A	Sh3tc2	045629	051720	055094
Carmil1	021338	125420	N/A	Lamp5	027270	143777	N/A	Shank1	038738	107938	103571
Carmil1	021338	144159	N/A	Lamp5	027270	123436	N/A	Shank1	038738	107935	103568
Carmil1	021338	140042	127121	Laptm4b	022257	022867	022867	Shank1	038738	107934	103567
Carmil1	021338	123076	130100	Laptm4b	022257	226437	154241	Shank1	038738	134470	N/A
Carmil1	021338	136517	N/A	Laptm4b	022257	226627	153935	Shank1	038738	154776	N/A
Cams1	075289	167055	131624	Laptm4b	022257	228547	154118	Shank1	038738	127164	N/A
Casp12	025887	027009	027009	Lars2	035202	038863	036710	Shank3	022623	109309	104932
Casp12	025887	151788	121565	Lars2	035202	215674	N/A	Shank3	022623	135214	N/A
Casp12	025887	149520	N/A	Lars2	035202	214074	N/A	Shank3	022623	066545	064477
Casp12	025887	138308	N/A	Lars2	035202	217116	150083	Shank3	022623	154240	N/A
Casp12	025887	151332	122201	Lars2	035202	216843	150895	Shank3	022623	123799	N/A
Casq2	027861	029454	029454	Lars2	035202	215464	149082	Shank3	022623	167173	132229
Casq2	027861	165540	130482	Lars2	035202	214557	N/A	Shank3	022623	039074	048062
Casq2	027861	164123	131232	Lars2	035202	213711	N/A	Shc3	021448	021898	021898
Casq2	027861	159521	N/A	Lars2	035202	215087	N/A	Shc3	021448	223543	152080
Casq2	027861	159833	N/A	Lbh	024063	024857	024857	Shc3	021448	221850	N/A
Cav1	007655	007799	007799	Lbh	024063	148556	123062	Shc4	035109	042246	043146
Cav1	007655	115456	111116	Lcat	035237	038896	038232	Shc4	035109	110480	106106
Cav1	007655	115455	111115	Lcorl	015882	045586	042677	Shc4	035109	110477	106103
Cav1	007655	130505	N/A	Lcorl	015882	190036	140503	Shc4	035109	157002	N/A
Cav1	007655	177234	135875	Lcorl	015882	121573	112416	Shisa6	053930	134562	N/A
Cav1	007655	150901	135374	Lcorl	015882	199744	N/A	Shisa6	053930	123454	120862
Cav1	007655	123439	120252	Lcorl	015882	200142	N/A	Shisa6	053930	066679	071025
Cav1	007655	115454	111114	Lcorl	015882	087164	084408	Shisa7	053550	117452	112405
Cav1	007655	115453	111113	Lcorl	015882	016026	016026	Shisa7	053550	119433	112423
Cav1	007655	133065	N/A	Lcorl	015882	189859	139996	Shisa7	053550	157068	N/A
Cav2	000058	000058	000058	Lcorl	015882	187615	139466	Shisa7	053550	132806	N/A
Cav2	000058	115459	111119	Lcorl	015882	067997	N/A	Shisa7	053550	066041	064886
Cav2	000058	115462	111122	Lcorl	015882	156295	N/A	Shroom3	029381	113055	108678
Cbfb	031885	052209	059382	Lcorl	015882	186633	141174	Shroom3	029381	168878	130419
Cbfb	031885	109392	105019	Ldah	037669	037383	042285	Shroom3	029381	202767	N/A
Cbfb	031885	109395	105022	Ldah	037669	218883	151802	Shroom3	029381	113054	108677
Cbfb	031885	109394	105021	Ldah	037669	218305	151881	Shroom3	029381	172849	N/A
Cbfb	031885	186070	N/A	Ldah	037669	219043	151289	Shroom3	029381	225438	153516
Cbfb	031885	190915	N/A	Ldah	037669	218086	151612	Shroom3	029381	113051	108674
Cbfb	031885	187323	N/A	Ldah	037669	169104	129424	Shroom3	029381	172706	133690
Cbln1	031654	034076	034076	Ldah	037669	220345	151631	Shroom3	029381	201800	N/A
Cbln1	031654	211279	N/A	Ldah	037669	217763	N/A	Shroom3	029381	200869	N/A
Cbln1	031654	169693	126575	Ldah	037669	217999	151852	Shroom3	029381	172752	N/A
Cbln2	024647	068423	068863	Ldah	037669	219357	151362	Shroom4	068270	103005	100070
Cbln2	024647	122464	113996	Ldah	037669	219058	151541	Shroom4	068270	143641	131806

Cbln2	024647	122079	113695	Ldah	037669	220274	151309	Shroom4	068270	089520	086949
Cbln2	024647	169470	126810	Ldah	037669	217872	151257	Shtn1	041362	047511	041378
Cbln3	040380	063871	070494	Ldah	037669	219532	151941	Shtn1	041362	163821	126227
Cbln3	040380	172378	127798	Ldb2	039706	199534	142442	Siah3	091722	164848	130827
Cdc13	079235	135986	114787	Ldb2	039706	070748	067737	Sidt1	022696	127567	116201
Cdc13	079235	155511	128061	Ldb2	039706	199256	143775	Sidt1	022696	136381	115372
Cdc13	079235	126851	N/A	Ldb2	039706	199261	143289	Sidt1	022696	047446	038433
Cdc13	079235	142783	130887	Ldb2	039706	199471	N/A	Sidt1	022696	127124	N/A
Cdc13	079235	140929	N/A	Ldb2	039706	198356	N/A	Sidt1	022696	147032	114424
Cdc13	079235	146716	N/A	Ldb2	039706	198894	N/A	Sidt1	022696	124651	N/A
Cdc152	091119	226261	153730	Leng9	043432	058358	061079	Sipa1l1	042700	220550	N/A
Cdc152	091119	228405	153740	Lfng	029570	031555	031555	Sipa1l1	042700	166429	131030
Cdc152	091119	165386	129305	Lfng	029570	200626	N/A	Sipa1l1	042700	220963	152681
Cdc175	021086	021494	021494	Lfng	029570	199848	N/A	Sipa1l1	042700	222312	N/A
Cdc180	035539	127261	N/A	Lgi4	036560	039775	041579	Sipa1l1	042700	222849	N/A
Cdc180	035539	149903	119784	Lgi4	036560	169785	145660	Sipa1l1	042700	222298	152356
Cdc180	035539	151024	122332	Lgi4	036560	164725	146008	Sipa1l1	042700	222714	152212
Cdc180	035539	178561	136714	Lgi4	036560	172001	125865	Sipa1l1	042700	220766	N/A
Cdc80	022665	139509	N/A	Lgr5	020140	020350	020350	Sipa1l1	042700	221169	152485
Cdc80	022665	138048	N/A	Lgr5	020140	172806	133860	Sipa1l1	042700	221327	N/A
Cdc80	022665	155800	N/A	Lgr5	020140	173740	133707	Sipa1l1	042700	053969	061014
Cdc80	022665	099498	097097	Lgr5	020140	173619	N/A	Sipa1l3	030583	183330	138345
Cdc80	022665	134924	N/A	Lgr5	020140	144732	N/A	Sipa1l3	030583	182223	N/A
Cdc80	022665	061050	058752	Lgr5	020140	105272	N/A	Sipa1l3	030583	183096	138171
Cdc85a	032878	160016	125648	Lgr5	020140	149008	N/A	Sipa1l3	030583	182009	N/A
Cdc85a	032878	140601	124184	Lgr5	020140	129309	N/A	Sipa1l3	030583	182780	138311
Cdc85a	032878	093253	090941	Lgr6	042793	044828	035444	Sipa1l3	030583	182484	138714
Cdc85a	032878	146385	124972	Lgr6	042793	137968	122334	Sipa1l3	030583	182829	N/A
Cdc85a	032878	042534	044649	Lgr6	042793	139369	N/A	Sipa1l3	030583	183164	N/A
Cdc85a	032878	109501	N/A	Lhfp	048332	059562	056364	Sipa1l3	030583	182911	N/A
Cdc85a	032878	109502	105128	Lhfp	048332	137954	N/A	Sipa1l3	030583	183275	138381
Cdc88a	032740	040182	048978	Lhfp	048332	147139	119019	Sipa1l3	030583	182529	N/A
Cdc88a	032740	123561	119173	Lhfp	048332	196913	N/A	Sipa1l3	030583	182011	N/A
Cdc88a	032740	155854	115117	Lhfpl2	045312	054274	062239	Sipa1l3	030583	181975	138592
Cdc88a	032740	140194	114942	Lhfpl2	045312	144838	N/A	Sipa1l3	030583	182702	N/A
Cdc88a	032740	137227	N/A	Lhfpl2	045312	156071	117113	Sipa1l3	030583	182236	N/A
Cdc88a	032740	144450	N/A	Lhfpl2	045312	221096	152453	Sipa1l3	030583	183081	N/A
Cdc88a	032740	109477	105103	Lhfpl2	045312	223423	152241	Sipa1l3	030583	183085	N/A
Cck	032532	216176	149163	Lhfpl2	045312	120051	113786	Sipa1l3	030583	085809	082965
Cck	032532	216138	150080	Lhfpl2	045312	118195	112655	Sipa	037902	127751	N/A
Cck	032532	035120	035120	Lhfpl2	045312	131595	N/A	Sipa	037902	136153	N/A
Cck	032532	215228	149679	Lhfpl2	045312	121618	113468	Sipa	037902	153491	120324
Cck	032532	213106	149410	Lhx1	018698	018842	018842	Sipa	037902	161620	124048
Cck	032532	217581	150557	Lhx1	018698	184646	138899	Sipa	037902	136554	N/A
Cckbr	030898	033189	033189	Lhx1	018698	176503	N/A	Sipa	037902	103203	099492
Cckbr	030898	181339	138052	Lhx1	018698	092827	090503	Sipa	037902	103202	099491
Ccnd1	070348	093962	091495	Lhx1os	087211	134800	N/A	Sipa	037902	049262	049022
Ccnd1	070348	208193	N/A	Lhx1os	087211	126072	N/A	Sipa	037902	160952	N/A
Ccnd1	070348	135985	N/A	Lhx1os	087211	128121	N/A	Sipa	037902	163034	124888
Ccnd2	000184	000188	000188	Lhx5	029595	031591	031591	Sipa	037902	160276	125004
Ccnd2	000184	201564	N/A	Lims2	024395	025254	025254	Sipa	037902	162764	N/A
Ccnd2	000184	201985	N/A	Lims2	024395	225404	153218	Sipa	037902	099113	096713
Ccnd2	000184	201902	144006	Lims2	024395	225470	N/A	Sipa	037902	179001	137611
Ccnd2	000184	202363	N/A	Lims2	024395	224383	152960	Skap2	059182	204778	145462
Ccnd2	000184	201066	144095	Lims2	024395	226112	N/A	Skap2	059182	205174	N/A
Ccnd2	000184	201637	144245	Lims2	024395	225400	N/A	Skap2	059182	078214	077342
Ccnd2	000184	201857	N/A	Lims2	024395	223753	153122	Skap2	059182	203948	145275
Cd70	019489	019633	019633	Lims2	024395	225125	N/A	Skap2	059182	205112	N/A
Cd82	027215	099696	097287	Lims2	024395	224328	153433	Skap2	059182	204178	N/A

Cd82	027215	028644	028644	Lin28b	063804	079390	078361	Skap2	059182	203313	N/A
Cd82	027215	126772	N/A	Lin28b	063804	215708	N/A	Skor1	022245	119146	113924
Cd82	027215	111257	106888	Lin28b	063804	214555	N/A	Skor1	022245	116613	112312
Cd82	027215	123565	114762	Lin7a	019906	020057	020057	Skor1	022245	055281	055037
Cd82	027215	145553	115310	Lin7a	019906	105280	100916	Skor2	091519	166956	132338
Cd82	027215	150508	120183	Lin7a	019906	218031	151715	Slc12a2	024597	115366	111023
Cd82	027215	111256	106887	Gm28653	099906	227082	N/A	Slc12a8	035506	121925	112439
Cd82	027215	144168	N/A	Gm28653	099906	185494	N/A	Slc12a8	035506	119173	113633
Cd82	027215	124804	115349	Lingo1	049556	210032	148179	Slc12a8	035506	122314	113901
Cd82	027215	116457	112158	Lingo1	049556	114256	109894	Slc12a8	035506	122427	113164
Cd9	030342	032492	032492	Lingo1	049556	114247	109885	Slc12a8	035506	117134	112925
Cd9	030342	130132	N/A	Lingo1	049556	209596	N/A	Slc12a8	035506	149291	N/A
Cd9	030342	140024	N/A	Lingo1	049556	210332	N/A	Slc12a8	035506	059056	062337
Cdc14b	033102	221634	152388	Lingo1	049556	209332	N/A	Slc14a1	059336	091813	089421
Cdc14b	033102	039318	046003	Lingo1	049556	210995	N/A	Slc14a1	059336	160292	125114
Cdc14b	033102	221139	152843	Lingo1	049556	053568	059050	Slc14a1	059336	160639	125367
Cdc14b	033102	109769	105391	Lingo2	045083	065173	069772	Slc14a2	024552	025434	025434
Cdc14b	033102	221788	N/A	Lingo2	045083	098151	095754	Slc14a2	024552	163367	126416
Cdc14b	033102	222713	152246	Lingo2	045083	108122	103757	Slc16a10	019838	092566	090227
Cdc14b	033102	221217	152736	Lingo2	045083	124999	N/A	Slc16a10	019838	213827	151126
Cdc14b	033102	222766	152870	Lingo2	045083	145615	N/A	Slc16a10	019838	213488	150416
Cdc14b	033102	223116	N/A	Lingo2	045083	127372	N/A	Slc16a10	019838	217252	N/A
Cdc14b	033102	221437	N/A	Lingo2	045083	144170	N/A	Slc17a7	070570	085374	082489
Cdc14b	033102	109770	105392	Lingo2	045083	125128	N/A	Slc17a7	070570	209634	147661
Cdc42ep1	049521	059619	060930	Lingo2	045083	108124	103759	Slc17a7	070570	210498	N/A
Cdc42ep4	041598	106616	102227	Lingo2	045083	164772	130423	Slc17a7	070570	210540	N/A
Cdc42ep4	041598	053536	060227	Litaf	022500	023143	023143	Slc17a7	070570	211652	N/A
Cdc42ep4	041598	131488	114599	Litaf	022500	117360	112667	Slc19a1	001436	136150	121237
Cdc42ep4	041598	153453	120316	Litaf	022500	162323	123948	Slc19a1	001436	133059	120266
Cdh1	000303	000312	000312	Litaf	022500	140170	N/A	Slc19a1	001436	144234	116784
Cdh1	000303	136580	N/A	Lmcd1	057604	032376	032376	Slc19a1	001436	105410	101050
Cdh1	000303	167688	132112	Lmo2	032698	111143	106773	Slc19a1	001436	136925	119382
Cdh10	022321	166873	128782	Lmo2	032698	111140	106770	Slc19a1	001436	130703	115658
Cdh10	022321	176801	N/A	Lmo2	032698	133210	N/A	Slc19a1	001436	132984	116657
Cdh10	022321	176593	N/A	Lmo2	032698	111139	106769	Slc19a1	001436	127249	N/A
Cdh10	022321	040562	042199	Lmo2	032698	123437	117703	Slc19a1	001436	131031	114884
Cdh10	022321	176146	135546	Lmo2	032698	138815	121927	Slc1a1	024935	161340	N/A
Cdh10	022321	176409	N/A	Lmo2	032698	156813	122369	Slc1a1	024935	025875	025875
Cdh11	031673	075190	074681	Lmo2	032698	170926	128317	Slc1a1	024935	161119	N/A
Cdh11	031673	210578	N/A	Lonrf2	048814	147695	117600	Slc1a1	024935	160702	N/A
Cdh11	031673	210425	N/A	Lonrf2	048814	191724	N/A	Slc1a1	024935	162189	N/A
Cdh13	031841	117160	113527	Lonrf2	048814	039612	047372	Slc1a4	020142	004634	004634
Cdh13	031841	145849	N/A	Lpcat2	033192	046290	049252	Slc1a4	020142	109594	105223
Cdh13	031841	142551	N/A	Lpcat2	033192	210099	147941	Slc1a6	005357	005490	005490
Cdh13	031841	129548	N/A	Lpcat2	033192	209265	148089	Slc1a6	005357	217717	151544
Cdh13	031841	148836	N/A	Lpcat2	033192	130471	N/A	Slc20a1	027397	028880	028880
Cdh13	031841	123567	N/A	Lpcat2	033192	151106	N/A	Slc20a1	027397	140907	N/A
Cdh13	031841	212476	N/A	Lpp	033306	115314	110969	Slc20a1	027397	144744	N/A
Cdh13	031841	151842	N/A	Lpp	033306	078988	078005	Slc20a1	027397	141285	N/A
Cdh15	031962	034443	034443	Lpp	033306	038053	036304	Slc20a1	027397	148988	121074
Cdh19	047216	094626	092210	Lrch1	068015	088970	086363	Slc20a1	027397	110315	105944
Cdh19	047216	187555	N/A	Lrch1	068015	228134	N/A	Slc20a1	027397	125714	N/A
Cdh2	024304	025166	025166	Lrch1	068015	228252	154004	Slc20a1	027397	144025	N/A
Cdh2	024304	152779	N/A	Lrch1	068015	226799	N/A	Slc22a15	033147	106928	102541
Cdh2	024304	115850	111516	Lrch1	068015	227433	N/A	Slc22a15	033147	190824	139518
Cdh4	000305	000314	000314	Lrig1	030029	204645	144963	Slc22a15	033147	182130	N/A
Cdh4	000305	108911	104539	Lrig1	030029	101126	098686	Slc22a15	033147	183293	N/A
Cdh4	000305	124708	N/A	Lrig1	030029	203876	N/A	Slc22a15	033147	183255	138357
Cdh4	000305	136411	N/A	Lrig1	030029	141014	N/A	Slc22a15	033147	183098	N/A

Cdh4	000305	129659	N/A	Lrig1	030029	150811	N/A	Slc22a15	033147	182040	N/A
Cdh4	000305	098996	096594	Lrig1	030029	124165	N/A	Slc22a23	038267	148390	122283
Cdh8	036510	155527	123619	Lrig1	030029	032105	032105	Slc22a23	038267	040336	042742
Cdh8	036510	142129	114507	Lrp1	040249	049149	044004	Slc22a23	038267	128392	N/A
Cdh8	036510	093249	090935	Lrp1	040249	125480	N/A	Slc22a23	038267	145038	122376
Cdh8	036510	145601	122493	Lrp1	040249	121829	113584	Slc22a23	038267	143353	N/A
Cdh8	036510	128860	117326	Lrp1	040249	133620	115305	Slc22a4	020334	020586	020586
Cdh8	036510	126895	N/A	Lrp1	040249	129877	N/A	Slc22a4	020334	146351	N/A
Cdh8	036510	142475	115977	Lrp1	040249	129727	120567	Slc22a4	020334	154369	N/A
Cdhr1	021803	022337	022337	Lrp1	040249	145947	N/A	Slc24a3	063873	153249	N/A
Cdk14	028926	115451	111111	Lrp1	040249	140269	N/A	Slc24a3	063873	131123	N/A
Cdk14	028926	030763	030763	Lrp1	040249	135188	N/A	Slc24a3	063873	110007	105634
Cdk14	028926	115450	111110	Lrp1	040249	118455	113497	Slc24a3	063873	137908	N/A
Cdk14	028926	115452	111112	Lrp1b	049252	129974	N/A	Slc24a3	063873	081121	079897
Cdk14	028926	199623	N/A	Lrp1b	049252	052550	054275	Slc24a4	041771	159329	124513
Cdk14	028926	133465	N/A	Lrp1b	049252	142546	117212	Slc24a4	041771	079020	078030
Cdk14	028926	156660	N/A	Lrp1b	049252	203015	145066	Slc24a4	041771	161325	125012
Cdk14	028926	134867	N/A	Lrp1b	049252	134032	N/A	Slc25a18	004902	112682	108302
Cdk14	028926	132390	N/A	Lrp1b	049252	203080	145278	Slc25a33	028982	105686	101311
Cdk14	028926	153331	N/A	Lrp1b	049252	138700	N/A	Slc26a3	001225	167432	130676
Cdk14	028926	171119	N/A	Lrp1b	049252	204204	145045	Slc26a3	001225	171616	128722
Cdk14	028926	131392	114741	Lrp1b	049252	133104	N/A	Slc26a3	001225	110854	106478
Cdk14	028926	167567	130895	Lrp1b	049252	142688	144957	Slc26a3	001225	001254	001254
Cdk14	028926	137554	N/A	Lrp1b	049252	185258	139874	Slc26a3	001225	168209	N/A
Cdk14	028926	200637	N/A	Lrp1b	049252	167270	129192	Slc26a3	001225	165816	N/A
Cdk18	026437	027697	027697	Lrrc2	032495	035076	035076	Slc26a3	001225	109275	N/A
Cdk18	026437	188387	N/A	Lrrc2	032495	196834	142360	Slc27a6	024600	025500	025500
Cdk18	026437	185601	140034	Lrrc2	032495	196598	143319	Slc2a10	027661	029196	029196
Cdk18	026437	189733	N/A	Lrrc20	037151	049242	048042	Slc2a10	027661	148463	N/A
Cdk18	026437	112362	107981	Lrrc38	028584	052458	053597	Slc2a4	018566	178809	N/A
Cdk5rap2	039298	124251	N/A	Lrrc38	097351	181564	137856	Slc2a4	018566	018710	018710
Cdk5rap2	039298	144099	119891	Lrrc3b	045201	055211	059463	Slc2a4	018566	141837	136806
Cdk5rap2	039298	076541	075856	Lrrc3b	045201	223700	153616	Slc2a4	018566	152487	136504
Cdk5rap2	039298	126416	N/A	Lrrc3b	045201	163937	128624	Slc2a4	018566	178363	136455
Cdk5rap2	039298	138561	116928	Lrrc4c	050587	135431	130984	Slc2a4	018566	179298	136726
Cdk5rap2	039298	140108	119151	Lrrc4c	050587	162807	125218	Slc2a4	018566	142500	137463
Cdkl1	020990	021377	021377	Lrrc4c	050587	059049	131795	Slc2a4	018566	135437	137092
Cdkl1	020990	221646	152086	Lrrc4c	050587	170144	128490	Slc30a3	029151	031037	031037
Cdo1	033022	035804	046517	Lrrc7	028176	200196	143365	Slc30a3	029151	202740	144566
Cdyl	059288	075220	074707	Lrrc7	028176	200137	142498	Slc30a3	029151	201783	144353
Cdyl	059288	225602	153274	Lrrc7	028176	199890	142440	Slc30a3	029151	202731	144574
Cdyl	059288	163595	131784	Lrrc7	028176	197866	N/A	Slc30a3	029151	200906	144098
Cdyl	059288	226071	N/A	Lrrc7	028176	198284	N/A	Slc30a3	029151	201396	144295
Cebpb	056501	070642	069850	Lrrc7	028176	106044	101659	Slc31a2	066152	107468	103092
Cep126	040729	037397	042904	Lrrk2	036273	060642	052584	Slc31a2	066152	084530	081578
Cep126	040729	217241	N/A	Lrrk2	036273	140734	N/A	Slc31a2	066152	107467	103091
Cep126	040729	214150	N/A	Lrrk2	036273	156900	N/A	Slc32a1	037771	045738	036299
Cep76	073542	097542	095149	Lrrk2	036273	133743	N/A	Slc35d1	028521	150285	122124
Cept1	040774	068301	065743	Lrrk2	036273	137657	N/A	Slc35d1	028521	036195	037617
Cept1	040774	121231	112509	Lrrk2	036273	172797	N/A	Slc35d1	028521	183432	138926
Cept1	040774	039153	037277	Lrrtm4	052581	147663	117263	Slc35d1	028521	094947	N/A
Cept1	040774	192438	142097	Lrrtm4	052581	128718	114425	Slc35d1	028521	154845	N/A
Cept1	040774	148269	118343	Lrrtm4	052581	126005	117445	Slc35f1	038602	105473	101113
Cept1	040774	137530	115898	Lrrtm4	052581	133918	115016	Slc38a1	023169	088452	085799
Cept1	040774	141525	122460	Lrrtm4	052581	126399	121124	Slc38a1	023169	088454	085801
Cercam	039787	154464	119476	Lrrtm4	052581	136421	121621	Slc38a1	023169	100262	097833
Cercam	039787	047521	041622	Lrrtm4	052581	145407	114465	Slc39a12	036949	114731	110379
Cercam	039787	134152	115902	Lrrtm4	052581	074662	074232	Slc39a12	036949	082290	080911
Cercam	039787	153863	N/A	Lrtm1	045776	055662	061828	Slc39a12	036949	133258	122795

Cercam	039787	155355	N/A	Lrtm1	045776	224760	153372	Slc41a1	013275	132585	N/A
Cerkl	075256	156731	121353	Lrtm1	045776	224708	153518	Slc41a1	013275	086559	083747
Cerkl	075256	099974	N/A	Ltbp2	002020	002073	002073	Slc41a1	013275	146360	N/A
Cerkl	075256	147402	N/A	Ltbp2	002020	163189	127693	Slc43a2	038178	042561	046074
Cerkl	075256	143974	114325	Ltbp2	002020	166383	127255	Slc43a2	038178	108433	104071
Cerkl	075256	152549	N/A	Ltbp2	002020	163214	132067	Slc43a2	038178	151891	N/A
Cerkl	075256	143602	N/A	Ltbp2	002020	165141	132690	Slc43a2	038178	145901	N/A
Cerkl	075256	123859	N/A	Ltbp2	002020	168699	N/A	Slc43a2	038178	134112	N/A
Cerkl	075256	153602	N/A	Ltbp2	002020	110254	105883	Slc43a2	038178	155981	N/A
Cerkl	075256	156830	N/A	Lurap1	028701	030469	030469	Slc43a2	038178	127226	117264
Cerkl	075256	130499	N/A	Lurap1	028701	135982	N/A	Slc43a2	038178	143035	123101
Cerkl	075256	145766	N/A	Lurap1l	048706	055922	062628	Slc43a2	038178	149727	116255
Cerkl	075256	152413	N/A	Ly6e	022587	188866	140145	Slc43a2	038178	152775	N/A
Cers4	008206	177010	N/A	Ly6e	022587	187606	139471	Slc43a2	038178	169547	126838
Cers4	008206	176042	135594	Ly6e	022587	189186	139477	Slc44a5	028360	089948	087394
Cers4	008206	008350	008350	Ly6e	022587	187284	140553	Slc44a5	028360	128362	N/A
Cers4	008206	176267	N/A	Ly6e	022587	190810	139482	Slc44a5	028360	144677	N/A
Cers4	008206	175781	N/A	Ly6e	022587	185861	141145	Slc45a1	039838	037827	036774
Cers4	008206	176837	N/A	Ly6e	022587	185863	140060	Slc45a1	039838	117997	112737
Cers4	008206	176932	N/A	Ly6e	022587	191127	139966	Slc45a1	039838	147706	N/A
Cers4	008206	176705	N/A	Ly6e	022587	191436	139549	Slc4a4	060961	148750	119325
Cers4	008206	176130	135652	Ly6e	022587	186927	N/A	Slc4a4	060961	135283	N/A
Cfap161	011154	119134	114051	Ly6e	022587	188503	N/A	Slc4a4	060961	113218	108844
Cfap161	011154	011298	011298	Ly6e	022587	191145	140829	Slc4a4	060961	156238	121744
Cfap161	011154	208785	N/A	Ly6e	022587	191439	N/A	Slc4a4	060961	144713	122975
Cfap161	011154	149671	115281	Ly6e	022587	188042	141059	Slc4a4	060961	130041	118413
Cfap20	031796	212731	N/A	Ly6e	022587	051698	056703	Slc4a4	060961	113216	108842
Cfap20	031796	034249	034249	Ly6e	022587	169343	132081	Slc4a4	060961	134303	119976
Cfap20	031796	213086	148651	Lypd1	026344	159417	125149	Slc4a7	021733	057015	058313
Cfap20	031796	212579	N/A	Lypd1	026344	162899	125158	Slc4a7	021733	225496	N/A
Cfap20	031796	212684	148527	Lypd1	026344	027582	027582	Slc4a7	021733	225232	153280
Cfap20	031796	211908	148668	Lypd1	026344	159529	123824	Slc4a7	021733	224197	N/A
Cfap20	031796	212807	N/A	Lypd1	026344	161361	124265	Slc4a7	021733	223981	153084
Cfap20	031796	212131	148415	Lypd6	050447	053208	061578	Slc4a7	021733	223607	153180
Cgn	068876	107272	102893	Lypd6	050447	128451	116803	Slc4a7	021733	225238	152984
Cgn	068876	107273	102894	Lypd6	050447	126337	119755	Slc4a7	021733	223761	153045
Cgn	068876	153263	143156	Lypd6	050447	112712	108332	Slc4a7	021733	225175	153166
Cgn	068876	155485	142809	Lypd6	050447	169232	131002	Slc4a7	021733	224222	153116
Cgnl1	032232	121322	113917	Lypd6b	026765	028103	028103	Slc4a7	021733	225630	153597
Cgnl1	032232	152224	N/A	Lypd6b	026765	153422	N/A	Slc4a7	021733	225979	153690
Cgnl1	032232	122065	112479	Lypd6b	026765	129867	N/A	Slc4a7	021733	226079	153323
Cgnl1	032232	136044	N/A	Lyzl4	032530	077706	076887	Slc4a7	021733	224952	153345
Cgnl1	032232	146567	N/A	Lyzl4	032530	120918	113034	Slc4a7	021733	223695	153648
Cgnl1	032232	072899	072672	Lyzl4	032530	213757	151031	Slc4a7	021733	224333	153470
Chac1	027313	028780	028780	Lyzl4	032530	125075	115284	Slc4a7	021733	223740	152933
Chd7	041235	170457	N/A	Lyzl4	032530	214592	150807	Slc4a7	021733	224672	152950
Chd7	041235	127476	118711	Mag	036634	187137	139564	Slc4a7	021733	224049	153093
Chd7	041235	051558	059079	Mag	036634	191081	139881	Slc4a7	021733	224752	153185
Chd7	041235	129655	123241	Mag	036634	188569	140526	Slc4a7	021733	225078	N/A
Chd7	041235	170391	127007	Mag	036634	186422	N/A	Slc4a7	021733	223771	153532
Chd7	041235	130709	N/A	Mag	036634	190638	140578	Slc4a7	021733	225508	N/A
Chd7	041235	222546	152166	Mag	036634	190950	139861	Slc4a7	021733	224750	N/A
Chd7	041235	039267	043903	Mag	036634	191486	N/A	Slc4a7	021733	225613	N/A
Chdh	015970	067620	065542	Mag	036634	040548	041464	Slc5a11	030769	131933	121459
Chdh	015970	125796	N/A	Magi3	052539	064371	067932	Slc5a11	030769	140721	N/A
Chdh	015970	118917	112916	Magi3	052539	121198	112934	Slc5a11	030769	033035	033035
Chgb	027350	028826	028826	Magi3	052539	122303	113713	Slc5a11	030769	131461	123027
Chid1	025512	153191	114693	Magi3	052539	199201	N/A	Slc5a11	030769	127655	117956
Chid1	025512	118694	112891	Mak	021363	225084	152946	Slc5a11	030769	131209	120678

Chid1	025512	209452	147938	Mak	021363	225789	N/A	Slc5a11	030769	206180	N/A
Chid1	025512	147610	N/A	Mak	021363	070193	064750	Slc5a11	030769	167299	127977
Chid1	025512	064642	065953	Mak	021363	224740	153314	Slc5a7	023945	095712	093379
Chid1	025512	155305	N/A	Mak	021363	225906	153176	Slc6a7	052026	025520	025520
Chid1	025512	143561	115174	Mak	021363	224423	152961	Slc7a1	041313	048116	046714
Chid1	025512	133359	N/A	Mak	021363	165087	129615	Slc7a1	041313	138257	117781
Chid1	025512	166082	130360	Mak	021363	021792	021792	Slc7a1	041313	201860	N/A
Chid1	025512	026586	026586	Mal	027375	028854	028854	Slc7a1	041313	202457	144000
Chl1	030077	203912	145026	Mal	027375	028853	028853	Slc7a1	041313	138596	122914
Chl1	030077	203489	N/A	Mal2	024479	025356	025356	Slc7a1	041313	201348	N/A
Chl1	030077	066905	063933	Manla	003746	003843	003843	Slc7a10	030495	135452	127577
Chl1	030077	203830	144758	Manla	003746	105470	101110	Slc7a10	030495	001854	001854
Chl1	030077	204321	144725	Manla	003746	218317	151328	Slc7a10	030495	131048	118331
Chl1	030077	205098	144739	Manla	003746	220088	151568	Slc7a10	030495	167441	129954
Chn2	004633	138930	N/A	Manla	003746	219234	N/A	Slc7a10	030495	146959	127311
Chn2	004633	046856	035908	Manla	003746	146483	N/A	Slc7a11	027737	194462	141988
Chn2	004633	133315	145072	Manla	003746	105469	N/A	Slc7a11	027737	029297	029297
Chn2	004633	114403	N/A	Manla	003746	133330	N/A	Slc7a11	027737	192564	N/A
Chn2	004633	127323	118990	Manlc1	037306	054096	050979	Slc7a11	027737	142932	N/A
Chn2	004633	204410	N/A	Manlc1	037306	176606	N/A	Slc7a11	027737	193838	N/A
Chn2	004633	146114	114476	Manlc1	037306	038628	037949	Slc7a14	069072	091259	088803
Chn2	004633	114402	110044	Man2a1	024085	086723	083928	Slc7a14	069072	108245	103880
Chn2	004633	114401	110043	Man2a1	024085	169239	N/A	Slc7a3	031297	138162	N/A
Chn2	004633	067741	066078	Man2a1	024085	169668	130529	Slc7a3	031297	101362	098914
Chn2	004633	204921	145231	Map2k6	020623	020949	020949	Slc7a3	031297	113710	109339
Chn2	004633	203091	145008	Map2k6	020623	146084	N/A	Slc7a3	031297	126282	N/A
Chn2	004633	204115	145507	Map2k6	020623	100260	097831	Slc7a3	031297	144410	N/A
Chn2	004633	203941	145314	Map2k6	020623	133920	N/A	Slc7a3	031297	151922	N/A
Chn2	004633	204746	144983	Map2k6	020623	146540	N/A	Slc7a3	031297	073927	073582
Chodl	022860	023568	023568	Map6d1	041205	040880	043332	Slc8a1	054640	163680	126373
Chodl	022860	069148	063961	Map7	019996	020173	020173	Slc8a1	054640	086538	083725
Chodl	022860	114216	109854	Map7	019996	116259	111963	Slc8a1	054640	163123	132809
Chrm1	032773	177197	135356	Map7	019996	214231	149367	Slc8a2	030376	211649	147497
Chrm1	032773	035444	042632	Map7	019996	214823	N/A	Slc8a2	030376	168693	128926
Chrm1	032773	163785	126103	Map7	019996	216909	N/A	Slc8a3	079055	085238	082334
Chrm3	046159	187510	140131	Map7	019996	217251	N/A	Slc8a3	079055	064594	063258
Chrm3	046159	223242	N/A	Map7	019996	215924	150818	Slc8a3	079055	182208	138735
Chrm3	046159	190395	N/A	Map7	019996	216065	N/A	Slc8a3	079055	182366	138803
Chrm3	046159	063093	055579	Map7	019996	213386	N/A	Slc8a3	079055	183102	N/A
Chst1	027221	065797	064246	Map7	019996	213312	151101	Slc8b1	032754	068326	064714
Chst10	026080	027249	027249	Map7	019996	215812	N/A	Slc8b1	032754	111890	107521
Chst10	026080	193441	142028	Map7	019996	216474	N/A	Slc8b1	032754	076051	075428
Chst10	026080	192948	141470	Map7	019996	216308	N/A	Slc8b1	032754	147496	120947
Chst10	026080	194361	141295	Mapk12	022610	088827	086207	Slc8b1	032754	140329	117260
Chst10	026080	194657	141481	Mapk4	024558	159162	123922	Slc8b1	032754	111889	107520
Chst10	026080	193435	141604	Mapk4	024558	091851	089462	Slc8b1	032754	123326	N/A
Chst10	026080	192175	N/A	Mapk4	024558	162863	124408	Slc9a3	036123	221410	N/A
Chst10	026080	195731	N/A	Mapk4	024558	160601	N/A	Slc9a3	036123	225423	153255
Chst11	034612	040110	045349	March11	022269	126304	153852	Slc9a3	036123	221703	152682
Chst15	030930	077472	076682	March11	022269	140840	118729	Slc9a3	036123	036208	038142
Chst15	030930	080215	079105	March11	022269	152841	120622	Slc9a9	031129	033463	033463
Chst15	030930	132508	N/A	March11	022269	155819	N/A	Slc9a9	031129	162870	N/A
Chst15	030930	207068	N/A	Marcks	069662	092584	090245	Slc9a9	031129	162329	N/A
Chst8	060402	078686	077752	Marcksl1	047945	062356	055637	Slco4a1	038963	038259	046502
Chst8	060402	205259	145646	Marveld2	021636	225754	153294	Slco4a1	038963	139902	N/A
Chst8	060402	154629	123498	Marveld2	021636	163163	129990	Slco4a1	038963	038225	045023
Chst8	060402	135295	N/A	Marveld2	021636	168772	126438	Slco4a1	038963	138446	N/A
Chst8	060402	206207	N/A	Marveld2	021636	022137	022137	Slco4a1	038963	128367	N/A
Chst8	060402	205390	N/A	Masp1	022887	089883	087327	Slco4c1	040693	071985	071875

Chst9	047161	053017	049975	Matn1	040533	102576	099636	Slit3	056427	069837	066857
Chst9	047161	130553	121484	Matn4	016995	109359	104983	Slit3	056427	156571	N/A
Chsy1	032640	036372	047487	Matn4	016995	109358	104982	Slit3	056427	153098	N/A
Chsy3	058152	080721	079546	Matn4	016995	103103	099392	Slit3	056427	124438	N/A
Chtf18	019214	170575	131366	Matn4	016995	103104	099393	Slitrk1	075478	100322	097897
Chtf18	019214	048054	043896	Matn4	016995	154940	N/A	Slitrk6	045871	078386	077492
Chtf18	019214	168914	N/A	Mboat1	038732	153269	N/A	Smad3	032402	034973	034973
Chtf18	019214	167940	131349	Mboat1	038732	152798	N/A	Smad3	032402	154323	116790
Chtf18	019214	169767	129694	Mboat1	038732	047311	045441	Smad3	032402	137065	N/A
Chtf18	019214	168060	N/A	Mboat1	038732	220870	N/A	Smad3	032402	133108	122217
Chtf18	019214	170070	131768	Mboat1	038732	222095	N/A	Smad3	032402	137713	121671
Cipc	034157	189246	140266	Mboat2	020646	222198	152150	Smad7	025880	026999	026999
Cipc	034157	185434	140769	Mboat2	020646	221952	152348	Smad7	025880	174843	133544
Cipc	034157	191032	140097	Mboat2	020646	220497	N/A	Smad7	025880	174411	133696
Cipc	034157	187814	141049	Mboat2	020646	078902	077937	Smad7	025880	172718	N/A
Cipc	034157	188901	N/A	Mboat2	020646	110942	106567	Smad7	025880	168918	129322
Cipc	034157	188046	139742	Mboat2	020646	222994	152712	Smpx	041476	038007	048522
Cipc	034157	185783	140830	Mcam	032135	149241	121090	Smpx	041476	136141	119573
Cipc	034157	186499	139553	Mcam	032135	034650	034650	Smpx	041476	112520	108139
Cipc	034157	190588	140595	Mcam	032135	098852	096451	Smpx	041476	147283	120412
Cipc	034157	191463	140683	Mcam	032135	216002	149002	Smpx	041476	112521	108140
Cipc	034157	038369	038630	Mcam	032135	147836	117924	Smpx	041476	132805	N/A
Cit	029516	147330	N/A	Mcam	032135	132490	N/A	Smpx	041476	126418	N/A
Cit	029516	137952	122745	Mcc	071856	089874	087318	Smpx	041476	190091	140268
Cit	029516	148245	119769	Mcc	071856	164666	128032	Sned1	047793	062202	050832
Cit	029516	146387	N/A	Mcc	071856	202090	N/A	Sned1	047793	172289	N/A
Cit	029516	141101	115802	Mcc	071856	202845	N/A	Sned1	047793	165843	N/A
Cit	029516	051704	062049	Mcc	071856	201270	N/A	Sned1	047793	163688	132455
Cit	029516	112008	107639	Mctp1	021596	125209	118958	Sned1	047793	168122	N/A
Cit	029516	102560	099620	Mctp1	021596	126960	120673	Sned1	047793	165883	N/A
Cit	029516	153407	N/A	Mctp1	021596	109589	105218	Sntb1	060429	039769	041294
Cit	029516	127976	N/A	Mctp1	021596	137052	N/A	Sntb1	060429	110200	105829
Cit	029516	202734	N/A	Mctp1	021596	155275	N/A	Sntb1	060429	140574	N/A
Cit	029516	128702	N/A	Mctp1	021596	122843	N/A	Snx33	032733	050916	060225
Cit	029516	145363	N/A	Mctp1	021596	149028	N/A	Soat1	026600	187987	N/A
Cit	029516	147479	N/A	Mctp1	021596	109583	105212	Soat1	026600	191379	N/A
Cit	029516	139881	N/A	Mdfi	032717	113280	108905	Soat1	026600	187507	139431
Cit	029516	122877	N/A	Mdfi	032717	066368	069915	Soat1	026600	187073	N/A
Cit	029516	136780	N/A	Mdfi	032717	035375	037888	Soat1	026600	188027	141074
Cit	029516	123736	134875	Mdfi	032717	125745	N/A	Soat1	026600	186420	N/A
Cit	029516	134609	N/A	Mdfi	032717	131971	120454	Soat1	026600	189661	140721
Clasrp	061028	086041	083205	Mdfi	032717	140234	N/A	Soat1	026600	051396	058344
Clasrp	061028	208427	N/A	Mdfi	032717	152455	117665	Sobp	038248	040275	040072
Clasrp	061028	208464	N/A	Mdfi	032717	132125	114581	Sobp	038248	189987	N/A
Clasrp	061028	208716	N/A	Mdfi	032717	129360	114930	Socs2	020027	139210	121305
Clasrp	061028	207253	N/A	Mdga2	034912	037181	046761	Socs2	020027	130784	N/A
Clasrp	061028	207907	146982	Mdga2	034912	222987	152049	Socs2	020027	128854	N/A
Clasrp	061028	207663	147069	Mdga2	034912	222623	152548	Socs2	020027	155148	N/A
Clasrp	061028	208068	147103	Mdga2	034912	178814	137608	Socs2	020027	020215	020215
Clasrp	061028	207447	N/A	Mdga2	034912	101379	098930	Socs2	020027	134918	N/A
Clasrp	061028	207524	146794	Mdga2	034912	178724	N/A	Socs2	020027	119917	113378
Clasrp	061028	207264	N/A	Mdga2	034912	223289	N/A	Socs2	020027	135822	118720
Clasrp	061028	209059	N/A	Mdga2	034912	179729	N/A	Socs2	020027	150432	117785
Clasrp	061028	207325	N/A	Mdga2	034912	177690	N/A	Socs2	020027	129942	117576
Clcn1	029862	031894	031894	Mdga2	034912	179577	N/A	Socs2	020027	128363	N/A
Clcn1	029862	164091	131354	Mdga2	034912	179025	N/A	Socs2	020027	145847	N/A
Clcn1	029862	170028	132154	Mdga2	034912	223141	152613	Socs2	020027	170690	129331
Clcn1	029862	163936	130148	Mdga2	034912	222167	152112	Socs2	020027	172070	131875
Clcn1	029862	165780	130550	Mdga2	034912	113942	109575	Sod3	072941	101208	098768

Clcn1	029862	169024	130968	Med12l	056476	040846	041859	Sorbs2	031626	209534	N/A
Clcn1	029862	168660	126045	Med12l	056476	199659	142903	Sorbs2	031626	124544	147462
Clcn1	029862	114684	N/A	Med12l	056476	197374	143419	Sorbs2	031626	138049	123503
Clcn1	029862	163235	132387	Med12l	056476	029393	029393	Sorbs2	031626	132139	123250
Clcn1	029862	169902	N/A	Med12l	056476	040325	042269	Sorbs2	031626	141039	117544
Clcn5	004317	004428	004428	Med12l	056476	164225	127038	Sorbs2	031626	171337	128000
Clcn5	004317	154382	N/A	Mef2c	005583	198199	143742	Sorbs2	031626	067107	067641
Clcn5	004317	128319	122555	Mef2c	005583	199450	143315	Sorbs2	031626	145458	116536
Clcn5	004317	115746	111412	Mef2c	005583	198916	143235	Sorbs2	031626	134321	115842
Clcn5	004317	132126	N/A	Mef2c	005583	200123	142833	Sorbs2	031626	135336	114286
Cldn11	037625	046174	042181	Mef2c	005583	005722	005722	Sorbs2	031626	127395	N/A
Clec2l	079598	114874	110524	Mef2c	005583	163888	132547	Sorbs2	031626	130850	123195
Clec7a	079293	195589	141234	Mef2c	005583	196493	142897	Sorbs2	031626	153798	118353
Clec7a	079293	184581	139167	Mef2c	005583	200394	143598	Sorbs2	031626	210946	147573
Clec7a	079293	184861	N/A	Mef2c	005583	199019	143401	Sorbs2	031626	134675	118160
Clec7a	079293	112076	107707	Mef2c	005583	199105	143212	Sorbs2	031626	139869	121235
Clic6	022949	023670	023670	Mef2c	005583	196832	N/A	Sorbs2	031626	133864	N/A
Clic6	022949	162181	124498	Mef2c	005583	199432	142714	Sorbs2	031626	211095	148072
Clmn	021097	109936	105562	Mef2c	005583	198069	143286	Sorbs2	031626	126067	118562
Clmn	021097	109937	105563	Mef2c	005583	197681	143420	Sorbs2	031626	136119	N/A
Clmn	021097	223103	152228	Mef2c	005583	197722	142456	Sorbs2	031626	143820	119539
Clmn	021097	223342	152070	Mef2c	005583	197938	143187	Sorbs2	031626	149752	121073
Clmn	021097	223177	152097	Mef2c	005583	199262	N/A	Sorbs2	031626	130011	121619
Clmn	021097	222323	152467	Mef2c	005583	198064	142399	Sorbs2	031626	150102	114951
Clmn	021097	222412	N/A	Mef2c	005583	196730	143338	Sorbs2	031626	139103	119380
Clmp	032024	139577	N/A	Mef2c	005583	196207	143221	Sorbs2	031626	211442	N/A
Clmp	032024	034522	034522	Mef2c	005583	197146	143227	Sorbs2	031626	125295	116768
Clmp	032024	141759	N/A	Mef2c	005583	197022	N/A	Sorbs2	031626	132767	N/A
Clmp	032024	134153	N/A	Mef2c	005583	185052	138826	Sorbs2	031626	140088	114158
Clstn2	032452	035027	035027	Mef2c	005583	195984	143611	Sorbs2	031626	155858	122820
Clstn2	032452	162295	124081	Mef2c	005583	199167	142884	Sorbs2	031626	132730	N/A
Clvs2	019785	019920	019920	Mef2c	005583	195904	143339	Sorbs2	031626	146627	120487
Clvs2	019785	159533	N/A	Mef2c	005583	198217	142487	Sorbs2	031626	211721	N/A
Clvs2	019785	161692	151805	Mef2c	005583	199210	142595	Sorbs2	031626	136344	N/A
Clvs2	019785	160299	125100	Mef2c	005583	200138	142715	Sorbs2	031626	156549	N/A
Nat8f5	079494	032074	032074	Mef2c	005583	198360	143058	Sorbs2	031626	067065	070720
Cmtm5	040759	037814	036138	Mef2c	005583	197145	142619	Sorbs3	022091	227653	154195
Cmtm5	040759	227441	153874	Megf10	024593	075770	075174	Sorbs3	022091	022682	022682
Cmtm5	040759	226807	N/A	Megf10	024593	139892	116814	Sorbs3	022091	227259	153715
Cnih3	026514	161880	124611	Mei4	043289	057067	061341	Sorbs3	022091	227929	154773
Cnih3	026514	027795	027795	Mei4	043289	189832	140647	Sorcs3	063434	078880	077919
Cnih3	026514	162685	124247	Mei4	043289	189391	139589	Sox10	033006	040019	039466
Cnih3	026514	209607	148015	Meis1	020160	144988	134969	Sox13	070643	144386	122980
Cnksr3	015202	015346	015346	Meis1	020160	102878	099942	Sox13	070643	153799	119729
Cnksr3	015202	150282	115863	Meis1	020160	068264	069277	Sox13	070643	145922	N/A
Cnp	006782	103120	099409	Meis1	020160	118661	N/A	Sox13	070643	126530	N/A
Cnp	006782	148034	N/A	Meis1	020160	177417	135726	Sox13	070643	094551	092130
Cnp	006782	150414	N/A	Meis1	020160	177357	139074	Sox2	074637	099151	096755
Cnp	006782	147403	N/A	Meis1	020160	125722	N/A	Sox6	051910	206034	145919
Cnpy1	044681	141601	122171	Meis1	020160	137300	N/A	Sox6	051910	169129	126404
Cnpy1	044681	118882	113944	Meis1	020160	185131	139219	Sox6	051910	206369	145931
Cnpy1	044681	120068	112773	Meis2	027210	028639	028639	Sox6	051910	205405	145732
Cnpy1	044681	117098	113956	Meis2	027210	102538	099597	Sox6	051910	205980	N/A
Cnpy1	044681	141196	116024	Meis2	027210	110907	106532	Sox6	051910	206775	N/A
Cnr1	044288	057188	055797	Meis2	027210	110908	106533	Sox6	051910	206573	N/A
Cnr1	044288	133462	N/A	Meis2	027210	110906	106531	Sox6	051910	205479	145561
Cnr1	044288	084736	081787	Meis2	027210	074285	073898	Sox6	051910	206427	N/A
Cntfr	028444	102961	100026	Meis2	027210	120995	N/A	Sox6	051910	206123	145576
Cntfr	028444	102962	100027	Meis2	027210	189640	N/A	Sox6	051910	205818	N/A

Cntfr	028444	151181	N/A	Meis2	027210	151279	N/A	Sox6	051910	206912	N/A
Cntfr	028444	064443	N/A	Meis2	027210	177493	N/A	Sox6	051910	072804	072583
Cntfr	028444	084701	N/A	Meis2	027210	149217	N/A	Sox6	051910	166877	129512
Cntfr	028444	145379	115631	Meis2	027210	118654	N/A	Sox6	051910	106612	102223
Cntn3	030075	204990	N/A	Meis2	027210	150477	N/A	Sox6	051910	166207	129027
Cntn3	030075	203619	145176	Meis2	027210	154671	N/A	Sox8	024176	025003	025003
Cntn3	030075	032159	032159	Meis2	027210	140461	N/A	Sox8	024176	174560	133742
Cntn4	064293	132044	N/A	Meis2	027210	135543	N/A	Sox8	024176	173447	133403
Cntn4	064293	113261	108886	Meis2	027210	134314	N/A	Sox9	000567	000579	000579
Cntn4	064293	089208	086616	Meis2	027210	133990	N/A	Sp5	075304	100043	097620
Cntn4	064293	113260	108885	Meis2	027210	138526	N/A	Spag5	002055	045026	045286
Cntn4	064293	113258	108883	Mertk	014361	014505	014505	Spag5	002055	133579	N/A
Cntn4	064293	125904	N/A	Mertk	014361	140221	N/A	Spag5	002055	146068	N/A
Cntn4	064293	079416	078385	Metrn	002274	165838	127275	Spag5	002055	141026	N/A
Cntn4	064293	130040	N/A	Metrn	002274	002344	002344	Spag5	002055	150016	N/A
Cntn4	064293	132395	N/A	Mfap3l	031647	161421	124136	Spag5	002055	149711	N/A
Cntn4	064293	204621	N/A	Mfap3l	031647	160719	125139	Spag5	002055	128359	N/A
Cntn4	064293	123596	N/A	Mfap3l	031647	161702	124330	Spag5	002055	125477	N/A
Cntn4	064293	142626	N/A	Mfap3l	031647	034066	034066	Sparc	018593	108858	104486
Cntn4	064293	113264	108889	Mff	026150	078332	077446	Sparc	018593	018737	018737
Cntn5	039488	160216	124327	Mff	026150	161572	N/A	Sparc	018593	123775	N/A
Cntn5	039488	162484	124214	Mff	026150	073025	072784	Sparc	018593	213866	149604
Cntn5	039488	160358	N/A	Mff	026150	161648	124164	Sparc	018593	216313	149918
Cntn5	039488	074133	073769	Mff	026150	162056	N/A	Sparc	018593	214685	151000
Cntn5	039488	179049	135903	Mff	026150	160786	125230	Sparc	018593	130642	N/A
Cntnap4	031772	125976	N/A	Mff	026150	162003	124334	Sparc	018593	141530	119475
Cntnap4	031772	118171	112511	Mff	026150	160972	124200	Sparc	018593	125787	N/A
Cntnap4	031772	125196	N/A	Mff	026150	160750	125223	Sparcl1	029309	031249	031249
Cntnap4	031772	127636	N/A	Mff	026150	159279	123713	Sparcl1	029309	199947	143177
Cntnap4	031772	140753	N/A	Mff	026150	160044	125005	Specc1	042331	201866	N/A
Cntnap4	031772	034225	034225	Mff	026150	160744	125629	Specc1	042331	202178	144161
Cntnap5a	070695	043725	035732	Mff	026150	160632	N/A	Specc1	042331	136971	N/A
Cobl	020173	172919	133669	Mff	026150	188333	N/A	Specc1	042331	202389	144055
Cobl	020173	109650	105277	Mff	026150	162794	N/A	Specc1	042331	202869	N/A
Cobl	020173	046755	045693	Mff	026150	162573	N/A	Specc1	042331	201624	144659
Cobl	020173	174874	133470	Mfge8	030605	206338	N/A	Specc1	042331	049836	063102
Cobl	020173	109651	105278	Mfge8	030605	107409	103032	Specc1	042331	202905	144311
Cobl	020173	172956	134372	Mfge8	030605	032825	032825	Specc1	042331	201364	143853
Cobl	020173	172827	133368	Mfge8	030605	205563	145720	Specc1	042331	092415	090071
Cobl	020173	136549	114779	Mfge8	030605	205649	N/A	Specc1	042331	201015	144174
Cobl	020173	130572	N/A	Mfge8	030605	205494	N/A	Specc1	042331	200742	N/A
Cobl	020173	146067	119008	Mfge8	030605	205929	N/A	Specc1	042331	202744	144483
Col11a1	027966	092155	089793	Mfge8	030605	205688	N/A	Specc1	042331	201723	144542
Col11a1	027966	196345	N/A	Mfge8	030605	205526	N/A	Specc1	042331	202179	144300
Col11a1	027966	196654	N/A	Mfge8	030605	206844	N/A	Specc1	042331	108709	104349
Col11a1	027966	211802	148798	Mfhas1	070056	037666	044135	Specc1	042331	201671	144030
Col11a1	027966	138680	N/A	Mfhas1	070056	209953	147927	Speg	026207	087122	084361
Col11a1	027966	184978	138879	Mfhas1	070056	154989	N/A	Speg	026207	148515	116953
Col11a1	027966	123619	121027	Mfsd2a	028655	152308	N/A	Speg	026207	113590	109220
Col11a2	024330	131134	122082	Mfsd2a	028655	030408	030408	Speg	026207	187214	N/A
Col11a2	024330	087497	084772	Mfsd2a	028655	138964	N/A	Speg	026207	125306	119969
Col11a2	024330	143354	115026	Mfsd2a	028655	127047	116782	Speg	026207	146705	N/A
Col11a2	024330	173749	N/A	Mgat4c	019888	146230	N/A	Speg	026207	125118	N/A
Col11a2	024330	137374	N/A	Mgat4c	019888	219195	151859	Speg	026207	132228	121825
Col11a2	024330	144927	N/A	Mgat4c	019888	134930	N/A	Speg	026207	132222	N/A
Col11a2	024330	114252	109890	Mgat4c	019888	127504	117148	Speg	026207	137868	141009
Col11a2	024330	114255	109893	Mgat4c	019888	156751	116216	Speg	026207	113589	109219
Col13a1	058806	145469	117248	Mgat4c	019888	138522	118056	Speg	026207	113588	109218
Col13a1	058806	105451	N/A	Mgat4c	019888	130580	N/A	Speg	026207	113587	109217

Col13a1	058806	105453	101093	Mgat4c	019888	138016	116902	Speg	026207	122266	113646
Col13a1	058806	105452	101092	Mgat4c	019888	219683	N/A	Speg	026207	143679	N/A
Col13a1	058806	105454	101094	Mgat4c	019888	218554	N/A	Sphkap	026163	160953	124872
Col13a1	058806	051826	N/A	Mgat4c	019888	143640	N/A	Sphkap	026163	159078	124384
Col13a1	058806	153120	N/A	Mgat4c	019888	020039	020039	Sphkap	026163	053075	N/A
Col15a1	028339	082303	080921	Mgat4c	019888	218984	N/A	Sphkap	026163	160237	N/A
Col15a1	028339	102917	099981	Mgat4c	019888	120748	114010	Sphkap	026163	160567	N/A
Col15a1	028339	124105	N/A	Mgat4c	019888	163753	131551	Spock3	054162	117377	113797
Col15a1	028339	148103	N/A	Mgat4c	019888	179929	135959	Spock3	054162	118003	113683
Col15a1	028339	140094	N/A	Mgat5b	043857	103027	099316	Spock3	054162	138398	N/A
Col15a1	028339	140413	119292	Mgat5b	043857	139905	N/A	Spock3	054162	119068	112930
Col15a1	028339	107731	103359	Mgat5b	043857	136584	122276	Spock3	054162	141513	N/A
Col15a1	028339	146967	118637	Mgat5b	043857	126757	N/A	Spock3	054162	093480	091192
Col15a1	028339	107730	103358	Mgll	033174	113585	109215	Spon1	038156	046687	041157
Col1a2	029661	141483	125275	Mgll	033174	151699	N/A	Spon1	038156	084696	081746
Col1a2	029661	031668	031668	Mgll	033174	113582	109212	Spp1	029304	086833	084043
Col1a2	029661	138511	N/A	Mgll	033174	203608	144883	Spp1	029304	031243	031243
Col1a2	029661	132029	N/A	Mgll	033174	113581	109211	Spp1	029304	112748	108368
Col1a2	029661	148864	N/A	Mgll	033174	150180	145068	Spp1	029304	112746	108366
Col1a2	029661	155687	N/A	Mgll	033174	089449	086872	Spp1	029304	145084	117338
Col1a2	029661	124686	N/A	Mgll	033174	203824	145364	Spp1	029304	132457	123163
Col1a2	029661	203346	N/A	Mgll	033174	205045	N/A	Spp1	029304	112747	108367
Col20a1	016356	149179	115291	Mgll	033174	163271	127374	Spsb4	046997	055433	057849
Col20a1	016356	108856	104484	Mgst1	008540	008684	008684	Spsb4	046997	162307	N/A
Col20a1	016356	228434	153871	Mgst1	008540	120939	112646	Spsb4	046997	159298	N/A
Col20a1	016356	152473	117514	Mgst1	008540	204628	144912	Spsb4	046997	064445	N/A
Col20a1	016356	155425	114654	Mgst1	008540	140932	145306	Sptb	021061	021458	021458
Col22a1	079022	159410	124182	Mgst1	008540	120302	113257	Sptb	021061	170532	N/A
Col22a1	079022	162081	N/A	Mgst1	008540	120230	113859	Sptb	021061	166101	129782
Col22a1	079022	159993	125069	Mgst1	008540	118091	112923	Sptbn2	067889	008991	008991
Col22a1	079022	160513	124270	Mgst1	008540	125810	114222	Src	027646	109533	105159
Col23a1	063564	102765	099826	Miat	097767	182953	N/A	Src	027646	145715	N/A
Col23a1	063564	151098	119825	Miat	097767	181535	N/A	Src	027646	029175	029175
Col4a5	031274	112931	108553	Miat	097767	182258	N/A	Src	027646	133900	N/A
Col4a5	031274	112930	108552	Miat	097767	182509	N/A	Src	027646	129770	N/A
Col4a5	031274	130732	116610	Miat	097767	183036	N/A	Src	027646	109531	105157
Col4a5	031274	128669	N/A	Miat	097767	182699	N/A	Src	027646	109529	105155
Col5a1	026837	028280	028280	Mical2	038244	050149	051163	Src	027646	092576	090237
Col5a1	026837	145423	123532	Mical2	038244	106647	N/A	Srgap1	020121	020322	020322
Col5a3	004098	004201	004201	Mical2	038244	106648	N/A	Srgap1	020121	161996	N/A
Col5a3	004098	145974	N/A	Mical2	038244	037991	047639	Srgap1	020121	161156	125109
Col6a1	001119	001147	001147	Mical2	038244	150428	N/A	Srgap1	020121	162710	N/A
Col6a1	001119	137599	N/A	Mical2	038244	144509	123341	Srgap1	020121	081688	080389
Colgalt2	032649	127586	119210	Micalcl	030771	051308	062443	Sshl	042121	159592	124312
Colgalt2	032649	044311	037532	Micalcl	030771	033033	033033	Sshl	042121	112298	107917
Colgalt2	032649	127586	119210	Micalcl	030771	106645	102256	Sshl	042121	077689	076873
Colgalt2	032649	044311	037532	Micalcl	030771	213108	150200	Sshl	042121	159510	125025
Corin	005220	167460	127389	Micalcl	030771	140202	N/A	Sshl	042121	162396	125388
Corin	005220	005352	005352	Mid1	035299	112104	107732	Sshl	042121	162322	N/A
Corin	005220	175766	135889	Mid1	035299	036753	038765	St18	033740	140079	118322
Corin	005220	177290	135511	Mid1	035299	078947	077974	St18	033740	131494	117789
Corin	005220	176974	135722	Mid1	035299	149258	N/A	St18	033740	043578	042056
Corin	005220	176320	N/A	Mid1	035299	133857	N/A	St18	033740	139756	142063
Corin	005220	176439	N/A	Mid1	035299	146073	N/A	St18	033740	131467	120134
Coro1c	004530	164980	129314	Mid1	035299	152163	N/A	St18	033740	150761	120298
Coro1c	004530	004646	004646	Mid1	035299	129642	N/A	St18	033740	151281	122055
Coro1c	004530	163995	N/A	Mid1	035299	151722	N/A	St18	033740	139838	118129
Coro1c	004530	168634	N/A	Mid1	035299	112107	107735	St18	033740	132207	142317
Coro1c	004530	172016	N/A	Mid1	035299	079443	078412	St18	033740	142304	N/A

Coro1c	004530	111283	N/A	Mid1	035299	143815	N/A	St18	033740	151015	N/A
Coro1c	004530	166647	N/A	Mid1	035299	171433	126746	St18	033740	130338	141266
Coro1c	004530	168493	N/A	Mid1	035299	163810	128176	St18	033740	163727	131417
Coro1c	004530	163264	129457	Mid1	035299	112105	107733	St3gal5	056091	069994	070414
Coro1c	004530	168399	132504	Mid2	000266	112990	108614	St3gal5	056091	114112	109747
Coro1c	004530	171630	N/A	Mid2	000266	112988	108612	St3gal5	056091	187007	146063
Coro2b	041729	048043	041826	Mid2	000266	140144	N/A	St3gal5	056091	188366	145599
Coro2b	041729	131981	133481	Mid2	000266	128809	123221	St5	031024	084738	081789
Coro2b	041729	164246	128441	Mid2	000266	112993	108617	St5	031024	077909	077067
Coro2b	041729	151604	N/A	Midn	035621	099492	097091	St5	031024	207664	N/A
Coro2b	041729	174439	134079	Midn	035621	042057	046967	St5	031024	208557	N/A
Coro2b	041729	173171	134709	Midn	035621	151202	115717	St5	031024	207745	146934
Coro2b	041729	123379	N/A	Midn	035621	124179	N/A	St5	031024	208981	N/A
Coro6	020836	102493	099551	Midn	035621	153477	119787	St5	031024	208583	146747
Coro6	020836	130255	120232	Midn	035621	146516	119962	St5	031024	207394	146549
Coro6	020836	021190	021190	Midn	035621	144526	120988	St5	031024	208734	146829
Coro6	020836	079770	078703	Mkx	061013	176586	N/A	St5	031024	079282	078264
Coro6	020836	108391	104028	Mkx	061013	079788	078718	St5	031024	168005	130119
Coro6	020836	052515	056862	Mkx	061013	188926	N/A	St6galnac3	052544	200397	143747
Cotl1	031827	034285	034285	Mkx	061013	176608	N/A	St6galnac3	052544	199707	143030
Cotl1	031827	211873	148448	Mkx	061013	176757	N/A	St6galnac3	052544	064460	068598
Cotl1	031827	212676	N/A	Mlc1	035805	042594	047667	St6galnac3	052544	200576	N/A
Cotl1	031827	168698	126329	Mlc1	035805	109368	104993	St6galnac3	052544	198775	N/A
Cpe	037852	048967	048555	Mlycd	074064	098367	095970	Stac	032502	161995	125182
Cpe	037852	210783	N/A	Mlycd	074064	145121	N/A	Stac	032502	035083	035083
Cpe	037852	210680	N/A	Mmd2	039533	037048	039357	Stac	032502	162345	N/A
Cpe	037852	211312	N/A	Mmd2	039533	195947	N/A	Stac2	017400	017544	017544
Cpm	020183	138020	N/A	Mmd2	039533	196972	N/A	Stac2	017400	131519	118164
Cpm	020183	123374	N/A	Mmp14	000957	089688	087119	Stag3	036928	160729	124170
Cpm	020183	020399	020399	Mmp14	000957	197874	142665	Stag3	036928	161113	N/A
Cpm	020183	141991	N/A	Mmp14	000957	225641	153679	Stag3	036928	159483	N/A
Cpne4	032564	098443	096042	Mmp14	000957	197947	N/A	Stag3	036928	048028	040945
Cpne4	032564	157006	117155	Mmp14	000957	198679	N/A	Stag3	036928	162245	125523
Cpne4	032564	057742	049663	Mmp14	000957	196155	143012	Stag3	036928	161691	125290
Cpne4	032564	077190	076432	Mmp14	000957	226710	N/A	Stag3	036928	161615	N/A
Cpne4	032564	213120	150096	Mmp2	031740	034187	034187	Stag3	036928	160849	125376
Cpne4	032564	213452	150551	Mmp2	031740	211691	N/A	Stag3	036928	159189	124959
Cpne7	034796	134235	N/A	Mmp2	031740	211308	N/A	Stambpl1	024776	054956	059927
Cpne7	034796	037900	042159	Mmp2	031740	211567	147838	Stambpl1	024776	125232	N/A
Cpne7	034796	131659	N/A	Mmp24	027612	029141	029141	Stambpl1	024776	119603	112938
Cpne7	034796	123191	N/A	Mmp24	027612	135945	N/A	Stambpl1	024776	129535	115333
Cpne7	034796	127431	N/A	Mns1	032221	183809	139105	Stambpl1	024776	130756	N/A
Cpne9	030270	041203	044416	Mns1	032221	184604	139232	Stard13	016128	110483	106109
Cpne9	030270	132372	N/A	Mns1	032221	034746	034746	Stard13	016128	062015	053232
Cpne9	030270	130191	138786	Mobp	032517	068698	071084	Stard13	016128	202111	144056
Cpne9	030270	124574	N/A	Mobp	032517	215512	149831	Stard13	016128	201680	N/A
Cpne9	030270	204050	N/A	Mobp	032517	111627	107254	Stard13	016128	202385	N/A
Cpne9	030270	128148	N/A	Mobp	032517	093773	091287	Stard13	016128	129088	116705
Cpne9	030270	155779	N/A	Mobp	032517	174193	134410	Stard13	016128	141117	N/A
Cpne9	030270	138388	N/A	Mobp	032517	214943	149285	Stard13	016128	146814	N/A
Cpne9	030270	134523	N/A	Mobp	032517	214008	N/A	Stard13	016128	126770	122468
Cpne9	030270	136728	N/A	Mog	076439	102665	099726	Stard13	016128	202866	N/A
Creb3l1	027230	028663	028663	Mog	076439	167275	129489	Stard8	031216	036606	044491
Crim1	024074	112498	108117	Mpp6	038388	166318	125880	Stard8	031216	149999	114897
Crispld1	025776	159958	124095	Mpp6	038388	036236	039314	Stard8	031216	145820	N/A
Crispld1	025776	160305	123800	Mpp6	038388	204545	144737	Stard8	031216	127361	N/A
Crispld1	025776	095075	092686	Mpp6	038388	203415	N/A	Stat2	040033	218863	N/A
Cryab	032060	217475	149803	Mpp6	038388	036225	038772	Stat2	040033	085708	082855
Cryab	032060	214609	149454	Mpp6	038388	171601	129004	Stat2	040033	217852	N/A

Cryab	032060	034562	034562	Mpp6	038388	167628	129355	Stat2	040033	220142	N/A
Cryab	032060	214962	149759	Mpp6	038388	167063	N/A	Stat2	040033	217727	N/A
Cryab	032060	216755	150669	Mpp6	038388	167319	N/A	Stat2	040033	218862	N/A
Cryab	032060	216393	N/A	Mpp7	057440	115869	111535	Stat2	040033	220277	N/A
Cryba2	006546	133833	140298	Mpped1	041708	109470	105096	Stat2	040033	105238	100872
Cryba2	006546	006721	006721	Mpped1	041708	123387	123230	Stc2	020303	020546	020546
Cryl1	021947	022517	022517	Mpped1	041708	046168	041981	Stc2	020303	152094	N/A
Cryl1	021947	223986	N/A	Mpped1	041708	109469	105095	Stc2	020303	134199	N/A
Cryl1	021947	224292	N/A	Mpped1	041708	150489	128786	Stc2	020303	139991	N/A
Cryl1	021947	225765	N/A	Mpped1	041708	125739	131463	Stc2	020303	149467	N/A
Crym	030905	134067	N/A	Mpped1	041708	148868	131679	Stk17b	026094	027263	027263
Crym	030905	033198	033198	Mpped1	041708	163723	126242	Stk17b	026094	187066	N/A
Csmd1	060924	082104	080751	Mpped1	041708	172115	132518	Stk17b	026094	185920	139880
Csmd1	060924	125551	N/A	Mpped1	041708	171560	125835	Stk3	022329	018476	018476
Csmd1	060924	131778	N/A	Mpped1	041708	172398	131333	Stk3	022329	226555	154154
Csmd1	060924	138348	N/A	Mtm2	029557	031536	031536	Stk3	022329	067033	064225
Csmd1	060924	137947	N/A	Msi1	054256	150779	120516	Stk3	022329	226730	N/A
Csmd1	060924	133933	N/A	Msi1	054256	151444	N/A	Stk3	022329	128425	N/A
Csmd1	060924	122983	N/A	Msi1	054256	067168	070415	Stk3	022329	138841	116310
Csmd2	028804	129619	N/A	Msi1	054256	131079	144032	Stk32a	039954	045477	038471
Csmd2	028804	144298	N/A	Msi1	054256	145005	N/A	Stmn4	022044	152093	117000
Csmd2	028804	184063	138958	Msi1	054256	139918	N/A	Stmn4	022044	074523	074113
Csmd2	028804	148247	N/A	Msi1	054256	145840	N/A	Stmn4	022044	136192	N/A
Csmd2	028804	139561	N/A	Msi1	054256	136586	143900	Stmn4	022044	123435	N/A
Csmd2	028804	221199	152795	Msi1	054256	130849	N/A	Stmn4	022044	118426	113629
Cspg4	032911	214057	N/A	Msra	054733	067927	065754	Stmn4	022044	121955	113788
Cspg4	032911	035661	038909	Msra	054733	210428	147689	Stmn4	022044	120229	113759
Cspg4	032911	215666	N/A	Msra	054733	210363	148189	Stmn4	022044	134440	123092
Cspg4	032911	217052	N/A	Msra	054733	209392	N/A	Stmn4	022044	147477	N/A
Cspg5	032482	035058	035058	Msra	054733	209513	N/A	Ston1	033855	137138	118522
Cspg5	032482	196060	143164	Msx2	021469	021922	021922	Ston1	033855	153613	N/A
Cspg5	032482	196176	N/A	Msx2	021469	188606	N/A	Ston1	033855	064035	067027
Cspg5	032482	197850	143005	mt-Co1	064351	082402	080993	Ston1	033855	150023	122928
Cspg5	032482	199736	142845	mt-Nd4	064363	082414	081000	Ston1	033855	132384	N/A
Csmp3	044647	122912	117533	Mt3	031760	034211	034211	Ston1	033855	112216	N/A
Csmp3	044647	053910	055719	Mt3	031760	211930	148345	Ston1	033855	163588	131703
Csmp3	044647	139896	N/A	Mt3	031760	211915	148383	Ston2	020961	052969	053908
Csmp3	044647	112397	135151	Mtch2	027282	136872	121851	Ston2	020961	164713	131098
Csmp3	044647	129133	N/A	Mtch2	027282	150232	118566	Ston2	020961	111609	N/A
Csmp3	044647	176109	135019	Mtch2	027282	111467	107092	Ston2	020961	170077	126429
Csmp3	044647	145598	135605	Mtch2	027282	111468	107093	Ston2	020961	170984	N/A
Csmp3	044647	112394	108013	Mtch2	027282	057216	N/A	Ston2	020961	166967	128561
Csrp1	026421	097561	095169	Mtch2	027282	148936	N/A	Ston2	020961	166008	N/A
Csrp1	026421	027677	027677	Mtch2	027282	146392	N/A	Stox2	038143	079195	078190
Csta1	034362	096090	093795	Mtch2	027282	143773	N/A	Stox2	038143	211882	148776
Csta1	034362	161638	125577	Mtch2	027282	142350	N/A	Stox2	038143	110367	105996
Ctnna3	060843	105441	101081	Mtch2	027282	144696	N/A	Stox2	038143	211737	147477
Ctnna3	060843	105440	101080	Mtch2	027282	135026	N/A	Stox2	038143	210030	147281
Ctnna3	060843	133190	N/A	Mtch2	111714	214148	149233	Stox2	038143	209337	148231
Ctnna3	060843	135474	N/A	Mtch2	111714	213376	149651	Stox2	038143	210153	147670
Ctnna3	060843	075099	074606	Mtch2	111714	217470	N/A	Stox2	038143	209941	N/A
Ctnbp2	000416	152499	N/A	Mtch2	111714	214378	150912	Stox2	038143	181417	N/A
Ctnbp2	000416	146775	119383	Mtch2	111714	215609	N/A	Stnp2	039629	046028	036477
Ctnbp2	000416	148602	118432	Mtch2	111714	216454	151033	Stnp2	039629	130969	N/A
Ctnbp2	000416	090601	088089	Mtch2	111714	216814	N/A	Strip2	039629	115224	110879
Ctnbp2	000416	141581	123162	Mtch2	111714	215750	N/A	Strip2	039629	137068	N/A
Ctnbp2	000416	139557	N/A	Mtch2	111714	214987	N/A	Stnp2	039629	151738	119506
Ctnbp2	000416	129669	116878	Mtch2	111714	216471	N/A	Stn	024077	145910	120830
Ctnbp2	000416	142963	122590	Mtch2	111714	217168	N/A	Stn	024077	024881	024881

Ctnbp2	000416	140416	N/A	Mtfp1	004748	004868	004868	Stm	024077	145480	117663
Ctxn1	048644	053252	057115	Mtfp1	004748	123607	N/A	Stx17	061455	107721	103349
Ctxn3	069372	091892	089507	Mtss1	022353	080371	079239	Stx17	061455	153502	117512
Ctxn3	069372	209782	147740	Mtss1	022353	226393	N/A	Stx17	061455	107720	103348
Ctxn3	069372	209786	147982	Mtss1	022353	226976	N/A	Stx17	061455	064765	068087
Cxcl14	021508	224801	153440	Mtss1	022353	227045	154093	Stxbp3	027882	102621	099681
Cxcl14	021508	021970	021970	Mtss1	022353	227196	154064	Stxbp3	027882	124782	N/A
Cxcl5	029371	202380	N/A	Mtss1	022353	228067	153850	Stxbp3	027882	124903	N/A
Cxcl5	029371	031318	031318	Mtss1	022353	227290	N/A	Stxbp3	027882	150010	N/A
Cxcr4	045382	052172	053489	Mtss1	022353	227238	N/A	Stxbp3	027882	196679	142785
Cxcr4	045382	142893	120153	Mtss1	022353	228365	N/A	Stxbp3	027882	200035	N/A
4930578C19Rik	037358	044188	046567	Mtss1	022353	228655	N/A	Stxbp3	027882	138552	142860
4930578C19Rik	037358	147039	N/A	Mtss1	022353	226923	N/A	Stxbp3	027882	106596	102206
Cxxc4	044365	197151	N/A	Mtss1	022353	227797	N/A	Sulf2	006800	109249	104872
Cxxc4	044365	181904	138000	Mxd4	037235	201189	N/A	Sulf2	006800	146497	154557
Cxxc4	044365	181597	N/A	Mxd4	037235	042701	039071	Sulf2	006800	088086	085405
Cxxc4	044365	199134	N/A	Mxd4	037235	119171	113300	Sulf2	006800	125503	N/A
Cxxc4	044365	166288	128574	Mxd4	037235	201763	N/A	Sulf2	006800	143996	N/A
Cyb5a	024646	160180	124480	Mxra8	029070	141883	114929	Sulf2	006800	139266	154315
Cyb5a	024646	025549	025549	Mxra8	029070	030947	030947	Sulf2	006800	133395	154724
Cyb5a	024646	159846	N/A	Mxra8	029070	133592	N/A	Susd5	086596	135338	128826
Cyb5a	024646	163083	124412	Mxra8	029070	143886	N/A	Svep1	028369	042850	045856
Cyb5a	024646	159837	N/A	Mxra8	029070	141766	N/A	Svep1	028369	128783	N/A
Cyfip2	020340	093166	090854	Mxra8	029070	126487	N/A	Svep1	028369	146329	N/A
Cyfip2	020340	142017	119801	Mxra8	029070	132142	N/A	Svep1	028369	149152	N/A
Cyfip2	020340	129474	116715	Mybpc1	020061	121629	112615	Svil	024236	126977	115078
Cyfip2	020340	165599	127586	Mybpc1	020061	124144	N/A	Svil	024236	131210	N/A
Cyfip2	020340	093165	090853	Mybpc1	020061	119185	112699	Svil	024236	138258	N/A
Cyp27a1	026170	027356	027356	Mybpc1	020061	153964	122472	Svil	024236	143254	119287
Cyp27a1	026170	190781	N/A	Mybpc1	020061	148205	N/A	Svil	024236	153016	121497
Cyp27a1	026170	189083	N/A	Mybpc1	020061	156573	119024	Svil	024236	140448	119803
Cyp2j9	015224	055693	050464	Mycl	028654	144998	117232	Svil	024236	148564	N/A
Cyp2j9	015224	126509	N/A	Mycl	028654	106252	101859	Svil	024236	210707	147843
Cyp7b1	039519	035625	037487	Mycl	028654	030407	030407	Svil	024236	127297	115223
D430019H16Rik	094910	178224	137376	Mycl	028654	135925	N/A	Svil	024236	131609	122242
D430041D05Rik	068373	136156	N/A	Mycl	028654	147259	N/A	Svil	024236	125512	121972
D430041D05Rik	068373	141159	117041	Myh14	030739	107899	103531	Svil	024236	139761	N/A
D430041D05Rik	068373	156278	N/A	Myh14	030739	048102	046059	Svil	024236	146723	115591
D430041D05Rik	068373	149165	N/A	Myh14	030739	208200	146686	Svil	024236	129543	N/A
D430041D05Rik	068373	155458	N/A	Myh14	030739	208044	N/A	Svil	024236	025079	025079
D430041D05Rik	068373	139015	124519	Myh14	030739	207775	147115	Swap70	031015	033325	033325
D430041D05Rik	068373	149466	124980	Myh14	030739	209024	N/A	Swap70	031015	209261	N/A
D430041D05Rik	068373	089726	106756	Myh14	030739	208085	N/A	Swap70	031015	210743	N/A
D430042O09Rik	032743	124223	118668	Myh14	030739	208131	146584	Swap70	031015	210513	N/A
D430042O09Rik	032743	069660	065744	Myh14	030739	107900	103532	Sycp1	027855	029448	029448
D430042O09Rik	032743	205723	N/A	Myh6	040752	081857	080538	Sycp1	027855	198651	N/A
D430042O09Rik	032743	148701	119527	Myh6	040752	226297	154634	Sycp1	027855	196988	143651
D430042O09Rik	032743	122337	N/A	Myh6	040752	228731	153961	Sycp1	027855	199930	143493
D430042O09Rik	032743	205462	N/A	Myh6	040752	227905	N/A	Syn3	059602	120638	113720
D430042O09Rik	032743	132204	115955	Myh6	040752	131892	N/A	Syn3	059602	145864	N/A
D430042O09Rik	032743	155059	N/A	Myh6	040752	124930	115615	Syn3	059602	123783	N/A
D630003M21Rik	037813	103121	099410	Myh6	040752	111456	107083	Syn3	059602	139197	N/A
D630003M21Rik	037813	046944	040546	Mylip	038175	038275	047403	Syn3	059602	121789	113408
D630003M21Rik	037813	169335	130623	Mylip	038175	222178	152597	Syn3	059602	143319	N/A
D7Ertd443e	030994	094002	091539	Myo10	022272	110457	106087	Syndig1	074736	109935	105561
D7Ertd443e	030994	172947	134479	Myo10	022272	137601	118280	Syndig1	074736	144179	116877
D7Ertd443e	030994	106129	101735	Myo10	022272	127486	N/A	Syndig1	074736	109934	105560
D7Ertd443e	030994	206005	N/A	Myo10	022272	130517	N/A	Syndig1	074736	137280	122838
D7Ertd443e	030994	174700	134411	Myo10	022272	126076	N/A	Syndig1	074736	149705	122327

D7Ertd443e	030994	173195	134585	Myo10	022272	135981	123057	Syndig1	074736	140870	114499
D7Ertd443e	030994	173754	133963	Myo10	022272	022882	022882	Syndig1l	071234	095550	093206
D7Ertd443e	030994	174271	N/A	Myo10	022272	135173	118744	Syndig1l	071234	222422	152374
Tmem131	026116	194563	142307	Myo10	022272	131834	119200	Syndig1l	071234	221905	152304
Tmem131	026116	191381	N/A	Myo10	022272	124966	120817	Syndig1l	071234	221793	N/A
Tmem131	026116	187917	N/A	Myo10	022272	151360	119367	Synj2	023805	146009	122381
Tmem131	026116	189470	140620	Myo10	022272	125667	120566	Synj2	023805	134767	138449
Tmem131	026116	190442	140187	Myo10	022272	145587	N/A	Synj2	023805	080283	079164
Tmem131	026116	186486	142080	Myo1d	035441	041065	037819	Synj2	023805	142409	120006
Tmem131	026116	185964	141413	Myo1d	035441	070997	066948	Synj2	023805	061091	060382
Tmem131	026116	027290	027290	Myo1d	035441	125944	N/A	Synj2	023805	115790	111456
Dagla	035735	039327	046358	Myo7a	030761	107128	102745	Synj2	023805	115789	111455
Dagla	035735	125567	138702	Myo7a	030761	156992	146114	Synj2	023805	115788	111454
Dagla	035735	156361	N/A	Myo7a	030761	084979	082046	Synj2	023805	115787	111453
Dao	042096	112292	107911	Myo7a	030761	107122	102739	Synj2	023805	115786	111452
Dao	042096	086599	083792	Myo7a	030761	205746	146165	Synj2	023805	115784	111450
Dao	042096	161610	125588	Myo7a	030761	107127	102744	Synj2	023805	115785	111451
Dao	042096	199175	143337	Myo7a	030761	124787	N/A	Synj2	023805	130661	N/A
Dao	042096	162214	N/A	Myo7a	030761	152975	N/A	Synj2	023805	154114	122316
Dapk1	021559	226059	153607	Myo7a	030761	153657	N/A	Synj2	023805	126881	115371
Dapk1	021559	077453	076666	Myo7a	030761	155637	N/A	Synj2	023805	115791	111457
Dapk1	021559	224340	N/A	Myo7a	030761	149079	N/A	Synpr	056296	070323	064986
Dapk1	021559	044083	040825	Myo7a	030761	138627	114944	Synpr	056296	223580	N/A
Dapk1	021559	225632	N/A	Myo7a	030761	131632	N/A	Synpr	056296	225636	N/A
Dapk1	021559	224789	153205	Myot	024471	025349	025349	Synpr	056296	226094	N/A
Dapk1	021559	225952	N/A	Myot	024471	115498	111160	Synpr	056296	223583	153361
Slc6a3	021609	022100	022100	Myrf	036098	088013	085329	Synpr	056296	153954	116342
Dcc	060534	114943	110593	Myrf	036098	190922	N/A	Synpr	056296	145700	N/A
Dcc	060534	073379	073094	Myrf	036098	186056	140871	Synpr	056296	147677	N/A
Dcc	060534	126030	N/A	Myrf	036098	186854	140838	Synpr	056296	112656	108275
Ddhd1	037697	111828	107459	Myrf	036098	189897	139601	Syt10	063260	029441	029441
Ddhd1	037697	087320	084577	Myrf	036098	189439	N/A	Syt12	049303	059295	055237
Ddhd1	037697	051310	050088	Ncald	051359	090150	087611	Syt12	049303	128114	N/A
Ddhd1	037697	152110	N/A	Ncald	051359	120746	112898	Syt12	049303	166191	130418
Ddhd1	037697	129599	N/A	Ncald	051359	119730	113858	Syt12	049303	133222	N/A
Ddhd1	037697	149286	118848	Ncald	051359	116445	112146	Syt14	016200	215093	151129
Ddhd1	037697	156758	121837	Ncald	051359	153775	114576	Syt14	016200	195354	142190
Ddhd1	037697	141487	133358	Ncald	051359	148652	121460	Syt14	016200	195530	141563
Ddhd1	037697	126428	N/A	Ncald	051359	132423	N/A	Syt14	016200	016344	016344
Ddhd1	037697	226301	154065	Ncald	051359	150453	119726	Syt14	016200	191907	N/A
Ddhd1	037697	147551	N/A	Ncald	051359	226924	N/A	Syt17	058420	081574	080284
Ddhd1	037697	153547	N/A	Ncald	051359	137944	N/A	Syt17	058420	203465	147122
Ddhd1	037697	226559	N/A	Ncald	051359	123317	N/A	Syt17	058420	203796	145087
Ddn	059213	075444	074895	Ncald	051359	168992	130126	Syt17	058420	203485	144987
Ddr2	026674	194690	141443	Ncam2	022762	037785	049390	Syt17	058420	207034	146460
Ddr2	026674	192312	142191	Ncam2	022762	067602	063468	Syt17	058420	207650	N/A
Ddr2	026674	195867	N/A	Ncan	002341	002412	002412	Syt4	024261	025110	025110
Ddr2	026674	194619	N/A	Nceh1	027698	046515	045864	Tanc1	035168	112568	108187
Ddr2	026674	027985	027985	Nceh1	027698	138947	115209	Tanc1	035168	142573	N/A
Ddr2	026674	170800	129624	Nceh1	027698	129412	N/A	Tanc1	035168	128030	N/A
Ddx3y	069045	091190	088729	Nceh1	027698	091284	088829	Tanc1	035168	139863	123345
Ddx3y	069045	188182	N/A	Nceh1	027698	140872	N/A	Tanc1	035168	127013	N/A
Ddx3y	069045	188484	140361	Nckap5	049690	161954	125624	Tanc1	035168	056900	N/A
Ddx3y	069045	187596	N/A	Nckap5	049690	162877	124748	Tanc1	035168	126271	N/A
Depdc1b	021697	051594	059291	Nckap5	049690	160736	N/A	Tanc1	035168	136248	N/A
Depdc1b	021697	168037	N/A	Nckap5	049690	057846	062229	Tanc1	035168	162857	N/A
Depdc1b	021697	163307	131707	Nckap5	049690	094610	092193	Tanc1	035168	147650	N/A
Depdc1b	021697	171178	132972	Nckap5	049690	159934	N/A	Tanc1	035168	037526	036003
Depdc1b	021697	167413	N/A	Nckap5	049690	162646	123936	Taok3	061288	111978	107609

Depdc1b	021697	172402	N/A	Nckap5	049690	160693	123975	Taok3	061288	125738	117841
Depdc7	027173	028595	028595	Nckap5	049690	162664	N/A	Taok3	061288	128720	N/A
Depdc7	027173	144133	N/A	Nckap5	049690	162647	N/A	Taok3	061288	092889	090565
Des	026208	027409	027409	Nckap5	049690	112583	108202	Taok3	061288	126813	N/A
Des	026208	144894	N/A	Nckap5	049690	094609	092192	Taok3	061288	145640	116920
Des	026208	125948	N/A	Ndrg1	005125	005256	005256	Taok3	061288	153709	N/A
Gsdme	029821	204417	N/A	Ndrg1	005125	165966	N/A	Taok3	061288	127814	119998
Gsdme	029821	165099	130522	Ndrg1	005125	166420	127099	Taok3	061288	111975	107606
Gsdme	029821	101405	098952	Ndrg1	005125	171569	N/A	Taok3	061288	179276	136750
Gsdme	029821	031845	031845	Ndrg1	005125	164675	130150	Tbc1d1	029174	199270	143451
Gsdme	029821	167893	132062	Ndrg1	005125	168542	127940	Tbc1d1	029174	043893	044577
Gsdme	029821	204700	N/A	Ndrg1	005125	167817	127075	Tbc1d1	029174	121370	112493
Gsdme	029821	170142	126759	Ndrg1	005125	168979	126985	Tbc1d1	029174	129389	N/A
Dgkb	036095	222337	152460	Ndrg1	005125	172447	130281	Tbc1d1	029174	119756	113643
Dgkb	036095	221176	152446	Ndrg1	005125	171266	129093	Tbc1d1	029174	147348	119710
Dgkb	036095	220990	152378	Ndrg1	005125	170903	127302	Tbc1d1	029174	140960	N/A
Dgkb	036095	221540	N/A	Ndrg1	005125	163496	130584	Tbc1d1	029174	101195	098756
Dgkb	036095	040500	037900	Ndrg1	005125	164070	126091	Tbc1d4	033083	161991	125509
Dgkb	036095	221098	N/A	Ndrg2	004558	004673	004673	Tbc1d4	033083	161304	N/A
Dgkb	036095	221686	N/A	Ndrg2	004558	111632	107259	Tbc1d4	033083	159951	124511
Dgkb	036095	220606	N/A	Ndrg2	004558	226698	N/A	Tbc1d4	033083	162617	124909
Dgkh	034731	226342	154036	Ndrg2	004558	227237	153938	Tbc1d4	033083	160297	N/A
Dgkh	034731	227537	154107	Ndrg2	004558	226122	N/A	Tbc1d4	033083	159484	N/A
Dgkh	034731	228362	154554	Ndrg2	004558	227402	154279	Tbc1d4	033083	159668	N/A
Dgkh	034731	227767	154031	Ndrg2	004558	228164	153830	Tbc1d4	033083	159664	124734
Dgkh	034731	227820	N/A	Ndrg2	004558	226366	N/A	Tbc1d4	033083	100340	097913
Dgkh	034731	074729	074290	Ndrg2	004558	226528	154716	Tbc1d4	033083	160473	N/A
Dgki	038665	101532	099071	Ndrg2	004558	226184	154135	Tbc1d5	023923	024717	024717
Dgki	038665	150300	138457	Ndrg2	004558	228620	N/A	Tbc1d5	023923	224977	N/A
Dgki	038665	138286	138628	Ndrg2	004558	226364	N/A	Tbc1d5	023923	224528	153172
Dgki	038665	090314	087788	Ndrg2	004558	228173	N/A	Tbc1d5	023923	225252	N/A
Dgki	038665	042075	047858	Ndst3	027977	137404	118796	Tbc1d5	023923	223979	N/A
Dgki	038665	143046	N/A	Ndst3	027977	132112	120623	Tbc1d5	023923	223758	N/A
Dgki	038665	146656	N/A	Ndst3	027977	154668	118207	Tbc1d5	023923	224547	N/A
Dgki	038665	136457	N/A	Ndst3	027977	124803	122617	Tbc1d5	023923	224123	N/A
Disp3	041544	047720	038490	Ndst3	027977	172537	133657	Tbc1d5	023923	225473	N/A
Disp3	041544	143851	N/A	Ndst3	027977	199046	N/A	Tbcel	037287	125995	114721
Disp3	041544	129734	N/A	Ndst3	027977	199825	N/A	Tbcel	037287	066148	067882
Dixdc1	032064	034566	034566	Ndst3	027977	132896	N/A	Tbcel	037287	066179	065125
Dixdc1	032064	141919	N/A	Ndst3	027977	029602	029602	Tbcel	037287	142775	N/A
Dixdc1	032064	117646	112431	Ndst4	027971	173932	133341	Tbcel	037287	138506	116616
Dixdc1	032064	119449	N/A	Ndst4	027971	147016	N/A	Tbcel	037287	128959	121164
Dixdc1	032064	121634	113089	Ndst4	027971	144344	120687	Tbcel	037287	134374	114275
Dixdc1	032064	124424	N/A	Ndst4	027971	174648	133575	Tbcel	037287	213428	N/A
Dixdc1	032064	120622	113934	Ndst4	027971	172632	N/A	Tbrl	035033	048934	046787
Dixdc1	032064	151109	N/A	Ndst4	027971	198101	142414	Tbrl	035033	102737	099798
Dixdc1	032064	149717	N/A	Nectin3	022656	023335	023335	Tbrl	035033	131538	N/A
Dixdc1	032064	154315	N/A	Nectin3	022656	023334	023334	Tbrl	035033	136867	N/A
Dixdc1	032064	117093	112654	Nectin3	022656	096052	093757	Tbxas1	029925	162521	125406
Dixdc1	032064	118707	113907	Nectin3	022656	133935	N/A	Tbxas1	029925	003017	003017
Dlc1	031523	033923	033923	Nectin3	022656	149901	117479	Tbxas1	029925	159226	N/A
Dlc1	031523	098826	096425	Nectin3	022656	121245	113146	Tbxas1	029925	161781	N/A
Dlc1	031523	163663	132812	Nectin3	022656	132089	N/A	Tbxas1	029925	160963	124640
Dlc1	031523	156312	N/A	Nectin3	022656	119941	113301	Tbxas1	029925	162656	N/A
Dlc1	031523	145245	N/A	Nectin3	022656	121803	112567	Tbxas1	029925	161360	N/A
Dlc1	031523	036104	N/A	Nectin3	022656	124602	115927	Tceal7	079428	126811	122260
Dlc1	031523	178717	N/A	Nedd4l	024589	225057	153537	Tceal7	079428	113116	108741
Dlc1	031523	179652	N/A	Nedd4l	024589	225261	153107	Tceg1l	091002	162222	N/A
Dlc1	031523	179501	137498	Nedd4l	024589	224385	153594	Tceg1l	091002	161213	N/A

Dlgap2	047495	152652	123078	Nedd4l	024589	223959	N/A	Tceng1l	091002	160436	124476
Dlgap2	047495	133298	119613	Nedd4l	024589	224347	153052	Tcf7l1	055799	069536	069403
Dlgap2	047495	150247	123104	Nedd4l	024589	224516	N/A	Tcf7l1	055799	114053	109687
Dlgap2	047495	141155	N/A	Nedd4l	024589	224890	N/A	Tcf7l1	055799	141743	N/A
Dlgap2	047495	136000	N/A	Nedd4l	024589	080418	079280	Tcf7l1	055799	149446	115060
Dlgap2	047495	141214	N/A	Nedd4l	024589	226058	153526	Tcf7l1	055799	182651	N/A
Dlgap2	047495	137130	N/A	Nedd4l	024589	224663	N/A	Tcp11l2	020034	020223	020223
Dlgap2	047495	129119	N/A	Nedd4l	024589	163516	132838	Tcp11l2	020034	162874	N/A
Dlgap2	047495	043279	039647	Nefh	020396	093369	091061	Tcp11l2	020034	160057	N/A
Dlgap4	061689	169464	126980	Negr1	040037	074015	073664	Tcte1	023949	113547	109175
Dlgap4	061689	109568	105196	Negr1	040037	041425	041132	Tctex1d1	028523	220547	152803
Dlgap4	061689	070782	068745	Negr1	040037	106065	101680	Tctex1d1	028523	223169	152761
Dlgap4	061689	137356	135698	Negr1	040037	197246	N/A	Tctex1d1	028523	030248	030248
Dlgap4	061689	131157	134941	Negr1	040037	175773	135531	Tctex1d1	028523	125417	117319
Dlgap4	061689	109566	105194	Nek2	026622	027931	027931	Tctex1d1	028523	169211	128228
Dlgap4	061689	127944	N/A	Nek2	026622	126446	N/A	Tctex1d1	028523	140654	116692
Dlgap4	061689	146412	135156	Nek2	026622	150839	N/A	Tctex1d1	028523	139883	N/A
Dlgap4	061689	177013	135409	Nek2	026622	136733	N/A	Tctex1d1	028523	116317	112019
Dlgap4	061689	171030	129756	Nek2	110797	213394	149034	Tdp1	021177	151019	N/A
Dlgap4	061689	000094	000094	Nek2	110797	216945	N/A	Tdp1	021177	125639	N/A
Dlgap4	061689	099145	096749	Nek2	110797	217216	N/A	Tdp1	021177	153627	118656
Dlgap4	061689	123730	N/A	Nek2	110797	215890	N/A	Tdp1	021177	221396	N/A
Dlgap4	061689	109567	105195	Nek4	021918	226551	154678	Tdp1	021177	137653	123269
Dlx4os	086552	156477	N/A	Nek4	021918	228328	154090	Tdp1	021177	126424	N/A
Dlx6os1	098326	184182	N/A	Nek4	021918	228392	N/A	Tdp1	021177	128739	N/A
Dlx6os1	090063	159827	N/A	Nek4	021918	050171	057915	Tdp1	021177	220685	N/A
Dlx6os1	090063	159568	N/A	Nek4	021918	226833	154606	Tdp1	021177	021594	021594
Dlx6os1	090063	210702	N/A	Nek4	021918	227602	N/A	Tead1	055320	084705	081755
Dmd	045103	114000	109633	Nek4	021918	227199	N/A	Tead1	055320	059768	060671
Dmd	045103	128983	N/A	Nek4	021918	226146	153710	Tead1	055320	106638	102249
Dmd	045103	113991	109624	Nell1	055409	151721	114706	Tead1	055320	172065	N/A
Dmd	045103	132333	N/A	Nell1	055409	081872	080550	Tead1	055320	171373	131765
Dmd	045103	146331	N/A	Nell1	055409	145096	N/A	Tead1	055320	164363	127574
Dmd	045103	149433	N/A	Nell1	055409	107603	103229	Tead1	055320	163593	N/A
Dmd	045103	113992	109625	Nell1	055409	154410	N/A	Tead1	055320	170352	129798
Dmd	045103	156107	N/A	Neo1	032340	068664	063656	Tead1	055320	168981	133025
Dmd	045103	147740	N/A	Neo1	032340	214547	150600	Tead1	055320	171197	128439
Dmd	045103	141778	N/A	Neo1	032340	215165	N/A	Tead1	055320	165036	131221
Dmd	045103	141261	N/A	Neo1	032340	217545	N/A	Tead1	055320	167060	130564
Dmd	045103	139998	N/A	Neo1	032340	215026	N/A	Tead1	055320	168328	N/A
Dmd	045103	123308	N/A	Neo1	032340	216964	149424	Tead1	055320	210510	N/A
Dmd	045103	127295	N/A	Nes	004891	159830	N/A	Tead1	055320	069256	130459
Dmp1	029307	066708	068053	Nes	004891	090973	088493	Tead4	030353	130454	118083
Dnah5	022262	067048	069751	Nes	004891	160694	125571	Tead4	030353	006311	006311
Dnah6	052861	114040	109674	Neto1	050321	058829	057340	Tead4	030353	112157	107784
Dnah6	052861	204053	144791	Neu4	034000	050890	051151	Tead4	030353	133118	120941
Dnah6	052861	114038	N/A	Neu4	034000	190212	140127	Tead4	030353	143004	118606
Dnah6	052861	064948	068758	Rbfox3	025576	117731	113636	Tec	029217	071944	071836
Dner	036766	049126	042927	Rbfox3	025576	103023	099312	Tec	029217	113594	109224
Dner	036766	191306	N/A	Rbfox3	025576	017576	017576	Tec	029217	126481	123606
Dner	036766	185606	140986	Rbfox3	025576	069343	069598	Tec	029217	155342	118980
Dner	036766	191546	140662	Rbfox3	025576	106278	101885	Tec	029217	073843	073509
Dnmbp	025195	212396	148582	Rbfox3	025576	120061	113987	Tec	029217	138842	120155
Dnmbp	025195	212592	148421	Rbfox3	025576	154746	118332	Tec	029217	149533	123258
Dnmbp	025195	212048	148546	Rbfox3	025576	136551	119255	Tec	029217	150193	N/A
Dnmbp	025195	212032	148708	Rbfox3	025576	128863	N/A	Tec	029217	202547	144458
Dnmbp	025195	212157	N/A	Rbfox3	025576	134774	N/A	Tek	006386	073939	073595
Dnmbp	025195	026209	026209	Rbfox3	025576	117731	113636	Tek	006386	102798	099862
Doc2b	020848	021209	021209	Rbfox3	025576	103023	099312	Tek	006386	071168	071162

Dock1	058325	211570	N/A	Rbfox3	025576	017576	017576	Tek	006386	131958	N/A
Dock1	058325	211593	147945	Rbfox3	025576	069343	069598	Tes	029552	115467	111127
Dock1	058325	084488	081531	Rbfox3	025576	106278	101885	Tes	029552	200690	N/A
Dock1	058325	210617	N/A	Rbfox3	025576	120061	113987	Tes	029552	154266	118791
Dock1	058325	210464	N/A	Rbfox3	025576	154746	118332	Tes	029552	121170	N/A
Dock1	058325	210121	147797	Rbfox3	025576	136551	119255	Tes	029552	076654	075950
Dock5	044447	039135	036674	Rbfox3	025576	128863	N/A	Tesc	029359	031304	031304
Dock5	044447	226033	N/A	Rbfox3	025576	134774	N/A	Tesc	029359	124648	138436
Dock5	044447	224823	N/A	Neurl1a	006435	111808	107439	Tesc	029359	135540	N/A
Dock6	032198	217336	149156	Neurl1a	006435	111807	107438	Tesc	029359	151792	N/A
Dock6	032198	215729	150250	Neurod1	034701	041099	040364	Tesc	029359	148777	N/A
Dock6	032198	034728	034728	Neurod6	037984	044767	047016	Tesc	029359	145526	N/A
Dock6	032198	217310	N/A	Nfatc2	027544	074618	074198	Tex36	030976	033275	033275
Dock6	032198	216626	150347	Nfatc2	027544	109184	104812	Tex52	079304	130785	145112
Dock6	032198	217515	N/A	Nfatc2	027544	151292	N/A	Tex52	079304	100926	098486
Dock6	032198	213296	N/A	Nfatc2	027544	099067	N/A	Tex9	090626	184312	138844
Dock6	032198	213775	N/A	Nfatc2	027544	029057	029057	Tex9	090626	085358	082467
Dock7	028556	030286	030286	Nfatc2	027544	137451	118329	Tex9	090626	184125	139026
Dock7	028556	206128	N/A	Nfatc2	027544	140137	N/A	Tex9	090626	183399	N/A
Dock7	028556	127417	117797	Nfatc2	027544	138546	N/A	Tex9	090626	184831	138999
Dock7	028556	124466	145749	Nfatc2	027544	171689	130875	Tex9	090626	183574	139386
Dock7	028556	075836	075233	Nhsl1	039835	207038	147021	Tex9	090626	183856	139247
Dock7	028556	205650	145604	Nhsl1	039835	159299	N/A	Tex9	090626	184557	139212
Dock7	028556	140225	N/A	Nhsl1	039835	161510	N/A	Tex9	090626	184066	N/A
Dock7	028556	205484	N/A	Nhsl1	039835	160602	N/A	Tex9	090626	184734	N/A
Dock7	028556	124040	N/A	Nhsl1	039835	037341	040799	Tex9	090626	183428	139326
Dock7	028556	205652	145833	Nhsl1	039835	160547	N/A	Tex9	090626	183551	N/A
Dock7	028556	139152	N/A	Nhsl1	039835	160600	N/A	Tex9	090626	183501	138882
Dock7	028556	140848	N/A	Nhsl1	039835	162891	124072	Tex9	090626	185151	138929
Dock7	028556	150254	114204	Nhsl1	039835	100054	097631	Tex9	090626	185106	N/A
Dock7	028556	127946	119103	Nid1	005397	005532	005532	Tex9	090626	184624	N/A
Dock7	028556	205783	N/A	Nid1	005397	222142	N/A	Tfap2a	021359	021787	021787
Dock7	028556	153362	N/A	Nid1	005397	222436	N/A	Tfap2a	021359	224319	N/A
Dock7	028556	131386	145985	Ninj2	041377	112711	108331	Tfap2a	021359	223869	153149
Dock7	028556	206604	N/A	Ninj2	041377	035244	046306	Tfap2a	021359	225180	153271
Dock8	052085	025831	025831	Nipal4	020411	020679	020679	Tfap2a	021359	224999	153522
Dok6	073514	097495	095103	Nkain2	069670	191234	140463	Tfap2a	021359	224665	153667
Dok6	073514	160328	N/A	Nkain2	069670	218645	151255	Tfap2a	021359	223908	N/A
Dopey2	022946	045004	044437	Nkain2	069670	219125	151959	Tfap2a	021359	224700	N/A
Dopey2	022946	226335	N/A	Nkain2	069670	219306	N/A	Tfap2a	021359	110193	105822
Dopey2	022946	226418	N/A	Nkain2	069670	092602	090264	Tfap2b	025927	027059	027059
Dopey2	022946	228846	154446	Nkain2	069670	092603	090265	Tfap2b	025927	187754	140213
Dopey2	022946	227156	154771	Nkx2-2	027434	109970	105596	Tfap2b	025927	064976	064488
Dopey2	022946	226836	154636	Nkx2-2	027434	067075	069666	Tfap2b	025927	191068	N/A
Dopey2	022946	226215	154229	Nkx2-2	027434	109969	N/A	Tfap2b	025927	186972	N/A
Dopey2	022946	226535	N/A	Nkx2-2	027434	172627	N/A	Tg	053469	065916	070239
Dopey2	022946	227939	N/A	Nlgn3	031302	118111	113863	Tg	053469	163495	129868
Dopey2	022946	228261	N/A	Nlgn3	031302	130555	122213	Tg	053469	167512	N/A
Dopey2	022946	227278	N/A	Nlgn3	031302	151528	123283	Tg	053469	171045	126454
Dopey2	022946	228423	N/A	Nlgn3	031302	065858	066304	Tg	053469	166906	N/A
Dpf3	021221	147469	122598	Nlgn3	031302	147443	N/A	Tg	053469	167344	N/A
Dpf3	021221	144237	122004	Nlgn3	031302	144860	N/A	Tg	053469	172153	128410
Dpf3	021221	133282	121199	Nln	021710	109315	104938	Tg	053469	166403	N/A
Dpf3	021221	140327	120700	Nln	021710	225324	153299	Tgfb2	039239	045288	043849
Dpf3	021221	178756	136280	Nln	021710	224058	N/A	Tgfb2	039239	195201	142149
Dpf3	021221	177959	137477	Nln	021710	225704	N/A	Tgfb2	039239	191766	N/A
Dpf3	021221	177801	136740	Nln	021710	224945	153227	Tgfb2	039239	194960	N/A
Dpp10	036815	112606	108225	Nln	021710	224475	N/A	Tgfb2	039239	194593	N/A
Dpp10	036815	112603	108222	Nln	021710	225478	N/A	Tgfb2	039239	193640	N/A

Dpp10	036815	187202	N/A	Nln	021710	224086	N/A	Tgfb3	021253	003687	003687
Dpp10	036815	140361	N/A	Nnt	025453	069902	070564	Th	000214	000219	000219
Dpy19l1	043067	115277	110932	Nnt	025453	099149	096753	Th	000214	105929	101549
Dpy19l1	043067	142064	119986	Nnt	025453	109204	104827	Th	000214	124951	122876
Dpy19l1	043067	152480	N/A	Nnt	025453	133627	N/A	Th	000214	138482	123661
Dpy19l1	043067	149001	N/A	Nnt	025453	144599	N/A	Th	000214	123057	122162
Dpy19l1	043067	129048	N/A	Nnt	025453	223268	152868	Th	000214	140344	115434
Dpy19l1	043067	170356	129575	Notch1	026923	028288	028288	Thbs2	023885	170872	128308
Dpy19l2	085576	133010	132092	Notch1	026923	132941	N/A	Thsd7b	042581	148051	N/A
Dpyd	033308	039177	039429	Notch1	026923	148948	N/A	Thsd7b	042581	073527	073220
Dpyd	033308	126254	N/A	Notch1	026923	138034	N/A	Thsd7b	042581	040311	041716
Dpyd	033308	150950	N/A	Notch1	026923	126872	N/A	Thsd7b	042581	140629	N/A
Dpyd	033308	149101	143022	Notch1	026923	140082	N/A	Thsd7b	042581	152305	117750
Dpyd	033308	200178	N/A	Notch1	026923	147481	N/A	Thsd7b	042581	190870	N/A
Dpyd	033308	129148	N/A	Notch1	026923	123873	N/A	Thsd7b	042581	151700	N/A
Dpysl3	024501	121805	112928	Notch1	026923	129506	N/A	Thsd7b	042581	140834	N/A
Dpysl3	024501	135547	N/A	Notch1	026923	132820	115258	Thsd7b	042581	143130	N/A
Dpysl3	024501	118043	113711	Notch1	026923	131393	N/A	Thyn1	035443	214910	N/A
Dpysl3	024501	025379	025379	Npr3	022206	066529	066737	Thyn1	035443	213770	151200
Dpysl3	024501	124207	114981	Npr3	022206	226139	N/A	Thyn1	035443	213683	150823
Dpysl3	024501	118071	113604	Npr3	022206	228603	154180	Thyn1	035443	039161	037614
Dpysl4	025478	026551	026551	Npr3	022206	228489	153895	Thyn1	035443	214458	N/A
Dpysl4	025478	139364	N/A	Npr3	022206	226878	N/A	Thyn1	035443	217143	N/A
Dpysl4	025478	154273	N/A	Npy1r	036437	212588	148417	Thyn1	035443	215024	N/A
Dpysl4	025478	122844	N/A	Npy1r	036437	039303	045530	Thyn1	035443	216361	N/A
Dpysl4	025478	145499	117764	Nrcam	020598	218940	N/A	Timp3	020044	020234	020234
Dpysl4	025478	121184	112896	Nrcam	020598	110748	106376	Timp3	020044	151134	N/A
Drd1	021478	221470	152768	Nrcam	020598	219592	N/A	Timp3	020044	136045	N/A
Drd1	021478	222706	N/A	Nrcam	020598	220130	N/A	Timp3	020044	132307	133236
Drd1	021478	021932	021932	Nrcam	020598	020939	020939	Tlcd1	019437	098545	096145
Drd2	032259	075764	075170	Nrcam	020598	220126	151296	Tlcd1	019437	147819	126593
Dscaml1	032087	217335	N/A	Nrcam	020598	217907	151419	Tlcd1	019437	145507	N/A
Dscaml1	032087	217538	149771	Nrcam	020598	218540	151732	Tlcd1	019437	092880	090556
Dscaml1	032087	213919	150245	Nrcam	020598	219928	N/A	Tlcd1	019437	127587	114202
Dscaml1	032087	216340	N/A	Nrcam	020598	218805	N/A	Tlcd1	019437	141578	N/A
Dscaml1	032087	034592	034592	Nrcam	020598	220123	151844	Tlcd1	019437	108338	103975
Dscaml1	032087	216078	148905	Nrcam	020598	218431	151873	Tlcd1	019437	140379	N/A
Dscaml1	032087	216685	149247	Nrcam	020598	219939	152002	Tle4	024642	052011	057527
Dscaml1	032087	215027	N/A	Nrcam	020598	219906	151243	Tle4	024642	167776	126249
Dscaml1	032087	214151	N/A	Nrcam	020598	220082	151824	Tll1	053626	066166	070560
Dusp16	030203	129433	115925	Nrcam	020598	217796	N/A	Tll1	053626	209451	N/A
Dusp16	030203	100857	098419	Nrcam	020598	218062	151475	Tll1	053626	211755	N/A
Dusp16	030203	204083	144834	Nrg1	062991	207470	146456	Tll1	053626	210256	147695
Dusp16	030203	203651	N/A	Nrg1	062991	207417	146905	Tlr3	031639	034056	034056
Dusp16	030203	203452	N/A	Nrg1	062991	209107	146617	Tlr3	031639	167106	126556
Dusp16	030203	148926	144917	Nrg1	062991	208617	146857	Tlr3	031639	210013	147783
Dusp16	030203	149776	144784	Nrg1	062991	208205	147156	Tlr3	031639	209772	147738
Dusp22	069255	091672	089260	Nrg1	062991	073884	073546	Tlr3	031639	211370	148127
Dusp22	069255	110310	105939	Nrg1	062991	208488	147121	Tlr3	031639	210996	148263
Dusp22	069255	220748	N/A	Nrg1	062991	208819	146403	Tlr3	031639	209651	147961
Dusp22	069255	221725	152283	Nrg1	062991	208335	146375	Tlr3	031639	209269	N/A
Dusp22	069255	095914	093603	Nrg1	062991	208598	146478	Tlr3	031639	210354	N/A
Dusp26	039661	036631	046794	Nrg1	062991	208497	146816	Tmc1	024749	039500	040859
Dusp26	039661	170204	126397	Nrg1	062991	207678	N/A	Tmc7	042246	044195	046927
Dusp26	039661	162551	N/A	Nrg1	062991	208355	N/A	Tmc7	042246	153635	N/A
Dusp26	039661	161713	124949	Nrg1	062991	208931	146507	Tmc7	042246	145989	N/A
Dusp26	039661	160700	N/A	Nrg1	062991	209022	146842	Tmc7	042246	139693	N/A
Dusp5	034765	038287	047900	Nrg1	062991	207584	N/A	N/A	N/A	N/A	N/A
Dzank1	037259	081982	080643	Nrg1	062991	208820	N/A	Tmem108	042757	049452	046021

Dzank1	037259	124823	N/A	Nrg1	062991	208206	N/A	Tmem108	042757	189588	140027
Dzank1	037259	150816	N/A	Nrg2	060275	115713	111378	Tmem108	042757	189066	141160
Dzank1	037259	163701	133177	Nrg2	060275	115712	111377	Tmem108	042757	191069	N/A
Dzip1l	037784	131095	116647	Nrg2	060275	115705	N/A	Tmem108	042757	215136	149890
Dzip1l	037784	078367	077475	Nrg2	060275	225173	N/A	Tmem108	042757	186455	N/A
Dzip1l	037784	112885	108506	Nrg3	041014	166968	136884	Tmem125	050854	060214	063157
Dzip1l	037784	112886	108507	Nrg3	041014	168810	129783	Tmem125	050854	128098	115304
Dzip1l	037784	112884	108505	Nrg3	041014	173780	134727	Tmem125	050854	150044	117871
Dzip1l	037784	134969	N/A	Nrg3	041014	176122	N/A	Tmem125	050854	156191	117286
Dzip1l	037784	190893	N/A	Nrgn	053310	065668	070113	Tmem125	050854	154025	N/A
Ebf1	057098	081265	080020	Nrgn	053310	182070	N/A	Tmem132b	070498	185104	139013
Ebf1	057098	101326	099857	Nrk	052854	113052	108675	Tmem132b	070498	031446	031446
Ebf1	057098	109268	104891	Nrk	052854	131829	115962	Tmem132b	070498	184422	N/A
Ebf1	057098	140822	N/A	Nrk	052854	155201	N/A	Tmem132c	034324	119026	113090
Ebf1	057098	149997	N/A	Nrk	052854	142132	N/A	Tmem132c	034324	134780	N/A
Ebf1	057098	135993	N/A	Nrk	052854	064937	063397	Tmem132c	034324	128068	N/A
Ebf1	057098	138452	N/A	Nrxn1	024109	072671	072458	Tmem132c	034324	132592	N/A
Ebf2	022053	022637	022637	Nrxn1	024109	160844	125407	Tmem132c	034324	145748	121783
Ebf2	022053	176161	135500	Nrxn1	024109	197268	142815	Tmem132e	020701	092852	090528
Ebf2	022053	177231	N/A	Nrxn1	024109	174331	133491	Tmem132e	020701	054245	052484
Ebf2	022053	176029	135782	Nrxn1	024109	159778	125561	Tmem132e	020701	132477	N/A
Ebf3	010476	033378	033378	Nrxn1	024109	173917	133389	Tmem132e	020701	202598	N/A
Ebf3	010476	106118	101724	Nrxn1	024109	174337	133724	Tmem150c	050640	124145	N/A
Ebf3	010476	210774	147829	Nrxn1	024109	161402	124116	Tmem150c	050640	165548	N/A
Ebf3	010476	209578	147512	Nrxn1	024109	173222	146701	Tmem150c	050640	139520	114464
Ebf3	010476	209905	N/A	Nrxn1	024109	054059	057294	Tmem150c	050640	063192	057116
Ebf3	010476	209864	N/A	Nrxn1	024109	172466	134402	Tmem150c	050640	146731	N/A
Ebf3	010476	168203	130334	Nrxn1	024109	160800	124561	Tmem163	026347	027585	027585
Ebf3	010476	169486	132563	Nrxn1	024109	197104	142621	Tmem163	026347	185560	140828
Ebf4	053552	110288	105917	Nrxn1	024109	176918	N/A	Tmem163	026347	160111	N/A
Ebf4	053552	110286	105915	Nrxn1	024109	196269	N/A	Tmem163	026347	162406	N/A
Ebf4	053552	134728	N/A	Nrxn1	024109	161102	N/A	Tmem163	026347	160616	124307
Ebf4	053552	126740	133528	Nrxn1	024109	196559	142891	Tmem178	024245	025092	025092
Ebf4	053552	140169	134520	Nrxn1	024109	176118	135241	Tmem179	054013	066791	068004
Ebf4	053552	110287	105916	Nrxn1	024109	198899	N/A	Tmem179	054013	222836	152792
Ece1	057530	102518	099576	Nrxn1	024109	161637	N/A	Tmem200a	049420	217910	N/A
Ece1	057530	130407	125529	Nrxn1	024109	177342	135301	Tmem200a	049420	218232	151861
Ece1	057530	151110	114671	Nrxn1	024109	197224	142650	Tmem200a	049420	066049	064080
Ece1	057530	129607	N/A	Nrxn1	024109	162227	N/A	Tmem200a	049420	219651	151832
Echdc2	028601	052999	051268	Nrxn1	024109	160467	N/A	Tmem200a	049420	219338	151494
Echdc2	028601	130942	124746	Nrxn1	024109	159419	N/A	Tmem200a	049420	219872	151559
Echdc2	028601	125647	123913	Nrxn1	024109	162002	N/A	Tmem255a	036502	089056	086457
Echdc2	028601	116307	112009	Ntf3	049107	204542	144828	Tmem255a	036502	089054	086455
Echdc2	028601	135718	114371	Ntf3	049107	112244	107863	Tmem255a	036502	155848	N/A
Echdc2	028601	138701	N/A	Ntf3	049107	050484	052302	Tmem255a	036502	066498	064511
Echdc2	028601	133049	N/A	Ntm	059974	075069	074578	Tmem255a	036502	139358	N/A
Echdc2	028601	123280	N/A	Ntm	059974	124119	N/A	Tmem266	032313	085754	082906
Echdc2	028601	126900	123734	Ntm	059974	151977	N/A	Tmem266	032313	034862	034862
Echdc2	028601	150487	N/A	Ntm	059974	115237	110892	Tmem266	032313	130465	N/A
Echdc2	028601	127392	N/A	Ntm	059974	152513	N/A	Tmem63a	026519	161847	124937
Echdc2	028601	106691	102302	Ntm	059974	140118	114810	Tmem63a	026519	162283	125287
Echdc2	028601	116309	112011	Ntm	059974	155308	119030	Tmem63a	026519	027800	027800
Edem1	030104	204804	144901	Ntm	059974	115236	110891	Tmem63a	026519	159436	125192
Edem1	030104	089162	086565	Ntm	059974	148606	N/A	Tmem63a	026519	161523	124021
Edem1	030104	203469	N/A	Ntm	059974	126044	N/A	Tmem63a	026519	160508	124973
Edem1	030104	204524	N/A	Ntm	059974	146651	N/A	Tmem63a	026519	160536	124860
Edem1	030104	203302	N/A	Ntn1	020902	108674	104314	Tmem63a	026519	161942	N/A
Edil3	034488	118731	112829	Ntn1	020902	135141	121193	Tmem98	035413	040865	042825
Edil3	034488	153974	N/A	Ntn1	020902	021284	021284	Tmod1	028328	107773	103402

Edil3	034488	081769	080462	Ntn4	020019	147080	123306	Tmod1	028328	156200	134075
Edil3	034488	134241	N/A	Ntn4	020019	020204	020204	Tmod1	028328	128689	N/A
Edil3	034488	133761	N/A	Ntsr1	027568	029084	029084	Tmod1	028328	136553	N/A
Edil3	034488	137921	N/A	Ntsr1	027568	170448	127548	Tmod1	028328	155730	N/A
Edil3	034488	140625	N/A	Ntsr2	020591	221596	152110	Tmprss5	032268	165088	132181
Edil3	034488	043111	044652	Ntsr2	020591	111064	106693	Tmprss5	032268	171217	N/A
Ednrb	022122	022718	022718	Ntsr2	020591	220892	152290	Tmprss5	032268	166272	130069
Ednrb	022122	227824	154806	Ntsr2	020591	222957	N/A	Tmprss5	032268	070390	064527
Ednrb	022122	172237	126057	Ntsr2	020591	221049	152592	Tmprss5	032268	167095	131650
Slc13a1	029700	031713	031713	Nudt4	020029	020217	020217	Tmprss5	032268	170246	129482
Slc13a1	029700	174594	N/A	Nup62cl	072944	101212	098772	Tmprss5	032268	170426	128662
Slc13a1	029700	177412	N/A	Nup62cl	072944	154385	121310	Tmtc4	041594	037726	046368
Slc13a1	029700	176692	N/A	Nup62cl	072944	133780	116491	Tmtc4	041594	143189	116480
Efemp1	020467	020759	020759	Nup62cl	072944	125678	116128	Tmtc4	041594	126867	116379
Efemp1	020467	139713	114757	Nup62cl	072944	124075	122713	Tmtc4	041594	148661	121523
Efemp1	020467	124103	N/A	Nwd1	048148	161386	N/A	Tmtc4	041594	126494	N/A
Efhc2	025038	026014	026014	Nwd1	048148	161557	125470	Tmtc4	041594	228661	N/A
Efhd1	026255	118687	112980	Nwd1	048148	161254	124804	Tmtc4	041594	125900	N/A
Efhd1	026255	027472	027472	Nwd1	048148	228312	154488	Tmtc4	041594	135917	N/A
Efhd1	026255	150831	N/A	Nwd1	048148	160443	124446	Tmtc4	041594	227430	N/A
Efhd2	040659	036854	044502	Nwd1	048148	163026	N/A	Tmtc4	041594	128969	118814
Efna5	048915	076840	076115	Nwd1	048148	160912	N/A	Tmtc4	041594	228552	N/A
Efna5	048915	078839	077883	Nwd1	048148	162248	N/A	Tmtc4	041594	153496	N/A
Efnb3	003934	004036	004036	Nwd1	048148	093427	091135	Tmtc4	041594	141478	N/A
Egfr	020122	020329	020329	Nxn	020844	021204	021204	Tnc	028364	030056	030056
Egfr	020122	102884	099948	Nxn	020844	131472	N/A	Tnc	028364	107372	102995
Egfr	020122	125984	122632	Nxpe3	075033	099705	097296	Tnc	028364	107371	102994
Egfr	020122	138518	N/A	Ogdhl	021913	228529	154185	Tnc	028364	107377	103000
Egfr	020122	139722	N/A	Ogdhl	021913	228286	N/A	Tnfaip6	053475	065927	069231
Egln3	035105	039516	041874	Ogdhl	021913	022480	022480	Tnfrsf13c	068105	089161	086564
Egr3	033730	035908	037042	Olfm1	026833	028177	028177	Tnfrsf13c	068105	109535	105161
Egr3	033730	225200	153491	Olfm1	026833	113920	109553	Tnfrsf19	060548	111236	106867
Egr3	033730	223809	N/A	Olfm1	026833	102879	099943	Tnfrsf19	060548	111234	106865
Egr3	033730	223747	N/A	Olfm1	026833	152415	N/A	Tnfrsf19	060548	225501	N/A
Ehd3	024065	024860	024860	Olfm1	026833	100244	097815	Tnfrsf19	060548	224371	153577
Eif2s3y	069049	091197	088736	Olfm3	027965	081752	080448	Tnfrsf19	060548	225730	152920
Eif2s3y	069049	137006	N/A	Olfm3	027965	149158	121097	Tnk2	022791	145627	152338
Eif2s3y	069049	148961	N/A	Olfm3	027965	051309	060985	Tnk2	022791	124585	152549
Eif2s3y	069049	154556	N/A	Olig1	046160	056882	061408	Tnk2	022791	115126	110779
Eif2s3y	069049	139083	N/A	Olig2	039830	035608	036797	Tnk2	022791	115125	110778
Eif2s3y	069049	134820	N/A	Onecut2	045991	175965	135692	Tnk2	022791	115124	110777
Elavl2	008489	107110	102727	Onecut2	045991	115145	110798	Tnk2	022791	115123	110776
Elavl2	008489	008633	008633	Opalin	050121	087176	084422	Tnk2	022791	164358	N/A
Elavl2	008489	107118	102735	Ophn1	031214	033560	033560	Tnk2	022791	150383	N/A
Elavl2	008489	107120	102737	Ophn1	031214	142267	119361	Tnk2	022791	156614	N/A
Elavl2	008489	102799	099863	Ophn1	031214	156634	N/A	Tnk2	022791	137044	N/A
Elavl2	008489	128599	N/A	Ophn1	031214	113826	109457	Tnk2	022791	115122	110775
Elavl2	008489	107116	102733	Ophn1	031214	125150	N/A	Tnk2	022791	115120	110773
Elavl2	008489	107109	102726	Ophn1	031214	147805	N/A	Tnk2	022791	131238	129382
Elavl2	008489	107111	102728	Ophn1	031214	156917	N/A	Tnk2	022791	115121	110774
Elavl2	008489	176469	N/A	Ophn1	031214	140598	N/A	Tnk2	022791	168506	N/A
Elavl2	008489	177109	135780	Ophn1	031214	147529	121723	Tnk2	022791	152361	125905
Elavl2	008489	147611	117770	Ophn1	031214	154920	N/A	Tnni1	026418	187830	N/A
Elavl2	008489	176362	135038	Oplah	022562	171340	129100	Tnni1	026418	132795	121122
Elavl2	008489	144769	N/A	Oplah	022562	170261	N/A	Tnni1	026418	152208	121966
Elavl2	008489	176151	N/A	Oplah	022562	169664	N/A	Tnni1	026418	137331	N/A
Elavl2	008489	107124	102741	Oplah	022562	170063	N/A	Tnni1	026418	152075	121343
Elavl4	028546	106603	102214	Oplah	022562	163127	N/A	Tnni1	026418	154463	122925
Elavl4	028546	102723	099784	Oplah	022562	164189	131967	Tnni1	026418	139986	123049

Elavl4	028546	106598	102208	Oplah	022562	163977	N/A	Tnni1	026418	148201	123509
Elavl4	028546	106597	102207	Oplah	022562	210024	148028	Tnni1	026418	129217	119848
Elavl4	028546	102722	099783	Oplah	022562	165279	127955	Tnr	015829	192069	141553
Elavl4	028546	106600	102210	Oplah	022562	023222	023222	Tnr	015829	195199	N/A
Elavl4	028546	106601	102212	Oprd1	050511	056336	050077	Tnr	015829	193325	141752
Elavl4	028546	142722	121828	Optc	010311	124051	120568	Tnr	015829	192457	141509
Elavl4	028546	153200	N/A	Optc	010311	153617	123262	Tnr	015829	111669	107298
Elavl4	028546	144554	N/A	Optc	010311	149380	115661	Tns1	055322	187584	140254
Elavl4	028546	153906	120942	Optc	010311	126123	117086	Tns1	055322	191104	140317
Elavl4	028546	138972	123014	Optc	010311	124245	N/A	Tns1	055322	187691	139844
Elf2	037174	194641	141197	Osbp	024687	025590	025590	Tns1	055322	185702	140094
Elf2	037174	183463	139360	Osbpl10	040875	183104	138287	Tns1	055322	185331	140771
Elf2	037174	062009	061076	Osbpl10	040875	182384	138552	Tns1	055322	212888	148638
Elf2	037174	091144	088678	Osbpl10	040875	183141	138760	Tns1	055322	189228	139721
Elf2	037174	108051	103686	Osbpl10	040875	182199	138206	Tns1	055322	191527	N/A
Elf2	037174	108053	103688	Osbpl10	040875	182920	138266	Tns1	055322	185264	N/A
Elf2	037174	193909	N/A	Osbpl10	040875	182363	N/A	Tns1	055322	185529	N/A
Elf2	037174	195432	142300	Osbpl10	040875	182413	N/A	Tns1	055322	191367	140991
Elf2	037174	183338	139358	Osbpl10	040875	046627	038013	Tns1	055322	188942	N/A
Elf2	037174	184677	139199	Osbpl3	029822	114468	110112	Tns1	055322	191264	N/A
Elf2	037174	194209	N/A	Osbpl3	029822	141466	N/A	Tns1	055322	186381	N/A
Elf2	037174	156983	141525	Osbpl3	029822	090019	087473	Tns1	055322	189571	N/A
Elf2	037174	163748	126871	Osbpl3	029822	071728	071643	Tns1	055322	190389	140448
Elfn1	048988	050519	053869	Osbpl3	029822	114466	110110	Tns1	055322	187281	139616
Elfn1	048988	198608	N/A	Osbpl3	029822	133141	N/A	Tns1	055322	188436	N/A
Elmo2	017670	103091	099380	Osbpl3	029822	203907	145249	Tns1	055322	191204	140878
Elmo2	017670	148643	117124	Osbpl3	029822	146341	114472	Tns1	055322	188208	140837
Elmo2	017670	074046	073691	Osbpl3	029822	136926	144934	Tns1	055322	190599	N/A
Elmo2	017670	094329	091887	Osbpl3	029822	154333	N/A	Tns1	055322	169786	127715
Elmo2	017670	103088	099377	P2ry1	027765	029331	029331	Tns3	020422	020695	020695
Elmo2	017670	071699	071619	P2ry1	027765	193201	142006	Tns3	020422	131941	N/A
Elmo2	017670	127496	N/A	P2ry1	027765	193943	141371	Tns3	020422	134823	N/A
Elmo2	017670	137188	123232	P2ry12	036353	196583	143036	Tns3	020422	129074	N/A
Elmo2	017670	149844	N/A	P2ry12	036353	050360	051353	Tox2	074607	109428	105055
Elmo2	017670	126318	116124	P2ry12	036353	199609	143521	Tox2	074607	128999	122344
Elmo2	017670	133205	119682	P2ry12	036353	199675	143706	Tox2	074607	099110	096710
Elmo2	017670	128690	114303	P2ry12	036353	170388	126819	Tox2	074607	148599	118219
Elmod1	041986	215313	N/A	Pak7	039913	035264	047285	Tox2	074607	165937	126243
Elmod1	041986	048409	046191	Pak7	039913	077200	076440	Tox3	043668	109621	105250
Elmod1	041986	216880	N/A	Pak7	039913	143329	N/A	Tox3	043668	176616	135697
Elmod1	041986	213111	N/A	Palm2	090053	102905	099969	Tox3	043668	176034	134931
Elmod1	041986	166580	129082	Palm2	090053	102904	099968	Tpcn1	032741	046426	042188
Elovl2	021364	021793	021793	Palm2	090053	142556	129817	Tpcn1	032741	200708	N/A
Elovl2	021364	117096	114112	Palm2	090053	131201	N/A	Tpcn1	032741	202072	N/A
Elovl7	021696	022207	022207	Pam	026335	159041	124284	Tpcn1	032741	201601	N/A
Elovl7	021696	225550	152997	Pam	026335	058762	057112	Tppp	021573	140217	N/A
Emilin2	024053	024849	024849	Pam	026335	161567	125418	Tppp	021573	022057	022057
Eml5	051166	065716	065643	Pam	026335	162681	125133	Trabd2b	070867	094894	092494
Eml5	051166	223282	152709	Pam	026335	159585	N/A	Traf1	026875	172159	130759
Eml5	051166	222717	N/A	Pam	026335	160210	N/A	Traf1	026875	028234	028234
Eml5	051166	220848	N/A	Pam	026335	162803	N/A	Traf1	026875	113064	108687
Eml5	051166	221107	N/A	Pam	026335	159131	N/A	Traf1	026875	129131	N/A
Eml5	051166	222097	152624	Pam	026335	161071	N/A	Traf1	026875	201690	144189
Eml5	051166	222593	N/A	Pam	026335	159841	124479	Traf1	026875	201335	N/A
Eml5	051166	221511	N/A	Pam	026335	159428	N/A	Traf1	026875	141238	N/A
Eml5	051166	220676	N/A	Pam	026335	162426	N/A	Traf1	026875	156479	N/A
Eml5	051166	222128	152401	Pam	026335	186731	N/A	Traf1	026875	135870	N/A
Emp2	022505	078357	077466	Pam	026335	163007	N/A	Trhde	050663	061632	057449
En2	039095	036177	036761	Pam	026335	097625	095228	Trhde	050663	152702	N/A

Enah	022995	193703	141462	Panx2	058441	161372	125514	Trhde	050663	152282	N/A
Enah	022995	111024	106653	Panx2	058441	162424	124354	Tril	043496	127748	116056
Enah	022995	195703	N/A	Panx2	058441	159960	124928	Trim30a	030921	076922	076189
Enah	022995	191649	N/A	Paqr6	041423	147948	119656	Trim30a	030921	125762	N/A
Enah	022995	193074	141936	Paqr6	041423	147991	114166	Trim30a	030921	142124	N/A
Enah	022995	078719	077781	Paqr6	041423	149640	N/A	Trim36	033949	167364	129771
Enah	022995	195059	141344	Paqr6	041423	123200	N/A	Trim36	033949	037011	037978
Enah	022995	111030	106659	Paqr6	041423	147818	N/A	Trim59	034317	107802	103432
Enah	022995	195788	N/A	Pard3	025812	162309	124282	Trim59	034317	136512	120270
Enah	022995	192768	N/A	Pard3	025812	160272	125453	Trim59	034317	142560	N/A
Enah	022995	192967	141330	Pard3	025812	162907	124319	Trim59	034317	153259	N/A
Enah	022995	195840	N/A	Pard3	025812	160717	125612	Trim62	041000	147852	123646
Enah	022995	195461	N/A	Pard3	025812	160593	N/A	Trim62	041000	035667	039121
Enah	022995	192497	N/A	Pard3	025812	026921	026921	Trim67	036913	167588	130343
Enah	022995	177811	136863	Pard3	025812	162456	124162	Trim67	036913	211867	148625
Enah	022995	111025	106654	Pard3	025812	162665	124718	Trim67	036913	041106	040601
Enc1	041773	041623	038783	Pard3	025812	161348	123951	Trp53cor1	085912	133221	N/A
Enox1	022012	022589	022589	Pard3	025812	162035	N/A	Trpc3	027716	029271	029271
Enox1	022012	226576	N/A	Pard3	025812	162176	123944	Trpc3	027716	129322	N/A
Enox1	022012	228148	N/A	Pard3	025812	159537	124934	Trpc3	027716	123220	N/A
Enox1	022012	228102	N/A	Pard3	025812	161277	124789	Trpc3	027716	133542	N/A
Enox1	022012	227831	154296	Pard3	025812	160766	124533	Trpc3	027716	146475	N/A
Enox1	022012	227662	154512	Pard3	025812	162602	125450	Trpc5	041710	040184	049063
Enox1	022012	228845	N/A	Pard3	025812	162531	125610	Trpc5	041710	148240	N/A
Enpp1	037370	105520	101159	Pard3	025812	160581	124141	Trpc7	021541	022023	022023
Enpp1	037370	039882	046090	Pard3	025812	162536	125212	Trpc7	021541	109871	105497
Enpp1	037370	135846	114273	Pard3	025812	161355	125064	Trpc7	021541	151918	119809
Enpp1	037370	150570	N/A	Pard3	025812	159141	124733	Trpc7	021541	174457	133305
Enpp1	037370	142974	N/A	Pard3	025812	159818	124339	Trpc7	021541	173067	134481
Enpp2	022425	041591	036180	Pard3	025812	163021	N/A	Trpc7	021541	173817	133411
Enpp2	022425	173516	133877	Pard3	025812	162727	124359	Trpc7	021541	173513	134662
Enpp2	022425	167541	132640	Pard3	025812	163002	N/A	Trpc7	021541	173466	134285
Enpp2	022425	171545	128941	Pard3	025812	159511	124441	Trpm2	009292	105401	101040
Enpp2	022425	228823	N/A	Pard3	025812	159940	N/A	Trpm2	009292	105400	N/A
Enpp2	022425	227483	N/A	Pard3	025812	079777	078710	Trpm2	009292	140471	N/A
Enpp2	022425	228222	154470	Pard3	025812	108752	104383	Trpm2	009292	153842	N/A
Enpp2	022425	227057	N/A	Pard3b	052062	138768	N/A	Trpm2	009292	138238	N/A
Enpp2	022425	226339	154729	Pard3b	052062	075374	074837	Trpm2	009292	126206	N/A
Enpp4	023961	024757	024757	Pard3b	052062	129030	N/A	Trpm2	009292	217806	N/A
Enpp4	023961	143137	114429	Pard3b	052062	188325	N/A	Trpm2	009292	219997	151231
Enpp6	038173	039840	044608	Pard3b	052062	046673	040439	Trpm2	009292	105399	101038
Enpp6	038173	140149	N/A	Pard3b	052062	094906	092510	Trpm2	009292	154996	N/A
Enpp6	038173	123066	147811	Pard6g	056214	070219	069182	Trpv3	043029	049676	053755
Enpp6	038173	119686	112633	Parm1	034981	040576	042844	Tsc22d3	031431	112995	N/A
Enpp6	038173	149593	121470	Patj	061859	141796	N/A	Tsc22d3	031431	055738	062589
Enpp6	038173	210466	N/A	Patj	061859	041284	049176	Tsc22d3	031431	133023	N/A
Epb41l4b	028434	030142	030142	Patj	061859	107033	102648	Tsc22d3	031431	112996	108620
Epb41l4b	028434	095076	092687	Patj	061859	107034	102649	Tsc22d3	031431	123898	123569
Epb41l4b	028434	044022	037625	Patj	061859	107030	102645	Tsc22d3	031431	152048	N/A
Epb41l4b	028434	136337	N/A	Patj	061859	136675	N/A	Tshb	027857	196958	N/A
Epb41l4b	028434	133859	N/A	Patj	061859	141965	N/A	Tshb	027857	029450	029450
Epb41l4b	028434	149109	N/A	Patj	061859	142103	116021	Tshb	027857	170856	127165
Epb41l4b	028434	150665	N/A	Patj	061859	107029	102644	Tshb	027857	200041	142782
Epha3	052504	064405	066554	Patj	061859	135606	N/A	Tshb	027857	197322	142670
Epha4	026235	188952	139640	Patj	061859	134901	115936	Tshb	027857	172026	128440
Epha4	026235	188797	140954	Patj	061859	102792	099854	Tshz2	047907	109159	104787
Epha4	026235	187346	140631	Patj	061859	030290	030290	Tshz2	047907	109157	104785
Epha4	026235	190149	140408	Pax2	004231	174490	134661	Tshz2	047907	185239	140884
Epha4	026235	189934	N/A	Pax2	004231	173346	134311	Tshz2	047907	123300	118550

Epha4	026235	186930	140370	Pax2	004231	004340	004340	Tshz2	047907	140699	120013
Epha4	026235	027451	027451	Pax3	004872	004994	004994	Tspan11	030351	032501	032501
Ephb1	032537	035129	035129	Pax3	004872	087086	084320	Tspan11	030351	149801	N/A
Ephb1	032537	085169	082261	Pax3	004872	172555	N/A	Tspan14	037824	224209	153208
Ephb1	032537	217014	N/A	Paxbp1	022974	118522	113835	Tspan14	037824	224349	N/A
Ephb1	032537	217184	N/A	Paxbp1	022974	023698	023698	Tspan14	037824	047652	035263
Ephb1	032537	215514	N/A	Paxbp1	022974	150397	N/A	Tspan15	037031	047883	047029
Ephb1	032537	149800	139470	Paxbp1	022974	146281	N/A	Tspan15	037031	218394	N/A
Eps15	028552	102729	099790	Paxbp1	022974	145136	117142	Tspan15	037031	219106	N/A
Eps15	028552	176251	135034	Paxbp1	022974	128922	N/A	Tspan15	037031	218824	N/A
Eps15	028552	177089	134922	Paxbp1	022974	124653	N/A	Tspan15	037031	220143	N/A
Eps15	028552	175776	135270	Paxbp1	022974	127002	N/A	Tspan18	027217	111265	106896
Eps15	028552	132165	118949	Pbx3	038718	113132	108757	Tspan18	027217	028646	028646
Eps15	028552	150755	N/A	Pbx3	038718	040638	045281	Tspan18	027217	154951	N/A
Eps15	028552	141751	N/A	Pbx3	038718	176213	N/A	Tspan18	027217	181716	N/A
Eps15	028552	030281	030281	Pbx3	038718	153278	123567	Tspan18	027217	152141	N/A
Eps15	028552	126015	N/A	Pbx3	038718	143776	119914	Tspan2	027858	029451	029451
Eps15	028552	177192	135755	Pbx3	038718	175855	135838	Tspan2	027858	196611	142964
Eps15	028552	177140	N/A	Pbx3	038718	138021	135226	Tspan2	027858	119902	113803
Erbb3	018166	082059	080716	Pbx3	038718	141653	115710	Tspan2	027858	197345	142543
Erbb4	062209	119142	112713	Pbx3	038718	127353	114695	Tspan5	028152	029800	029800
Erbb4	062209	121473	114123	Pbx3	038718	155423	N/A	Tspan5	028152	142890	120969
Erbb4	062209	153432	115373	Pkd1	032855	228550	154062	Tspan5	028152	127772	122500
Erbb4	062209	131148	N/A	Pkd1	032855	035565	049296	Tspan5	028152	153336	122120
Erbb4	062209	126682	N/A	Pkd1	032855	228745	153873	Tspan5	028152	142001	117857
Erich5	044726	060894	058182	Pkd1	032855	227107	154792	Tspan5	028152	135629	120961
Ermn	026830	090940	088458	Pkd1	032855	226883	154668	Tspan5	028152	146356	114663
Esrrb	021255	116402	112103	Pkd1	032855	226178	N/A	Tspan5	028152	119993	113230
Esrrb	021255	110203	105832	Pkd1	032855	227836	154626	Tspan5	028152	121826	113359
Esrrb	021255	110204	105833	Pkd1	032855	228750	N/A	Tspan6	067377	087557	084838
Esrrb	021255	021680	021680	Pkd1	032855	227058	153867	Tspan6	067377	176718	135005
Esrrb	021255	167891	131335	Pkd1	032855	228581	154141	Tspan6	067377	176641	135626
Esrrb	021255	136464	N/A	Pkd2	034462	086831	084041	Tspan6	067377	177468	N/A
Esrrg	026610	127489	119286	Pkd2	034462	130931	N/A	Tspoap1	034156	039627	048063
Esrrg	026610	110939	106564	Pkd2	034462	133540	N/A	Tspoap1	034156	100644	098209
Esrrg	026610	152927	N/A	Pcsk1	021587	022075	022075	Tspoap1	034156	148422	N/A
Esrrg	026610	027906	027906	Pcsk1	021587	135349	N/A	Tspoap1	034156	144502	122665
Esrrg	026610	110938	106563	Pcsk1	021587	222727	152702	Tspoap1	034156	142329	118819
Etl4	036617	114610	110257	Ifrd1	001627	001672	001672	Tspoap1	034156	153578	N/A
Etl4	036617	146881	119778	Ifrd1	001627	164047	127553	Tspoap1	034156	148814	N/A
Etl4	036617	131714	116637	Ifrd1	001627	170119	N/A	Tspoap1	034156	135957	N/A
Etl4	036617	045555	041431	Ifrd1	001627	165027	133028	Tspoap1	034156	133645	117356
Etl4	036617	114614	110261	Ifrd1	001627	171530	128635	Tspoap1	034156	154758	N/A
Etl4	036617	114604	110251	Ifrd1	001627	169926	127673	Tstd2	035495	107772	103401
Etl4	036617	146613	N/A	Ifrd1	001627	169319	130824	Tstd2	035495	107770	103399
Etl4	036617	066509	066170	Ifrd1	001627	170752	N/A	Tstd2	035495	160008	N/A
Etl4	036617	129278	N/A	Ifrd1	001627	164354	130846	Tstd2	035495	137399	N/A
Etl4	036617	123383	N/A	Ifrd1	001627	171553	N/A	Tstd2	035495	147837	115473
Etl4	036617	136870	N/A	Pcsk5	024713	025618	025618	Tstd2	035495	144495	117990
Etl4	036617	125556	N/A	Pcsk5	024713	050715	050272	Tstd2	035495	129929	125707
Etl4	036617	146488	N/A	Pcsk5	024713	025618	025618	Tstd2	035495	156021	117865
Etl4	036617	125772	N/A	Pcsk5	024713	050715	050272	Ttc28	033209	156290	137609
Etl4	036617	114607	110254	Pcsk7	035382	039059	047508	Ttc28	033209	143505	N/A
Etl4	036617	114606	110253	Pcsk7	035382	215535	N/A	Ttc28	033209	125470	N/A
Etl4	036617	114608	110255	Pcsk7	035382	215189	150500	Ttc28	033209	128584	N/A
Etl4	036617	139531	N/A	Pcsk7	035382	216672	150393	Ttc28	033209	129017	N/A
Etl4	036617	156587	N/A	Pcsk7	035382	213854	150379	Ttc28	033209	040111	136116
Etl4	036617	114627	110274	Pcsk7	035382	216614	N/A	Ttll3	030276	204026	145049
Etnppl	019232	166187	131294	Pcsk7	035382	216504	N/A	Ttll3	030276	204683	N/A

Etnppl	019232	072271	072121	Pcsk7	035382	216514	N/A	Ttll3	030276	032414	032414
Etnppl	019232	199940	N/A	Pcsk7	035382	214425	N/A	Ttll3	030276	203524	145329
Etnppl	019232	172432	N/A	Pcdh1	051375	160721	124732	Ttll3	030276	205017	145044
Etnppl	019232	163620	129120	Pcdh1	051375	161701	125576	Ttll3	030276	203925	N/A
Etnppl	019232	170664	128425	Pcdh1	051375	057185	055199	Ttll3	030276	204255	N/A
Etv1	004151	160244	125733	Pcdh1	051375	159405	125309	Ttll3	030276	203880	N/A
Etv1	004151	095767	093442	Pcdh1	051375	194312	141877	Ttll3	030276	038889	037870
Etv1	004151	162563	125157	Pcdh1	051375	193828	142328	Ttpa	073988	125799	117031
Etv1	004151	161164	124650	Pcdh15	052613	123398	N/A	Ttpa	073988	121491	113966
Etv1	004151	160996	124705	Pcdh15	052613	148572	N/A	Ttpa	073988	117632	113026
Etv1	004151	160856	125692	Pcdh15	052613	156999	N/A	Ttpa	073988	098244	095845
Etv1	004151	162730	N/A	Pcdh15	052613	193174	142238	Tuba8	030137	032233	032233
Etv1	004151	161513	124166	Pcdh15	052613	105426	101066	Tubb2b	045136	075774	075178
Etv1	004151	161980	124736	Pcdh15	052613	129404	117731	Tubb2b	045136	220744	N/A
Etv1	004151	160701	124019	Pcdh15	052613	131321	122911	Tubb4a	062591	071135	071135
Etv1	004151	159334	125676	Pcdh15	052613	126920	121939	Tulp3	001521	001562	001562
Etv1	004151	220492	N/A	Pcdh15	052613	147189	122940	Tulp3	001521	128708	N/A
Etv1	004151	161591	N/A	Pcdh15	052613	105424	101064	Tulp3	001521	138313	N/A
Etv4	017724	107176	102794	Pcdh15	052613	092420	090076	Tulp3	001521	133134	145180
Etv4	017724	017868	017868	Pcdh15	052613	136096	121534	Tulp3	001521	203625	N/A
Etv4	017724	132040	N/A	Pcdh15	052613	105429	101069	Tulp3	001521	157005	145361
Etv4	017724	129160	N/A	Pcdh15	052613	125055	114326	Tusc3	039530	209440	148134
Etv4	017724	131862	N/A	Pcdh15	052613	193361	141792	Tusc3	039530	211241	148022
Etv4	017724	129995	N/A	Pcdh15	052613	131724	122466	Tusc3	039530	209970	N/A
Etv4	017724	140970	N/A	Pcdh15	052613	152655	118201	Tusc3	039530	210890	147691
Etv4	017724	131117	N/A	Pcdh15	052613	144302	122606	Tusc3	039530	167992	126080
Etv4	017724	149099	N/A	Pcdh15	052613	151116	119662	Tusc3	039530	169034	129916
Etv4	017724	137179	N/A	Pcdh15	052613	155701	135495	Txnip	038393	074519	102710
Etv4	017724	154512	N/A	Pcdh15	052613	152819	123647	Txnip	038393	049093	041467
Etv4	017724	164750	129261	Pcdh15	052613	125517	115399	Txnip	038393	151832	N/A
Etv5	013089	079601	078551	Pcdh15	052613	124046	121130	Txnip	038393	196871	N/A
Etv5	013089	168774	131791	Pcdh15	052613	146682	134863	Txnip	038393	144639	N/A
Etv5	013089	170803	128338	Pcdh15	052613	177107	135501	Txnip	038393	128221	N/A
Etv5	013089	165506	N/A	Pcdh15	052613	149977	118833	Ubash3b	032020	044155	043865
Etv5	013089	170393	132210	Pcdh15	052613	191854	141973	Ubash3b	032020	151485	116038
Eva1a	035104	150976	122674	Pcdh15	052613	134009	120618	Ubash3b	032020	124819	N/A
Eva1a	035104	042974	037422	Pcdh15	052613	177420	135849	Ubash3b	032020	136530	114176
Eva1a	035104	150691	N/A	Pcdh15	052613	125006	120056	Ubash3b	032020	129906	134923
Eva1a	035104	149023	117345	Pcdh15	052613	191709	142313	Ubash3b	032020	132996	N/A
Exph5	034584	051014	062632	Pcdh15	052613	193739	142173	Ube2b	020390	020657	020657
Exph5	034584	139096	N/A	Pcdh15	052613	195531	141920	Ube2b	020390	109086	104714
Exph5	034584	132410	N/A	Pcdh15	052613	147455	N/A	Ube2b	020390	124699	N/A
Extl2	027963	029575	029575	Pcdh15	052613	194315	141594	Ube2b	020390	147833	N/A
Extl2	027963	106501	102110	Pcdh15	052613	139106	N/A	Ube2ql1	052981	065118	070906
Extl2	027963	128228	N/A	Pcdh15	052613	128843	N/A	Ucp2	033685	126534	120967
Extl2	027963	145945	N/A	Pcdh15	052613	127928	N/A	Ucp2	033685	207890	N/A
Extl2	027963	149920	N/A	Pcdh15	052613	194729	N/A	Ucp2	033685	126381	N/A
Extl2	027963	106502	102111	Pcdh15	052613	192370	N/A	Ucp2	033685	207748	146337
Eya1	025932	168081	126383	Pcdh15	052613	064562	068561	Ucp2	033685	129324	115648
Eya1	025932	080664	079493	Pcdh17	035566	071370	071325	Ucp2	033685	153287	115953
Eya1	025932	190337	141112	Pcdh17	035566	226362	N/A	Ucp2	033685	133044	115598
Eya1	025932	189526	140619	Pcdh9	055421	195826	141396	Ucp2	033685	151221	N/A
Eya1	025932	188857	140171	Pcdh9	055421	193901	141759	Ucp2	033685	133498	N/A
Eya1	025932	185453	141072	Pcdh9	055421	192221	142260	Ucp2	033685	138673	N/A
Eya1	025932	187790	139542	Pcdh9	055421	195376	142224	Ucp2	033685	149808	N/A
Eya1	025932	185329	N/A	Pcdh9	055421	194129	141205	Ugt8a	032854	057944	050852
Eya1	025932	027066	027066	Pcdh9	055421	192817	N/A	Ugt8a	032854	198610	143605
F3	028128	029771	029771	Pcdh9	055421	194056	141602	Ugt8a	032854	196481	N/A
F3	028128	196746	N/A	Pcdh9	055421	068992	070935	Unc13c	062151	184666	139027

F3	028128	197731	N/A	Pcdha1	103442	193839	142308	Unc13c	062151	075245	074726
F3	028128	199997	143678	Pcdha1	103442	070797	068828	Unc80	055567	061620	053692
Fa2h	033579	038475	043597	Pcdha3	102312	192503	141989	Unc80	055567	114008	109641
Fa2h	033579	162463	N/A	Pcp2	004630	136105	121079	Unc80	055567	136727	N/A
Fa2h	033579	159336	N/A	Pcp2	004630	145855	N/A	Unc80	055567	212557	148517
Fa2h	033579	162216	N/A	Pcp2	004630	142431	121403	Unc80	055567	187179	N/A
Fam102a	039157	136816	N/A	Pcp2	004630	133459	122902	Unc80	055567	152844	117070
Fam102a	039157	133512	116809	Pcp2	004630	004749	004749	Uncx	029546	172997	134067
Fam102a	039157	048375	044731	Pcp2	004630	128566	146683	Uncx	029546	174792	139081
Fam102a	039157	133366	118624	Pcp2	004630	144977	146399	Upp1	020407	020677	020677
Fam102a	039157	147723	N/A	Pcp4	090223	061739	062539	Upp1	020407	101525	099063
Fam107b	026655	226435	154419	Pcsk6	030513	176199	135851	Upp1	020407	170444	125934
Fam107b	026655	115052	110704	Pcsk6	030513	055576	053742	Upp1	020407	130522	123285
Fam107b	026655	115055	110707	Pcsk6	030513	098391	095992	Upp1	020407	168121	N/A
Fam107b	026655	115054	110706	Pcsk6	030513	176209	135033	Upp1	020407	172452	129787
Fam107b	026655	027965	027965	Pcsk6	030513	177369	N/A	Upp1	020407	166455	129276
Fam107b	026655	115053	110705	Pcsk6	030513	177272	N/A	Upp1	020407	146696	N/A
Fam107b	026655	177125	135757	Pcx	024892	224726	153479	Upp1	020407	164791	127473
Fam107b	026655	177037	135325	Pcx	024892	223659	N/A	Usp11	031066	033383	033383
Fam107b	026655	176254	135846	Pcx	024892	225189	152918	Usp11	031066	127294	N/A
Fam114a1	029185	031080	031080	Pcx	024892	113825	109456	Usp11	031066	137101	N/A
Fam114a1	029185	139366	119284	Pcx	024892	068004	063825	Usp11	031066	149960	N/A
Fam117a	038893	037502	049162	Pdc	006007	191228	141136	Uty	068457	143286	115113
Fam117a	038893	129553	N/A	Pdc	006007	186572	140843	Uty	068457	154666	122818
Fam117a	038893	143482	N/A	Pdc	006007	185698	140669	Uty	068457	069309	070012
Fam117a	038893	129290	N/A	Pdc	006007	165062	131631	Uty	068457	139365	114752
Fam117a	038893	155999	N/A	Pde1a	059173	102655	099715	Uty	068457	154004	114910
Fam117a	038893	132357	N/A	Pde1a	059173	183775	139327	Uty	068457	185837	N/A
Fam124a	035184	162987	N/A	Pde1a	059173	102653	099713	Uty	068457	143958	120069
Fam124a	035184	161899	N/A	Pde1a	059173	090756	088260	Uty	068457	137048	119406
Fam124a	035184	039064	047681	Pde1a	059173	102652	099712	Uty	068457	133976	N/A
Fam124a	035184	160745	N/A	Pde1a	059173	102651	099711	Uty	068457	157073	N/A
Retreg1	022270	022881	022881	Pde1a	059173	134739	120188	Uty	068457	150715	116372
Retreg1	022270	228600	154407	Pde1a	059173	146076	N/A	Uty	068457	154527	N/A
Retreg1	022270	228327	154377	Pde1a	059173	125887	N/A	Slc18a3	100241	191501	139829
Retreg1	022270	227275	154471	Pde1a	059173	102654	099714	Vamp1	030337	032487	032487
Retreg1	022270	226750	154791	Pde1b	022489	226468	153865	Vamp1	030337	100942	098503
Retreg1	022270	226438	154765	Pde1b	022489	023132	023132	Vamp1	030337	063588	063466
Retreg1	022270	110438	106068	Pde1b	022489	226493	154483	Vamp1	030337	205223	144835
Retreg1	022270	228306	154070	Pde1b	022489	227955	153722	Vamp1	030337	160523	N/A
Fam171b	048388	051454	062702	Pde1b	022489	227925	N/A	Vamp1	030337	159547	N/A
Fam171b	048388	148184	N/A	Pde1c	004347	044505	046601	Vat1l	046844	142591	N/A
Fam196a	073805	210055	N/A	Pde1c	004347	203372	145508	Vat1l	046844	049509	053431
Fam196a	073805	171394	129222	Pde1c	004347	203967	N/A	Vat1l	046844	150963	116680
Fam196a	073805	210826	N/A	Pde1c	004347	114327	109966	Vat1l	046844	124143	N/A
Fam198b	027955	118853	114093	Pde1c	004347	170774	133170	Vav2	009621	185188	138964
Fam198b	027955	145992	120603	Pde1c	004347	203462	145419	Vav2	009621	056176	062782
Fam198b	027955	135021	117199	Pde1c	004347	168944	128364	Vav2	009621	149758	N/A
Fam198b	027955	193204	N/A	Pde1c	004347	166102	131350	Vav2	009621	148067	N/A
Fam198b	027955	029567	029567	Pde1c	004347	166890	131892	Vav2	009621	146843	N/A
Fam19a1	059187	122120	113152	Pde1c	004347	164752	129185	Vav2	009621	135584	N/A
Fam19a1	059187	075080	074589	Pde1c	004347	164037	130139	Vav2	009621	132642	N/A
Fam19a1	059187	129844	N/A	Pde1c	004347	204821	N/A	Vax2	034777	037807	035976
Fam19a1	059187	125951	N/A	Pde1c	004347	203492	N/A	Vcan	021614	159910	125446
Fam19a4	046500	089295	086710	Pde1c	004347	203689	N/A	Vcan	021614	159337	125432
Fam19a4	046500	203930	N/A	Pde3b	030671	032909	032909	Vcan	021614	160029	N/A
Fam20a	020614	155559	116687	Pde3b	030671	140007	N/A	Vcan	021614	109546	105173
Fam20a	020614	020938	020938	Pde3b	030671	210411	N/A	Vcan	021614	109543	105170
Fam20a	020614	146408	N/A	Pde3b	030671	149455	N/A	Vcan	021614	109544	105171

Fam20a	020614	144972	N/A	Pde4d	021699	133929	N/A	Vcan	021614	162715	125521
Fam222b	037750	073705	073384	Pde4d	021699	151111	N/A	Vcan	021614	160740	125694
Fam222b	037750	100782	126620	Pde4d	021699	122041	113488	Vcan	021614	159285	125674
Fam222b	037750	155571	121832	Pde4d	021699	129374	N/A	Vgll4	030315	152710	N/A
Fam46a	032265	034802	034802	Pde4d	021699	138938	N/A	Vgll4	030315	032459	032459
Fam46a	032265	187711	140869	Pde4d	021699	120671	112991	Vgll4	030315	123478	N/A
Fam49b	022378	063838	066359	Pde4d	021699	153234	121592	Vgll4	030315	155620	N/A
Fam49b	022378	164532	132486	Pde4d	021699	119507	114089	Vgll4	030315	147639	123139
Fam49b	022378	228226	154320	Pde4d	021699	079975	078891	Vgll4	030315	139640	118618
Fam49b	022378	228908	154547	Pde4d	021699	135275	119583	Vgll4	030315	204693	N/A
Fam49b	022378	227024	153790	Pde4d	021699	074103	073742	Vim	026728	141365	114742
Fam49b	022378	226675	154205	Pde4d	021699	134973	N/A	Vim	026728	028062	028062
Fam49b	022378	227118	N/A	Pde4d	021699	152630	N/A	Vim	026728	193675	141494
Fam49b	022378	226129	N/A	Pde4d	021699	119672	113567	Vim	026728	155605	N/A
Fam69a	029270	031198	031198	Pde4d	021699	120664	113024	Vim	026728	191615	N/A
Fam69a	029270	145239	117801	Pde4d	021699	151429	N/A	Vim	026728	148248	N/A
Fam69a	029270	153172	114892	Pde4d	021699	117879	112774	Vip	019772	019906	019906
Fam84a	020607	020926	020926	Pde4d	021699	117420	113610	Vip	019772	217331	N/A
Fam84a	020607	221405	152642	Pde4d	021699	155459	114945	Vipr2	011171	176078	N/A
Fam89a	043068	055257	058156	Pde4d	021699	177907	136485	Vipr2	011171	011315	011315
Fam92b	042269	048786	038825	Pde5a	053965	066728	069011	Vipr2	011171	100988	N/A
Fam92b	042269	153177	N/A	Pde5a	053965	200389	143042	Vipr2	011171	175785	N/A
Fam92b	042269	135567	134033	Pde5a	053965	198314	N/A	Vipr2	011171	177199	N/A
Fam92b	042269	142478	N/A	Pde5a	053965	199253	N/A	Vipr2	011171	176433	135149
Fat1	070047	191428	140596	Pde7b	019990	020165	020165	Vit	024076	024880	024880
Fat1	070047	189017	140765	Pde7b	019990	169016	130596	Vmp1	018171	018315	018315
Fat1	070047	215588	149194	Pde7b	019990	169404	132378	Vmp1	018171	123590	N/A
Fat1	070047	186342	139921	Pde7b	019990	170265	126324	Vmp1	018171	145846	N/A
Fat1	070047	189367	N/A	Pde7b	019990	164195	126913	Vmp1	018171	150176	N/A
Fat1	070047	098796	096394	Pde7b	019990	217240	N/A	Vmp1	018171	153971	N/A
Fat2	055333	068853	067556	Pde7b	019990	170683	N/A	Vmp1	018171	127267	N/A
Fat2	055333	108864	104492	Pde7b	019990	166147	N/A	Vmp1	018171	139040	N/A
Fbln2	064080	113498	109126	Pde8a	025584	026672	026672	Vmp1	018171	143991	118302
Fbln2	064080	041544	048334	Pde8a	025584	128154	N/A	Vsig2	001943	002008	002008
Fbln2	064080	153364	120101	Pde8a	025584	130494	N/A	Vsig2	001943	215957	149703
Fbln2	064080	132021	116456	Pde8b	021684	162412	124409	Vsig2	001943	215271	150115
Fbln2	064080	203406	N/A	Pde8b	021684	162670	125237	Vsig2	001943	213502	N/A
Fbln2	064080	134974	116302	Pde8b	021684	162292	124068	Vsig2	001943	213699	149098
Fbln2	064080	147371	N/A	Pde8b	021684	162882	N/A	Vsig2	001943	215710	N/A
Fbln2	064080	134286	N/A	Pde8b	021684	162153	124704	Vsnl1	054459	220506	152711
Fbln2	064080	137029	N/A	Pde8b	021684	172104	128987	Vsnl1	054459	072299	072145
Fbn1	027204	028633	028633	Pde8b	021684	067082	070465	Vstm2b	039257	044705	044002
Fbn1	027204	148272	N/A	Pde8b	021684	022192	022192	Vstm2b	039257	206223	145703
Fbn1	027204	103234	099524	Pde8b	021684	159608	125191	Vstm2b	039257	186352	140241
Fbn2	024598	025497	025497	Pde8b	021684	160957	125115	Vstm2b	039257	205845	146231
Fchsd2	030691	208439	146962	Pde8b	021684	160412	N/A	Vwc2	050830	109681	105303
Fchsd2	030691	032931	032931	Pde8b	021684	162328	N/A	Vwc2	050830	129670	128761
Fchsd2	030691	098250	095850	Pde8b	021684	159598	124447	Vwc2	050830	154155	N/A
Fchsd2	030691	137196	N/A	Pde8b	021684	162716	N/A	Vwc2	050830	056344	049692
Fchsd2	030691	145802	N/A	Pde9a	041119	047168	038005	Galnt17	034040	086023	083187
Fchsd2	030691	142727	N/A	Pde9a	041119	143549	117911	Galnt17	034040	160609	125395
Fchsd2	030691	130426	N/A	Pde9a	041119	131417	115188	Galnt17	034040	160807	N/A
Fchsd2	030691	208063	N/A	Pde9a	041119	134525	121003	Galnt17	034040	161228	N/A
Fchsd2	030691	151693	N/A	Pde9a	041119	127929	117611	Galnt17	034040	162966	N/A
Fchsd2	030691	208638	N/A	Pde9a	041119	137927	121126	Wdr17	039375	144711	117710
Fchsd2	030691	208917	N/A	Pde9a	041119	124902	118869	Wdr17	039375	127511	115550
Fezf2	021743	224714	153090	Pde9a	041119	154567	N/A	Wdr17	039375	175915	135805
Fezf2	021743	022262	022262	Pde9a	041119	141314	117364	Wdr17	039375	128850	N/A
Fezf2	021743	224023	153647	Pde9a	041119	136384	116724	Wdr17	039375	150488	122326

Fgd3	037946	110087	105714	Pde9a	041119	130547	N/A	Wdr17	039375	153074	N/A
Fgd3	037946	048716	048692	Pde9a	041119	155395	N/A	Wdr17	039375	144482	134950
Fgd3	037946	110086	105713	Pde9a	041119	154392	117065	Wdr17	039375	126316	N/A
Fgd4	022788	161861	125174	Pde9a	041119	155113	N/A	Wdr17	039375	129132	134935
Fgd4	022788	162671	125736	Pdgfc	028019	029652	029652	Wdr17	039375	148806	N/A
Fgd4	022788	069284	069573	Pdgfc	028019	129285	118970	Wdr17	039375	176866	134978
Fgd4	022788	172181	N/A	Pdgfc	028019	143721	122047	Wdr17	039375	148408	135523
Fgd4	022788	162045	N/A	Pdgfd	032006	058692	056240	Wdr17	039375	176180	N/A
Fgd4	022788	162124	N/A	Pdgfd	032006	168039	128388	Wdr49	104301	193989	144721
Fgd4	022788	159542	125649	Pdgfd	032006	214892	149162	Wdr49	104301	203169	144789
Fgd4	022788	159058	N/A	Pdgfra	029231	202681	143906	Wdr49	104301	204982	N/A
Fgd4	022788	162414	N/A	Pdgfra	029231	000476	000476	Wdr49	104301	204341	145379
Fgd4	022788	162542	N/A	Pdgfra	029231	202186	144543	Wfdc1	023336	212901	148437
Fgd4	022788	161624	N/A	Pdgfra	029231	201711	143891	Wfdc1	023336	024107	024107
Fgd4	022788	161188	123763	Pdgfra	029231	201241	N/A	Wfs1	039474	043964	048053
Fgd6	020021	020208	020208	Pdgfra	029231	202161	144485	Wfs1	039474	166339	132404
Fgd6	020021	141143	N/A	Pdgfra	029231	168162	127173	Wfs1	039474	167937	125779
Fgd6	020021	125535	N/A	Pdgfra	029231	202992	144132	Wif1	020218	020439	020439
Fgf13	031137	033473	033473	Pdgfra	029231	200822	144634	Wif1	020218	175867	135486
Fgf13	031137	138503	N/A	Pdk3	035232	045748	036604	Wif1	020218	145691	N/A
Fgf13	031137	123660	N/A	Pdk3	035232	134502	N/A	Wipi1	041895	103060	099349
Fgf13	031137	124402	114905	Pdk3	035232	154717	N/A	Wipi1	041895	047186	038635
Fgf13	031137	145767	119897	Pdlim4	020388	018755	018755	Wipi1	041895	106689	102300
Fgf13	031137	119833	113639	Pdlim4	020388	093109	090797	Wipi1	041895	153738	N/A
Fgf13	031137	131319	115765	Pdlim4	020388	144477	121248	Wls	028173	068952	067898
Fgf13	031137	119306	113206	Pdlim4	020388	127271	N/A	Wls	028173	198878	143475
Fgf13	031137	150413	N/A	Pdlim4	020388	151948	N/A	Wls	028173	200571	N/A
Fgfr1	031565	155564	117884	Pdzd3	032105	034618	034618	Wls	028173	197328	N/A
Fgfr1	031565	084027	081041	Pdzd3	032105	213186	N/A	Wls	028173	200191	142774
Fgfr1	031565	119398	113855	Pdzph1	024227	177108	N/A	Wls	028173	196276	N/A
Fgfr1	031565	117179	113909	Pdzph1	024227	025064	025064	Wls	028173	196782	N/A
Fgfr1	031565	148322	N/A	Pdzph1	024227	177360	135180	Wnt6	033227	006716	006716
Fgfr1	031565	210778	N/A	Pdzrn4	036218	169942	133159	Wnt6	033227	189544	N/A
Fgfr1	031565	124228	116564	Pdzrn4	036218	035399	040456	Wnt7a	030093	032180	032180
Fgfr1	031565	210846	148032	Pea15a	013698	013842	013842	Wnt7a	030093	133092	N/A
Fgfr1	031565	167764	131343	Pea15a	013698	111247	106878	Wnt7a	030093	132936	N/A
Fgfr1	031565	138104	148135	Pea15a	013698	125361	N/A	Wscd1	020811	150531	123659
Fgfr1	031565	138455	147898	Pea15a	013698	155109	117735	Wscd1	020811	021168	021168
Fgfr1	031565	126118	N/A	Pea15a	013698	152432	N/A	Wscd1	020811	108511	104151
Fgfr1	031565	210504	N/A	Peg3	002265	051209	050750	Wscd1	020811	138339	N/A
Fgfr1	031565	120106	N/A	Peg3	002265	150182	116161	Wscd1	020811	108510	104150
Fgfr1	031565	211419	N/A	Peg3	002265	143703	122423	Wscd1	020811	132095	N/A
Fgfr1	031565	145218	N/A	Peg3	002265	155910	N/A	Wwc1	018849	018993	018993
Fgfr1	031565	133936	N/A	Penk	045573	070375	066822	Wwc1	018849	131001	N/A
Fgfr1	031565	179592	136640	Penk	045573	133567	122389	Wwc1	018849	127086	N/A
Fgfr1	031565	178276	137515	Pet100	087687	208950	146433	Xist	086503	153883	N/A
Fgfr2	030849	120187	113248	Pet100	087687	208185	N/A	Xist	086503	127786	N/A
Fgfr2	030849	124096	130971	Pet100	087687	156380	137626	Xist	086503	185876	N/A
Fgfr2	030849	153166	120100	Pet100	087687	207257	N/A	Xrra1	035211	036155	035929
Fgfr2	030849	117872	113994	Pet100	087687	207428	146950	Xrra1	035211	208354	146815
Fgfr2	030849	130557	N/A	Pet100	087687	207389	146942	Xrra1	035211	207855	147177
Fgfr2	030849	122054	112430	Pex5l	027674	194016	142196	Xrra1	035211	208270	N/A
Fgfr2	030849	136264	N/A	Pex5l	027674	193681	141454	Xrra1	035211	208449	N/A
Fgfr2	030849	121064	113452	Pex5l	027674	192093	141387	Yes1	014932	202543	144001
Fgfr2	030849	117754	113187	Pex5l	027674	193289	142008	Yes1	014932	072311	072154
Fgfr2	030849	120715	113474	Pex5l	027674	078226	077353	Yes1	014932	200779	N/A
Fgfr2	030849	119260	113010	Pex5l	027674	108224	103859	Yes1	014932	168707	132161
Fgfr2	030849	117089	112992	Pex5l	027674	108226	103861	Yes1	014932	200999	144355
Fgfr2	030849	117691	113180	Pex5l	027674	108221	103856	Zbtb16	066687	093852	091374

Fgfr2	030849	117858	112623	Pex5l	027674	108219	N/A	Zbtb16	066687	216150	150887
Fgfr2	030849	120141	113415	Pex5l	027674	155264	N/A	Zcchc24	055538	069180	068677
Fgfr2	030849	117357	112580	Pex5l	027674	194627	N/A	Zcchc24	055538	184642	N/A
Fgfr2	030849	122448	113993	Pex5l	027674	108225	103860	Zdhhc14	034265	089185	086589
Fgfr2	030849	118296	112471	Pfkfb4	025648	198140	142378	Zdhhc2	039470	049389	041727
Fgfr2	030849	121080	112585	Pfkfb4	025648	051873	057197	Zdhhc2	039470	131672	N/A
Fgfr2	030849	117073	112672	Pfkfb4	025648	198277	N/A	Zdhhc2	039470	128166	123070
Fgfr2	030849	129542	N/A	Pfkfb4	025648	199620	N/A	Zdhhc2	039470	164934	N/A
Fgfr2	030849	147859	N/A	Pfkfb4	025648	196249	143249	Zdhhc2	039470	168799	N/A
Fgfr2	030849	133806	N/A	Pfkfb4	025648	199591	142992	Zdhhc2	039470	167766	129996
Fgfr2	030849	148675	N/A	Pfkfb4	025648	199184	N/A	Zeb2	026872	176438	134849
Fgfr2	030849	127091	122856	Pfkfb4	025648	200229	N/A	Zeb2	026872	176732	135393
Fgfr2	030849	129103	N/A	Pfkfb4	025648	200015	142339	Zeb2	026872	028229	028229
Fgfr2	030849	208844	N/A	Pfkfb4	025648	198763	N/A	Zeb2	026872	068415	069685
Fgfr3	054252	201437	144379	Pfkm	033065	163507	132803	Zeb2	026872	200844	144421
Fgfr3	054252	067150	070998	Pfkm	033065	051226	059801	Zeb2	026872	177302	134747
Fgfr3	054252	164207	133064	Pfkp	021196	131648	N/A	Zeb2	026872	076836	076111
Fgfr3	054252	087820	085122	Pfkp	021196	138703	117030	Zeb2	026872	201804	144637
Fgfr3	054252	202182	143936	Pfkp	021196	021614	021614	Zeb2	026872	201623	144075
Fgfr3	054252	134610	N/A	Pfkp	021196	142972	114439	Zeb2	026872	202432	144197
Fgfr3	054252	155002	119941	Pfkp	021196	154100	116523	Zeb2	026872	201211	144406
Fgfr3	054252	181298	143963	Pfkp	021196	133041	123662	Zeb2	026872	209076	N/A
Fgfr3	054252	132724	N/A	Pfkp	021196	142372	N/A	Zeb2	026872	201413	N/A
Fgfr3	054252	201295	144104	Pfkp	021196	151894	N/A	Zeb2	026872	201969	144141
Fgfr3	054252	202791	143797	Pfkp	021196	144053	N/A	Zeb2	026872	131635	N/A
Fgfr3	054252	152661	N/A	Pfkp	021196	148999	N/A	Zeb2	026872	202935	143841
Fgfr3	054252	142860	N/A	Pfkp	021196	135761	N/A	Zeb2	026872	202371	N/A
Fgfr3	054252	202138	143945	Pfkp	021196	137327	N/A	Zeb2	026872	145529	N/A
Fgfr3	054252	169212	130856	Pfkp	021196	136585	115313	Zeb2	026872	202187	144552
Fgfr3	054252	114411	110053	Pgghg	062031	164337	N/A	Zeb2	026872	127520	120130
Fgfr3	054252	171509	131845	Pgghg	062031	164580	128214	Zeb2	026872	201490	143976
Fggy	028573	079223	078216	Pgghg	062031	169736	N/A	Zeb2	026872	153561	135491
Fggy	028573	176162	N/A	Pgghg	062031	168084	N/A	Zeb2	026872	152232	N/A
Fggy	028573	141248	N/A	Pgghg	062031	079403	078372	Zeb2	026872	124942	N/A
Fggy	028573	177394	134881	Pgghg	062031	163094	128478	Zeb2	026872	201982	N/A
Fggy	028573	043335	043460	Pgm2l1	030729	084935	081998	Zeb2	026872	201298	N/A
Fggy	028573	147783	N/A	Pgm2l1	030729	208158	N/A	Zeb2	026872	202345	N/A
Fggy	028573	150830	115546	Pgm2l1	030729	162108	124851	Zeb2	026872	123037	N/A
Fggy	028573	134012	115859	Pgm2l1	030729	054436	054782	Zeb2	026872	126743	N/A
Fggy	028573	131654	116264	Pgr	031870	070463	063562	Zfand6	030629	209117	146518
Fggy	028573	107091	102706	Pgr	031870	098986	096584	Zfand6	030629	069537	069228
Fggy	028573	176840	N/A	Pgr	031870	151080	N/A	Zfand6	030629	178385	135968
Fggy	028573	147766	N/A	Pgr	031870	189181	140124	Zfand6	030629	209140	N/A
Fggy	028573	143742	117386	Phf21b	016624	016768	016768	Zfand6	030629	209165	146878
Fggy	028573	125742	N/A	Phf21b	016624	162996	N/A	Zfand6	030629	207865	146682
Fggy	028573	153119	N/A	Phf21b	016624	159939	125355	Zfand6	030629	208782	147192
Fggy	028573	130541	115688	Phf21b	016624	162044	124941	Zfand6	030629	208519	N/A
Fggy	028573	156223	118147	Phf21b	016624	159502	N/A	Zfand6	030629	208831	N/A
Fggy	028573	142384	123407	Phf21b	016624	160389	N/A	Zfand6	030629	207975	146559
Fhl3	032643	106199	101805	Phf24	036062	151824	N/A	Zfhx4	025255	175866	135827
Fhl3	032643	145942	121702	Phf24	036062	132173	138443	Zfhx4	025255	175641	N/A
Fhl3	032643	038684	040150	Phf24	036062	107975	103609	Zfhx4	025255	176175	139253
Fhl5	028259	029922	029922	Phf24	036062	107976	103610	Zfhx4	025255	176383	135289
Fhl5	028259	108204	103839	Phf24	036062	069184	071011	Zfhx4	025255	026284	026284
Fign	075324	131615	122855	Phf24	036062	124380	138593	Zfp36l1	021127	021552	021552
Fign	075324	102728	124338	Phf24	036062	139100	138130	Zfp36l1	021127	219642	151682
Fign	075324	153538	N/A	Phf24	036062	138425	115816	Zfp36l1	021127	218835	151269
Fign	075324	126042	N/A	Phf24	036062	131234	138332	Zfp36l1	021127	165114	127522
Filip1l	043336	159816	124179	Phkg1	025537	026617	026617	Zfp385c	014198	103119	099408

Filip1l	043336	099667	133252	Phkg1	025537	154932	122040	Zfp385c	014198	148560	N/A
Filip1l	043336	159414	124069	Phkg1	025537	140667	117510	Zfp385c	014198	151589	119259
Fli1	016087	016231	016231	Phkg1	025537	154495	N/A	Zfp385c	014198	153494	115268
Fli1	016087	183767	138984	Phkg1	025537	200832	N/A	Zfp395	034522	224623	153350
Flrt2	047414	057324	062171	Phkg1	025537	200922	N/A	Zfp395	034522	225865	N/A
Flrt2	047414	110117	105744	Phox2a	007946	008090	008090	Zfp395	034522	066994	064422
Flt3	042817	049324	039041	Phox2a	007946	209878	N/A	Zfp395	034522	224687	153406
Flt3	042817	110549	N/A	Phyhip	003469	003561	003561	Zfp395	034522	225512	N/A
Fmnl1	055805	042286	046296	Phyhip	003469	159180	125254	Zfp423	045333	165770	129724
Fmnl1	055805	218163	151439	Pid1	045658	168574	127716	Zfp423	045333	109655	105282
Fmnl1	055805	107027	102642	Pid1	045658	176559	135164	Zfp423	045333	052250	052379
Fmnl1	055805	126425	N/A	Pid1	045658	175948	N/A	Zfp423	045333	174764	134575
Fmnl1	055805	154871	N/A	Pid1	045658	176720	134961	Zfp423	045333	174249	134103
Fmnl1	055805	021322	N/A	Pid1	045658	175996	134979	Zfp423	045333	173725	N/A
Fmnl1	055805	129726	133299	Pid1	045658	176822	135425	Zfp423	045333	173092	N/A
Fmo3	026691	028010	028010	Pid1	045658	177458	135120	Zfp462	060206	133895	122775
Fmo3	026691	142759	N/A	Pid1	045658	187992	N/A	Zfp462	060206	098070	095677
Fndc3b	039286	195008	141620	Piezo2	041482	047480	040019	Zfp462	060206	030131	030131
Fndc3b	039286	046157	041495	Piezo2	041482	137141	117107	Zfp462	060206	079605	078555
Fndc3b	039286	191684	N/A	Piezo2	041482	132576	N/A	Zfp521	024420	025288	025288
Fndc3b	039286	193779	141888	Piezo2	041482	123322	N/A	Zfp608	052713	064763	068192
Folh1	001773	001824	001824	Piezo2	041482	183217	138758	Zfp804b	092094	200317	143568
Folh1	001773	107271	102892	Piezo2	041482	182233	138170	Zfp804b	092094	164784	130571
Folh1	001773	209082	N/A	Piezo2	041482	182166	138754	Zfp831	050600	059452	060255
Fosb	003545	003640	003640	Piezo2	041482	182177	N/A	Zic1	032368	034927	034927
Fosb	003545	207334	147210	Piezo2	041482	046860	036099	Zic1	032368	065360	068858
Fosb	003545	208505	146525	Piga	031381	208741	147146	Zic1	032368	173121	N/A
Fosb	003545	207716	146949	Piga	031381	112257	137831	Zic2	061524	075888	075283
Fosb	003545	208326	146569	Piga	031381	033754	033754	Zic2	061524	137059	N/A
Fosb	003545	208446	146789	Piga	031381	151911	138077	Zic3	067860	137687	116383
Fosb	003545	208230	N/A	Piga	031381	208697	146731	Zic3	067860	088627	085999
Foxa1	035451	044380	041118	Piga	031381	208261	146808	Zic3	067860	088631	086003
Foxa1	035451	218398	N/A	Piga	031381	112255	107874	Zic3	067860	088629	086001
Foxa2	037025	109964	105590	Piga	031381	133813	122176	Zic4	036972	173342	133974
Foxa2	037025	047315	045918	Piga	031381	155849	N/A	Zic4	036972	172978	N/A
Foxa2	037025	172928	134081	Pigh	021120	072154	072018	Zic4	036972	173054	134364
Foxa2	037025	146242	N/A	Pigh	021120	217998	151930	Zic4	036972	174611	N/A
Foxg1	020950	135006	N/A	Pigh	021120	217979	N/A	Zic4	036972	172646	134053
Foxg1	020950	154930	N/A	Pigs	041958	048073	044871	Zic4	036972	170572	N/A
Foxg1	020950	179669	136372	Pigz	045625	052174	057509	Zic4	036972	174212	133808
Foxg1	020950	021333	021333	Pigz	045625	151412	N/A	Zic4	036972	173933	133958
Foxh1	033837	037824	036591	Pigz	045625	134928	N/A	Zic4	036972	174802	N/A
Foxp4	023991	113265	108890	Pigz	045625	134666	N/A	Zic4	036972	172858	N/A
Foxp4	023991	113263	108888	Pih1h3b	042433	044806	048754	Zic4	036972	066384	069568
Foxp4	023991	097311	094916	Pik3c2b	026447	153707	115469	Zic4	036972	085242	N/A
Foxp4	023991	113262	108887	Pik3c2b	026447	145153	N/A	Zic5	041703	039118	035754
Foxp4	023991	136314	N/A	Pik3c2b	026447	124934	N/A	Zic5	041703	143084	N/A
Foxp4	023991	154108	N/A	Pik3c2b	026447	077730	076911	Zkscan1	029729	019660	019660
Foxp4	023991	137039	N/A	Pik3r1	041417	055518	056774	Zkscan1	029729	110963	106588
Foxp4	023991	153752	N/A	Pik3r1	041417	035532	047004	Zkscan1	029729	110962	106587
Frem1	059049	107230	102849	Pik3r1	041417	187009	140256	Zkscan1	029729	066617	068480
Frem1	059049	127886	122467	Pik3r1	041417	185795	140312	Zmat4	037492	131410	115719
Frem1	059049	131102	N/A	Pik3r1	041417	190171	N/A	Zmat4	037492	042352	049430
Frem1	059049	130889	N/A	Pik3r1	041417	185701	N/A	Zmat4	037492	123412	121626
Frem1	059049	141841	N/A	Pik3r1	041417	189426	N/A	Zmat4	037492	208021	N/A
Frem1	059049	133610	N/A	Pitpnm3	040543	075258	074737	Zmat4	037492	207301	146734
Frem1	059049	071708	071627	Pitpnm3	040543	134210	N/A	Zmat4	037492	135747	121337
								Zmat4	037492	146774	N/A

[0062] For human samples, Table 4 provides the unique ENSEMBL identifiers corresponding to the human genes (ENSG), transcripts (ENST), and proteins (if available) (ENSP) analyzed in the experiments herein. The unique identifiers for each ENSEMBL entry has been modified to remove the first five leading zeros (0) of the identifier after the ENSG, ENST, and ENSP label.

Table 4. ENSEMBL IDs for humans

Symbol	ENSG	ENST	SEQ ID	ENSP	SEQ ID	Symbol	ENSG	ENST	SEQ ID	ENSP	SEQ ID	Symbol	ENSG	ENST	SEQ ID	ENSP	SEQ ID
A2M	175899	543436	1	N/A		GABBR1	232569	489750	7939	N/A		PLD1	075651	463281	15877	N/A	
A2M	175899	495442	2	N/A		GABBR1	232569	461230	7940	N/A		PLD1	075651	356327	15878	348681	33603
A2M	175899	495709	3	N/A		GABBR1	232569	467296	7941	N/A		PLD1	075651	351298	15879	342793	33604
A2M	175899	318602	4	323929	23816	GABBR1	232569	481333	7942	N/A		PLD1	075651	446289	15880	395556	33605
A2M	175899	545828	5	N/A		GABBR1	232569	547410	7943	448531	28716	PLD1	075651	465816	15881	N/A	
A2M	175899	542567	6	N/A		GABBR1	232569	546913	7944	448999	28717	PLD1	075651	467432	15882	N/A	
A2M	175899	462568	7	N/A		GABBR1	206466	383542	7945	373034	28718	PLD1	075651	471075	15883	N/A	
A2M	175899	546069	8	438599	23817	GABBR1	206466	383537	7946	373029	28719	PLD1	075651	481505	15884	N/A	
A2M	175899	472360	9	N/A		GABBR1	206466	383541	7947	373033	28720	PLD1	075651	498278	15885	N/A	
A2M	175899	539638	10	445717	23818	GABBR1	206466	495291	7948	N/A		PLD1	075651	475273	15886	N/A	
A2M	175899	404455	11	385710	23819	GABBR1	206466	489481	7949	N/A		PLD1	075651	440204	15887	391164	33606
A2M	175899	467091	12	N/A		GABBR1	206466	482350	7950	N/A		PLD1	075651	418087	15888	400639	33607
A2M	175899	497324	13	N/A		GABBR1	206466	498610	7951	N/A		PLD1	075651	489995	15889	N/A	
AASS	008311	460376	14	N/A		GABBR1	206466	383543	7952	373035	28721	PLD1	075651	460926	15890	N/A	
AASS	008311	393376	15	377040	23820	GABBR1	206466	493602	7953	N/A		PLD1	075651	497307	15891	N/A	
AASS	008311	473553	16	N/A		GABBR1	206466	471385	7954	N/A		PLD1	075651	627725	15892	486967	33608
AASS	008311	417368	17	403768	23821	GABBR1	206466	462863	7955	N/A		PLD1	075651	331659	15893	328422	33609
AASS	008311	431170	18	414001	23822	GABBR1	206466	478066	7956	N/A		PLD4	166428	540372	15894	438677	33610
AASS	008311	358954	19	351834	23823	GABBR1	206466	552399	7957	449449	28722	PLD4	166428	392593	15895	376372	33611
AASS	008311	426162	20	394180	23824	GABBR1	232632	438094	7958	406285	28723	PLD4	166428	557573	15896	451278	33612
AATK	181409	326724	21	324196	23825	GABBR1	232632	460735	7959	N/A		PLD4	166428	472901	15897	N/A	
AATK	181409	570932	22	460986	23826	GABBR1	232632	486623	7960	N/A		PLD4	166428	472702	15898	N/A	
AATK	181409	374792	23	363924	23827	GABBR1	232632	434660	7961	412167	28724	PLD4	166428	553861	15899	451636	33613
AATK	181409	417379	24	398796	23828	GABBR1	232632	423604	7962	388035	28725	PLD5	180287	536534	15900	440896	33614
AATK	181409	573469	25	N/A		GABBR1	232632	414980	7963	406499	28726	PLD5	180287	314833	15901	314748	33615
AATK	181409	573441	26	N/A		GABBR1	232632	483304	7964	N/A		PLD5	180287	366545	15902	355503	33616
AATK	181409	572339	27	N/A		GABBR1	232632	470098	7965	N/A		PLD5	180287	467561	15903	440132	33617
AATK	181409	576053	28	N/A		GABBR1	232632	487021	7966	N/A		PLD5	180287	474177	15904	N/A	
AATK	181409	575363	29	460202	23829	GABBR1	232632	474366	7967	N/A		PLD5	180287	459864	15905	438191	33618
AATK	181409	572798	30	N/A		GABBR1	232632	468622	7968	N/A		PLD5	180287	442594	15906	414188	33619
ABAT	183044	268251	31	268251	23830	GABBR1	232632	463819	7969	N/A		PLD5	180287	427495	15907	401285	33620
ABAT	183044	564714	32	456392	23831	GABBR1	232632	548767	7970	446983	28727	PLEKHD1	175985	556123	15908	N/A	
ABAT	183044	563992	33	N/A		GABBR1	237051	418225	7971	416731	28728	PLEKHD1	175985	322564	15909	317175	33621
ABAT	183044	568847	34	455184	23832	GABBR1	237051	458612	7972	416903	28729	PLEKHG3	126822	555982	15910	450501	33622
ABAT	183044	561870	35	456267	23833	GABBR1	237051	440316	7973	412044	28730	PLEKHG3	126822	634379	15911	489373	33623
ABAT	183044	569695	36	N/A		GABBR1	237051	496339	7974	N/A		PLEKHG3	126822	247226	15912	247226	33624
ABAT	183044	566590	37	455198	23834	GABBR1	237051	491155	7975	N/A		PLEKHG3	126822	554088	15913	450880	33625
ABAT	183044	563215	38	N/A		GABBR1	237051	475876	7976	N/A		PLEKHG3	126822	554499	15914	451256	33626
ABAT	183044	565016	39	454415	23835	GABBR1	237051	473033	7977	N/A		PLEKHG3	126822	556801	15915	N/A	
ABAT	183044	567812	40	456330	23836	GABBR1	237051	448754	7978	405709	28731	PLEKHG3	126822	490180	15916	N/A	
ABAT	183044	425191	41	411916	23837	GABBR1	237051	464091	7979	N/A		PLEKHG3	126822	471182	15917	450945	33627
ABAT	183044	569156	42	454963	23838	GABBR1	237051	496077	7980	N/A		PLEKHG3	126822	484731	15918	450973	33628
ABAT	183044	562115	43	455502	23839	GABBR1	237051	460802	7981	N/A		PLEKHG3	126822	492928	15919	N/A	
ABAT	183044	565671	44	N/A		GABBR1	237051	482516	7982	N/A		PLEKHG3	126822	394691	15920	378183	33629
ABAT	183044	564453	45	N/A		GABBR1	237051	550820	7983	448763	28732	PLEKHG5	171680	377748	15921	366977	33630
ABAT	183044	396600	46	379845	23840	GABBR2	136928	259455	7984	259455	28733	PLEKHG5	171680	487949	15922	N/A	
ABCA1	165029	374733	47	363865	23841	GABBR2	136928	637410	7985	N/A		PLEKHG5	171680	377725	15923	366954	33631

ABCA1	165029	423487	48	416623	23842	GABBR2	136928	636575	7986	N/A		PLEKHG5	171680	377728	15924	366957	33632
ABCA1	165029	494467	49	N/A		GABBR2	136928	634457	7987	489352	28734	PLEKHG5	171680	377732	15925	366961	33633
ABCA1	165029	374736	50	363868	23843	GABBR2	136928	634354	7988	N/A		PLEKHG5	171680	400915	15926	383706	33634
ABCA17P	238098	512848	51	N/A		GABBR2	136928	635462	7989	N/A		PLEKHG5	171680	377740	15927	366969	33635
ABCA17P	238098	640929	52	N/A		GABBR2	136928	634314	7990	N/A		PLEKHG5	171680	639593	15928	491569	33636
ABCA17P	238098	469908	53	N/A		GABBR2	136928	634919	7991	N/A		PLEKHG5	171680	400913	15929	383704	33637
ABCA17P	238098	482286	54	N/A		GABBR2	136928	477471	7992	N/A		PLEKHG5	171680	535355	15930	441445	33638
ABCA17P	238098	505660	55	N/A		GABBR2	136928	634227	7993	N/A		PLEKHG5	171680	340850	15931	344570	33639
ABCA17P	238098	466730	56	N/A		GABBR2	136928	637717	7994	490789	28735	PLEKHG5	171680	537245	15932	439625	33640
ABCA17P	238098	494925	57	N/A		GABBR2	136928	638001	7995	N/A		PLEKHG5	171680	489097	15933	N/A	
ABCA8	141338	269080	58	269080	23844	GABRA2	151834	510861	7996	421828	28736	PLEKHH1	054690	329153	15934	330278	33641
ABCA8	141338	586539	59	467271	23845	GABRA2	151834	514090	7997	421300	28737	PLEKHH1	054690	558386	15935	N/A	
ABCA8	141338	588458	60	N/A		GABRA2	151834	381620	7998	371033	28738	PLEKHH1	054690	561456	15936	N/A	
ABCA8	141338	586292	61	N/A		GABRA2	151834	356504	7999	348897	28739	PLEKHH1	054690	558981	15937	N/A	
ABCA8	141338	591459	62	N/A		GABRA2	151834	630416	8000	486333	28740	PLEKHH1	054690	557971	15938	N/A	
ABCA8	141338	589980	63	N/A		GABRA2	151834	510233	8001	422642	28741	PLEKHH1	054690	561135	15939	N/A	
ABCA8	141338	541225	64	N/A		GABRA2	151834	507069	8002	427603	28742	PLEKHH1	054690	561370	15940	452988	33642
ABCA8	141338	589533	65	467186	23846	GABRA2	151834	513005	8003	421639	28743	PLEKHH1	054690	558296	15941	N/A	
ABCA8	141338	590359	66	N/A		GABRA2	151834	515082	8004	423840	28744	PLEKHH1	054690	560100	15942	N/A	
ABCA8	141338	587206	67	N/A		GABRA2	151834	514236	8005	425240	28745	PLEKHH1	054690	558366	15943	N/A	
ABCA8	141338	428549	68	N/A		GABRA2	151834	514193	8006	425526	28746	PLEKHH1	054690	559981	15944	N/A	
ABCA8	141338	585850	69	N/A		GABRA2	151834	503806	8007	424362	28747	PLEKHH1	054690	561057	15945	453343	33643
ABCA8	141338	585531	70	466126	23847	GABRA2	151834	506961	8008	424093	28748	PLEKHH1	054690	559766	15946	N/A	
ABCA8	141338	430352	71	402814	23848	GABRA2	151834	507460	8009	422805	28749	PLEKHH1	054690	559832	15947	N/A	
ABCA8	141338	615593	72	481467	23849	GABRA2	151834	509716	8010	N/A		PLEKHH1	054690	559168	15948	453699	33644
ABCC10	124574	372515	73	361593	23850	GABRA2	151834	540012	8011	444409	28750	PLEKHH1	054690	558214	15949	N/A	
ABCC10	124574	502549	74	N/A		GABRA4	109158	264318	8012	264318	28751	PLEKHH2	152527	282406	15950	282406	33645
ABCC10	124574	372530	75	361608	23851	GABRA4	109158	511523	8013	422152	28752	PLEKHH2	152527	405223	15951	N/A	
ABCC10	124574	443426	76	N/A		GABRA4	109158	508560	8014	425445	28753	PLEKHH2	152527	405000	15952	N/A	
ABCC10	124574	244533	77	244533	23852	GABRA4	109158	502874	8015	424386	28754	PLEKHH2	152527	491692	15953	427746	33646
ABCC10	124574	463024	78	N/A		GABRA4	109158	509316	8016	N/A		PLEKHH2	152527	460356	15954	N/A	
ABCC10	124574	469856	79	N/A		GABRA6	145863	522269	8017	N/A		PLEKHH2	152527	480103	15955	N/A	
ABCC10	124574	372512	80	N/A		GABRA6	145863	518888	8018	N/A		PLEKHH2	152527	493408	15956	N/A	
ABCC10	124574	437104	81	N/A		GABRA6	145863	274545	8019	274545	28755	PLEKHH2	152527	490038	15957	430377	33647
ABCC10	124574	505344	82	422699	23853	GABRA6	145863	523217	8020	430527	28756	PLEKHO2	241839	323544	15958	326706	33648
ABCC8	006071	531642	83	435378	23854	GABRA6	145863	524220	8021	N/A		PLEKHO2	241839	616065	15959	483505	33649
ABCC8	006071	526037	84	N/A		GABRA6	145863	520000	8022	429943	28757	PLK2	145632	274289	15960	274289	33650
ABCC8	006071	389817	85	374467	23855	GABRA6	145863	517823	8023	430212	28758	PLK2	145632	502671	15961	N/A	
ABCC8	006071	526168	86	437233	23856	GABRA6	145863	523691	8024	427989	28759	PLK2	145632	511326	15962	N/A	
ABCC8	006071	525022	87	N/A		GABRA6	145863	521520	8025	N/A		PLK2	145632	503378	15963	N/A	
ABCC8	006071	532220	88	N/A		GABRB1	163288	513567	8026	426753	28760	PLK2	145632	505244	15964	N/A	
ABCC8	006071	528374	89	433638	23857	GABRB1	163288	295454	8027	295454	28761	PLK2	145632	503713	15965	N/A	
ABCC8	006071	527905	90	431653	23858	GABRB1	163288	509366	8028	N/A		PLK2	145632	510629	15966	N/A	
ABCC8	006071	531891	91	434893	23859	GABRB1	163288	381582	8029	N/A		PLK2	145632	503115	15967	N/A	
ABCC8	006071	531137	92	N/A		GABRB1	163288	510909	8030	426766	28762	PLK2	145632	515415	15968	N/A	
ABCC8	006071	524561	93	N/A		GABRD	187730	378585	8031	367848	28763	PLK2	145632	509555	15969	N/A	
ABCC8	006071	526921	94	N/A		GABRD	187730	638411	8032	491632	28764	PLK2	145632	509422	15970	N/A	
ABCC8	006071	529967	95	N/A		GABRD	187730	639045	8033	491997	28765	PLK2	145632	508300	15971	N/A	
ABCC8	006071	530147	96	N/A		GABRD	187730	640067	8034	491844	28766	PLK2	145632	514306	15972	N/A	
ABCC8	006071	531911	97	N/A		GABRD	187730	638604	8035	N/A		PLK2	145632	504196	15973	N/A	
ABCC8	006071	532728	98	N/A		GABRD	187730	638771	8036	492435	28767	PLK2	145632	617412	15974	478685	33651
ABCC8	006071	528202	99	N/A		GABRD	187730	639935	8037	N/A		PLK5	185988	454744	15975	468376	33652
ABCC8	006071	635881	100	N/A		GABRD	187730	640949	8038	492500	28768	PLK5	185988	642079	15976	493341	33653
ABCC8	006071	526002	101	N/A		GABRD	187730	640030	8039	491411	28769	PLK5	185988	334770	15977	466248	33654
ABCC8	006071	302539	102	303960	23860	GABRD	187730	640423	8040	N/A		PLK5	185988	588430	15978	465896	33655
ABCC8	006071	612903	103	483031	23861	GABRD	187730	639625	8041	N/A		PLK5	185988	588292	15979	N/A	
ABCG2	118777	515655	104	426917	23862	GABRD	187730	639777	8042	N/A		PLLP	102934	564376	15980	N/A	
ABCG2	118777	237612	105	237612	23863	GABRD	187730	640981	8043	491287	28770	PLLP	102934	613167	15981	481720	33656
ABCG2	118777	505480	106	426916	23864	GABRD	187730	638763	8044	492352	28771	PLLP	102934	219207	15982	219207	33657

ABCG2	118777	503830	107	426934	23865	GABRD	187730	639070	8045	N/A		PLLP	102934	569059	15983	454656	33658
ABHD2	140526	569411	108	457882	23866	GABRD	187730	640892	8046	N/A		PLLP	102934	564018	15984	463575	33659
ABHD2	140526	352732	109	268129	23867	GABRD	187730	640317	8047	N/A		PLOD2	152952	461497	15985	419354	33660
ABHD2	140526	564876	110	N/A		GABRD	187730	638804	8048	491871	28772	PLOD2	152952	282903	15986	282903	33661
ABHD2	140526	569550	111	454645	23868	GABRD	187730	640688	8049	N/A		PLOD2	152952	360060	15987	353170	33662
ABHD2	140526	563066	112	454531	23869	GABRG2	113327	522053	8050	N/A		PLOD2	152952	494950	15988	420094	33663
ABHD2	140526	565973	113	455639	23870	GABRG2	113327	640500	8051	N/A		PLOD2	152952	495700	15989	N/A	
ABHD2	140526	565825	114	N/A		GABRG2	113327	638253	8052	N/A		PLOD2	152952	475505	15990	N/A	
ABHD2	140526	562254	115	N/A		GABRG2	113327	639278	8053	491958	28773	PLOD2	152952	478436	15991	N/A	
ABHD2	140526	562073	116	N/A		GABRG2	113327	638660	8054	492869	28774	PLOD2	152952	460520	15992	N/A	
ABHD2	140526	568308	117	N/A		GABRG2	113327	638552	8055	491763	28775	PLOD2	152952	469350	15993	419963	33664
ABHD3	158201	289119	118	289119	23871	GABRG2	113327	640574	8056	491582	28776	PLOD2	152952	480704	15994	419880	33665
ABHD3	158201	580981	119	462935	23872	GABRG2	113327	639111	8057	492125	28777	PLP1	123560	434483	15995	403335	33666
ABHD3	158201	578270	120	462578	23873	GABRG2	113327	639975	8058	492096	28778	PLP1	123560	494475	15996	480409	33667
ABHD3	158201	577564	121	N/A		GABRG2	113327	639213	8059	491909	28779	PLP1	123560	455268	15997	409802	33668
ABHD3	158201	580477	122	463996	23874	GABRG2	113327	639683	8060	492581	28780	PLP1	123560	422393	15998	413931	33669
ABHD3	158201	577891	123	463365	23875	GABRG2	113327	639384	8061	491240	28781	PLP1	123560	433491	15999	393391	33670
ABHD3	158201	579875	124	N/A		GABRG2	113327	640985	8062	492293	28782	PLP1	123560	443502	16000	391853	33671
ABHD3	158201	584464	125	463848	23876	GABRG2	113327	638772	8063	491557	28783	PLP1	123560	621218	16001	484450	33672
ABHD3	158201	577928	126	N/A		GABRG2	113327	639424	8064	491245	28784	PLP1	123560	619236	16002	477619	33673
ABHD3	158201	579982	127	N/A		GABRG2	113327	414552	8065	410732	28785	PLP1	123560	464776	16003	N/A	
ABHD5	011198	456453	128	391582	23877	GABRG2	113327	639549	8066	N/A		PLP1	123560	619257	16004	N/A	
ABHD5	011198	458276	129	390849	23878	GABRG2	113327	522990	8067	430732	28786	PLP1	123560	465975	16005	N/A	
ABHD5	011198	486764	130	N/A		GABRG2	113327	361925	8068	354651	28787	PLP1	123560	480325	16006	N/A	
ABHD5	011198	013894	131	013894	23879	GABRG2	113327	638782	8069	N/A		PLP1	123560	485931	16007	N/A	
ABHD5	011198	454293	132	412014	23880	GABRG2	113327	641017	8070	493461	28788	PLP1	123560	495678	16008	N/A	
ABHD5	011198	413300	133	392159	23881	GABRG2	113327	640910	8071	492545	28789	PLP1	123560	479569	16009	N/A	
ABHD5	011198	463153	134	N/A		GABRG2	113327	523372	8072	430124	28790	PLP1	123560	485688	16010	N/A	
ABI3	108798	225941	135	225941	23882	GABRG2	113327	356592	8073	349000	28791	PLP1	123560	478642	16011	N/A	
ABI3	108798	419580	136	406651	23883	GABRG2	113327	639554	8074	N/A		PLP1	123560	476160	16012	N/A	
ABI3	108798	573347	137	460776	23884	GABRG2	113327	640739	8075	N/A		PLP1	123560	461231	16013	N/A	
ABI3	108798	571035	138	459171	23885	GABRG2	113327	638877	8076	491621	28792	PLP1	123560	466486	16014	N/A	
ABI3BP	154175	471714	139	420524	23886	GABRG2	113327	639046	8077	492659	28793	PLP1	123560	494119	16015	N/A	
ABI3BP	154175	470336	140	N/A		GABRG2	113327	640757	8078	492329	28794	PLP1	123560	496836	16016	N/A	
ABI3BP	154175	284322	141	284322	23887	GABRG3	182256	615808	8079	479113	28795	PLP1	123560	612423	16017	481006	33674
ABI3BP	154175	495591	142	418817	23888	GABRG3	182256	555083	8080	452244	28796	PLPP2	141934	327790	16018	329697	33675
ABI3BP	154175	487012	143	N/A		GABRG3	182256	553440	8081	N/A		PLPP2	141934	434325	16019	388565	33676
ABI3BP	154175	497021	144	N/A		GABRG3	182256	554786	8082	N/A		PLPP2	141934	269812	16020	269812	33677
ABI3BP	154175	486770	145	419029	23889	GABRG3	182256	554696	8083	451862	28797	PLPP2	141934	621795	16021	N/A	
ABI3BP	154175	469764	146	N/A		GABRG3	182256	557596	8084	450976	28798	PLPP2	141934	633125	16022	488312	33678
ABI3BP	154175	497395	147	420704	23890	GABRG3	182256	451330	8085	390708	28799	PLPP2	141934	586998	16023	466947	33679
ABI3BP	154175	471901	148	418024	23891	GABRG3	182256	333743	8086	331912	28800	PLPP2	141934	591572	16024	466545	33680
ABI3BP	154175	527943	149	431537	23892	GACAT2	265962	579368	8087	N/A		PLPP2	141934	589672	16025	N/A	
ABI3BP	154175	482765	150	418800	23893	GAD2	136750	376261	8088	365437	28801	PLPP3	162407	371250	16026	360296	33681
ABI3BP	154175	478235	151	417745	23894	GAD2	136750	259271	8089	259271	28802	PLPP3	162407	472957	16027	N/A	
ABI3BP	154175	466947	152	418063	23895	GAD2	136750	428517	8090	390434	28803	PLPP3	162407	459962	16028	N/A	
ABI3BP	154175	533795	153	433981	23896	GAD2	136750	376248	8091	365424	28804	PLPP3	162407	461655	16029	N/A	
ABI3BP	154175	528305	154	432069	23897	GADD45A	116717	370986	8092	360025	28805	PLPP3	162407	476206	16030	N/A	
ABI3BP	154175	495063	155	433993	23898	GADD45A	116717	370985	8093	360024	28806	PLPP4	203805	427079	16031	407979	33682
ABI3BP	154175	528490	156	436070	23899	GADD45A	116717	460575	8094	N/A		PLPP4	203805	369073	16032	358069	33683
ABI3BP	154175	487249	157	N/A		GADD45A	116717	484245	8095	N/A		PLPP4	203805	496437	16033	N/A	
ABI3BP	154175	534413	158	437308	23900	GADD45A	116717	617962	8096	482814	28807	PLPP4	203805	398250	16034	381302	33684
ABI3BP	154175	534256	159	434425	23901	GAL3ST1	128242	406955	8097	385825	28808	PLPPR1	148123	374874	16035	364008	33685
ABI3BP	154175	533855	160	437031	23902	GAL3ST1	128242	402321	8098	385735	28809	PLPPR1	148123	456287	16036	410223	33686
ABI3BP	154175	459682	161	417325	23903	GAL3ST1	128242	402369	8099	384122	28810	PLPPR1	148123	494890	16037	N/A	
ABI3BP	154175	483129	162	418479	23904	GAL3ST1	128242	401975	8100	384388	28811	PLPPR1	148123	395056	16038	378496	33687
ABI3BP	154175	475896	163	N/A		GAL3ST1	128242	406361	8101	385207	28812	PLPPR1	148123	463206	16039	N/A	
ABI3BP	154175	527258	164	435319	23905	GAL3ST1	128242	441967	8102	390545	28813	PLPPR1	276539	611695	16040	478338	33688
ABI3BP	154175	530539	165	436918	23906	GAL3ST1	128242	431313	8103	395080	28814	PLPPR1	276539	633861	16041	488301	33689

ABI3BP	154175	530236	166	434256	23907	GAL3ST1	128242	452827	8104	405017	28815	PLPPR1	276539	631622	16042	N/A	
ABI3BP	154175	532144	167	N/A		GAL3ST1	128242	437282	8105	401426	28816	PLPPR1	276539	614834	16043	477959	33690
ABLIM1	099204	392952	168	376679	23908	GAL3ST1	128242	416358	8106	391485	28817	PLPPR1	276539	632580	16044	488839	33691
ABLIM1	099204	392955	169	376682	23909	GAL3ST1	128242	427899	8107	397092	28818	PLPPR4	117600	370185	16045	359204	33692
ABLIM1	099204	369253	170	358257	23910	GAL3ST1	128242	423299	8108	391996	28819	PLPPR4	117600	370184	16046	359203	33693
ABLIM1	099204	369256	171	358260	23911	GAL3ST1	128242	443136	8109	405381	28820	PLPPR4	117600	457765	16047	394913	33694
ABLIM1	099204	277895	172	277895	23912	GAL3ST1	128242	423371	8110	401074	28821	PLS1	120756	457734	16048	387890	33695
ABLIM1	099204	485570	173	N/A		GAL3ST1	128242	428682	8111	389876	28822	PLS1	120756	483373	16049	419893	33696
ABLIM1	099204	440467	174	414154	23913	GAL3ST1	128242	453479	8112	398380	28823	PLS1	120756	475296	16050	417311	33697
ABLIM1	099204	428430	175	400934	23914	GAL3ST1	128242	426220	8113	414542	28824	PLS1	120756	495744	16051	419531	33698
ABLIM1	099204	466400	176	N/A		GAL3ST1	128242	447224	8114	412995	28825	PLS1	120756	476044	16052	417481	33699
ABLIM1	099204	481974	177	N/A		GAL3ST1	128242	411821	8115	394912	28826	PLS1	120756	461644	16053	419271	33700
ABLIM1	099204	477638	178	N/A		GAL3ST1	128242	445645	8116	399649	28827	PLS1	120756	464320	16054	418880	33701
ABLIM1	099204	533213	179	433629	23915	GAL3ST1	128242	448604	8117	390068	28828	PLS1	120756	337777	16055	336831	33702
ABLIM1	099204	369252	180	358256	23916	GAL3ST1	128242	338911	8118	343234	28829	PLS1	120756	497199	16056	417491	33703
ABLIM1	099204	369266	181	358270	23917	GAL3ST4	197093	460995	8119	488800	28830	PLS1	120756	497002	16057	418700	33704
ABLIM2	163995	512594	182	N/A		GAL3ST4	197093	482469	8120	487594	28831	PLS1	120756	460104	16058	N/A	
ABLIM2	163995	361737	183	354887	23918	GAL3ST4	197093	498000	8121	488586	28832	PLS1	120756	483507	16059	N/A	
ABLIM2	163995	509819	184	N/A		GAL3ST4	197093	411994	8122	414733	28833	PLSCR1	188313	342435	16060	345494	33705
ABLIM2	163995	514025	185	423661	23919	GAL3ST4	197093	423751	8123	399066	28834	PLSCR1	188313	493432	16061	419680	33706
ABLIM2	163995	447017	186	393511	23920	GAL3ST4	197093	360039	8124	353142	28835	PLSCR1	188313	463777	16062	419228	33707
ABLIM2	163995	341937	187	342813	23921	GAL3ST4	197093	495882	8125	N/A		PLSCR1	188313	487389	16063	417792	33708
ABLIM2	163995	361581	188	355003	23922	GAL3ST4	197093	413800	8126	400451	28836	PLSCR1	188313	468985	16064	417469	33709
ABLIM2	163995	407564	189	384658	23923	GALNT14	158089	324589	8127	314500	28837	PLSCR1	188313	448787	16065	411675	33710
ABLIM2	163995	505872	190	421283	23924	GALNT14	158089	349752	8128	288988	28838	PLSCR1	188313	488253	16066	418654	33711
ABLIM2	163995	428004	191	389410	23925	GALNT14	158089	406653	8129	385435	28839	PLSCR1	188313	489775	16067	417733	33712
ABLIM2	163995	504172	192	N/A		GALNT14	158089	475320	8130	N/A		PLSCR1	188313	483300	16068	420006	33713
ABLIM2	163995	510277	193	421718	23926	GALNT14	158089	486364	8131	N/A		PLSCR1	188313	484560	16069	N/A	
ABLIM2	163995	515079	194	N/A		GALNT14	158089	430167	8132	406399	28840	PLSCR1	188313	478267	16070	417588	33714
ABLIM2	163995	502800	195	N/A		GALNT14	158089	455477	8133	399886	28841	PLSCR1	188313	470496	16071	N/A	
ABLIM2	163995	545242	196	441255	23927	GALNT14	158089	464038	8134	N/A		PLSCR1	188313	462666	16072	418103	33715
ABLIM3	173210	326685	197	315841	23928	GALNT14	158089	481023	8135	N/A		PLSCR1	188313	486631	16073	418550	33716
ABLIM3	173210	309868	198	310309	23929	GALNT14	158089	424136	8136	398723	28842	PLSCR1	188313	472349	16074	420523	33717
ABLIM3	173210	506113	199	425394	23930	GALNT14	158089	496397	8137	N/A		PLSCR1	188313	494568	16075	N/A	
ABLIM3	173210	515171	200	421002	23931	GALNT14	158089	461193	8138	N/A		PLSCR1	188313	490745	16076	N/A	
ABLIM3	173210	504238	201	421183	23932	GALNT14	158089	490212	8139	N/A		PLSCR1	188313	469266	16077	N/A	
ABLIM3	173210	508983	202	420855	23933	GALNT14	158089	498206	8140	N/A		PLSCR1	188313	477974	16078	N/A	
ABLIM3	173210	515796	203	N/A		GALNT14	158089	485468	8141	N/A		PLSCR4	114698	354952	16079	347038	33718
ABLIM3	173210	514212	204	N/A		GALNT15	131386	339732	8142	344260	28843	PLSCR4	114698	433593	16080	415605	33719
ABLIM3	173210	519549	205	N/A		GALNT15	131386	437509	8143	395873	28844	PLSCR4	114698	446574	16081	399315	33720
ABLIM3	173210	517451	206	430150	23934	GALNT15	131386	470031	8144	N/A		PLSCR4	114698	493382	16082	419040	33721
ABLIM3	173210	502855	207	N/A		GALNT15	131386	430410	8145	389079	28845	PLSCR4	114698	475019	16083	N/A	
ABLIM3	173210	356541	208	348938	23935	GALNT15	131386	489467	8146	N/A		PLSCR4	114698	460350	16084	417896	33722
ABRA	174429	311955	209	311436	23936	GALNT15	131386	617544	8147	480229	28846	PLSCR4	114698	460885	16085	420385	33723
ABTB2	166016	435224	210	410157	23937	GALNT16	100626	554858	8148	N/A		PLSCR4	114698	476202	16086	418173	33724
ABTB2	166016	530814	211	N/A		GALNT16	100626	554317	8149	N/A		PLSCR4	114698	481701	16087	418419	33725
ACAD8	151498	281182	212	281182	23938	GALNT16	100626	555920	8150	N/A		PLSCR4	114698	498625	16088	417248	33726
ACAD8	151498	526026	213	431532	23939	GALNT16	100626	337827	8151	336729	28847	PLSCR4	114698	383083	16089	372561	33727
ACAD8	151498	524426	214	431310	23940	GALNT16	100626	553471	8152	451420	28848	PLTP	100979	354050	16090	335290	33728
ACAD8	151498	534433	215	N/A		GALNT16	100626	448469	8153	402970	28849	PLTP	100979	372420	16091	361497	33729
ACAD8	151498	374752	216	363884	23941	GALNT16	100626	553669	8154	451200	28850	PLTP	100979	372431	16092	361508	33730
ACAD8	151498	525961	217	N/A		GALNT16	100626	553740	8155	N/A		PLTP	100979	477313	16093	417138	33731
ACAD8	151498	530533	218	N/A		GALNT16	100626	556677	8156	N/A		PLTP	100979	420868	16094	411671	33732
ACAD8	151498	534240	219	N/A		GALNT16	100626	556829	8157	N/A		PLXDC1	161381	315392	16095	323927	33733
ACAD8	151498	533387	220	N/A		GALNT18	110328	227756	8158	227756	28851	PLXDC1	161381	394318	16096	N/A	
ACAD8	151498	527082	221	N/A		GALNT18	110328	526064	8159	N/A		PLXDC1	161381	578390	16097	462089	33734
ACAD8	151498	524547	222	N/A		GALNT3	115339	392701	8160	376465	28852	PLXDC1	161381	578517	16098	N/A	
ACAD8	151498	531338	223	N/A		GALNT3	115339	409882	8161	386955	28853	PLXDC1	161381	493200	16099	N/A	
ACAD8	151498	528325	224	N/A		GALNT3	115339	412248	8162	412643	28854	PLXDC1	161381	461225	16100	N/A	

ACAD8	151498	527665	225	N/A		GALNT3	115339	437849	8163	391104	28855	PLXDC1	161381	444911	16101	409687	33735
ACAD8	151498	527713	226	N/A		GALNT3	115339	463254	8164	N/A		PLXDC1	161381	578277	16102	N/A	
ACAD8	151498	524739	227	N/A		GALNT3	115339	431484	8165	397112	28856	PLXDC1	161381	582025	16103	N/A	
ACAD8	151498	524502	228	N/A		GALNT3	115339	414977	8166	413477	28857	PLXDC1	161381	579417	16104	N/A	
ACAP3	131584	354700	229	346733	23942	GALNT3	115339	422973	8167	413694	28858	PLXDC1	161381	579279	16105	464353	33736
ACAP3	131584	492936	230	N/A		GALNT3	115339	447156	8168	399880	28859	PLXDC1	161381	578808	16106	462241	33737
ACAP3	131584	467278	231	N/A		GALNT5	136542	259056	8169	259056	28860	PLXDC1	161381	441877	16107	393227	33738
ACAP3	131584	470659	232	N/A		GALNT5	136542	463418	8170	N/A		PLXDC1	161381	444435	16108	N/A	
ACAP3	131584	379037	233	N/A		GALNT5	136542	461704	8171	N/A		PLXDC1	161381	577838	16109	N/A	
ACAP3	131584	476572	234	N/A		GALNT6	139629	543196	8172	444171	28861	PLXDC1	161381	415163	16110	416819	33739
ACAP3	131584	493992	235	N/A		GALNT6	139629	356317	8173	348668	28862	PLXDC1	161381	579190	16111	464029	33740
ACAP3	131584	472541	236	N/A		GALNT6	139629	603680	8174	N/A		PLXDC1	161381	580667	16112	N/A	
ACAP3	131584	354980	237	347075	23943	GALNT6	139629	603641	8175	474670	28863	PLXDC1	161381	577941	16113	N/A	
ACAP3	131584	478065	238	N/A		GALNT6	139629	604381	8176	474101	28864	PLXDC1	161381	583285	16114	N/A	
ACAP3	131584	479108	239	N/A		GALNT6	139629	604847	8177	474515	28865	PLXDC2	120594	377242	16115	366450	33741
ACAP3	131584	438966	240	N/A		GALNT6	139629	605720	8178	N/A		PLXDC2	120594	377252	16116	366460	33742
ACAP3	131584	353662	241	321139	23944	GALNT6	139629	605367	8179	N/A		PLXDC2	120594	377238	16117	N/A	
ACE	159640	583336	242	N/A		GALNT6	139629	603482	8180	N/A		PLXNA1	114554	393409	16118	377061	33743
ACE	159640	584529	243	N/A		GALNT6	139629	605089	8181	N/A		PLXNA1	114554	503234	16119	N/A	
ACE	159640	582678	244	462995	23945	GALNT6	139629	605822	8182	N/A		PLXNA1	114554	503363	16120	N/A	
ACE	159640	579462	245	N/A		GALNT6	139629	603203	8183	N/A		PLXNA1	114554	505278	16121	N/A	
ACE	159640	290866	246	290866	23946	GALNT6	139629	605055	8184	474483	28866	PLXNA4	221866	359827	16122	352882	33744
ACE	159640	582627	247	462280	23947	GALNT6	139629	604506	8185	474163	28867	PLXNA4	221866	496550	16123	N/A	
ACE	159640	580318	248	N/A		GALNT6	139629	605138	8186	473981	28868	PLXNA4	221866	423507	16124	392772	33745
ACE	159640	579726	249	463673	23948	GALNT6	139629	603563	8187	473948	28869	PLXNA4	221866	378539	16125	367800	33746
ACE	159640	290863	250	290863	23949	GALNT6	139629	603188	8188	474052	28870	PLXNA4	221866	321063	16126	323194	33747
ACE	159640	582005	251	462002	23950	GALNT6	139629	605617	8189	473836	28871	PLXNB1	164050	296440	16127	296440	33748
ACE	159640	578839	252	462110	23951	GALNT6	139629	604426	8190	473918	28872	PLXNB1	164050	485535	16128	N/A	
ACE	159640	413513	253	392247	23952	GALNTL6	174473	511251	8191	425590	28873	PLXNB1	164050	358536	16129	351338	33749
ACE	159640	579314	254	462599	23953	GALNTL6	174473	506823	8192	423313	28874	PLXNB1	164050	456774	16130	414199	33750
ACE	159640	579204	255	464629	23954	GALNTL6	174473	504379	8193	N/A		PLXNB1	164050	483753	16131	N/A	
ACE	159640	584865	256	N/A		GALNTL6	174473	513061	8194	N/A		PLXNB1	164050	497627	16132	N/A	
ACE	159640	582761	257	462909	23955	GALNTL6	174473	508122	8195	423827	28875	PLXNB1	164050	483676	16133	N/A	
ACE	159640	577418	258	N/A		GALNTL6	174473	457021	8196	N/A		PLXNB1	164050	478171	16134	N/A	
ACE	159640	583645	259	N/A		GALNTL6	174473	616459	8197	483822	28876	PLXNB1	164050	470525	16135	N/A	
ACE	159640	578679	260	N/A		GALR1	166573	299727	8198	299727	28877	PLXNB1	164050	461261	16136	N/A	
ACE	159640	579409	261	464428	23956	GALR1	166573	582943	8199	N/A		PLXNB1	164050	473996	16137	N/A	
ACE	159640	582244	262	N/A		GAP43	172020	305124	8200	305010	28878	PLXNB1	164050	449094	16138	395987	33751
ACE	159640	428043	263	397593	23957	GAP43	172020	393780	8201	377372	28879	PLXNB1	164050	465117	16139	N/A	
ACER3	078124	534206	264	435733	23958	GAPDH	111640	229239	8202	229239	28880	PLXNB1	164050	467913	16140	N/A	
ACER3	078124	532485	265	434480	23959	GAPDH	111640	496049	8203	N/A		PLXNB1	164050	464294	16141	N/A	
ACER3	078124	530182	266	N/A		GAPDH	111640	396856	8204	380065	28881	PLXNB1	164050	484485	16142	N/A	
ACER3	078124	525194	267	432109	23960	GAPDH	111640	492719	8205	N/A		PLXNB1	164050	462738	16143	N/A	
ACER3	078124	525861	268	432379	23961	GAPDH	111640	396861	8206	380070	28882	PLXNB1	164050	466353	16144	N/A	
ACER3	078124	531461	269	433368	23962	GAPDH	111640	474249	8207	N/A		PLXNB1	164050	473683	16145	N/A	
ACER3	078124	530334	270	435048	23963	GAPDH	111640	466588	8208	N/A		PLXNB3	198753	361971	16146	355378	33752
ACER3	078124	526597	271	431149	23964	GAPDH	111640	396859	8209	380068	28883	PLXNB3	198753	411613	16147	391650	33753
ACER3	078124	533873	272	436252	23965	GAPDH	111640	466525	8210	N/A		PLXNB3	198753	482654	16148	N/A	
ACER3	078124	531352	273	431504	23966	GAPDH	111640	396858	8211	380067	28884	PLXNB3	198753	455214	16149	396048	33754
ACER3	078124	278544	274	278544	23967	GAPDH	111640	619601	8212	478864	28885	PLXNB3	198753	485980	16150	N/A	
ACER3	078124	527508	275	N/A		GAREM2	157833	401533	8213	384593	28886	PLXNB3	198753	448847	16151	412454	33755
ACER3	078124	525325	276	N/A		GAREM2	157833	407684	8214	384581	28887	PLXNB3	198753	469190	16152	N/A	
ACER3	078124	530921	277	N/A		GAREM2	157833	496070	8215	N/A		PLXNB3	198753	472415	16153	N/A	
ACHE	087085	419336	278	403474	23968	GARNL3	136895	439286	8216	400579	28888	PLXNB3	198753	538966	16154	442736	33756
ACHE	087085	241069	279	241069	23969	GARNL3	136895	444677	8217	411160	28889	PLXNC1	136040	258526	16155	258526	33757
ACHE	087085	428317	280	414858	23970	GARNL3	136895	429629	8218	397246	28890	PLXNC1	136040	546733	16156	N/A	
ACHE	087085	412389	281	394976	23971	GARNL3	136895	453030	8219	389679	28891	PLXNC1	136040	551850	16157	447843	33758
ACHE	087085	426415	282	397143	23972	GARNL3	136895	446764	8220	416473	28892	PLXNC1	136040	546659	16158	N/A	
ACHE	087085	454485	283	390004	23973	GARNL3	136895	441134	8221	396319	28893	PLXNC1	136040	549810	16159	N/A	

ACHE	087085	440755	284	410380	23974	GARNL3	136895	478702	8222	N/A		PLXNC1	136040	549217	16160	446781	33759
ACHE	087085	430554	285	399725	23975	GARNL3	136895	425970	8223	411329	28894	PLXNC1	136040	550080	16161	447625	33760
ACHE	087085	442452	286	415901	23976	GARNL3	136895	498801	8224	N/A		PLXNC1	136040	547057	16162	446720	33761
ACHE	087085	411582	287	404865	23977	GARNL3	136895	487565	8225	N/A		PLXNC1	136040	551495	16163	N/A	
ACHE	087085	441605	288	396360	23978	GARNL3	136895	373387	8226	362485	28895	PLXNC1	136040	545312	16164	439225	33762
ACHE	087085	445236	289	400933	23979	GARNL3	136895	373386	8227	362484	28896	PLXNC1	136040	549187	16165	N/A	
ACHE	087085	619863	290	N/A		GARNL3	136895	464616	8228	N/A		PMEL	185664	449260	16166	402758	33763
ACHE	087085	302913	291	303211	23980	GARNL3	136895	495172	8229	N/A		PMEL	185664	552882	16167	449690	33764
ACO2	100412	216254	292	216254	23981	GARNL3	136895	460176	8230	474589	28897	PMEL	185664	550464	16168	450036	33765
ACO2	100412	396512	293	379769	23982	GARNL3	136895	481875	8231	N/A		PMEL	185664	548747	16169	448828	33766
ACO2	100412	471094	294	N/A		GARNL3	136895	478696	8232	N/A		PMEL	185664	548493	16170	447374	33767
ACO2	100412	482208	295	N/A		GARNL3	136895	496711	8233	N/A		PMEL	185664	550447	16171	448029	33768
ACO2	100412	478010	296	N/A		GARNL3	136895	481242	8234	N/A		PMEL	185664	549564	16172	N/A	
ACO2	100412	481310	297	N/A		GARNL3	136895	497703	8235	N/A		PMEL	185664	549404	16173	449520	33769
ACO2	100412	466237	298	N/A		GARNL3	136895	463005	8236	N/A		PMEL	185664	550762	16174	N/A	
ACOT11	162390	481208	299	N/A		GARNL3	136895	435213	8237	396205	28898	PMEL	185664	548803	16175	447732	33770
ACOT11	162390	498228	300	N/A		GAS1	180447	298743	8238	298743	28899	PMEL	185664	547137	16176	448849	33771
ACOT11	162390	343744	301	340260	23983	GATM	171766	396659	8239	379895	28900	PMEL	185664	546543	16177	446662	33772
ACOT11	162390	371316	302	360366	23984	GATM	171766	558362	8240	N/A		PMEL	185664	556802	16178	N/A	
ACOT11	162390	479837	303	N/A		GATM	171766	558336	8241	454008	28901	PMEL	185664	548689	16179	N/A	
ACOT7	097021	608083	304	476610	23985	GATM	171766	561376	8242	N/A		PMEL	185664	550590	16180	N/A	
ACOT7	097021	377842	305	367073	23986	GATM	171766	558916	8243	N/A		PMEL	185664	549430	16181	N/A	
ACOT7	097021	377845	306	367076	23987	GATM	171766	558163	8244	453781	28902	PMEL	185664	549418	16182	446633	33773
ACOT7	097021	377855	307	367086	23988	GATM	171766	558537	8245	453151	28903	PMEL	185664	549233	16183	448871	33774
ACOT7	097021	377860	308	367091	23989	GATM	171766	561148	8246	453860	28904	PMEL	185664	549413	16184	N/A	
ACOT7	097021	418124	309	402532	23990	GATM	171766	559885	8247	453087	28905	PMEPA1	124225	341744	16185	345826	33775
ACOT7	097021	361521	310	354615	23991	GATM	171766	558118	8248	452971	28906	PMEPA1	124225	395816	16186	379161	33776
ACOT7	097021	473466	311	465719	23992	GATM	171766	560538	8249	N/A		PMEPA1	124225	347215	16187	344014	33777
ACOT7	097021	481175	312	N/A		GATM	171766	458245	8250	N/A		PMEPA1	124225	395814	16188	379159	33778
ACOT7	097021	545482	313	439218	23993	GATM	171766	527933	8251	N/A		PMEPA1	124225	414037	16189	401506	33779
ACSBG1	103740	258873	314	258873	23994	CASTOR2	274070	616305	8252	484732	28907	PMEPA1	124225	395819	16190	379164	33780
ACSBG1	103740	560124	315	453605	23995	CASTOR2	274070	622472	8253	N/A		PMEPA1	124225	472841	16191	N/A	
ACSBG1	103740	560817	316	453451	23996	CASTOR1	239282	459785	8254	N/A		PMEPA1	124225	265626	16192	265626	33781
ACSBG1	103740	560183	317	N/A		CASTOR1	239282	407689	8255	384183	28908	PMP2	147588	256103	16193	256103	33782
ACSBG1	103740	558301	318	N/A		CASTOR1	239282	404953	8256	385868	28909	PMP2	147588	519260	16194	429917	33783
ACSBG1	103740	559707	319	453447	23997	CASTOR1	239282	440839	8257	411842	28910	PMP22	109099	395938	16195	379269	33784
ACSBG1	103740	558728	320	N/A		CASTOR1	239282	421236	8258	390869	28911	PMP22	109099	312280	16196	308937	33785
ACSBG1	103740	557935	321	453585	23998	CASTOR1	239282	497605	8259	N/A		PMP22	109099	494511	16197	462782	33786
ACSBG1	103740	559114	322	454188	23999	CASTOR1	239282	415484	8260	416041	28912	PMP22	109099	395936	16198	379268	33787
ACSBG1	103740	559241	323	453547	24000	CASTOR1	239282	425691	8261	408419	28913	PMP22	109099	580584	16199	464468	33788
ACSBG1	103740	558130	324	453800	24001	CASTOR1	239282	463795	8262	N/A		PMP22	109099	426385	16200	409824	33789
ACSBG1	103740	558828	325	N/A		CASTOR1	239282	471480	8263	N/A		PMP22	109099	580497	16201	N/A	
ACSBG1	103740	558793	326	N/A		CASTOR1	239282	492159	8264	N/A		PMP22	109099	471150	16202	N/A	
ACSBG1	103740	559713	327	N/A		CASTOR1	239282	440704	8265	407871	28914	PMP22	109099	612492	16203	484631	33790
ACSM5	183549	575584	328	460112	24002	CASTOR1	239282	464854	8266	N/A		PMVK	163344	368467	16204	357452	33791
ACSM5	183549	331849	329	327916	24003	CASTOR1	239282	498572	8267	N/A		PNLIP	175535	369221	16205	358223	33792
ACSM5	183549	575070	330	478073	24004	GBAP1	160766	459805	8268	N/A		PNLIP	175535	470562	16206	N/A	
ACSM5	183549	570305	331	N/A		GBAP1	160766	486869	8269	N/A		PNMA2	240694	522362	16207	429344	33793
ACSM5	183549	574748	332	N/A		GBAP1	160766	368374	8270	N/A		PNMA2	240694	521740	16208	N/A	
ACSM5	183549	573920	333	461752	24005	GBAP1	160766	486197	8271	N/A		PNMA2	240694	518212	16209	N/A	
ACSM5	183549	577024	334	N/A		GBAP1	160766	473223	8272	N/A		PNMA2	240694	521875	16210	N/A	
ACSS1	154930	484396	335	N/A		GBAP1	160766	566701	8273	N/A		PNMA2	240694	523244	16211	N/A	
ACSS1	154930	323482	336	316924	24006	GBAP1	160766	463838	8274	N/A		PNMA2	240694	522450	16212	N/A	
ACSS1	154930	376726	337	365916	24007	GBAP1	160766	462587	8275	N/A		PNMA2	240694	522764	16213	N/A	
ACSS1	154930	432802	338	388793	24008	GCA	115271	473240	8276	N/A		PNMA2	240694	523616	16214	N/A	
ACSS1	154930	537502	339	439304	24009	GCA	115271	446271	8277	393218	28915	PNP	198805	553418	16215	450663	33794
ACSS3	111058	616449	340	N/A		GCA	115271	429691	8278	412899	28916	PNP	198805	361505	16216	354532	33795
ACSS3	111058	549175	341	447748	24010	GCA	115271	437150	8279	394842	28917	PNP	198805	556293	16217	N/A	
ACSS3	111058	548058	342	449535	24011	GCA	115271	481161	8280	N/A		PNP	198805	557229	16218	N/A	

ACSS3	111058	261206	343	261206	24012	GCA	115271	453113	8281	403805	28918	PNP	198805	554056	16219	N/A	
ACSS3	111058	548387	344	N/A		GCA	115271	487445	8282	N/A		PNP	198805	553591	16220	452421	33796
ACSS3	111058	548324	345	N/A		GCA	115271	479199	8283	N/A		PNP	198805	554065	16221	451108	33797
ACSS3	111058	551745	346	N/A		GCA	115271	233612	8284	233612	28919	PNP	198805	556754	16222	N/A	
ACSS3	111058	546664	347	449507	24013	GCA	115271	414723	8285	408620	28920	PNPLA3	100344	216180	16223	216180	33798
ACTB	075624	464611	348	N/A		GCH1	131979	543643	8286	444011	28921	PNPLA3	100344	406117	16224	384668	33799
ACTB	075624	331789	349	349960	24014	GCH1	131979	491895	8287	419045	28922	PNPLA3	100344	423180	16225	397987	33800
ACTB	075624	425660	350	409264	24015	GCH1	131979	254299	8288	N/A		PNPLA3	100344	478713	16226	N/A	
ACTB	075624	462491	351	N/A		GCH1	131979	536224	8289	445246	28923	PNPLA3	100344	497129	16227	N/A	
ACTB	075624	493945	352	N/A		GCH1	131979	395521	8290	N/A		PNPLA8	135241	426128	16228	394988	33801
ACTB	075624	484841	353	N/A		GCH1	131979	622544	8291	477796	28924	PNPLA8	135241	257694	16229	257694	33802
ACTB	075624	473257	354	N/A		GCH1	131979	395514	8292	378890	28925	PNPLA8	135241	422087	16230	410804	33803
ACTB	075624	477812	355	N/A		GCK	106633	459642	8293	N/A		PNPLA8	135241	453144	16231	387789	33804
ACTB	075624	432588	356	407473	24016	GCK	106633	336642	8294	338009	28926	PNPLA8	135241	436062	16232	406779	33805
ACTB	075624	480301	357	N/A		GCK	106633	403799	8295	384247	28927	PNPLA8	135241	453085	16233	402274	33806
ACTB	075624	443528	358	393951	24017	GCK	106633	395796	8296	379142	28928	PNPLA8	135241	483879	16234	N/A	
ACTB	075624	417101	359	399487	24018	GCK	106633	345378	8297	223366	28929	PNPLA8	135241	476592	16235	N/A	
ACTB	075624	414620	360	401032	24019	GCK	106633	437084	8298	402840	28930	PNPLA8	135241	462466	16236	N/A	
ACTBL2	169067	423391	361	416706	24020	GCK	106633	473353	8299	N/A		PNPLA8	135241	489738	16237	N/A	
ACTC1	159251	290378	362	290378	24021	GCK	106633	476008	8300	N/A		PNPLA8	135241	427008	16238	406033	33807
ACTC1	159251	557860	363	N/A		GCK	106633	616242	8301	482149	28931	PNPLA8	135241	415498	16239	391872	33808
ACTC1	159251	560563	364	N/A		GDA	119125	376986	8302	366185	28932	POLR2A	181222	617998	16240	N/A	
ACTL6B	077080	160382	365	160382	24022	GDA	119125	358399	8303	351170	28933	POLR2A	181222	572844	16241	461879	33809
ACTL6B	077080	487125	366	N/A		GDA	119125	475764	8304	436619	28934	POLR2A	181222	576952	16242	N/A	
ACTL6B	077080	485601	367	N/A		GDA	119125	477618	8305	N/A		POLR2A	181222	575547	16243	N/A	
ACTL6B	077080	487225	368	N/A		GDA	119125	414671	8306	403897	28935	POLR2A	181222	576114	16244	N/A	
ACTL6B	077080	489904	369	N/A		GDA	119125	489618	8307	434682	28936	POLR2A	181222	576718	16245	N/A	
ACTL6B	077080	461605	370	420151	24023	GDA	119125	436438	8308	400857	28937	POLR2A	181222	574158	16246	N/A	
ACTN2	077522	366578	371	355537	24024	GDA	119125	238018	8309	238018	28938	POLR2A	181222	573603	16247	N/A	
ACTN2	077522	492634	372	N/A		GDA	119125	545168	8310	437972	28939	POLR2A	181222	576553	16248	N/A	
ACTN2	077522	494762	373	N/A		GDF10	266524	580279	8311	464145	28940	POLR2J3	168255	464525	16249	419082	33810
ACTN2	077522	492101	374	N/A		GDF11	135414	257868	8312	257868	28941	POLR2J3	168255	489144	16250	419145	33811
ACTN2	077522	461367	375	N/A		GDF11	135414	546799	8313	448390	28942	POLR2J3	168255	379340	16251	368645	33812
ACTN2	077522	546208	376	438384	24025	GDPD4	178795	376217	8314	365390	28943	POLR2J3	168255	486319	16252	419146	33813
ACTN2	077522	542672	377	443495	24026	GDPD4	178795	315938	8315	320815	28944	POLR2J3	168255	503564	16253	N/A	
ACTR3B	133627	377776	378	367007	24027	GDPD4	178795	532907	8316	N/A		POLR2J3	168255	511773	16254	N/A	
ACTR3B	133627	256001	379	256001	24028	GDPD4	178795	532155	8317	N/A		POLR2J3	168255	508848	16255	425877	33814
ACTR3B	133627	397282	380	380452	24029	GDPD4	178795	527489	8318	N/A		POLR2J3	168255	513506	16256	421085	33815
ACTR3B	133627	488782	381	N/A		GDPD4	178795	534245	8319	N/A		POLR2J3	168255	504677	16257	N/A	
ACTR3B	133627	479402	382	N/A		GDPD5	158555	526177	8320	434050	28945	POLR2J3	168255	506060	16258	N/A	
ADAM11	073670	200557	383	200557	24030	GDPD5	158555	527820	8321	437123	28946	POLR2J3	168255	502415	16259	N/A	
ADAM11	073670	355638	384	347856	24031	GDPD5	158555	533784	8322	437049	28947	POLR2J3	168255	507355	16260	426619	33816
ADAM11	073670	535346	385	443773	24032	GDPD5	158555	529721	8323	433214	28948	POLR2J3	168255	608621	16261	477228	33817
ADAM11	073670	587773	386	465537	24033	GDPD5	158555	336898	8324	337972	28949	POLR2J3	168255	511313	16262	422109	33818
ADAM11	073670	588363	387	N/A		GDPD5	158555	533805	8325	435196	28950	POLR2J3	168255	504157	16263	N/A	
ADAM12	148848	368679	388	357668	24034	GDPD5	158555	531759	8326	N/A		POLR2J3	168255	508910	16264	N/A	
ADAM12	148848	368676	389	357665	24035	GDPD5	158555	534322	8327	435728	28951	POLR2J3	168255	621093	16265	483328	33819
ADAM12	148848	467145	390	N/A		GDPD5	158555	531561	8328	N/A		POLR2J3	168255	443430	16266	N/A	
ADAM12	148848	482291	391	N/A		GDPD5	158555	527322	8329	N/A		POLR2J3	168255	513438	16267	421950	33820
ADAM12	148848	485388	392	N/A		GDPD5	158555	533911	8330	N/A		POLR2J3	168255	504101	16268	N/A	
ADAM12	148848	448723	393	391268	24036	GDPD5	158555	528031	8331	N/A		POLR2J3	168255	613744	16269	482932	33821
ADAM12	148848	494661	394	N/A		GDPD5	158555	532435	8332	433727	28952	PON2	105854	455123	16270	414515	33822
ADAM19	135074	517951	395	428376	24037	GDPD5	158555	529095	8333	N/A		PON2	105854	433091	16271	404622	33823
ADAM19	135074	517374	396	431027	24038	GDPD5	158555	524785	8334	N/A		PON2	105854	222572	16272	222572	33824
ADAM19	135074	257527	397	257527	24039	GDPD5	158555	531441	8335	N/A		PON2	105854	633192	16273	488378	33825
ADAM19	135074	517905	398	428654	24040	GDPD5	158555	443276	8336	396535	28953	PON2	105854	483292	16274	488874	33826
ADAM19	135074	519752	399	N/A		GEM	164949	396194	8337	379497	28954	PON2	105854	446142	16275	405211	33827
ADAMTS10	142303	595838	400	470501	24041	GEM	164949	297596	8338	297596	28955	PON2	105854	459842	16276	N/A	
ADAMTS10	142303	593913	401	469901	24042	GEM	164949	523660	8339	N/A		PON2	105854	469926	16277	488550	33828

ADAMTS10	142303	597188	402	471851	24043	GEM	164949	521817	8340	N/A		PON2	105854	491069	16278	488462	33829
ADAMTS10	142303	596851	403	469559	24044	GEM	164949	523433	8341	428258	28956	PON2	105854	490778	16279	488826	33830
ADAMTS10	142303	596911	404	N/A		GFAP	131095	639277	8342	492432	28957	PON2	105854	632034	16280	487898	33831
ADAMTS10	142303	593826	405	469516	24045	GFAP	131095	588735	8343	466598	28958	PON2	105854	493290	16281	488822	33832
ADAMTS10	142303	596236	406	N/A		GFAP	131095	638304	8344	491042	28959	PON2	105854	478801	16282	487703	33833
ADAMTS10	142303	603221	407	N/A		GFAP	131095	441312	8345	N/A		PON2	105854	460873	16283	N/A	
ADAMTS10	142303	601163	408	N/A		GFAP	131095	639243	8346	491375	28960	PON2	105854	493469	16284	N/A	
ADAMTS10	142303	601872	409	N/A		GFAP	131095	638488	8347	N/A		PON2	105854	471883	16285	N/A	
ADAMTS10	142303	596709	410	N/A		GFAP	131095	639369	8348	491243	28961	PON2	105854	469716	16286	N/A	
ADAMTS10	142303	596466	411	N/A		GFAP	131095	592065	8349	N/A		PON2	105854	633531	16287	488838	33834
ADAMTS10	142303	593534	412	N/A		GFAP	131095	640859	8350	492300	28962	POR	127948	453773	16288	395813	33835
ADAMTS10	142303	270328	413	270328	24046	GFAP	131095	638400	8351	491466	28963	POR	127948	439963	16289	390540	33836
ADAMTS15	166106	299164	414	299164	24047	GFAP	131095	639042	8352	492860	28964	POR	127948	461988	16290	419970	33837
ADAMTS16	145536	511368	415	421631	24048	GFAP	131095	640545	8353	491735	28965	POR	127948	448410	16291	399409	33838
ADAMTS16	145536	274181	416	274181	24049	GFAP	131095	638921	8354	N/A		POR	127948	421059	16292	409881	33839
ADAMTS16	145536	433402	417	N/A		GFAP	131095	253408	8355	253408	28966	POR	127948	471238	16293	N/A	
ADAMTS16	145536	513709	418	N/A		GFAP	131095	586125	8356	467397	28967	POR	127948	394893	16294	378355	33840
ADAMTS17	140470	268070	419	268070	24050	GFAP	131095	638618	8357	492832	28968	POR	127948	412521	16295	409238	33841
ADAMTS17	140470	557896	420	N/A		GFAP	131095	589701	8358	N/A		POR	127948	414186	16296	399327	33842
ADAMTS17	140470	568565	421	456161	24051	GFAP	131095	592706	8359	N/A		POR	127948	432753	16297	389409	33843
ADAMTS17	140470	378898	422	N/A		GFAP	131095	585543	8360	N/A		POR	127948	449920	16298	399556	33844
ADAMTS17	140470	559976	423	N/A		GFAP	131095	591880	8361	467530	28969	POR	127948	418341	16299	389719	33845
ADAMTS17	140470	560486	424	N/A		GFAP	131095	588640	8362	N/A		POR	127948	412064	16300	404731	33846
ADAMTS17	140470	558960	425	453604	24052	GFAP	131095	640552	8363	N/A		POR	127948	454934	16301	414263	33847
ADAMTS17	140470	561355	426	458005	24053	GFAP	131095	435360	8364	403962	28970	POR	127948	447222	16302	393527	33848
ADAMTS17	140470	558930	427	N/A		GFAP	131095	591327	8365	N/A		POR	127948	426184	16303	400964	33849
ADAMTS18	140873	562332	428	454368	24054	GFAP	131095	638281	8366	491088	28971	POR	127948	439297	16304	403494	33850
ADAMTS18	140873	282849	429	282849	24055	GFAP	131095	639921	8367	492156	28972	POR	127948	475509	16305	N/A	
ADAMTS18	140873	568393	430	N/A		GFAP	131095	592320	8368	465320	28973	POR	127948	460892	16306	N/A	
ADAMTS18	140873	449265	431	392540	24056	GFAP	131095	586127	8369	N/A		POR	127948	439269	16307	412490	33851
ADAMTS18	140873	562345	432	457395	24057	GFAP	131095	586793	8370	468500	28974	POR	127948	496888	16308	N/A	
ADAMTS18	140873	567914	433	N/A		GFAP	131095	587997	8371	N/A		POR	127948	487247	16309	N/A	
ADAMTS18	140873	567121	434	N/A		GFAP	131095	376990	8372	366189	28975	POR	127948	495770	16310	N/A	
ADAMTS18	140873	564369	435	N/A		GFAP	131095	591719	8373	N/A		POR	127948	493973	16311	N/A	
ADAMTS18	140873	569309	436	N/A		GFAP	131095	590922	8374	N/A		POU3F2	184486	328345	16312	329170	33852
ADAMTS2	087116	251582	437	251582	24058	GFAP	131095	588957	8375	465565	28976	PPARG	132170	397010	16313	380205	33853
ADAMTS2	087116	522937	438	N/A		GFAP	131095	588316	8376	465629	28977	PPARG	132170	397029	16314	380224	33854
ADAMTS2	087116	523450	439	N/A		GFAP	131095	585728	8377	465208	28978	PPARG	132170	309576	16315	312472	33855
ADAMTS2	087116	518335	440	489888	24059	GFAP	131095	588037	8378	466163	28979	PPARG	132170	397015	16316	380210	33856
ADAMTS2	087116	274609	441	274609	24060	GFAP	131095	593179	8379	467106	28980	PPARG	132170	455517	16317	411931	33857
ADAMTS2	283802	639986	442	492346	24061	GFRA2	168546	524240	8380	428518	28981	PPARG	132170	397012	16318	380207	33858
ADAMTS2	283802	639510	443	N/A		GFRA2	168546	306793	8381	306654	28982	PPARG	132170	397026	16319	380221	33859
ADAMTS2	283802	639035	444	N/A		GFRA2	168546	517328	8382	429445	28983	PPARG	132170	497594	16320	N/A	
ADAMTS2	283802	638226	445	491140	24062	GFRA2	168546	518077	8383	429206	28984	PPARG	132170	438682	16321	392285	33860
ADAMTS2	283802	639107	446	492365	24063	GFRA2	168546	517892	8384	429979	28985	PPARG	132170	397000	16322	380196	33861
ADAMTS6	049192	381055	447	370443	24064	GFRA2	168546	522071	8385	428721	28986	PPARG	132170	477039	16323	N/A	
ADAMTS6	049192	381052	448	424377	24065	GFRA2	168546	519195	8386	430622	28987	PPARG	132170	287820	16324	287820	33862
ADAMTS6	049192	314351	449	N/A		GFRA2	168546	520676	8387	N/A		PPARG	132170	397023	16325	380218	33863
ADAMTS6	049192	417396	450	N/A		GHITM	165678	372134	8388	361207	28988	PPARG	132170	396999	16326	380195	33864
ADAMTS6	049192	470597	451	N/A		GHR	112964	230882	8389	230882	28989	PPFIA4	143847	367240	16327	356209	33865
ADAMTS6	049192	464680	452	N/A		GHR	112964	513671	8390	426739	28990	PPFIA4	143847	447715	16328	402576	33866
ADAMTS6	049192	504282	453	N/A		GHR	112964	505006	8391	N/A		PPFIA4	143847	601609	16329	N/A	
ADAMTS6	049192	502886	454	N/A		GHR	112964	511135	8392	422333	28991	PPFIA4	143847	600426	16330	470427	33867
ADAMTS7	136378	388820	455	373472	24066	GHR	112964	513625	8393	N/A		PPFIA4	143847	272198	16331	272198	33868
ADAMTS7	136378	569934	456	N/A		GHR	112964	615111	8394	478291	28992	PPFIA4	143847	599966	16332	471264	33869
ADAMTS7	136378	566303	457	N/A		GHR	112964	618088	8395	482373	28993	PPFIA4	143847	600447	16333	N/A	
ADAMTS7	136378	565793	458	N/A		GHR	112964	357703	8396	350335	28994	PPFIA4	143847	599514	16334	472251	33870
ADAMTS7	136378	568712	459	N/A		GHR	112964	537449	8397	442206	28995	PPFIA4	143847	594656	16335	N/A	
ADAMTS9	163638	498707	460	418735	24067	GHR	112964	612382	8398	478332	28996	PPFIA4	143847	486360	16336	N/A	

ADAMTS9	163638	477180	461	N/A		GHR	112964	622294	8399	483926	28997	PPFIA4	143847	597023	16337	N/A	
ADAMTS9	163638	295903	462	295903	24068	GHR	112964	620156	8400	483403	28998	PPFIA4	143847	594572	16338	N/A	
ADAMTS9	163638	467257	463	478086	24069	GHR	112964	612626	8401	479846	28999	PPFIA4	143847	295706	16339	295706	33871
ADAMTS9	163638	481060	464	417521	24070	GIPC2	137960	476882	8402	N/A		PPFIBP1	110841	538433	16340	442462	33872
ADAMTS9	163638	482490	465	N/A		GIPC2	137960	370759	8403	359795	29000	PPFIBP1	110841	545381	16341	445822	33873
ADAMTS9	163638	475557	466	N/A		GIPR	010310	590918	8404	467494	29001	PPFIBP1	110841	545334	16342	438036	33874
ADAMTS9	163638	459780	467	419217	24071	GIPR	010310	263281	8405	263281	29002	PPFIBP1	110841	540114	16343	444304	33875
ADAMTS9	163638	467119	468	N/A		GIPR	010310	304207	8406	305321	29003	PPFIBP1	110841	541633	16344	N/A	
ADAMTS9	163638	494004	469	N/A		GIPR	010310	585889	8407	467342	29004	PPFIBP1	110841	537927	16345	445425	33876
ADAMTSL3	156218	286744	470	286744	24072	GIPR	010310	591322	8408	465385	29005	PPFIBP1	110841	318304	16346	314724	33877
ADAMTSL3	156218	567476	471	456313	24073	GIPR	010310	588816	8409	N/A		PPFIBP1	110841	535047	16347	444046	33878
ADAMTSL3	156218	569510	472	N/A		GIPR	010310	591224	8410	N/A		PPFIBP1	110841	542629	16348	443442	33879
ADAMTSL3	156218	561483	473	N/A		GIPR	010310	593127	8411	N/A		PPFIBP1	110841	228425	16349	228425	33880
ADAMTSL3	156218	565653	474	N/A		GJA1	152661	282561	8412	282561	29006	PPFIBP1	110841	535575	16350	437438	33881
ADAMTSL3	156218	567663	475	N/A		GJB1	169562	374029	8413	363141	29007	PPFIBP1	110841	542187	16351	445132	33882
ADAMTSL3	156218	562296	476	N/A		GJB1	169562	374022	8414	363134	29008	PPFIBP1	110841	534917	16352	N/A	
ADAMTSL3	156218	567716	477	N/A		GJB1	169562	447581	8415	407223	29009	PPFIBP1	110841	537261	16353	443324	33883
ADAMTSL4	143382	369041	478	358037	24074	GJB1	169562	361726	8416	354900	29010	PPFIBP1	110841	619325	16354	479763	33884
ADAMTSL4	143382	483335	479	N/A		GJB4	189433	339480	8417	345868	29011	PPFIBP1	110841	540503	16355	N/A	
ADAMTSL4	143382	369038	480	358034	24075	GJB6	121742	241124	8418	241124	29012	PPFIBP1	110841	539326	16356	438174	33885
ADAMTSL4	143382	489159	481	N/A		GJB6	121742	400066	8419	382939	29013	PPFIBP1	110841	540256	16357	N/A	
ADAMTSL4	143382	369039	482	358035	24076	GJB6	121742	400065	8420	382938	29014	PPFIBP2	166387	526873	16358	434641	33886
ADAMTSL4	143382	271643	483	271643	24077	GJB6	121742	356192	8421	348521	29015	PPFIBP2	166387	528947	16359	431724	33887
ADARB1	197381	462214	484	N/A		GJB6	121742	636852	8422	489698	29016	PPFIBP2	166387	299492	16360	299492	33888
ADARB1	197381	460734	485	N/A		GJC2	198835	366714	8423	355675	29017	PPFIBP2	166387	527790	16361	434981	33889
ADARB1	197381	389861	486	N/A		GJC3	176402	312891	8424	325775	29018	PPFIBP2	166387	526046	16362	433026	33890
ADARB1	197381	492414	487	436367	24078	GJD2	159248	290374	8425	290374	29019	PPFIBP2	166387	524548	16363	433917	33891
ADARB1	197381	496664	488	435381	24079	SLC1A3	079215	265113	8426	265113	29020	PPFIBP2	166387	529575	16364	435794	33892
ADARB1	197381	389863	489	374513	24080	SLC1A3	079215	513903	8427	427203	29021	PPFIBP2	166387	533792	16365	436498	33893
ADARB1	197381	348831	490	015877	24081	SLC1A3	079215	504121	8428	N/A		PPFIBP2	166387	532926	16366	N/A	
ADARB1	197381	449478	491	387480	24082	SLC1A3	079215	512374	8429	N/A		PPFIBP2	166387	525597	16367	433839	33894
ADARB1	197381	464215	492	N/A		SLC1A3	079215	416645	8430	N/A		PPFIBP2	166387	529021	16368	N/A	
ADARB1	197381	360697	493	353920	24083	SLC1A3	079215	506725	8431	N/A		PPFIBP2	166387	528883	16369	435469	33895
ADARB1	197381	481022	494	N/A		SLC1A3	079215	505202	8432	424986	29022	PPFIBP2	166387	529321	16370	N/A	
ADARB1	197381	631642	495	N/A		SLC1A3	079215	513646	8433	420992	29023	PPFIBP2	166387	530189	16371	N/A	
ADARB1	197381	437626	496	414600	24084	SLC1A3	079215	502864	8434	N/A		PPFIBP2	166387	530181	16372	437321	33896
ADARB1	197381	611195	497	478160	24085	SLC1A3	079215	514563	8435	N/A		PPFIBP2	166387	532416	16373	N/A	
ADARB1	197381	629643	498	486475	24086	SLC1A3	079215	509272	8436	N/A		PPFIBP2	166387	534409	16374	433713	33897
ADARB2	185736	381312	499	370713	24087	SLC1A3	079215	505376	8437	N/A		PPFIBP2	166387	530582	16375	N/A	
ADARB2	185736	381310	500	370711	24088	SLC1A3	079215	506178	8438	N/A		PPFIBP2	166387	532381	16376	N/A	
ADARB2	185736	474762	501	N/A		SLC1A3	079215	612708	8439	483657	29024	PPFIBP2	166387	530081	16377	436739	33898
ADARB2	185736	490172	502	N/A		SLC1A3	079215	381918	8440	371343	29025	PPFIBP2	166387	532172	16378	N/A	
ADARB2	185736	381305	503	370706	24089	SLC1A3	079215	613445	8441	477672	29026	PPFIBP2	166387	524495	16379	N/A	
ADARB2	185736	477140	504	N/A		SLC1A3	079215	265113	8442	265113	29027	PPFIBP2	166387	532112	16380	N/A	
ADARB2	185736	469464	505	N/A		SLC1A3	079215	513903	8443	427203	29028	PPFIBP2	166387	528929	16381	N/A	
ADCY1	164742	432715	506	392721	24090	SLC1A3	079215	504121	8444	N/A		PPFIBP2	166387	529664	16382	N/A	
ADCY1	164742	297323	507	297323	24091	SLC1A3	079215	512374	8445	N/A		PPFIBP2	166387	534552	16383	436489	33899
ADCY1	164742	468353	508	N/A		SLC1A3	079215	416645	8446	N/A		PPM1E	175175	308249	16384	312411	33900
ADCY1	164742	621543	509	479770	24092	SLC1A3	079215	506725	8447	N/A		PPM1H	111110	228705	16385	228705	33901
ADCYAP1R1	078549	304166	510	306620	24093	SLC1A3	079215	505202	8448	424986	29029	PPM1H	111110	551214	16386	N/A	
ADCYAP1R1	078549	409363	511	387335	24094	SLC1A3	079215	513646	8449	420992	29030	PPM1H	111110	551519	16387	N/A	
ADCYAP1R1	078549	431811	512	400893	24095	SLC1A3	079215	502864	8450	N/A		PPM1H	111110	548414	16388	N/A	
ADCYAP1R1	078549	396211	513	379514	24096	SLC1A3	079215	514563	8451	N/A		PPM1H	111110	547857	16389	N/A	
ADCYAP1R1	078549	409489	514	386395	24097	SLC1A3	079215	509272	8452	N/A		PPM1J	155367	471106	16390	474405	33902

ADCYAP1R1	078549	436116	515	416622	24098	SLC1A3	079215	505376	8453	N/A		PPM1J	155367	309276	16391	308926	33903
ADCYAP1R1	078549	614107	516	483721	24099	SLC1A3	079215	506178	8454	N/A		PPM1J	155367	464951	16392	475711	33904
ADD2	075340	403045	517	384303	24100	SLC1A3	079215	612708	8455	483657	29031	PPM1J	155367	482367	16393	474145	33905
ADD2	075340	264436	518	264436	24101	SLC1A3	079215	381918	8456	371343	29032	PPM1J	155367	486709	16394	N/A	
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ADD2	075340	355733	520	347972	24103	GLB1L3	166105	389887	8458	374537	29034	PPP1R11	237403	448378	16396	403557	33907
ADD2	075340	481675	521	N/A		GLB1L3	166105	431683	8459	396615	29035	PPP1R11	237403	429382	16397	390917	33908
ADD2	075340	522886	522	430243	24104	GLB1L3	166105	532985	8460	N/A		PPP1R11	237403	418211	16398	411976	33909
ADD2	075340	456320	523	414546	24105	GLB1L3	166105	486034	8461	N/A		PPP1R11	237403	444101	16399	396522	33910
ADD2	075340	413157	524	388072	24106	GLB1L3	166105	498012	8462	N/A		PPP1R11	237403	430959	16400	399723	33911
ADD2	075340	430656	525	398112	24107	GLB1L3	166105	455971	8463	397929	29036	PPP1R11	233314	441553	16401	392044	33912
ADD2	075340	415348	526	412357	24108	GLB1L3	166105	410100	8464	N/A		PPP1R11	233314	437937	16402	394056	33913
ADD2	075340	425976	527	412681	24109	GLB1L3	166105	467068	8465	N/A		PPP1R11	233314	446310	16403	400763	33914
ADD2	075340	447731	528	403722	24110	GLDC	178445	321612	8466	370737	29037	PPP1R11	233314	414618	16404	404824	33915
ADD2	075340	473232	529	N/A		GLDC	178445	638274	8467	491487	29038	PPP1R11	233314	434591	16405	399965	33916
ADD2	075340	496178	530	N/A		GLDC	178445	639639	8468	491312	29039	PPP1R11	233314	452227	16406	392260	33917
ADGRA1	197177	607359	531	475778	24111	GLDC	178445	640505	8469	N/A		PPP1R11	236560	448550	16407	411693	33918
ADGRA1	197177	392607	532	376384	24112	GLDC	178445	638233	8470	N/A		PPP1R11	236560	431424	16408	411038	33919
ADGRA1	197177	392606	533	376383	24113	GLDC	178445	639364	8471	N/A		PPP1R11	236560	414032	16409	408173	33920
ADGRA3	152990	511051	534	424927	24114	GLDC	178445	638661	8472	491369	29040	PPP1R11	236560	439463	16410	416038	33921
ADGRA3	152990	334304	535	334952	24115	GLDC	178445	639461	8473	N/A		PPP1R11	236560	451993	16411	415651	33922
ADGRA3	152990	499527	536	N/A		GLDC	178445	639954	8474	N/A		PPP1R11	236560	450177	16412	399167	33923
ADGRA3	152990	282943	537	N/A		GLDC	178445	639318	8475	491932	29041	PPP1R11	234058	436591	16413	414808	33924
ADGRA3	152990	504617	538	N/A		GLDC	178445	638694	8476	N/A		PPP1R11	234058	448210	16414	414471	33925
ADGRA3	152990	506155	539	N/A		GLDC	178445	477960	8477	N/A		PPP1R11	234058	422273	16415	406410	33926
ADGRA3	152990	508133	540	422606	24116	GLDC	178445	639443	8478	N/A		PPP1R11	234058	430828	16416	391581	33927
ADGRA3	152990	502482	541	421006	24117	GLDC	178445	640592	8479	N/A		PPP1R11	234058	412077	16417	401267	33928
ADGRA3	152990	514129	542	425223	24118	GLDC	178445	460457	8480	N/A		PPP1R11	234058	444994	16418	390548	33929
ADGRA3	152990	506133	543	N/A		GLDC	178445	640208	8481	491895	29042	PPP1R11	204619	376773	16419	365964	33930
ADGRA3	152990	513385	544	N/A		GLDC	178445	463305	8482	491209	29043	PPP1R11	204619	376772	16420	365963	33931
ADGRA3	152990	514749	545	N/A		GLDC	178445	640703	8483	N/A		PPP1R11	204619	376769	16421	365960	33932
ADGRA3	152990	506346	546	N/A		GLDC	178445	639493	8484	N/A		PPP1R11	204619	376765	16422	365956	33933
ADGRG1	205336	565587	547	456781	24119	GLDC	178445	638654	8485	491101	29044	PPP1R11	204619	376763	16423	365954	33934
ADGRG1	205336	568791	548	454321	24120	GLDC	178445	639840	8486	491161	29045	PPP1R11	204619	376758	16424	365949	33935
ADGRG1	205336	570044	549	456166	24121	GLDC	178445	639020	8487	491392	29046	PPP1R11	227720	433942	16425	399222	33936
ADGRG1	205336	567553	550	455812	24122	GLDN	186417	335449	8488	335196	29047	PPP1R11	227720	452679	16426	412297	33937
ADGRG1	205336	565314	551	456469	24123	GLDN	186417	560215	8489	484633	29048	PPP1R11	227720	417223	16427	412526	33938
ADGRG1	205336	564912	552	N/A		GLDN	186417	558286	8490	N/A		PPP1R11	227720	436833	16428	400589	33939
ADGRG1	205336	562673	553	N/A		GLDN	186417	560690	8491	N/A		PPP1R11	227720	428563	16429	406648	33940
ADGRG1	205336	564907	554	455245	24124	GLDN	186417	559317	8492	N/A		PPP1R11	227720	449435	16430	409066	33941
ADGRG1	205336	568908	555	457456	24125	GLDN	186417	464150	8493	N/A		PPP1R11	206501	400658	16431	383499	33942
ADGRG1	205336	568909	556	455215	24126	GLDN	186417	396399	8494	379681	29049	PPP1R11	206501	383612	16432	373107	33943
ADGRG1	205336	566778	557	456796	24127	GLDN	186417	561194	8495	N/A		PPP1R11	206501	400657	16433	383498	33944
ADGRG1	205336	562101	558	N/A		GLDN	186417	558426	8496	453433	29050	PPP1R11	206501	400656	16434	383497	33945
ADGRG1	205336	561872	559	N/A		GLDN	186417	612989	8497	479249	29051	PPP1R11	206501	400655	16435	383496	33946
ADGRG1	205336	561988	560	456238	24128	GLI1	111087	532291	8498	436671	29052	PPP1R11	206501	400654	16436	383495	33947
ADGRG1	205336	567835	561	456794	24129	GLI1	111087	228682	8499	228682	29053	PPP1R11	237829	437171	16437	404779	33948
ADGRG1	205336	569372	562	457979	24130	GLI1	111087	528432	8500	434421	29054	PPP1R11	237829	449087	16438	398205	33949
ADGRG1	205336	563548	563	454263	24131	GLI1	111087	530789	8501	N/A		PPP1R11	237829	431977	16439	407981	33950
ADGRG1	205336	562003	564	454607	24132	GLI1	111087	528467	8502	434408	29055	PPP1R11	237829	433662	16440	410429	33951
ADGRG1	205336	561833	565	458063	24133	GLI1	111087	527742	8503	N/A		PPP1R11	237829	458506	16441	403611	33952
ADGRG1	205336	569531	566	457307	24134	GLI1	111087	543426	8504	437607	29056	PPP1R11	237829	455887	16442	388044	33953
ADGRG1	205336	565013	567	454364	24135	GLI1	111087	546141	8505	441006	29057	PPP1R14A	167641	587515	16443	465811	33954
ADGRG1	205336	561696	568	455600	24136	GLI2	074047	482119	8506	N/A		PPP1R14A	167641	591291	16444	466572	33955
ADGRG1	205336	562414	569	456494	24137	GLI2	074047	472722	8507	N/A		PPP1R14A	167641	347262	16445	301243	33956
ADGRG1	205336	561969	570	456002	24138	GLI2	074047	418323	8508	398992	29058	PPP1R14A	167641	301242	16446	301242	33957
ADGRG1	205336	568487	571	N/A		GLI2	074047	438299	8509	400593	29059	PPP1R14A	167641	591585	16447	465104	33958

ADGRG1	205336	562631	572	455351	24139	GLI2	074047	452692	8510	403715	29060	PPP1R15A	087074	200453	16448	200453	33959
ADGRG1	205336	563445	573	457073	24140	GLI2	074047	445186	8511	397488	29061	PPP1R15A	087074	600406	16449	469239	33960
ADGRG1	205336	562608	574	N/A		GLI2	074047	341310	8512	344473	29062	PPP1R16B	101445	299824	16450	299824	33961
ADGRG1	205336	565338	575	457122	24141	GLI2	074047	452319	8513	390436	29063	PPP1R16B	101445	373331	16451	362428	33962
ADGRG1	205336	567702	576	456787	24142	GLI2	074047	437950	8514	415773	29064	PPP1R16B	101445	468265	16452	N/A	
ADGRG1	205336	567154	577	456632	24143	GLI2	074047	435313	8515	N/A		PPP1R16B	101445	463749	16453	N/A	
ADGRG1	205336	388813	578	373465	24144	GLI2	074047	360874	8516	441454	29065	PPP1R17	106341	342032	16454	340125	33963
ADGRG1	205336	563007	579	454574	24145	GLI2	074047	433812	8517	402383	29066	PPP1R17	106341	409146	16455	386459	33964
ADGRG1	205336	562558	580	456620	24146	GLI2	074047	361492	8518	354586	29067	PPP1R17	106341	498609	16456	N/A	
ADGRG1	205336	566271	581	454855	24147	GLI3	106571	395925	8519	379258	29068	PPP1R1C	150722	495820	16457	N/A	
ADGRG1	205336	568645	582	454879	24148	GLI3	106571	479210	8520	N/A		PPP1R1C	150722	486067	16458	N/A	
ADGRG1	205336	563374	583	455209	24149	GLI3	106571	464291	8521	N/A		PPP1R1C	150722	475249	16459	N/A	
ADGRG1	205336	568234	584	458014	24150	GLI3	106571	448703	8522	406135	29069	PPP1R1C	150722	464264	16460	N/A	
ADGRG1	205336	565770	585	456603	24151	GLI3	106571	437480	8523	407963	29070	PPP1R1C	150722	490645	16461	N/A	
ADGRG1	205336	564338	586	457657	24152	GLI3	106571	428534	8524	N/A		PPP1R1C	150722	465612	16462	N/A	
ADGRG1	205336	566164	587	455074	24153	GLIPR1	139278	266659	8525	266659	29071	PPP1R1C	150722	409137	16463	386359	33965
ADGRG1	205336	567397	588	455226	24154	GLIPR1	139278	536703	8526	440595	29072	PPP1R1C	150722	280295	16464	280295	33966
ADGRG1	205336	568979	589	455553	24155	GLIPR1	139278	456650	8527	391144	29073	PPP1R1C	150722	409702	16465	386778	33967
ADGRG1	205336	569992	590	N/A		GLIPR1	139278	550491	8528	448008	29074	PPP1R1C	150722	479855	16466	N/A	
ADGRG1	205336	566123	591	457143	24156	GLIPR2	122694	377959	8529	367195	29075	PPP1R1C	150722	461410	16467	N/A	
ADGRG1	205336	562682	592	456819	24157	GLIPR2	122694	377960	8530	367196	29076	PPP1R1C	150722	494189	16468	N/A	
ADGRG1	205336	561782	593	455176	24158	GLIPR2	122694	474050	8531	N/A		PPP1R36	165807	298705	16469	298705	33968
ADGRG1	205336	564783	594	454490	24159	GLIPR2	122694	619700	8532	478768	29077	PPP1R36	165807	555645	16470	451900	33969
ADGRG1	205336	564729	595	455965	24160	GLIPR2	122694	396613	8533	379857	29078	PPP1R36	165807	467261	16471	435229	33970
ADGRG1	205336	565976	596	454933	24161	GLIS1	174332	312233	8534	309653	29079	PPP1R36	165807	557202	16472	452491	33971
ADGRG1	205336	566888	597	N/A		GLIS1	174332	628545	8535	486112	29080	PPP1R36	165807	554400	16473	N/A	
ADGRG1	205336	562804	598	N/A		GLIS3	107249	324333	8536	325494	29081	PPP1R36	165807	556023	16474	N/A	
ADGRG1	205336	566508	599	454779	24162	GLIS3	107249	461870	8537	N/A		PPP2CA	113575	481195	16475	418447	33972
ADGRG1	205336	565539	600	457612	24163	GLIS3	107249	381971	8538	371398	29082	PPP2CA	113575	472253	16476	N/A	
ADGRG1	205336	567915	601	457063	24164	GLIS3	107249	467497	8539	N/A		PPP2CA	113575	495833	16477	N/A	
ADGRG1	205336	569132	602	N/A		GLIS3	107249	463680	8540	N/A		PPP2CA	113575	522385	16478	430869	33973
ADGRG1	205336	564103	603	457994	24165	GLIS3	107249	464391	8541	N/A		PPP2CA	113575	523082	16479	428816	33974
ADGRG1	205336	562467	604	456256	24166	GLIS3	107249	469833	8542	N/A		PPP2CA	113575	231504	16480	N/A	
ADGRG1	205336	568700	605	N/A		GLIS3	107249	490709	8543	N/A		PPP2R2C	074211	335585	16481	335083	33975
ADGRG1	205336	540164	606	444911	24167	GLIS3	107249	473846	8544	N/A		PPP2R2C	074211	506140	16482	423649	33976
ADGRG1	205336	568531	607	456682	24168	GLIS3	107249	462164	8545	418671	29083	PPP2R2C	074211	515571	16483	422374	33977
ADGRG1	205336	564360	608	457223	24169	GLIS3	107249	478315	8546	418995	29084	PPP2R2C	074211	382599	16484	372042	33978
ADGRG1	205336	568074	609	458087	24170	GLIS3	107249	478844	8547	418005	29085	PPP2R2C	074211	507294	16485	425247	33979
ADGRG1	205336	563414	610	456147	24171	GLIS3	107249	481827	8548	417883	29086	PPP2R2C	074211	513943	16486	N/A	
ADGRG1	205336	568618	611	454233	24172	GLIS3	107249	491889	8549	419914	29087	PPP2R2C	074211	314348	16487	N/A	
ADGRG1	205336	569494	612	456362	24173	GLIS3	107249	477901	8550	417794	29088	PPP2R2C	074211	509917	16488	423650	33980
ADGRG1	205336	566169	613	456263	24174	GLIS3	107249	465708	8551	N/A		PPP2R2C	074211	507028	16489	N/A	
ADGRG1	205336	568157	614	454289	24175	GLIS3	107249	471664	8552	N/A		PPP4R4	119698	304338	16490	305924	33981
ADGRG1	205336	569154	615	456544	24176	GLP2R	065325	574745	8553	458242	29089	PPP4R4	119698	328839	16491	330831	33982
ADGRG1	205336	569101	616	457953	24177	GLP2R	065325	262441	8554	262441	29090	PPP4R4	119698	553661	16492	451543	33983
ADGRG1	205336	563862	617	457806	24178	GLP2R	065325	458005	8555	404471	29091	PPP4R4	119698	556884	16493	452121	33984
ADGRG1	205336	564722	618	456599	24179	GLP2R	065325	304773	8556	303605	29092	PPP4R4	119698	555690	16494	N/A	
ADGRG1	205336	569158	619	457635	24180	GLRA1	145888	274576	8557	274576	29093	PPP4R4	119698	556470	16495	451556	33985
ADGRG1	205336	566187	620	457178	24181	GLRA1	145888	462581	8558	430595	29094	PPP4R4	278326	630860	16496	487248	33986
ADGRG1	205336	565505	621	N/A		GLRA1	145888	455880	8559	411593	29095	PPP4R4	278326	619905	16497	480902	33987
ADGRG1	205336	565391	622	456731	24182	GLRA1	145888	471351	8560	N/A		PPP4R4	278326	614957	16498	482849	33988
ADGRG1	205336	456916	623	398034	24183	GLUD1	148672	277865	8561	277865	29096	PPP4R4	278326	628432	16499	487271	33989
ADGRL3	150471	512091	624	423388	24184	GLUD1	148672	487058	8562	N/A		PPP4R4	278326	630154	16500	486247	33990
ADGRL3	150471	509779	625	N/A		GLUD1	148672	465164	8563	N/A		PPP6R2	100239	359139	16501	352051	33991
ADGRL3	150471	514591	626	422533	24185	GLUD1	148672	474574	8564	N/A		PPP6R2	100239	395741	16502	379090	33992
ADGRL3	150471	509896	627	423787	24186	GLUL	135821	331872	8565	356537	29097	PPP6R2	100239	395744	16503	379093	33993
ADGRL3	150471	511324	628	425033	24187	GLUL	135821	491322	8566	N/A		PPP6R2	100239	216061	16504	216061	33994
ADGRL3	150471	506700	629	424120	24188	GLUL	135821	339526	8567	344958	29098	PPP6R2	100239	401672	16505	384532	33995
ADGRL3	150471	507164	630	421476	24189	GLUL	135821	463851	8568	N/A		PPP6R2	100239	427222	16506	391595	33996

ADGRL3	150471	508693	631	424030	24190	GLUL	135821	461447	8569	N/A		PPP6R2	100239	473283	16507	N/A	
ADGRL3	150471	507625	632	421372	24191	GLUL	135821	484996	8570	N/A		PPP6R2	100239	470046	16508	N/A	
ADGRL3	150471	514157	633	425201	24192	GLUL	135821	489818	8571	N/A		PPP6R2	100239	612753	16509	478417	33997
ADGRL3	150471	504896	634	423434	24193	GLUL	135821	475808	8572	N/A		PRAG1	275342	615670	16510	481109	33998
ADGRL3	150471	508946	635	421627	24194	GLUL	135821	480604	8573	N/A		PRAG1	275342	622241	16511	479068	33999
ADGRL3	150471	506720	636	420931	24195	GLUL	135821	462444	8574	N/A		PRDM1	057657	369091	16512	358087	34000
ADGRL3	150471	506746	637	425884	24196	GLUL	135821	311223	8575	307900	29099	PRDM1	057657	369096	16513	358092	34001
ADGRL3	150471	514996	638	424258	24197	GLUL	135821	417584	8576	398320	29100	PRDM1	057657	424894	16514	395566	34002
ADGRL3	150471	509089	639	N/A		C6orf163	203872	388923	8577	373575	29101	PRDM1	057657	489365	16515	N/A	
ADGRL3	150471	502815	640	424402	24198	C6orf163	203872	608326	8578	477323	29102	PRDM1	057657	450060	16516	399772	34003
ADGRL3	150471	508078	641	N/A		C6orf163	203872	369574	8579	N/A		PRDM1	057657	481163	16517	N/A	
ADGRV1	164199	508842	642	425936	24199	C6orf163	203872	608891	8580	N/A		PRDM1	057657	369089	16518	358085	34004
ADGRV1	164199	638316	643	N/A		TF	091513	402696	8581	385834	29103	PRDM8	152784	508965	16519	N/A	
ADGRV1	164199	405460	644	384582	24200	TF	091513	466911	8582	417468	29104	PRDM8	152784	509375	16520	N/A	
ADGRV1	164199	640109	645	N/A		TF	091513	474287	8583	N/A		PRDM8	152784	506547	16521	N/A	
ADGRV1	164199	640281	646	N/A		TF	091513	460531	8584	N/A		PRDM8	152784	511825	16522	N/A	
ADGRV1	164199	638638	647	N/A		TF	091513	414694	8585	401505	29105	PRDM8	152784	504452	16523	423985	34005
ADGRV1	164199	640083	648	N/A		TF	091513	494430	8586	418396	29106	PRDM8	152784	508061	16524	N/A	
ADGRV1	164199	504142	649	N/A		TF	091513	493011	8587	N/A		PRDM8	152784	515013	16525	425149	34006
ADGRV1	164199	640403	650	492531	24201	TF	091513	482271	8588	419338	29107	PRDM8	152784	507025	16526	N/A	
ADGRV1	164199	639676	651	N/A		TF	091513	485977	8589	418716	29108	PRDM8	152784	415738	16527	406998	34007
ADGRV1	164199	639473	652	N/A		TF	091513	475382	8590	N/A		PRDM8	152784	339711	16528	339764	34008
ADGRV1	164199	450321	653	492054	24202	TF	091513	498622	8591	N/A		PRELP	188783	343110	16529	343924	34009
ADGRV1	164199	639431	654	491057	24203	TF	091513	461695	8592	419714	29109	PREX1	124126	482556	16530	434632	34010
ADGRV1	164199	640779	655	492527	24204	TF	091513	462495	8593	N/A		PREX1	124126	371941	16531	361009	34011
ADGRV1	164199	640012	656	492538	24205	TF	091513	467842	8594	N/A		PREX1	124126	496915	16532	N/A	
ADGRV1	164199	640374	657	N/A		TF	091513	402696	8595	385834	29110	PREX1	124126	620554	16533	481444	34012
ADGRV1	164199	509621	658	N/A		TF	091513	466911	8596	417468	29111	PREX2	046889	288368	16534	288368	34013
ADGRV1	164199	640464	659	N/A		TF	091513	474287	8597	N/A		PREX2	046889	529398	16535	N/A	
ADGRV1	164199	425867	660	392618	24206	TF	091513	460531	8598	N/A		PREX2	046889	517617	16536	N/A	
ADGRV1	164199	639884	661	N/A		TF	091513	414694	8599	401505	29112	PREX2	046889	522247	16537	N/A	
ADGRV1	164199	640729	662	N/A		TF	091513	494430	8600	418396	29113	PREX2	046889	520235	16538	N/A	
ADGRV1	164199	638510	663	N/A		TF	091513	493011	8601	N/A		PRICKLE1	139174	345127	16539	345064	34014
ADGRV1	164199	638975	664	492630	24207	TF	091513	482271	8602	419338	29114	PRICKLE1	139174	639589	16540	491051	34015
ADGRV1	164199	640407	665	491425	24208	TF	091513	485977	8603	418716	29115	PRICKLE1	139174	445766	16541	398947	34016
ADGRV1	164199	638585	666	N/A		TF	091513	475382	8604	N/A		PRICKLE1	139174	640132	16542	491228	34017
ADGRV1	164199	507314	667	491299	24209	TF	091513	498622	8605	N/A		PRICKLE1	139174	455697	16543	401060	34018
ADGRV1	164199	513828	668	N/A		TF	091513	461695	8606	419714	29116	PRICKLE1	139174	640840	16544	N/A	
ADGRV1	164199	640061	669	N/A		TF	091513	462495	8607	N/A		PRICKLE1	139174	640055	16545	492763	34019
ADGRV1	164199	638990	670	492781	24210	TF	091513	467842	8608	N/A		PRICKLE1	139174	639958	16546	492644	34020
ADGRV1	164199	505845	671	N/A		GNA12	146535	275364	8609	275364	29117	PRICKLE1	139174	548696	16547	448359	34021
ADGRV1	164199	640815	672	491767	24211	GNA12	146535	491117	8610	N/A		PRICKLE1	139174	639566	16548	492332	34022
ADGRV1	164199	639821	673	492216	24212	GNA12	146535	407904	8611	385935	29118	PRICKLE1	139174	552240	16549	449819	34023
ADGRV1	164199	639707	674	492328	24213	GNA12	146535	407653	8612	386054	29119	PRICKLE1	139174	640361	16550	N/A	
ADGRV1	164199	640369	675	491401	24214	GNA12	146535	496740	8613	N/A		PRICKLE1	139174	640946	16551	N/A	
ADGRV1	164199	640256	676	N/A		GNA12	146535	471281	8614	N/A		PRICKLE1	139174	552108	16552	447870	34024
ADGRV1	164199	639530	677	N/A		GNA12	146535	485329	8615	N/A		PRICKLE1	139174	640801	16553	491473	34025
ADGRV1	164199	639212	678	N/A		GNA12	146535	447791	8616	391462	29120	PRICKLE1	139174	551050	16554	446970	34026
ADM	148926	278175	679	278175	24215	GNAL	141404	334049	8617	334051	29121	PRICKLE1	139174	547113	16555	446699	34027
ADM	148926	534464	680	431438	24216	GNAL	141404	585590	8618	N/A		PRICKLE1	139174	640646	16556	492483	34028
ADM	148926	530439	681	436837	24217	GNAL	141404	535121	8619	439023	29122	PRICKLE1	139174	639414	16557	N/A	
ADM	148926	524948	682	433062	24218	GNAL	141404	269162	8620	269162	29123	PRICKLE1	139174	552200	16558	N/A	
ADM	148926	528655	683	436607	24219	GNAL	141404	423027	8621	408489	29124	PRICKLE1	139174	639588	16559	N/A	
ADM	148926	526492	684	434354	24220	GNAL	141404	585642	8622	467345	29125	PRIMA1	175785	393140	16560	376848	34029
ADM	148926	525063	685	435124	24221	GNAL	141404	590972	8623	N/A		PRIMA1	175785	477603	16561	434370	34030
ADM	148926	528544	686	434749	24222	GNAL	141404	590228	8624	467709	29126	PRIMA1	175785	393143	16562	376851	34031
ADORA1	163485	309502	687	308549	24223	GNAL	141404	602628	8625	473600	29127	PRIMA1	175785	316227	16563	320948	34032
ADORA1	163485	367236	688	356205	24224	GNAL	141404	586926	8626	466709	29128	PRIMA1	274089	629961	16564	486953	34033
ADORA1	163485	367235	689	356204	24225	GNAO1	087258	262493	8627	262493	29129	PRIMA1	274089	627063	16565	486875	34034

ADORA1	163485	464019	690	N/A		GNAO1	087258	569295	8628	492271	29130	PRIMA1	274089	617019	16566	479855	34035
ADORA1	163485	472535	691	N/A		GNAO1	087258	638705	8629	491223	29131	PRIMA1	274089	611347	16567	479082	34036
ADORA1	163485	467253	692	N/A		GNAO1	087258	262494	8630	262494	29132	PRKAG2	106617	287878	16568	287878	34037
ADORA1	163485	337894	693	338435	24226	GNAO1	087258	570235	8631	477740	29133	PRKAG2	106617	418337	16569	387386	34038
ADORA1	163485	640524	694	491900	24227	GNAO1	087258	563661	8632	492694	29134	PRKAG2	106617	492843	16570	419577	34039
ADORA1	163485	618295	695	483953	24228	GNAO1	087258	639966	8633	N/A		PRKAG2	106617	392801	16571	376549	34040
ADORA2B	170425	304222	696	304501	24229	GNAO1	087258	640893	8634	492677	29135	PRKAG2	106617	479461	16572	N/A	
ADORA2B	170425	582124	697	N/A		GNAO1	087258	639770	8635	491999	29136	PRKAG2	106617	485183	16573	N/A	
ADRA1A	120907	380586	698	369960	24230	GNAO1	087258	565363	8636	N/A		PRKAG2	106617	478989	16574	420645	34041
ADRA1A	120907	519096	699	431073	24231	GNAO1	087258	638836	8637	N/A		PRKAG2	106617	488258	16575	420783	34042
ADRA1A	120907	380582	700	369956	24232	GNAO1	087258	639251	8638	N/A		PRKAG2	106617	476632	16576	419493	34043
ADRA1A	120907	521711	701	430414	24233	GNAO1	087258	640390	8639	N/A		PRKAG2	106617	493872	16577	417252	34044
ADRA1A	120907	519229	702	430793	24234	GNAO1	087258	638210	8640	N/A		PRKAG2	106617	491938	16578	N/A	
ADRA1A	120907	354550	703	346557	24235	GNAO1	087258	563440	8641	N/A		PRKAG2	106617	483775	16579	N/A	
ADRA1A	120907	276393	704	276393	24236	GNAO1	087258	638185	8642	N/A		PRKAG2	106617	481434	16580	N/A	
ADRA1A	120907	380573	705	369947	24237	GNAO1	087258	639055	8643	N/A		PRKAG2	106617	487375	16581	N/A	
ADRA1A	120907	518621	706	N/A		GNAO1	087258	639268	8644	491391	29137	PRKAG2	106617	461529	16582	N/A	
ADRA1A	120907	380572	707	369946	24238	GNAO1	087258	562316	8645	457238	29138	PRKAG2	106617	474383	16583	N/A	
ADRA1A	120907	518810	708	N/A		GNAO1	087258	639341	8646	491137	29139	PRKAG3	115592	233944	16584	233944	34045
ADRA1B	170214	641205	709	493019	24239	GNAO1	087258	640560	8647	N/A		PRKAG3	115592	529249	16585	436068	34046
ADRA1B	170214	641475	710	N/A		GNAO1	087258	568375	8648	491143	29140	PRKAG3	115592	470307	16586	419272	34047
ADRA1B	170214	306675	711	306662	24240	GNAO1	087258	640469	8649	491875	29141	PRKAG3	115592	490971	16587	N/A	
ADRA1D	171873	379453	712	368766	24241	GNAO1	087258	564727	8650	454971	29142	PRKAG3	115592	430489	16588	416100	34048
ADRA1D	171873	621688	713	N/A		GNAO1	087258	639787	8651	N/A		PRKAG3	115592	439262	16589	397133	34049
ADRA2B	274286	620793	714	480573	24242	GNAO1	087258	564798	8652	N/A		PRKCB	166501	321728	16590	318315	34050
ADRB2	169252	305988	715	305372	24243	GNB3	111664	540458	8653	N/A		PRKCB	166501	303531	16591	305355	34051
KIAA1024	169330	305428	716	307461	24244	GNB3	111664	229264	8654	229264	29143	PRKCB	166501	498058	16592	454428	34052
KIAA1024	169330	559272	717	454088	24245	GNB3	111664	541257	8655	442002	29144	PRKCB	166501	498739	16593	459227	34053
AFAP1	196526	360265	718	353402	24246	GNB3	111664	541978	8656	439753	29145	PRKCB	166501	486868	16594	N/A	
AFAP1	196526	505447	719	N/A		GNB3	111664	435982	8657	414734	29146	PRKCB	166501	482000	16595	N/A	
AFAP1	196526	513842	720	N/A		GNB3	111664	539127	8658	444325	29147	PRKCB	166501	472066	16596	457980	34054
AFAP1	196526	382543	721	371983	24247	GNB3	111664	542868	8659	N/A		PRKCB	166501	463752	16597	N/A	
AFAP1	196526	508415	722	N/A		GNB3	111664	537035	8660	445967	29148	PRKCB	166501	487674	16598	N/A	
AFAP1	196526	614385	723	483962	24248	GNB3	111664	542751	8661	N/A		PRKCB	166501	466124	16599	458564	34055
AFAP1	196526	513856	724	N/A		GNG11	127920	248564	8662	248564	29149	PRKCD	163932	478843	16600	419726	34056
AFAP1	196526	612691	725	N/A		GNG12	172380	370982	8663	360021	29150	PRKCD	163932	394729	16601	378217	34057
AFAP1	196526	358461	726	351245	24249	GNG12	172380	494936	8664	N/A		PRKCD	163932	330452	16602	331602	34058
AFAP1	196526	420658	727	410689	24250	GNG13	127588	248150	8665	248150	29151	PRKCD	163932	477794	16603	N/A	
AFAP1L1	157510	455574	728	N/A		GNG2	186469	553432	8666	451279	29152	PRKCD	163932	487897	16604	418106	34059
AFAP1L1	157510	296721	729	296721	24251	GNG2	186469	556522	8667	450904	29153	PRKCD	163932	464818	16605	419629	34060
AFAP1L1	157510	522492	730	N/A		GNG2	186469	557376	8668	450758	29154	PRKCG	126583	479081	16606	471544	34061
AFAP1L1	157510	515000	731	424427	24252	GNG2	186469	553560	8669	450586	29155	PRKCG	126583	474397	16607	471271	34062
AFAP1L1	157510	508444	732	N/A		GNG2	186469	554832	8670	N/A		PRKCG	126583	263431	16608	263431	34063
AFAP1L1	157510	513665	733	N/A		GNG2	186469	553299	8671	N/A		PRKCG	126583	419486	16609	387919	34064
AFAP1L2	169129	304129	734	303042	24253	GNG2	186469	335281	8672	334448	29156	PRKCQ	065675	539722	16610	441752	34065
AFAP1L2	169129	369271	735	358276	24254	GNG2	186469	557208	8673	N/A		PRKCQ	065675	263125	16611	263125	34066
AFAP1L2	169129	491814	736	N/A		GNG2	186469	555472	8674	451102	29157	PRKCQ	065675	610727	16612	483428	34067
AFAP1L2	169129	486300	737	N/A		GNG2	186469	556766	8675	451231	29158	PRKCQ	065675	397176	16613	380361	34068
AFAP1L2	169129	419268	738	396781	24255	GNG2	186469	554840	8676	N/A		PRKD3	115825	379066	16614	368356	34069
AFAP1L2	169129	483496	739	N/A		GNG2	186469	554736	8677	452014	29159	PRKD3	115825	469275	16615	N/A	
AFF2	155966	370460	740	359489	24256	GNG2	186469	556752	8678	451576	29160	PRKD3	115825	452104	16616	399540	34070
AFF2	155966	342251	741	345459	24257	GNG2	186469	556471	8679	N/A		PRKD3	115825	443977	16617	398743	34071
AFF2	155966	370458	742	359487	24258	GNG2	186469	554875	8680	451536	29161	PRKD3	115825	494667	16618	N/A	
AFF2	155966	370457	743	359486	24259	GNG2	186469	615906	8681	484021	29162	PRKD3	115825	475912	16619	N/A	
AFF2	155966	286437	744	286437	24260	GNL3	163938	479230	8682	419734	29163	PRKD3	115825	443187	16620	401839	34072
AFP	081051	513720	745	N/A		GNL3	163938	418458	8683	395772	29164	PRKD3	115825	464552	16621	N/A	
AFP	081051	515675	746	N/A		GNL3	163938	468146	8684	N/A		PRKD3	115825	477132	16622	N/A	
AFP	081051	395792	747	379138	24261	GNL3	163938	394799	8685	378278	29165	PRKD3	115825	234179	16623	234179	34073
AFP	081051	226359	748	226359	24262	GNL3	163938	468885	8686	N/A		PRKG1	185532	373985	16624	363097	34074

AFP	081051	508838	749	N/A		GNL3	163938	462550	8687	N/A		PRKG1	185532	373980	16625	363092	34075
AFP	081051	514279	750	N/A		GNL3	163938	492349	8688	420345	29166	PRKG1	185532	373976	16626	363087	34076
AFP	081051	506820	751	N/A		GNL3	163938	496254	8689	N/A		PRKG1	185532	373975	16627	N/A	
AGAP1	157985	409457	752	387174	24263	GNL3	163938	474423	8690	419895	29167	PRKG1	185532	401604	16628	384200	34077
AGAP1	157985	336665	753	338378	24264	GNL3	163938	460073	8691	N/A		PRKG2	138669	395578	16629	378945	34078
AGAP1	157985	304032	754	307634	24265	GNL3	163938	484022	8692	N/A		PRKG2	138669	628926	16630	486129	34079
AGAP1	157985	635100	755	489496	24266	GNL3	163938	497356	8693	N/A		PRKG2	138669	509169	16631	N/A	
AGAP1	157985	402604	756	385492	24267	GOLGA7B	155265	370602	8694	359634	29168	PRKG2	138669	509474	16632	N/A	
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AGAP1	157985	448025	758	403482	24269	GOLGA7B	155265	596005	8696	471396	29169	PRKG2	138669	545647	16634	439967	34080
AGAP1	157985	418654	759	393838	24270	GOT1	120053	370508	8697	359539	29170	PRKG2	138669	264399	16635	264399	34081
AGAP1	157985	466575	760	N/A		GOT1	120053	489349	8698	N/A		PRKY	099725	528056	16636	N/A	
AGAP1	157985	482882	761	N/A		GOT1	120053	471741	8699	N/A		PRKY	099725	533551	16637	N/A	
AGAP1	157985	453371	762	N/A		GPATCH4	160818	368232	8700	357215	29171	PRKY	099725	495163	16638	N/A	
AGAP1	157985	619456	763	483085	24271	GPATCH4	160818	438976	8701	396441	29172	PRKY	099725	472666	16639	N/A	
AGAP1	157985	428334	764	411824	24272	GPATCH4	160818	415314	8702	412620	29173	PRMT8	111218	452611	16640	414507	34082
AGAP1	157985	614409	765	484463	24273	GPATCH4	160818	494414	8703	N/A		PRMT8	111218	382622	16641	372067	34083
AGBL2	165923	528609	766	431912	24274	GPATCH4	160818	497287	8704	N/A		PRMT8	111218	543701	16642	N/A	
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AGBL2	165923	528244	768	436630	24276	GPATCH4	160818	498641	8706	N/A		PRMT9	164169	322396	16644	314396	34084
AGBL2	165923	529712	769	N/A		GPATCH4	160818	529520	8707	N/A		PRMT9	164169	510269	16645	N/A	
AGBL2	165923	532595	770	436063	24277	GPATCH4	160818	473910	8708	N/A		PRMT9	164169	514886	16646	426732	34085
AGBL2	165923	526331	771	N/A		GPATCH4	160818	531129	8709	N/A		PRMT9	164169	511687	16647	N/A	
AGBL2	165923	530577	772	432264	24278	GPATCH4	160818	474904	8710	436907	29175	PRNP	171867	379440	16648	368752	34086
AGBL2	165923	532835	773	N/A		GPATCH4	160818	498756	8711	N/A		PRNP	171867	430350	16649	399376	34087
AGBL2	165923	528632	774	432090	24279	GPATCH4	160818	506832	8712	N/A		PRNP	171867	424424	16650	411599	34088
AGBL2	165923	529154	775	436518	24280	GPATCH4	160818	527691	8713	N/A		PRNP	171867	457586	16651	415284	34089
AGBL2	165923	531835	776	N/A		GPATCH4	160818	531900	8714	N/A		PROCR	101000	216968	16652	216968	34090
AGBL2	165923	530969	777	431835	24281	GPATCH4	160818	525375	8715	N/A		PROCR	101000	635377	16653	489117	34091
AGBL2	165923	425363	778	N/A		GPC2	213420	471717	8716	N/A		PROCR	101000	634509	16654	489456	34092
AGBL2	165923	357610	779	350228	24282	GPC2	213420	480087	8717	488396	29176	PRODH	100033	491604	16655	N/A	
AGPAT3	160216	291572	780	291572	24283	GPC2	213420	490629	8718	N/A		PRODH	100033	420436	16656	410805	34093
AGPAT3	160216	474735	781	N/A		GPC2	213420	486702	8719	N/A		PRODH	100033	313755	16657	N/A	
AGPAT3	160216	448287	782	389318	24284	GPC2	213420	292377	8720	292377	29177	PRODH	100033	429300	16658	N/A	
AGPAT3	160216	398061	783	381138	24285	GPC6	183098	377047	8721	366246	29178	PRODH	100033	482858	16659	N/A	
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AGPAT3	160216	445582	785	412079	24287	GPCPD1	125772	379019	8723	368305	29180	PRODH	100033	357068	16661	349577	34095
AGPAT3	160216	398063	786	381140	24288	GPCPD1	125772	418646	8724	396720	29181	PRODH	100033	609229	16662	N/A	
AGPAT3	160216	398058	787	381135	24289	GPCPD1	125772	481038	8725	N/A		PRODH	100033	446371	16663	N/A	
AGPAT3	160216	457068	788	413906	24290	GPCPD1	125772	462080	8726	N/A		PRODH	100033	438924	16664	409742	34096
AGPAT3	160216	448845	789	394102	24291	GPCPD1	125772	633552	8727	487616	29182	PRODH	100033	399694	16665	N/A	
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AGPAT3	160216	422850	791	414440	24292	GPCPD1	125772	481690	8729	488635	29183	PRODH	100033	457083	16667	413941	34098
AGPAT3	160216	497909	792	N/A		GPHN	171723	315266	8730	312771	29184	PRODH	100033	496625	16668	N/A	
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AGPAT3	160216	481319	794	N/A		GPHN	171723	459628	8732	452220	29186	PROX1	117707	471129	16670	419517	34100
AGPAT3	160216	467358	795	N/A		GPHN	171723	543237	8733	438404	29187	PROX1	117707	366958	16671	355925	34101
AGPAT3	160216	484865	796	N/A		GPHN	171723	555668	8734	451935	29188	PROX1	117707	607726	16672	N/A	
AGPAT3	160216	546158	797	443510	24293	GPHN	171723	556633	8735	451056	29189	PROX1	117707	435016	16673	400694	34102
AGPAT4	026652	320285	798	314036	24294	GPHN	171723	557654	8736	451790	29190	PROX1	117707	607425	16674	475357	34103
AGPAT4	026652	437165	799	400211	24295	GPHN	171723	553936	8737	451725	29191	PROX1	117707	498508	16675	420283	34104
AGPAT4	026652	436279	800	413901	24296	GPHN	171723	556020	8738	N/A		PROX1	117707	261454	16676	261454	34105
AGPAT4	026652	366905	801	355872	24297	GPHN	171723	544752	8739	N/A		PRR5	186654	432186	16677	400925	34106
AGPAT4	026652	366911	802	355878	24298	GPHN	171723	555456	8740	450706	29192	PRR5	186654	492475	16678	N/A	
AGRN	188157	379370	803	368678	24299	GPHN	171723	556501	8741	N/A		PRR5	186654	006251	16679	006251	34107
AGRN	188157	477585	804	492725	24300	GPHN	171723	555527	8742	N/A		PRR5	186654	459857	16680	N/A	
AGRN	188157	469403	805	N/A		GPHN	171723	555503	8743	452009	29193	PRR5	186654	403581	16681	384848	34108
AGRN	188157	479707	806	N/A		GPHN	171723	557678	8744	N/A		PRR5	186654	492289	16682	N/A	
AGRN	188157	466223	807	N/A		GPHN	171723	556240	8745	450442	29194	PRR5	186654	336985	16683	337464	34109

AGRN	188157	478677	808	N/A		GPNMB	136235	465673	8746	N/A		PRR5	186654	403696	16684	384746	34110
AGRN	188157	492947	809	N/A		GPNMB	136235	492858	8747	N/A		PRR5	186654	457960	16685	410215	34111
AGRN	188157	419249	810	400771	24301	GPNMB	136235	258733	8748	258733	29195	PRR5	186654	431834	16686	407637	34112
AGRN	188157	461111	811	N/A		GPNMB	136235	381990	8749	371420	29196	PRR5	186654	432916	16687	392026	34113
AGRN	188157	620552	812	484607	24302	GPNMB	136235	409458	8750	386476	29197	PRR5	186654	477331	16688	N/A	
AGT	135744	366667	813	355627	24303	GPNMB	136235	459927	8751	N/A		PRR5	186654	455389	16689	N/A	
AHNAK	124942	530124	814	433789	24304	GPNMB	136235	487890	8752	N/A		PRR5	186654	495017	16690	N/A	
AHNAK	124942	257247	815	257247	24305	GPNMB	136235	474157	8753	N/A		PRR5	186654	475850	16691	N/A	
AHNAK	124942	525875	816	N/A		GPNMB	136235	492512	8754	N/A		PRR5	186654	611394	16692	480357	34114
AHNAK	124942	533365	817	433635	24306	GPNMB	136235	479625	8755	N/A		PRR5	186654	624862	16693	485597	34115
AHNAK	124942	378024	818	367263	24307	GPNMB	136235	470994	8756	N/A		PRR5	186654	617066	16694	479623	34116
AHNAK	124942	530285	819	433286	24308	GPNMB	136235	463011	8757	N/A		PRR5L	135362	531269	16695	N/A	
AHNAK	124942	528508	820	435357	24309	GPNMB	136235	478451	8758	N/A		PRR5L	135362	529034	16696	N/A	
AHNAK	124942	531324	821	436845	24310	GPNMB	136235	468723	8759	N/A		PRR5L	135362	530639	16697	435050	34117
AHRR	063438	505113	822	424601	24311	GPR107	148358	372406	8760	361483	29198	PRR5L	135362	527172	16698	433708	34118
AHRR	063438	316418	823	323816	24312	GPR107	148358	347136	8761	336988	29199	PRR5L	135362	532121	16699	433893	34119
AHRR	063438	512529	824	424880	24313	GPR107	148358	493417	8762	475772	29200	PRR5L	135362	526728	16700	431610	34120
AHRR	063438	514523	825	430914	24314	GPR107	148358	462907	8763	N/A		PRR5L	135362	378867	16701	368144	34121
AHRR	063438	510400	826	428893	24315	GPR107	148358	483935	8764	N/A		PRR5L	135362	389693	16702	N/A	
AHRR	063438	515206	827	430842	24316	GPR107	148358	415344	8765	N/A		PRR5L	135362	524380	16703	433305	34122
AHRR	063438	504625	828	429944	24317	GPR107	148358	372410	8766	361487	29201	PRR5L	135362	526682	16704	436485	34123
AHRR	063438	506456	829	426932	24318	GPR107	148358	610997	8767	483750	29202	PRR5L	135362	532843	16705	N/A	
AHRR	063438	510910	830	N/A		GPR135	181619	481661	8768	432696	29203	PRR5L	135362	527751	16706	N/A	
AHRR	063438	511487	831	426076	24319	GPR135	181619	395116	8769	378548	29204	PRR5L	135362	530252	16707	431475	34124
AHRR	063438	507048	832	N/A		GPR153	158292	377893	8770	367125	29205	PRR5L	135362	532578	16708	N/A	
AHSA1	100591	555133	833	451569	24320	GPR161	143147	367838	8771	356812	29206	PRR5L	135362	530050	16709	432203	34125
AHSA1	100591	216479	834	216479	24321	GPR161	143147	478868	8772	N/A		PRR5L	135362	526679	16710	436402	34126
AHSA1	100591	535854	835	440108	24322	GPR161	143147	367836	8773	356810	29207	PRR5L	135362	527487	16711	435241	34127
AHSA1	100591	554156	836	N/A		GPR161	143147	367835	8774	356809	29208	PRR5L	135362	525672	16712	N/A	
AHSA1	100591	555517	837	451467	24323	GPR161	143147	493800	8775	N/A		PRR5L	135362	529020	16713	N/A	
AHSA1	100591	556963	838	N/A		GPR161	143147	485232	8776	N/A		PRR5L	135362	530627	16714	N/A	
AHSA1	100591	556866	839	N/A		GPR161	143147	546300	8777	444348	29209	PRRC1	164244	296666	16715	296666	34128
AHSA1	100591	553374	840	451475	24324	GPR161	143147	271357	8778	271357	29210	PRRC1	164244	512871	16716	N/A	
AHSA1	100591	555457	841	N/A		GPR161	143147	539777	8779	437576	29211	PRRC1	164244	442138	16717	392873	34129
AHSA1	100591	555729	842	452127	24325	GPR161	143147	537209	8780	441039	29212	PRRC1	164244	512635	16718	421965	34130
AHSA1	100591	555473	843	N/A		GPR22	172209	473300	8781	N/A		PRRC1	164244	507774	16719	N/A	
AHSA1	100591	556369	844	450890	24326	GPR22	172209	304402	8782	302676	29213	PRRC1	164244	513427	16720	N/A	
AHSA1	100591	557476	845	N/A		GPR22	172209	496754	8783	N/A		PRRG3	130032	448726	16721	411509	34131
MYORG	164976	297625	846	297625	24327	GPR22	283812	638179	8784	N/A		PRRG3	130032	370354	16722	359379	34132
MYORG	164976	379142	847	368437	24328	GPR22	283812	639742	8785	492841	29214	PRRG3	130032	370353	16723	359378	34133
AK4	162433	497030	848	N/A		GPR22	283812	640321	8786	N/A		PRRG3	130032	448324	16724	394121	34134
AK4	162433	470888	849	N/A		GPR34	171659	378142	8787	367384	29215	PRRG3	130032	538575	16725	440217	34135
AK4	162433	546702	850	448458	24329	GPR34	171659	378138	8788	367378	29216	PRRT2	167371	568516	16726	N/A	
AK4	162433	327299	851	322175	24330	GPR34	171659	620846	8789	480296	29217	PRRT2	167371	637596	16727	489805	34136
AK4	162433	474968	852	N/A		GPR37	170775	303921	8790	306449	29218	PRRT2	167371	562148	16728	454634	34137
AK4	162433	479060	853	N/A		GPR37L1	170075	367282	8791	356251	29219	PRRT2	167371	637542	16729	N/A	
AK4	162433	545314	854	445912	24331	GPR63	112218	229955	8792	229955	29220	PRRT2	167371	636001	16730	N/A	
AK4	162433	395334	855	378743	24332	GPR84	139572	267015	8793	267015	29221	PRRT2	167371	358758	16731	351608	34138
AKAIN1	231824	580650	856	462259	24333	GPR84	139572	551809	8794	450310	29222	PRRT2	167371	636131	16732	490390	34139
AKAIN1	231824	434239	857	399075	24334	GPRASP2	158301	332262	8795	339057	29223	PRRT2	167371	567551	16733	489813	34140
AKAP13	170776	560571	858	N/A		GPRASP2	158301	483720	8796	N/A		PRRT2	167371	637290	16734	490278	34141
AKAP13	170776	559362	859	453768	24335	GPRASP2	158301	486814	8797	N/A		PRRT2	167371	567659	16735	456226	34142
AKAP13	170776	560302	860	453634	24336	GPRASP2	158301	543253	8798	437872	29224	PRRT2	167371	637565	16736	490207	34143
AKAP13	170776	394518	861	378026	24337	GPRASP2	158301	535209	8799	437394	29225	PRRT2	167371	636619	16737	489669	34144
AKAP13	170776	361243	862	354718	24338	GPRC5C	170412	482723	8800	N/A		PRRT2	167371	636019	16738	N/A	
AKAP13	170776	560256	863	453620	24339	GPRC5C	170412	582873	8801	N/A		PRRT2	167371	300797	16739	300797	34145
AKAP13	170776	558166	864	452622	24340	GPRC5C	170412	342648	8802	340595	29226	PRRT2	167371	637403	16740	489782	34146
AKAP13	170776	558811	865	452698	24341	GPRC5C	170412	481232	8803	462147	29227	PRRT2	167371	572820	16741	458291	34147
AKAP13	170776	560340	866	483091	24342	GPRC5C	170412	582444	8804	463813	29228	PRRT2	167371	637064	16742	490826	34148

AKAP13	170776	560676	867	481485	24343	GPRC5C	170412	582473	8805	462440	29229	PRRT2	167371	636246	16743	489948	34149
AKAP13	170776	560579	868	477780	24344	GPRC5C	170412	577663	8806	N/A		PRRT2	167371	636902	16744	489935	34150
AKAP13	170776	559486	869	453205	24345	GPRC5C	170412	581590	8807	463090	29230	PRRT2	167371	637425	16745	N/A	
AKAP13	170776	612418	870	482058	24346	GPRC5C	170412	392629	8808	376405	29231	PRRT4	224940	489835	16746	419296	34151
AKAP13	170776	560957	871	N/A		GPRC5C	170412	392628	8809	376404	29232	PRRT4	224940	480290	16747	417878	34152
AKAP13	170776	558092	872	N/A		GPRC5C	170412	392627	8810	376403	29233	PRRT4	224940	489517	16748	419282	34153
AKAP13	170776	557852	873	480789	24347	GPSM2	121957	406462	8811	385510	29234	PRRT4	224940	464607	16749	420155	34154
AKAP13	170776	560482	874	N/A		GPSM2	121957	435987	8812	408664	29235	PRRT4	224940	495931	16750	419221	34155
AKAP13	170776	559278	875	N/A		GPSM2	121957	435475	8813	401948	29236	PRRT4	224940	535159	16751	445239	34156
AKAP13	170776	558644	876	N/A		GPSM2	121957	446797	8814	392138	29237	PRRT4	224940	446477	16752	415026	34157
AKAP13	170776	559820	877	N/A		GPSM2	121957	441735	8815	390629	29238	PRRX1	116132	553786	16753	N/A	
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AKAP13	170776	559391	879	N/A		GPX2	176153	553522	8817	450991	29240	PRRX1	116132	239461	16755	239461	34159
AKAP13	170776	560185	880	N/A		GPX2	176153	389614	8818	374265	29241	PRRX1	116132	497230	16756	450762	34160
AKAP13	170776	394510	881	378018	24348	GPX2	176153	557049	8819	451721	29242	PRRX1	116132	476867	16757	N/A	
AKNA	106948	374088	882	363201	24349	GPX2	176153	557323	8820	451844	29243	PRRX1	116132	495280	16758	N/A	
AKNA	106948	492875	883	N/A		GPX2	176153	612794	8821	478082	29244	PRRX1	116132	485529	16759	N/A	
AKNA	106948	223791	884	223791	24350	GRAMD2B	155324	513040	8822	426120	29245	PRRX1	116132	496573	16760	N/A	
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AKNA	106948	491133	886	N/A		GRAMD2B	155324	285689	8824	285689	29247	PRSS55	184647	522210	16762	430459	34162
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AKNA	106948	312033	888	309222	24352	GRAMD2B	155324	514932	8826	N/A		PSD2	146005	274710	16764	274710	34164
AKNA	106948	307564	889	303769	24353	GRAMD2B	155324	513913	8827	N/A		PSRC1	134222	369904	16765	358920	34165
AKNA	106948	374079	890	363192	24354	GRAMD2B	155324	505720	8828	N/A		PSRC1	134222	409267	16766	386323	34166
AKR1C1	187134	477661	891	N/A		GRAMD2B	155324	514099	8829	423236	29249	PSRC1	134222	369907	16767	358923	34167
AKR1C1	187134	380872	892	370254	24355	GRAMD2B	155324	513978	8830	421494	29250	PSRC1	134222	409138	16768	474667	34168
AKR1C1	187134	442997	893	416415	24356	GRAMD2B	155324	502348	8831	427596	29251	PSRC1	134222	492431	16769	N/A	
AKR1C1	187134	380859	894	370240	24357	GRAMD2B	155324	509882	8832	N/A		PSRC1	134222	369903	16770	358919	34169
AKR1C1	187134	476100	895	N/A		GRAMD2B	155324	505441	8833	N/A		PSRC1	134222	474126	16771	474682	34170
AKR1C2	151632	380753	896	370129	24358	GRAMD2B	155324	511134	8834	426088	29252	PSRC1	134222	429031	16772	387791	34171
AKR1C2	151632	421196	897	392694	24359	GRAMD2B	155324	504859	8835	N/A		PSRC1	134222	418914	16773	413186	34172
AKR1C2	151632	460124	898	N/A		GRAMD2B	155324	508523	8836	N/A		PSRC1	134222	459765	16774	N/A	
AKR1C2	151632	604507	899	474566	24360	GRAMD2B	155324	512579	8837	N/A		PSRC1	134222	471740	16775	N/A	
AKR1C2	151632	604184	900	N/A		GRAMD2B	155324	503702	8838	N/A		PSRC1	134222	369909	16776	358925	34173
AKR1C2	151632	604428	901	N/A		GRAMD2B	155324	542322	8839	441876	29253	PSTPIP2	152229	589328	16777	468622	34174
AKR1C2	151632	604711	902	N/A		GRAMD2B	155324	544396	8840	444049	29254	PSTPIP2	152229	409746	16778	387261	34175
AKR1C2	151632	603073	903	N/A		GRAMD4	075240	447351	8841	409784	29255	PSTPIP2	152229	588801	16779	N/A	
AKR1C2	151632	604439	904	N/A		GRAMD4	075240	431155	8842	408042	29256	PSTPIP2	152229	593086	16780	N/A	
AKR1C2	151632	455190	905	408440	24361	GRAMD4	075240	406902	8843	385689	29257	PSTPIP2	152229	591729	16781	N/A	
AKR1C3	196139	605781	906	N/A		GRAMD4	075240	490378	8844	N/A		PSTPIP2	152229	587042	16782	N/A	
AKR1C3	196139	470862	907	N/A		GRAMD4	075240	456069	8845	397501	29258	PTCH2	117425	438067	16783	413169	34176
AKR1C3	196139	480822	908	N/A		GRAMD4	075240	408031	8846	385851	29259	PTCH2	117425	372192	16784	361266	34177
AKR1C3	196139	602997	909	474188	24362	GRAMD4	075240	361034	8847	354313	29260	PTCH2	117425	447098	16785	389703	34178
AKR1C3	196139	439082	910	401327	24363	GRB10	106070	402578	8848	385189	29261	PTCHD1	165186	379361	16786	368666	34179
AKR1C3	196139	605149	911	474882	24364	GRB10	106070	403097	8849	385544	29262	PTCHD1	165186	456522	16787	406663	34180
AKR1C3	196139	380554	912	369927	24365	GRB10	106070	406641	8850	385366	29263	PTCHD4	244694	339488	16788	341914	34181
AKR1C3	196139	480697	913	N/A		GRB10	106070	357271	8851	349818	29264	PTCHD4	244694	398738	16789	381722	34182
AKR1C3	196139	605322	914	N/A		GRB10	106070	407526	8852	385046	29265	PTER	165983	535784	16790	439485	34183
AKR1C3	196139	603312	915	N/A		GRB10	106070	401949	8853	385770	29266	PTER	165983	378000	16791	367239	34184
AKR1C3	196139	603484	916	N/A		GRB10	106070	402497	8854	385748	29267	PTER	165983	485788	16792	N/A	
AKR1C4	198610	469875	917	N/A		GRB10	106070	461886	8855	N/A		PTER	165983	423462	16793	389535	34185
AKR1C4	198610	380448	918	369814	24366	GRB10	106070	473696	8856	N/A		PTER	165983	298942	16794	298942	34186
AKR1C4	198610	263126	919	263126	24367	GRB10	106070	482397	8857	N/A		PTGES3	110958	537473	16795	N/A	
ALAS2	158578	396198	920	379501	24368	GRB10	106070	428711	8858	410920	29268	PTGES3	110958	262033	16796	262033	34187
ALAS2	158578	330807	921	332369	24369	GRB10	106070	439044	8859	413023	29269	PTGES3	110958	414274	16797	405299	34188
ALAS2	158578	335854	922	337131	24370	GRB10	106070	465602	8860	N/A		PTGES3	110958	436399	16798	402385	34189
ALAS2	158578	498636	923	N/A		GRB10	106070	483819	8861	N/A		PTGES3	110958	448157	16799	414892	34190
ALAS2	158578	463868	924	N/A		GRB10	106070	470992	8862	N/A		PTGES3	110958	456859	16800	389090	34191
ALAS2	158578	477869	925	N/A		GRB10	106070	483157	8863	N/A		PTGES3	110958	614328	16801	482075	34192

ALAS2	158578	455688	926	407204	24371	GRB10	106070	492265	8864	N/A		PTGFRN	134247	393203	16802	376899	34193
ALAS2	158578	493869	927	N/A		GRB10	106070	467386	8865	N/A		PTGFRN	134247	496699	16803	N/A	
ALCAM	170017	306107	928	305988	24372	GRB10	106070	478162	8866	N/A		PTGFRN	134247	497385	16804	N/A	
ALCAM	170017	470756	929	N/A		GRB10	106070	490051	8867	N/A		PTK2B	120899	397501	16805	380638	34194
ALCAM	170017	472644	930	419236	24373	GRB10	106070	398812	8868	381793	29270	PTK2B	120899	519650	16806	N/A	
ALCAM	170017	481337	931	N/A		GRB10	106070	335866	8869	338543	29271	PTK2B	120899	522338	16807	429694	34195
ALCAM	170017	486979	932	418213	24374	GRB10	106070	398810	8870	381790	29272	PTK2B	120899	521164	16808	430404	34196
ALCAM	170017	460954	933	N/A		GRB14	115290	488342	8871	N/A		PTK2B	120899	346049	16809	332816	34197
ALCAM	170017	465413	934	418937	24375	GRB14	115290	263915	8872	263915	29273	PTK2B	120899	522517	16810	428271	34198
ALCAM	170017	491388	935	N/A		GRB14	115290	497306	8873	N/A		PTK2B	120899	412793	16811	416174	34199
ALCAM	170017	489178	936	N/A		GRB14	115290	446413	8874	416786	29274	PTK2B	120899	496920	16812	N/A	
ALDH1A1	165092	297785	937	297785	24376	GRB14	115290	469573	8875	N/A		PTK2B	120899	517339	16813	427931	34200
ALDH1A1	165092	376939	938	366138	24377	GRB14	115290	424693	8876	401702	29275	PTK2B	120899	521000	16814	N/A	
ALDH1A1	165092	482210	939	N/A		GRB7	141738	577695	8877	463416	29276	PTK2B	120899	519512	16815	428837	34201
ALDH1A1	165092	419959	940	388026	24378	GRB7	141738	309156	8878	310771	29277	PTK2B	120899	397497	16816	N/A	
ALDH1A1	165092	446946	941	401361	24379	GRB7	141738	485182	8879	N/A		PTK2B	120899	461615	16817	N/A	
ALDH1A1	165092	493113	942	N/A		GRB7	141738	583813	8880	463126	29278	PTK2B	120899	495097	16818	N/A	
ALDH1A1	165092	493311	943	N/A		GRB7	141738	584853	8881	N/A		PTK2B	120899	482543	16819	N/A	
ALDH1A1	165092	297785	944	297785	24380	GRB7	141738	584819	8882	N/A		PTK2B	120899	522245	16820	N/A	
ALDH1A1	165092	376939	945	366138	24381	GRB7	141738	394211	8883	377761	29279	PTK2B	120899	420218	16821	391995	34202
ALDH1A1	165092	482210	946	N/A		GRB7	141738	578702	8884	N/A		PTK7	112655	230419	16822	230419	34203
ALDH1A1	165092	419959	947	388026	24382	GRB7	141738	445327	8885	403459	29280	PTK7	112655	476760	16823	417607	34204
ALDH1A1	165092	446946	948	401361	24383	GRB7	141738	394209	8886	377759	29281	PTK7	112655	470019	16824	420322	34205
ALDH1A1	165092	493113	949	N/A		GRB7	141738	584053	8887	N/A		PTK7	112655	471863	16825	419037	34206
ALDH1A1	165092	493311	950	N/A		GRB7	141738	394204	8888	377754	29282	PTK7	112655	349241	16826	325462	34207
ALDH1A3	184254	561338	951	452789	24384	GRB7	141738	461756	8889	N/A		PTK7	112655	352931	16827	326029	34208
ALDH1A3	184254	329841	952	332256	24385	GRB7	141738	473071	8890	N/A		PTK7	112655	345201	16828	325992	34209
ALDH1A3	184254	558033	953	454107	24386	GREB1	196208	628795	8891	487278	29283	PTK7	112655	230418	16829	230418	34210
ALDH1A3	184254	557963	954	453328	24387	GREB1	196208	381486	8892	370896	29284	PTK7	112655	487673	16830	N/A	
ALDH1A3	184254	560555	955	N/A		GREB1	196208	263834	8893	263834	29285	PTK7	112655	481273	16831	418754	34211
ALDH1A3	184254	346623	956	343294	24388	GREB1	196208	389825	8894	374475	29286	PTK7	112655	481946	16832	420165	34212
ALDH1A3	184254	558869	957	N/A		GREB1	196208	381483	8895	370892	29287	PTK7	112655	490710	16833	N/A	
ALDH1L1	144908	273450	958	273450	24389	GREB1	196208	470980	8896	N/A		PTK7	112655	489707	16834	420765	34213
ALDH1L1	144908	472186	959	420293	24390	GREB1	196208	432985	8897	403886	29288	PTK7	112655	470471	16835	N/A	
ALDH1L1	144908	467370	960	N/A		GREB1	196208	396123	8898	379429	29289	PTK7	112655	493339	16836	N/A	
ALDH1L1	144908	452905	961	395881	24391	GREB1	196208	472040	8899	N/A		PTK7	112655	461100	16837	418545	34214
ALDH1L1	144908	393434	962	377083	24392	GREB1	196208	234142	8900	234142	29290	PTK7	112655	494146	16838	419096	34215
ALDH1L1	144908	462808	963	N/A		GREB1L	141449	584446	8901	N/A		PTK7	112655	497957	16839	418462	34216
ALDH1L1	144908	476245	964	N/A		GREB1L	141449	269218	8902	269218	29291	PTK7	112655	473339	16840	420186	34217
ALDH1L1	144908	473607	965	419448	24393	GREB1L	141449	580732	8903	464162	29292	PTK7	112655	461389	16841	418386	34218
ALDH1L1	144908	413612	966	N/A		GREB1L	141449	578368	8904	N/A		PTMS	159335	540667	16842	N/A	
ALDH1L1	144908	484724	967	N/A		GREB1L	141449	579454	8905	463926	29293	PTMS	159335	389462	16843	374113	34219
ALDH1L1	144908	493803	968	418905	24394	GREB1L	141449	581327	8906	463976	29294	PTMS	159335	540874	16844	442325	34220
ALDH1L1	144908	490367	969	418711	24395	GREB1L	141449	580683	8907	N/A		PTMS	159335	309083	16845	310088	34221
ALDH1L1	144908	460368	970	419826	24396	GREB1L	141449	578955	8908	N/A		PTMS	159335	540828	16846	N/A	
ALDH1L1	144908	488356	971	419955	24397	GREB1L	141449	578383	8909	N/A		PTMS	159335	538057	16847	N/A	
ALDH1L1	144908	509952	972	426594	24398	GREB1L	141449	580384	8910	462152	29295	PTMS	159335	619580	16848	478828	34222
ALDH1L1	144908	511283	973	426713	24399	GREB1L	141449	424526	8911	412060	29296	PTN	105894	348225	16849	341170	34223
ALDH1L1	144908	393431	974	377081	24400	GRHL1	134317	439493	8912	387521	29297	PTN	105894	393083	16850	376798	34224
ALDH1L1	144908	455064	975	414126	24401	GRHL1	134317	497403	8913	N/A		PTP4A1	112245	639568	16851	N/A	
ALDH1L2	136010	549335	976	N/A		GRHL1	134317	464418	8914	420654	29298	PTP4A1	112245	470661	16852	N/A	
ALDH1L2	136010	258494	977	258494	24402	GRHL1	134317	324907	8915	324693	29299	PTP4A1	112245	370651	16853	359685	34225
ALDH1L2	136010	552270	978	447538	24403	GRHL1	134317	472167	8916	418275	29300	PTP4A1	112245	578299	16854	462406	34226
ALDH1L2	136010	548418	979	447464	24404	GRHL1	134317	494520	8917	N/A		PTP4A1	112245	473334	16855	N/A	
ALDH1L2	136010	552427	980	N/A		GRHL1	134317	480736	8918	419831	29301	PTP4A1	112245	626021	16856	485687	34227
ALDH6A1	119711	553458	981	450436	24405	GRHL1	134317	405379	8919	384209	29302	PTP4A1	112245	627002	16857	487586	34228
ALDH6A1	119711	554501	982	N/A		GRIA1	155511	481559	8920	N/A		PTP4A3	275575	633518	16858	487595	34229
ALDH6A1	119711	350259	983	342564	24406	GRIA1	155511	520353	8921	N/A		PTP4A3	275575	633621	16859	487610	34230
ALDH6A1	119711	555126	984	452081	24407	GRIA1	155511	518862	8922	N/A		PTP4A3	275575	633262	16860	487861	34231

ALDH6A1	119711	554231	985	N/A		GRIA1	155511	285900	8923	285900	29303	PTP4A3	275575	633366	16861	N/A	
ALDH6A1	119711	553814	986	N/A		GRIA1	155511	474198	8924	N/A		PTP4A3	275575	634147	16862	N/A	
ALDH6A1	119711	556852	987	N/A		GRIA1	155511	518142	8925	427920	29304	PTP4A3	275575	632997	16863	N/A	
ALDOC	109107	395319	988	378729	24408	GRIA1	155511	340592	8926	339343	29305	PTP4A3	275575	633470	16864	N/A	
ALDOC	109107	395321	989	378731	24409	GRIA1	155511	517469	8927	N/A		PTP4A3	275575	632834	16865	N/A	
ALDOC	109107	226253	990	226253	24410	GRIA1	155511	521843	8928	427864	29306	PTP4A3	275575	633677	16866	N/A	
ALDOC	109107	460201	991	463174	24411	GRIA1	155511	448073	8929	415569	29307	PTP4A3	275575	614325	16867	481205	34232
ALDOC	109107	584086	992	462674	24412	GRIA1	155511	518783	8930	428994	29308	PTP4A3	275575	622569	16868	484300	34233
ALDOC	109107	581807	993	465623	24413	GRIA1	155511	492291	8931	N/A		PTP4A3	184489	521578	16869	428976	34234
ALDOC	109107	435638	994	398976	24414	GRIA1	155511	520966	8932	N/A		PTP4A3	184489	520105	16870	428758	34235
ALDOC	109107	578590	995	463118	24415	GRIA3	125675	616590	8933	479607	29309	PTP4A3	184489	523147	16871	428725	34236
ALDOC	109107	582381	996	N/A		GRIA3	125675	611689	8934	478758	29310	PTP4A3	184489	524028	16872	430332	34237
ALK	171094	642122	997	493203	24416	GRIA3	125675	541091	8935	446440	29311	PTP4A3	184489	329397	16873	332274	34238
ALK	171094	389048	998	373700	24417	GRIA3	125675	620443	8936	478489	29312	PTP4A3	184489	349124	16874	331730	34239
ALK	171094	431873	999	414027	24418	GRIA3	125675	479118	8937	N/A		PTPN14	152104	366956	16875	355923	34240
ALK	171094	638605	1000	N/A		GRIA3	125675	477389	8938	N/A		PTPN14	152104	473261	16876	N/A	
ALK	171094	453137	1001	387488	24419	GRIA3	125675	460123	8939	N/A		PTPN14	152104	486173	16877	N/A	
ALK	171094	498037	1002	N/A		GRIA3	125675	622768	8940	481554	29313	PTPN14	152104	491277	16878	N/A	
ALK	171094	618119	1003	482733	24420	GRIA3	125675	620581	8941	481875	29314	PTPN14	152104	543945	16879	443330	34241
ALOX5	275565	610656	1004	484468	24421	GRID1	182771	327946	8942	330148	29315	PTPN22	134242	460620	16880	433141	34242
ALOX5	275565	622032	1005	N/A		GRID1	182771	552278	8943	N/A		PTPN22	134242	359785	16881	352833	34243
ALOX5	275565	622781	1006	N/A		GRID1	182771	464741	8944	433064	29316	PTPN22	134242	528414	16882	435176	34244
ALOX5	275565	616521	1007	N/A		GRID2	152208	282020	8945	282020	29317	PTPN22	134242	469077	16883	N/A	
ALOX5	275565	612275	1008	N/A		GRID2	152208	505687	8946	N/A		PTPN22	134242	532224	16884	431249	34245
ALOX5	275565	617751	1009	N/A		GRID2	152208	510992	8947	421257	29318	PTPN22	134242	420377	16885	388229	34246
ALOX5	275565	622021	1010	479958	24422	GRID2	152208	515744	8948	N/A		PTPN22	134242	525799	16886	432674	34247
ALOX5	275565	622238	1011	479452	24423	GRID2	152208	502699	8949	422845	29319	PTPN22	134242	484147	16887	N/A	
ALOX5	012779	374391	1012	363512	24424	GRID2	152208	512631	8950	423331	29320	PTPN22	134242	534519	16888	N/A	
ALOX5	012779	483623	1013	N/A		GRID2	152208	513976	8951	425794	29321	PTPN22	134242	529045	16889	434932	34248
ALOX5	012779	475300	1014	N/A		GRID2	152208	637838	8952	490775	29322	PTPN22	134242	538253	16890	439372	34249
ALOX5	012779	493336	1015	N/A		GRID2	152208	611049	8953	483084	29323	PTPN3	070159	447271	16891	N/A	
ALOX5	012779	481117	1016	N/A		GRID2IP	215045	452113	8954	397887	29324	PTPN3	070159	374541	16892	363667	34250
ALOX5	012779	498461	1017	N/A		GRID2IP	215045	435185	8955	408364	29325	PTPN3	070159	497739	16893	N/A	
ALOX5	012779	542434	1018	437634	24425	GRID2IP	215045	457091	8956	397351	29326	PTPN3	070159	412145	16894	416654	34251
ALOX5	012779	612635	1019	483803	24426	GRIK1	171189	327783	8957	327687	29327	PTPN3	070159	446349	16895	395384	34252
ALS2	003393	264276	1020	264276	24427	GRIK1	171189	389125	8958	373777	29328	PTPN3	070159	262539	16896	262539	34253
ALS2	003393	439495	1021	403832	24428	GRIK1	171189	399913	8959	382797	29329	PTPN5	110786	477854	16897	435056	34254
ALS2	003393	489440	1022	N/A		GRIK1	171189	399914	8960	382798	29330	PTPN5	110786	358540	16898	351342	34255
ALS2	003393	482891	1023	N/A		GRIK1	171189	389124	8961	373776	29331	PTPN5	110786	396166	16899	379469	34256
ALS2	003393	494017	1024	N/A		GRIK1	171189	399907	8962	382791	29332	PTPN5	110786	396170	16900	379473	34257
ALS2	003393	483703	1025	N/A		GRIK1	171189	399909	8963	382793	29333	PTPN5	110786	396168	16901	379471	34258
ALS2	003393	482789	1026	N/A		GRIK1	171189	472429	8964	N/A		PTPN5	110786	496201	16902	N/A	
ALS2	003393	467448	1027	429223	24429	GRIK2	164418	421544	8965	397026	29334	PTPRB	127329	334414	16903	334928	34259
ALS2	003393	496244	1028	N/A		GRIK2	164418	413795	8966	405596	29335	PTPRB	127329	550358	16904	448058	34260
ALS2	003393	409632	1029	386384	24430	GRIK2	164418	369138	8967	358134	29336	PTPRB	127329	538708	16905	438927	34261
ALS2	003393	410052	1030	386948	24431	GRIK2	164418	358361	8968	351128	29337	PTPRB	127329	550857	16906	447302	34262
ALS2	003393	462747	1031	N/A		GRIK2	164418	455610	8969	391988	29338	PTPRB	127329	261266	16907	261266	34263
ALS2CR12	155749	286190	1032	286190	24432	GRIK2	164418	436862	8970	407140	29339	PTPRB	127329	549400	16908	N/A	
ALS2CR12	155749	415745	1033	402327	24433	GRIK2	164418	487395	8971	N/A		PTPRB	127329	551525	16909	448349	34264
ALS2CR12	155749	494171	1034	N/A		GRIK2	164418	487161	8972	N/A		PTPRB	127329	548122	16910	446982	34265
ALS2CR12	155749	392257	1035	376086	24434	GRIK2	164418	369134	8973	358130	29340	PTPRB	127329	538174	16911	N/A	
ALS2CR12	155749	439709	1036	412073	24435	GRIK2	164418	318991	8974	313276	29341	PTPRB	127329	552253	16912	N/A	
ALS2CR12	155749	494223	1037	N/A		GRIK2	164418	369137	8975	358133	29342	PTPRB	127329	547715	16913	446934	34266
ALS2CR12	155749	425488	1038	393945	24436	GRIK3	163873	373091	8976	362183	29343	PTPRE	132334	254667	16914	254667	34267
ALS2CR12	155749	448967	1039	N/A		GRIK3	163873	373093	8977	362185	29344	PTPRE	132334	442830	16915	410540	34268
ALS2CR12	155749	418364	1040	407585	24437	GRIK3	163873	462621	8978	N/A		PTPRE	132334	471218	16916	474102	34269
ALS2CR12	155749	405148	1041	385098	24438	GRIK3	163873	479620	8979	N/A		PTPRE	132334	455661	16917	416939	34270
AMPD3	133805	527261	1042	N/A		GRIN2A	183454	396573	8980	379818	29345	PTPRE	132334	467366	16918	474830	34271
AMPD3	133805	532250	1043	432707	24439	GRIN2A	183454	461292	8981	N/A		PTPRE	132334	306042	16919	303350	34272

AMPD3	133805	295663	1044	N/A		GRIN2A	183454	636273	8982	N/A		PTPRE	132334	487428	16920	N/A	
AMPD3	133805	532966	1045	N/A		GRIN2A	183454	562109	8983	454998	29346	PTPRE	132334	495530	16921	475063	34273
AMPD3	133805	527369	1046	N/A		GRIN2A	183454	330684	8984	332549	29347	PTPRE	132334	479896	16922	473761	34274
AMPD3	133805	529835	1047	N/A		GRIN2A	183454	463531	8985	N/A		PTPRE	132334	492479	16923	N/A	
AMPD3	133805	396554	1048	379802	24440	GRIN2A	183454	566683	8986	N/A		PTPRE	132334	463727	16924	N/A	
AMPD3	133805	524866	1049	433284	24441	GRIN2A	183454	568247	8987	N/A		PTPRJ	149177	418331	16925	400010	34275
AMPD3	133805	534047	1050	433937	24442	GRIN2A	183454	637393	8988	490232	29348	PTPRJ	149177	440289	16926	409733	34276
AMPD3	133805	396553	1051	379801	24443	GRIN2A	183454	566670	8989	N/A		PTPRJ	149177	534219	16927	432686	34277
AMPD3	133805	529834	1052	435382	24444	GRIN2A	183454	637334	8990	N/A		PTPRJ	149177	527952	16928	435618	34278
AMPD3	133805	528723	1053	436987	24445	GRIN2A	183454	566665	8991	N/A		PTPRJ	149177	526550	16929	N/A	
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AMPD3	133805	533116	1056	433351	24447	GRIN2A	183454	535259	8994	441572	29351	PTPRJ	149177	615445	16932	479342	34280
AMPD3	133805	530864	1057	N/A		GRIN2B	273079	637214	8995	489997	29352	PTPRK	152894	368226	16933	357209	34281
AMPD3	133805	529744	1058	434608	24448	GRIN2B	273079	609686	8996	477455	29353	PTPRK	152894	532331	16934	432973	34282
AMPD3	133805	444303	1059	396000	24449	GRIN2B	273079	636207	8997	N/A		PTPRK	152894	368213	16935	357196	34283
AMZ1	174945	312371	1060	308149	24450	GRIN2B	273079	628166	8998	N/A		PTPRK	152894	368210	16936	357193	34284
AMZ1	174945	407112	1061	386020	24451	GRIN2B	273079	636855	8999	N/A		PTPRK	152894	368215	16937	357198	34285
AMZ1	174945	485540	1062	N/A		GRIN2B	273079	636856	9000	N/A		PTPRK	152894	368207	16938	357190	34286
AMZ1	174945	480560	1063	N/A		GRIN2B	273079	630791	9001	486677	29354	PTPRK	152894	415046	16939	406825	34287
AMZ1	174945	489665	1064	N/A		GRIN2B	273079	627535	9002	486411	29355	PTPRK	152894	415055	16940	408180	34288
AMZ1	174945	433945	1065	N/A		GRIN2B	273079	637875	9003	N/A		PTPRK	152894	531050	16941	432960	34289
ANGPT1	154188	517746	1066	428340	24452	GRIN2C	161509	293190	9004	293190	29356	PTPRK	152894	524481	16942	N/A	
ANGPT1	154188	297450	1067	297450	24453	GRIN2C	161509	584176	9005	N/A		PTPRK	152894	531466	16943	N/A	
ANGPT1	154188	520734	1068	430750	24454	GRIN2C	161509	347612	9006	338645	29357	PTPRK	152894	434424	16944	N/A	
ANGPT1	154188	520052	1069	429349	24455	GRIN2C	161509	578159	9007	N/A		PTPRK	152894	524534	16945	N/A	
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ANGPT1	154188	521950	1071	N/A		GRIN2D	105464	263269	9009	263269	29358	PTPRK	152894	490332	16947	434058	34290
ANGPT1	154188	522400	1072	N/A		GRIP1	155974	398016	9010	381098	29359	PTPRK	152894	498284	16948	N/A	
ANGPT1	154188	520033	1073	428908	24456	GRIP1	155974	538164	9011	439053	29360	PTPRK	152894	495748	16949	N/A	
ANGPTL3	132855	371129	1074	360170	24457	GRIP1	155974	540854	9012	443006	29361	PTPRK	152894	429595	16950	N/A	
ANGPTL3	132855	482591	1075	N/A		GRIP1	155974	538211	9013	446047	29362	PTPRK	152894	525459	16951	434116	34291
ANGPTL3	132855	493994	1076	N/A		GRIP1	155974	535323	9014	N/A		PTPRK	152894	392449	16952	376243	34292
ANKRD33B	164236	504806	1077	422195	24458	GRIP1	155974	540433	9015	446024	29363	PTPRK	152894	532751	16953	437299	34293
ANKRD33B	164236	296657	1078	296657	24459	GRIP1	155974	536215	9016	446011	29364	PTPRK	152894	368202	16954	N/A	
ANKRD37	186352	507479	1079	N/A		GRIP1	155974	541299	9017	N/A		PTPRK	273993	618924	16955	483766	34294
ANKRD37	186352	507753	1080	421529	24460	GRIP1	155974	542021	9018	N/A		PTPRK	273993	619256	16956	477791	34295
ANKRD37	186352	335174	1081	335147	24461	GRIP1	155974	543172	9019	443860	29365	PTPRK	273993	618215	16957	484742	34296
ANKRD37	186352	511393	1082	N/A		GRIP1	155974	535002	9020	440918	29366	PTPRK	273993	625760	16958	487066	34297
ANKRD37	186352	511311	1083	N/A		GRIP1	155974	545666	9021	439124	29367	PTPRK	273993	628183	16959	486442	34298
ANKRD37	186352	506424	1084	N/A		GRIP1	155974	542309	9022	438300	29368	PTPRK	273993	626594	16960	487005	34299
ANKRD42	137494	393389	1085	377049	24462	GRIP1	155974	539540	9023	443392	29369	PTPRK	273993	625615	16961	485812	34300
ANKRD42	137494	528722	1086	432375	24463	GRIP1	155974	541947	9024	438921	29370	PTPRK	273993	625418	16962	487578	34301
ANKRD42	137494	260047	1087	260047	24464	GRIP1	155974	538373	9025	446067	29371	PTPRK	273993	628245	16963	486036	34302
ANKRD42	137494	526731	1088	433585	24465	GRIP1	155974	359742	9026	352780	29372	PTPRK	273993	626859	16964	N/A	
ANKRD42	137494	531895	1089	434666	24466	GRK3	100077	324198	9027	317578	29373	PTPRK	273993	628763	16965	N/A	
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ANLN	011426	265748	1094	265748	24470	GRK4	125388	398052	9032	381129	29378	PTPRK	273993	627390	16970	N/A	
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ANLN	011426	418118	1097	406584	24473	GRK4	125388	507230	9035	N/A		PTPRK	273993	628472	16973	486448	34304
ANLN	011426	460598	1098	N/A		GRK4	125388	505271	9036	N/A		PTPRK	273993	621720	16974	482183	34305
ANLN	011426	429082	1099	398712	24474	GRK4	125388	509545	9037	N/A		PTPRK	273993	627768	16975	485893	34306
ANLN	011426	441696	1100	397465	24475	GRK4	125388	511827	9038	N/A		PTPRK	273993	625700	16976	N/A	
ANLN	011426	452877	1101	413441	24476	GRK4	125388	504308	9039	N/A		PTPRM	173482	580170	16977	463325	34307
ANLN	011426	495714	1102	N/A		GRK5	198873	392870	9040	376609	29381	PTPRM	173482	332175	16978	331418	34308

ANLN	011426	428612	1103	413522	24477	GRK5	198873	369108	9041	N/A		PTPRM	173482	400053	16979	382927	34309
ANLN	011426	446635	1104	400777	24478	GRM1	152822	507005	9042	N/A		PTPRM	173482	578916	16980	463558	34310
ANLN	011426	457743	1105	399553	24479	GRM1	152822	502405	9043	N/A		PTPRM	173482	578600	16981	N/A	
ANLN	011426	491782	1106	N/A		GRM1	152822	492807	9044	424095	29382	PTPRM	173482	578571	16982	N/A	
ANO4	262139	573650	1107	469449	24480	GRM1	152822	355289	9045	347437	29383	PTPRM	173482	578698	16983	N/A	
ANO4	262139	573847	1108	470039	24481	GRM1	152822	282753	9046	282753	29384	PTPRM	173482	583289	16984	462176	34311
ANO4	262139	570509	1109	471431	24482	GRM1	152822	507907	9047	425599	29385	PTPRM	173482	577468	16985	464128	34312
ANO4	151572	549155	1110	449116	24483	GRM1	152822	361719	9048	354896	29386	PTPRM	173482	577827	16986	N/A	
ANO4	151572	551148	1111	N/A		GRM4	124493	538487	9049	440556	29387	PTPRM	173482	578093	16987	N/A	
ANO4	151572	546991	1112	447867	24484	GRM4	124493	374177	9050	363292	29388	PTPRM	173482	580838	16988	N/A	
ANO4	151572	392979	1113	376705	24485	GRM4	124493	545715	9051	N/A		PTPRM	173482	583153	16989	462809	34313
ANO4	151572	392977	1114	376703	24486	GRM4	124493	609222	9052	477466	29389	PTPRM	173482	580949	16990	N/A	
ANO4	151572	549234	1115	N/A		GRM4	124493	609860	9053	N/A		PTPRM	173482	400060	16991	382933	34314
ANO4	151572	548940	1116	N/A		GRM4	124493	544773	9054	437730	29390	PTPRN	054356	409251	16992	386638	34315
ANO4	151572	550015	1117	450192	24487	GRM4	124493	455714	9055	398456	29391	PTPRN	054356	295718	16993	295718	34316
ANO6	177119	426898	1118	N/A		GRM4	124493	609278	9056	477016	29392	PTPRN	054356	460801	16994	N/A	
ANO6	177119	425752	1119	391417	24488	GRM4	124493	609443	9057	476561	29393	PTPRN	054356	462351	16995	N/A	
ANO6	177119	423947	1120	409126	24489	GRM4	124493	609915	9058	N/A		PTPRN	054356	443981	16996	396842	34317
ANO6	177119	550630	1121	449423	24490	GRM4	124493	609973	9059	N/A		PTPRN	054356	423636	16997	392598	34318
ANO6	177119	320560	1122	320087	24491	GRM4	124493	607916	9060	N/A		PTPRN	054356	497977	16998	N/A	
ANO6	177119	441606	1123	413137	24492	GRM4	124493	535756	9061	437925	29394	PTPRN	054356	486480	16999	N/A	
ANO6	177119	551667	1124	N/A		GRM4	124493	374181	9062	363296	29395	PTPRN	054356	489650	17000	N/A	
ANXA3	138772	264908	1125	264908	24493	GRM5	168959	305432	9063	305905	29396	PTPRN	054356	412847	17001	388429	34319
ANXA3	138772	512884	1126	423068	24494	GRM5	168959	305447	9064	306138	29397	PTPRN	054356	446182	17002	395379	34320
ANXA3	138772	512542	1127	426591	24495	GRM5	168959	449371	9065	403724	29398	PTPRN	054356	440552	17003	408036	34321
ANXA3	138772	503570	1128	421015	24496	GRM5	168959	393294	9066	376972	29399	PTPRN	054356	476930	17004	N/A	
ANXA3	138772	510502	1129	N/A		GRM5	168959	455756	9067	405690	29400	PTPRN	054356	442029	17005	396464	34322
ANXA3	138772	512373	1130	424584	24497	GRM7	196277	443259	9068	404161	29401	PTPRN	054356	451506	17006	397105	34323
ANXA3	138772	514171	1131	421512	24498	GRM7	196277	448328	9069	393799	29402	PTPRN	054356	606213	17007	475591	34324
ANXA3	138772	508214	1132	422281	24499	GRM7	196277	467425	9070	419835	29403	PTPRN	054356	468454	17008	N/A	
ANXA3	138772	505805	1133	N/A		GRM7	196277	357716	9071	350348	29404	PTPRN	054356	484986	17009	N/A	
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AOX1	138356	374700	1135	363832	24500	GRM7	196277	440923	9073	412329	29406	PTPRO	151490	281171	17011	281171	34325
AOX1	138356	454629	1136	392485	24501	GRM7	196277	389336	9074	373987	29407	PTPRO	151490	543886	17012	444173	34326
AOX1	138356	485965	1137	N/A		GRM7	196277	389335	9075	373986	29408	PTPRO	151490	348962	17013	343434	34327
AOX1	138356	465297	1138	N/A		GRM7	196277	435689	9076	405194	29409	PTPRO	151490	545023	17014	N/A	
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AOX1	138356	472553	1140	N/A		GRM7	196277	463676	9078	N/A		PTPRO	151490	542557	17016	437571	34329
AOX1	138356	260930	1141	260930	24502	GRM7	196277	445087	9079	395035	29410	PTPRO	151490	445537	17017	393449	34330
AOX1	138356	439380	1142	413326	24503	GRM7	196277	458641	9080	N/A		PTPRO	151490	544244	17018	439234	34331
AP1S3	152056	443700	1143	397155	24504	GRM7	196277	471242	9081	N/A		PTPRO	151490	535311	17019	445621	34332
AP1S3	152056	415298	1144	401705	24505	GRM7	196277	402647	9082	384585	29411	PTPRO	151490	538907	17020	N/A	
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AP1S3	152056	396654	1146	379891	24507	GRM8	179603	358373	9084	351142	29413	PTPRO	151490	544706	17022	N/A	
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APBA2	276495	631794	1152	488322	24513	GRM8	179603	448250	9090	N/A		PTPRR	153233	342084	17028	339605	34337
APBA2	276495	633212	1153	N/A		GRM8	179603	457830	9091	415522	29416	PTPRR	153233	549308	17029	446943	34338
APBA2	276495	612449	1154	483174	24514	GRM8	179603	465844	9092	418255	29417	PTPRR	153233	549107	17030	N/A	
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APBA2	276495	632415	1157	488620	24517	GRM8	179603	473254	9095	N/A		PTPRR	153233	378778	17033	368054	34340
APBA2	276495	631996	1158	488031	24518	GRM8	179603	412160	9096	398012	29418	PTPRT	196090	373187	17034	362283	34341
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APBA2	034053	558402	1162	453293	24521	GSAP	186088	257626	9100	257626	29420	PTPRT	196090	373198	17038	362294	34345
APBA2	034053	558330	1163	452722	24522	GSAP	186088	482866	9101	N/A		PTPRT	196090	373201	17039	362297	34346
APBA2	034053	559814	1164	N/A		GSAP	186088	474686	9102	N/A		PTPRT	196090	373193	17040	362289	34347
APBA2	034053	559709	1165	452699	24523	GSAP	186088	440473	9103	N/A		PTPRT	196090	617474	17041	484248	34348
APBA2	034053	558804	1166	454001	24524	GSAP	186088	415112	9104	396230	29421	PTPRT	196090	485499	17042	N/A	
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APBA2	034053	558206	1168	453981	24526	GSAP	186088	489920	9106	N/A		PTPRT	196090	618610	17044	484524	34350
APBA2	034053	558358	1169	453715	24527	GSAP	186088	334003	9107	N/A		PTPRT	196090	612229	17045	481466	34351
APBA2	034053	382938	1170	N/A		GSAP	186088	434084	9108	N/A		PTPRZ1	106278	393386	17046	377047	34352
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APCDD1	154856	355285	1203	347433	24549	GSX1	169840	302945	9141	304331	29442	PVALB	100362	467935	17079	N/A	
APCDD1	154856	423585	1204	404930	24550	GTF2A1L	242441	448460	9142	412645	29443	PVALB	100362	443735	17080	406977	34373
APCDD1	154856	582723	1205	463110	24551	GTF2A1L	242441	437125	9143	396702	29444	PXDC1	168994	477592	17081	N/A	
APCDD1	154856	578882	1206	463104	24552	GTF2A1L	242441	403751	9144	384597	29445	PXDC1	168994	380277	17082	369630	34374
APCDD1	154856	584596	1207	476491	24553	GTF2A1L	242441	423675	9145	394793	29446	PXDC1	168994	380283	17083	369636	34375
APCDD1	154856	579685	1208	464649	24554	GTF2A1L	242441	468326	9146	N/A		PXDC1	168994	485986	17084	N/A	
APEX2	169188	374987	1209	364126	24555	GTF2A1L	242441	508440	9147	421474	29447	PXDN	130508	252804	17085	252804	34376
APEX2	169188	471758	1210	N/A		GTF2A1L	242441	430487	9148	387896	29448	PXDN	130508	493654	17086	N/A	
APH1B	138613	560890	1211	453002	24556	GTF2B	137947	370500	9149	359531	29449	PXDN	130508	478155	17087	N/A	
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APH1B	138613	261879	1213	261879	24557	GTF2B	137947	494819	9151	N/A		PXDN	130508	477093	17089	N/A	
APH1B	138613	380343	1214	369700	24558	GTF2B	137947	418217	9152	402345	29451	PXDN	130508	493779	17090	N/A	
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APH1B	138613	559971	1217	453516	24561	GTF2B	137947	471471	9155	N/A		PXDN	130508	467191	17093	N/A	
APH1B	138613	558631	1218	N/A		GTPBP2	172432	496137	9156	436973	29452	PXDN	130508	483018	17094	N/A	
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APH1B	138613	560716	1220	N/A		GTPBP2	172432	432918	9158	398905	29454	PXDN	130508	447941	17096	408701	34379

APLNR	134817	257254	1221	257254	24562	GTPBP2	172432	476510	9159	N/A		PXDN	130508	425171	17097	398363	34380
APLNR	134817	606794	1222	475344	24563	GTPBP2	172432	307126	9160	303997	29455	PXDN	130508	485177	17098	N/A	
APLNR	134817	611099	1223	477818	24564	GTPBP2	172432	459959	9161	N/A		PXDNL	147485	522628	17099	429855	34381
APLP1	105290	537454	1224	441501	24565	GTPBP2	172432	442748	9162	411358	29456	PXDNL	147485	522933	17100	428114	34382
APLP1	105290	221891	1225	221891	24566	GTPBP2	172432	480263	9163	N/A		PXDNL	147485	356297	17101	348645	34383
APLP1	105290	590561	1226	466623	24567	GTPBP2	172432	452781	9164	410676	29457	PXDNL	147485	519183	17102	N/A	
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APLP1	105290	589743	1228	466116	24569	GTSCR1	263417	582578	9166	N/A		PXK	168297	468776	17104	417167	34385
APLP1	105290	592316	1229	467854	24570	GUCY1A3	164116	506455	9167	424361	29459	PXK	168297	463280	17105	417903	34386
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APLP1	105290	589298	1231	N/A		GUCY1A3	164116	512983	9169	N/A		PXK	168297	484288	17107	417915	34388
APLP1	105290	587274	1232	474762	24572	GUCY1A3	164116	511507	9170	426968	29461	PXK	168297	479241	17108	419049	34389
APLP1	105290	590926	1233	N/A		GUCY1A3	164116	515602	9171	N/A		PXK	168297	477308	17109	420403	34390
APLP1	105290	591165	1234	N/A		GUCY1A3	164116	455639	9172	412201	29462	PXK	168297	491164	17110	418831	34391
APOD	189058	343267	1235	345179	24573	GUCY1A3	164116	509901	9173	424863	29463	PXK	168297	479134	17111	418202	34392
APOD	189058	458447	1236	391597	24574	GUCY1A3	164116	443668	9174	409903	29464	PXK	168297	459676	17112	476179	34393
APOD	189058	421243	1237	415235	24575	GUCY1A3	164116	393832	9175	377418	29465	PXK	168297	495557	17113	418376	34394
APOD	189058	453131	1238	393076	24576	GUCY1A3	164116	296518	9176	296518	29466	PXK	168297	493474	17114	418836	34395
APOD	189058	463719	1239	N/A		GUCY1A3	164116	515201	9177	422141	29467	PXK	168297	383716	17115	373222	34396
APPL2	136044	258530	1240	258530	24577	GUCY1A3	164116	513574	9178	426040	29468	PXK	168297	302779	17116	305045	34397
APPL2	136044	547439	1241	449410	24578	GUCY1A3	164116	621234	9179	479710	29469	PXN	089159	458477	17117	395536	34398
APPL2	136044	539978	1242	444472	24579	GYG2	056998	398806	9180	381786	29470	PXN	089159	228307	17118	228307	34399
APPL2	136044	547790	1243	N/A		GYG2	056998	381163	9181	370555	29471	PXN	089159	424649	17119	391283	34400
APPL2	136044	546731	1244	447828	24580	GYG2	056998	381161	9182	N/A		PXN	089159	637624	17120	490896	34401
APPL2	136044	551662	1245	446917	24581	GYG2	056998	520904	9183	430764	29472	PXN	089159	536957	17121	443887	34402
APPL2	136044	553109	1246	446510	24582	GYG2	056998	469234	9184	N/A		PXN	089159	323871	17122	489977	34403
APPL2	136044	548425	1247	N/A		GYG2	056998	353656	9185	487294	29473	PXN	089159	538144	17123	N/A	
APPL2	136044	547809	1248	N/A		GYG2	056998	453106	9186	N/A		PXN	089159	637617	17124	489840	34404
APPL2	136044	552945	1249	N/A		GYG2	056998	381157	9187	370549	29474	PXN	089159	550795	17125	N/A	
APPL2	136044	549573	1250	N/A		GYG2	056998	639373	9188	491962	29475	PXN	089159	637386	17126	490352	34405
APPL2	136044	549974	1251	448569	24583	GYG2P1	206159	382966	9189	N/A		PXN	089159	547983	17127	446893	34406
APPL2	136044	550648	1252	N/A		GYG2P1	206159	493160	9190	N/A		PXN	089159	551327	17128	N/A	
APPL2	136044	546768	1253	N/A		GYG2P1	206159	357871	9191	N/A		PXN	089159	543331	17129	443745	34407
APPL2	136044	553097	1254	449767	24584	GYG2P1	206159	382963	9192	N/A		PXN	089159	546532	17130	447180	34408
APPL2	136044	549056	1255	447520	24585	GYG2P1	206159	382965	9193	N/A		PXN	089159	548912	17131	446607	34409
AQP4	171885	383168	1256	372654	24586	GYS1	104812	323798	9194	317904	29476	PXN	089159	552550	17132	446650	34410
AQP4	171885	581374	1257	462597	24587	GYS1	104812	263276	9195	263276	29477	PXN	089159	440827	17133	N/A	
AQP4	171885	440832	1258	393121	24588	GYS1	104812	594220	9196	470072	29478	PXN	089159	547746	17134	N/A	
AQP4	171885	583022	1259	N/A		GYS1	104812	472004	9197	N/A		PXN	089159	540221	17135	N/A	
AQP4	171885	584088	1260	N/A		GYS1	104812	496048	9198	N/A		PXN	089159	550205	17136	N/A	
AQP4	171885	578776	1261	462075	24589	GYS1	104812	484289	9199	N/A		PXN	089159	547772	17137	N/A	
AQP4	171885	383170	1262	372656	24590	GYS1	104812	457974	9200	N/A		PXN	089159	267257	17138	267257	34411
AQP4	171885	622234	1263	484446	24591	GZF1	125812	338121	9201	338290	29479	PXYLP1	155893	505013	17139	421271	34412
AQP7	165269	379507	1264	368821	24592	GZF1	125812	424216	9202	410009	29480	PXYLP1	155893	636601	17140	490861	34413
AQP7	165269	537089	1265	441619	24593	GZF1	125812	461789	9203	N/A		PXYLP1	155893	514880	17141	425264	34414
AQP7	165269	377425	1266	396111	24594	GZF1	125812	477239	9204	N/A		PXYLP1	155893	286353	17142	286353	34415
AQP7	165269	297988	1267	297988	24595	GZF1	125812	377051	9205	366250	29481	PXYLP1	155893	637751	17143	490743	34416
AQP7	165269	623097	1268	N/A		HAMP	105697	598398	9206	471894	29482	PXYLP1	155893	502783	17144	422558	34417
AQP7	165269	439678	1269	410138	24596	HAMP	105697	222304	9207	222304	29483	PXYLP1	155893	393010	17145	376733	34418
AQP7	165269	379506	1270	368820	24597	HAMP	105697	593580	9208	N/A		PXYLP1	155893	511968	17146	N/A	
AQP7	165269	624075	1271	485332	24598	HAPLN2	132702	255039	9209	255039	29484	PXYLP1	155893	514680	17147	426956	34419
AQP7	165269	624890	1272	485131	24599	HAPLN2	132702	487988	9210	N/A		PXYLP1	155893	513528	17148	426348	34420
AQP7	165269	624005	1273	485224	24600	HAPLN2	132702	456112	9211	388835	29485	PXYLP1	155893	505502	17149	N/A	
AQP7	165269	447660	1274	412868	24601	HAPLN2	132702	482204	9212	N/A		PXYLP1	155893	513007	17150	N/A	
AQP7	165269	379503	1275	N/A		HAPLN2	132702	494218	9213	N/A		PXYLP1	155893	637579	17151	490114	34421
AQP7	165269	624420	1276	485348	24602	HAS2	170961	303924	9214	306991	29486	PXYLP1	155893	512457	17152	423702	34422
AQP7	165269	624095	1277	485419	24603	HCN1	164588	303230	9215	307342	29487	PXYLP1	155893	504264	17153	426877	34423
AQP7	165269	625109	1278	485081	24604	HCN1	164588	637305	9216	N/A		PXYLP1	155893	508812	17154	422901	34424
AQP7	165269	624432	1279	N/A		HCN1	164588	637256	9217	N/A		PXYLP1	155893	514263	17155	N/A	

AQP7	165269	623743	1280	N/A		HCN1	164588	634658	9218	489134	29488	PYGM	068976	483742	17156	N/A	
AQP7	165269	625032	1281	485246	24605	HCN1	164588	638054	9219	N/A		PYGM	068976	377432	17157	366650	34425
AQP7	165269	623519	1282	N/A		HCN2	099822	251287	9220	251287	29489	PYGM	068976	164139	17158	164139	34426
AQP9	103569	536493	1283	441390	24606	HCN4	138622	261917	9221	261917	29490	PYGM	068976	462303	17159	N/A	
AQP9	103569	559443	1284	N/A		HDAC8	147099	373583	9222	362685	29491	PYGM	068976	460413	17160	N/A	
AQP9	103569	219919	1285	219919	24607	HDAC8	147099	373573	9223	362674	29492	PYROXD2	119943	483923	17161	N/A	
AQP9	103569	558772	1286	452673	24608	HDAC8	147099	470998	9224	N/A		PYROXD2	119943	370575	17162	359607	34427
AR	169083	374690	1287	363822	24609	HDAC8	147099	373568	9225	362669	29493	PYROXD2	119943	464808	17163	N/A	
AR	169083	513847	1288	N/A		HDAC8	147099	436675	9226	416489	29494	PYROXD2	119943	494941	17164	N/A	
AR	169083	504326	1289	421155	24610	HDAC8	147099	415409	9227	396424	29495	PYROXD2	119943	462874	17165	N/A	
AR	169083	514029	1290	425199	24611	HDAC8	147099	412342	9228	400180	29496	QDPR	151552	511609	17166	N/A	
AR	169083	396043	1291	379358	24612	HDAC8	147099	373571	9229	362672	29497	QDPR	151552	514300	17167	426039	34428
AR	169083	612010	1292	482407	24613	HDAC8	147099	439122	9230	414486	29498	QDPR	151552	505710	17168	420873	34429
AR	169083	613054	1293	479013	24614	HDAC8	147099	373560	9231	362661	29499	QDPR	151552	501943	17169	N/A	
AR	169083	612452	1294	484033	24615	HDAC8	147099	373559	9232	362660	29500	QDPR	151552	508623	17170	426377	34430
AR	169083	396044	1295	379359	24616	HDAC8	147099	478743	9233	N/A		QDPR	151552	281243	17171	281243	34431
ARAP3	120318	508305	1296	421826	24617	HDAC8	147099	421523	9234	398997	29501	QDPR	151552	428702	17172	390944	34432
ARAP3	120318	239440	1297	239440	24618	HDAC8	147099	373556	9235	362657	29502	QDPR	151552	507439	17173	423227	34433
ARAP3	120318	512390	1298	N/A		HDAC8	147099	373554	9236	362655	29503	QDPR	151552	513615	17174	422759	34434
ARAP3	120318	513878	1299	421468	24619	HDAC8	147099	444609	9237	409778	29504	QKI	112531	361758	17175	354951	34435
ARAP3	120318	504448	1300	421148	24620	HDAC8	147099	486704	9238	N/A		QKI	112531	453779	17176	408775	34436
ARAP3	120318	524066	1301	N/A		HDAC8	147099	373589	9239	362691	29505	QKI	112531	275262	17177	275262	34437
ARAP3	120318	626478	1302	486980	24621	HDHD2	167220	300605	9240	300605	29506	QKI	112531	392127	17178	375973	34438
ARC	198576	356613	1303	349022	24622	HDHD2	167220	588183	9241	466602	29507	QKI	112531	361752	17179	355094	34439
ARC	198576	581404	1304	N/A		HDHD2	167220	588861	9242	N/A		QKI	112531	361195	17180	354867	34440
ARF4	168374	303436	1305	306010	24623	HDHD2	167220	587841	9243	N/A		QKI	112531	424802	17181	408382	34441
ARF4	168374	496292	1306	417501	24624	HDHD2	167220	590815	9244	468067	29508	QKI	112531	545607	17182	437867	34442
ARF4	168374	489843	1307	475828	24625	HDHD2	167220	591480	9245	466710	29509	QKI	112531	544436	17183	443690	34443
ARF4	168374	486310	1308	420655	24626	HDHD2	167220	586546	9246	467309	29510	QKI	112531	537041	17184	440991	34444
ARF4	168374	483848	1309	N/A		HDHD2	167220	590481	9247	467998	29511	QKI	112531	537124	17185	443106	34445
ARF4	168374	463880	1310	420254	24627	HDHD2	167220	588940	9248	467775	29512	QKI	112531	545346	17186	441252	34446
ARF4	168374	493378	1311	N/A		HDHD2	167220	591268	9249	465829	29513	QKI	112531	544823	17187	440599	34447
ARF4	168374	495354	1312	N/A		HDHD2	167220	587388	9250	466923	29514	QKI	112531	537883	17188	441773	34448
ARF4	168374	488156	1313	418388	24628	HDHD2	167220	592591	9251	465282	29515	QKI	112531	540719	17189	N/A	
ARG2	081181	261783	1314	261783	24629	HDHD2	167220	591671	9252	N/A		QKI	112531	544361	17190	442848	34449
ARG2	081181	557120	1315	N/A		HEBP1	013583	014930	9253	014930	29516	QKI	112531	541696	17191	N/A	
ARG2	081181	556491	1316	N/A		HEBP1	013583	540916	9254	N/A		QKI	112531	361758	17192	354951	34450
ARG2	081181	557319	1317	N/A		HEBP1	013583	535636	9255	442020	29517	QKI	112531	453779	17193	408775	34451
ARHGAP10	071205	510379	1318	N/A		HEBP1	013583	536942	9256	441678	29518	QKI	112531	275262	17194	275262	34452
ARHGAP10	071205	336498	1319	336923	24630	HECA	112406	367658	9257	356630	29519	QKI	112531	392127	17195	375973	34453
ARHGAP10	071205	506054	1320	N/A		HECW1	002746	395891	9258	379228	29520	QKI	112531	361752	17196	355094	34454
ARHGAP10	071205	507661	1321	422358	24631	HECW1	002746	490954	9259	N/A		QKI	112531	361195	17197	354867	34455
ARHGAP10	071205	506020	1322	N/A		HECW1	002746	453890	9260	407774	29521	QKI	112531	424802	17198	408382	34456
ARHGAP10	071205	513548	1323	N/A		HECW1	002746	492310	9261	N/A		QKI	112531	545607	17199	437867	34457
ARHGAP10	071205	510076	1324	N/A		HECW1	002746	471527	9262	N/A		QKI	112531	544436	17200	443690	34458
ARHGAP15	075884	409869	1325	386560	24632	HECW1	002746	493057	9263	N/A		QKI	112531	537041	17201	440991	34459
ARHGAP15	075884	295095	1326	295095	24633	HECW1	002746	464944	9264	N/A		QKI	112531	537124	17202	443106	34460
ARHGAP15	075884	552641	1327	N/A		HECW1	002746	481031	9265	N/A		QKI	112531	545346	17203	441252	34461
ARHGAP15	075884	460776	1328	N/A		HECW1	002746	471043	9266	N/A		QKI	112531	544823	17204	440599	34462
ARHGAP15	075884	474474	1329	N/A		HECW1	002746	461842	9267	N/A		QKI	112531	537883	17205	441773	34463
ARHGAP15	075884	469117	1330	N/A		HECW1	002746	429529	9268	413336	29522	QKI	112531	540719	17206	N/A	
ARHGAP15	075884	548800	1331	N/A		HEG1	173706	311127	9269	311502	29523	QKI	112531	544361	17207	442848	34464
ARHGAP15	075884	548242	1332	N/A		HEG1	173706	487661	9270	417648	29524	QKI	112531	541696	17208	N/A	
ARHGAP15	075884	548929	1333	N/A		HEG1	173706	480667	9271	N/A		QPRT	103485	219771	17209	N/A	
ARHGAP15	075884	552289	1334	N/A		HEG1	173706	482699	9272	417494	29525	QPRT	103485	395384	17210	378782	34465
ARHGAP15	075884	549436	1335	N/A		HEG1	173706	488654	9273	N/A		QPRT	103485	562473	17211	455183	34466
ARHGAP15	075884	419455	1336	390310	24634	HEG1	173706	477536	9274	N/A		QPRT	103485	564967	17212	N/A	
ARHGAP15	075884	549060	1337	N/A		HEPACAM	165478	528971	9275	N/A		RAB11FIP1	156675	287263	17213	287263	34467

ARHGAP20	137727	260283	1338	260283	24635	HEPACAM	165478	526273	9276	N/A		RAB11FIP1	156675	330843	17214	331342	34468
ARHGAP20	137727	529591	1339	437905	24636	HEPACAM	165478	298251	9277	298251	29526	RAB11FIP1	156675	522727	17215	430009	34469
ARHGAP20	137727	524756	1340	432076	24637	HERPUD1	051108	439977	9278	409555	29527	RAB11FIP1	156675	523182	17216	N/A	
ARHGAP20	137727	528829	1341	436319	24638	HERPUD1	051108	562914	9279	N/A		RAB11FIP1	156675	522774	17217	N/A	
ARHGAP20	137727	533353	1342	436522	24639	HERPUD1	051108	568676	9280	N/A		RAB11FIP1	156675	524118	17218	430680	34470
ARHGAP20	137727	527598	1343	431399	24640	HERPUD1	051108	569569	9281	N/A		RAB15	139998	267512	17219	267512	34471
ARHGAP22	128805	249601	1344	249601	24641	HERPUD1	051108	565966	9282	456384	29528	RAB15	139998	533601	17220	434103	34472
ARHGAP22	128805	477708	1345	422868	24642	HERPUD1	051108	344114	9283	340931	29529	RAB15	139998	585059	17221	464662	34473
ARHGAP22	128805	374170	1346	363285	24643	HERPUD1	051108	300302	9284	300302	29530	RAB15	139998	426039	17222	433485	34474
ARHGAP22	128805	374172	1347	363287	24644	HERPUD1	051108	570273	9285	N/A		RAB15	139998	554593	17223	452195	34475
ARHGAP22	128805	417247	1348	410054	24645	HERPUD1	051108	379792	9286	369118	29531	RAB15	139998	555256	17224	N/A	
ARHGAP22	128805	435790	1349	416701	24646	HERPUD1	051108	569429	9287	457321	29532	RAB27A	069974	396307	17225	379601	34476
ARHGAP22	128805	417912	1350	412461	24647	HERPUD1	051108	563343	9288	455094	29533	RAB27A	069974	564609	17226	455012	34477
ARHGAP22	128805	460425	1351	422663	24648	HERPUD1	051108	566550	9289	N/A		RAB27A	069974	569493	17227	456059	34478
ARHGAP22	128805	515523	1352	N/A		HERPUD1	051108	563781	9290	N/A		RAB27A	069974	566877	17228	454695	34479
ARHGAP22	128805	471013	1353	N/A		HERPUD1	051108	568358	9291	457095	29534	RAB27A	069974	567380	17229	458127	34480
ARHGAP22	128805	489984	1354	N/A		HERPUD1	051108	564678	9292	N/A		RAB27A	069974	565972	17230	456536	34481
ARHGAP22	128805	493012	1355	N/A		HERPUD1	051108	563911	9293	455841	29535	RAB27A	069974	563262	17231	457595	34482
ARHGAP22	128805	491108	1356	N/A		HERPUD1	051108	567944	9294	N/A		RAB27A	069974	568803	17232	457517	34483
ARHGAP22	128805	511570	1357	N/A		HERPUD1	051108	568651	9295	457955	29536	RAB27A	069974	567639	17233	N/A	
ARHGAP22	128805	464445	1358	N/A		HERPUD1	051108	568814	9296	N/A		RAB27A	069974	565776	17234	N/A	
ARHGAP23	275832	633445	1359	N/A		HES1	114315	232424	9297	232424	29537	RAB27A	069974	561545	17235	N/A	
ARHGAP23	275832	622683	1360	481862	24649	HES1	114315	476918	9298	N/A		RAB27A	069974	336787	17236	337761	34484
ARHGAP23	275832	620417	1361	482992	24650	HES3	173673	377898	9299	367130	29538	RAB27B	041353	586570	17237	468542	34485
ARHGAP23	275832	616767	1362	N/A		HEY2	135547	368365	9300	357349	29539	RAB27B	041353	262094	17238	262094	34486
ARHGAP23	275832	618942	1363	482982	24651	HEY2	135547	368364	9301	357348	29540	RAB27B	041353	586594	17239	N/A	
ARHGAP23	275832	619156	1364	483748	24652	HGF	019991	222390	9302	222390	29541	RAB27B	041353	592334	17240	465009	34487
ARHGAP23	275832	616909	1365	481292	24653	HGF	019991	457544	9303	391238	29542	RAB31	168461	578921	17241	461945	34488
ARHGAP23	275832	620325	1366	482425	24654	HGF	019991	444829	9304	389854	29543	RAB31	168461	578734	17242	462164	34489
ARHGAP23	275832	620329	1367	478142	24655	HGF	019991	453411	9305	408270	29544	RAB31	168461	581109	17243	464046	34490
ARHGAP23	275832	617798	1368	N/A		HGF	019991	423064	9306	413829	29545	RAB31	168461	583137	17244	462561	34491
ARHGAP23	275832	614693	1369	484509	24656	HGF	019991	465234	9307	N/A		RAB31	168461	435762	17245	N/A	
ARHGAP23	275832	618325	1370	N/A		HGF	019991	453018	9308	395468	29546	RAB31	168461	578737	17246	N/A	
ARHGAP23	273780	610551	1371	479208	24657	HGF	019991	412881	9309	396307	29547	RAB31	168461	583921	17247	N/A	
ARHGAP23	273780	631799	1372	488428	24658	HGF	019991	421558	9310	388592	29548	RAB31	168461	580361	17248	N/A	
ARHGAP23	273780	633736	1373	N/A		HGF	019991	354224	9311	346164	29549	RAB31	168461	577796	17249	N/A	
ARHGAP23	273780	632947	1374	488885	24659	HHATL	010282	490003	9312	N/A		RAB31	168461	577371	17250	N/A	
ARHGAP23	273780	633443	1375	487883	24660	HHATL	010282	466007	9313	N/A		RAB31	168461	580795	17251	N/A	
ARHGAP23	273780	633302	1376	488827	24661	HHATL	010282	426666	9314	401568	29550	RAB31	168461	577284	17252	N/A	
ARHGAP23	273780	632895	1377	488699	24662	HHATL	010282	310417	9315	310621	29551	RAB33A	134594	257017	17253	257017	34492
ARHGAP23	273780	631490	1378	488310	24663	HHATL	010282	441594	9316	405423	29552	RAB34	109113	395243	17254	378664	34493
ARHGAP23	273780	633368	1379	N/A		HHATL	010282	480939	9317	N/A		RAB34	109113	625712	17255	487160	34494
ARHGAP23	273780	634129	1380	487994	24664	HHATL	010282	457462	9318	403787	29553	RAB34	109113	301043	17256	301043	34495
ARHGAP23	273780	633715	1381	N/A		HHATL	010282	416756	9319	395779	29554	RAB34	109113	450529	17257	391048	34496
ARHGAP24	138639	395184	1382	378611	24665	HHATL	010282	455195	9320	415351	29555	RAB34	109113	415040	17258	410279	34497
ARHGAP24	138639	503995	1383	423206	24666	HHATL	010282	417472	9321	413810	29556	RAB34	109113	484161	17259	N/A	
ARHGAP24	138639	506421	1384	N/A		HHATL	010282	442469	9322	408999	29557	RAB34	109113	422279	17260	397499	34498
ARHGAP24	138639	505856	1385	N/A		HHATL	010282	497000	9323	N/A		RAB34	109113	474704	17261	N/A	
ARHGAP24	138639	509709	1386	N/A		HHIP	164161	296575	9324	296575	29558	RAB34	109113	436730	17262	404180	34499
ARHGAP24	138639	512201	1387	426105	24667	HHIP	164161	434550	9325	408587	29559	RAB34	109113	430132	17263	407953	34500
ARHGAP24	138639	395183	1388	378610	24668	HHIP	164161	505891	9326	N/A		RAB34	109113	583538	17264	463488	34501
ARHGAP24	138639	509300	1389	424256	24669	HHIP	164161	511314	9327	N/A		RAB34	109113	636772	17265	489794	34502
ARHGAP24	138639	514229	1390	425589	24670	HHIP	164161	515080	9328	N/A		RAB34	109113	353676	17266	226259	34503
ARHGAP24	138639	502537	1391	N/A		HHIP	164161	509630	9329	N/A		RAB34	109113	412625	17267	398706	34504
ARHGAP24	138639	503917	1392	N/A		HHIP	164161	512791	9330	N/A		RAB34	109113	496866	17268	N/A	

ARHGAP24	138639	264343	1393	264343	24671	HHIP	164161	503090	9331	N/A		RAB34	109113	636513	17269	490855	34505
ARHGAP25	163219	463483	1394	417283	24672	HIF3A	124440	244302	9332	N/A		RAB34	109113	419712	17270	464723	34506
ARHGAP25	163219	481684	1395	N/A		HIF3A	124440	377670	9333	366898	29560	RAB34	109113	481501	17271	N/A	
ARHGAP25	163219	491237	1396	N/A		HIF3A	124440	524533	9334	N/A		RAB34	109113	636154	17272	490450	34507
ARHGAP25	163219	409202	1397	386911	24673	HIF3A	124440	244303	9335	244303	29561	RAB34	109113	636534	17273	490529	34508
ARHGAP25	163219	456116	1398	N/A		HIF3A	124440	528563	9336	435532	29562	RAB34	109113	580843	17274	465352	34509
ARHGAP25	163219	467265	1399	420583	24674	HIF3A	124440	533145	9337	435200	29563	RAB34	109113	483554	17275	N/A	
ARHGAP25	163219	485573	1400	N/A		HIF3A	124440	472815	9338	434653	29564	RAB34	109113	482688	17276	N/A	
ARHGAP25	163219	488795	1401	420427	24675	HIF3A	124440	526506	9339	432613	29565	RAB34	109113	582934	17277	476427	34510
ARHGAP25	163219	463061	1402	N/A		HIF3A	124440	291300	9340	N/A		RAB34	109113	453384	17278	413156	34511
ARHGAP25	163219	485700	1403	N/A		HIF3A	124440	300862	9341	300862	29566	RAB34	109113	395245	17279	378666	34512
ARHGAP25	163219	496266	1404	N/A		HIF3A	124440	600879	9342	469031	29567	RAB37	172794	340415	17280	341354	34513
ARHGAP25	163219	409030	1405	386863	24676	HIF3A	124440	600383	9343	471560	29568	RAB37	172794	402449	17281	383934	34514
ARHGAP25	163219	409220	1406	386241	24677	HIF3A	124440	525854	9344	N/A		RAB37	172794	392617	17282	N/A	
ARHGAP25	163219	473986	1407	417425	24678	HIF3A	124440	529205	9345	N/A		RAB37	172794	528438	17283	432086	34515
ARHGAP25	163219	497079	1408	417139	24679	HIF3A	124440	531043	9346	434700	29569	RAB37	172794	392615	17284	376391	34516
ARHGAP25	163219	497259	1409	417818	24680	HIF3A	124440	600236	9347	N/A		RAB37	172794	392614	17285	376390	34517
ARHGAP25	163219	479844	1410	417467	24681	HIF3A	124440	529542	9348	N/A		RAB37	172794	392613	17286	376389	34518
ARHGAP26	145819	274498	1411	274498	24682	HIF3A	124440	475432	9349	N/A		RAB37	172794	533530	17287	N/A	
ARHGAP26	145819	378004	1412	367243	24683	HIF3A	124440	533789	9350	432809	29570	RAB37	172794	527040	17288	N/A	
ARHGAP26	145819	378013	1413	367252	24684	HIGD1A	181061	321331	9351	319393	29571	RAB37	172794	577548	17289	N/A	
ARHGAP26	145819	475287	1414	N/A		HIGD1A	181061	418900	9352	402160	29572	RAB37	172794	392612	17290	376388	34519
ARHGAP26	145819	477867	1415	N/A		HIGD1A	181061	470543	9353	N/A		RAB37	172794	392610	17291	376387	34520
ARHGAP26	145819	451259	1416	411571	24685	HIGD1A	181061	430190	9354	408289	29573	RAB37	172794	481224	17292	436563	34521
ARHGAP26	145819	461314	1417	N/A		HIGD1A	181061	452906	9355	398064	29574	RAB37	172794	488977	17293	N/A	
ARHGAP26	145819	469131	1418	N/A		HIP1	127946	336926	9356	336747	29575	RAB37	172794	531420	17294	N/A	
ARHGAP26	145819	469396	1419	N/A		HIP1	127946	434438	9357	410300	29576	RAB37	172794	613645	17295	483155	34522
ARHGAP26	145819	464838	1420	N/A		HIP1	127946	404944	9358	N/A		RAB3A	105649	222256	17296	222256	34523
ARHGAP26	145819	470032	1421	N/A		HIP1	127946	420909	9359	414280	29577	RAB3A	105649	464076	17297	474603	34524
ARHGAP26	145819	443674	1422	393276	24686	HIP1	127946	485723	9360	N/A		RAB3A	105649	481914	17298	472335	34525
ARHGAP26	145819	418236	1423	416889	24687	HIP1	127946	479835	9361	N/A		RAB3A	105649	515410	17299	N/A	
ARHGAP26	145819	443045	1424	392186	24688	HIP1	127946	616821	9362	484528	29578	RAB3B	169213	371655	17300	360718	34526
ARHGAP26	145819	419676	1425	413283	24689	HIP1R	130787	535831	9363	N/A		RAB3C	152932	513316	17301	N/A	
ARHGAP26	145819	424007	1426	400565	24690	HIP1R	130787	253083	9364	253083	29579	RAB3C	152932	282878	17302	282878	34527
ARHGAP26	145819	489924	1427	N/A		HIP1R	130787	452196	9365	N/A		RAB3C	152932	507977	17303	N/A	
ARHGAP26	145819	486650	1428	N/A		HIP1R	130787	536772	9366	N/A		RAB3C	152932	381158	17304	N/A	
ARHGAP26	145819	421521	1429	389137	24691	HIP1R	130787	536847	9367	N/A		RAB6B	154917	285208	17305	285208	34528
ARHGAP26	145819	425417	1430	403388	24692	HIP1R	130787	541712	9368	N/A		RAB6B	154917	469959	17306	418540	34529
ARHGAP29	137962	546444	1431	N/A		HIP1R	130787	536617	9369	N/A		RAB6B	154917	486858	17307	419381	34530
ARHGAP29	137962	552844	1432	449764	24693	HIP1R	130787	538236	9370	N/A		RAB6B	154917	477759	17308	419941	34531
ARHGAP29	137962	260526	1433	260526	24694	HIP1R	130787	535012	9371	446236	29580	RAB6B	154917	460865	17309	419526	34532
ARHGAP29	137962	482481	1434	N/A		HIP1R	130787	537322	9372	N/A		RAB6B	154917	488969	17310	417433	34533
ARHGAP29	137962	370217	1435	359237	24695	HIPK4	160396	291823	9373	291823	29581	RAB6B	154917	543906	17311	437797	34534
ARHGAP32	134909	310343	1436	310561	24696	HIST1H2BD	158373	377777	9374	367008	29582	RAI2	131831	415486	17312	392578	34535
ARHGAP32	134909	526162	1437	N/A		HIST1H2BD	158373	289316	9375	289316	29583	RAI2	131831	360011	17313	353106	34536
ARHGAP32	134909	392657	1438	376425	24697	HIST2H2BA	223345	430394	9376	N/A		RAI2	131831	331511	17314	333456	34537
ARHGAP32	134909	524655	1439	432468	24698	HIST2H2BA	223345	4121669	9377	N/A		RAI2	131831	509491	17315	473562	34538
ARHGAP32	134909	527272	1440	432862	24699	HIST2H2BE	184678	369155	9378	358151	29584	RAI2	131831	451717	17316	401323	34539
ARHGAP32	134909	534357	1441	N/A		HIST2H2BF	203814	420462	9379	N/A		RAI2	131831	545871	17317	444210	34540
ARHGAP32	134909	533509	1442	N/A		HIST2H2BF	203814	469483	9380	N/A		RALGPS2	116191	495034	17318	N/A	
ARHGAP32	134909	525234	1443	432303	24700	HIST2H2BF	203814	620458	9381	N/A		RALGPS2	116191	367635	17319	356607	34541
ARHGEF10L	074964	361221	1444	355060	24701	HIST2H2BF	203814	369167	9382	358164	29585	RALGPS2	116191	324778	17320	313613	34542
ARHGEF10L	074964	375415	1445	364564	24702	HIST2H2BF	203814	545683	9383	445831	29586	RALGPS2	116191	477383	17321	N/A	
ARHGEF10L	074964	482892	1446	N/A		HK2	159399	290573	9384	290573	29587	RALGPS2	116191	415888	17322	405903	34543
ARHGEF10L	074964	469726	1447	N/A		HK2	159399	409174	9385	387140	29588	RALGPS2	116191	480743	17323	N/A	
ARHGEF10L	074964	375408	1448	364557	24703	HK2	159399	472302	9386	N/A		RALGPS2	116191	367632	17324	356604	34544
ARHGEF10L	074964	167825	1449	167825	24704	HMCES	183624	509042	9387	423132	29589	RALGPS2	116191	478871	17325	N/A	
ARHGEF10L	074964	482359	1450	N/A		HMCES	183624	383463	9388	372955	29590	RALGPS2	116191	367634	17326	356606	34545
ARHGEF10L	074964	466782	1451	N/A		HMCES	183624	417226	9389	392966	29591	RALYL	184672	522613	17327	427787	34546

ARHGEF10L	074964	495593	1452	N/A		HMCES	183624	510314	9390	426276	29592	RALYL	184672	522455	17328	430394	34547
ARHGEF2	116584	313695	1453	315325	24705	HMCES	183624	502878	9391	426215	29593	RALYL	184672	521695	17329	428667	34548
ARHGEF2	116584	361247	1454	354837	24706	HMCES	183624	389735	9392	374385	29594	RALYL	184672	521268	17330	430367	34549
ARHGEF2	116584	462460	1455	476916	24707	HMCES	183624	509551	9393	424594	29595	RALYL	184672	518566	17331	430065	34550
ARHGEF2	116584	477754	1456	N/A		HMCES	183624	511665	9394	421895	29596	RALYL	184672	517988	17332	428711	34551
ARHGEF2	116584	470541	1457	476689	24708	HMGCLL1	146151	274901	9395	274901	29597	RALYL	184672	517638	17333	430128	34552
ARHGEF2	116584	313667	1458	314787	24709	HMGCLL1	146151	398661	9396	381654	29598	RALYL	184672	522647	17334	429284	34553
ARHGEF2	116584	474428	1459	N/A		HMGCLL1	146151	370852	9397	359889	29599	RALYL	184672	523850	17335	428807	34554
ARHGEF2	116584	470975	1460	N/A		HMGCLL1	146151	370850	9398	359887	29600	RALYL	184672	521376	17336	428310	34555
ARHGEF2	116584	608543	1461	N/A		HMGCLL1	146151	508459	9399	424309	29601	RALYL	184672	518065	17337	N/A	
ARHGEF2	116584	470874	1462	477448	24710	HMGCLL1	146151	308161	9400	309737	29602	RAMP1	132329	404910	17338	384688	34556
ARHGEF2	116584	471589	1463	477299	24711	HMGCLL1	146151	507223	9401	N/A		RAMP1	132329	254661	17339	254661	34557
ARHGEF2	116584	497907	1464	476724	24712	HMGCLL1	146151	428842	9402	412924	29603	RAMP1	132329	409726	17340	386720	34558
ARHGEF2	116584	476273	1465	N/A		HMGCLL1	146151	515546	9403	426054	29604	RAMP1	132329	403885	17341	386046	34559
ARHGEF2	116584	609707	1466	476699	24713	HMGCR	113161	511206	9404	426745	29605	RAMP2	131477	591972	17342	N/A	
ARHGEF2	116584	487755	1467	N/A		HMGCR	113161	287936	9405	287936	29606	RAMP2	131477	589683	17343	467463	34560
ARHGEF2	116584	465079	1468	N/A		HMGCR	113161	343975	9406	340816	29607	RAMP2	131477	588928	17344	466980	34561
ARHGEF2	116584	495070	1469	476532	24714	HMGCR	113161	509431	9407	N/A		RAMP2	131477	253796	17345	253796	34562
ARHGEF2	116584	423422	1470	476518	24715	HMGCR	113161	507942	9408	427340	29608	RAMP2	131477	587142	17346	466455	34563
ARHGEF2	116584	609126	1471	N/A		HMGCR	113161	442032	9409	409100	29609	RAMP2	131477	588576	17347	465725	34564
ARHGEF2	116584	368315	1472	357298	24716	HMGCR	113161	504466	9410	N/A		RANBP2	153201	283195	17348	283195	34565
ARHGEF26	114790	356448	1473	348828	24717	HMGCR	113161	515776	9411	N/A		RANBP2	153201	425282	17349	398970	34566
ARHGEF26	114790	465093	1474	423418	24718	HMGCR	113161	508070	9412	N/A		RANBP2	153201	495924	17350	N/A	
ARHGEF26	114790	496710	1475	424446	24719	HMGCR	113161	509085	9413	421378	29610	RANBP2	153201	495506	17351	N/A	
ARHGEF26	114790	465817	1476	423295	24720	HMGCR	113161	511986	9414	420871	29611	RANBP2	153201	629728	17352	485979	34567
ARHGEF26	114790	483068	1477	N/A		HMGCR	113161	514315	9415	N/A		RANBP3L	164188	296604	17353	296604	34568
ARHGEF26	277101	630534	1478	N/A		HMGCR	113161	512053	9416	N/A		RANBP3L	164188	502994	17354	421853	34569
ARHGEF26	277101	629129	1479	486665	24721	HMGCS1	112972	325110	9417	322706	29612	RANBP3L	164188	515759	17355	421149	34570
ARHGEF26	277101	630729	1480	487265	24722	HMGCS1	112972	433297	9418	399402	29613	RANBP3L	164188	505865	17356	427147	34571
ARHGEF26	277101	614308	1481	481927	24723	HMGCS1	112972	508319	9419	N/A		RAPGEF3	079337	449771	17357	395708	34572
ARHGEF26	277101	618535	1482	484367	24724	HMGCS1	112972	514610	9420	N/A		RAPGEF3	079337	547856	17358	449905	34573
ARHGEF28	214944	296794	1483	296794	24725	HMGCS1	112972	507004	9421	N/A		RAPGEF3	079337	549151	17359	448619	34574
ARHGEF28	214944	509848	1484	421859	24726	HMGCS1	112972	507293	9422	N/A		RAPGEF3	079337	395360	17360	N/A	
ARHGEF28	214944	437974	1485	411459	24727	HMGCS1	112972	511774	9423	427339	29614	RAPGEF3	079337	482843	17361	N/A	
ARHGEF28	214944	426542	1486	412175	24728	HMGN1	205581	288344	9424	288344	29615	RAPGEF3	079337	479866	17362	N/A	
ARHGEF28	214944	510131	1487	N/A		HMGN1	205581	486741	9425	N/A		RAPGEF3	079337	488250	17363	N/A	
ARHGEF28	214944	296799	1488	296799	24729	HMGN1	205581	431390	9426	395291	29616	RAPGEF3	079337	389212	17364	373864	34575
ARHGEF28	214944	513841	1489	N/A		HMGN1	205581	380749	9427	370125	29617	RAPGEF3	079337	548919	17365	448480	34576
ARHGEF28	214944	506334	1490	N/A		HMGN1	205581	492280	9428	N/A		RAPGEF3	079337	490387	17366	N/A	
ARHGEF28	214944	510312	1491	N/A		HMGN1	205581	436324	9429	414421	29618	RAPGEF3	079337	548434	17367	447691	34577
ARHGEF28	214944	512883	1492	421081	24730	HMGN1	205581	380748	9430	370124	29619	RAPGEF3	079337	473777	17368	N/A	
ARHGEF28	214944	504003	1493	N/A		HMGN1	205581	419378	9431	396693	29620	RAPGEF3	079337	476259	17369	N/A	
ARHGEF28	214944	503341	1494	N/A		HMGN1	205581	489072	9432	N/A		RAPGEF3	079337	395358	17370	378764	34578
ARHGEF28	214944	545377	1495	441913	24731	HMGN1	205581	482192	9433	N/A		RAPGEF3	079337	494764	17371	N/A	
ARHGEF28	214944	513042	1496	441436	24732	HMGN1	205581	380747	9434	370123	29621	RAPGEF3	079337	495465	17372	449818	34579
ARHGEF3	163947	296315	1497	296315	24733	HMGN1	205581	485550	9435	N/A		RAPGEF3	079337	466322	17373	446731	34580
ARHGEF3	163947	338458	1498	341071	24734	HMGN1	205581	490032	9436	N/A		RAPGEF3	079337	495953	17374	448804	34581
ARHGEF3	163947	413728	1499	410922	24735	HMGN1	205581	443046	9437	395787	29622	RAPGEF3	079337	549347	17375	N/A	
ARHGEF3	163947	465659	1500	417810	24736	HMGN1	205581	464078	9438	N/A		RAPGEF3	079337	405493	17376	384521	34582
ARHGEF3	163947	496106	1501	420420	24737	HMGN1	205581	491183	9439	N/A		RAPGEF4	091428	484331	17377	N/A	
ARHGEF3	163947	497267	1502	418826	24738	HMGN1	205581	479586	9440	N/A		RAPGEF4	091428	397081	17378	380271	34583
ARHGEF3	163947	495373	1503	417986	24739	HMGN1	205581	471260	9441	N/A		RAPGEF4	091428	409036	17379	387104	34584
ARHGEF3	163947	468727	1504	417087	24740	HMGN1	205581	482733	9442	N/A		RAPGEF4	091428	464976	17380	N/A	
ARHGEF3	163947	473779	1505	420402	24741	HMGN1	205581	463631	9443	N/A		RAPGEF4	091428	397087	17381	380276	34585
ARHGEF3	163947	481422	1506	N/A		HOMER1	152413	334082	9444	334382	29623	RAPGEF4	091428	473003	17382	N/A	
ARHGEF3	163947	498517	1507	N/A		HOMER1	152413	460741	9445	N/A		RAPGEF4	091428	473043	17383	N/A	
ARHGEF3	163947	477833	1508	418984	24742	HOMER1	152413	282260	9446	282260	29624	RAPGEF4	091428	466030	17384	N/A	
ARHGEF3	163947	477440	1509	N/A		HOMER1	152413	508576	9447	426651	29625	RAPGEF4	091428	473182	17385	N/A	
ARHGEF3	163947	468466	1510	418469	24743	HOMER1	152413	535690	9448	441587	29626	RAPGEF4	091428	459852	17386	N/A	

ARHGEF3	163947	486829	1511	420633	24744	HOMER3	051128	221222	9449	221222	29627	RAPGEF4	091428	397085	17387	380274	34586
ARHGEF33	214694	409978	1512	387020	24745	HOMER3	051128	539827	9450	439937	29628	RAPGEF4	091428	484645	17388	N/A	
ARHGEF33	214694	488692	1513	N/A		HOMER3	051128	392351	9451	376162	29629	RAPGEF4	091428	535187	17389	438011	34587
ARHGEF33	214694	486958	1514	N/A		HOMER3	051128	594794	9452	469800	29630	RAPGEF4	091428	540783	17390	440250	34588
ARHGEF33	214694	483305	1515	N/A		HOMER3	051128	594439	9453	471835	29631	RAPGEF4	091428	538974	17391	440135	34589
ARHGEF33	214694	411874	1516	399688	24746	HOMER3	051128	542541	9454	446026	29632	RARB	077092	383772	17392	373282	34590
ARHGEF33	214694	433605	1517	413620	24747	HOMER3	051128	595756	9455	N/A		RARB	077092	437042	17393	398840	34591
ARHGEF33	214694	430382	1518	N/A		HOMER3	051128	596482	9456	472815	29633	RARB	077092	330688	17394	332296	34592
ARHGEF33	214694	398800	1519	381780	24748	HOMER3	051128	600077	9457	470659	29634	RARB	077092	489694	17395	N/A	
ARHGEF37	183111	505810	1520	425621	24749	HOMER3	051128	599808	9458	N/A		RARB	077092	480001	17396	N/A	
ARHGEF37	183111	333677	1521	328083	24750	HOMER3	051128	599097	9459	472800	29635	RARB	077092	462272	17397	N/A	
ARHGEF37	183111	509831	1522	N/A		HOMER3	051128	433218	9460	396154	29636	RARB	077092	479097	17398	N/A	
ARHGEF4	136002	409359	1523	386794	24751	HOXD1	128645	331462	9461	328598	29637	RARB	077092	458646	17399	391391	34593
ARHGEF4	136002	526381	1524	N/A		HPCAL1	115756	423674	9462	413689	29638	RASAL1	111344	546530	17400	450244	34594
ARHGEF4	136002	636987	1525	490717	24752	HPCAL1	115756	307845	9463	310749	29639	RASAL1	111344	261729	17401	261729	34595
ARHGEF4	136002	438985	1526	389661	24753	HPCAL1	115756	381765	9464	371184	29640	RASAL1	111344	446861	17402	395920	34596
ARHGEF4	136002	392953	1527	376680	24754	HPCAL1	115756	419810	9465	416359	29641	RASAL1	111344	549444	17403	N/A	
ARHGEF4	136002	409303	1528	387285	24755	HPCAL1	115756	422133	9466	388856	29642	RASAL1	111344	548055	17404	448510	34597
ARHGEF4	136002	355771	1529	348017	24756	HPCAL1	115756	622018	9467	482993	29643	RASAL1	111344	551051	17405	N/A	
ARHGEF4	136002	496764	1530	N/A		HPCAL1	115756	620771	9468	483786	29644	RASAL1	111344	546727	17406	N/A	
ARHGEF4	136002	439368	1531	N/A		HPCAL1	115756	613496	9469	478231	29645	RASAL1	111344	418411	17407	N/A	
ARHGEF4	136002	528247	1532	N/A		HPCAL4	116983	372844	9470	361935	29646	RASAL1	111344	548972	17408	N/A	
ARHGEF4	136002	490728	1533	N/A		HPCAL4	116983	612703	9471	484070	29647	RASAL1	111344	547810	17409	N/A	
ARHGEF4	136002	532720	1534	432301	24757	HPCAL4	116983	617690	9472	481834	29648	RASAL2	075391	367649	17410	356621	34598
ARHGEF4	136002	527365	1535	N/A		HPN	105707	262626	9473	262626	29649	RASAL2	075391	465723	17411	N/A	
ARHGEF4	136002	525092	1536	N/A		HPN	105707	392226	9474	376060	29650	RASAL2	075391	462775	17412	420558	34599
ARHGEF4	136002	326016	1537	316845	24758	HPN	105707	600390	9475	472310	29651	RASAL2	075391	433130	17413	402897	34600
ARHGEF4	136002	525839	1538	432267	24759	HPN	105707	597419	9476	470327	29652	RASAL2	075391	463079	17414	N/A	
ARHGEF4	136002	611048	1539	483548	24760	HPN	105707	599363	9477	N/A		RASGEF1B	138670	509081	17415	425393	34601
ARHGEF4	136002	428230	1540	398455	24761	HPN	105707	596662	9478	N/A		RASGEF1B	138670	264400	17416	264400	34602
ARHGEF6	129675	370620	1541	359654	24762	HPN	105707	541345	9479	N/A		RASGEF1B	138670	638048	17417	490436	34603
ARHGEF6	129675	370622	1542	359656	24763	HPN	105707	593305	9480	N/A		RASGEF1B	138670	335927	17418	338437	34604
ARHGEF6	129675	250617	1543	250617	24764	HPN	105707	600675	9481	N/A		RASGEF1B	138670	504863	17419	426929	34605
ARIH1	166233	379887	1544	369217	24765	HPSE2	172987	370552	9482	359583	29653	RASGEF1B	138670	436139	17420	398763	34606
ARIH1	166233	570085	1545	456746	24766	HPSE2	172987	370549	9483	359580	29654	RASGEF1B	138670	514889	17421	N/A	
ARIH1	166233	564062	1546	454774	24767	HPSE2	172987	628193	9484	485916	29655	RASGEF1B	138670	507538	17422	N/A	
ARIH1	166233	567762	1547	N/A		HPSE2	172987	370546	9485	359577	29656	RASGEF1B	138670	512716	17423	476065	34607
ARIH1	166233	561987	1548	N/A		HPSE2	172987	404542	9486	384384	29657	RASGEF1B	138670	514050	17424	490814	34608
ARIH1	166233	565950	1549	N/A		HPSE2	172987	614306	9487	484672	29658	RASGEF1B	138670	512343	17425	489822	34609
ARIH1	166233	561770	1550	457767	24768	HRASLS	127252	264735	9488	264735	29659	RASGEF1B	138670	510780	17426	490663	34610
ARIH1	166233	566063	1551	N/A		HRASLS	127252	416012	9489	414431	29660	RASGEF1B	138670	508294	17427	N/A	
ARIH1	166233	562891	1552	477687	24769	HRH2	113749	377291	9490	366506	29661	RASGEF1B	138670	613784	17428	484927	34611
ARIH1	166233	563310	1553	N/A		HRH2	113749	624694	9491	490705	29662	RASGRF1	058335	558480	17429	452781	34612
ARL4A	122644	396662	1554	379897	24770	HRH2	113749	636584	9492	489742	29663	RASGRF1	058335	419573	17430	405963	34613
ARL4A	122644	356797	1555	349250	24771	HRH2	113749	231683	9493	231683	29664	RASGRF1	058335	394745	17431	378228	34614
ARL4A	122644	396664	1556	379899	24772	HRH3	101180	340177	9494	342560	29665	RASGRF1	058335	559926	17432	N/A	

ARL4A	122644	439721	1557	397651	24773	HRH3	101180	317393	9495	321482	29666	RASGRF1	058335	560334	17433	N/A	
ARL4A	122644	404894	1558	385236	24774	HRH3	101180	611492	9496	482567	29667	RASGRF1	058335	623620	17434	N/A	
ARL4A	122644	396663	1559	379898	24775	HS3ST1	002587	002596	9497	002596	29668	RASGRF1	058335	560286	17435	N/A	
ARL5B	165997	377275	1560	366487	24776	HS3ST1	002587	514690	9498	425673	29669	RASGRF1	058335	560943	17436	N/A	
ARMCX1	126947	372829	1561	361917	24777	HS3ST1	002587	510712	9499	422629	29670	RASGRF1	058335	561112	17437	N/A	
ARNT2	172379	529181	1562	N/A		HS3ST2	122254	261374	9500	261374	29671	RASGRP1	172575	310803	17438	310244	34615
ARNT2	172379	303329	1563	307479	24778	HS3ST2	122254	473392	9501	454505	29672	RASGRP1	172575	558432	17439	453583	34616
ARNT2	172379	533983	1564	453651	24779	HS3ST4	182601	331351	9502	330606	29673	RASGRP1	172575	561180	17440	452859	34617
ARNT2	172379	527771	1565	453792	24780	HS3ST4	182601	475436	9503	N/A		RASGRP1	172575	450598	17441	388540	34618
ARNT2	172379	525103	1566	452961	24781	HS6ST2	171004	370836	9504	359873	29674	RASGRP1	172575	559830	17442	452721	34619
ARNT2	172379	531595	1567	N/A		HS6ST2	171004	521489	9505	429473	29675	RASGRP1	172575	414708	17443	413105	34620
ARNT2	172379	558849	1568	N/A		HS6ST2	171004	602570	9506	N/A		RASGRP1	172575	558164	17444	454164	34621
ARNT2	172379	525505	1569	N/A		HS6ST2	171004	370833	9507	359870	29676	RASGRP1	172575	557875	17445	453729	34622
ARNT2	172379	622346	1570	479393	24782	HS6ST2	171004	406696	9508	384013	29677	RASGRP1	172575	560425	17446	454053	34623
ARPP21	172995	450234	1571	411644	24783	HS6ST2	171004	640529	9509	491722	29678	RASGRP1	172575	558418	17447	453905	34624
ARPP21	172995	428373	1572	412411	24784	HSD17B11	198189	358290	9510	351035	29679	RASGRP1	172575	561117	17448	454005	34625
ARPP21	172995	421492	1573	398598	24785	HSD17B11	198189	507518	9511	N/A		RASGRP1	172575	560929	17449	452892	34626
ARPP21	172995	444190	1574	405276	24786	HSD17B11	198189	512344	9512	N/A		RASGRP1	172575	539159	17450	444762	34627
ARPP21	172995	449196	1575	409808	24787	HSD17B11	198189	502576	9513	N/A		RASGRP3	152689	402538	17451	385886	34628
ARPP21	172995	187397	1576	187397	24788	HSD17B11	198189	507286	9514	423775	29680	RASGRP3	152689	484909	17452	N/A	
ARPP21	172995	452563	1577	396324	24789	HSD17B11	198189	513854	9515	N/A		RASGRP3	152689	497723	17453	N/A	
ARPP21	172995	438577	1578	409331	24790	HSD17B11	198189	508413	9516	N/A		RASGRP3	152689	479528	17454	N/A	
ARPP21	172995	414496	1579	415134	24791	HSD17B12	149084	278353	9517	278353	29681	RASGRP3	152689	437184	17455	393866	34629
ARPP21	172995	419330	1580	413005	24792	HSD17B12	149084	527433	9518	490749	29682	RASGRP3	152689	403687	17456	384192	34630
ARPP21	172995	427542	1581	401602	24793	HSD17B12	149084	531185	9519	436582	29683	RASGRP3	152689	482857	17457	N/A	
ARPP21	172995	474696	1582	417838	24794	HSD17B12	149084	636007	9520	490822	29684	RASGRP3	152689	442390	17458	405648	34631
ARPP21	172995	412048	1583	390151	24795	HSD17B12	149084	395700	9521	379052	29685	RASGRP3	152689	425210	17459	401974	34632
ARPP21	172995	396482	1584	379742	24796	HSD17B12	149084	636722	9522	490003	29686	RASGRP3	152689	444784	17460	400602	34633
ARPP21	172995	432682	1585	389754	24797	HSD17B12	149084	637401	9523	490421	29687	RASGRP3	152689	423159	17461	388139	34634
ARPP21	172995	432450	1586	412341	24798	HSD17B12	149084	638034	9524	490701	29688	RASGRP3	152689	494927	17462	N/A	
ARPP21	172995	413378	1587	390169	24799	HSD17B12	149084	527213	9525	N/A		RASGRP3	152689	407811	17463	383917	34635
ARPP21	172995	417925	1588	412326	24800	HSD17B12	149084	532178	9526	N/A		RASGRP3	152689	477927	17464	N/A	
ARPP21	172995	396481	1589	379741	24801	HSD17B12	149084	533090	9527	N/A		RASGRP3	152689	490150	17465	N/A	
ARPP21	172995	434383	1590	N/A		HSD17B12	149084	533802	9528	N/A		RASGRP3	152689	419772	17466	409593	34636
ARPP21	172995	441454	1591	406964	24802	HSD17B12	149084	534053	9529	N/A		RASGRP3	152689	468856	17467	N/A	
ARPP21	172995	436702	1592	397720	24803	HSD17B12	149084	525736	9530	N/A		RASGRP3	152689	482731	17468	N/A	
ARPP21	172995	438071	1593	410171	24804	HSP90AA1	080824	216281	9531	216281	29689	RASIP1	105538	601530	17469	N/A	
ARPP21	172995	461826	1594	N/A		HSP90AA1	080824	334701	9532	335153	29690	RASIP1	105538	222145	17470	222145	34637
ARPP21	172995	446068	1595	399482	24805	HSP90AA1	080824	554401	9533	451400	29691	RASIP1	105538	599291	17471	471633	34638
ARPP21	172995	425289	1596	408271	24806	HSP90AA1	080824	557089	9534	N/A		RASIP1	105538	594232	17472	N/A	
ARPP21	172995	427590	1597	396116	24807	HSP90AA1	080824	560130	9535	N/A		RASL11B	128045	248706	17473	248706	34639
ARPP21	172995	476327	1598	N/A		HSP90AA1	080824	553585	9536	450712	29692	RASL11B	128045	515677	17474	N/A	
ARPP21	172995	494494	1599	N/A		HSP90AA1	080824	555662	9537	N/A		RASL11B	128045	505041	17475	N/A	
ARPP21	172995	481854	1600	N/A		HSP90AA1	080824	556554	9538	N/A		RASL12	103710	220062	17476	220062	34640
ARPP21	172995	457165	1601	412233	24808	HSP90AA1	080824	557234	9539	452241	29693	RASL12	103710	421977	17477	390028	34641
ARPP21	172995	462173	1602	N/A		HSP90AA1	080824	558600	9540	489370	29694	RASL12	103710	434605	17478	412787	34642
ARPP21	172995	463970	1603	N/A		HSP90AB1	096384	371646	9541	360709	29695	RASSF2	101265	478553	17479	N/A	
ARPP21	172995	473138	1604	N/A		HSP90AB1	096384	353801	9542	325875	29696	RASSF2	101265	379400	17480	368710	34643
ARPP21	172995	476052	1605	N/A		HSP90AB1	096384	371554	9543	360609	29697	RASSF2	101265	379376	17481	368684	34644
ARRB1	137486	420843	1606	409581	24809	HSP90AB1	096384	620073	9544	481908	29698	RBKS	171174	302188	17482	306817	34645
ARRB1	137486	360025	1607	353124	24810	HSPA1A	234475	433487	9545	408907	29699	RBKS	171174	449378	17483	413789	34646
ARRB1	137486	532447	1608	436530	24811	HSPA1A	234475	452298	9546	393259	29700	RBKS	171174	458185	17484	393558	34647
ARRB1	137486	531012	1609	N/A		HSPA1A	215328	400040	9547	382915	29701	RBKS	171174	453412	17485	415975	34648
ARRB1	137486	529741	1610	N/A		HSPA1A	215328	383389	9548	372880	29702	RBKS	171174	612015	17486	483033	34649
ARRB1	137486	532525	1611	433171	24812	HSPA1A	235941	430065	9549	404524	29703	RBM22	086589	520132	17487	N/A	
ARRB1	137486	524400	1612	434196	24813	HSPA1A	235941	422919	9550	415927	29704	RBM22	086589	199814	17488	199814	34650
ARRB1	137486	533609	1613	436352	24814	HSPA1A	204389	375651	9551	364802	29705	RBM22	086589	447771	17489	412118	34651
ARRB1	137486	527385	1614	433137	24815	HSPA1A	204389	608703	9552	477378	29706	RBM22	086589	522469	17490	N/A	
ARRB1	137486	530086	1615	N/A		HSPA1A	237724	441618	9553	406359	29707	RBM22	086589	518917	17491	428154	34652

ARRB1	137486	529280	1616	N/A		HSPA1A	237724	449876	9554	410693	29708	RBM22	086589	521248	17492	N/A	
ARRB1	137486	533255	1617	N/A		HSPA1B	231555	445736	9555	403530	29709	RBM22	086589	521594	17493	N/A	
ARRDC3	113369	265138	1618	265138	24816	HSPA1B	204388	375650	9556	364801	29710	RBM22	086589	521464	17494	430946	34653
ARRDC3	113369	511391	1619	N/A		HSPA1B	212866	391555	9557	375399	29711	RBM24	112183	379052	17495	368341	34654
ARRDC3	113369	505631	1620	N/A		HSPA1B	212866	458062	9558	402651	29712	RBM24	112183	509686	17496	426222	34655
ARRDC3	113369	514284	1621	N/A		HSPA1B	232804	450744	9559	393087	29713	RBM24	112183	425446	17497	396898	34656
ARRDC3	113369	508948	1622	N/A		HSPA1B	232804	417199	9560	387691	29714	RBM24	112183	503965	17498	421971	34657
ARRDC3	113369	503192	1623	N/A		HSPA1B	224501	391548	9561	375391	29715	RBM24	112183	318204	17499	319551	34658
ARRDC3	113369	507075	1624	N/A		HSPA1B	224501	545241	9562	442789	29716	RBM24	112183	504055	17500	N/A	
ARSDP1	225117	443820	1625	N/A		HSPA4	170606	304858	9563	302961	29717	RBM24	112183	510826	17501	N/A	
ARSG	141337	448504	1626	407193	24817	HSPA4	170606	504328	9564	N/A		RBM24	112183	508508	17502	N/A	
ARSG	141337	578726	1627	N/A		HSPA4	170606	514825	9565	N/A		RBM25	119707	261973	17503	261973	34659
ARSG	141337	581639	1628	462306	24818	HSPA4	170606	615899	9566	478102	29718	RBM25	119707	527432	17504	431150	34660
ARSG	141337	452479	1629	413953	24819	HSPA4	170606	617074	9567	481686	29719	RBM25	119707	531500	17505	434333	34661
ARSG	141337	582154	1630	N/A		HSPA4L	164070	508776	9568	422482	29720	RBM25	119707	532683	17506	N/A	
ARSG	141337	581032	1631	N/A		HSPA4L	164070	296464	9569	296464	29721	RBM25	119707	525321	17507	436868	34662
ARSG	141337	578554	1632	N/A		HSPA4L	164070	508549	9570	427305	29722	RBM25	119707	526754	17508	436225	34663
ARSG	141337	590690	1633	N/A		HSPA4L	164070	505726	9571	425645	29723	RBM25	119707	525161	17509	434004	34664
ARSG	141337	621439	1634	480910	24820	HSPA4L	164070	515262	9572	N/A		RBM25	119707	528081	17510	434444	34665
ARX	004848	379044	1635	368332	24821	HSPA8	109971	532636	9573	437125	29724	RBM25	119707	532192	17511	434950	34666
ARX	004848	636885	1636	N/A		HSPA8	109971	533540	9574	437189	29725	RBM25	119707	532483	17512	N/A	
ARX	004848	637993	1637	490122	24822	HSPA8	109971	534624	9575	432083	29726	RBM25	119707	527449	17513	N/A	
ARX	004848	636609	1638	N/A		HSPA8	109971	453788	9576	404372	29727	RBM25	119707	530978	17514	N/A	
ARX	004848	637394	1639	N/A		HSPA8	109971	532091	9577	N/A		RBM7	076053	540163	17515	439918	34667
ASAP3	088280	495646	1640	436130	24823	HSPA8	109971	227378	9578	227378	29728	RBM7	076053	375490	17516	364639	34668
ASAP3	088280	336689	1641	338769	24824	HSPA8	109971	534319	9579	433316	29729	RBM7	076053	541475	17517	440949	34669
ASAP3	088280	465372	1642	435394	24825	HSPA8	109971	526110	9580	433584	29730	RBM7	076053	544313	17518	437847	34670
ASAP3	088280	492982	1643	435858	24826	HSPA8	109971	524552	9581	435908	29731	RBM7	076053	542140	17519	437998	34671
ASAP3	088280	437606	1644	408826	24827	HSPA8	109971	526686	9582	435019	29732	RBM7	076053	544582	17520	440923	34672
ASAP3	088280	484418	1645	434897	24828	HSPA8	109971	533238	9583	N/A		RBM7	076053	545678	17521	445848	34673
ASAP3	088280	475814	1646	436439	24829	HSPA8	109971	526862	9584	N/A		RBM7	076053	538134	17522	N/A	
ASAP3	088280	530874	1647	N/A		HSPA8	109971	527983	9585	N/A		RBM7	076053	624815	17523	485655	34674
ASAP3	088280	478858	1648	N/A		HSPA8	109971	528292	9586	432884	29733	RBMS3	144642	432518	17524	N/A	
ASAP3	088280	608765	1649	476400	24830	HSPA8	109971	532780	9587	N/A		RBMS3	144642	443912	17525	N/A	
ASAP3	088280	449467	1650	N/A		HSPA8	109971	525463	9588	436762	29734	RBMS3	144642	445077	17526	N/A	
ASAP3	088280	618240	1651	483740	24831	HSPA8	109971	532167	9589	N/A		RBMS3	144642	636680	17527	490271	34675
ASAP3	282854	634513	1652	488934	24832	HSPA8	109971	525624	9590	435154	29735	RBMS3	144642	636900	17528	N/A	
ASAP3	282854	634561	1653	488946	24833	HSPA8	109971	534567	9591	431641	29736	RBMS3	144642	636582	17529	N/A	
ASAP3	282854	635693	1654	489432	24834	HSPA8	109971	527387	9592	436183	29737	RBMS3	144642	637842	17530	489718	34676
ASAP3	282854	635461	1655	489483	24835	HSPA8	109971	532182	9593	434415	29738	RBMS3	144642	434693	17531	395592	34677
ASAP3	282854	634705	1656	489485	24836	HSPA8	109971	524590	9594	434565	29739	RBMS3	144642	471426	17532	N/A	
ASAP3	282854	635198	1657	488953	24837	HSPA8	109971	530391	9595	434851	29740	RBMS3	144642	383767	17533	373277	34678
ASAP3	282854	635167	1658	489344	24838	HSPA8	109971	531063	9596	N/A		RBMS3	144642	445033	17534	391934	34679
ASAP3	282854	634883	1659	489094	24839	HSPA9	113013	297185	9597	297185	29741	RBMS3	144642	273139	17535	273139	34680
ASAP3	282854	635442	1660	N/A		HSPA9	113013	501917	9598	N/A		RBMS3	144642	383766	17536	373276	34681
ASAP3	282854	634459	1661	N/A		HSPA9	113013	524109	9599	N/A		RBMS3	144642	452462	17537	397926	34682
ASAP3	282854	634548	1662	489187	24840	HSPA9	113013	512328	9600	421892	29742	RBMS3	144642	456853	17538	400519	34683
ASAP3	282854	635351	1663	N/A		HSPA9	113013	507097	9601	N/A		RBMS3	144642	497205	17539	N/A	
ASCL1	139352	266744	1664	266744	24841	HSPA9	113013	523929	9602	429475	29743	RBMS3	144642	478716	17540	N/A	
ASGR1	141505	269299	1665	269299	24842	HSPA9	113013	508003	9603	N/A		RBMS3	144642	497319	17541	N/A	
ASGR1	141505	380920	1666	370307	24843	HSPA9	113013	504902	9604	421311	29744	RBMS3	144642	473799	17542	N/A	
ASGR1	141505	574330	1667	467511	24844	HSPA9	113013	507115	9605	423759	29745	RBMS3	144642	497274	17543	N/A	
ASGR1	141505	574388	1668	459169	24845	HSPA9	113013	505110	9606	420944	29746	RBP2	114113	232217	17544	232217	34684
ASGR1	141505	572879	1669	458530	24846	HSPA9	113013	504810	9607	425598	29747	RBP2	114113	511956	17545	424333	34685
ASGR1	141505	570576	1670	458803	24847	HSPA9	113013	506477	9608	N/A		RBP2	114113	506825	17546	421266	34686
ASGR1	141505	573596	1671	N/A		HSPA9	113013	507886	9609	423098	29748	RBPJL	124232	372743	17547	361828	34687
ASGR1	141505	573083	1672	459896	24848	HSPB1	106211	248553	9610	248553	29749	RBPJL	124232	372741	17548	361826	34688
ASGR1	141505	619926	1673	481182	24849	HSPB1	106211	447574	9611	414357	29750	RBPJL	124232	343694	17549	341243	34689
ASIC1	110881	228468	1674	228468	24850	HSPB1	106211	429938	9612	405285	29751	RBPJL	124232	464504	17550	483978	34690

ASIC1	110881	447966	1675	400228	24851	HSPD1	144381	388968	9613	373620	29752	RBPJL	124232	622729	17551	N/A	
ASIC1	110881	550558	1676	448263	24852	HSPD1	144381	491249	9614	N/A		RBPMS2	166831	560606	17552	456720	34691
ASIC1	110881	453327	1677	402896	24853	HSPD1	144381	482167	9615	N/A		RBPMS2	166831	300069	17553	300069	34692
ASIC1	110881	551199	1678	N/A		HSPD1	144381	430176	9616	393670	29753	RCAN2	172348	330430	17554	329454	34693
ASIC1	110881	552438	1679	450247	24854	HSPD1	144381	486181	9617	N/A		RCAN2	172348	371374	17555	360425	34694
ASIC1	110881	549792	1680	N/A		HSPD1	144381	452200	9618	412717	29754	RCAN2	172348	306764	17556	305223	34695
ASIC1	110881	548350	1681	N/A		HSPD1	144381	440114	9619	390404	29755	RCAN2	172348	405162	17557	384317	34696
ASIC1	110881	552633	1682	446863	24855	HSPD1	144381	476746	9620	N/A		RCN1	049449	530348	17558	436482	34697
ASIC2	108684	225823	1683	225823	24856	HSPD1	144381	461097	9621	N/A		RCN1	049449	532942	17559	436422	34698
ASIC2	108684	359872	1684	352934	24857	HSPD1	144381	426480	9622	414446	29756	RCN1	049449	506388	17560	N/A	
ASIC2	108684	448983	1685	N/A		HSPD1	144381	428204	9623	396460	29757	RCN1	049449	530146	17561	N/A	
ASIC2	108684	579816	1686	N/A		HSPD1	144381	439605	9624	402478	29758	RCN1	049449	054950	17562	054950	34699
ASIC2	108684	583395	1687	N/A		HSPD1	144381	418022	9625	412227	29759	RCN1	049449	532721	17563	433249	34700
ASIC4	072182	461395	1688	N/A		HSPD1	144381	345042	9626	340019	29760	RCN1	049449	533898	17564	N/A	
ASIC4	072182	347842	1689	326627	24858	HSPE1-MOB4	270757	604458	9627	474534	29761	RCN1	049449	532474	17565	N/A	
ASIC4	072182	358078	1690	350786	24859	HSPH1	120694	320027	9628	318687	29762	RCN1	049449	527337	17566	436427	34701
ASIC4	072182	474489	1691	N/A		HSPH1	120694	435381	9629	408991	29763	RCN1	049449	531345	17567	N/A	
ASIC4	072182	473709	1692	N/A		HSPH1	120694	630972	9630	487365	29764	RCN1	049449	528630	17568	433237	34702
ASNS	070669	394309	1693	377846	24860	HSPH1	120694	380405	9631	369768	29765	RCN2	117906	394885	17569	378349	34703
ASNS	070669	454046	1694	401651	24861	HSPH1	120694	602786	9632	473512	29766	RCN2	117906	320963	17570	319739	34704
ASNS	070669	437628	1695	414379	24862	HSPH1	120694	626866	9633	N/A		RCN2	117906	394883	17571	378347	34705
ASNS	070669	394308	1696	377845	24863	HSPH1	120694	469538	9634	N/A		RCN2	117906	557805	17572	453052	34706
ASNS	070669	422745	1697	414901	24864	HSPH1	120694	629751	9635	N/A		RCN2	117906	558598	17573	N/A	
ASNS	070669	455086	1698	408472	24865	HSPH1	120694	445273	9636	396090	29767	RCN2	117906	560833	17574	N/A	
ASNS	070669	444334	1699	406994	24866	HTR1B	135312	369947	9637	358963	29768	RECK	122707	377966	17575	367202	34707
ASNS	070669	487714	1700	N/A		HTR2A	102468	378688	9638	367959	29769	RECK	122707	475774	17576	N/A	
ASNS	070669	462436	1701	N/A		HTR2A	102468	612998	9639	482708	29770	RECK	122707	479053	17577	N/A	
ASNS	070669	442734	1702	400422	24867	HTR2A	102468	543956	9640	441861	29771	REEP1	068615	165698	17578	165698	34708
ASNS	070669	495255	1703	N/A		HTR2A	102468	542664	9641	437737	29772	REEP1	068615	538924	17579	438346	34709
ASNS	070669	437657	1704	394242	24868	HTR2C	147246	371951	9642	361019	29773	REEP1	068615	535845	17580	437567	34710
ASNS	070669	448127	1705	402350	24869	HTR2C	147246	276198	9643	276198	29774	REEP1	068615	541910	17581	442681	34711
ASNS	070669	453600	1706	408797	24870	HTR2C	147246	371950	9644	361018	29775	REEP1	068615	453231	17582	392197	34712
ASNS	070669	451771	1707	397802	24871	HTR5A	157219	287907	9645	287907	29776	REEP1	068615	490915	17583	N/A	
ASNS	070669	414884	1708	413797	24872	HTR5A	157219	486819	9646	N/A		REEP1	068615	473407	17584	N/A	
ASNS	070669	175506	1709	175506	24873	HTR5A-AS1	220575	395731	9647	N/A		REEP1	068615	489855	17585	475269	34713
ASPA	108381	577034	1710	458324	24874	HTR5A-AS1	220575	493904	9648	N/A		REEP1	068615	475475	17586	N/A	
ASPA	108381	456349	1711	409976	24875	HTRA1	166033	368984	9649	357980	29777	RELN	189056	424685	17587	388446	34714
ASPA	108381	263080	1712	263080	24876	HTRA1	166033	420892	9650	412676	29778	RELN	189056	473945	17588	N/A	
ASPA	108381	571278	1713	461358	24877	HUNK	142149	270112	9651	270112	29779	RELN	189056	478148	17589	N/A	
ASPG	166183	551177	1714	450040	24878	HUNK	142149	430354	9652	411860	29780	RELN	189056	473457	17590	N/A	
ASPG	166183	548372	1715	N/A		HUNK	142149	465574	9653	N/A		RELN	189056	429186	17591	404818	34715
ASPG	166183	546892	1716	448911	24879	HUNK	142149	439107	9654	408219	29781	RELN	189056	343529	17592	345694	34716
ASPG	166183	551170	1717	447032	24880	ICAM5	105376	221980	9655	221980	29782	RELN	189056	428762	17593	392423	34717
ASPG	166183	549809	1718	N/A		ICAM5	105376	588912	9656	N/A		REP15	174236	310791	17594	310335	34718
ASPG	166183	552126	1719	N/A		ICAM5	105376	586004	9657	N/A		REPIN1	214022	519397	17595	428562	34719
ASPG	166183	556267	1720	N/A		ICAM5	105376	587398	9658	464796	29783	REPIN1	214022	487455	17596	N/A	
ASPG	166183	550583	1721	446856	24881	ICAM5	105376	586480	9659	N/A		REPIN1	214022	479668	17597	420578	34720
ASPG	166183	551871	1722	N/A		ICMT	116237	343813	9660	343552	29784	REPIN1	214022	466559	17598	418507	34721
ASTN2	148219	288520	1723	288520	24882	ICMT	116237	495791	9661	N/A		REPIN1	214022	489432	17599	417291	34722
ASTN2	148219	341734	1724	339925	24883	ICMT	116237	489498	9662	466222	29785	REPIN1	214022	475514	17600	419789	34723
ASTN2	148219	373986	1725	363098	24884	ICMT	116237	474756	9663	467999	29786	REPIN1	214022	473391	17601	N/A	
ASTN2	148219	361209	1726	354504	24885	ICOSLG	160223	344330	9664	339477	29787	REPIN1	214022	482680	17602	417982	34724
ASTN2	148219	417725	1727	412099	24886	ICOSLG	160223	407780	9665	384432	29788	REPIN1	214022	488943	17603	419872	34725
ASTN2	148219	358637	1728	351460	24887	ICOSLG	160223	400379	9666	383230	29789	REPIN1	214022	495535	17604	N/A	
ASTN2	148219	361477	1729	355116	24888	ICOSLG	160223	400377	9667	383228	29790	REPIN1	214022	467980	17605	418279	34726
ASTN2	148219	313400	1730	314038	24889	ID2	115738	234091	9668	234091	29791	REPIN1	214022	469309	17606	N/A	
ATAD2	156802	517666	1731	429331	24890	ID2	115738	331129	9669	385465	29792	REPIN1	214022	518514	17607	428129	34727
ATAD2	156802	287394	1732	287394	24891	ID2	115738	472142	9670	N/A		REPIN1	214022	522266	17608	427721	34728

ATAD2	156802	521903	1733	429213	24892	ID2	115738	396290	9671	379585	29793	REPIN1	214022	518462	17609	N/A	
ATAD2	156802	519124	1734	429617	24893	ID4	172201	378700	9672	367972	29794	REPIN1	214022	486714	17610	417786	34729
ATAD2	156802	521496	1735	N/A		IDI1	067064	381344	9673	370748	29795	REPIN1	214022	425389	17611	388287	34730
ATAD2	156802	550993	1736	N/A		IDI1	067064	491735	9674	N/A		REPIN1	214022	397281	17612	380451	34731
ATAD2	156802	534257	1737	N/A		IDI1	067064	427898	9675	404771	29796	REPIN1	214022	444957	17613	407714	34732
ATAD2	156802	530065	1738	N/A		IDI1	067064	429642	9676	401879	29797	RERG	134533	256953	17614	256953	34733
ATF3	162772	366981	1739	355948	24894	IDI1	067064	482091	9677	N/A		RERG	134533	538313	17615	441505	34734
ATF3	162772	465155	1740	N/A		IFFO1	010295	472558	9678	N/A		RERG	134533	536465	17616	438280	34735
ATF3	162772	341491	1741	344352	24895	IFFO1	010295	471408	9679	N/A		RERG	134533	546331	17617	444485	34736
ATF3	162772	366985	1742	355952	24896	IFFO1	010295	465801	9680	436261	29798	RERG	134533	545567	17618	439532	34737
ATF3	162772	492118	1743	N/A		IFFO1	010295	336604	9681	337593	29799	RERG	134533	537647	17619	441860	34738
ATF3	162772	336937	1744	336908	24897	IFFO1	010295	487279	9682	432493	29800	RERG	134533	393736	17620	440887	34739
ATF3	162772	464547	1745	432208	24898	IFFO1	010295	396840	9683	380052	29801	RERG	134533	537717	17621	N/A	
ATF3	162772	366983	1746	355950	24899	IFFO1	010295	356896	9684	349364	29802	RERG	134533	437578	17622	N/A	
ATF3	162772	613104	1747	480606	24900	IFFO1	010295	488007	9685	N/A		RET	165731	355710	17623	347942	34740
ATF3	162772	366987	1748	355954	24901	IFFO1	010295	396830	9686	N/A		RET	165731	498820	17624	419080	34741
ATF3	162772	613954	1749	483576	24902	IFFO1	010295	619571	9687	482285	29803	RET	165731	340058	17625	344798	34742
ATF6B	234539	427136	1750	404725	24903	IFFO1	010295	436152	9688	390721	29804	RET	165731	638465	17626	491505	34743
ATF6B	234539	439240	1751	391131	24904	IFFO1	010295	615885	9689	482340	29805	RET	165731	640619	17627	492728	34744
ATF6B	234539	417614	1752	399944	24905	IFNLR1	185436	327535	9690	327824	29806	RET	165731	479913	17628	N/A	
ATF6B	234539	477445	1753	N/A		IFNLR1	185436	327575	9691	328994	29807	RET	165731	615310	17629	480088	34745
ATF6B	234539	465605	1754	N/A		IFNLR1	185436	374421	9692	363542	29808	RFTN1	131378	607320	17630	475367	34746
ATF6B	234539	498564	1755	N/A		IFNLR1	185436	374419	9693	363540	29809	RFTN1	131378	432519	17631	403926	34747
ATF6B	234539	477295	1756	N/A		IFNLR1	185436	374418	9694	363539	29810	RFTN1	131378	334133	17632	334153	34748
ATF6B	234539	475964	1757	N/A		IFRD1	006652	432734	9695	391379	29811	RFTN1	131378	483671	17633	N/A	
ATF6B	213676	494022	1758	N/A		IFRD1	006652	005558	9696	005558	29812	RFTN1	131378	451036	17634	403997	34749
ATF6B	213676	375203	1759	364349	24906	IFRD1	006652	443101	9697	397592	29813	RFTN1	131378	495666	17635	N/A	
ATF6B	213676	375201	1760	364347	24907	IFRD1	006652	445335	9698	402453	29814	RFTN1	131378	484752	17636	N/A	
ATF6B	213676	453203	1761	393419	24908	IFRD1	006652	417662	9699	413893	29815	RFTN1	131378	470458	17637	N/A	
ATF6B	213676	475705	1762	N/A		IFRD1	006652	403825	9700	384477	29816	RFTN1	131378	449415	17638	409427	34750
ATF6B	213676	492342	1763	N/A		IFRD1	006652	429071	9701	397314	29817	RFTN1	131378	441460	17639	388718	34751
ATF6B	213676	495579	1764	N/A		IFRD1	006652	476927	9702	437250	29818	RFTN1	131378	453536	17640	410493	34752
ATF6B	213676	485314	1765	N/A		IFRD1	006652	440625	9703	402177	29819	RFTN1	131378	431547	17641	393216	34753
ATF6B	213676	468502	1766	N/A		IFRD1	006652	466459	9704	N/A		RFX4	111783	392842	17642	376585	34754
ATF6B	228628	425571	1767	404814	24909	IFRD1	006652	486688	9705	N/A		RFX4	111783	546882	17643	447423	34755
ATF6B	228628	435768	1768	399764	24910	IFRD1	006652	421296	9706	403203	29820	RFX4	111783	549040	17644	447735	34756
ATF6B	228628	436157	1769	389467	24911	IFRD1	006652	489994	9707	N/A		RFX4	111783	539967	17645	473326	34757
ATF6B	228628	462947	1770	N/A		IFRD1	006652	470441	9708	N/A		RFX4	111783	357881	17646	350552	34758
ATF6B	228628	461317	1771	N/A		IFRD1	006652	462155	9709	435635	29821	RFX4	111783	536722	17647	444163	34759
ATF6B	228628	492011	1772	N/A		IFRD1	006652	621379	9710	483255	29822	RFX4	111783	536688	17648	N/A	
ATF6B	228628	483144	1773	N/A		IFRD1	006652	535603	9711	439188	29823	RFX4	111783	552773	17649	N/A	
ATF6B	228628	476416	1774	N/A		IFRD1	006652	432734	9712	391379	29824	RFX4	111783	551640	17650	448694	34760
ATF6B	168468	293709	1775	293709	24912	IFRD1	006652	005558	9713	005558	29825	RFX4	111783	552866	17651	N/A	
ATF6B	168468	383156	1776	372642	24913	IFRD1	006652	443101	9714	397592	29826	RFX4	111783	229387	17652	229387	34761
ATF6B	168468	413319	1777	412066	24914	IFRD1	006652	445335	9715	402453	29827	RFX4	111783	552917	17653	449732	34762
ATF6B	168468	465333	1778	N/A		IFRD1	006652	417662	9716	413893	29828	RGCC	102760	379359	17654	368664	34763
ATF6B	168468	491968	1779	N/A		IFRD1	006652	403825	9717	384477	29829	RGCC	102760	487837	17655	N/A	
ATF6B	168468	463669	1780	N/A		IFRD1	006652	429071	9718	397314	29830	KIAA0513	135709	566428	17656	457408	34764
ATF6B	168468	465377	1781	N/A		IFRD1	006652	476927	9719	437250	29831	KIAA0513	135709	567328	17657	455544	34765
ATF6B	168468	467437	1782	N/A		IFRD1	006652	440625	9720	402177	29832	KIAA0513	135709	562580	17658	454547	34766
ATL2	119787	378954	1783	368237	24915	IFRD1	006652	466459	9721	N/A		KIAA0513	135709	562564	17659	454758	34767
ATL2	119787	406122	1784	385446	24916	IFRD1	006652	486688	9722	N/A		KIAA0513	135709	562388	17660	N/A	
ATL2	119787	402054	1785	384062	24917	IFRD1	006652	421296	9723	403203	29833	KIAA0513	135709	258180	17661	258180	34768
ATL2	119787	405384	1786	383944	24918	IFRD1	006652	489994	9724	N/A		KIAA0513	135709	538274	17662	446439	34769
ATL2	119787	419554	1787	415336	24919	IFRD1	006652	470441	9725	N/A		RGL3	205517	562663	17663	454678	34770
ATL2	119787	452935	1788	390743	24920	IFRD1	006652	462155	9726	435635	29834	RGL3	205517	563726	17664	455922	34771
ATL2	119787	477642	1789	N/A		IFRD1	006652	621379	9727	483255	29835	RGL3	205517	566153	17665	N/A	
ATL2	119787	489896	1790	N/A		IFRD1	006652	535603	9728	439188	29836	RGL3	205517	380456	17666	369823	34772
ATL2	119787	449130	1791	409811	24921	IFT43	119650	554026	9729	N/A		RGL3	205517	568628	17667	N/A	

ATL2	119787	443098	1792	410592	24922	IFT43	119650	555305	9730	N/A		RGL3	205517	393423	17668	377075	34773
ATL2	119787	456736	1793	413216	24923	IFT43	119650	555370	9731	452051	29837	RGL3	205517	566919	17669	N/A	
ATL2	119787	474535	1794	N/A		IFT43	119650	238628	9732	238628	29838	RGL3	205517	589032	17670	466669	34774
ATL2	119787	472097	1795	N/A		IFT43	119650	556742	9733	451096	29839	RGL3	205517	453604	17671	N/A	
ATL2	119787	451483	1796	404921	24924	IFT43	119650	553338	9734	N/A		RGL3	205517	565895	17672	N/A	
ATL2	119787	486927	1797	N/A		IFT43	119650	553438	9735	N/A		RGL3	205517	569439	17673	N/A	
ATL2	119787	416222	1798	406004	24925	IFT43	119650	554423	9736	N/A		RGL3	205517	561687	17674	N/A	
ATL2	119787	629272	1799	486809	24926	IFT43	119650	554233	9737	N/A		RGL3	205517	567431	17675	464876	34775
ATL3	184743	398868	1800	381844	24927	IFT43	119650	314067	9738	324177	29840	RGL3	205517	563436	17676	N/A	
ATL3	184743	538786	1801	437593	24928	IFT43	119650	555677	9739	N/A		RGL3	205517	567080	17677	456429	34776
ATL3	184743	540699	1802	441842	24929	IFT43	119650	542766	9740	440064	29841	RGL3	205517	568420	17678	N/A	
ATL3	184743	535789	1803	N/A		IGDCC3	174498	327987	9741	332773	29842	RGL3	205517	561570	17679	N/A	
ATOH8	168874	469442	1804	N/A		IGDCC3	174498	558354	9742	454105	29843	RGMA	182175	329082	17680	330005	34777
ATOH8	168874	306279	1805	304676	24930	IGDCC3	174498	559231	9743	N/A		RGMA	182175	542321	17681	440025	34778
ATOH8	168874	463422	1806	N/A		IGDCC3	174498	559058	9744	452838	29844	RGMA	182175	554387	17682	451505	34779
ATOH8	168874	473116	1807	N/A		IGDCC3	174498	559947	9745	N/A		RGMA	182175	557301	17683	452126	34780
ATOH8	168874	489682	1808	N/A		IGDCC4	103742	352385	9746	319623	29845	RGMA	182175	557420	17684	452170	34781
ATP13A4	127249	400270	1809	383129	24931	IGDCC4	103742	558048	9747	N/A		RGMA	182175	556658	17685	456290	34782
ATP13A4	127249	428352	1810	395367	24932	IGDCC4	103742	559327	9748	N/A		RGMA	182175	555584	17686	N/A	
ATP13A4	127249	450950	1811	402023	24933	IGDCC4	103742	561309	9749	N/A		RGMA	182175	555598	17687	451709	34783
ATP13A4	127249	392443	1812	376238	24934	IGDCC4	103742	560319	9750	N/A		RGMA	182175	557608	17688	N/A	
ATP13A4	127249	342695	1813	339182	24935	IGDCC4	103742	558819	9751	N/A		RGMA	182175	556950	17689	452350	34784
ATP13A4	127249	482964	1814	N/A		IGF2	167244	416167	9752	414497	29846	RGMA	182175	425933	17690	404442	34785
ATP13A4	127249	474776	1815	N/A		IGF2	167244	434045	9753	391826	29847	RGMA	182175	543599	17691	442498	34786
ATP13A4	127249	437904	1816	401481	24936	IGF2	167244	381392	9754	370799	29848	RGMB	174136	504776	17692	N/A	
ATP13A4	127249	490925	1817	N/A		IGF2	167244	381389	9755	370796	29849	RGMB	174136	505265	17693	N/A	
ATP13A4	127249	295548	1818	295548	24937	IGF2	167244	418738	9756	402047	29850	RGMB	174136	434027	17694	N/A	
ATP13A4	127249	489140	1819	N/A		IGF2	167244	381395	9757	370802	29851	RGMB	174136	308234	17695	308219	34787
ATP1A1	163399	418797	1820	400124	24938	IGF2	167244	381406	9758	370813	29852	RGMB	174136	507054	17696	N/A	
ATP1A1	163399	295598	1821	295598	24939	IGFBP3	146674	381086	9759	370476	29853	RGMB	174136	513185	17697	423256	34788
ATP1A1	163399	488733	1822	N/A		IGFBP3	146674	275521	9760	275521	29854	RGMB	174136	508978	17698	N/A	
ATP1A1	163399	369494	1823	358506	24940	IGFBP3	146674	460209	9761	N/A		RGS16	143333	367558	17699	356529	34789
ATP1A1	163399	463382	1824	N/A		IGFBP3	146674	381083	9762	370473	29855	RGS2	116741	483295	17700	N/A	
ATP1A1	163399	491156	1825	N/A		IGFBP3	146674	428530	9763	390298	29856	RGS2	116741	235382	17701	235382	34790
ATP1A1	163399	440951	1826	396236	24941	IGFBP3	146674	417621	9764	399116	29857	RGS2	116741	464302	17702	N/A	
ATP1A1	163399	479960	1827	N/A		IGFBP3	146674	448817	9765	389668	29858	RGS2	116741	487236	17703	N/A	
ATP1A1	163399	495965	1828	N/A		IGFBP3	146674	465642	9766	N/A		RGS20	147509	297313	17704	297313	34791
ATP1A1	163399	369496	1829	358508	24942	IGFBP3	146674	460477	9767	N/A		RGS20	147509	517659	17705	428795	34792
ATP1A1	163399	537345	1830	445306	24943	IGFBP3	146674	613132	9768	477772	29859	RGS20	147509	344277	17706	344630	34793
ATP1A2	018625	472488	1831	N/A		IGFBP3	146674	615754	9769	480717	29860	RGS20	147509	523280	17707	429897	34794
ATP1A2	018625	478587	1832	N/A		IGFBP5	115461	233813	9770	233813	29861	RGS20	147509	518286	17708	N/A	
ATP1A2	018625	361216	1833	354490	24944	IGFBP5	115461	486341	9771	N/A		RGS20	147509	523414	17709	N/A	
ATP1A2	018625	392233	1834	376066	24945	IGFBP5	115461	449583	9772	413474	29862	RGS20	147509	522225	17710	430627	34795
ATP1A2	018625	468587	1835	N/A		IGSF11	144847	425327	9773	406092	29863	RGS20	147509	276500	17711	276500	34796
ATP1A2	018625	447527	1836	411705	24946	IGSF11	144847	393775	9774	377370	29864	RGS20	147509	523064	17712	N/A	
ATP1A2	018625	463989	1837	N/A		IGSF11	144847	489689	9775	420486	29865	RGS20	147509	517405	17713	N/A	
ATP1A2	018625	459972	1838	N/A		IGSF11	144847	441144	9776	401240	29866	RGS4	117152	421743	17714	397181	34797
ATP1A3	105409	441343	1839	411503	24947	IGSF11	144847	491903	9777	417413	29867	RGS4	117152	527393	17715	N/A	
ATP1A3	105409	302102	1840	302397	24948	IGSF11	144847	459718	9778	N/A		RGS4	117152	367909	17716	356885	34798
ATP1A3	105409	602133	1841	471581	24949	IGSF11	144847	483401	9779	418976	29868	RGS4	117152	531057	17717	436106	34799
ATP1A3	105409	545399	1842	444688	24950	IGSF11	144847	480431	9780	418047	29869	RGS4	117152	527809	17718	433261	34800
ATP1A3	105409	543770	1843	437577	24951	IGSF11	144847	494802	9781	N/A		RGS4	117152	367908	17719	356884	34801
ATP1A3	105409	485672	1844	N/A		IGSF11	144847	354673	9782	346700	29870	RGS4	117152	491263	17720	N/A	
ATP1A3	105409	473086	1845	469129	24952	IGSF3	143061	369486	9783	358498	29871	RGS4	117152	533019	17721	N/A	
ATP1A3	105409	468774	1846	N/A		IGSF3	143061	318837	9784	321184	29872	RGS4	117152	367906	17722	356882	34802
ATP1A3	105409	465007	1847	N/A		IGSF3	143061	481589	9785	474657	29873	RGS4	117152	528938	17723	432194	34803
ATP1A3	105409	636197	1848	489877	24953	IGSF3	143061	369483	9786	358495	29874	RGS6	182732	553525	17724	451030	34804
ATP1A3	105409	636238	1849	N/A		ELP1	070061	495759	9787	433514	29875	RGS6	182732	555571	17725	450936	34805
ATP1A3	105409	636282	1850	N/A		ELP1	070061	374647	9788	363779	29876	RGS6	182732	553530	17726	452331	34806

ATP1A3	105409	637406	1851	N/A		ELP1	070061	467959	9789	N/A		RGS6	182732	554474	17727	450858	34807
ATP1B1	143153	494797	1852	477015	24954	ELP1	070061	537196	9790	439367	29877	RGS6	182732	556437	17728	451855	34808
ATP1B1	143153	367815	1853	356789	24955	IL15	164136	320650	9791	323505	29878	RGS6	182732	355512	17729	347699	34809
ATP1B1	143153	367816	1854	356790	24956	IL15	164136	296545	9792	296545	29879	RGS6	182732	404301	17730	385243	34810
ATP1B2	129244	577026	1855	459145	24957	IL15	164136	514653	9793	422271	29880	RGS6	182732	406236	17731	384218	34811
ATP1B2	129244	250111	1856	250111	24958	IL15	164136	529613	9794	435462	29881	RGS6	182732	407322	17732	384612	34812
ATP1B2	129244	577113	1857	460499	24959	IL15	164136	477265	9795	436914	29882	RGS6	182732	553690	17733	N/A	
ATP1B3	069849	475483	1858	417522	24960	IL15	164136	505351	9796	N/A		RGS6	182732	555368	17734	N/A	
ATP1B3	069849	286371	1859	286371	24961	IL15	164136	509249	9797	N/A		RGS6	182732	434263	17735	412144	34813
ATP1B3	069849	465172	1860	418280	24962	IL15	164136	394159	9798	377714	29883	RGS6	182732	554782	17736	451912	34814
ATP1B3	069849	466678	1861	418952	24963	IL16	172349	560989	9799	N/A		RGS6	182732	554734	17737	N/A	
ATP1B3	069849	462082	1862	418353	24964	IL16	172349	560241	9800	452738	29884	RGS6	182732	553519	17738	N/A	
ATP1B3	069849	495216	1863	419962	24965	IL16	172349	360547	9801	456972	29885	RGS6	182732	554300	17739	N/A	
ATP1B3	069849	482635	1864	N/A		IL16	172349	559383	9802	453250	29886	RGS6	182732	402788	17740	383953	34815
ATP1B3	069849	487199	1865	417608	24966	IL16	172349	394660	9803	378155	29887	RGS6	182732	622468	17741	478186	34816
ATP1B3	069849	484727	1866	N/A		IL16	172349	302987	9804	302935	29888	RGS6	182732	343854	17742	341199	34817
ATP1B3	069849	486782	1867	N/A		IL16	172349	560115	9805	454636	29889	RGS7BP	186479	508162	17743	N/A	
ATP2A3	074370	397041	1868	380234	24967	IL16	172349	394652	9806	378147	29890	RGS7BP	186479	334025	17744	334851	34818
ATP2A3	074370	397035	1869	380229	24968	IL16	172349	560230	9807	N/A		RGS7BP	186479	505263	17745	N/A	
ATP2A3	074370	574999	1870	N/A		IL16	172349	558857	9808	453131	29891	RGS8	135824	258302	17746	258302	34819
ATP2A3	074370	570773	1871	N/A		IL16	172349	558332	9809	453214	29892	RGS8	135824	483095	17747	426289	34820
ATP2A3	074370	570845	1872	461480	24969	IL16	172349	559342	9810	N/A		RGS8	135824	367557	17748	356528	34821
ATP2A3	074370	359983	1873	353072	24970	IL16	172349	559953	9811	N/A		RGS8	135824	367556	17749	356527	34822
ATP2A3	074370	352011	1874	301387	24971	IL18	150782	280357	9812	280357	29893	RGS8	135824	491420	17750	N/A	
ATP2A3	074370	397043	1875	380236	24972	IL18	150782	524595	9813	434561	29894	RGS8	135824	508450	17751	427076	34823
ATP2A3	074370	572116	1876	458865	24973	IL18	150782	525547	9814	N/A		RGS8	135824	515211	17752	N/A	
ATP2A3	074370	571245	1877	N/A		IL18	150782	528832	9815	434161	29895	RGS9	108370	638125	17753	N/A	
ATP2A3	074370	576957	1878	N/A		IL18	150782	533858	9816	N/A		RGS9	108370	637818	17754	N/A	
ATP2A3	074370	572176	1879	N/A		IL18	150782	534225	9817	N/A		RGS9	108370	582940	17755	N/A	
ATP2A3	074370	572694	1880	N/A		IL20RB	174564	484501	9818	N/A		RGS9	108370	635833	17756	490658	34824
ATP2A3	074370	574202	1881	N/A		IL20RB	174564	329582	9819	328133	29896	RGS9	108370	583473	17757	N/A	
ATP2A3	074370	309890	1882	312577	24974	IL20RB	174564	469964	9820	418637	29897	RGS9	108370	443584	17758	405814	34825
ATP2B2	157087	352432	1883	324172	24975	IL20RB	174564	491483	9821	417437	29898	RGS9	108370	584234	17759	463410	34826
ATP2B2	157087	383800	1884	373311	24976	IL20RB	174564	475972	9822	420725	29899	RGS9	108370	449996	17760	396329	34827
ATP2B2	157087	460129	1885	424494	24977	IL22	127318	538666	9823	442424	29900	RGS9	108370	262406	17761	262406	34828
ATP2B2	157087	397077	1886	380267	24978	IL22	127318	328087	9824	329384	29901	RGS9	108370	581175	17762	N/A	
ATP2B2	157087	452124	1887	414854	24979	IL22	127318	538666	9825	442424	29902	RGS9	108370	577186	17763	N/A	
ATP2B2	157087	467702	1888	N/A		IL22	127318	328087	9826	329384	29903	RGS9	108370	577595	17764	N/A	
ATP2B2	157087	468426	1889	N/A		IL33	137033	381434	9827	370842	29904	RHBG	132677	467375	17765	N/A	
ATP2B2	157087	480680	1890	N/A		IL33	137033	463336	9828	N/A		RHBG	132677	451864	17766	389836	34829
ATP2B2	157087	638646	1891	492732	24980	IL33	137033	417746	9829	394039	29905	RHBG	132677	537040	17767	441197	34830
ATP2B2	157087	360273	1892	353414	24981	IL33	137033	611532	9830	478858	29906	RHBG	132677	613460	17768	483178	34831
ATP2B3	067842	349466	1893	343886	24982	IL33	137033	456383	9831	414238	29907	RHBG	132677	612897	17769	477836	34832
ATP2B3	067842	370186	1894	359205	24983	ILDR2	143195	414590	9832	N/A		RHBG	132677	618120	17770	N/A	
ATP2B3	067842	393842	1895	377425	24984	ILDR2	143195	614979	9833	N/A		RHBG	132677	620376	17771	478851	34833
ATP2B3	067842	359149	1896	352062	24985	ILDR2	143195	271417	9834	271417	29908	RHBG	132677	494874	17772	N/A	
ATP2B3	067842	460549	1897	N/A		ILDR2	143195	528703	9835	432750	29909	RHBG	132677	622297	17773	N/A	
ATP2B3	067842	496610	1898	N/A		ILDR2	143195	525740	9836	436120	29910	RHCG	140519	560081	17774	453588	34834
ATP2B3	067842	263519	1899	263519	24986	ILDR2	143195	529387	9837	431316	29911	RHCG	140519	268122	17775	268122	34835
ATP2C2	064270	262429	1900	262429	24987	ILDR2	143195	469934	9838	437008	29912	RHCG	140519	558360	17776	453496	34836
ATP2C2	064270	416219	1901	397925	24988	ILDR2	143195	529071	9839	436882	29913	RHCG	140519	558030	17777	452899	34837
ATP2C2	064270	565631	1902	N/A		ILDR2	143195	526687	9840	434273	29914	RHCG	140519	558184	17778	453716	34838
ATP2C2	064270	569207	1903	456595	24989	IMPA2	141401	588752	9841	N/A		RHCG	140519	559638	17779	N/A	
ATP2C2	064270	565546	1904	N/A		IMPA2	141401	589238	9842	465416	29915	RHEB	106615	262187	17780	262187	34839
ATP2C2	064270	420010	1905	N/A		IMPA2	141401	269159	9843	269159	29916	RHEB	106615	472642	17781	420726	34840
ATP2C2	064270	565927	1906	N/A		IMPA2	141401	590107	9844	466059	29917	RHEB	106615	478470	17782	417802	34841
ATP2C2	064270	568160	1907	N/A		IMPA2	141401	383376	9845	372867	29918	RHEB	106615	496004	17783	418161	34842
ATP2C2	064270	563340	1908	N/A		IMPA2	141401	590138	9846	465938	29919	RHEB	106615	470072	17784	N/A	
ATP2C2	064270	564099	1909	N/A		IMPA2	141401	588927	9847	464767	29920	RHEB	106615	470370	17785	417212	34843

ATP2C2	064270	567892	1910	N/A		IMPA2	141401	588863	9848	N/A		RHEB	106615	482053	17786	N/A	
ATP2C2	064270	567222	1911	N/A		IMPA2	141401	588167	9849	N/A		RHOB	143878	272233	17787	272233	34844
ATP2C2	064270	624933	1912	N/A		IMPA2	141401	586230	9850	464754	29921	RHOBTB1	072422	337910	17788	338671	34845
ATP2C2	064270	567629	1913	N/A		IMPA2	141401	589374	9851	N/A		RHOBTB1	072422	357917	17789	350595	34846
ATP2C2	064270	566874	1914	N/A		IMPA2	141401	625802	9852	486461	29922	RHOBTB1	072422	496237	17790	N/A	
ATP6V0B	117410	472505	1915	432994	24990	IMPG1	112706	369950	9853	358966	29923	RHOBTB1	072422	461910	17791	N/A	
ATP6V0B	117410	472174	1916	431605	24991	IMPG1	112706	369952	9854	358968	29924	RHOBTB1	072422	490827	17792	N/A	
ATP6V0B	117410	532642	1917	434729	24992	IMPG1	112706	611179	9855	481913	29925	RHOBTB1	072422	483488	17793	N/A	
ATP6V0B	117410	236067	1918	236067	24993	IMPG1	112706	369963	9856	358980	29926	RHOBTB3	164292	515852	17794	N/A	
ATP6V0B	117410	471859	1919	432754	24994	INAVA	163362	532631	9857	431682	29927	RHOBTB3	164292	510226	17795	N/A	
ATP6V0B	117410	472277	1920	N/A		INAVA	163362	451872	9858	397255	29928	RHOBTB3	164292	504949	17796	N/A	
ATP6V0B	117410	461670	1921	435396	24995	INAVA	163362	367342	9859	356311	29929	RHOBTB3	164292	506959	17797	423688	34847
ATP6V0B	117410	468183	1922	N/A		INAVA	163362	413687	9860	392105	29930	RHOBTB3	164292	506817	17798	426479	34848
ATP6V0B	117410	473485	1923	N/A		INAVA	163362	531649	9861	N/A		RHOBTB3	164292	379982	17799	369318	34849
ATP6V0B	117410	496131	1924	N/A		INAVA	163362	526172	9862	N/A		RHOBTB3	164292	512878	17800	N/A	
ATP6V0B	117410	498208	1925	431375	24996	INAVA	163362	465162	9863	N/A		RHOBTB3	164292	510623	17801	423652	34850
ATP6V0B	117410	532072	1926	N/A		INAVA	163362	532631	9864	431682	29931	RHOBTB3	164292	502541	17802	421875	34851
ATP6V0B	117410	498664	1927	434094	24997	INAVA	163362	451872	9865	397255	29932	RHOBTB3	164292	504179	17803	422360	34852
ATP8A1	124406	514372	1928	426495	24998	INAVA	163362	367342	9866	356311	29933	RHOBTB3	164292	510313	17804	424844	34853
ATP8A1	124406	381668	1929	371084	24999	INAVA	163362	413687	9867	392105	29934	RHOBTB3	164292	507186	17805	N/A	
ATP8A1	124406	264449	1930	264449	25000	INAVA	163362	531649	9868	N/A		RHOBTB3	164292	511558	17806	N/A	
ATP8A1	124406	511858	1931	N/A		INAVA	163362	526172	9869	N/A		RHOBTB3	164292	503737	17807	426390	34854
ATP8A1	124406	506602	1932	421164	25001	INAVA	163362	465162	9870	N/A		RHOBTB3	164292	513091	17808	425342	34855
ATP8A1	124406	515872	1933	426935	25002	INF2	203485	330634	9871	376406	29935	RHOBTB3	164292	514198	17809	424700	34856
ATP8A1	124406	506713	1934	N/A		INF2	203485	398337	9872	381380	29936	RHOD	173156	308831	17810	308576	34857
ATP8A1	124406	504510	1935	N/A		INF2	203485	392634	9873	376410	29937	RHOD	173156	533360	17811	N/A	
ATP8A1	124406	504024	1936	427295	25003	INF2	203485	252527	9874	252527	29938	RHOD	173156	532559	17812	432003	34858
ATP8A1	124406	510289	1937	426636	25004	INF2	203485	474229	9875	N/A		RHOJ	126785	557447	17813	451796	34859
ATP8B1	081923	283684	1938	283684	25005	INF2	203485	480763	9876	N/A		RHOJ	126785	316754	17814	316729	34860
ATP8B1	081923	588255	1939	468266	25006	INF2	203485	477497	9877	N/A		RHOJ	126785	557133	17815	N/A	
ATP8B1	081923	589147	1940	N/A		INF2	203485	481338	9878	N/A		RHOJ	126785	555125	17816	451643	34861
ATP8B1	081923	591728	1941	467767	25007	INF2	203485	617571	9879	483829	29939	RHOU	116574	366691	17817	355652	34862
ATP8B1	081923	585322	1942	468751	25008	INHBA	122641	416150	9880	N/A		RHPN2	131941	544458	17818	N/A	
ATRNL1	107518	616894	1943	483722	25009	INHBA	122641	242208	9881	242208	29940	RHPN2	131941	254260	17819	254260	34863
ATRNL1	107518	609571	1944	476902	25010	INHBA	122641	464515	9882	N/A		RHPN2	131941	588388	17820	465898	34864
ATRNL1	107518	526946	1945	431423	25011	INHBA	122641	442711	9883	397197	29941	RHPN2	131941	588683	17821	N/A	
ATRNL1	107518	527407	1946	473412	25012	INHBA	122641	638023	9884	490646	29942	RHPN2	131941	592247	17822	N/A	
ATRNL1	107518	355044	1947	347152	25013	INPP1	151689	322522	9885	325423	29943	RHPN2	131941	591502	17823	N/A	
ATRNL1	107518	524503	1948	N/A		INPP1	151689	430311	9886	415014	29944	RHPN2	131941	583641	17824	N/A	
ATRNL1	107518	526373	1949	434118	25014	INPP1	151689	413239	9887	391415	29945	RIMBP2	060709	261655	17825	261655	34865
ATRNL1	107518	534530	1950	N/A		INPP1	151689	431594	9888	409786	29946	RIMBP2	060709	540658	17826	439437	34866
ATRNL1	107518	424738	1951	N/A		INPP1	151689	444194	9889	404732	29947	RIMBP2	060709	536632	17827	439030	34867
ATRNL1	107518	449616	1952	N/A		INPP1	151689	422454	9890	N/A		RIMBP2	060709	535703	17828	440347	34868
ATXN1	124788	244769	1953	244769	25015	INPP1	151689	417336	9891	N/A		RIMBP2	060709	544568	17829	N/A	
ATXN1	124788	483591	1954	N/A		INPP1	151689	458647	9892	392814	29948	RIMS1	079841	491071	17830	430101	34869
ATXN1	124788	473388	1955	N/A		INPP1	151689	423767	9893	395424	29949	RIMS1	079841	517960	17831	429959	34870
ATXN1	124788	495178	1956	N/A		INPP1	151689	451089	9894	410662	29950	RIMS1	079841	518273	17832	430408	34871
ATXN1	124788	483954	1957	N/A		INPP1	151689	409027	9895	387079	29951	RIMS1	079841	522291	17833	430932	34872
ATXN1	124788	467008	1958	N/A		INPP1	151689	458193	9896	412119	29952	RIMS1	079841	521978	17834	428417	34873
ATXN1	124788	498374	1959	N/A		INPP1	151689	487628	9897	N/A		RIMS1	079841	520567	17835	430502	34874
ATXN1	124788	492857	1960	N/A		INPP1	151689	470892	9898	N/A		RIMS1	079841	264839	17836	264839	34875
ATXN1	124788	479680	1961	N/A		INPP1	151689	392329	9899	376142	29953	RIMS1	079841	517433	17837	430359	34876
ATXN1	124788	436367	1962	416360	25016	INPP4B	109452	513000	9900	425487	29954	RIMS1	079841	401910	17838	385649	34877
ATXN7L2	162650	463678	1963	474312	25017	INPP4B	109452	508116	9901	423954	29955	RIMS1	079841	523963	17839	428328	34878
ATXN7L2	162650	369870	1964	358886	25018	INPP4B	109452	509777	9902	422793	29956	RIMS1	079841	425662	17840	411235	34879
ATXN7L2	162650	497545	1965	N/A		INPP4B	109452	511838	9903	426207	29957	RIMS1	079841	453976	17841	389503	34880
ATXN7L2	162650	604728	1966	N/A		INPP4B	109452	512630	9904	423771	29958	RIMS1	079841	524197	17842	N/A	
ATXN7L2	162650	369869	1967	N/A		INPP4B	109452	510812	9905	427250	29959	RIMS1	079841	517827	17843	428367	34881
ATXN7L2	162650	459635	1968	N/A		INPP4B	109452	514525	9906	421065	29960	RIMS1	079841	370420	17844	359448	34882

AVPI1	119986	370626	1969	359660	25019	INPP4B	109452	506297	9907	424731	29961	RIMS1	079841	522211	17845	429338	34883
AXL	167601	301178	1970	301178	25020	INPP4B	109452	507462	9908	425764	29962	RIMS1	079841	463023	17846	N/A	
AXL	167601	359092	1971	351995	25021	INPP4B	109452	506217	9909	424057	29963	RIMS1	079841	431478	17847	N/A	
AXL	167601	599659	1972	N/A		INPP4B	109452	506788	9910	426957	29964	RIMS1	079841	414192	17848	402273	34884
AXL	167601	594880	1973	N/A		INPP4B	109452	506517	9911	N/A		RIMS1	079841	370419	17849	N/A	
AXL	167601	593513	1974	471497	25022	INPP4B	109452	506000	9912	420888	29965	RIMS3	117016	372684	17850	361769	34885
AZGP1	160862	483612	1975	N/A		INPP4B	109452	504632	9913	N/A		RIMS3	117016	372683	17851	361768	34886
AZGP1	160862	292401	1976	292401	25023	INPP4B	109452	506243	9914	N/A		RIMS4	101098	372851	17852	361942	34887
AZGP1	160862	419575	1977	389942	25024	INPP4B	109452	507861	9915	426897	29966	RIMS4	101098	541604	17853	439287	34888
AZGP1	160862	411734	1978	396093	25025	INPP4B	109452	503927	9916	422052	29967	RIN2	132669	255006	17854	255006	34889
AZGP1	160862	477251	1979	N/A		INPP4B	109452	514964	9917	N/A		RIN2	132669	459721	17855	N/A	
AZGP1	160862	495765	1980	N/A		INPP4B	109452	505483	9918	N/A		RIN2	132669	467569	17856	N/A	
AZIN1	155096	337198	1981	337180	25026	INPP4B	109452	512489	9919	N/A		RIN2	132669	488077	17857	N/A	
AZIN1	155096	347770	1982	321507	25027	INPP4B	109452	508084	9920	N/A		RIN2	132669	465815	17858	N/A	
AZIN1	155096	518697	1983	N/A		INPP4B	109452	262992	9921	262992	29968	RIN2	132669	484638	17859	N/A	
AZIN1	155096	523071	1984	N/A		INPP4B	109452	630044	9922	486368	29969	RIN2	132669	440354	17860	391239	34890
AZIN1	155096	521536	1985	475919	25028	INPP5A	068383	368594	9923	357583	29970	RIT2	152214	326695	17861	321805	34891
AZIN1	155096	522311	1986	N/A		INPP5A	068383	368593	9924	357582	29971	RIT2	152214	589109	17862	467217	34892
AZIN1	155096	520402	1987	429449	25029	INPP5A	068383	423490	9925	390936	29972	RIT2	152214	590910	17863	466620	34893
AZIN1	155096	518353	1988	429215	25030	INPP5A	068383	342652	9926	340707	29973	RIT2	152214	594852	17864	N/A	
AZIN1	155096	518940	1989	N/A		INPP5A	068383	487614	9927	N/A		RLBP1	140522	268125	17865	268125	34894
AZIN1	155096	517581	1990	N/A		INPP5A	068383	498337	9928	N/A		RLBP1	140522	563254	17866	454740	34895
B3GALT4	236802	430971	1991	414880	25031	INPP5A	068383	445580	9929	390749	29974	RLBP1	140522	567787	17867	457251	34896
B3GALT4	235155	419471	1992	398660	25032	INPP5D	281614	629761	9930	486669	29975	RLBP1	140522	564388	17868	N/A	
B3GALT4	206285	383209	1993	372696	25033	INPP5D	281614	630338	9931	N/A		RLF	117000	372771	17869	361857	34897
B3GALT4	226936	415322	1994	394876	25034	INPP5D	281614	630854	9932	487191	29976	RNF112	128482	575165	17870	464134	34898
B3GALT4	235863	451237	1995	390784	25035	INPP5D	281614	627806	9933	N/A		RNF112	128482	574149	17871	N/A	
B3GALT4	235863	606990	1996	N/A		INPP5D	281614	630466	9934	N/A		RNF112	128482	461366	17872	454919	34899
B3GAT2	112309	230053	1997	230053	25036	INPP5D	281614	631055	9935	N/A		RNF112	128482	580109	17873	N/A	
B3GAT2	112309	615536	1998	481320	25037	INPP5D	281614	627169	9936	487535	29977	RNF112	128482	574782	17874	N/A	
B3GLCT	187676	343307	1999	343002	25038	INPP5D	281614	628466	9937	N/A		RNF122	133874	256257	17875	256257	34900
B3GLCT	187676	461652	2000	N/A		INPP5D	281614	627243	9938	N/A		RNF139	170881	303545	17876	304051	34901
B3GNT5	176597	326505	2001	316173	25039	INPP5D	281614	628814	9939	N/A		RNF139	170881	517684	17877	429836	34902
B3GNT5	176597	493370	2002	N/A		INPP5D	281614	629540	9940	N/A		RNF152	176641	312828	17878	316628	34903
B3GNT5	176597	480551	2003	N/A		INPP5D	281614	627349	9941	N/A		RNF152	176641	591306	17879	466492	34904
B3GNT5	176597	464191	2004	418785	25040	INPP5D	281614	628842	9942	487335	29978	RNF152	176641	588064	17880	N/A	
B3GNT5	176597	460419	2005	420778	25041	INPP5D	281614	629792	9943	486018	29979	RNF152	176641	619552	17881	N/A	
B3GNT5	176597	464923	2006	418477	25042	INPP5D	168918	359570	9944	352575	29980	RNF152	176641	588396	17882	N/A	
B3GNT5	176597	496270	2007	N/A		INPP5D	168918	451407	9945	N/A		RNF17	132972	255324	17883	255324	34905
B3GNT5	176597	465010	2008	417868	25043	INPP5D	168918	445964	9946	405338	29981	RNF17	132972	255326	17884	N/A	
B3GNT5	176597	488301	2009	N/A		INPP5D	168918	467393	9947	N/A		RNF17	132972	255325	17885	255325	34906
B3GNT5	176597	477699	2010	N/A		INPP5D	168918	474278	9948	N/A		RNF17	132972	418120	17886	388892	34907
B3GNT5	176597	481531	2011	417301	25044	INPP5D	168918	496402	9949	N/A		RNF17	132972	339524	17887	344776	34908
B3GNT5	176597	462559	2012	N/A		INPP5D	168918	415617	9950	397421	29982	RNF182	180537	488763	17888	417500	34909
B3GNT7	156966	287590	2013	287590	25045	INPP5D	168918	493078	9951	N/A		RNF182	180537	488300	17889	420465	34910
B3GNT7	156966	479618	2014	N/A		INPP5D	168918	472517	9952	N/A		RNF182	180537	420478	17890	419329	34911
B4GALT6	118276	578114	2015	N/A		INPP5D	168918	493632	9953	N/A		RNF182	180537	471906	17891	417514	34912
B4GALT6	118276	306851	2016	306459	25046	INPP5D	168918	480983	9954	N/A		RNF182	180537	423553	17892	418717	34913
B4GALT6	118276	237019	2017	237019	25047	INPP5D	168918	465281	9955	N/A		RNF182	180537	537663	17893	443228	34914
B4GALT6	118276	383131	2018	372613	25048	INPP5D	168918	417661	9956	414835	29983	RNF182	180537	544682	17894	442021	34915
B4GALT6	118276	579372	2019	463961	25049	INPP5D	168918	491070	9957	473280	29984	RNF182	180537	537388	17895	441271	34916
BACH2	112182	257749	2020	257749	25050	INSC	188487	379554	9958	368872	29985	RNF207	158286	466994	17896	N/A	
BACH2	112182	343122	2021	345642	25051	INSC	188487	379556	9959	368874	29986	RNF207	158286	484435	17897	N/A	
BACH2	112182	481150	2022	N/A		INSC	188487	528567	9960	435022	29987	RNF207	158286	377939	17898	367173	34917
BACH2	112182	406998	2023	384145	25052	INSC	188487	530161	9961	436194	29988	RNF207	158286	485539	17899	N/A	
BACH2	112182	453877	2024	397668	25053	INSC	188487	525218	9962	436113	29989	RNF207	158286	496676	17900	N/A	
BACH2	112182	470301	2025	N/A		INSC	188487	447214	9963	N/A		RNF207	158286	463453	17901	N/A	
BACH2	112182	493201	2026	N/A		INSC	188487	526102	9964	N/A		RNF207	158286	496329	17902	N/A	
BACH2	112182	472023	2027	N/A		INSC	188487	424273	9965	389161	29990	RNF207	158286	492476	17903	N/A	

BACH2	112182	494747	2028	N/A		INSIG1	186480	340368	9966	344741	29991	RNF207	158286	483336	17904	N/A	
BACH2	112182	537989	2029	437473	25054	INSIG1	186480	425172	9967	414691	29992	RNF212	178222	514024	17905	N/A	
BAD	002330	394532	2030	378040	25055	INSIG1	186480	342407	9968	344035	29993	RNF212	178222	503206	17906	N/A	
BAD	002330	309032	2031	309103	25056	INSIG1	186480	476756	9969	420198	29994	RNF212	178222	514757	17907	N/A	
BAD	002330	544785	2032	440575	25057	INSIG1	186480	468307	9970	N/A		RNF212	178222	505693	17908	N/A	
BAD	002330	394531	2033	378039	25058	INSIG1	186480	344756	9971	340010	29995	RNF212	178222	508633	17909	N/A	
BAD	002330	493798	2034	438975	25059	IPCEF1	074706	470622	9972	N/A		RNF212	178222	506730	17910	425843	34918
BAD	002330	492141	2035	439202	25060	IPCEF1	074706	265198	9973	265198	29996	RNF212	178222	382968	17911	372428	34919
BAD	002330	544271	2036	N/A		IPCEF1	074706	422970	9974	394751	29997	RNF212	178222	433731	17912	389709	34920
BAG3	151929	369085	2037	358081	25061	IPCEF1	074706	522590	9975	N/A		RNF212	178222	511620	17913	426115	34921
BAG3	151929	450186	2038	410036	25062	IPCEF1	074706	367220	9976	356189	29998	RNF212	178222	508428	17914	423030	34922
BAIAP2	175866	321280	2039	315685	25063	IPCEF1	074706	519344	9977	430287	29999	RNF212	178222	510715	17915	423560	34923
BAIAP2	175866	576470	2040	N/A		IPCEF1	074706	519091	9978	N/A		RNF212	178222	512552	17916	N/A	
BAIAP2	175866	575750	2041	460344	25064	IPCEF1	074706	484827	9979	N/A		RNF212	178222	333673	17917	327481	34924
BAIAP2	175866	570913	2042	N/A		IPCEF1	074706	517438	9980	431092	30000	RNF212	178222	454487	17918	N/A	
BAIAP2	175866	575989	2043	458494	25065	IPCEF1	074706	519405	9981	428767	30001	RNF212	178222	505730	17919	N/A	
BAIAP2	175866	572329	2044	460492	25066	IPCEF1	074706	519190	9982	429972	30002	RNF215	099999	332468	17920	487588	34925
BAIAP2	175866	428708	2045	401022	25067	IPCEF1	074706	518162	9983	N/A		RNF215	099999	631046	17921	485721	34926
BAIAP2	175866	575712	2046	458964	25068	IPCEF1	074706	520261	9984	431004	30003	RNF215	099999	630264	17922	486757	34927
BAIAP2	175866	575245	2047	461144	25069	ITPR1	150995	357086	9985	349597	30004	RNF215	099999	421022	17923	396278	34928
BAIAP2	175866	435091	2048	413069	25070	ITPR1	150995	456211	9986	397885	30005	RNF215	099999	382363	17924	371800	34929
BAIAP2	175866	321300	2049	316338	25071	ITPR1	150995	443694	9987	401671	30006	RNF215	099999	215798	17925	215798	34930
BAIAP2	175866	573894	2050	N/A		ITPR1	150995	491868	9988	N/A		RNF215	099999	463319	17926	N/A	
BAIAP2	175866	571530	2051	458202	25072	ITPR1	150995	477577	9989	N/A		RNF215	099999	473077	17927	N/A	
BAIAP2	175866	573017	2052	N/A		ITPR1	150995	494681	9990	N/A		RNF215	099999	431544	17928	404738	34931
BAIAP2	175866	572918	2053	460131	25073	ITPR1	150995	487016	9991	N/A		RNF215	099999	619645	17929	486180	34932
BAIAP2	175866	575958	2054	458522	25074	ITPR1	150995	479831	9992	N/A		RNF217	146373	521654	17930	428698	34933
BAIAP2	175866	573659	2055	461736	25075	ITPR1	150995	481415	9993	N/A		RNF217	146373	519971	17931	N/A	
BAIAP2	175866	572073	2056	459787	25076	ITPR1	150995	467545	9994	N/A		RNF217	146373	519565	17932	429012	34934
BAIAP2	175866	573677	2057	458735	25077	ITPR1	150995	493491	9995	N/A		RNF217	146373	454842	17933	N/A	
BAIAP2	175866	574804	2058	459730	25078	ITPR1	150995	463980	9996	N/A		RNF217	146373	519799	17934	427711	34935
BAIAP2	175866	576364	2059	N/A		ITPR1	150995	490572	9997	N/A		RNF217	146373	368414	17935	357399	34936
BAIAP2	175866	574688	2060	N/A		ITPR1	150995	472205	9998	N/A		RNF217	146373	359704	17936	352734	34937
BAIAP2	175866	577097	2061	N/A		ITPR1	150995	478515	9999	N/A		RNF217	146373	431104	17937	N/A	
BAIAP2	175866	576225	2062	N/A		ITPR1	150995	302640	10000	306253	30007	RNF217	146373	432158	17938	404282	34938
BAIAP2	175866	575841	2063	461101	25079	ITPR1	150995	354582	10001	346595	30008	RNF217	146373	368415	17939	N/A	
BAIAP2	175866	574027	2064	N/A		ITPR1	150995	544951	10002	440564	30009	RNF217	146373	560949	17940	452812	34939
BAIAP2	175866	576756	2065	458440	25080	ITPR1	150995	467056	10003	N/A		RNF220	187147	355387	17941	347548	34940
BAIAP2	175866	416299	2066	391837	25081	ITPR1	150995	357086	10004	349597	30010	RNF220	187147	361799	17942	354872	34941
BAIAP2	175866	572498	2067	460350	25082	ITPR1	150995	456211	10005	397885	30011	RNF220	187147	487332	17943	N/A	
BAIAP2	175866	576995	2068	N/A		ITPR1	150995	443694	10006	401671	30012	RNF220	187147	470498	17944	N/A	
BAMBI	095739	375533	2069	364683	25083	ITPR1	150995	491868	10007	N/A		RNF220	187147	496262	17945	N/A	
BAMBI	095739	497699	2070	N/A		ITPR1	150995	477577	10008	N/A		RNF220	187147	453863	17946	411541	34942
BARHL1	125492	263610	2071	263610	25084	ITPR1	150995	494681	10009	N/A		RNF220	187147	335497	17947	335580	34943
BARHL1	125492	542090	2072	444704	25085	ITPR1	150995	487016	10010	N/A		RNF220	187147	440132	17948	388533	34944
BARHL2	143032	370445	2073	359474	25086	ITPR1	150995	479831	10011	N/A		RNF220	187147	474064	17949	N/A	
BASP1	176788	606445	2074	476090	25087	ITPR1	150995	481415	10012	N/A		RNF220	187147	471494	17950	N/A	
BASP1	176788	322611	2075	319281	25088	ITPR1	150995	467545	10013	N/A		RNF220	187147	488865	17951	475383	34945
BASP1	176788	616743	2076	482066	25089	ITPR1	150995	493491	10014	N/A		RNF220	187147	497469	17952	N/A	
BBS2	125124	564123	2077	463176	25090	ITPR1	150995	463980	10015	N/A		RNF220	187147	475378	17953	N/A	
BBS2	125124	564459	2078	463731	25091	ITPR1	150995	490572	10016	N/A		RNF220	187147	484745	17954	N/A	
BBS2	125124	568104	2079	456289	25092	ITPR1	150995	472205	10017	N/A		RNF220	187147	474394	17955	N/A	
BBS2	125124	565781	2080	N/A		ITPR1	150995	478515	10018	N/A		RNF220	187147	480686	17956	N/A	
BBS2	125124	245157	2081	245157	25093	ITPR1	150995	302640	10019	306253	30013	RNF220	187147	474956	17957	N/A	
BBS2	125124	562813	2082	N/A		ITPR1	150995	354582	10020	346595	30014	RNF220	187147	372247	17958	361321	34946
BBS2	125124	569192	2083	N/A		ITPR1	150995	544951	10021	440564	30015	RNF39	230332	451425	17959	391822	34947
BBS2	125124	566495	2084	N/A		ITPR1	150995	467056	10022	N/A		RNF39	230332	432647	17960	398512	34948
BBS2	125124	561877	2085	454986	25094	IQCH	103599	512104	10023	427323	30016	RNF39	227171	425956	17961	393560	34949
BBS2	125124	566410	2086	N/A		IQCH	103599	514049	10024	421223	30017	RNF39	227171	442378	17962	401131	34950

BBS2	125124	566452	2087	N/A		IQCH	103599	335894	10025	336861	30018	RNF39	236967	441449	17963	392508	34951
BBS2	125124	566210	2088	N/A		IQCH	103599	535744	10026	441306	30019	RNF39	236967	450015	17964	407291	34952
BBS2	125124	562012	2089	455651	25095	IQCH	103599	559568	10027	453749	30020	RNF39	237733	417541	17965	407248	34953
BBS2	125124	562059	2090	N/A		IQCH	103599	560497	10028	N/A		RNF39	237733	449145	17966	408539	34954
BBS2	125124	569342	2091	N/A		IQCH	103599	561339	10029	454387	30021	RNF39	206500	376750	17967	365941	34955
BBS2	125124	561951	2092	N/A		IQCH	103599	560790	10030	N/A		RNF39	206500	383611	17968	373106	34956
BBS2	125124	561853	2093	N/A		IQCH	103599	559172	10031	N/A		RNF39	204618	376751	17969	365942	34957
BBS2	125124	565859	2094	N/A		IQCH	103599	561357	10032	457425	30022	RNF39	204618	244360	17970	244360	34958
BBS2	125124	569941	2095	456741	25096	IQCH	103599	558759	10033	456295	30023	RNF39	235022	456156	17971	395696	34959
BBS2	125124	566689	2096	N/A		IQCH	103599	546225	10034	444118	30024	RNF39	235022	442063	17972	415281	34960
BBS2	125124	565378	2097	N/A		IQCH	103599	358767	10035	351617	30025	RNF39	230467	457092	17973	405340	34961
BCAR1	050820	393422	2098	377074	25097	IQCH	103599	629425	10036	486970	30026	RNF39	230467	420562	17974	387930	34962
BCAR1	050820	162330	2099	162330	25098	IQGAP1	140575	268182	10037	268182	30027	RNF43	108375	407977	17975	385328	34963
BCAR1	050820	562556	2100	455166	25099	IQGAP1	140575	633485	10038	488618	30028	RNF43	108375	583753	17976	462502	34964
BCAR1	050820	563038	2101	N/A		IQGAP1	140575	560738	10039	453181	30029	RNF43	108375	584437	17977	463069	34965
BCAR1	050820	566982	2102	N/A		IQGAP1	140575	560418	10040	452723	30030	RNF43	108375	577716	17978	462764	34966
BCAR1	050820	535626	2103	440370	25100	IQGAP1	140575	559809	10041	484647	30031	RNF43	108375	577625	17979	463716	34967
BCAR1	050820	538440	2104	443841	25101	IQGAP1	140575	559682	10042	N/A		RNF43	108375	581868	17980	462447	34968
BCAR1	050820	418647	2105	391669	25102	IQGAP1	140575	560373	10043	480393	30032	RNF43	108375	582293	17981	N/A	
BCAR1	050820	542031	2106	440415	25103	IQGAP1	140575	558003	10044	N/A		RNF43	108375	580014	17982	N/A	
BCAR1	050820	420641	2107	392708	25104	IQGAP1	140575	560733	10045	N/A		ROBO2	185008	487694	17983	417335	34969
BCAR1	050820	393420	2108	377072	25105	IQGAP1	140575	560020	10046	N/A		ROBO2	185008	602589	17984	473268	34970
BCAR1	050820	569340	2109	454702	25106	IQGAP1	140575	560218	10047	N/A		ROBO2	185008	475034	17985	N/A	
BCAR1	050820	564170	2110	N/A		IQGAP1	140575	558491	10048	N/A		ROBO2	185008	461745	17986	417164	34971
BCAR1	050820	568864	2111	456625	25107	IQGAP1	140575	561132	10049	N/A		ROBO2	185008	332191	17987	327536	34972
BCAR1	050820	564028	2112	455810	25108	IQGAP1	140575	561461	10050	N/A		ROBO2	185008	473767	17988	418117	34973
BCAR1	050820	566465	2113	456929	25109	IQGAP1	140575	559031	10051	N/A		ROBO2	185008	490991	17989	418344	34974
BCAR1	050820	569006	2114	458088	25110	IQGAP1	140575	559674	10052	N/A		ROBO2	185008	471893	17990	418190	34975
BCAR1	050820	561970	2115	457457	25111	IQGAP1	140575	558957	10053	N/A		ROBO2	185008	469233	17991	N/A	
BCAR1	050820	563523	2116	457097	25112	IQGAP1	140575	561086	10054	N/A		ROBO2	185008	475334	17992	418446	34976
BCAR1	050820	567215	2117	457231	25113	IQSEC1	144711	273221	10055	273221	30033	ROBO2	185008	470802	17993	N/A	
BCAR1	050820	563700	2118	N/A		IQSEC1	144711	618604	10056	478001	30034	ROBO2	185008	490534	17994	417471	34977
BCAR1	050820	546196	2119	442161	25114	IQSEC1	144711	613206	10057	480301	30035	ROBO2	185008	614793	17995	480344	34978
BCAS1	064787	448484	2120	396361	25115	IQSEC1	144711	473088	10058	N/A		ROBO3	154134	397801	17996	380903	34979
BCAS1	064787	371435	2121	360490	25116	IQSEC1	144711	474467	10059	N/A		ROBO3	154134	538940	17997	441797	34980
BCAS1	064787	395961	2122	379290	25117	IQSEC3	120645	538872	10060	437554	30036	ROBO3	154134	527196	17998	N/A	
BCAS1	064787	422805	2123	399936	25118	IQSEC3	120645	382841	10061	372292	30037	ROBO3	154134	527245	17999	N/A	
BCAS2	116752	369541	2124	358554	25119	IQSEC3	120645	540907	10062	N/A		ROBO3	154134	529658	18000	N/A	
BCAS2	116752	485021	2125	N/A		IQSEC3	120645	537151	10063	N/A		ROBO3	154134	531545	18001	N/A	
BCHE	114200	264381	2126	264381	25120	IQSEC3	120645	544511	10064	N/A		ROBO3	154134	525448	18002	N/A	
BCHE	114200	497011	2127	419505	25121	IQSEC3	262607	575724	10065	461496	30038	ROBO3	154134	528144	18003	N/A	
BCHE	114200	482958	2128	419804	25122	IQSEC3	262607	571363	10066	461043	30039	ROBO3	154134	531888	18004	N/A	
BCHE	114200	479451	2129	418325	25123	IQSEC3	262607	574111	10067	N/A		ROBO3	154134	528068	18005	N/A	
BCHE	114200	488954	2130	418504	25124	IQSEC3	262607	573139	10068	N/A		ROBO3	154134	532472	18006	N/A	
BCL11A	119866	356842	2131	349300	25125	IRAK2	134070	256458	10069	256458	30040	ROBO3	154134	531119	18007	N/A	
BCL11A	119866	359629	2132	352648	25126	IRX1	170549	302006	10070	305244	30041	ROBO3	154134	530647	18008	N/A	
BCL11A	119866	489516	2133	488390	25127	IRX2	170561	382611	10071	372056	30042	ROBO3	154134	526551	18009	N/A	
BCL11A	119866	479026	2134	488636	25128	IRX2	170561	302057	10072	307006	30043	ROBO3	154134	528820	18010	N/A	
BCL11A	119866	631857	2135	488886	25129	IRX5	176842	394636	10073	378132	30044	ROBO3	154134	525482	18011	N/A	
BCL11A	119866	492272	2136	N/A		IRX5	176842	560154	10074	453660	30045	ROBO3	154134	534598	18012	N/A	
BCL11A	119866	335712	2137	338774	25130	IRX5	176842	320990	10075	316250	30046	ROBO3	154134	531075	18013	N/A	
BCL11A	119866	477659	2138	N/A		IRX5	176842	558597	10076	N/A		ROBO3	154134	525304	18014	N/A	
BCL11A	119866	358510	2139	351307	25131	IRX5	176842	620085	10077	483446	30047	ROBO3	154134	524971	18015	N/A	
BCL11A	119866	409351	2140	487844	25132	ISYNA1	105655	582811	10078	463628	30048	ROBO3	154134	543966	18016	438799	34981
BCL11A	119866	489183	2141	N/A		ISYNA1	105655	338128	10079	337746	30049	RORA	069667	335670	18017	335087	34982
BCL11B	127152	357195	2142	349723	25133	ISYNA1	105655	457269	10080	415458	30050	RORA	069667	309157	18018	309753	34983
BCL11B	127152	345514	2143	280435	25134	ISYNA1	105655	582287	10081	N/A		RORA	069667	261523	18019	261523	34984
BCL11B	127152	443726	2144	387419	25135	ISYNA1	105655	581672	10082	464528	30051	RORA	069667	449337	18020	402971	34985
BCL11B	127152	357195	2145	349723	25136	ISYNA1	105655	578963	10083	475677	30052	RORA	069667	559587	18021	N/A	

BCL11B	127152	345514	2146	280435	25137	ISYNA1	105655	582770	10084	464209	30053	RORA	069667	551975	18022	449482	34986
BCL11B	127152	443726	2147	387419	25138	ISYNA1	105655	577916	10085	N/A		RORA	069667	560004	18023	N/A	
BDNF	176697	439476	2148	389345	25139	ISYNA1	105655	577820	10086	463271	30054	RORA	069667	559343	18024	453322	34987
BDNF	176697	525528	2149	437138	25140	ISYNA1	105655	583816	10087	N/A		RORA	069667	558234	18025	N/A	
BDNF	176697	395986	2150	379309	25141	ISYNA1	105655	583309	10088	N/A		RORA	069667	557822	18026	N/A	
BDNF	176697	533131	2151	432727	25142	ISYNA1	105655	578352	10089	462001	30055	RORA	069667	559145	18027	N/A	
BDNF	176697	356660	2152	349084	25143	ISYNA1	105655	581800	10090	463500	30056	RORA	069667	561093	18028	N/A	
BDNF	176697	418212	2153	400502	25144	ISYNA1	105655	583534	10091	464430	30057	RORA	069667	560300	18029	N/A	
BDNF	176697	533246	2154	432376	25145	ITGA11	137809	423218	10092	403392	30058	RORA	069667	558904	18030	484955	34988
BDNF	176697	530861	2155	435564	25146	ITGA11	137809	315757	10093	327290	30059	RPA1	132383	571058	18031	461733	34989
BDNF	176697	530786	2156	433003	25147	ITGA11	137809	569346	10094	N/A		RPA1	132383	570451	18032	459788	34990
BDNF	176697	395983	2157	379307	25148	ITGA11	137809	566429	10095	N/A		RPA1	132383	254719	18033	254719	34991
BDNF	176697	438929	2158	414303	25149	ITGA11	137809	562826	10096	N/A		RPA1	132383	571725	18034	N/A	
BDNF	176697	584049	2159	N/A		ITGA11	137809	565868	10097	N/A		RPA1	132383	573924	18035	N/A	
BDNF	176697	532997	2160	435805	25150	ITGA11	137809	568677	10098	N/A		RPA1	132383	574049	18036	461466	34992
BDNF	176697	395981	2161	379305	25151	ITGA2	164171	296585	10099	296585	30060	RPA1	132383	573994	18037	N/A	
BDNF	176697	395978	2162	379302	25152	ITGA2	164171	503810	10100	426489	30061	RPH3A	089169	549736	18038	446789	34993
BDNF	176697	525950	2163	432035	25153	ITGA2	164171	513685	10101	422095	30062	RPH3A	089169	548197	18039	446570	34994
BDNF	176697	314915	2164	320002	25154	ITGA2	164171	509814	10102	424397	30063	RPH3A	089169	547686	18040	449705	34995
BDNF	176697	395980	2165	379304	25155	ITGA2	164171	509960	10103	424642	30064	RPH3A	089169	543106	18041	440384	34996
BDNF	176697	420794	2166	389564	25156	ITGA2	164171	510722	10104	422145	30065	RPH3A	089169	551593	18042	446780	34997
BEAN1	166546	536005	2167	442793	25157	ITGA4	115232	476089	10105	N/A		RPH3A	089169	546426	18043	447639	34998
BEAN1	166546	562849	2168	456822	25158	ITGA4	115232	339307	10106	340149	30066	RPH3A	089169	551748	18044	447306	34999
BEAN1	166546	299694	2169	299694	25159	ITGA4	115232	397033	10107	380227	30067	RPH3A	089169	546703	18045	446556	35000
BEAN1	166546	561796	2170	455212	25160	ITGA4	115232	465522	10108	N/A		RPH3A	089169	547840	18046	450382	35001
BEAN1	166546	569272	2171	N/A		ITGA4	115232	233573	10109	233573	30068	RPH3A	089169	547728	18047	449613	35002
BEAN1	166546	618932	2172	477843	25161	ITGA4	115232	484404	10110	N/A		RPH3A	089169	549769	18048	447505	35003
BEAN1	166546	564819	2173	456430	25162	ITGA4	115232	478440	10111	N/A		RPH3A	089169	552667	18049	449650	35004
BEAN1	166546	563075	2174	N/A		ITGA4	115232	473002	10112	N/A		RPH3A	089169	389385	18050	374036	35005
BEAN1	166546	562146	2175	462088	25163	ITGA4	115232	490435	10113	N/A		RPH3A	089169	550901	18051	448100	35006
BEAN1	166546	566654	2176	N/A		ITGA4	115232	476824	10114	N/A		RPH3A	089169	551198	18052	447083	35007
BEAN1	166546	622872	2177	483700	25164	ITGA4	115232	468948	10115	N/A		RPH3A	089169	551052	18053	448297	35008
BEGAIN	183092	443071	2178	411124	25165	ITGA5	161638	552564	10116	N/A		RPH3A	089169	415485	18054	405357	35009
BEGAIN	183092	554747	2179	N/A		ITGA5	161638	293379	10117	293379	30069	RPH3A	089169	552679	18055	N/A	
BEGAIN	183092	554274	2180	N/A		ITGA5	161638	547197	10118	450267	30070	RPH3A	089169	553114	18056	450216	35010
BEGAIN	183092	554140	2181	451125	25166	ITGA5	161638	549601	10119	N/A		RPH3A	089169	548866	18057	450347	35011
BEGAIN	183092	557378	2182	450722	25167	ITGA5	161638	552431	10120	N/A		RPH3A	089169	547099	18058	448662	35012
BEGAIN	183092	554356	2183	452607	25168	ITGA5	161638	552387	10121	N/A		RPH3A	089169	547222	18059	N/A	
BEGAIN	183092	556188	2184	452157	25169	ITGA5	161638	552583	10122	N/A		RPH3A	089169	549913	18060	N/A	
BEGAIN	183092	553553	2185	451397	25170	ITGA5	161638	551564	10123	N/A		RPH3A	089169	552755	18061	N/A	
BEGAIN	183092	556751	2186	N/A		ITGA5	161638	550141	10124	N/A		RPH3A	089169	546687	18062	N/A	
BEGAIN	183092	637716	2187	490571	25171	ITGA5	161638	551861	10125	N/A		RPH3A	089169	552352	18063	N/A	
BEGAIN	183092	355173	2188	347301	25172	ITGA5	161638	435631	10126	405865	30071	RPH3A	089169	549324	18064	N/A	
BEGAIN	183092	637646	2189	489826	25173	ITGA5	161638	553071	10127	447347	30072	RPL10	147403	492572	18065	N/A	
BEST3	127325	547208	2190	449868	25174	ITGA5	161638	547744	10128	N/A		RPL10	147403	369817	18066	358832	35013
BEST3	127325	331471	2191	329064	25175	ITGA7	135424	553804	10129	452120	30073	RPL10	147403	479366	18067	N/A	
BEST3	127325	488961	2192	433213	25176	ITGA7	135424	257879	10130	257879	30074	RPL10	147403	436473	18068	388600	35014
BEST3	127325	330891	2193	332413	25177	ITGA7	135424	554327	10131	450695	30075	RPL10	147403	344746	18069	341730	35015
BEST3	127325	553096	2194	449548	25178	ITGA7	135424	347027	10132	343009	30076	RPL10	147403	489200	18070	N/A	
BEST3	127325	476098	2195	434713	25179	ITGA7	135424	452168	10133	393844	30077	RPL10	147403	491035	18071	N/A	
BEST3	127325	552295	2196	447689	25180	ITGA7	135424	555728	10134	452387	30078	RPL10	147403	458500	18072	395025	35016
BEST3	127325	548658	2197	446575	25181	ITGA7	135424	557555	10135	451039	30079	RPL10	147403	485196	18073	N/A	
BEST3	127325	266661	2198	266661	25182	ITGA7	135424	557058	10136	N/A		RPL10	147403	482732	18074	N/A	
BEST3	127325	529843	2199	N/A		ITGA7	135424	557488	10137	N/A		RPL10	147403	467168	18075	N/A	
BEST3	127325	551160	2200	449377	25183	ITGA7	135424	556273	10138	450679	30080	RPL10	147403	406022	18076	385621	35017
BEST3	127325	533674	2201	N/A		ITGA7	135424	554543	10139	N/A		RPL10	147403	451365	18077	406125	35018
BGN	182492	331595	2202	327336	25184	ITGA7	135424	557257	10140	450578	30081	RPL10	147403	449494	18078	407754	35019
BGN	182492	472615	2203	N/A		ITGA7	135424	553276	10141	N/A		RPL10	147403	427682	18079	405064	35020
BGN	182492	480756	2204	N/A		ITGA7	135424	555687	10142	451311	30082	RPL10	147403	428169	18080	398047	35021

BGN	182492	431891	2205	402525	25185	ITGA7	135424	554724	10143	452043	30083	RPL10	147403	424325	18081	413436	35022
BGN	182492	492658	2206	N/A		ITGA7	135424	553737	10144	N/A		RPL10	147403	618723	18082	479103	35023
BHLHE22	180828	321870	2207	318799	25186	ITGA7	135424	556371	10145	N/A		RPRM	177519	325926	18083	314946	35024
BHLHE40	134107	256495	2208	256495	25187	ITGA7	135424	553893	10146	452467	30084	RPS4Y1	129824	250784	18084	250784	35025
BHLHE40	134107	467610	2209	N/A		ITGA7	135424	555809	10147	450798	30085	RPS4Y1	129824	430575	18085	415317	35026
BHLHE40	134107	460806	2210	N/A		ITGA7	135424	554359	10148	N/A		RPS4Y1	129824	477725	18086	N/A	
BHLHE40-AS1	235831	620618	2211	N/A		ITGA8	077943	378076	10149	367316	30086	RPS4Y1	129824	515575	18087	N/A	
BHLHE40-AS1	235831	615178	2212	N/A		ITGA8	077943	477064	10150	N/A		RPS6KA1	281877	628001	18088	485797	35027
BHLHE40-AS1	235831	615017	2213	N/A		ITGA8	077943	468882	10151	N/A		RPS6KA1	281877	627677	18089	486119	35028
BHLHE40-AS1	235831	441386	2214	N/A		ITGA9	144668	422441	10152	397258	30087	RPS6KA1	281877	629832	18090	486881	35029
BICD1	151746	551848	2215	448933	25188	ITGA9	144668	264741	10153	264741	30088	RPS6KA1	281877	625208	18091	N/A	
BICD1	151746	550207	2216	447663	25189	ITGA9	144668	461533	10154	N/A		RPS6KA1	281877	630838	18092	486031	35030
BICD1	151746	548411	2217	446793	25190	ITGA9	144668	411817	10155	406533	30089	RPS6KA1	281877	631108	18093	487166	35031
BICD1	151746	281474	2218	281474	25191	ITGAV	138448	261023	10156	261023	30090	RPS6KA1	281877	629025	18094	487239	35032
BICD1	151746	395758	2219	379107	25192	ITGAV	138448	374907	10157	364042	30091	RPS6KA1	281877	628081	18095	487553	35033
BICD1	151746	551086	2220	447238	25193	ITGAV	138448	433736	10158	404291	30092	RPS6KA1	281877	625391	18096	487154	35034
BICD1	151746	547680	2221	475837	25194	ITGAV	138448	460641	10159	N/A		RPS6KA1	281877	628816	18097	N/A	
BICD1	151746	552160	2222	481877	25195	ITGAV	138448	496477	10160	N/A		RPS6KA1	281877	626401	18098	486849	35035
BICD1	151746	552226	2223	N/A		ITGAV	138448	496854	10161	N/A		RPS6KA1	281877	627022	18099	N/A	
BICD1	151746	614004	2224	N/A		ITGAV	138448	474571	10162	N/A		RPS6KA1	281877	628256	18100	487349	35036
BICD2	185963	356884	2225	349351	25196	ITGAV	138448	430709	10163	389442	30093	RPS6KA1	281877	627890	18101	N/A	
BICD2	185963	375512	2226	364662	25197	ITGB4	132470	579662	10164	463651	30094	RPS6KA1	281877	625549	18102	N/A	
BLM	197299	355112	2227	347232	25198	ITGB4	132470	200181	10165	200181	30095	RPS6KA1	281877	627508	18103	N/A	
BLM	197299	560809	2228	454158	25199	ITGB4	132470	450894	10166	405536	30096	RPS6KA1	281877	625911	18104	N/A	
BLM	197299	559724	2229	453359	25200	ITGB4	132470	580542	10167	N/A		RPS6KA1	281877	625863	18105	486179	35037
BLM	197299	559282	2230	N/A		ITGB4	132470	449880	10168	400217	30097	RPS6KA1	281877	630873	18106	N/A	
BLM	197299	558599	2231	N/A		ITGB4	132470	584558	10169	N/A		RPS6KA1	281877	629099	18107	487207	35038
BLM	197299	559426	2232	N/A		ITGB4	132470	582629	10170	463788	30098	RPS6KA1	117676	525525	18108	434616	35039
BLM	197299	560136	2233	N/A		ITGB4	132470	584374	10171	N/A		RPS6KA1	117676	526040	18109	436990	35040
BLM	197299	560559	2234	N/A		ITGB4	132470	584025	10172	N/A		RPS6KA1	117676	374168	18110	363283	35041
BLM	197299	558825	2235	N/A		ITGB4	132470	583327	10173	N/A		RPS6KA1	117676	524436	18111	N/A	
BLM	197299	560821	2236	N/A		ITGB4	132470	579211	10174	N/A		RPS6KA1	117676	374166	18112	363281	35042
BLNK	095585	224337	2237	224337	25201	ITGB4	132470	584939	10175	464259	30099	RPS6KA1	117676	526792	18113	431651	35043
BLNK	095585	371176	2238	360218	25202	ITGB4	132470	578318	10176	462494	30100	RPS6KA1	117676	529454	18114	433039	35044
BLNK	095585	485193	2239	N/A		ITGB5	082781	296181	10177	296181	30101	RPS6KA1	117676	530003	18115	432281	35045
BLNK	095585	467799	2240	466331	25203	ITGB5	082781	460797	10178	N/A		RPS6KA1	117676	366866	18116	355831	35046
BLNK	095585	468252	2241	N/A		ITGB5	082781	461306	10179	N/A		RPS6KA1	117676	531113	18117	N/A	
BLNK	095585	472763	2242	N/A		ITGB5	082781	481591	10180	420814	30102	RPS6KA1	117676	374163	18118	363278	35047
BLNK	095585	495266	2243	465741	25204	ITGB5	082781	488466	10181	477446	30103	RPS6KA1	117676	530607	18119	N/A	
BLNK	095585	427367	2244	391924	25205	ITGB5	082781	474838	10182	N/A		RPS6KA1	117676	531382	18120	435412	35048
BLNK	095585	413476	2245	397487	25206	ITGB5	082781	496703	10183	418367	30104	RPS6KA1	117676	525582	18121	N/A	
BMP2K	138756	389010	2246	373662	25207	ITGB5	082781	476988	10184	N/A		RPS6KA1	117676	527264	18122	N/A	
BMP2K	138756	502871	2247	421768	25208	ITGB5	082781	465464	10185	418079	30105	RPS6KA1	117676	474934	18123	N/A	
BMP2K	138756	505725	2248	N/A		ITGB5	082781	608657	10186	477230	30106	RPS6KA1	117676	488985	18124	N/A	
BMP2K	138756	515075	2249	N/A		ITGB5	082781	483168	10187	419198	30107	RPS6KA1	117676	403732	18125	383967	35049
BMP2K	138756	502613	2250	424668	25209	ITGB5	082781	608107	10188	476655	30108	RPS6KA1	117676	530305	18126	N/A	
BMP2K	138756	507670	2251	N/A		ITGB5	082781	608945	10189	N/A		RPS6KA1	117676	438977	18127	403548	35050
BMP2K	138756	335016	2252	334836	25210	ITGB8	105855	537992	10190	441561	30109	RPS6KA5	100784	614987	18128	479667	35051
BMP2K	138756	628286	2253	487317	25211	ITGB8	105855	478974	10191	N/A		RPS6KA5	100784	536315	18129	442803	35052
BMP3	152785	282701	2254	282701	25212	ITGB8	105855	222573	10192	222573	30110	RPS6KA5	100784	556178	18130	451305	35053
BMPER	164619	448280	2255	398835	25213	ITGB8	105855	460204	10193	N/A		RPS6KA5	100784	418736	18131	402787	35054
BMPER	164619	297161	2256	297161	25214	ITGB8	105855	477859	10194	N/A		RPS6KA5	100784	554206	18132	450591	35055
BMPER	164619	496609	2257	N/A		ITIH3	162267	467268	10195	N/A		RPS6KA5	100784	556304	18133	N/A	
BMPER	164619	436222	2258	399843	25215	ITIH3	162267	416872	10196	413922	30111	RPS6KA5	100784	556594	18134	451736	35056
BMPER	164619	444773	2259	409998	25216	ITIH3	162267	449956	10197	415769	30112	RPUSD3	156990	423108	18135	405054	35057
BMPER	164619	494786	2260	N/A		ITIH3	162267	465243	10198	N/A		RPUSD3	156990	433535	18136	398921	35058

BMPER	164619	476525	2261	N/A		ITIH3	162267	463893	10199	N/A		RPUSD3	156990	383820	18137	373331	35059
BMS1P21	283101	634565	2262	N/A		ITIH3	162267	464804	10200	N/A		RPUSD3	156990	464783	18138	N/A	
BNC2	173068	380672	2263	370047	25217	ITIH3	162267	465314	10201	N/A		RPUSD3	156990	466141	18139	N/A	
BNC2	173068	484726	2264	431516	25218	ITIH3	162267	475931	10202	N/A		RPUSD3	156990	424438	18140	408693	35060
BNC2	173068	411752	2265	392212	25219	ITIH3	162267	495622	10203	N/A		RPUSD3	156990	427174	18141	400397	35061
BNC2	173068	418777	2266	408370	25220	ITIH3	162267	493136	10204	N/A		RPUSD3	156990	475470	18142	N/A	
BNC2	173068	380667	2267	370042	25221	ITIH3	162267	621946	10205	479928	30113	RPUSD3	156990	484134	18143	N/A	
BNC2	173068	380666	2268	370041	25222	ITM2A	078596	373298	10206	362395	30114	RPUSD3	156990	418713	18144	415616	35062
BNC2	173068	603713	2269	474045	25223	ITM2A	078596	469541	10207	N/A		RPUSD3	156990	472381	18145	N/A	
BNC2	173068	486514	2270	474647	25224	ITM2A	078596	482194	10208	N/A		RPUSD3	156990	433972	18146	395446	35063
BNC2	173068	603313	2271	473935	25225	ITM2A	078596	462038	10209	N/A		RPUSD3	156990	433555	18147	396405	35064
BNC2	173068	468187	2272	474468	25226	ITM2A	078596	461357	10210	N/A		RPUSD3	156990	451405	18148	395492	35065
BNC2	173068	471301	2273	474832	25227	ITM2A	078596	434584	10211	415533	30115	RPUSD3	156990	485705	18149	N/A	
BNC2	173068	613349	2274	477717	25228	ITPKA	137825	425927	10212	396560	30116	RPUSD3	156990	473522	18150	N/A	
BNC2	173068	617779	2275	482793	25229	ITPKA	137825	260386	10213	260386	30117	RPUSD3	156990	460909	18151	N/A	
BNC2	173068	545497	2276	444640	25230	ITPKA	137825	462816	10214	N/A		RRNAD1	143303	368218	18152	357201	35066
BOC	144857	464546	2277	417362	25231	ITPKA	137825	491007	10215	N/A		RRNAD1	143303	368216	18153	357199	35067
BOC	144857	495514	2278	418663	25232	ITPKB	143772	272117	10216	272117	30118	RRNAD1	143303	519086	18154	429756	35068
BOC	144857	498710	2279	419022	25233	ITPKB	143772	366784	10217	355748	30119	RRNAD1	143303	524343	18155	429389	35069
BOC	144857	485230	2280	420154	25234	ITPKB	143772	429204	10218	411152	30120	RRNAD1	143303	484742	18156	429053	35070
BOC	144857	462425	2281	418118	25235	ITPRIPL2	205730	566735	10219	455257	30121	RRNAD1	143303	476229	18157	430787	35071
BOC	144857	273395	2282	273395	25236	ITPRIPL2	205730	381440	10220	370849	30122	RRNAD1	143303	517871	18158	N/A	
BOC	144857	494687	2283	418260	25237	ITSN2	198399	478720	10221	N/A		RRNAD1	143303	522237	18159	429800	35072
BOC	144857	471963	2284	N/A		ITSN2	198399	361999	10222	354561	30123	RRNAD1	143303	462397	18160	N/A	
BOC	144857	484034	2285	417337	25238	ITSN2	198399	355123	10223	347244	30124	RRNAD1	143303	497515	18161	N/A	
BOC	144857	477178	2286	N/A		ITSN2	198399	427234	10224	395682	30125	RRNAD1	143303	481920	18162	N/A	
BOC	144857	466059	2287	N/A		ITSN2	198399	449392	10225	411319	30126	RSPO1	169218	615459	18163	481178	35073
BOC	144857	479182	2288	N/A		ITSN2	198399	479575	10226	N/A		RSPO1	169218	612451	18164	479832	35074
BOC	144857	497495	2289	N/A		ITSN2	198399	406921	10227	384499	30127	RSPO1	169218	356545	18165	348944	35075
BOC	144857	463971	2290	N/A		ITSN2	198399	416160	10228	389013	30128	RSPO1	169218	401068	18166	383846	35076
BOC	144857	488486	2291	420056	25239	ITSN2	198399	412011	10229	391224	30129	RSPO2	147655	517939	18167	428940	35077
BOC	144857	473008	2292	418182	25240	ITSN2	198399	469848	10230	N/A		RSPO2	147655	517781	18168	427937	35078
BOC	144857	355385	2293	347546	25241	ITSN2	198399	443927	10231	391715	30130	RSPO2	147655	276659	18169	276659	35079
BRINP2	198797	361539	2294	354481	25242	ITSN2	198399	407704	10232	N/A		RSPO2	147655	521502	18170	428614	35080
BRINP2	198797	478325	2295	N/A		ITSN2	198399	622089	10233	479408	30131	RSPO2	147655	521757	18171	430485	35081
BRINP2	198797	460161	2296	N/A		JAG1	101384	254958	10234	254958	30132	RSPO2	147655	521956	18172	430010	35082
BRINP3	162670	367462	2297	356432	25243	JAG1	101384	423891	10235	N/A		RSPO2	147655	520026	18173	429159	35083
BRINP3	162670	463404	2298	N/A		JAG1	101384	617357	10236	N/A		RSPO2	147655	522333	18174	430973	35084
BRINP3	162670	631494	2299	487601	25244	JAG1	101384	488480	10237	N/A		RSPO4	101282	217260	18175	217260	35085
BRINP3	162670	445957	2300	393441	25245	JAG1	101384	612857	10238	N/A		RSPO4	101282	400634	18176	383475	35086
BRINP3	162670	633243	2301	N/A		JAG1	101384	613518	10239	481034	30133	RTN1	139970	481205	18177	N/A	
BSG	172270	545507	2302	473664	25246	JAG1	101384	622545	10240	484139	30134	RTN1	139970	395090	18178	378525	35087
BSG	172270	346916	2303	344707	25247	JAG1	101384	620743	10241	N/A		RTN1	139970	342503	18179	340716	35088
BSG	172270	333511	2304	333769	25248	JAG1	101384	617965	10242	N/A		RTN1	139970	267484	18180	267484	35089
BSG	172270	576925	2305	N/A		JAM2	154721	400532	10243	383376	30135	RTN1	139970	432103	18181	N/A	
BSG	172270	573216	2306	458665	25249	JAM2	154721	480456	10244	420419	30136	RTN1	139970	474911	18182	N/A	
BSG	172270	353555	2307	343809	25250	JAM2	154721	460679	10245	436801	30137	RTN1	139970	557422	18183	N/A	
BSG	172270	572899	2308	N/A		JAM2	154721	492962	10246	N/A		RTN1	139970	490111	18184	N/A	
BSG	172270	590218	2309	N/A		JAM2	154721	477351	10247	N/A		RTN1	139970	611068	18185	483039	35090
BSG	172270	613627	2310	484849	25251	JAM2	154721	471689	10248	N/A		RTN1	139970	481205	18186	N/A	
BSG	172270	618006	2311	478958	25252	JAM2	154721	312957	10249	318416	30138	RTN1	139970	395090	18187	378525	35091
BSG	172270	614867	2312	484624	25253	JAM3	166086	299106	10250	299106	30139	RTN1	139970	342503	18188	340716	35092
BSG	172270	573784	2313	473393	25254	JAM3	166086	532252	10251	432455	30140	RTN1	139970	267484	18189	267484	35093
BSG	172270	574970	2314	N/A		JAM3	166086	534549	10252	433206	30141	RTN1	139970	432103	18190	N/A	
BSG	172270	576984	2315	473528	25255	JAM3	166086	441717	10253	395742	30142	RTN1	139970	474911	18191	N/A	
BSG	172270	571735	2316	N/A		JAM3	166086	531302	10254	N/A		RTN1	139970	557422	18192	N/A	
BSG	172270	618112	2317	N/A		JAM3	166086	524969	10255	N/A		RTN1	139970	490111	18193	N/A	
BSN	164061	296452	2318	296452	25256	JAM3	166086	532165	10256	N/A		RTN1	139970	611068	18194	483039	35094
BSN	164061	467456	2319	N/A		JAM3	166086	533711	10257	N/A		RTN4R	040608	416372	18195	396872	35095

BTAF1	095564	265990	2320	265990	25257	JAML	160593	529164	10258	N/A		RTN4R	040608	043402	18196	043402	35096
BTAF1	095564	471217	2321	N/A		JAML	160593	531536	10259	N/A		RTN4R	040608	425986	18197	403535	35097
BTAF1	095564	476401	2322	N/A		JAML	160593	524477	10260	432769	30143	RTN4R	040608	469601	18198	N/A	
BTAF1	095564	544642	2323	439924	25258	JAML	160593	527877	10261	435145	30144	RTN4R	040608	474642	18199	N/A	
BTBD1	064726	261721	2324	261721	25259	JAML	160593	525565	10262	431791	30145	RTN4R	040608	463936	18200	N/A	
BTBD1	064726	379403	2325	368713	25260	JAML	160593	640745	10263	492467	30146	RTN4RL1	185924	331238	18201	330631	35098
BTBD1	064726	559652	2326	453104	25261	JAML	160593	531530	10264	N/A		RTN4RL2	186907	335099	18202	335397	35099
BTBD1	064726	558344	2327	N/A		JAML	160593	526620	10265	431218	30147	RTN4RL2	186907	533205	18203	435606	35100
BTBD1	064726	560015	2328	N/A		JAML	160593	526595	10266	431614	30148	RTN4RL2	186907	395120	18204	378552	35101
BTBD11	151136	280758	2329	280758	25262	JAML	160593	356289	10267	348635	30149	RUBCNL	102445	389908	18205	374558	35102
BTBD11	151136	420571	2330	413889	25263	JAML	160593	292067	10268	292067	30150	RUBCNL	102445	487195	18206	N/A	
BTBD11	151136	490090	2331	447319	25264	JAML	160593	534294	10269	N/A		RUBCNL	102445	378784	18207	368061	35103
BTBD11	151136	550706	2332	447606	25265	JAML	160593	533261	10270	436117	30151	RUBCNL	102445	441284	18208	412507	35104
BTBD11	151136	415943	2333	407416	25266	JAZF1	153814	427814	10271	388302	30152	RUBCNL	102445	378787	18209	368064	35105
BTBD11	151136	357167	2334	349690	25267	JAZF1	153814	283928	10272	283928	30153	RUBCNL	102445	409879	18210	386578	35106
BTBD11	151136	494235	2335	448322	25268	JAZF1	153814	466516	10273	N/A		RUBCNL	102445	631139	18211	485932	35107
BTBD17	204347	375366	2336	364515	25269	JAZF1	153814	430432	10274	387976	30154	RUBCNL	102445	417405	18212	402357	35108
BTG1	133639	256015	2337	256015	25270	JAZF1	153814	447620	10275	415096	30155	RUBCNL	102445	439642	18213	414579	35109
BTG1	133639	552315	2338	447551	25271	JAZF1	153814	452993	10276	415984	30156	RUBCNL	102445	378797	18214	368074	35110
BTG2	159388	475157	2339	433553	25272	JAZF1	153814	420835	10277	N/A		RUBCNL	102445	378781	18215	368057	35111
BTG2	159388	290551	2340	290551	25273	JAZF1	153814	454041	10278	399083	30157	RUBCNL	102445	429979	18216	396935	35112
BTG2	159388	475157	2341	433553	25274	JDP2	140044	419727	10279	415558	30158	RUNX1T1	079102	523629	18217	428543	35113
BTG2	159388	290551	2342	290551	25275	JDP2	140044	559773	10280	N/A		RUNX1T1	079102	396218	18218	379520	35114
BTN1A1	124557	244513	2343	244513	25276	JDP2	140044	559060	10281	452769	30159	RUNX1T1	079102	360348	18219	353504	35115
BTN1A1	124557	613186	2344	484707	25277	JDP2	140044	558068	10282	N/A		RUNX1T1	079102	422361	18220	390137	35116
BUB1B	156970	560120	2345	N/A		JDP2	140044	435893	10283	399587	30160	RUNX1T1	079102	520724	18221	428742	35117
BUB1B	156970	287598	2346	287598	25278	JDP2	140044	267569	10284	267569	30161	RUNX1T1	079102	521078	18222	N/A	
BUB1B	156970	559414	2347	N/A		JDP2	140044	437176	10285	409787	30162	RUNX1T1	079102	518844	18223	430728	35118
BUB1B	156970	558715	2348	453861	25279	JKAMP	050130	261247	10286	261247	30163	RUNX1T1	079102	521751	18224	430778	35119
BUB1B	156970	412359	2349	398470	25280	JKAMP	050130	554754	10287	N/A		RUNX1T1	079102	520978	18225	429085	35120
BUB1B	156970	559733	2350	453643	25281	JKAMP	050130	557560	10288	N/A		RUNX1T1	079102	518361	18226	430863	35121
BUB1B	156970	559461	2351	N/A		JKAMP	050130	425728	10289	389699	30164	RUNX1T1	079102	520047	18227	N/A	
BUB1B	156970	557848	2352	N/A		JKAMP	050130	553156	10290	N/A		RUNX1T1	079102	521553	18228	429728	35122
BUB1B	156970	559772	2353	N/A		JKAMP	050130	555491	10291	451723	30165	RUNX1T1	079102	522316	18229	N/A	
BUB1B	156970	558972	2354	N/A		JKAMP	050130	556985	10292	451076	30166	RUNX1T1	079102	518992	18230	431094	35123
BUB1B	156970	558151	2355	N/A		JKAMP	050130	554271	10293	450749	30167	RUNX1T1	079102	521054	18231	427763	35124
BZW1	082153	450637	2356	412072	25282	JKAMP	050130	554795	10294	450813	30168	RUNX1T1	079102	523290	18232	N/A	
BZW1	082153	452206	2357	390766	25283	JKAMP	050130	553941	10295	N/A		RUNX1T1	079102	519847	18233	430204	35125
BZW1	082153	410110	2358	387086	25284	JKAMP	050130	602482	10296	N/A		RUNX1T1	079102	517792	18234	429940	35126
BZW1	082153	409600	2359	386474	25285	JKAMP	050130	554721	10297	N/A		RUNX1T1	079102	522467	18235	429532	35127
BZW1	082153	464483	2360	N/A		JKAMP	050130	553647	10298	N/A		RUNX1T1	079102	517919	18236	429506	35128
BZW1	082153	460660	2361	N/A		JKAMP	050130	356057	10299	348351	30169	RUNX1T1	079102	521733	18237	430637	35129
BZW1	082153	409226	2362	386837	25286	JKAMP	050130	616435	10300	479775	30170	RUNX1T1	079102	520556	18238	428100	35130
BZW1	082153	452790	2363	394316	25287	JMY	152409	396137	10301	379441	30171	RUNX1T1	079102	521319	18239	429137	35131
BZW1	082153	447069	2364	393587	25288	JMY	152409	412001	10302	N/A		RUNX1T1	079102	520583	18240	430070	35132
BZW1	082153	419090	2365	407268	25289	JOSD1	100221	216039	10303	216039	30172	RUNX1T1	079102	523168	18241	429118	35133
BZW1	082153	463310	2366	N/A		JOSD1	100221	545590	10304	444798	30173	RUNX1T1	079102	519577	18242	430084	35134
BZW1	082153	491576	2367	N/A		JOSD1	100221	482442	10305	N/A		RUNX1T1	079102	518823	18243	428475	35135
BZW1	082153	359893	2368	395673	25290	JOSD1	100221	427389	10306	410610	30174	RUNX1T1	079102	521897	18244	429653	35136
FOS	170345	303562	2369	306245	25291	JOSD1	100221	412832	10307	415189	30175	RUNX1T1	079102	518317	18245	429062	35137
FOS	170345	554617	2370	450519	25292	JOSD1	100221	417712	10308	393131	30176	RUNX1T1	079102	521375	18246	429666	35138
FOS	170345	556324	2371	N/A		JOSD1	100221	456626	10309	405182	30177	RUNX1T1	079102	519422	18247	429587	35139
FOS	170345	554212	2372	452443	25293	JOSD1	100221	462610	10310	N/A		RUNX1T1	079102	524215	18248	429034	35140
FOS	170345	535987	2373	442268	25294	JOSD1	100221	490169	10311	N/A		RUNX1T1	079102	520974	18249	429375	35141
FOS	170345	555242	2374	452386	25295	JOSD1	100221	493939	10312	N/A		RUNX1T1	079102	518832	18250	429864	35142
FOS	170345	555686	2375	452590	25296	JPH1	104369	342232	10313	344488	30178	RUNX1T1	079102	520172	18251	N/A	
FOS	170345	555672	2376	452440	25297	JPH1	104369	518195	10314	N/A		RUNX1T1	079102	517493	18252	N/A	
FOS	170345	557139	2377	451786	25298	JPH1	104369	519947	10315	429652	30179	RUNX1T1	079102	522065	18253	N/A	
FOS	170345	555347	2378	450886	25299	JPH3	154118	537256	10316	N/A		RUNX1T1	079102	518954	18254	430080	35143

FOS	170345	303562	2379	306245	25300	JPH3	154118	301008	10317	N/A		RUNX1T1	079102	519061	18255	430334	35144
FOS	170345	554617	2380	450519	25301	JPH3	154118	284262	10318	284262	30180	RUNX1T1	079102	518256	18256	N/A	
FOS	170345	556324	2381	N/A		JPH3	154118	563609	10319	N/A		RUNX1T1	079102	520428	18257	429857	35145
FOS	170345	554212	2382	452443	25302	JUN	177606	371222	10320	360266	30181	RUNX1T1	079102	522163	18258	N/A	
FOS	170345	535987	2383	442268	25303	JUNB	171223	302754	10321	303315	30182	RUNX1T1	079102	521902	18259	N/A	
FOS	170345	555242	2384	452386	25304	JUND	130522	252818	10322	252818	30183	RUNX1T1	079102	522860	18260	N/A	
FOS	170345	555686	2385	452590	25305	JUND	130522	600972	10323	475153	30184	RUNX1T1	079102	518449	18261	428133	35146
FOS	170345	555672	2386	452440	25306	KANK1	107104	382303	10324	371740	30185	RUNX1T1	079102	613886	18262	478331	35147
FOS	170345	557139	2387	451786	25307	KANK1	107104	467541	10325	N/A		RUNX1T1	079102	617740	18263	481112	35148
FOS	170345	555347	2388	450886	25308	KANK1	107104	475690	10326	N/A		RUNX1T1	079102	613302	18264	481799	35149
C11orf87	185742	327419	2389	331581	25309	KANK1	107104	489369	10327	N/A		RUNX1T1	079102	615601	18265	480500	35150
C11orf87	185742	327419	2390	331581	25310	KANK1	107104	354485	10328	N/A		RUNX1T1	079102	436581	18266	402257	35151
C12orf49	111412	261318	2391	261318	25311	KANK1	107104	382297	10329	371734	30186	RUNX1T1	079102	614812	18267	481315	35152
C12orf49	111412	547630	2392	446478	25312	KANK1	107104	382293	10330	371730	30187	RUNX1T1	079102	265814	18268	265814	35153
C12orf49	111412	548356	2393	449151	25313	KANK1	107104	382289	10331	371726	30188	RUVBL2	183207	595090	18269	473172	35154
C12orf49	111412	547606	2394	447722	25314	KANK1	107104	382286	10332	371723	30189	RUVBL2	183207	601968	18270	471524	35155
ERG28	133935	256319	2395	256319	25315	KANK1	107104	619269	10333	477725	30190	RUVBL2	183207	596837	18271	469189	35156
C14orf132	227051	555004	2396	490729	25316	KANK2	197256	586659	10334	465650	30191	RUVBL2	183207	595811	18272	469760	35157
C14orf132	227051	553764	2397	489964	25317	KANK2	197256	588787	10335	464896	30192	RUVBL2	183207	594017	18273	N/A	
C14orf132	227051	556728	2398	490894	25318	KANK2	197256	587317	10336	N/A		RUVBL2	183207	598768	18274	N/A	
C14orf132	227051	553782	2399	490925	25319	KANK2	197256	589359	10337	468002	30193	RUVBL2	183207	596247	18275	471538	35158
C14orf132	227051	555004	2400	490729	25320	KANK2	197256	589894	10338	467029	30194	RUVBL2	183207	221413	18276	221413	35159
C14orf132	227051	553764	2401	489964	25321	KANK2	197256	590400	10339	N/A		RUVBL2	183207	593570	18277	469488	35160
C14orf132	227051	556728	2402	490894	25322	KANK2	197256	592675	10340	468409	30195	RUVBL2	183207	594338	18278	N/A	
C14orf132	227051	553782	2403	490925	25323	KANK2	197256	590685	10341	468490	30196	RUVBL2	183207	595002	18279	N/A	
C14orf37	139971	556788	2404	N/A		KANK2	197256	588724	10342	465914	30197	RUVBL2	183207	627972	18280	486242	35161
C14orf37	139971	267485	2405	267485	25324	KANK2	197256	592903	10343	464861	30198	RUVBL2	183207	640699	18281	492610	35162
C14orf37	139971	557175	2406	N/A		KANK2	197256	592215	10344	N/A		RUVBL2	183207	639391	18282	492564	35163
C14orf37	139971	334342	2407	N/A		KANK2	197256	590095	10345	N/A		RXFP1	171509	460056	18283	423306	35164
C14orf37	139971	555101	2408	477692	25325	KANK2	197256	589427	10346	N/A		RXFP1	171509	472969	18284	N/A	
C14orf37	139971	554218	2409	N/A		KANK4	132854	317477	10347	321161	30199	RXFP1	171509	307765	18285	303248	35165
C1orf146	203910	370375	2410	359401	25326	KANK4	132854	371153	10348	360195	30200	RXFP1	171509	342048	18286	432036	35166
C1orf146	203910	370373	2411	359399	25327	KANK4	132854	371150	10349	360192	30201	RXFP1	171509	471616	18287	434475	35167
C1orf21	116667	235307	2412	235307	25328	KANK4	132854	354381	10350	346352	30202	RXFP1	171509	343542	18288	345889	35168
C1orf21	116667	489143	2413	N/A		KCNA1	111262	382545	10351	371985	30203	RXFP1	171509	470033	18289	420712	35169
C1orf21	116667	367514	2414	N/A		KCNA1	111262	543874	10352	N/A		RXFP1	171509	484785	18290	N/A	
C1orf21	116667	477517	2415	N/A		KCNA1	111262	639306	10353	492506	30204	RXFP1	171509	613319	18291	480522	35170
C1orf61	125462	608007	2416	N/A		KCNA1	111262	639680	10354	492218	30205	RXFP1	171509	423548	18292	405841	35171
C1orf61	125462	400991	2417	383776	25329	KCNA2	177301	640680	10355	N/A		RXFP1	171509	448688	18293	414885	35172
C1orf61	125462	368242	2418	357225	25330	KCNA2	177301	640450	10356	N/A		RYR1	196218	355481	18294	347667	35173
C1orf61	125462	471156	2419	N/A		KCNA2	177301	525120	10357	N/A		RYR1	196218	359596	18295	352608	35174
C1orf61	125462	497824	2420	N/A		KCNA2	177301	639227	10358	N/A		RYR1	196218	594111	18296	N/A	
C1orf61	125462	488498	2421	N/A		KCNA2	177301	633222	10359	487785	30206	RYR1	196218	594335	18297	470927	35175
C1orf61	125462	465270	2422	N/A		KCNA2	177301	369770	10360	358785	30207	RYR1	196218	599547	18298	471601	35176
C1orf61	125462	462458	2423	N/A		KCNA2	177301	639048	10361	491627	30208	RYR1	196218	600337	18299	N/A	
C1orf61	125462	486517	2424	N/A		KCNA2	177301	640774	10362	492008	30209	RYR1	196218	601514	18300	472497	35177
C1orf61	125462	465570	2425	N/A		KCNA2	177301	639233	10363	492716	30210	RYR1	196218	596431	18301	470848	35178
C1orf61	125462	310027	2426	310651	25331	KCNA2	177301	638477	10364	491354	30211	RYR1	196218	593322	18302	471404	35179
C1orf61	125462	368243	2427	357226	25332	KCNA2	177301	638616	10365	491977	30212	RYR1	196218	593677	18303	472126	35180
C1orf61	125462	498346	2428	N/A		KCNA2	177301	316361	10366	314520	30213	RYR2	198626	366574	18304	355533	35181
C1orf61	125462	497822	2429	N/A		KCNA2	177301	638532	10367	491613	30214	RYR2	198626	609119	18305	N/A	
C1orf61	125462	492750	2430	N/A		KCNA2	177301	485317	10368	433109	30215	RYR2	198626	609253	18306	N/A	
C1orf61	125462	357975	2431	350661	25333	KCNA2	177301	640956	10369	491647	30216	RYR2	198626	608590	18307	N/A	
C1orf61	125462	464238	2432	N/A		KCNA3	177272	369769	10370	358784	30217	RYR2	198626	466626	18308	N/A	
C1orf61	125462	482932	2433	N/A		KCNA4	182255	328224	10371	328511	30218	RYR2	198626	462585	18309	N/A	
C1orf61	125462	489918	2434	N/A		KCNA4	182255	526518	10372	N/A		RYR2	198626	360064	18310	353174	35182
C1orf61	125462	484428	2435	N/A		KCNAB1	169282	478609	10373	N/A		RYR3	198838	634891	18311	489262	35183
C1orf61	125462	489877	2436	N/A		KCNAB1	169282	477912	10374	N/A		RYR3	198838	415757	18312	399610	35184
C1orf61	125462	476966	2437	N/A		KCNAB1	169282	472028	10375	420755	30219	RYR3	198838	389232	18313	373884	35185

C1orf61	125462	463309	2438	N/A		KCNAB1	169282	490337	10376	419952	30220	RYR3	198838	634418	18314	489529	35186
C1orf61	125462	464203	2439	N/A		KCNAB1	169282	389636	10377	374287	30221	RYR3	198838	634750	18315	489294	35187
C1orf61	125462	469813	2440	N/A		KCNAB1	169282	471742	10378	418956	30222	RYR3	198838	635875	18316	N/A	
C1orf61	125462	495000	2441	N/A		KCNAB1	169282	475456	10379	420221	30223	RYR3	198838	636753	18317	N/A	
C1orf61	125462	615748	2442	479346	25334	KCNAB1	169282	302490	10380	305858	30224	RYR3	198838	636583	18318	N/A	
STUM	203685	366788	2443	355752	25335	KCNAB1	169282	389634	10381	374285	30225	RYR3	198838	635790	18319	489672	35188
STUM	203685	467495	2444	N/A		KCNAB1	169282	489036	10382	418048	30226	RYR3	198838	636417	18320	N/A	
STUM	203685	366789	2445	355753	25336	KCNAB1	169282	476362	10383	N/A		RYR3	198838	637201	18321	N/A	
C1QA	173372	374642	2446	363773	25337	KCNAB1	169282	461717	10384	N/A		RYR3	198838	638085	18322	N/A	
C1QA	173372	438241	2447	416841	25338	KCNAB1	169282	497291	10385	N/A		RYR3	198838	638038	18323	N/A	
C1QA	173372	402322	2448	385564	25339	KCNAB1	169282	496923	10386	N/A		RYR3	198838	557931	18324	N/A	
C1QB	173369	510260	2449	426317	25340	KCNAB1	169282	618897	10387	484368	30227	RYR3	198838	558060	18325	N/A	
C1QB	173369	509305	2450	423689	25341	KCNAB2	069424	378111	10388	367351	30228	RYR3	198838	638145	18326	N/A	
C1QB	173369	432749	2451	404606	25342	KCNAB2	069424	378097	10389	367337	30229	RYR3	198838	635749	18327	N/A	
C1QB	173369	314933	2452	313967	25343	KCNAB2	069424	493807	10390	N/A		RYR3	198838	635842	18328	490438	35189
C1QL1	131094	253407	2453	253407	25344	KCNAB2	069424	378092	10391	367332	30230	RYR3	198838	638032	18329	489937	35190
C1QL2	144119	272520	2454	272520	25345	KCNAB2	069424	478098	10392	N/A		RYR3	198838	637948	18330	489832	35191
C1QTNF4	172247	302514	2455	302274	25346	KCNAB2	069424	445501	10393	398395	30231	RYR3	198838	636845	18331	490033	35192
C1QTNF4	172247	530097	2456	434548	25347	KCNAB2	069424	389632	10394	374283	30232	RYR3	198838	634730	18332	489346	35193
C1RL	139178	539803	2457	444157	25348	KCNAB2	069424	428161	10395	400285	30233	RYR3	198838	637984	18333	N/A	
C1RL	139178	545280	2458	438286	25349	KCNAB2	069424	602612	10396	473602	30234	RYR3	198838	637615	18334	N/A	
C1RL	139178	266542	2459	266542	25350	KCNAB2	069424	435937	10397	N/A		RYR3	198838	638052	18335	N/A	
C1RL	139178	504702	2460	N/A		KCNAB2	069424	164247	10398	164247	30235	RYR3	198838	636656	18336	N/A	
C1RL	139178	544702	2461	441885	25351	KCNAB2	069424	459822	10399	N/A		RYR3	198838	636568	18337	490632	35194
C1RL	139178	534950	2462	439180	25352	KCNAB2	069424	472700	10400	464860	30236	RYR3	198838	637522	18338	N/A	
C1RL	139178	543933	2463	437398	25353	KCNAB2	069424	378083	10401	367323	30237	RYR3	198838	559917	18339	N/A	
C1RL	139178	537833	2464	438951	25354	KCNAB2	069424	458166	10402	396167	30238	RYR3	198838	559333	18340	N/A	
C1RL	139178	534969	2465	437569	25355	KCNAB2	069424	462676	10403	465785	30239	RYR3	198838	637072	18341	N/A	
C1RL	139178	545337	2466	442611	25356	KCNAB2	069424	481789	10404	N/A		RYR3	198838	560791	18342	N/A	
C1RL	139178	543941	2467	N/A		KCNAB2	069424	352527	10405	318772	30240	RYR3	198838	636497	18343	N/A	
C1RL	139178	539927	2468	N/A		KCNAB2	069424	341524	10406	340824	30241	RYR3	198838	636878	18344	N/A	
C2orf27A	197927	624391	2469	N/A		KCNAB3	170049	303790	10407	302719	30242	RYR3	198838	622037	18345	483166	35195
C2orf27A	197927	623058	2470	N/A		KCNAB3	170049	572275	10408	N/A		S100A4	196154	368715	18346	357704	35196
C2orf27A	197927	463645	2471	N/A		KCNAB3	170049	570587	10409	458237	30243	S100A4	196154	481009	18347	N/A	
C2orf27A	197927	466372	2472	N/A		KCNAB3	170049	576981	10410	N/A		S100A4	196154	354332	18348	346294	35197
C2orf27A	197927	481510	2473	N/A		KCNAB3	170049	574006	10411	N/A		S100A4	196154	468373	18349	N/A	
C2orf69	178074	319974	2474	312770	25357	KCNAB3	170049	570852	10412	461290	30244	S100A4	196154	368716	18350	357705	35198
C2orf69	178074	491721	2475	N/A		KCNC1	129159	379472	10413	368785	30245	S100A4	196154	368714	18351	357703	35199
C2orf72	204128	373640	2476	362743	25358	KCNC1	129159	265969	10414	265969	30246	S100B	160307	291700	18352	291700	35200
C2orf72	204128	477463	2477	N/A		KCNC1	129159	640318	10415	491189	30247	S100B	160307	367071	18353	356038	35201
C2orf72	204128	463834	2478	N/A		KCNC1	129159	640153	10416	N/A		S100B	160307	397648	18354	380769	35202
C2orf72	204128	373640	2479	362743	25359	KCNC1	129159	640909	10417	491644	30248	S1PR1	170989	305352	18355	305416	35203
C2orf72	204128	477463	2480	N/A		KCNC1	129159	639495	10418	491700	30249	S1PR1	170989	475821	18356	N/A	
C2orf72	204128	463834	2481	N/A		KCNC1	129159	638366	10419	491016	30250	S1PR1	170989	475289	18357	N/A	
C2orf73	177994	486488	2482	417971	25360	KCNC1	129159	639325	10420	492663	30251	S1PR5	180739	333430	18358	328472	35204
C2orf73	177994	405749	2483	385348	25361	KCNC1	129159	640461	10421	491345	30252	S1PR5	180739	439028	18359	416915	35205
C2orf73	177994	398634	2484	381631	25362	KCNC1	129159	638825	10422	491247	30253	S1PR5	180739	590601	18360	464884	35206
C2orf73	177994	317627	2485	325555	25363	KCNC1	129159	525802	10423	N/A		S1PR5	180739	617721	18361	481239	35207
C2orf73	177994	447328	2486	389570	25364	KCNC1	129159	638395	10424	N/A		SALL1	103449	251020	18362	251020	35208
C2orf73	177994	414747	2487	403195	25365	KCNC1	129159	526029	10425	N/A		SALL1	103449	566102	18363	455582	35209
C2orf73	177994	491538	2488	N/A		KCNC2	166006	550433	10426	448301	30254	SALL1	103449	570206	18364	456777	35210
C2orf73	177994	615983	2489	481108	25366	KCNC2	166006	548513	10427	449941	30255	SALL1	103449	562674	18365	N/A	
C3	125730	245907	2490	245907	25367	KCNC2	166006	549446	10428	449253	30256	SALL1	103449	440970	18366	407914	35211
C3	125730	601475	2491	N/A		KCNC2	166006	350228	10429	319877	30257	SAMD12	177570	453675	18367	402786	35212
C3	125730	599899	2492	N/A		KCNC2	166006	540018	10430	438423	30258	SAMD12	177570	524796	18368	435927	35213
C3	125730	602229	2493	469482	25368	KCNC2	166006	393288	10431	376966	30259	SAMD12	177570	445741	18369	387605	35214
C3	125730	599668	2494	N/A		KCNC2	166006	548243	10432	N/A		SAMD12	177570	527515	18370	N/A	
C3	125730	601008	2495	471384	25369	KCNC2	166006	546456	10433	N/A		SAMD12	177570	314727	18371	314173	35215
C3	125730	596548	2496	469744	25370	KCNC2	166006	298972	10434	298972	30260	SAMD12	177570	526328	18372	431360	35216

C3	125730	596179	2497	N/A		KCNC3	131398	376959	10435	366158	30261	SAMD12	177570	526765	18373	434079	35217
C3	125730	596238	2498	N/A		KCNC3	131398	474951	10436	432438	30262	SAMD12	177570	409003	18374	387133	35218
C3	125730	598805	2499	N/A		KCNC3	131398	477616	10437	434241	30263	SAMD9L	177409	318238	18375	326247	35219
C3	125730	594005	2500	N/A		KCND3	171385	369697	10438	358711	30264	SAMD9L	177409	411955	18376	405760	35220
C3	125730	602053	2501	N/A		KCND3	171385	315987	10439	319591	30265	SAMD9L	177409	437805	18377	408796	35221
C3	125730	600763	2502	N/A		KCND3	171385	302127	10440	306923	30266	SAMD9L	177409	446959	18378	391699	35222
C3	125730	594270	2503	N/A		KCNF1	162975	295082	10441	295082	30267	SAMD9L	177409	439952	18379	391387	35223
C3	125730	597442	2504	N/A		KCNG4	168418	308251	10442	312129	30268	SAMD9L	177409	414791	18380	396137	35224
C3	125730	595577	2505	N/A		KCNG4	168418	568181	10443	457897	30269	SAMD9L	177409	446033	18381	410062	35225
C3	125730	594936	2506	N/A		KCNH1	143473	367007	10444	355974	30270	SAMD9L	177409	477816	18382	N/A	
C3	125730	600744	2507	472044	25371	KCNH1	143473	638498	10445	490983	30271	SAMD9L	177409	610760	18383	484397	35226
C4orf22	197826	358105	2508	350818	25372	KCNH1	143473	640710	10446	492513	30272	SAPCD2	186193	409687	18384	386348	35227
C4orf22	197826	512931	2509	N/A		KCNH1	143473	271751	10447	271751	30273	SAT1	130066	379251	18385	368553	35228
C4orf22	197826	514249	2510	426308	25373	KCNH1	143473	639952	10448	492697	30274	SAT1	130066	379253	18386	368555	35229
C4orf22	197826	502497	2511	N/A		KCNH1	143473	640528	10449	491725	30275	SAT1	130066	379254	18387	368556	35230
C4orf22	197826	513920	2512	422569	25374	KCNH1	143473	638960	10450	492302	30276	SAT1	130066	379270	18388	368572	35231
C4orf22	197826	508675	2513	425786	25375	KCNH1	143473	640625	10451	492609	30277	SAT1	130066	489394	18389	N/A	
C4orf22	197826	503883	2514	N/A		KCNH1	143473	638357	10452	492865	30278	SAT1	130066	463236	18390	N/A	
C4orf22	197826	508314	2515	N/A		KCNH1	143473	640243	10453	492803	30279	SAT1	130066	487713	18391	N/A	
C4orf22	197826	621014	2516	480723	25376	KCNH1	143473	640044	10454	491434	30280	SAT1	130066	474223	18392	N/A	
C4orf33	151470	281146	2517	281146	25377	KCNH1	143473	640566	10455	491302	30281	SAT1	130066	462639	18393	N/A	
C4orf33	151470	502887	2518	427406	25378	KCNH1	143473	640522	10456	491019	30282	SBDS	126524	246868	18394	246868	35232
C4orf33	151470	502360	2519	N/A		KCNH1	143473	639754	10457	N/A		SBDS	126524	414306	18395	394586	35233
C4orf33	151470	508673	2520	427096	25379	KCNH1	143473	640890	10458	N/A		SBDS	126524	490953	18396	N/A	
C4orf33	151470	508622	2521	427431	25380	KCNH1	143473	639385	10459	N/A		SBDS	126524	463579	18397	N/A	
C4orf33	151470	425929	2522	401090	25381	KCNH1	143473	624583	10460	N/A		SBDS	126524	617799	18398	483040	35234
C6orf106	196821	374023	2523	363135	25382	KCNH1	283965	639262	10461	491565	30283	SBNO2	064932	361757	18399	354733	35235
C6orf106	196821	374026	2524	363138	25383	KCNH1	283965	639694	10462	492724	30284	SBNO2	064932	438103	18400	400762	35236
C6orf106	196821	374021	2525	363133	25384	KCNH1	283965	639420	10463	492350	30285	SBNO2	064932	587024	18401	468520	35237
C8orf34	165084	518698	2526	427820	25385	KCNH1	283965	638907	10464	492550	30286	SBNO2	064932	587673	18402	N/A	
C8orf34	165084	349492	2527	N/A		KCNH1	283965	638293	10465	491986	30287	SBNO2	064932	586109	18403	N/A	
C8orf34	165084	523686	2528	429102	25386	KCNH1	283965	640402	10466	491804	30288	SBNO2	064932	592222	18404	N/A	
C8orf34	165084	348340	2529	345255	25387	KCNH1	283965	639355	10467	491578	30289	SBNO2	064932	590446	18405	N/A	
C8orf34	165084	337103	2530	337174	25388	KCNH1	283965	638734	10468	492255	30290	SBNO2	064932	590998	18406	468534	35238
C8orf34	165084	521406	2531	429081	25389	KCNH1	283965	639736	10469	491426	30291	SBNO2	064932	590176	18407	466861	35239
C8orf34	165084	518515	2532	N/A		KCNH1	283965	640738	10470	491522	30292	SBNO2	064932	587655	18408	468302	35240
C8orf34	165084	325233	2533	319532	25390	KCNH1	283965	640013	10471	492387	30293	SBNO2	278788	631948	18409	488808	35241
C8orf46	169085	482608	2534	N/A		KCNH1	283965	639281	10472	492092	30294	SBNO2	278788	622719	18410	482802	35242
C8orf46	169085	519702	2535	N/A		KCNH1	283965	640966	10473	491901	30295	SBNO2	278788	634172	18411	488286	35243
C8orf46	169085	498712	2536	N/A		KCNH1	283965	639471	10474	N/A		SBNO2	278788	631689	18412	N/A	
C8orf46	169085	470796	2537	N/A		KCNH1	283965	639652	10475	N/A		SBNO2	278788	632999	18413	N/A	
C8orf46	169085	490228	2538	N/A		KCNH1	283965	640802	10476	N/A		SBNO2	278788	631752	18414	N/A	
C8orf46	169085	305454	2539	302260	25391	KCNH1	283965	635558	10477	N/A		SBNO2	278788	631951	18415	N/A	
C8orf46	169085	521495	2540	430501	25392	KCNH5	140015	322893	10478	321427	30296	SBNO2	278788	632777	18416	488832	35244
C8orf46	169085	521813	2541	N/A		KCNH5	140015	420622	10479	395439	30297	SBNO2	278788	633604	18417	488079	35245
C8orf46	169085	460144	2542	430388	25393	KCNH5	140015	394968	10480	378419	30298	SBNO2	278788	631778	18418	488056	35246
C8orf46	169085	450307	2543	473681	25394	KCNH5	140015	394964	10481	N/A		SBNO2	278788	612198	18419	477651	35247
C8orf46	169085	484919	2544	N/A		KCNH7	184611	332142	10482	331727	30299	SCAMP5	198794	568423	18420	457520	35248
C8orf46	169085	522977	2545	430141	25395	KCNH7	184611	328032	10483	333781	30300	SCAMP5	198794	425597	18421	406547	35249
C8orf46	169085	480005	2546	429883	25396	KCNH7	184611	477019	10484	N/A		SCAMP5	198794	562327	18422	456505	35250
C8orf46	169085	485639	2547	N/A		KCNH7	184611	621889	10485	483158	30301	SCAMP5	198794	568018	18423	456991	35251
C8orf46	169085	488582	2548	N/A		KCNH7	184611	618399	10486	482818	30302	SCAMP5	198794	562212	18424	455313	35252
C8orf46	169085	482608	2549	N/A		KCNH8	183960	328405	10487	328813	30303	SCAMP5	198794	565923	18425	N/A	
C8orf46	169085	519702	2550	N/A		KCNH8	183960	452398	10488	412141	30304	SCAMP5	198794	567920	18426	454860	35253
C8orf46	169085	498712	2551	N/A		KCNH8	183960	475063	10489	N/A		SCAMP5	198794	562765	18427	455598	35254
C8orf46	169085	470796	2552	N/A		KCNIP1	182132	518527	10490	N/A		SCAMP5	198794	567535	18428	N/A	
C8orf46	169085	490228	2553	N/A		KCNIP1	182132	377360	10491	366577	30305	SCAMP5	198794	566872	18429	454766	35255
C8orf46	169085	305454	2554	302260	25397	KCNIP1	182132	517344	10492	431053	30306	SCAMP5	198794	564491	18430	458072	35256
C8orf46	169085	521495	2555	430501	25398	KCNIP1	182132	328939	10493	329686	30307	SCAMP5	198794	361900	18431	355387	35257

C8orf46	169085	521813	2556	N/A		KCNIP1	182132	520740	10494	431102	30308	SCAMP5	198794	564141	18432	N/A	
C8orf46	169085	460144	2557	430388	25399	KCNIP1	182132	434108	10495	414886	30309	SCAMP5	198794	568119	18433	457444	35258
C8orf46	169085	450307	2558	473681	25400	KCNIP1	182132	411494	10496	395323	30310	SCAMP5	198794	565989	18434	457121	35259
C8orf46	169085	484919	2559	N/A		KCNIP1	182132	636734	10497	489903	30311	SCAMP5	198794	564779	18435	455039	35260
C8orf46	169085	522977	2560	430141	25401	KCNIP1	182132	390656	10498	375071	30312	SCAMP5	198794	567529	18436	455203	35261
C8orf46	169085	480005	2561	429883	25402	KCNIP1	182132	616807	10499	478151	30313	SCAMP5	198794	568081	18437	454602	35262
C8orf46	169085	485639	2562	N/A		KCNIP2	120049	348850	10500	239118	30314	SCARA3	168077	337221	18438	337985	35263
C8orf46	169085	488582	2563	N/A		KCNIP2	120049	355657	10501	N/A		SCARA3	168077	301904	18439	301904	35264
C9orf135	204711	377197	2564	366402	25403	KCNIP2	120049	356640	10502	349055	30315	SCEL	136155	471491	18440	432840	35265
C9orf135	204711	527647	2565	431855	25404	KCNIP2	120049	460388	10503	N/A		SCEL	136155	377246	18441	366454	35266
C9orf135	204711	529446	2566	434032	25405	KCNIP2	120049	370046	10504	359063	30316	SCEL	136155	349847	18442	302579	35267
C9orf135	204711	529131	2567	436701	25406	KCNIP2	120049	472764	10505	N/A		SCEL	136155	469982	18443	N/A	
C9orf135	204711	466872	2568	N/A		KCNIP2	120049	434163	10506	411679	30317	SCEL	136155	535157	18444	437895	35268
C9orf135	204711	495399	2569	433973	25407	KCNIP2	120049	353068	10507	341624	30318	SCG3	104112	220478	18445	220478	35269
C9orf135	204711	480564	2570	433123	25408	KCNIP2	120049	461105	10508	420040	30319	SCG3	104112	542355	18446	445205	35270
C9orf72	147894	380003	2571	369339	25409	KCNIP2	120049	343195	10509	344169	30320	SCG3	104112	558709	18447	452745	35271
C9orf72	147894	488117	2572	N/A		KCNIP2	120049	239117	10510	239117	30321	SCGN	079689	377961	18448	367197	35272
C9orf72	147894	379997	2573	369333	25410	KCNIP2	120049	483385	10511	N/A		SCGN	079689	612225	18449	484392	35273
C9orf72	147894	379995	2574	369331	25411	KCNIP2	120049	358038	10512	350733	30322	SCGN	079689	334979	18450	333933	35274
C9orf72	147894	461679	2575	N/A		KCNIP4	185774	382148	10513	371583	30323	SCHLAP1	281131	629145	18451	N/A	
C9orf72	147894	619707	2576	482753	25412	KCNIP4	185774	447367	10514	399080	30324	SCN1A	144285	641996	18452	493054	35275
CA7	168748	338437	2577	345659	25413	KCNIP4	185774	382150	10515	371585	30325	SCN1A	144285	641575	18453	492917	35276
CA7	168748	548332	2578	447178	25414	KCNIP4	185774	382152	10516	371587	30326	SCN1A	144285	641603	18454	492945	35277
CA7	168748	394069	2579	377632	25415	KCNIP4	185774	509207	10517	423257	30327	SCN1A	144285	640036	18455	491573	35278
CA7	168748	338437	2580	345659	25416	KCNIP4	185774	382149	10518	N/A		SCN1A	144285	637988	18456	490780	35279
CA7	168748	548332	2581	447178	25417	KCNIP4	185774	515786	10519	445321	30328	SCN1A	144285	635776	18457	490692	35280
CA7	168748	394069	2582	377632	25418	KCNIP4	185774	515373	10520	N/A		SCN1A	144285	636194	18458	490288	35281
CAB39L	102547	355854	2583	348113	25419	KCNIP4	185774	512102	10521	N/A		SCN1A	144285	303395	18459	303540	35282
CAB39L	102547	409308	2584	386375	25420	KCNIP4	185774	359001	10522	351892	30329	SCN1A	144285	635750	18460	490799	35283
CAB39L	102547	409130	2585	387245	25421	KCNIP4	281758	629874	10523	N/A		SCN1A	144285	375405	18461	364554	35284
CAB39L	102547	425242	2586	416719	25422	KCNIP4	281758	629040	10524	486886	30330	SCN1A	144285	637038	18462	490184	35285
CAB39L	102547	410043	2587	386328	25423	KCNIP4	281758	630138	10525	N/A		SCN1A	144285	409050	18463	386312	35286
CAB39L	102547	457041	2588	409253	25424	KCNJ10	177807	639408	10526	491635	30331	SCN1A	144285	625916	18464	N/A	
CAB39L	102547	413278	2589	404028	25425	KCNJ10	177807	637644	10527	490282	30332	SCN1A	144285	473295	18465	N/A	
CAB39L	102547	409082	2590	386979	25426	KCNJ10	177807	640914	10528	491175	30333	SCN1A	144285	491429	18466	N/A	
CAB39L	102547	476943	2591	N/A		KCNJ10	177807	509700	10529	491416	30334	SCN1A	144285	635893	18467	489986	35287
CAB39L	102547	470410	2592	N/A		KCNJ10	177807	368089	10530	357068	30335	SCN1A	144285	637968	18468	N/A	
CAB39L	102547	610540	2593	479669	25427	KCNJ10	177807	636689	10531	N/A		SCN1A	144285	636759	18469	490895	35288
CAB39L	102547	347776	2594	261669	25428	KCNJ10	177807	638840	10532	492249	30336	SCN1A	144285	642141	18470	N/A	
CABIN1	099991	454754	2595	394209	25429	KCNJ10	177807	640017	10533	491337	30337	SCN1A	144285	507401	18471	N/A	
CABIN1	099991	263119	2596	263119	25430	KCNJ10	177807	638728	10534	492619	30338	SCN1A	144285	637285	18472	490612	35289
CABIN1	099991	405822	2597	384694	25431	KCNJ10	177807	638868	10535	491250	30339	SCN1A	144285	423058	18473	407030	35290
CABIN1	099991	445422	2598	412389	25432	KCNJ12	184185	583088	10536	463778	30340	SCN2A	136531	640791	18474	N/A	
CABIN1	099991	398319	2599	381364	25433	KCNJ12	184185	331718	10537	328150	30341	SCN2A	136531	636384	18475	490765	35291
CABIN1	099991	474981	2600	N/A		KCNJ16	153822	591891	10538	465646	30342	SCN2A	136531	424833	18476	406454	35292
CABIN1	099991	484593	2601	N/A		KCNJ16	153822	588112	10539	N/A		SCN2A	136531	636071	18477	490107	35293
CABIN1	099991	496016	2602	N/A		KCNJ16	153822	589377	10540	465967	30343	SCN2A	136531	637367	18478	490592	35294
CABIN1	099991	467937	2603	N/A		KCNJ16	153822	586462	10541	467568	30344	SCN2A	136531	635945	18479	N/A	
CABIN1	099991	337989	2604	336991	25434	KCNJ16	153822	585558	10542	465295	30345	SCN2A	136531	636985	18480	490849	35295
CABIN1	099991	495121	2605	N/A		KCNJ16	153822	587698	10543	466132	30346	SCN2A	136531	631182	18481	486885	35296
CABIN1	099991	485008	2606	N/A		KCNJ16	153822	587892	10544	465163	30347	SCN2A	136531	636135	18482	489821	35297
CABIN1	099991	459824	2607	N/A		KCNJ16	153822	283936	10545	283936	30348	SCN2A	136531	638151	18483	N/A	
CABIN1	099991	617531	2608	480560	25435	KCNJ16	153822	392670	10546	376438	30349	SCN2A	136531	637266	18484	490866	35298
CABIN1	281670	629653	2609	N/A		KCNJ16	153822	392671	10547	376439	30350	SCN2A	136531	283256	18485	283256	35299
CABIN1	281670	626356	2610	N/A		KCNJ16	153822	615244	10548	479817	30351	SCN2A	136531	636662	18486	489873	35300
CABIN1	281670	626232	2611	N/A		KCNJ3	162989	295101	10549	295101	30352	SCN2A	136531	480032	18487	N/A	
CABIN1	281670	627229	2612	N/A		KCNJ3	162989	493505	10550	N/A		SCN2A	136531	636769	18488	490800	35301
CABIN1	281670	630829	2613	N/A		KCNJ3	162989	544049	10551	438410	30353	SCN2A	136531	486878	18489	487466	35302
ABL1	097007	372348	2614	361423	25436	KCNJ4	168135	303592	10552	306497	30354	SCN2A	136531	375437	18490	364586	35303

ABL1	097007	393293	2615	376971	25437	KCNJ6	157542	609713	10553	477437	30355	SCN2A	136531	375427	18491	364576	35304
ABL1	097007	318560	2616	323315	25438	KCNK1	135750	366621	10554	355580	30356	SCN2B	149575	278947	18492	278947	35305
CABLES1	134508	400473	2617	383321	25439	KCNK1	135750	472190	10555	N/A		SCN4B	177098	415030	18493	N/A	
CABLES1	134508	579963	2618	464435	25440	KCNK1	135750	366620	10556	N/A		SCN4B	177098	324727	18494	322460	35306
CABLES1	134508	580153	2619	461994	25441	KCNK1	135750	487728	10557	N/A		SCN4B	177098	423160	18495	N/A	
CABLES1	134508	256925	2620	256925	25442	KCNK1	135750	446915	10558	409626	30357	SCN4B	177098	531550	18496	N/A	
CABLES1	134508	582882	2621	476575	25443	KCNK1	135750	472869	10559	N/A		SCN4B	177098	529878	18497	436343	35307
CABLES1	134508	583220	2622	N/A		KCNK10	100433	340700	10560	343104	30358	SCN4B	177098	532138	18498	N/A	
CABLES1	134508	580644	2623	N/A		KCNK10	100433	312350	10561	310568	30359	SCN9A	169432	409672	18499	386306	35308
CABLES1	134508	578052	2624	N/A		KCNK10	100433	319231	10562	312811	30360	SCN9A	169432	409435	18500	386330	35309
CABLES1	134508	585061	2625	N/A		KCNK10	100433	556282	10563	452587	30361	SCN9A	169432	454569	18501	413212	35310
CABLES1	134508	420687	2626	413851	25444	KCNK12	184261	327876	10564	327611	30362	SCN9A	169432	452182	18502	393141	35311
CABP1	157782	316803	2627	317310	25445	KCNK12	184261	493527	10565	N/A		SCN9A	169432	472119	18503	N/A	
CABP1	157782	288616	2628	288616	25446	KCNK13	152315	282146	10566	282146	30363	SCN9A	169432	303354	18504	304748	35312
CABP1	157782	351200	2629	288615	25447	KCNK3	171303	302909	10567	306275	30364	SCNN1G	166828	300061	18505	300061	35313
CABP1	157782	453000	2630	398959	25448	KCNK3	171303	620977	10568	483136	30365	SCRT1	261678	569446	18506	455711	35314
CABP1	157782	498082	2631	N/A		KCNMA1	156113	604624	10569	473714	30366	SCUBE1	159307	360835	18507	354080	35315
CACHD1	158966	290039	2632	290039	25449	KCNMA1	156113	639601	10570	492806	30367	SCUBE1	159307	449304	18508	395327	35316
CACHD1	158966	495994	2633	N/A		KCNMA1	156113	638991	10571	490978	30368	SCUBE1	159307	290460	18509	290460	35317
CACHD1	158966	470527	2634	N/A		KCNMA1	156113	639913	10572	492241	30369	SCUBE1	159307	477991	18510	N/A	
CACHD1	158966	486580	2635	N/A		KCNMA1	156113	639205	10573	492718	30370	SCUBE1	159307	470433	18511	N/A	
CACNA1A	141837	360228	2636	353362	25450	KCNMA1	156113	639486	10574	492005	30371	SCUBE1	159307	461595	18512	N/A	
CACNA1A	141837	637769	2637	489778	25451	KCNMA1	156113	639498	10575	492835	30372	SCUBE1	159307	480833	18513	N/A	
CACNA1A	141837	635895	2638	490323	25452	KCNMA1	156113	640523	10576	491795	30373	SCUBE1	159307	615096	18514	484780	35318
CACNA1A	141837	638009	2639	489913	25453	KCNMA1	156113	372443	10577	361520	30374	SDC1	115884	254351	18515	254351	35319
CACNA1A	141837	587525	2640	467729	25454	KCNMA1	156113	638223	10578	492492	30375	SDC1	115884	403076	18516	384613	35320
CACNA1A	141837	637736	2641	489861	25455	KCNMA1	156113	639344	10579	492559	30376	SDC1	115884	429035	18517	400773	35321
CACNA1A	141837	636389	2642	489992	25456	KCNMA1	156113	638848	10580	492414	30377	SDC1	115884	482879	18518	N/A	
CACNA1A	141837	585802	2643	465598	25457	KCNMA1	156113	639090	10581	491673	30378	SDC1	115884	447124	18519	390201	35322
CACNA1A	141837	637432	2644	490617	25458	KCNMA1	156113	639489	10582	491927	30379	SDC1	115884	381150	18520	370542	35323
CACNA1A	141837	638029	2645	489829	25459	KCNMA1	156113	639069	10583	N/A		SDC3	162512	336798	18521	338346	35324
CACNA1A	141837	636012	2646	490223	25460	KCNMA1	156113	639657	10584	N/A		SDC3	162512	339394	18522	344468	35325
CACNA1A	141837	635727	2647	490001	25461	KCNMA1	156113	372408	10585	361485	30380	SDC3	162512	471567	18523	N/A	
CACNA1A	141837	573710	2648	460092	25462	KCNMA1	156113	639995	10586	491902	30381	SDC3	162512	487984	18524	N/A	
CACNA1A	141837	637276	2649	489777	25463	KCNMA1	156113	639483	10587	492406	30382	SDC4	124145	372733	18525	361818	35326
CACNA1A	141837	637927	2650	489715	25464	KCNMA1	156113	639691	10588	491040	30383	SDK1	146555	404826	18526	385899	35327
CACNA1A	141837	636473	2651	490173	25465	KCNMA1	156113	638512	10589	N/A		SDK1	146555	389531	18527	374182	35328
CACNA1A	141837	636549	2652	490578	25466	KCNMA1	156113	372421	10590	361498	30384	SDK1	146555	426596	18528	404118	35329
CACNA1A	141837	636610	2653	N/A		KCNMA1	156113	640570	10591	N/A		SDK1	146555	478527	18529	N/A	
CACNA1A	141837	636768	2654	490190	25467	KCNMA1	156113	372437	10592	361514	30385	SDK1	146555	484011	18530	N/A	
CACNA1A	141837	637819	2655	490686	25468	KCNMA1	156113	638895	10593	491207	30386	SDK1	146555	476701	18531	N/A	
CACNA1A	141837	636074	2656	N/A		KCNMA1	156113	457953	10594	396608	30387	SDK1	146555	481856	18532	N/A	
CACNA1A	141837	635988	2657	N/A		KCNMA1	156113	404771	10595	385717	30388	SDK1	146555	466611	18533	N/A	
CACNA1A	141837	638114	2658	N/A		KCNMA1	156113	638351	10596	491156	30389	SDK1	146555	467827	18534	N/A	
CACNA1A	141837	586190	2659	N/A		KCNMA1	156113	372440	10597	361517	30390	SDK1	146555	615806	18535	478062	35330
CACNA1A	141837	636670	2660	N/A		KCNMA1	156113	638306	10598	491008	30391	SEC14L5	103184	251170	18536	251170	35331
CACNA1A	141837	637832	2661	N/A		KCNMA1	156113	640182	10599	492510	30392	SEC14L5	103184	587469	18537	468423	35332
CACNA1A	141837	637777	2662	490475	25469	KCNMA1	156113	638606	10600	491981	30393	SEC24D	150961	280551	18538	280551	35333
CACNA1A	141837	574822	2663	N/A		KCNMA1	156113	639591	10601	492793	30394	SEC24D	150961	505134	18539	N/A	
CACNA1A	141837	635742	2664	N/A		KCNMA1	156113	640605	10602	491435	30395	SEC24D	150961	511481	18540	425491	35334
CACNA1A	141837	637809	2665	N/A		KCNMA1	156113	638203	10603	491123	30396	SEC24D	150961	502830	18541	N/A	
CACNA1A	141837	573891	2666	460276	25470	KCNMA1	156113	639968	10604	491723	30397	SEC24D	150961	511715	18542	N/A	
CACNA1A	141837	636058	2667	490075	25471	KCNMA1	156113	372403	10605	361480	30398	SEC24D	150961	514561	18543	422717	35335
CACNA1A	141837	637297	2668	489692	25472	KCNMA1	156113	640626	10606	491545	30399	SEC24D	150961	502526	18544	N/A	
CACNA1A	141837	593267	2669	N/A		KCNMA1	156113	639851	10607	N/A		SEC24D	150961	511033	18545	N/A	
CACNA1A	141837	637475	2670	N/A		KCNMA1	156113	468471	10608	N/A		SEC24D	150961	509818	18546	424085	35336
CACNA1A	141837	637004	2671	N/A		KCNMA1	156113	640934	10609	491539	30400	SEC24D	150961	514418	18547	N/A	
CACNA1A	141837	637692	2672	N/A		KCNMA1	156113	640029	10610	491463	30401	SEC24D	150961	506622	18548	427249	35337
CACNA1A	141837	635917	2673	N/A		KCNMA1	156113	404857	10611	385806	30402	SEC24D	150961	503683	18549	426309	35338

CACNA1A	141837	636816	2674	N/A		KCNMA1	156113	640093	10612	492224	30403	SEC24D	150961	505280	18550	N/A	
CACNA1A	141837	637168	2675	N/A		KCNMA1	156113	638252	10613	492178	30404	SEC24D	150961	419654	18551	388324	35339
CACNA1A	141837	636984	2676	N/A		KCNMA1	156113	639544	10614	492075	30405	SEL1L3	091490	399878	18552	382767	35340
CACNA1A	141837	590205	2677	N/A		KCNMA1	156113	640807	10615	491555	30406	SEL1L3	091490	264868	18553	264868	35341
CACNA1A	141837	637485	2678	N/A		KCNMA1	156113	434208	10616	402150	30407	SEL1L3	091490	513416	18554	N/A	
CACNA1A	141837	635786	2679	N/A		KCNMA1	156113	286627	10617	286627	30408	SEL1L3	091490	512286	18555	N/A	
CACNA1A	141837	637774	2680	N/A		KCNMA1	156113	286628	10618	286628	30409	SEL1L3	091490	502949	18556	425438	35342
CACNA1A	141837	637966	2681	N/A		KCNMA1	156113	638283	10619	491300	30410	SEL1L3	091490	510448	18557	421701	35343
CACNA1A	141837	637117	2682	N/A		KCNMA1	156113	639730	10620	492519	30411	SEL1L3	091490	507618	18558	426050	35344
CACNA1A	141837	636974	2683	N/A		KCNMA1	156113	639370	10621	491277	30412	SEL1L3	091490	509290	18559	N/A	
CACNA1A	141837	636022	2684	N/A		KCNMA1	156113	639716	10622	491131	30413	SEL1L3	091490	514321	18560	424564	35345
CACNA1A	141837	637625	2685	N/A		KCNMA1	156113	640141	10623	491418	30414	SEL1L3	091490	513364	18561	N/A	
CACNA1A	141837	593160	2686	N/A		KCNMA1	156113	638754	10624	491166	30415	SEL1L3	091490	510880	18562	423743	35346
CACNA1A	141837	636966	2687	N/A		KCNMA1	156113	638632	10625	N/A		SEL1L3	091490	513691	18563	421567	35347
CACNA1A	141837	637952	2688	N/A		KCNMA1	156113	640969	10626	492200	30416	SEL1L3	091490	514872	18564	420951	35348
CACNA1A	141837	637981	2689	N/A		KCNMA1	156113	638751	10627	492172	30417	SELENOK	113811	495461	18565	418813	35349
CACNA1A	141837	574974	2690	459963	25473	KCNMA1	156113	639406	10628	491732	30418	SELENOK	113811	488746	18566	417272	35350
CACNA1A	141837	637616	2691	N/A		KCNMA1	156113	639823	10629	490982	30419	SELENOK	113811	487571	18567	N/A	
CACNA1A	141837	592864	2692	464729	25474	KCNMA1	156113	640834	10630	491920	30420	SELENOK	113811	485414	18568	N/A	
CACNA1A	141837	587451	2693	N/A		KCNMA1	156113	626620	10631	485867	30421	SELENOK	113811	541726	18569	443164	35351
CACNA1A	141837	614285	2694	479983	25475	KCNMA1	156113	638759	10632	492632	30422	SELENOM	198832	402395	18570	384564	35352
CACNA1B	148408	277551	2695	277551	25476	KCNMA1	156113	638575	10633	492049	30423	SELENOM	198832	490967	18571	N/A	
CACNA1B	148408	371372	2696	360423	25477	KCNMA1	156113	638999	10634	N/A		SELENOM	198832	400299	18572	383155	35353
CACNA1B	148408	371363	2697	360414	25478	KCNMA1	156113	638514	10635	491840	30424	SELENOM	198832	465536	18573	N/A	
CACNA1B	148408	371357	2698	360408	25479	KCNMA1	156113	640353	10636	492153	30425	SELENOM	198832	491958	18574	N/A	
CACNA1B	148408	413253	2699	413042	25480	KCNMA1	156113	640773	10637	491173	30426	SELENOM	198832	495533	18575	N/A	
CACNA1B	148408	277549	2700	277549	25481	KCNMA1	156113	639321	10638	N/A		SELENOM	198832	460642	18576	N/A	
CACNA1B	148408	371355	2701	360406	25482	KCNMA1	156113	638370	10639	N/A		SELENOM	198832	469262	18577	N/A	
CACNA1D	157388	637424	2702	489769	25483	KCNMA1	156113	638361	10640	N/A		SELENOM	198832	465447	18578	N/A	
CACNA1D	157388	350061	2703	288133	25484	KCNMA1	156113	484507	10641	N/A		SELENOM	198832	611680	18579	480176	35354
CACNA1D	157388	636938	2704	490039	25485	KCNMA1	156113	637862	10642	490881	30427	SELPLG	110876	550948	18580	447752	35355
CACNA1D	157388	288139	2705	288139	25486	KCNMA1	156113	475352	10643	491045	30428	SELPLG	110876	228463	18581	228463	35356
CACNA1D	157388	636480	2706	N/A		KCNMA1	156113	450795	10644	388370	30429	SELPLG	110876	388962	18582	373614	35357
CACNA1D	157388	422281	2707	409174	25487	KCNMA1	156113	638249	10645	492837	30430	SEMA3B	012171	621029	18583	482586	35358
CACNA1D	157388	636570	2708	490183	25488	KCNMA1	156113	640386	10646	491313	30431	SEMA3B	012171	619119	18584	N/A	
CACNA1D	157388	640483	2709	491921	25489	KCNMA1	156113	640632	10647	492854	30432	SEMA3B	012171	616701	18585	484146	35359
CACNA1D	157388	636627	2710	490889	25490	KCNMA1	156113	428546	10648	N/A		SEMA3B	012171	612509	18586	N/A	
CACNA1D	157388	481085	2711	418045	25491	KCNMA1	156113	638506	10649	492740	30433	SEMA3B	012171	433753	18587	485281	35360
CACNA1D	157388	464429	2712	N/A		KCNMA1	156113	639120	10650	492236	30434	SEMA3B	012171	611067	18588	480680	35361
CACNA1D	157388	481478	2713	418014	25492	KCNMA1	156113	484343	10651	492283	30435	SEMA3B	012171	441915	18589	N/A	
CACNA1D	157388	498251	2714	N/A		KCNMA1	156113	638531	10652	491374	30436	SEMA3B	012171	456560	18590	485646	35362
CACNA1D	157388	637301	2715	489962	25493	KCNMA1	156113	640311	10653	N/A		SEMA3B	012171	439487	18591	N/A	
CACNA1D	157388	637714	2716	490108	25494	KCNMA1	156113	640824	10654	N/A		SEMA3B	012171	434030	18592	N/A	
CACNA1D	157388	636138	2717	N/A		KCNMA1	156113	639282	10655	N/A		SEMA3B	012171	456210	18593	N/A	
CACNA1D	157388	637078	2718	N/A		KCNMA1	156113	639204	10656	N/A		SEMA3B	012171	418576	18594	485173	35363
CACNA1D	157388	636723	2719	490908	25495	KCNMA1	156113	480683	10657	474686	30437	SEMA3B	012171	419007	18595	N/A	
CACNA1D	157388	638120	2720	489790	25496	KCNMA1	156113	618048	10658	482747	30438	SEMA3B	012171	416295	18596	N/A	
CACNA1D	157388	638129	2721	490523	25497	KCNMA1	156113	481070	10659	475086	30439	SEMA3B	012171	618865	18597	481957	35364
CACNA1D	157388	636448	2722	490839	25498	KCNMA1	156113	406533	10660	385552	30440	SEMA3C	075223	265361	18598	265361	35365
CACNA1D	157388	637081	2723	N/A		KCNMA1	156113	354353	10661	346321	30441	SEMA3C	075223	419255	18599	411193	35366
CACNA1D	157388	636595	2724	N/A		KCNN3	143603	271915	10662	271915	30442	SEMA3C	075223	458729	18600	393825	35367
CACNA1D	157388	636633	2725	N/A		KCNN3	143603	515643	10663	N/A		SEMA3C	075223	475955	18601	N/A	
CACNA1D	157388	637589	2726	N/A		KCNN3	143603	361147	10664	354764	30443	SEMA3C	075223	459652	18602	N/A	
CACNA1D	157388	636629	2727	N/A		KCNN3	143603	358505	10665	351295	30444	SEMA3C	075223	411788	18603	395398	35368
CACNA1D	157388	636999	2728	N/A		KCNN3	143603	618040	10666	481848	30445	SEMA3C	075223	427167	18604	399891	35369
CACNA1D	157388	637844	2729	N/A		KCNQ3	184156	388996	10667	373648	30446	SEMA3C	075223	487621	18605	N/A	
CACNA1D	157388	636581	2730	N/A		KCNQ3	184156	639496	10668	491165	30447	SEMA3C	075223	470581	18606	N/A	
CACNA1D	157388	636833	2731	N/A		KCNQ3	184156	521134	10669	429799	30448	SEMA3D	153993	284136	18607	284136	35370
CACNA1E	198216	524607	2732	432038	25499	KCNQ3	184156	519445	10670	428790	30449	SEMA3D	153993	484038	18608	N/A	

CACNA1E	198216	533229	2733	N/A		KCNQ3	184156	519589	10671	N/A		SEMA3D	153993	463315	18609	N/A	
CACNA1E	198216	367570	2734	356542	25500	KCNQ3	184156	638588	10672	491940	30450	SEMA3D	153993	444867	18610	401366	35371
CACNA1E	198216	621791	2735	481619	25501	KCNQ3	184156	639358	10673	492691	30451	SEMA3E	170381	307792	18611	303212	35372
CACNA1E	198216	360108	2736	353222	25502	KCNQ3	184156	621976	10674	482510	30452	SEMA3E	170381	427262	18612	405052	35373
CACNA1E	198216	367573	2737	356545	25503	KCNQ5	185760	342056	10675	345055	30453	SEMA3E	170381	442159	18613	412867	35374
CACNA1E	198216	357570	2738	350183	25504	KCNQ5	185760	628967	10676	486187	30454	SEMA3E	170381	453333	18614	415184	35375
CACNA1E	198216	367567	2739	356539	25505	KCNQ5	185760	370398	10677	359425	30455	SEMA3G	010319	231721	18615	231721	35376
CACNA1E	198216	621551	2740	483914	25506	KCNQ5	185760	370392	10678	359419	30456	SEMA3G	010319	465657	18616	420291	35377
CACNA1E	198216	358338	2741	351101	25507	KCNQ5	185760	629977	10679	485743	30457	SEMA3G	010319	475739	18617	419181	35378
CACNA1G	006283	360761	2742	353900	25508	KCNQ5	185760	443915	10680	414829	30458	SEMA4D	187764	537934	18618	446394	35379
CACNA1G	006283	352832	2743	339302	25509	KCNQ5	185760	441538	10681	391971	30459	SEMA4D	187764	450295	18619	416523	35380
CACNA1G	006283	442258	2744	409759	25510	KCNQ5	185760	427928	10682	388098	30460	SEMA4D	187764	438547	18620	405102	35381
CACNA1G	006283	416767	2745	392390	25511	KCNQ5	185760	403813	10683	384453	30461	SEMA4D	187764	422704	18621	388768	35382
CACNA1G	006283	502264	2746	425522	25512	KCNQ5	185760	414165	10684	409861	30462	SEMA4D	187764	486935	18622	N/A	
CACNA1G	006283	512389	2747	426261	25513	KCNQ5	185760	355194	10685	347326	30463	SEMA4D	187764	540183	18623	N/A	
CACNA1G	006283	513964	2748	425451	25514	KCNQ5	185760	402622	10686	385501	30464	SEMA4D	187764	544513	18624	N/A	
CACNA1G	006283	514717	2749	422407	25515	KCNQ5	185760	355635	10687	347853	30465	SEMA4D	187764	474258	18625	N/A	
CACNA1G	006283	510366	2750	426814	25516	KCNT2	162687	367433	10688	356403	30466	SEMA4D	187764	420681	18626	390754	35383
CACNA1G	006283	503485	2751	427238	25517	KCNT2	162687	498426	10689	N/A		SEMA4D	187764	433650	18627	413352	35384
CACNA1G	006283	507510	2752	423112	25518	KCNT2	162687	609185	10690	476657	30467	SEMA4D	187764	540475	18628	438389	35385
CACNA1G	006283	511765	2753	427247	25519	KCNT2	162687	294725	10691	294725	30468	SEMA4D	187764	418828	18629	416747	35386
CACNA1G	006283	507336	2754	420918	25520	KCNT2	162687	610076	10692	N/A		SEMA4D	187764	420670	18630	405652	35387
CACNA1G	006283	506406	2755	426313	25521	KCNT2	162687	466914	10693	477456	30469	SEMA4D	187764	464051	18631	N/A	
CACNA1G	006283	504076	2756	425153	25522	KCNT2	162687	451324	10694	405474	30470	SEMA4D	187764	482128	18632	N/A	
CACNA1G	006283	513689	2757	426172	25523	KCNV1	164794	524391	10695	435954	30471	SEMA4D	187764	356444	18633	348822	35388
CACNA1G	006283	507609	2758	423045	25524	KCNV1	164794	297404	10696	297404	30472	SEMA4D	187764	420987	18634	391733	35389
CACNA1G	006283	503436	2759	427231	25525	KCTD13	174943	308768	10697	311202	30473	SEMA4D	187764	339861	18635	344923	35390
CACNA1G	006283	510115	2760	427173	25526	KCTD13	174943	568000	10698	455785	30474	SEMA4D	187764	492386	18636	N/A	
CACNA1G	006283	515165	2761	426098	25527	KCTD13	174943	566842	10699	459104	30475	SEMA4D	187764	420101	18637	399948	35391
CACNA1G	006283	514181	2762	425698	25528	KCTD13	174943	568995	10700	454282	30476	SEMA4D	187764	475255	18638	N/A	
CACNA1G	006283	515765	2763	426232	25529	KCTD13	174943	563955	10701	N/A		SEMA4D	187764	469653	18639	N/A	
CACNA1G	006283	514079	2764	423317	25530	KCTD13	174943	563264	10702	N/A		SEMA4D	187764	455551	18640	411981	35392
CACNA1G	006283	507896	2765	421518	25531	KCTD13	174943	566413	10703	460526	30477	SEMA4D	187764	429836	18641	395222	35393
CACNA1G	006283	511768	2766	424664	25532	KCTD13	174943	561540	10704	458486	30478	SEMA4G	095539	519649	18642	428896	35394
CACNA1G	006283	505165	2767	422268	25533	KCTD13	174943	568721	10705	N/A		SEMA4G	095539	521006	18643	430881	35395
CACNA1G	006283	503607	2768	426558	25534	KCTD21-AS1	246174	532831	10706	N/A		SEMA4G	095539	518124	18644	430103	35396
CACNA1G	006283	515411	2769	423155	25535	KCTD21-AS1	246174	523626	10707	N/A		SEMA4G	095539	518244	18645	N/A	
CACNA1G	006283	429973	2770	414388	25536	KCTD21-AS1	246174	530261	10708	N/A		SEMA4G	095539	370250	18646	359270	35397
CACNA1G	006283	359106	2771	352011	25537	KCTD21-AS1	246174	500113	10709	N/A		SEMA4G	095539	517724	18647	430175	35398
CACNA1G	006283	358244	2772	350979	25538	KCTD21-AS1	246174	527321	10710	N/A		SEMA4G	095539	210633	18648	210633	35399
CACNA1G	006283	570567	2773	459988	25539	KCTD21-AS1	246174	528468	10711	N/A		SEMA4G	095539	519756	18649	N/A	
CACNA1G	006283	506520	2774	427697	25540	KCTD21-AS1	246174	600795	10712	N/A		SEMA4G	095539	518948	18650	N/A	
CACNA1G	006283	354983	2775	347078	25541	KCTD3	136636	259154	10713	259154	30479	SEMA4G	095539	476171	18651	429888	35400
CACNA2D1	153956	356860	2776	349320	25542	KCTD3	136636	448333	10714	396726	30480	SEMA4G	095539	484128	18652	N/A	
CACNA2D1	153956	469297	2777	N/A		KCTD3	136636	452413	10715	399962	30481	SEMA4G	095539	613292	18653	479499	35401
CACNA2D1	153956	486539	2778	N/A		KCTD3	136636	495537	10716	N/A		SEMA5A	112902	382496	18654	371936	35402
CACNA2D1	153956	443883	2779	409374	25543	KCTD3	136636	465650	10717	N/A		SEMA5A	112902	514923	18655	N/A	
CACNA2D1	153956	466806	2780	N/A		KDELR3	100196	216014	10718	216014	30482	SEMA5A	112902	513968	18656	421961	35403
CACNA2D1	153956	464354	2781	N/A		KDELR3	100196	409006	10719	386918	30483	SEMA5A	112902	509486	18657	N/A	
CACNA2D1	153956	475237	2782	N/A		KDELR3	100196	471268	10720	N/A		SEMA5B	082684	451541	18658	400828	35404
CACNA2D1	153956	492734	2783	N/A		KDM5C	126012	375401	10721	364550	30484	SEMA5B	082684	357599	18659	350215	35405
CACNA2D1	153956	423588	2784	405395	25544	KDM5C	126012	404049	10722	385394	30485	SEMA5B	082684	475244	18660	417570	35406
CACNA2D1	153956	461275	2785	N/A		KDM5C	126012	375379	10723	364528	30486	SEMA5B	082684	393583	18661	377208	35407

CACNA2D1	153956	484706	2786	N/A		KDM5C	126012	375383	10724	364532	30487	SEMA5B	082684	465147	18662	N/A	
CACNA2D1	153956	356253	2787	348589	25545	KDM5C	126012	477109	10725	N/A		SEMA5B	082684	421053	18663	401056	35408
CACNA2D2	007402	423994	2788	407393	25546	KDM5C	126012	497100	10726	N/A		SEMA5B	082684	477001	18664	N/A	
CACNA2D2	007402	429770	2789	404631	25547	KDM5C	126012	465402	10727	N/A		SEMA5B	082684	449546	18665	401038	35409
CACNA2D2	007402	266039	2790	266039	25548	KDM5C	126012	481369	10728	N/A		SEMA5B	082684	451055	18666	389588	35410
CACNA2D2	007402	360963	2791	354228	25549	KDM5C	126012	497995	10729	N/A		SEMA5B	082684	616742	18667	479602	35411
CACNA2D2	007402	483620	2792	N/A		KDM5C	126012	429877	10730	409757	30488	SEMA5B	082684	195173	18668	195173	35412
CACNA2D2	007402	424201	2793	390329	25550	KDM5C	126012	495519	10731	N/A		SEMA6A	092421	343348	18669	345512	35413
CACNA2D2	007402	479441	2794	418081	25551	KDM5C	126012	467093	10732	N/A		SEMA6A	092421	257414	18670	257414	35414
CACNA2D2	007402	487413	2795	N/A		KDM5C	126012	428012	10733	407277	30489	SEMA6A	092421	513137	18671	422997	35415
CACNA2D3	157445	474759	2796	419101	25552	KDM5C	126012	349663	10734	344004	30490	SEMA6A	092421	515129	18672	422275	35416
CACNA2D3	157445	490478	2797	417279	25553	KDM5C	126012	452825	10735	445176	30491	SEMA6A	092421	503865	18673	425364	35417
CACNA2D3	157445	471363	2798	418228	25554	KDM5D	012817	469599	10736	N/A		SEMA6A	092421	510263	18674	424388	35418
CACNA2D3	157445	477024	2799	417318	25555	KDM5D	012817	317961	10737	322408	30492	SEMA6A	092421	506114	18675	N/A	
CACNA2D3	157445	492460	2800	418028	25556	KDM5D	012817	382806	10738	372256	30493	SEMA6A	092421	514316	18676	N/A	
CACNA2D3	157445	468658	2801	417455	25557	KDM5D	012817	492117	10739	N/A		SEMA6A	092421	503402	18677	N/A	
CACNA2D3	157445	478466	2802	N/A		KDM5D	012817	440077	10740	398543	30494	SEMA6A	092421	510024	18678	N/A	
CACNA2D3	157445	478261	2803	N/A		KDM5D	012817	415360	10741	389433	30495	SEMA6A	092421	502996	18679	N/A	
CACNA2D3	157445	471865	2804	N/A		KDM5D	012817	485154	10742	N/A		SEMA6A	092421	503962	18680	N/A	
CACNA2D3	157445	415676	2805	389506	25558	KDM5D	012817	478891	10743	N/A		SEMA6A	092421	515009	18681	421935	35419
CACNA2D3	157445	620722	2806	478969	25559	KDM5D	012817	447300	10744	416377	30496	SEMA6A	092421	509665	18682	425553	35420
CACNA2D3	157445	288197	2807	288197	25560	KDM5D	012817	541639	10745	444293	30497	SEMA6A	092421	512156	18683	N/A	
CACNB3	167535	547693	2808	N/A		KEL	197993	355265	10746	347409	30498	SEMA6D	137872	558014	18684	452815	35421
CACNB3	167535	550391	2809	449389	25561	KEL	197993	470850	10747	N/A		SEMA6D	137872	559184	18685	453097	35422
CACNB3	167535	540990	2810	445495	25562	KEL	197993	478969	10748	N/A		SEMA6D	137872	560636	18686	453420	35423
CACNB3	167535	549226	2811	N/A		KEL	197993	465697	10749	N/A		SEMA6D	137872	561133	18687	453530	35424
CACNB3	167535	548860	2812	N/A		KEL	197993	479768	10750	N/A		SEMA6D	137872	536845	18688	446152	35425
CACNB3	167535	536187	2813	444160	25563	KEL	197993	494148	10751	N/A		SEMA6D	137872	561106	18689	N/A	
CACNB3	167535	548874	2814	446611	25564	KEL	197993	476829	10752	419889	30499	SEMA6D	137872	558816	18690	453661	35426
CACNB3	167535	551716	2815	N/A		KEL	197993	467543	10753	420011	30500	SEMA6D	137872	389425	18691	374076	35427
CACNB3	167535	550168	2816	N/A		KEL	197993	460479	10754	418886	30501	SEMA6D	137872	316364	18692	324857	35428
CACNB3	167535	552465	2817	N/A		KEL	276615	615381	10755	477793	30502	SEMA6D	137872	354744	18693	346786	35429
CACNB3	167535	550064	2818	448074	25565	KEL	276615	633816	10756	N/A		SEMA6D	137872	358066	18694	350770	35430
CACNB3	167535	552022	2819	N/A		KEL	276615	633860	10757	N/A		SEMA6D	137872	389428	18695	374079	35431
CACNB3	167535	549971	2820	N/A		KEL	276615	633614	10758	N/A		SEMA6D	137872	559196	18696	453755	35432
CACNB3	167535	547818	2821	448137	25566	KEL	276615	633778	10759	N/A		SEMA6D	137872	558431	18697	N/A	
CACNB3	167535	547392	2822	446529	25567	KEL	276615	634110	10760	N/A		SEMA6D	137872	559064	18698	453518	35433
CACNB3	167535	301050	2823	301050	25568	KEL	276615	633704	10761	488896	30503	SEMA6D	137872	560006	18699	453689	35434
CACNB3	167535	548279	2824	449497	25569	KEL	276615	632261	10762	488564	30504	SEMA6D	137872	355997	18700	348276	35435
CACNB3	167535	550771	2825	N/A		KEL	276615	631527	10763	488333	30505	SEPSECS	109618	382103	18701	371535	35436
CACNB3	167535	547230	2826	448304	25570	KHDRBS3	131773	522578	10764	N/A		SEPSECS	109618	358971	18702	351857	35437
CACNB3	167535	551544	2827	447462	25571	KHDRBS3	131773	521461	10765	428643	30506	SEPSECS	109618	514585	18703	421880	35438
CACNB3	167535	552812	2828	N/A		KHDRBS3	131773	518728	10766	N/A		SEPSECS	109618	503150	18704	423850	35439
CACNB3	167535	550190	2829	447261	25572	KHDRBS3	131773	522433	10767	N/A		SEPSECS	109618	515272	18705	N/A	
CACNB3	167535	550483	2830	448076	25573	KHDRBS3	131773	522079	10768	N/A		SEPSECS	109618	505513	18706	N/A	
CACNB3	167535	552480	2831	N/A		KHDRBS3	131773	524282	10769	427841	30507	SEPSECS	109618	513285	18707	423361	35440
CACNB4	182389	539935	2832	438949	25574	KHDRBS3	131773	517859	10770	427851	30508	SEPSECS-AS1	281501	510415	18708	N/A	
CACNB4	182389	637547	2833	490124	25575	KHDRBS3	131773	519600	10771	N/A		SEPSECS-AS1	281501	507794	18709	N/A	
CACNB4	182389	636901	2834	490145	25576	KHDRBS3	131773	517394	10772	430284	30509	SEPT4	108387	583114	18710	463768	35441
CACNB4	182389	635738	2835	489881	25577	KHDRBS3	131773	520981	10773	428607	30510	SEPT4	108387	426861	18711	402348	35442
CACNB4	182389	636130	2836	490607	25578	KHDRBS3	131773	524199	10774	431022	30511	SEPT4	108387	580796	18712	N/A	
CACNB4	182389	637217	2837	490250	25579	KHDRBS3	131773	355849	10775	348108	30512	SEPT4	108387	582270	18713	N/A	
CACNB4	182389	637309	2838	490127	25580	KIAA0895	164542	297063	10776	297063	30513	SEPT4	108387	579371	18714	464373	35443
CACNB4	182389	636350	2839	489621	25581	KIAA0895	164542	338533	10777	344805	30514	SEPT4	108387	583273	18715	N/A	
CACNB4	182389	636598	2840	490247	25582	KIAA0895	164542	317020	10778	319251	30515	SEPT4	108387	317268	18716	321674	35444
CACNB4	182389	636831	2841	N/A		KIAA0895	164542	440378	10779	390837	30516	SEPT4	108387	577440	18717	N/A	
CACNB4	182389	636617	2842	490660	25583	KIAA0895	164542	436884	10780	389985	30517	SEPT4	108387	457347	18718	402000	35445

CACNB4	182389	635890	2843	489915	25584	KIAA0895	164542	453212	10781	390183	30518	SEPT4	108387	580844	18719	462727	35446
CACNB4	182389	638005	2844	489677	25585	KIAA0895	164542	483360	10782	N/A		SEPT4	108387	317256	18720	321071	35447
CACNB4	182389	636507	2845	490252	25586	KIAA0895	164542	480192	10783	N/A		SEPT4	108387	412945	18721	414779	35448
CACNB4	182389	637232	2846	490138	25587	KIAA0895	164542	483526	10784	N/A		SEPT4	108387	584488	18722	N/A	
CACNB4	182389	635930	2847	489953	25588	KIAA0895	164542	431396	10785	399935	30519	SEPT4	108387	580809	18723	464382	35449
CACNB4	182389	636442	2848	489779	25589	KIAA0895	164542	415803	10786	400749	30520	SEPT4	108387	577729	18724	463671	35450
CACNB4	182389	636785	2849	489788	25590	KIAA0895	164542	493327	10787	N/A		SEPT4	108387	581615	18725	462278	35451
CACNB4	182389	638091	2850	489967	25591	KIAA0895	164542	429651	10788	390527	30521	SEPT4	108387	578131	18726	462362	35452
CACNB4	182389	636773	2851	489818	25592	KIAA0895L	196123	562514	10789	N/A		SEPT4	108387	585170	18727	N/A	
CACNB4	182389	637942	2852	N/A		KIAA0895L	196123	561679	10790	N/A		SEPT4	108387	583291	18728	463461	35453
CACNB4	182389	637132	2853	490651	25593	KIAA0895L	196123	568563	10791	459322	30522	SEPT4	108387	584789	18729	N/A	
CACNB4	182389	637762	2854	489876	25594	KIAA0895L	196123	561621	10792	457099	30523	SEPT4	108387	581921	18730	N/A	
CACNB4	182389	637550	2855	489943	25595	KIAA0895L	196123	290881	10793	290881	30524	SEPT4	108387	584528	18731	N/A	
CACNB4	182389	637312	2856	490144	25596	KIAA0895L	196123	563918	10794	N/A		SEPT4	108387	580791	18732	N/A	
CACNB4	182389	637436	2857	489746	25597	KIAA0895L	196123	563902	10795	456838	30525	SEPT4	108387	582248	18733	N/A	
CACNB4	182389	635803	2858	N/A		KIAA0895L	196123	563831	10796	N/A		SEPT4	108387	580740	18734	N/A	
CACNB4	182389	636762	2859	490918	25598	KIAA0895L	196123	570009	10797	N/A		SEPT4	108387	578747	18735	N/A	
CACNB4	182389	534999	2860	443893	25599	KIAA0895L	196123	564835	10798	N/A		SEPT4	108387	581607	18736	464360	35454
CACNB4	182389	637913	2861	N/A		KIAA0895L	196123	564423	10799	N/A		SEPT4	108387	582976	18737	N/A	
CACNB4	182389	637284	2862	489787	25600	KIAA0895L	196123	568165	10800	N/A		SEPT4	108387	393086	18738	376801	35455
CACNB4	182389	439467	2863	390161	25601	KIAA1456	250305	447063	10801	443288	30526	SEPT7	122545	635172	18739	489466	35456
CACNB4	182389	637319	2864	N/A		KIAA1456	250305	525249	10802	N/A		SEPT7	122545	635476	18740	489044	35457
CACNB4	182389	637418	2865	489679	25602	KIAA1456	250305	524591	10803	432695	30527	SEPT7	122545	399034	18741	381992	35458
CACNB4	182389	397327	2866	380490	25603	KIAA1456	250305	528335	10804	N/A		SEPT7	122545	435235	18742	413507	35459
CACNB4	182389	637330	2867	490817	25604	KIAA1456	250305	400069	10805	468715	30528	SEPT7	122545	634600	18743	489538	35460
CACNB4	182389	638040	2868	489883	25605	KIAA1456	250305	528753	10806	466330	30529	SEPT7	122545	635669	18744	N/A	
CACNB4	182389	427385	2869	410978	25606	KIAA1456	250305	532376	10807	431717	30530	SEPT7	122545	493626	18745	N/A	
CACNB4	182389	636721	2870	490795	25607	KIAA1456	250305	529706	10808	N/A		SEPT7	122545	635047	18746	489480	35461
CACNB4	182389	636664	2871	490572	25608	KIAA1456	250305	529978	10809	N/A		SEPT7	122545	475109	18747	N/A	
CACNB4	182389	637779	2872	489732	25609	KIAA1644	138944	381176	10810	370568	30531	SEPT7	122545	635175	18748	489192	35462
CACNB4	182389	636380	2873	490488	25610	KIAA1644	138944	381176	10811	370568	30532	SEPT7	122545	425198	18749	N/A	
CACNB4	182389	636108	2874	490176	25611	KIF13A	137177	378814	10812	368091	30533	SEPT7	122545	634700	18750	N/A	
CACNB4	182389	637535	2875	490891	25612	KIF13A	137177	502297	10813	425616	30534	SEPT7	122545	635420	18751	N/A	
CACNB4	182389	637491	2876	490510	25613	KIF13A	137177	259711	10814	259711	30535	SEPT7	122545	634591	18752	N/A	
CACNB4	182389	635904	2877	490430	25614	KIF13A	137177	378843	10815	368120	30536	SEPT7	122545	473201	18753	N/A	
CACNB4	182389	636810	2878	N/A		KIF13A	137177	378826	10816	368103	30537	SEPT7	122545	492940	18754	N/A	
CACNB4	182389	637530	2879	N/A		KIF13A	137177	636847	10817	490031	30538	SEPT7	122545	485569	18755	489596	35463
CACNB4	182389	360283	2880	353425	25615	KIF13A	137177	358380	10818	351150	30539	SEPT7	122545	350320	18756	344868	35464
CACNB4	182389	637514	2881	490304	25616	KIF13A	137177	506044	10819	422808	30540	SEPT7	122545	432293	18757	444240	35465
CACNB4	182389	638150	2882	490501	25617	KIF13A	137177	514714	10820	N/A		SEPT7	122545	399035	18758	381993	35466
CACNB4	182389	637956	2883	490298	25618	KIF13A	137177	503342	10821	N/A		SERINC2	168528	373710	18759	362814	35467
CACNB4	182389	637007	2884	489772	25619	KIF13A	137177	507576	10822	N/A		SERINC2	168528	487207	18760	N/A	
CACNB4	182389	637828	2885	490443	25620	KIF13A	137177	505588	10823	N/A		SERINC2	168528	373709	18761	362813	35468
CACNB4	182389	637765	2886	N/A		KIF13A	137177	502704	10824	425453	30541	SERINC2	168528	491976	18762	N/A	
CACNB4	182389	201943	2887	201943	25621	KIF13B	197892	524189	10825	427900	30542	SERINC2	168528	536384	18763	439048	35469
CACNB4	182389	637773	2888	N/A		KIF13B	197892	523130	10826	429106	30543	SERINC2	168528	536859	18764	444307	35470
CACNB4	182389	637216	2889	490910	25622	KIF13B	197892	522355	10827	429027	30544	SERP1	120742	479209	18765	420076	35471
CACNB4	182389	635731	2890	N/A		KIF13B	197892	521515	10828	429201	30545	SERP1	120742	487153	18766	420002	35472
CACNB4	182389	636390	2891	490603	25623	KIF13B	197892	523968	10829	431006	30546	SERP1	120742	491660	18767	419472	35473
CACNB4	182389	636834	2892	N/A		KIF13B	197892	522846	10830	N/A		SERP1	120742	491195	18768	N/A	
CACNB4	182389	637622	2893	N/A		KIF19	196169	551294	10831	449134	30547	SERP1	120742	490945	18769	N/A	
CACNB4	182389	636947	2894	490337	25624	KIF19	196169	389916	10832	374566	30548	SERP1	120742	463647	18770	N/A	
CACNB4	182389	637884	2895	N/A		KIF19	196169	551017	10833	N/A		SERP1	120742	484608	18771	N/A	
CACNB4	182389	470066	2896	N/A		KIF19	196169	359939	10834	N/A		SERP1	120742	239944	18772	239944	35474
CACNB4	182389	636129	2897	489912	25625	KIF19	196169	547389	10835	N/A		SERPINB1	021355	380739	18773	370115	35475
CACNB4	182389	638056	2898	490787	25626	KIF19	196169	549637	10836	N/A		SERPINB1	021355	468511	18774	N/A	
CACNB4	182389	434468	2899	399242	25627	KIF19	196169	551294	10837	449134	30549	SERPINB1	021355	490094	18775	N/A	
CACNB4	182389	635743	2900	N/A		KIF19	196169	389916	10838	374566	30550	SERPINB1	021355	476896	18776	N/A	
CACNB4	182389	635835	2901	N/A		KIF19	196169	551017	10839	N/A		SERPINB1	021355	460260	18777	N/A	

CACNB4	182389	475848	2902	N/A		KIF19	196169	359939	10840	N/A		SERPINE2	135919	409304	18778	386412	35476
CACNB4	182389	636496	2903	490249	25628	KIF19	196169	547389	10841	N/A		SERPINE2	135919	258405	18779	258405	35477
CACNB4	182389	638083	2904	N/A		KIF19	196169	549637	10842	N/A		SERPINE2	135919	473202	18780	N/A	
CACNB4	182389	637479	2905	N/A		KIF21B	116852	332129	10843	328494	30551	SERPINE2	135919	409840	18781	386969	35478
CACNG3	006116	005284	2906	005284	25629	KIF21B	116852	461742	10844	433808	30552	SERPINE2	135919	447280	18782	415786	35479
CACNG4	075461	262138	2907	262138	25630	KIF21B	116852	360529	10845	353724	30553	SERPINE2	135919	478966	18783	N/A	
CACNG5	075429	533854	2908	436836	25631	KIF21B	116852	422435	10846	411831	30554	SERPINE2	135919	432738	18784	408452	35480
CACNG5	075429	307139	2909	303092	25632	KIF21B	116852	534043	10847	N/A		SERPINE2	135919	489065	18785	N/A	
CACNG8	142408	270458	2910	270458	25633	KIF26B	162849	407071	10848	385545	30555	SERPINE2	135919	454956	18786	399655	35481
CACNG8	142408	638874	2911	492637	25634	KIF26B	162849	479506	10849	N/A		SERPINE2	135919	423446	18787	394518	35482
CACYBP	116161	613570	2912	479414	25635	KIF26B	162849	366518	10850	355475	30556	SERPINH1	149257	533603	18788	434657	35483
CACYBP	116161	426793	2913	403674	25636	KIF26B	162849	483253	10851	N/A		SERPINH1	149257	358171	18789	350894	35484
CACYBP	116161	461977	2914	N/A		KIF26B	281216	615502	10852	N/A		SERPINH1	149257	526242	18790	431384	35485
CACYBP	116161	367679	2915	356652	25637	KIF26B	281216	629409	10853	486478	30557	SERPINH1	149257	526397	18791	434964	35486
CACYBP	116161	483307	2916	N/A		KIF26B	281216	626550	10854	N/A		SERPINH1	149257	529643	18792	435936	35487
CACYBP	116161	473925	2917	N/A		KIF3B	101350	375712	10855	364864	30558	SERPINH1	149257	525492	18793	434482	35488
CACYBP	116161	406752	2918	384139	25638	KIF6	164627	458470	10856	409417	30559	SERPINH1	149257	530284	18794	436305	35489
CACYBP	116161	405362	2919	385771	25639	KIF6	164627	287152	10857	287152	30560	SERPINH1	149257	532356	18795	436040	35490
CACYBP	116161	469173	2920	N/A		KIF6	164627	394362	10858	377889	30561	SERPINH1	149257	524558	18796	434412	35491
CADM3	162706	368124	2921	357106	25640	KIF6	164627	229913	10859	229913	30562	SERPINH1	149257	528990	18797	432007	35492
CADM3	162706	368125	2922	357107	25641	KIF6	164627	441975	10860	404856	30563	SERPINH1	149257	533449	18798	431827	35493
CADM3	162706	416746	2923	387802	25642	KIF6	164627	482238	10861	N/A		SERPINH1	149257	525611	18799	435452	35494
CADPS	163618	383710	2924	373215	25643	KIF6	164627	465719	10862	N/A		SERPINH1	149257	528760	18800	437108	35495
CADPS	163618	486172	2925	N/A		KIF6	164627	538893	10863	441435	30564	SERPINH1	149257	525876	18801	433532	35496
CADPS	163618	473635	2926	418889	25644	KIRREL1	183853	360089	10864	353202	30565	SERPINH1	149257	526638	18802	436306	35497
CADPS	163618	357948	2927	350632	25645	KIRREL1	183853	359209	10865	352138	30566	SERPINI1	163536	472941	18803	420133	35498
CADPS	163618	474560	2928	N/A		KIRREL1	183853	368172	10866	357154	30567	SERPINI1	163536	446050	18804	397373	35499
CADPS	163618	283269	2929	283269	25646	KIRREL1	183853	368173	10867	357155	30568	SERPINI1	163536	295777	18805	295777	35500
CADPS	163618	466621	2930	417568	25647	KIT	157404	412167	10868	390987	30569	SERPINI1	163536	472747	18806	420561	35501
CADPS	163618	469292	2931	N/A		KIT	157404	288135	10869	288135	30570	SERPINI1	163536	488374	18807	N/A	
CADPS	163618	462768	2932	N/A		KIT	157404	514582	10870	N/A		SERPINI1	163536	466865	18808	420807	35502
CADPS	163618	478408	2933	N/A		KIT	157404	512959	10871	N/A		SERPINI1	163536	494666	18809	N/A	
CADPS	163618	478570	2934	N/A		KITLG	049130	378535	10872	N/A		SERPINI2	114204	476257	18810	420621	35503
CADPS	163618	463002	2935	N/A		KITLG	049130	228280	10873	228280	30571	SERPINI2	114204	461846	18811	417692	35504
CADPS	163618	491424	2936	418110	25648	KITLG	049130	347404	10874	054216	30572	SERPINI2	114204	471111	18812	419407	35505
CADPS	163618	468271	2937	417827	25649	KITLG	049130	357116	10875	474021	30573	SERPINI2	114204	495108	18813	N/A	
CADPS	163618	478434	2938	N/A		KITLG	049130	552044	10876	475042	30574	SERPINI2	114204	466903	18814	417752	35506
CADPS	163618	542833	2939	439528	25650	KITLG	049130	378535	10877	N/A		SERPINI2	114204	467583	18815	419255	35507
CADPS	163618	490424	2940	N/A		KITLG	049130	228280	10878	228280	30575	SERPINI2	114204	463031	18816	N/A	
CADPS	163618	490353	2941	418736	25651	KITLG	049130	347404	10879	054216	30576	SERPINI2	114204	264677	18817	264677	35508
CADPS	163618	613879	2942	482556	25652	KITLG	049130	357116	10880	474021	30577	SERPINI2	114204	616363	18818	481699	35509
CADPS	163618	612439	2943	484365	25653	KITLG	049130	552044	10881	475042	30578	SERTM1	180440	315190	18819	325776	35510
CADPS2	081803	462699	2944	419418	25654	KLHDC4	104731	568444	10882	N/A		SESTD1	187231	428443	18820	415332	35511
CADPS2	081803	412584	2945	400401	25655	KLHDC4	104731	567298	10883	457570	30579	SESTD1	187231	446758	18821	410632	35512
CADPS2	081803	449022	2946	398481	25656	KLHDC4	104731	568346	10884	N/A		SESTD1	187231	335289	18822	334183	35513
CADPS2	081803	397721	2947	380833	25657	KLHDC4	104731	568499	10885	N/A		SESTD1	187231	426988	18823	391000	35514
CADPS2	081803	476131	2948	N/A		KLHDC4	104731	316853	10886	N/A		SESTD1	187231	489901	18824	N/A	
CADPS2	081803	334010	2949	333940	25658	KLHDC4	104731	353170	10887	262530	30580	SESTD1	187231	440010	18825	416164	35515
CADPS2	081803	615869	2950	484355	25659	KLHDC4	104731	347925	10888	325717	30581	SESTD1	187231	435047	18826	410286	35516
CADPS2	081803	313070	2951	325581	25660	KLHDC4	104731	566349	10889	N/A		SESTD1	187231	486468	18827	N/A	
CALB1	104327	469032	2952	N/A		KLHDC4	104731	270583	10890	270583	30582	SESTD1	187231	452991	18828	387517	35517
CALB1	104327	265431	2953	265431	25661	KLHDC4	104731	569487	10891	N/A		SETBP1	152217	426838	18829	390687	35518
CALB1	104327	518457	2954	429602	25662	KLHDC4	104731	562155	10892	455824	30583	SETBP1	152217	282030	18830	282030	35519
CALB1	104327	497376	2955	N/A		KLHDC4	104731	562261	10893	455780	30584	SETBP1	152217	591940	18831	468506	35520
CALB1	104327	522070	2956	N/A		KLHDC4	104731	566661	10894	N/A		SEZ6L2	174938	346932	18832	319215	35521
CALB1	104327	523716	2957	429246	25663	KLHDC4	104731	562913	10895	N/A		SEZ6L2	174938	350527	18833	310206	35522
CALB1	104327	520613	2958	430281	25664	KLHDC4	104731	567513	10896	N/A		SEZ6L2	174938	308713	18834	312550	35523
CALB1	104327	482702	2959	N/A		KLHDC4	104731	562872	10897	N/A		SEZ6L2	174938	563118	18835	454654	35524
CALB1	104327	476853	2960	N/A		KLHDC4	104731	564484	10898	N/A		SEZ6L2	174938	568407	18836	N/A	

CALB1	104327	473670	2961	N/A		KLHDC4	104731	565328	10899	N/A		SEZ6L2	174938	562159	18837	N/A	
CALB1	104327	514406	2962	430192	25665	KLHDC4	104731	569747	10900	455666	30585	SEZ6L2	174938	568380	18838	458490	35525
CALB2	172137	302628	2963	307508	25666	KLHDC4	104731	564396	10901	455214	30586	SEZ6L2	174938	537485	18839	439412	35526
CALB2	172137	562305	2964	454639	25667	KLHDC4	104731	568502	10902	N/A		SEZ6L2	174938	617533	18840	481917	35527
CALB2	172137	490520	2965	454467	25668	KLHDC4	104731	561825	10903	457990	30587	SF3B4	143368	271628	18841	271628	35528
CALB2	172137	467817	2966	N/A		KLHDC4	104731	568338	10904	457098	30588	SF3B4	143368	457312	18842	391114	35529
CALB2	172137	349553	2967	340294	25669	KLHDC4	104731	563845	10905	454681	30589	SFXN5	144040	474528	18843	N/A	
CALB2	282830	635154	2968	489007	25670	KLHDC4	104731	566561	10906	457857	30590	SFXN5	144040	461352	18844	N/A	
CALB2	282830	635371	2969	488916	25671	KLHDC4	104731	622456	10907	482433	30591	SFXN5	144040	272433	18845	272433	35530
CALB2	282830	635576	2970	489176	25672	KLHDC4	104731	446344	10908	392909	30592	SFXN5	144040	495208	18846	N/A	
CALB2	282830	634959	2971	489458	25673	KLHL13	003096	371882	10909	360949	30593	SFXN5	144040	490056	18847	N/A	
CALB2	282830	634226	2972	N/A		KLHL13	003096	371876	10910	360943	30594	SFXN5	144040	482289	18848	N/A	
CALCRL	064989	392370	2973	376177	25674	KLHL13	003096	371878	10911	360945	30595	SFXN5	144040	411783	18849	402141	35531
CALCRL	064989	409998	2974	386972	25675	KLHL13	003096	262820	10912	262820	30596	SFXN5	144040	410065	18850	387076	35532
CALCRL	064989	410068	2975	387190	25676	KLHL13	003096	469946	10913	419803	30597	SFXN5	144040	482542	18851	N/A	
CALCRL	064989	447403	2976	415626	25677	KLHL13	003096	453826	10914	393807	30598	SFXN5	144040	463277	18852	N/A	
CALCRL	064989	410102	2977	386599	25678	KLHL13	003096	545703	10915	440707	30599	SFXN5	144040	416579	18853	N/A	
CALCRL	064989	474212	2978	N/A		KLHL13	003096	540167	10916	441029	30600	SFXN5	144040	464825	18854	N/A	
CALCRL	064989	485973	2979	N/A		KLHL13	003096	541812	10917	444450	30601	SFXN5	144040	450185	18855	398580	35533
CALCRL	064989	461244	2980	N/A		KLHL15	174010	328046	10918	332791	30602	SFXN5	144040	442582	18856	396825	35534
CALCRL	064989	479784	2981	N/A		KLHL22	099910	328879	10919	331682	30603	SFXN5	144040	487508	18857	N/A	
CALHM3	183128	369783	2982	358798	25679	KLHL22	099910	487090	10920	N/A		SFXN5	144040	497144	18858	N/A	
CALN1	183166	329008	2983	332498	25680	KLHL22	099910	479601	10921	N/A		SFXN5	144040	479293	18859	N/A	
CALN1	183166	395275	2984	378690	25681	KLHL22	099910	451553	10922	400095	30604	SFXN5	144040	485057	18860	N/A	
CALN1	183166	395276	2985	378691	25682	KLHL22	099910	444967	10923	403999	30605	SFXN5	144040	475630	18861	N/A	
CALN1	183166	431984	2986	410704	25683	KLHL22	099910	458248	10924	398616	30606	SFXN5	144040	472259	18862	N/A	
CALN1	183166	446128	2987	411806	25684	KLHL22	099910	443285	10925	397882	30607	SFXN5	144040	484123	18863	N/A	
CALN1	183166	405452	2988	384354	25685	KLHL22	099910	494929	10926	N/A		SFXN5	144040	488839	18864	N/A	
CALR	179218	587486	2989	N/A		KLHL22	099910	431430	10927	409092	30608	SGCA	108823	513942	18865	N/A	
CALR	179218	316448	2990	320866	25686	KLHL22	099910	470335	10928	N/A		SGCA	108823	514934	18866	423168	35535
CALR	179218	590325	2991	N/A		KLHL22	099910	490556	10929	N/A		SGCA	108823	513821	18867	426571	35536
CALR	179218	588454	2992	463105	25687	KLHL22	099910	423364	10930	402746	30609	SGCA	108823	344627	18868	345522	35537
CALR	179218	586760	2993	465918	25688	KLHL5	109790	261425	10931	261425	30610	SGCA	108823	262018	18869	262018	35538
CALR	179218	586803	2994	N/A		KLHL5	109790	508137	10932	423080	30611	SGCA	108823	502555	18870	422817	35539
CALR	179218	586967	2995	466037	25689	KLHL5	109790	504108	10933	423897	30612	SGCA	108823	511303	18871	426104	35540
CALY	130643	252939	2996	252939	25690	KLHL5	109790	381930	10934	371355	30613	SGCA	108823	512526	18872	426606	35541
CALY	130643	467433	2997	N/A		KLHL5	109790	261426	10935	261426	30614	SGCA	108823	504073	18873	422030	35542
CALY	130643	467611	2998	N/A		KLHL5	109790	514399	10936	426949	30615	SGCA	108823	508382	18874	N/A	
CALY	130643	368558	2999	357546	25691	KLHL5	109790	515612	10937	425512	30616	SGCA	108823	505964	18875	N/A	
CALY	130643	368555	3000	357543	25692	KLK6	167755	376851	10938	366047	30617	SGCD	170624	517913	18876	429378	35543
CAMK1G	008118	009105	3001	009105	25693	KLK6	167755	310157	10939	309148	30618	SGCD	170624	435422	18877	403003	35544
CAMK1G	008118	423146	3002	392173	25694	KLK6	167755	597379	10940	469630	30619	SGCD	170624	337851	18878	338343	35545
CAMK1G	008118	361322	3003	354861	25695	KLK6	167755	594641	10941	470482	30620	SGCD	170624	524347	18879	430794	35546
CAMK1G	008118	494990	3004	N/A		KLK6	167755	599881	10942	471948	30621	SGK2	101049	373100	18880	362192	35547
CAMK2A	070808	348628	3005	261793	25696	KLK6	167755	599690	10943	469702	30622	SGK2	101049	373077	18881	362168	35548
CAMK2A	070808	351010	3006	N/A		KLK6	167755	391808	10944	375684	30623	SGK2	101049	373092	18882	362184	35549
CAMK2A	070808	398376	3007	381412	25697	KNDC1	171798	304613	10945	304437	30624	SGK2	101049	496343	18883	436841	35550
CAMK2A	070808	508662	3008	N/A		KNDC1	171798	478074	10946	N/A		SGK2	101049	617268	18884	481432	35551
CAMK2A	070808	515758	3009	427580	25698	KNDC1	171798	485110	10947	N/A		SGK2	101049	617358	18885	N/A	
CAMK2A	070808	510347	3010	426607	25699	KNDC1	171798	530127	10948	N/A		SGK2	101049	412111	18886	396222	35552
CAMK2A	070808	507995	3011	N/A		KNDC1	171798	368571	10949	357560	30625	SGK2	101049	341458	18887	340608	35553
CAMK2G	148660	351293	3012	277853	25700	KNOP1	103550	219837	10950	219837	30626	SGK2	101049	426287	18888	412214	35554
CAMK2G	148660	322635	3013	315599	25701	KNOP1	103550	568230	10951	455015	30627	SGK2	101049	485914	18889	N/A	
CAMK2G	148660	433289	3014	393784	25702	KNOP1	103550	567367	10952	455369	30628	SGK2	101049	423407	18890	392795	35555
CAMK2G	148660	305762	3015	307082	25703	KNOP1	103550	565844	10953	N/A		SGMS2	164023	506462	18891	N/A	
CAMK2G	148660	372765	3016	361851	25704	KNOP1	103550	564480	10954	454329	30629	SGMS2	164023	394684	18892	378176	35556
CAMK2G	148660	441192	3017	405561	25705	KNTC1	184445	535410	10955	N/A		SGMS2	164023	515332	18893	N/A	
CAMK2G	148660	472912	3018	N/A		KNTC1	184445	450485	10956	397992	30630	SGMS2	164023	503862	18894	428176	35557
CAMK2G	148660	474131	3019	N/A		KNTC1	184445	333479	10957	328236	30631	SGMS2	164023	359079	18895	351981	35558

CAMK2G	148660	477205	3020	N/A		KNTC1	184445	535186	10958	N/A		SGMS2	164023	506993	18896	428294	35559
CAMK2G	148660	492020	3021	N/A		KNTC1	184445	423927	10959	397140	30632	SGMS2	164023	394686	18897	378178	35560
CAMK2G	148660	477652	3022	N/A		KNTC1	184445	545065	10960	N/A		SGMS2	164023	503385	18898	430172	35561
CAMK2G	148660	394762	3023	378243	25706	KNTC1	184445	377192	10961	N/A		SGMS2	164023	504754	18899	N/A	
CAMK2G	148660	322680	3024	319060	25707	KNTC1	184445	436959	10962	408760	30633	SH2B2	160999	617975	18900	483034	35562
CAMK2G	148660	423381	3025	410298	25708	KNTC1	184445	541466	10963	N/A		SH2B2	160999	536178	18901	440273	35563
CAMK4	152495	508074	3026	426940	25709	KNTC1	184445	546125	10964	439119	30634	SH2B2	160999	444095	18902	401883	35564
CAMK4	152495	512453	3027	422634	25710	KNTC1	184445	536625	10965	N/A		SH2D1A	183918	635645	18903	N/A	
CAMK4	152495	282356	3028	282356	25711	KNTC1	184445	542727	10966	N/A		SH2D1A	183918	371139	18904	360181	35565
CAMK4	152495	504544	3029	423761	25712	KNTC1	184445	539013	10967	N/A		SH2D1A	183918	360027	18905	353126	35566
CAMK4	152495	515231	3030	424912	25713	KNTC1	184445	541427	10968	N/A		SH2D1A	183918	491950	18906	N/A	
CAMK4	152495	509408	3031	N/A		KNTC1	184445	534995	10969	437344	30635	SH2D1A	183918	494073	18907	N/A	
CAMK4	152495	514007	3032	421606	25714	KRT222	213424	394049	10970	377613	30636	SH2D1A	183918	477673	18908	477094	35567
CAMK4	152495	504090	3033	N/A		KRT222	213424	394052	10971	377616	30637	SH2D4B	178217	339284	18909	345295	35568
CAMK4	152495	502916	3034	N/A		KRT222	213424	581564	10972	463865	30638	SH2D4B	178217	313455	18910	314242	35569
CAMK4	152495	505763	3035	N/A		KRT222	213424	580719	10973	464647	30639	SH2D4B	178217	372150	18911	N/A	
CAMK4	152495	509645	3036	N/A		KRT24	167916	264651	10974	264651	30640	SH2D4B	178217	481537	18912	N/A	
CAMK4	152495	510858	3037	N/A		KRTAP12-2	221864	360770	10975	354001	30641	SH3BGRL2	198478	369838	18913	358853	35570
CAMK4	152495	512890	3038	N/A		KSR2	171435	339824	10976	339952	30642	SH3BP2	087266	452765	18914	409746	35571
CAMKK2	110931	392474	3039	376266	25715	KSR2	171435	545002	10977	N/A		SH3BP2	087266	503219	18915	422796	35572
CAMKK2	110931	347034	3040	321230	25716	KSR2	171435	543793	10978	N/A		SH3BP2	087266	512131	18916	N/A	
CAMKK2	110931	538733	3041	445944	25717	KSR2	171435	425217	10979	389715	30643	SH3BP2	087266	510193	18917	N/A	
CAMKK2	110931	337174	3042	336634	25718	L1CAM	198910	370060	10980	359077	30644	SH3BP2	087266	511237	18918	N/A	
CAMKK2	110931	324774	3043	312741	25719	L1CAM	198910	370055	10981	359072	30645	SH3BP2	087266	510074	18919	N/A	
CAMKK2	110931	545538	3044	441352	25720	L1CAM	198910	370058	10982	359075	30646	SH3BP2	087266	504294	18920	423275	35573
CAMKK2	110931	412367	3045	388368	25721	L1CAM	198910	361699	10983	355380	30647	SH3BP2	087266	508385	18921	424917	35574
CAMKK2	110931	404169	3046	384600	25722	L1CAM	198910	491983	10984	N/A		SH3BP2	087266	513020	18922	424072	35575
CAMKK2	110931	402834	3047	384591	25723	L1CAM	198910	474853	10985	N/A		SH3BP2	087266	511663	18923	N/A	
CAMKK2	110931	446440	3048	388273	25724	L1CAM	198910	455590	10986	397792	30648	SH3BP2	087266	512014	18924	424105	35576
CAMKK2	110931	392473	3049	376265	25725	L1CAM	198910	496122	10987	N/A		SH3BP2	087266	513095	18925	423823	35577
CAMKK2	110931	535524	3050	N/A		L1CAM	198910	484652	10988	N/A		SH3BP2	087266	502260	18926	425537	35578
CAMKK2	110931	542540	3051	N/A		L1CAM	198910	439496	10989	402407	30649	SH3BP2	087266	511185	18927	N/A	
CAMKK2	110931	539380	3052	N/A		L1CAM	198910	407935	10990	384902	30650	SH3BP2	087266	435136	18928	403231	35579
CAMKK2	110931	543477	3053	444894	25726	L1CAM	198910	464967	10991	N/A		SH3BP2	087266	508338	18929	N/A	
CAMKK2	110931	544485	3054	445400	25727	L1CAM	198910	420165	10992	392524	30651	SH3BP2	087266	511747	18930	424846	35580
CAMKV	164076	475665	3055	N/A		L1CAM	198910	458029	10993	396079	30652	SH3BP2	087266	509677	18931	N/A	
CAMKV	164076	296471	3056	296471	25728	L1CAM	198910	460553	10994	N/A		SH3BP2	087266	515737	18932	422605	35581
CAMKV	164076	488336	3057	418809	25729	L1CAM	198910	616195	10995	N/A		SH3BP2	087266	356331	18933	348685	35582
CAMKV	164076	463537	3058	417614	25730	L1CAM	198910	361981	10996	354712	30653	SH3BP2	087266	506932	18934	N/A	
CAMKV	164076	477224	3059	419195	25731	L3HYPDH	126790	466522	10997	N/A		SH3BP2	087266	515183	18935	N/A	
CAMKV	164076	487726	3060	420139	25732	L3HYPDH	126790	247194	10998	247194	30654	SH3BP2	087266	505941	18936	N/A	
CAMKV	164076	467248	3061	420053	25733	L3HYPDH	126790	463432	10999	N/A		SH3BP2	087266	510204	18937	N/A	
CAMKV	164076	466940	3062	420724	25734	L3HYPDH	126790	478430	11000	N/A		SH3BP2	087266	515802	18938	N/A	
CAMKV	164076	478149	3063	N/A		L3HYPDH	126790	532049	11001	N/A		SH3BP2	087266	504450	18939	N/A	
CAMKV	164076	466535	3064	420766	25735	L3HYPDH	126790	543619	11002	N/A		SH3BP2	087266	513069	18940	426818	35583
CAMKV	164076	483811	3065	N/A		L3HYPDH	126790	487285	11003	431608	30655	SH3BP2	087266	442312	18941	388152	35584
CAMKV	164076	480398	3066	420000	25736	L3HYPDH	126790	481608	11004	423874	30656	SH3BP2	087266	503393	18942	422168	35585
CAMKV	164076	472895	3067	N/A		L3HYPDH	126790	527981	11005	N/A		SH3BP4	130147	392011	18943	375867	35586
CAMKV	164076	479704	3068	N/A		L3MBTL2	100395	216237	11006	216237	30657	SH3BP4	130147	484097	18944	N/A	
CAMKV	164076	498324	3069	N/A		L3MBTL2	100395	481902	11007	N/A		SH3BP4	130147	416021	18945	403251	35587
CAMKV	164076	476105	3070	N/A		L3MBTL2	100395	489136	11008	N/A		SH3BP4	130147	409212	18946	386862	35588
CAMKV	164076	620470	3071	484045	25737	L3MBTL2	100395	466589	11009	N/A		SH3BP4	130147	489601	18947	N/A	
CAP2	112186	229922	3072	229922	25738	L3MBTL2	100395	453659	11010	405849	30658	SH3BP4	130147	344528	18948	340237	35589
CAP2	112186	489374	3073	417705	25739	L3MBTL2	100395	479978	11011	N/A		SH3BP4	130147	444916	18949	387995	35590
CAP2	112186	378990	3074	368275	25740	L3MBTL2	100395	452106	11012	414423	30659	SH3BP4	130147	446904	18950	415391	35591
CAP2	112186	493172	3075	417208	25741	L3MBTL2	100395	449635	11013	399405	30660	SH3BP4	130147	462602	18951	N/A	
CAP2	112186	479291	3076	420615	25742	L3MBTL2	100395	450939	11014	403767	30661	SH3BP4	130147	493436	18952	N/A	

CAP2	112186	465994	3077	418604	25743	LACTB2-AS1	246366	499227	11015	N/A		SH3BP4	130147	454947	18953	414740	35592
CAP2	112186	476263	3078	419906	25744	LACTB2-AS1	246366	519358	11016	N/A		SH3D19	109686	604922	18954	N/A	
CAP2	112186	616440	3079	483435	25745	LACTB2-AS1	246366	518553	11017	N/A		SH3D19	109686	409598	18955	387030	35593
CAP2	112186	611958	3080	482279	25746	LACTB2-AS1	246366	518152	11018	N/A		SH3D19	109686	409252	18956	386848	35594
CAPN1	014216	528396	3081	435847	25747	LACTB2-AS1	246366	519167	11019	N/A		SH3D19	109686	478503	18957	N/A	
CAPN1	014216	529133	3082	432512	25748	LAMA1	101680	389658	11020	374309	30662	SH3D19	109686	514152	18958	423449	35595
CAPN1	014216	533820	3083	435272	25749	LAMA1	101680	492048	11021	N/A		SH3D19	109686	604030	18959	488951	35596
CAPN1	014216	527739	3084	433823	25750	LAMA1	101680	488064	11022	N/A		SH3D19	109686	427414	18960	415694	35597
CAPN1	014216	526966	3085	431528	25751	LAMA1	101680	579014	11023	N/A		SH3D19	109686	508492	18961	N/A	
CAPN1	014216	533129	3086	431686	25752	LAMA1	101680	488089	11024	N/A		SH3D19	109686	462257	18962	489087	35598
CAPN1	014216	524773	3087	434176	25753	LAMA1	101680	490190	11025	N/A		SH3D19	109686	604440	18963	N/A	
CAPN1	014216	530442	3088	N/A		LAMA1	101680	484335	11026	N/A		SH3D19	109686	474743	18964	N/A	
CAPN1	014216	279247	3089	279247	25754	LAMA1	101680	585178	11027	N/A		SH3D19	109686	514013	18965	N/A	
CAPN1	014216	528739	3090	N/A		LAMA1	101680	638611	11028	491821	30663	SH3D19	109686	304527	18966	302913	35599
CAPN1	014216	532285	3091	436693	25755	LAMA2	196569	421865	11029	400365	30664	SH3GL3	140600	492099	18967	N/A	
CAPN1	014216	527189	3092	N/A		LAMA2	196569	466230	11030	N/A		SH3GL3	140600	427482	18968	391372	35600
CAPN1	014216	527469	3093	N/A		LAMA2	196569	498257	11031	N/A		SH3GL3	140600	563901	18969	456249	35601
CAPN1	014216	534373	3094	431793	25756	LAMA2	196569	494137	11032	N/A		SH3GL3	140600	324537	18970	320092	35602
CAPN1	014216	526954	3095	436002	25757	LAMA2	196569	618192	11033	480802	30665	SH3GL3	140600	564054	18971	N/A	
CAPN1	014216	531068	3096	435092	25758	LAMA2	196569	617695	11034	481744	30666	SH3GL3	140600	467735	18972	N/A	
CAPN1	014216	527699	3097	431172	25759	LAMA3	053747	313654	11035	324532	30667	SH3RF1	154447	284637	18973	284637	35603
CAPN1	014216	533909	3098	435198	25760	LAMA3	053747	585600	11036	468316	30668	SH3RF1	154447	511421	18974	426418	35604
CAPN1	014216	527323	3099	431984	25761	LAMA3	053747	399516	11037	382432	30669	SH3RF1	154447	508685	18975	N/A	
CAPN1	014216	526468	3100	433366	25762	LAMA3	053747	591749	11038	N/A		SH3RF1	154447	502315	18976	427585	35605
CAPN1	014216	527897	3101	N/A		LAMA3	053747	592519	11039	467662	30670	SH3RF1	154447	510806	18977	421714	35606
CAPN1	014216	533079	3102	N/A		LAMA3	053747	269217	11040	269217	30671	SH3RF3	172985	309415	18978	309186	35607
CAPN1	014216	527887	3103	N/A		LAMA3	053747	587184	11041	466557	30672	SH3TC2	169247	504690	18979	425627	35608
CAPN1	014216	530495	3104	N/A		LAMA3	053747	586751	11042	464836	30673	SH3TC2	169247	510350	18980	N/A	
CAPN1	014216	525013	3105	N/A		LAMA3	053747	588770	11043	N/A		SH3TC2	169247	323829	18981	313025	35609
CAPN1	014216	528165	3106	N/A		LAMA3	053747	586709	11044	N/A		SH3TC2	169247	515229	18982	N/A	
CAPN1	014216	533704	3107	N/A		LAMA3	053747	588164	11045	467473	30674	SH3TC2	169247	504517	18983	421779	35610
CAPN1	014216	530567	3108	N/A		LAMA3	053747	592442	11046	N/A		SH3TC2	169247	502274	18984	421092	35611
CAPN3	092529	357568	3109	350181	25763	LAMA3	053747	590104	11047	466658	30675	SH3TC2	169247	510779	18985	423940	35612
CAPN3	092529	349748	3110	183936	25764	LAMA3	053747	588004	11048	468315	30676	SH3TC2	169247	515425	18986	423660	35613
CAPN3	092529	397163	3111	380349	25765	LAMA4	112769	230538	11049	230538	30677	SH3TC2	169247	512049	18987	421860	35614
CAPN3	092529	638141	3112	N/A		LAMA4	112769	522006	11050	429488	30678	SH3TC2	169247	513604	18988	423111	35615
CAPN3	092529	397200	3113	380384	25766	LAMA4	112769	389463	11051	374114	30679	SH3TC2	169247	511307	18989	421420	35616
CAPN3	092529	569827	3114	454379	25767	LAMA4	112769	424408	11052	416470	30680	SH3TC2	169247	513340	18990	N/A	
CAPN3	092529	567071	3115	456607	25768	LAMA4	112769	604740	11053	N/A		SH3TC2	169247	503071	18991	N/A	
CAPN3	092529	337571	3116	336840	25769	LAMA4	112769	521693	11054	N/A		SH3TC2	169247	511949	18992	N/A	
CAPN3	092529	569136	3117	455254	25770	LAMA4	112769	519245	11055	N/A		SH3TC2	169247	504091	18993	N/A	
CAPN3	092529	561817	3118	456575	25771	LAMA4	112769	523765	11056	427837	30681	SHANK1	161681	391813	18994	375689	35617
CAPN3	092529	565173	3119	N/A		LAMA4	112769	521187	11057	N/A		SHANK1	161681	293441	18995	293441	35618
CAPN3	092529	397204	3120	380387	25772	LAMA4	112769	521732	11058	427865	30682	SHANK1	161681	391814	18996	375690	35619
CAPN3	092529	565559	3121	457878	25773	LAMA4	112769	368640	11059	357629	30683	SHANK1	161681	359082	18997	351984	35620
CAPN3	092529	565274	3122	457759	25774	LAMA4	112769	521398	11060	430336	30684	SHANK1	161681	483981	18998	N/A	
CAPN3	092529	564503	3123	457898	25775	LAMA4	112769	518842	11061	N/A		SHANK1	161681	468654	18999	469719	35621
CAPN3	092529	466222	3124	N/A		LAMA4	112769	524032	11062	N/A		SHANK1	161681	461154	19000	N/A	
CAPN3	092529	562199	3125	N/A		LAMA4	112769	423735	11063	N/A		SHANK1	161681	483128	19001	N/A	
CAPN3	092529	567817	3126	456514	25776	LAMA4	112769	519932	11064	428583	30685	SHANK2	162105	608988	19002	476264	35622
CAPN3	092529	568153	3127	454937	25777	LAMA4	112769	431543	11065	412136	30686	SHANK2	162105	618363	19003	482553	35623
CAPN3	092529	356316	3128	348667	25778	LAMA4	112769	243219	11066	243219	30687	SHANK2	162105	425049	19004	392674	35624
CAPN3	092529	318023	3129	326281	25779	LAMA4	112769	521690	11067	430415	30688	SHANK2	162105	498519	19005	N/A	
CAPN5	149260	531028	3130	467244	25780	LAMA4	112769	368638	11068	357627	30689	SHANK2	162105	468619	19006	483920	35625
CAPN5	149260	278559	3131	278559	25781	LAMA4	112769	453937	11069	398226	30690	SHANK2	162105	470759	19007	N/A	

CAPN5	149260	527066	3132	435894	25782	LAMA4	112769	455073	11070	408604	30691	SHANK2	162105	409530	19008	387324	35626
CAPN5	149260	529629	3133	432332	25783	LAMB1	091136	472714	11071	N/A		SHANK2	162105	412252	19009	414876	35627
CAPN5	149260	456580	3134	409996	25784	LAMB1	091136	393561	11072	377191	30692	SHANK2	162105	606715	19010	N/A	
CAPN5	149260	533889	3135	N/A		LAMB1	091136	222399	11073	222399	30693	SHANK2	162105	449833	19011	399423	35628
CAPN5	149260	527129	3136	N/A		LAMB1	091136	474380	11074	N/A		SHANK2	162105	357171	19012	349694	35629
CAPN9	135773	271971	3137	271971	25785	LAMB1	091136	468518	11075	N/A		SHANK2	162105	482659	19013	N/A	
CAPN9	135773	354537	3138	346538	25786	LAMB1	091136	491196	11076	N/A		SHANK2	162105	458632	19014	390636	35630
CAPN9	135773	480004	3139	N/A		LAMB1	091136	470995	11077	N/A		SHANK2	162105	460048	19015	N/A	
CAPN9	135773	366666	3140	355626	25787	LAMB1	091136	468999	11078	N/A		SHANK2	162105	445654	19016	N/A	
CAPZB	077549	264203	3141	264203	25788	LAMB1	091136	476039	11079	N/A		SHANK2	162105	426687	19017	391570	35631
CAPZB	077549	375144	3142	364286	25789	LAMB1	091136	479448	11080	N/A		SHANK2	162105	449116	19018	394939	35632
CAPZB	077549	375142	3143	364284	25790	LAMB1	091136	393560	11081	377190	30694	SHANK2	162105	601538	19019	469689	35633
CAPZB	077549	433834	3144	401010	25791	LAMB1	091136	439976	11082	412686	30695	SHANK2	162105	338508	19020	345193	35634
CAPZB	077549	264202	3145	264202	25792	LAMB1	091136	393559	11083	377189	30696	SHANK2	162105	424924	19021	402944	35635
CAPZB	077549	459967	3146	N/A		LAMB2	172037	467506	11084	N/A		SHANK2	162105	409161	19022	386491	35636
CAPZB	077549	457768	3147	N/A		LAMB2	172037	418109	11085	388325	30697	SHANK3	251322	414786	19023	N/A	
CAPZB	077549	489607	3148	N/A		LAMB2	172037	484713	11086	N/A		SHANK3	251322	445220	19024	489407	35637
CAPZB	077549	482808	3149	N/A		LAMB2	172037	305544	11087	307156	30698	SHANK3	251322	262795	19025	489147	35638
CA12	074410	178638	3150	178638	25793	LAMB2	172037	498377	11088	N/A		SHANK3	283243	635818	19026	490818	35639
CA12	074410	344366	3151	343088	25794	LAMB2	172037	469665	11089	N/A		SHC3	148082	375835	19027	364995	35640
CA12	074410	422263	3152	403028	25795	LAMB2	172037	477225	11090	N/A		SHC3	148082	375831	19028	364991	35641
CA12	074410	560666	3153	N/A		LAMB2	172037	480640	11091	N/A		SHC4	185634	332408	19029	329668	35642
CA12	074410	558287	3154	N/A		LAMB2	172037	538659	11092	N/A		SHC4	185634	396535	19030	379786	35643
CA12	074410	560293	3155	N/A		LAMB2	172037	542580	11093	N/A		SHC4	185634	537958	19031	443300	35644
CA14	118298	369111	3156	358107	25796	LAMB2	172037	462930	11094	N/A		SHC4	185634	557797	19032	453344	35645
CA14	118298	582010	3157	N/A		LAMB2	172037	464891	11095	N/A		SHC4	185634	558220	19033	453397	35646
CA14	118298	607652	3158	N/A		LAMB2	172037	483057	11096	N/A		SHC4	185634	559289	19034	N/A	
CA14	118298	483993	3159	475869	25797	LAMB2	172037	486298	11097	N/A		SHF	138606	560540	19035	453370	35647
CA14	118298	607082	3160	475238	25798	LAMB2	172037	477701	11098	N/A		SHF	138606	290894	19036	290894	35648
CA2	104267	285379	3161	285379	25799	LAMB2	172037	493571	11099	N/A		SHF	138606	560734	19037	453168	35649
CA2	104267	520127	3162	428443	25800	LAMB2	172037	488638	11100	N/A		SHF	138606	458022	19038	411530	35650
CA2	104267	520996	3163	N/A		LAMB2	172037	483321	11101	N/A		SHF	138606	558294	19039	454034	35651
CA2	104267	518231	3164	N/A		LAMB2	172037	494831	11102	444751	30699	SHF	138606	561239	19040	453676	35652
CA2	104267	522742	3165	428947	25801	LAMP5	125869	427562	11103	406360	30700	SHF	138606	560471	19041	453260	35653
CA4	167434	300900	3166	300900	25802	LAMP5	125869	246070	11104	246070	30701	SHF	138606	559566	19042	452726	35654
CA4	167434	585705	3167	N/A		LAPTM4B	104341	445593	11105	402301	30702	SHF	138606	558685	19043	453827	35655
CA4	167434	591725	3168	466964	25803	LAPTM4B	104341	521545	11106	428409	30703	SHF	138606	561091	19044	N/A	
CA4	167434	586876	3169	467465	25804	LAPTM4B	104341	517924	11107	429868	30704	SHF	138606	561278	19045	453986	35656
CA4	167434	590203	3170	465837	25805	LAPTM4B	104341	619747	11108	482533	30705	SHISA6	188803	441885	19046	390084	35657
CA4	167434	587265	3171	464757	25806	LARP6	166173	299213	11109	299213	30706	SHISA6	188803	432116	19047	388659	35658
CA8	178538	317995	3172	314407	25807	LARP6	166173	559316	11110	467334	30707	SHISA6	188803	409168	19048	387157	35659
CA8	178538	524872	3173	N/A		LARP6	166173	560052	11111	N/A		SHISA6	188803	343478	19049	477331	35660
CA8	178538	528666	3174	N/A		LARP6	166173	344870	11112	343869	30708	SHISA7	187902	376325	19050	365503	35661
CA8	178538	529918	3175	N/A		LARP6	166173	559140	11113	453551	30709	SHISA7	187902	416792	19051	401307	35662
CARMIL1	079691	461945	3176	489403	25808	LARS2	011376	265537	11114	265537	30710	SHISA8	234965	457093	19052	389964	35663
CARMIL1	079691	329474	3177	331983	25809	LARS2	011376	415258	11115	408576	30711	SHISA8	234965	621082	19053	481203	35664
CARMIL1	079691	497227	3178	N/A		LARS2	011376	431023	11116	406611	30712	SHROOM2	146950	380913	19054	370299	35665
CARMIL1	079691	635618	3179	489114	25810	LARS2	011376	414984	11117	412895	30713	SHROOM2	146950	493668	19055	N/A	
CARMIL1	079691	476458	3180	N/A		LARS2	011376	430399	11118	401388	30714	SHROOM2	146950	452575	19056	406724	35666
CARNS1	172508	525907	3181	N/A		LARS2	011376	467936	11119	N/A		SHROOM2	146950	418909	19057	415229	35667
CARNS1	172508	529925	3182	N/A		LARS2	011376	485461	11120	N/A		SHROOM3	138771	296043	19058	296043	35668
CARNS1	172508	531040	3183	431670	25811	LARS2	011376	474585	11121	N/A		SHROOM3	138771	497440	19059	N/A	
CARNS1	172508	531958	3184	N/A		LBH	213626	395323	11122	378733	30715	SHROOM3	138771	466541	19060	N/A	

CARNS1	172508	307823	3185	308268	25812	LBH	213626	412933	11123	392167	30716	SHROOM3	138771	469923	19061	N/A	
CARNS1	172508	531388	3186	N/A		LBH	213626	464412	11124	N/A		SHROOM3	138771	490690	19062	N/A	
CARNS1	172508	445895	3187	389009	25813	LBH	213626	406087	11125	385409	30717	SHROOM3	138771	481002	19063	N/A	
CASP12	204403	613512	3188	482745	25814	LBH	213626	404397	11126	384443	30718	SHROOM3	138771	485780	19064	N/A	
CASP12	204403	458137	3189	421408	25815	LBH	213626	401506	11127	385703	30719	SHROOM3	138771	484236	19065	N/A	
CASP12	204403	375726	3190	424038	25816	LBH	213626	467242	11128	N/A		SHROOM3	138771	486758	19066	N/A	
CASP12	204403	447913	3191	426427	25817	LBH	213626	407930	11129	386106	30720	SHROOM3	138771	473602	19067	N/A	
CASP12	204403	446862	3192	425652	25818	LBH	213626	484150	11130	N/A		SHROOM4	158352	289292	19068	289292	35669
CASP12	204403	441710	3193	423970	25819	LBX1	138136	370193	11131	359212	30721	SHROOM4	158352	483955	19069	N/A	
CASP12	204403	433738	3194	427437	25820	LCAT	213398	264005	11132	264005	30722	SHROOM4	158352	460112	19070	421450	35670
CASP12	204403	448103	3195	423899	25821	LCAT	213398	573538	11133	463220	30723	SHROOM4	158352	484922	19071	N/A	
CASP12	204403	417998	3196	424963	25822	LCAT	213398	570369	11134	459014	30724	SHROOM4	158352	376020	19072	365188	35671
CASP12	204403	494737	3197	421815	25823	LCAT	213398	570980	11135	464651	30725	SHTN1	187164	615301	19073	480109	35672
CASP12	204403	508062	3198	426566	25824	LCAT	213398	575467	11136	460653	30726	SHTN1	187164	497044	19074	N/A	
CASP12	204403	422698	3199	427128	25825	LCAT	213398	576450	11137	458141	30727	SHTN1	187164	392901	19075	376635	35673
CASP3	164305	393585	3200	377210	25826	LCAT	213398	570396	11138	459291	30728	SHTN1	187164	490615	19076	N/A	
CASP3	164305	308394	3201	311032	25827	LCAT	213398	573846	11139	N/A		SHTN1	187164	260777	19077	260777	35674
CASP3	164305	523916	3202	428929	25828	LCAT	213398	575277	11140	N/A		SHTN1	187164	392903	19078	376636	35675
CASP3	164305	517513	3203	428372	25829	LCN8	204001	480597	11141	N/A		SHTN1	187164	355371	19079	347532	35676
CASP3	164305	393588	3204	377213	25830	LCN8	204001	479767	11142	N/A		SIAH2	181788	312960	19080	322457	35677
CASP3	164305	447121	3205	407142	25831	LCN8	204001	482893	11143	N/A		SIAH2	181788	482706	19081	417619	35678
CASP4	196954	525116	3206	N/A		LCN8	204001	371688	11144	360753	30729	SIAH2	181788	472885	19082	N/A	
CASP4	196954	444739	3207	388566	25832	LCN8	204001	612714	11145	482512	30730	SIAH3	215475	400405	19083	383256	35679
CASP4	196954	393150	3208	376857	25833	LCORL	178177	635767	11146	490600	30731	SIDT1	072858	264852	19084	264852	35680
CASP4	196954	533252	3209	432879	25834	LCORL	178177	326877	11147	317566	30732	SIDT1	072858	491730	19085	N/A	
CASP4	196954	529565	3210	N/A		LCORL	178177	637787	11148	490873	30733	SIDT1	072858	483946	19086	N/A	
CASP4	196954	530309	3211	N/A		LCORL	178177	510451	11149	423489	30734	SIDT1	072858	488390	19087	N/A	
CASP4	196954	533730	3212	N/A		LCORL	178177	510121	11150	N/A		SIDT1	072858	480746	19088	N/A	
CASP4	196954	534356	3213	N/A		LCORL	178177	382224	11151	371659	30735	SIDT1	072858	468728	19089	N/A	
CASP4	196954	529183	3214	N/A		LCORL	178177	512376	11152	N/A		SIDT1	072858	463226	19090	N/A	
CASP4	196954	524843	3215	N/A		LCORL	178177	382226	11153	371661	30736	SIDT1	072858	465803	19091	N/A	
CASP4	196954	531333	3216	N/A		LDAH	118961	403006	11154	384267	30737	SIDT1	072858	492863	19092	N/A	
CASP4	196954	417440	3217	401673	25835	LDAH	118961	381090	11155	370480	30738	SIDT1	072858	481891	19093	N/A	
CASP4	196954	531546	3218	N/A		LDAH	118961	470099	11156	N/A		SIDT1	072858	498152	19094	N/A	
CASP9	132906	546424	3219	449584	25836	LDAH	118961	237822	11157	237822	30739	SIDT1	072858	393830	19095	377416	35681
CASP9	132906	333868	3220	330237	25837	LDAH	118961	626491	11158	487592	30740	SIK3	160584	488337	19096	N/A	
CASP9	132906	348549	3221	255256	25838	LDAH	118961	432947	11159	396911	30741	SIK3	160584	445177	19097	391295	35682
CASP9	132906	400777	3222	383588	25839	LDAH	118961	412261	11160	400910	30742	SIK3	160584	375300	19098	364449	35683
CASP9	132906	424908	3223	408691	25840	LDAH	118961	402479	11161	385951	30743	SIK3	160584	454905	19099	392849	35684
CASP9	132906	375890	3224	365051	25841	LDAH	118961	419825	11162	414710	30744	SIK3	160584	465421	19100	N/A	
CASP9	132906	474305	3225	449216	25842	LDAH	118961	619656	11163	483067	30745	SIK3	160584	415541	19101	392761	35685
CASP9	132906	447522	3226	396540	25843	LDAH	118961	541941	11164	440570	30746	SIK3	160584	446921	19102	390442	35686
CASP9	132906	440484	3227	411304	25844	LDAH	118961	440866	11165	400340	30747	SIK3	160584	480468	19103	N/A	
CASP9	132906	546969	3228	N/A		LDAH	118961	435420	11166	388635	30748	SIK3	160584	480222	19104	N/A	
CASP9	132906	469637	3229	480785	25845	LDB2	169744	515064	11167	422552	30749	SIK3	160584	413553	19105	414347	35687
CASQ2	118729	261448	3230	261448	25846	LDB2	169744	441778	11168	392089	30750	SIK3	160584	472648	19106	N/A	
CASQ2	118729	488931	3231	N/A		LDB2	169744	304523	11169	306772	30751	SIK3	160584	497049	19107	N/A	
CATSPERG	099338	410018	3232	387057	25847	LDB2	169744	509803	11170	N/A		SIK3	160584	485363	19108	N/A	

CATSPERG	099338	409235	3233	386962	25848	LDB2	169744	502640	11171	423963	30752	SIPA1L1	197555	553453	19109	N/A	
CATSPERG	099338	312265	3234	311314	25849	LDB2	169744	507464	11172	425754	30753	SIPA1L1	197555	555989	19110	N/A	
CATSPERG	099338	471517	3235	468028	25850	LDB2	169744	508918	11173	424770	30754	SIPA1L1	197555	556408	19111	N/A	
CATSPERG	099338	475343	3236	467947	25851	LDB2	169744	512345	11174	424676	30755	SIPA1L1	197555	554126	19112	N/A	
CATSPERG	099338	409410	3237	386950	25852	LDB2	169744	503153	11175	N/A		SIPA1L1	197555	556780	19113	N/A	
CATSPERG	099338	477793	3238	N/A		LDB2	169744	504886	11176	N/A		SIPA1L1	197555	554362	19114	N/A	
CATSPERG	099338	466060	3239	N/A		LDB2	169744	506732	11177	421767	30756	SIPA1L1	197555	555652	19115	N/A	
CATSPERG	099338	412458	3240	395093	25853	LDB2	169744	503829	11178	N/A		SIPA1L1	197555	557151	19116	452080	35688
CATSPERG	099338	475646	3241	N/A		LDB2	169744	508804	11179	N/A		SIPA1L1	197555	557469	19117	N/A	
CATSPERG	099338	488473	3242	N/A		LDB2	169744	513457	11180	N/A		SIPA1L1	197555	557712	19118	N/A	
CATSPERG	099338	467739	3243	N/A		LDB2	169744	510825	11181	N/A		SIPA1L1	197555	381232	19119	370630	35689
CATSPERG	099338	489693	3244	470225	25854	LDB2	169744	504189	11182	N/A		SIPA1L1	197555	555818	19120	450832	35690
CATSPERG	099338	470292	3245	N/A		LDB3	122367	623056	11183	485500	30757	SIPA1L1	197555	358550	19121	351352	35691
CATSPERG	099338	585424	3246	N/A		LDB3	122367	372066	11184	361136	30758	SIPA1L1	197555	537413	19122	440682	35692
CATSPERG	099338	492088	3247	N/A		LDB3	122367	361373	11185	355296	30759	SIPA1L1	197555	555066	19123	452450	35693
CAV1	105974	341049	3248	339191	25855	LDB3	122367	623007	11186	485389	30760	SIPA1L1	197555	554960	19124	N/A	
CAV1	105974	393470	3249	377113	25856	LDB3	122367	372056	11187	361126	30761	SIPA1L1	197555	554874	19125	N/A	
CAV1	105974	451122	3250	409541	25857	LDB3	122367	263066	11188	263066	30762	SIPA1L1	197555	556959	19126	N/A	
CAV1	105974	489856	3251	N/A		LDB3	122367	477489	11189	485538	30763	SIPA1L2	116991	366630	19127	355589	35694
CAV1	105974	405348	3252	384348	25858	LDB3	122367	429277	11190	401437	30764	SIPA1L2	116991	308942	19128	309102	35695
CAV1	105974	456473	3253	389033	25859	LDB3	122367	542786	11191	438866	30765	SIPA1L2	116991	486472	19129	N/A	
CAV1	105974	393468	3254	377111	25860	CNMD	136110	448904	11192	388576	30766	SIPA1L2	116991	495863	19130	N/A	
CAV1	105974	393467	3255	377110	25861	CNMD	136110	377962	11193	367198	30767	SIPA1L2	116991	494056	19131	N/A	
CAV1	105974	614113	3256	479447	25862	CNMD	136110	431550	11194	396035	30768	SIPA1L2	116991	262861	19132	262861	35696
CAV2	105971	490906	3257	N/A		LECT2	145826	522943	11195	429618	30769	SIPA1L3	105738	222345	19133	222345	35697
CAV2	105971	460222	3258	N/A		LECT2	145826	471827	11196	N/A		SIPA1L3	105738	599644	19134	N/A	
CAV2	105971	477018	3259	N/A		LECT2	145826	274507	11197	274507	30770	SIPA1L3	105738	476317	19135	N/A	
CAV2	105971	467035	3260	N/A		LECT2	145826	512872	11198	427012	30771	SIPA1L3	105738	595982	19136	N/A	
CAV2	105971	484871	3261	N/A		LECT2	145826	514447	11199	421123	30772	SIPA1L3	105738	595384	19137	468981	35698
CAV2	105971	485561	3262	N/A		LENG9	274495	614111	11200	483600	30773	SIPA1L3	105738	601222	19138	N/A	
CAV2	105971	472470	3263	N/A		LENG9	275183	611161	11201	479355	30774	SIPA1L3	105738	594553	19139	N/A	
CAV2	105971	498493	3264	N/A		LENG9	273574	622419	11202	477636	30775	SIPA1L3	105738	601881	19140	N/A	
CAV2	105971	478226	3265	N/A		LENG9	278312	622643	11203	478498	30776	SIPA1L3	105738	600919	19141	N/A	
CAV2	105971	462876	3266	N/A		LFNG	106003	402506	11204	385764	30777	SIPA1L3	105738	595495	19142	N/A	
CAV2	105971	465451	3267	N/A		LFNG	106003	402045	11205	384786	30778	SIPA1L3	105738	601054	19143	472734	35699
CAV2	105971	222693	3268	222693	25863	LFNG	106003	222725	11206	222725	30779	SIPA1L3	105738	596403	19144	N/A	
CAV2	105971	343213	3269	345679	25864	LFNG	106003	359574	11207	352579	30780	SIRPA	198053	622179	19145	478763	35700
CAV2	105971	393480	3270	377120	25865	LFNG	106003	493850	11208	N/A		SIRPA	198053	356025	19146	348307	35701
CAV2	105971	495841	3271	N/A		LFNG	106003	338732	11209	343095	30781	SIRPA	198053	358771	19147	351621	35702
CBFA2T3	129993	327483	3272	332122	25866	LFNG	106003	614382	11210	483986	30782	SIRPA	198053	400068	19148	382941	35703
CBFA2T3	129993	268679	3273	268679	25867	LGALS3	131981	553493	11211	451526	30783	SIX4	100625	216513	19149	216513	35704
CBFA2T3	129993	563856	3274	N/A		LGALS3	131981	254301	11212	254301	30784	SIX4	100625	554079	19150	N/A	
CBFA2T3	129993	563920	3275	N/A		LGALS3	131981	553755	11213	N/A		SIX4	100625	556952	19151	450761	35705
CBFA2T3	129993	566868	3276	464125	25868	LGALS3	131981	554715	11214	451381	30785	SKAP2	005020	345317	19152	005587	35706
CBFA2T3	129993	569464	3277	454851	25869	LGALS3	131981	556438	11215	N/A		SKAP2	005020	489977	19153	N/A	
CBFA2T3	129993	569443	3278	457410	25870	LGALS3	131981	556322	11216	N/A		SKAP2	005020	468712	19154	N/A	
CBFA2T3	129993	562719	3279	456717	25871	LGALS3	131981	556263	11217	N/A		SKAP2	005020	495802	19155	N/A	
CBFA2T3	129993	563640	3280	454872	25872	LGI2	153012	382114	11218	371548	30786	SKAP2	005020	432747	19156	408163	35707
CBFA2T3	129993	564416	3281	454609	25873	LGI2	153012	512108	11219	426254	30787	SKAP2	005020	490456	19157	N/A	
CBFA2T3	129993	570046	3282	456102	25874	LGI4	153902	310123	11220	312273	30788	SKAP2	005020	497511	19158	N/A	
CBFB	067955	561924	3283	462273	25875	LGI4	153902	392225	11221	376059	30789	SKAP2	005020	481204	19159	N/A	
CBFB	067955	290858	3284	290858	25876	LGI4	153902	493050	11222	N/A		SKAP2	005020	487720	19160	N/A	
CBFB	067955	564034	3285	456637	25877	LGI4	153902	587780	11223	467044	30790	SKOR1	188779	341418	19161	343200	35708
CBFB	067955	412916	3286	415151	25878	LGI4	153902	591840	11224	N/A		SKOR1	188779	554240	19162	451193	35709
CBFB	067955	565389	3287	462932	25879	LGI4	153902	593248	11225	N/A		SKOR1	188779	554054	19163	452361	35710
CBFB	067955	563939	3288	462148	25880	LGI4	153902	591633	11226	467784	30791	SKOR1	188779	380035	19164	369374	35711
CBFB	067955	567947	3289	N/A		LGI4	153902	473160	11227	N/A		SKOR2	215474	425639	19165	414750	35712
CBFB	067955	566281	3290	N/A		LGI4	153902	592346	11228	N/A		SKOR2	215474	400404	19166	383255	35713
CBFB	067955	568858	3291	N/A		LGR5	139292	266674	11229	266674	30792	SKOR2	215474	620245	19167	483333	35714

CBLB	114423	394030	3292	377598	25881	LGR5	139292	550851	11230	N/A		SLC12A2	064651	262461	19168	262461	35715
CBLB	114423	264122	3293	264122	25882	LGR5	139292	536515	11231	443033	30793	SLC12A2	064651	509205	19169	427109	35716
CBLB	114423	476370	3294	N/A		LGR5	139292	540815	11232	441035	30794	SLC12A2	064651	343225	19170	340878	35717
CBLB	114423	407712	3295	384170	25883	LGR5	139292	549015	11233	N/A		SLC12A2	064651	504416	19171	N/A	
CBLB	114423	403724	3296	384816	25884	LGR5	139292	547310	11234	N/A		SLC12A2	064651	509616	19172	N/A	
CBLB	114423	405772	3297	384938	25885	LGR6	133067	367278	11235	356247	30795	SLC12A2	064651	507791	19173	N/A	
CBLB	114423	438603	3298	409750	25886	LGR6	133067	255432	11236	255432	30796	SLC12A2	064651	502849	19174	N/A	
CBLB	114423	447441	3299	400949	25887	LGR6	133067	487787	11237	422143	30797	SLC12A2	064651	628403	19175	486323	35718
CBLB	114423	443752	3300	393906	25888	LGR6	133067	423542	11238	402284	30798	SLC12A3	070915	566786	19176	457552	35719
CBLN1	102924	219197	3301	219197	25889	LGR6	133067	439764	11239	387869	30799	SLC12A3	070915	438926	19177	402152	35720
CBLN1	102924	564786	3302	455718	25890	LGR6	133067	503519	11240	N/A		SLC12A3	070915	563236	19178	456149	35721
CBLN1	102924	536749	3303	444651	25891	LGR6	133067	308543	11241	N/A		SLC12A3	070915	262502	19179	262502	35722
CBLN2	141668	585159	3304	463771	25892	LGR6	133067	506931	11242	N/A		SLC12A3	070915	569002	19180	N/A	
CBLN2	141668	269503	3305	269503	25893	LHFPL6	183722	379589	11243	368908	30800	SLC12A3	070915	563352	19181	N/A	
CBLN2	141668	581425	3306	N/A		LHFPL6	183722	495922	11244	N/A		SLC12A4	124067	316341	19182	318557	35723
CBLN2	141668	584764	3307	464490	25894	LHFPL2	145685	515007	11245	425906	30801	SLC12A4	124067	572037	19183	461403	35724
CBLN2	141668	583651	3308	N/A		LHFPL2	145685	502722	11246	N/A		SLC12A4	124067	541864	19184	438334	35725
CBLN2	141668	581073	3309	462632	25895	LHFPL2	145685	503686	11247	N/A		SLC12A4	124067	576616	19185	458902	35726
CBLN2	141668	580889	3310	N/A		LHFPL2	145685	512759	11248	N/A		SLC12A4	124067	570802	19186	N/A	
CBLN2	141668	583570	3311	N/A		LHFPL2	145685	510949	11249	N/A		SLC12A4	124067	537830	19187	445962	35727
CBLN2	141668	582667	3312	N/A		LHFPL2	145685	515349	11250	N/A		SLC12A4	124067	570616	19188	463148	35728
CBLN3	139899	267406	3313	267406	25896	LHFPL2	145685	514587	11251	N/A		SLC12A4	124067	575857	19189	464660	35729
CBLN3	139899	555436	3314	450935	25897	LHFPL2	145685	380345	11252	369702	30802	SLC12A4	124067	573023	19190	N/A	
CBS	160200	461686	3315	N/A		LHFPL3	187416	424859	11253	393128	30803	SLC12A4	124067	576513	19191	N/A	
CBS	160200	398158	3316	381225	25898	LHFPL3	187416	401970	11254	385374	30804	SLC12A4	124067	572476	19192	N/A	
CBS	160200	398165	3317	381231	25899	LHX1	274577	634033	11255	N/A		SLC12A4	124067	574665	19193	N/A	
CBS	160200	359624	3318	352643	25900	LHX1	274577	620305	11256	484449	30805	SLC12A4	124067	572766	19194	N/A	
CBS	160200	352178	3319	344460	25901	LHX1	274577	631483	11257	N/A		SLC12A4	124067	573702	19195	N/A	
CBS	160200	451248	3320	402823	25902	LHX1	274577	631517	11258	N/A		SLC12A4	124067	576377	19196	458975	35730
CBS	160200	462349	3321	N/A		LHX1	274577	633397	11259	488248	30806	SLC12A4	124067	571299	19197	464168	35731
CBS	160200	491776	3322	N/A		LHX1	273706	619297	11260	N/A		SLC12A4	124067	572010	19198	N/A	
CBS	160200	458223	3323	408014	25903	LHX1	273706	614239	11261	477829	30807	SLC12A4	124067	576462	19199	N/A	
CBS	160200	430013	3324	405929	25904	LHX1	273706	619939	11262	N/A		SLC12A4	124067	422611	19200	395983	35732
CBS	160200	496485	3325	N/A		LHX1	273706	616237	11263	N/A		SLC12A5	124140	454036	19201	387694	35733
CBS	160200	486098	3326	N/A		LHX1	273706	621767	11264	481496	30808	SLC12A5	124140	628272	19202	486382	35734
CBS	160200	441030	3327	388235	25905	LHX5	089116	261731	11265	261731	30809	SLC12A5	124140	626701	19203	487372	35735
CBS	160200	470912	3328	N/A		LHX5	089116	557836	11266	N/A		SLC12A5	124140	428198	19204	N/A	
CBS	160200	465732	3329	N/A		LIMD1	144791	465039	11267	N/A		SLC12A5	124140	413737	19205	487291	35736
CBS	160200	488526	3330	N/A		LIMD1	144791	440097	11268	394537	30810	SLC12A5	124140	626695	19206	N/A	
CBS	160200	478709	3331	N/A		LIMD1	144791	273317	11269	273317	30811	SLC12A5	124140	608944	19207	476885	35737
CBWD6	215126	382436	3332	484049	25906	LIMD1	144791	474665	11270	N/A		SLC12A5	124140	622711	19208	N/A	
CBWD6	215126	611553	3333	N/A		LIMS2	072163	426981	11271	397253	30812	SLC12A5	124140	629054	19209	N/A	
CBWD6	215126	494538	3334	484231	25907	LIMS2	072163	469300	11272	N/A		SLC12A5	124140	625683	19210	N/A	
CBWD6	215126	617917	3335	N/A		LIMS2	072163	494613	11273	N/A		SLC12A5	124140	626937	19211	485953	35738
CBWD6	215126	613125	3336	N/A		LIMS2	072163	409286	11274	386252	30813	SLC12A5	124140	616202	19212	478369	35739
CBWD6	215126	610358	3337	N/A		LIMS2	072163	409754	11275	386345	30814	SLC12A5	124140	243964	19213	243964	35740
CBWD6	215126	622791	3338	N/A		LIMS2	072163	476932	11276	N/A		SLC12A5	124140	627290	19214	487449	35741
CBWD6	215126	486387	3339	480837	25908	LIMS2	072163	324938	11277	326888	30815	SLC12A5	124140	372315	19215	N/A	
CBWD6	215126	617722	3340	N/A		LIMS2	072163	484252	11278	N/A		SLC12A5	124140	539566	19216	446091	35742
CBWD6	215126	457288	3341	N/A		LIMS2	072163	466410	11279	N/A		SLC12A5	124140	636324	19217	N/A	
CBWD6	215126	467791	3342	480830	25909	LIMS2	072163	409455	11280	386383	30816	SLC12A5	124140	637831	19218	N/A	
CBWD6	215126	490294	3343	N/A		LIMS2	072163	355119	11281	347240	30817	SLC12A5	124140	637863	19219	N/A	
CBWD6	215126	610377	3344	N/A		LIMS2	072163	409808	11282	386637	30818	SLC12A5	124140	608594	19220	N/A	
CBWD6	215126	620776	3345	478412	25910	LIMS2	072163	410011	11283	387002	30819	SLC12A5	124140	626144	19221	N/A	
CBWD6	215126	613716	3346	482804	25911	LIMS2	072163	410038	11284	386570	30820	SLC12A5	124140	628413	19222	N/A	
CBWD6	215126	617933	3347	481300	25912	LIMS2	072163	545738	11285	443794	30821	SLC12A5	124140	637437	19223	490442	35743
CBWD6	215126	377391	3348	366608	25913	LIMS2	072163	413578	11286	388611	30822	SLC12A5	124140	616933	19224	477369	35744
CBWD6	215126	456520	3349	401079	25914	LIMS2	072163	409254	11287	386907	30823	SLC12A5	124140	616201	19225	484585	35745
CCBE1	183287	439986	3350	404464	25915	LIMS2	072163	582671	11288	N/A		SLC12A8	221955	430155	19226	415713	35746

CCBE1	183287	589116	3351	N/A		LIN28B	187772	345080	11289	344401	30824	SLC12A8	221955	393469	19227	377112	35747
CCBE1	183287	589419	3352	467710	25916	LIN28B	187772	637759	11290	490468	30825	SLC12A8	221955	473262	19228	419424	35748
CCBE1	183287	398179	3353	381241	25917	LIN28B	187772	635857	11291	489735	30826	SLC12A8	221955	465475	19229	N/A	
CCDC13	244607	479631	3354	N/A		LIN7A	111052	552864	11292	447488	30827	SLC12A8	221955	469902	19230	418783	35749
CCDC13	244607	496027	3355	N/A		LIN7A	111052	261203	11293	261203	30828	SLC12A8	221955	479352	19231	N/A	
CCDC13	244607	310232	3356	309836	25918	LIN7A	111052	549417	11294	448975	30829	SLC12A8	221955	483944	19232	N/A	
CCDC13	244607	466031	3357	N/A		LIN7A	111052	552093	11295	448891	30830	SLC12A8	221955	461616	19233	N/A	
CCDC13	244607	472921	3358	N/A		LINCMD1	225613	418518	11296	N/A		SLC12A8	221955	485954	19234	N/A	
CCDC13	244607	482100	3359	N/A		LINC00278	231535	444263	11297	N/A		SLC12A8	221955	479231	19235	N/A	
CCDC13	244607	479576	3360	N/A		LINC00278	231535	425031	11298	N/A		SLC12A8	221955	465777	19236	N/A	
CCDC13	244607	492806	3361	N/A		LINC00457	225179	440160	11299	N/A		SLC12A8	221955	495105	19237	N/A	
CCDC13	244607	435327	3362	N/A		LINC00457	225179	428706	11300	N/A		SLC12A8	221955	485849	19238	N/A	
CCDC146	135205	415750	3363	388649	25919	LINC00499	251372	502757	11301	N/A		SLC12A8	221955	479826	19239	420197	35750
CCDC146	135205	285871	3364	285871	25920	LINC00499	251372	507145	11302	N/A		SLC12A8	221955	462437	19240	418636	35751
CCDC146	135205	461882	3365	N/A		LINC00499	251372	515282	11303	N/A		SLC12A8	221955	481760	19241	N/A	
CCDC146	135205	415740	3366	N/A		LINC00499	251372	510736	11304	N/A		SLC13A5	141485	433363	19242	406220	35752
CCDC146	135205	461259	3367	N/A		LINC00844	237949	432535	11305	N/A		SLC13A5	141485	574580	19243	N/A	
CCDC146	135205	474733	3368	N/A		LINC00963	204054	454968	11306	N/A		SLC13A5	141485	293800	19244	293800	35753
CCDC146	135205	464021	3369	N/A		LINC00963	204054	444184	11307	N/A		SLC13A5	141485	381074	19245	370464	35754
CCDC146	135205	478101	3370	N/A		LINC00963	204054	608369	11308	N/A		SLC13A5	141485	573648	19246	459372	35755
CCDC146	135205	488998	3371	N/A		LINC00963	204054	419300	11309	N/A		SLC13A5	141485	570687	19247	460037	35756
CCDC152	198865	361970	3372	354888	25921	LINC00963	204054	423918	11310	N/A		SLC13A5	141485	572727	19248	N/A	
CCDC152	198865	388827	3373	373479	25922	LINC00963	204054	454635	11311	N/A		SLC13A5	141485	574824	19249	N/A	
CCDC155	161609	447857	3374	404220	25923	LINC00963	204054	625171	11312	N/A		SLC13A5	141485	572094	19250	461495	35757
CCDC155	161609	600895	3375	N/A		LINC00963	204054	624138	11313	N/A		SLC13A5	141485	572352	19251	461622	35758
CCDC155	161609	598730	3376	469367	25924	LINC00963	204054	624009	11314	N/A		SLC13A5	141485	576323	19252	N/A	
CCDC155	161609	596771	3377	N/A		LINC00963	204054	622972	11315	N/A		SLC13A5	141485	575230	19253	460903	35759
CCDC155	161609	596862	3378	N/A		LINC00963	204054	624390	11316	N/A		SLC14A1	141469	321925	19254	318546	35760
CCDC155	161609	597993	3379	470765	25925	LINC00963	204054	622680	11317	N/A		SLC14A1	141469	587601	19255	465029	35761
CCDC155	161609	593725	3380	N/A		LINC00963	204054	623185	11318	N/A		SLC14A1	141469	502059	19256	442180	35762
CCDC155	161609	594905	3381	468838	25926	LINC00963	204054	607931	11319	N/A		SLC14A1	141469	586951	19257	465702	35763
CCDC155	161609	595828	3382	471777	25927	LINC00963	204054	622120	11320	N/A		SLC14A1	141469	589322	19258	466273	35764
CCDC155	161609	594043	3383	469435	25928	LINC00963	204054	608272	11321	N/A		SLC14A1	141469	415427	19259	412309	35765
CCDC155	161609	600570	3384	470819	25929	LINC00963	204054	453213	11322	N/A		SLC14A1	141469	535474	19260	441998	35766
CCDC155	161609	596130	3385	N/A		LINC00963	204054	427778	11323	N/A		SLC14A1	141469	402943	19261	385320	35767
CCDC155	161609	593631	3386	N/A		LINC00963	204054	608669	11324	N/A		SLC14A1	141469	588179	19262	467898	35768
CCDC155	161609	593362	3387	N/A		LINC00963	204054	412141	11325	N/A		SLC14A1	141469	586056	19263	470055	35769
CCDC155	161609	596419	3388	N/A		LINC01032	234871	451690	11326	N/A		SLC14A1	141469	436407	19264	390637	35770
CCDC175	151838	553317	3389	N/A		LINC01158	233639	413121	11327	N/A		SLC14A1	141469	589891	19265	466093	35771
CCDC175	151838	537690	3390	453940	25930	LINC01158	233639	443988	11328	N/A		SLC14A1	141469	590246	19266	468763	35772
CCDC175	151838	556936	3391	N/A		LINC01158	233639	447876	11329	N/A		SLC14A1	141469	591943	19267	N/A	
CCDC175	151838	556996	3392	N/A		LINC01158	233639	458253	11330	N/A		SLC14A1	141469	586142	19268	470476	35773
CCDC175	151838	281581	3393	452964	25931	LINC01158	233639	454729	11331	N/A		SLC14A1	141469	589700	19269	465044	35774
CCDC180	197816	472746	3394	N/A		LINC01208	223715	434969	11332	N/A		SLC14A1	141469	590377	19270	465150	35775
CCDC180	197816	494917	3395	N/A		LINC01208	223715	421034	11333	N/A		SLC14A1	141469	591642	19271	N/A	
CCDC180	197816	460482	3396	N/A		LINC01515	228065	433152	11334	N/A		SLC14A1	141469	586854	19272	N/A	
CCDC180	197816	529487	3397	434727	25932	LINC01515	228065	601979	11335	N/A		SLC14A1	141469	591541	19273	N/A	
CCDC180	197816	528678	3398	N/A		LINC01515	228065	599409	11336	N/A		SLC14A1	141469	619403	19274	479595	35776
CCDC180	197816	530011	3399	N/A		LINC01515	228065	620859	11337	N/A		SLC14A2	132874	586448	19275	465953	35777
CCDC180	197816	471314	3400	N/A		LINC01515	228065	608678	11338	N/A		SLC14A2	132874	255226	19276	255226	35778
CCDC180	197816	527182	3401	N/A		LINC01515	228065	593568	11339	N/A		SLC14A2	132874	323329	19277	320689	35779
CCDC180	197816	483504	3402	N/A		LINC01515	228065	595269	11340	N/A		SLC15A2	163406	489711	19278	417085	35780
CCDC180	197816	526038	3403	N/A		LINC01515	228065	598092	11341	N/A		SLC15A2	163406	295605	19279	295605	35781
CCDC180	197816	534189	3404	N/A		LINC01515	228065	618687	11342	N/A		SLC15A2	163406	469013	19280	418704	35782
CCDC180	197816	530551	3405	N/A		LINC01515	228065	601389	11343	N/A		SLC15A2	163406	489886	19281	N/A	
CCDC180	197816	487976	3406	N/A		LINC01515	228065	598902	11344	N/A		SLC15A2	163406	489957	19282	N/A	
CCDC61	104983	596161	3407	N/A		LINC01515	228065	595737	11345	N/A		SLC15A2	163406	465060	19283	N/A	
CCDC61	104983	595338	3408	471454	25933	LINC01515	228065	601926	11346	N/A		SLC15A2	163406	469422	19284	N/A	
CCDC61	104983	594672	3409	469909	25934	LINC01515	228065	601888	11347	N/A		SLC16A10	112394	368851	19285	357844	35783

CCDC61	104983	596687	3410	469524	25935	LINC01515	228065	629716	11348	N/A		SLC16A10	112394	439288	19286	387501	35784
CCDC61	104983	599044	3411	N/A		LINC01515	228065	626101	11349	N/A		SLC16A10	112394	465319	19287	N/A	
CCDC61	104983	594087	3412	469466	25936	LINC01515	228065	626907	11350	N/A		SLC16A10	112394	419619	19288	399601	35785
CCDC61	104983	601763	3413	N/A		LINC01515	228065	596743	11351	N/A		SLC16A10	112394	368850	19289	357843	35786
CCDC61	104983	536603	3414	444279	25937	LINC01515	228065	594054	11352	N/A		SLC16A10	112394	612036	19290	483868	35787
CCDC80	091986	206423	3415	206423	25938	LINC01515	228065	600848	11353	N/A		SLC17A4	146039	377905	19291	367137	35788
CCDC80	091986	439685	3416	411814	25939	LINC01515	283079	634651	11354	N/A		SLC17A4	146039	439485	19292	391345	35789
CCDC80	091986	479368	3417	418188	25940	LINC01515	283079	634872	11355	N/A		SLC17A4	146039	397076	19293	380266	35790
CCDC80	091986	461431	3418	420123	25941	LINC01515	283079	635412	11356	N/A		SLC17A7	104888	221485	19294	221485	35791
CCDC80	091986	475181	3419	N/A		LINC01515	283079	635635	11357	N/A		SLC17A7	104888	600601	19295	470338	35792
CCDC80	091986	469554	3420	N/A		LINC01515	283079	634807	11358	N/A		SLC17A7	104888	600672	19296	N/A	
CCDC80	091986	473959	3421	N/A		LINC01515	283079	634663	11359	N/A		SLC17A7	104888	596689	19297	472086	35793
CCDC80	091986	480275	3422	N/A		LINC01515	283079	634943	11360	N/A		SLC17A7	104888	598018	19298	N/A	
CCDC85A	055813	407595	3423	384040	25942	LINC01515	283079	635203	11361	N/A		SLC19A1	173638	417954	19299	393988	35794
CCDC88A	115355	336838	3424	338728	25943	LINC01515	283079	634292	11362	N/A		SLC19A1	173638	567670	19300	457278	35795
CCDC88A	115355	263630	3425	263630	25944	LINC01515	283079	634289	11363	N/A		SLC19A1	173638	461785	19301	N/A	
CCDC88A	115355	444458	3426	413401	25945	LINC01515	283079	635024	11364	N/A		SLC19A1	173638	468508	19302	N/A	
CCDC88A	115355	412148	3427	390012	25946	LINC01515	283079	634792	11365	N/A		SLC19A1	173638	460174	19303	N/A	
CCDC88A	115355	426576	3428	405080	25947	LINC01515	283079	634691	11366	N/A		SLC19A1	173638	311124	19304	308895	35796
CCDC88A	115355	456975	3429	415267	25948	LINC01515	283079	635204	11367	N/A		SLC19A1	173638	380010	19305	369347	35797
CCDC88A	115355	474059	3430	N/A		LINC01515	283079	635232	11368	N/A		SLC19A1	173638	485649	19306	441772	35798
CCDC88A	115355	476903	3431	N/A		LINC01515	283079	634685	11369	N/A		SLC19A1	173638	427839	19307	401850	35799
CCDC88A	115355	468534	3432	N/A		LINC01515	283079	634668	11370	N/A		SLC19A1	173638	443742	19308	411345	35800
CCDC88A	115355	430086	3433	399237	25949	LINC01515	283079	634507	11371	N/A		SLC19A1	173638	486303	19309	N/A	
CCDC88A	115355	471947	3434	N/A		LINC01515	283079	635143	11372	N/A		SLC19A1	173638	528477	19310	435780	35801
CCDC88A	115355	413716	3435	404431	25950	LINC01515	283079	635709	11373	N/A		SLC19A2	117479	236137	19311	236137	35802
CCDC88A	115355	621814	3436	480931	25951	LINC01544	260440	567801	11374	N/A		SLC19A2	117479	367804	19312	356778	35803
CCDC88A	115355	436346	3437	410608	25952	LINGO1	169783	355300	11375	347451	30831	SLC1A1	106688	262352	19313	262352	35804
CCK	187094	334681	3438	335657	25953	LINGO1	169783	561030	11376	453853	30832	SLC1A1	106688	490167	19314	N/A	
CCK	187094	396169	3439	379472	25954	LINGO1	169783	557798	11377	453780	30833	SLC1A1	106688	422398	19315	414620	35805
CCK	187094	434608	3440	409124	25955	LINGO1	169783	561686	11378	455605	30834	SLC1A4	115902	493121	19316	N/A	
CCK	187094	484359	3441	N/A		LINGO1	169783	567726	11379	454465	30835	SLC1A4	115902	471551	19317	N/A	
CCKBR	110148	334619	3442	335544	25956	LINGO1	169783	566711	11380	454687	30836	SLC1A4	115902	531327	19318	431942	35806
CCKBR	110148	532715	3443	432079	25957	LINGO1	169783	559893	11381	454051	30837	SLC1A4	115902	234256	19319	234256	35807
CCKBR	110148	525014	3444	437001	25958	LINGO1	169783	564472	11382	454245	30838	SLC1A4	115902	480594	19320	N/A	
CCKBR	110148	531712	3445	435675	25959	LINGO1	169783	570216	11383	454577	30839	SLC1A6	105143	430939	19321	409386	35808
CCKBR	110148	525462	3446	435534	25960	LINGO1	169783	562933	11384	456516	30840	SLC1A6	105143	221742	19322	221742	35809
CCKBR	110148	532396	3447	N/A		LINGO1	169783	563316	11385	457101	30841	SLC1A6	105143	600144	19323	471038	35810
CCM2L	101331	262659	3448	262659	25961	LINGO1	169783	567605	11386	N/A		SLC1A6	105143	598504	19324	471781	35811
CCM2L	101331	452892	3449	392448	25962	LINGO1	169783	568951	11387	N/A		SLC1A6	105143	544886	19325	446175	35812
CCND1	110092	227507	3450	227507	25963	LINGO1	169783	564066	11388	N/A		SLC1A6	105143	596697	19326	N/A	
CCND1	110092	539241	3451	N/A		LINGO2	174482	379992	11389	369328	30842	SLC1A6	105143	597262	19327	471562	35813
CCND1	110092	536559	3452	438482	25964	LINGO2	174482	493941	11390	N/A		SLC1A6	105143	599636	19328	472837	35814
CCND1	110092	535993	3453	N/A		LINGO2	174482	613945	11391	479634	30843	SLC1A6	105143	595863	19329	469551	35815
CCND1	110092	545484	3454	N/A		LINGO2	174482	308675	11392	310126	30844	SLC1A6	105143	601761	19330	471129	35816
CCND1	110092	542367	3455	N/A		LIPG	101670	577628	11393	463835	30845	SLC1A6	105143	594383	19331	472133	35817
CCND2	118971	261254	3456	261254	25965	LIPG	101670	583083	11394	463077	30846	SLC20A1	144136	272542	19332	272542	35818
CCND2	118971	536537	3457	442807	25966	LIPG	101670	261292	11395	261292	30847	SLC20A1	144136	423633	19333	392050	35819
CCND2	118971	536795	3458	N/A		LIPG	101670	427224	11396	387978	30848	SLC20A1	144136	498224	19334	N/A	
CCND2	118971	541542	3459	N/A		LIPG	101670	580036	11397	462420	30849	SLC20A1	144136	433924	19335	390021	35820
CCNH	134480	505587	3460	N/A		LIPG	101670	579750	11398	462480	30850	SLC20A1	144136	456264	19336	403763	35821
CCNH	134480	510921	3461	N/A		LIPG	101670	623277	11399	N/A		SLC20A1	144136	413135	19337	413393	35822
CCNH	134480	508855	3462	426454	25967	LITAF	189067	571688	11400	459533	30851	SLC20A1	144136	480984	19338	N/A	
CCNH	134480	256897	3463	256897	25968	LITAF	189067	413364	11401	397958	30852	SLC20A1	144136	492076	19339	N/A	
CCNH	134480	504878	3464	426075	25969	LITAF	189067	339430	11402	340118	30853	SLC20A1	144136	490674	19340	N/A	
CCNH	134480	511207	3465	N/A		LITAF	189067	570904	11403	459138	30854	SLC22A15	163393	369503	19341	358515	35823
CCNH	134480	504115	3466	N/A		LITAF	189067	571459	11404	459603	30855	SLC22A15	163393	369502	19342	358514	35824
CCNH	134480	513499	3467	N/A		LITAF	189067	575426	11405	459094	30856	SLC22A15	163393	481127	19343	N/A	
CCNH	134480	510020	3468	N/A		LITAF	189067	573332	11406	460873	30857	SLC22A23	137266	436008	19344	410245	35825

CCNH	134480	505230	3469	N/A		LITAF	189067	572255	11407	458836	30858	SLC22A23	137266	406686	19345	385028	35826
CD101	134256	369470	3470	358482	25970	LITAF	189067	576036	11408	461667	30859	SLC22A23	137266	497691	19346	417737	35827
CD101	134256	467588	3471	N/A		LITAF	189067	574763	11409	461813	30860	SLC22A23	137266	380302	19347	369657	35828
CD101	134256	460180	3472	N/A		LITAF	189067	571627	11410	460743	30861	SLC22A23	137266	490273	19348	419463	35829
CD101	134256	256652	3473	256652	25971	LITAF	189067	570798	11411	458871	30862	SLC22A23	137266	482874	19349	N/A	
CD27	139193	266557	3474	266557	25972	LITAF	189067	574701	11412	458981	30863	SLC22A23	137266	485307	19350	418134	35830
CD27	139193	541233	3475	N/A		LITAF	189067	571976	11413	460133	30864	SLC22A23	137266	467177	19351	418985	35831
CD33	105383	436584	3476	403331	25973	LITAF	189067	574703	11414	459913	30865	SLC22A23	137266	467144	19352	N/A	
CD33	105383	421133	3477	410126	25974	LITAF	189067	574848	11415	459898	30866	SLC22A23	137266	496753	19353	N/A	
CD33	105383	391796	3478	375673	25975	LITAF	189067	571277	11416	459026	30867	SLC22A23	137266	433689	19354	N/A	
CD33	105383	262262	3479	262262	25976	LITAF	189067	576334	11417	458538	30868	SLC22A23	137266	380298	19355	369653	35832
CD33	105383	601785	3480	N/A		LITAF	189067	620789	11418	481589	30869	SLC22A4	197208	200652	19356	200652	35833
CD33	105383	598473	3481	N/A		LITAF	189067	622633	11419	483114	30870	SLC22A4	197208	491257	19357	N/A	
CD33	105383	600557	3482	N/A		LITAF	189067	381810	11420	371231	30871	SLC22A4	197208	425923	19358	N/A	
CD70	125726	423145	3483	395294	25977	LMCD1	071282	157600	11421	157600	30872	SLC22A6	197901	540654	19359	445946	35834
CD70	125726	245903	3484	245903	25978	LMCD1	071282	426878	11422	411222	30873	SLC22A6	197901	360421	19360	353597	35835
CD70	125726	597430	3485	470805	25979	LMCD1	071282	415597	11423	400555	30874	SLC22A6	197901	377871	19361	367102	35836
CD74	019582	377795	3486	367026	25980	LMCD1	071282	470776	11424	N/A		SLC22A6	197901	458333	19362	396401	35837
CD74	019582	353334	3487	230685	25981	LMCD1	071282	454244	11425	396515	30875	SLC22A6	197901	421062	19363	404441	35838
CD74	019582	518797	3488	430614	25982	LMCD1	071282	456506	11426	405049	30876	SLC22A6	197901	537349	19364	N/A	
CD74	019582	524315	3489	429024	25983	LMCD1	071282	397386	11427	380542	30877	SLC22A8	149452	539841	19365	N/A	
CD74	019582	009530	3490	009530	25984	LMNTD2	275873	632043	11428	N/A		SLC22A8	149452	336232	19366	337335	35839
CD74	019582	523208	3491	430654	25985	LMNTD2	275873	621319	11429	478197	30878	SLC22A8	149452	451262	19367	N/A	
CD74	019582	517752	3492	N/A		LMNTD2	275873	631419	11430	488238	30879	SLC22A8	149452	545207	19368	441658	35840
CD74	019582	522246	3493	429641	25986	LMNTD2	275873	633856	11431	488391	30880	SLC22A8	149452	535878	19369	443368	35841
CD74	019582	523813	3494	429478	25987	LMNTD2	275873	631522	11432	N/A		SLC22A8	149452	311438	19370	311463	35842
CD74	019582	523836	3495	N/A		LMNTD2	185522	469990	11433	N/A		SLC22A8	149452	430500	19371	398548	35843
CD74	019582	517791	3496	N/A		LMNTD2	185522	329451	11434	331167	30881	SLC22A8	149452	542795	19372	N/A	
CD74	019582	522153	3497	N/A		LMNTD2	185522	441853	11435	393529	30882	SLC22A8	149452	542904	19373	N/A	
CD82	085117	526958	3498	435682	25988	LMNTD2	185522	486629	11436	435529	30883	SLC22A8	149452	544707	19374	N/A	
CD82	085117	227155	3499	227155	25989	LMNTD2	185522	492515	11437	N/A		SLC24A3	185052	328041	19375	333519	35844
CD82	085117	342935	3500	339686	25990	LMO2	135363	464025	11438	N/A		SLC24A3	185052	613834	19376	482967	35845
CD82	085117	532544	3501	431767	25991	LMO2	135363	411482	11439	401967	30884	SLC24A4	140090	393265	19377	376948	35846
CD82	085117	529277	3502	N/A		LMO2	135363	395833	11440	379175	30885	SLC24A4	140090	531433	19378	433302	35847
CD82	085117	525210	3503	435661	25992	LMO2	135363	257818	11441	257818	30886	SLC24A4	140090	532405	19379	431840	35848
CD82	085117	525898	3504	N/A		LMO2	135363	465614	11442	N/A		SLC24A4	140090	554461	19380	452099	35849
CD82	085117	527737	3505	433151	25993	LMO2	135363	493667	11443	N/A		SLC24A4	140090	525557	19381	432464	35850
CD82	085117	524704	3506	436403	25994	AC027575.2	264278	585258	11444	N/A		SLC24A4	140090	554925	19382	N/A	
CD82	085117	525813	3507	433804	25995	AL691447.2	232063	454869	11445	N/A		SLC24A4	140090	556739	19383	N/A	
CD82	085117	529853	3508	N/A		RPL13	167526	311528	11446	307889	30887	SLC24A4	140090	526482	19384	N/A	
CD82	085117	530601	3509	433788	25996	RPL13	167526	491523	11447	N/A		SLC25A18	182902	327451	19385	329033	35851
CD82	085117	530931	3510	N/A		RPL13	167526	563749	11448	N/A		SLC25A18	182902	399813	19386	382710	35852
CD82	085117	524750	3511	433036	25997	RPL13	167526	484610	11449	N/A		SLC25A18	182902	496051	19387	N/A	
CD83	112149	379153	3512	368450	25998	RPL13	167526	563270	11450	457686	30888	SLC25A18	182902	467228	19388	N/A	
CD83	112149	612003	3513	480760	25999	RPL13	167526	567815	11451	455009	30889	SLC25A18	182902	497401	19389	N/A	
CD9	010278	382518	3514	371958	26000	RPL13	167526	487034	11452	N/A		SLC25A18	182902	469889	19390	N/A	
CD9	010278	543916	3515	N/A		RPL13	167526	562879	11453	457174	30890	SLC25A29	197119	359232	19391	352167	35853
CD9	010278	536586	3516	440985	26001	RPL13	167526	565571	11454	N/A		SLC25A29	197119	554912	19392	450913	35854
CD9	010278	382519	3517	371959	26002	RPL13	167526	452368	11455	438959	30891	SLC25A29	197119	392908	19393	376640	35855
CD9	010278	546073	3518	N/A		RPL13	167526	467736	11456	464612	30892	SLC25A29	197119	556505	19394	452446	35856
CD9	010278	538834	3519	N/A		RPL13	167526	393099	11457	376811	30893	SLC25A29	197119	555927	19395	452078	35857
CD9	010278	538418	3520	N/A		RPL13	167526	399461	11458	N/A		SLC25A29	197119	554224	19396	451573	35858
CD9	010278	009180	3521	009180	26003	RPL13	167526	570149	11459	N/A		SLC25A29	197119	556715	19397	451952	35859
CD9	010278	382515	3522	371955	26004	RPL13	167526	472354	11460	462380	30894	SLC25A29	197119	554291	19398	452324	35860
CD9	010278	481267	3523	N/A		TEX52	283297	637658	11461	489863	30895	SLC25A29	197119	554060	19399	451644	35861
CD9	010278	540891	3524	N/A		TEX52	283297	637658	11462	489863	30896	SLC25A29	197119	556868	19400	451808	35862
CD9	010278	610354	3525	478288	26005	AC006213.2	267058	587128	11463	N/A		SLC25A29	197119	555475	19401	N/A	
CDADC1	102543	251108	3526	251108	26006	AC006213.2	267058	591815	11464	N/A		SLC25A29	197119	553359	19402	N/A	
CDADC1	102543	496952	3527	N/A		LINC02398	256287	536666	11465	N/A		SLC25A29	197119	556873	19403	N/A	

CDADC1	102543	496061	3528	434135	26007	PRSS51	253649	523024	11466	N/A		SLC25A29	197119	553574	19404	N/A	
CDADC1	102543	466868	3529	N/A		PRSS51	253649	521149	11467	N/A		SLC25A29	197119	555051	19405	N/A	
CDADC1	102543	484126	3530	434986	26008	PRSS51	253649	636217	11468	490515	30897	SLC25A29	197119	555949	19406	N/A	
CDADC1	102543	429346	3531	389571	26009	PRSS51	253649	637190	11469	490582	30898	SLC25A29	197119	557438	19407	N/A	
CDC14B	081377	474602	3532	417897	26010	SPRY4-AS1	231185	510311	11470	N/A		SLC25A29	197119	555888	19408	N/A	
CDC14B	081377	412285	3533	413940	26011	SPRY4-AS1	231185	515288	11471	N/A		SLC25A29	197119	556201	19409	N/A	
CDC14B	081377	375241	3534	364389	26012	SPRY4-AS1	231185	514303	11472	N/A		SLC25A29	197119	556844	19410	N/A	
CDC14B	081377	375240	3535	364388	26013	SPRY4-AS1	231185	443800	11473	N/A		SLC25A3	075415	401722	19411	383898	35863
CDC14B	081377	375242	3536	364390	26014	SPRY4-AS1	231185	425963	11474	N/A		SLC25A3	075415	188376	19412	188376	35864
CDC14B	081377	463569	3537	420572	26015	SPRY4-AS1	231185	414314	11475	N/A		SLC25A3	075415	551917	19413	447310	35865
CDC14B	081377	481149	3538	N/A		AC010230.1	246316	514115	11476	N/A		SLC25A3	075415	546766	19414	N/A	
CDC14B	081377	452280	3539	396951	26016	AC010230.1	246316	506265	11477	N/A		SLC25A3	075415	548046	19415	447339	35866
CDC14B	081377	415608	3540	400480	26017	LINC02405	249345	512624	11478	N/A		SLC25A3	075415	552981	19416	448708	35867
CDC14B	081377	480920	3541	N/A		LINC02405	249345	540244	11479	N/A		SLC25A3	075415	551265	19417	448969	35868
CDC14B	081377	496750	3542	N/A		LINC02405	249345	546062	11480	N/A		SLC25A3	075415	550695	19418	449479	35869
CDC14B	081377	463547	3543	N/A		AC074035.1	236513	420725	11481	N/A		SLC25A3	075415	547534	19419	449793	35870
CDC14B	081377	484948	3544	N/A		LINC02125	250514	512279	11482	N/A		SLC25A3	075415	549338	19420	447740	35871
CDC42EP1	128283	249014	3545	249014	26018	AC012349.1	254254	518662	11483	N/A		SLC25A3	075415	551123	19421	449009	35872
CDC42EP1	128283	430687	3546	411682	26019	AC012349.1	254254	522511	11484	N/A		SLC25A3	075415	548847	19422	449166	35873
CDC42EP1	128283	415670	3547	405006	26020	AL451060.1	226251	443448	11485	N/A		SLC25A3	075415	547908	19423	N/A	
CDC42EP1	128283	434728	3548	403710	26021	AL451060.1	226251	412221	11486	N/A		SLC25A3	075415	547444	19424	N/A	
CDC42EP3	163171	295324	3549	295324	26022	AL451060.1	226251	431307	11487	N/A		SLC25A3	075415	548480	19425	N/A	
CDC42EP3	163171	457889	3550	403298	26023	AC104123.1	251314	502645	11488	N/A		SLC25A3	075415	547869	19426	N/A	
CDC42EP3	163171	453555	3551	398062	26024	AC104123.1	251314	511775	11489	N/A		SLC25A3	075415	228318	19427	228318	35874
CDC42EP3	163171	422687	3552	409147	26025	AC104123.1	251314	513158	11490	N/A		SLC25A33	171612	302692	19428	306328	35875
CDC42EP3	163171	494083	3553	N/A		AC002985.2	269019	601106	11491	N/A		SLC25A6	169100	381401	19429	370808	35876
CDC42EP3	163171	611976	3554	480549	26026	AC022639.1	253554	523191	11492	N/A		SLC25A6	169100	475167	19430	N/A	
CDC42EP4	179604	335793	3555	338258	26027	AC022639.1	253554	524360	11493	N/A		SLC25A6	169100	484026	19431	N/A	
CDC42EP4	179604	439510	3556	404270	26028	AC022639.1	253554	521958	11494	N/A		SLC26A3	091138	379083	19432	368375	35877
CDC42EP4	179604	581014	3557	464104	26029	AC022639.1	253554	520365	11495	N/A		SLC26A3	091138	340010	19433	345873	35878
CDC42EP4	179604	580315	3558	462231	26030	AC109927.1	250195	505607	11496	N/A		SLC26A3	091138	469651	19434	N/A	
CDC42EP4	179604	579611	3559	463877	26031	AC109927.1	250195	511951	11497	N/A		SLC26A3	091138	468551	19435	N/A	
CDC42EP4	179604	581045	3560	N/A		AC109927.1	250195	507038	11498	N/A		SLC26A3	091138	453332	19436	395955	35879
CDC42EP4	179604	582303	3561	N/A		BX248123.1	226676	421256	11499	N/A		SLC26A5	170615	339444	19437	342396	35880
CDC42EP4	179604	578516	3562	N/A		BX248123.1	226676	429070	11500	N/A		SLC26A5	170615	356767	19438	349210	35881
CDC42EP4	179604	630622	3563	485861	26032	LINC02112	249781	512976	11501	N/A		SLC26A5	170615	393735	19439	377336	35882
CDH1	039068	261769	3564	261769	26033	LINC02112	249781	511616	11502	N/A		SLC26A5	170615	445809	19440	396833	35883
CDH1	039068	566612	3565	454782	26034	LINC02112	249781	606744	11503	N/A		SLC26A5	170615	454864	19441	416502	35884
CDH1	039068	422392	3566	414946	26035	LINC02112	249781	606222	11504	N/A		SLC26A5	170615	393730	19442	377331	35885
CDH1	039068	566510	3567	458139	26036	LINC02112	249781	606169	11505	N/A		SLC26A5	170615	306312	19443	304783	35886
CDH1	039068	562836	3568	N/A		AC010210.1	250608	502521	11506	N/A		SLC26A5	170615	423416	19444	389018	35887
CDH1	039068	564676	3569	N/A		AC010210.1	250608	511699	11507	N/A		SLC26A5	170615	456463	19445	395568	35888
CDH1	039068	564745	3570	N/A		AC010210.1	250608	513905	11508	N/A		SLC26A5	170615	393729	19446	377330	35889
CDH1	039068	561751	3571	463170	26037	AC010210.1	250608	441345	11509	N/A		SLC26A5	170615	393727	19447	377328	35890
CDH1	039068	567320	3572	N/A		C3orf67	163689	486145	11510	421046	30899	SLC26A5	170615	393723	19448	377324	35891
CDH1	039068	565810	3573	N/A		C3orf67	163689	470454	11511	419245	30900	SLC26A5	170615	487407	19449	N/A	
CDH1	039068	562118	3574	N/A		C3orf67	163689	484535	11512	419949	30901	SLC26A5	170615	432958	19450	389733	35892
CDH1	039068	612417	3575	478360	26038	C3orf67	163689	460459	11513	417917	30902	SLC26A5	170615	354356	19451	346325	35893
CDH1	039068	621016	3576	480664	26039	C3orf67	163689	295966	11514	295966	30903	SLC26A8	112053	490799	19452	417638	35894
CDH1	039068	611625	3577	481063	26040	C3orf67	163689	482387	11515	417122	30904	SLC26A8	112053	466805	19453	N/A	
CDH10	040731	264463	3578	264463	26041	C3orf67	163689	468415	11516	419142	30905	SLC26A8	112053	394602	19454	378100	35895
CDH10	040731	502921	3579	N/A		C3orf67	163689	495572	11517	417881	30906	SLC26A8	112053	355574	19455	347778	35896
CDH10	040731	510477	3580	425653	26042	C3orf67	163689	472469	11518	417271	30907	SLC26A8	112053	465492	19456	418107	35897
CDH10	040731	503958	3581	N/A		C3orf67	163689	479931	11519	419028	30908	SLC26A8	112053	486155	19457	N/A	
CDH11	140937	394156	3582	377711	26043	C3orf67	163689	491845	11520	418832	30909	SLC26A8	112053	469847	19458	419700	35898
CDH11	140937	268603	3583	268603	26044	C3orf67	163689	471288	11521	417639	30910	SLC26A8	112053	480663	19459	420488	35899
CDH11	140937	566827	3584	457812	26045	C3orf67	163689	478363	11522	N/A		SLC27A6	113396	508645	19460	421759	35900
CDH11	140937	569095	3585	N/A		BX890604.1	205664	461011	11523	N/A		SLC27A6	113396	262462	19461	262462	35901
CDH11	140937	619158	3586	484650	26046	BX890604.1	205664	469903	11524	N/A		SLC27A6	113396	395266	19462	378684	35902

CDH11	140937	569128	3587	N/A		BX890604.1	205664	483854	11525	N/A		SLC27A6	113396	506176	19463	421024	35903
CDH11	140937	567934	3588	455779	26047	BX890604.1	205664	475317	11526	N/A		SLC2A10	197496	359271	19464	352216	35904
CDH11	140937	569624	3589	N/A		BX890604.1	205664	425492	11527	N/A		SLC2A10	197496	486000	19465	478679	35905
CDH11	140937	562998	3590	455420	26048	BX890604.1	205664	471090	11528	N/A		SLC2A10	197496	611837	19466	N/A	
CDH11	140937	564317	3591	456772	26049	BX890604.1	205664	486571	11529	N/A		SLC2A13	151229	280871	19467	280871	35906
CDH11	140937	562712	3592	455120	26050	BX890604.1	205664	490920	11530	N/A		SLC2A13	151229	465517	19468	N/A	
CDH11	140937	562882	3593	455697	26051	AL512625.3	234665	586625	11531	N/A		SLC2A13	151229	505338	19469	N/A	
CDH11	140937	562325	3594	456110	26052	AL512625.3	234665	591993	11532	N/A		SLC2A13	151229	380858	19470	370239	35907
CDH11	140937	568340	3595	N/A		AL512625.3	234665	445604	11533	N/A		SLC2A3	059804	075120	19471	075120	35908
CDH11	140937	565210	3596	N/A		AL512625.3	234665	438699	11534	N/A		SLC2A3	059804	543435	19472	N/A	
CDH11	140937	563492	3597	N/A		AL512625.3	234665	585533	11535	N/A		SLC2A3	059804	486749	19473	N/A	
CDH11	140937	563255	3598	N/A		AL512625.3	234665	612590	11536	N/A		SLC2A3	059804	469295	19474	N/A	
CDH11	140937	564770	3599	N/A		AL512625.3	234665	609749	11537	N/A		SLC2A3	059804	479059	19475	N/A	
CDH11	140937	569783	3600	N/A		KRTAP10-1	215455	400375	11538	383226	30911	SLC2A3	059804	490763	19476	N/A	
CDH13	140945	539548	3601	442225	26053	KRTAP10-10	221859	380095	11539	369438	30912	SLC2A3	059804	495813	19477	N/A	
CDH13	140945	566333	3602	N/A		KRTAP10-11	243489	334670	11540	334197	30913	SLC2A3	059804	544291	19478	440750	35909
CDH13	140945	569455	3603	N/A		KRTAP10-12	189169	400365	11541	383216	30914	SLC2A3	059804	544936	19479	441496	35910
CDH13	140945	567445	3604	456297	26054	KRTAP10-12	189169	618832	11542	482575	30915	SLC2A3	059804	476634	19480	N/A	
CDH13	140945	569454	3605	N/A		KRTAP10-2	205445	391621	11543	375479	30916	SLC2A3	059804	541671	19481	N/A	
CDH13	140945	562307	3606	N/A		KRTAP10-2	205445	498210	11544	N/A		SLC2A4	181856	317370	19482	320935	35911
CDH13	140945	567109	3607	479395	26055	KRTAP10-3	212935	391620	11545	375478	30917	SLC2A4	181856	572485	19483	461086	35912
CDH13	140945	268613	3608	268613	26056	KRTAP10-4	215454	400374	11546	383225	30918	SLC2A4	181856	571308	19484	459864	35913
CDH13	140945	569144	3609	457914	26057	KRTAP10-4	215454	622352	11547	484068	30919	SLC2A4	181856	570783	19485	459056	35914
CDH13	140945	562601	3610	455781	26058	KRTAP10-4	215454	616689	11548	481165	30920	SLC2A4	181856	424875	19486	396887	35915
CDH13	140945	568770	3611	457149	26059	KRTAP10-5	241123	400372	11549	383223	30921	SLC30A3	115194	497341	19487	N/A	
CDH13	140945	565636	3612	456491	26060	KRTAP10-6	188155	400368	11550	383219	30922	SLC30A3	115194	482990	19488	N/A	
CDH13	140945	431540	3613	408632	26061	KRTAP10-7	272804	609664	11551	476821	30923	SLC30A3	115194	233535	19489	233535	35916
CDH13	140945	428848	3614	394557	26062	KRTAP10-8	187766	334662	11552	335565	30924	SLC30A3	115194	445870	19490	388219	35917
CDH15	129910	521087	3615	N/A		KRTAP10-9	221837	397911	11553	381009	30925	SLC30A3	115194	432351	19491	414320	35918
CDH15	129910	524089	3616	N/A		KRTAP10-9	221837	484861	11554	N/A		SLC30A3	115194	426924	19492	393545	35919
CDH15	129910	289746	3617	289746	26063	KRTAP10-9	221837	616529	11555	477523	30926	SLC30A3	115194	424577	19493	403959	35920
CDH19	071991	262150	3618	262150	26064	LONRF2	170500	393437	11556	377086	30927	SLC30A3	115194	486309	19494	N/A	
CDH19	071991	579658	3619	463085	26065	LONRF2	170500	409647	11557	386823	30928	SLC30A3	115194	450118	19495	403912	35921
CDH19	071991	540086	3620	439593	26066	LOXL2	134013	389131	11558	373783	30929	SLC30A3	115194	426569	19496	392673	35922
CDH19	071991	454642	3621	401998	26067	LOXL2	134013	520617	11559	N/A		SLC31A2	136867	259392	19497	259392	35923
CDH19	071991	580157	3622	464477	26068	LOXL2	134013	523833	11560	473322	30930	SLC31A2	136867	490809	19498	N/A	
CDH2	170558	269141	3623	269141	26069	LOXL2	134013	520349	11561	427907	30931	SLC31A2	136867	374220	19499	363337	35924
CDH2	170558	399380	3624	382312	26070	LOXL2	134013	518878	11562	427826	30932	SLC32A1	101438	217420	19500	217420	35925
CDH2	170558	418492	3625	411360	26071	LOXL2	134013	522446	11563	N/A		SLC35D1	116704	235345	19501	235345	35926
CDH2	170558	430882	3626	412120	26072	LOXL2	134013	519809	11564	N/A		SLC35F1	196376	360388	19502	353557	35927
CDH2	170558	413878	3627	414269	26073	LOXL2	134013	520925	11565	N/A		SLC35F1	196376	621341	19503	484738	35928
CDH23	107736	224721	3628	224721	26074	LOXL2	134013	518472	11566	N/A		SLC35F4	151812	556826	19504	452086	35929
CDH23	107736	461841	3629	473454	26075	LOXL2	134013	524144	11567	427883	30933	SLC35F4	151812	554729	19505	451990	35930
CDH23	107736	299366	3630	299366	26076	LOXL2	134013	520871	11568	429778	30934	SLC35F4	151812	557254	19506	450836	35931
CDH23	107736	616684	3631	482036	26077	LOXL2	134013	518083	11569	430519	30935	SLC35F4	151812	556306	19507	452196	35932
CDH23	107736	466757	3632	473539	26078	LOXL2	134013	524168	11570	428497	30936	SLC35F4	151812	557430	19508	N/A	
CDH23	107736	470494	3633	480146	26079	LOXL2	134013	519243	11571	428933	30937	SLC35F4	151812	556568	19509	N/A	
CDH23	107736	442677	3634	388894	26080	LOXL2	134013	524075	11572	N/A		SLC35F4	151812	554648	19510	N/A	
CDH23	107736	398792	3635	N/A		LPAR1	198121	374431	11573	363553	30938	SLC35F4	151812	339762	19511	342518	35933
CDH23	107736	475158	3636	N/A		LPAR1	198121	374430	11574	363552	30939	SLC38A1	111371	398637	19512	381634	35934
CDH23	107736	619887	3637	478374	26081	LPAR1	198121	358883	11575	351755	30940	SLC38A1	111371	549049	19513	449607	35935
CDH23	107736	398788	3638	381768	26082	LPAR1	198121	441240	11576	401810	30941	SLC38A1	111371	439706	19514	398142	35936
CDH23	107736	622827	3639	483211	26083	LPAR1	198121	541779	11577	445697	30942	SLC38A1	111371	546893	19515	447853	35937
CDH23	107736	398842	3640	381822	26084	LPCAT2	087253	262134	11578	262134	30943	SLC38A1	111371	552197	19516	449756	35938
CDH23	107736	398809	3641	381789	26085	LPCAT2	087253	566911	11579	N/A		SLC38A1	111371	548979	19517	N/A	
CDH26	124215	348616	3642	339390	26086	LPCAT2	087253	564084	11580	457496	30944	SLC38A1	111371	549633	19518	N/A	
CDH26	124215	477058	3643	N/A		LPCAT2	087253	566915	11581	N/A		SLC38A1	111371	551506	19519	N/A	
CDH26	124215	370991	3644	360030	26087	LPCAT2	087253	563095	11582	N/A		SLC38A1	111371	550173	19520	449744	35939
CDH26	124215	497614	3645	N/A		LPCAT2	087253	566375	11583	N/A		SLC38A1	111371	546519	19521	N/A	

CDH26	124215	244049	3646	244049	26088	LPCAT2	087253	565056	11584	N/A		SLC38A1	111371	612161	19522	478907	35940
CDH26	124215	350849	3647	310845	26089	LPCAT2	087253	562299	11585	N/A		SLC38A10	157637	374759	19523	363891	35941
CDH26	124215	456106	3648	407939	26090	LPCAT4	176454	314891	11586	317300	30945	SLC38A10	157637	539643	19524	N/A	
CDH4	280641	629889	3649	486680	26091	LPCAT4	176454	563748	11587	N/A		SLC38A10	157637	540966	19525	437601	35942
CDH4	280641	628489	3650	487355	26092	LPCAT4	176454	567507	11588	454422	30946	SLC38A10	157637	576151	19526	458273	35943
CDH4	280641	625686	3651	486568	26093	LPCAT4	176454	563240	11589	N/A		SLC38A10	157637	542075	19527	N/A	
CDH4	179242	614565	3652	484928	26094	LPCAT4	176454	562404	11590	N/A		SLC38A10	157637	573058	19528	N/A	
CDH4	179242	611855	3653	480844	26095	LPCAT4	176454	566581	11591	N/A		SLC38A10	157637	288439	19529	288439	35944
CDH4	179242	543233	3654	443301	26096	LPCAT4	176454	623384	11592	N/A		SLC38A10	157637	546352	19530	N/A	
CDH7	081138	323011	3655	319166	26097	LPCAT4	176454	569804	11593	N/A		SLC38A10	157637	543204	19531	444523	35945
CDH7	081138	536984	3656	443030	26098	LPCAT4	176454	562431	11594	N/A		SLC38A10	157637	539748	19532	439115	35946
CDH7	081138	397968	3657	381058	26099	LPCAT4	176454	617710	11595	478003	30947	SLC38A10	157637	540233	19533	N/A	
CDH7	081138	581601	3658	N/A		LPL	175445	520959	11596	428496	30948	SLC38A5	017483	595796	19534	471683	35947
CDH8	150394	577730	3659	462018	26100	LPL	175445	524029	11597	428237	30949	SLC38A5	017483	619100	19535	478807	35948
CDH8	150394	585315	3660	463266	26101	LPL	175445	522701	11598	428557	30950	SLC38A5	017483	497336	19536	N/A	
CDH8	150394	577390	3661	462701	26102	LPL	175445	311322	11599	309757	30951	SLC38A5	017483	615300	19537	N/A	
CDH8	150394	299345	3662	299345	26103	LPL	175445	519773	11600	431028	30952	SLC38A5	017483	480105	19538	N/A	
CDH8	150394	583483	3663	N/A		LPL	175445	521994	11601	N/A		SLC38A5	017483	494034	19539	482638	35949
CDH8	150394	580044	3664	N/A		LPL	175445	523696	11602	N/A		SLC38A5	017483	440085	19540	402988	35950
CDH8	150394	577536	3665	N/A		LPP	145012	448637	11603	393602	30953	SLC38A5	017483	441948	19541	407258	35951
CDH8	150394	584337	3666	463511	26104	LPP	145012	416784	11604	410340	30954	SLC38A5	017483	413668	19542	403976	35952
CDH8	150394	582242	3667	N/A		LPP	145012	430340	11605	397166	30955	SLC38A5	017483	416711	19543	389644	35953
CDH8	150394	583382	3668	462976	26105	LPP	145012	414139	11606	392667	30956	SLC38A5	017483	488083	19544	483716	35954
CDH8	150394	584966	3669	N/A		LPP	145012	454789	11607	394257	30957	SLC38A5	017483	429543	19545	416948	35955
CDH8	150394	577228	3670	N/A		LPP	145012	426274	11608	397017	30958	SLC38A5	017483	620913	19546	481291	35956
CDH8	150394	584506	3671	462847	26106	LPP	145012	420410	11609	405138	30959	SLC38A5	017483	622196	19547	484236	35957
CDH8	150394	582980	3672	N/A		LPP	145012	443217	11610	404679	30960	SLC38A7	103042	570101	19548	454646	35958
CDHR1	148600	623527	3673	485478	26107	LPP	145012	618621	11611	482617	30961	SLC38A7	103042	219320	19549	219320	35959
CDHR1	148600	332904	3674	331063	26108	LPP	145012	457242	11612	403825	30962	SLC38A7	103042	564100	19550	454325	35960
CDHR1	148600	372117	3675	361189	26109	LPP	145012	494233	11613	N/A		SLC38A7	103042	566598	19551	455119	35961
CDHR1	148600	624091	3676	485460	26110	LPP	145012	474472	11614	N/A		SLC38A7	103042	564010	19552	455362	35962
CDHR1	148600	622973	3677	485151	26111	LPP	145012	484468	11615	N/A		SLC38A7	103042	566953	19553	N/A	
CDHR1	148600	459673	3678	N/A		LPP	145012	462758	11616	N/A		SLC38A7	103042	562149	19554	N/A	
CDHR1	148600	623399	3679	485245	26112	LPP	145012	471917	11617	N/A		SLC38A7	103042	569209	19555	N/A	
CDK14	058091	449528	3680	393616	26113	LPP	145012	487347	11618	N/A		SLC38A7	103042	565785	19556	457988	35963
CDK14	058091	484035	3681	N/A		LPP	145012	415906	11619	393008	30963	SLC38A7	103042	570214	19557	456464	35964
CDK14	058091	446224	3682	410770	26114	LPP	145012	483938	11620	N/A		SLC38A7	103042	562397	19558	455490	35965
CDK14	058091	430760	3683	394570	26115	LPP	145012	494044	11621	N/A		SLC38A7	103042	563196	19559	454734	35966
CDK14	058091	456689	3684	406848	26116	LPP	145012	459897	11622	N/A		SLC38A7	103042	564391	19560	457462	35967
CDK14	058091	380050	3685	369390	26117	LPP	145012	640853	11623	491657	30964	SLC38A7	103042	564720	19561	N/A	
CDK14	058091	496279	3686	N/A		LPP	145012	617246	11624	478901	30965	SLC38A7	103042	567930	19562	N/A	
CDK14	058091	446790	3687	401603	26118	LRCH1	136141	311191	11625	308493	30966	SLC38A7	103042	564964	19563	N/A	
CDK14	058091	265741	3688	265741	26119	LRCH1	136141	443945	11626	N/A		SLC39A12	148482	377374	19564	366591	35968
CDK14	058091	406263	3689	385034	26120	LRCH1	136141	389798	11627	374448	30967	SLC39A12	148482	377371	19565	366588	35969
CDK14	058091	431029	3690	387794	26121	LRCH1	136141	389797	11628	374447	30968	SLC39A12	148482	539911	19566	440445	35970
CDK14	058091	478540	3691	N/A		LRCH1	136141	463929	11629	417121	30969	SLC39A12	148482	377369	19567	366586	35971
CDK14	058091	487145	3692	N/A		LRCH1	136141	478412	11630	419256	30970	SLC41A1	133065	367137	19568	356105	35972
CDK14	058091	460493	3693	N/A		LRIG1	144749	273261	11631	273261	30971	SLC41A1	133065	468057	19569	N/A	
CDK14	058091	436577	3694	398936	26122	LRIG1	144749	383703	11632	373208	30972	SLC41A1	133065	484228	19570	N/A	
CDK15	138395	451080	3695	389831	26123	LRIG1	144749	496559	11633	N/A		SLC41A1	133065	484000	19571	N/A	
CDK15	138395	410091	3696	386901	26124	LRIG1	144749	495037	11634	N/A		SLC43A2	278550	634102	19572	488355	35973
CDK15	138395	493754	3697	N/A		LRIG1	144749	491821	11635	N/A		SLC43A2	278550	612931	19573	483848	35974
CDK15	138395	260967	3698	260967	26125	LRIG1	144749	497721	11636	N/A		SLC43A2	278550	382147	19574	371582	35975
CDK15	138395	488419	3699	N/A		LRIG1	144749	498287	11637	N/A		SLC43A2	278550	632441	19575	N/A	
CDK15	138395	450471	3700	406472	26126	LRIG1	144749	475366	11638	N/A		SLC43A2	278550	633495	19576	N/A	
CDK15	138395	434439	3701	412775	26127	LRIG1	144749	495671	11639	N/A		SLC43A2	278550	616586	19577	N/A	
CDK15	138395	460149	3702	N/A		LRIG1	282243	631853	11640	488729	30973	SLC43A2	278550	632428	19578	N/A	
CDK15	138395	466337	3703	N/A		LRIG1	282243	633161	11641	488182	30974	SLC43A2	278550	633994	19579	488706	35976
CDK16	102225	517997	3704	N/A		LRIG1	282243	632666	11642	N/A		SLC43A2	278550	634196	19580	N/A	

CDK16	102225	517479	3705	N/A		LRIG1	282243	632591	11643	N/A		SLC43A2	278550	633255	19581	487944	35977
CDK16	102225	457458	3706	405798	26128	LRIG1	282243	631562	11644	N/A		SLC43A2	278550	631603	19582	487841	35978
CDK16	102225	522883	3707	431085	26129	LRIG1	282243	631537	11645	N/A		SLC43A2	278550	632084	19583	N/A	
CDK16	102225	520295	3708	430966	26130	LRIG1	282243	633144	11646	N/A		SLC43A2	278550	613070	19584	484291	35979
CDK16	102225	357227	3709	349762	26131	LRIG1	282243	631476	11647	N/A		SLC43A2	167703	301335	19585	301335	35980
CDK16	102225	519758	3710	429259	26132	LRIG1	282243	631776	11648	N/A		SLC43A2	167703	571650	19586	461382	35981
CDK16	102225	520893	3711	428351	26133	LRP1	123384	553277	11649	451449	30975	SLC43A2	167703	412517	19587	408284	35982
CDK16	102225	517426	3712	429985	26134	LRP1	123384	243077	11650	243077	30976	SLC43A2	167703	576537	19588	N/A	
CDK16	102225	522234	3713	N/A		LRP1	123384	338962	11651	341264	30977	SLC43A2	167703	576769	19589	N/A	
CDK16	102225	518391	3714	429044	26135	LRP1	123384	554174	11652	451737	30978	SLC43A2	167703	572135	19590	N/A	
CDK16	102225	428400	3715	N/A		LRP1	123384	556830	11653	N/A		SLC43A2	167703	574743	19591	N/A	
CDK16	102225	518022	3716	429751	26136	LRP1	123384	553446	11654	N/A		SLC43A2	167703	572801	19592	461298	35983
CDK16	102225	523034	3717	430486	26137	LRP1	123384	554118	11655	451622	30979	SLC43A2	167703	574274	19593	N/A	
CDK16	102225	523344	3718	428349	26138	LRP1	123384	555941	11656	N/A		SLC43A2	167703	576721	19594	460388	35984
CDK16	102225	523699	3719	N/A		LRP1	123384	555124	11657	451012	30980	SLC43A2	167703	571376	19595	461553	35985
CDK16	102225	523543	3720	N/A		LRP1	123384	556247	11658	N/A		SLC43A2	167703	575944	19596	N/A	
CDK16	102225	493213	3721	N/A		LRP1	123384	451724	11659	N/A		SLC43A3	134802	625097	19597	N/A	
CDK16	102225	520141	3722	430988	26139	LRP1	123384	556356	11660	N/A		SLC43A3	134802	395123	19598	378555	35986
CDK16	102225	462827	3723	430824	26140	LRP1B	168702	389484	11661	374135	30981	SLC43A3	134802	395124	19599	378556	35987
CDK16	102225	462483	3724	N/A		LRP1B	168702	437977	11662	415052	30982	SLC43A3	134802	352187	19600	337561	35988
CDK16	102225	276052	3725	276052	26141	LRP1B	168702	442974	11663	393859	30983	SLC43A3	134802	529554	19601	436254	35989
CDK16	102225	622098	3726	482886	26142	LRP1B	168702	434794	11664	413239	30984	SLC43A3	134802	525205	19602	433078	35990
CDK18	117266	429964	3727	399082	26143	LRP1B	168702	486364	11665	N/A		SLC43A3	134802	533524	19603	434515	35991
CDK18	117266	512922	3728	422470	26144	LRP2	081479	263816	11666	263816	30985	SLC43A3	134802	530005	19604	435893	35992
CDK18	117266	504648	3729	425036	26145	LRP2	081479	491228	11667	N/A		SLC43A3	134802	528098	19605	N/A	
CDK18	117266	506784	3730	423665	26146	LRP2	081479	461418	11668	N/A		SLC43A3	134802	529113	19606	434293	35993
CDK18	117266	360066	3731	353176	26147	LRP2	081479	443831	11669	409813	30986	SLC43A3	134802	525474	19607	436055	35994
CDK18	117266	507067	3732	N/A		LRP2	081479	493501	11670	N/A		SLC43A3	134802	529112	19608	434913	35995
CDK18	117266	462976	3733	422842	26148	LRPAP1	163956	500728	11671	421922	30987	SLC43A3	134802	526125	19609	N/A	
CDK18	117266	478560	3734	423408	26149	LRPAP1	163956	296325	11672	N/A		SLC43A3	134802	530232	19610	N/A	
CDK18	117266	443813	3735	397831	26150	LRPAP1	163956	515119	11673	421648	30988	SLC43A3	134802	528187	19611	435273	35996
CDK18	117266	506215	3736	426368	26151	LRPAP1	163956	509198	11674	N/A		SLC43A3	134802	529494	19612	433974	35997
CDK18	117266	419301	3737	391324	26152	LRRC1	137269	487251	11675	435217	30989	SLC43A3	134802	533245	19613	431762	35998
CDK18	117266	507240	3738	N/A		LRRC1	137269	370888	11676	359925	30990	SLC43A3	134802	533235	19614	435156	35999
CDK18	117266	515494	3739	425177	26153	LRRC1	137269	370882	11677	359919	30991	SLC43A3	134802	524863	19615	434569	36000
CDK18	117266	476153	3740	N/A		LRRC1	137269	490222	11678	N/A		SLC43A3	134802	532795	19616	435109	36001
CDK18	117266	505932	3741	N/A		LRRC2	163827	395905	11679	379241	30992	SLC43A3	134802	533051	19617	435490	36002
CDK18	117266	489617	3742	N/A		LRRC2	163827	296144	11680	296144	30993	SLC43A3	134802	529896	19618	431367	36003
CDK18	117266	506489	3743	N/A		LRRC2	163827	496388	11681	N/A		SLC43A3	134802	526621	19619	434710	36004
CDK18	117266	468954	3744	N/A		LRRC2	163827	469912	11682	N/A		SLC43A3	134802	530316	19620	431765	36005
CDK18	117266	504162	3745	N/A		LRRC20	172731	355790	11683	348043	30994	SLC43A3	134802	529748	19621	433393	36006
CDK18	117266	512008	3746	N/A		LRRC20	172731	373224	11684	362321	30995	SLC43A3	134802	532278	19622	434371	36007
CDK18	117266	484080	3747	N/A		LRRC20	172731	358141	11685	350860	30996	SLC44A5	137968	370859	19623	359896	36008
CDK18	117266	515514	3748	N/A		LRRC20	172731	357631	11686	350255	30997	SLC44A5	137968	370855	19624	359892	36009
CDK18	117266	459862	3749	N/A		LRRC20	172731	446961	11687	413745	30998	SLC44A5	137968	469525	19625	N/A	
CDK2	123374	266970	3750	266970	26154	LRRC20	172731	395011	11688	378458	30999	SLC45A1	162426	471889	19626	418096	36010
CDK2	123374	556464	3751	N/A		LRRC20	172731	395010	11689	378457	31000	SLC45A1	162426	497660	19627	N/A	
CDK2	123374	555408	3752	450983	26155	LRRC38	162494	376085	11690	365253	31001	SLC45A1	162426	481265	19628	N/A	
CDK2	123374	553376	3753	452514	26156	LRRC3B	179796	396641	11691	379880	31002	SLC45A1	162426	289877	19629	289877	36011
CDK2	123374	440311	3754	393605	26157	LRRC3B	179796	414619	11692	389764	31003	SLC45A3	158715	460934	19630	N/A	
CDK2	123374	555357	3755	452138	26158	LRRC3B	179796	432040	11693	398184	31004	SLC45A3	158715	367145	19631	356113	36012
CDK2	123374	554056	3756	243067	26159	LRRC3B	179796	417744	11694	406370	31005	SLC4A4	080493	264485	19632	264485	36013
CDK2	123374	554619	3757	N/A		LRRC3B	179796	469437	11695	N/A		SLC4A4	080493	351898	19633	307349	36014
CDK2	123374	556276	3758	N/A		LRRC3B	179796	456208	11696	394940	31006	SLC4A4	080493	639096	19634	491107	36015
CDK2	123374	556656	3759	N/A		LRRC4C	148948	278198	11697	278198	31007	SLC4A4	080493	638464	19635	492496	36016
CDK2	123374	556146	3760	N/A		LRRC4C	148948	527150	11698	436976	31008	SLC4A4	080493	514331	19636	N/A	
CDK2	123374	554545	3761	N/A		LRRC4C	148948	528697	11699	437132	31009	SLC4A4	080493	512686	19637	422400	36017
CDK5R2	171450	302625	3762	304250	26160	LRRC4C	148948	530763	11700	434761	31010	SLC4A4	080493	340595	19638	344272	36018
CDK5RAP2	136861	349780	3763	343818	26161	LRRC4C	148948	533474	11701	431363	31011	SLC4A4	080493	425175	19639	393557	36019

CDK5RAP2	136861	360190	3764	353317	26162	LRRC4C	148948	534577	11702	N/A		SLC4A7	033867	419036	19640	411031	36020
CDK5RAP2	136861	495406	3765	N/A		LRRC4C	148948	619527	11703	480903	31012	SLC4A7	033867	295736	19641	295736	36021
CDK5RAP2	136861	474262	3766	N/A		LRRC69	214954	518304	11704	428285	31013	SLC4A7	033867	428386	19642	416368	36022
CDK5RAP2	136861	473282	3767	419265	26163	LRRC69	214954	520099	11705	428537	31014	SLC4A7	033867	454389	19643	390394	36023
CDK5RAP2	136861	480112	3768	418418	26164	LRRC69	214954	343709	11706	343221	31015	SLC4A7	033867	440156	19644	414797	36024
CDK5RAP2	136861	416449	3769	400395	26165	LRRC69	214954	448384	11707	400803	31016	SLC4A7	033867	457377	19645	408323	36025
CDK5RAP2	136861	433194	3770	N/A		LRRC69	214954	522144	11708	N/A		SLC4A7	033867	438530	19646	407304	36026
CDK5RAP2	136861	480467	3771	N/A		LRRC69	214954	518487	11709	N/A		SLC4A7	033867	437179	19647	394252	36027
CDK5RAP2	136861	484546	3772	N/A		LRRC69	214954	521519	11710	N/A		SLC4A7	033867	446700	19648	406605	36028
CDK5RAP2	136861	425647	3773	409941	26166	LRRC7	033122	310961	11711	309245	31017	SLC4A7	033867	455077	19649	407382	36029
CDK5RAP2	136861	483412	3774	N/A		LRRC7	033122	370958	11712	359997	31018	SLC4A7	033867	445684	19650	406804	36030
CDK5RAP2	136861	468989	3775	N/A		LRRC7	033122	035383	11713	035383	31019	SLC4A7	033867	465487	19651	N/A	
CDK5RAP2	136861	479584	3776	N/A		LRRC7	033122	588515	11714	466082	31020	SLC4A7	033867	437266	19652	409418	36031
CDK5RAP2	136861	482047	3777	419640	26167	LRRC7	033122	609498	11715	476660	31021	SLC4A7	033867	428179	19653	388703	36032
CDK5RAP2	136861	472883	3778	N/A		LRRC7	033122	608815	11716	476307	31022	SLC4A7	033867	475120	19654	N/A	
CDK5RAP2	136861	481266	3779	417925	26168	LRRC7	033122	608744	11717	477399	31023	SLC4A7	033867	491211	19655	N/A	
CDK5RAP2	136861	491334	3780	N/A		LRRC7	033122	609072	11718	N/A		SLC4A7	033867	428005	19656	N/A	
CDK5RAP2	136861	360822	3781	354065	26169	LRRC7	033122	608470	11719	N/A		SLC4A7	033867	425128	19657	401949	36033
CDKL1	100490	395834	3782	379176	26170	LRRC7	033122	607936	11720	N/A		SLC5A11	158865	347898	19658	289932	36034
CDKL1	100490	525911	3783	431449	26171	LRRC7	033122	565615	11721	N/A		SLC5A11	158865	488922	19659	458806	36035
CDKL1	100490	534267	3784	435044	26172	LRRC7	033122	441830	11722	N/A		SLC5A11	158865	564125	19660	N/A	
CDKL1	100490	216378	3785	216378	26173	LRRC7	033122	415775	11723	394867	31024	SLC5A11	158865	565769	19661	457179	36036
CDKL1	100490	356146	3786	N/A		LRRK2	188906	416796	11724	398726	31025	SLC5A11	158865	569520	19662	454732	36037
CDKL1	100490	542671	3787	N/A		LRRK2	188906	343742	11725	341930	31026	SLC5A11	158865	568579	19663	456234	36038
CDKL1	100490	529347	3788	N/A		LRRK2	188906	298910	11726	298910	31027	SLC5A11	158865	567758	19664	454401	36039
CDKL1	100490	528197	3789	N/A		LRRK2	188906	474202	11727	N/A		SLC5A11	158865	569071	19665	456376	36040
CDKL1	100490	531052	3790	N/A		LRRK2	188906	430804	11728	410821	31028	SLC5A11	158865	565586	19666	N/A	
CDKL1	100490	530553	3791	N/A		LRRK2	188906	479187	11729	N/A		SLC5A11	158865	545376	19667	441384	36041
CDKL1	100490	534566	3792	N/A		LRRK2	188906	481256	11730	N/A		SLC5A11	158865	449109	19668	389606	36042
CDKN1A	124762	459970	3793	N/A		LRRK2	188906	636518	11731	490200	31029	SLC5A11	158865	424767	19669	416782	36043
CDKN1A	124762	244741	3794	244741	26174	LRRTM4	176204	409911	11732	387228	31030	SLC5A4	100191	266086	19670	266086	36044
CDKN1A	124762	373711	3795	362815	26175	LRRTM4	176204	409884	11733	387297	31031	SLC5A7	115665	409059	19671	387346	36045
CDKN1A	124762	478800	3796	N/A		LRRTM4	176204	409093	11734	386357	31032	SLC5A7	115665	264047	19672	264047	36046
CDKN1A	124762	462537	3797	N/A		LRRTM4	176204	409088	11735	386236	31033	SLC5A8	256870	536262	19673	445340	36047
CDKN1A	124762	405375	3798	384849	26176	LRRTM4	176204	409282	11736	386286	31034	SLC5A8	262217	572861	19674	461697	36048
CDKN1A	124762	615513	3799	482768	26177	LRRTM4	176204	456154	11737	408722	31035	SLC6A12	111181	359674	19675	352702	36049
CDKN1A	124762	448526	3800	409259	26178	LRRTM4	176204	491242	11738	N/A		SLC6A12	111181	545058	19676	N/A	
CDO1	129596	250535	3801	250535	26179	LRTM1	144771	273286	11739	273286	31036	SLC6A12	111181	424061	19677	399136	36050
CDO1	129596	502631	3802	N/A		LRTM1	144771	493075	11740	419772	31037	SLC6A12	111181	536824	19678	444268	36051
CDO1	129596	504877	3803	N/A		LSM5	106355	450169	11741	410758	31038	SLC6A12	111181	542825	19679	N/A	
CDO1	129596	504613	3804	N/A		LSM5	106355	409909	11742	386363	31039	SLC6A12	111181	535498	19680	N/A	
CDYL	153046	328908	3805	330512	26180	LSM5	106355	409292	11743	386814	31040	SLC6A12	111181	544782	19681	N/A	
CDYL	153046	491864	3806	N/A		LSM5	106355	468872	11744	N/A		SLC6A12	111181	538272	19682	N/A	
CDYL	153046	440139	3807	394740	26181	LSM5	106355	410044	11745	386707	31041	SLC6A12	111181	540094	19683	N/A	
CDYL	153046	483019	3808	N/A		LSM5	106355	409987	11746	386275	31042	SLC6A12	111181	538580	19684	N/A	
CDYL	153046	397588	3809	380718	26182	LSM5	106355	223084	11747	223084	31043	SLC6A12	111181	536116	19685	N/A	
CDYL	153046	472453	3810	N/A		LSM5	106355	409782	11748	387109	31044	SLC6A12	111181	537793	19686	439351	36052
CDYL	153046	449732	3811	394076	26183	LSM5	106355	409952	11749	387126	31045	SLC6A12	111181	535347	19687	446082	36053
CDYL	153046	343762	3812	340908	26184	LSM5	106355	480956	11750	N/A		SLC6A12	111181	537826	19688	N/A	
CDYL	153046	469671	3813	N/A		LTBP2	119681	261978	11751	261978	31046	SLC6A12	111181	538424	19689	N/A	
CDYL2	166446	570137	3814	476295	26185	LTBP2	119681	553939	11752	452110	31047	SLC6A12	111181	397296	19690	380464	36054
CDYL2	166446	562812	3815	454546	26186	LTBP2	119681	554861	11753	N/A		SLC6A13	010379	343164	19691	339260	36055
CDYL2	166446	563890	3816	455111	26187	LTBP2	119681	556690	11754	451477	31048	SLC6A13	010379	539668	19692	N/A	
CDYL2	166446	566173	3817	456934	26188	LTBP2	119681	556206	11755	450668	31049	SLC6A13	010379	542379	19693	N/A	
CDYL2	166446	561616	3818	N/A		LTBP2	119681	557425	11756	N/A		SLC6A13	010379	543722	19694	N/A	
CDYL2	166446	567924	3819	N/A		LTK	062524	355166	11757	347293	31050	SLC6A13	010379	542947	19695	N/A	
CDYL2	166446	562753	3820	N/A		LTK	062524	263800	11758	263800	31051	SLC6A13	010379	546319	19696	444606	36056
CEBPB	172216	303004	3821	305422	26189	LTK	062524	563518	11759	N/A		SLC6A13	010379	536842	19697	N/A	
CEMIP	103888	220244	3822	220244	26190	LTK	062524	561619	11760	458111	31052	SLC6A13	010379	534887	19698	N/A	

CEMIP	103888	394685	3823	378177	26191	LTK	062524	453182	11761	392196	31053	SLC6A13	010379	539260	19699	437386	36057
CEMIP	103888	356249	3824	348583	26192	LTK	062524	569283	11762	N/A		SLC6A13	010379	542272	19700	443466	36058
CEMIP	103888	560027	3825	453066	26193	LURAP1	171357	371980	11763	361048	31054	SLC6A13	010379	436453	19701	389316	36059
CEMIP	103888	495041	3826	431426	26194	LURAP1L	153714	319264	11764	321026	31055	SLC6A13	010379	445055	19702	407104	36060
CEMIP	103888	559966	3827	N/A		LURAP1L	153714	489107	11765	N/A		SLC6A7	011083	230671	19703	230671	36061
CEP126	110318	263468	3828	263468	26195	LY6E	160932	517503	11766	428427	31056	SLC6A7	011083	524041	19704	428200	36062
CEP126	110318	532529	3829	433643	26196	LY6E	160932	292494	11767	292494	31057	SLC6A7	011083	513403	19705	N/A	
CEP126	110318	532077	3830	437014	26197	LY6E	160932	429120	11768	414307	31058	SLC7A1	139514	380752	19706	370128	36063
CEP76	101624	590143	3831	464760	26198	LY6E	160932	521699	11769	427915	31059	SLC7A1	139514	473577	19707	N/A	
CEP76	101624	262127	3832	262127	26199	LY6E	160932	520531	11770	430131	31060	SLC7A1	139514	450494	19708	390092	36064
CEP76	101624	423709	3833	403074	26200	LY6E	160932	520466	11771	428572	31061	SLC7A10	130876	253188	19709	253188	36065
CEP76	101624	589490	3834	N/A		LY6E	160932	521003	11772	428169	31062	SLC7A10	130876	590490	19710	N/A	
CEP76	101624	587666	3835	464911	26201	LY6E	160932	522528	11773	428365	31063	SLC7A10	130876	590036	19711	465421	36066
CEP76	101624	593250	3836	466689	26202	LY6E	160932	522971	11774	428159	31064	SLC7A10	130876	587064	19712	466876	36067
CEP76	101624	591034	3837	467361	26203	LY6E	160932	519611	11775	430796	31065	SLC7A10	130876	592596	19713	466410	36068
CEP76	101624	585751	3838	467224	26204	LY6E	160932	521182	11776	430770	31066	SLC7A11	151012	509248	19714	424046	36069
CEP76	101624	592660	3839	N/A		LY6E	160932	519546	11777	428467	31067	SLC7A11	151012	280612	19715	280612	36070
CEP76	101624	589875	3840	N/A		LY6E	160932	523847	11778	430700	31068	SLC7A14	013293	231706	19716	231706	36071
CEP76	101624	587929	3841	466833	26205	LY6E	160932	522024	11779	428442	31069	SLC7A14	013293	466168	19717	N/A	
CEP76	101624	586887	3842	N/A		LY6E	160932	519615	11780	N/A		SLC7A3	165349	374299	19718	363417	36072
CEPT1	134255	498239	3843	N/A		LY6E	278032	633898	11781	488311	31070	SLC7A3	165349	298085	19719	298085	36073
CEPT1	134255	480324	3844	N/A		LY6E	278032	619718	11782	482517	31071	SLC7A5	103257	565644	19720	454323	36074
CEPT1	134255	476865	3845	N/A		LY6E	278032	632424	11783	488421	31072	SLC7A5	103257	261622	19721	261622	36075
CEPT1	134255	357172	3846	349696	26206	LY6E	278032	632519	11784	488443	31073	SLC7A5	103257	563489	19722	N/A	
CEPT1	134255	460443	3847	N/A		LY6E	278032	633934	11785	488115	31074	SLC8A1	183023	406785	19723	383886	36076
CEPT1	134255	478042	3848	N/A		LY6E	278032	632812	11786	488556	31075	SLC8A1	183023	407929	19724	386116	36077
CEPT1	134255	473474	3849	N/A		LY6E	278032	632516	11787	487664	31076	SLC8A1	183023	403092	19725	384763	36078
CEPT1	134255	467362	3850	N/A		LY6E	278032	632232	11788	488743	31077	SLC8A1	183023	405901	19726	385678	36079
CEPT1	134255	483427	3851	N/A		LY6E	278032	631568	11789	488891	31078	SLC8A1	183023	402441	19727	385188	36080
CEPT1	134255	545121	3852	441980	26207	LY6E	278032	632902	11790	488121	31079	SLC8A1	183023	405269	19728	385535	36081
CEPT1	134255	615636	3853	477632	26208	LY6E	278032	632978	11791	488414	31080	SLC8A1	183023	408028	19729	384908	36082
CERCAM	167123	420034	3854	402508	26209	LY6E	278032	632618	11792	487700	31081	SLC8A1	183023	455476	19730	389330	36083
CERCAM	167123	372842	3855	361933	26210	LY6E	278032	633551	11793	488627	31082	SLC8A1	183023	448531	19731	398575	36084
CERCAM	167123	447915	3856	402928	26211	LY6E	278032	633451	11794	488559	31083	SLC8A1	183023	417271	19732	412560	36085
CERCAM	167123	420512	3857	416676	26212	LY6E	278032	631680	11795	N/A		SLC8A1	183023	332839	19733	332931	36086
CERCAM	167123	372838	3858	361929	26213	LYPD1	150551	397463	11796	380605	31084	SLC8A1	183023	406391	19734	385811	36087
CERCAM	167123	493788	3859	N/A		LYPD1	150551	345008	11797	340563	31085	SLC8A1-AS1	227028	599740	19735	N/A	
CERCAM	167123	411852	3860	403766	26214	LYPD1	150551	449209	11798	396651	31086	SLC8A1-AS1	227028	628471	19736	N/A	
CERCAM	167123	483737	3861	N/A		LYPD6	187123	334166	11799	334463	31087	SLC8A1-AS1	227028	631142	19737	N/A	
CERCAM	167123	463535	3862	N/A		LYPD6	187123	418762	11800	396855	31088	SLC8A1-AS1	227028	627210	19738	N/A	
CERCAM	167123	483893	3863	N/A		LYPD6	187123	414420	11801	392286	31089	SLC8A1-AS1	227028	631330	19739	N/A	
CERCAM	167123	487001	3864	N/A		LYPD6	187123	392854	11802	376594	31090	SLC8A1-AS1	227028	627538	19740	N/A	
CERCAM	167123	472858	3865	N/A		LYPD6	187123	409381	11803	386413	31091	SLC8A1-AS1	227028	630783	19741	N/A	
CERCAM	167123	613052	3866	478713	26215	LYPD6B	150556	473800	11804	N/A		SLC8A1-AS1	227028	626098	19742	N/A	
CERCAM	167123	612334	3867	481729	26216	LYPD6B	150556	409642	11805	387077	31092	SLC8A1-AS1	227028	630006	19743	N/A	
CERKL	188452	410087	3868	386725	26217	LYPD6B	150556	409876	11806	386479	31093	SLC8A1-AS1	227028	418854	19744	N/A	
CERKL	188452	409440	3869	387080	26218	LYPD6B	150556	409029	11807	386650	31094	SLC8A1-AS1	227028	439606	19745	N/A	
CERKL	188452	374969	3870	364108	26219	LYPD6B	150556	480545	11808	N/A		SLC8A1-AS1	227028	629157	19746	N/A	

CERKL	188452	452174	3871	409198	26220	LYPD6B	150556	473975	11809	N/A		SLC8A1-AS1	227028	599268	19747	N/A	
CERKL	188452	339098	3872	341159	26221	LYPD6B	150556	437627	11810	388361	31095	SLC8A1-AS1	227028	597385	19748	N/A	
CERKL	188452	374970	3873	364109	26222	LYPD6B	150556	450639	11811	412070	31096	SLC8A1-AS1	227028	625234	19749	N/A	
CERKL	188452	374967	3874	364106	26223	LYPD6B	150556	442722	11812	410840	31097	SLC8A1-AS1	227028	631204	19750	N/A	
CERKL	188452	494398	3875	N/A		LYPD6B	150556	498249	11813	N/A		SLC8A1-AS1	227028	629180	19751	N/A	
CERKL	188452	421817	3876	411466	26224	LYPD6B	150556	280115	11814	280115	31098	SLC8A1-AS1	227028	625324	19752	N/A	
CERKL	188452	479558	3877	N/A		LYRM1	102897	564457	11815	N/A		SLC8A1-AS1	227028	627108	19753	N/A	
CERKL	188452	466715	3878	N/A		LYRM1	102897	568663	11816	454826	31099	SLC8A1-AS1	227028	601679	19754	N/A	
CERKL	188452	460319	3879	N/A		LYRM1	102897	412082	11817	396868	31100	SLC8A1-AS1	227028	627219	19755	N/A	
CERKL	188452	476070	3880	N/A		LYRM1	102897	567165	11818	457743	31101	SLC8A1-AS1	227028	593878	19756	N/A	
CERKL	188452	497337	3881	N/A		LYRM1	102897	569023	11819	454551	31102	SLC8A1-AS1	227028	596532	19757	N/A	
CERS4	090661	561008	3882	453796	26225	LYRM1	102897	568820	11820	454890	31103	SLC8A1-AS1	227028	599956	19758	N/A	
CERS4	090661	558268	3883	453388	26226	LYRM1	102897	562740	11821	454759	31104	SLC8A1-AS1	227028	597170	19759	N/A	
CERS4	090661	558331	3884	452753	26227	LYRM1	102897	567954	11822	457333	31105	SLC8A1-AS1	227028	629329	19760	N/A	
CERS4	090661	561053	3885	452910	26228	LYRM1	102897	396052	11823	379367	31106	SLC8A1-AS1	227028	631137	19761	N/A	
CERS4	090661	559490	3886	N/A		LYRM1	102897	439021	11824	407883	31107	SLC8A1-AS1	227028	625381	19762	N/A	
CERS4	090661	251363	3887	251363	26229	LYRM1	102897	219168	11825	219168	31108	SLC8A1-AS1	227028	631022	19763	N/A	
CERS4	090661	559450	3888	453509	26230	LYZL4	157093	287748	11826	287748	31109	SLC8A1-AS1	227028	444629	19764	N/A	
CERS4	090661	559336	3889	453815	26231	LYZL4	157093	441172	11827	387897	31110	SLC8A1-AS1	227028	610721	19765	N/A	
CERS4	090661	600912	3890	N/A		LYZL4	157093	470991	11828	N/A		SLC8A1-AS1	227028	598247	19766	N/A	
CERS4	090661	595722	3891	N/A		MAATS1	183833	468630	11829	N/A		SLC8A1-AS1	227028	593848	19767	N/A	
CERS4	090661	558501	3892	N/A		MAATS1	183833	273390	11830	273390	31111	SLC8A1-AS1	227028	435515	19768	N/A	
CERS4	090661	560412	3893	452920	26232	MAATS1	183833	482573	11831	419520	31112	SLC8A1-AS1	227028	625780	19769	N/A	
CERS4	090661	558877	3894	454122	26233	MAATS1	183833	463700	11832	419489	31113	SLC8A1-AS1	227028	620276	19770	N/A	
CERS4	090661	557925	3895	N/A		MAATS1	183833	482927	11833	418601	31114	SLC8A1-AS1	227028	611583	19771	N/A	
CERS4	090661	558302	3896	N/A		MAATS1	183833	488533	11834	N/A		SLC8A1-AS1	227028	427354	19772	N/A	
CERS4	090661	599275	3897	N/A		MAATS1	183833	469659	11835	N/A		SLC8A1-AS1	227028	413479	19773	N/A	
CFAP161	156206	560091	3898	453414	26234	MAATS1	183833	475093	11836	419972	31115	SLC8A1-AS1	227028	619351	19774	N/A	
CFAP161	156206	561216	3899	454135	26235	MAATS1	183833	483134	11837	N/A		SLC8A1-AS1	227028	417875	19775	N/A	
CFAP161	156206	286732	3900	286732	26236	MAATS1	183833	498167	11838	419554	31116	SLC8A2	118160	236877	19776	236877	36088
CFAP20	070761	262498	3901	262498	26237	MAATS1	183833	461322	11839	N/A		SLC8A2	118160	542837	19777	437536	36089
CFAP20	070761	562622	3902	N/A		MAATS1	183833	470948	11840	N/A		SLC8A2	118160	539381	19778	N/A	

CFAP20	070761	564150	3903	N/A		MAATS1	183833	482995	11841	N/A		SLC8A2	118160	600576	19779	N/A	
CFAP20	070761	562443	3904	N/A		MAATS1	183833	472117	11842	N/A		SLC8A2	118160	601757	19780	N/A	
CFAP20	070761	565880	3905	455220	26238	MAATS1	183833	496010	11843	N/A		SLC8A2	118160	594353	19781	472233	36090
CFAP20	070761	567092	3906	N/A		MAATS1	183833	475543	11844	N/A		SLC8A2	118160	597014	19782	472208	36091
CFAP20	070761	567660	3907	N/A		MAF	178573	569649	11845	455097	31117	SLC8A3	100678	356921	19783	349392	36092
CFAP221	163075	295220	3908	295220	26239	MAF	178573	326043	11846	327048	31118	SLC8A3	100678	494208	19784	436332	36093
CFAP221	163075	463985	3909	470662	26240	MAF	178573	393350	11847	377019	31119	SLC8A3	100678	381269	19785	370669	36094
CFAP221	163075	413057	3910	391760	26241	MAFF	185022	624676	11848	N/A		SLC8A3	100678	216568	19786	216568	36095
CFAP221	163075	442513	3911	409912	26242	MAFF	185022	338483	11849	345395	31120	SLC8A3	100678	394330	19787	377863	36096
CFAP221	163075	594033	3912	470784	26243	MAFF	185022	441709	11850	391589	31121	SLC8A3	100678	534137	19788	436688	36097
CFAP221	163075	413369	3913	393222	26244	MAFF	185022	417948	11851	416493	31122	SLC8A3	100678	528359	19789	433531	36098
CFAP221	163075	598644	3914	472563	26245	MAFF	185022	407965	11852	384094	31123	SLC8A3	100678	533541	19790	437103	36099
CFAP221	163075	594371	3915	470283	26246	MAFF	185022	538999	11853	441482	31124	SLC8A3	100678	533899	19791	N/A	
CFAP221	163075	488358	3916	N/A		MAFF	185022	426621	11854	388882	31125	SLC8A3	100678	357887	19792	350560	36100
CFAP221	163075	475569	3917	N/A		MAFF	185022	538320	11855	442060	31126	SLC8B1	089060	552014	19793	447091	36101
CFAP221	163075	594141	3918	472069	26247	MAG	105695	600291	11856	470772	31127	SLC8B1	089060	552565	19794	N/A	
CFAP221	163075	597189	3919	N/A		MAG	105695	392213	11857	376048	31128	SLC8B1	089060	550672	19795	448758	36102
CFAP221	163075	599827	3920	471092	26248	MAG	105695	361922	11858	355234	31129	SLC8B1	089060	550047	19796	447585	36103
CFAP221	163075	443972	3921	413299	26249	MAG	105695	595791	11859	473125	31130	SLC8B1	089060	549069	19797	449519	36104
CFAP221	163075	600951	3922	471998	26250	MAG	105695	597035	11860	473245	31131	SLC8B1	089060	546737	19798	450081	36105
CFAP221	163075	434869	3923	399793	26251	MAG	105695	537831	11861	440695	31132	SLC8B1	089060	553238	19799	N/A	
CFAP221	163075	464578	3924	N/A		MAG	105695	593348	11862	N/A		SLC8B1	089060	551230	19800	N/A	
CFAP43	197748	457071	3925	394274	26252	MAG	105695	597162	11863	N/A		SLC8B1	089060	548477	19801	N/A	
CFAP43	197748	434629	3926	391364	26253	MAG	105695	600291	11864	470772	31133	SLC8B1	089060	549181	19802	448703	36106
CFAP43	197748	479392	3927	N/A		MAG	105695	392213	11865	376048	31134	SLC8B1	089060	549605	19803	448749	36107
CFAP43	197748	278064	3928	278064	26254	MAG	105695	361922	11866	355234	31135	SLC8B1	089060	552613	19804	447502	36108
CFAP43	197748	369720	3929	358734	26255	MAG	105695	595791	11867	473125	31136	SLC8B1	089060	548186	19805	449448	36109
CFAP43	197748	369719	3930	358733	26256	MAG	105695	597035	11868	473245	31137	SLC8B1	089060	549372	19806	447972	36110
CFAP43	197748	357060	3931	349568	26257	MAG	105695	537831	11869	440695	31138	SLC8B1	089060	548518	19807	N/A	
CFAP46	171811	368586	3932	357575	26258	MAG	105695	593348	11870	N/A		SLC8B1	089060	202831	19808	202831	36111
CFAP46	171811	639072	3933	491877	26259	MAG	105695	597162	11871	N/A		SLC9A3	066230	264938	19809	264938	36112
CFAP46	171811	448925	3934	417039	26260	MAGI3	081026	369617	11872	358630	31139	SLC9A3	066230	514375	19810	422983	36113
CFAP46	171811	476633	3935	N/A		MAGI3	081026	307546	11873	304604	31140	SLC9A3	066230	507407	19811	N/A	
CFAP46	171811	417862	3936	N/A		MAGI3	081026	369615	11874	358628	31141	SLC9A3	281861	628307	19812	486364	36114
CFAP46	171811	486104	3937	N/A		MAGI3	081026	369611	11875	358624	31142	SLC9A3	281861	626862	19813	486297	36115
CFAP46	171811	466834	3938	N/A		MAGI3	081026	486456	11876	N/A		SLC9A9	181804	316549	19814	320246	36116
CFAP46	171811	368585	3939	357574	26261	MAGI3	081026	477955	11877	N/A		SLC9A9	181804	483124	19815	N/A	
CFAP46	171811	475340	3940	N/A		MAGT1	102158	358075	11878	354649	31143	SLC9A9	181804	474727	19816	419090	36117
CFAP53	172361	398545	3941	381553	26262	MAGT1	102158	618282	11879	480732	31144	SLC9A9	181804	474151	19817	418627	36118
CFAP70	156042	462684	3942	N/A		MAGT1	102158	476168	11880	N/A		SLC9A9	181804	498717	19818	N/A	
CFAP70	156042	495161	3943	N/A		MAGT1	102158	373336	11881	362433	31145	SLCO2B1	137491	526660	19819	N/A	
CFAP70	156042	433268	3944	409527	26263	MAGT1	102158	610432	11882	478379	31146	SLCO2B1	137491	531713	19820	432889	36119
CFAP70	156042	493787	3945	N/A		MAK	111837	313243	11883	313021	31147	SLCO2B1	137491	289575	19821	289575	36120
CFAP70	156042	340329	3946	343650	26264	MAK	111837	474039	11884	476067	31148	SLCO2B1	137491	532236	19822	434112	36121
CFAP70	156042	355577	3947	347781	26265	MAK	111837	354489	11885	346484	31149	SLCO2B1	137491	531756	19823	N/A	
CFAP70	156042	310715	3948	310829	26266	MAK	111837	536370	11886	442221	31150	SLCO2B1	137491	531457	19824	N/A	
CFAP70	156042	394865	3949	378334	26267	MAK	111837	538030	11887	442250	31151	SLCO2B1	137491	525650	19825	436324	36122
CFAP74	142609	493964	3950	417061	26268	MAL	172005	489399	11888	N/A		SLCO2B1	137491	454962	19826	389653	36123
CFAP74	142609	464311	3951	N/A		MAL	172005	309988	11889	310880	31152	SLCO2B1	137491	530556	19827	435384	36124
CFAP74	142609	412120	3952	N/A		MAL	172005	353004	11890	306568	31153	SLCO2B1	137491	534004	19828	431192	36125
CFAP74	142609	493316	3953	N/A		MAL	172005	354078	11891	304924	31154	SLCO2B1	137491	527180	19829	436513	36126
CFAP74	142609	270720	3954	N/A		MAL	172005	349807	11892	322860	31155	SLCO2B1	137491	525845	19830	431324	36127
CFAP74	142609	468610	3955	N/A		MAL2	147676	522112	11893	483044	31156	SLCO2B1	137491	534186	19831	433872	36128
CFAP74	142609	461752	3956	N/A		MAL2	147676	534619	11894	482729	31157	SLCO2B1	137491	428359	19832	388912	36129
CFAP74	142609	378592	3957	N/A		MAL2	147676	614891	11895	479708	31158	SLCO2B1	137491	526839	19833	434742	36130
CFAP74	142609	378590	3958	367853	26269	MAL2	147676	531508	11896	484544	31159	SLCO2B1	137491	530012	19834	N/A	
CGN	143375	505188	3959	425532	26270	MAMSTR	176909	318083	11897	324175	31160	SLCO2B1	137491	528108	19835	N/A	
CGN	143375	502442	3960	422299	26271	MAMSTR	176909	356751	11898	349192	31161	SLCO2B1	137491	530015	19836	N/A	
CGN	143375	427934	3961	410836	26272	MAMSTR	176909	594582	11899	471590	31162	SLCO2B1	137491	341411	19837	N/A	

CGN	143375	271636	3962	271636	26273	MAMSTR	176909	599703	11900	469544	31163	SLCO4A1	101187	497209	19838	434245	36131
CGN	143375	416743	3963	390686	26274	MAMSTR	176909	595591	11901	469127	31164	SLCO4A1	101187	370507	19839	359538	36132
CGN	143375	464886	3964	N/A		MAN1A1	111885	368468	11902	357453	31165	SLCO4A1	101187	470412	19840	N/A	
CGN	143375	473377	3965	N/A		MAN1C1	117643	374332	11903	363452	31166	SLCO4A1	101187	495889	19841	N/A	
CGN	143375	467998	3966	N/A		MAN1C1	117643	263979	11904	263979	31167	SLCO4A1	101187	466961	19842	N/A	
CGNL1	128849	281282	3967	281282	26275	MAN1C1	117643	473891	11905	N/A		SLCO4A1	101187	451793	19843	414855	36133
CGNL1	128849	557813	3968	N/A		MAN1C1	117643	374329	11906	363449	31168	SLCO4A1	101187	497919	19844	N/A	
CGNL1	128849	559194	3969	N/A		MAN1C1	117643	496532	11907	N/A		SLCO4A1	101187	466818	19845	N/A	
CHAC1	128965	444189	3970	395466	26276	MAN1C1	117643	475314	11908	N/A		SLCO4A1	101187	217159	19846	217159	36134
CHAC1	128965	446533	3971	398105	26277	MAN1C1	117643	487493	11909	N/A		SLCO4C1	173930	310954	19847	309741	36135
CHAC1	128965	617961	3972	481816	26278	MAN1C1	117643	611903	11910	482317	31169	SLFN11	172716	589562	19848	N/A	
CHAC1	128965	487220	3973	452707	26279	MAN2A1	112893	261483	11911	261483	31170	SLFN11	172716	588579	19849	468602	36136
CHAC1	128965	617768	3974	484644	26280	MAN2A1	112893	502261	11912	N/A		SLFN11	172716	427966	19850	395140	36137
CHD7	171316	423902	3975	392028	26281	MAN2A1	112893	508043	11913	N/A		SLFN11	172716	430814	19851	397454	36138
CHD7	171316	526846	3976	436492	26282	MAN2A1	112893	513921	11914	N/A		SLFN11	172716	589811	19852	468095	36139
CHD7	171316	524602	3977	437061	26283	MAN2A1	112893	505313	11915	N/A		SLFN11	172716	441608	19853	393615	36140
CHD7	171316	525508	3978	436027	26284	MAN2A1	112893	503970	11916	N/A		SLFN11	172716	591682	19854	464806	36141
CHD7	171316	527825	3979	432627	26285	MAP2K6	108984	590474	11917	468348	31171	SLFN11	172716	394566	19855	378067	36142
CHD7	171316	527900	3980	433336	26286	MAP2K6	108984	586641	11918	N/A		SLFN11	172716	592108	19856	465198	36143
CHD7	171316	527921	3981	N/A		MAP2K6	108984	359094	11919	351997	31172	SLFN11	172716	586099	19857	N/A	
CHD7	171316	529472	3982	N/A		MAP2K6	108984	589295	11920	466143	31173	SLFN11	172716	308377	19858	312402	36144
CHD7	171316	531695	3983	N/A		MAP2K6	108984	588110	11921	464916	31174	SLFN11	172716	498396	19859	N/A	
CHD7	171316	618450	3984	N/A		MAP2K6	108984	589647	11922	467213	31175	SLFN11	172716	592122	19860	465777	36145
CHD7	171316	532149	3985	N/A		MAP2K6	108984	591445	11923	N/A		SLIT2	145147	503823	19861	427548	36146
CHD7	171316	528280	3986	N/A		MAP2K6	108984	592348	11924	N/A		SLIT2	145147	504154	19862	422391	36147
CHDH	016391	315251	3987	319851	26287	MAP2K6	108984	613873	11925	477701	31176	SLIT2	145147	273739	19863	273739	36148
CHDH	016391	481668	3988	418273	26288	MAP6D1	180834	318631	11926	314560	31177	SLIT2	145147	503837	19864	422261	36149
CHDH	016391	467802	3989	419863	26289	MAP6D1	180834	431348	11927	388945	31178	SLIT2	145147	508824	19865	426356	36150
CHGB	089199	378961	3990	368244	26290	MAP6D1	180834	445426	11928	390816	31179	SLIT2	145147	509099	19866	N/A	
CHGB	089199	455042	3991	416643	26291	MAP6D1	180834	463801	11929	N/A		SLIT2	145147	509394	19867	N/A	
CHGB	089199	488832	3992	N/A		MAP7	135525	354570	11930	346581	31180	SLIT2	145147	511508	19868	421975	36151
CHID1	177830	532909	3993	433879	26292	MAP7	135525	454590	11931	414712	31181	SLIT2	145147	509941	19869	425609	36152
CHID1	177830	529539	3994	431169	26293	MAP7	135525	544465	11932	445737	31182	SLIT2	145147	512993	19870	423179	36153
CHID1	177830	323578	3995	325055	26294	MAP7	135525	438100	11933	400790	31183	SLIT2	145147	508541	19871	N/A	
CHID1	177830	534207	3996	431356	26295	MAP7	135525	611373	11934	482998	31184	SLIT2	145147	622093	19872	482129	36154
CHID1	177830	429789	3997	416034	26296	MAP7	135525	616617	11935	483511	31185	SLIT3	184347	519560	19873	430333	36155
CHID1	177830	528581	3998	435503	26297	MAP7	135525	432797	11936	414879	31186	SLIT3	184347	332966	19874	332164	36156
CHID1	177830	436108	3999	388156	26298	MAP7	135525	617204	11937	482335	31187	SLIT3	184347	518092	19875	N/A	
CHID1	177830	524538	4000	N/A		MAP7	135525	618822	11938	482356	31188	SLIT3	184347	519486	19876	N/A	
CHID1	177830	528521	4001	435336	26299	MAPK12	188130	497036	11939	N/A		SLIT3	184347	518140	19877	N/A	
CHID1	177830	526714	4002	N/A		MAPK12	188130	395780	11940	379126	31189	SLIT3	184347	521150	19878	N/A	
CHID1	177830	528534	4003	N/A		MAPK12	188130	488504	11941	N/A		SLIT3	184347	521130	19879	N/A	
CHID1	177830	524832	4004	N/A		MAPK12	188130	215659	11942	215659	31190	SLIT3	184347	404867	19880	384890	36157
CHID1	177830	531010	4005	N/A		MAPK12	188130	467891	11943	N/A		SLITRK1	178235	377084	19881	366288	36158
CHID1	177830	531859	4006	434651	26300	MAPK12	188130	496942	11944	N/A		SLITRK6	184564	400286	19882	383143	36159
CHID1	177830	534254	4007	432697	26301	MAPK12	188130	482969	11945	N/A		SMAD3	166949	559460	19883	453082	36160
CHID1	177830	528426	4008	432431	26302	MAPK12	188130	497738	11946	N/A		SMAD3	166949	327367	19884	332973	36161
CHID1	177830	533056	4009	436017	26303	MAPK12	188130	492218	11947	N/A		SMAD3	166949	559937	19885	N/A	
CHID1	177830	533059	4010	435731	26304	MAPK12	188130	395778	11948	379124	31191	SMAD3	166949	559092	19886	453788	36162
CHID1	177830	530939	4011	436752	26305	MAPK12	188130	622558	11949	479972	31192	SMAD3	166949	560175	19887	455095	36163
CHID1	177830	525225	4012	433570	26306	MAPK4	141639	587823	11950	N/A		SMAD3	166949	540846	19888	437757	36164
CHID1	177830	525840	4013	435607	26307	MAPK4	141639	588540	11951	465661	31193	SMAD3	166949	558894	19889	458060	36165
CHID1	177830	528154	4014	431766	26308	MAPK4	141639	586735	11952	N/A		SMAD3	166949	439724	19890	401133	36166
CHID1	177830	454838	4015	398722	26309	MAPK4	141639	540640	11953	439231	31194	SMAD3	166949	558739	19891	453684	36167
CHID1	177830	449825	4016	391255	26310	MAPK4	141639	592595	11954	466233	31195	SMAD3	166949	537194	19892	445348	36168
CHL1	134121	256509	4017	256509	26311	MAPK4	141639	400384	11955	383234	31196	SMAD3	166949	558428	19893	454165	36169
CHL1	134121	481167	4018	N/A		MAPK4	282110	632577	11956	N/A		SMAD3	166949	558827	19894	452767	36170
CHL1	134121	397491	4019	380628	26312	MAPK4	282110	632712	11957	N/A		SMAD3	166949	560402	19895	N/A	
CHL1	134121	427688	4020	403311	26313	MAPK4	282110	631501	11958	N/A		SMAD3	166949	560424	19896	455540	36171

CHL1	134121	421198	4021	413628	26314	MAPK4	282110	631637	11959	N/A		SMAD3	166949	558763	19897	N/A	
CHL1	134121	489224	4022	N/A		MAPRE2	166974	591734	11960	468216	31197	SMAD7	101665	262158	19898	262158	36172
CHL1	134121	453040	4023	413109	26315	MAPRE2	166974	589180	11961	465939	31198	SMAD7	101665	545051	19899	N/A	
CHL1	134121	435603	4024	397445	26316	MAPRE2	166974	590793	11962	N/A		SMAD7	101665	591805	19900	466902	36173
CHL1	134121	486881	4025	N/A		MAPRE2	166974	587359	11963	466871	31199	SMAD7	101665	589634	19901	467621	36174
CHL1	134121	449294	4026	390440	26317	MAPRE2	166974	436190	11964	407723	31200	SMAD7	101665	587336	19902	N/A	
CHL1	134121	461289	4027	N/A		MAPRE2	166974	588349	11965	468904	31201	SMAD7	101665	585986	19903	N/A	
CHL1	134121	471332	4028	N/A		MAPRE2	166974	300249	11966	300249	31202	SMAD7	101665	586093	19904	465590	36175
CHL1	134121	470880	4029	N/A		MAPRE2	166974	538170	11967	446343	31203	SMAD7	101665	588190	19905	N/A	
CHL1	134121	470005	4030	N/A		MAPRE2	166974	588910	11968	468588	31204	SMIM17	268182	598409	19906	471126	36176
CHL1	134121	445697	4031	395239	26318	MAPRE2	166974	585592	11969	N/A		SMIM17	268182	600547	19907	472019	36177
CHL1	134121	620033	4032	483512	26319	MAPRE2	166974	589699	11970	464921	31205	SMOC1	198732	555917	19908	N/A	
CHN2	106069	582692	4033	N/A		MAPRE2	166974	588085	11971	N/A		SMOC1	198732	361956	19909	355110	36178
CHN2	106069	578605	4034	N/A		MAPRE2	166974	413393	11972	396074	31206	SMOC1	198732	381280	19910	370680	36179
CHN2	106069	606897	4035	N/A		MARC2	117791	469583	11973	435450	31207	SMOC1	198732	553839	19911	N/A	
CHN2	106069	443025	4036	N/A		MARC2	117791	359316	11974	352266	31208	SMOC1	198732	557483	19912	N/A	
CHN2	106069	588769	4037	N/A		MARC2	117791	366913	11975	355880	31209	SMPX	091482	379494	19913	368808	36180
CHN2	106069	423511	4038	462650	26320	MARC2	117791	425560	11976	416442	31210	SMPX	091482	494525	19914	N/A	
CHN2	106069	439384	4039	409843	26321	MARC2	117791	496078	11977	N/A		SNAI2	019549	020945	19915	020945	36181
CHN2	106069	461824	4040	N/A		MARC2	117791	472447	11978	N/A		SNAI2	019549	396822	19916	380034	36182
CHN2	106069	474070	4041	441183	26322	MARCH1	145416	503008	11979	427223	31211	SNAI3-AS1	260630	563261	19917	N/A	
CHN2	106069	470261	4042	N/A		MARCH1	145416	514618	11980	421322	31212	SNAI3-AS1	260630	565633	19918	N/A	
CHN2	106069	222792	4043	222792	26323	MARCH1	145416	339875	11981	345676	31213	SNAI3-AS1	260630	569786	19919	N/A	
CHN2	106069	409350	4044	386968	26324	MARCH1	145416	510786	11982	424089	31214	SNAI3-AS1	260630	563475	19920	N/A	
CHN2	106069	409964	4045	N/A		MARCH1	145416	512214	11983	N/A		SNAI3-AS1	260630	568633	19921	N/A	
CHN2	106069	409922	4046	N/A		MARCH1	145416	505517	11984	N/A		SNAI3-AS1	260630	567997	19922	N/A	
CHN2	106069	412536	4047	N/A		MARCH1	145416	507270	11985	426731	31215	SNAPC1	023608	216294	19923	216294	36183
CHN2	106069	478128	4048	N/A		MARCH1	145416	511245	11986	N/A		SNCAIP	064692	514467	19924	427090	36184
CHN2	106069	482820	4049	N/A		MARCH1	145416	510696	11987	N/A		SNCAIP	064692	510658	19925	426526	36185
CHN2	106069	483081	4050	N/A		MARCH1	145416	503104	11988	N/A		SNCAIP	064692	506272	19926	426551	36186
CHN2	106069	491856	4051	N/A		MARCH1	145416	508725	11989	N/A		SNCAIP	064692	508681	19927	422610	36187
CHN2	106069	446446	4052	396867	26325	MARCH1	145416	505391	11990	N/A		SNCAIP	064692	509154	19928	422106	36188
CHN2	106069	412711	4053	486515	26326	MARCH1	145416	515471	11991	N/A		SNCAIP	064692	261368	19929	261368	36189
CHN2	106069	467441	4054	N/A		MARCH1	145416	510075	11992	N/A		SNCAIP	064692	512385	19930	426280	36190
CHN2	106069	493906	4055	N/A		MARCH1	145416	274056	11993	274056	31216	SNCAIP	064692	514497	19931	425063	36191
CHN2	106069	410098	4056	N/A		MARCH11	183654	332432	11994	333181	31217	SNCAIP	064692	261367	19932	261367	36192
CHN2	106069	433720	4057	398326	26327	MARCH11	183654	507111	11995	424425	31218	SNCAIP	064692	510003	19933	N/A	
CHN2	106069	439711	4058	387425	26328	MARCH11	183654	505509	11996	N/A		SNCAIP	064692	509023	19934	427078	36193
CHN2	106069	421775	4059	394284	26329	MARCKS	277443	612661	11997	478061	31219	SNCAIP	064692	508017	19935	424338	36194
CHN2	106069	424025	4060	406337	26330	MARCKSL1	175130	329421	11998	362638	31220	SNCAIP	064692	509652	19936	427587	36195
CHN2	106069	409041	4061	386849	26331	MARVELD2	274671	622835	11999	480068	31221	SNCAIP	064692	512146	19937	423360	36196
CHN2	106069	495789	4062	438587	26332	MARVELD2	274671	614617	12000	480044	31222	SNCAIP	064692	395469	19938	378852	36197
CHODL	154645	400128	4063	382993	26333	MARVELD2	274671	611349	12001	480310	31223	SNCAIP	064692	395466	19939	378849	36198
CHODL	154645	400131	4064	382996	26334	MARVELD2	274671	622563	12002	480479	31224	SNCAIP	064692	515215	19940	427575	36199
CHODL	154645	400135	4065	383001	26335	MARVELD2	274671	611064	12003	477520	31225	SNCAIP	064692	513719	19941	N/A	
CHODL	154645	400127	4066	382992	26336	MARVELD2	274671	612528	12004	484889	31226	SNCAIP	064692	379538	19942	368854	36200
CHODL	154645	299295	4067	299295	26337	MARVELD2	152939	325631	12005	323264	31227	SNCAIP	064692	414317	19943	394392	36201
CHODL	154645	543733	4068	443566	26338	MARVELD2	152939	454295	12006	396244	31228	SNCAIP	064692	504884	19944	426904	36202
CHODL	154645	338326	4069	339975	26339	MARVELD2	152939	515844	12007	421902	31229	SNCAIP	064692	542191	19945	441681	36203
CHORDC1	110172	320585	4070	319255	26340	MARVELD2	152939	512803	12008	423490	31230	SNED1	162804	401884	19946	384871	36204
CHORDC1	110172	529987	4071	433719	26341	MARVELD2	152939	436532	12009	414776	31231	SNED1	162804	405547	19947	386007	36205
CHORDC1	110172	533724	4072	N/A		MARVELD2	152939	413223	12010	398922	31232	SNED1	162804	310397	19948	308893	36206
CHORDC1	110172	457199	4073	401080	26342	MASP1	127241	337774	12011	336792	31233	SNED1	162804	493358	19949	N/A	
CHORDC1	110172	529726	4074	436632	26343	MASP1	127241	468121	12012	N/A		SNED1	162804	401644	19950	384789	36207

CHORDC1	110172	525317	4075	436945	26344	MASP1	127241	480349	12013	N/A		SNED1	162804	431690	19951	401865	36208
CHORDC1	110172	533772	4076	434040	26345	MASP1	127241	296280	12014	296280	31234	SNED1	162804	420591	19952	394324	36209
CHORDC1	110172	530765	4077	431929	26346	MASP1	127241	392472	12015	376264	31235	SNED1	162804	469006	19953	N/A	
CHORDC1	110172	533062	4078	433440	26347	MASP1	127241	495249	12016	N/A		SNED1	162804	483962	19954	N/A	
CHORDC1	110172	529402	4079	432019	26348	MASP1	127241	169293	12017	169293	31236	SNED1	162804	466618	19955	N/A	
CHORDC1	110172	533739	4080	N/A		MASP1	127241	392470	12018	376262	31237	SNED1	162804	491761	19956	N/A	
CHRD	090539	356534	4081	348930	26349	MASP1	127241	483719	12019	N/A		SNED1	162804	342631	19957	342992	36210
CHRD	090539	204604	4082	204604	26350	MASP1	127241	460839	12020	N/A		SNHG5	203875	623163	19958	N/A	
CHRD	090539	448472	4083	408624	26351	MASP1	127241	490558	12021	N/A		SNHG5	203875	623901	19959	N/A	
CHRD	090539	420973	4084	392794	26352	MASP1	127241	392475	12022	376267	31238	SNHG5	203875	589187	19960	N/A	
CHRD	090539	460627	4085	N/A		MASP1	127241	463015	12023	N/A		SNHG5	203875	622963	19961	N/A	
CHRD	090539	450923	4086	408972	26353	MASP1	127241	439271	12024	412021	31239	SNHG5	203875	623650	19962	N/A	
CHRD	090539	348986	4087	334036	26354	MASP1	127241	425937	12025	409047	31240	SNHG5	203875	624128	19963	N/A	
CHRD	090539	470150	4088	N/A		MATN1	162510	373765	12026	362870	31241	SNHG5	203875	587692	19964	N/A	
CHRD	090539	496527	4089	N/A		MATN1	162510	494561	12027	N/A		SNHG5	203875	369605	19965	N/A	
CHRD	090539	459711	4090	N/A		MATN1	162510	477320	12028	N/A		SNHG5	203875	427501	19966	N/A	
CHRD	090539	485883	4091	N/A		MATN4	124159	372756	12029	361842	31242	SNHG5	203875	435947	19967	N/A	
CHRD	090539	482805	4092	N/A		MATN4	124159	372754	12030	361840	31243	SNHG5	203875	624295	19968	N/A	
CHRD	090539	486066	4093	N/A		MATN4	124159	360607	12031	353819	31244	SNHG5	203875	625175	19969	N/A	
CHRD	090539	461684	4094	N/A		MATN4	124159	353917	12032	243983	31245	SNHG5	203875	623910	19970	N/A	
CHRD	090539	482014	4095	N/A		MATN4	124159	537548	12033	440328	31246	SNHG5	203875	428833	19971	N/A	
CHRD	090539	461120	4096	N/A		MBOAT1	172197	324607	12034	324944	31247	SNHG5	203875	453754	19972	N/A	
CHRD	090539	464833	4097	N/A		MBOAT2	143797	305997	12035	302177	31248	SNHG5	203875	420199	19973	N/A	
CHRM1	168539	306960	4098	306490	26355	MBOAT2	143797	471753	12036	419573	31249	SNHG5	203875	414002	19974	N/A	
CHRM1	168539	543973	4099	441188	26356	MBOAT2	143797	486315	12037	N/A		SNHG5	203875	623267	19975	N/A	
CHRM1	168539	536524	4100	444482	26357	MBOAT2	143797	473432	12038	N/A		SNHG5	203875	623001	19976	N/A	
CHRM3	133019	468573	4101	N/A		MBOAT2	143797	486484	12039	N/A		SNHG5	203875	431043	19977	N/A	
CHRM3	133019	492335	4102	N/A		MBOAT2	143797	494760	12040	N/A		SNHG5	203875	433843	19978	N/A	
CHRM3	133019	481779	4103	N/A		MBOAT2	143797	477073	12041	420114	31250	SNHG5	203875	425170	19979	N/A	
CHRM3	133019	255380	4104	255380	26358	MBOAT2	143797	474341	12042	N/A		SNTB1	172164	395601	19980	378965	36211
CHRM3	133019	487470	4105	N/A		MBOAT2	143797	462696	12043	417409	31251	SNTB1	172164	517992	19981	431124	36212
CHRM3	133019	448020	4106	404764	26359	MBOAT2	143797	460786	12044	N/A		SNTB1	172164	519177	19982	N/A	
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CHRNA3	080644	559002	4108	N/A		MBOAT7	278519	621455	12046	477891	31253	SNTB1	172164	520717	19984	429292	36213
CHRNA3	080644	559658	4109	452896	26361	MBOAT7	278519	612053	12047	482884	31254	SNX22	157734	557789	19985	N/A	
CHRNA3	080644	348639	4110	267951	26362	MBOAT7	278322	621612	12048	478088	31255	SNX22	157734	325881	19986	323435	36214
CHRNA3	080644	326828	4111	315602	26363	MBOAT7	278322	611602	12049	482369	31256	SNX22	157734	561334	19987	N/A	
CHRNA3	080644	558903	4112	N/A		MBOAT7	278322	620636	12050	482742	31257	SNX22	157734	558466	19988	452692	36215
CHRNA3	080644	561128	4113	N/A		MBOAT7	277733	621875	12051	478041	31258	SNX22	157734	560607	19989	N/A	
CHRNA3	080644	559080	4114	453993	26364	MBOAT7	277733	621146	12052	481758	31259	SNX22	157734	560945	19990	N/A	
CHRNA3	080644	559941	4115	N/A		MBOAT7	277733	612567	12053	483526	31260	SNX22	157734	560997	19991	N/A	
CHST1	175264	308064	4116	309270	26365	MBOAT7	276935	617012	12054	484199	31261	SNX33	173548	308527	19992	311427	36216
CHST1	175264	533673	4117	N/A		MBOAT7	276935	610862	12055	481119	31262	SNX33	173548	569152	19993	455436	36217
CHST1	175264	531322	4118	N/A		MBOAT7	276935	622772	12056	N/A		SOAT1	057252	367619	19994	356591	36218
CHST10	115526	264249	4119	264249	26366	MBOAT7	276935	613056	12057	N/A		SOAT1	057252	426956	19995	411309	36219
CHST10	115526	409701	4120	387309	26367	MBOAT7	276935	616849	12058	484102	31263	SOAT1	057252	540564	19996	445315	36220
CHST10	115526	484382	4121	N/A		MBOAT7	276935	620231	12059	477618	31264	SOAT1	057252	539888	19997	441356	36221
CHST10	115526	409046	4122	387121	26368	MBOAT7	276935	615450	12060	N/A		SOBP	112320	317357	19998	318900	36222
CHST10	115526	420858	4123	405922	26369	MBOAT7	276935	618692	12061	N/A		SOBP	112320	477448	19999	N/A	
CHST10	115526	448989	4124	387977	26370	MBOAT7	276935	611939	12062	N/A		SOBP	112320	494935	20000	N/A	
CHST10	115526	421474	4125	407525	26371	MBOAT7	276935	615263	12063	N/A		SOBP	112320	618129	20001	478366	36223
CHST10	115526	418201	4126	416831	26372	MBOAT7	276935	621905	12064	N/A		SOCS2	120833	340600	20002	339428	36224
CHST10	115526	435960	4127	395643	26373	MBOAT7	276935	619104	12065	N/A		SOCS2	120833	549206	20003	448815	36225
CHST10	115526	485085	4128	N/A		MBOAT7	276935	614279	12066	480894	31265	SOCS2	120833	536696	20004	442898	36226
CHST10	115526	487860	4129	N/A		MBOAT7	125505	437868	12067	404915	31266	SOCS2	120833	548091	20005	447902	36227
CHST10	115526	466583	4130	N/A		MBOAT7	125505	338624	12068	344377	31267	SOCS2	120833	549122	20006	447161	36228
CHST11	171310	550711	4131	N/A		MBOAT7	125505	245615	12069	245615	31268	SOCS2	120833	548537	20007	448709	36229
CHST11	171310	547956	4132	449093	26374	MBOAT7	125505	494142	12070	N/A		SOCS2	120833	549887	20008	448611	36230
CHST11	171310	549260	4133	450004	26375	MBOAT7	125505	449249	12071	406794	31269	SOCS2	120833	551556	20009	449227	36231

CHST11	171310	303694	4134	305725	26376	MBOAT7	125505	391754	12072	375634	31270	SOCS2	120833	547229	20010	473902	36232
CHST11	171310	546689	4135	448678	26377	MBOAT7	125505	495279	12073	472209	31271	SOCS2	120833	551883	20011	474805	36233
CHST11	171310	549016	4136	449095	26378	MBOAT7	125505	414665	12074	388250	31272	SOCS2	120833	549510	20012	474888	36234
CHST12	136213	258711	4137	258711	26379	MBOAT7	125505	453320	12075	410320	31273	SOCS2	120833	622746	20013	481249	36235
CHST12	136213	432336	4138	411207	26380	MBOAT7	125505	464098	12076	N/A		SOD1	142168	270142	20014	270142	36236
CHST12	136213	313156	4139	N/A		MBOAT7	125505	474910	12077	N/A		SOD1	142168	389995	20015	374645	36237
CHST12	136213	618655	4140	481912	26381	MBOAT7	125505	491216	12078	N/A		SOD1	142168	476106	20016	N/A	
CHST15	182022	346248	4141	333947	26382	MBOAT7	125505	495968	12079	N/A		SOD1	142168	470944	20017	N/A	
CHST15	182022	628426	4142	485905	26383	MBOAT7	125505	431666	12080	410503	31274	SOD3	109610	598411	20018	472134	36238
CHST15	182022	476765	4143	N/A		MBOAT7	273592	614745	12081	N/A		SOD3	109610	593742	20019	N/A	
CHST15	182022	462406	4144	487014	26384	MBOAT7	273592	619855	12082	484954	31275	SOD3	109610	382120	20020	371554	36239
CHST15	182022	435907	4145	402394	26385	MBOAT7	273592	610921	12083	N/A		SORBS2	154556	319471	20021	322182	36240
CHST5	135702	336257	4146	338783	26386	MBOAT7	273592	614760	12084	N/A		SORBS2	154556	449407	20022	397262	36241
CHST5	135702	565039	4147	454375	26387	MBOAT7	273592	618899	12085	480531	31276	SORBS2	154556	355634	20023	347852	36242
CHST8	124302	591231	4148	467012	26388	MBOAT7	273592	616653	12086	N/A		SORBS2	154556	393528	20024	377162	36243
CHST8	124302	438847	4149	393879	26389	MBOAT7	273592	617324	12087	478623	31277	SORBS2	154556	478461	20025	N/A	
CHST8	124302	604556	4150	N/A		MBOAT7	273592	619692	12088	N/A		SORBS2	154556	319454	20026	321983	36244
CHST8	124302	262622	4151	262622	26390	MBOAT7	273592	617095	12089	482316	31278	SORBS2	154556	498125	20027	N/A	
CHST8	124302	434302	4152	392604	26391	MBOAT7	273592	616410	12090	N/A		SORBS2	154556	480146	20028	N/A	
CHST9	154080	618847	4153	480991	26392	MBOAT7	273592	618614	12091	N/A		SORBS2	154556	451974	20029	401818	36245
CHST9	154080	581714	4154	462852	26393	MBOAT7	273592	611302	12092	N/A		SORBS2	154556	438278	20030	389995	36246
CHST9	154080	580774	4155	464655	26394	MBOAT7	273592	620371	12093	479760	31279	SORBS2	154556	487184	20031	N/A	
CHSY1	131873	254190	4156	254190	26395	MBOAT7	275118	615872	12094	481141	31280	SORBS2	154556	445625	20032	391940	36247
CHSY1	131873	543813	4157	N/A		MBOAT7	275118	615282	12095	483987	31281	SORBS2	154556	487836	20033	N/A	
CHSY1	131873	560766	4158	N/A		MBOAT7	275118	613746	12096	484933	31282	SORBS2	154556	495932	20034	N/A	
CHSY1	131873	561414	4159	N/A		MBOAT7	275118	610768	12097	N/A		SORBS2	154556	490562	20035	N/A	
CHSY1	131873	561143	4160	N/A		MBOAT7	275118	621334	12098	483561	31283	SORBS2	154556	492104	20036	N/A	
CHSY1	131873	559384	4161	N/A		MBOAT7	275118	619670	12099	479750	31284	SORBS2	154556	490779	20037	N/A	
CHSY3	198108	305031	4162	302629	26396	MBOAT7	275118	612092	12100	482357	31285	SORBS2	154556	492810	20038	N/A	
CHSY3	198108	507545	4163	N/A		MBOAT7	275118	619844	12101	480282	31286	SORBS2	154556	476311	20039	N/A	
CHTF18	127586	464728	4164	N/A		MBOAT7	275118	612519	12102	479717	31287	SORBS2	154556	466289	20040	N/A	
CHTF18	127586	262315	4165	262315	26397	MBOAT7	275118	621649	12103	N/A		SORBS2	154556	485380	20041	N/A	
CHTF18	127586	570058	4166	N/A		MBOAT7	275118	621527	12104	N/A		SORBS2	154556	470685	20042	N/A	
CHTF18	127586	563545	4167	456998	26398	MBOAT7	275118	611912	12105	N/A		SORBS2	154556	494140	20043	N/A	
CHTF18	127586	479976	4168	N/A		MBOAT7	275118	621865	12106	N/A		SORBS2	154556	445343	20044	399048	36248
CHTF18	127586	455171	4169	406252	26399	MBOAT7	274194	613506	12107	478965	31288	SORBS2	154556	439914	20045	408909	36249
CHTF18	127586	440239	4170	399111	26400	MBOAT7	274194	617656	12108	481864	31289	SORBS2	154556	444771	20046	410483	36250
CHTF18	127586	471202	4171	N/A		MBOAT7	274194	617772	12109	480575	31290	SORBS2	154556	430503	20047	405349	36251
CHTF18	127586	491530	4172	N/A		MBOAT7	277025	618378	12110	482252	31291	SORBS2	154556	450341	20048	415680	36252
CHTF18	127586	426047	4173	412015	26401	MBOAT7	277025	619745	12111	481544	31292	SORBS2	154556	445115	20049	397664	36253
CHTF18	127586	484349	4174	N/A		MBOAT7	277025	611239	12112	481947	31293	SORBS2	154556	457247	20050	398335	36254
CHTF18	127586	569270	4175	454679	26402	MBOAT7	277923	619842	12113	481455	31294	SORBS2	154556	456596	20051	410967	36255
CHTF18	127586	567620	4176	N/A		MBOAT7	277923	618826	12114	483839	31295	SORBS2	154556	425679	20052	415637	36256
CHTF18	127586	565787	4177	N/A		MBOAT7	277923	620311	12115	478522	31296	SORBS2	154556	439049	20053	416464	36257
CHTF18	127586	461268	4178	N/A		MBP	197971	382582	12116	372025	31297	SORBS2	154556	451958	20054	405092	36258
CHTF18	127586	493715	4179	N/A		MBP	197971	490319	12117	N/A		SORBS2	154556	444781	20055	396183	36259
CHTF18	127586	498439	4180	N/A		MBP	197971	585201	12118	462734	31298	SORBS2	154556	414724	20056	403417	36260
CHTF18	127586	564940	4181	N/A		MBP	197971	397875	12119	380973	31299	SORBS2	154556	419063	20057	408504	36261
CHTF18	127586	631357	4182	486314	26403	MBP	197971	397866	12120	380964	31300	SORBS2	154556	393523	20058	377158	36262
CHTF18	127586	317063	4183	313029	26404	MBP	197971	397865	12121	380963	31301	SORBS2	154556	420158	20059	410233	36263
CIPC	198894	361786	4184	355319	26405	MBP	197971	527041	12122	435243	31302	SORBS2	154556	421639	20060	405646	36264
CIPC	198894	555437	4185	451997	26406	MBP	197971	359645	12123	352667	31303	SORBS2	154556	493709	20061	N/A	
CIPC	198894	556863	4186	N/A		MBP	197971	528160	12124	436830	31304	SORBS2	154556	457934	20062	405314	36265
CIPC	198894	555611	4187	450972	26407	MBP	197971	577755	12125	462780	31305	SORBS2	154556	431902	20063	405432	36266
CIPC	198894	554658	4188	451522	26408	MBP	197971	527975	12126	431267	31306	SORBS2	154556	435480	20064	415166	36267
CIPC	198894	557115	4189	452589	26409	MBP	197971	578715	12127	N/A		SORBS2	154556	415274	20065	415392	36268
CIPC	198894	554447	4190	452380	26410	MBP	197971	397869	12128	380967	31307	SORBS2	154556	432655	20066	407006	36269
CIPC	198894	555200	4191	451493	26411	MBP	197971	354542	12129	346545	31308	SORBS2	154556	451701	20067	404430	36270
CIT	122966	392521	4192	376306	26412	MBP	197971	531144	12130	431335	31309	SORBS2	154556	428330	20068	402328	36271

CIT	122966	261833	4193	261833	26413	MBP	197971	583474	12131	462758	31310	SORBS2	154556	421420	20069	393258	36272
CIT	122966	545913	4194	N/A		MBP	197971	533278	12132	434011	31311	SORBS2	154556	464975	20070	N/A	
CIT	122966	392520	4195	376305	26414	MBP	197971	526111	12133	435641	31312	SORBS2	154556	464819	20071	N/A	
CIT	122966	537607	4196	N/A		MBP	197971	580402	12134	462223	31313	SORBS2	154556	478249	20072	N/A	
CIT	122966	544872	4197	N/A		MBP	197971	579129	12135	463780	31314	SORBS2	154556	452351	20073	412447	36273
CIT	122966	469414	4198	N/A		MBP	197971	578193	12136	463403	31315	SORBS2	154556	429056	20074	390162	36274
CIT	122966	538073	4199	N/A		MBP	197971	397868	12137	N/A		SORBS2	154556	463104	20075	N/A	
CIT	122966	543324	4200	N/A		MBP	197971	447114	12138	405882	31316	SORBS2	154556	456060	20076	389829	36275
CIT	122966	544800	4201	N/A		MBP	197971	581179	12139	N/A		SORBS2	154556	476878	20077	N/A	
CIT	122966	543239	4202	N/A		MBP	197971	580473	12140	N/A		SORBS2	154556	462661	20078	N/A	
CIT	122966	536008	4203	N/A		MBP	197971	582282	12141	N/A		SORBS2	154556	469627	20079	N/A	
CIT	122966	544588	4204	N/A		MBP	197971	473302	12142	432988	31317	SORBS2	154556	488562	20080	N/A	
CIT	122966	536325	4205	443199	26415	MBP	197971	483025	12143	442393	31318	SORBS2	154556	418609	20081	397482	36276
CIT	122966	546026	4206	446105	26416	MBP	197971	493623	12144	436951	31319	SORBS2	154556	448662	20082	409158	36277
CIT	122966	541841	4207	N/A		MBP	197971	585216	12145	N/A		SORBS2	154556	437304	20083	396008	36278
CIT	122966	488203	4208	N/A		MBP	197971	484548	12146	N/A		SORBS2	154556	284776	20084	284776	36279
CIT	122966	539413	4209	N/A		MBP	197971	583118	12147	N/A		SORBS3	120896	522037	20085	N/A	
CIT	122966	612548	4210	482318	26417	MBP	197971	578873	12148	463137	31320	SORBS3	120896	523941	20086	N/A	
CKMT1B	237289	453782	4211	413999	26418	MBP	197971	467108	12149	N/A		SORBS3	120896	240123	20087	240123	36280
CKMT1B	237289	437924	4212	391900	26419	MBP	197971	459948	12150	435322	31321	SORBS3	120896	517500	20088	429723	36281
CKMT1B	237289	475589	4213	N/A		MBP	197971	482445	12151	N/A		SORBS3	120896	517535	20089	N/A	
CKMT1B	237289	481666	4214	N/A		MBP	197971	498683	12152	437063	31322	SORBS3	120896	523402	20090	N/A	
CKMT1B	237289	449946	4215	416467	26420	MBP	197971	583266	12153	N/A		SORBS3	120896	520563	20091	428102	36282
CKMT1B	237289	417289	4216	396707	26421	MBP	197971	397863	12154	380961	31323	SORBS3	120896	524057	20092	N/A	
CKMT1B	237289	441322	4217	413255	26422	MBP	197971	397860	12155	380958	31324	SORBS3	120896	518512	20093	N/A	
CKMT1B	237289	495545	4218	N/A		MBP	197971	581878	12156	462374	31325	SORBS3	120896	520574	20094	N/A	
CKMT1B	237289	498538	4219	N/A		MBP	197971	487778	12157	N/A		SORBS3	120896	521787	20095	N/A	
CKMT1B	237289	453733	4220	411531	26423	MBP	197971	490754	12158	N/A		SORBS3	120896	523740	20096	N/A	
CKMT1B	237289	437534	4221	416717	26424	MBP	197971	495162	12159	N/A		SORBS3	120896	522315	20097	N/A	
CKMT1B	237289	428981	4222	399467	26425	MBP	197971	497479	12160	N/A		SORBS3	120896	519453	20098	N/A	
CKMT1B	237289	411560	4223	N/A		MBP	197971	493247	12161	N/A		SORBS3	120896	523900	20099	431128	36283
CKMT1B	237289	300283	4224	300283	26426	MBP	197971	583798	12162	463164	31326	SORBS3	120896	523965	20100	429764	36284
CKMT1B	237289	627381	4225	486477	26427	MBP	197971	355994	12163	348273	31327	SORBS3	120896	521554	20101	N/A	
CLASRP	104859	221455	4226	221455	26428	MCAM	076706	264036	12164	264036	31328	SORBS3	120896	522721	20102	429479	36285
CLASRP	104859	391953	4227	375815	26429	MCAM	076706	528533	12165	N/A		SORBS3	120896	523348	20103	428678	36286
CLASRP	104859	592056	4228	N/A		MCAM	076706	525586	12166	N/A		SORBS3	120896	517962	20104	428327	36287
CLASRP	104859	591410	4229	465750	26430	MCAM	076706	524940	12167	N/A		SORBS3	120896	520207	20105	N/A	
CLASRP	104859	391952	4230	375814	26431	MCAM	076706	528976	12168	N/A		SORBS3	120896	519127	20106	N/A	
CLASRP	104859	588247	4231	N/A		MCAM	076706	530706	12169	N/A		SORCS3	156395	369701	20107	358715	36288
CLASRP	104859	588936	4232	465562	26432	MCAM	076706	529257	12170	N/A		SORCS3	156395	393176	20108	376876	36289
CLASRP	104859	544944	4233	438702	26433	MCAM	076706	529295	12171	N/A		SORCS3	156395	369699	20109	358713	36290
CLASRP	104859	587112	4234	466371	26434	MCAM	076706	530006	12172	N/A		SOS1	115904	426016	20110	387784	36291
CLASRP	104859	588016	4235	N/A		MCAM	076706	530937	12173	N/A		SOS1	115904	395038	20111	378479	36292
CLASRP	104859	585432	4236	N/A		MCAM	076706	528502	12174	N/A		SOS1	115904	469581	20112	N/A	
CLASRP	104859	585615	4237	N/A		MCAM	076706	529686	12175	N/A		SOS1	115904	474390	20113	N/A	
CLASRP	104859	591904	4238	467177	26435	MCAM	076706	526190	12176	N/A		SOS1	115904	472480	20114	N/A	
CLASRP	104859	587472	4239	N/A		MCAM	076706	525555	12177	N/A		SOS1	115904	461545	20115	N/A	
CLASRP	104859	592876	4240	N/A		MCAM	076706	534522	12178	N/A		SOS1	115904	451331	20116	393899	36293
CLASRP	104859	588070	4241	N/A		MCAM	076706	530144	12179	N/A		SOS1	115904	402219	20117	384675	36294
CLCN1	188037	343257	4242	339867	26436	MCAM	076706	526992	12180	N/A		SOX10	100146	427770	20118	414853	36295
CLCN1	188037	432192	4243	395949	26437	MCC	171444	302475	12181	305617	31329	SOX10	100146	470555	20119	N/A	
CLCN1	188037	455478	4244	400027	26438	MCC	171444	515367	12182	421615	31330	SOX10	100146	360880	20120	354130	36296
CLCN1	188037	495612	4245	N/A		MCC	171444	408903	12183	386227	31331	SOX10	100146	446929	20121	399777	36297
CLCN3	109572	511092	4246	425160	26439	MCC	171444	624689	12184	485492	31332	SOX10	100146	396884	20122	380093	36298
CLCN3	109572	513761	4247	424603	26440	MCC	171444	514701	12185	485220	31333	SOX13	143842	367203	20123	N/A	
CLCN3	109572	347613	4248	261514	26441	MCC	171444	502648	12186	N/A		SOX13	143842	534185	20124	N/A	
CLCN3	109572	360642	4249	353857	26442	MCC	171444	505604	12187	N/A		SOX13	143842	530882	20125	N/A	
CLCN3	109572	512813	4250	425823	26443	MCC	171444	506605	12188	N/A		SOX13	143842	367204	20126	356172	36299
CLCN3	109572	506924	4251	N/A		MCC	171444	511847	12189	N/A		SOX13	143842	525442	20127	433595	36300

CLCN3	109572	507875	4252	425323	26444	MCC	171444	511242	12190	N/A		SOX13	143842	528591	20128	436297	36301
CLCN3	109572	502998	4253	N/A		MCL1	143384	369026	12191	358022	31334	SOX13	143842	272193	20129	N/A	
CLCN3	109572	515420	4254	422678	26445	MCL1	143384	464132	12192	N/A		SOX13	143842	480326	20130	434093	36302
CLCN3	109572	613795	4255	478336	26446	MCL1	143384	307940	12193	309973	31335	SOX13	143842	525258	20131	N/A	
CLCN3	109572	504131	4256	424540	26447	MCL1	143384	620947	12194	477624	31336	SOX13	143842	618875	20132	478239	36303
CLCN5	171365	376088	4257	365256	26448	MCTP1	175471	514040	12195	N/A		SOX2	181449	325404	20133	323588	36304
CLCN5	171365	376091	4258	365259	26449	MCTP1	175471	515393	12196	424126	31337	SOX6	110693	316399	20134	324948	36305
CLCN5	171365	482218	4259	476732	26450	MCTP1	175471	429576	12197	391639	31338	SOX6	110693	528252	20135	432134	36306
CLCN5	171365	376108	4260	365276	26451	MCTP1	175471	505078	12198	426417	31339	SOX6	110693	527619	20136	434455	36307
CLCN5	171365	307367	4261	304257	26452	MCTP1	175471	312216	12199	308957	31340	SOX6	110693	528429	20137	433233	36308
CLDN1	163347	295522	4262	295522	26453	MCTP1	175471	509850	12200	N/A		SOX6	110693	527840	20138	N/A	
CLDN1	163347	490800	4263	N/A		MCTP1	175471	508309	12201	423410	31341	SOX6	110693	524650	20139	N/A	
CLDN11	013297	064724	4264	064724	26454	MCTP1	175471	512425	12202	431075	31342	SOX6	110693	531297	20140	N/A	
CLDN11	013297	486975	4265	417434	26455	MCTP1	175471	505208	12203	426438	31343	SOX6	110693	533411	20141	436170	36309
CLDN11	013297	486429	4266	N/A		MCTP1	175471	506568	12204	426294	31344	SOX6	110693	530378	20142	432577	36310
CLDN11	013297	489485	4267	N/A		MCTP1	175471	503301	12205	425515	31345	SOX6	110693	533870	20143	N/A	
CLDN11	013297	468358	4268	N/A		MCTP1	175471	507214	12206	424936	31346	SOX6	110693	533658	20144	N/A	
CLDN11	013297	471373	4269	N/A		MCTP1	175471	514780	12207	421543	31347	SOX6	110693	526673	20145	434892	36311
CLDN11	013297	477531	4270	N/A		MCTP1	175471	512568	12208	N/A		SOX6	110693	529469	20146	432596	36312
CLDN11	013297	488989	4271	N/A		MCTP1	175471	510732	12209	422219	31348	SOX6	110693	525835	20147	N/A	
CLDN11	013297	480067	4272	N/A		MCTP1	175471	513695	12210	N/A		SOX6	110693	524520	20148	N/A	
CLEC2L	236279	422142	4273	390661	26456	MCTP1	175471	505465	12211	422317	31349	SOX6	110693	525259	20149	N/A	
CLEC2L	236279	521281	4274	428508	26457	MCTP1	175471	513857	12212	N/A		SOX6	110693	396356	20150	379644	36313
CLEC2L	236279	520413	4275	N/A		MDFI	112559	432027	12213	413226	31350	SOX8	005513	293894	20151	293894	36314
CLEC7A	172243	353231	4276	266456	26458	MDFI	112559	419164	12214	393881	31351	SOX8	005513	566034	20152	N/A	
CLEC7A	172243	534609	4277	N/A		MDFI	112559	373051	12215	362142	31352	SOX9	125398	245479	20153	245479	36315
CLEC7A	172243	529761	4278	432876	26459	MDFI	112559	441667	12216	406600	31353	SP5	204335	375281	20154	364430	36316
CLEC7A	172243	298523	4279	298523	26460	MDFI	112559	230321	12217	230321	31354	SP5	204335	487037	20155	N/A	
CLEC7A	172243	396484	4280	379743	26461	MDFI	112559	373050	12218	362141	31355	SPAG5	076382	580377	20156	N/A	
CLEC7A	172243	304084	4281	302569	26462	MDFI	112559	446650	12219	411829	31356	SPAG5	076382	582175	20157	N/A	
CLEC7A	172243	465100	4282	436923	26463	MDFI	112559	435476	12220	403587	31357	SPAG5	076382	321765	20158	323300	36317
CLEC7A	172243	349926	4283	344723	26464	MDFI	112559	471092	12221	N/A		SPAG5	076382	582076	20159	466061	36318
CLEC7A	172243	533022	4284	431461	26465	MDGA1	112139	434837	12222	402584	31358	SPAG5	076382	580676	20160	N/A	
CLEC7A	172243	531192	4285	434392	26466	MDGA1	112139	373401	12223	N/A		SPAG5	076382	581133	20161	N/A	
CLEC7A	172243	528799	4286	N/A		MDGA1	112139	505425	12224	422042	31359	SPAG5	076382	580682	20162	N/A	
CLEC7A	172243	310002	4287	312089	26467	MDGA1	112139	503419	12225	N/A		SPAG5	076382	577259	20163	N/A	
CLEC7A	172243	525605	4288	434954	26468	MDGA1	112139	418178	12226	393330	31360	SPAG5	076382	580406	20164	N/A	
CLIC5	112782	185206	4289	185206	26469	MDGA1	112139	502298	12227	425911	31361	SPAG5	076382	378976	20165	466021	36319
CLIC5	112782	487396	4290	N/A		MDGA1	112139	510077	12228	N/A		SPAG5	076382	578230	20166	464280	36320
CLIC5	112782	339561	4291	344165	26470	MDGA1	112139	478143	12229	N/A		SPAG5	076382	580083	20167	464474	36321
CLIC5	112782	484572	4292	N/A		MDGA1	112139	515437	12230	421510	31362	SPAG5	076382	584206	20168	463095	36322
CLIC5	112782	486570	4293	N/A		MDGA1	112139	508399	12231	427645	31363	SPAG5	076382	580567	20169	464400	36323
CLIC5	112782	476852	4294	N/A		MDGA2	139915	399232	12232	382178	31364	SPAG5	076382	578479	20170	462663	36324
CLIC5	112782	464137	4295	N/A		MDGA2	139915	357362	12233	349925	31365	SPAG5	076382	536674	20171	444223	36325
CLIC5	112782	544153	4296	439195	26471	MDGA2	139915	557238	12234	452593	31366	SPAG9	008294	262013	20172	262013	36326
CLIC6	159212	360731	4297	353959	26472	MDGA2	139915	557516	12235	N/A		SPAG9	008294	509724	20173	N/A	
CLIC6	159212	349499	4298	290332	26473	MDGA2	139915	555521	12236	N/A		SPAG9	008294	510283	20174	423165	36327
CLK1	013441	321356	4299	326830	26474	MDGA2	139915	554762	12237	450827	31367	SPAG9	008294	505279	20175	426900	36328
CLK1	013441	461981	4300	N/A		MDGA2	139915	482848	12238	434991	31368	SPAG9	008294	357122	20176	349636	36329
CLK1	013441	464454	4301	N/A		MDGA2	139915	486952	12239	452515	31369	SPAG9	008294	506500	20177	N/A	
CLK1	013441	432425	4302	400487	26475	MDGA2	139915	472499	12240	N/A		SPAG9	008294	513746	20178	423346	36330
CLK1	013441	473565	4303	N/A		MDGA2	139915	426342	12241	405456	31370	SPAG9	008294	511312	20179	N/A	
CLK1	013441	472679	4304	N/A		MED12L	144893	469768	12242	N/A		SPAG9	008294	513906	20180	430205	36331
CLK1	013441	409769	4305	386358	26476	MED12L	144893	422248	12243	403308	31371	SPAG9	008294	514613	20181	N/A	
CLK1	013441	409403	4306	386875	26477	MED12L	144893	309237	12244	310760	31372	SPAG9	008294	505173	20182	N/A	
CLK1	013441	434813	4307	394734	26478	MED12L	144893	474524	12245	417235	31373	SPAG9	008294	514205	20183	N/A	
CLK1	013441	461326	4308	N/A		MED12L	144893	273432	12246	273432	31374	SPAG9	008294	506483	20184	N/A	
CLK1	013441	496205	4309	N/A		MED12L	144893	480026	12247	417420	31375	SPAG9	008294	513827	20185	N/A	
CLK1	013441	492793	4310	N/A		MED12L	144893	491549	12248	N/A		SPAG9	008294	515685	20186	N/A	

CLK1	013441	481641	4311	N/A		MED12L	144893	468305	12249	N/A		SPAG9	008294	513547	20187	N/A	
CLK1	013441	482590	4312	N/A		MED12L	144893	488092	12250	N/A		SPAG9	008294	511795	20188	429343	36332
CLK1	013441	621181	4313	479484	26479	MEF2C	081189	504921	12251	421925	31376	SPAG9	008294	576492	20189	N/A	
CLMN	165959	298912	4314	298912	26480	MEF2C	081189	340208	12252	340874	31377	SPAG9	008294	510855	20190	426061	36333
CLMN	165959	557215	4315	N/A		MEF2C	081189	424173	12253	389610	31378	SPAG9	008294	511987	20191	N/A	
CLMN	165959	557696	4316	N/A		MEF2C	081189	637481	12254	490354	31379	SPAG9	008294	502329	20192	N/A	
CLMN	165959	556454	4317	N/A		MEF2C	081189	636998	12255	490630	31380	SPAG9	008294	618113	20193	484908	36334
CLMN	165959	556441	4318	452305	26481	MEF2C	081189	623674	12256	487430	31381	SPARC	113140	231061	20194	231061	36335
CLMN	165959	556416	4319	N/A		MEF2C	081189	437473	12257	396219	31382	SPARC	113140	520687	20195	N/A	
CLMN	165959	555336	4320	451705	26482	MEF2C	081189	625585	12258	487538	31383	SPARC	113140	538026	20196	440127	36336
CLMN	165959	555615	4321	452525	26483	MEF2C	081189	514028	12259	426665	31384	SPARC	113140	537849	20197	N/A	
CLMN	165959	553733	4322	451189	26484	MEF2C	081189	510942	12260	422390	31385	SPARC	113140	521569	20198	428119	36337
CLMP	166250	448775	4323	405577	26485	MEF2C	081189	506554	12261	425636	31386	SPARC	113140	524277	20199	N/A	
CLMP	166250	530371	4324	N/A		MEF2C	081189	637732	12262	490241	31387	SPARC	113140	539687	20200	444998	36338
CLMP	166250	527977	4325	N/A		MEF2C	081189	514015	12263	424606	31388	SPARC	113140	521327	20201	N/A	
CLMP	166250	529128	4326	N/A		MEF2C	081189	629612	12264	486554	31389	SPARC	113140	522348	20202	429152	36339
CLSTN2	158258	458420	4327	402460	26486	MEF2C	081189	636143	12265	N/A		SPARCL1	152583	282470	20203	282470	36340
CLSTN2	158258	511524	4328	N/A		MEF2C	081189	636294	12266	490473	31390	SPARCL1	152583	503414	20204	422903	36341
CLSTN3	139182	541953	4329	443959	26487	MEF2C	081189	627659	12267	486490	31391	SPARCL1	152583	541496	20205	445678	36342
CLSTN3	139182	266546	4330	266546	26488	MEF2C	081189	508569	12268	423597	31392	SPARCL1	152583	509407	20206	423483	36343
CLSTN3	139182	541667	4331	N/A		MEF2C	081189	627170	12269	487157	31393	SPARCL1	152583	434434	20207	416971	36344
CLSTN3	139182	545663	4332	442612	26489	MEF2C	081189	627717	12270	486932	31394	SPARCL1	152583	535835	20208	438188	36345
CLSTN3	139182	535452	4333	443468	26490	MEF2C	081189	503554	12271	487437	31395	SPARCL1	152583	512317	20209	423448	36346
CLSTN3	139182	534830	4334	443490	26491	MEF2C	081189	626391	12272	487184	31396	SPARCL1	152583	543631	20210	444832	36347
CLSTN3	139182	539982	4335	442801	26492	MEF2C	081189	628656	12273	487311	31397	SPARCL1	152583	458304	20211	406251	36348
CLSTN3	139182	537408	4336	440679	26493	MEF2C	081189	510980	12274	N/A		SPARCL1	152583	418378	20212	414856	36349
CLSTN3	139182	538933	4337	N/A		MEF2C	081189	515715	12275	N/A		SPATA13	228741	439928	20213	N/A	
CLSTN3	139182	540931	4338	N/A		MEF2C	081189	513252	12276	423826	31398	SPATA13	182957	424834	20214	398560	36350
CLSTN3	139182	535668	4339	N/A		MEF2C	081189	506716	12277	423656	31399	SPATA13	182957	466831	20215	N/A	
CLSTN3	139182	544584	4340	N/A		MEF2C	081189	637664	12278	N/A		SPATA13	182957	382095	20216	371527	36351
CLSTN3	139182	541770	4341	N/A		MEF2C	081189	631026	12279	485972	31400	SPATA13	182957	474317	20217	N/A	
CLSTN3	139182	542663	4342	N/A		MEF2C	081189	502831	12280	427286	31401	SPATA13	182957	434675	20218	401605	36352
CLSTN3	139182	331148	4343	N/A		MEF2C	081189	507984	12281	424331	31402	SPATA13	182957	494772	20219	477296	36353
CLSTN3	139182	535313	4344	N/A		MEF2C	081189	502983	12282	427163	31403	SPATA13	182957	399949	20220	382830	36354
CLVS2	146352	275162	4345	275162	26494	MEF2C	081189	508610	12283	426442	31404	SPATA13	182957	409126	20221	386471	36355
CLVS2	146352	368438	4346	357423	26495	MEF2C	081189	636541	12284	489865	31405	SPATA13	182957	454083	20222	397498	36356
NAI8	144035	272425	4347	272425	26496	MEF2C	081189	637372	12285	N/A		SPATA13	182957	488060	20223	477304	36357
CMTM5	166091	359320	4348	352270	26497	MEF2C	081189	636517	12286	N/A		SPATA13	182957	343003	20224	343631	36358
CMTM5	166091	339180	4349	344819	26498	MEF2C	081189	503075	12287	426465	31406	SPATA13	182957	382108	20225	371542	36359
CMTM5	166091	342473	4350	344160	26499	MEF2C	081189	637506	12288	N/A		SPATA9	145757	477715	20226	427257	36360
CMTM5	166091	397227	4351	380404	26500	MEF2C	081189	637754	12289	N/A		SPATA9	145757	477047	20227	N/A	
CMTM5	166091	553750	4352	N/A		MEF2C	081189	637531	12290	N/A		SPATA9	145757	316087	20228	325491	36361
CMTM5	166091	555731	4353	451514	26501	MEF2C	081189	511086	12291	N/A		SPATA9	145757	274432	20229	274432	36362
CMTM5	166091	382809	4354	372259	26502	MEF2C	081189	635898	12292	490525	31407	SPATA9	145757	379990	20230	N/A	
CMTM5	166091	555487	4355	N/A		MEF2C	081189	509373	12293	427309	31408	SPATA9	145757	489917	20231	420883	36363
CMTM8	170293	458535	4356	412934	26503	MEF2C	081189	515093	12294	N/A		SPATC1	186583	377470	20232	366690	36364
CMTM8	170293	307526	4357	307741	26504	MEF2C	081189	509349	12295	N/A		SPATC1	186583	447830	20233	387613	36365
CNDP1	150656	358821	4358	351682	26505	MEF2C	081189	636336	12296	N/A		SPECC1	128487	472876	20234	N/A	
CNDP1	150656	585136	4359	N/A		MEF2C	081189	637048	12297	N/A		SPECC1	128487	395527	20235	378898	36366
CNDP1	150656	582365	4360	462096	26506	MEF2C	081189	637801	12298	N/A		SPECC1	128487	583482	20236	463006	36367
CNDP1	150656	584316	4361	463807	26507	MEF2C	081189	629847	12299	N/A		SPECC1	128487	583528	20237	461918	36368
CNDP1	150656	584004	4362	N/A		MEF2C	081189	637663	12300	N/A		SPECC1	128487	583463	20238	464489	36369
CNDP1	150656	578498	4363	N/A		MEF2C	081189	636061	12301	N/A		SPECC1	128487	578321	20239	462266	36370
CNDP1	150656	582461	4364	N/A		MEF2C	081189	635837	12302	N/A		SPECC1	128487	582604	20240	464639	36371
CNIH3	143786	471578	4365	N/A		MEF2C	081189	503955	12303	N/A		SPECC1	128487	413167	20241	N/A	
CNIH3	143786	483512	4366	N/A		MEF2C	081189	637231	12304	N/A		SPECC1	128487	395529	20242	378900	36372
CNIH3	143786	498126	4367	N/A		MEF2C	081189	636349	12305	N/A		SPECC1	128487	261503	20243	261503	36373
CNIH3	143786	496372	4368	N/A		MEF2C	081189	637167	12306	N/A		SPECC1	128487	581973	20244	464341	36374
CNIH3	143786	470602	4369	N/A		MEF2C-AS1	248309	511100	12307	N/A		SPECC1	128487	580934	20245	461944	36375

CNIH3	143786	498382	4370	N/A		MEF2C-AS1	248309	514794	12308	N/A		SPECC1	128487	582063	20246	N/A	
CNIH3	143786	478120	4371	N/A		MEF2C-AS1	248309	512585	12309	N/A		SPECC1	128487	579688	20247	N/A	
CNIH3	143786	481095	4372	N/A		MEF2C-AS1	248309	513704	12310	N/A		SPECC1	128487	395530	20248	378901	36376
CNIH3	143786	470788	4373	N/A		MEF2C-AS1	248309	514011	12311	N/A		SPECC1	128487	467722	20249	463130	36377
CNIH3	143786	489556	4374	N/A		MEF2C-AS1	248309	509179	12312	N/A		SPECC1	128487	395522	20250	378893	36378
CNIH3	143786	496277	4375	N/A		MEF2C-AS1	248309	514092	12313	N/A		SPECC1	128487	395525	20251	378896	36379
CNIH3	143786	492470	4376	N/A		MEF2C-AS1	248309	511876	12314	N/A		SPECC1	128487	581399	20252	462471	36380
CNIH3	143786	479227	4377	N/A		MEF2C-AS1	248309	508718	12315	N/A		SPECC1	128487	582226	20253	462092	36381
CNIH3	143786	272133	4378	272133	26508	MEF2C-AS1	248309	514158	12316	N/A		SPECC1	128487	584527	20254	463799	36382
CNKSR3	153721	607772	4379	475915	26509	MEF2C-AS1	248309	506665	12317	N/A		SPECC1	128487	578153	20255	462987	36383
CNKSR3	153721	433165	4380	N/A		MEF2C-AS1	248309	639552	12318	N/A		SPECC1	128487	492188	20256	N/A	
CNKSR3	153721	479339	4381	418975	26510	MEF2C-AS1	248309	508521	12319	N/A		SPEG	072195	312358	20257	311684	36384
CNKSR3	153721	424998	4382	393225	26511	MEF2C-AS1	248309	514571	12320	N/A		SPEG	072195	498378	20258	N/A	
CNKSR3	153721	454664	4383	N/A		MEF2C-AS1	248309	508742	12321	N/A		SPEG	072195	435853	20259	393134	36385
CNP	173786	393892	4384	377470	26512	MEG8	225746	553584	12322	N/A		SPEG	072195	403148	20260	383902	36386
CNP	173786	472031	4385	467641	26513	MEG8	225746	554852	12323	N/A		SPEG	072195	431523	20261	410986	36387
CNP	173786	591945	4386	N/A		MEG8	225746	636052	12324	N/A		SPEG	072195	396698	20262	379926	36388
CNP	173786	592446	4387	N/A		MEG8	225746	553465	12325	N/A		SPEG	072195	452101	20263	406530	36389
CNP	173786	587679	4388	468198	26514	MEG8	225746	554323	12326	N/A		SPEG	072195	420132	20264	397514	36390
CNP	173786	393888	4389	377466	26515	MEG8	225746	556475	12327	N/A		SPEG	072195	464989	20265	N/A	
CNP	173786	441615	4390	413104	26516	MEG8	225746	553421	12328	N/A		SPEG	072195	451076	20266	414549	36391
CNP	173786	589772	4391	466807	26517	MEG8	225746	638012	12329	N/A		SPEG	072195	409595	20267	387344	36392
CNP	173786	585452	4392	468471	26518	MEG8	225746	556720	12330	N/A		SPEG	072195	497065	20268	N/A	
CNP	173786	592861	4393	N/A		MEG8	225746	555354	12331	N/A		SPEG	072195	491248	20269	N/A	
CNP	173786	592105	4394	N/A		MEG8	225746	554485	12332	N/A		SPEG	072195	485813	20270	N/A	
CNP	173786	486438	4395	N/A		MEG8	225746	427085	12333	N/A		SPEG	072195	462545	20271	N/A	
CNPY1	146910	406197	4396	384514	26519	MEG8	225746	414488	12334	N/A		SPEG	072195	463218	20272	N/A	
CNPY1	146910	321736	4397	317439	26520	MEG8	225746	434716	12335	N/A		SPEG	072195	396688	20273	379919	36393
CNPY1	146910	636446	4398	490477	26521	MEG8	225746	554369	12336	N/A		SPEG	072195	496786	20274	N/A	
CNPY1	146910	636372	4399	490060	26522	MEG8	225746	556637	12337	N/A		SPEG	072195	475921	20275	N/A	
CNR1	118432	369501	4400	358513	26523	MEG8	225746	443252	12338	N/A		SPEG	072195	396686	20276	379917	36394
CNR1	118432	369499	4401	358511	26524	MEG8	225746	423708	12339	N/A		SPEG	072195	396689	20277	379920	36395
CNR1	118432	549890	4402	446819	26525	MEG8	225746	442197	12340	N/A		SPEG	072195	485069	20278	N/A	
CNR1	118432	362094	4403	355418	26526	MEG8	225746	636391	12341	N/A		SPEG	072195	412982	20279	390353	36396
CNR1	118432	468898	4404	420188	26527	MEG8	225746	554693	12342	N/A		SPEG	072195	475104	20280	N/A	
CNR1	118432	428600	4405	412192	26528	MEG8	225746	637332	12343	N/A		SPEG	072195	617028	20281	479190	36397
CNR1	118432	551417	4406	446702	26529	MEG8	225746	614605	12344	N/A		SPHK2	063176	245222	20282	245222	36398
CNTFR	122756	351266	4407	242338	26530	MEGF10	145794	503335	12345	423354	31409	SPHK2	063176	601712	20283	471180	36399
CNTFR	122756	378980	4408	368265	26531	MEGF10	145794	508365	12346	423195	31410	SPHK2	063176	600537	20284	470092	36400
CNTFR	122756	417345	4409	388082	26532	MEGF10	145794	418761	12347	416284	31411	SPHK2	063176	598088	20285	469158	36401
CNTFR	122756	610543	4410	480451	26533	MEGF10	145794	274473	12348	274473	31412	SPHK2	063176	426514	20286	410044	36402
CNTN2	184144	640352	4411	491080	26534	MEGF10	145794	515002	12349	N/A		SPHK2	063176	597434	20287	471111	36403
CNTN2	184144	638378	4412	492617	26535	MEGF10	145794	506709	12350	N/A		SPHK2	063176	601704	20288	469448	36404
CNTN2	184144	331830	4413	330633	26536	MEGF10	145794	510513	12351	N/A		SPHK2	063176	593308	20289	470679	36405
CNTN2	184144	636809	4414	N/A		MEGF10	145794	510828	12352	N/A		SPHK2	063176	599033	20290	N/A	
CNTN2	184144	640428	4415	491474	26537	MEGF10	145794	507158	12353	N/A		SPHK2	063176	599748	20291	471205	36406
CNTN2	184144	532366	4416	491665	26538	MEGF10	145794	515622	12354	N/A		SPHK2	063176	599029	20292	472983	36407
CNTN2	184144	639302	4417	491671	26539	MEGF11	157890	409699	12355	386908	31413	SPHK2	063176	598574	20293	N/A	
CNTN2	184144	639971	4418	491959	26540	MEGF11	157890	288745	12356	288745	31414	SPHK2	063176	340932	20294	341091	36408
CNTN2	184144	640326	4419	492495	26541	MEGF11	157890	395614	12357	378976	31415	SPHKAP	153820	392056	20295	375909	36409
CNTN2	184144	639015	4420	N/A		MEGF11	157890	478721	12358	N/A		SPHKAP	153820	344657	20296	339886	36410
CNTN2	184144	530117	4421	N/A		MEGF11	157890	490495	12359	456118	31416	SPHKAP	153820	490603	20297	N/A	
CNTN2	184144	638928	4422	N/A		MEGF11	157890	489275	12360	478311	31417	SPOCK3	196104	357154	20298	349677	36411
CNTN2	184144	639023	4423	N/A		MEGF11	157890	562154	12361	483007	31418	SPOCK3	196104	357545	20299	350153	36412
CNTN2	184144	481872	4424	N/A		MEGF11	157890	493192	12362	N/A		SPOCK3	196104	504953	20300	425570	36413
CNTN2	184144	636312	4425	489754	26542	MEGF11	157890	478590	12363	N/A		SPOCK3	196104	511531	20301	423421	36414
CNTN2	184144	639831	4426	N/A		MEGF11	157890	564573	12364	477691	31419	SPOCK3	196104	506886	20302	420920	36415
CNTN2	184144	639503	4427	N/A		MEGF11	157890	455812	12365	401400	31420	SPOCK3	196104	535728	20303	441396	36416
CNTN2	184144	639122	4428	491982	26543	MEGF11	157890	484618	12366	N/A		SPOCK3	196104	510741	20304	426716	36417

CNTN2	184144	530594	4429	N/A		MEGF11	157890	474398	12367	N/A		SPOCK3	196104	502330	20305	423606	36418
CNTN2	184144	638449	4430	N/A		MEGF11	157890	469917	12368	N/A		SPOCK3	196104	511905	20306	425712	36419
CNTN2	184144	638980	4431	N/A		MEGF11	157890	422354	12369	414475	31421	SPOCK3	196104	512681	20307	426318	36420
CNTN2	184144	639156	4432	N/A		MEGF11	277848	615799	12370	N/A		SPOCK3	196104	511269	20308	425502	36421
CNTN2	184144	527340	4433	N/A		MEGF11	277848	612969	12371	N/A		SPOCK3	196104	507370	20309	424677	36422
CNTN2	184144	525433	4434	N/A		MEGF11	277848	618218	12372	N/A		SPOCK3	196104	502821	20310	424980	36423
CNTN2	184144	639843	4435	491680	26544	MEGF11	277848	617841	12373	N/A		SPOCK3	196104	505187	20311	422170	36424
CNTN2	184144	636641	4436	N/A		MEGF11	277848	614417	12374	480105	31422	SPOCK3	196104	512648	20312	426177	36425
CNTN2	184144	638577	4437	492457	26545	MEGF11	277848	621793	12375	N/A		SPOCK3	196104	510403	20313	423176	36426
CNTN2	184144	638715	4438	N/A		MEGF11	277848	615866	12376	478094	31423	SPOCK3	196104	515143	20314	425859	36427
CNTN2	184144	639788	4439	N/A		MEGF11	277848	614717	12377	480614	31424	SPOCK3	196104	511226	20315	424674	36428
CNTN2	184144	638050	4440	N/A		MEGF11	277848	622356	12378	488336	31425	SPOCK3	196104	507086	20316	420928	36429
CNTN2	184144	639354	4441	N/A		MEGF11	277848	613422	12379	N/A		SPOCK3	196104	502741	20317	422336	36430
CNTN2	184144	640227	4442	N/A		MEGF11	277848	614563	12380	N/A		SPOCK3	196104	509854	20318	423367	36431
CNTN2	184144	640714	4443	N/A		MEGF11	277848	620966	12381	N/A		SPOCK3	196104	515316	20319	426995	36432
CNTN3	113805	263665	4444	263665	26546	MEGF11	277848	614471	12382	N/A		SPOCK3	196104	506697	20320	424168	36433
CNTN3	113805	477856	4445	N/A		MEI4	269964	602452	12383	473370	31426	SPOCK3	196104	512042	20321	425407	36434
CNTN4	144619	422330	4446	408594	26547	MEIS1	143995	496248	12384	N/A		SPOCK3	196104	421836	20322	411344	36435
CNTN4	144619	427741	4447	396719	26548	MEIS1	143995	560281	12385	454209	31427	SPOCK3	196104	541354	20323	444789	36436
CNTN4	144619	455083	4448	390560	26549	MEIS1	143995	491706	12386	N/A		SPON1	262655	576479	20324	460236	36437
CNTN4	144619	418658	4449	396010	26550	MEIS1	143995	272369	12387	272369	31428	SPON1	262655	591785	20325	N/A	
CNTN4	144619	490876	4450	N/A		MEIS1	143995	488550	12388	475161	31429	SPON2	159674	290902	20326	290902	36438
CNTN4	144619	397461	4451	380602	26551	MEIS1	143995	490726	12389	N/A		SPON2	159674	509697	20327	N/A	
CNTN4	144619	438282	4452	N/A		MEIS1	143995	398506	12390	381518	31430	SPON2	159674	507466	20328	N/A	
CNTN4	144619	430505	4453	N/A		MEIS1	143995	495021	12391	440571	31431	SPON2	159674	503765	20329	424542	36439
CNTN4	144619	434053	4454	404085	26552	MEIS1	143995	409622	12392	N/A		SPON2	159674	504909	20330	N/A	
CNTN4	144619	480113	4455	N/A		MEIS1	143995	437869	12393	397418	31432	SPON2	159674	512888	20331	N/A	
CNTN4	144619	473058	4456	N/A		MEIS1	143995	466811	12394	N/A		SPON2	159674	512150	20332	N/A	
CNTN4	144619	473173	4457	N/A		MEIS1	143995	498705	12395	N/A		SPON2	159674	515004	20333	425871	36440
CNTN4	144619	397459	4458	380600	26553	MEIS1	143995	606455	12396	N/A		SPON2	159674	502483	20334	422516	36441
CNTN4	144619	473845	4459	422120	26554	MEIS1	143995	475239	12397	N/A		SPON2	159674	514490	20335	421634	36442
CNTN4	144619	475817	4460	N/A		MEIS1	143995	409517	12398	N/A		SPON2	159674	509233	20336	421379	36443
CNTN4	144619	484686	4461	N/A		MEIS1	143995	542964	12399	N/A		SPON2	159674	511679	20337	423414	36444
CNTN4	144619	427331	4462	413642	26555	MEIS1	143995	450027	12400	N/A		SPON2	159674	511672	20338	421858	36445
CNTN5	149972	525047	4463	N/A		MEIS2	134138	561208	12401	453793	31433	SPON2	159674	506266	20339	N/A	
CNTN5	149972	528727	4464	N/A		MEIS2	134138	338564	12402	341400	31434	SPON2	159674	504871	20340	N/A	
CNTN5	149972	527185	4465	433575	26556	MEIS2	134138	397624	12403	380749	31435	SPON2	159674	502657	20341	N/A	
CNTN5	149972	528682	4466	436185	26557	MEIS2	134138	560702	12404	N/A		SPON2	159674	400762	20342	N/A	
CNTN5	149972	524871	4467	435637	26558	MEIS2	134138	314177	12405	326296	31436	SPON2	159674	505653	20343	N/A	
CNTN5	149972	418526	4468	393229	26559	MEIS2	134138	559085	12406	453390	31437	SPON2	159674	515553	20344	N/A	
CNTN5	149972	530458	4469	N/A		MEIS2	134138	560570	12407	453481	31438	SPON2	159674	510542	20345	N/A	
CNTN5	149972	525236	4470	N/A		MEIS2	134138	557796	12408	452693	31439	SPON2	159674	617421	20346	483599	36446
CNTN5	149972	527682	4471	N/A		MEIS2	134138	397620	12409	380745	31440	SPON2	159674	431380	20347	394832	36447
CNTN5	149972	524560	4472	N/A		MEIS2	134138	424352	12410	404185	31441	SPP1	118785	237623	20348	237623	36448
CNTN5	149972	619298	4473	478120	26560	MEIS2	134138	559972	12411	N/A		SPP1	118785	395080	20349	378517	36449
CNTN5	149972	279463	4474	279463	26561	MEIS2	134138	561264	12412	N/A		SPP1	118785	504310	20350	N/A	
CNTNAP4	152910	611870	4475	479811	26562	MEIS2	134138	561284	12413	N/A		SPP1	118785	513981	20351	N/A	
CNTNAP4	152910	622250	4476	477698	26563	MEIS2	134138	559371	12414	N/A		SPP1	118785	509334	20352	N/A	
CNTNAP4	152910	471618	4477	N/A		MEIS2	134138	557992	12415	N/A		SPP1	118785	508233	20353	422973	36450
CNTNAP4	152910	463177	4478	N/A		MEIS2	134138	558643	12416	N/A		SPP1	118785	360804	20354	354042	36451
CNTNAP4	152910	478060	4479	418741	26564	MEIS2	134138	559561	12417	453497	31442	SPP1	118785	509659	20355	N/A	
CNTNAP4	152910	476707	4480	417628	26565	MEIS2	134138	559408	12418	N/A		SPP1	118785	508002	20356	N/A	
CNTNAP4	152910	619533	4481	N/A		MEIS2	134138	607277	12419	475899	31443	SPP1	118785	505146	20357	N/A	
CNTNAP4	152910	377504	4482	439733	26566	MEIS2	134138	561163	12420	N/A		SPP1	118785	614857	20358	477824	36452
CNTNAP4	152910	307431	4483	306893	26567	MEIS2	134138	606653	12421	475660	31444	SPRED3	188766	587013	20359	467540	36453
CNTNAP5	155052	423939	4484	N/A		MEIS2	134138	561422	12422	N/A		SPRED3	188766	586301	20360	466568	36454
CNTNAP5	155052	431078	4485	399013	26568	MEIS2	134138	560617	12423	452874	31445	SPRED3	188766	587947	20361	467532	36455
CNTNAP5	155052	470921	4486	N/A		MEIS2	134138	558313	12424	453782	31446	SPRED3	188766	338502	20362	345405	36456
COBL	106078	431948	4487	413498	26569	MEIS2	134138	560697	12425	452770	31447	SPRED3	188766	587564	20363	N/A	

COBL	106078	445054	4488	401204	26570	MEIS2	134138	559129	12426	N/A		SPRED3	188766	586958	20364	465713	36457
COBL	106078	265136	4489	265136	26571	MEIS2	134138	340545	12427	339549	31448	SPRED3	188766	590962	20365	N/A	
COBL	106078	462395	4490	N/A		MEIS3	105419	561204	12428	N/A		SPSB4	175093	310546	20366	311609	36458
COBL	106078	452534	4491	405059	26572	MEIS3	105419	441740	12429	388667	31449	SPSB4	175093	508126	20367	422034	36459
COBL	106078	395540	4492	378910	26573	MEIS3	105419	331559	12430	333552	31450	SPSB4	175093	508828	20368	N/A	
COBL	106078	441453	4493	399500	26574	MEIS3	105419	560245	12431	453757	31451	SPSB4	175093	507895	20369	N/A	
COBL	106078	632460	4494	488001	26575	MEIS3	105419	561096	12432	453934	31452	SPTB	070182	556626	20370	451752	36460
COBL	106078	449281	4495	391864	26576	MEIS3	105419	561293	12433	453307	31453	SPTB	070182	342835	20371	N/A	
COBL	106078	395542	4496	378912	26577	MEIS3	105419	560253	12434	N/A		SPTB	070182	553938	20372	451324	36461
COL11A1	060718	370096	4497	359114	26578	MEIS3	105419	558555	12435	454073	31454	SPTB	070182	556227	20373	N/A	
COL11A1	060718	635193	4498	489428	26579	MEIS3	105419	559524	12436	452854	31455	SPTB	070182	389721	20374	374371	36462
COL11A1	060718	639098	4499	N/A		MEIS3	105419	607695	12437	475941	31456	SPTB	070182	389720	20375	374370	36463
COL11A1	060718	470170	4500	N/A		MEIS3	105419	559338	12438	453249	31457	SPTB	070182	542694	20376	N/A	
COL11A1	060718	512756	4501	426533	26580	MEIS3	105419	557833	12439	476248	31458	SPTB	070182	389722	20377	374372	36464
COL11A1	060718	465209	4502	N/A		MEIS3	105419	607330	12440	N/A		SPTBN2	173898	533211	20378	432568	36465
COL11A1	060718	461720	4503	N/A		MEIS3	105419	561040	12441	N/A		SPTBN2	173898	529997	20379	433593	36466
COL11A1	060718	475980	4504	N/A		MERTK	153208	295408	12442	295408	31459	SPTBN2	173898	528051	20380	N/A	
COL11A1	060718	427239	4505	408640	26581	MERTK	153208	409780	12443	387277	31460	SPTBN2	173898	530775	20381	N/A	
COL11A1	060718	447608	4506	410177	26582	MERTK	153208	439966	12444	402129	31461	SPTBN2	173898	532650	20382	N/A	
COL11A1	060718	353414	4507	302551	26583	MERTK	153208	473065	12445	N/A		SPTBN2	173898	532902	20383	N/A	
COL11A1	060718	358392	4508	351163	26584	MERTK	153208	449344	12446	412660	31462	SPTBN2	173898	530665	20384	N/A	
COL11A2	223699	425729	4509	408123	26585	MERTK	153208	421804	12447	389152	31463	SPTBN2	173898	527010	20385	433631	36467
COL11A2	223699	496849	4510	N/A		MERTK	153208	616902	12448	482824	31464	SPTBN2	173898	309996	20386	311489	36468
COL11A2	223699	452044	4511	416619	26586	METRN	103260	568223	12449	455068	31465	SPTBN2	173898	617502	20387	482000	36469
COL11A2	223699	435763	4512	396587	26587	METRN	103260	570132	12450	456647	31466	SPTBN2	173898	611817	20388	480692	36470
COL11A2	223699	552134	4513	449320	26588	METRN	103260	219542	12451	219542	31467	SPTY2D1	179119	336349	20389	337991	36471
COL11A2	223699	551413	4514	448715	26589	METRN	103260	567076	12452	459900	31468	SPTY2D1	179119	536336	20390	N/A	
COL11A2	235708	447349	4515	388309	26590	METRN	103260	564661	12453	N/A		SPTY2D1	179119	543776	20391	N/A	
COL11A2	235708	496392	4516	N/A		METRN	103260	568415	12454	457702	31469	SRC	197122	497734	20392	N/A	
COL11A2	235708	452730	4517	388775	26591	METTL7A	185432	548553	12455	448785	31470	SRC	197122	373578	20393	362680	36472
COL11A2	235708	447741	4518	400813	26592	METTL7A	185432	550502	12456	450239	31471	SRC	197122	373567	20394	362668	36473
COL11A2	235708	552473	4519	446870	26593	METTL7A	185432	547104	12457	447542	31472	SRC	197122	373558	20395	362659	36474
COL11A2	235708	549885	4520	448931	26594	METTL7A	185432	550097	12458	448286	31473	SRC	197122	472968	20396	N/A	
COL11A2	206290	383219	4521	372706	26595	METTL7A	185432	332160	12459	331787	31474	SRC	197122	489153	20397	N/A	
COL11A2	206290	420405	4522	394196	26596	METTL9	197006	563026	12460	N/A		SRC	197122	477066	20398	N/A	
COL11A2	206290	383088	4523	372566	26597	METTL9	197006	567404	12461	454733	31475	SRC	197122	467556	20399	N/A	
COL11A2	206290	433947	4524	388108	26598	METTL9	197006	358154	12462	350874	31476	SRC	197122	477475	20400	N/A	
COL11A2	206290	549836	4525	448701	26599	METTL9	197006	396014	12463	379335	31477	SRC	197122	493775	20401	N/A	
COL11A2	206290	549491	4526	450084	26600	METTL9	197006	562379	12464	457311	31478	SRC	197122	358208	20402	350941	36475
COL11A2	232541	443138	4527	404513	26601	METTL9	197006	570074	12465	456345	31479	SRCIN1	273608	615049	20403	480869	36476
COL11A2	232541	447855	4528	415296	26602	METTL9	197006	562961	12466	454239	31480	SRCIN1	273608	631564	20404	488014	36477
COL11A2	232541	434780	4529	408523	26603	METTL9	197006	568826	12467	455285	31481	SRCIN1	273608	632724	20405	488440	36478
COL11A2	232541	486982	4530	N/A		METTL9	197006	569290	12468	455720	31482	SRCIN1	273608	631905	20406	N/A	
COL11A2	227801	383087	4531	372565	26604	METTL9	197006	564733	12469	N/A		SRCIN1	273608	631691	20407	N/A	
COL11A2	227801	443125	4532	402987	26605	METTL9	197006	615720	12470	480710	31483	SRCIN1	273608	631684	20408	488254	36479
COL11A2	227801	451040	4533	398170	26606	METTL9	284548	640479	12471	491241	31484	SRCIN1	273608	631897	20409	N/A	
COL11A2	227801	439039	4534	410284	26607	METTL9	284548	640441	12472	492687	31485	SRCIN1	273608	613116	20410	N/A	
COL11A2	227801	549811	4535	449275	26608	METTL9	284548	639291	12473	N/A		SRCIN1	273608	632117	20411	487679	36480
COL11A2	227801	551542	4536	447864	26609	METTL9	284548	638803	12474	491526	31486	SRCIN1	277363	617146	20412	484715	36481
COL11A2	204248	374708	4537	363840	26610	METTL9	284548	638391	12475	492407	31487	SRCIN1	277363	621492	20413	483931	36482
COL11A2	204248	477772	4538	N/A		METTL9	284548	640147	12476	491618	31488	SRCIN1	277363	622190	20414	479718	36483
COL11A2	204248	457788	4539	405520	26611	METTL9	284548	638433	12477	491636	31489	SRCIN1	277363	622519	20415	N/A	
COL11A2	204248	395194	4540	378620	26612	METTL9	284548	639220	12478	492878	31490	SRCIN1	277363	621763	20416	N/A	
COL11A2	204248	341947	4541	339915	26613	METTL9	284548	638363	12479	492569	31491	SRCIN1	277363	613927	20417	477811	36484
COL11A2	204248	361917	4542	355123	26614	METTL9	284548	638474	12480	492256	31492	SRCIN1	277363	621275	20418	N/A	
COL11A2	230930	448717	4543	408627	26615	METTL9	284548	638846	12481	N/A		SRCIN1	277363	612208	20419	N/A	
COL11A2	230930	494246	4544	N/A		MFAP3L	198948	393704	12482	377307	31493	SRCIN1	277363	612431	20420	478342	36485
COL11A2	230930	438711	4545	398256	26616	MFAP3L	198948	361618	12483	354583	31494	SRGAP1	196935	355086	20421	347198	36486
COL11A2	230930	452937	4546	406347	26617	MFAP3L	198948	512698	12484	422791	31495	SRGAP1	196935	537556	20422	N/A	

COL11A2	230930	551758	4547	447062	26618	MFAP3L	198948	502832	12485	423722	31496	SRGAP1	196935	543397	20423	437948	36487
COL11A2	230930	550998	4548	450046	26619	MFAP3L	198948	507601	12486	423802	31497	SRGAP1	196935	542381	20424	N/A	
COL12A1	111799	425443	4549	399812	26620	MFAP3L	198948	393702	12487	377305	31498	SRGAP1	196935	537585	20425	N/A	
COL12A1	111799	322507	4550	325146	26621	MFAP3L	198948	506110	12488	422571	31499	SRGAP1	196935	542841	20426	N/A	
COL12A1	111799	345356	4551	305147	26622	MFAP3L	198948	504999	12489	425303	31500	SRGAP1	196935	631006	20427	485752	36488
COL12A1	111799	416123	4552	412864	26623	MFAP3L	198948	506764	12490	426247	31501	SRGN	122862	462445	20428	N/A	
COL12A1	111799	483888	4553	421216	26624	MFAP3L	198948	510306	12491	423549	31502	SRGN	122862	242465	20429	242465	36489
COL12A1	111799	511023	4554	N/A		MFAP3L	198948	514683	12492	N/A		SRPX	101955	378533	20430	367794	36490
COL12A1	111799	493109	4555	423423	26625	MFF	168958	423098	12493	390165	31503	SRPX	101955	479015	20431	N/A	
COL12A1	111799	419671	4556	393217	26626	MFF	168958	304593	12494	304898	31504	SRPX	101955	461865	20432	N/A	
COL12A1	111799	474564	4557	N/A		MFF	168958	476924	12495	N/A		SRPX	101955	432886	20433	411165	36491
COL12A1	111799	486533	4558	N/A		MFF	168958	489696	12496	N/A		SRPX	101955	544439	20434	440758	36492
COL12A1	111799	615798	4559	483232	26627	MFF	168958	353339	12497	302037	31505	SRPX	101955	538295	20435	445034	36493
COL13A1	197467	479733	4560	430089	26628	MFF	168958	354503	12498	346498	31506	SRRM4	139767	267260	20436	267260	36494
COL13A1	197467	398978	4561	381949	26629	MFF	168958	530359	12499	431725	31507	SRRM4	139767	545224	20437	N/A	
COL13A1	197467	354547	4562	346553	26630	MFF	168958	531278	12500	432447	31508	SRRM4	139767	537597	20438	N/A	
COL13A1	197467	357811	4563	350463	26631	MFF	168958	409565	12501	386964	31509	SRRM4	139767	641899	20439	493188	36495
COL13A1	197467	520267	4564	428057	26632	MFF	168958	452930	12502	415996	31510	SRSF3	112081	613941	20440	484891	36496
COL13A1	197467	517713	4565	430061	26633	MFF	168958	409616	12503	386641	31511	SRSF3	112081	620242	20441	N/A	
COL13A1	197467	522165	4566	428342	26634	MFF	168958	460756	12504	N/A		SRSF3	112081	339436	20442	N/A	
COL13A1	197467	520133	4567	430173	26635	MFF	168958	337110	12505	338412	31512	SRSF3	112081	373715	20443	362820	36497
COL13A1	197467	484990	4568	N/A		MFF	168958	525195	12506	436920	31513	SRSF3	112081	477442	20444	436036	36498
COL13A1	197467	398975	4569	381947	26636	MFF	168958	470090	12507	N/A		SRSF3	112081	620941	20445	482833	36499
COL13A1	197467	456019	4570	388774	26637	MFF	168958	534203	12508	435354	31514	SRSF3	112081	620389	20446	N/A	
COL13A1	197467	518052	4571	N/A		MFF	168958	524634	12509	436289	31515	SRSF3	112081	614136	20447	N/A	
COL13A1	197467	478219	4572	N/A		MFF	168958	349901	12510	304134	31516	SSH1	084112	326495	20448	315713	36500
COL13A1	197467	398969	4573	381941	26638	MFF	168958	436237	12511	411386	31517	SSH1	084112	546433	20449	447629	36501
COL15A1	204291	467052	4574	N/A		MFF	168958	443428	12512	391829	31518	SSH1	084112	551165	20450	448824	36502
COL15A1	204291	471477	4575	N/A		MFF	168958	418961	12513	407547	31519	SSH1	084112	326470	20451	326107	36503
COL15A1	204291	375001	4576	364140	26639	MFF	168958	436791	12514	N/A		SSH1	084112	547862	20452	N/A	
COL15A1	204291	496686	4577	N/A		MFF	168958	456345	12515	415313	31520	SSH1	084112	548522	20453	448586	36504
COL15A1	204291	610452	4578	483455	26640	MFF	168958	490857	12516	N/A		SSH1	084112	547381	20454	N/A	
COL18A1	182871	400337	4579	383191	26641	MFF	168958	476262	12517	N/A		SSH1	084112	546697	20455	446652	36505
COL18A1	182871	355480	4580	347665	26642	MFF	168958	477362	12518	N/A		SSH1	084112	546812	20456	N/A	
COL18A1	182871	342220	4581	339118	26643	MFF	168958	392059	12519	375912	31521	SSTR1	139874	267377	20457	267377	36506
COL18A1	182871	459895	4582	N/A		MFGE8	140545	558018	12520	452734	31522	SSTR2	180616	579323	20458	N/A	
COL18A1	182871	423214	4583	415692	26644	MFGE8	140545	268151	12521	268151	31523	SSTR2	180616	357585	20459	350198	36507
COL18A1	182871	473212	4584	N/A		MFGE8	140545	268150	12522	268150	31524	ST13	100380	216218	20460	216218	36508
COL18A1	182871	359759	4585	352798	26645	MFGE8	140545	566497	12523	456281	31525	ST13	100380	480048	20461	N/A	
COL1A1	108821	225964	4586	225964	26646	MFGE8	140545	560937	12524	N/A		ST13	100380	455824	20462	397062	36509
COL1A1	108821	510710	4587	N/A		MFGE8	140545	542878	12525	444332	31526	ST13	100380	413424	20463	412049	36510
COL1A1	108821	486572	4588	N/A		MFGE8	140545	558029	12526	452926	31527	ST13	100380	411695	20464	392067	36511
COL1A1	108821	511732	4589	N/A		MFGE8	140545	617199	12527	N/A		ST13	100380	495652	20465	N/A	
COL1A1	108821	494334	4590	N/A		MFGE8	140545	613965	12528	478952	31528	ST13	100380	620312	20466	481328	36512
COL1A1	108821	476387	4591	N/A		MFGE8	140545	560553	12529	N/A		ST18	147488	276480	20467	276480	36513
COL1A1	108821	504289	4592	N/A		MFGE8	140545	559259	12530	N/A		ST18	147488	521824	20468	429579	36514
COL1A1	108821	463440	4593	N/A		MFGE8	140545	559997	12531	N/A		ST18	147488	522251	20469	428920	36515
COL1A1	108821	471344	4594	N/A		MFGE8	140545	558352	12532	N/A		ST18	147488	521582	20470	430763	36516
COL1A1	108821	483870	4595	N/A		MFGE8	140545	559770	12533	N/A		ST18	147488	518053	20471	N/A	
COL1A1	108821	495677	4596	N/A		MFGE8	140545	559143	12534	N/A		ST18	147488	522861	20472	N/A	
COL1A1	108821	474644	4597	N/A		MFGE8	140545	558773	12535	N/A		ST18	147488	518501	20473	N/A	
COL1A1	108821	507689	4598	460459	26647	MFGE8	140545	557944	12536	N/A		ST18	147488	517580	20474	428521	36517
COL1A2	164692	297268	4599	297268	26648	MFHAS1	147324	276282	12537	276282	31529	ST18	147488	520257	20475	N/A	
COL1A2	164692	488298	4600	N/A		MFHAS1	147324	521881	12538	N/A		ST18	147488	521549	20476	N/A	
COL1A2	164692	473573	4601	N/A		MFHAS1	147324	520715	12539	N/A		ST18	147488	518037	20477	N/A	
COL1A2	164692	497316	4602	N/A		MFHAS1	147324	520091	12540	N/A		ST18	147488	517456	20478	N/A	
COL1A2	164692	461525	4603	N/A		MFSD2A	168389	372811	12541	361898	31530	ST18	147488	519118	20479	428096	36518
COL1A2	164692	467931	4604	N/A		MFSD2A	168389	434861	12542	407606	31531	ST18	147488	518545	20480	N/A	
COL1A2	164692	481570	4605	N/A		MFSD2A	168389	372809	12543	361895	31532	ST18	147488	521119	20481	N/A	

COL1A2	164692	469732	4606	N/A		MFSD2A	168389	483824	12544	N/A		ST18	147488	518453	20482	N/A	
COL1A2	164692	478215	4607	N/A		MFSD2A	168389	469745	12545	N/A		ST18	147488	520279	20483	N/A	
COL1A2	164692	488121	4608	N/A		MFSD2A	168389	480630	12546	N/A		ST18	147488	519201	20484	N/A	
COL1A2	164692	492110	4609	N/A		MFSD2A	168389	491515	12547	N/A		ST18	147488	524183	20485	N/A	
COL1A2	164692	464916	4610	N/A		MFSD2A	168389	459917	12548	N/A		ST18	147488	522102	20486	N/A	
COL1A2	164692	620463	4611	477719	26649	MFSD2A	168389	481612	12549	N/A		ST18	147488	520811	20487	N/A	
COL20A1	101203	358894	4612	351767	26650	MFSD2A	168389	420632	12550	391261	31533	ST18	147488	524078	20488	N/A	
COL20A1	101203	479501	4613	N/A		MFSD9	135953	496253	12551	N/A		ST18	147488	520716	20489	N/A	
COL20A1	101203	422202	4614	414753	26651	MFSD9	135953	258436	12552	258436	31534	ST18	147488	523652	20490	N/A	
COL20A1	101203	415763	4615	410799	26652	MFSD9	135953	438943	12553	408630	31535	ST3GAL2	157350	393640	20491	377257	36519
COL20A1	101203	455906	4616	406345	26653	MFSD9	135953	437075	12554	414870	31536	ST3GAL2	157350	567822	20492	N/A	
COL20A1	101203	471582	4617	N/A		MFSD9	135953	411991	12555	392605	31537	ST3GAL2	157350	566097	20493	N/A	
COL20A1	101203	494913	4618	N/A		MFSD9	135953	428085	12556	413641	31538	ST3GAL2	157350	561708	20494	N/A	
COL20A1	101203	496810	4619	N/A		MFSD9	135953	421966	12557	402411	31539	ST3GAL2	157350	567586	20495	N/A	
COL22A1	169436	341807	4620	N/A		MFSD9	135953	462099	12558	N/A		ST3GAL2	157350	342907	20496	345477	36520
COL22A1	169436	303045	4621	303153	26654	MGAT3	128268	341184	12559	345270	31540	ST3GAL5	115525	638572	20497	491316	36521
COL22A1	169436	487854	4622	N/A		MGAT3	128268	429402	12560	416226	31541	ST3GAL5	115525	639867	20498	N/A	
COL22A1	169436	522546	4623	428244	26655	MGAT3	128268	418314	12561	408075	31542	ST3GAL5	115525	461206	20499	N/A	
COL22A1	169436	517515	4624	N/A		MGAT4C	182050	611864	12562	481096	31543	ST3GAL5	115525	640378	20500	492030	36522
COL22A1	169436	484387	4625	N/A		MGAT4C	182050	620241	12563	477650	31544	ST3GAL5	115525	393808	20501	377397	36523
COL22A1	169436	435777	4626	387655	26656	MGAT4C	182050	621808	12564	478300	31545	ST3GAL5	115525	393805	20502	377394	36524
COL23A1	050767	390654	4627	375069	26657	MGAT4C	182050	552808	12565	446647	31546	ST3GAL5	115525	640322	20503	491564	36525
COL23A1	050767	484750	4628	N/A		MGAT4C	182050	547225	12566	449172	31547	ST3GAL5	115525	640712	20504	N/A	
COL23A1	050767	407622	4629	385092	26658	MGAT4C	182050	552435	12567	448093	31548	ST3GAL5	115525	638659	20505	491395	36526
COL25A1	188517	494183	4630	437131	26659	MGAT4C	182050	602941	12568	N/A		ST3GAL5	115525	639311	20506	491398	36527
COL25A1	188517	512961	4631	426841	26660	MGAT4C	182050	550365	12569	N/A		ST3GAL5	115525	377332	20507	366549	36528
COL25A1	188517	399132	4632	382083	26661	MGAT4C	182050	551921	12570	N/A		ST3GAL5	115525	639119	20508	492045	36529
COL25A1	188517	399127	4633	382078	26662	MGAT4C	182050	551751	12571	N/A		ST3GAL5	115525	640763	20509	491495	36530
COL25A1	188517	399126	4634	382077	26663	MGAT4C	182050	548651	12572	447253	31549	ST3GAL5	115525	640418	20510	492098	36531
COL25A1	188517	505377	4635	N/A		MGAT4C	283530	638103	12573	490547	31550	ST3GAL5	115525	639472	20511	N/A	
COL25A1	188517	505591	4636	422266	26664	MGAT4C	283530	637661	12574	489751	31551	ST3GAL5	115525	640315	20512	492089	36532
COL25A1	188517	610288	4637	482699	26665	MGAT4C	283530	636626	12575	490784	31552	ST3GAL5	115525	639743	20513	N/A	
COL25A1	188517	622134	4638	484110	26666	MGAT4C	283530	637362	12576	490416	31553	ST3GAL5	115525	638227	20514	492602	36533
COL4A1	187498	375820	4639	364979	26667	MGAT4C	283530	636211	12577	489618	31554	ST3GAL5	115525	640453	20515	N/A	
COL4A1	187498	467182	4640	N/A		MGAT4C	283530	636470	12578	489858	31555	ST3GAL5	115525	639074	20516	N/A	
COL4A1	187498	474391	4641	N/A		MGAT4C	283530	636416	12579	490212	31556	ST3GAL5	115525	640798	20517	N/A	
COL4A1	187498	543140	4642	443348	26668	MGAT4C	283530	637408	12580	N/A		ST3GAL5	115525	638321	20518	491084	36534
COL4A1	187498	615732	4643	478222	26669	MGAT4C	283530	637621	12581	N/A		ST3GAL5	115525	639432	20519	491828	36535
COL4A5	188153	477429	4644	N/A		MGAT4C	283530	637470	12582	N/A		ST3GAL5	115525	639184	20520	492305	36536
COL4A5	188153	328300	4645	331902	26670	MGAT4C	283530	635762	12583	N/A		ST3GAL5	115525	640982	20521	492299	36537
COL4A5	188153	361603	4646	354505	26671	MGAT5B	167889	301618	12584	301618	31557	ST3GAL5	115525	640992	20522	492753	36538
COL4A5	188153	470339	4647	N/A		MGAT5B	167889	569840	12585	456037	31558	ST3GAL5	115525	640425	20523	492459	36539
COL4A5	188153	483338	4648	N/A		MGAT5B	167889	565675	12586	457614	31559	ST3GAL5	115525	638678	20524	492847	36540
COL4A5	188153	505728	4649	424137	26672	MGAT5B	167889	374998	12587	N/A		ST3GAL5	115525	640295	20525	491027	36541
COL4A5	188153	489230	4650	N/A		MGAT5B	167889	428789	12588	391227	31560	ST3GAL5	115525	638885	20526	492209	36542
COL4A5	188153	510690	4651	N/A		MGAT5B	167889	565043	12589	455631	31561	ST3GAL5	115525	640594	20527	491356	36543
COL4A5	188153	515658	4652	423520	26673	MGAT5B	167889	563627	12590	N/A		ST3GAL5	115525	638484	20528	492635	36544
COL4A5	188153	504541	4653	424845	26674	MGAT5B	167889	563153	12591	N/A		ST3GAL5	115525	638542	20529	492468	36545
COL5A1	130635	371817	4654	360882	26675	MGAT5B	167889	568598	12592	N/A		ST3GAL5	115525	639820	20530	491802	36546
COL5A1	130635	464187	4655	N/A		MGLL	074416	434178	12593	402798	31562	ST3GAL5	115525	640024	20531	491238	36547
COL5A1	130635	469093	4656	N/A		MGLL	074416	496306	12594	417060	31563	ST3GAL5	115525	640222	20532	492035	36548
COL5A1	130635	463925	4657	N/A		MGLL	074416	476682	12595	N/A		ST3GAL5	115525	638178	20533	492103	36549
COL5A1	130635	460264	4658	N/A		MGLL	074416	487473	12596	420125	31564	ST3GAL5	115525	638855	20534	490979	36550
COL5A1	130635	371820	4659	360885	26676	MGLL	074416	398101	12597	381173	31565	ST3GAL5	115525	638288	20535	491699	36551
COL5A1	130635	465877	4660	N/A		MGLL	074416	484451	12598	419340	31566	ST3GAL5	115525	639305	20536	492244	36552
COL5A1	130635	618395	4661	481360	26677	MGLL	074416	465597	12599	N/A		ST3GAL5	115525	638986	20537	491853	36553
COL5A3	080573	264828	4662	264828	26678	MGLL	074416	479967	12600	N/A		ST3GAL5	115525	639608	20538	492473	36554
COL5A3	080573	461214	4663	N/A		MGLL	074416	493611	12601	417689	31567	ST3GAL5	115525	639541	20539	492280	36555
COL6A1	142156	361866	4664	355180	26679	MGLL	074416	476654	12602	N/A		ST3GAL5	115525	639945	20540	492866	36556

COL6A1	142156	492851	4665	N/A		MGLL	074416	494830	12603	417489	31568	ST3GAL5	115525	638956	20541	492097	36557
COL6A1	142156	466285	4666	N/A		MGLL	074416	265052	12604	265052	31569	ST3GAL5	115525	639981	20542	491172	36558
COL6A1	142156	463060	4667	N/A		MGLL	074416	398104	12605	381176	31570	ST3GAL5	115525	640903	20543	491443	36559
COL6A1	142156	498614	4668	N/A		MGLL	074416	453507	12606	404146	31571	ST3GAL5	115525	640572	20544	491880	36560
COL6A1	142156	486023	4669	N/A		MGP	111341	539261	12607	445907	31572	ST3GAL5	115525	640314	20545	491315	36561
COL6A1	142156	612273	4670	483630	26680	MGP	111341	545199	12608	445436	31573	ST3GAL5	115525	639216	20546	N/A	
COL9A1	112280	357250	4671	349790	26681	MGP	111341	228938	12609	228938	31574	ST3GAL5	115525	640835	20547	491038	36562
COL9A1	112280	320755	4672	315252	26682	MGP	111341	507170	12610	N/A		ST3GAL5	115525	638523	20548	491664	36563
COL9A1	112280	486080	4673	N/A		MGST1	008394	536371	12611	442557	31575	ST3GAL5	115525	638581	20549	N/A	
COL9A1	112280	489611	4674	N/A		MGST1	008394	534835	12612	N/A		ST3GAL5	115525	639202	20550	492710	36564
COL9A1	112280	447041	4675	N/A		MGST1	008394	543076	12613	442767	31576	ST3GAL5	115525	640336	20551	N/A	
COL9A1	112280	493682	4676	N/A		MGST1	008394	396210	12614	379513	31577	ST3GAL5	115525	640849	20552	491701	36565
COL9A1	112280	360859	4677	N/A		MGST1	008394	539036	12615	N/A		ST3GAL5	115525	306262	20553	306247	36566
COL9A1	112280	489861	4678	N/A		MGST1	008394	537878	12616	N/A		ST3GAL5	115525	639421	20554	491029	36567
COL9A1	112280	470652	4679	N/A		MGST1	008394	542256	12617	N/A		ST3GAL5	115525	639519	20555	491857	36568
COL9A1	112280	370496	4680	359527	26683	MGST1	008394	539708	12618	N/A		ST3GAL5	115525	455892	20556	401375	36569
COLEC12	158270	580242	4681	N/A		MGST1	008394	535309	12619	438308	31578	ST3GAL5	115525	639690	20557	491917	36570
COLEC12	158270	400256	4682	383115	26684	MGST1	008394	540056	12620	437988	31579	ST3GAL5	115525	473122	20558	491314	36571
COLEC12	158270	582147	4683	N/A		MGST1	008394	540126	12621	442970	31580	ST3GAL5	115525	487896	20559	N/A	
COLGALT2	198756	486375	4684	N/A		MGST1	008394	538885	12622	440443	31581	ST3GAL5	115525	461892	20560	N/A	
COLGALT2	198756	367521	4685	356491	26685	MGST1	008394	396207	12623	379510	31582	ST3GAL5	115525	461199	20561	N/A	
COLGALT2	198756	361927	4686	354960	26686	MGST1	008394	538857	12624	N/A		ST3GAL5	115525	433665	20562	408635	36572
COLGALT2	198756	367520	4687	356490	26687	MGST1	008394	535624	12625	N/A		ST3GAL5	115525	484728	20563	N/A	
COLGALT2	198756	486375	4688	N/A		MGST1	008394	624056	12626	N/A		ST3GAL5	115525	490946	20564	N/A	
COLGALT2	198756	367521	4689	356491	26688	MGST1	008394	359720	12627	N/A		ST3GAL5	115525	638258	20565	491126	36573
COLGALT2	198756	361927	4690	354960	26689	MGST1	008394	010404	12628	010404	31583	ST5	166444	526757	20566	435097	36574
COLGALT2	198756	367520	4691	356490	26690	MGST1	008394	396209	12629	379512	31584	ST5	166444	534127	20567	433528	36575
COQ10B	115520	263960	4692	263960	26691	MIAT	225783	421867	12630	N/A		ST5	166444	313726	20568	319678	36576
COQ10B	115520	409398	4693	386785	26692	MIAT	225783	418918	12631	N/A		ST5	166444	530991	20569	432887	36577
COQ10B	115520	488445	4694	N/A		MIAT	225783	440347	12632	N/A		ST5	166444	526099	20570	436808	36578
COQ10B	115520	409010	4695	387223	26693	MIAT	225783	450203	12633	N/A		ST5	166444	527540	20571	N/A	
CORIN	145244	273857	4696	273857	26694	MIAT	225783	430483	12634	N/A		ST5	166444	532162	20572	N/A	
CORIN	145244	508498	4697	425597	26695	MIAT	225783	439738	12635	N/A		ST5	166444	534278	20573	433349	36579
CORIN	145244	502252	4698	424212	26696	MIAT	225783	422403	12636	N/A		ST5	166444	524513	20574	N/A	
CORIN	145244	505909	4699	425401	26697	MIAT	225783	436238	12637	N/A		ST5	166444	530438	20575	436802	36580
CORIN	145244	515827	4700	N/A		MIAT	225783	425476	12638	N/A		ST5	166444	532738	20576	N/A	
CORIN	145244	505754	4701	N/A		MIAT	225783	455640	12639	N/A		ST5	166444	526062	20577	433043	36581
CORIN	145244	504584	4702	423216	26698	MIAT	225783	451141	12640	N/A		ST5	166444	532871	20578	N/A	
CORIN	145244	503821	4703	N/A		MIAT	225783	452429	12641	N/A		ST5	166444	533081	20579	N/A	
CORIN	145244	502726	4704	N/A		MIAT	225783	413665	12642	N/A		ST5	166444	526701	20580	N/A	
CORIN	145244	510974	4705	N/A		MIAT	225783	616469	12643	N/A		ST5	166444	530922	20581	N/A	
CORIN	145244	610355	4706	484087	26699	MIAT	225783	620145	12644	N/A		ST5	166444	530559	20582	N/A	
CORO1C	110880	261401	4707	261401	26700	MIAT	225783	616213	12645	N/A		ST5	166444	533020	20583	433588	36582
CORO1C	110880	541030	4708	438341	26701	MIAT	225783	613780	12646	N/A		ST5	166444	526837	20584	N/A	
CORO1C	110880	546705	4709	447337	26702	MIAT	225783	458302	12647	N/A		ST5	166444	530338	20585	435016	36583
CORO1C	110880	549384	4710	N/A		MIAT	225783	419237	12648	N/A		ST5	166444	532734	20586	433793	36584
CORO1C	110880	421578	4711	415554	26703	MIAT	225783	449717	12649	N/A		ST5	166444	530593	20587	437096	36585
CORO1C	110880	550542	4712	448130	26704	MIAT	225783	453023	12650	N/A		ST5	166444	528527	20588	431580	36586
CORO1C	110880	549772	4713	447534	26705	MICAL2	133816	532179	12651	434209	31585	ST5	166444	531060	20589	433858	36587
CORO1C	110880	549387	4714	N/A		MICAL2	133816	526065	12652	435270	31586	ST5	166444	533425	20590	N/A	
CORO1C	110880	552030	4715	N/A		MICAL2	133816	532945	12653	N/A		ST5	166444	526057	20591	437006	36588
CORO1C	110880	547361	4716	N/A		MICAL2	133816	256194	12654	256194	31587	ST5	166444	528196	20592	431564	36589
CORO1C	110880	552871	4717	449658	26706	MICAL2	133816	531732	12655	N/A		ST5	166444	527510	20593	434701	36590
CORO1C	110880	547291	4718	449330	26707	MICAL2	133816	530823	12656	434957	31588	ST5	166444	530580	20594	432521	36591
CORO1C	110880	550032	4719	447989	26708	MICAL2	133816	532420	12657	433818	31589	ST5	166444	532651	20595	N/A	
CORO1C	110880	551550	4720	448527	26709	MICAL2	133816	527546	12658	433965	31590	ST5	166444	527870	20596	N/A	
CORO1C	110880	546571	4721	448195	26710	MICAL2	133816	524685	12659	437229	31591	ST5	166444	531093	20597	436506	36592
CORO1C	110880	551044	4722	447049	26711	MICAL2	133816	525119	12660	433509	31592	ST5	166444	533225	20598	435292	36593
CORO1C	110880	547170	4723	N/A		MICAL2	133816	533389	12661	433357	31593	ST5	166444	526126	20599	436760	36594

CORO1C	110880	551059	4724	N/A		MICAL2	133816	528931	12662	N/A		ST5	166444	526221	20600	N/A	
CORO1C	110880	420959	4725	394496	26712	MICAL2	133816	532166	12663	N/A		ST5	166444	529940	20601	N/A	
CORO2A	106789	343933	4726	343746	26713	MICAL2	133816	527195	12664	N/A		ST5	166444	528523	20602	433647	36595
CORO2A	106789	375077	4727	364218	26714	MICAL2	133816	530691	12665	N/A		ST5	166444	527930	20603	431252	36596
CORO2B	103647	261861	4728	261861	26715	MICAL2	133816	524730	12666	N/A		ST5	166444	534783	20604	N/A	
CORO2B	103647	566799	4729	454783	26716	MICAL2	133816	533219	12667	N/A		ST5	166444	533681	20605	434935	36597
CORO2B	103647	540068	4730	446250	26717	MICAL2	133816	529562	12668	N/A		ST5	166444	526241	20606	433346	36598
CORO2B	103647	543950	4731	443819	26718	MICAL2	133816	526475	12669	N/A		ST5	166444	530959	20607	433008	36599
CORO6	167549	469090	4732	N/A		MICAL2	133816	525075	12670	N/A		ST5	166444	533580	20608	431332	36600
CORO6	167549	345068	4733	344562	26719	MICAL2	133816	525216	12671	N/A		ST5	166444	526155	20609	431139	36601
CORO6	167549	459686	4734	N/A		MICAL2	133816	534563	12672	N/A		ST5	166444	534248	20610	432872	36602
CORO6	167549	580212	4735	463723	26720	MICAL2	133816	525979	12673	N/A		ST5	166444	527347	20611	431673	36603
CORO6	167549	579388	4736	N/A		MICAL2	133816	526672	12674	N/A		ST5	166444	533016	20612	434332	36604
CORO6	167549	467534	4737	N/A		MICAL2	133816	525618	12675	N/A		ST5	166444	527516	20613	431990	36605
CORO6	167549	480954	4738	464621	26721	MICAL2	133816	530021	12676	N/A		ST5	166444	527473	20614	435228	36606
CORO6	167549	584969	4739	462627	26722	MICAL2	133816	526604	12677	N/A		ST5	166444	530938	20615	436748	36607
CORO6	167549	577909	4740	N/A		MICAL2	133816	525444	12678	N/A		ST5	166444	533471	20616	434930	36608
CORO6	167549	492276	4741	464396	26723	MICAL2	133816	379612	12679	368932	31594	ST5	166444	524757	20617	435925	36609
CORO6	167549	584602	4742	468235	26724	MICAL2	133816	342902	12680	344894	31595	ST5	166444	527392	20618	435180	36610
CORO6	167549	388767	4743	373419	26725	MICAL2	133816	537344	12681	441689	31596	ST5	166444	526828	20619	435562	36611
COTL1	103187	262428	4744	262428	26726	MICALCL	133808	529028	12682	N/A		ST5	166444	525169	20620	433175	36612
COTL1	103187	567278	4745	N/A		MICALCL	133808	533534	12683	432324	31597	ST5	166444	534665	20621	436363	36613
COTL1	103187	564057	4746	457033	26727	MICALCL	133808	256186	12684	256186	31598	ST5	166444	531578	20622	436154	36614
COTL1	103187	561707	4747	N/A		MID1	101871	380779	12685	370156	31599	ST5	166444	531237	20623	N/A	
COTL1	103187	564662	4748	N/A		MID1	101871	380780	12686	370157	31600	ST5	166444	531640	20624	N/A	
COTL1	103187	567786	4749	480117	26728	MID1	101871	380785	12687	370162	31601	ST5	166444	528452	20625	N/A	
COX6B2	160471	588572	4750	467959	26729	MID1	101871	380787	12688	370164	31602	ST5	166444	626808	20626	486899	36615
COX6B2	160471	326529	4751	320672	26730	MID1	101871	380782	12689	370159	31603	ST6GAL2	144057	361686	20627	355273	36616
COX6B2	160471	593184	4752	467266	26731	MID1	101871	479925	12690	N/A		ST6GAL2	144057	409382	20628	386942	36617
COX6B2	160471	590900	4753	467128	26732	MID1	101871	413894	12691	391154	31604	ST6GAL2	144057	361803	20629	355386	36618
COX6B2	160471	589879	4754	N/A		MID1	101871	423614	12692	387771	31605	ST6GAL2	144057	409087	20630	387332	36619
COX6B2	160471	588586	4755	N/A		MID1	101871	453318	12693	414521	31606	ST6GAL2	144057	419159	20631	395581	36620
COX6B2	160471	586191	4756	N/A		MID1	101871	610939	12694	483707	31607	ST6GALNAC3	184005	328299	20632	329214	36621
COX6B2	160471	589467	4757	476768	26733	MID1	101871	616003	12695	484712	31608	ST6GALNAC3	184005	464140	20633	N/A	
COX6B2	160471	587357	4758	N/A		MID1	101871	317552	12696	312678	31609	ST6GALNAC3	184005	621530	20634	480283	36622
COX6B2	160471	587854	4759	N/A		MID2	080561	451923	12697	410730	31610	ST6GALNAC5	117069	477717	20635	417583	36623
CPE	109472	513982	4760	424830	26734	MID2	080561	262843	12698	262843	31611	ST6GALNAC5	117069	480428	20636	N/A	
CPE	109472	402744	4761	386104	26735	MID2	080561	443968	12699	413976	31612	ST6GALNAC5	117069	318803	20637	436263	36624
CPE	109472	480404	4762	427629	26736	MID2	080561	474517	12700	N/A		ST6GALNAC5	117069	496845	20638	N/A	
CPE	109472	431967	4763	416601	26737	MIDN	167470	586757	12701	466895	31613	ST6GALNAC5	117069	488940	20639	N/A	
CPE	109472	511992	4764	423699	26738	MIDN	167470	591446	12702	467679	31614	STAB2	136011	388887	20640	373539	36625
CPLX2	145920	359546	4765	352544	26739	MIDN	167470	591302	12703	N/A		STAB2	136011	549474	20641	449282	36626
CPLX2	145920	506642	4766	N/A		MIDN	167470	586843	12704	466835	31615	STAB2	136011	549798	20642	N/A	
CPLX2	145920	515502	4767	423564	26740	MIDN	167470	590136	12705	N/A		STAB2	136011	548073	20643	N/A	
CPLX2	145920	509837	4768	421106	26741	MIDN	167470	300952	12706	300952	31616	STAB2	136011	548579	20644	N/A	
CPLX2	145920	393745	4769	377346	26742	MIR136	207942	385207	12707	N/A		STAB2	136011	552777	20645	446629	36627
CPLX2	145920	512824	4770	425973	26743	MIR31HG	171889	304425	12708	N/A		STAC	144681	273183	20646	273183	36628
CPLX2	145920	514150	4771	423612	26744	MIR346	199104	362234	12709	N/A		STAC	144681	457375	20647	393713	36629
CPLX2	145920	502265	4772	424305	26745	MIR34C	207562	384831	12710	N/A		STAC	144681	427486	20648	397521	36630
CPLX2	145920	515025	4773	425284	26746	MIR3671	265996	580455	12711	N/A		STAC	144681	434649	20649	398403	36631
CPLX2	145920	515094	4774	421825	26747	MIR384	283242	638003	12712	N/A		STAC	144681	476388	20650	N/A	
CPLX3	213578	395018	4775	378464	26748	MIR646HG	228340	426753	12713	N/A		STAC	144681	486143	20651	N/A	

CPM	135678	546556	4776	447051	26749	MIR646HG	228340	428772	12714	N/A		STAC	144681	473452	20652	N/A	
CPM	135678	551897	4777	447455	26750	MIR646HG	228340	431181	12715	N/A		STAC	144681	465064	20653	N/A	
CPM	135678	551568	4778	448517	26751	MIR646HG	228340	427691	12716	N/A		STAC2	141750	333461	20654	327509	36632
CPM	135678	546373	4779	447255	26752	MIR646HG	228340	439507	12717	N/A		STAC2	141750	584501	20655	463299	36633
CPM	135678	546912	4780	N/A		MIR646HG	228340	457508	12718	N/A		STAG3	066923	426455	20656	400359	36634
CPM	135678	548954	4781	446799	26753	MIR646HG	228340	458422	12719	N/A		STAG3	066923	394018	20657	377586	36635
CPM	135678	551728	4782	446573	26754	MIR646HG	228340	432910	12720	N/A		STAG3	066923	416412	20658	409283	36636
CPM	135678	547134	4783	450400	26755	MIR646HG	228340	437035	12721	N/A		STAG3	066923	317296	20659	319318	36637
CPM	135678	547924	4784	N/A		MIR646HG	228340	421257	12722	N/A		STAG3	066923	422690	20660	407884	36638
CPM	135678	548262	4785	449911	26756	MIR646HG	228340	427820	12723	N/A		STAG3	066923	496157	20661	N/A	
CPM	135678	549781	4786	448078	26757	MIR6723	278791	621981	12724	N/A		STAG3	066923	439782	20662	397067	36639
CPM	135678	549691	4787	N/A		MIR7-3HG	176840	317292	12725	N/A		STAG3	066923	482546	20663	N/A	
CPM	135678	338356	4788	339157	26758	MIR7-3HG	176840	586721	12726	N/A		STAG3	066923	459699	20664	N/A	
CPNE4	196353	617767	4789	478878	26759	MIR7-3HG	176840	592709	12727	N/A		STAG3	066923	491498	20665	N/A	
CPNE4	196353	429747	4790	411904	26760	MIR7-3HG	176840	588711	12728	N/A		STAG3	066923	440830	20666	N/A	
CPNE4	196353	505881	4791	425506	26761	MIR7-3HG	176840	589639	12729	N/A		STAG3	066923	477469	20667	N/A	
CPNE4	196353	511604	4792	423811	26762	MIR7-3HG	176840	591008	12730	N/A		STAG3	066923	476057	20668	N/A	
CPNE4	196353	512332	4793	424853	26763	MIR7-3HG	176840	592663	12731	N/A		STAG3	066923	479359	20669	N/A	
CPNE4	196353	503204	4794	N/A		MIR7-3HG	176840	588758	12732	N/A		STAG3	066923	412190	20670	395039	36640
CPNE4	196353	514439	4795	N/A		MIR7-3HG	176840	588923	12733	N/A		STAG3	066923	451963	20671	393790	36641
CPNE4	196353	505331	4796	N/A		MIR7-3HG	176840	589368	12734	N/A		STAG3	066923	492674	20672	N/A	
CPNE4	196353	506687	4797	N/A		MIR9-3HG	255571	536780	12735	N/A		STAG3	066923	620100	20673	484098	36642
CPNE4	196353	505957	4798	421394	26764	MIR9-3HG	255571	560008	12736	N/A		STAG3	066923	615138	20674	477973	36643
CPNE4	196353	514999	4799	427561	26765	MIR9-3HG	255571	561327	12737	N/A		STAMBPL1	138134	371926	20675	360994	36644
CPNE4	196353	502818	4800	421646	26766	MIR9-3HG	255571	560663	12738	N/A		STAMBPL1	138134	371927	20676	360995	36645
CPNE4	196353	515418	4801	N/A		MIR9-3HG	255571	560596	12739	N/A		STAMBPL1	138134	461650	20677	N/A	
CPNE4	196353	512055	4802	421705	26767	MIR9-3HG	255571	558692	12740	N/A		STAMBPL1	138134	468698	20678	N/A	
CPNE7	178773	268720	4803	268720	26768	MIR9-3HG	255571	538734	12741	N/A		STAMBPL1	138134	371924	20679	360992	36646
CPNE7	178773	525982	4804	431863	26769	MIR9-3HG	255571	559235	12742	N/A		STAMBPL1	138134	371922	20680	360990	36647
CPNE7	178773	319518	4805	317374	26770	MIR9-3HG	255571	558754	12743	N/A		STARD13	133121	336934	20681	338785	36648
CPNE7	178773	532500	4806	N/A		MIR9-3HG	255571	558982	12744	N/A		STARD13	133121	255486	20682	255486	36649
CPNE7	178773	529800	4807	435876	26771	MIR9-3HG	255571	561037	12745	N/A		STARD13	133121	399365	20683	382300	36650
CPNE7	178773	568977	4808	455086	26772	MIR9-3HG	255571	546186	12746	N/A		STARD13	133121	491333	20684	N/A	
CPNE7	178773	566398	4809	N/A		MKX	150051	375790	12747	364946	31617	STARD13	133121	567873	20685	456233	36651
CPNE7	178773	526232	4810	434886	26773	MKX	150051	460919	12748	452751	31618	STARD13	133121	487412	20686	N/A	
CPNE7	178773	564421	4811	N/A		MKX	150051	561227	12749	453746	31619	STARD13	133121	498019	20687	N/A	
CPNE8	139117	552259	4812	N/A		MKX	150051	419761	12750	400896	31620	STARD13	133121	344312	20688	N/A	
CPNE8	139117	331366	4813	329748	26774	MLC1	100427	393876	12751	379216	31621	STARD13	133121	439831	20689	457840	36652
CPNE8	139117	538596	4814	439237	26775	MLC1	100427	311597	12752	310375	31622	STARD8	130052	488088	20690	N/A	
CPNE8	139117	546603	4815	N/A		MLC1	100427	483836	12753	N/A		STARD8	130052	523864	20691	428031	36653
CPNE8	139117	360449	4816	353633	26776	MLC1	100427	442311	12754	401385	31623	STARD8	130052	374599	20692	363727	36654
CPNE8	139117	547417	4817	N/A		MLC1	100427	470008	12755	N/A		STARD8	130052	374597	20693	363725	36655
CPNE8	139117	549842	4818	N/A		MLLT11	213190	368921	12756	357917	31624	STARD8	130052	252336	20694	252336	36656
CPNE8	139117	551855	4819	N/A		MLYCD	103150	262430	12757	262430	31625	STAT2	170581	556539	20695	N/A	
CPNE8	139117	550863	4820	447761	26777	MLYCD	103150	569024	12758	N/A		STAT2	170581	314128	20696	315768	36657
CPNE9	144550	383832	4821	373343	26778	MMD2	136297	406755	12759	385963	31626	STAT2	170581	557235	20697	450751	36658
CPNE9	144550	383831	4822	373342	26779	MMD2	136297	404774	12760	384690	31627	STAT2	170581	555488	20698	N/A	
CPNE9	144550	491802	4823	N/A		MMD2	136297	401401	12761	384141	31628	STAT2	170581	557199	20699	N/A	
CPNE9	144550	273027	4824	273027	26780	MMD2	136297	612910	12762	484193	31629	STAT2	170581	418572	20700	387354	36659
CPNE9	144550	613455	4825	480762	26781	MMP14	157227	547279	12763	450323	31630	STAT2	170581	555519	20701	N/A	
CPVL	106066	265394	4826	265394	26782	MMP14	157227	548761	12764	446989	31631	STAT2	170581	557252	20702	N/A	
CPVL	106066	396276	4827	379572	26783	MMP14	157227	547596	12765	N/A		STAT2	170581	556140	20703	N/A	
CPVL	106066	432534	4828	397327	26784	MMP14	157227	311852	12766	308208	31632	STAT2	170581	557156	20704	N/A	
CPVL	106066	455893	4829	403580	26785	MMP14	157227	547074	12767	N/A		STAT2	170581	557417	20705	N/A	

CPVL	106066	409850	4830	387164	26786	MMP14	157227	548162	12768	N/A		STAT2	170581	555646	20706	450985	36660
CPVL	106066	448959	4831	409036	26787	MMP15	102996	219271	12769	219271	31633	STAT5A	126561	345506	20707	341208	36661
CPVL	106066	458405	4832	417015	26788	MMP15	102996	570065	12770	457084	31634	STAT5A	126561	590949	20708	468749	36662
CPVL	106066	447426	4833	395690	26789	MMP16	156103	286614	12771	286614	31635	STAT5A	126561	546010	20709	443107	36663
CPVL	106066	488891	4834	N/A		MMP16	156103	544227	12772	N/A		STAT5A	126561	590726	20710	464730	36664
CPVL	106066	449801	4835	413287	26790	MMP16	156103	522726	12773	429147	31636	STAT5A	126561	469124	20711	N/A	
CPVL	106066	455544	4836	412857	26791	MMP16	156103	520568	12774	N/A		STAT5A	126561	444283	20712	407327	36665
CPVL	106066	437527	4837	416555	26792	MMP2	087245	570308	12775	461421	31637	STAT5A	126561	588868	20713	465437	36666
CREB3L1	157613	621158	4838	481956	26793	MMP2	087245	568715	12776	457949	31638	STAT5A	126561	478897	20714	N/A	
CREB3L1	157613	534787	4839	431677	26794	MMP2	087245	219070	12777	219070	31639	STAT5A	126561	479417	20715	N/A	
CREB3L1	157613	527342	4840	N/A		MMP2	087245	564864	12778	456096	31640	STAT5A	126561	468096	20716	N/A	
CREB3L1	157613	530518	4841	436574	26795	MMP2	087245	543485	12779	444143	31641	STAT5A	126561	591556	20717	N/A	
CREB3L1	157613	534616	4842	N/A		MMP2	087245	437642	12780	394237	31642	STAT5A	126561	587646	20718	466320	36667
CREB3L1	157613	616094	4843	N/A		MMP2	087245	570283	12781	456518	31643	STC2	113739	265087	20719	265087	36668
CREB3L2	182158	330387	4844	329140	26796	MMP2	087245	566564	12782	461915	31644	STC2	113739	520593	20720	N/A	
CREB3L2	182158	456390	4845	403550	26797	MMP24	125966	246186	12783	246186	31645	STC2	113739	520648	20721	428470	36669
CREB3L2	182158	452463	4846	410314	26798	MNS1	138587	566386	12784	N/A		STC2	113739	518455	20722	427816	36670
CREB3L2	182158	458726	4847	388917	26799	MNS1	138587	260453	12785	260453	31646	STC2	113739	519511	20723	N/A	
CREB3L2	182158	420629	4848	402889	26800	MNS1	138587	558694	12786	N/A		STEAP3	115107	393110	20724	376822	36671
CREB3L2	182158	468127	4849	N/A		MOBP	168314	451925	12787	410720	31647	STEAP3	115107	393106	20725	376818	36672
CREB3L2	182158	616381	4850	478432	26801	MOBP	168314	428261	12788	401312	31648	STEAP3	115107	409811	20726	386510	36673
CREB3L2	182158	620715	4851	478809	26802	MOBP	168314	420739	12789	400491	31649	STEAP3	115107	393107	20727	376819	36674
CRIM1	150938	280527	4852	280527	26803	MOBP	168314	415443	12790	388148	31650	STIP1	168439	358794	20728	351646	36675
CRIM1	150938	426856	4853	407636	26804	MOBP	168314	447324	12791	409730	31651	STIP1	168439	305218	20729	305958	36676
CRIM1	150938	428774	4854	415706	26805	MOBP	168314	383754	12792	373261	31652	STIP1	168439	536973	20730	441036	36677
CRIM1	150938	473403	4855	N/A		MOBP	168314	436143	12793	409071	31653	STIP1	168439	538945	20731	445957	36678
CRIM1	150938	477491	4856	N/A		MOBP	168314	441980	12794	388827	31654	STIP1	168439	543847	20732	442704	36679
CRIM1	150938	497236	4857	N/A		MOBP	168314	311042	12795	312293	31655	STIP1	168439	540736	20733	N/A	
CRIM1	150938	481321	4858	N/A		MOBP	168314	452959	12796	405549	31656	STIP1	168439	540501	20734	N/A	
CRIM1	150938	413985	4859	403120	26806	MOBP	168314	424090	12797	389055	31657	STIP1	168439	544739	20735	N/A	
CRIM1	277354	619072	4860	480938	26807	MOBP	168314	442631	12798	413771	31658	STIP1	168439	537479	20736	N/A	
CRIM1	277354	613124	4861	480932	26808	MOBP	168314	479860	12799	N/A		STIP1	168439	538497	20737	N/A	
CRIM1	277354	619935	4862	478123	26809	MOG	236561	447285	12800	401609	31659	STIP1	168439	540887	20738	443416	36680
CRIPT	119878	486447	4863	N/A		MOG	236561	419309	12801	395005	31660	STIP1	168439	355603	20739	N/A	
CRIPT	119878	238892	4864	238892	26810	MOG	236561	417639	12802	408039	31661	STK17B	081320	263955	20740	263955	36681
CRISPLD1	121005	262207	4865	262207	26811	MOG	236561	441138	12803	402363	31662	STK17B	081320	409228	20741	386853	36682
CRISPLD1	121005	519798	4866	N/A		MOG	236561	419274	12804	411489	31663	STK17B	081320	606789	20742	475843	36683
CRISPLD1	121005	520277	4867	430504	26812	MOG	236561	442244	12805	391516	31664	STK17B	081320	420683	20743	399755	36684
CRISPLD1	121005	523524	4868	430105	26813	MOG	236561	457090	12806	415883	31665	STK17B	081320	449152	20744	413289	36685
CRISPLD1	121005	517786	4869	429746	26814	MOG	236561	483865	12807	N/A		STK19	226257	497732	20745	N/A	
CRISPLD2	103196	262424	4870	262424	26815	MOG	236561	470227	12808	N/A		STK19	226257	426802	20746	389352	36686
CRISPLD2	103196	566151	4871	456554	26816	MOG	236561	433500	12809	413364	31666	STK19	226257	452688	20747	413766	36687
CRISPLD2	103196	567845	4872	457183	26817	MOG	236561	438803	12810	414862	31667	STK19	226257	466867	20748	N/A	
CRISPLD2	103196	566431	4873	N/A		MOG	236561	481712	12811	N/A		STK19	226257	478799	20749	N/A	
CRISPLD2	103196	565561	4874	N/A		MOG	236561	472402	12812	N/A		STK19	226257	520138	20750	428007	36688
CRISPLD2	103196	564567	4875	457655	26818	MOG	236561	553111	12813	447099	31668	STK19	226257	486358	20751	N/A	
CRISPLD2	103196	569090	4876	454858	26819	MOG	204655	376917	12814	366115	31669	STK19	226257	468899	20752	N/A	
CRISPLD2	103196	569262	4877	N/A		MOG	204655	376903	12815	366101	31670	STK19	226257	460232	20753	N/A	
CRISPLD2	103196	563066	4878	456952	26820	MOG	204655	376888	12816	366085	31671	STK19	226257	464694	20754	N/A	
CRISPLD2	103196	566789	4879	457259	26821	MOG	204655	376894	12817	366091	31672	STK19	226257	473747	20755	N/A	
CRISPLD2	103196	566165	4880	463171	26822	MOG	204655	469353	12818	N/A		STK19	226257	447249	20756	N/A	
CRLF1	006016	594325	4881	N/A		MOG	204655	396704	12819	379932	31673	STK19	226257	549310	20757	446620	36689
CRLF1	006016	596360	4882	N/A		MOG	204655	483013	12820	418090	31674	STK19	234947	459769	20758	N/A	
CRLF1	006016	392386	4883	376188	26823	MOG	204655	490427	12821	420350	31675	STK19	234947	425138	20759	395028	36690
CRLF1	006016	597131	4884	470625	26824	MOG	204655	416766	12822	409394	31676	STK19	234947	433397	20760	395864	36691
CRLF1	006016	593286	4885	N/A		MOG	204655	376891	12823	366088	31677	STK19	234947	483467	20761	N/A	
CRTAC1	095713	413387	4886	408445	26825	MOG	204655	376898	12824	366095	31678	STK19	234947	487912	20762	N/A	
CRTAC1	095713	370597	4887	359629	26826	MOG	204655	396701	12825	379929	31679	STK19	234947	461093	20763	N/A	
CRTAC1	095713	436034	4888	404549	26827	MOG	204655	494692	12826	417405	31680	STK19	234947	462407	20764	N/A	

CRTAC1	095713	309155	4889	310810	26828	MOG	204655	431798	12827	410866	31681	STK19	234947	490195	20765	N/A	
CRTAC1	095713	468549	4890	N/A		MOG	204655	476244	12828	N/A		STK19	234947	490429	20766	N/A	
CRTAC1	095713	370591	4891	359623	26829	MOG	204655	469603	12829	N/A		STK19	234947	479148	20767	N/A	
CRY1	008405	008527	4892	008527	26830	MOG	204655	485211	12830	418872	31682	STK19	234947	474087	20768	N/A	
CRY1	008405	552790	4893	N/A		MOG	204655	376889	12831	366086	31683	STK19	234947	551718	20769	449149	36692
CRY1	008405	549356	4894	447738	26831	MOG	204655	485885	12832	N/A		STK19	204344	466132	20770	N/A	
CRY1	008405	546722	4895	N/A		MOG	234623	432271	12833	389221	31684	STK19	204344	460018	20771	418350	36693
CRY1	008405	550633	4896	N/A		MOG	234623	462016	12834	N/A		STK19	204344	479644	20772	N/A	
CRYAB	109846	526180	4897	436051	26832	MOG	234623	425145	12835	397101	31685	STK19	204344	375331	20773	364480	36694
CRYAB	109846	524660	4898	432454	26833	MOG	234623	489187	12836	N/A		STK19	204344	492583	20774	N/A	
CRYAB	109846	533280	4899	435046	26834	MOG	234623	452233	12837	394873	31686	STK19	204344	375333	20775	364482	36695
CRYAB	109846	525823	4900	435411	26835	MOG	234623	427061	12838	395304	31687	STK19	204344	473983	20776	N/A	
CRYAB	109846	533475	4901	433560	26836	MOG	234623	434177	12839	398197	31688	STK19	204344	478486	20777	N/A	
CRYAB	109846	527950	4902	437149	26837	MOG	234623	430264	12840	403058	31689	STK19	204344	463823	20778	N/A	
CRYAB	109846	227251	4903	227251	26838	MOG	234623	414889	12841	403380	31690	STK19	204344	483801	20779	418866	36696
CRYAB	109846	531198	4904	434247	26839	MOG	234623	442629	12842	399240	31691	STK19	204344	519179	20780	454870	36697
CRYAB	109846	528961	4905	435960	26840	MOG	234623	417635	12843	401457	31692	STK19	204344	466336	20781	N/A	
CRYAB	109846	527899	4906	436089	26841	MOG	234623	470893	12844	N/A		STK19	204344	471028	20782	N/A	
CRYAB	109846	526167	4907	434793	26842	MOG	234623	497074	12845	N/A		STK19	204344	491861	20783	N/A	
CRYAB	109846	529647	4908	431754	26843	MOG	234623	551175	12846	448879	31693	STK19	204344	484540	20784	N/A	
CRYAB	109846	533971	4909	434269	26844	MOG	234096	430351	12847	410268	31694	STK19	204344	469907	20785	N/A	
CRYAB	109846	528628	4910	432182	26845	MOG	234096	428719	12848	397723	31695	STK19	204344	490822	20786	N/A	
CRYAB	109846	533879	4911	435931	26846	MOG	234096	418693	12849	396344	31696	STK19	236250	424104	20787	393272	36698
CRYAB	109846	616970	4912	483554	26847	MOG	234096	450851	12850	392661	31697	STK19	236250	438256	20788	391798	36699
CRYBA2	163499	392096	4913	375946	26848	MOG	234096	420045	12851	390682	31698	STK19	236250	469677	20789	N/A	
CRYBA2	163499	496566	4914	N/A		MOG	234096	439634	12852	404957	31699	STK19	236250	478011	20790	N/A	
CRYBA2	163499	487181	4915	N/A		MOG	234096	417019	12853	404537	31700	STK19	236250	460069	20791	N/A	
CRYBA2	163499	295728	4916	295728	26849	MOG	234096	415546	12854	404149	31701	STK19	236250	464830	20792	N/A	
CRYBA2	163499	453769	4917	395120	26850	MOG	234096	449096	12855	391898	31702	STK19	236250	472631	20793	N/A	
CRYBA2	163499	490678	4918	N/A		MOG	234096	494200	12856	N/A		STK19	236250	493840	20794	N/A	
CRYBG3	080200	389622	4919	374273	26851	MOG	234096	477504	12857	N/A		STK19	236250	486636	20795	N/A	
CRYBG3	080200	495403	4920	418420	26852	MOG	234096	476989	12858	N/A		STK19	236250	491132	20796	N/A	
CRYBG3	080200	485253	4921	N/A		MOG	234096	477366	12859	N/A		STK19	236250	468547	20797	N/A	
CRYL1	165475	480748	4922	479908	26853	MOG	234096	548017	12860	448732	31703	STK19	236250	550656	20798	447097	36700
CRYL1	165475	382812	4923	372262	26854	MOG	237834	488730	12861	N/A		STK19	206342	478304	20799	N/A	
CRYL1	165475	298248	4924	298248	26855	MOG	237834	383525	12862	373017	31704	STK19	206342	383328	20800	372818	36701
CRYM	103316	574448	4925	459982	26856	MOG	237834	439884	12863	398394	31705	STK19	206342	383327	20801	372817	36702
CRYM	103316	570401	4926	460820	26857	MOG	237834	473784	12864	N/A		STK19	206342	497879	20802	N/A	
CRYM	103316	219599	4927	219599	26858	MOG	237834	383521	12865	373013	31706	STK19	206342	469629	20803	N/A	
CRYM	103316	572113	4928	N/A		MOG	237834	400671	12866	383512	31707	STK19	206342	481181	20804	476036	36703
CRYM	103316	576703	4929	460126	26859	MOG	237834	444952	12867	400564	31708	STK19	206342	468702	20805	N/A	
CRYM	103316	571666	4930	N/A		MOG	237834	400669	12868	383510	31709	STK19	206342	490657	20806	N/A	
CRYM	103316	572914	4931	461904	26860	MOG	237834	412760	12869	404245	31710	STK19	206342	465945	20807	N/A	
CRYM	103316	571358	4932	460510	26861	MOG	237834	448816	12870	397837	31711	STK19	206342	460304	20808	N/A	
CRYM	103316	574787	4933	N/A		MOG	237834	421858	12871	403235	31712	STK19	206342	469343	20809	N/A	
CRYM	103316	543948	4934	440227	26862	MOG	237834	479627	12872	N/A		STK19	206342	547578	20810	448123	36704
CRYM	283922	639469	4935	492884	26863	MOG	237834	494392	12873	N/A		STK19	226033	496606	20811	N/A	
CRYM	283922	639312	4936	491775	26864	MOG	237834	550849	12874	449682	31713	STK19	226033	444147	20812	399915	36705
CRYM	283922	639592	4937	490961	26865	MOG	230885	427289	12875	414489	31714	STK19	226033	431383	20813	403479	36706
CRYM	283922	640547	4938	492104	26866	MOG	230885	482220	12876	N/A		STK19	226033	481637	20814	N/A	
CRYM	283922	640971	4939	N/A		MOG	230885	423895	12877	390632	31715	STK19	226033	478362	20815	N/A	
CRYM	283922	640031	4940	491052	26867	MOG	230885	472743	12878	N/A		STK19	226033	523972	20816	429285	36707
CRYM	283922	639726	4941	N/A		MOG	230885	426782	12879	410699	31716	STK19	226033	472138	20817	N/A	
CRYM	283922	640994	4942	491368	26868	MOG	230885	421125	12880	404362	31717	STK19	226033	480096	20818	N/A	
CRYM	283922	638658	4943	492312	26869	MOG	230885	440561	12881	409534	31718	STK19	226033	465050	20819	N/A	
CRYM	283922	638961	4944	N/A		MOG	230885	457626	12882	402139	31719	STK19	226033	465734	20820	N/A	
CRYM-AS1	189149	338573	4945	N/A		MOG	230885	444674	12883	390469	31720	STK19	226033	480672	20821	N/A	
CRYM-AS1	189149	561968	4946	N/A		MOG	230885	458179	12884	413370	31721	STK19	226033	463291	20822	N/A	
CRYM-AS1	189149	444326	4947	N/A		MOG	230885	440073	12885	407143	31722	STK19	226033	549916	20823	446725	36708

CRYM-AS1	189149	637983	4948	N/A		MOG	230885	493966	12886	N/A		STK3	104375	517832	20824	N/A	
CSF1R	182578	504875	4949	422212	26870	MOG	230885	478704	12887	N/A		STK3	104375	419617	20825	390500	36709
CSF1R	182578	286301	4950	286301	26871	MOG	230885	551993	12888	446871	31723	STK3	104375	523601	20826	429744	36710
CSF1R	182578	509861	4951	N/A		MOG	232641	411455	12889	387448	31724	STK3	104375	520440	20827	N/A	
CSF1R	182578	515068	4952	427545	26872	MOG	232641	434870	12890	395146	31725	STK3	104375	518582	20828	N/A	
CSF1R	182578	515239	4953	N/A		MOG	232641	450634	12891	400681	31726	STK3	104375	523159	20829	N/A	
CSF1R	182578	513609	4954	N/A		MOG	232641	431084	12892	406627	31727	STK3	104375	518165	20830	428014	36711
CSF1R	182578	502660	4955	N/A		MOG	232641	453271	12893	402247	31728	STK3	104375	518627	20831	N/A	
CSF1R	182578	511344	4956	421174	26873	MOG	232641	459677	12894	420250	31729	STK3	104375	522924	20832	N/A	
CSF1R	182578	543093	4957	445282	26874	MOG	232641	452744	12895	389022	31730	STK3	104375	521649	20833	429369	36712
CSMD1	183117	335551	4958	334828	26875	MOG	232641	400668	12896	383509	31731	STK3	104375	520053	20834	N/A	
CSMD1	183117	400186	4959	383047	26876	MOG	232641	429153	12897	390785	31732	STK3	104375	521768	20835	N/A	
CSMD1	183117	602723	4960	473617	26877	MOG	232641	495495	12898	N/A		STK3	104375	520653	20836	N/A	
CSMD1	183117	635120	4961	489225	26878	MOG	232641	497130	12899	N/A		STK3	104375	424861	20837	428167	36713
CSMD1	183117	520002	4962	430733	26879	MOG	232641	425569	12900	N/A		STK3	104375	523567	20838	N/A	
CSMD1	183117	602557	4963	473359	26880	MOG	232641	495080	12901	N/A		STK3	104375	523960	20839	N/A	
CSMD1	183117	519623	4964	N/A		MOG	232641	639922	12902	491870	31733	STK3	104375	519420	20840	428295	36714
CSMD1	183117	523062	4965	N/A		MOG	137345	400691	12903	383528	31734	STK3	104375	617590	20841	482260	36715
CSMD1	183117	520561	4966	N/A		MOG	137345	383631	12904	373127	31735	STK32A	169302	306304	20842	N/A	
CSMD1	183117	523387	4967	N/A		MOG	137345	359539	12905	352534	31736	STK32A	169302	397936	20843	381030	36716
CSMD1	183117	523488	4968	N/A		MOG	137345	400687	12906	383525	31737	STK32A	169302	503975	20844	N/A	
CSMD1	183117	520451	4969	N/A		MOG	137345	400688	12907	383526	31738	STK32A	169302	626951	20845	487441	36717
CSMD1	183117	521646	4970	N/A		MOG	137345	383630	12908	373126	31739	STK32A	169302	398523	20846	381535	36718
CSMD1	183117	524177	4971	N/A		MOG	137345	259891	12909	259891	31740	STK32A	169302	503384	20847	N/A	
CSMD1	183117	520630	4972	N/A		MOG	137345	415631	12910	394156	31741	STK32A	169302	515832	20848	N/A	
CSMD1	183117	519090	4973	N/A		MOG	137345	442444	12911	414146	31742	STK32A	169302	506091	20849	N/A	
CSMD1	183117	518151	4974	N/A		MOG	137345	461235	12912	N/A		STK32A	169302	510953	20850	N/A	
CSMD1	183117	537824	4975	441462	26881	MOG	137345	484234	12913	N/A		STK32B	152953	282908	20851	282908	36719
CSMD1	183117	335551	4976	334828	26882	MOG	137345	492471	12914	N/A		STK32B	152953	512018	20852	422820	36720
CSMD1	183117	400186	4977	383047	26883	MOG	137345	465504	12915	N/A		STK32B	152953	512636	20853	423209	36721
CSMD1	183117	602723	4978	473617	26884	MOG	137345	547083	12916	449213	31743	STK32B	152953	510398	20854	420984	36722
CSMD1	183117	635120	4979	489225	26885	MORF4L2	123562	360458	12917	353643	31744	STK32B	152953	513705	20855	N/A	
CSMD1	183117	520002	4980	430733	26886	MORF4L2	123562	441076	12918	391969	31745	STK32B	152953	505508	20856	N/A	
CSMD1	183117	602557	4981	473359	26887	MORF4L2	123562	434230	12919	413664	31746	STK32B	152953	511959	20857	N/A	
CSMD1	183117	519623	4982	N/A		MORF4L2	123562	418819	12920	393283	31747	STK32B	152953	508728	20858	N/A	
CSMD1	183117	523062	4983	N/A		MORF4L2	123562	442614	12921	400938	31748	STK33	130413	473980	20859	N/A	
CSMD1	183117	520561	4984	N/A		MORF4L2	123562	492116	12922	N/A		STK33	130413	486305	20860	N/A	
CSMD1	183117	523387	4985	N/A		MORF4L2	123562	422355	12923	408607	31749	STK33	130413	447869	20861	416750	36723
CSMD1	183117	523488	4986	N/A		MORF4L2	123562	474653	12924	N/A		STK33	130413	315204	20862	320754	36724
CSMD1	183117	520451	4987	N/A		MORF4L2	123562	467755	12925	N/A		STK33	130413	396672	20863	379905	36725
CSMD1	183117	521646	4988	N/A		MORF4L2	123562	498064	12926	N/A		STK33	130413	358872	20864	351743	36726
CSMD1	183117	524177	4989	N/A		MORF4L2	123562	488331	12927	N/A		STK33	130413	444064	20865	415688	36727
CSMD1	183117	520630	4990	N/A		MORF4L2	123562	422154	12928	394417	31750	STK33	130413	534493	20866	436418	36728
CSMD1	183117	519090	4991	N/A		MORF4L2	123562	433176	12929	415476	31751	STK33	130413	526517	20867	N/A	
CSMD1	183117	518151	4992	N/A		MORF4L2	123562	451301	12930	410532	31752	STK33	130413	524760	20868	436905	36729
CSMD1	183117	537824	4993	441462	26888	MORF4L2	123562	423833	12931	416120	31753	STK33	130413	418597	20869	391362	36730
CSMD2	121904	241312	4994	241312	26889	MPND	008382	262966	12932	262966	31754	STK33	130413	422559	20870	411510	36731
CSMD2	121904	465819	4995	N/A		MPND	008382	359935	12933	353015	31755	STK33	130413	457885	20871	403599	36732
CSMD2	121904	373380	4996	362478	26890	MPND	008382	599840	12934	471735	31756	STK33	130413	532336	20872	N/A	
CSMD2	121904	489419	4997	N/A		MPND	008382	594716	12935	470987	31757	STK33	130413	431279	20873	397569	36733
CSMD2	121904	373377	4998	362475	26891	MPND	008382	596722	12936	471715	31758	STK33	130413	454443	20874	397874	36734
CSMD2	121904	338325	4999	340311	26892	MPND	008382	597036	12937	471189	31759	STK33	130413	526360	20875	432822	36735
CSMD2	121904	471438	5000	N/A		MPND	008382	601877	12938	469230	31760	STK38L	211455	541191	20876	437856	36736
CSMD2	121904	373388	5001	362486	26893	MPND	008382	594162	12939	469057	31761	STK38L	211455	389032	20877	373684	36737
CSMD2	121904	373381	5002	362479	26894	MPP6	105926	432190	12940	395859	31762	STK38L	211455	545470	20878	439457	36738
CSMD2	121904	619121	5003	483463	26895	MPP6	105926	222644	12941	222644	31763	STK38L	211455	544367	20879	445898	36739
CSPG4	173546	308508	5004	312506	26896	MPP6	105926	409761	12942	386262	31764	STK38L	211455	539863	20880	N/A	
CSPG4	173546	308508	5005	312506	26897	MPP6	105926	396475	12943	379737	31765	STK38L	211455	434385	20881	N/A	
CSPG5	114646	456150	5006	392096	26898	MPP6	105926	430180	12944	391020	31766	STK38L	211455	540996	20882	443838	36740

CSPG5	114646	383738	5007	373244	26899	MPP6	105926	426450	12945	400515	31767	STK38L	211455	546286	20883	443456	36741
CSPG5	114646	264723	5008	264723	26900	MPP6	105926	472674	12946	N/A		STK38L	211455	543246	20884	442253	36742
CSPG5	114646	465441	5009	N/A		MPP6	105926	464384	12947	473560	31768	STK38L	211455	544969	20885	440279	36743
CSPG5	114646	610462	5010	478923	26901	MPP6	105926	625307	12948	487215	31769	STK38L	211455	407753	20886	385174	36744
CSRNP1	144655	273153	5011	273153	26902	MPP7	150054	375732	12949	364884	31770	STK38L	211455	536093	20887	443961	36745
CSRNP1	144655	514182	5012	422532	26903	MPP7	150054	496637	12950	473899	31771	STK38L	211455	543992	20888	N/A	
CSRNP3	178662	421875	5013	412081	26904	MPP7	150054	375719	12951	364871	31772	STMN4	015592	350889	20889	342538	36746
CSRNP3	178662	409664	5014	386278	26905	MPP7	150054	441595	12952	398319	31773	STMN4	015592	519997	20890	428474	36747
CSRNP3	178662	464503	5015	N/A		MPP7	150054	481244	12953	N/A		STMN4	015592	265770	20891	265770	36748
CSRNP3	178662	342316	5016	344042	26906	MPP7	150054	474731	12954	N/A		STMN4	015592	523048	20892	428428	36749
CSRNP3	178662	409420	5017	387195	26907	MPP7	150054	474682	12955	N/A		STMN4	015592	519614	20893	430699	36750
CSRNP3	178662	314499	5018	318258	26908	MPP7	150054	337532	12956	337907	31774	STMN4	015592	522908	20894	430389	36751
CSRP1	159176	367306	5019	356275	26909	MPPED1	186732	417669	12957	388137	31775	STMN4	015592	522750	20895	N/A	
CSRP1	159176	533402	5020	N/A		MPPED1	186732	334209	12958	335568	31776	STON1	243244	484110	20896	N/A	
CSRP1	159176	527662	5021	N/A		MPPED1	186732	447567	12959	401378	31777	STON1	243244	404752	20897	385273	36752
CSRP1	159176	532313	5022	N/A		MPPED1	186732	465861	12960	N/A		STON1	243244	406226	20898	384615	36753
CSRP1	159176	531916	5023	432110	26910	MPPED1	186732	480239	12961	N/A		STON1	243244	444932	20899	399868	36754
CSRP1	159176	532460	5024	434147	26911	MPPED1	186732	443721	12962	400686	31778	STON2	140022	555447	20900	450857	36755
CSRP1	159176	526256	5025	483864	26912	MPZ	158887	463290	12963	431538	31779	STON2	140022	553821	20901	450577	36756
CSRP1	159176	533432	5026	436792	26913	MPZ	158887	533357	12964	432943	31780	STON2	140022	555284	20902	N/A	
CSRP1	159176	530120	5027	N/A		MPZ	158887	491222	12965	431441	31781	STON2	140022	267540	20903	267540	36757
CSRP1	159176	526723	5028	436491	26914	MPZ	158887	526189	12966	488104	31782	STON2	140022	556280	20904	N/A	
CSRP1	159176	526317	5029	N/A		MPZ	158887	476410	12967	N/A		STON2	140022	555226	20905	N/A	
CSRP1	159176	524951	5030	437218	26915	MPZ	158887	488271	12968	N/A		STON2	140022	557055	20906	450990	36758
CSRP1	159176	458271	5031	N/A		MRAP2	135324	257776	12969	257776	31783	STON2	140022	554710	20907	451383	36759
CSRP1	159176	527573	5032	N/A		MRGPRF	172935	309099	12970	309782	31784	STON2	140022	614646	20908	477736	36760
CSRP1	159176	529975	5033	N/A		MRGPRF	172935	320913	12971	323414	31785	STOX2	173320	513034	20909	422118	36761
CSRP1	159176	533188	5034	N/A		MRGPRF	172935	441623	12972	403660	31786	STOX2	173320	511250	20910	N/A	
CSRP1	159176	471596	5035	N/A		MRLN	227877	628562	12973	488429	31787	STOX2	173320	308497	20911	311257	36762
CSRP1	159176	481851	5036	N/A		MRLN	227877	430431	12974	488299	31788	STOX2	173320	512520	20912	425388	36763
CSRP1	159176	340006	5037	345079	26916	MRLN	227877	414264	12975	488748	31789	STOX2	173320	506529	20913	426209	36764
CSTA	121552	264474	5038	264474	26917	MRLN	227877	594536	12976	488584	31790	STRAP	023734	541731	20914	445693	36765
CSTA	121552	479204	5039	418891	26918	MRLN	227877	598384	12977	N/A		STRAP	023734	025399	20915	025399	36766
CSTF2T	177613	331173	5040	332444	26919	MRLN	227877	600486	12978	N/A		STRAP	023734	419869	20916	392270	36767
LINC01933	254226	524295	5041	N/A		MRLN	227877	602051	12979	488673	31791	STRAP	023734	536737	20917	N/A	
LINC01933	254226	524034	5042	N/A		MRLN	227877	599605	12980	487738	31792	STRAP	023734	538718	20918	445814	36768
LINC01933	254226	518431	5043	N/A		MRLN	227877	612853	12981	N/A		STRAP	023734	539887	20919	N/A	
LINC01933	254226	523605	5044	N/A		MRLN	227877	621566	12982	N/A		STRC	242866	450892	20920	401513	36769
CTH	116761	464926	5045	N/A		MRLN	227877	629130	12983	N/A		STRC	242866	471703	20921	N/A	
CTH	116761	370938	5046	359976	26920	MRM2	122687	467199	12984	N/A		STRC	242866	448437	20922	N/A	
CTH	116761	346806	5047	311554	26921	MRM2	122687	242257	12985	242257	31793	STRC	242866	485556	20923	N/A	
CTH	116761	482383	5048	N/A		MRM2	122687	486040	12986	N/A		STRC	242866	428650	20924	415991	36770
CTH	116761	411986	5049	413407	26922	MRM2	122687	407040	12987	384423	31794	STRC	242866	440125	20925	394866	36771
CTNNA3	183230	433211	5050	389714	26923	MRM2	122687	440306	12988	392343	31795	STRC	242866	460952	20926	N/A	
CTNNA3	183230	373735	5051	N/A		MRPL18	112110	476826	12989	N/A		STRC	242866	493750	20927	N/A	
CTNNA3	183230	494580	5052	477144	26924	MRPL18	112110	479638	12990	N/A		STRC	242866	455136	20928	394755	36772
CTNNA3	183230	330298	5053	330570	26925	MRPL18	112110	367034	12991	356001	31796	STRC	242866	483250	20929	N/A	
CTNNA3	183230	545309	5054	441444	26926	MRPL18	112110	480842	12992	N/A		STRC	242866	470279	20930	N/A	
CTSL	135047	343150	5055	345344	26927	MSI1	135097	257552	12993	257552	31797	STRC	242866	432436	20931	407303	36773
CTSL	135047	340342	5056	363061	26928	MSI1	135097	546985	12994	446710	31798	STRC	242866	541030	20932	440413	36774
CTSL	135047	375894	5057	N/A		MSI1	135097	546622	12995	N/A		STRIP2	128578	249344	20933	249344	36775
CTSL	135047	495822	5058	N/A		MSMO1	052802	261507	12996	261507	31799	STRIP2	128578	435494	20934	392393	36776
CTSL	135047	342020	5059	340470	26929	MSMO1	052802	507013	12997	425241	31800	STRIP2	128578	465033	20935	N/A	
CTSL	135047	482054	5060	N/A		MSMO1	052802	393766	12998	377361	31801	STRN	115808	263918	20936	263918	36777
CTSS	163131	368985	5061	357981	26930	MSMO1	052802	504317	12999	423633	31802	STRN	115808	495595	20937	N/A	
CTSS	163131	472977	5062	475176	26931	MSMO1	052802	505270	13000	425112	31803	STRN	115808	379213	20938	368513	36778
CTSS	163131	607427	5063	475557	26932	MSRA	175806	317173	13001	313921	31804	STX17	136874	259400	20939	259400	36779
CTSS	163131	448301	5064	408414	26933	MSRA	175806	441698	13002	410912	31805	STX17	136874	529340	20940	434323	36780
CTSS	163131	483930	5065	475812	26934	MSRA	175806	518255	13003	429461	31806	STX17	136874	533696	20941	N/A	

CTSS	163131	480760	5066	N/A		MSRA	175806	521209	13004	435644	31807	STX17	136874	531035	20942	433694	36781
CTTNBP2	077063	160373	5067	160373	26935	MSRA	175806	522907	13005	428214	31808	STX17	136874	525342	20943	433701	36782
CTTNBP2	077063	446636	5068	389576	26936	MSRA	175806	528246	13006	436839	31809	STX17	136874	524405	20944	436666	36783
CTTNBP2	077063	441556	5069	397678	26937	MSRA	175806	523637	13007	N/A		STX17	136874	525640	20945	435981	36784
CTTNBP2	077063	445366	5070	389491	26938	MSRA	175806	382490	13008	371930	31810	STX17	136874	534052	20946	433484	36785
CTTNBP2	077063	435233	5071	395925	26939	MSRA	175806	521686	13009	427725	31811	STX17	136874	526607	20947	434547	36786
CTTNBP2	077063	482124	5072	N/A		MSRA	175806	517594	13010	N/A		STX17	136874	525579	20948	N/A	
CTTNBP2	077063	416239	5073	406142	26940	MSX2	120149	239243	13011	239243	31812	STX17	136874	525847	20949	N/A	
CTTNBP2	077063	467088	5074	N/A		MSX2	120149	507785	13012	427425	31813	STX17	136874	529385	20950	N/A	
CTTNBP2	077063	434890	5075	396014	26941	MT-CO1	198804	361624	13013	354499	31814	STXBP2	076944	593535	20951	470313	36787
CTTNBP2	077063	487820	5076	N/A		MT-ND4	198886	361381	13014	354961	31815	STXBP2	076944	597467	20952	N/A	
CTTNBP2	077063	454375	5077	405831	26942	MT2A	125148	561491	13015	456804	31816	STXBP2	076944	595950	20953	471161	36788
CTTNBP2	077063	412853	5078	393373	26943	MT2A	125148	567300	13016	N/A		STXBP2	076944	595181	20954	N/A	
CTXN1	178531	318978	5079	313226	26944	MT2A	125148	562017	13017	N/A		STXBP2	076944	441779	20955	413606	36789
CTXN3	205279	379445	5080	368758	26945	MT2A	125148	245185	13018	245185	31817	STXBP2	076944	599905	20956	N/A	
CTXN3	205279	514851	5081	N/A		MT2A	125148	563985	13019	N/A		STXBP2	076944	221283	20957	221283	36790
CTXN3	205279	395322	5082	378732	26946	MT3	087250	561640	13020	455353	31818	STXBP2	076944	597068	20958	471327	36791
CTXN3	205279	620385	5083	482081	26947	MT3	087250	565838	13021	455980	31819	STXBP2	076944	414284	20959	409471	36792
CUL7	044090	265348	5084	265348	26948	MT3	087250	200691	13022	200691	31820	STXBP2	076944	599737	20960	471585	36793
CUL7	044090	478630	5085	N/A		MT3	087250	566451	13023	N/A		STXBP2	076944	599648	20961	N/A	
CUL7	044090	535468	5086	438788	26949	MT3	087250	570176	13024	457164	31821	STXBP2	076944	594221	20962	N/A	
CX3CL1	006210	006053	5087	006053	26950	MT3	087250	566576	13025	N/A		STXBP2	076944	595861	20963	N/A	
CX3CL1	006210	563383	5088	456830	26951	MTCH1	137409	373616	13026	362718	31822	STXBP2	076944	600702	20964	471737	36794
CX3CL1	006210	564948	5089	457996	26952	MTCH1	137409	373627	13027	362730	31823	STXBP2	076944	599400	20965	473040	36795
CX3CL1	006210	565912	5090	464114	26953	MTCH1	137409	471737	13028	N/A		STXBP2	076944	593854	20966	N/A	
CX3CR1	168329	399220	5091	382166	26954	MTCH1	137409	418541	13029	399187	31824	STXBP2	076944	595800	20967	N/A	
CX3CR1	168329	435290	5092	394960	26955	MTCH1	137409	460219	13030	419739	31825	STXBP2	076944	599558	20968	N/A	
CX3CR1	168329	412814	5093	408835	26956	MTCH1	137409	492754	13031	N/A		STXBP2	076944	601061	20969	N/A	
CX3CR1	168329	541347	5094	439140	26957	MTCH2	109919	539759	13032	N/A		STXBP2	076944	602355	20970	473406	36796
CX3CR1	168329	542107	5095	444928	26958	MTCH2	109919	302503	13033	303222	31826	STXBP2	076944	599278	20971	N/A	
CX3CR1	168329	358309	5096	351059	26959	MTCH2	109919	534074	13034	N/A		STXBP2	076944	612033	20972	478797	36797
CXCL12	107562	374429	5097	363551	26960	MTCH2	109919	525649	13035	N/A		STXBP3	116266	483586	20973	N/A	
CXCL12	107562	395793	5098	379139	26961	MTCH2	109919	530428	13036	432043	31827	STXBP3	116266	469338	20974	N/A	
CXCL12	107562	374426	5099	363548	26962	MTCH2	109919	533571	13037	N/A		STXBP3	116266	370008	20975	359025	36798
CXCL12	107562	343575	5100	339913	26963	MTFP1	242114	266263	13038	266263	31828	STXBP3	116266	486601	20976	N/A	
CXCL12	107562	395794	5101	379140	26964	MTFP1	242114	614920	13039	N/A		STXBP3	116266	485167	20977	N/A	
CXCL12	107562	496375	5102	N/A		MTFP1	242114	355143	13040	347267	31829	STXBP3	116266	495245	20978	N/A	
CXCL12	107562	488591	5103	N/A		MTFP1	242114	412752	13041	393954	31830	STXBP3	116266	472099	20979	N/A	
CXCL12	107562	395795	5104	379141	26965	MTFP1	242114	407550	13042	383926	31831	SULF2	196562	479472	20980	N/A	
CXCL14	145824	512158	5105	423783	26966	MTFP1	242114	629597	13043	487369	31832	SULF2	196562	359930	20981	353007	36799
CXCL14	145824	337225	5106	337065	26967	MTHFD1L	120254	367321	13044	356290	31833	SULF2	196562	479970	20982	N/A	
CXCL5	163735	296027	5107	296027	26968	MTHFD1L	120254	367307	13045	356276	31834	SULF2	196562	484875	20983	418290	36800
CXCR4	121966	409817	5108	386884	26969	MTHFD1L	120254	367308	13046	356277	31835	SULF2	196562	495544	20984	417894	36801
CXCR4	121966	241393	5109	241393	26970	MTHFD1L	120254	441122	13047	407070	31836	SULF2	196562	467815	20985	418442	36802
CXCR4	121966	466288	5110	N/A		MTHFD1L	120254	423867	13048	400776	31837	SULF2	196562	433632	20986	N/A	
CXorf36	147113	398000	5111	381086	26971	MTHFD1L	120254	421497	13049	N/A		SULF2	196562	465769	20987	N/A	
CXorf36	147113	477281	5112	N/A		MTHFD1L	120254	478643	13050	N/A		SULF2	196562	474450	20988	N/A	
CXorf36	147113	377934	5113	367168	26972	MTHFD1L	120254	420192	13051	395158	31838	SULF2	196562	463221	20989	N/A	
CXorf36	147113	492138	5114	N/A		MTHFD1L	120254	453602	13052	391022	31839	SULF2	196562	437955	20990	410026	36803
CXXC4	168772	394767	5115	378248	26973	MTHFD1L	120254	450635	13053	399804	31840	SULF2	196562	478766	20991	N/A	
CXXC4	168772	466963	5116	N/A		MTHFD1L	120254	618312	13054	479539	31841	SURF2	148291	371964	20992	361032	36804
CXXC4	168772	515509	5117	N/A		MTHFD1L	120254	611279	13055	478253	31842	SURF2	148291	495524	20993	N/A	
CYB5A	166347	340533	5118	341625	26974	MTHFD2L	163738	429519	13056	391327	31843	SURF2	148291	486887	20994	N/A	
CYB5A	166347	580678	5119	N/A		MTHFD2L	163738	490698	13057	N/A		SURF2	281024	630633	20995	487370	36805
CYB5A	166347	299438	5120	299438	26975	MTHFD2L	163738	475291	13058	N/A		SURF2	281024	627396	20996	N/A	
CYB5A	166347	494131	5121	436461	26976	MTHFD2L	163738	429335	13059	409391	31844	SURF2	281024	626704	20997	N/A	
CYB5A	166347	583418	5122	N/A		MTHFD2L	163738	423607	13060	387614	31845	SUSD5	173705	309558	20998	308727	36806
CYB5A	166347	397914	5123	381011	26977	MTHFD2L	163738	461101	13061	N/A		SUSD5	173705	412539	20999	406475	36807
CYB5A	166347	579064	5124	N/A		MTHFD2L	163738	359107	13062	352012	31846	SUSD6	100647	342745	21000	344424	36808

CYCS	172115	305786	5125	307786	26978	MTHFD2L	163738	325278	13063	321984	31847	SUSD6	100647	553497	21001	N/A	
CYCS	172115	409409	5126	386270	26979	MTHFD2L	163738	484725	13064	N/A		SUSD6	100647	556993	21002	N/A	
CYCS	172115	409764	5127	387279	26980	MTHFD2L	163738	492183	13065	N/A		SV2B	185518	545111	21003	443243	36809
CYCS	172115	413447	5128	416479	26981	MTHFD2L	163738	461856	13066	N/A		SV2B	185518	394232	21004	377779	36810
CYFIP2	055163	616178	5129	479719	26982	MTHFD2L	163738	465255	13067	N/A		SV2B	185518	557410	21005	450992	36811
CYFIP2	055163	620254	5130	479968	26983	MTHFD2L	163738	490128	13068	N/A		SV2B	185518	557291	21006	N/A	
CYFIP2	055163	522463	5131	428009	26984	MTHFD2L	163738	395759	13069	379108	31848	SV2B	185518	553727	21007	N/A	
CYFIP2	055163	435847	5132	403793	26985	MTHFD2L	163738	433372	13070	405692	31849	SV2B	185518	330276	21008	332818	36812
CYFIP2	055163	522637	5133	428079	26986	MTHFSD	103248	360900	13071	354152	31850	SV2C	122012	502798	21009	423541	36813
CYFIP2	055163	521420	5134	430904	26987	MTHFSD	103248	625049	13072	N/A		SV2C	122012	322285	21010	316983	36814
CYFIP2	055163	622696	5135	N/A		MTHFSD	103248	546093	13073	438761	31851	SV2C	122012	506257	21011	N/A	
CYFIP2	055163	617629	5136	480605	26988	MTHFSD	103248	634347	13074	489295	31852	SVEP1	165124	374469	21012	363593	36815
CYFIP2	055163	611075	5137	479376	26989	MTHFSD	103248	543303	13075	444003	31853	SVEP1	165124	476205	21013	N/A	
CYFIP2	055163	611925	5138	478058	26990	MTHFSD	103248	381214	13076	370612	31854	SVEP1	165124	467821	21014	N/A	
CYFIP2	055163	618329	5139	484819	26991	MTHFSD	103248	566050	13077	456910	31855	SVEP1	165124	374461	21015	363585	36816
CYFIP2	055163	518456	5140	N/A		MTHFSD	103248	567539	13078	454593	31856	SVEP1	165124	401783	21016	384917	36817
CYFIP2	055163	621516	5141	479211	26992	MTHFSD	103248	562096	13079	N/A		SVIL	197321	375400	21017	364549	36818
CYFIP2	055163	518511	5142	N/A		MTHFSD	103248	562940	13080	456652	31857	SVIL	197321	355867	21018	348128	36819
CYFIP2	055163	520942	5143	N/A		MTHFSD	103248	566469	13081	455940	31858	SVIL	197321	632315	21019	488171	36820
CYFIP2	055163	520960	5144	482739	26993	MTHFSD	103248	569000	13082	454807	31859	SVIL	197321	460007	21020	N/A	
CYFIP2	055163	518555	5145	N/A		MTHFSD	103248	568798	13083	455262	31860	SVIL	197321	482607	21021	N/A	
CYFIP2	055163	520424	5146	N/A		MTHFSD	103248	562994	13084	456628	31861	SVIL	197321	474106	21022	N/A	
CYFIP2	055163	522892	5147	N/A		MTHFSD	103248	561522	13085	454429	31862	SVIL	197321	491872	21023	N/A	
CYFIP2	055163	523383	5148	N/A		MTHFSD	103248	564364	13086	458104	31863	SVIL	197321	464984	21024	N/A	
CYFIP2	055163	524058	5149	N/A		MTHFSD	103248	568037	13087	480673	31864	SVIL	197321	483758	21025	N/A	
CYFIP2	055163	519663	5150	N/A		MTHFSD	103248	561989	13088	455208	31865	SVIL	197321	464726	21026	N/A	
CYFIP2	055163	522884	5151	N/A		MTHFSD	103248	565482	13089	457794	31866	SVIL	197321	490031	21027	N/A	
CYFIP2	055163	522775	5152	N/A		MTHFSD	103248	561848	13090	N/A		SVIL	197321	465422	21028	N/A	
CYGB	161544	293230	5153	293230	26994	MTRF1	120662	379480	13091	368793	31867	SVIL	197321	375398	21029	364547	36821
CYGB	161544	586160	5154	N/A		MTRF1	120662	473492	13092	N/A		SVOP	166111	610966	21030	479104	36822
CYGB	161544	589342	5155	466448	26995	MTRF1	120662	379477	13093	368790	31868	SVOP	166111	551211	21031	N/A	
CYGB	161544	590175	5156	464817	26996	MTRF1	120662	239852	13094	481161	31869	SVOP	166111	550436	21032	447583	36823
CYGB	161544	589145	5157	468559	26997	MTRF1	120662	480434	13095	482339	31870	SVOP	166111	546618	21033	447275	36824
CYP27A1	135929	494263	5158	N/A		MTRF1	120662	452359	13096	399279	31871	SVOP	166111	548229	21034	N/A	
CYP27A1	135929	258415	5159	258415	26998	MTRF1	120662	497679	13097	484414	31872	SWAP70	133789	447399	21035	399056	36825
CYP27A1	135929	445971	5160	404945	26999	MTRF1	120662	492827	13098	N/A		SWAP70	133789	318950	21036	315630	36826
CYP27A1	135929	466602	5161	N/A		MTRF1	120662	498245	13099	N/A		SWAP70	133789	526358	21037	431768	36827
CYP27A1	135929	411688	5162	392671	27000	MTRF1	120662	430347	13100	400031	31873	SWAP70	133789	531814	21038	N/A	
CYP2D6	100197	360124	5163	353241	27001	MTRNR2L6	282017	633925	13101	488809	31874	SWAP70	133789	524817	21039	N/A	
CYP2D6	100197	360608	5164	353820	27002	MTRNR2L6	270672	604952	13102	473686	31875	SWAP70	133789	534662	21040	435587	36828
CYP2D6	100197	488442	5165	N/A		MTRNR2L8	255823	536684	13103	439666	31876	SWAP70	133789	534562	21041	433824	36829
CYP2D6	100197	359033	5166	351927	27003	MTSS1	170873	378017	13104	367256	31877	SYAP1	169895	380155	21042	369500	36830
CYP2D6	100197	389970	5167	374620	27004	MTSS1	170873	518547	13105	429064	31878	SYAP1	169895	495743	21043	N/A	
CYP2D6	275211	625976	5168	487214	27005	MTSS1	170873	520771	13106	N/A		SYCP1	198765	369522	21044	358535	36831
CYP2D6	275211	615454	5169	479867	27006	MTSS1	170873	519168	13107	428685	31879	SYCP1	198765	455987	21045	410011	36832
CYP2D6	275211	628592	5170	N/A		MTSS1	170873	325064	13108	322804	31880	SYCP1	198765	369518	21046	358531	36833
CYP2D6	275211	612990	5171	483677	27007	MTSS1	170873	431961	13109	393606	31881	SYCP1	198765	477215	21047	N/A	
CYP2D6	272532	607853	5172	476021	27008	MTSS1	170873	523587	13110	N/A		SYCP1	198765	468191	21048	N/A	
CYP2D6	272532	619390	5173	483245	27009	MTSS1	170873	524090	13111	428319	31882	SYCP1	198765	482717	21049	N/A	
CYP2D6	280905	630793	5174	487281	27010	MTSS1	170873	523179	13112	428348	31883	SYCP1	198765	493377	21050	N/A	
CYP2D6	280905	630716	5175	486094	27011	MTSS1	170873	520094	13113	N/A		SYCP1	198765	477590	21051	N/A	
CYP2D6	280905	625898	5176	487558	27012	MTSS1	170873	522722	13114	N/A		SYCP1	198765	618516	21052	480997	36834
CYP2D6	280905	626412	5177	N/A		MTSS1	170873	522118	13115	428145	31884	SYCP1	198765	613524	21053	482532	36835
CYP2D6	280905	629640	5178	486619	27013	MTSS1	170873	519226	13116	N/A		SYN3	185666	358763	21054	351614	36836
CYP2D6	282966	635505	5179	488991	27014	MTSS1	170873	522162	13117	429752	31885	SYN3	185666	483062	21055	N/A	
CYP2D6	282966	634240	5180	489231	27015	MTSS1	170873	529463	13118	N/A		SYN3	185666	467095	21056	N/A	
CYP2D6	282966	635201	5181	N/A		MTSS1	170873	519671	13119	N/A		SYN3	185666	461446	21057	N/A	
CYP2D6	282966	634653	5182	489103	27016	MTSS1	170873	524243	13120	N/A		SYN3	185666	459990	21058	N/A	
CYP2D6	282966	635028	5183	489144	27017	MTSS1	170873	472084	13121	N/A		SYN3	185666	468922	21059	N/A	

CYP2D6	283284	636910	5184	490065	27018	MTTP	138823	513404	13122	424972	31886	SYN3	185666	462268	21060	N/A	
CYP2D6	283284	638004	5185	489906	27019	MTTP	138823	505142	13123	425987	31887	SYN3	185666	467824	21061	N/A	
CYP2D6	283284	636361	5186	489990	27020	MTTP	138823	506883	13124	426755	31888	SYN3	185666	472027	21062	N/A	
CYP2D6	283284	635910	5187	N/A		MTTP	138823	515141	13125	425642	31889	SYN3	185666	441821	21063	395794	36837
CYP2D6	283284	637987	5188	490398	27021	MTTP	138823	504724	13126	422667	31890	SYN3	185666	412575	21064	388582	36838
CYP2J2	134716	371204	5189	360247	27022	MTTP	138823	511610	13127	422178	31891	SYN3	185666	619146	21065	477861	36839
CYP2J2	134716	492633	5190	N/A		MTTP	138823	505094	13128	422782	31892	SYN3	185666	332840	21066	330219	36840
CYP2J2	134716	466095	5191	N/A		MTTP	138823	511045	13129	427679	31893	SYNDIG1	101463	376862	21067	366058	36841
CYP2J2	134716	469406	5192	N/A		MTTP	138823	265517	13130	265517	31894	SYNDIG1	101463	482637	21068	N/A	
CYP2J2	134716	468257	5193	N/A		MTTP	138823	422897	13131	407350	31895	SYNDIG1L	183379	554823	21069	450439	36842
CYP7B1	172817	523954	5194	N/A		MTTP	138823	457717	13132	400821	31896	SYNDIG1L	183379	554953	21070	451519	36843
CYP7B1	172817	310193	5195	310721	27023	MVP	013364	563915	13133	455819	31897	SYNDIG1L	183379	331628	21071	331474	36844
CYR61	142871	451137	5196	398736	27024	MVP	013364	357402	13134	349977	31898	SYNJ2	078269	355585	21072	347792	36845
CYR61	142871	480413	5197	N/A		MVP	013364	566859	13135	455741	31899	SYNJ2	078269	640338	21073	492532	36846
CYSTM1	120306	261811	5198	261811	27025	MVP	013364	563096	13136	N/A		SYNJ2	078269	367113	21074	356080	36847
CYSTM1	120306	509589	5199	N/A		MVP	013364	566066	13137	455186	31900	SYNJ2	078269	638626	21075	492369	36848
CYSTM1	120306	504227	5200	N/A		MVP	013364	562463	13138	457734	31901	SYNJ2	078269	449320	21076	411202	36849
CYSTM1	120306	509789	5201	N/A		MVP	013364	563558	13139	454825	31902	SYNJ2	078269	640569	21077	N/A	
CYYR1	166265	299340	5202	299340	27026	MVP	013364	565830	13140	N/A		SYNJ2	078269	485863	21078	436657	36850
CYYR1	166265	400043	5203	382918	27027	MVP	013364	569887	13141	455532	31903	SYNJ2	078269	367112	21079	N/A	
C21orf91	154642	284881	5204	284881	27028	MVP	013364	565164	13142	454819	31904	SYNJ2	078269	367122	21080	356089	36851
C21orf91	154642	400559	5205	383404	27029	MVP	013364	570234	13143	456291	31905	SYNPR	163630	478456	21081	N/A	
C21orf91	154642	400558	5206	383403	27030	MVP	013364	566252	13144	457685	31906	SYNPR	163630	478300	21082	418994	36852
C21orf91	154642	405964	5207	385566	27031	MVP	013364	566554	13145	N/A		SYNPR	163630	450542	21083	402121	36853
C21orf91	154642	493464	5208	N/A		MVP	013364	569612	13146	N/A		SYNPR	163630	468110	21084	419441	36854
C21orf91	154642	482915	5209	N/A		MVP	013364	563123	13147	458583	31907	SYNPR	163630	496889	21085	N/A	
KIAA1549L	110427	526400	5210	433481	27032	MVP	013364	570061	13148	N/A		SYNPR	163630	460142	21086	N/A	
KIAA1549L	110427	321505	5211	315295	27033	MVP	013364	568068	13149	N/A		SYNPR	163630	493532	21087	N/A	
KIAA1549L	110427	265654	5212	265654	27034	MVP	013364	395353	13150	378760	31908	SYNPR	163630	467934	21088	N/A	
KIAA1549L	110427	526400	5213	433481	27035	MVP	013364	629059	13151	486166	31909	SYNPR	163630	295894	21089	295894	36855
KIAA1549L	110427	321505	5214	315295	27036	MXD1	059728	435990	13152	410672	31910	SYNPR	163630	498449	21090	420383	36856
KIAA1549L	110427	265654	5215	265654	27037	MXD1	059728	264444	13153	264444	31911	SYNPR	163630	472899	21091	420623	36857
KIAA0556	047578	566023	5216	N/A		MXD1	059728	409442	13154	386523	31912	SYNPR	163630	479198	21092	418929	36858
KIAA0556	047578	261588	5217	261588	27038	MXD1	059728	410000	13155	N/A		SYNPR	163630	478744	21093	N/A	
KIAA0556	047578	568238	5218	454884	27039	MXD1	059728	465446	13156	N/A		SYNPR	163630	460711	21094	418701	36859
KIAA0556	047578	565672	5219	455380	27040	MXD1	059728	540449	13157	443935	31913	SYNPR	163630	465156	21095	418123	36860
KIAA0556	047578	618117	5220	483214	27041	MXD4	123933	337190	13158	337889	31914	SYT10	110975	228567	21096	228567	36861
KIAA0556	047578	564749	5221	N/A		MXD4	123933	513372	13159	N/A		SYT10	110975	539102	21097	444577	36862
KIAA0556	047578	567894	5222	N/A		MXD4	123933	513380	13160	422660	31915	SYT10	110975	567656	21098	N/A	
KIAA0556	047578	573850	5223	N/A		MXD4	123933	515378	13161	N/A		SYT12	173227	393946	21099	377520	36863
KIAA0556	047578	562207	5224	N/A		MXD4	123933	510822	13162	421209	31916	SYT12	173227	525457	21100	431400	36864
KIAA0556	047578	568622	5225	N/A		MXRA8	162576	474033	13163	N/A		SYT12	173227	527043	21101	435316	36865
C2orf80	188674	451342	5226	389385	27042	MXRA8	162576	309212	13164	307887	31917	SYT12	173227	526281	21102	N/A	
C2orf80	188674	341287	5227	343171	27043	MXRA8	162576	445648	13165	399229	31918	SYT12	173227	531392	21103	N/A	
C2orf80	188674	451346	5228	405393	27044	MXRA8	162576	477278	13166	436135	31919	SYT12	173227	533427	21104	434709	36866
C2orf80	188674	428015	5229	408378	27045	MXRA8	162576	473097	13167	N/A		SYT12	173227	525149	21105	N/A	
C2orf80	188674	453017	5230	397144	27046	MXRA8	162576	478517	13168	N/A		SYT14	143469	367019	21106	355986	36867
C2orf80	188674	423952	5231	413016	27047	MXRA8	162576	476718	13169	N/A		SYT14	143469	637265	21107	489897	36868
C2orf80	188674	449053	5232	397281	27048	MXRA8	162576	464351	13170	N/A		SYT14	143469	637945	21108	489671	36869
C10orf90	154493	424927	5233	411609	27049	MXRA8	162576	460473	13171	N/A		SYT14	143469	472886	21109	418901	36870
C10orf90	154493	480379	5234	474753	27050	MXRA8	162576	342753	13172	344998	31920	SYT14	143469	399639	21110	445837	36871
C10orf90	154493	356858	5235	349318	27051	MYBPC1	196091	547405	13173	448175	31921	SYT14	143469	367015	21111	355982	36872
C10orf90	154493	432642	5236	405995	27052	MYBPC1	196091	452455	13174	400908	31922	SYT14	143469	534859	21112	442891	36873
C10orf90	154493	568674	5237	N/A		MYBPC1	196091	547627	13175	N/A		SYT14	143469	629778	21113	486230	36874
C10orf90	154493	488181	5238	474558	27053	MYBPC1	196091	392934	13176	376665	31923	SYT14	143469	537238	21114	437423	36875
C10orf90	154493	463082	5239	474615	27054	MYBPC1	196091	547509	13177	447362	31924	SYT16	139973	554138	21115	N/A	
C10orf90	154493	284694	5240	284694	27055	MYBPC1	196091	361685	13178	354845	31925	SYT16	139973	636344	21116	N/A	

TMEM131L	121210	409663	5241	386574	27056	MYBPC1	196091	550501	13179	N/A		SYT16	139973	636133	21117	490266	36876
TMEM131L	121210	445960	5242	413054	27057	MYBPC1	196091	549145	13180	447660	31926	SYT16	139973	554436	21118	N/A	
TMEM131L	121210	409959	5243	386787	27058	MYBPC1	196091	553190	13181	447900	31927	SYT16	139973	568344	21119	478637	36877
TMEM131L	121210	462540	5244	N/A		MYBPC1	196091	545503	13182	440034	31928	SYT16	139973	555409	21120	451035	36878
TMEM131L	121210	240487	5245	240487	27059	MYBPC1	196091	536007	13183	446128	31929	SYT16	139973	430451	21121	394700	36879
TMEM131L	121210	509565	5246	N/A		MYBPC1	196091	541119	13184	442847	31930	SYT17	103528	570264	21122	456790	36880
TMEM131L	121210	497247	5247	N/A		MYBPC1	196091	361466	13185	354849	31931	SYT17	103528	566261	21123	454335	36881
TMEM131L	121210	478919	5248	N/A		MYBPC1	196091	551300	13186	447116	31932	SYT17	103528	355377	21124	347538	36882
DAB1	173406	371236	5249	360280	27060	MYBPC1	196091	550270	13187	449702	31933	SYT17	103528	568115	21125	456009	36883
DAB1	173406	485760	5250	N/A		MYBPC1	196091	552198	13188	N/A		SYT17	103528	562034	21126	456252	36884
DAB1	173406	371231	5251	360275	27061	MYBPC1	196091	550312	13189	N/A		SYT17	103528	562711	21127	454721	36885
DAB1	173406	371232	5252	360276	27062	MYBPC1	196091	548834	13190	N/A		SYT17	103528	562274	21128	N/A	
DAB1	173406	332102	5253	329120	27063	MYBPC1	196091	550812	13191	N/A		SYT17	103528	565183	21129	456879	36886
DAB1	173406	371230	5254	360274	27064	MYBPC1	196091	548298	13192	N/A		SYT17	103528	568433	21130	456915	36887
DAB1	173406	489267	5255	N/A		MYBPC1	196091	548532	13193	N/A		SYT2	143858	367267	21131	356236	36888
DAB1	173406	473821	5256	N/A		MYBPC1	196091	549608	13194	N/A		SYT2	143858	367268	21132	356237	36889
DAB1	173406	477280	5257	N/A		MYBPC1	196091	550514	13195	447404	31934	SYT3	213023	595557	21133	469834	36890
DAB1	173406	414851	5258	387581	27065	MYCL	116990	397332	13196	380494	31935	SYT3	213023	338916	21134	340914	36891
DAB1	173406	420954	5259	395296	27066	MYCL	116990	372816	13197	361903	31936	SYT3	213023	600079	21135	469398	36892
DACH1	276644	613252	5260	482245	27067	MYCL	116990	372815	13198	361902	31937	SYT3	213023	593901	21136	468982	36893
DACH1	276644	619232	5261	482797	27068	MYCL	116990	450953	13199	434375	31938	SYT3	213023	595117	21137	N/A	
DACH1	276644	611519	5262	482493	27069	MYH11	276480	612165	13200	478092	31939	SYT3	213023	598997	21138	469637	36894
DACH1	276644	620444	5263	481551	27070	MYH11	276480	621545	13201	478109	31940	SYT4	132872	255224	21139	255224	36895
DACT2	164488	366796	5264	355761	27071	MYH11	276480	632764	13202	N/A		SYT4	132872	586678	21140	N/A	
DACT2	164488	366795	5265	355760	27072	MYH11	276480	616422	13203	478816	31941	SYT4	132872	590752	21141	466930	36896
DACT2	164488	610183	5266	476573	27073	MYH11	276480	634050	13204	488461	31942	SYT4	132872	585604	21142	N/A	
DACT2	164488	607983	5267	476434	27074	MYH11	276480	631693	13205	N/A		SYT4	132872	596867	21143	470516	36897
DAGLA	134780	257215	5268	257215	27075	MYH11	276480	633845	13206	N/A		SYT4	132872	589479	21144	N/A	
DAGLA	134780	540717	5269	440264	27076	MYH11	276480	632352	13207	N/A		SYT4	132872	593720	21145	472583	36898
DAO	110887	548052	5270	N/A		MYH11	276480	632632	13208	N/A		SYT4	132872	591820	21146	N/A	
DAO	110887	551281	5271	446853	27077	MYH11	276480	631759	13209	N/A		SYT7	011347	263846	21147	263846	36899
DAO	110887	228476	5272	228476	27078	MYH11	276480	633799	13210	N/A		SYT7	011347	540677	21148	444201	36900
DAO	110887	547122	5273	448095	27079	MYH11	133392	396324	13211	379616	31943	SYT7	011347	539246	21149	438171	36901
DAO	110887	547768	5274	449967	27080	MYH11	133392	452625	13212	407821	31944	SYT7	011347	539468	21150	441184	36902
DAO	110887	549215	5275	449248	27081	MYH11	133392	573908	13213	N/A		SYT7	011347	539008	21151	439694	36903
DAO	110887	547166	5276	447104	27082	MYH11	133392	576790	13214	458731	31945	SYT7	011347	542836	21152	444568	36904
DAO	110887	546552	5277	N/A		MYH11	133392	300036	13215	300036	31946	SYT7	011347	542670	21153	444019	36905
DAPK1	196730	358077	5278	350785	27083	MYH11	133392	576164	13216	N/A		SYT7	011347	535826	21154	437720	36906
DAPK1	196730	472284	5279	417076	27084	MYH11	133392	571275	13217	N/A		SYT7	011347	540831	21155	N/A	
DAPK1	196730	469067	5280	N/A		MYH11	133392	574119	13218	N/A		SYT7	011347	545053	21156	443576	36907
DAPK1	196730	495182	5281	N/A		MYH11	133392	570785	13219	N/A		TANC1	115183	263635	21157	263635	36908
DAPK1	196730	408954	5282	386135	27085	MYH11	133392	571910	13220	N/A		TANC1	115183	464096	21158	N/A	
DAPK1	196730	470267	5283	N/A		MYH11	133392	571505	13221	N/A		TANC1	115183	465963	21159	N/A	
DAPK1	196730	496522	5284	N/A		MYH14	105357	598205	13222	472543	31947	TANC1	115183	470074	21160	N/A	
DAPK1	196730	472344	5285	N/A		MYH14	105357	599920	13223	469573	31948	TANC1	115183	496406	21161	N/A	
DAPK1	196730	491893	5286	419026	27086	MYH14	105357	601313	13224	470298	31949	TAOK2	149930	308893	21162	310094	36909
DAPK1	196730	489291	5287	417746	27087	MYH14	105357	596571	13225	472819	31950	TAOK2	149930	543033	21163	440336	36910
DAPK1	196730	463069	5288	N/A		MYH14	105357	595016	13226	N/A		TAOK2	149930	279394	21164	279394	36911
DAPK1	196730	475804	5289	N/A		MYH14	105357	597072	13227	N/A		TAOK2	149930	416441	21165	393048	36912
DAPK1	196730	495281	5290	N/A		MYH14	105357	425460	13228	407879	31951	TAOK2	149930	566552	21166	N/A	
DAPK1	196730	494010	5291	N/A		MYH14	105357	376970	13229	366169	31952	TAOK2	149930	570844	21167	N/A	
DAPK1	196730	466188	5292	N/A		MYH14	105357	262269	13230	262269	31953	TAOK3	135090	419821	21168	416374	36913
DAPK1	196730	497743	5293	N/A		MYH14	105357	440075	13231	406273	31954	TAOK3	135090	392533	21169	376317	36914
DAPK1	196730	468482	5294	N/A		MYH6	197616	356287	13232	348634	31955	TAOK3	135090	543709	21170	N/A	
DAPK1	196730	622514	5295	484267	27088	MYH6	197616	557461	13233	N/A		TAOK3	135090	537305	21171	N/A	
DAPK1	196730	469640	5296	418885	27089	MYH6	197616	405093	13234	386041	31956	TAOK3	135090	536979	21172	441932	36915
DAPK2	035664	559007	5297	453639	27090	MYLIP	007944	356840	13235	349298	31957	TAOK3	135090	537952	21173	443834	36916
DAPK2	035664	457488	5298	408277	27091	MYLIP	007944	349606	13236	008686	31958	TAOK3	135090	537569	21174	N/A	
DAPK2	035664	559731	5299	N/A		MYO10	145555	513610	13237	421280	31959	TAOK3	135090	540561	21175	443487	36917

DAPK2	035664	558064	5300	453101	27092	MYO10	145555	515803	13238	425051	31960	TAOK3	135090	537822	21176	439620	36918
DAPK2	035664	557867	5301	N/A		MYO10	145555	505695	13239	421170	31961	TAOK3	135090	536584	21177	N/A	
DAPK2	035664	612884	5302	484390	27093	MYO10	145555	513882	13240	421309	31962	TAOK3	135090	538601	21178	437389	36919
DAPK2	035664	558076	5303	N/A		MYO10	145555	506343	13241	N/A		TAOK3	135090	535570	21179	443465	36920
DAPK2	035664	558482	5304	N/A		MYO10	145555	512061	13242	N/A		TAOK3	135090	541186	21180	438820	36921
DAPK2	035664	559897	5305	N/A		MYO10	145555	510401	13243	N/A		TAOK3	135090	541878	21181	444057	36922
DAPK2	035664	561162	5306	453284	27094	MYO10	145555	508318	13244	N/A		TAOK3	135090	542902	21182	440315	36923
DAPK2	035664	559306	5307	452970	27095	MYO10	145555	511972	13245	N/A		TAOK3	135090	542532	21183	441071	36924
DAPK2	035664	261891	5308	261891	27096	MYO10	145555	502436	13246	426783	31963	TAOK3	135090	541786	21184	442541	36925
DAPK2	035664	558069	5309	453235	27097	MYO10	145555	507288	13247	426664	31964	TAOK3	135090	539872	21185	438766	36926
SLC6A3	142319	270349	5310	270349	27098	MYO10	145555	274203	13248	274203	31965	TAOK3	135090	542692	21186	N/A	
SLC6A3	142319	512002	5311	N/A		MYO16	041515	251041	13249	251041	31966	TBC1D1	065882	508802	21187	423651	36927
SLC6A3	142319	511750	5312	N/A		MYO16	041515	357550	13250	350160	31967	TBC1D1	065882	261439	21188	261439	36928
SLC6A3	276996	621716	5313	479597	27099	MYO16	041515	467639	13251	N/A		TBC1D1	065882	402522	21189	383994	36929
SLC6A3	276996	626610	5314	N/A		MYO16	041515	375857	13252	N/A		TBC1D1	065882	446803	21190	396877	36930
SLC6A3	276996	630314	5315	N/A		MYO16	041515	482793	13253	N/A		TBC1D1	065882	491553	21191	N/A	
DBH	123454	393056	5316	376776	27100	MYO16	041515	356711	13254	349145	31968	TBC1D1	065882	510573	21192	421641	36931
DBH	123454	263611	5317	263611	27101	MYO16	041515	457511	13255	401633	31969	TBC1D1	065882	513936	21193	425655	36932
DCBLD1	164465	528138	5318	N/A		MYO16	282848	634397	13256	489329	31970	TBC1D1	065882	509761	21194	N/A	
DCBLD1	164465	525483	5319	N/A		MYO16	282848	634615	13257	488923	31971	TBC1D1	065882	443855	21195	397640	36933
DCBLD1	164465	533950	5320	N/A		MYO16	282848	634825	13258	489279	31972	TBC1D1	065882	421339	21196	410167	36934
DCBLD1	164465	528162	5321	N/A		MYO16	282848	635050	13259	488918	31973	TBC1D1	065882	469803	21197	N/A	
DCBLD1	164465	296955	5322	296955	27102	MYO16	282848	634250	13260	N/A		TBC1D1	065882	511238	21198	N/A	
DCBLD1	164465	338728	5323	342422	27103	MYO16	282848	635544	13261	N/A		TBC1D1	065882	401554	21199	N/A	
DCBLD1	164465	533453	5324	N/A		MYO16	282848	634599	13262	N/A		TBC1D1	065882	407365	21200	N/A	
DCBLD1	164465	481630	5325	N/A		MYO1D	176658	318217	13263	324527	31974	TBC1D1	065882	475531	21201	N/A	
DCBLD1	164465	424717	5326	391700	27104	MYO1D	176658	394649	13264	464741	31975	TBC1D1	065882	406664	21202	N/A	
DCBLD1	164465	534777	5327	N/A		MYO1D	176658	577576	13265	N/A		TBC1D1	065882	405444	21203	N/A	
DCBLD1	164465	478345	5328	N/A		MYO1D	176658	577352	13266	N/A		TBC1D1	065882	492180	21204	N/A	
DCBLD1	164465	487076	5329	N/A		MYO1D	176658	579584	13267	464305	31976	TBC1D1	065882	615497	21205	478039	36935
DCC	187323	442544	5330	389140	27105	MYO1D	176658	580547	13268	N/A		TBC1D4	136111	377636	21206	366863	36936
DCC	187323	578080	5331	463699	27106	MYO1D	176658	581059	13269	N/A		TBC1D4	136111	478591	21207	N/A	
DCC	187323	580024	5332	N/A		MYO1D	176658	582217	13270	N/A		TBC1D4	136111	493487	21208	N/A	
DCC	187323	582875	5333	463131	27107	MYO1D	176658	623444	13271	N/A		TBC1D4	136111	413735	21209	396932	36937
DCC	187323	304775	5334	304146	27108	MYO1D	176658	585094	13272	N/A		TBC1D4	136111	488955	21210	N/A	
DCC	187323	579349	5335	464277	27109	MYO1D	176658	577252	13273	464346	31977	TBC1D4	136111	377625	21211	366852	36938
DCC	187323	581559	5336	463463	27110	MYO1D	176658	580538	13274	N/A		TBC1D4	136111	431480	21212	395986	36939
DCC	187323	579666	5337	N/A		MYO1D	176658	584232	13275	N/A		TBC1D5	131374	253692	21213	253692	36940
DCC	187323	582595	5338	N/A		MYO1D	176658	583611	13276	N/A		TBC1D5	131374	429383	21214	398127	36941
DCC	187323	584710	5339	N/A		MYO1D	176658	582751	13277	N/A		TBC1D5	131374	414318	21215	N/A	
DCC	187323	579883	5340	N/A		MYO1D	176658	583621	13278	462055	31978	TBC1D5	131374	446818	21216	402935	36942
DCC	187323	581580	5341	464582	27111	MYO7A	137474	409709	13279	386331	31979	TBC1D5	131374	429924	21217	411925	36943
DCC	187323	578949	5342	463766	27112	MYO7A	137474	409893	13280	386689	31980	TBC1D5	131374	465884	21218	N/A	
DCC	187323	580146	5343	N/A		MYO7A	137474	458637	13281	392185	31981	TBC1D5	131374	415814	21219	396239	36944
DCC	187323	579941	5344	464292	27113	MYO7A	137474	409619	13282	386635	31982	TBC1D5	131374	452492	21220	405886	36945
DCC	187323	579702	5345	N/A		MYO7A	137474	481328	13283	N/A		TBC1D5	131374	412981	21221	414250	36946
DCC	187323	577224	5346	N/A		MYO7A	137474	458169	13284	417017	31983	TBC1D5	131374	428355	21222	387395	36947
DCC	187323	412726	5347	397322	27114	MYO7A	137474	467137	13285	N/A		TBC1D5	131374	425944	21223	399967	36948
DCLK1	133083	360631	5348	353846	27115	MYO7A	137474	605744	13286	N/A		TBC1D5	131374	430169	21224	411780	36949
DCLK1	133083	379893	5349	369223	27116	MYO7A	137474	526863	13287	N/A		TBC1D5	131374	445294	21225	410596	36950
DCLK1	133083	255448	5350	255448	27117	MYO7A	137474	481532	13288	N/A		TBC1D5	131374	414349	21226	393882	36951
DCLK1	133083	477664	5351	N/A		MYO7A	137474	620575	13289	477640	31984	TBC1D5	131374	443499	21227	N/A	
DCLK1	133083	486239	5352	N/A		MYOT	120729	239926	13290	239926	31985	TBC1D5	131374	443386	21228	N/A	
DCLK1	133083	460982	5353	N/A		MYOT	120729	421631	13291	391185	31986	TBC1D5	131374	497531	21229	N/A	
DCLK1	133083	379892	5354	369222	27118	MYOT	120729	511625	13292	N/A		TBC1D5	131374	444756	21230	N/A	
DCLK1	133083	615680	5355	484452	27119	MYOT	120729	509812	13293	N/A		TBC1D5	131374	507877	21231	424998	36952
DCUN1D3	188215	324344	5356	319482	27120	MYOT	120729	515645	13294	426281	31987	TBC1D5	131374	446863	21232	415379	36953
DCUN1D3	188215	563934	5357	454762	27121	MYOT	120729	511254	13295	N/A		TBC1D5	131374	434420	21233	414159	36954
DCX	077279	635795	5358	489635	27122	MYOT	120729	503748	13296	N/A		TBC1D5	131374	486224	21234	N/A	

DCX	077279	636035	5359	490614	27123	MYOT	120729	508938	13297	N/A		TBC1D5	131374	444471	21235	396850	36955
DCX	077279	358070	5360	350776	27124	MYRF	124920	537766	13298	N/A		TBC1D5	131374	433533	21236	408603	36956
DCX	077279	637570	5361	490878	27125	MYRF	124920	278836	13299	278836	31988	TBC1D5	131374	481396	21237	N/A	
DCX	077279	356220	5362	348553	27126	MYRF	124920	265460	13300	265460	31989	TBC1D5	131374	480435	21238	N/A	
DCX	077279	488120	5363	419861	27127	MYRF	124920	389602	13301	374253	31990	TBC1D5	131374	423331	21239	N/A	
DCX	077279	637453	5364	490357	27128	MYRF	124920	536352	13302	N/A		TBC1D5	131374	485432	21240	N/A	
DCX	077279	496551	5365	490448	27129	MYRF	124920	537318	13303	N/A		TBC1D5	131374	473612	21241	N/A	
DCX	077279	636381	5366	490068	27130	MYRF	124920	546247	13304	N/A		TBC1D5	131374	471679	21242	N/A	
DCX	077279	468911	5367	418811	27131	MYRF	124920	539361	13305	N/A		TBCEL	154114	529397	21243	437184	36957
DCX	077279	371993	5368	361061	27132	MYRIP	170011	444716	13306	398665	31991	TBCEL	154114	284259	21244	284259	36958
DDHD1	100523	395606	5369	378970	27133	MYRIP	170011	302541	13307	301972	31992	TBCEL	154114	528512	21245	431803	36959
DDHD1	100523	323669	5370	327104	27134	MYRIP	170011	425621	13308	389323	31993	TBCEL	154114	531148	21246	433365	36960
DDHD1	100523	357758	5371	350401	27135	MYRIP	170011	458441	13309	400916	31994	TBCEL	154114	422003	21247	403925	36961
DDHD1	100523	556027	5372	N/A		MYRIP	170011	458292	13310	413392	31995	TBCEL	154114	533712	21248	431156	36962
DDHD1	100523	555621	5373	N/A		MYRIP	170011	475082	13311	N/A		TBCEL	154114	524726	21249	432783	36963
DDHD1	100523	555400	5374	N/A		MYRIP	170011	459828	13312	N/A		TBCEL	154114	530362	21250	N/A	
DDHD1	100523	553406	5375	N/A		MYRIP	170011	482033	13313	N/A		TBCEL	154114	533134	21251	436419	36964
DDHD1	100523	556910	5376	450785	27136	MYRIP	170011	396217	13314	379519	31996	TBCEL	154114	533169	21252	N/A	
DDHD1	100523	557445	5377	N/A		MYRIP	170011	539167	13315	438297	31997	TBL1X	101849	441088	21253	402923	36965
DDHD1	100523	612692	5378	483405	27137	MYT1	196132	360149	13316	353269	31998	TBL1X	101849	380961	21254	370348	36966
DDIT3	175197	547303	5379	447188	27138	MYT1	196132	328439	13317	327465	31999	TBL1X	101849	415293	21255	407069	36967
DDIT3	175197	551116	5380	448665	27139	MYT1	196132	610671	13318	N/A		TBL1X	101849	217964	21256	217964	36968
DDIT3	175197	623876	5381	N/A		MYT1	196132	622439	13319	480510	32000	TBL1X	101849	422314	21257	415508	36969
DDIT3	175197	346473	5382	340671	27140	MYT1	196132	536311	13320	442412	32001	TBL1X	101849	452824	21258	397878	36970
DDIT3	175197	552740	5383	447803	27141	MYT1	276876	616597	13321	481863	32002	TBL1X	101849	497555	21259	N/A	
DDIT3	175197	547526	5384	447503	27142	MYT1	276876	613234	13322	477771	32003	TBL1X	101849	424279	21260	394097	36971
DDIT4	168209	307365	5385	307305	27143	MYT1	276876	630159	13323	N/A		TBL1X	101849	407597	21261	385988	36972
DDIT4	168209	473155	5386	N/A		MYT1	276876	621996	13324	478819	32004	TBR1	136535	389554	21262	374205	36973
DDIT4	168209	471240	5387	N/A		MYT1	276876	616648	13325	483021	32005	TBR1	136535	463544	21263	N/A	
DDIT4L	145358	273990	5388	354830	27144	MYT1L	186487	399161	13326	382114	32006	TBR1	136535	411412	21264	393934	36974
DDIT4L	145358	502763	5389	427301	27145	MYT1L	186487	407844	13327	384219	32007	TBR1	136535	410035	21265	387023	36975
DDIT4L	145358	513992	5390	427040	27146	MYT1L	186487	399157	13328	382111	32008	TBR1	136535	477804	21266	N/A	
DDN	181418	421952	5391	390590	27147	MYT1L	186487	428368	13329	396103	32009	TBR1	136535	489530	21267	N/A	
DDO	203797	368924	5392	357920	27148	MYT1L	186487	471668	13330	N/A		TBXAS1	059377	493340	21268	N/A	
DDO	203797	368923	5393	357919	27149	MYT1L	186487	602387	13331	473409	32010	TBXAS1	059377	462053	21269	N/A	
DDO	203797	479373	5394	436642	27150	MYT1L	186487	470954	13332	N/A		TBXAS1	059377	473948	21270	N/A	
DDR2	162733	446985	5395	400309	27151	MYT1L	186487	490585	13333	N/A		TBXAS1	059377	425687	21271	388736	36976
DDR2	162733	415555	5396	391310	27152	MYT1L	186487	485547	13334	N/A		TBXAS1	059377	474763	21272	N/A	
DDR2	162733	367922	5397	356899	27153	MYT1L	186487	485348	13335	N/A		TBXAS1	059377	481440	21273	N/A	
DDR2	162733	367921	5398	356898	27154	MYT1L	186487	479156	13336	N/A		TBXAS1	059377	438104	21274	388612	36977
DDR2	162733	458105	5399	417030	27155	MYT1L	186487	476547	13337	N/A		TBXAS1	059377	336425	21275	338087	36978
DDR2	162733	433757	5400	396864	27156	MYT1L	186487	460585	13338	N/A		TBXAS1	059377	448866	21276	402536	36979
DDX3Y	067048	360160	5401	353284	27157	NAA20	173418	334982	13339	335636	32011	TBXAS1	059377	422328	21277	415892	36980
DDX3Y	067048	454054	5402	398953	27158	NAA20	173418	484480	13340	N/A		TBXAS1	059377	492560	21278	N/A	
DDX3Y	067048	336079	5403	336725	27159	NAA20	173418	310450	13341	311027	32012	TBXAS1	059377	455353	21279	391567	36981
DDX3Y	067048	493363	5404	N/A		NAA20	173418	463154	13342	N/A		TBXAS1	059377	458722	21280	411274	36982
DDX3Y	067048	440554	5405	400377	27160	NAA20	173418	480550	13343	N/A		TBXAS1	059377	411653	21281	411326	36983
DDX3Y	067048	469101	5406	N/A		NAA20	173418	398602	13344	381608	32013	TBXAS1	059377	476637	21282	N/A	
DDX3Y	067048	472510	5407	N/A		NAA20	173418	481837	13345	N/A		TBXAS1	059377	462275	21283	N/A	
DDX3Y	067048	463199	5408	N/A		NAB2	166886	300131	13346	300131	32014	TBXAS1	059377	414041	21284	412710	36984
DDX3Y	067048	495478	5409	N/A		NAB2	166886	555857	13347	N/A		TBXAS1	059377	469630	21285	N/A	
DDX49	105671	247003	5410	247003	27161	NAB2	166886	342556	13348	341491	32015	TBXAS1	059377	494876	21286	N/A	
DDX49	105671	599981	5411	N/A		NAB2	166886	554718	13349	N/A		TBXAS1	059377	416849	21287	389414	36985
DDX49	105671	599373	5412	N/A		NAB2	166886	554839	13350	N/A		TCEAL2	184905	476749	21288	N/A	
DDX49	105671	594021	5413	470440	27162	NAF1	145414	509434	13351	427518	32016	TCEAL2	184905	329035	21289	332359	36986
DDX49	105671	595858	5414	471292	27163	NAF1	145414	422287	13352	408963	32017	TCEAL2	184905	372780	21290	361866	36987
DDX49	105671	593361	5415	472289	27164	NAF1	145414	274054	13353	274054	32018	TCEAL5	204065	372680	21291	361765	36988
DDX49	105671	598972	5416	472084	27165	NAF1	145414	509884	13354	N/A		TCEAL6	204071	372774	21292	361860	36989
DDX49	105671	602113	5417	469086	27166	NAF1	145414	509232	13355	N/A		TCEAL6	204071	372773	21293	361859	36990

DDX49	105671	601803	5418	N/A		NAF1	145414	502973	13356	N/A		TCEAL7	182916	332431	21294	329794	36991
DDX49	105671	599156	5419	N/A		NAMA	271086	603491	13357	N/A		TCEAL7	182916	372666	21295	361751	36992
DDX49	105671	601772	5420	N/A		NAMA	271086	605377	13358	N/A		TCEAL9	185222	372661	21296	361745	36993
DDX49	105671	598277	5421	N/A		NAMA	271086	604237	13359	N/A		TCEAL9	185222	372656	21297	361740	36994
DDX49	105671	596502	5422	N/A		NAMA	271086	604258	13360	N/A		TCERG1L	176769	483040	21298	N/A	
DDX49	105671	629999	5423	487048	27167	NAMA	271086	605707	13361	N/A		TCERG1L	176769	368642	21299	357631	36995
DEDD2	160570	336034	5424	336972	27168	NAMA	271086	604009	13362	N/A		TCF7L1	152284	282111	21300	282111	36996
DEDD2	160570	595337	5425	470082	27169	NAMA	271086	605043	13363	N/A		TCF7L1	152284	494519	21301	N/A	
DEDD2	160570	593804	5426	N/A		NAMPT	105835	222553	13364	222553	32019	TCF7L1	152284	442813	21302	388984	36997
DEDD2	160570	596251	5427	471512	27170	NAMPT	105835	463871	13365	N/A		TCF7L1	152284	490744	21303	N/A	
DEDD2	160570	601135	5428	N/A		NAMPT	105835	354289	13366	346242	32020	TCP1	120438	321394	21304	317334	36998
DEDD2	160570	598415	5429	N/A		NAMPT	105835	491027	13367	N/A		TCP1	120438	544255	21305	439447	36999
DEDD2	160570	602075	5430	N/A		NAMPT	105835	467730	13368	N/A		TCP1	120438	420894	21306	390159	37000
DEDD2	160570	600559	5431	N/A		NAMPT	105835	484527	13369	N/A		TCP1	120438	392168	21307	376008	37001
DEDD2	160570	598090	5432	N/A		NAMPT	105835	393618	13370	N/A		TCP1	120438	546204	21308	N/A	
DEDD2	160570	598727	5433	469233	27171	NAMPT	105835	441045	13371	N/A		TCP1	120438	539756	21309	441345	37002
DEDD2	160570	593561	5434	N/A		NAMPT	105835	486949	13372	N/A		TCP1	120438	536807	21310	N/A	
DEDD2	160570	602201	5435	N/A		NAMPT	105835	489358	13373	N/A		TCP1	120438	538530	21311	440617	37003
DEDD2	160570	598200	5436	469898	27172	NAMPT	105835	424768	13374	390591	32021	TCP1	120438	543532	21312	N/A	
DEPDC1B	035499	265036	5437	265036	27173	NAMPT	105835	489732	13375	N/A		TCP1	120438	467544	21313	N/A	
DEPDC1B	035499	453022	5438	389101	27174	NAMPT	105835	417537	13376	390896	32022	TCP1	120438	538128	21314	442185	37004
DEPDC1B	035499	512078	5439	427527	27175	NAPA	105402	263354	13377	263354	32023	TCP1	120438	543517	21315	444423	37005
DEPDC1B	035499	509006	5440	N/A		NAPA	105402	597778	13378	N/A		TCP1	120438	539948	21316	439671	37006
DEPDC1B	035499	505017	5441	N/A		NAPA	105402	594217	13379	472235	32024	TCP1	120438	545764	21317	N/A	
DEPDC1B	035499	512452	5442	426979	27176	NAPA	105402	597271	13380	N/A		TCP1	120438	537390	21318	437840	37007
DEPDC7	121690	241051	5443	241051	27177	NAPA	105402	595227	13381	471520	32025	TCP1	120438	536394	21319	442856	37008
DEPDC7	121690	427755	5444	N/A		NAPA	105402	594001	13382	470654	32026	TCP1	120438	536607	21320	N/A	
DEPDC7	121690	532078	5445	N/A		NAPA	105402	593761	13383	472667	32027	TCP1	120438	546023	21321	N/A	
DEPDC7	121690	311388	5446	308971	27178	NAPA	105402	593905	13384	N/A		TCP11L2	166046	553143	21322	447416	37009
DES	175084	373960	5447	363071	27179	NAPA	105402	594155	13385	471261	32028	TCP11L2	166046	547153	21323	448952	37010
DES	175084	477226	5448	N/A		NAPA	105402	601208	13386	470665	32029	TCP11L2	166046	299045	21324	299045	37011
DES	175084	492726	5449	N/A		NAPA	105402	598615	13387	470946	32030	TCP11L2	166046	546625	21325	449123	37012
DES	175084	483395	5450	N/A		NAPA	105402	602082	13388	N/A		TCP11L2	166046	553098	21326	448629	37013
GSDME	105928	342947	5451	339587	27180	NAPA	105402	602174	13389	N/A		TCP11L2	166046	549906	21327	448064	37014
GSDME	105928	479636	5452	N/A		NAPA	105402	595826	13390	N/A		TCP11L2	166046	551802	21328	447174	37015
GSDME	105928	409970	5453	387119	27181	NAPA	105402	597118	13391	471018	32031	TCP11L2	166046	548428	21329	447457	37016
GSDME	105928	409775	5454	386670	27182	NAPA	105402	596892	13392	N/A		TCP11L2	166046	551228	21330	449844	37017
GSDME	105928	430096	5455	395540	27183	NAPA	105402	594288	13393	N/A		TCP11L2	166046	552690	21331	N/A	
GSDME	105928	415480	5456	389874	27184	NAPA	105402	594740	13394	N/A		TCTE1	146221	371505	21332	360560	37018
GSDME	105928	446822	5457	398445	27185	NAPA	105402	597274	13395	470954	32032	TCTE1	146221	371504	21333	360559	37019
GSDME	105928	469133	5458	N/A		NAPA	105402	601927	13396	N/A		TCTEX1D1	152760	525663	21334	N/A	
GSDME	105928	411476	5459	414090	27186	NAPA	105402	593785	13397	N/A		TCTEX1D1	152760	282670	21335	282670	37020
GSDME	105928	559637	5460	N/A		NAPA	105402	597160	13398	N/A		TCTEX1D1	152760	528352	21336	436731	37021
GSDME	105928	493723	5461	N/A		NARS2	137513	281038	13399	281038	32033	TCTEX1D1	152760	491611	21337	N/A	
GSDME	105928	414428	5462	413963	27187	NARS2	137513	529771	13400	435298	32034	TCTEX1D1	152760	448074	21338	N/A	
GSDME	105928	473990	5463	N/A		NARS2	137513	528850	13401	432635	32035	TCTEX1D1	152760	489510	21339	N/A	
GSDME	105928	419307	5464	401332	27188	NARS2	137513	525345	13402	436114	32036	TDP1	042088	554976	21340	452042	37022
DGCR5	283406	440005	5465	N/A		NARS2	137513	529880	13403	432240	32037	TDP1	042088	393452	21341	377098	37023
DGCR5	237517	438934	5466	N/A		NARS2	137513	529571	13404	433478	32038	TDP1	042088	554180	21342	450872	37024
DGCR5	237517	421572	5467	N/A		NARS2	137513	526709	13405	N/A		TDP1	042088	393454	21343	377099	37025
DGCR5	237517	399539	5468	N/A		NAV2	166833	360655	13406	353871	32039	TDP1	042088	553617	21344	450708	37026
DGKA	065357	546878	5469	446515	27189	NAV2	166833	396085	13407	379394	32040	TDP1	042088	335725	21345	337353	37027
DGKA	065357	546995	5470	N/A		NAV2	166833	349880	13408	309577	32041	TDP1	042088	555565	21346	N/A	
DGKA	065357	547015	5471	449178	27190	NAV2	166833	396087	13409	379396	32042	TDP1	042088	556867	21347	452279	37028

DGKA	065357	331886	5472	328405	27191	NAV2	166833	534229	13410	N/A		TDP1	042088	553569	21348	N/A	
DGKA	065357	555090	5473	452353	27192	NAV2	166833	528008	13411	N/A		TDP1	042088	553527	21349	451358	37029
DGKA	065357	549629	5474	450977	27193	NAV2	166833	533917	13412	437316	32043	TDP1	042088	553989	21350	452333	37030
DGKA	065357	555218	5475	451743	27194	NAV2	166833	525322	13413	437136	32044	TDP1	042088	545686	21351	444587	37031
DGKA	065357	548479	5476	N/A		NAV2	166833	530408	13414	431276	32045	TDP1	042088	555178	21352	452363	37032
DGKA	065357	547324	5477	N/A		NAV2	166833	534299	13415	N/A		TDP1	042088	556498	21353	452183	37033
DGKA	065357	553084	5478	446605	27195	NAV2	166833	526675	13416	N/A		TDP1	042088	555880	21354	450628	37034
DGKA	065357	547358	5479	N/A		NAV2	166833	533746	13417	N/A		TDP1	042088	557782	21355	451767	37035
DGKA	065357	548549	5480	448565	27196	NAV2	166833	525025	13418	N/A		TDP1	042088	556063	21356	450795	37036
DGKA	065357	549368	5481	447050	27197	NAV2	166833	528923	13419	N/A		TEAD1	187079	527636	21357	435233	37037
DGKA	065357	548407	5482	N/A		NAV2	166833	540292	13420	443489	32046	TEAD1	187079	527376	21358	432587	37038
DGKA	065357	555025	5483	450608	27198	NAV2	166833	527559	13421	435395	32047	TEAD1	187079	527575	21359	435977	37039
DGKA	065357	551615	5484	N/A		NCALD	104490	220931	13422	220931	32048	TEAD1	187079	525312	21360	N/A	
DGKA	065357	547535	5485	N/A		NCALD	104490	521599	13423	428105	32049	TEAD1	187079	526600	21361	435393	37040
DGKA	065357	549323	5486	N/A		NCALD	104490	519508	13424	430476	32050	TEAD1	187079	638666	21362	491500	37041
DGKA	065357	549097	5487	N/A		NCALD	104490	522951	13425	428781	32051	TEAD1	187079	334310	21363	334754	37042
DGKA	065357	551156	5488	450359	27199	NCALD	104490	522754	13426	N/A		TEAD4	197905	358409	21364	351184	37043
DGKA	065357	402956	5489	385792	27200	NCALD	104490	522448	13427	429466	32052	TEAD4	197905	540314	21365	438960	37044
DGKA	065357	553783	5490	450999	27201	NCALD	104490	520690	13428	429255	32053	TEAD4	197905	536826	21366	438453	37045
DGKA	065357	557080	5491	451814	27202	NCALD	104490	518727	13429	430731	32054	TEAD4	197905	359864	21367	352926	37046
DGKA	065357	432422	5492	402307	27203	NCALD	104490	520425	13430	430925	32055	TEAD4	197905	543035	21368	444528	37047
DGKA	065357	556001	5493	451266	27204	NCALD	104490	518166	13431	429522	32056	TEAD4	197905	397122	21369	380311	37048
DGKA	065357	550115	5494	N/A		NCALD	104490	522252	13432	428598	32057	TEAD4	197905	443986	21370	411475	37049
DGKA	065357	548378	5495	N/A		NCALD	104490	517822	13433	428312	32058	TEAD4	197905	544666	21371	441959	37050
DGKA	065357	551296	5496	N/A		NCALD	104490	524209	13434	429493	32059	TEC	135605	381501	21372	370912	37051
DGKA	065357	551707	5497	447460	27205	NCALD	104490	517531	13435	429245	32060	TEC	135605	505452	21373	424567	37052
DGKA	065357	552478	5498	N/A		NCALD	104490	521964	13436	430064	32061	TEC	135605	515146	21374	424365	37053
DGKA	065357	550888	5499	449923	27206	NCALD	104490	519098	13437	430534	32062	TEC	135605	511150	21375	N/A	
DGKA	065357	556344	5500	N/A		NCALD	104490	523923	13438	428193	32063	TEC	135605	511471	21376	N/A	
DGKA	065357	549079	5501	N/A		NCALD	104490	520346	13439	430365	32064	TEK	120156	519097	21377	430686	37054
DGKA	065357	551739	5502	N/A		NCALD	104490	518661	13440	428093	32065	TEK	120156	380036	21378	369375	37055
DGKA	065357	549085	5503	N/A		NCALD	104490	522206	13441	429296	32066	TEK	120156	406359	21379	383977	37056
DGKA	065357	552687	5504	N/A		NCALD	104490	524137	13442	430578	32067	TEK	120156	519080	21380	428337	37057
DGKA	065357	546895	5505	N/A		NCALD	104490	522078	13443	429162	32068	TEK	120156	615002	21381	480251	37058
DGKA	065357	549986	5506	N/A		NCALD	104490	523645	13444	429347	32069	TES	135269	358204	21382	350937	37059
DGKA	065357	552335	5507	N/A		NCALD	104490	518952	13445	N/A		TES	135269	461440	21383	N/A	
DGKA	065357	548047	5508	N/A		NCALD	104490	521957	13446	N/A		TES	135269	455989	21384	413002	37060
DGKA	065357	554434	5509	N/A		NCALD	104490	521371	13447	N/A		TES	135269	492891	21385	420220	37061
DGKA	065357	557180	5510	451330	27207	NCALD	104490	524101	13448	N/A		TES	135269	496871	21386	N/A	
DGKA	065357	552652	5511	N/A		NCALD	104490	517639	13449	N/A		TES	135269	393481	21387	377121	37062
DGKA	065357	550484	5512	N/A		NCALD	104490	395923	13450	379256	32070	TES	135269	485009	21388	N/A	
DGKA	065357	552903	5513	451518	27208	NCALD	104490	311028	13451	310587	32071	TES	135269	393484	21389	377124	37063
DGKA	065357	551585	5514	N/A		NCAM2	154654	400546	13452	383392	32072	TES	135269	494384	21390	N/A	
DGKA	065357	550957	5515	N/A		NCAM2	154654	486367	13453	N/A		TES	135269	496912	21391	N/A	
DGKA	065357	548491	5516	N/A		NCAM2	154654	461281	13454	N/A		TES	135269	463746	21392	N/A	
DGKA	065357	394147	5517	377703	27209	NCAM2	154654	484983	13455	N/A		TESC	088992	470612	21393	432716	37064
DGKB	136267	403951	5518	385780	27210	NCAM2	154654	284894	13456	284894	32073	TESC	088992	335209	21394	334785	37065
DGKB	136267	402815	5519	384909	27211	NCAN	130287	252575	13457	252575	32074	TESC	088992	549210	21395	450386	37066
DGKB	136267	407950	5520	385031	27212	NCAN	130287	590187	13458	N/A		TESC	088992	462502	21396	432608	37067
DGKB	136267	493142	5521	N/A		NCAN	130287	588231	13459	465599	32075	TESC	088992	535198	21397	N/A	
DGKB	136267	406247	5522	386066	27213	NCAN	130287	585410	13460	N/A		TESC	088992	482176	21398	N/A	
DGKB	136267	403963	5523	N/A		NCEH1	144959	475381	13461	418571	32076	TESC	088992	552139	21399	N/A	
DGKB	136267	471732	5524	N/A		NCEH1	144959	470419	13462	N/A		TESC	088992	541210	21400	445689	37068
DGKB	136267	477401	5525	N/A		NCEH1	144959	424772	13463	392934	32077	TEX14	121101	389934	21401	374584	37069
DGKB	136267	464065	5526	N/A		NCEH1	144959	421723	13464	402196	32078	TEX14	121101	584699	21402	N/A	
DGKB	136267	467449	5527	N/A		NCEH1	144959	538775	13465	442464	32079	TEX14	121101	240361	21403	240361	37070
DGKB	136267	437998	5528	405569	27214	NCEH1	144959	543711	13466	443227	32080	TEX14	121101	349033	21404	268910	37071
DGKB	136267	463981	5529	N/A		NCKAP5	176771	640590	13467	490966	32081	TEX14	121101	582740	21405	463593	37072
DGKB	136267	399322	5530	382260	27215	NCKAP5	176771	409261	13468	387128	32082	TEX14	121101	581147	21406	463243	37073

DGKH	102780	337343	5531	337572	27216	NCKAP5	176771	639875	13469	492746	32083	TEX2	136478	258991	21407	258991	37074
DGKH	102780	261491	5532	261491	27217	NCKAP5	176771	409213	13470	386952	32084	TEX2	136478	584498	21408	N/A	
DGKH	102780	611224	5533	482250	27218	NCKAP5	176771	473859	13471	N/A		TEX2	136478	583097	21409	462665	37075
DGKH	102780	628433	5534	485809	27219	NCKAP5	176771	427594	13472	399070	32085	TEX2	136478	584379	21410	463001	37076
DGKH	102780	627777	5535	486838	27220	NCKAP5	176771	358991	13473	351882	32086	TEX2	136478	583501	21411	462230	37077
DGKH	102780	626247	5536	486329	27221	NCKAP5	176771	317721	13474	380603	32087	TEX2	136478	581812	21412	N/A	
DGKH	102780	536612	5537	445114	27222	NCKAP5	176771	405974	13475	385692	32088	TEX2	136478	577489	21413	N/A	
DGKH	102780	498255	5538	N/A		NDEL1	166579	582812	13476	462052	32089	TEX2	136478	583922	21414	463286	37078
DGKH	102780	489851	5539	N/A		NDEL1	166579	579150	13477	N/A		TEX2	136478	583738	21415	462210	37079
DGKH	102780	379274	5540	368576	27223	NDEL1	166579	580237	13478	464154	32090	TEX2	136478	615733	21416	479308	37080
DGKI	157680	453654	5541	392161	27224	NDEL1	166579	582665	13479	463430	32091	TEX36	175018	532135	21417	431764	37081
DGKI	157680	494390	5542	N/A		NDEL1	166579	579880	13480	N/A		TEX36	175018	526819	21418	434299	37082
DGKI	157680	288490	5543	288490	27225	NDEL1	166579	334527	13481	333982	32092	TEX36	175018	368821	21419	357811	37083
DGKI	157680	446122	5544	399131	27226	NDEL1	166579	585098	13482	463492	32093	TEX9	151575	560827	21420	452791	37084
DGKI	157680	424189	5545	396078	27227	NDEL1	166579	380025	13483	369364	32094	TEX9	151575	352903	21421	342169	37085
DGKI	157680	477835	5546	N/A		NDEL1	166579	402554	13484	384963	32095	TEX9	151575	537232	21422	438745	37086
DGKI	157680	486153	5547	N/A		NDEL1	166579	584866	13485	462458	32096	TEX9	151575	561221	21423	456593	37087
DGKI	157680	497321	5548	N/A		NDEL1	166579	582490	13486	462759	32097	TEX9	151575	558127	21424	453431	37088
DGKI	157680	460662	5549	N/A		NDEL1	166579	580738	13487	N/A		TEX9	151575	558083	21425	453398	37089
DGKI	157680	470895	5550	N/A		NDEL1	166579	583066	13488	N/A		TEX9	151575	559142	21426	N/A	
DGKI	157680	483619	5551	N/A		NDEL1	166579	580012	13489	463351	32098	TEX9	151575	559546	21427	N/A	
DGKI	157680	475388	5552	N/A		NDEL1	166579	581189	13490	N/A		TEX9	151575	560582	21428	453960	37090
DGKI	157680	614521	5553	479053	27228	NDEL1	166579	582277	13491	464441	32099	TFAP2A	137203	461628	21429	417735	37091
DHDDS	117682	434391	5554	403529	27229	NDEL1	166579	581679	13492	464634	32100	TFAP2A	137203	379613	21430	368933	37092
DHDDS	117682	427245	5555	399177	27230	NDEL1	166579	583683	13493	N/A		TFAP2A	137203	489805	21431	420568	37093
DHDDS	117682	527611	5556	N/A		NDEL1	166579	578172	13494	N/A		TFAP2A	137203	319516	21432	316516	37094
DHDDS	117682	374186	5557	N/A		NDNF	173376	379692	13495	369014	32101	TFAP2A	137203	379608	21433	368928	37095
DHDDS	117682	525682	5558	434984	27231	NDNF	173376	506900	13496	N/A		TFAP2A	137203	488193	21434	419823	37096
DHDDS	117682	236342	5559	236342	27232	NDNF	173376	515757	13497	423352	32102	TFAP2A	137203	482890	21435	418541	37097
DHDDS	117682	526219	5560	434219	27233	NDNF	173376	511408	13498	426723	32103	TFAP2A	137203	466073	21436	417495	37098
DHDDS	117682	374185	5561	363300	27234	NDRG1	104419	323851	13499	319977	32104	TFAP2A	137203	497266	21437	N/A	
DHDDS	117682	487944	5562	N/A		NDRG1	104419	521438	13500	N/A		TFAP2A	137203	475264	21438	419696	37099
DHDDS	117682	360009	5563	353104	27235	NDRG1	104419	521026	13501	N/A		TFAP2A	137203	478375	21439	N/A	
DHDDS	117682	533087	5564	436119	27236	NDRG1	104419	521414	13502	N/A		TFAP2A	137203	498450	21440	419961	37100
DHDDS	117682	531312	5565	436764	27237	NDRG1	104419	519278	13503	N/A		TFAP2A	137203	490875	21441	N/A	
DHDDS	117682	525165	5566	434185	27238	NDRG1	104419	517599	13504	429172	32105	TFAP2A	137203	473652	21442	N/A	
DHDDS	117682	525326	5567	431407	27239	NDRG1	104419	414097	13505	404854	32106	TFAP2A	137203	474952	21443	N/A	
DHDDS	117682	525546	5568	433976	27240	NDRG1	104419	518176	13506	429007	32107	TFAP2A	137203	462727	21444	N/A	
DHDDS	117682	528557	5569	N/A		NDRG1	104419	522476	13507	427894	32108	TFAP2A	137203	464323	21445	N/A	
DHDDS	117682	526278	5570	N/A		NDRG1	104419	518066	13508	431057	32109	TFAP2A	137203	465858	21446	418391	37101
DHDDS	117682	436153	5571	405604	27241	NDRG1	104419	523642	13509	N/A		TFAP2A	137203	486038	21447	N/A	
DHDDS	117682	529688	5572	N/A		NDRG1	104419	522665	13510	N/A		TFAP2B	008196	344788	21448	342252	37102
DHDDS	117682	530781	5573	433491	27242	NDRG1	104419	517331	13511	N/A		TFAP2B	008196	393655	21449	377265	37103
DHDDS	117682	531955	5574	N/A		NDRG1	104419	522377	13512	429380	32110	TFAP2B	008196	489228	21450	N/A	
DHDDS	117682	525410	5575	N/A		NDRG1	104419	521664	13513	N/A		TFRC	072274	426789	21451	414015	37104
DHDDS	117682	430232	5576	397584	27243	NDRG1	104419	520230	13514	428345	32111	TFRC	072274	420415	21452	390133	37105
DHDDS	117682	431933	5577	399781	27244	NDRG1	104419	518010	13515	N/A		TFRC	072274	360110	21453	353224	37106
DHDDS	117682	416052	5578	393961	27245	NDRG1	104419	518480	13516	428802	32112	TFRC	072274	392396	21454	376197	37107
DHFR	228716	439211	5579	396308	27246	NDRG1	104419	519228	13517	429994	32113	TFRC	072274	463047	21455	N/A	
DHFR	228716	505337	5580	426474	27247	NDRG1	104419	519580	13518	429272	32114	TFRC	072274	475593	21456	N/A	
DHFR	228716	511032	5581	422732	27248	NDRG1	104419	522890	13519	428384	32115	TFRC	072274	483983	21457	N/A	
DHFR	228716	504396	5582	421334	27249	NDRG1	104419	520943	13520	429840	32116	TFRC	072274	463356	21458	N/A	
DHFR	228716	513048	5583	N/A		NDRG1	104419	521544	13521	429524	32117	TFRC	072274	482479	21459	N/A	
DHFR	228716	508282	5584	N/A		NDRG1	104419	517745	13522	N/A		TFRC	072274	465288	21460	N/A	
DHFR	228716	513314	5585	N/A		NDRG1	104419	518094	13523	N/A		TFRC	072274	477148	21461	N/A	
DIRAS2	165023	375765	5586	364919	27250	NDRG1	104419	522738	13524	428991	32118	TFRC	072274	464368	21462	N/A	
DIRAS2	165023	636786	5587	490457	27251	NDRG1	104419	523892	13525	430171	32119	TFRC	072274	491658	21463	N/A	
DIRAS2	165023	637905	5588	490853	27252	NDRG1	104419	523931	13526	N/A		TFRC	072274	421258	21464	402839	37108
DISP2	140323	267889	5589	267889	27253	NDRG1	104419	537882	13527	437443	32120	TFRC	072274	464011	21465	N/A	

DISP2	140323	559721	5590	N/A		NDRG2	165795	298687	13528	298687	32121	TG	042832	523901	21466	427871	37109
DISP2	140323	558623	5591	N/A		NDRG2	165795	350792	13529	344620	32122	TG	042832	220616	21467	220616	37110
DISP2	140323	561261	5592	N/A		NDRG2	165795	556716	13530	N/A		TG	042832	520769	21468	N/A	
DISP3	204624	423056	5593	N/A		NDRG2	165795	557633	13531	450835	32123	TG	042832	523756	21469	428628	37111
DISP3	204624	294484	5594	294484	27254	NDRG2	165795	554104	13532	452216	32124	TG	042832	518097	21470	N/A	
DISP3	204624	304391	5595	303400	27255	NDRG2	165795	555158	13533	452038	32125	TG	042832	518505	21471	429605	37112
DIXDC1	150764	529225	5596	434130	27256	NDRG2	165795	553503	13534	452306	32126	TG	042832	519178	21472	430523	37113
DIXDC1	150764	440460	5597	394352	27257	NDRG2	165795	397853	13535	380951	32127	TG	042832	518058	21473	429164	37114
DIXDC1	150764	528399	5598	N/A		NDRG2	165795	360463	13536	353649	32128	TG	042832	519543	21474	430430	37115
DIXDC1	150764	614104	5599	479434	27258	NDRG2	165795	556147	13537	451712	32129	TG	042832	520197	21475	N/A	
DIXDC1	150764	615255	5600	480808	27259	NDRG2	165795	557353	13538	450446	32130	TG	042832	520089	21476	N/A	
DIXDC1	150764	618522	5601	N/A		NDRG2	165795	554143	13539	452006	32131	TG	042832	519294	21477	N/A	
DIXDC1	150764	526500	5602	N/A		NDRG2	165795	397851	13540	380949	32132	TG	042832	524151	21478	N/A	
DIXDC1	150764	530645	5603	N/A		NDRG2	165795	397847	13541	380945	32133	TG	042832	522523	21479	N/A	
DIXDC1	150764	526418	5604	N/A		NDRG2	165795	298684	13542	298684	32134	TG	042832	522797	21480	430087	37116
DKK4	104371	220812	5605	220812	27260	NDRG2	165795	555650	13543	N/A		TG	042832	518108	21481	429761	37117
DLC1	164741	276297	5606	276297	27261	NDRG2	165795	397844	13544	380943	32135	TG	042832	522996	21482	N/A	
DLC1	164741	358919	5607	351797	27262	NDRG2	165795	403829	13545	385889	32136	TG	042832	522809	21483	N/A	
DLC1	164741	510318	5608	N/A		NDRG2	165795	553593	13546	452117	32137	TG	042832	521107	21484	430161	37118
DLC1	164741	512044	5609	422595	27263	NDRG2	165795	553793	13547	N/A		TG	042832	522691	21485	N/A	
DLC1	164741	520226	5610	428028	27264	NDRG2	165795	556008	13548	451966	32138	TGFB2	092969	366930	21486	355897	37119
DLC1	164741	521730	5611	N/A		NDRG2	165795	557416	13549	N/A		TGFB2	092969	366929	21487	355896	37120
DLC1	164741	513883	5612	N/A		NDRG2	165795	635386	13550	489341	32139	TGFB2	092969	488793	21488	N/A	
DLC1	164741	510250	5613	N/A		NDRG2	165795	556366	13551	452413	32140	TGFB2	092969	479322	21489	N/A	
DLC1	164741	509922	5614	N/A		NDRG2	165795	556974	13552	452362	32141	TGFB3	119699	556507	21490	N/A	
DLC1	164741	503161	5615	429537	27265	NDRG2	165795	555026	13553	451274	32142	TGFB3	119699	557493	21491	N/A	
DLC1	164741	515225	5616	N/A		NDRG2	165795	554277	13554	N/A		TGFB3	119699	556285	21492	451110	37121
DLC1	164741	506171	5617	N/A		NDRG2	165795	553867	13555	450691	32143	TGFB3	119699	555193	21493	N/A	
DLC1	164741	316609	5618	321034	27266	NDRG2	165795	449431	13556	397250	32144	TGFB3	119699	556674	21494	N/A	
DLC1	164741	511869	5619	425878	27267	NDRG2	165795	557169	13557	452334	32145	TGFB3	119699	238682	21495	238682	37122
DLC1	164741	517868	5620	473289	27268	NDRG2	165795	555695	13558	451353	32146	TGFB3	119699	554980	21496	N/A	
DLC1	164741	631382	5621	488100	27269	NDRG2	165795	555869	13559	451105	32147	TGFBR2	163513	295754	21497	295754	37123
DLC1	164741	517333	5622	N/A		NDRG2	165795	557182	13560	450545	32148	TGFBR2	163513	359013	21498	351905	37124
DLC1	164741	529018	5623	N/A		NDRG2	165795	555733	13561	452482	32149	TH	180176	381178	21499	370571	37125
DLG1	075711	346964	5624	345731	27270	NDRG2	165795	555384	13562	451094	32150	TH	180176	381175	21500	370567	37126
DLG1	075711	469371	5625	N/A		NDRG2	165795	554094	13563	452278	32151	TH	180176	352909	21501	325951	37127
DLG1	075711	419354	5626	407531	27271	NDRG2	165795	366204	13564	N/A		TH	180176	324155	21502	325831	37128
DLG1	075711	452595	5627	398939	27272	NDRG2	165795	553741	13565	N/A		TH	180176	479437	21503	N/A	
DLG1	075711	422288	5628	413238	27273	NDRG2	165795	557728	13566	N/A		TH	180176	416223	21504	403440	37129
DLG1	075711	448528	5629	391732	27274	NDRG2	165795	553567	13567	N/A		TH	180176	412076	21505	403546	37130
DLG1	075711	443183	5630	396658	27275	NDRG2	165795	557305	13568	N/A		TH	180176	461172	21506	N/A	
DLG1	075711	450955	5631	411278	27276	NDRG2	165795	557198	13569	N/A		TH	180176	381168	21507	370560	37131
DLG1	075711	392382	5632	376187	27277	NDRG2	165795	553442	13570	450493	32152	TH	180176	469226	21508	N/A	
DLG1	075711	475394	5633	N/A		NDRG2	165795	556420	13571	451951	32153	TH	180176	333684	21509	328814	37132
DLG1	075711	470629	5634	N/A		NDRG2	165795	553784	13572	451059	32154	THBS2	186340	366787	21510	355751	37133
DLG1	075711	419227	5635	396768	27278	NDRG2	165795	557149	13573	452592	32155	THBS2	186340	488355	21511	N/A	
DLG1	075711	392381	5636	376186	27279	NDRG2	165795	555142	13574	450513	32156	THBS2	186340	461848	21512	N/A	
DLG1	075711	471733	5637	N/A		NDRG2	165795	555767	13575	452053	32157	THBS2	186340	472733	21513	N/A	
DLG1	075711	493937	5638	N/A		NDRG2	165795	554531	13576	451302	32158	THBS2	186340	435791	21514	398928	37134
DLG1	075711	447466	5639	398702	27280	NDRG2	165795	557264	13577	451471	32159	THBS2	186340	617924	21515	482784	37135
DLG1	075711	477312	5640	N/A		NDRG2	165795	557676	13578	452548	32160	THBS4	113296	513310	21516	N/A	
DLG1	075711	453607	5641	412579	27281	NDRG2	165795	556924	13579	450504	32161	THBS4	113296	510218	21517	N/A	
DLG1	075711	456699	5642	396474	27282	NDRG2	165795	556329	13580	452262	32162	THBS4	113296	350881	21518	339730	37136
DLG1	075711	392380	5643	376185	27283	NDRG2	165795	554379	13581	450929	32163	THBS4	113296	511733	21519	422298	37137
DLG1	075711	485409	5644	N/A		NDRG2	165795	554398	13582	451185	32164	THBS4	113296	515510	21520	N/A	
DLG1	075711	419553	5645	414189	27284	NDRG2	165795	554472	13583	451348	32165	THBS4	113296	504720	21521	N/A	
DLG1	075711	469073	5646	N/A		NDRG2	165795	554483	13584	451472	32166	THBS4	113296	511888	21522	N/A	
DLG1	075711	436682	5647	393771	27285	NDRG2	165795	555657	13585	452247	32167	THSD7B	144229	472720	21523	473349	37138
DLG1	075711	486877	5648	N/A		NDRG2	165795	557616	13586	451414	32168	THSD7B	144229	409968	21524	387145	37139

DLG1	075711	412364	5649	390403	27286	NDRG2	165795	557274	13587	452344	32169	THSD7B	144229	485379	21525	N/A	
DLG1	075711	434148	5650	400169	27287	NDRG2	165795	556457	13588	450852	32170	THSD7B	144229	480352	21526	N/A	
DLG1	075711	357674	5651	350303	27288	NDRG2	165795	556688	13589	451981	32171	THSD7B	144229	413152	21527	413841	37140
DLG4	132535	489885	5652	N/A		NDRG2	165795	553862	13590	N/A		THSD7B	144229	272643	21528	272643	37141
DLG4	132535	399506	5653	382425	27289	NDRG2	165795	557669	13591	N/A		THYN1	151500	392595	21529	376374	37142
DLG4	132535	302955	5654	307471	27290	NDRG2	165795	557113	13592	N/A		THYN1	151500	341541	21530	341657	37143
DLG4	132535	399510	5655	382428	27291	NDRG2	165795	553900	13593	N/A		THYN1	151500	392594	21531	376373	37144
DLG4	132535	491753	5656	467897	27292	NDRG2	165795	557318	13594	N/A		THYN1	151500	352327	21532	341452	37145
DLG4	132535	485100	5657	460625	27293	NDRG2	165795	554561	13595	451163	32172	THYN1	151500	531135	21533	N/A	
DLG4	132535	451807	5658	407918	27294	NDRG2	165795	554419	13596	452179	32173	THYN1	151500	533975	21534	N/A	
DLG4	132535	447163	5659	388122	27295	NDRG2	165795	553563	13597	451541	32174	THYN1	151500	533781	21535	N/A	
DLG4	132535	486626	5660	465720	27296	NDRG2	165795	554489	13598	452302	32175	THYN1	151500	525677	21536	N/A	
DLG4	132535	493294	5661	465789	27297	NDRG2	165795	556561	13599	450825	32176	TIMP3	100234	266085	21537	266085	37146
DLGAP2	274161	620101	5662	478085	27298	NDRG2	165795	554893	13600	450450	32177	TIPARP	163659	486483	21538	418757	37147
DLGAP2	274161	633183	5663	488195	27299	NDRG2	165795	554833	13601	452458	32178	TIPARP	163659	295924	21539	295924	37148
DLGAP2	274161	632909	5664	N/A		NDRG2	165795	554415	13602	452274	32179	TIPARP	163659	461166	21540	420612	37149
DLGAP2	274161	633560	5665	N/A		NDRG2	165795	557167	13603	N/A		TIPARP	163659	473702	21541	419982	37150
DLGAP2	274161	632284	5666	N/A		NDRG2	165795	397858	13604	380956	32180	TIPARP	163659	481853	21542	418829	37151
DLGAP2	274161	633014	5667	N/A		NDRG2	165795	397856	13605	380954	32181	TIPARP	163659	495891	21543	420141	37152
DLGAP2	274161	620226	5668	483427	27300	NDST3	164100	394488	13606	N/A		TIPARP	163659	542783	21544	438345	37153
DLGAP2	282318	633645	5669	488273	27301	NDST3	164100	296499	13607	296499	32182	TLCD1	160606	292090	21545	292090	37154
DLGAP2	282318	633447	5670	488705	27302	NDST4	138653	264363	13608	264363	32183	TLCD1	160606	581236	21546	468670	37155
DLGAP2	282318	631606	5671	N/A		NDST4	138653	504854	13609	423218	32184	TLCD1	160606	394933	21547	378391	37156
DLGAP2	282318	633079	5672	487701	27303	NDST4	138653	514570	13610	N/A		TLCD1	160606	580518	21548	466264	37157
DLGAP2	282318	631949	5673	N/A		NDST4	138653	613194	13611	483949	32185	TLE4	106829	376552	21549	365735	37158
DLGAP2	282318	632589	5674	488020	27304	NEAT1	245532	499732	13612	N/A		TLE4	106829	461758	21550	417906	37159
DLGAP2	282152	633655	5675	487728	27305	NEAT1	245532	501122	13613	N/A		TLE4	106829	470872	21551	417245	37160
DLGAP2	282152	633162	5676	488908	27306	NEAT1	245532	601801	13614	N/A		TLE4	106829	435650	21552	415423	37161
DLGAP2	282103	632928	5677	N/A		NEAT1	245532	612303	13615	N/A		TLE4	106829	414465	21553	397822	37162
DLGAP2	282103	633950	5678	N/A		NEAT1	245532	616315	13616	N/A		TLE4	106829	376537	21554	365720	37163
DLGAP2	282103	633407	5679	N/A		NECAB1	123119	417640	13617	387380	32186	TLE4	106829	462803	21555	417715	37164
DLGAP2	198010	637795	5680	489774	27307	NECAB1	123119	522729	13618	N/A		TLE4	106829	376524	21556	N/A	
DLGAP2	198010	522092	5681	N/A		NECAB1	123119	523962	13619	N/A		TLE4	106829	476523	21557	N/A	
DLGAP2	198010	520816	5682	N/A		NECAB1	123119	521954	13620	N/A		TLE4	106829	376525	21558	N/A	
DLGAP2	198010	577187	5683	N/A		NECAB1	123119	522820	13621	428953	32187	TLE4	106829	265284	21559	265284	37165
DLGAP2	198010	421627	5684	400258	27308	NECAB1	123119	521366	13622	428632	32188	TLE4	106829	425506	21560	412367	37166
DLGAP2	198010	524139	5685	N/A		NECTIN3	177707	491525	13623	418691	32189	TLE4	106829	485159	21561	N/A	
DLGAP2	198010	578839	5686	N/A		NECTIN3	177707	461477	13624	418327	32190	TLE4	106829	466428	21562	N/A	
DLGAP2	198010	520524	5687	N/A		NECTIN3	177707	485303	13625	418070	32191	TLE4	106829	428713	21563	409313	37167
DLGAP2	198010	522989	5688	N/A		NECTIN3	177707	319792	13626	321514	32192	TLE4	106829	455913	21564	N/A	
DLGAP2	198010	522626	5689	N/A		NECTIN3	177707	486596	13627	417572	32193	TLE4	106829	496853	21565	N/A	
DLGAP2	198010	520901	5690	430563	27309	NECTIN3	177707	493615	13628	420579	32194	TLE4	106829	474519	21566	N/A	
DLGAP2	198010	522499	5691	488645	27310	NECTIN3	177707	488016	13629	N/A		TLE4	106829	483597	21567	N/A	
DLGAP2	198010	524065	5692	N/A		NECTIN3	177707	470618	13630	N/A		TLE4	106829	490347	21568	417844	37168
DLGAP2	198010	518530	5693	488445	27311	NECTIN3	177707	481766	13631	420479	32195	TLE4	106829	493163	21569	N/A	
DLGAP2	198010	612087	5694	484215	27312	NECTIN3	177707	478327	13632	N/A		TLE4	106829	463431	21570	N/A	
DLGAP4	080845	373913	5695	363023	27313	NECTIN3	177707	485506	13633	419829	32196	TLE4	106829	495170	21571	N/A	
DLGAP4	080845	373907	5696	363014	27314	NEDD4	069869	508871	13634	422455	32197	TLE4	106829	467142	21572	418409	37169
DLGAP4	080845	475894	5697	477723	27315	NEDD4	069869	503468	13635	426051	32198	TLE4	106829	496114	21573	417102	37170
DLGAP4	080845	482872	5698	480166	27316	NEDD4	069869	338963	13636	345530	32199	TLE4	106829	417836	21574	400334	37171
DLGAP4	080845	495241	5699	484696	27317	NEDD4	069869	508342	13637	424827	32200	TLE4	106829	478290	21575	N/A	
DLGAP4	080845	491207	5700	N/A		NEDD4	069869	435532	13638	410613	32201	TLE4	106829	376544	21576	365727	37172
DLGAP4	080845	482037	5701	N/A		NEDD4	069869	506154	13639	422705	32202	TLE6	104953	246112	21577	246112	37173
DLGAP4	080845	340491	5702	345700	27318	NEDD4	069869	502612	13640	424471	32203	TLE6	104953	453329	21578	411783	37174
DLGAP4	080845	479220	5703	N/A		NEDD4	069869	514893	13641	N/A		TLE6	104953	482627	21579	467126	37175
DLGAP4	080845	489701	5704	419311	27319	NEDD4	069869	507063	13642	421047	32204	TLE6	104953	468176	21580	N/A	
DLGAP4	080845	479951	5705	N/A		NEDD4	069869	513957	13643	N/A		TLE6	104953	452088	21581	406893	37176
DLGAP4	080845	478910	5706	N/A		NEDD4	069869	508075	13644	N/A		TLE6	104953	591953	21582	N/A	
DLGAP4	080845	497862	5707	N/A		NEDD4	069869	557845	13645	N/A		TLE6	104953	478073	21583	N/A	

DLGAP4	080845	477195	5708	N/A		NEDD4L	049759	356462	13646	348847	32205	TLE6	104953	474207	21584	N/A	
DLGAP4	080845	401952	5709	384954	27320	NEDD4L	049759	400345	13647	383199	32206	TLE6	104953	497878	21585	N/A	
DLGAP4	080845	339266	5710	341633	27321	NEDD4L	049759	589054	13648	465669	32207	TLE6	104953	469572	21586	N/A	
DMD	198947	481143	5711	N/A		NEDD4L	049759	617539	13649	479462	32208	TLL1	038295	061240	21587	061240	37177
DMD	198947	378723	5712	367997	27322	NEDD4L	049759	382850	13650	372301	32209	TLL1	038295	509505	21588	422692	37178
DMD	198947	358062	5713	350765	27323	NEDD4L	049759	256830	13651	256830	32210	TLL1	038295	507499	21589	426082	37179
DMD	198947	378677	5714	367948	27324	NEDD4L	049759	590694	13652	N/A		TLL1	038295	504560	21590	421732	37180
DMD	198947	357033	5715	354923	27325	NEDD4L	049759	591989	13653	N/A		TLL1	038295	513213	21591	422937	37181
DMD	198947	378702	5716	367974	27326	NEDD4L	049759	591579	13654	N/A		TLL1	038295	506144	21592	423748	37182
DMD	198947	474231	5717	417123	27327	NEDD4L	049759	592846	13655	466776	32211	TLR3	164342	296795	21593	296795	37183
DMD	198947	361471	5718	354464	27328	NEDD4L	049759	585363	13656	N/A		TLR3	164342	513189	21594	423386	37184
DMD	198947	378680	5719	367951	27329	NEDD4L	049759	588516	13657	N/A		TLR3	164342	512264	21595	N/A	
DMD	198947	378705	5720	367977	27330	NEDD4L	049759	585594	13658	N/A		TLR3	164342	504367	21596	423684	37185
DMD	198947	475732	5721	N/A		NEDD4L	049759	587547	13659	N/A		TLR3	164342	508051	21597	N/A	
DMD	198947	469142	5722	N/A		NEDD4L	049759	435432	13660	393395	32212	TLR4	136869	394487	21598	377997	37186
DMD	198947	634285	5723	N/A		NEDD4L	049759	357895	13661	350569	32213	TLR4	136869	355622	21599	363089	37187
DMD	198947	634315	5724	N/A		NEDD4L	049759	586263	13662	468546	32214	TLR4	136869	472304	21600	N/A	
DMD	198947	445312	5725	N/A		NEDD4L	049759	456173	13663	405440	32215	TLR4	136869	490685	21601	N/A	
DMD	198947	471779	5726	417075	27331	NEDD4L	049759	588494	13664	466789	32216	TM2D2	169490	456845	21602	391674	37188
DMD	198947	488902	5727	N/A		NEDD4L	049759	588066	13665	N/A		TM2D2	169490	456397	21603	416050	37189
DMD	198947	493412	5728	417725	27332	NEDD4L	049759	431212	13666	389406	32217	TM2D2	169490	397070	21604	380260	37190
DMD	198947	420596	5729	399897	27333	NEDD4L	049759	586268	13667	467072	32218	TM2D2	169490	522434	21605	N/A	
DMD	198947	448370	5730	388559	27334	NEDD4L	049759	587190	13668	467768	32219	TM2D2	169490	522142	21606	428394	37191
DMD	198947	288447	5731	288447	27335	NEDD4L	049759	585323	13669	N/A		TM2D2	169490	521060	21607	N/A	
DMD	198947	480751	5732	N/A		NEDD4L	049759	587634	13670	N/A		TM2D2	169490	524331	21608	N/A	
DMD	198947	447523	5733	395904	27336	NEDD4L	049759	635997	13671	490696	32220	TM2D2	169490	519186	21609	N/A	
DMD	198947	472681	5734	N/A		NEDD4L	049759	592601	13672	N/A		TM2D2	169490	517872	21610	430685	37192
DMD	198947	472266	5735	N/A		NEDD4L	049759	590020	13673	N/A		TM2D2	169490	520152	21611	428203	37193
DMD	198947	463609	5736	N/A		NEDD4L	049759	587881	13674	468332	32221	TM4SF1	169908	305366	21612	304277	37194
DMD	198947	378707	5737	367979	27337	NEDD4L	049759	589167	13675	N/A		TM4SF1	169908	472441	21613	417084	37195
DMD	198947	343523	5738	340057	27338	NEDD4L	049759	590638	13676	N/A		TM4SF1	169908	493348	21614	419426	37196
DMD	198947	541735	5739	444119	27339	NEDD4L	049759	585970	13677	N/A		TM4SF1	169908	493298	21615	418025	37197
DMD	198947	359836	5740	352894	27340	NEDD4L	049759	587246	13678	N/A		TMC1	165091	297784	21616	297784	37198
DMD	198947	619831	5741	479270	27341	NEDD4L	049759	592097	13679	N/A		TMC1	165091	497073	21617	N/A	
DMD	198947	620040	5742	478150	27342	NEDD4L	049759	590248	13680	N/A		TMC1	165091	492418	21618	N/A	
DMGDH	132837	255189	5743	255189	27343	NEDD4L	049759	588712	13681	N/A		TMC1	165091	486417	21619	N/A	
DMGDH	132837	523732	5744	430972	27344	NEDD4L	049759	590506	13682	N/A		TMC1	165091	469455	21620	N/A	
DMGDH	132837	518477	5745	427834	27345	NEDD4L	049759	456986	13683	411947	32222	TMC1	165091	340019	21621	341433	37199
DMGDH	132837	517853	5746	428995	27346	NEFH	100285	310624	13684	311997	32223	TMC3-AS1	259343	559781	21622	N/A	
DMGDH	132837	523201	5747	N/A		NEFL	277586	610854	13685	482169	32224	TMC3-AS1	259343	560973	21623	N/A	
DMGDH	132837	521052	5748	430133	27347	NEFL	277586	615973	13686	N/A		TMC3-AS1	259343	560851	21624	N/A	
DMGDH	132837	524206	5749	428092	27348	NEFL	277586	639464	13687	491612	32225	TMC3-AS1	259343	559277	21625	N/A	
DMGDH	132837	520388	5750	N/A		NEFL	277586	619417	13688	483690	32226	TMC3-AS1	259343	612811	21626	N/A	
DMGDH	132837	518707	5751	N/A		NEFM	104722	221166	13689	221166	32227	TMC3-AS1	259343	558086	21627	N/A	
DMGDH	132837	520855	5752	N/A		NEFM	104722	523467	13690	N/A		TMC3-AS1	259343	642113	21628	N/A	
DMP1	152592	339673	5753	340935	27349	NEFM	104722	518131	13691	427872	32228	TMC7	170537	569532	21629	455041	37200
DMP1	152592	282479	5754	282479	27350	NEFM	104722	521540	13692	N/A		TMC7	170537	304381	21630	304710	37201
DNAH5	039139	265104	5755	265104	27351	NEFM	104722	433454	13693	412295	32229	TMC7	170537	568469	21631	N/A	
DNAH5	039139	504001	5756	N/A		NEFM	104722	437366	13694	410137	32230	TMC7	170537	421369	21632	397081	37202
DNAH5	039139	512443	5757	N/A		NEGR1	172260	357731	13695	350364	32231	TMC7	170537	561963	21633	N/A	
DNAH5	039139	508040	5758	N/A		NEGR1	172260	306821	13696	305938	32232	TMEM100	166292	424486	21634	395328	37203
DNAH6	115423	476689	5759	N/A		NEGR1	172260	474357	13697	N/A		TMEM100	166292	575734	21635	465638	37204
DNAH6	115423	468661	5760	N/A		NEGR1	172260	478526	13698	N/A		TMEM100	166292	571679	21636	459290	37205
DNAH6	115423	237449	5761	237449	27352	NEGR1	172260	467479	13699	N/A		TMEM100	166292	575685	21637	N/A	
DNAH6	115423	494025	5762	N/A		NEK2	117650	366999	13700	355966	32233	TMEM100	166292	570586	21638	N/A	
DNAH6	115423	602588	5763	N/A		NEK2	117650	462283	13701	N/A		TMEM100	166292	575806	21639	N/A	
DNAH6	115423	389394	5764	374045	27353	NEK2	117650	489633	13702	N/A		TMEM108	144868	514529	21640	N/A	
DNAJA1	086061	330899	5765	369127	27354	NEK2	117650	366998	13703	355965	32234	TMEM108	144868	321871	21641	324651	37206
DNAJA1	086061	495015	5766	N/A		NEK2	117650	540251	13704	440237	32235	TMEM108	144868	393130	21642	376838	37207

DNAJA1	08606	465677	5767	N/A		NEK4	114904	233027	13705	233027	32236	TMEM108	144868	514894	21643	422072	37208
DNAJA4	140403	394855	5768	378324	27355	NEK4	114904	383721	13706	373227	32237	TMEM108	144868	512662	21644	427447	37209
DNAJA4	140403	489435	5769	438263	27356	NEK4	114904	461689	13707	419666	32238	TMEM108	144868	512137	21645	426301	37210
DNAJA4	140403	440911	5770	395191	27357	NEK4	114904	493199	13708	N/A		TMEM108	144868	511555	21646	422196	37211
DNAJA4	140403	423642	5771	407136	27358	NEK4	114904	487068	13709	420231	32239	TMEM108	144868	508711	21647	424897	37212
DNAJA4	140403	483802	5772	443962	27359	NEK4	114904	496822	13710	417119	32240	TMEM108	144868	515826	21648	423338	37213
DNAJA4	140403	343789	5773	339581	27360	NEK4	114904	535191	13711	437703	32241	TMEM108	144868	510183	21649	421486	37214
DNAJA4	140403	394852	5774	378321	27361	NELL1	165973	298925	13712	298925	32242	TMEM108	144868	511388	21650	N/A	
DNAJA4	140403	542636	5775	441946	27362	NELL1	165973	357134	13713	349654	32243	TMEM123	152558	361236	21651	355285	37215
DNAJA4	140403	446172	5776	413499	27363	NELL1	165973	532434	13714	437170	32244	TMEM123	152558	398136	21652	381204	37216
DNAJA4	140403	485075	5777	N/A		NELL1	165973	528046	13715	N/A		TMEM123	152558	532161	21653	435331	37217
DNAJA4	140403	493321	5778	N/A		NELL1	165973	527873	13716	N/A		TMEM123	152558	528969	21654	434976	37218
DNAJA4	140403	480425	5779	N/A		NELL1	165973	529595	13717	N/A		TMEM123	152558	529492	21655	N/A	
DNAJB1	132002	254322	5780	254322	27364	NELL1	165973	524738	13718	N/A		TMEM123	152558	525577	21656	N/A	
DNAJB1	132002	396969	5781	444212	27365	NELL1	165973	528495	13719	N/A		TMEM123	152558	531103	21657	433695	37219
DNAJB1	132002	598235	5782	471073	27366	NELL1	165973	530672	13720	N/A		TMEM123	152558	526676	21658	435842	37220
DNAJB1	132002	595139	5783	469221	27367	NELL1	165973	529218	13721	N/A		TMEM125	179178	439858	21659	429775	37221
DNAJB1	132002	596853	5784	470063	27368	NELL1	165973	534263	13722	N/A		TMEM125	179178	432792	21660	429275	37222
DNAJB1	132002	595992	5785	470596	27369	NELL1	165973	325319	13723	317837	32245	TMEM125	179178	442284	21661	N/A	
DNAJB1	132002	594099	5786	470460	27370	NEO1	067141	339362	13724	341198	32246	TMEM125	179178	456751	21662	428627	37223
DNAJB1	132002	601533	5787	471798	27371	NEO1	067141	560262	13725	453317	32247	TMEM130	166448	416379	21663	413163	37224
DNAJB1	132002	598692	5788	472886	27372	NEO1	067141	558964	13726	453200	32248	TMEM130	166448	339375	21664	341256	37225
DNAJB1	132002	596075	5789	471603	27373	NEO1	067141	558485	13727	N/A		TMEM130	166448	450876	21665	390200	37226
DNAJB1	132002	601087	5790	N/A		NEO1	067141	560328	13728	454024	32249	TMEM130	166448	474857	21666	N/A	
DNAJB4	162616	487931	5791	N/A		NEO1	067141	560352	13729	N/A		TMEM130	166448	345589	21667	330262	37227
DNAJB4	162616	477671	5792	N/A		NEO1	067141	560407	13730	N/A		TMEM130	166448	461092	21668	N/A	
DNAJB4	162616	484662	5793	N/A		NEO1	067141	558807	13731	N/A		TMEM130	166448	486839	21669	N/A	
DNAJB4	162616	426517	5794	399494	27374	NEO1	067141	560808	13732	N/A		TMEM130	166448	445790	21670	389379	37228
DNAJB4	162616	370763	5795	359799	27375	NEO1	067141	558886	13733	N/A		TMEM132B	139364	418253	21671	N/A	
DNAJB4	162616	476396	5796	N/A		NEO1	067141	261908	13734	261908	32250	TMEM132B	139364	535330	21672	N/A	
DNAJB5	137094	541010	5797	N/A		NES	132688	368223	13735	357206	32251	TMEM132B	139364	299308	21673	299308	37229
DNAJB5	137094	454002	5798	413684	27376	NETO1	166342	583169	13736	464312	32252	TMEM132B	139364	534945	21674	N/A	
DNAJB5	137094	545841	5799	441999	27377	NETO1	166342	582281	13737	462993	32253	TMEM132B	139364	535886	21675	N/A	
DNAJB5	137094	539059	5800	445536	27378	NETO1	166342	327305	13738	313088	32254	TMEM132B	139364	613307	21676	482788	37230
DNAJB5	137094	443266	5801	396332	27379	NETO1	166342	579730	13739	N/A		TMEM132C	181234	435159	21677	410852	37231
DNAJB5	137094	537321	5802	439217	27380	NETO1	166342	397929	13740	381024	32255	TMEM132D	151952	389441	21678	374092	37232
DNAJB5	137094	469798	5803	433640	27381	NETO1	166342	579169	13741	464188	32256	TMEM132D	151952	422113	21679	408581	37233
DNAJB5	137094	458263	5804	393749	27382	NETO1	166342	577184	13742	N/A		TMEM132E	181291	321639	21680	316532	37234
DNAJB5	137094	312316	5805	312517	27383	NEU4	204099	407683	13743	385402	32257	TMEM132E	181291	631683	21681	487800	37235
DNAJB5	137094	453597	5806	404079	27384	NEU4	204099	415936	13744	397167	32258	TMEM132E	181291	577271	21682	N/A	
DNAJB6	105993	441561	5807	410643	27385	NEU4	204099	405370	13745	384804	32259	TMEM144	164124	505049	21683	425266	37236
DNAJB6	105993	429029	5808	397556	27386	NEU4	204099	476542	13746	N/A		TMEM144	164124	505189	21684	421289	37237
DNAJB6	105993	262177	5809	262177	27387	NEU4	204099	435855	13747	394769	32260	TMEM144	164124	511038	21685	422255	37238
DNAJB6	105993	486083	5810	N/A		NEU4	204099	618597	13748	N/A		TMEM144	164124	508243	21686	422297	37239
DNAJB6	105993	417758	5811	400665	27388	NEU4	204099	423583	13749	397860	32261	TMEM144	164124	296529	21687	296529	37240
DNAJB6	105993	459889	5812	488263	27389	NEU4	204099	404257	13750	385149	32262	TMEM144	164124	512481	21688	424659	37241
DNAJB6	105993	488001	5813	N/A		NEU4	204099	391969	13751	375830	32263	TMEM144	164124	504569	21689	422082	37242
DNAJB6	105993	443280	5814	396267	27390	NEU4	204099	325935	13752	320318	32264	TMEM144	164124	509278	21690	425815	37243

DNAJB6	105993	441291	5815	415201	27391	NEU4	204099	435934	13753	412688	32265	TMEM144	164124	514558	21691	426211	37244
DNAJB6	105993	437030	5816	391690	27392	NEU4	204099	435894	13754	398571	32266	TMEM144	164124	513744	21692	N/A	
DNAJB6	105993	412557	5817	403407	27393	NEU4	204099	426032	13755	406678	32267	TMEM144	164124	514346	21693	N/A	
DNAJB6	105993	453383	5818	396240	27394	NEU4	204099	420288	13756	388707	32268	TMEM144	164124	503200	21694	420990	37245
DNAJB6	105993	439402	5819	389599	27395	NEU4	204099	494678	13757	N/A		TMEM144	164124	511532	21695	420930	37246
DNAJB6	105993	634080	5820	488740	27396	NEU4	204099	488997	13758	N/A		TMEM144	164124	502698	21696	425907	37247
DNAJB6	105993	468928	5821	N/A		NEU4	204099	428592	13759	396197	32269	TMEM144	164124	514971	21697	422899	37248
DNAJB6	105993	465908	5822	N/A		NEU4	277926	630923	13760	486602	32270	TMEM144	164124	503404	21698	N/A	
DNAJB6	105993	487480	5823	N/A		NEU4	277926	626222	13761	486591	32271	TMEM144	164124	512272	21699	N/A	
DNAJB6	105993	486247	5824	N/A		NEU4	277926	621851	13762	478409	32272	TMEM150C	249242	515780	21700	420919	37249
DNAJC27	115137	264711	5825	264711	27397	NEU4	277926	626675	13763	N/A		TMEM150C	249242	449862	21701	403438	37250
DNAJC27	115137	380809	5826	370187	27398	NEU4	277926	629521	13764	487192	32273	TMEM150C	249242	508701	21702	421812	37251
DNAJC27	115137	494239	5827	N/A		NEU4	277926	629786	13765	N/A		TMEM150C	249242	454948	21703	414988	37252
DNAJC27	115137	468467	5828	N/A		NEU4	277926	625452	13766	485788	32274	TMEM163	152128	281924	21704	281924	37253
DNAJC27	115137	468750	5829	N/A		NEU4	277926	616490	13767	482722	32275	TMEM163	152128	467316	21705	N/A	
DNAJC27	115137	492985	5830	N/A		NEU4	277926	618866	13768	483726	32276	TMEM163	152128	476823	21706	N/A	
DNAJC27	115137	534855	5831	440086	27399	NEU4	277926	626600	13769	485701	32277	TMEM175	127419	507319	21707	424746	37254
DNAJC7	168259	457167	5832	406463	27400	NEU4	277926	627618	13770	486118	32278	TMEM175	127419	264771	21708	264771	37255
DNAJC7	168259	587727	5833	467702	27401	NEU4	277926	629646	13771	487199	32279	TMEM175	127419	513952	21709	427218	37256
DNAJC7	168259	426588	5834	394327	27402	NEU4	277926	627724	13772	485934	32280	TMEM175	127419	514453	21710	425181	37257
DNAJC7	168259	588814	5835	466114	27403	NEU4	277926	626195	13773	487103	32281	TMEM175	127419	505734	21711	N/A	
DNAJC7	168259	316603	5836	313311	27404	NEU4	277926	631177	13774	N/A		TMEM175	127419	515492	21712	425867	37258
DNAJC7	168259	585693	5837	N/A		NEU4	277926	626326	13775	N/A		TMEM175	127419	504744	21713	423751	37259
DNAJC7	168259	586335	5838	464993	27405	NEU4	277926	625706	13776	485992	32282	TMEM175	127419	509508	21714	421750	37260
DNAJC7	168259	590197	5839	N/A		RBFOX3	167281	583458	13777	464186	32283	TMEM175	127419	452360	21715	N/A	
DNAJC7	168259	590847	5840	N/A		RBFOX3	167281	582043	13778	463964	32284	TMEM175	127419	515876	21716	N/A	
DNAJC7	168259	589810	5841	467477	27406	RBFOX3	167281	581393	13779	N/A		TMEM175	127419	513682	21717	427626	37261
DNAJC7	168259	588641	5842	468805	27407	RBFOX3	167281	580155	13780	463653	32285	TMEM175	127419	515740	21718	427039	37262
DNAJC7	168259	590348	5843	464756	27408	RBFOX3	167281	578998	13781	N/A		TMEM175	127419	438836	21719	N/A	
DNAJC7	168259	591153	5844	N/A		RBFOX3	167281	582880	13782	465367	32286	TMEM175	127419	504505	21720	N/A	
DNAJC7	168259	589576	5845	468102	27409	RBFOX3	167281	582894	13783	468693	32287	TMEM175	127419	508204	21721	423669	37263
DNAJC7	168259	590774	5846	465340	27410	RBFOX3	167281	584778	13784	462007	32288	TMEM175	127419	510493	21722	424208	37264
DNAJC7	168259	589586	5847	466748	27411	RBFOX3	167281	580508	13785	467872	32289	TMEM175	127419	514546	21723	425763	37265
DNAJC7	168259	585866	5848	466877	27412	RBFOX3	167281	582139	13786	464946	32290	TMEM175	127419	504850	21724	N/A	
DNAJC7	168259	589773	5849	465228	27413	RBFOX3	167281	578887	13787	N/A		TMEM175	127419	504180	21725	N/A	
DNAJC7	168259	590886	5850	465399	27414	RBFOX3	167281	582344	13788	N/A		TMEM175	127419	502513	21726	N/A	
DNAJC7	168259	591787	5851	465140	27415	RBFOX3	167281	583458	13789	464186	32291	TMEM175	127419	506669	21727	N/A	
DNAJC7	168259	589547	5852	N/A		RBFOX3	167281	582043	13790	463964	32292	TMEM175	127419	622959	21728	485461	37266
DNAJC7	168259	587380	5853	N/A		RBFOX3	167281	581393	13791	N/A		TMEM176A	002933	484928	21729	417626	37267
DNAJC7	168259	586240	5854	N/A		RBFOX3	167281	580155	13792	463653	32293	TMEM176A	002933	004103	21730	004103	37268
DNER	187957	341772	5855	345229	27416	RBFOX3	167281	578998	13793	N/A		TMEM176A	002933	494349	21731	N/A	
DNER	187957	482831	5856	N/A		RBFOX3	167281	582880	13794	465367	32294	TMEM176A	002933	475710	21732	N/A	
DNMBP	107554	543621	5857	443657	27417	RBFOX3	167281	582894	13795	468693	32295	TMEM176A	002933	461345	21733	420818	37269
DNMBP	107554	636706	5858	489875	27418	RBFOX3	167281	584778	13796	462007	32296	TMEM176A	002933	475536	21734	417834	37270
DNMBP	107554	324109	5859	315659	27419	RBFOX3	167281	580508	13797	467872	32297	TMEM176A	002933	468689	21735	420081	37271
DNMBP	107554	472036	5860	N/A		RBFOX3	167281	582139	13798	464946	32298	TMEM176A	002933	462826	21736	N/A	
DOC2B	272670	496357	5861	417238	27420	RBFOX3	167281	578887	13799	N/A		TMEM176A	002933	475007	21737	N/A	

DOC2B	272670	633410	5862	N/A		RBFOX3	167281	582344	13800	N/A		TMEM176A	002933	481305	21738	N/A	
DOC2B	272670	633635	5863	N/A		NEURL1	107954	369780	13801	358795	32299	TMEM176A	002933	474166	21739	N/A	
DOC2B	272636	613549	5864	482950	27421	NEURL1	107954	437579	13802	416709	32300	TMEM176B	106565	492607	21740	419258	37272
DOC2B	272636	343572	5865	N/A		NEURL1	107954	455386	13803	387714	32301	TMEM176B	106565	326442	21741	318409	37273
DOC2B	272636	609727	5866	N/A		NEURL1	107954	465048	13804	N/A		TMEM176B	106565	447204	21742	410269	37274
DOCK1	150760	280333	5867	280333	27422	NEUROD1	162992	496876	13805	N/A		TMEM176B	106565	429904	21743	397810	37275
DOCK1	150760	623213	5868	485033	27423	NEUROD1	162992	295108	13806	295108	32302	TMEM176B	106565	450753	21744	404831	37276
DOCK1	150760	473861	5869	N/A		NEUROD6	164600	297142	13807	297142	32303	TMEM176B	106565	434545	21745	413531	37277
DOCK1	150760	484400	5870	N/A		NEXN	162614	401035	13808	383814	32304	TMEM178A	152154	437068	21746	N/A	
DOCK1	150760	495574	5871	N/A		NEXN	162614	334785	13809	333938	32305	TMEM178A	152154	482239	21747	N/A	
DOCK1	150760	464466	5872	N/A		NEXN	162614	440324	13810	411902	32306	TMEM178A	152154	281961	21748	281961	37278
DOCK5	147459	410074	5873	387036	27424	NEXN	162614	342754	13811	343928	32307	TMEM178A	152154	413011	21749	N/A	
DOCK5	147459	481100	5874	429737	27425	NEXN	162614	464998	13812	N/A		TMEM178A	152154	495402	21750	N/A	
DOCK5	147459	276440	5875	276440	27426	NEXN	162614	480732	13813	N/A		TMEM178A	152154	618232	21751	477622	37279
DOCK5	147459	495236	5876	N/A		NEXN	162614	470735	13814	N/A		TMEM178B	261115	565468	21752	456594	37280
DOCK5	147459	444569	5877	414125	27427	NEXN	162614	330010	13815	327363	32308	TMEM178B	261115	563442	21753	N/A	
DOCK5	147459	478099	5878	N/A		NFAM1	235568	329021	13816	333680	32309	TMEM178B	261115	610315	21754	484025	37281
DOCK5	147459	487948	5879	N/A		NFAM1	235568	355469	13817	347650	32310	TMEM179	258986	415614	21755	397763	37282
DOCK5	147459	467709	5880	428479	27428	NFATC2	101096	371564	13818	360619	32311	TMEM179	258986	556320	21756	452113	37283
DOCK5	147459	481728	5881	N/A		NFATC2	101096	396009	13819	379330	32312	TMEM179	258986	556573	21757	450958	37284
DOCK5	147459	463457	5882	N/A		NFATC2	101096	609943	13820	477370	32313	TMEM179	258986	341595	21758	340477	37285
DOCK5	147459	521405	5883	N/A		NFATC2	101096	610033	13821	477142	32314	TMEM179	258986	615704	21759	483627	37286
DOCK5	147459	479547	5884	N/A		NFATC2	101096	414705	13822	396471	32315	TMEM179	258986	616017	21760	479740	37287
DOCK6	130158	586702	5885	N/A		NFATC2	101096	609507	13823	477342	32316	TMEM179	276342	615269	21761	481424	37288
DOCK6	130158	294618	5886	294618	27429	NFATC2	101096	496054	13824	N/A		TMEM179	276342	625459	21762	486955	37289
DOCK6	130158	587734	5887	468291	27430	NFATC4	100968	440487	13825	N/A		TMEM179	276342	630378	21763	485891	37290
DOCK6	130158	587656	5888	468638	27431	NFATC4	100968	413692	13826	388910	32317	TMEM179	276342	625335	21764	487568	37291
DOCK6	130158	588666	5889	467231	27432	NFATC4	100968	554591	13827	452039	32318	TMEM179	276342	621393	21765	484829	37292
DOCK6	130158	592463	5890	N/A		NFATC4	100968	556957	13828	N/A		TMEM179	276342	620158	21766	477614	37293
DOCK6	130158	588429	5891	N/A		NFATC4	100968	555590	13829	451224	32319	TMEM184C	164168	296582	21767	296582	37294
DOCK6	130158	592403	5892	N/A		NFATC4	100968	554966	13830	450644	32320	TMEM184C	164168	508208	21768	425940	37295
DOCK6	130158	592550	5893	N/A		NFATC4	100968	424781	13831	388668	32321	TMEM184C	164168	505999	21769	421159	37296
DOCK6	130158	590680	5894	467191	27433	NFATC4	100968	539237	13832	439350	32322	TMEM184C	164168	506826	21770	N/A	
DOCK6	130158	590452	5895	N/A		NFATC4	100968	556279	13833	452270	32323	TMEM198	188760	344458	21771	343507	37297
DOCK6	130158	585904	5896	465767	27434	NFATC4	100968	553469	13834	451502	32324	TMEM198	188760	421791	21772	388087	37298
DOCK6	130158	591750	5897	N/A		NFATC4	100968	554050	13835	451151	32325	TMEM198	188760	373883	21773	362990	37299
DOCK6	130158	585609	5898	N/A		NFATC4	100968	554655	13836	N/A		TMEM198	188760	451952	21774	415186	37300
DOCK6	130158	586482	5899	N/A		NFATC4	100968	554903	13837	451853	32326	TMEM2	135048	377044	21775	366243	37301
DOCK6	130158	587572	5900	N/A		NFATC4	100968	554779	13838	451992	32327	TMEM2	135048	377057	21776	N/A	

DOCK7	116641	634495	5901	N/A		NFATC4	100968	557028	13839	N/A		TMEM2	135048	538669	21777	N/A	
DOCK7	116641	251157	5902	251157	27435	NFATC4	100968	250373	13840	250373	32328	TMEM2	135048	377066	21778	366266	37302
DOCK7	116641	454575	5903	413583	27436	NFATC4	100968	553708	13841	450590	32329	TMEM2	135048	542935	21779	437750	37303
DOCK7	116641	635348	5904	N/A		NFATC4	100968	557674	13842	452352	32330	TMEM2	135048	396272	21780	379569	37304
DOCK7	116641	635983	5905	N/A		NFATC4	100968	553879	13843	452349	32331	TMEM2	135048	474495	21781	N/A	
DOCK7	116641	340370	5906	340742	27437	NFATC4	100968	554344	13844	450469	32332	TMEM2	135048	377055	21782	366254	37305
DOCK7	116641	637255	5907	490888	27438	NFATC4	100968	554661	13845	450733	32333	TMEM2	135048	377043	21783	366242	37306
DOCK7	116641	634264	5908	489284	27439	NFATC4	100968	556169	13846	451454	32334	TMEM2	135048	537329	21784	N/A	
DOCK7	116641	635123	5909	489499	27440	NFATC4	100968	557451	13847	451284	32335	TMEM2	135048	546219	21785	N/A	
DOCK7	116641	635253	5910	489124	27441	NFATC4	100968	422617	13848	396788	32336	TMEM2	135048	543165	21786	N/A	
DOCK7	116641	637306	5911	N/A		NFATC4	100968	555453	13849	450686	32337	TMEM2	135048	545719	21787	444571	37307
DOCK7	116641	489185	5912	N/A		NFATC4	100968	556302	13850	N/A		TMEM200A	164484	296978	21788	296978	37308
DOCK7	116641	467758	5913	N/A		NFATC4	100968	554473	13851	450810	32338	TMEM200A	164484	392429	21789	376224	37309
DOCK7	116641	637487	5914	N/A		NFATC4	100968	556759	13852	451183	32339	TMEM200A	164484	617887	21790	480294	37310
DOCK7	116641	635088	5915	489412	27442	NFATC4	100968	555167	13853	451395	32340	TMEM200A	164484	545622	21791	438928	37311
DOCK7	116641	637839	5916	N/A		NFATC4	100968	557767	13854	451496	32341	TMEM252	181778	377311	21792	366528	37312
DOCK7	116641	638042	5917	N/A		NFATC4	100968	555393	13855	451801	32342	TMEM254	133678	472622	21793	N/A	
DOCK7	116641	636370	5918	N/A		NFATC4	100968	555802	13856	451590	32343	TMEM254	133678	372281	21794	361355	37313
DOCK7	116641	636746	5919	N/A		NFATC4	100968	555821	13857	N/A		TMEM254	133678	372275	21795	361349	37314
DOCK7	116641	637735	5920	N/A		NFIL3	165030	297689	13858	297689	32344	TMEM254	133678	372274	21796	361348	37315
DOCK7	116641	637208	5921	490079	27443	NFKBID	167604	590828	13859	467127	32345	TMEM254	133678	372273	21797	361347	37316
DOCK7	116641	479983	5922	N/A		NFKBID	167604	641389	13860	493265	32346	TMEM254	133678	467529	21798	N/A	
DOCK7	116641	637144	5923	N/A		NFKBID	167604	606253	13861	475712	32347	TMEM254	133678	463029	21799	N/A	
DOCK7	116641	635286	5924	N/A		NFKBID	167604	586361	13862	N/A		TMEM254	133678	476173	21800	N/A	
DOCK7	116641	634929	5925	489037	27444	NFKBID	167604	588497	13863	N/A		TMEM254	133678	483732	21801	N/A	
DOCK7	116641	634652	5926	489450	27445	NFKBID	167604	590094	13864	N/A		TMEM254	133678	463209	21802	N/A	
DOCK7	116641	635027	5927	N/A		NFKBID	167604	591730	13865	N/A		TMEM254	133678	450179	21803	393450	37317
DOCK7	116641	637431	5928	N/A		NFKBID	167604	585925	13866	465684	32348	TMEM254	133678	613758	21804	482766	37318
DOCK7	116641	634223	5929	488988	27446	NFKBID	167604	588039	13867	N/A		TMEM254	133678	372277	21805	361351	37319
DOCK7	116641	404627	5930	384446	27447	NFKBID	167604	585544	13868	N/A		TMEM255A	125355	309720	21806	310110	37320
DOCK7	116641	614472	5931	483062	27448	NFKBID	167604	396901	13869	380109	32349	TMEM255A	125355	371369	21807	360420	37321
DOCK7	116641	637227	5932	N/A		NHS	188158	380060	13870	369400	32350	TMEM255A	125355	371352	21808	360403	37322
DOCK7	116641	464312	5933	489164	27449	NHS	188158	398097	13871	381170	32351	TMEM255A	125355	519908	21809	428013	37323
DOCK7	116641	635827	5934	490677	27450	NHS	188158	485305	13872	N/A		TMEM255A	125355	480821	21810	N/A	
DOCK7	116641	634912	5935	N/A		NHS	188158	615422	13873	480113	32352	TMEM255A	125355	440464	21811	405781	37324
DOCK7	116641	636167	5936	N/A		NHS	188158	617601	13874	478433	32353	TMEM255B	282107	631591	21812	488630	37325
DOCK7	116641	636635	5937	N/A		NHSL1	135540	427025	13875	394546	32354	TMEM255B	282107	633279	21813	488348	37326
DOCK8	107099	469197	5938	418587	27451	NHSL1	135540	343505	13876	344672	32355	TMEM255B	184497	488362	21814	479391	37327
DOCK8	107099	524396	5939	436628	27452	NHSL1	135540	342260	13877	344582	32356	TMEM255B	184497	375353	21815	364502	37328
DOCK8	107099	432829	5940	394888	27453	NHSL1	135540	426841	13878	N/A		TMEM255B	184497	483678	21816	N/A	
DOCK8	107099	454469	5941	N/A		NHSL1	135540	491526	13879	433523	32357	TMEM255B	184497	375348	21817	N/A	
DOCK8	107099	479404	5942	417082	27454	NHSL1	135540	533765	13880	434958	32358	TMEM255B	184497	498692	21818	N/A	

DOCK8	107099	487230	5943	418318	27455	NHSL1	135540	479393	13881	N/A		TMEM255B	184497	467169	21819	N/A	
DOCK8	107099	382341	5944	N/A		NHSL1	135540	534376	13882	N/A		TMEM266	169758	388942	21820	373594	37329
DOCK8	107099	483757	5945	417691	27456	NHSL1	135540	468095	13883	N/A		TMEM266	169758	484722	21821	435049	37330
DOCK8	107099	478380	5946	N/A		NHSL2	204131	373677	13884	N/A		TMEM266	169758	559079	21822	N/A	
DOCK8	107099	469391	5947	419438	27457	NHSL2	204131	623354	13885	N/A		TMEM266	169758	561302	21823	453957	37331
DOCK8	107099	495184	5948	N/A		NHSL2	204131	510661	13886	424079	32359	TMEM266	169758	558249	21824	N/A	
DOCK8	107099	474772	5949	N/A		NHSL2	204131	639939	13887	492082	32360	TMEM44	145014	392432	21825	376227	37332
DOCK8	107099	382331	5950	371768	27458	NHSL2	204131	632230	13888	487835	32361	TMEM44	145014	432352	21826	409963	37333
DOCK8	107099	382329	5951	371766	27459	NHSL2	204131	631375	13889	488715	32362	TMEM44	145014	477651	21827	N/A	
DOCK8	107099	493666	5952	N/A		NHSL2	204131	631833	13890	N/A		TMEM44	145014	381975	21828	371402	37334
DOCK8	107099	462618	5953	N/A		NHSL2	204131	633930	13891	488668	32363	TMEM44	145014	347147	21829	333355	37335
DOCK8	107099	453981	5954	408464	27460	NID1	116962	366595	13892	355554	32364	TMEM44	145014	476750	21830	N/A	
DOK6	206052	382713	5955	372160	27461	NID1	116962	264187	13893	264187	32365	TMEM44	145014	473092	21831	418674	37336
DOK6	206052	582172	5956	N/A		NINJ2	171840	305108	13894	307552	32366	TMEM44	145014	452358	21832	414333	37337
DOK6	206052	584435	5957	N/A		NINJ2	171840	397265	13895	380435	32367	TMEM44	145014	429560	21833	403053	37338
DOK6	206052	582992	5958	462984	27462	NINJ2	171840	542920	13896	438831	32368	TMEM44	145014	419280	21834	414077	37339
DOK6	206052	577609	5959	N/A		NINJ2	171840	433832	13897	415158	32369	TMEM44	145014	467284	21835	N/A	
DOPEY2	142197	270190	5960	270190	27463	NINJ2	171840	537416	13898	N/A		TMEM44	145014	494894	21836	N/A	
DOPEY2	142197	399151	5961	382104	27464	NIPAL4	172548	435489	13899	406456	32370	TMEM44	145014	330115	21837	328300	37340
DOPEY2	142197	492760	5962	N/A		NIPAL4	172548	311946	13900	311687	32371	TMEM44	145014	430601	21838	390186	37341
DOPEY2	142197	463668	5963	N/A		NIPAL4	172548	521390	13901	N/A		TMEM51	171729	376014	21839	365182	37342
DPF3	205683	556509	5964	450518	27465	NIPAL4	172548	519150	13902	430810	32372	TMEM51	171729	451326	21840	412298	37343
DPF3	205683	557704	5965	N/A		NIPAL4	172548	519946	13903	N/A		TMEM51	171729	400796	21841	383600	37344
DPF3	205683	366353	5966	381791	27466	NKAIN2	188580	476571	13904	N/A		TMEM51	171729	434578	21842	409665	37345
DPF3	205683	381216	5967	370614	27467	NKAIN2	188580	368416	13905	357401	32373	TMEM51	171729	376008	21843	365176	37346
DPF3	205683	546183	5968	444662	27468	NKAIN2	188580	368417	13906	357402	32374	TMEM51	171729	428417	21844	394899	37347
DPF3	205683	556891	5969	N/A		NKAIN2	188580	640160	13907	492855	32375	TMEM63A	196187	366835	21845	355800	37348
DPF3	205683	556997	5970	N/A		NKAIN2	188580	546092	13908	440287	32376	TMEM63A	196187	496025	21846	N/A	
DPF3	205683	556238	5971	N/A		NKAIN2	188580	545433	13909	437798	32377	TMEM63A	196187	482753	21847	N/A	
DPF3	205683	554594	5972	N/A		NKAIN3	185942	519049	13910	N/A		TMEM63A	196187	487971	21848	N/A	
DPF3	205683	555781	5973	N/A		NKAIN3	185942	523367	13911	N/A		TMEM63A	196187	474478	21849	N/A	
DPF3	205683	553608	5974	N/A		NKAIN3	185942	523211	13912	429073	32378	TMEM63A	196187	483779	21850	N/A	
DPF3	205683	556902	5975	N/A		NKAIN3	185942	524201	13913	429393	32379	TMEM63A	196187	436966	21851	409002	37349
DPF3	205683	555469	5976	N/A		NKAIN4	101198	370313	13914	359336	32380	TMEM63A	196187	487817	21852	N/A	
DPF3	205683	541685	5977	441640	27469	NKAIN4	101198	370316	13915	359340	32381	TMEM63A	196187	537914	21853	445237	37350
DPF3	205683	610283	5978	479526	27470	NKAIN4	101198	466885	13916	N/A		TMEM88B	205116	378821	21854	453099	37351
DPF3	205683	614862	5979	481992	27471	NKAIN4	101198	470246	13917	N/A		TMEM98	006042	394642	21855	378138	37352
DPP10	175497	436732	5980	391092	27472	NKAIN4	101198	370307	13918	359330	32382	TMEM98	006042	579849	21856	463245	37353
DPP10	175497	410059	5981	386565	27473	NKAIN4	101198	370317	13919	359341	32383	TMEM98	006042	395149	21857	398446	37354
DPP10	175497	461250	5982	N/A		NKAIN4	101198	486495	13920	N/A		TMEM98	006042	261713	21858	261713	37355
DPP10	175497	409163	5983	387038	27474	NKAIN4	101198	461738	13921	N/A		TMEM98	006042	582227	21859	N/A	
DPP10	175497	492708	5984	N/A		NKAIN4	101198	472670	13922	N/A		TMEM98	006042	578289	21860	464537	37356
DPP10	175497	393146	5985	376854	27475	NKD1	140807	268459	13923	268459	32384	TMEM98	006042	439138	21861	406394	37357
DPP10	175497	393147	5986	376855	27476	NKD1	140807	564336	13924	N/A		TMEM98	006042	583437	21862	463539	37358
DPP10	175497	310323	5987	309066	27477	NKD1	140807	566396	13925	N/A		TMEM98	006042	583120	21863	N/A	
DPP10	175497	486885	5988	N/A		NKIRAS2	168256	585955	13926	468081	32385	TMOD1	136842	259365	21864	259365	37359
DPP10	175497	429914	5989	408535	27478	NKIRAS2	168256	307641	13927	303580	32386	TMOD1	136842	375175	21865	364318	37360
DPP10	175497	419287	5990	402499	27479	NKIRAS2	168256	393885	13928	377463	32387	TMOD1	136842	395211	21866	378637	37361
DPP10	175497	488208	5991	N/A		NKIRAS2	168256	587337	13929	468245	32388	TMPRSS5	166682	536856	21867	437937	37362
DPP10	175497	473362	5992	N/A		NKIRAS2	168256	485789	13930	466135	32389	TMPRSS5	166682	540540	21868	437761	37363
DPY19L1	173852	638088	5993	490722	27480	NKIRAS2	168256	479407	13931	465633	32390	TMPRSS5	166682	299882	21869	299882	37364
DPY19L1	173852	310974	5994	308695	27481	NKIRAS2	168256	393880	13932	377458	32391	TMPRSS5	166682	545579	21870	441104	37365
DPY19L1	173852	428054	5995	412745	27482	NKIRAS2	168256	393881	13933	377459	32392	TMPRSS5	166682	538955	21871	445528	37366
DPY19L1	173852	446375	5996	400510	27483	NKIRAS2	168256	462043	13934	419929	32393	TMPRSS5	166682	544634	21872	440783	37367
DPY19L1	173852	493989	5997	N/A		NKIRAS2	168256	587028	13935	N/A		TMPRSS5	166682	544476	21873	445930	37368
DPY19L1	173852	462134	5998	N/A		NKIRAS2	168256	491638	13936	465588	32394	TMPRSS5	166682	545265	21874	N/A	
DPY19L1	173852	463538	5999	N/A		NKIRAS2	168256	449471	13937	401976	32395	TMPRSS5	166682	545412	21875	N/A	
DPY19L1	173852	481923	6000	N/A		NKIRAS2	168256	316082	13938	312773	32396	TMPRSS5	166682	539732	21876	443681	37369

DPY19L1	173852	612226	6001	478865	27484	NKIRAS2	168256	393879	13939	N/A		TMPRSS5	166682	538770	21877	445502	37370
DPY19L2	177990	324472	6002	315988	27485	NKRF	186416	371527	13940	360582	32397	TMPRSS5	166682	538091	21878	440976	37371
DPY19L2	177990	541911	6003	N/A		NKRF	186416	304449	13941	304803	32398	TMTC1	133687	256062	21879	256062	37372
DPY19L2	177990	413230	6004	N/A		NKRF	186416	487600	13942	N/A		TMTC1	133687	551659	21880	448112	37373
DPY19L2	177990	439061	6005	437474	27486	NKRF	186416	542113	13943	442308	32399	TMTC1	133687	552618	21881	449043	37374
DPY19L2	177990	306389	6006	445878	27487	NKX2-2	125820	377142	13944	366347	32400	TMTC1	133687	552925	21882	N/A	
DPY19L2	177990	541083	6007	443126	27488	NLGN3	196338	395855	13945	379196	32401	TMTC1	133687	319685	21883	N/A	
DPY19L2	177990	536494	6008	N/A		NLGN3	196338	374051	13946	363163	32402	TMTC1	133687	539277	21884	442046	37375
DPY19L2	177990	538147	6009	439567	27489	NLGN3	196338	358741	13947	351591	32403	TMTC1	133687	553189	21885	N/A	
DPY19L2	177990	542209	6010	444932	27490	NLGN3	196338	476589	13948	N/A		TMTC1	133687	550354	21886	449054	37376
DPY19L4	156162	522422	6011	428762	27491	NLGN3	196338	536169	13949	445298	32404	TMTC1	133687	546582	21887	N/A	
DPY19L4	156162	520774	6012	430162	27492	NLGN3	196338	612180	13950	479877	32405	TMTC4	125247	376234	21888	365408	37377
DPY19L4	156162	414645	6013	389630	27493	NLGN4Y	165246	471252	13951	N/A		TMTC4	125247	342624	21889	343871	37378
DPY19L4	156162	519353	6014	428041	27494	NLGN4Y	165246	382872	13952	372325	32406	TMTC4	125247	328767	21890	365409	37379
DPY19L4	156162	519176	6015	430417	27495	NLGN4Y	165246	355905	13953	348169	32407	TMTC4	125247	489713	21891	N/A	
DPY19L4	156162	521525	6016	429559	27496	NLGN4Y	165246	382868	13954	372320	32408	TMTC4	125247	462211	21892	N/A	
DPY19L4	156162	523020	6017	429785	27497	NLGN4Y	165246	476359	13955	N/A		TMTC4	125247	478272	21893	N/A	
DPY19L4	156162	522669	6018	429711	27498	NLGN4Y	165246	481089	13956	N/A		TMTC4	125247	496511	21894	N/A	
DPYD	188641	370192	6019	359211	27499	NLGN4Y	165246	339174	13957	342535	32409	TMTC4	125247	440120	21895	393600	37380
DPYD	188641	474241	6020	N/A		NLGN4Y	165246	413217	13958	412638	32410	TMTC4	125247	480433	21896	N/A	
DPYD	188641	306031	6021	307107	27500	NLN	123213	380985	13959	370372	32411	TMTC4	125247	423847	21897	398400	37381
DPYD	188641	460019	6022	N/A		NLN	123213	502464	13960	423214	32412	TMTC4	125247	475272	21898	419613	37382
DPYSL3	113657	398514	6023	381526	27501	NLN	123213	514991	13961	422822	32413	TNC	041982	481475	21899	N/A	
DPYSL3	113657	343218	6024	343690	27502	NLN	123213	506539	13962	N/A		TNC	041982	460345	21900	N/A	
DPYSL3	113657	520473	6025	430267	27503	NLN	123213	506799	13963	N/A		TNC	041982	423613	21901	411406	37383
DPYSL3	113657	507309	6026	N/A		NLN	123213	506677	13964	N/A		TNC	041982	350763	21902	265131	37384
DPYSL3	113657	523458	6027	428958	27504	NLN	123213	511299	13965	427417	32414	TNC	041982	535648	21903	438152	37385
DPYSL3	113657	508042	6028	N/A		NLN	123213	509935	13966	426959	32415	TNC	041982	534839	21904	443469	37386
DPYSL3	113657	519672	6029	N/A		NLN	123213	507201	13967	N/A		TNC	041982	635336	21905	489385	37387
DPYSL3	113657	512722	6030	426720	27505	NLN	123213	515595	13968	N/A		TNC	041982	473855	21906	N/A	
DPYSL3	113657	504965	6031	N/A		NNT	112992	505678	13969	427670	32416	TNC	041982	476680	21907	N/A	
DPYSL4	151640	338492	6032	339850	27506	NNT	112992	512422	13970	421886	32417	TNC	041982	498724	21908	N/A	
DPYSL4	151640	493927	6033	N/A		NNT	112992	264663	13971	264663	32418	TNC	041982	544972	21909	445380	37388
DPYSL4	151640	493882	6034	N/A		NNT	112992	344920	13972	343873	32419	TNC	041982	542877	21910	442242	37389
DPYSL4	151640	368627	6035	357616	27507	NNT	112992	512996	13973	426343	32420	TNC	041982	537320	21911	443478	37390
DPYSL4	151640	471544	6036	N/A		NNT	112992	515208	13974	425542	32421	TNC	041982	341037	21912	339553	37391
DRD1	184845	393752	6037	377353	27508	NNT	112992	506893	13975	N/A		TNFAIP6	123610	243347	21913	243347	37392
DRD2	149295	346454	6038	278597	27509	NNT	112992	503651	13976	421674	32422	TNFAIP6	123610	460812	21914	N/A	
DRD2	149295	362072	6039	354859	27510	NNT	112992	513390	13977	N/A		TNFRSF13C	159958	291232	21915	291232	37393
DRD2	149295	544518	6040	441068	27511	NNT	112992	503059	13978	424782	32423	TNFRSF19	127863	248484	21916	248484	37394
DRD2	149295	542968	6041	442172	27512	NOL3	140939	565560	13979	457732	32424	TNFRSF19	127863	464735	21917	N/A	
DRD2	149295	538967	6042	438215	27513	NOL3	140939	563439	13980	454256	32425	TNFRSF19	127863	382258	21918	371693	37395
DRD2	149295	540600	6043	N/A		NOL3	140939	568086	13981	N/A		TNFRSF19	127863	382263	21919	371698	37396
DRD2	149295	535984	6044	N/A		NOL3	140939	564992	13982	457720	32426	TNFRSF19	127863	403372	21920	385408	37397
DRD2	149295	539420	6045	N/A		NOL3	140939	564053	13983	457243	32427	TNFSF9	125657	245817	21921	245817	37398
DRD2	149295	543292	6046	438419	27514	NOL3	140939	565645	13984	N/A		TNK2	061938	416152	21922	398614	37399
DRD2	149295	542616	6047	441474	27515	NOL3	140939	568199	13985	N/A		TNK2	061938	381916	21923	371341	37400
DSCAML1	177103	527706	6048	434335	27516	NOL3	140939	566871	13986	455808	32428	TNK2	061938	333602	21924	329425	37401
DSCAML1	177103	321322	6049	315465	27517	NOL3	140939	568503	13987	N/A		TNK2	061938	420716	21925	N/A	
DSCAML1	177103	525836	6050	436387	27518	NOL3	140939	563258	13988	463698	32429	TNK2	061938	428187	21926	392546	37402
DTX4	110042	532982	6051	434055	27519	NOL3	140939	568146	13989	454598	32430	TNK2	061938	495247	21927	N/A	
DTX4	110042	227451	6052	227451	27520	NOL3	140939	564860	13990	463685	32431	TNK2	061938	464041	21928	N/A	
DTX4	110042	531902	6053	N/A		NOL3	140939	268605	13991	268605	32432	TNK2	061938	439230	21929	395588	37403
DTX4	110042	527475	6054	N/A		NOS1	089250	317775	13992	320758	32433	TNK2	061938	481865	21930	N/A	
DUS3L	141994	590343	6055	466351	27521	NOS1	089250	338101	13993	337459	32434	TNK2	061938	424563	21931	390435	37404
DUS3L	141994	320699	6056	315558	27522	NOS1	089250	549189	13994	N/A		TNK2	061938	478623	21932	N/A	
DUS3L	141994	589085	6057	N/A		NOS1	089250	477584	13995	N/A		TNK2	061938	411741	21933	415126	37405
DUS3L	141994	309061	6058	311977	27523	NOS1	089250	618760	13996	477999	32435	TNK2	061938	489628	21934	N/A	

DUS3L	141994	589841	6059	N/A		NOS1	089250	344089	13997	339862	32436	TNK2	061938	478715	21935	N/A	
DUS3L	141994	592468	6060	468075	27524	NOTCH1	148400	277541	13998	277541	32437	TNK2	061938	468680	21936	N/A	
DUS3L	141994	591560	6061	467987	27525	NOTCH1	148400	494783	13999	N/A		TNK2	061938	486523	21937	N/A	
DUS3L	141994	592673	6062	N/A		NOTCH1	148400	491649	14000	N/A		TNK2	061938	438207	21938	392253	37406
DUS3L	141994	590087	6063	N/A		NOTCH3	074181	263388	14001	263388	32438	TNK2	061938	430929	21939	409462	37407
DUS3L	141994	593229	6064	N/A		NOTCH3	074181	595514	14002	470661	32439	TNK2	061938	468819	21940	N/A	
DUS3L	141994	590110	6065	465369	27526	NOTCH3	074181	597756	14003	468879	32440	TNK2	061938	447060	21941	393707	37408
DUS3L	141994	592491	6066	467302	27527	NOTCH3	074181	601011	14004	473138	32441	TNK2	061938	433111	21942	395154	37409
DUS3L	141994	585587	6067	468233	27528	NOTCH3	074181	600841	14005	N/A		TNK2	061938	427576	21943	390088	37410
DUS3L	141994	590681	6068	N/A		NOTCH3	074181	595045	14006	N/A		TNNI1	159173	361379	21944	354488	37411
DUS3L	141994	589854	6069	N/A		NPAS4	174576	311034	14007	311196	32442	TNNI1	159173	336092	21945	337022	37412
DUSP1	120129	239223	6070	239223	27529	NPAS4	174576	525148	14008	433135	32443	TNNI1	159173	555948	21946	451307	37413
DUSP16	111266	298573	6071	298573	27530	NPAS4	174576	524617	14009	N/A		TNNI1	159173	367312	21947	356281	37414
DUSP16	111266	545864	6072	N/A		NPAS4	174576	639555	14010	492526	32444	TNNI1	159173	555340	21948	451660	37415
DUSP16	111266	539940	6073	443039	27531	NPL	135838	488424	14011	N/A		TNNI1	159173	556362	21949	451776	37416
DUSP16	111266	541207	6074	441250	27532	NPL	135838	460690	14012	N/A		TNNI1	159173	622580	21950	477578	37417
DUSP16	111266	536236	6075	N/A		NPL	135838	463899	14013	N/A		TNR	116147	367674	21951	356646	37418
DUSP16	111266	228862	6076	228862	27533	NPL	135838	367555	14014	356526	32445	TNR	116147	422274	21952	403413	37419
DUSP16	280962	626413	6077	487512	27534	NPL	135838	479721	14015	N/A		TNR	116147	263525	21953	263525	37420
DUSP16	280962	628303	6078	487034	27535	NPL	135838	471010	14016	N/A		TNS1	079308	171887	21954	171887	37421
DUSP16	280962	630190	6079	N/A		NPL	135838	367553	14017	356524	32446	TNS1	079308	446688	21955	394171	37422
DUSP16	280962	626461	6080	485919	27536	NPL	135838	460179	14018	N/A		TNS1	079308	490566	21956	N/A	
DUSP16	280962	629698	6081	487493	27537	NPL	135838	367552	14019	356523	32447	TNS1	079308	419504	21957	408724	37423
DUSP16	280962	627160	6082	N/A		NPL	135838	258317	14020	258317	32448	TNS1	079308	430930	21958	406016	37424
DUSP22	112679	603296	6083	474082	27538	NPL	135838	367554	14021	356525	32449	TNS1	079308	480416	21959	N/A	
DUSP22	112679	344450	6084	345281	27539	NPL	135838	614468	14022	482415	32450	TNS1	079308	495556	21960	N/A	
DUSP22	112679	603453	6085	474646	27540	NPR1	169418	368680	14023	357669	32451	TNS1	079308	446903	21961	405460	37425
DUSP22	112679	605315	6086	474827	27541	NPR1	169418	413826	14024	N/A		TNS1	079308	479185	21962	N/A	
DUSP22	112679	603881	6087	474450	27542	NPR1	169418	368677	14025	N/A		TNS1	079308	480665	21963	N/A	
DUSP22	112679	603795	6088	475106	27543	NPR3	113389	509104	14026	425325	32452	TNS1	079308	413554	21964	400383	37426
DUSP22	112679	419235	6089	397459	27544	NPR3	113389	434067	14027	388408	32453	TNS1	079308	310858	21965	308321	37427
DUSP22	112679	605035	6090	475061	27545	NPR3	113389	506712	14028	N/A		TNS1	079308	453356	21966	414704	37428
DUSP22	112679	605863	6091	474000	27546	NPR3	113389	265074	14029	265074	32454	TNS1	079308	492338	21967	N/A	
DUSP22	112679	603005	6092	N/A		NPR3	113389	415167	14030	398028	32455	TNS1	079308	413280	21968	395615	37429
DUSP22	112679	603726	6093	474330	27547	NPR3	113389	507141	14031	423730	32456	TNS1	079308	439083	21969	404477	37430
DUSP22	112679	603290	6094	N/A		NPR3	113389	326958	14032	318340	32457	TNS1	079308	423413	21970	411349	37431
DUSP22	112679	605391	6095	N/A		NPY1R	164128	296533	14033	354652	32458	TNS1	079308	449814	21971	393925	37432
DUSP22	112679	604971	6096	474505	27548	NPY1R	164128	509586	14034	427284	32459	TNS1	079308	465306	21972	N/A	
DUSP22	112679	604914	6097	N/A		NPY1R	164128	504391	14035	422963	32460	TNS1	079308	611415	21973	484271	37433
DUSP22	112679	604988	6098	N/A		NPY1R	164128	512819	14036	421618	32461	TNS1	079308	615025	21974	480559	37434
DUSP26	133878	256261	6099	256261	27549	NPY1R	164128	504790	14037	427564	32462	TNS3	136205	428457	21975	387990	37435
DUSP26	133878	523956	6100	429176	27550	NPY1R	164128	515701	14038	426099	32463	TNS3	136205	311160	21976	312143	37436
DUSP26	133878	522982	6101	430922	27551	NPY1R	164128	511901	14039	423878	32464	TNS3	136205	457718	21977	414358	37437
DUSP5	138166	369583	6102	358596	27552	NPY6R	226306	510937	14040	N/A		TNS3	136205	450444	21978	396914	37438
DUSP5	138166	468749	6103	N/A		NPY6R	226306	503807	14041	N/A		TNS3	136205	469470	21979	N/A	
DYNLT3	165169	378581	6104	367844	27553	NR3C2	151623	344721	14042	341390	32465	TNS3	136205	485555	21980	N/A	
DYNLT3	165169	378578	6105	367841	27554	NR3C2	151623	358102	14043	350815	32466	TNS3	136205	442536	21981	389285	37439
DYNLT3	165169	432389	6106	402695	27555	NR3C2	151623	512865	14044	423510	32467	TNS3	136205	415929	21982	409415	37440
DYRK1B	105204	593685	6107	469863	27556	NR3C2	151623	342437	14045	343907	32468	TNS3	136205	413551	21983	388142	37441
DYRK1B	105204	323039	6108	312789	27557	NR3C2	151623	511528	14046	421481	32469	TNS3	136205	434451	21984	407464	37442
DYRK1B	105204	597639	6109	472941	27558	NR3C2	151623	503313	14047	N/A		TNS3	136205	474346	21985	N/A	
DYRK1B	105204	430012	6110	403182	27559	NR3C2	151623	503174	14048	N/A		TNS3	136205	458317	21986	388318	37443
DYRK1B	105204	601696	6111	N/A		NR3C2	151623	504753	14049	N/A		TOB1	141232	499247	21987	427695	37444
DYRK1B	105204	600611	6112	471609	27560	NR3C2	151623	625323	14050	486719	32470	TOB1	141232	268957	21988	268957	37445
DYRK1B	105204	601972	6113	472861	27561	NR4A1	123358	548977	14051	456633	32471	TOB1	141232	509385	21989	N/A	
DYRK1B	105204	348817	6114	221803	27562	NR4A1	123358	546842	14052	457070	32472	TOM1L1	141198	570371	21990	458553	37446
DYRK1B	281320	631090	6115	486377	27563	NR4A1	123358	553200	14053	456776	32473	TOM1L1	141198	574744	21991	N/A	
DYRK1B	281320	625757	6116	485915	27564	NR4A1	123358	545748	14054	440864	32474	TOM1L1	141198	575882	21992	460823	37447
DYRK1B	281320	625398	6117	486839	27565	NR4A1	123358	550082	14055	449539	32475	TOM1L1	141198	570965	21993	459079	37448

DYRK1B	281320	625438	6118	487313	27566	NR4A1	123358	549102	14056	N/A		TOM1L1	141198	445275	21994	408958	37449
DYRK1B	281320	627034	6119	487539	27567	NR4A1	123358	478250	14057	N/A		TOM1L1	141198	348161	21995	343901	37450
DYRK1B	281320	629412	6120	N/A		NR4A1	123358	547206	14058	N/A		TOM1L1	141198	572405	21996	460721	37451
DYRK1B	281320	626964	6121	486913	27568	NR4A1	123358	550763	14059	449858	32476	TOM1L1	141198	576932	21997	461876	37452
DYRK1B	281320	630714	6122	486264	27569	NR4A1	123358	394824	14060	378301	32477	TOM1L1	141198	572158	21998	461284	37453
DYRK4	010219	543431	6123	439697	27570	NR4A1	123358	548232	14061	449587	32478	TOM1L1	141198	572298	21999	459003	37454
DYRK4	010219	539701	6124	441996	27571	NR4A1	123358	562373	14062	455399	32479	TOM1L1	141198	536554	22000	443099	37455
DYRK4	010219	537719	6125	444842	27572	NR4A1	123358	548733	14063	N/A		TOM1L1	141198	571319	22001	458219	37456
DYRK4	010219	539309	6126	439168	27573	NR4A1	123358	550557	14064	N/A		TOM1L1	141198	575333	22002	458918	37457
DYRK4	010219	538520	6127	N/A		NR4A1	123358	564201	14065	N/A		TOM1L1	141198	572360	22003	460565	37458
DYRK4	010219	539490	6128	N/A		NR4A1	123358	550339	14066	N/A		TOM1L1	141198	570499	22004	461215	37459
DYRK4	010219	540757	6129	441755	27574	NR4A1	123358	567890	14067	N/A		TOM1L1	141198	572576	22005	458809	37460
DYRK4	010219	536157	6130	N/A		NR4A1	123358	550582	14068	455767	32480	TOM1L1	141198	573607	22006	461396	37461
DYRK4	010219	542905	6131	N/A		NR4A1	123358	565848	14069	N/A		TOM1L1	141198	575909	22007	460213	37462
DYRK4	010219	536645	6132	N/A		NR4A1	123358	394825	14070	378302	32481	TOM1L1	141198	570977	22008	N/A	
DYRK4	010219	540644	6133	N/A		NR4A1	123358	360284	14071	353427	32482	TOM1L1	141198	570623	22009	N/A	
DYRK4	010219	545571	6134	N/A		NR4A1	123358	243050	14072	243050	32483	TOM1L1	141198	572905	22010	N/A	
DYRK4	010219	536137	6135	N/A		NR4A2	153234	339562	14073	344479	32484	TOM1L1	141198	574653	22011	N/A	
DYRK4	010219	541024	6136	N/A		NR4A2	153234	426264	14074	389986	32485	TOM1L1	141198	574318	22012	467227	37463
DYRK4	010219	544671	6137	438769	27575	NR4A2	153234	409572	14075	386747	32486	TOP1	198900	361337	22013	354522	37464
DYRK4	010219	544050	6138	N/A		NR4A2	153234	417764	14076	415632	32487	TOX2	124191	341197	22014	344724	37465
DYRK4	010219	010132	6139	010132	27576	NR4A2	153234	417972	14077	394671	32488	TOX2	124191	423191	22015	390278	37466
DYSF	135636	409762	6140	387137	27577	NR4A2	153234	409108	14078	386993	32489	TOX2	124191	372999	22016	362090	37467
DYSF	135636	409582	6141	386547	27578	NR4A2	153234	429376	14079	410952	32490	TOX2	124191	358131	22017	350849	37468
DYSF	135636	429174	6142	398305	27579	NR4A2	153234	406048	14080	385379	32491	TOX2	124191	435864	22018	N/A	
DYSF	135636	413539	6143	407046	27580	NR4A2	153234	424077	14081	406808	32492	TOX2	124191	413823	22019	390876	37469
DYSF	135636	258104	6144	258104	27581	NR4A2	153234	421709	14082	388120	32493	TOX3	103460	407228	22020	385705	37470
DYSF	135636	409651	6145	386683	27582	NR4A3	119508	338488	14083	340301	32494	TOX3	103460	566696	22021	N/A	
DYSF	135636	394120	6146	377678	27583	NR4A3	119508	395097	14084	378531	32495	TOX3	103460	219746	22022	219746	37471
DYSF	135636	409744	6147	386285	27584	NR4A3	119508	330847	14085	333122	32496	TOX3	103460	563091	22023	457401	37472
DYSF	135636	409366	6148	386512	27585	NR4A3	119508	618101	14086	482027	32497	TOX3	103460	568436	22024	463843	37473
DYSF	135636	410020	6149	386881	27586	NRBF2	148572	277746	14087	277746	32498	TP53INP2	078804	374810	22025	363943	37474
DYSF	135636	410041	6150	386617	27587	NRBF2	148572	435510	14088	397502	32499	TP53INP2	078804	374809	22026	363942	37475
DYSF	135636	461565	6151	N/A		NRCAM	091129	351718	14089	325269	32500	TP53INP2	078804	451665	22027	395784	37476
DYSF	135636	475076	6152	N/A		NRCAM	091129	379024	14090	368310	32501	TP53INP2	078804	414082	22028	404410	37477
DYSF	135636	479049	6153	N/A		NRCAM	091129	425651	14091	401244	32502	TP73	078900	378295	22029	367545	37478
DYSF	135636	493767	6154	N/A		NRCAM	091129	445634	14092	398174	32503	TP73	078900	604074	22030	475143	37479
DYSF	135636	472873	6155	N/A		NRCAM	091129	415105	14093	N/A		TP73	078900	354437	22031	346423	37480
DYSF	135636	494501	6156	N/A		NRCAM	091129	465585	14094	N/A		TP73	078900	603362	22032	474626	37481
DYSF	135636	487180	6157	N/A		NRCAM	091129	417701	14095	390421	32504	TP73	078900	604479	22033	474322	37482
DYSF	135636	468173	6158	N/A		NRCAM	091129	489800	14096	N/A		TP73	078900	378285	22034	367534	37483
DZANK1	089091	476058	6159	479439	27588	NRCAM	091129	442580	14097	390868	32505	TP73	078900	378280	22035	367529	37484
DZANK1	089091	377630	6160	366857	27589	NRCAM	091129	419936	14098	397544	32506	TP73	078900	378288	22036	367537	37485
DZANK1	089091	357236	6161	349774	27590	NRCAM	091129	456431	14099	408203	32507	TP73	078900	603364	22037	N/A	
DZANK1	089091	358866	6162	351734	27591	NRCAM	091129	418239	14100	393663	32508	TP73	078900	604194	22038	N/A	
DZANK1	089091	608192	6163	476391	27592	NRCAM	091129	379028	14101	368314	32509	TP73	078900	378290	22039	367539	37486
DZANK1	089091	609267	6164	477046	27593	NRCAM	091129	413765	14102	407858	32510	TP73	078900	604566	22040	N/A	
DZANK1	089091	480488	6165	484666	27594	NRCAM	091129	379022	14103	368308	32511	TP73	078900	357733	22041	350366	37487
DZANK1	089091	460891	6166	477872	27595	NRCAM	091129	613830	14104	484840	32512	TP73	078900	346387	22042	340740	37488
DZANK1	089091	470526	6167	N/A		NRCAM	091129	522550	14105	N/A		TPCN1	186815	552077	22043	N/A	
DZANK1	089091	262547	6168	262547	27596	NREP	134986	514515	14106	427595	32513	TPCN1	186815	392569	22044	376350	37489
DZANK1	089091	329494	6169	328866	27597	NREP	134986	509025	14107	426834	32514	TPCN1	186815	552542	22045	446767	37490
DZIP1L	158163	327532	6170	332148	27598	NREP	134986	379671	14108	368993	32515	TPCN1	186815	428632	22046	N/A	
DZIP1L	158163	486487	6171	417228	27599	NREP	134986	257435	14109	257435	32516	TPCN1	186815	548465	22047	448561	37491
DZIP1L	158163	488595	6172	N/A		NREP	134986	446294	14110	402965	32517	TPCN1	186815	546781	22048	449564	37492
DZIP1L	158163	469243	6173	419486	27600	NREP	134986	395634	14111	378996	32518	TPCN1	186815	551127	22049	N/A	
DZIP1L	158163	466301	6174	N/A		NREP	134986	515855	14112	422278	32519	TPCN1	186815	546503	22050	N/A	
DZIP1L	158163	473830	6175	N/A		NREP	134986	507742	14113	N/A		TPCN1	186815	550543	22051	N/A	
DZIP1L	158163	490472	6176	N/A		NREP	134986	509979	14114	423320	32520	TPCN1	186815	547955	22052	448010	37493

DZIP1L	158163	467030	6177	420600	27601	NREP	134986	450761	14115	416617	32521	TPCN1	186815	546907	22053	N/A	
DZIP1L	158163	492010	6178	420051	27602	NREP	134986	419114	14116	399766	32522	TPCN1	186815	546787	22054	N/A	
E2F3	112242	346618	6179	262904	27603	NREP	134986	509427	14117	422630	32523	TPCN1	186815	541517	22055	438125	37494
E2F3	112242	535432	6180	443418	27604	NREP	134986	453526	14118	403383	32524	TPCN1	186815	549279	22056	448704	37495
E2F3	112242	613242	6181	483249	27605	NREP	134986	455559	14119	392559	32525	TPCN1	186815	335509	22057	335300	37496
EBF1	164330	519890	6182	N/A		NREP	134986	508870	14120	427149	32526	TPCN1	186815	552897	22058	449944	37497
EBF1	164330	519739	6183	N/A		NREP	134986	513100	14121	427476	32527	TPCN1	186815	550785	22059	448083	37498
EBF1	164330	518836	6184	N/A		NREP	134986	504018	14122	N/A		TPCN1	186815	552642	22060	447806	37499
EBF1	164330	313708	6185	322898	27606	NREP	134986	508161	14123	422046	32528	TPCN1	186815	547275	22061	449560	37500
EBF1	164330	518323	6186	N/A		NREP	134986	503429	14124	N/A		TPCN1	186815	552985	22062	447569	37501
EBF1	164330	380654	6187	370029	27607	NREP	134986	505864	14125	N/A		TPCN1	186815	550873	22063	447073	37502
EBF1	164330	517373	6188	428020	27608	NREP	134986	507032	14126	422514	32529	TPCN1	186815	551096	22064	447263	37503
EBF1	164330	522192	6189	N/A		NREP	134986	513684	14127	N/A		TPCN1	186815	551099	22065	447181	37504
EBF1	164330	523464	6190	N/A		NREP	134986	447165	14128	408839	32530	TPM3	143549	368533	22066	357521	37505
EBF1	164330	523315	6191	N/A		NRG1	157168	518104	14129	430053	32531	TPM3	143549	368545	22067	N/A	
EBF1	164330	622875	6192	477809	27609	NRG1	157168	519301	14130	429582	32532	TPM3	143549	469717	22068	N/A	
EBF2	221818	520164	6193	430241	27610	NRG1	157168	520407	14131	434640	32533	TPM3	143549	330188	22069	339035	37506
EBF2	221818	408929	6194	386178	27611	NRG1	157168	523534	14132	429067	32534	TPM3	143549	341485	22070	341653	37507
EBF2	221818	517825	6195	N/A		NRG1	157168	517967	14133	N/A		TPM3	143549	341372	22071	339378	37508
EBF2	221818	535548	6196	437909	27612	NRG1	157168	523320	14134	N/A		TPM3	143549	328159	22072	357520	37509
EBF3	108001	368648	6197	357637	27613	NRG1	157168	631040	14135	486375	32535	TPM3	143549	509409	22073	426521	37510
EBF3	108001	355311	6198	347463	27614	NRG1	157168	523079	14136	430120	32536	TPM3	143549	271850	22074	271850	37511
EBF3	108001	440978	6199	387543	27615	NRG1	157168	356819	14137	349275	32537	TPM3	143549	312970	22075	N/A	
EBF4	088881	449079	6200	405003	27616	NRG1	157168	521670	14138	428828	32538	TPM3	143549	513769	22076	N/A	
EBF4	088881	497450	6201	N/A		NRG1	157168	287842	14139	287842	32539	TPM3	143549	302206	22077	307712	37512
EBF4	088881	342725	6202	345030	27617	NRG1	157168	405005	14140	384620	32540	TPM3	143549	368531	22078	357517	37513
EBF4	088881	609451	6203	477023	27618	NRG1	157168	518206	14141	432052	32541	TPM3	143549	323144	22079	357518	37514
EBF4	088881	609967	6204	N/A		NRG1	157168	522569	14142	N/A		TPM3	143549	368530	22080	357516	37515
EBF4	088881	469215	6205	N/A		NRG1	157168	520502	14143	433289	32542	TPM3	143549	504663	22081	N/A	
EBF4	088881	463145	6206	477107	27619	NRG1	157168	523041	14144	433350	32543	TPM3	143549	509601	22082	422207	37516
EBF4	088881	491472	6207	N/A		NRG1	157168	518084	14145	428546	32544	TPM3	143549	505010	22083	N/A	
EBF4	088881	481662	6208	N/A		NRG1	157168	522402	14146	430862	32545	TPM3	143549	368527	22084	N/A	
EBF4	088881	477287	6209	N/A		NRG1	157168	519240	14147	428411	32546	TPM3	143549	473036	22085	N/A	
EBF4	088881	380648	6210	370022	27620	NRG1	157168	523681	14148	N/A		TPM3	143549	466010	22086	N/A	
ECD	122882	494307	6211	475102	27621	NRG1	157168	539990	14149	439276	32547	TPM3	143549	515609	22087	426306	37517
ECD	122882	372979	6212	362070	27622	NRG1	157168	614767	14150	483727	32548	TPM3	143549	611659	22088	480520	37518
ECD	122882	484976	6213	433778	27623	NRG2	158458	289422	14151	289422	32549	TPM4	167460	589897	22089	466158	37519
ECD	122882	454759	6214	395786	27624	NRG2	158458	361474	14152	354910	32550	TPM4	167460	344824	22090	345230	37520
ECD	122882	430082	6215	401566	27625	NRG2	158458	340391	14153	342660	32551	TPM4	167460	586499	22091	468246	37521
ECD	122882	453402	6216	391367	27626	NRG2	158458	289409	14154	289409	32552	TPM4	167460	586833	22092	467087	37522
ECD	122882	413026	6217	416288	27627	NRG2	158458	358522	14155	351323	32553	TPM4	167460	588507	22093	467558	37523
ECD	122882	610256	6218	N/A		NRG2	158458	378238	14156	367483	32554	TPM4	167460	300933	22094	300933	37524
ECE1	117298	415912	6219	405088	27628	NRG2	158458	519478	14157	N/A		TPM4	167460	587201	22095	N/A	
ECE1	117298	357071	6220	349581	27629	NRG2	158458	518130	14158	N/A		TPM4	167460	588410	22096	467250	37525
ECE1	117298	531334	6221	N/A		NRG2	158458	541337	14159	444235	32555	TPM4	167460	590180	22097	N/A	
ECE1	117298	374893	6222	364028	27630	NRG3	185737	372141	14160	361214	32556	TPM4	167460	588483	22098	466106	37526
ECE1	117298	436918	6223	388439	27631	NRG3	185737	404547	14161	384796	32557	TPM4	167460	592138	22099	466654	37527
ECE1	117298	264205	6224	264205	27632	NRG3	185737	372142	14162	361215	32558	TPM4	167460	588032	22100	467319	37528
ECE1	117298	526194	6225	N/A		NRG3	185737	602794	14163	473669	32559	TPM4	167460	586193	22101	N/A	
ECE1	117298	470394	6226	N/A		NRG3	185737	555784	14164	451858	32560	TPM4	167460	591645	22102	N/A	
ECE1	117298	528294	6227	N/A		NRG3	185737	404576	14165	385804	32561	TPM4	167460	592822	22103	468010	37529
ECE1	117298	473505	6228	431856	27633	NRG3	185737	556918	14166	451376	32562	TPM4	167460	591226	22104	N/A	
ECE1	117298	481130	6229	436633	27634	NRG3	185737	537893	14167	440377	32563	TPPP	171368	360578	22105	353785	37530
ECE1	117298	527991	6230	432860	27635	NRG3	185737	545131	14168	441201	32564	TPT1	133112	530705	22106	431872	37531
ECE1	117298	463334	6231	N/A		NRGN	154146	284292	14169	284292	32565	TPT1	133112	379056	22107	368345	37532
ECHDC2	121310	371522	6232	360577	27636	NRGN	154146	412681	14170	399591	32566	TPT1	133112	528619	22108	433091	37533
ECHDC2	121310	460612	6233	N/A		NRIP3	175352	309166	14171	310205	32567	TPT1	133112	529421	22109	N/A	
ECHDC2	121310	539680	6234	N/A		NRIP3	175352	534759	14172	435785	32568	TPT1	133112	484604	22110	N/A	
ECHDC2	121310	479183	6235	N/A		NRIP3	175352	531142	14173	432002	32569	TPT1	133112	533567	22111	N/A	

ECHDC2	121310	543419	6236	N/A		NRIP3	175352	531090	14174	432451	32570	TPT1	133112	490277	22112	N/A	
ECHDC2	121310	463923	6237	N/A		NRIP3	175352	525100	14175	433845	32571	TPT1	133112	530245	22113	432457	37534
ECHDC2	121310	371520	6238	360575	27637	NRK	123572	243300	14176	434830	32572	TPT1	133112	379060	22114	368350	37535
ECHDC2	121310	358358	6239	351125	27638	NRK	123572	536164	14177	438785	32573	TPT1	133112	379055	22115	368344	37536
ECHDC2	121310	498544	6240	N/A		NRK	123572	428173	14178	438378	32574	TPT1	133112	309246	22116	339051	37537
ECHDC2	121310	476477	6241	446190	27639	NRK	123572	540278	14179	438148	32575	TPT1	133112	527226	22117	433738	37538
ECHDC2	121310	479593	6242	N/A		NRXN1	179915	625672	14180	485887	32576	TPT1	133112	442760	22118	N/A	
ECHDC2	121310	467988	6243	441962	27640	NRXN1	179915	406316	14181	384311	32577	TPT1	133112	616577	22119	477781	37539
ECHDC2	121310	487866	6244	N/A		NRXN1	179915	636345	14182	489745	32578	TRA2B	136527	453386	22120	416959	37540
ECHDC2	121310	486170	6245	N/A		NRXN1	179915	634764	14183	N/A		TRA2B	136527	492417	22121	N/A	
ECHDC2	121310	487851	6246	N/A		NRXN1	179915	634431	14184	N/A		TRA2B	136527	463328	22122	N/A	
ECHDC2	121310	488268	6247	N/A		NRXN1	179915	635519	14185	489258	32579	TRA2B	136527	259043	22123	259043	37541
ECHDC2	121310	544365	6248	439906	27641	NRXN1	179915	635164	14186	N/A		TRA2B	136527	414862	22124	406561	37542
ECHDC2	121310	495920	6249	N/A		NRXN1	179915	412315	14187	396738	32580	TRA2B	136527	466832	22125	N/A	
ECHDC2	121310	492992	6250	N/A		NRXN1	179915	404971	14188	385142	32581	TRA2B	136527	487615	22126	N/A	
ECHDC2	121310	480312	6251	N/A		NRXN1	179915	634412	14189	N/A		TRA2B	136527	456380	22127	416887	37543
ECHDC2	121310	544531	6252	N/A		NRXN1	179915	342183	14190	341184	32582	TRA2B	136527	382191	22128	371626	37544
ECHDC2	121310	493896	6253	N/A		NRXN1	179915	378262	14191	367510	32583	TRA2B	136527	465245	22129	N/A	
ECHDC2	121310	487040	6254	N/A		NRXN1	179915	401710	14192	385580	32584	TRA2B	136527	485530	22130	N/A	
ECHDC2	121310	542552	6255	438535	27642	NRXN1	179915	637906	14193	490198	32585	TRA2B	136527	493864	22131	N/A	
ECHDC2	121310	474789	6256	N/A		NRXN1	179915	484192	14194	N/A		TRA2B	136527	477939	22132	N/A	
ECHDC2	121310	536120	6257	439264	27643	NRXN1	179915	401669	14195	385017	32586	TRA2B	136527	471134	22133	N/A	
EDEM1	134109	434243	6258	393659	27644	NRXN1	179915	630656	14196	486993	32587	TRA2B	136527	480461	22134	N/A	
EDEM1	134109	256497	6259	256497	27645	NRXN1	179915	629717	14197	N/A		TRA2B	136527	342294	22135	343857	37545
EDEM1	134109	465369	6260	N/A		NRXN1	179915	628364	14198	485815	32588	TRABD2B	269113	606738	22136	476820	37546
EDEM1	134109	443790	6261	394615	27646	NRXN1	179915	405472	14199	434015	32589	TRABD2B	269113	435576	22137	N/A	
EDEM1	134109	465187	6262	N/A		NRXN1	179915	630543	14200	486879	32590	TRAF1	056558	373887	22138	362994	37547
EDEM1	134109	445686	6263	394099	27647	NRXN1	179915	635264	14201	N/A		TRAF1	056558	546084	22139	438583	37548
EDEM1	134109	492751	6264	N/A		NRXN1	179915	637889	14202	N/A		TRAF1	056558	540010	22140	443183	37549
EDIL3	164176	296591	6265	296591	27648	NRXN1	179915	636736	14203	N/A		TRAF4	076604	262395	22141	262395	37550
EDIL3	164176	380138	6266	369483	27649	NRXN1	179915	636298	14204	N/A		TRAF4	076604	478021	22142	464097	37551
EDIL3	164176	510271	6267	N/A		NRXN1	179915	331040	14205	489573	32591	TRAF4	076604	461195	22143	N/A	
EDIL3	164176	507663	6268	N/A		NRXN1	179915	625320	14206	486253	32592	TRAF4	076604	498540	22144	N/A	
EDNRB	136160	377211	6269	366416	27650	NRXN1	179915	636818	14207	N/A		TRAF4	076604	422344	22145	415789	37552
EDNRB	136160	334286	6270	335311	27651	NRXN1	179915	635834	14208	N/A		TRAF4	076604	586813	22146	466306	37553
EDNRB	136160	626030	6271	486202	27652	NRXN1	179915	637151	14209	N/A		TRAF4	076604	444415	22147	438154	37554
EDNRB	136160	475537	6272	487082	27653	NRXN1	179915	626192	14210	N/A		TRAF4	076604	394925	22148	N/A	
SLC13A1	081800	194130	6273	194130	27654	NRXN1	179915	474354	14211	N/A		TRAF4	076604	262396	22149	262396	37555
SLC13A1	081800	427975	6274	388403	27655	NRXN1	179915	462791	14212	N/A		TRAF4	076604	475329	22150	464583	37556
SLC13A1	081800	439260	6275	401417	27656	NRXN1	179915	495871	14213	486185	32593	TRAF4	076604	584944	22151	465164	37557
SLC13A1	081800	539873	6276	441309	27657	NRXN1	179915	636342	14214	N/A		TRAF4	076604	473421	22152	468107	37558
EFEMP1	115380	394555	6277	378058	27658	NRXN1	179915	637207	14215	N/A		TRAF4	076604	454852	22153	396602	37559
EFEMP1	115380	635671	6278	489578	27659	NRXN1	179915	637653	14216	N/A		TRAF4	076604	578917	22154	N/A	
EFEMP1	115380	355426	6279	347596	27660	NRXN1	179915	638037	14217	490210	32594	TRAF4	076604	469529	22155	N/A	
EFEMP1	115380	634374	6280	489183	27661	NRXN1	179915	637459	14218	N/A		TRAF4	076604	580073	22156	N/A	
EFEMP1	115380	438672	6281	392055	27662	NRXN1	179915	637021	14219	N/A		TRAF4	076604	618771	22157	481248	37560
EFEMP1	115380	452161	6282	N/A		NRXN1	179915	637605	14220	N/A		TRAF5	082512	462410	22158	N/A	
EFEMP1	115380	439193	6283	408195	27663	NRXN1	179915	626249	14221	485723	32595	TRAF5	082512	488428	22159	N/A	
EFEMP1	115380	440439	6284	398345	27664	NRXN1	179915	628515	14222	486544	32596	TRAF5	082512	494355	22160	N/A	
EFEMP1	115380	429909	6285	389319	27665	NRXN1	179915	625891	14223	489108	32597	TRAF5	082512	261464	22161	261464	37561
EFEMP1	115380	452337	6286	399480	27666	NRXN1	179915	628761	14224	N/A		TRAF5	082512	367004	22162	355971	37562
EFEMP1	115380	421664	6287	405686	27667	NRXN1	179915	630431	14225	N/A		TRAF5	082512	473385	22163	N/A	
EFEMP1	115380	480016	6288	N/A		NRXN1	179915	627198	14226	487268	32598	TRAF5	082512	336184	22164	336825	37563
EFEMP1	115380	424207	6289	398387	27668	NRXN1	179915	637472	14227	N/A		TRDN	186439	334268	22165	333984	37564
EFEMP1	115380	497698	6290	N/A		NRXN1	179915	405581	14228	385310	32599	TRDN	186439	628709	22166	486095	37565
EFHC2	183690	343571	6291	N/A		NRXN1	179915	636066	14229	490017	32600	TRDN	186439	361029	22167	354307	37566
EFHC2	183690	420999	6292	404232	27669	NRXN1	179915	637511	14230	490494	32601	TRDN	186439	542443	22168	437684	37567
EFHD1	115468	409613	6293	386556	27670	NRXN1	179915	626899	14231	485912	32602	TRDN	186439	422596	22169	406768	37568
EFHD1	115468	264059	6294	264059	27671	NRXN1	179915	496792	14232	487165	32603	TRDN	186439	546248	22170	439281	37569

EFHD1	115468	442845	6295	395119	27672	NRXN1	179915	637679	14233	N/A		TREH	118094	264029	22171	264029	37570
EFHD1	115468	409708	6296	386243	27673	NRXN1	179915	635310	14234	N/A		TREH	118094	613915	22172	477923	37571
EFHD1	115468	427698	6297	401073	27674	NRXN1	179915	637006	14235	N/A		TREH	118094	397925	22173	381020	37572
EFHD1	115468	410095	6298	386685	27675	NRXN1	179915	638060	14236	N/A		TREH	118094	531295	22174	N/A	
EFHD1	115468	611312	6299	484568	27676	NRXN1	179915	636599	14237	N/A		TREH	118094	527558	22175	N/A	
EFHD2	142634	375980	6300	365147	27677	NRXN1	179915	635126	14238	N/A		TREM2	095970	373122	22176	362214	37573
EFHD2	142634	445566	6301	395153	27678	NRXN1	179915	636104	14239	N/A		TREM2	095970	373113	22177	362205	37574
EFNA5	184349	505499	6302	N/A		NRXN1	179915	447773	14240	N/A		TREM2	095970	338469	22178	342651	37575
EFNA5	184349	611503	6303	484681	27679	NRXN1	179915	637975	14241	N/A		TRHDE	072657	548156	22179	N/A	
EFNA5	184349	333274	6304	328777	27680	NRXN1	179915	416262	14242	N/A		TRHDE	072657	261180	22180	261180	37576
EFNA5	184349	510359	6305	N/A		NRXN1	179915	637368	14243	N/A		TRHDE	072657	547300	22181	447822	37577
EFNA5	184349	504941	6306	N/A		NRXN1	179915	611589	14244	483634	32604	TRHDE	072657	552503	22182	N/A	
EFNA5	184349	509503	6307	426989	27681	NRXN1	179915	406859	14245	385681	32605	TRHDE	072657	549138	22183	N/A	
EFNB3	108947	226091	6308	226091	27682	NRXN1	179915	402717	14246	385434	32606	TRHDE	072657	549401	22184	N/A	
EFR3B	084710	401432	6309	386082	27683	NRXN2	110076	464307	14247	N/A		TRHDE	072657	549922	22185	N/A	
EFR3B	084710	403714	6310	384081	27684	NRXN2	110076	301894	14248	301894	32607	TRIL	255690	539664	22186	479256	37578
EFR3B	084710	402191	6311	385832	27685	NRXN2	110076	377551	14249	366774	32608	TRIM15	227147	421984	22187	413961	37579
EFR3B	084710	405108	6312	384454	27686	NRXN2	110076	377559	14250	366782	32609	TRIM15	227147	423220	22188	400174	37580
EFR3B	084710	264719	6313	264719	27687	NRXN2	110076	409571	14251	386416	32610	TRIM15	227147	476225	22189	N/A	
EGF	138798	509793	6314	424316	27688	NRXN2	110076	475737	14252	N/A		TRIM15	227147	478964	22190	N/A	
EGF	138798	265171	6315	265171	27689	NRXN2	110076	423049	14253	407374	32611	TRIM15	227147	548732	22191	449583	37581
EGF	138798	503392	6316	421384	27690	NRXN2	110076	467055	14254	N/A		TRIM15	233599	431059	22192	403221	37582
EGF	138798	502723	6317	N/A		NRXN2	110076	487484	14255	N/A		TRIM15	233599	426765	22193	389858	37583
EGF	138798	504633	6318	N/A		NRXN2	110076	486057	14256	N/A		TRIM15	233599	490570	22194	N/A	
EGF	138798	502579	6319	N/A		NRXN2	110076	496291	14257	N/A		TRIM15	233599	474092	22195	N/A	
EGF	138798	541061	6320	N/A		NRXN2	110076	442300	14258	388971	32612	TRIM15	233599	548653	22196	447232	37584
EGF	138798	511228	6321	N/A		NRXN2	110076	417749	14259	411271	32613	TRIM15	233599	550400	22197	447500	37585
EGF	138798	509996	6322	N/A		NRXN2	110076	437746	14260	412211	32614	TRIM15	235905	429524	22198	409605	37586
EGF	138798	544918	6323	N/A		NRXN2	110076	466324	14261	N/A		TRIM15	235905	424597	22199	403836	37587
EGF	138798	537316	6324	N/A		NRXN2	110076	265459	14262	265459	32615	TRIM15	235905	493180	22200	N/A	
EGF	138798	540840	6325	N/A		NRXN3	021645	634499	14263	488920	32616	TRIM15	235905	496657	22201	N/A	
EGFR	146648	459688	6326	N/A		NRXN3	021645	554738	14264	450683	32617	TRIM15	235905	552676	22202	449686	37588
EGFR	146648	463948	6327	N/A		NRXN3	021645	635466	14265	489551	32618	TRIM15	235905	550702	22203	448772	37589
EGFR	146648	450046	6328	413354	27691	NRXN3	021645	556088	14266	N/A		TRIM15	137384	259930	22204	259930	37590
EGFR	146648	485503	6329	N/A		NRXN3	021645	553363	14267	451754	32619	TRIM15	137384	427952	22205	392768	37591
EGFR	146648	638463	6330	492462	27692	NRXN3	021645	553631	14268	451947	32620	TRIM15	137384	492678	22206	N/A	
EGFR	146648	454757	6331	395243	27693	NRXN3	021645	554719	14269	451648	32621	TRIM15	137384	479020	22207	N/A	
EGFR	146648	455089	6332	415559	27694	NRXN3	021645	556496	14270	N/A		TRIM15	137384	550969	22208	447725	37592
EGFR	146648	342916	6333	342376	27695	NRXN3	021645	634266	14271	N/A		TRIM15	204610	376694	22209	365884	37593
EGFR	146648	344576	6334	345973	27696	NRXN3	021645	557081	14272	450462	32622	TRIM15	204610	433744	22210	398285	37594
EGFR	146648	420316	6335	413843	27697	NRXN3	021645	557594	14273	451672	32623	TRIM15	204610	477944	22211	N/A	
EGFR	146648	275493	6336	275493	27698	NRXN3	021645	281127	14274	281127	32624	TRIM15	204610	376688	22212	365878	37595
EGLN3	129521	250457	6337	250457	27699	NRXN3	021645	428277	14275	394426	32625	TRIM15	204610	619857	22213	484001	37596
EGLN3	129521	553215	6338	447470	27700	NRXN3	021645	555387	14276	451393	32626	TRIM15	235960	427091	22214	411683	37597
EGLN3	129521	556785	6339	N/A		NRXN3	021645	555073	14277	N/A		TRIM15	235960	444157	22215	412755	37598
EGLN3	129521	487915	6340	451316	27701	NRXN3	021645	553803	14278	N/A		TRIM15	235960	498654	22216	N/A	
EGLN3	129521	547327	6341	446572	27702	NRXN3	021645	556003	14279	N/A		TRIM15	235960	465041	22217	N/A	
EGLN3	129521	550114	6342	N/A		NRXN3	021645	335750	14280	338349	32627	TRIM15	235960	550694	22218	450011	37599
EGLN3	129521	551935	6343	N/A		NT5DC2	168268	463947	14281	418780	32628	TRIM15	224145	430090	22219	398224	37600
EGLN3	129521	548285	6344	N/A		NT5DC2	168268	479024	14282	N/A		TRIM15	224145	440260	22220	402326	37601
EGLN3	129521	546681	6345	N/A		NT5DC2	168268	307076	14283	302468	32629	TRIM15	224145	469125	22221	N/A	
EGLN3	129521	464521	6346	N/A		NT5DC2	168268	422318	14284	406933	32630	TRIM15	224145	473556	22222	N/A	
EGLN3	129521	557521	6347	N/A		NT5DC2	168268	462261	14285	N/A		TRIM15	224145	546888	22223	447004	37602
EGR1	120738	239938	6348	239938	27703	NT5DC2	168268	459839	14286	419547	32631	TRIM15	224145	552836	22224	449617	37603
EGR3	179388	317216	6349	318057	27704	NT5DC2	168268	492555	14287	419774	32632	TRIM15	235259	414873	22225	415480	37604
EGR3	179388	522910	6350	430310	27705	NT5DC2	168268	469616	14288	N/A		TRIM15	235259	425255	22226	391673	37605
EGR3	179388	519492	6351	429370	27706	NT5DC2	168268	466112	14289	N/A		TRIM15	235259	485505	22227	N/A	
EGR3	179388	524088	6352	N/A		NT5DC2	168268	478091	14290	N/A		TRIM15	235259	479130	22228	N/A	
EGR3	179388	518773	6353	N/A		NT5DC2	168268	489316	14291	417269	32633	TRIM15	235259	552062	22229	448307	37606

EHD3	013016	322054	6354	327116	27707	NT5DC2	168268	486792	14292	N/A		TRIM2	109654	491446	22230	N/A	
EIF2AK3	172071	419748	6355	408325	27708	NT5DC2	168268	471522	14293	418583	32634	TRIM2	109654	441616	22231	400879	37607
EIF2AK3	172071	303236	6356	307235	27709	NT5DC2	168268	487779	14294	N/A		TRIM2	109654	437508	22232	415812	37608
EIF2AK3	172071	415570	6357	412076	27710	NT5DC2	168268	490681	14295	N/A		TRIM2	109654	496978	22233	N/A	
EIF2AK3	172071	470706	6358	N/A		NT5E	135318	369646	14296	358660	32635	TRIM2	109654	479711	22234	N/A	
EIF2AK3	172071	478003	6359	N/A		NT5E	135318	257770	14297	257770	32636	TRIM2	109654	494872	22235	488229	37609
EIF2AK3	172071	477083	6360	N/A		NT5E	135318	416334	14298	414674	32637	TRIM2	109654	338700	22236	339659	37610
EIF2S3	130741	253039	6361	253039	27711	NT5E	135318	437581	14299	387630	32638	TRIM2	109654	632856	22237	487836	37611
EIF2S3	130741	487075	6362	N/A		NT5E	135318	369651	14300	358665	32639	TRIM2	109654	502281	22238	488602	37612
EIF2S3	130741	423068	6363	391383	27712	NTF3	185652	535299	14301	N/A		TRIM2	109654	482578	22239	487750	37613
EIF2S3	130741	460032	6364	N/A		NTF3	185652	423158	14302	397297	32640	TRIM2	109654	433687	22240	400375	37614
EIF2S3	130741	457332	6365	N/A		NTF3	185652	543548	14303	N/A		TRIM2	109654	460908	22241	488751	37615
EIF4A3	141543	269349	6366	269349	27713	NTF3	185652	331010	14304	328738	32641	TRIM26	230230	493978	22242	N/A	
EIF4A3	141543	575978	6367	N/A		NTF3	185652	544836	14305	N/A		TRIM26	230230	438908	22243	409182	37616
EIF4A3	141543	570625	6368	N/A		NTF3	185652	541234	14306	N/A		TRIM26	230230	455000	22244	392805	37617
EIF4A3	141543	576573	6369	N/A		NTM	182667	436745	14307	409221	32642	TRIM26	230230	436219	22245	390258	37618
EIF4A3	141543	575668	6370	N/A		NTM	182667	477098	14308	N/A		TRIM26	230230	446196	22246	402135	37619
EIF4A3	141543	570837	6371	N/A		NTM	182667	550167	14309	448104	32643	TRIM26	230230	451189	22247	393753	37620
EIF4A3	141543	576547	6372	460439	27714	NTM	182667	416661	14310	400205	32644	TRIM26	230230	422881	22248	412641	37621
EIF4A3	141543	575957	6373	N/A		NTM	182667	463395	14311	N/A		TRIM26	230230	435387	22249	405923	37622
ELAVL2	107105	380110	6374	369453	27715	NTM	182667	498764	14312	N/A		TRIM26	230230	475230	22250	N/A	
ELAVL2	107105	223951	6375	223951	27716	NTM	182667	470371	14313	N/A		TRIM26	231002	469107	22251	N/A	
ELAVL2	107105	380117	6376	369460	27717	NTM	182667	374786	14314	363918	32645	TRIM26	231002	450392	22252	394421	37623
ELAVL2	107105	423281	6377	391757	27718	NTM	182667	479431	14315	N/A		TRIM26	231002	415923	22253	415755	37624
ELAVL2	107105	440102	6378	412602	27719	NTM	182667	425719	14316	396722	32646	TRIM26	231002	428486	22254	414248	37625
ELAVL2	107105	462649	6379	N/A		NTM	182667	374784	14317	363916	32647	TRIM26	231002	446540	22255	391602	37626
ELAVL2	107105	397312	6380	380479	27720	NTM	182667	467255	14318	N/A		TRIM26	231002	450103	22256	416276	37627
ELAVL2	107105	544538	6381	440998	27721	NTM	182667	496094	14319	N/A		TRIM26	231002	433361	22257	391031	37628
ELAVL3	196361	359227	6382	352162	27722	NTM	182667	474900	14320	N/A		TRIM26	231002	431641	22258	388005	37629
ELAVL3	196361	438662	6383	390878	27723	NTM	182667	482316	14321	N/A		TRIM26	231002	477569	22259	N/A	
ELAVL3	196361	588853	6384	467314	27724	NTM	182667	490356	14322	N/A		TRIM26	231641	425831	22260	394371	37630
ELAVL3	196361	592218	6385	N/A		NTM	182667	457381	14323	387984	32648	TRIM26	231641	432326	22261	407876	37631
ELAVL4	162374	371827	6386	360892	27725	NTM	182667	483174	14324	N/A		TRIM26	231641	438384	22262	416737	37632
ELAVL4	162374	463650	6387	N/A		NTM	182667	496198	14325	N/A		TRIM26	231641	464955	22263	N/A	
ELAVL4	162374	357083	6388	349594	27726	NTM	182667	539799	14326	437668	32649	TRIM26	231641	449136	22264	389386	37633
ELAVL4	162374	371824	6389	360889	27727	NTM	182667	427481	14327	416320	32650	TRIM26	231641	419401	22265	405710	37634
ELAVL4	162374	371823	6390	360888	27728	NTM	182667	374791	14328	363923	32651	TRIM26	231641	481596	22266	N/A	
ELAVL4	162374	371821	6391	360886	27729	NTN1	065320	173229	14329	173229	32652	TRIM26	231641	445457	22267	403765	37635
ELAVL4	162374	371819	6392	360884	27730	NTN1	065320	436734	14330	389375	32653	TRIM26	231641	424124	22268	400655	37636
ELAVL4	162374	494555	6393	N/A		NTN4	074527	343702	14331	340998	32654	TRIM26	234127	480999	22269	N/A	
ELAVL4	162374	492299	6394	N/A		NTN4	074527	344911	14332	339436	32655	TRIM26	234127	437089	22270	395491	37637
ELAVL4	162374	474675	6395	N/A		NTN4	074527	538383	14333	444432	32656	TRIM26	234127	454678	22271	410446	37638
ELAVL4	162374	448907	6396	399939	27731	NTN4	074527	553059	14334	447292	32657	TRIM26	234127	453195	22272	391879	37639
ELF2	109381	379549	6397	368867	27732	NTN4	074527	550074	14335	N/A		TRIM26	234127	416596	22273	413673	37640
ELF2	109381	379550	6398	368868	27733	NTN4	074527	552603	14336	N/A		TRIM26	234127	418026	22274	387530	37641
ELF2	109381	514606	6399	N/A		NTN4	074527	547980	14337	447594	32658	TRIM26	234127	434785	22275	400920	37642
ELF2	109381	504314	6400	N/A		NTNG1	162631	370074	14338	359091	32659	TRIM26	234127	487829	22276	N/A	
ELF2	109381	514577	6401	N/A		NTNG1	162631	370068	14339	359085	32660	TRIM26	137313	463977	22277	N/A	
ELF2	109381	512627	6402	426087	27734	NTNG1	162631	294649	14340	N/A		TRIM26	137313	383607	22278	373102	37643
ELF2	109381	515489	6403	N/A		NTNG1	162631	370067	14341	359084	32661	TRIM26	137313	327357	22279	331131	37644
ELF2	109381	511006	6404	N/A		NTNG1	162631	462149	14342	N/A		TRIM26	137313	396558	22280	379806	37645
ELF2	109381	511184	6405	421278	27735	NTNG1	162631	370076	14343	N/A		TRIM26	137313	412755	22281	390908	37646
ELF2	109381	420916	6406	397796	27736	NTNG1	162631	370066	14344	359083	32662	TRIM26	137313	419171	22282	412165	37647
ELF2	109381	510408	6407	426997	27737	NTNG1	162631	370065	14345	359082	32663	TRIM26	137313	427612	22283	405526	37648
ELF2	109381	358635	6408	351458	27738	NTNG1	162631	477948	14346	N/A		TRIM26	137313	461313	22284	N/A	
ELF2	109381	394235	6409	377782	27739	NTNG1	162631	370071	14347	359088	32664	TRIM26	234046	472707	22285	N/A	
ELFN1	225968	424383	6410	456548	27740	NTNG1	162631	370073	14348	359090	32665	TRIM26	234046	422349	22286	396188	37649
ELFN1	225968	561626	6411	457193	27741	NTNG2	196358	393229	14349	376921	32666	TRIM26	234046	445259	22287	407294	37650
ELMO1	155849	396045	6412	379360	27742	NTNG2	196358	490694	14350	N/A		TRIM26	234046	427535	22288	398545	37651

ELMO1	155849	310758	6413	312185	27743	NTNG2	196358	483055	14351	N/A		TRIM26	234046	423901	22289	395820	37652
ELMO1	155849	396040	6414	379355	27744	NTNG2	196358	372179	14352	361252	32667	TRIM26	234046	444979	22290	403395	37653
ELMO1	155849	442504	6415	406952	27745	NTSR1	101188	370501	14353	359532	32668	TRIM26	234046	415789	22291	407035	37654
ELMO1	155849	497024	6416	N/A		NTSR1	101188	482259	14354	N/A		TRIM26	234046	447942	22292	396089	37655
ELMO1	155849	487843	6417	N/A		NTSR2	169006	306928	14355	303686	32669	TRIM26	234046	477353	22293	N/A	
ELMO1	155849	448602	6418	394458	27746	NUDC	090273	435827	14356	404020	32670	TRIM26	226060	487616	22294	N/A	
ELMO1	155849	464262	6419	N/A		NUDC	090273	321265	14357	319664	32671	TRIM26	226060	433314	22295	402395	37656
ELMO1	155849	420636	6420	396465	27747	NUDC	090273	452707	14358	400981	32672	TRIM26	226060	447711	22296	408233	37657
ELMO1	155849	472359	6421	N/A		NUDC	090273	484772	14359	N/A		TRIM26	226060	456093	22297	406707	37658
ELMO1	155849	433246	6422	413108	27748	NUDCD3	015676	355451	14360	347626	32673	TRIM26	226060	438785	22298	397048	37659
ELMO1	155849	487336	6423	N/A		NUDCD3	015676	487118	14361	N/A		TRIM26	226060	415966	22299	402684	37660
ELMO1	155849	424212	6424	395933	27749	NUDCD3	015676	460110	14362	N/A		TRIM26	226060	433836	22300	402990	37661
ELMO1	155849	455119	6425	406610	27750	NUDCD3	015676	475952	14363	N/A		TRIM26	226060	429583	22301	393827	37662
ELMO1	155849	455879	6426	416090	27751	NUDCD3	015676	338427	14364	N/A		TRIM26	226060	486529	22302	N/A	
ELMO1	155849	463390	6427	N/A		NUDCD3	015676	493613	14365	N/A		TRIM26	228881	425523	22303	393011	37663
ELMO1	155849	453399	6428	391734	27752	NUDCD3	015676	472246	14366	N/A		TRIM26	228881	439094	22304	389203	37664
ELMO1	155849	445322	6429	397857	27753	NUDCD3	015676	464812	14367	N/A		TRIM26	228881	456770	22305	415328	37665
ELMO1	155849	479447	6430	N/A		NUDCD3	015676	478769	14368	N/A		TRIM26	228881	471458	22306	N/A	
ELMO2	062598	290246	6431	290246	27754	NUDCD3	015676	480209	14369	N/A		TRIM26	228881	422802	22307	412838	37666
ELMO2	062598	467800	6432	431972	27755	NUDCD3	015676	497978	14370	N/A		TRIM26	228881	453442	22308	416664	37667
ELMO2	062598	372176	6433	361249	27756	NUDT4	173598	337179	14371	338352	32674	TRIM26	228881	484938	22309	N/A	
ELMO2	062598	452857	6434	414329	27757	NUDT4	173598	415493	14372	406612	32675	TRIM26	228881	440149	22310	403887	37668
ELMO2	062598	352077	6435	326172	27758	NUDT4	173598	550056	14373	448504	32676	TRIM26	228881	438064	22311	405791	37669
ELMO2	062598	464448	6436	N/A		NUDT4	173598	549992	14374	449552	32677	TRIM5	132256	380034	22312	369373	37670
ELMO2	062598	425546	6437	388962	27759	NUDT4	173598	548662	14375	449724	32678	TRIM5	132256	380027	22313	369366	37671
ELMO2	062598	462491	6438	N/A		NUDT4	173598	547014	14376	448032	32679	TRIM5	132256	433961	22314	393052	37672
ELMO2	062598	481852	6439	N/A		NUDT4	173598	546925	14377	448620	32680	TRIM5	132256	396847	22315	380058	37673
ELMO2	062598	488853	6440	N/A		NUMBL	105245	252891	14378	252891	32681	TRIM5	132256	438025	22316	398196	37674
ELMO2	062598	450812	6441	416181	27760	NUMBL	105245	598779	14379	472400	32682	TRIM5	132256	483835	22317	N/A	
ELMO2	062598	480042	6442	N/A		NUMBL	105245	540131	14380	442759	32683	TRIM5	132256	492086	22318	N/A	
ELMO2	062598	469801	6443	N/A		NUMBL	105245	600967	14381	469310	32684	TRIM5	132256	465634	22319	N/A	
ELMO2	062598	460474	6444	N/A		NUMBL	105245	593367	14382	N/A		TRIM5	132256	487241	22320	N/A	
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ELMO2	062598	487583	6446	N/A		NUMBL	105245	595741	14384	470794	32686	TRIM5	132256	419850	22322	388150	37676
ELMO2	062598	462593	6447	N/A		NUMBL	105245	599786	14385	N/A		TRIM36	152503	282369	22323	282369	37677
ELMO2	062598	396391	6448	379673	27761	NUMBL	105245	600636	14386	471376	32687	TRIM36	152503	513154	22324	423934	37678
ELMOD1	110675	531234	6449	433232	27762	NUMBL	105245	599594	14387	N/A		TRIM36	152503	514154	22325	424259	37679
ELMOD1	110675	265840	6450	265840	27763	NUMBL	105245	598759	14388	N/A		TRIM36	152503	513485	22326	N/A	
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ELMOD1	110675	524378	6452	N/A		NUP58	139496	481980	14390	418341	32689	TRIM36	152503	510222	22328	N/A	
ELMOD1	110675	529675	6453	N/A		NUP58	139496	480187	14391	N/A		TRIM36	152503	508894	22329	424743	37680
ELMOD1	110675	527036	6454	N/A		NUP58	139496	460326	14392	N/A		TRIM36	152503	379618	22330	368938	37681
ELMOD1	110675	534236	6455	N/A		NUP58	139496	465068	14393	418904	32690	TRIM36	152503	511701	22331	N/A	
ELN	049540	445912	6456	389857	27765	NUP58	139496	490231	14394	418244	32691	TRIM36	152503	379617	22332	368937	37682
ELN	049540	252034	6457	252034	27766	NUP58	139496	463407	14395	418555	32692	TRIM59	213186	543469	22333	444313	37683
ELN	049540	431562	6458	394549	27767	NUP58	139496	466694	14396	N/A		TRIM59	213186	468542	22334	420451	37684
ELN	049540	320492	6459	315607	27768	NUP58	139496	381718	14397	371137	32693	TRIM59	213186	494486	22335	417605	37685
ELN	049540	438906	6460	406949	27769	NUP58	139496	495460	14398	N/A		TRIM59	213186	471155	22336	418699	37686
ELN	049540	494160	6461	N/A		NUP58	139496	381747	14399	371166	32694	TRIM59	213186	496222	22337	418856	37687
ELN	049540	492003	6462	N/A		NUP58	139496	394327	14400	408147	32695	TRIM59	213186	471396	22338	420520	37688
ELN	049540	468517	6463	N/A		NUP58	139496	476553	14401	N/A		TRIM59	213186	479460	22339	417081	37689
ELN	049540	438880	6464	389206	27770	NUP58	139496	477876	14402	N/A		TRIM59	213186	309784	22340	311219	37690
ELN	049540	414324	6465	392575	27771	NUP62CL	198088	372466	14403	361544	32696	TRIM62	116525	291416	22341	291416	37691
ELN	049540	380562	6466	369936	27772	NUP62CL	198088	484614	14404	433269	32697	TRIM62	116525	543586	22342	441173	37692
ELN	049540	480728	6467	N/A		NUP62CL	198088	432145	14405	408612	32698	TRIM62	116525	485148	22343	N/A	
ELN	049540	380575	6468	369949	27773	NUP62CL	198088	421752	14406	405906	32699	TRIM62	116525	486583	22344	N/A	
ELN	049540	380584	6469	369958	27774	NUP93	102900	308159	14407	310668	32700	TRIM67	119283	444294	22345	412124	37693
ELN	049540	458204	6470	403162	27775	NUP93	102900	563858	14408	455230	32701	TRIM67	119283	449018	22346	400163	37694
ELN	049540	357036	6471	349540	27776	NUP93	102900	566315	14409	456264	32702	TRIM67	119283	366653	22347	355613	37695

ELN	049540	462506	6472	N/A		NUP93	102900	569842	14410	458101	32703	TP53I11	175274	354556	22348	346564	37696
ELN	049540	479432	6473	N/A		NUP93	102900	569863	14411	454587	32704	TP53I11	175274	395648	22349	379009	37697
ELN	049540	417091	6474	411092	27777	NUP93	102900	562496	14412	457902	32705	TP53I11	175274	533940	22350	436152	37698
ELN	049540	429192	6475	391129	27778	NUP93	102900	568656	14413	454285	32706	TP53I11	175274	525680	22351	433474	37699
ELN	049540	416107	6476	404138	27779	NUP93	102900	566678	14414	454935	32707	TP53I11	175274	532253	22352	437243	37700
ELN	049540	442310	6477	403961	27780	NUP93	102900	564887	14415	458039	32708	TP53I11	175274	524774	22353	N/A	
ELN	049540	380553	6478	369926	27781	NUP93	102900	569595	14416	N/A		TP53I11	175274	528473	22354	433454	37701
ELN	049540	380576	6479	369950	27782	NUP93	102900	566727	14417	N/A		TP53I11	175274	528290	22355	437258	37702
ELN	049540	473523	6480	N/A		NUP93	102900	567641	14418	455210	32709	TP53I11	175274	533955	22356	N/A	
ELN	049540	428787	6481	399499	27783	NUP93	102900	568283	14419	454844	32710	TP53I11	175274	531130	22357	N/A	
ELN	049540	320399	6482	313565	27784	NUP93	102900	567081	14420	455181	32711	TP53I11	175274	531928	22358	475501	37703
ELN	049540	419398	6483	412262	27785	NUP93	102900	542526	14421	440235	32712	TP53I11	175274	525667	22359	N/A	
ELN	049540	477397	6484	N/A		NUP93	102900	563437	14422	N/A		TP53I11	175274	532921	22360	N/A	
ELN	049540	493839	6485	N/A		NUP93	102900	563405	14423	458078	32713	TP53I11	175274	525145	22361	435800	37704
ELN	049540	466878	6486	N/A		NUP93	102900	563486	14424	456196	32714	TP53I11	175274	525683	22362	434461	37705
ELN	049540	492210	6487	N/A		NUP93	102900	569322	14425	457907	32715	TP53I11	175274	525138	22363	435739	37706
ELN	049540	621115	6488	480955	27786	NUP93	102900	564278	14426	N/A		TP53I11	175274	533443	22364	437284	37707
ELN	049540	358929	6489	351807	27787	NUP93	102900	563465	14427	N/A		TP53I11	175274	530035	22365	432089	37708
ELOVL1	066322	372458	6490	361536	27788	NWD1	188039	518676	14428	428224	32716	TP53I11	175274	527685	22366	431556	37709
ELOVL1	066322	468865	6491	N/A		NWD1	188039	524140	14429	428579	32717	TP53I11	175274	533937	22367	432926	37710
ELOVL1	066322	464204	6492	N/A		NWD1	188039	549814	14430	447548	32718	TP53I11	175274	616990	22368	481456	37711
ELOVL1	066322	470968	6493	N/A		NWD1	188039	438489	14431	400248	32719	TP53I11	175274	308212	22369	309532	37712
ELOVL1	066322	487209	6494	N/A		NWD1	188039	552788	14432	447224	32720	TP53I11	175274	627720	22370	486799	37713
ELOVL1	066322	470769	6495	N/A		NWD1	188039	379808	14433	369136	32721	TRPC3	138741	264811	22371	264811	37714
ELOVL1	066322	497569	6496	N/A		NXN	280563	627023	14434	N/A		TRPC3	138741	379645	22372	368966	37715
ELOVL1	066322	482302	6497	N/A		NXN	280563	626807	14435	N/A		TRPC3	138741	506449	22373	423866	37716
ELOVL1	066322	497050	6498	N/A		NXN	280563	628478	14436	486232	32722	TRPC3	138741	513531	22374	426899	37717
ELOVL1	066322	478481	6499	N/A		NXN	167693	575801	14437	461038	32723	TRPC3	138741	502968	22375	422214	37718
ELOVL1	066322	479439	6500	N/A		NXN	167693	336868	14438	337443	32724	TRPC5	072315	262839	22376	262839	37719
ELOVL1	066322	465321	6501	N/A		NXN	167693	571281	14439	N/A		TRPC6	137672	344327	22377	340913	37720
ELOVL1	066322	479686	6502	N/A		NXN	167693	571684	14440	461562	32725	TRPC6	137672	532133	22378	435574	37721
ELOVL1	066322	496932	6503	N/A		NXN	167693	537628	14441	446446	32726	TRPC6	137672	348423	22379	343672	37722
ELOVL1	066322	621943	6504	477602	27789	NXN	167693	574018	14442	N/A		TRPC6	137672	360497	22380	353687	37723
ELOVL1	066322	413844	6505	416024	27790	NXN	167693	575455	14443	N/A		TRPC6	137672	532184	22381	N/A	
ELOVL2	197977	354666	6506	346693	27791	NXN	167693	577098	14444	N/A		TRPC6	137672	527240	22382	N/A	
ELOVL5	012660	304434	6507	306640	27792	NXN	167693	571338	14445	N/A		TRPC6	137672	526713	22383	N/A	
ELOVL5	012660	485336	6508	N/A		NXN	167693	575171	14446	N/A		TRPC7	069018	502753	22384	424854	37724
ELOVL5	012660	465983	6509	N/A		NXN	167693	576991	14447	N/A		TRPC7	069018	378459	22385	367720	37725
ELOVL5	012660	486973	6510	N/A		NXN	167693	571080	14448	N/A		TRPC7	069018	352189	22386	330322	37726
ELOVL5	012660	370913	6511	359951	27793	NXN	281300	628640	14449	N/A		TRPC7	069018	514963	22387	426870	37727
ELOVL5	012660	370918	6512	359956	27794	NXN	281300	629250	14450	N/A		TRPC7	069018	513104	22388	426070	37728
ELOVL5	012660	542638	6513	440728	27795	NXN	281300	627182	14451	485976	32727	TRPC7	069018	509288	22389	N/A	
ELOVL7	164181	508821	6514	424123	27796	NXNL2	130045	487646	14452	N/A		TRPC7	069018	503275	22390	421571	37729
ELOVL7	164181	505959	6515	421043	27797	NXNL2	130045	375855	14453	365015	32728	TRPM2	142185	300482	22391	300482	37730
ELOVL7	164181	504455	6516	425127	27798	NXNL2	130045	478686	14454	N/A		TRPM2	142185	431901	22392	393982	37731
ELOVL7	164181	511799	6517	424081	27799	NXNL2	130045	375854	14455	365014	32729	TRPM2	142185	397928	22393	381023	37732
ELOVL7	164181	507047	6518	426400	27800	NXNL2	130045	618633	14456	480855	32730	TRPM2	142185	397932	22394	381026	37733
ELOVL7	164181	514809	6519	422602	27801	NXPE3	144815	495842	14457	418381	32731	TRPM2	142185	300481	22395	300481	37734
ELOVL7	164181	425382	6520	402634	27802	NXPE3	144815	273347	14458	273347	32732	TRPM2	142185	498430	22396	N/A	
EME2	197774	568449	6521	457353	27803	NXPE3	144815	474165	14459	419667	32733	TRPM2	142185	490982	22397	N/A	
EME2	197774	570069	6522	N/A		NXPE3	144815	491511	14460	417485	32734	TRPM2	142185	621064	22398	477514	37735
EME2	197774	561564	6523	N/A		NXPE3	144815	487830	14461	N/A		TRPV3	167723	381913	22399	371338	37736
EME2	197774	565326	6524	N/A		NXPE3	144815	477909	14462	418369	32735	TRPV3	167723	577016	22400	460856	37737
EME2	197774	561903	6525	457966	27804	NXPE3	144815	616286	14463	478069	32736	TRPV3	167723	301365	22401	301365	37738
EME2	197774	564182	6526	456946	27805	NYAP2	144460	636099	14464	490942	32737	TRPV3	167723	571139	22402	458187	37739
EMILIN2	132205	254528	6527	254528	27806	NYAP2	144460	272907	14465	272907	32738	TRPV3	167723	573539	22403	458239	37740
EMILIN2	132205	308080	6528	N/A		NYX	188937	342595	14466	340328	32739	TRPV3	167723	576742	22404	461518	37741
EMILIN2	132205	583776	6529	N/A		NYX	188937	378220	14467	367465	32740	TRPV3	167723	572519	22405	460215	37742
EML5	165521	554922	6530	451998	27807	NYX	188937	486842	14468	N/A		TRPV3	167723	571005	22406	N/A	

EML5	165521	553973	6531	N/A		OAT	065154	368845	14469	357838	32741	TRPV3	167723	575865	22407	N/A	
EML5	165521	553526	6532	450965	27808	OAT	065154	471127	14470	N/A		TRPV3	167723	574773	22408	N/A	
EML5	165521	380664	6533	370039	27809	OAT	065154	467675	14471	N/A		TRPV3	167723	616411	22409	483947	37743
EML5	165521	555823	6534	452030	27810	OAT	065154	483711	14472	N/A		TRPV6	165125	359396	22410	352358	37744
EML5	165521	553320	6535	N/A		OAT	065154	476917	14473	N/A		TRPV6	165125	485138	22411	N/A	
EML5	165521	553281	6536	452360	27811	OAT	065154	490096	14474	N/A		TRPV6	165125	615386	22412	N/A	
EML5	165521	553962	6537	N/A		OAT	065154	492376	14475	N/A		TRPV6	165125	619250	22413	N/A	
EMP2	213853	359543	6538	352540	27812	OAT	065154	539214	14476	439042	32742	TRPV6	165125	436401	22414	411100	37745
EMP2	213853	536829	6539	445712	27813	OGDHL	197444	374103	14477	363216	32743	TRPV6	165125	474388	22415	N/A	
EMP2	213853	342147	6540	N/A		OGDHL	197444	490844	14478	N/A		TRPV6	165125	489123	22416	N/A	
EN2	164778	297375	6541	297375	27814	OGDHL	197444	496884	14479	N/A		TRPV6	165125	431833	22417	415917	37746
ENAH	154380	366844	6542	355809	27815	OGDHL	197444	471460	14480	N/A		TRPV6	165125	638686	22418	492723	37747
ENAH	154380	358675	6543	N/A		OGDHL	197444	419399	14481	401356	32744	TRPV6	276971	611485	22419	479828	37748
ENAH	154380	635051	6544	489607	27816	OGDHL	197444	432695	14482	390240	32745	TRPV6	276971	632381	22420	N/A	
ENAH	154380	366843	6545	355808	27817	OLFM1	130558	371799	14483	360864	32746	TRPV6	276971	632455	22421	N/A	
ENAH	154380	498108	6546	N/A		OLFM1	130558	277415	14484	277415	32747	TRPV6	276971	632330	22422	N/A	
ENAH	154380	483952	6547	N/A		OLFM1	130558	252854	14485	252854	32748	TRPV6	276971	632149	22423	N/A	
ENAH	154380	497899	6548	489106	27818	OLFM1	130558	371801	14486	360866	32749	TRPV6	276971	633318	22424	488490	37749
ENAH	154380	391874	6549	N/A		OLFM1	130558	339720	14487	340318	32750	TRPV6	276971	631384	22425	N/A	
ENAH	154380	284563	6550	284563	27819	OLFM1	130558	371796	14488	360861	32751	TRPV6	276971	634074	22426	N/A	
ENC1	171617	302351	6551	306356	27820	OLFM1	130558	539529	14489	444296	32752	TRPV6	276971	633826	22427	487762	37750
ENC1	171617	510316	6552	423804	27821	OLFM1	130558	392991	14490	376717	32753	TSC22D2	196428	361875	22428	354543	37751
ENC1	171617	509284	6553	N/A		OLFM1	130558	371793	14491	360858	32754	TSC22D2	196428	480589	22429	418149	37752
ENC1	171617	508331	6554	422943	27822	OLFM1	130558	539877	14492	443806	32755	TSC22D2	196428	466814	22430	417747	37753
ENC1	171617	509127	6555	426889	27823	OLFM1	130558	545657	14493	437906	32756	TSC22D2	196428	485421	22431	420689	37754
ENC1	171617	537006	6556	446289	27824	OLFM1	130558	483042	14494	N/A		TSC22D2	196428	492828	22432	N/A	
ENC1	171617	618628	6557	479101	27825	OLFM2	105088	264833	14495	264833	32757	TSC22D2	196428	460316	22433	N/A	
ENOX1	120658	261488	6558	261488	27826	OLFM2	105088	590841	14496	464877	32758	TSC22D3	157514	372390	22434	361466	37755
ENOX1	120658	482207	6559	N/A		OLFM2	105088	592448	14497	466018	32759	TSC22D3	157514	372397	22435	361474	37756
ENPP1	197594	486853	6560	N/A		OLFM2	105088	593091	14498	465809	32760	TSC22D3	157514	315660	22436	314655	37757
ENPP1	197594	360971	6561	354238	27827	OLFM2	105088	590410	14499	N/A		TSC22D3	157514	372383	22437	361458	37758
ENPP1	197594	513998	6562	422424	27828	OLFM3	118733	338858	14500	345192	32761	TSC22D3	157514	372384	22438	361459	37759
ENPP1	197594	459624	6563	N/A		OLFM3	118733	465523	14501	N/A		TSC22D3	157514	372382	22439	361457	37760
ENPP2	136960	259486	6564	259486	27829	OLFM3	118733	370103	14502	359121	32762	TSC22D3	157514	506081	22440	427427	37761
ENPP2	136960	427067	6565	403315	27830	OLFM3	118733	462354	14503	N/A		TSC22D3	157514	514426	22441	421016	37762
ENPP2	136960	523861	6566	N/A		OLFM3	118733	468901	14504	N/A		TSC22D3	157514	486554	22442	425414	37763
ENPP2	136960	522167	6567	429476	27831	OLFM3	118733	536598	14505	443471	32763	TSC22D3	157514	503515	22443	422060	37764
ENPP2	136960	522826	6568	428291	27832	OLIG1	184221	382348	14506	371785	32764	TSC22D3	157514	514897	22444	427199	37765
ENPP2	136960	075322	6569	075322	27833	OLIG1	184221	426947	14507	414840	32765	TSC22D3	157514	480691	22445	425155	37766
ENPP2	136960	518109	6570	N/A		OLIG1	184221	498799	14508	N/A		TSC22D3	157514	510887	22446	422636	37767
ENPP2	136960	520066	6571	428304	27834	OLIG2	205927	382357	14509	371794	32766	TSC22D3	157514	502650	22447	424653	37768
ENPP2	136960	518958	6572	429447	27835	OLIG2	205927	430860	14510	391183	32767	TSC22D3	157514	506724	22448	427075	37769
ENPP4	001561	321037	6573	318066	27836	OLIG2	205927	333337	14511	331040	32768	TSC22D3	157514	505965	22449	425158	37770
ENPP6	164303	296741	6574	296741	27837	OLIG2	205927	382357	14512	371794	32769	TSC22D3	157514	502961	22450	422228	37771
ENPP6	164303	510054	6575	N/A		OLIG2	205927	430860	14513	391183	32770	TSHB	134200	369517	22451	358530	37772
ENPP6	164303	512353	6576	423497	27838	OLIG2	205927	333337	14514	331040	32771	TSHB	134200	256592	22452	256592	37773
ENPP6	164303	505644	6577	N/A		ONECUT1	169856	305901	14515	302630	32772	TSHZ2	182463	371497	22453	360552	37774
ENTPD2	054179	355097	6578	347213	27839	ONECUT1	169856	561401	14516	N/A		TSHZ2	182463	603338	22454	475114	37775
ENTPD2	054179	460614	6579	N/A		ONECUT1	169856	560699	14517	453718	32773	TSHZ2	182463	605656	22455	474159	37776
ENTPD2	054179	312665	6580	312494	27840	ONECUT1	169856	570208	14518	476168	32774	TSHZ2	182463	626626	22456	487408	37777
ENTPD2	054179	469106	6581	N/A		ONECUT2	119547	491143	14519	419185	32775	TSHZ2	182463	329613	22457	333114	37778
EPB41L1	088367	202028	6582	202028	27841	ONECUT2	119547	481727	14520	N/A		TSIX	270641	604411	22458	N/A	
EPB41L1	088367	432589	6583	393106	27842	OPALIN	197430	371172	14521	360214	32776	TSPAN11	110900	545802	22459	443890	37779
EPB41L1	088367	406771	6584	385244	27843	OPALIN	197430	611913	14522	484599	32777	TSPAN11	110900	546076	22460	437403	37780
EPB41L1	088367	430276	6585	404341	27844	OPALIN	197430	393871	14523	377449	32778	TSPAN11	110900	535215	22461	445503	37781
EPB41L1	088367	373950	6586	363061	27845	OPALIN	197430	536387	14524	445125	32779	TSPAN11	110900	261177	22462	261177	37782
EPB41L1	088367	628415	6587	487049	27846	OPALIN	197430	419479	14525	398025	32780	TSPAN14	108219	429989	22463	396270	37783
EPB41L1	088367	452261	6588	413262	27847	OPALIN	197430	393870	14526	377448	32781	TSPAN14	108219	481124	22464	418195	37784
EPB41L1	088367	447825	6589	396366	27848	OPHN1	079482	355520	14527	347710	32782	TSPAN14	108219	372157	22465	361230	37785

EPB41L1	088367	427533	6590	408877	27849	OPHN1	079482	484842	14528	N/A		TSPAN14	108219	469149	22466	N/A	
EPB41L1	088367	373945	6591	363056	27850	OPHN1	079482	467444	14529	N/A		TSPAN14	108219	372164	22467	361237	37786
EPB41L1	088367	338074	6592	337168	27851	OPHN1	079482	486068	14530	N/A		TSPAN14	108219	372158	22468	361231	37787
EPB41L1	088367	373941	6593	363052	27852	OPHN1	079482	491714	14531	N/A		TSPAN14	108219	341863	22469	344076	37788
EPB41L1	088367	451082	6594	406464	27853	OPLAH	178814	618853	14532	480476	32783	TSPAN14	108219	372156	22470	361229	37789
EPB41L1	088367	454226	6595	388281	27854	OPLAH	178814	527993	14533	N/A		TSPAN14	108219	265450	22471	N/A	
EPB41L1	088367	636016	6596	489867	27855	OPLAH	178814	531027	14534	N/A		TSPAN14	108219	616406	22472	480263	37790
EPB41L1	088367	479336	6597	N/A		OPLAH	178814	567871	14535	481640	32784	TSPAN15	099282	373290	22473	362387	37791
EPB41L1	088367	432603	6598	390262	27856	OPRD1	116329	234961	14536	234961	32785	TSPAN15	099282	478112	22474	N/A	
EPB41L1	088367	441639	6599	399214	27857	OPRD1	116329	621425	14537	477970	32786	TSPAN15	099282	475069	22475	N/A	
EPB41L1	088367	373946	6600	363057	27858	OPTC	188770	367222	14538	356191	32787	TSPAN15	099282	452130	22476	404528	37792
EPB41L4B	095203	374566	6601	363694	27859	OPTC	188770	448911	14539	399491	32788	TSPAN15	099282	490083	22477	N/A	
EPB41L4B	095203	374557	6602	363685	27860	OSBP	110048	263847	14540	263847	32789	TSPAN15	099282	486093	22478	N/A	
EPHA3	044524	336596	6603	337451	27861	OSBP	110048	525357	14541	432399	32790	TSPAN15	099282	459981	22479	N/A	
EPHA3	044524	452448	6604	399926	27862	OSBP	110048	528903	14542	N/A		TSPAN15	099282	470508	22480	N/A	
EPHA3	044524	494014	6605	419190	27863	OSBPL10	144645	396556	14543	379804	32791	TSPAN18	157570	533786	22481	433592	37793
EPHA4	116106	469354	6606	N/A		OSBPL10	144645	429492	14544	416078	32792	TSPAN18	157570	533202	22482	434625	37794
EPHA4	116106	472696	6607	N/A		OSBPL10	144645	438237	14545	406124	32793	TSPAN18	157570	533080	22483	433362	37795
EPHA4	116106	409854	6608	386276	27864	OSBPL10	144645	469557	14546	N/A		TSPAN18	157570	520358	22484	429993	37796
EPHA4	116106	409938	6609	386829	27865	OSBPL10	144645	467598	14547	N/A		TSPAN18	157570	520999	22485	427942	37797
EPHA4	116106	424339	6610	408145	27866	OSBPL10	144645	472175	14548	N/A		TSPAN18	157570	520837	22486	430343	37798
EPHA4	116106	495693	6611	N/A		OSBPL10	144645	479396	14549	N/A		TSPAN18	157570	518429	22487	429020	37799
EPHA4	116106	443796	6612	395917	27867	OSBPL10	144645	490009	14550	N/A		TSPAN18	157570	519051	22488	N/A	
EPHA4	116106	441679	6613	401405	27868	OSBPL10	144645	467647	14551	N/A		TSPAN18	157570	520245	22489	N/A	
EPHA4	116106	463446	6614	N/A		OSBPL10	144645	428241	14552	399200	32794	TSPAN18	157570	517621	22490	N/A	
EPHA4	116106	415749	6615	391517	27869	OSBPL10	144645	480671	14553	N/A		TSPAN18	157570	521990	22491	N/A	
EPHA4	116106	419964	6616	410158	27870	OSBPL10	144645	485205	14554	N/A		TSPAN18	157570	520278	22492	N/A	
EPHA4	116106	541600	6617	444085	27871	OSBPL10	144645	467955	14555	N/A		TSPAN18	157570	340160	22493	339820	37800
EPHA4	116106	434266	6618	404089	27872	OSBPL10	144645	466604	14556	N/A		TSPAN2	134198	369516	22494	358529	37801
EPHA4	116106	281821	6619	281821	27873	OSBPL10	144645	463504	14557	N/A		TSPAN2	134198	369515	22495	358528	37802
EPHA6	080224	470610	6620	420598	27874	OSBPL10	144645	479173	14558	N/A		TSPAN2	134198	491992	22496	N/A	
EPHA6	080224	389672	6621	374323	27875	OSBPL10	144645	452791	14559	N/A		TSPAN2	134198	433172	22497	415256	37803
EPHA6	080224	506569	6622	425132	27876	OSBPL10	144645	465626	14560	N/A		TSPAN5	168785	508798	22498	421808	37804
EPHA6	080224	503760	6623	421260	27877	OSBPL3	070882	313367	14561	315410	32795	TSPAN5	168785	305798	22499	307701	37805
EPHA6	080224	477384	6624	419470	27878	OSBPL3	070882	409863	14562	386429	32796	TSPAN5	168785	505184	22500	423916	37806
EPHA6	080224	514100	6625	421711	27879	OSBPL3	070882	396431	14563	379708	32797	TSPAN5	168785	511753	22501	N/A	
EPHA6	080224	508345	6626	424638	27880	OSBPL3	070882	409452	14564	386801	32798	TSPAN5	168785	515440	22502	422351	37807
EPHA6	080224	502694	6627	423950	27881	OSBPL3	070882	409759	14565	386325	32799	TSPAN5	168785	509168	22503	N/A	
EPHA6	080224	506349	6628	421353	27882	OSBPL3	070882	487020	14566	N/A		TSPAN5	168785	515287	22504	423504	37808
EPHB1	154928	467013	6629	N/A		OSBPL3	070882	409555	14567	386990	32800	TSPAN5	168785	511651	22505	426248	37809
EPHB1	154928	472904	6630	N/A		OSBPL3	070882	396429	14568	379706	32801	TSPAN5	168785	511800	22506	422548	37810
EPHB1	154928	467708	6631	N/A		OSBPL3	070882	409069	14569	386953	32802	TSPAN5	168785	507167	22507	N/A	
EPHB1	154928	460895	6632	417435	27883	OSBPL3	070882	459987	14570	N/A		TSPAN6	000003	373020	22508	362111	37811
EPHB1	154928	482618	6633	420338	27884	OSBPL3	070882	461835	14571	N/A		TSPAN6	000003	496771	22509	N/A	
EPHB1	154928	398015	6634	381097	27885	OSBPL3	070882	415162	14572	407829	32803	TSPAN6	000003	494424	22510	N/A	
EPHB1	154928	488154	6635	N/A		OSBPL3	070882	441059	14573	403374	32804	TSPAN6	000003	612152	22511	482130	37812
EPHB1	154928	497173	6636	419688	27886	OSBPL3	070882	415952	14574	411249	32805	TSPAN6	000003	614008	22512	482894	37813
EPHB1	154928	473867	6637	417216	27887	OTUD6B	155100	285420	14575	285420	32806	TSPOAP1	005379	581692	22513	N/A	
EPHB1	154928	474732	6638	418352	27888	OTUD6B	155100	522894	14576	428528	32807	TSPOAP1	005379	581675	22514	462518	37814
EPHB1	154928	493838	6639	419574	27889	OTUD6B	155100	524027	14577	N/A		TSPOAP1	005379	268893	22515	268895	37815
EPHB1	154928	488992	6640	N/A		OTUD6B	155100	404789	14578	384190	32808	TSPOAP1	005379	578511	22516	N/A	
EPHB4	196411	360620	6641	353833	27890	OTUD6B	155100	617869	14579	483706	32809	TSPOAP1	005379	343736	22517	345824	37816
EPHB4	196411	358173	6642	350896	27891	OTUD6B	155100	615618	14580	481196	32810	TSPOAP1	005379	577871	22518	N/A	
EPHB4	196411	487222	6643	N/A		OTUD6B-AS1	253738	522817	14581	N/A		TSPOAP1	005379	580669	22519	462822	37817
EPHB4	196411	492403	6644	N/A		OTUD6B-AS1	253738	524003	14582	N/A		TSPOAP1	005379	582679	22520	462710	37818
EPHB4	196411	478459	6645	N/A		OXSR1	172939	492714	14583	N/A		TSPOAP1	005379	578486	22521	N/A	
EPHB4	196411	467515	6646	N/A		OXSR1	172939	446845	14584	415851	32811	TSPOAP1	005379	585149	22522	N/A	

EPHB4	196411	477446	6647	N/A		OXSR1	172939	311806	14585	311713	32812	TSPOAP1	005379	583624	22523	N/A	
EPHB4	196411	489808	6648	N/A		OXSR1	172939	426620	14586	398356	32813	TSTD2	136925	375173	22524	N/A	
EPHB4	196411	492878	6649	N/A		OXSR1	172939	483695	14587	N/A		TSTD2	136925	341170	22525	342499	37819
EPHB4	196411	616502	6650	482702	27892	OXSR1	172939	467900	14588	N/A		TSTD2	136925	375172	22526	364315	37820
EPN1	063245	270460	6651	270460	27893	P2RY1	169860	305097	14589	304767	32814	TSTD2	136925	375165	22527	364308	37821
EPN1	063245	085079	6652	085079	27894	P2RY12	169313	302632	14590	307259	32815	TSTD2	136925	375163	22528	N/A	
EPN1	063245	411543	6653	406209	27895	P2RY12	169313	468596	14591	N/A		TSTD2	136925	484708	22529	N/A	
EPN1	063245	591743	6654	N/A		P4HA1	122884	307116	14592	307318	32816	TTC23L	205838	502782	22530	N/A	
EPN1	063245	586194	6655	N/A		P4HA1	122884	373008	14593	362099	32817	TTC23L	205838	506758	22531	N/A	
EPN1	063245	589704	6656	466593	27896	P4HA1	122884	464310	14594	N/A		TTC23L	205838	505624	22532	422188	37822
EPN1	063245	587937	6657	N/A		P4HA1	122884	440381	14595	414464	32818	TTC23L	205838	508722	22533	424418	37823
EPS15	085832	371730	6658	360795	27897	P4HA1	122884	394890	14596	378353	32819	TTC23L	205838	508377	22534	N/A	
EPS15	085832	371733	6659	360798	27898	P4HA1	122884	263556	14597	263556	32820	TTC23L	205838	514080	22535	N/A	
EPS15	085832	486505	6660	N/A		P4HA2	072682	401867	14598	384999	32821	TTC23L	205838	502674	22536	425242	37824
EPS15	085832	478657	6661	N/A		P4HA2	072682	379086	14599	368379	32822	TTC23L	205838	610313	22537	484792	37825
EPS15	085832	493793	6662	N/A		P4HA2	072682	166534	14600	166534	32823	TTC23L	205838	638320	22538	491000	37826
EPS15	085832	371727	6663	N/A		P4HA2	072682	360568	14601	353772	32824	TTC28	100154	397906	22539	381003	37827
EPS15	085832	464478	6664	N/A		P4HA2	072682	474628	14602	N/A		TTC28	100154	431039	22540	410244	37828
EPS15	085832	471391	6665	N/A		P4HA2	072682	506807	14603	N/A		TTC28	100154	480563	22541	N/A	
EPS15	085832	465467	6666	474739	27899	P4HA2	072682	467587	14604	N/A		TTC28	100154	469670	22542	N/A	
ERBB3	065361	549282	6667	448636	27900	P4HA2	072682	417528	14605	389523	32825	TTC28	100154	442232	22543	388788	37829
ERBB3	065361	549061	6668	449138	27901	P4HA2	072682	431054	14606	391257	32826	TTC28	100154	490475	22544	N/A	
ERBB3	065361	267101	6669	267101	27902	P4HA2	072682	439698	14607	405406	32827	TTC28	100154	468807	22545	N/A	
ERBB3	065361	411731	6670	415753	27903	P4HA2	072682	395164	14608	378593	32828	TTC28	100154	612946	22546	479834	37830
ERBB3	065361	550869	6671	448671	27904	P4HA2	072682	453286	14609	413542	32829	TTC32	183891	402414	22547	385708	37831
ERBB3	065361	551085	6672	448483	27905	P4HA2	072682	428369	14610	396495	32830	TTC32	183891	333610	22548	333018	37832
ERBB3	065361	546884	6673	N/A		P4HA2	072682	418055	14611	403883	32831	TTC32	183891	495698	22549	N/A	
ERBB3	065361	551242	6674	447510	27906	P4HA2	072682	478055	14612	N/A		TTC32	183891	431392	22550	412874	37833
ERBB3	065361	549672	6675	449713	27907	P4HA2	072682	416053	14613	394953	32832	TTLL3	214021	414814	22551	399930	37834
ERBB3	065361	415288	6676	408340	27908	P4HA2	072682	428841	14614	395956	32833	TTLL3	214021	452597	22552	399782	37835
ERBB3	065361	549472	6677	N/A		P4HA2	072682	471826	14615	N/A		TTLL3	214021	419081	22553	401686	37836
ERBB3	065361	546748	6678	N/A		P4HA2	072682	481636	14616	N/A		TTLL3	214021	438596	22554	414965	37837
ERBB3	065361	551176	6679	N/A		P4HA2	072682	379100	14617	368394	32834	TTLL3	214021	459758	22555	N/A	
ERBB3	065361	549205	6680	N/A		P4HA2	072682	379104	14618	368398	32835	TTLL3	214021	417065	22556	408128	37838
ERBB3	065361	550828	6681	482073	27909	P4HA2-AS1	237714	417667	14619	N/A		TTLL3	214021	439814	22557	394481	37839
ERBB3	065361	550070	6682	448946	27910	PACS2	179364	430725	14620	393524	32836	TTLL3	214021	418745	22558	400462	37840
ERBB3	065361	549644	6683	N/A		PACS2	179364	325438	14621	321834	32837	TTLL3	214021	430718	22559	402197	37841
ERBB3	065361	553131	6684	449129	27911	PACS2	179364	447393	14622	393559	32838	TTLL3	214021	427220	22560	395912	37842
ERBB3	065361	548709	6685	N/A		PACS2	179364	547217	14623	449525	32839	TTLL3	214021	426895	22561	392549	37843
ERBB3	065361	549832	6686	448729	27912	PACS2	179364	548265	14624	N/A		TTLL3	214021	426827	22562	389904	37844
ERBB3	065361	552691	6687	N/A		PACS2	179364	546915	14625	447229	32840	TTLL3	214021	431204	22563	398996	37845
ERBB4	178568	342788	6688	342235	27913	PACS2	179364	552138	14626	N/A		TTLL3	214021	422738	22564	412915	37846
ERBB4	178568	436443	6689	403204	27914	PACS2	179364	551692	14627	N/A		TTLL3	214021	430390	22565	396606	37847
ERBB4	178568	484594	6690	N/A		PACS2	179364	547903	14628	N/A		TTLL3	214021	483051	22566	N/A	
ERBB4	178568	260943	6691	260943	27915	PACS2	179364	551743	14629	N/A		TTLL3	214021	310252	22567	312148	37848
ERBB4	178568	463121	6692	N/A		PACS2	179364	549030	14630	N/A		TTLL3	214021	496526	22568	N/A	
ERBB4	178568	484474	6693	N/A		PACS2	179364	548796	14631	N/A		TTLL3	214021	496246	22569	473440	37849
ERBB4	178568	435846	6694	405564	27916	PACS2	179364	551801	14632	N/A		TTLL3	214021	474948	22570	473376	37850
ERBB4	178568	459774	6695	N/A		PACS2	179364	550790	14633	N/A		TTLL3	214021	452823	22571	399191	37851
ERBB4	178568	402597	6696	385565	27917	PAFAH1B1	007168	576586	14634	461087	32841	TTLL3	214021	443148	22572	398097	37852
ERBIN	112851	284037	6697	284037	27918	PAFAH1B1	007168	397195	14635	380378	32842	TTLL3	214021	383827	22573	373338	37853
ERBIN	112851	380943	6698	370330	27919	PAFAH1B1	007168	575477	14636	N/A		TTLL3	214021	473661	22574	430051	37854
ERBIN	112851	507490	6699	N/A		PAFAH1B1	007168	572915	14637	N/A		TTLL3	214021	455274	22575	409632	37855
ERBIN	112851	416865	6700	397833	27920	PAFAH1B1	007168	570400	14638	460258	32843	TTLL3	214021	438141	22576	409246	37856
ERBIN	112851	380938	6701	370325	27921	PAFAH1B1	007168	571289	14639	N/A		TTLL3	214021	430793	22577	403874	37857
ERBIN	112851	511297	6702	422766	27922	PAFAH1B1	007168	574816	14640	N/A		TTLL3	214021	602338	22578	N/A	
ERBIN	112851	506030	6703	426632	27923	PAFAH1B1	007168	609078	14641	N/A		TTLL3	214021	482269	22579	N/A	
ERBIN	112851	508515	6704	422015	27924	PAFAH1B1	007168	397193	14642	N/A		TTLL3	214021	492440	22580	N/A	
ERBIN	112851	507128	6705	N/A		PAFAH1B1	007168	574468	14643	460591	32844	TTLL3	214021	466245	22581	N/A	

ERBIN	112851	515185	6706	N/A		PAFAH1B1	007168	571495	14644	N/A		TTLL3	214021	471058	22582	473314	37858
ERBIN	112851	511671	6707	425728	27925	PAFAH1B1	007168	610190	14645	N/A		TTLL3	214021	493241	22583	N/A	
ERBIN	112851	503913	6708	N/A		PAFAH1B1	007168	574213	14646	N/A		TTLL5	119685	557636	22584	450713	37859
ERBIN	112851	512354	6709	423959	27926	PAGR1	280789	320330	14647	326519	32845	TTLL5	119685	286650	22585	286650	37860
ERBIN	112851	505822	6710	N/A		PAK5	101349	378423	14648	367679	32846	TTLL5	119685	298832	22586	298832	37861
ERBIN	112851	509946	6711	N/A		PAK5	101349	353224	14649	322957	32847	TTLL5	119685	556173	22587	N/A	
ERBIN	112851	506744	6712	N/A		PAK5	101349	378429	14650	367686	32848	TTLL5	119685	554185	22588	N/A	
ERBIN	112851	380935	6713	370322	27927	PALM2	243444	374531	14651	363656	32849	TTLL5	119685	555422	22589	N/A	
ERC2	187672	288221	6714	288221	27928	PALM2	243444	483909	14652	417525	32850	TTLL5	119685	554935	22590	N/A	
ERC2	187672	486496	6715	N/A		PALM2	243444	314527	14653	323805	32851	TTLL5	119685	554148	22591	N/A	
ERC2	187672	484530	6716	N/A		PALM2	243444	497711	14654	419747	32852	TTLL5	119685	554878	22592	N/A	
ERC2	187672	473469	6717	N/A		PALM2	243444	465091	14655	N/A		TTLL5	119685	556976	22593	N/A	
ERC2	187672	469720	6718	N/A		PAM	145730	505654	14656	421569	32853	TTLL5	119685	556893	22594	452524	37862
ERC2	187672	460849	6719	417445	27929	PAM	145730	508060	14657	N/A		TTLL5	119685	554510	22595	451946	37863
ERC2	187672	468118	6720	N/A		PAM	145730	510208	14658	N/A		TTLL5	119685	555018	22596	478640	37864
ERC2	187672	487287	6721	N/A		PAM	145730	506127	14659	N/A		TTLL5	119685	608522	22597	N/A	
ERC2	187672	466358	6722	N/A		PAM	145730	512073	14660	420851	32854	TTLL5	119685	557219	22598	N/A	
ERC2	187672	492584	6723	417280	27930	PAM	145730	502472	14661	N/A		TTLL5	119685	554972	22599	N/A	
ERC2	187672	484857	6724	N/A		PAM	145730	509523	14662	N/A		TTLL5	119685	554487	22600	N/A	
ERC2	187672	477381	6725	N/A		PAM	145730	511839	14663	426448	32855	TTLL5	119685	556685	22601	N/A	
ERC2	187672	472917	6726	N/A		PAM	145730	511477	14664	421823	32856	TTLL5	119685	556977	22602	451917	37865
ERC2	187672	612797	6727	483127	27931	PAM	145730	506006	14665	423611	32857	TTLL5	119685	556265	22603	N/A	
ERGIC1	113719	393784	6728	377374	27932	PAM	145730	509832	14666	423763	32858	TTLL5	119685	554132	22604	N/A	
ERGIC1	113719	519860	6729	489795	27933	PAM	145730	438793	14667	396493	32859	TTLL5	119685	555290	22605	N/A	
ERGIC1	113719	520326	6730	N/A		PAM	145730	346918	14668	282992	32860	TTPA	137561	521138	22606	N/A	
ERGIC1	113719	520642	6731	428064	27934	PAM	145730	513648	14669	N/A		TTPA	137561	260116	22607	260116	37866
ERGIC1	113719	523291	6732	427713	27935	PAM	145730	345721	14670	302544	32861	TTTY10	229236	455084	22608	N/A	
ERGIC1	113719	518247	6733	429501	27936	PAM	145730	348126	14671	314638	32862	TTTY10	229236	439472	22609	N/A	
ERGIC1	113719	326654	6734	325127	27937	PAM	145730	304400	14672	306100	32863	TTTY14	176728	324446	22610	N/A	
ERGIC1	113719	519567	6735	N/A		PAM	145730	455264	14673	403461	32864	TTTY14	176728	454875	22611	N/A	
ERGIC1	113719	519796	6736	428116	27938	PAM	145730	509636	14674	N/A		TTTY14	176728	452584	22612	N/A	
ERGIC1	113719	523650	6737	N/A		PAM	145730	506260	14675	N/A		TTTY14	176728	331787	22613	N/A	
ERGIC1	113719	521392	6738	N/A		PAM	145730	379799	14676	369125	32865	TTTY14	176728	447937	22614	N/A	
ERGIC1	113719	523366	6739	N/A		PAM	145730	505372	14677	N/A		TTTY14	176728	610801	22615	N/A	
ERGIC1	113719	520399	6740	N/A		PAM	145730	511429	14678	N/A		TTTY15	233864	457658	22616	N/A	
ERGIC1	113719	523215	6741	N/A		PAM	145730	510006	14679	N/A		TTTY15	233864	440408	22617	N/A	
ERICH5	177459	318528	6742	315614	27939	PAM	145730	515456	14680	N/A		TTTY15	233864	417071	22618	N/A	
ERICH5	177459	545282	6743	440297	27940	PAM	145730	504691	14681	424203	32866	TTTY15	233864	457658	22619	N/A	
ERMN	136541	410096	6744	387047	27941	PAM	145730	504456	14682	N/A		TTTY15	233864	440408	22620	N/A	
ERMN	136541	397283	6745	380453	27942	PANX2	073150	159647	14683	159647	32867	TTTY15	233864	417071	22621	N/A	
ERMN	136541	409395	6746	387339	27943	PANX2	073150	395842	14684	379183	32868	TTYH3	136295	258796	22622	258796	37867
ERMN	136541	420719	6747	410646	27944	PANX2	073150	402472	14685	384148	32869	TTYH3	136295	407643	22623	385316	37868
ERMN	136541	420317	6748	398149	27945	PAQR4	162073	318782	14686	321804	32870	TTYH3	136295	400376	22624	383227	37869
ERMN	136541	411762	6749	389595	27946	PAQR4	162073	293978	14687	293978	32871	TTYH3	136295	403167	22625	385015	37870
ERMN	136541	409216	6750	387049	27947	PAQR4	162073	576565	14688	460326	32872	TTYH3	136295	477439	22626	N/A	
ERMN	136541	409925	6751	387325	27948	PAQR4	162073	572687	14689	459418	32873	TTYH3	136295	498454	22627	N/A	
ERMN	136541	419116	6752	410934	27949	PAQR4	162073	574988	14690	458683	32874	TTYH3	136295	429448	22628	413757	37871
ESRRB	119715	512784	6753	424992	27950	PAQR6	160781	492619	14691	N/A		TUBA8	183785	426208	22629	407624	37872
ESRRB	119715	505752	6754	423004	27951	PAQR6	160781	292291	14692	292291	32875	TUBA8	183785	316027	22630	318575	37873
ESRRB	119715	507951	6755	N/A		PAQR6	160781	335852	14693	338330	32876	TUBA8	183785	330423	22631	333326	37874
ESRRB	119715	380887	6756	370270	27952	PAQR6	160781	340183	14694	341926	32877	TUBA8	183785	416740	22632	412646	37875
ESRRB	119715	556177	6757	451658	27953	PAQR6	160781	491107	14695	N/A		TUBA8	183785	608634	22633	477306	37876
ESRRB	119715	509323	6758	N/A		PAQR6	160781	368270	14696	357253	32878	TUBB2B	137285	259818	22634	259818	37877
ESRRB	119715	611036	6759	N/A		PAQR6	160781	468632	14697	N/A		TUBB2B	137285	473006	22635	N/A	
ESRRB	119715	509242	6760	422488	27954	PAQR6	160781	480773	14698	N/A		TUBB4A	104833	264071	22636	264071	37878
ERRFI1	116285	474874	6761	466958	27955	PAQR6	160781	470198	14699	N/A		TUBB4A	104833	594276	22637	472481	37879
ERRFI1	116285	377482	6762	366702	27956	PAQR6	160781	475507	14700	N/A		TUBB4A	104833	594075	22638	469936	37880
ERRFI1	116285	467067	6763	465100	27957	PAQR6	160781	623241	14701	485607	32879	TUBB4A	104833	600216	22639	470983	37881
ERRFI1	116285	469499	6764	466454	27958	PAQR6	160781	613336	14702	479864	32880	TUBB4A	104833	595324	22640	469560	37882

ERRFI1	116285	487559	6765	467030	27959	PAQR6	160781	356983	14703	349474	32881	TUBB4A	104833	601152	22641	471320	37883
ESRRG	196482	366940	6766	355907	27960	PAQR6	160781	540423	14704	443167	32882	TUBB4A	104833	598006	22642	472795	37884
ESRRG	196482	366937	6767	355904	27961	PAQR6	160781	612424	14705	482685	32883	TUBB4A	104833	596291	22643	471880	37885
ESRRG	196482	408911	6768	386171	27962	PARD3	148498	374789	14706	363921	32884	TUBB4A	104833	597686	22644	472375	37886
ESRRG	196482	360012	6769	353108	27963	PARD3	148498	374788	14707	363920	32885	TUBB4A	104833	596926	22645	468843	37887
ESRRG	196482	361395	6770	354584	27964	PARD3	148498	346874	14708	340591	32886	TUBB4A	104833	594290	22646	471503	37888
ESRRG	196482	366938	6771	355905	27965	PARD3	148498	374794	14709	363926	32887	TUBB4A	104833	601640	22647	469660	37889
ESRRG	196482	359162	6772	352077	27966	PARD3	148498	350537	14710	311986	32888	TUBB4A	104833	598635	22648	470627	37890
ESRRG	196482	493603	6773	419594	27967	PARD3	148498	374790	14711	363922	32889	TULP3	078246	540184	22649	444110	37891
ESRRG	196482	463665	6774	418629	27968	PARD3	148498	466092	14712	N/A		TULP3	078246	544943	22650	442631	37892
ESRRG	196482	487276	6775	419155	27969	PARD3	148498	374776	14713	363908	32890	TULP3	078246	538354	22651	437899	37893
ESRRG	196482	493748	6776	417374	27970	PARD3	148498	374773	14714	363905	32891	TULP3	078246	545331	22652	441599	37894
ESRRG	196482	475275	6777	419514	27971	PARD3	148498	374768	14715	363900	32892	TULP3	078246	448120	22653	410051	37895
ESRRG	196482	586199	6778	466343	27972	PARD3	148498	340077	14716	341844	32893	TULP3	078246	397132	22654	380321	37896
ESRRG	196482	469486	6779	417900	27973	PARD3	148498	545260	14717	440857	32894	TULP3	078246	541678	22655	441319	37897
ESRRG	196482	459955	6780	420370	27974	PARD3	148498	545693	14718	443147	32895	TULP3	078246	538704	22656	440364	37898
ESRRG	196482	481543	6781	418895	27975	PARD3	148498	544292	14719	444429	32896	TUNAR	250366	504119	22657	N/A	
ESRRG	196482	469913	6782	N/A		PARD3B	116117	415947	14720	407718	32897	TUNAR	250366	503525	22658	489624	37899
ESRRG	196482	477799	6783	N/A		PARD3B	116117	406610	14721	385848	32898	TUNAR	250366	554321	22659	490254	37900
ESRRG	196482	471371	6784	N/A		PARD3B	116117	462231	14722	473503	32899	TUSC3	104723	503191	22660	N/A	
ESRRG	196482	488947	6785	N/A		PARD3B	116117	471958	14723	N/A		TUSC3	104723	382020	22661	371450	37901
ESRRG	196482	459825	6786	N/A		PARD3B	116117	358768	14724	351618	32900	TUSC3	104723	515859	22662	420829	37902
ESRRG	196482	616180	6787	481528	27976	PARD3B	116117	351153	14725	317261	32901	TUSC3	104723	506802	22663	425777	37903
ESRRG	196482	391890	6788	375761	27977	PARD3B	116117	349953	14726	340280	32902	TUSC3	104723	510836	22664	426973	37904
ESRRG	196482	361525	6789	355225	27978	PARD3B	116117	489565	14727	N/A		TUSC3	104723	509380	22665	423426	37905
ESYT2	117868	251527	6790	251527	27979	PARD3B	116117	465890	14728	N/A		TUSC3	104723	503731	22666	424544	37906
ESYT2	117868	275418	6791	275418	27980	PARD3B	116117	494482	14729	N/A		TUSC3	104723	507400	22667	N/A	
ESYT2	117868	435514	6792	N/A		PARD3B	116117	488622	14730	N/A		TUSC3	104723	509177	22668	N/A	
ESYT2	117868	483958	6793	N/A		PARD3B	116117	613457	14731	484434	32903	TUSC3	104723	511783	22669	426880	37907
ESYT2	117868	497111	6794	N/A		PARD3B	116117	614500	14732	481918	32904	TUSC3	104723	508446	22670	N/A	
ESYT2	117868	613624	6795	481296	27981	PARD3B	116117	622699	14733	482649	32905	TUSC3	104723	507316	22671	N/A	
ETF1	120705	499810	6796	421288	27982	PARD6G	178184	353265	14734	343144	32906	TUSC3	104723	511342	22672	N/A	
ETF1	120705	360541	6797	353741	27983	PARD6G	178184	470488	14735	468735	32907	TWISTNB	105849	222567	22673	222567	37908
ETF1	120705	503014	6798	422203	27984	PARD6G	178184	463384	14736	466076	32908	TWISTNB	105849	462263	22674	N/A	
ETF1	120705	506345	6799	N/A		PARD6G-AS1	267270	587254	14737	N/A		TXLNGY	131002	407724	22675	N/A	
ETF1	120705	512198	6800	422272	27985	PARD6G-AS1	267270	586421	14738	N/A		TXLNGY	131002	459719	22676	N/A	
ETF1	120705	503183	6801	N/A		PARD6G-AS1	267270	589574	14739	N/A		TXLNGY	131002	447520	22677	N/A	
ETF1	120705	572514	6802	461082	27986	PARD6G-AS1	267270	588226	14740	N/A		TXLNGY	131002	445715	22678	N/A	
ETF1	120705	507939	6803	425689	27987	PARD6G-AS1	267270	585422	14741	N/A		TXLNGY	131002	538014	22679	N/A	
ETF1	120705	514005	6804	N/A		PARM1	169116	513238	14742	424276	32909	TXLNGY	131002	447202	22680	N/A	
KIAA1217	120549	376462	6805	365645	27988	PARM1	169116	307428	14743	370224	32910	TXLNGY	131002	588613	22681	N/A	
KIAA1217	120549	481700	6806	N/A		PATJ	132849	635214	14744	N/A		TXLNGY	131002	589075	22682	N/A	
KIAA1217	120549	636305	6807	489926	27989	PATJ	132849	459752	14745	N/A		TXLNGY	131002	585549	22683	N/A	
KIAA1217	120549	376456	6808	365639	27990	PATJ	132849	484562	14746	N/A		TXLNGY	131002	587095	22684	N/A	
KIAA1217	120549	376454	6809	365637	27991	PATJ	132849	371158	14747	360200	32911	TXLNGY	131002	488280	22685	N/A	
KIAA1217	120549	635504	6810	489052	27992	PATJ	132849	635023	14748	489335	32912	TXLNGY	131002	253320	22686	N/A	
KIAA1217	120549	438429	6811	404798	27993	PATJ	132849	484937	14749	433669	32913	TXLNGY	131002	593000	22687	N/A	
KIAA1217	120549	307544	6812	302343	27994	PATJ	132849	488913	14750	N/A		TXLNGY	131002	592697	22688	N/A	
KIAA1217	120549	396446	6813	379723	27995	PATJ	132849	493967	14751	N/A		TXNIP	265972	582401	22689	462521	37909
KIAA1217	120549	396445	6814	379722	27996	PATJ	132849	494842	14752	489200	32914	TXNIP	265972	488537	22690	N/A	
KIAA1217	120549	376451	6815	365634	27997	PATJ	132849	490547	14753	489475	32915	TXNIP	265972	486597	22691	N/A	
KIAA1217	120549	460373	6816	N/A		PATJ	132849	635137	14754	489159	32916	TXNIP	265972	425134	22692	396322	37910
KIAA1217	120549	635163	6817	489575	27998	PATJ	132849	307297	14755	307496	32917	TXNL4A	141759	269601	22693	269601	37911
KIAA1217	120549	492009	6818	N/A		PATJ	132849	465798	14756	489130	32918	TXNL4A	141759	585474	22694	465572	37912
KIAA1217	120549	458595	6819	392625	27999	PATJ	132849	472512	14757	N/A		TXNL4A	141759	588162	22695	465321	37913

KIAA1217	120549	376452	6820	365635	28000	PATJ	132849	316485	14758	326199	32919	TXNL4A	141759	592957	22696	465493	37914
KIAA1217	120549	430453	6821	389680	28001	PATJ	132849	613764	14759	479041	32920	TXNL4A	141759	355491	22697	347678	37915
ETNPPL	164089	296486	6822	296486	28002	PAX2	075891	553492	14760	N/A		TXNL4A	141759	585769	22698	466266	37916
ETNPPL	164089	411864	6823	392269	28003	PAX2	075891	355243	14761	347385	32921	TXNL4A	141759	586612	22699	N/A	
ETNPPL	164089	512646	6824	427065	28004	PAX2	075891	370296	14762	359319	32922	TXNL4A	141759	592837	22700	468761	37917
ETNPPL	164089	510706	6825	423240	28005	PAX2	075891	554363	14763	N/A		TXNL4A	141759	591711	22701	468493	37918
ETNPPL	164089	503912	6826	N/A		PAX2	075891	361791	14764	355069	32923	TXNL4A	141759	586825	22702	467304	37919
ETNPPL	164089	505233	6827	422050	28006	PAX2	075891	427256	14765	398652	32924	TXNL4A	141759	586295	22703	466694	37920
ETNPPL	164089	511923	6828	N/A		PAX2	075891	483202	14766	N/A		TXNL4A	141759	589926	22704	N/A	
ETNPPL	164089	509402	6829	426871	28007	PAX2	075891	554172	14767	452489	32925	TYMS	176890	323274	22705	315644	37921
ETNPPL	164089	512320	6830	421217	28008	PAX2	075891	428433	14768	396259	32926	TYMS	176890	579128	22706	N/A	
ETNPPL	164089	510723	6831	426525	28009	PAX3	135903	392069	14769	375921	32927	TYMS	176890	323250	22707	314902	37922
ETS1	134954	392668	6832	376436	28010	PAX3	135903	344493	14770	342092	32928	TYMS	176890	323224	22708	314727	37923
ETS1	134954	526145	6833	433500	28011	PAX3	135903	350526	14771	343052	32929	TYMS	176890	584122	22709	N/A	
ETS1	134954	531611	6834	435666	28012	PAX3	135903	336840	14772	338767	32930	TYMS	176890	581920	22710	N/A	
ETS1	134954	319397	6835	324578	28013	PAX3	135903	392070	14773	375922	32931	U2AF1	160201	471250	22711	N/A	
ETS1	134954	530924	6836	N/A		PAX3	135903	409551	14774	386750	32932	U2AF1	160201	478282	22712	N/A	
ETS1	134954	608978	6837	476649	28014	PAX3	135903	464706	14775	N/A		U2AF1	160201	459639	22713	418705	37924
ETS1	134954	525404	6838	N/A		PAX3	135903	555548	14776	N/A		U2AF1	160201	464750	22714	420672	37925
ETS1	134954	527676	6839	N/A		PAX3	135903	409828	14777	386817	32933	U2AF1	160201	475639	22715	N/A	
ETS1	134954	535549	6840	441430	28015	PAX3	135903	258387	14778	258387	32934	U2AF1	160201	380276	22716	369629	37926
ETV1	006468	430479	6841	405327	28016	PAX6	007372	606377	14779	480026	32935	U2AF1	160201	291552	22717	291552	37927
ETV1	006468	405192	6842	385381	28017	PAX6	007372	640368	14780	492024	32936	U2AF1	160201	486519	22718	489632	37928
ETV1	006468	405358	6843	384085	28018	PAX6	007372	638914	14781	492315	32937	U2AF1	160201	463599	22719	N/A	
ETV1	006468	403527	6844	384138	28019	PAX6	007372	419022	14782	404100	32938	U2AF1	160201	496462	22720	N/A	
ETV1	006468	405218	6845	385551	28020	PAX6	007372	640610	14783	491295	32939	U2AF1	160201	468039	22721	N/A	
ETV1	006468	443137	6846	413836	28021	PAX6	007372	379132	14784	368427	32940	U2AF1	160201	398137	22722	381205	37929
ETV1	006468	403685	6847	385686	28022	PAX6	007372	379109	14785	368403	32941	UAP1	117143	367926	22723	356903	37930
ETV1	006468	493831	6848	N/A		PAX6	007372	379129	14786	368424	32942	UAP1	117143	476240	22724	N/A	
ETV1	006468	472931	6849	N/A		PAX6	007372	639916	14787	490963	32943	UAP1	117143	367925	22725	356902	37931
ETV1	006468	438956	6850	393078	28023	PAX6	007372	638685	14788	492316	32944	UAP1	117143	367924	22726	356901	37932
ETV1	006468	476720	6851	N/A		PAX6	007372	379107	14789	368401	32945	UAP1	117143	474728	22727	N/A	
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ETV1	006468	476355	6854	N/A		PAX6	007372	640975	14792	491872	32948	UBASH3B	154127	284273	22730	284273	37934
ETV1	006468	421381	6855	391043	28025	PAX6	007372	638963	14793	491948	32949	UBASH3B	154127	525711	22731	N/A	
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ETV1	006468	460438	6857	N/A		PAX6	007372	241001	14795	241001	32951	UBASH3B	154127	530917	22733	N/A	
ETV1	006468	483075	6858	N/A		PAX6	007372	474783	14796	N/A		UBASH3B	154127	533451	22734	N/A	
ETV1	006468	433547	6859	406931	28027	PAX6	007372	638629	14797	490971	32952	UBASH3B	154127	529998	22735	N/A	
ETV1	006468	485475	6860	N/A		PAX6	007372	639548	14798	491944	32953	UBASH3B	154127	526493	22736	N/A	
ETV1	006468	420159	6861	411626	28028	PAX6	007372	640125	14799	492166	32954	UBASH3B	154127	530578	22737	N/A	
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ETV1	006468	399357	6863	382293	28030	PAX6	007372	639386	14801	492658	32956	UBB	170315	302182	22739	304697	37936
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ETV3	117036	460850	6865	N/A		PAX6	007372	638755	14803	492181	32958	UBB	170315	535788	22741	437475	37938
ETV3	117036	368192	6866	357175	28032	PAX6	007372	470027	14804	N/A		UBB	170315	578649	22742	N/A	
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ETV4	175832	393664	6868	377273	28034	PAX6	007372	533333	14806	N/A		UBB	170315	395837	22744	379178	37940
ETV4	175832	545954	6869	440023	28035	PAX6	007372	640613	14807	492587	32960	UBB	170315	578706	22745	464510	37941
ETV4	175832	545089	6870	441749	28036	PAX6	007372	423822	14808	388132	32961	UBB	170315	614404	22746	478771	37942
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ETV4	175832	586826	6872	468636	28038	PAX6	007372	640766	14810	491214	32963	UBC	150991	538617	22748	443053	37944
ETV4	175832	590236	6873	N/A		PAX6	007372	640963	14811	492397	32964	UBC	150991	339647	22749	344818	37945
ETV4	175832	585508	6874	N/A		PAX6	007372	471303	14812	N/A		UBC	150991	541272	22750	440205	37946
ETV4	175832	587151	6875	N/A		PAX6	007372	379111	14813	368406	32965	UBC	150991	540351	22751	442800	37947
ETV4	175832	586764	6876	466673	28039	PAX6	007372	639950	14814	491862	32966	UBC	150991	541645	22752	445337	37948
ETV4	175832	538265	6877	443846	28040	PAX6	007372	464174	14815	N/A		UBC	150991	535131	22753	439492	37949
ETV5	244405	306376	6878	306894	28041	PAX6	007372	494377	14816	N/A		UBC	150991	544481	22754	N/A	

ETV5	244405	434744	6879	413755	28042	PAX6	007372	638250	14817	491365	32967	UBC	150991	546271	22755	438289	37950
ETV5	244405	480706	6880	N/A		PAX6	007372	379123	14818	368418	32968	UBC	150991	540700	22756	441238	37951
ETV5	244405	433149	6881	399707	28043	PAX6	007372	640038	14819	N/A		UBC	150991	535859	22757	437452	37952
ETV5	244405	489830	6882	N/A		PAX6	007372	524853	14820	431585	32969	UBC	150991	536661	22758	N/A	
ETV5	244405	484223	6883	N/A		PAX6	007372	640872	14821	491065	32970	UBC	150991	542416	22759	441556	37953
ETV5	244405	472868	6884	N/A		PAX6	007372	639394	14822	492177	32971	UBC	150991	546120	22760	438394	37954
ETV5	244405	440773	6885	389707	28044	PAX6	007372	640735	14823	N/A		UBE2B	119048	265339	22761	265339	37955
ETV5	244405	421809	6886	412171	28045	PAX6	007372	639109	14824	491904	32972	UBE2B	119048	510021	22762	425237	37956
ETV5	244405	413301	6887	405157	28046	PAX6	007372	638853	14825	491280	32973	UBE2B	119048	511807	22763	N/A	
ETV5	244405	422039	6888	388737	28047	PAX6	007372	640460	14826	492802	32974	UBE2B	119048	506787	22764	426364	37957
ETV5	244405	476890	6889	N/A		PAX6	007372	638913	14827	N/A		UBE2B	119048	507277	22765	425137	37958
ETV5	244405	475484	6890	N/A		PAX6	007372	638802	14828	492437	32975	UBE2B	119048	504431	22766	N/A	
ETV5	244405	495808	6891	N/A		PAX6	007372	638346	14829	491267	32976	UBE2B	119048	499038	22767	N/A	
EVA1A	115363	490746	6892	N/A		PAX6	007372	530373	14830	N/A		UBE2B	119048	503080	22768	N/A	
EVA1A	115363	485891	6893	N/A		PAX6	007372	379115	14831	368410	32977	UBE2QL1	215218	399816	22769	382713	37959
EVA1A	115363	393913	6894	377490	28048	PAX6	007372	639006	14832	491210	32978	UBE4A	110344	252108	22770	252108	37960
EVA1A	115363	410113	6895	386435	28049	PAX6	007372	639054	14833	N/A		UBE4A	110344	431736	22771	387362	37961
EVA1A	115363	410010	6896	386835	28050	PAX6	007372	640335	14834	492808	32979	UBE4A	110344	545354	22772	438918	37962
EVA1A	115363	410071	6897	386930	28051	PAX6	007372	638762	14835	491517	32980	UCP2	175567	310473	22773	312029	37963
EVA1A	115363	432649	6898	398249	28052	PAX6	007372	438681	14836	404356	32981	UCP2	175567	536983	22774	441147	37964
EVA1A	115363	452003	6899	388105	28053	PAX6	007372	638878	14837	492081	32982	UCP2	175567	544615	22775	439951	37965
EVA1A	115363	486696	6900	N/A		PAX6	007372	639943	14838	491229	32983	UCP2	175567	545212	22776	439706	37966
EVA1A	115363	486489	6901	N/A		PAX6	007372	640431	14839	491779	32984	UCP2	175567	545562	22777	N/A	
EVA1A	115363	233712	6902	233712	28054	PAX6	007372	532916	14840	N/A		UCP2	175567	543714	22778	N/A	
EXOSC4	178896	316052	6903	315476	28055	PAX6	007372	531910	14841	N/A		UCP2	175567	539764	22779	438230	37967
EXOSC4	178896	525936	6904	432661	28056	PAX6	007372	639034	14842	491679	32985	UCP2	175567	542615	22780	N/A	
EXOSC4	178896	527954	6905	436539	28057	PAX6	007372	640172	14843	N/A		UCP2	175567	541027	22781	N/A	
EXPH5	110723	265843	6906	265843	28058	PAX6	007372	640684	14844	491492	32986	UCP2	175567	539330	22782	N/A	
EXPH5	110723	525344	6907	432546	28059	PAX6	007372	639079	14845	492129	32987	UFL1	014123	461673	22783	N/A	
EXPH5	110723	526312	6908	432683	28060	PAX6	007372	640242	14846	492409	32988	UFL1	014123	369278	22784	358283	37968
EXPH5	110723	533052	6909	446434	28061	PAX6	007372	455099	14847	397384	32989	UFSP2	109775	514247	22785	423599	37969
EXPH5	110723	524840	6910	482691	28062	PAX6	007372	530714	14848	N/A		UFSP2	109775	264689	22786	264689	37970
EXPH5	110723	531386	6911	433909	28063	PAX6	007372	534353	14849	N/A		UFSP2	109775	510206	22787	N/A	
EXTL2	162694	370113	6912	359131	28064	PAX6	007372	533156	14850	N/A		UFSP2	109775	510755	22788	421133	37971
EXTL2	162694	370114	6913	359132	28065	PAX6	007372	639920	14851	492111	32990	UFSP2	109775	511485	22789	425855	37972
EXTL2	162694	450240	6914	403363	28066	PAX6	007372	534390	14852	N/A		UFSP2	109775	509180	22790	423657	37973
EXTL2	162694	416479	6915	392255	28067	PAX6	007372	527769	14853	N/A		UFSP2	109775	502428	22791	424419	37974
EXTL2	162694	494907	6916	N/A		PAX6	007372	532175	14854	N/A		UFSP2	109775	502282	22792	N/A	
EXTL2	162694	480774	6917	N/A		PAX6	007372	525535	14855	436365	32991	UFSP2	109775	505357	22793	423108	37975
EXTL2	162694	535414	6918	444385	28068	PAX6	007372	640251	14856	N/A		UGGT2	102595	376747	22794	365938	37976
EYA1	104313	388742	6919	373394	28069	PAX6	007372	638278	14857	N/A		UGGT2	102595	462472	22795	N/A	
EYA1	104313	465115	6920	428391	28070	PAX6	007372	640617	14858	N/A		UGGT2	102595	476866	22796	N/A	
EYA1	104313	340726	6921	342626	28071	PAX6	007372	639203	14859	N/A		UGGT2	102595	491509	22797	N/A	
EYA1	104313	303824	6922	303221	28072	PAX6	007372	640819	14860	N/A		UGGT2	102595	463054	22798	N/A	
EYA1	104313	388741	6923	373393	28073	PAXBP1	159086	331923	14861	328992	32992	UGGT2	102595	465196	22799	N/A	
EYA1	104313	388743	6924	373395	28074	PAXBP1	159086	466846	14862	N/A		UGGT2	102595	461329	22800	N/A	
EYA1	104313	496494	6925	N/A		PAXBP1	159086	443785	14863	393038	32993	UGGT2	102595	467305	22801	N/A	
EYA1	104313	419131	6926	410176	28075	PAXBP1	159086	497873	14864	N/A		UGGT2	102595	376712	22802	365902	37977
EYA1	104313	493349	6927	428517	28076	PAXBP1	159086	290178	14865	290178	32994	UGGT2	102595	376714	22803	365904	37978
EYA1	104313	422295	6928	N/A		PAXBP1	159086	445049	14866	408048	32995	UGGT2	102595	621375	22804	482021	37979
EYA1	104313	388740	6929	373392	28077	PAXBP1	159086	421049	14867	388973	32996	UGGT2	102595	397618	22805	380743	37980
EYS	188107	503581	6930	424243	28078	PAXBP1	159086	472588	14868	N/A		UGGT2	102595	638479	22806	491729	37981
EYS	188107	370621	6931	359655	28079	PAXBP1	159086	464256	14869	N/A		UGT8	174607	310836	22807	311648	37982
EYS	188107	398580	6932	381585	28080	PAXBP1	263141	573680	14870	458892	32997	UGT8	174607	507710	22808	421446	37983
EYS	188107	486069	6933	N/A		PAXBP1	263141	575821	14871	N/A		UGT8	174607	394511	22809	378019	37984
EYS	188107	330816	6934	N/A		PAXBP1	263141	611190	14872	N/A		UNC13C	137766	260323	22810	260323	37985
EYS	188107	370615	6935	N/A		PAXBP1	263141	575419	14873	N/A		UNC13C	137766	561210	22811	N/A	
EYS	188107	447127	6936	N/A		PAXBP1	263141	574159	14874	458262	32998	UNC13C	137766	559093	22812	453018	37986
EYS	188107	393390	6937	377042	28081	PBX3	167081	428092	14875	397903	32999	UNC13C	137766	539562	22813	443886	37987

EYS	188107	342421	6938	341818	28082	PBX3	167081	491160	14876	N/A		UNC13C	137766	560537	22814	456350	37988
EYS	188107	489873	6939	N/A		PBX3	167081	538998	14877	N/A		UNC5B	107731	335350	22815	334329	37989
EYS	188107	471279	6940	420530	28083	PBX3	167081	492314	14878	N/A		UNC5B	107731	373192	22816	362288	37990
F3	117525	334047	6941	334145	28084	PBX3	167081	447726	14879	387456	33000	UNC5D	156687	404895	22817	385143	37991
F3	117525	370207	6942	359226	28085	PBX3	167081	491787	14880	475679	33001	UNC5D	156687	420357	22818	392739	37992
F3	117525	478217	6943	N/A		PBX3	167081	373482	14881	362581	33002	UNC5D	156687	287272	22819	287272	37993
F3	117525	480356	6944	N/A		PBX3	167081	373492	14882	362591	33003	UNC5D	156687	416672	22820	412652	37994
FA2H	103089	562145	6945	N/A		PBX3	167081	373489	14883	362588	33004	UNC5D	156687	453357	22821	394303	37995
FA2H	103089	219368	6946	219368	28086	PBX3	167081	373487	14884	362586	33005	UNC5D	156687	474634	22822	N/A	
FA2H	103089	567683	6947	455126	28087	PBX3	167081	497091	14885	N/A		UNC5D	156687	449677	22823	397211	37996
FA2H	103089	569949	6948	464576	28088	PBX3	167081	342287	14886	341990	33006	UNC80	144406	478701	22824	N/A	
FA2H	103089	618933	6949	479548	28089	PBXIP1	163346	368465	14887	357450	33007	UNC80	144406	272845	22825	272845	37997
FAM102A	167106	373095	6950	362187	28090	PBXIP1	163346	368463	14888	357448	33008	UNC80	144406	489023	22826	N/A	
FAM102A	167106	465821	6951	N/A		PBXIP1	163346	368460	14889	357445	33009	UNC80	144406	477301	22827	N/A	
FAM102A	167106	373084	6952	362176	28091	PBXIP1	163346	498553	14890	N/A		UNC80	144406	481494	22828	N/A	
FAM102A	167106	300434	6953	N/A		PBXIP1	163346	490230	14891	432543	33010	UNC80	144406	333907	22829	335576	37998
FAM102A	167106	479828	6954	N/A		PBXIP1	163346	493133	14892	N/A		UNC80	144406	477924	22830	N/A	
FAM102A	167106	493175	6955	N/A		PC	173599	529047	14893	435905	33011	UNC80	144406	439458	22831	391088	37999
FAM102A	167106	494606	6956	N/A		PC	173599	393955	14894	377527	33012	UNCX	164853	316333	22832	314480	38000
FAM102B	162636	370035	6957	359052	28092	PC	173599	393958	14895	377530	33013	UPP1	183696	416681	22833	405209	38001
FAM102B	162636	405454	6958	386084	28093	PC	173599	528224	14896	N/A		UPP1	183696	331803	22834	330032	38002
FAM102B	162636	483371	6959	N/A		PC	173599	529352	14897	N/A		UPP1	183696	432131	22835	387607	38003
FAM107A	168309	360997	6960	354270	28094	PC	173599	530259	14898	N/A		UPP1	183696	457596	22836	408899	38004
FAM107A	168309	394481	6961	377991	28095	PC	173599	530187	14899	N/A		UPP1	183696	421046	22837	414963	38005
FAM107A	168309	464064	6962	419529	28096	PC	173599	524491	14900	434192	33014	UPP1	183696	395564	22838	378931	38006
FAM107A	168309	474531	6963	419124	28097	PC	173599	531614	14901	N/A		UPP1	183696	436673	22839	390118	38007
FAM107A	168309	447756	6964	400858	28098	PC	173599	528403	14902	N/A		UPP1	183696	395560	22840	378927	38008
FAM107A	168309	465970	6965	418038	28099	PC	173599	534194	14903	N/A		UPP1	183696	444999	22841	396820	38009
FAM107A	168309	497310	6966	N/A		PC	173599	525476	14904	N/A		UPP1	183696	482015	22842	N/A	
FAM107B	065809	378470	6967	367731	28100	PC	173599	393960	14905	377532	33015	UPP1	183696	417464	22843	413611	38010
FAM107B	065809	181796	6968	181796	28101	PC	173599	628663	14906	486373	33016	UPP1	183696	495446	22844	N/A	
FAM107B	065809	468747	6969	418120	28102	PC	173599	529047	14907	435905	33017	USP11	102226	377107	22845	366311	38011
FAM107B	065809	378467	6970	367728	28103	PC	173599	393955	14908	377527	33018	USP11	102226	478596	22846	N/A	
FAM107B	065809	487335	6971	420273	28104	PC	173599	393958	14909	377530	33019	USP11	102226	469080	22847	N/A	
FAM107B	065809	378465	6972	367726	28105	PC	173599	528224	14910	N/A		USP11	102226	377080	22848	366282	38012
FAM107B	065809	378458	6973	367719	28106	PC	173599	529352	14911	N/A		USP11	102226	377078	22849	366279	38013
FAM107B	065809	478076	6974	417782	28107	PC	173599	530259	14912	N/A		USP11	102226	489111	22850	N/A	
FAM107B	065809	378462	6975	367723	28108	PC	173599	530187	14913	N/A		USP11	102226	489030	22851	N/A	
FAM107B	065809	481209	6976	418365	28109	PC	173599	524491	14914	434192	33020	USP11	102226	480104	22852	N/A	
FAM107B	065809	475858	6977	N/A		PC	173599	531614	14915	N/A		USP11	102226	488848	22853	N/A	
FAM107B	065809	496330	6978	418330	28110	PC	173599	528403	14916	N/A		USP11	102226	497179	22854	N/A	
FAM107B	065809	492700	6979	N/A		PC	173599	534194	14917	N/A		USP11	102226	467378	22855	N/A	
FAM107B	065809	479731	6980	419603	28111	PC	173599	525476	14918	N/A		USP11	102226	218348	22856	218348	38014
FAM107B	065809	468492	6981	420444	28112	PC	173599	393960	14919	377532	33021	USP28	048028	003302	22857	003302	38015
FAM107B	065809	452706	6982	413676	28113	PC	173599	628663	14920	486373	33022	USP28	048028	544967	22858	442431	38016
FAM107B	065809	489100	6983	420249	28114	PKD1	008710	262304	14921	262304	33023	USP28	048028	545540	22859	444991	38017
FAM107B	065809	494865	6984	418395	28115	PKD1	008710	423118	14922	399501	33024	USP28	048028	544272	22860	N/A	
FAM107B	065809	475786	6985	417242	28116	PKD1	008710	472577	14923	N/A		USP28	048028	540438	22861	441513	38018
FAM107B	065809	488576	6986	420314	28117	PKD1	008710	564313	14924	N/A		USP28	048028	538224	22862	440260	38019
FAM107B	065809	474143	6987	N/A		PKD1	008710	561668	14925	461391	33025	USP28	048028	538475	22863	442257	38020
FAM107B	065809	442012	6988	397949	28118	PKD1	008710	487932	14926	457132	33026	USP28	048028	537706	22864	445743	38021
FAM107B	065809	482277	6989	417845	28119	PKD1	008710	485120	14927	N/A		USP28	048028	545608	22865	438050	38022
FAM107B	065809	472095	6990	419064	28120	PKD1	008710	562425	14928	455753	33027	USP28	048028	535607	22866	437688	38023
FAM107B	065809	471815	6991	N/A		PKD1	008710	567355	14929	N/A		USP28	048028	537490	22867	445722	38024
FAM107B	065809	464952	6992	N/A		PKD1	008710	472659	14930	N/A		USP28	048028	537642	22868	440799	38025
FAM107B	065809	495292	6993	N/A		PKD1	008710	568796	14931	N/A		USP28	048028	542033	22869	N/A	
FAM107B	065809	491458	6994	N/A		PKD1	008710	570253	14932	N/A		USP28	048028	540925	22870	446284	38026
FAM107B	065809	622567	6995	479842	28121	PKD1	008710	562297	14933	N/A		USP28	048028	544750	22871	437450	38027
FAM114A1	197712	510213	6996	422965	28122	PKD1	008710	567946	14934	457984	33028	USP37	135913	258399	22872	258399	38028

FAM114A1	197712	515037	6997	424115	28123	PKD1	008710	486339	14935	N/A		USP37	135913	454775	22873	393662	38029
FAM114A1	197712	358869	6998	351740	28124	PKD1	008710	415938	14936	N/A		USP37	135913	415516	22874	400902	38030
FAM114A1	197712	512889	6999	N/A		PKD1	008710	483731	14937	N/A		USP37	135913	418019	22875	396585	38031
FAM114A1	197712	508737	7000	N/A		PKD1	008710	566905	14938	N/A		USP37	135913	473554	22876	N/A	
FAM114A1	197712	513966	7001	N/A		PKD1	008710	496574	14939	N/A		USP37	135913	484018	22877	N/A	
FAM117A	121104	240364	7002	240364	28125	PKD1	008710	566784	14940	N/A		USP37	135913	475553	22878	N/A	
FAM117A	121104	513602	7003	465808	28126	PKD1	008710	471603	14941	N/A		USP37	135913	466523	22879	N/A	
FAM117A	121104	503573	7004	467070	28127	PKD1	008710	480227	14942	N/A		USP37	135913	486242	22880	N/A	
FAM117A	121104	511743	7005	427326	28128	PKD1	008710	570193	14943	N/A		USP37	135913	478329	22881	N/A	
FAM117A	121104	503855	7006	N/A		PKD1	008710	469851	14944	N/A		USP37	135913	338465	22882	345043	38032
FAM117A	121104	514018	7007	N/A		PKD1	008710	483814	14945	N/A		USP4	114316	351842	22883	341028	38033
FAM117A	121104	505159	7008	N/A		PKD1	008710	474088	14946	N/A		USP4	114316	265560	22884	265560	38034
FAM117A	121104	506156	7009	421412	28129	PKD1	008710	475889	14947	N/A		USP4	114316	483212	22885	N/A	
FAM117A	121104	515240	7010	N/A		PKD1	008710	561991	14948	N/A		USP4	114316	485450	22886	N/A	
FAM117A	121104	509347	7011	N/A		PKD1	008710	565639	14949	N/A		USP4	114316	431357	22887	399079	38035
FAM117A	121104	503720	7012	N/A		PKD1	008710	564865	14950	N/A		USP4	114316	475873	22888	N/A	
FAM117A	121104	514841	7013	N/A		PKD1	008710	564890	14951	N/A		USP4	114316	486549	22889	N/A	
FAM122C	156500	495147	7014	N/A		PKD1	008710	483558	14952	N/A		USP4	114316	488520	22890	N/A	
FAM122C	156500	370785	7015	359821	28130	PKD1	008710	568591	14953	457162	33029	USP4	114316	461553	22891	N/A	
FAM122C	156500	482240	7016	N/A		PKD1	008710	569983	14954	N/A		USP4	114316	416417	22892	400623	38036
FAM122C	156500	475361	7017	N/A		PKD1	008710	483024	14955	456670	33030	USP4	114316	415188	22893	408274	38037
FAM122C	156500	494709	7018	N/A		PKD1	008710	488185	14956	456672	33031	USP4	114316	462673	22894	N/A	
FAM122C	156500	470657	7019	N/A		PKD1	008710	473780	14957	N/A		USP4	114316	464168	22895	N/A	
FAM122C	156500	460216	7020	N/A		PKD1	008710	468674	14958	N/A		USP4	114316	491791	22896	N/A	
FAM122C	156500	463842	7021	N/A		PKD1	008710	469241	14959	N/A		USP43	154914	570827	22897	N/A	
FAM122C	156500	623326	7022	485120	28131	PKD1	008710	570150	14960	N/A		USP43	154914	570475	22898	458963	38038
FAM122C	156500	370784	7023	359820	28132	PKD2	118762	237596	14961	237596	33032	USP43	154914	285199	22899	285199	38039
FAM122C	156500	414371	7024	402477	28133	PKD2	118762	506727	14962	N/A		USP43	154914	574408	22900	459328	38040
FAM124A	150510	615498	7025	481212	28134	PKD2	118762	506367	14963	N/A		USP43	154914	575346	22901	N/A	
FAM124A	150510	322475	7026	324625	28135	PKD2	118762	508588	14964	427131	33033	USP43	154914	573955	22902	477318	38041
FAM124A	150510	280057	7027	280057	28136	PKD2	118762	511337	14965	N/A		USP9Y	114374	338981	22903	342812	38042
FAM124A	150510	497449	7028	N/A		PKD2	118762	512858	14966	N/A		USP9Y	114374	493168	22904	N/A	
FAM131A	175182	450976	7029	388551	28137	PKD2	118762	502363	14967	425289	33034	USP9Y	114374	426564	22905	N/A	
FAM131A	175182	418281	7030	414050	28138	PCSK5	099139	376767	14968	365958	33035	USP9Y	114374	453031	22906	406876	38043
FAM131A	175182	340957	7031	340974	28139	PCSK5	099139	376752	14969	365943	33036	USP9Y	114374	471409	22907	N/A	
FAM131A	175182	433578	7032	399875	28140	PCSK5	099139	424854	14970	411654	33037	USPL1	132952	465952	22908	N/A	
FAM131A	175182	418768	7033	414913	28141	PCSK5	099139	455778	14971	407239	33038	USPL1	132952	255304	22909	255304	38044
FAM131A	175182	639617	7034	491845	28142	PCSK5	099139	545128	14972	446280	33039	USPL1	132952	614860	22910	480656	38045
FAM131A	175182	383847	7035	373360	28143	PCSK5	099139	376767	14973	365958	33040	UTY	183878	331397	22911	328939	38046
FAM131A	175182	497070	7036	N/A		PCSK5	099139	376752	14974	365943	33041	UTY	183878	624098	22912	485539	38047
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FAM131A	175182	487702	7039	N/A		PCSK5	099139	545128	14977	446280	33044	UTY	183878	478900	22915	N/A	
RETREG1	154153	510362	7040	425089	28146	PCSK7	160613	320934	14978	325917	33045	UTY	183878	474365	22916	N/A	
RETREG1	154153	399793	7041	382691	28147	PCSK7	160613	534529	14979	N/A		UTY	183878	382893	22917	372349	38050
RETREG1	154153	306320	7042	304642	28148	PCSK7	160613	529458	14980	N/A		UTY	183878	479713	22918	N/A	
RETREG1	154153	509977	7043	N/A		PCSK7	160613	527037	14981	N/A		UTY	183878	538878	22919	445274	38051
RETREG1	154153	506441	7044	N/A		PCSK7	160613	527861	14982	N/A		UTY	183878	540140	22920	441943	38052
RETREG1	154153	509048	7045	N/A		PCSK7	160613	532810	14983	N/A		UTY	183878	382896	22921	372352	38053
FAM135B	147724	395297	7046	378710	28149	PCSK7	160613	531573	14984	N/A		UTY	183878	537580	22922	439922	38054
FAM135B	147724	482951	7047	429874	28150	PCSK7	160613	533135	14985	N/A		UTY	183878	545955	22923	442047	38055
FAM135B	147724	276737	7048	276737	28151	PCSK7	160613	528973	14986	N/A		UTY	183878	617789	22924	483735	38056
FAM135B	147724	467365	7049	430088	28152	PCSK7	160613	528217	14987	N/A		UTY	183878	618474	22925	484698	38057
FAM135B	147724	395295	7050	N/A		PCSK7	160613	525027	14988	431181	33046	UTY	183878	612274	22926	485013	38058
FAM135B	147724	160713	7051	160713	28153	PCSK7	160613	524507	14989	433841	33047	SLC18A3	187714	374115	22927	363229	38059
FAM135B	147724	517849	7052	N/A		PCSK7	160613	532301	14990	436459	33048	VAMP1	139190	400911	22928	383702	38060
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FAM135B	147724	520954	7054	N/A		PCSK7	160613	540028	14992	441944	33050	VAMP1	139190	544432	22930	N/A	
FAM135B	147724	520283	7055	N/A		PCBP1	169564	303577	14993	305556	33051	VAMP1	139190	535180	22931	444181	38062

FAM135B	147724	523049	7056	N/A		PCDH1	156453	287008	14994	287008	33052	VAMP1	139190	396308	22932	379602	38063
FAM167A	154319	284486	7057	284486	28155	PCDH1	156453	503492	14995	424667	33053	VAMP1	139190	538970	22933	N/A	
FAM167A	154319	531564	7058	N/A		PCDH1	156453	394536	14996	378043	33054	VAMP1	139190	535927	22934	N/A	
FAM167A	154319	534308	7059	432232	28156	PCDH1	156453	511044	14997	N/A		VAMP1	139190	539047	22935	N/A	
FAM167A	154319	527445	7060	N/A		PCDH1	156453	515351	14998	424204	33055	VAT1L	171724	302536	22936	303129	38064
FAM167A	154319	528897	7061	436655	28157	PCDH1	156453	357517	14999	N/A		VAT1L	171724	563850	22937	N/A	
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FAM167A	154319	528111	7063	N/A		PCDH1	156453	514773	15001	424163	33057	VAV2	160293	371850	22939	360916	38066
FAM171B	144369	304698	7064	304108	28159	PCDH15	150275	373965	15002	363076	33058	VAV2	160293	371851	22940	360917	38067
FAM171B	144369	612606	7065	478477	28160	PCDH15	150275	616114	15003	483745	33059	VAV2	160293	486113	22941	N/A	
TOGARAM2	189350	401723	7066	384897	28161	PCDH15	150275	621708	15004	484454	33060	VAV2	160293	472905	22942	N/A	
TOGARAM2	189350	420297	7067	402415	28162	PCDH15	150275	495484	15005	480780	33061	VAX2	116035	234392	22943	234392	38068
TOGARAM2	189350	379558	7068	368876	28163	PCDH15	150275	618301	15006	482780	33062	VCAN	038427	265077	22944	265077	38069
TOGARAM2	189350	465300	7069	N/A		PCDH15	150275	476074	15007	N/A		VCAN	038427	503923	22945	N/A	
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TOGARAM2	189350	460951	7071	N/A		PCDH15	150275	395440	15009	378827	33064	VCAN	038427	513960	22947	426251	38071
TOGARAM2	189350	475900	7072	N/A		PCDH15	150275	617271	15010	478076	33065	VCAN	038427	513984	22948	426715	38072
FAM196A	188916	522781	7073	429763	28165	PCDH15	150275	395446	15011	378833	33066	VCAN	038427	502527	22949	421362	38073
FAM196A	188916	424811	7074	428730	28166	PCDH15	150275	409834	15012	386693	33067	VCAN	038427	515397	22950	N/A	
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FAM198B	164125	592586	7080	465491	28172	PCDH15	150275	395430	15018	378818	33073	VGLL4	144560	273038	22956	273038	38076
FAM198B	164125	593260	7081	468648	28173	PCDH15	150275	395433	15019	378821	33074	VGLL4	144560	413604	22957	404624	38077
FAM198B	164125	589306	7082	N/A		PCDH15	150275	373956	15020	363067	33075	VGLL4	144560	451674	22958	416615	38078
FAM198B	164125	592057	7083	466873	28174	PCDH15	150275	373957	15021	363068	33076	VGLL4	144560	424529	22959	402878	38079
FAM198B	164125	587787	7084	466595	28175	PCDH15	150275	448885	15022	412320	33077	VGLL4	144560	430365	22960	404251	38080
FAM19A1	183662	478136	7085	418575	28176	PCDH15	150275	437009	15023	412628	33078	VGLL4	144560	426568	22961	413030	38081
FAM19A1	183662	496687	7086	417496	28177	PCDH15	150275	463095	15024	N/A		VGLL4	144560	445411	22962	412923	38082
FAM19A1	183662	491017	7087	N/A		PCDH15	150275	320301	15025	322604	33079	VGLL4	144560	418000	22963	394439	38083
FAM19A1	183662	617084	7088	485030	28178	PCDH15	150275	373955	15026	363066	33080	VGLL4	144560	458499	22964	394123	38084
FAM19A4	163377	295569	7089	295569	28179	PCDH15	150275	613346	15027	481211	33081	VGLL4	144560	417206	22965	391932	38085
FAM19A4	163377	495737	7090	419439	28180	PCDH15	150275	458638	15028	394465	33082	VGLL4	144560	417466	22966	411670	38086
FAM19A4	163377	634242	7091	489092	28181	PCDH15	150275	395432	15029	378820	33083	VGLL4	144560	424709	22967	391554	38087
FAM20A	108950	226094	7092	N/A		PCDH15	150275	617051	15030	484703	33084	VGLL4	144560	419541	22968	395557	38088
FAM20A	108950	592554	7093	468308	28182	PCDH15	150275	614895	15031	478512	33085	VGLL4	144560	437722	22969	393100	38089
FAM20A	108950	590873	7094	467884	28183	PCDH15	150275	622048	15032	482329	33086	VGLL4	144560	623028	22970	485472	38090
FAM20A	108950	375556	7095	N/A		PCDH15	150275	414778	15033	410304	33087	VGLL4	144560	480288	22971	N/A	
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FAM212B	197852	527570	7099	N/A		PCDH17	118946	377918	15037	367151	33091	VIM	026025	544301	22975	446007	38092
FAM212B	197852	357260	7100	349805	28186	PCDH17	118946	612954	15038	481329	33092	VIM	026025	478746	22976	489830	38093
FAM212B	197852	534365	7101	436075	28187	PCDH17	118946	615375	15039	483215	33093	VIM	026025	497849	22977	490509	38094
FAM212B	197852	444059	7102	408238	28188	PCDH9	184226	377865	15040	367096	33094	VIM	026025	224237	22978	224237	38095
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FAM212B	197852	412270	7104	N/A		PCDH9	184226	456367	15042	401699	33096	VIM	026025	485947	22980	N/A	
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FAM222B	173065	584059	7110	464019	28193	PCDHA1	204970	504120	15048	420840	33101	VIP	146469	367243	22986	356212	38099
FAM222B	173065	579381	7111	464291	28194	PCDHA3	255408	522353	15049	429808	33102	VIP	146469	431366	22987	410356	38100
FAM222B	173065	341217	7112	343115	28195	PCDHA3	255408	532566	15050	434086	33103	VIPR2	106018	262178	22988	262178	38101
FAM222B	173065	577376	7113	464355	28196	PCGF5	180628	496708	15051	N/A		VIPR2	106018	377633	22989	366860	38102
FAM222B	173065	577682	7114	463278	28197	PCGF5	180628	490164	15052	N/A		VIPR2	106018	402066	22990	384497	38103

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FAM222B	173065	582059	7118	462251	28201	PCK1	124253	467047	15056	N/A		VIT	205221	497382	22994	417874	38107
FAM222B	173065	583953	7119	463753	28202	PCK1	124253	319441	15057	319814	33107	VIT	205221	404084	22995	384154	38108
FAM222B	173065	582266	7120	462534	28203	PCK1	124253	475833	15058	N/A		VIT	205221	379241	22996	368543	38109
FAM222B	173065	581407	7121	462419	28204	PCK1	124253	498194	15059	N/A		VIT	205221	401530	22997	385658	38110
FAM43A	185112	329759	7122	371397	28205	PCK1	124253	470051	15060	N/A		VIT	205221	464309	22998	419251	38111
FAM46A	112773	412306	7123	401884	28206	PCK1	124253	485958	15061	N/A		VIT	205221	389975	22999	374625	38112
FAM46A	112773	369754	7124	358769	28207	PCP2	174788	598935	15062	472761	33108	VMP1	062716	588915	23000	N/A	
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FAM46A	112773	369756	7126	358771	28209	PCP4	183036	328619	15064	329403	33110	VMP1	062716	593168	23002	465972	38114
FAM46A	112773	423467	7127	404872	28210	PCP4	183036	462224	15065	433172	33111	VMP1	062716	586245	23003	466579	38115
FAM46C	183508	369448	7128	358458	28211	PCP4	183036	468717	15066	N/A		VMP1	062716	585847	23004	465947	38116
FAM49B	153310	519824	7129	429150	28212	PCP4	183036	467565	15067	N/A		VMP1	062716	587945	23005	466413	38117
FAM49B	153310	522746	7130	428117	28213	PCSK6	140479	558864	15068	452839	33112	VMP1	062716	588131	23006	N/A	
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FAM49B	153310	401979	7132	384880	28215	PCSK6	140479	611716	15070	482760	33114	VMP1	062716	592106	23008	467093	38119
FAM49B	153310	519110	7133	429078	28216	PCSK6	140479	398185	15071	381246	33115	VMP1	062716	591315	23009	466511	38120
FAM49B	153310	523288	7134	N/A		PCSK6	140479	559499	15072	N/A		VMP1	062716	587259	23010	465397	38121
FAM49B	153310	522250	7135	429978	28217	PCSK6	140479	618548	15073	479496	33116	VMP1	062716	592619	23011	465911	38122
FAM49B	153310	517654	7136	430674	28218	PCSK6	140479	557794	15074	N/A		VMP1	062716	591877	23012	467350	38123
FAM49B	153310	519540	7137	429499	28219	PCSK6	140479	632686	15075	487813	33117	VMP1	062716	591782	23013	N/A	
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FAM49B	153310	519142	7141	430806	28221	PCSK6	140479	622483	15079	481556	33118	VPS37B	139722	267202	23017	267202	38124
FAM49B	153310	518879	7142	N/A		PCSK6	140479	619160	15080	482831	33119	VPS37B	139722	535765	23018	446075	38125
FAM49B	153310	522702	7143	N/A		PCSK6	140479	559605	15081	453155	33120	VPS37B	139722	371248	23019	360294	38126
FAM49B	153310	521223	7144	N/A		PCSK6	140479	560902	15082	N/A		VPS37B	139722	543590	23020	N/A	
FAM49B	153310	520204	7145	429051	28222	PCSK6	140479	611967	15083	477768	33121	VSIG2	019102	326621	23021	318684	38127
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FAM49B	153310	520254	7148	430127	28225	PCSK6	140479	558154	15086	N/A		VSNL1	163032	404666	23024	384014	38130
FAM49B	153310	519020	7149	429659	28226	PCSK6	140479	559417	15087	452997	33124	VSNL1	163032	457525	23025	405511	38131
FAM49B	153310	518167	7150	427994	28227	PCSK6	140479	331826	15088	332052	33125	VSNL1	163032	295156	23026	295156	38132
FAM49B	153310	517672	7151	430434	28228	PCYT1B	102230	379145	15089	368440	33126	VSNL1	163032	451533	23027	390124	38133
FAM49B	153310	519070	7152	429860	28229	PCYT1B	102230	356768	15090	349211	33127	VSNL1	163032	483921	23028	N/A	
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FAM49B	153310	518344	7154	N/A		PCYT1B	102230	496020	15092	436562	33129	VSTM2B	187135	335523	23030	335038	38135
FAM49B	153310	523514	7155	N/A		PDC	116703	391997	15093	375855	33130	VTN	109072	226218	23031	226218	38136
FAM49B	153310	518285	7156	N/A		PDC	116703	497198	15094	422775	33131	VTN	109072	539746	23032	N/A	
FAM49B	153310	615041	7157	483964	28231	PDE1A	115252	435564	15095	410309	33132	VTN	109072	542029	23033	440439	38137
FAM49B	153310	639004	7158	492779	28232	PDE1A	115252	409365	15096	386767	33133	VWA5A	110002	456829	23034	407726	38138
FAM53A	174137	489029	7159	423987	28233	PDE1A	115252	410103	15097	387037	33134	VWA5A	110002	361352	23035	355070	38139
FAM53A	174137	489363	7160	419044	28234	PDE1A	115252	482538	15098	N/A		VWA5A	110002	449321	23036	404683	38140
FAM53A	174137	461064	7161	418243	28235	PDE1A	115252	462938	15099	N/A		VWA5A	110002	392744	23037	376501	38141
FAM53A	174137	472884	7162	426260	28236	PDE1A	115252	482782	15100	N/A		VWA5A	110002	533623	23038	N/A	
FAM53A	174137	467215	7163	N/A		PDE1A	115252	495511	15101	N/A		VWA5A	110002	392748	23039	376504	38142
FAM53A	174137	463238	7164	417615	28237	PDE1A	115252	351439	15102	309269	33135	VWA5B2	145198	426955	23040	398688	38143
FAM53A	174137	308132	7165	310057	28238	PDE1A	115252	358139	15103	350858	33136	VWA5B2	145198	497229	23041	N/A	
FAM69A	154511	370310	7166	359333	28239	PDE1A	115252	435564	15104	410309	33137	VWA5B2	145198	273794	23042	273794	38144
FAM69A	154511	616709	7167	482718	28240	PDE1A	115252	409365	15105	386767	33138	VWA5B2	145198	461141	23043	N/A	
FAM69A	154511	613902	7168	484866	28241	PDE1A	115252	410103	15106	387037	33139	VWA5B2	145198	474580	23044	N/A	
FAM69A	154511	615519	7169	483279	28242	PDE1A	115252	482538	15107	N/A		VWA5B2	145198	493493	23045	N/A	
FAM69A	154511	613047	7170	482478	28243	PDE1A	115252	462938	15108	N/A		VWC2	188730	340652	23046	341819	38145
FAM83D	101447	619304	7171	481110	28244	PDE1A	115252	482782	15109	N/A		WASH7P	227232	488147	23047	N/A	
FAM83D	101447	619830	7172	481465	28245	PDE1A	115252	495511	15110	N/A		GALNT17	185274	333538	23048	329654	38146
FAM84A	162981	295092	7173	295092	28246	PDE1A	115252	351439	15111	309269	33140	GALNT17	185274	498380	23049	N/A	

FAM84A	162981	331243	7174	330681	28247	PDE1A	115252	358139	15112	350858	33141	GALNT17	185274	447516	23050	392019	38147
FAM84A	162981	497769	7175	N/A		PDE1B	123360	243052	15113	243052	33142	GALNT17	185274	467723	23051	N/A	
FAM84A	162981	464947	7176	N/A		PDE1B	123360	611899	15114	478185	33143	GALNT17	185274	618959	23052	479090	38148
FAM89A	182118	366654	7177	355614	28248	PDE1B	123360	548855	15115	N/A		TMEM270	175877	320531	23053	316775	38149
FAM89A	182118	494111	7178	N/A		PDE1B	123360	550285	15116	447354	33144	TMEM270	175877	426490	23054	403621	38150
FAM89A	182118	466258	7179	N/A		PDE1B	123360	538346	15117	442559	33145	WDR17	150627	508596	23055	422763	38151
FAM8A4P	232730	435433	7180	N/A		PDE1B	123360	394277	15118	N/A		WDR17	150627	509792	23056	N/A	
FAM92B	153789	539556	7181	443411	28249	PDE1B	123360	550620	15119	448519	33146	WDR17	150627	280190	23057	280190	38152
FAM92B	153789	618669	7182	478373	28250	PDE1B	123360	542335	15120	N/A		WDR17	150627	507824	23058	422200	38153
FAM92B	153789	629253	7183	487117	28251	PDE1B	123360	552774	15121	N/A		WDR17	150627	513261	23059	427502	38154
FAR2	064763	551451	7184	450117	28252	PDE1C	154678	396193	15122	379496	33147	WDR17	150627	505894	23060	426847	38155
FAR2	064763	536681	7185	443291	28253	PDE1C	154678	396191	15123	379494	33148	WDR17	150627	443118	23061	426985	38156
FAR2	064763	549080	7186	N/A		PDE1C	154678	321453	15124	318105	33149	WDR17	150627	508773	23062	N/A	
FAR2	064763	547411	7187	N/A		PDE1C	154678	396184	15125	379487	33150	WDR45B	141580	392325	23063	376139	38157
FAR2	064763	550541	7188	N/A		PDE1C	154678	479980	15126	N/A		WDR45B	141580	572583	23064	461488	38158
FAR2	064763	182377	7189	182377	28254	PDE1C	154678	396182	15127	379485	33151	WDR45B	141580	576517	23065	460297	38159
FAR2	064763	547116	7190	449349	28255	PDE1C	154678	478736	15128	N/A		WDR45B	141580	573656	23066	N/A	
FAR2	064763	552137	7191	449436	28256	PDE1C	154678	482681	15129	N/A		WDR45B	141580	571835	23067	N/A	
FAR2	064763	551193	7192	449187	28257	PDE1C	154678	464881	15130	N/A		WDR45B	141580	573616	23068	458738	38160
FAR2	064763	547759	7193	447467	28258	PDE1C	154678	396189	15131	379492	33152	WDR45B	141580	577774	23069	N/A	
FARP1	152767	595437	7194	471242	28259	PDE1C	154678	495221	15132	N/A		WDR45B	141580	571767	23070	N/A	
FARP1	152767	600648	7195	N/A		PDE3A	172572	359062	15133	351957	33153	WDR45B	141580	571817	23071	461355	38161
FARP1	152767	319562	7196	322926	28260	PDE3A	172572	542675	15134	N/A		WDR45B	141580	574828	23072	N/A	
FARP1	152767	596580	7197	490391	28261	PDE3A	172572	544307	15135	N/A		WDR49	174776	308378	23073	311343	38162
FARP1	152767	376581	7198	365765	28262	PDE3B	152270	282096	15136	282096	33154	WDR49	174776	476376	23074	N/A	
FARP1	152767	598389	7199	469712	28263	PDE3B	152270	455098	15137	388644	33155	WDR49	174776	472600	23075	419130	38163
FARP1	152767	601361	7200	N/A		PDE3B	152270	534317	15138	N/A		WDR49	174776	479765	23076	419749	38164
FARP1	152767	595817	7201	N/A		PDE3B	152270	532740	15139	N/A		WDR49	174776	493061	23077	418539	38165
FARP1	152767	427404	7202	N/A		PDE3B	152270	525439	15140	N/A		WDR49	174776	460448	23078	417090	38166
FARP1	152767	601656	7203	N/A		PDE4D	113448	340635	15141	345502	33156	WDR49	174776	466760	23079	418718	38167
FARP1	152767	602015	7204	N/A		PDE4D	113448	636120	15142	490821	33157	WDR49	174776	488012	23080	419917	38168
FARP1	152767	598698	7205	N/A		PDE4D	113448	360047	15143	353152	33158	WDR49	174776	471198	23081	N/A	
FARP1	152767	599151	7206	N/A		PDE4D	113448	507116	15144	424852	33159	WDR66	158023	288912	23082	288912	38169
FARP1	152767	601762	7207	N/A		PDE4D	113448	358923	15145	351800	33160	WDR66	158023	397454	23083	380595	38170
FARP1	152767	595366	7208	N/A		PDE4D	113448	317118	15146	321739	33161	WDR66	158023	540779	23084	N/A	
FARP1	152767	596545	7209	N/A		PDE4D	113448	503258	15147	425605	33162	WDR66	158023	546044	23085	N/A	
FARP1	152767	602272	7210	N/A		PDE4D	113448	405755	15148	384806	33163	WDR66	158023	543211	23086	N/A	
FARP1	152767	598346	7211	N/A		PDE4D	113448	515011	15149	N/A		WDR66	158023	535257	23087	N/A	
FARP1	152767	602171	7212	N/A		PDE4D	113448	502484	15150	423094	33164	WDR66	158023	545752	23088	N/A	
FARP1	152767	596613	7213	N/A		PDE4D	113448	505453	15151	421013	33165	WDR66	158023	428465	23089	N/A	
FARP1	152767	601853	7214	N/A		PDE4D	113448	309641	15152	308485	33166	WDR66	158023	545988	23090	N/A	
FARP1	152767	600032	7215	N/A		PDE4D	113448	405053	15153	N/A		WFDC1	103175	219454	23091	219454	38171
FARP1	152767	596467	7216	N/A		PDE4D	113448	502575	15154	425917	33167	WFDC1	103175	568638	23092	456920	38172
FARP1	152767	595380	7217	N/A		PDE4D	113448	621323	15155	N/A		WFDC1	103175	613603	23093	481580	38173
FARP1	152767	601133	7218	N/A		PDE4D	113448	515324	15156	N/A		WFDC1	103175	567056	23094	N/A	
FARP1	152767	593990	7219	N/A		PDE4D	113448	514231	15157	N/A		WFDC1	103175	622779	23095	N/A	
FARP1	152767	594657	7220	N/A		PDE4D	113448	512069	15158	N/A		WFS1	109501	503569	23096	423337	38174
FARP1	152767	457431	7221	N/A		PDE4D	113448	509368	15159	423555	33168	WFS1	109501	506588	23097	N/A	
FARP1	152767	599040	7222	N/A		PDE4D	113448	509355	15160	N/A		WFS1	109501	226760	23098	226760	38175
FARP1	152767	602263	7223	N/A		PDE4D	113448	504624	15161	N/A		WFS1	109501	507765	23099	N/A	
FARP1	152767	601009	7224	472346	28264	PDE4D	113448	506024	15162	N/A		WFS1	109501	506362	23100	424103	38176
FARP1	152767	593548	7225	N/A		PDE4D	113448	506510	15163	N/A		WFS1	109501	513395	23101	N/A	
FARP1	152767	490389	7226	N/A		PDE4D	113448	511382	15164	N/A		WIF1	156076	286574	23102	286574	38177
FARP1	152767	600190	7227	N/A		PDE4D	113448	505507	15165	425910	33169	WIF1	156076	543094	23103	439024	38178
FARP1	152767	457029	7228	N/A		PDE4D	113448	514552	15166	421829	33170	WIF1	156076	546001	23104	442063	38179
FARP1	152767	423063	7229	410930	28265	PDE4D	113448	515835	15167	424281	33171	WIPI1	070540	592645	23105	465695	38180
FARP1	152767	596256	7230	469365	28266	PDE4D	113448	546160	15168	442734	33172	WIPI1	070540	262139	23106	262139	38181
FARP1	152767	597777	7231	N/A		PDE4D	113448	638939	15169	492052	33173	WIPI1	070540	589459	23107	N/A	
FARP1	152767	594346	7232	N/A		PDE5A	138735	354960	15170	347046	33174	WIPI1	070540	589316	23108	465470	38182

FARP1	152767	600380	7233	N/A		PDE5A	138735	264805	15171	264805	33175	WIPI1	070540	585393	23109	465557	38183
FARP1	152767	597596	7234	N/A		PDE5A	138735	503412	15172	425810	33176	WIPI1	070540	546360	23110	437345	38184
FARP1	152767	627049	7235	486285	28267	PDE5A	138735	512494	15173	N/A		WIPI1	070540	590402	23111	N/A	
FAT1	083857	441802	7236	406229	28268	PDE5A	138735	509612	15174	N/A		WIPI1	070540	591744	23112	466270	38185
FAT1	083857	500085	7237	N/A		PDE5A	138735	513594	15175	N/A		WIPI1	070540	587731	23113	N/A	
FAT1	083857	512772	7238	424157	28269	PDE5A	138735	512450	15176	N/A		WIPI1	070540	591494	23114	N/A	
FAT1	083857	507105	7239	423801	28270	PDE5A	138735	512739	15177	N/A		WIPI1	070540	586815	23115	N/A	
FAT1	083857	509537	7240	421003	28271	PDE5A	138735	502912	15178	N/A		WLS	116729	354777	23116	346829	38186
FAT1	083857	509927	7241	420869	28272	PDE5A	138735	508914	15179	N/A		WLS	116729	262348	23117	262348	38187
FAT1	083857	507662	7242	N/A		PDE5A	138735	420633	15180	416309	33177	WLS	116729	370976	23118	360015	38188
FAT1	083857	512347	7243	N/A		PDE5A	138735	394439	15181	377957	33178	WLS	116729	498615	23119	N/A	
FAT1	083857	503253	7244	N/A		PDE7A	205268	401827	15182	385632	33179	WLS	116729	491811	23120	N/A	
FAT1	083857	508035	7245	N/A		PDE7A	205268	379419	15183	368730	33180	WLS	116729	497187	23121	N/A	
FAT1	083857	509647	7246	423736	28273	PDE7A	205268	396642	15184	379881	33181	WLS	116729	534713	23122	431552	38189
FAT1	083857	614102	7247	479573	28274	PDE7A	205268	522220	15185	N/A		WLS	116729	533537	23123	433690	38190
FAT2	086570	520200	7248	429678	28275	PDE7A	205268	518667	15186	N/A		WLS	116729	530486	23124	433111	38191
FAT2	086570	261800	7249	261800	28276	PDE7A	205268	519231	15187	N/A		WLS	116729	370973	23125	360012	38192
FAT3	165323	525166	7250	432586	28277	PDE7A	205268	523253	15188	430262	33182	WLS	116729	471243	23126	436196	38193
FAT3	165323	528921	7251	N/A		PDE7A	205268	519626	15189	N/A		WLS	116729	491076	23127	433188	38194
FAT3	165323	533797	7252	436399	28278	PDE7B	171408	308191	15190	310661	33183	WLS	116729	527864	23128	433867	38195
FAT3	165323	489716	7253	N/A		PDE7B	171408	446774	15191	403732	33184	WLS	116729	370971	23129	360010	38196
FAT3	165323	469900	7254	N/A		PDE7B	171408	615259	15192	482117	33185	WNT6	115596	233948	23130	233948	38197
FAT3	165323	409404	7255	387040	28279	PDE8A	073417	310298	15193	311453	33186	WNT6	115596	486233	23131	N/A	
FAT3	282908	634703	7256	489369	28280	PDE8A	073417	557957	15194	453808	33187	WNT7A	154764	285018	23132	285018	38198
FAT3	282908	634649	7257	489343	28281	PDE8A	073417	339708	15195	340679	33188	WNT7A	154764	489346	23133	N/A	
FAT3	282908	634625	7258	N/A		PDE8A	073417	478717	15196	432309	33189	WNT7A	154764	497808	23134	N/A	
FAT3	282908	634743	7259	488913	28282	PDE8A	073417	485596	15197	431976	33190	WNT7B	188064	339464	23135	341032	38199
FAT3	282908	634894	7260	N/A		PDE8A	073417	559742	15198	452907	33191	WNT7B	188064	409496	23136	386546	38200
FAT3	282908	634756	7261	N/A		PDE8A	073417	559086	15199	454094	33192	WNT7B	188064	410089	23137	386781	38201
FBLN2	163520	404922	7262	384169	28283	PDE8A	073417	560789	15200	N/A		WNT7B	188064	410058	23138	387217	38202
FBLN2	163520	295760	7263	295760	28284	PDE8A	073417	557819	15201	N/A		WNT7B	188064	428540	23139	392750	38203
FBLN2	163520	465610	7264	420164	28285	PDE8A	073417	558543	15202	N/A		WSCD1	179314	563763	23140	N/A	
FBLN2	163520	492059	7265	420042	28286	PDE8A	073417	557954	15203	N/A		WSCD1	179314	573619	23141	461865	38204
FBLN2	163520	477845	7266	N/A		PDE8A	073417	561105	15204	N/A		WSCD1	179314	572764	23142	N/A	
FBLN2	163520	295761	7267	295761	28287	PDE8A	073417	561374	15205	N/A		WSCD1	179314	574946	23143	460825	38205
FBLN2	163520	421373	7268	399224	28288	PDE8A	073417	560333	15206	N/A		WSCD1	179314	573634	23144	460396	38206
FBN1	166147	316623	7269	325527	28289	PDE8A	073417	561024	15207	N/A		WSCD1	179314	576083	23145	460041	38207
FBN1	166147	559133	7270	453958	28290	PDE8A	073417	394553	15208	378056	33193	WSCD1	179314	574232	23146	458374	38208
FBN1	166147	561429	7271	N/A		PDE8B	113231	505926	15209	425720	33194	WSCD1	179314	571973	23147	458527	38209
FBN1	166147	560720	7272	N/A		PDE8B	113231	340978	15210	345446	33195	WSCD1	179314	576233	23148	461642	38210
FBN1	166147	537463	7273	440294	28291	PDE8B	113231	346042	15211	330428	33196	WSCD1	179314	571494	23149	458339	38211
FBN1	166147	560820	7274	N/A		PDE8B	113231	264917	15212	264917	33197	WSCD1	179314	576947	23150	460428	38212
FBN1	166147	560355	7275	453901	28292	PDE8B	113231	342343	15213	345646	33198	WSCD1	179314	317744	23151	323087	38213
FBN1	166147	558230	7276	N/A		PDE8B	113231	333194	15214	331336	33199	WSCD1	179314	539421	23152	446032	38214
FBN2	138829	508053	7277	424571	28293	PDE8B	113231	502945	15215	426200	33200	WSCD2	075035	547525	23153	448047	38215
FBN2	138829	507835	7278	426839	28294	PDE8B	113231	503963	15216	422861	33201	WSCD2	075035	552195	23154	N/A	
FBN2	138829	508989	7279	425596	28295	PDE8B	113231	505283	15217	423461	33202	WSCD2	075035	550529	23155	N/A	
FBN2	138829	511489	7280	N/A		PDE9A	160191	335512	15218	335242	33203	WSCD2	075035	551106	23156	N/A	
FBN2	138829	502468	7281	424753	28296	PDE9A	160191	470987	15219	N/A		WSCD2	075035	551638	23157	446744	38216
FBN2	138829	514742	7282	N/A		PDE9A	160191	291539	15220	291539	33204	WSCD2	075035	546401	23158	N/A	
FBN2	138829	262464	7283	262464	28297	PDE9A	160191	490803	15221	N/A		WSCD2	075035	332082	23159	331933	38217
FBN2	138829	619499	7284	482132	28298	PDE9A	160191	486902	15222	N/A		WSCD2	075035	551057	23160	N/A	
FBXL21	164616	495672	7285	N/A		PDE9A	160191	380328	15223	369685	33205	WSCD2	075035	551734	23161	N/A	
FBXL21	164616	635168	7286	N/A		PDE9A	160191	495521	15224	N/A		WSCD2	075035	546811	23162	N/A	
FBXL21	164616	475169	7287	N/A		PDE9A	160191	398232	15225	381287	33206	WSCD2	075035	549903	23163	447272	38218
FBXL21	164616	472159	7288	N/A		PDE9A	160191	462571	15226	N/A		WSCD2	075035	547185	23164	N/A	
FBXL21	164616	467490	7289	N/A		PDE9A	160191	398234	15227	381289	33207	WSCD2	075035	546629	23165	N/A	
FBXL21	164616	297158	7290	N/A		PDE9A	160191	398236	15228	381291	33208	WWC1	113645	265293	23166	265293	38219
FBXL21	164616	478939	7291	N/A		PDE9A	160191	468805	15229	N/A		WWC1	113645	521089	23167	427772	38220

FBXL21	164616	498734	7292	N/A		PDE9A	160191	328862	15230	328699	33209	WWC1	113645	523043	23168	N/A	
FBXO24	106336	461079	7293	419587	28299	PDE9A	160191	335440	15231	335365	33210	WWC1	113645	519859	23169	N/A	
FBXO24	106336	498195	7294	N/A		PDE9A	160191	398225	15232	381281	33211	WWC1	113645	393895	23170	377473	38221
FBXO24	106336	241071	7295	241071	28300	PDE9A	160191	497805	15233	N/A		WWC1	113645	519659	23171	N/A	
FBXO24	106336	488079	7296	418814	28301	PDE9A	160191	398229	15234	381285	33212	WWC1	113645	517425	23172	N/A	
FBXO24	106336	474649	7297	N/A		PDE9A	160191	398227	15235	381283	33213	WWC1	113645	524228	23173	429339	38222
FBXO24	106336	465843	7298	419602	28302	PDE9A	160191	460989	15236	N/A		WWC1	113645	517646	23174	N/A	
FBXO24	106336	466053	7299	417179	28303	PDE9A	160191	467403	15237	N/A		WWC1	113645	624315	23175	N/A	
FBXO24	106336	468962	7300	420239	28304	PDE9A	160191	349112	15238	344730	33214	WWC1	113645	518334	23176	N/A	
FBXO24	106336	427939	7301	416558	28305	PDE9A	160191	398224	15239	381280	33215	WWC1	113645	524093	23177	N/A	
FBXO32	156804	517956	7302	428205	28306	PDE9A	160191	467162	15240	N/A		WWC1	113645	524038	23178	428084	38223
FBXO32	156804	524000	7303	N/A		PDE9A	160191	495343	15241	N/A		WWC1	113645	522140	23179	N/A	
FBXO32	156804	287396	7304	N/A		PDE9A	160191	489319	15242	N/A		WWC1	113645	521391	23180	N/A	
FBXO32	156804	443022	7305	390790	28307	PDE9A	160191	466472	15243	N/A		WWC1	113645	518204	23181	N/A	
FBXO32	156804	521719	7306	N/A		PDE9A	160191	460905	15244	N/A		WWC2	151718	403733	23182	384222	38224
FBXO32	156804	520511	7307	N/A		PDE9A	160191	472401	15245	N/A		WWC2	151718	508614	23183	423238	38225
FBXW5	159069	487794	7308	485109	28308	PDGFC	145431	502773	15246	422464	33216	WWC2	151718	513834	23184	425054	38226
FBXW5	159069	325285	7309	313034	28309	PDGFC	145431	274071	15247	274071	33217	WWC2	151718	448232	23185	398577	38227
FBXW5	159069	483559	7310	N/A		PDGFC	145431	504672	15248	N/A		WWC2	151718	427431	23186	393342	38228
FBXW5	159069	459905	7311	N/A		PDGFC	145431	506880	15249	424600	33218	WWC2	151718	438543	23187	413521	38229
FBXW5	159069	480818	7312	N/A		PDGFC	145431	422544	15250	410048	33219	WWC2	151718	504005	23188	427569	38230
FBXW5	159069	491246	7313	485322	28310	PDGFC	145431	510982	15251	N/A		WWC2	151718	506225	23189	N/A	
FBXW5	159069	428398	7314	404829	28311	PDGFC	145431	511985	15252	N/A		WWC2	151718	515284	23190	N/A	
FBXW5	159069	443788	7315	394011	28312	PDGFC	145431	512711	15253	N/A		WWC2	151718	508747	23191	420835	38231
FBXW9	132004	587296	7316	465854	28313	PDGFC	145431	513664	15254	N/A		XIST	229807	434839	23192	N/A	
FBXW9	132004	393261	7317	376945	28314	PDGFD	170962	529268	15255	432909	33220	XIST	229807	421322	23193	N/A	
FBXW9	132004	587955	7318	465387	28315	PDGFD	170962	302251	15256	302195	33221	XIST	229807	417942	23194	N/A	
FCER2	104921	597312	7319	N/A		PDGFD	170962	393158	15257	376865	33222	XIST	229807	416330	23195	N/A	
FCER2	104921	346664	7320	264072	28316	PDGFRA	134853	257290	15258	257290	33223	XIST	229807	429829	23196	N/A	
FCER2	104921	597921	7321	471974	28317	PDGFRA	134853	508170	15259	425648	33224	XIST	229807	635841	23197	N/A	
FCER2	104921	598803	7322	N/A		PDGFRA	134853	509092	15260	N/A		XIST	229807	433732	23198	N/A	
FCER2	104921	597934	7323	N/A		PDGFRA	134853	512143	15261	425626	33225	XIST	229807	602587	23199	N/A	
FCER2	104921	593418	7324	472067	28318	PDGFRA	134853	509490	15262	424218	33226	XIST	229807	445814	23200	N/A	
FCER2	104921	360067	7325	353178	28319	PDGFRA	134853	503856	15263	425902	33227	XIST	229807	602863	23201	N/A	
FCHSD2	137478	311172	7326	308978	28320	PDGFRA	134853	504461	15264	426472	33228	XIST	229807	602495	23202	N/A	
FCHSD2	137478	409314	7327	386987	28321	PDGFRA	134853	512522	15265	425232	33229	XKR7	260903	562532	23203	477059	38232
FCHSD2	137478	409418	7328	386722	28322	PDGFRA	134853	461294	15266	N/A		XRRA1	166435	530562	23204	436390	38233
FCHSD2	137478	409263	7329	386903	28323	PDGFRA	134853	507536	15267	N/A		XRRA1	166435	340360	23205	339918	38234
FCHSD2	137478	458644	7330	402972	28324	PDGFRA	134853	257290	15268	257290	33230	XRRA1	166435	321448	23206	319303	38235
FCHSD2	137478	409853	7331	386314	28325	PDGFRA	134853	508170	15269	425648	33231	XRRA1	166435	531849	23207	433431	38236
FCHSD2	137478	432043	7332	406420	28326	PDGFRA	134853	509092	15270	N/A		XRRA1	166435	531449	23208	432689	38237
FCHSD2	137478	543644	7333	441616	28327	PDGFRA	134853	512143	15271	425626	33232	XRRA1	166435	527087	23209	435838	38238
FCHSD2	137478	422375	7334	408706	28328	PDGFRA	134853	509490	15272	424218	33233	XRRA1	166435	431210	23210	N/A	
FDFT1	079459	530337	7335	431852	28329	PDGFRA	134853	503856	15273	425902	33234	XRRA1	166435	530280	23211	N/A	
FDFT1	079459	220584	7336	220584	28330	PDGFRA	134853	504461	15274	426472	33235	XRRA1	166435	529926	23212	N/A	
FDFT1	079459	446331	7337	N/A		PDGFRA	134853	512522	15275	425232	33236	XRRA1	166435	528819	23213	N/A	
FDFT1	079459	443614	7338	390367	28331	PDGFRA	134853	461294	15276	N/A		XRRA1	166435	525407	23214	437334	38239
FDFT1	079459	525283	7339	433985	28332	PDGFRA	134853	507536	15277	N/A		XRRA1	166435	528219	23215	435662	38240
FDFT1	079459	525607	7340	432551	28333	PDGFRB	113721	261799	15278	261799	33237	XRRA1	166435	526047	23216	N/A	
FDFT1	079459	529464	7341	434770	28334	PDGFRB	113721	520851	15279	N/A		XRRA1	166435	531852	23217	433940	38241
FDFT1	079459	525900	7342	434714	28335	PDGFRB	113721	520579	15280	430026	33238	XRRA1	166435	533598	23218	N/A	
FDFT1	079459	525571	7343	N/A		PDGFRB	113721	519575	15281	N/A		XRRA1	166435	534041	23219	N/A	
FDFT1	079459	527045	7344	N/A		PDGFRB	113721	521723	15282	N/A		XRRA1	166435	534798	23220	N/A	
FDFT1	079459	528812	7345	431749	28336	PDGFRB	113721	520229	15283	N/A		XRRA1	166435	529400	23221	N/A	
FDFT1	079459	525551	7346	N/A		PDGFRB	113721	522466	15284	N/A		XRRA1	166435	524430	23222	N/A	
FDFT1	079459	530664	7347	432331	28337	PDGFRB	113721	517488	15285	429218	33239	XRRA1	166435	533990	23223	N/A	
FDFT1	079459	525954	7348	491537	28338	PDGFRB	113721	517957	15286	430715	33240	XYLT1	103489	261381	23224	261381	38242
FDFT1	079459	531733	7349	N/A		PDGFRB	113721	517660	15287	N/A		XYLT1	103489	575674	23225	N/A	
FDFT1	079459	531249	7350	N/A		PDGFRB	113721	523456	15288	N/A		XYLT1	103489	568226	23226	N/A	

FDFT1	079459	532266	7351	435900	28339	PDK3	067992	379162	15289	368460	33241	XYLT1	103489	563403	23227	N/A	
FDFT1	079459	528643	7352	431649	28340	PDK3	067992	441463	15290	387536	33242	YBX2	006047	007699	23228	007699	38243
FDFT1	079459	525777	7353	436069	28341	PDK3	067992	493226	15291	N/A		YBX2	006047	571834	23229	N/A	
FDFT1	079459	528729	7354	N/A		PDLIM3	154553	284770	15292	284770	33243	YBX2	006047	571485	23230	N/A	
FDFT1	079459	529521	7355	N/A		PDLIM3	154553	514142	15293	N/A		YBX2	006047	571464	23231	459587	38244
FDFT1	079459	623368	7356	485229	28342	PDLIM3	154553	284771	15294	284771	33244	YBX2	006047	570720	23232	N/A	
FDFT1	079459	538689	7357	444248	28343	PDLIM3	154553	514308	15295	N/A		YBX2	006047	570627	23233	N/A	
FDFT1	079459	618539	7358	480828	28344	PDLIM3	154553	505886	15296	425138	33245	YBX2	006047	571127	23234	N/A	
FDFT1	079459	615631	7359	481481	28345	PDLIM3	154553	512293	15297	421972	33246	YES1	176105	577961	23235	464380	38245
FDFT1	079459	622850	7360	484122	28346	PDLIM3	154553	504011	15298	N/A		YES1	176105	584307	23236	462468	38246
FEM1C	145780	274457	7361	274457	28347	PDLIM3	154553	504355	15299	N/A		YES1	176105	314574	23237	324740	38247
FERMT1	101311	478194	7362	N/A		PDLIM3	154553	512380	15300	N/A		YES1	176105	577611	23238	N/A	
FERMT1	101311	217289	7363	217289	28348	PDLIM3	154553	515261	15301	N/A		YES1	176105	581960	23239	N/A	
FERMT1	101311	378844	7364	368121	28349	PDLIM3	154553	620787	15302	481771	33247	YIPF5	145817	274496	23240	274496	38248
FERMT1	101311	536936	7365	441063	28350	PDLIM3	154553	284767	15303	284767	33248	YIPF5	145817	448443	23241	397704	38249
FEZF2	153266	486811	7366	418589	28351	PDLIM3	154553	629667	15304	486107	33249	YIPF5	145817	513112	23242	425422	38250
FEZF2	153266	283268	7367	283268	28352	PDLIM4	131435	253754	15305	253754	33250	YIPF5	145817	519064	23243	429777	38251
FEZF2	153266	475839	7368	418804	28353	PDLIM4	131435	463615	15306	N/A		YIPF5	145817	522203	23244	428715	38252
FGD3	127084	375482	7369	364631	28354	PDLIM4	131435	474421	15307	N/A		YIPF5	145817	508754	23245	N/A	
FGD3	127084	468206	7370	N/A		PDLIM4	131435	379018	15308	368303	33251	YIPF7	177752	415895	23246	412696	38253
FGD3	127084	494669	7371	N/A		PDLIM4	131435	418373	15309	411753	33252	YIPF7	177752	510035	23247	N/A	
FGD3	127084	467786	7372	432310	28355	PDLIM4	131435	484620	15310	N/A		YIPF7	177752	502794	23248	N/A	
FGD3	127084	494553	7373	N/A		PDLIM4	131435	462597	15311	N/A		YIPF7	177752	508947	23249	477355	38254
FGD3	127084	488407	7374	N/A		PDZD3	172367	527308	15312	N/A		YIPF7	177752	332990	23250	332772	38255
FGD3	127084	416701	7375	413833	28356	PDZD3	172367	526279	15313	N/A		ZBTB16	109906	335953	23251	338157	38256
FGD3	127084	337352	7376	336914	28357	PDZD3	172367	527951	15314	N/A		ZBTB16	109906	541602	23252	N/A	
FGD4	139132	534526	7377	449273	28358	PDZD3	172367	525131	15315	434559	33253	ZBTB16	109906	544220	23253	437716	38257
FGD4	139132	550091	7378	N/A		PDZD3	172367	534790	15316	N/A		ZBTB16	109906	535700	23254	443013	38258
FGD4	139132	531134	7379	431323	28359	PDZD3	172367	529098	15317	N/A		ZBTB16	109906	392996	23255	376721	38259
FGD4	139132	472289	7380	434356	28360	PDZD3	172367	527028	15318	N/A		ZBTB16	109906	539918	23256	445047	38260
FGD4	139132	494275	7381	N/A		PDZD3	172367	531114	15319	431164	33254	ZBTB16	109906	545851	23257	N/A	
FGD4	139132	497153	7382	N/A		PDZD3	172367	533688	15320	434264	33255	ZBTB16	109906	535379	23258	N/A	
FGD4	139132	493087	7383	437109	28361	PDZD3	172367	355547	15321	347742	33256	ZBTB16	109906	535509	23259	N/A	
FGD4	139132	551984	7384	449614	28362	PDZD3	172367	526836	15322	N/A		ZBTB21	173276	398505	23260	381517	38261
FGD4	139132	427716	7385	394487	28363	PDZD3	172367	528730	15323	N/A		ZBTB21	173276	310826	23261	308759	38262
FGD4	139132	473513	7386	N/A		PDZD3	172367	322712	15324	327107	33257	ZBTB21	173276	398499	23262	381512	38263
FGD4	139132	395740	7387	379089	28364	PDZD3	172367	529573	15325	N/A		ZBTB21	173276	398511	23263	381523	38264
FGD4	139132	479023	7388	N/A		PDZD7	186862	474125	15326	474447	33258	ZBTB21	173276	465968	23264	N/A	
FGD4	139132	546442	7389	446695	28365	PDZD7	186862	433616	15327	412533	33259	ZBTB21	173276	425521	23265	387788	38265
FGD4	139132	583694	7390	462623	28366	PDZD7	186862	370215	15328	359234	33260	ZBTB21	173276	449949	23266	395186	38266
FGD4	139132	525053	7391	433666	28367	PDZD7	186862	476306	15329	N/A		ZBTB21	173276	398497	23267	381510	38267
FGD4	139132	494977	7392	434062	28368	PDZD7	186862	470414	15330	474831	33261	ZBTB46	130584	245663	23268	245663	38268
FGD6	180263	343958	7393	344446	28369	PDZD7	186862	619208	15331	480489	33262	ZBTB46	130584	460757	23269	N/A	
FGD6	180263	548069	7394	448350	28370	PDZRN4	165966	402685	15332	384197	33263	ZBTB46	130584	480766	23270	N/A	
FGD6	180263	451107	7395	408291	28371	PDZRN4	165966	539469	15333	439990	33264	ZBTB46	130584	302995	23271	303102	38269
FGD6	180263	546711	7396	450342	28372	PDZRN4	165966	298919	15334	298919	33265	ZBTB46	130584	395104	23272	378536	38270
FGD6	180263	551521	7397	450240	28373	PDZRN4	165966	548316	15335	N/A		RTL4	187823	340433	23273	340590	38271
FGD6	180263	549499	7398	449005	28374	PEA15	162734	360472	15336	353660	33266	ZCCHC24	165424	372336	23274	361411	38272
FGD6	180263	550368	7399	N/A		PEA15	162734	368077	15337	357056	33267	ZCCHC24	165424	372333	23275	361408	38273
FGF13	129682	315930	7400	322390	28375	PEA15	162734	368076	15338	357055	33268	ZDHHC14	175048	414563	23276	410713	38274
FGF13	129682	305414	7401	303391	28376	PEA15	162734	488858	15339	N/A		ZDHHC14	175048	359775	23277	352821	38275
FGF13	129682	441825	7402	409276	28377	PEBP4	134020	256404	15340	256404	33269	ZDHHC14	175048	518214	23278	428211	38276
FGF13	129682	626909	7403	487411	28378	PEBP4	134020	521284	15341	N/A		ZDHHC14	175048	523468	23279	N/A	
FGF13	129682	436198	7404	396198	28379	PEBP4	134020	522278	15342	429414	33270	ZDHHC14	175048	341375	23280	N/A	
FGF13	129682	455663	7405	406916	28380	PEG3	198300	326441	15343	326581	33271	ZDHHC14	175048	340347	23281	345721	38277
FGF13	129682	448673	7406	411999	28381	PEG3	198300	599565	15344	N/A		ZDHHC14	175048	523706	23282	N/A	
FGF13	129682	421460	7407	388688	28382	PEG3	198300	598410	15345	473190	33272	ZDHHC14	175048	517432	23283	N/A	
FGF3	186895	334134	7408	334122	28383	PEG3	198300	593695	15346	472402	33273	ZDHHC14	175048	422910	23284	N/A	
FGF5	138675	312465	7409	311697	28384	PEG3	198300	599534	15347	472395	33274	ZDHHC2	104219	262096	23285	262096	38278

FGF5	138675	456523	7410	398353	28385	PEG3	198300	599577	15348	469486	33275	ZDHHC2	104219	523132	23286	430804	38279
FGF5	138675	380628	7411	N/A		PEG3	198300	600833	15349	470467	33276	ZDHHC2	104219	522184	23287	430317	38280
FGF5	138675	507780	7412	423903	28386	PEG3	198300	596261	15350	N/A		ZDHHC2	104219	517334	23288	N/A	
FGF5	138675	503413	7413	N/A		PEG3	198300	594706	15351	N/A		ZDHHC23	184307	330212	23289	330485	38281
FGFBP3	174721	311575	7414	339067	28387	PEG3	198300	594389	15352	469144	33277	ZDHHC23	184307	498275	23290	417840	38282
FGFR1	077782	397091	7415	380280	28388	PENK	181195	517415	15353	430268	33278	ZDHHC23	184307	478793	23291	420251	38283
FGFR1	077782	532791	7416	432972	28389	PENK	181195	520589	15354	N/A		ZDHHC23	184307	491556	23292	420292	38284
FGFR1	077782	526688	7417	N/A		PENK	181195	514922	15355	324248	33279	ZDHHC23	184307	638807	23293	492287	38285
FGFR1	077782	397113	7418	380302	28390	PENK	181195	451791	15356	400894	33280	ZDHHC23	184307	488129	23294	N/A	
FGFR1	077782	356207	7419	348537	28391	PENK	181195	523274	15357	N/A		ZDHHC23	184307	496083	23295	417579	38286
FGFR1	077782	335922	7420	337247	28392	PENK	181195	518974	15358	428012	33281	ZEB2	169554	639389	23296	492572	38287
FGFR1	077782	326324	7421	327229	28393	PENK	181195	523051	15359	429326	33282	ZEB2	169554	638087	23297	490673	38288
FGFR1	077782	526570	7422	N/A		PENK	181195	518770	15360	430592	33283	ZEB2	169554	638007	23298	490723	38289
FGFR1	077782	397103	7423	380292	28394	PENK	181195	521153	15361	N/A		ZEB2	169554	636413	23299	490508	38290
FGFR1	077782	531196	7424	434800	28395	PER1	179094	317276	15362	314420	33284	ZEB2	169554	637045	23300	490141	38291
FGFR1	077782	397108	7425	380297	28396	PER1	179094	581082	15363	462064	33285	ZEB2	169554	636820	23301	N/A	
FGFR1	077782	533619	7426	N/A		PER1	179094	582719	15364	463054	33286	ZEB2	169554	636179	23302	N/A	
FGFR1	077782	527114	7427	N/A		PER1	179094	583677	15365	N/A		ZEB2	169554	637304	23303	490872	38292
FGFR1	077782	487647	7428	435254	28397	PER1	179094	585284	15366	N/A		ZEB2	169554	638128	23304	490934	38293
FGFR1	077782	466021	7429	N/A		PER1	179094	579098	15367	N/A		ZEB2	169554	636471	23305	490317	38294
FGFR1	077782	527745	7430	N/A		PER1	179094	578089	15368	N/A		ZEB2	169554	627532	23306	487174	38295
FGFR1	077782	524528	7431	N/A		PER1	179094	578950	15369	N/A		ZEB2	169554	419938	23307	394777	38296
FGFR1	077782	475621	7432	N/A		PER1	179094	354903	15370	346979	33287	ZEB2	169554	409487	23308	386854	38297
FGFR1	077782	530701	7433	N/A		PER1	179094	583559	15371	463369	33288	ZEB2	169554	636732	23309	490175	38298
FGFR1	077782	464163	7434	N/A		PER1	179094	581395	15372	464696	33289	ZEB2	169554	636026	23310	490776	38299
FGFR1	077782	470826	7435	N/A		PER1	179094	585095	15373	N/A		ZEB2	169554	539609	23311	443792	38300
FGFR1	077782	496296	7436	N/A		PER1	179094	577424	15374	N/A		ZEB2	169554	558170	23312	454157	38301
FGFR1	077782	527203	7437	N/A		PER1	179094	579203	15375	N/A		ZEB2	169554	303660	23313	302501	38302
FGFR1	077782	533668	7438	434869	28398	PER1	179094	578223	15376	N/A		ZEB2	169554	637873	23314	489701	38303
FGFR1	077782	525001	7439	434712	28399	PER1	179094	579065	15377	N/A		ZEB2	169554	427902	23315	395496	38304
FGFR1	077782	532386	7440	N/A		PER1	179094	581703	15378	463385	33290	ZEB2	169554	637267	23316	490293	38305
FGFR1	077782	474970	7441	N/A		PER1	179094	577253	15379	462546	33291	ZEB2	169554	392861	23317	376601	38306
FGFR1	077782	526742	7442	433569	28400	PER1	179094	584202	15380	463661	33292	ZEB2	169554	497268	23318	N/A	
FGFR1	077782	529552	7443	435283	28401	PET100	229833	594797	15381	470539	33293	ZEB2	169554	431672	23319	475267	38307
FGFR1	077782	484370	7444	433163	28402	PET100	229833	623154	15382	N/A		ZEB2	169554	409211	23320	387256	38308
FGFR1	077782	530568	7445	434473	28403	PET100	229833	456958	15383	392303	33294	ZEB2	169554	465308	23321	487476	38309
FGFR1	077782	434187	7446	392645	28404	PET100	229833	601829	15384	N/A		ZEB2	169554	434448	23322	487261	38310
FGFR1	077782	397090	7447	N/A		PET100	229833	601406	15385	470935	33295	ZEB2	169554	472146	23323	N/A	
FGFR1	077782	413133	7448	400708	28405	PET100	229833	598540	15386	470314	33296	ZEB2	169554	461784	23324	N/A	
FGFR1	077782	440174	7449	398318	28406	PET100	229833	600836	15387	N/A		ZEB2	169554	476394	23325	N/A	
FGFR1	077782	496629	7450	N/A		PEX5L	114757	467460	15388	419975	33297	ZEB2	169554	479735	23326	N/A	
FGFR1	077782	480571	7451	N/A		PEX5L	114757	263962	15389	263962	33298	ZEB2	169554	435831	23327	400993	38311
FGFR1	077782	425967	7452	393312	28407	PEX5L	114757	485199	15390	418440	33299	ZEB2	169554	453352	23328	N/A	
FGFR1	077782	447712	7453	400162	28408	PEX5L	114757	468741	15391	418665	33300	ZEB2	169554	444559	23329	399451	38312
FGFR1	077782	619564	7454	484553	28409	PEX5L	114757	476138	15392	420555	33301	ZEB2	169554	630572	23330	486346	38313
FGFR1	077782	341462	7455	340636	28410	PEX5L	114757	467440	15393	N/A		ZEB2	169554	628473	23331	N/A	
FGFR2	066468	358487	7456	351276	28411	PEX5L	114757	472994	15394	418054	33302	ZEB2	169554	484313	23332	486341	38314
FGFR2	066468	478859	7457	474011	28412	PEX5L	114757	464614	15395	417270	33303	ZEB2	169554	637591	23333	N/A	
FGFR2	066468	638709	7458	491912	28413	PEX5L	114757	465751	15396	419348	33304	ZEB2	169554	629955	23334	N/A	
FGFR2	066468	356226	7459	348559	28414	PEX5L	114757	477829	15397	N/A		ZEB2	169554	463070	23335	475502	38315
FGFR2	066468	369060	7460	358056	28415	PEX5L	114757	461537	15398	N/A		ZEB2	169554	470879	23336	475329	38316
FGFR2	066468	604236	7461	474109	28416	PEX5L	114757	496721	15399	418746	33305	ZEB2	169554	629520	23337	486240	38317
FGFR2	066468	369059	7462	358055	28417	PEX5L	114757	491640	15400	419790	33306	ZEB2	169554	636445	23338	490851	38318
FGFR2	066468	467584	7463	N/A		PEX5L	114757	469198	15401	417438	33307	ZEB2	169554	625161	23339	N/A	
FGFR2	066468	429361	7464	404219	28418	PEX5L	114757	463761	15402	419406	33308	ZEB2	169554	462355	23340	475400	38319
FGFR2	066468	346997	7465	263451	28419	PEX5L	114757	487198	15403	N/A		ZEB2	169554	475115	23341	N/A	
FGFR2	066468	457416	7466	410294	28420	PEX5L	114757	474909	15404	N/A		ZEB2	169554	440875	23342	475553	38320
FGFR2	066468	360144	7467	353262	28421	PEX5L	114757	392649	15405	376420	33309	ZFAND2A	178381	401903	23343	386031	38321
FGFR2	066468	369056	7468	358052	28422	PFKFB4	114268	232375	15406	232375	33310	ZFAND2A	178381	397083	23344	380273	38322

FGFR2	066468	369058	7469	358054	28423	PFKFB4	114268	416568	15407	388394	33311	ZFAND2A	178381	316495	23345	314619	38323
FGFR2	066468	336553	7470	337665	28424	PFKFB4	114268	417753	15408	389169	33312	ZFAND2A	178381	471448	23346	N/A	
FGFR2	066468	463870	7471	N/A		PFKFB4	114268	445633	15409	400772	33313	ZFAND2A	178381	574135	23347	459173	38324
FGFR2	066468	490349	7472	N/A		PFKFB4	114268	383734	15410	373240	33314	ZFAND2A	178381	484977	23348	N/A	
FGFR2	066468	359354	7473	352309	28425	PFKFB4	114268	490115	15411	N/A		ZFAND2A	178381	478137	23349	N/A	
FGFR2	066468	491475	7474	N/A		PFKFB4	114268	478516	15412	N/A		ZFAND5	107372	488164	23350	N/A	
FGFR2	066468	613324	7475	481464	28426	PFKFB4	114268	452531	15413	407657	33315	ZFAND5	107372	376962	23351	366161	38325
FGFR2	066468	611527	7476	484892	28427	PFKFB4	114268	468162	15414	N/A		ZFAND5	107372	376960	23352	366159	38326
FGFR2	066468	636922	7477	490905	28428	PFKFB4	114268	412035	15415	393047	33316	ZFAND5	107372	343431	23353	350586	38327
FGFR2	066468	491111	7478	N/A		PFKFB4	114268	471890	15416	N/A		ZFAND5	107372	471197	23354	N/A	
FGFR2	066468	357555	7479	350166	28429	PFKFB4	114268	496767	15417	N/A		ZFAND5	107372	376956	23355	366155	38328
FGFR2	066468	613048	7480	484154	28430	PFKFB4	114268	422701	15418	415764	33317	ZFAND5	107372	487330	23356	N/A	
FGFR2	066468	369061	7481	358057	28431	PFKFB4	114268	490404	15419	N/A		ZFAND5	107372	237937	23357	237937	38329
FGFR2	066468	351936	7482	309878	28432	PFKFB4	114268	467176	15420	N/A		ZFAND6	086666	261749	23358	261749	38330
FGFR3	068078	481110	7483	420533	28433	PFKM	152556	550345	15421	450369	33318	ZFAND6	086666	561060	23359	452735	38331
FGFR3	068078	260795	7484	260795	28434	PFKM	152556	549003	15422	449835	33319	ZFAND6	086666	559157	23360	454152	38332
FGFR3	068078	352904	7485	231803	28435	PFKM	152556	550924	15423	446945	33320	ZFAND6	086666	561012	23361	453590	38333
FGFR3	068078	507588	7486	427289	28436	PFKM	152556	549941	15424	446829	33321	ZFAND6	086666	564367	23362	454273	38334
FGFR3	068078	474521	7487	N/A		PFKM	152556	550257	15425	447997	33322	ZFAND6	086666	558494	23363	454137	38335
FGFR3	068078	469068	7488	N/A		PFKM	152556	340802	15426	345771	33323	ZFAND6	086666	560470	23364	455515	38336
FGFR3	068078	340107	7489	339824	28437	PFKM	152556	547581	15427	447992	33324	ZFAND6	086666	560228	23365	454409	38337
FGFR3	068078	412135	7490	412903	28438	PFKM	152556	546755	15428	450173	33325	ZFAND6	086666	559835	23366	453291	38338
FGFR3	068078	440486	7491	414914	28439	PFKM	152556	549366	15429	449622	33326	ZFAND6	086666	559775	23367	453709	38339
FGFR3	068078	613647	7492	479472	28440	PFKM	152556	552792	15430	448940	33327	ZFAND6	086666	558688	23368	452664	38340
FGGY	172456	582567	7493	463260	28441	PFKM	152556	548288	15431	448018	33328	ZFAND6	086666	560392	23369	455146	38341
FGGY	172456	413489	7494	406607	28442	PFKM	152556	359794	15432	352842	33329	ZFAND6	086666	560976	23370	453710	38342
FGGY	172456	634606	7495	489030	28443	PFKM	152556	547066	15433	448318	33330	ZFAND6	086666	558272	23371	456973	38343
FGGY	172456	474476	7496	N/A		PFKM	152556	546964	15434	N/A		ZFAND6	086666	558390	23372	453308	38344
FGGY	172456	462744	7497	N/A		PFKM	152556	548720	15435	N/A		ZFAND6	086666	557793	23373	N/A	
FGGY	172456	371218	7498	360262	28444	PFKM	152556	552989	15436	447774	33331	ZFAND6	086666	558997	23374	453571	38345
FGGY	172456	495718	7499	N/A		PFKM	152556	551548	15437	N/A		ZFAND6	086666	558087	23375	453888	38346
FGGY	172456	583635	7500	N/A		PFKM	152556	551485	15438	448315	33332	ZFAND6	086666	558724	23376	452625	38347
FGGY	172456	303721	7501	305922	28445	PFKM	152556	551339	15439	448253	33333	ZFAND6	086666	561017	23377	N/A	
FGGY	172456	430447	7502	403425	28446	PFKM	152556	548345	15440	449269	33334	ZFAND6	086666	557983	23378	N/A	
FGGY	172456	634364	7503	489446	28447	PFKM	152556	551804	15441	448177	33335	ZFAND6	086666	618205	23379	484971	38348
FGGY	172456	635297	7504	489549	28448	PFKM	152556	549022	15442	446805	33336	ZFAND6	086666	616533	23380	478129	38349
FGGY	172456	634399	7505	489146	28449	PFKM	152556	547587	15443	449426	33337	ZFAND6	086666	613266	23381	479071	38350
FGGY	172456	635156	7506	489417	28450	PFKM	152556	546465	15444	446519	33338	ZFHX4	091656	521891	23382	430497	38351
FGGY	172456	424725	7507	489345	28451	PFKM	152556	547148	15445	N/A		ZFHX4	091656	517683	23383	N/A	
FGGY	172456	371212	7508	360256	28452	PFKM	152556	552752	15446	446740	33339	ZFHX4	091656	458716	23384	N/A	
FGGY	172456	475949	7509	N/A		PFKM	152556	550802	15447	N/A		ZFHX4	091656	520307	23385	428525	38352
FGGY	172456	485720	7510	N/A		PFKM	152556	552214	15448	N/A		ZFHX4	091656	523885	23386	429495	38353
FGGY	172456	371210	7511	360254	28453	PFKM	152556	552818	15449	N/A		ZFHX4	091656	517585	23387	427775	38354
FGGY	172456	493891	7512	N/A		PFKM	152556	553055	15450	450091	33340	ZFHX4	091656	523809	23388	427739	38355
FGGY	172456	466791	7513	N/A		PFKM	152556	312352	15451	309438	33341	ZFHX4	091656	518282	23389	430848	38356
FGGY	172456	476939	7514	N/A		PFKM	152556	629846	15452	486196	33342	ZFHX4	091656	523625	23390	431101	38357
FGGY	172456	472783	7515	N/A		PFKP	067057	607886	15453	477128	33343	ZFHX4	091656	524290	23391	N/A	
FGGY	172456	471169	7516	N/A		PFKP	067057	381125	15454	370517	33344	ZFHX4	091656	519536	23392	430375	38358
FGGY	172456	480847	7517	N/A		PFKP	067057	495715	15455	N/A		ZFHX4	091656	522409	23393	N/A	
FHDC1	137460	511601	7518	427567	28454	PFKP	067057	381075	15456	370465	33345	ZFP36L1	185650	555997	23394	451093	38359
FHDC1	137460	260008	7519	260008	28455	PFKP	067057	421751	15457	N/A		ZFP36L1	185650	439696	23395	388402	38360
FHL3	183386	485803	7520	N/A		PFKP	067057	407806	15458	385880	33346	ZFP36L1	185650	336440	23396	337386	38361
FHL3	183386	373016	7521	362107	28456	PFKP	067057	415005	15459	408858	33347	ZFP36L1	185650	557086	23397	450784	38362
FHL3	183386	475084	7522	N/A		PFKP	067057	468050	15460	476311	33348	ZFP36L1	185650	557022	23398	450600	38363
FHL3	183386	477194	7523	N/A		PFKP	067057	460445	15461	N/A		ZFP36L1	185650	553375	23399	452119	38364
FHL3	183386	483132	7524	N/A		PFKP	067057	413079	15462	387871	33349	ZNF385C	187595	496039	23400	N/A	
FHL5	122214	450218	7525	396390	28457	PFKP	067057	381072	15463	370462	33350	ZNF385C	187595	461831	23401	N/A	
FHL5	122214	326771	7526	326022	28458	PFKP	067057	433193	15464	410275	33351	ZNF385C	187595	436535	23402	411514	38365
FHL5	122214	541107	7527	442357	28459	PGGHG	142102	474221	15465	N/A		ZNF385C	187595	453355	23403	N/A	

FHOD3	134775	257209	7528	257209	28460	PGGHG	142102	409548	15466	387185	33352	ZNF385C	187595	618554	23404	480744	38366
FHOD3	134775	589114	7529	N/A		PGGHG	142102	409655	15467	386297	33353	ZNF395	186918	344423	23405	340494	38367
FHOD3	134775	590592	7530	466937	28461	PGGHG	142102	529087	15468	N/A		ZNF395	186918	520535	23406	427719	38368
FHOD3	134775	359247	7531	352186	28462	PGGHG	142102	409479	15469	387099	33354	ZNF395	186918	523202	23407	429640	38369
FHOD3	134775	591635	7532	467195	28463	PGGHG	142102	482937	15470	431881	33355	ZNF395	186918	523095	23408	428452	38370
FHOD3	134775	592930	7533	468163	28464	PGGHG	142102	476372	15471	N/A		ZNF395	186918	517372	23409	N/A	
FHOD3	134775	587493	7534	N/A		PGGHG	142102	397660	15472	380780	33356	ZNF395	186918	521912	23410	427934	38371
FHOD3	134775	592128	7535	467462	28465	PGM2L1	165434	298198	15473	298198	33357	ZNF395	186918	520290	23411	430203	38372
FHOD3	134775	585579	7536	465843	28466	PGM2L1	165434	622957	15474	N/A		ZNF395	186918	521185	23412	427812	38373
FIBIN	176971	318627	7537	321962	28467	PGM5	154330	604870	15475	N/A		ZNF395	186918	522795	23413	429823	38374
FIGN	182263	409634	7538	386768	28468	PGM5	154330	396392	15476	379674	33358	ZNF395	186918	517459	23414	429649	38375
FIGN	182263	333129	7539	333836	28469	PGM5	154330	396396	15477	379678	33359	ZNF395	186918	519730	23415	N/A	
FIGN	182263	482917	7540	N/A		PGM5	154330	431583	15478	394864	33360	ZNF423	102935	561648	23416	455426	38376
FILIP1L	168386	476723	7541	N/A		PGM5	154330	587852	15479	N/A		ZNF423	102935	563137	23417	455588	38377
FILIP1L	168386	477258	7542	417617	28470	PGM5	154330	472639	15480	N/A		ZNF423	102935	562871	23418	457928	38378
FILIP1L	168386	354552	7543	346560	28471	PGM5	154330	496758	15481	N/A		ZNF423	102935	535559	23419	442321	38379
FILIP1L	168386	487087	7544	417774	28472	PGR	082175	325455	15482	325120	33361	ZNF423	102935	567169	23420	455061	38380
FILIP1L	168386	471562	7545	419642	28473	PGR	082175	534013	15483	436561	33362	ZNF423	102935	562520	23421	457664	38381
FILIP1L	168386	331335	7546	327880	28474	PGR	082175	533207	15484	N/A		ZNF423	102935	568094	23422	479288	38382
FILIP1L	168386	495625	7547	419874	28475	PGR	082175	528960	15485	432914	33363	ZNF423	102935	262383	23423	262383	38383
FILIP1L	168386	398326	7548	381371	28476	PGR	082175	534780	15486	432352	33364	ZNF462	148143	277225	23424	277225	38384
FILIP1L	168386	468533	7549	N/A		PGR	082175	526300	15487	436803	33365	ZNF462	148143	472574	23425	476222	38385
FILIP1L	168386	383694	7550	373192	28477	PGR	082175	263463	15488	263463	33366	ZNF462	148143	480607	23426	N/A	
FJX1	179431	317811	7551	400223	28478	PGR	082175	530764	15489	N/A		ZNF462	148143	374686	23427	363818	38386
FJX1	179431	532914	7552	N/A		PGR	082175	632634	15490	487607	33367	ZNF462	148143	441147	23428	397306	38387
FKBP4	004478	001008	7553	001008	28479	PGR	082175	619228	15491	482698	33368	ZNF462	148143	497489	23429	N/A	
FKBP4	004478	543769	7554	439703	28480	PGR	082175	617858	15492	481227	33369	ZNF462	148143	469433	23430	N/A	
FKBP4	004478	540260	7555	N/A		PHACTR2-AS1	235740	450575	15493	N/A		ZNF462	148143	471032	23431	N/A	
FKBP4	004478	538622	7556	446368	28481	PHF10	130024	366780	15494	355743	33370	ZNF462	148143	479166	23432	N/A	
FKBP4	004478	543037	7557	N/A		PHF10	130024	339209	15495	341805	33371	ZNF462	148143	427098	23433	405837	38388
FKBP4	004478	539181	7558	438491	28482	PHF10	130024	480008	15496	N/A		ZNF462	148143	482115	23434	N/A	
FKBP4	004478	544366	7559	442193	28483	PHF10	130024	464779	15497	N/A		ZNF462	148143	483287	23435	N/A	
FKBP4	004478	630279	7560	486800	28484	PHF10	130024	612128	15498	479515	33372	ZNF521	198795	361524	23436	354794	38389
FKBP5	096060	357266	7561	349811	28485	PHF10	130024	621772	15499	484117	33373	ZNF521	198795	584787	23437	463000	38390
FKBP5	096060	536438	7562	444810	28486	PHF21B	056487	403565	15500	385053	33374	ZNF521	198795	399425	23438	382352	38391
FKBP5	096060	539068	7563	441205	28487	PHF21B	056487	313237	15501	324403	33375	ZNF521	198795	538137	23439	440768	38392
FKBP5	096060	542713	7564	442340	28488	PHF21B	056487	629843	15502	487086	33376	ZNF521	198795	577775	23440	463748	38393
FLI1	151702	608303	7565	477262	28489	PHF21B	056487	414269	15503	401091	33377	ZNF521	198795	577720	23441	N/A	
FLI1	151702	527767	7566	476428	28490	PHF21B	056487	420689	15504	401294	33378	ZNF521	198795	577801	23442	462724	38394
FLI1	151702	527786	7567	433488	28491	PHF21B	056487	490679	15505	N/A		ZNF521	198795	581869	23443	N/A	
FLI1	151702	429175	7568	399985	28492	PHF21B	056487	460507	15506	N/A		ZNF521	198795	580488	23444	464415	38395
FLI1	151702	534087	7569	432950	28493	PHF21B	056487	474327	15507	N/A		ZNF521	198795	583005	23445	N/A	
FLI1	151702	608055	7570	N/A		PHF21B	056487	462631	15508	N/A		ZNF521	198795	579111	23446	N/A	
FLI1	151702	528790	7571	N/A		PHF21B	056487	495348	15509	N/A		ZNF521	198795	583398	23447	N/A	
FLI1	151702	344954	7572	339627	28494	PHF21B	056487	491522	15510	N/A		ZNF521	198795	582584	23448	N/A	
FLI1	151702	281428	7573	281428	28495	PHF21B	056487	396103	15511	379410	33379	ZNF521	198795	577461	23449	462746	38396
FLNB	136068	490882	7574	420213	28496	PHF24	122733	486477	15512	N/A		ZNF608	168916	513985	23450	N/A	
FLNB	136068	295956	7575	295956	28497	PHF24	122733	476115	15513	N/A		ZNF608	168916	504926	23451	427657	38397
FLNB	136068	358537	7576	351339	28498	PHF24	122733	242315	15514	242315	33380	ZNF608	168916	306315	23452	307746	38398
FLNB	136068	429972	7577	415599	28499	PHF24	122733	440503	15515	N/A		ZNF608	168916	505686	23453	424086	38399
FLNB	136068	493452	7578	418510	28500	PHKA1	067177	373542	15516	362643	33381	ZNF608	168916	503896	23454	N/A	
FLNB	136068	481470	7579	N/A		PHKA1	067177	373545	15517	362646	33382	ZNF608	168916	509799	23455	423279	38400
FLNB	136068	491408	7580	N/A		PHKA1	067177	373539	15518	362640	33383	ZNF608	168916	513986	23456	421899	38401
FLNB	136068	477629	7581	N/A		PHKA1	067177	339490	15519	342469	33384	ZNF608	168916	511308	23457	N/A	
FLNB	136068	466455	7582	420199	28501	PHKA1	067177	541944	15520	441251	33385	ZNF608	168916	512940	23458	N/A	
FLNB	136068	470231	7583	419954	28502	PHKA2	044446	379942	15521	369274	33386	ZNF608	168916	613878	23459	477767	38402
FLNB	136068	468939	7584	N/A		PHKA2	044446	481718	15522	N/A		ZNF804B	182348	333190	23460	329638	38403
FLNB	136068	475487	7585	N/A		PHKA2	044446	469485	15523	N/A		ZNF804B	182348	611114	23461	478506	38404

FLNB	136068	484981	7586	N/A		PHKA2	044446	473597	15524	N/A		ZNF831	124203	637017	23462	490240	38405
FLNB	136068	419752	7587	414532	28503	PHKA2	044446	473739	15525	N/A		ZNF831	124203	610729	23463	N/A	
FLRT2	185070	330753	7588	332879	28504	PHKA2	044446	469645	15526	N/A		ZNF831	124203	371030	23464	360069	38406
FLRT2	185070	556335	7589	N/A		PHKA2	044446	486231	15527	N/A		ZFPM1	179588	319555	23465	326630	38407
FLRT2	185070	557419	7590	N/A		PHKA2	044446	464455	15528	N/A		ZFPM1	179588	562417	23466	N/A	
FLRT2	185070	554746	7591	451050	28505	PHKG1	164776	297373	15529	297373	33387	ZFPM1	179588	569086	23467	482796	38408
FLRT2	185070	555398	7592	N/A		PHKG1	164776	446428	15530	389721	33388	ZFPM1	179588	563351	23468	484216	38409
FLRT2	185070	553627	7593	N/A		PHKG1	164776	432123	15531	397193	33389	ZFPM1	179588	562437	23469	480412	38410
FLRT2	185070	553650	7594	N/A		PHKG1	164776	471665	15532	N/A		ZFPM2	169946	521923	23470	N/A	
FLT3	122025	241453	7595	241453	28506	PHKG1	164776	395428	15533	378817	33390	ZFPM2	169946	518180	23471	N/A	
FLT3	122025	380987	7596	370374	28507	PHKG1	164776	489604	15534	N/A		ZFPM2	169946	407775	23472	384179	38411
FLT3	122025	469894	7597	N/A		PHKG1	164776	467726	15535	N/A		ZFPM2	169946	520492	23473	430757	38412
FMNL1	184922	592415	7598	N/A		PHKG1	164776	492124	15536	N/A		ZFPM2	169946	520027	23474	428149	38413
FMNL1	184922	331495	7599	329219	28508	PHKG1	164776	452681	15537	445440	33391	ZFPM2	169946	524235	23475	N/A	
FMNL1	184922	585852	7600	N/A		PHKG1	164776	537360	15538	441528	33392	ZFPM2	169946	511341	23476	N/A	
FMNL1	184922	592006	7601	N/A		PHOX2A	165462	546310	15539	444845	33393	ZFPM2	169946	522160	23477	N/A	
FMNL1	184922	592527	7602	N/A		PHOX2A	165462	298231	15540	298231	33394	ZFPM2	169946	517361	23478	428720	38414
FMNL1	184922	587856	7603	N/A		PHOX2A	165462	544057	15541	N/A		ZFPM2	169946	522296	23479	N/A	
FMNL1	184922	591434	7604	N/A		PHYHIP	168490	321613	15542	320017	33395	ZFX	005889	497813	23480	N/A	
FMNL1	184922	587489	7605	465474	28509	PHYHIP	168490	454243	15543	415491	33396	ZFX	005889	428571	23481	411637	38415
FMNL1	184922	586643	7606	465137	28510	PHYHIP	168490	523252	15544	430870	33397	ZFX	005889	419690	23482	416298	38416
FMNL1	184922	589911	7607	466711	28511	PHYHIP	168490	522869	15545	N/A		ZFX	005889	379177	23483	368475	38417
FMNL1	184922	586092	7608	468301	28512	PHYHIP	168490	518274	15546	N/A		ZFX	005889	304543	23484	304985	38418
FMNL1	184922	328118	7609	327442	28513	PI16	164530	373674	15547	362778	33398	ZFX	005889	459724	23485	N/A	
FMNL3	161791	335154	7610	335655	28514	PI16	164530	491324	15548	N/A		ZFX	005889	480195	23486	N/A	
FMNL3	161791	550668	7611	N/A		PI16	164530	611814	15549	478888	33399	ZFX	005889	338565	23487	343384	38419
FMNL3	161791	550488	7612	447479	28515	PID1	153823	482518	15550	N/A		ZFX	005889	474385	23488	N/A	
FMNL3	161791	549137	7613	N/A		PID1	153823	392054	15551	375907	33400	ZFX	005889	379188	23489	368486	38420
FMNL3	161791	352151	7614	344311	28516	PID1	153823	409462	15552	386826	33401	ZFX	005889	539115	23490	438233	38421
FMNL3	161791	550970	7615	N/A		PID1	153823	392055	15553	375908	33402	ZFY	067646	383052	23491	372525	38422
FMNL3	161791	550424	7616	448939	28517	PID1	153823	354069	15554	283937	33403	ZFY	067646	625061	23492	485605	38423
FMO3	007933	367755	7617	356729	28518	PID1	153823	534952	15555	438228	33404	ZFY	067646	469869	23493	N/A	
FMO3	007933	530212	7618	N/A		PIEZO2	154864	582937	15556	462187	33405	ZFY	067646	443793	23494	388814	38424
FMO3	007933	534514	7619	N/A		PIEZO2	154864	302079	15557	303316	33406	ZFY	067646	449237	23495	393908	38425
FMO3	007933	472784	7620	476963	28519	PIEZO2	154864	538948	15558	443129	33407	ZFY	067646	478783	23496	N/A	
FMO3	007933	479749	7621	477451	28520	PIEZO2	154864	580640	15559	463094	33408	ZFY	067646	155093	23497	155093	38426
FMO3	007933	478457	7622	N/A		PIEZO2	154864	503781	15560	421377	33409	ZIC1	152977	472523	23498	N/A	
FNDC3B	075420	421757	7623	408496	28521	PIEZO2	154864	582913	15561	462115	33410	ZIC1	152977	488404	23499	419664	38427
FNDC3B	075420	415807	7624	411242	28522	PIEZO2	154864	581680	15562	N/A		ZIC1	152977	282928	23500	282928	38428
FNDC3B	075420	469491	7625	N/A		PIEZO2	154864	579151	15563	N/A		ZIC1	152977	474034	23501	N/A	
FNDC3B	075420	336824	7626	338523	28523	PIEZO2	154864	579949	15564	477311	33411	ZIC1	152977	481840	23502	N/A	
FNDC3B	075420	423424	7627	392471	28524	PIEZO2	154864	578145	15565	N/A		ZIC2	043355	376335	23503	365514	38429
FNDC3B	075420	416957	7628	389094	28525	PIEZO2	154864	583325	15566	462560	33412	ZIC2	043355	490085	23504	N/A	
FNDC3B	075420	478016	7629	N/A		PIEZO2	154864	579112	15567	463589	33413	ZIC2	043355	468291	23505	N/A	
FNDC3B	075420	443501	7630	389064	28526	PIEZO2	154864	579899	15568	N/A		ZIC2	043355	477213	23506	N/A	
FNDC3B	075420	476794	7631	N/A		PIEZO2	154864	383408	15569	372900	33414	ZIC2	043355	481565	23507	N/A	
FNDC3B	075420	483344	7632	N/A		PIGA	165195	333590	15570	369820	33415	ZIC3	156925	287538	23508	287538	38430
FNDC3B	075420	494000	7633	N/A		PIGA	165195	635631	15571	N/A		ZIC3	156925	370606	23509	359638	38431
FNDC3B	075420	490832	7634	N/A		PIGA	165195	542278	15572	442653	33416	ZIC3	156925	478471	23510	N/A	
FOLH1	086205	458311	7635	N/A		PIGA	165195	635045	15573	N/A		ZIC4	174963	383075	23511	372553	38432
FOLH1	086205	256999	7636	256999	28527	PIGA	165195	635598	15574	489207	33417	ZIC4	174963	472749	23512	N/A	
FOLH1	086205	356696	7637	349129	28528	PIGA	165195	637626	15575	489928	33418	ZIC4	174963	494569	23513	N/A	
FOLH1	086205	525826	7638	434928	28529	PIGA	165195	638131	15576	490483	33419	ZIC4	174963	493664	23514	N/A	
FOLH1	086205	340334	7639	344131	28530	PIGA	165195	637296	15577	490545	33420	ZIC4	174963	484399	23515	417855	38433
FOLH1	086205	533034	7640	431463	28531	PIGA	165195	634582	15578	489540	33421	ZIC4	174963	473123	23516	420775	38434
FOLH1	086205	532018	7641	N/A		PIGA	165195	482148	15579	489528	33422	ZIC4	174963	463850	23517	N/A	
FOLH1	086205	525629	7642	N/A		PIGA	165195	634640	15580	489083	33423	ZIC4	174963	480015	23518	N/A	
FOLH1	086205	526226	7643	N/A		PIGA	165195	475746	15581	488970	33424	ZIC4	174963	464502	23519	N/A	
FOLH1	086205	529646	7644	N/A		PIGA	165195	463173	15582	N/A		ZIC4	174963	491672	23520	418277	38435

FOLH1	086205	533510	7645	436569	28532	PIGA	165195	635480	15583	N/A		ZIC4	174963	475502	23521	N/A	
FOLH1	086205	529117	7646	431577	28533	PIGA	165195	634286	15584	489491	33425	ZIC4	174963	462748	23522	420627	38436
FOLH1	086205	529648	7647	431263	28534	PIGA	165195	474662	15585	N/A		ZIC4	174963	484586	23523	418343	38437
FOLH1	086205	343844	7648	344086	28535	PIGA	165195	637799	15586	N/A		ZIC4	174963	463250	23524	419727	38438
FOSB	125740	585836	7649	467497	28536	PIGA	165195	634484	15587	N/A		ZIC4	174963	464144	23525	N/A	
FOSB	125740	417353	7650	407207	28537	PIGA	165195	635543	15588	489205	33426	ZIC4	174963	425731	23526	397695	38439
FOSB	125740	353609	7651	245919	28538	PIGH	100564	561272	15589	453759	33427	ZIC4	174963	525172	23527	435509	38440
FOSB	125740	591858	7652	466530	28539	PIGH	100564	216452	15590	216452	33428	ZIC5	139800	267294	23528	267294	38441
FOSB	125740	443841	7653	414177	28540	PIGH	100564	558987	15591	452816	33429	ZKSCAN1	106261	324306	23529	323148	38442
FOSB	125740	590335	7654	465068	28541	PIGH	100564	559118	15592	N/A		ZKSCAN1	106261	482979	23530	N/A	
FOSB	125740	592436	7655	465552	28542	PIGH	100564	560722	15593	453394	33430	ZKSCAN1	106261	426572	23531	409172	38443
FOSB	125740	592811	7656	468482	28543	PIGH	100564	558493	15594	453158	33431	ZKSCAN1	106261	432317	23532	394445	38444
FOSB	125740	586113	7657	N/A		PIGH	100564	558198	15595	452924	33432	ZKSCAN1	106261	620510	23533	480305	38445
FOSB	125740	586615	7658	468207	28544	PIGH	100564	561303	15596	452974	33433	ZKSCAN1	106261	535170	23534	443508	38446
FOSB	125740	589593	7659	465528	28545	PIGH	100564	558001	15597	454061	33434	ZMAT4	165061	315769	23535	319785	38447
FOSB	125740	587358	7660	N/A		PIGH	100564	559581	15598	453733	33435	ZMAT4	165061	297737	23536	297737	38448
FOSB	125740	615753	7661	485018	28546	PIGH	100564	559415	15599	452996	33436	ZMAT4	165061	519406	23537	428423	38449
FOSL2	075426	460736	7662	N/A		PIGH	100564	559097	15600	N/A		ZMAT4	165061	519806	23538	N/A	
FOSL2	075426	379619	7663	368939	28547	PIGS	087111	268758	15601	268758	33437	ZMAT4	165061	518242	23539	N/A	
FOSL2	075426	264716	7664	264716	28548	PIGS	087111	487231	15602	N/A		ZMAT4	165061	523188	23540	430050	38450
FOSL2	075426	436647	7665	396497	28549	PIGS	087111	492429	15603	N/A		ZMAT4	165061	523542	23541	427918	38451
FOXA1	129514	250448	7666	250448	28550	PIGS	087111	395346	15604	378755	33438	ZMAT4	165061	522623	23542	429068	38452
FOXA1	129514	545425	7667	N/A		PIGS	087111	308360	15605	309430	33439	ZMAT4	165061	523823	23543	N/A	
FOXA1	129514	553751	7668	451704	28551	PIGS	087111	484580	15606	N/A		ZNF10	256223	538918	23544	445997	38453
FOXA1	129514	554607	7669	N/A		PIGS	087111	582615	15607	N/A		ZNF10	256223	540609	23545	438232	38454
FOXA1	129514	557418	7670	N/A		PIGS	087111	577620	15608	N/A		ZNF10	256223	248211	23546	248211	38455
FOXA2	125798	419308	7671	400341	28552	PIGS	087111	465444	15609	N/A		ZNF10	256223	543271	23547	N/A	
FOXA2	125798	377115	7672	366319	28553	PIGS	087111	580968	15610	N/A		ZNF10	256223	540927	23548	N/A	
FOXG1	176165	636604	7673	N/A		PIGS	087111	584080	15611	463406	33440	ZNF10	256223	536704	23549	N/A	
FOXG1	176165	637220	7674	N/A		PIGS	087111	582721	15612	466846	33441	ZNF10	256223	536877	23550	441339	38456
FOXG1	176165	636893	7675	N/A		PIGS	087111	577594	15613	N/A		ZNF10	256223	426665	23551	393814	38457
FOXG1	176165	637351	7676	N/A		PIGS	087111	583631	15614	N/A		ZNF10	256223	402932	23552	384893	38458
FOXG1	176165	637817	7677	N/A		PIGS	087111	584413	15615	N/A		ZNF10	256223	537119	23553	N/A	
FOXG1	176165	636346	7678	N/A		PIGZ	119227	412723	15616	413405	33442	ZNF124	196418	472531	23554	462445	38459
FOXG1	176165	636353	7679	N/A		PIGZ	119227	413127	15617	405341	33443	ZNF124	196418	476312	23555	N/A	
FOXG1	176165	313071	7680	339004	28554	PIGZ	119227	443835	15618	389327	33444	ZNF124	196418	491356	23556	463191	38460
FOXH1	160973	377317	7681	366534	28555	PIGZ	119227	238138	15619	N/A		ZNF124	196418	340684	23557	340749	38461
FOXH1	160973	525197	7682	N/A		PIH1D3	080572	372453	15620	361531	33445	ZNF124	196418	543802	23558	440365	38462
FOXP4	137166	373063	7683	362154	28556	PIH1D3	080572	336387	15621	337757	33446	ZNF124	196418	491848	23559	N/A	
FOXP4	137166	409208	7684	386958	28557	PIH1D3	080572	535523	15622	441930	33447	ZNF131	172262	503599	23560	N/A	
FOXP4	137166	373057	7685	362148	28558	PIK3C2B	133056	367187	15623	356155	33448	ZNF131	172262	490046	23561	N/A	
FOXP4	137166	307972	7686	309823	28559	PIK3C2B	133056	462752	15624	N/A		ZNF131	172262	508795	23562	N/A	
FOXP4	137166	451305	7687	393704	28560	PIK3C2B	133056	479079	15625	N/A		ZNF131	172262	507393	23563	427003	38463
FOXP4	137166	373060	7688	362151	28561	PIK3C2B	133056	496872	15626	N/A		ZNF131	172262	514169	23564	N/A	
FRAS1	138759	325942	7689	326330	28562	PIK3C2B	133056	367184	15627	356152	33449	ZNF131	172262	515326	23565	422079	38464
FRAS1	138759	512123	7690	422834	28563	PIK3C2B	133056	415899	15628	401795	33450	ZNF131	172262	510026	23566	425623	38465
FRAS1	138759	508909	7691	425583	28564	PIK3C2B	133056	429009	15629	409554	33451	ZNF131	172262	504359	23567	N/A	
FRAS1	138759	502446	7692	423645	28565	PIK3C2B	133056	424712	15630	400561	33452	ZNF131	172262	509156	23568	426504	38466
FRAS1	138759	508900	7693	423809	28566	PIK3R1	145675	521381	15631	428056	33453	ZNF131	172262	508259	23569	422659	38467
FRAS1	138759	510944	7694	422221	28567	PIK3R1	145675	521657	15632	429277	33454	ZNF131	172262	507218	23570	425139	38468
FRAS1	138759	509802	7695	N/A		PIK3R1	145675	517643	15633	N/A		ZNF131	172262	306938	23571	305804	38469
FREM1	164946	380894	7696	370278	28568	PIK3R1	145675	517412	15634	N/A		ZNF131	172262	505606	23572	423945	38470
FREM1	164946	380875	7697	370257	28569	PIK3R1	145675	520675	15635	428566	33455	ZNF131	172262	509634	23573	421246	38471
FREM1	164946	427623	7698	412597	28570	PIK3R1	145675	523807	15636	430126	33456	ZNF131	172262	509341	23574	424771	38472
FREM1	164946	380880	7699	370262	28571	PIK3R1	145675	522084	15637	429766	33457	ZNF131	172262	509931	23575	425722	38473
FREM1	164946	486223	7700	N/A		PIK3R1	145675	520694	15638	323512	33458	ZNF131	172262	511736	23576	426614	38474
FREM1	164946	485068	7701	N/A		PIK3R1	145675	521409	15639	431058	33459	ZNF131	172262	510037	23577	N/A	
FREM1	164946	466679	7702	N/A		PIK3R1	145675	336483	15640	338554	33460	ZNF131	172262	502623	23578	423254	38475
FREM1	164946	497634	7703	N/A		PIK3R1	145675	518292	15641	N/A		ZNF131	172262	507231	23579	N/A	

FREM1	164946	422223	7704	412940	28572	PIK3R1	145675	517698	15642	430424	33461	ZNF141	131127	366506	23580	N/A	
FRMD1	153303	283309	7705	283309	28573	PIK3R1	145675	518813	15643	N/A		ZNF141	131127	512994	23581	425799	38476
FRMD1	153303	432403	7706	N/A		PIK3R1	145675	519025	15644	429156	33462	ZNF141	131127	503699	23582	N/A	
FRMD1	153303	358587	7707	N/A		PIK3R1	145675	523872	15645	430098	33463	ZNF141	131127	505939	23583	424403	38477
FRMD1	153303	440994	7708	414115	28574	PIK3R1	145675	520550	15646	N/A		ZNF141	131127	240499	23584	240499	38478
FRMD1	153303	468647	7709	427668	28575	PILRA	085514	432297	15647	415111	33464	ZNF141	131127	579770	23585	N/A	
FRMD1	153303	509157	7710	423552	28576	PILRA	085514	198536	15648	198536	33465	ZNF184	096654	377419	23586	366636	38479
FRMD1	153303	336070	7711	N/A		PILRA	085514	453419	15649	390026	33466	ZNF184	096654	211936	23587	211936	38480
FRMD1	153303	506415	7712	N/A		PILRA	085514	484934	15650	N/A		ZNF212	170260	335870	23588	338572	38481
FRMD1	153303	511714	7713	424439	28577	PILRA	085514	394000	15651	377569	33467	ZNF212	170260	486371	23589	418281	38482
FRMD3	172159	328788	7714	328615	28578	PILRA	085514	350573	15652	340109	33468	ZNF212	170260	462724	23590	418167	38483
FRMD3	172159	376434	7715	365617	28579	PILRA	085514	474013	15653	N/A		ZNF212	170260	481584	23591	419419	38484
FRMD3	172159	376438	7716	365621	28580	PIM3	198355	360612	15654	353824	33469	ZNF212	170260	488917	23592	419261	38485
FRMD3	172159	304195	7717	303508	28581	PIM3	198355	467480	15655	N/A		ZNF219	165804	360947	23593	354206	38486
FRMD3	172159	465485	7718	N/A		PIN4	102309	373662	15656	421392	33470	ZNF219	165804	451119	23594	388538	38487
FRMD3	172159	431299	7719	412719	28582	PIN4	102309	218432	15657	218432	33471	ZNF219	165804	421093	23595	392401	38488
FRMD3	172159	621208	7720	484839	28583	PIN4	102309	373669	15658	362773	33472	ZNF219	165804	555270	23596	450803	38489
FRMD4A	151474	357447	7721	350032	28584	PIN4	102309	496835	15659	421676	33473	ZNF219	165804	554478	23597	451212	38490
FRMD4A	151474	475325	7722	N/A		PIN4	102309	439980	15660	394066	33474	ZNF219	165804	556174	23598	450609	38491
FRMD4A	151474	495956	7723	488764	28585	PIN4	102309	446576	15661	402330	33475	ZNF219	165804	554923	23599	451890	38492
FRMD4A	151474	264546	7724	264546	28586	PIN4	102309	423432	15662	409154	33476	ZNF219	165804	553296	23600	450900	38493
FRMD4A	151474	632570	7725	487974	28587	PIP4K2A	150867	376573	15663	365757	33477	ZNF219	165804	553980	23601	451969	38494
FRMD4A	151474	632314	7726	N/A		PIP4K2A	150867	323883	15664	326294	33478	ZNF219	165804	556944	23602	N/A	
FRMD4A	151474	492155	7727	N/A		PIP4K2A	150867	474335	15665	N/A		ZNF219	165804	555697	23603	451595	38495
FRMD4A	151474	342409	7728	N/A		PIP4K2A	150867	545335	15666	442098	33479	ZNF219	165804	556101	23604	N/A	
FRMD4A	151474	477221	7729	488325	28588	PIP4K2A	150867	604912	15667	473858	33480	ZNF219	165804	624093	23605	N/A	
FRMD4A	151474	640906	7730	492091	28589	PIP4K2A	150867	422321	15668	N/A		ZNF253	256771	592725	23606	467235	38496
FRMD4A	151474	493380	7731	474863	28590	PIP4K2A	150867	432610	15669	N/A		ZNF253	256771	589717	23607	468720	38497
FRMD4A	151474	475141	7732	473870	28591	PIP4K2A	150867	605011	15670	N/A		ZNF253	256771	355650	23608	347868	38498
FRMD4B	114541	398540	7733	381549	28592	PIP5K1C	186111	335312	15671	335333	33481	ZNF253	256771	589668	23609	N/A	
FRMD4B	114541	478263	7734	418682	28593	PIP5K1C	186111	539785	15672	445992	33482	ZNF253	256771	640599	23610	492582	38499
FRMD4B	114541	462512	7735	419869	28594	PIP5K1C	186111	589578	15673	466363	33483	ZNF304	131845	443917	23611	401642	38500
FRMD4B	114541	497475	7736	N/A		PIP5K1C	186111	537021	15674	444779	33484	ZNF304	131845	598744	23612	470319	38501
FRMD4B	114541	489817	7737	420735	28595	PIP5K1C	186111	592530	15675	N/A		ZNF304	131845	282286	23613	282286	38502
FRMD4B	114541	470070	7738	N/A		PIP5K1C	186111	587482	15676	N/A		ZNF304	131845	391705	23614	375586	38503
FRMD4B	114541	483668	7739	N/A		PIP5K1C	186111	636612	15677	N/A		ZNF331	130844	513929	23615	N/A	
FRMD4B	114541	487751	7740	N/A		PIP5K1C	186111	637724	15678	N/A		ZNF331	130844	253144	23616	253144	38504
FRMD4B	114541	493880	7741	418962	28596	PIPOX	179761	580241	15679	N/A		ZNF331	130844	502248	23617	423675	38505
FRMD4B	114541	473029	7742	418373	28597	PIPOX	179761	580383	15680	N/A		ZNF331	130844	511593	23618	427439	38506
FRMD4B	114541	460709	7743	418023	28598	PIPOX	179761	583215	15681	N/A		ZNF331	130844	504033	23619	N/A	
FRMD4B	114541	473188	7744	N/A		PIPOX	179761	578748	15682	N/A		ZNF331	130844	514374	23620	424835	38507
FRMD4B	114541	459638	7745	417550	28599	PIPOX	179761	577182	15683	N/A		ZNF331	130844	411977	23621	393336	38508
FRMD4B	114541	462308	7746	N/A		PIPOX	179761	323372	15684	317721	33485	ZNF331	130844	511154	23622	421014	38509
FRMD4B	114541	497880	7747	417765	28600	PIPOX	179761	466889	15685	465428	33486	ZNF331	130844	509069	23623	N/A	
FRMD4B	114541	497757	7748	N/A		PIPOX	179761	469082	15686	465329	33487	ZNF331	130844	509047	23624	423263	38510
FRMD4B	114541	493127	7749	N/A		PIPOX	179761	484308	15687	N/A		ZNF331	130844	509585	23625	426155	38511
FRMD4B	114541	462888	7750	N/A		PIPOX	179761	419875	15688	N/A		ZNF331	130844	504940	23626	N/A	
FRMPD1	070601	377765	7751	366995	28601	PITPNM3	091622	421306	15689	407882	33488	ZNF331	130844	513999	23627	423156	38512
FRMPD1	070601	539465	7752	444411	28602	PITPNM3	091622	262483	15690	262483	33489	ZNF331	130844	512387	23628	421728	38513
FRMPD1	070601	359927	7753	439868	28603	PITPNM3	091622	576664	15691	N/A		ZNF331	130844	511567	23629	426127	38514
FRMPD2	170324	635925	7754	N/A		PITPNM3	091622	572795	15692	N/A		ZNF331	130844	514022	23630	422471	38515
FRMPD2	170324	637395	7755	490362	28604	PITPNM3	091622	575201	15693	458901	33490	ZNF331	130844	505949	23631	427532	38516
FRMPD2	170324	636244	7756	490201	28605	PIWIL1	125207	245255	15694	245255	33491	ZNF331	130844	513265	23632	426458	38517
FRMPD2	170324	474573	7757	N/A		PIWIL1	125207	546060	15695	442086	33492	ZNF331	130844	502616	23633	422586	38518
FRMPD2	170324	374201	7758	363317	28606	PIWIL1	125207	539400	15696	440677	33493	ZNF331	130844	504493	23634	425517	38519
FRMPD2	170324	305531	7759	307079	28607	PIWIL1	125207	539995	15697	439096	33494	ZNF331	130844	505426	23635	424929	38520
FRMPD2	170324	491130	7760	N/A		PIWIL1	125207	535956	15698	444353	33495	ZNF331	130844	449416	23636	393817	38521
FRMPD2	170324	463706	7761	N/A		PIWIL1	125207	542723	15699	438582	33496	ZNF404	176222	587539	23637	466051	38522
FRMPD2	170324	477710	7762	N/A		PIWIL1	125207	540672	15700	N/A		ZNF404	176222	588094	23638	N/A	

FRMPD2	170324	486151	7763	N/A		PIWIL1	125207	541480	15701	N/A		ZNF404	176222	324394	23639	319479	38523
FRMPD2	170324	494505	7764	N/A		PIWIL1	275051	613226	15702	481042	33497	ZNF496	162714	462139	23640	N/A	
FRMPD2	170324	505547	7765	N/A		PIWIL1	275051	632888	15703	487688	33498	ZNF496	162714	294753	23641	294753	38524
FRMPD2	170324	468556	7766	N/A		PIWIL1	275051	634077	15704	487799	33499	ZNF496	162714	461277	23642	473324	38525
FRMPD2	170324	492045	7767	N/A		PIWIL1	275051	633272	15705	487920	33500	ZNF496	162714	478225	23643	N/A	
FRMPD4	169933	380682	7768	370057	28608	PIWIL1	275051	633252	15706	488716	33501	ZNF496	162714	477903	23644	N/A	
FRMPD4	169933	640291	7769	492353	28609	PIWIL1	275051	634115	15707	488677	33502	ZNF546	187187	597363	23645	N/A	
FRMPD4	169933	616992	7770	482182	28610	PIWIL1	275051	633042	15708	488197	33503	ZNF546	187187	599504	23646	469334	38526
FRRS1	156869	287474	7771	287474	28611	PIWIL1	275051	631528	15709	N/A		ZNF546	187187	596894	23647	470423	38527
FRRS1	156869	489209	7772	N/A		PIWIL1	275051	631714	15710	N/A		ZNF546	187187	593687	23648	N/A	
FRRS1	156869	492943	7773	N/A		PKD2L1	107593	318222	15711	325296	33504	ZNF546	187187	601138	23649	469168	38528
FRRS1	156869	370176	7774	N/A		PKD2L1	107593	465680	15712	434019	33505	ZNF546	187187	600094	23650	469540	38529
FRRS1L	260230	561981	7775	477141	28612	PKD2L1	107593	528248	15713	436514	33506	ZNF546	187187	347077	23651	339823	38530
FRY	073910	642040	7776	493189	28613	PKD2L1	107593	532547	15714	434224	33507	ZNF546	187187	602253	23652	N/A	
FRY	073910	542859	7777	445043	28614	PKDCC	162878	294964	15715	294964	33508	ZNF546	187187	595225	23653	472403	38531
FRY	073910	463566	7778	N/A		PKDCC	162878	401498	15716	385220	33509	ZNF546	281526	627810	23654	N/A	
FRY	073910	436046	7779	398010	28615	PKDCC	162878	485578	15717	N/A		ZNF546	281526	631242	23655	486015	38532
FRY	073910	641614	7780	N/A		PKDCC	162878	492861	15718	N/A		ZNF546	281526	629260	23656	487382	38533
FRY	073910	477712	7781	434694	28616	PKDCC	162878	475868	15719	N/A		ZNF546	281526	625917	23657	N/A	
FRY	073910	380217	7782	N/A		PKDCC	162878	475241	15720	N/A		ZNF546	281526	628247	23658	486807	38534
FRY	073910	418076	7783	N/A		PKDCC	162878	490302	15721	N/A		ZNF546	281526	627583	23659	487351	38535
FRY	073910	380250	7784	369600	28617	PKDCC	162878	470578	15722	N/A		ZNF546	281526	626389	23660	487125	38536
FSD2	186628	334574	7785	335651	28618	PKDCC	162878	480099	15723	N/A		ZNF546	281526	626141	23661	N/A	
FSD2	186628	541889	7786	444078	28619	PKIA	171033	396418	15724	379696	33510	ZNF546	281526	626396	23662	486294	38537
FSD2	186628	561368	7787	453127	28620	PKIA	171033	352966	15725	336552	33511	ZNF580	213015	592881	23663	468407	38538
FSIP2	188738	424728	7788	401306	28621	PKIA	171033	518467	15726	430887	33512	ZNF580	213015	325333	23664	320050	38539
FSIP2	188738	465275	7789	N/A		PKMYT1	127564	431515	15727	392855	33513	ZNF580	213015	590190	23665	465028	38540
FSIP2	188738	469367	7790	N/A		PKMYT1	127564	572832	15728	N/A		ZNF580	213015	543039	23666	443957	38541
FSIP2	188738	429412	7791	395888	28622	PKMYT1	127564	574333	15729	N/A		ZNF580	213015	592461	23667	467142	38542
FSIP2	188738	415915	7792	390251	28623	PKMYT1	127564	440027	15730	397739	33514	ZNF580	213015	545125	23668	446126	38543
FSIP2	188738	611759	7793	478995	28624	PKMYT1	127564	262300	15731	262300	33515	ZNF585A	196967	587817	23669	466825	38544
FSTL4	053108	265342	7794	265342	28625	PKMYT1	127564	575040	15732	459880	33516	ZNF585A	196967	588723	23670	N/A	
FSTL4	053108	509525	7795	N/A		PKMYT1	127564	575981	15733	N/A		ZNF585A	196967	292841	23671	292841	38545
FSTL4	053108	511375	7796	N/A		PKMYT1	127564	574680	15734	N/A		ZNF585A	196967	392157	23672	375998	38546
FSTL4	053108	507112	7797	N/A		PKMYT1	127564	574385	15735	458943	33517	ZNF585A	196967	588354	23673	466185	38547
FSTL4	053108	514998	7798	N/A		PKMYT1	127564	574730	15736	460868	33518	ZNF585A	196967	356958	23674	349440	38548
FSTL4	053108	510685	7799	427662	28626	PKMYT1	127564	573944	15737	459123	33519	ZNF607	198182	355202	23675	347338	38549
FSTL4	053108	621681	7800	484273	28627	PKMYT1	127564	382240	15738	371675	33520	ZNF607	198182	395835	23676	438015	38550
FSTL5	168843	379164	7801	368462	28628	PKMYT1	127564	576268	15739	458545	33521	ZNF607	198182	586559	23677	466265	38551
FSTL5	168843	427802	7802	389270	28629	PKMYT1	127564	574415	15740	460598	33522	ZNF607	198182	590670	23678	466785	38552
FSTL5	168843	511999	7803	N/A		PKMYT1	127564	575632	15741	461330	33523	ZNF607	198182	591664	23679	468817	38553
FSTL5	168843	511170	7804	N/A		PKMYT1	127564	572059	15742	458842	33524	ZNF703	183779	331569	23680	332325	38554
FSTL5	168843	306100	7805	305334	28630	PKMYT1	127564	572619	15743	461628	33525	ZNF711	147180	373165	23681	362260	38555
FTH1	167996	529191	7806	431659	28631	PKMYT1	127564	570649	15744	N/A		ZNF711	147180	276123	23682	276123	38556
FTH1	167996	529631	7807	431575	28632	PKMYT1	127564	572658	15745	N/A		ZNF711	147180	360700	23683	353922	38557
FTH1	167996	530019	7808	433470	28633	PKMYT1	127564	571102	15746	N/A		ZNF736	234444	493036	23684	N/A	
FTH1	167996	273550	7809	273550	28634	PKNOX2	165495	530517	15747	N/A		ZNF736	234444	465343	23685	N/A	
FTH1	167996	532829	7810	432223	28635	PKNOX2	165495	531116	15748	N/A		ZNF736	234444	492322	23686	N/A	
FTH1	167996	534180	7811	434403	28636	PKNOX2	165495	298282	15749	298282	33526	ZNF736	234444	606716	23687	N/A	
FTH1	167996	526640	7812	433321	28637	PKNOX2	165495	559662	15750	N/A		ZNF736	234444	438373	23688	391083	38558
FTH1	167996	532601	7813	435111	28638	PKNOX2	165495	557814	15751	N/A		ZNF736	234444	488621	23689	N/A	
FTH1	167996	534719	7814	N/A		PKNOX2	165495	527238	15752	431599	33527	ZNF736	234444	423484	23690	400852	38559
FTH1	167996	533138	7815	N/A		PKNOX2	165495	561399	15753	N/A		ZNF736	234444	355095	23691	347210	38560
FTH1	167996	529548	7816	436947	28639	PKNOX2	165495	532623	15754	434377	33528	ZNF84	198040	543758	23692	437949	38561
FTH1	167996	620041	7817	484477	28640	PKNOX2	165495	531212	15755	434255	33529	ZNF84	198040	539354	23693	445549	38562
FTL	087086	331825	7818	366525	28641	PKNOX2	165495	558729	15756	N/A		ZNF84	198040	438628	23694	387416	38563
FXYD1	266964	351325	7819	343314	28642	PKNOX2	165495	561115	15757	N/A		ZNF84	198040	540031	23695	445820	38564
FXYD1	266964	592818	7820	N/A		PKNOX2	165495	558705	15758	453374	33530	ZNF84	198040	539098	23696	N/A	
FXYD1	266964	589209	7821	466398	28643	PKNOX2	165495	561298	15759	N/A		ZNF84	198040	539686	23697	N/A	

FXYD1	266964	455515	7822	393611	28644	PKNOX2	165495	526955	15760	N/A		ZNF84	198040	536123	23698	445958	38565
FXYD1	266964	588715	7823	465289	28645	PKP3	184363	534401	15761	434517	33531	ZNF84	198040	327668	23699	331465	38566
FXYD1	266964	588607	7824	468535	28646	PKP3	184363	533249	15762	435383	33532	ZNF84	198040	543310	23700	438982	38567
FXYD1	266964	587056	7825	N/A		PKP3	184363	527442	15763	435522	33533	ZNF84	198040	545299	23701	437636	38568
FXYD1	266964	588081	7826	467727	28647	PKP3	184363	528036	15764	434110	33534	ZNF84	198040	542358	23702	N/A	
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FXYD1	266964	612146	7829	481244	28649	PKP3	184363	531857	15767	435478	33536	ZNF84	198040	535439	23705	439130	38570
FXYD7	221946	586063	7830	466915	28650	PKP3	184363	530695	15768	N/A		ZNF84	198040	543124	23706	N/A	
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FXYD7	221946	439441	7832	N/A		PKP3	184363	526971	15770	N/A		ZNF891	214029	537226	23708	437590	38572
FXYD7	221946	588265	7833	465784	28652	PKP3	184363	525642	15771	436847	33537	ZNHIT1	106400	305105	23709	304593	38573
FZD7	155760	286201	7834	286201	28653	PLA2G16	176485	323646	15772	320337	33538	ZNHIT1	106400	461205	23710	N/A	
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FZR1	105325	588327	7838	N/A		PLA2G16	176485	415826	15776	389124	33540	ZNRD1	224859	455948	23714	402198	38575
FZR1	105325	591290	7839	467967	28657	PLA2G16	176485	639271	15777	492682	33541	ZNRD1	224859	481657	23715	N/A	
FZR1	105325	395095	7840	378529	28658	PLA2G3	100078	215885	15778	215885	33542	ZNRD1	224859	472459	23716	N/A	
FZR1	105325	313639	7841	321800	28659	PLA2G4A	116711	367466	15779	356436	33543	ZNRD1	224859	428913	23717	414110	38576
FZR1	105325	592214	7842	N/A		PLA2G4A	116711	466600	15780	N/A		ZNRD1	224859	451875	23718	387914	38577
FZR1	105325	586212	7843	N/A		PLA2G4E	188089	399518	15781	382434	33544	ZNRD1	235443	471263	23719	N/A	
FZR1	105325	588084	7844	N/A		PLA2G4E	188089	547930	15782	N/A		ZNRD1	235443	437507	23720	412369	38578
GAB1	109458	262995	7845	262995	28660	PLA2G4E	188089	551073	15783	N/A		ZNRD1	235443	443494	23721	395397	38579
GAB1	109458	262994	7846	262994	28661	PLA2G5	127472	486277	15784	N/A		ZNRD1	235443	465992	23722	N/A	
GAB1	109458	514639	7847	427435	28662	PLA2G5	127472	465698	15785	N/A		ZNRD1	235443	453694	23723	405636	38580
GAB1	109458	515366	7848	426668	28663	PLA2G5	127472	460175	15786	N/A		ZNRD1	235443	443142	23724	391809	38581
GAB1	109458	505913	7849	424554	28664	PLA2G5	127472	469069	15787	N/A		ZNRD1	235176	466305	23725	N/A	
GAB1	109458	515388	7850	N/A		PLA2G5	127472	489871	15788	N/A		ZNRD1	235176	417738	23726	407715	38582
GAB1	109458	509992	7851	425921	28665	PLA2G5	127472	498348	15789	N/A		ZNRD1	235176	429558	23727	410954	38583
GAB1	109458	511836	7852	420867	28666	PLA2G5	127472	375108	15790	364249	33545	ZNRD1	235176	441251	23728	413265	38584
GAB1	109458	512843	7853	426297	28667	PLA2G5	127472	478803	15791	N/A		ZNRD1	235176	431416	23729	395065	38585
GAB1	109458	507334	7854	N/A		PLA2G7	146070	274793	15792	274793	33546	ZNRD1	235176	477956	23730	N/A	
GAB1	109458	507070	7855	N/A		PLA2G7	146070	537365	15793	445666	33547	ZNRD1	236808	466296	23731	N/A	
GAB1	109458	510615	7856	N/A		PLAG1	181690	316981	15794	325546	33548	ZNRD1	236808	432904	23732	414720	38586
GAB1	109458	508833	7857	N/A		PLAG1	181690	522009	15795	N/A		ZNRD1	236808	420100	23733	410530	38587
GAB1	109458	511109	7858	N/A		PLAG1	181690	423799	15796	404067	33549	ZNRD1	236808	432227	23734	399302	38588
GAB2	033327	340149	7859	343959	28668	PLAG1	181690	429357	15797	416537	33550	ZNRD1	236808	444027	23735	396661	38589
GAB2	033327	361507	7860	354952	28669	PLAG1	181690	519027	15798	N/A		ZNRD1	236808	476397	23736	N/A	
GAB2	033327	528329	7861	N/A		PLAT	104368	429089	15799	392045	33551	ZNRD1	206502	484199	23737	N/A	
GAB2	033327	526030	7862	N/A		PLAT	104368	220809	15800	220809	33552	ZNRD1	206502	400662	23738	383503	38590
GAB2	033327	528886	7863	433762	28670	PLAT	104368	352041	15801	270188	33553	ZNRD1	206502	383613	23739	373108	38591
GAB2	033327	530915	7864	431868	28671	PLAT	104368	519510	15802	428886	33554	ZNRD1	206502	400660	23740	383501	38592
GAB2	033327	534823	7865	N/A		PLAT	104368	429710	15803	407861	33555	ZNRD1	206502	400659	23741	383500	38593
GABARAPL1	139112	539408	7866	443122	28672	PLAT	104368	524009	15804	429401	33556	ZNRD1	206502	476699	23742	N/A	
GABARAPL1	139112	542722	7867	438029	28673	PLAT	104368	522812	15805	N/A		ZNRD1	236949	485907	23743	N/A	
GABARAPL1	139112	545859	7868	444108	28674	PLAT	104368	521042	15806	429542	33557	ZNRD1	236949	437373	23744	410127	38594
GABARAPL1	139112	266458	7869	266458	28675	PLAT	104368	524261	15807	N/A		ZNRD1	236949	431032	23745	416599	38595
GABARAPL1	139112	421801	7870	411256	28676	PLAT	104368	521647	15808	N/A		ZNRD1	236949	433264	23746	393236	38596
GABARAPL1	139112	544284	7871	439734	28677	PLAT	104368	520523	15809	428797	33558	ZNRD1	236949	432545	23747	405264	38597
GABARAPL1	139112	545047	7872	441165	28678	PLAT	104368	521694	15810	429801	33559	ZNRD1	236949	459984	23748	N/A	
GABARAPL1	139112	541453	7873	446297	28679	PLCB1	182621	637919	15811	490862	33560	ZNRD1	233795	481680	23749	N/A	

GABARAPL1	139112	543602	7874	445857	28680	PLCB1	182621	625874	15812	486301	33561	ZNRD1	233795	417275	23750	397636	38598
GABARAPL1	139112	540424	7875	443720	28681	PLCB1	182621	630495	15813	486655	33562	ZNRD1	233795	444794	23751	407364	38599
GABARAPL1	139112	537201	7876	444055	28682	PLCB1	182621	378641	15814	367908	33563	ZNRD1	233795	442585	23752	394779	38600
GABARAPL1	139112	545887	7877	444186	28683	PLCB1	182621	338037	15815	338185	33564	ZNRD1	233795	412396	23753	396922	38601
GABARAPL1	139112	541960	7878	445709	28684	PLCB1	182621	629992	15816	486531	33565	ZNRD1	233795	484119	23754	N/A	
GABARAPL1	139112	539289	7879	N/A		PLCB1	182621	636319	15817	490455	33566	ZNRD1	066379	471008	23755	N/A	
GABARAPL1	139112	546017	7880	446456	28685	PLCB1	182621	626161	15818	N/A		ZNRD1	066379	332435	23756	331111	38602
GABARAPL1	139112	535576	7881	444738	28686	PLCB1	182621	404098	15819	384001	33567	ZNRD1	066379	376782	23757	365978	38603
GABARAPL1	139112	539170	7882	444209	28687	PLCB1	182621	378637	15820	367904	33568	ZNRD1	066379	359374	23758	352333	38604
GABARAPL1	139112	545290	7883	437451	28688	PLCB1	182621	630757	15821	N/A		ZNRD1	066379	376785	23759	365981	38605
GABARAPL1	139112	629504	7884	486133	28689	PLCB1	182621	637204	15822	490771	33569	ZNRD1	066379	463141	23760	N/A	
GABBR1	237112	425097	7885	411286	28690	PLCB1	182621	636825	15823	N/A		ZNRF1	186187	335325	23761	335091	38606
GABBR1	237112	446436	7886	394528	28691	PLCB1	182621	635830	15824	N/A		ZNRF1	186187	320619	23762	323362	38607
GABBR1	237112	443440	7887	399318	28692	PLCB1	182621	636784	15825	N/A		ZNRF1	186187	566250	23763	456168	38608
GABBR1	237112	466282	7888	N/A		PLCB1	182621	626114	15826	N/A		ZNRF1	186187	567962	23764	455601	38609
GABBR1	237112	492358	7889	N/A		PLCB1	182621	628900	15827	N/A		ZNRF1	186187	564320	23765	N/A	
GABBR1	237112	475099	7890	N/A		PLCB1	182621	626966	15828	487075	33570	ZNRF1	186187	568511	23766	462910	38610
GABBR1	237112	493150	7891	N/A		PLCB1	182621	637000	15829	N/A		ZNRF1	186187	579084	23767	N/A	
GABBR1	237112	417759	7892	391572	28693	PLCB1	182621	635850	15830	N/A		ZNRF1	186187	566244	23768	N/A	
GABBR1	237112	471103	7893	N/A		PLCB1	182621	475958	15831	486428	33571	ZNRF1	186187	568351	23769	457606	38611
GABBR1	237112	497560	7894	N/A		PLCB1	182621	487210	15832	431704	33572	ZNRF1	186187	568494	23770	N/A	
GABBR1	237112	472409	7895	N/A		PLCB1	182621	494924	15833	N/A		ZNRF1	186187	568844	23771	N/A	
GABBR1	237112	481954	7896	N/A		PLCB1	182621	636711	15834	N/A		ZP2	103310	574091	23772	458991	38612
GABBR1	237112	551140	7897	448654	28694	PLCB1	182621	439627	15835	391162	33573	ZP2	103310	574002	23773	460971	38613
GABBR1	204681	355973	7898	348248	28695	PLCB1	182621	628239	15836	487544	33574	ZP2	103310	573114	23774	N/A	
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GABBR1	204681	377034	7903	366233	28700	PLCB1	182621	637254	15841	N/A		ZP2	284588	639836	23779	N/A	
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GABBR1	204681	494877	7905	419061	28701	PLCB1	182621	617005	15843	477664	33579	ZP2	284588	640539	23781	N/A	
GABBR1	204681	488334	7906	N/A		PLCB1	182621	612075	15844	479997	33580	ZSCAN29	140265	396976	23782	380174	38616
GABBR1	204681	486434	7907	N/A		PLCE1	138193	371380	15845	360431	33581	ZSCAN29	140265	566849	23783	457835	38617
GABBR1	204681	473774	7908	N/A		PLCE1	138193	371375	15846	360426	33582	ZSCAN29	140265	562072	23784	456089	38618
GABBR1	204681	489839	7909	N/A		PLCE1	138193	464214	15847	N/A		ZSCAN29	140265	568898	23785	456883	38619
GABBR1	204681	494634	7910	N/A		PLCE1	138193	371385	15848	360438	33583	ZSCAN29	140265	570181	23786	454548	38620
GABBR1	204681	477029	7911	N/A		PLCH1	114805	494598	15849	419100	33584	ZSCAN29	140265	561661	23787	458119	38621
GABBR1	204681	485508	7912	417663	28702	PLCH1	114805	460012	15850	417502	33585	ZSCAN29	140265	563508	23788	N/A	
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GABBR1	204681	467259	7914	N/A		PLCH1	114805	340059	15852	345988	33587	ZSCAN30	186814	333206	23790	329738	38623
GABBR1	204681	462632	7915	419755	28704	PLCH1	114805	469040	15853	N/A		ZSCAN30	186814	420878	23791	392371	38624
GABBR1	204681	476670	7916	417332	28705	PLCH1	114805	334686	15854	335469	33588	ZSCAN30	186814	590777	23792	N/A	
GABBR1	204681	376977	7917	366176	28706	PLCH2	276429	627854	15855	487140	33589	ZSCAN30	186814	589178	23793	465046	38625
GABBR1	206511	383638	7918	373134	28707	PLCH2	276429	626246	15856	486186	33590	ZSCAN30	186814	588448	23794	470677	38626
GABBR1	206511	383636	7919	373132	28708	PLCH2	276429	627279	15857	N/A		ZSCAN30	186814	601405	23795	472179	38627
GABBR1	206511	383637	7920	373133	28709	PLCH2	276429	625637	15858	N/A		ZSCAN30	186814	592278	23796	470443	38628
GABBR1	206511	466873	7921	N/A		PLCH2	276429	627778	15859	N/A		ZSCAN30	186814	592598	23797	468180	38629
GABBR1	206511	473906	7922	N/A		PLCH2	276429	620687	15860	481938	33591	ZSCAN30	186814	592211	23798	467308	38630

GABBR1	206511	490214	7923	N/A		PLCH2	149527	609981	15861	476436	33592	ZSCAN30	186814	588832	23799	N/A	
GABBR1	206511	486760	7924	N/A		PLCH2	149527	449969	15862	397289	33593	ZSCAN30	186814	610712	23800	480152	38631
GABBR1	206511	476629	7925	N/A		PLCH2	149527	419816	15863	389803	33594	ZSCAN30	186814	639929	23801	491237	38632
GABBR1	206511	495153	7926	N/A		PLCH2	149527	343889	15864	N/A		ZSWIM6	130449	252744	23802	252744	38633
GABBR1	206511	383639	7927	373135	28710	PLCH2	149527	278878	15865	278878	33595	ZYG11A	203995	371532	23803	360587	38634
GABBR1	206511	483838	7928	N/A		PLCH2	149527	473964	15866	N/A		ZYG11A	203995	371528	23804	360583	38635
GABBR1	206511	475370	7929	N/A		PLCH2	149527	462379	15867	N/A		ZYG11A	203995	612017	23805	482761	38636
GABBR1	206511	551423	7930	449342	28711	PLCH2	149527	378486	15868	367747	33596	ZYX	159840	322764	23806	324422	38637
GABBR1	232569	439457	7931	406066	28712	PLCL1	115896	428675	15869	402861	33597	ZYX	159840	449630	23807	413467	38638
GABBR1	232569	452300	7932	408938	28713	PLCL1	115896	435320	15870	410488	33598	ZYX	159840	468083	23808	N/A	
GABBR1	232569	419674	7933	399861	28714	PLCL1	115896	487695	15871	457588	33599	ZYX	159840	457235	23809	400537	38639
GABBR1	232569	481198	7934	N/A		PLCL1	115896	625084	15872	N/A		ZYX	159840	354434	23810	346417	38640
GABBR1	232569	491396	7935	N/A		PLCL1	115896	472193	15873	N/A		ZYX	159840	392910	23811	376642	38641
GABBR1	232569	477417	7936	N/A		PLCL1	115896	437704	15874	414138	33600	ZYX	159840	477373	23812	N/A	
GABBR1	232569	486592	7937	N/A		PLCXD3	182836	377801	15875	367032	33601	ZYX	159840	436448	23813	411230	38642
GABBR1	232569	449163	7938	411263	28715	PLCXD3	182836	328457	15876	333751	33602	ZYX	159840	446634	23814	403714	38643
												ZYX	159840	497119	23815	N/A	

III. METHODS FOR ISOLATING AND PROFILING NUCLEI FROM A CELL TYPE

[0063] Many issues of human biology may be investigated productively in defined cell populations. For example, an understanding of molecular events associated with human neurodegenerative events may be gained through longitudinal studies of a variety of cell types in significant numbers from human samples due to the genetic complexities of these conditions (Burguière, E., et al. (2015) Curr Opin Neurobiol 30, 59–65.; Hinz, et al. (2017) Cold Spring Harb Perspect Biol 9, a023705; Vorstman, et al. (2017) Nat Rev Genet 18, 362–376, each of which is hereby incorporated by reference herein in its entirety), the probabilistic nature of neuronal cell loss (Clarke, et al. (2000). Nature 406, 195–199 and Clarke, et al. (2005) Brain Research Bulletin 65, 59–67, each of which is hereby incorporated by reference herein in its entirety), and the variable impacts of aging on both disease onset and progression (Corrada, et al. (2010) Ann. Neurol. 67, 114–121 and Niccoli, et al. (2012) Current Biology 22, R741–R752, each of which is hereby incorporated by reference herein in its entirety). Given these considerations, the methodology herein was developed to determine precisely the molecular properties of defined brain cell types and that is sufficiently robust to employ postmortem tissue from common brain tissue banks without requiring transgenic animals.

[0064] The cellular profiling technique described herein was developed as an approach for cell type specific analysis that takes advantage of the unique complement of nuclear-localized and nuclear associated proteins within each cell type to enable robust and reproducible studies of defined cell types in the mammalian brain. The cellular profiling technique described herein allows for cell-type specific gene expression profiling of mouse, rat, and human post-mortem brains and these methods may be extended to any organ or tissue sample.

[0065] Comparative studies of data generated from the cellular profiling technique described herein from rodent and human brain cell types reveal evolutionary divergence of gene expression

profiles from classically defined, highly conserved cerebellar cell types (D'Angelo, E. (2013) Handbook of the Cerebellum and Cerebellar Disorders, (Dordrecht: Springer Netherlands), pp. 765–791; Eccles, J.C. (1967) The Cerebellum as a Neuronal Machine (Berlin/Heidelberg/ New York: Springer); Llinas, R.R. (1969). Neurobiology of Cerebellar Evolution and Development (Chicago: American Medical Association); each of which is hereby incorporated by reference herein in its entirety). Data show also that molecular mechanisms of brain aging unfold differently in each human cell type. Finally, the data show robust, molecular phenotypes indicating a shared external event may be identified in control postmortem human brains. Correlative studies of human genetic and clinical data with expression and epigenetic studies using the cellular profiling technique described herein will provide insight into additional, yet unrecognized molecular characteristics of human brain function and dysfunction.

[0066] Transgenic mice expressing an EGFP-L10a ribosomal protein fusion under the control of cell-type specific drivers were previously developed in Doyle, et al. (2008) Cell 135, 749–762 and Heiman, et al. (2008) Cell 135, 738–748, each of which is hereby incorporated by reference herein in its entirety. Using these five transgenic animal lines developed for use in the TRAP method, EGFP+ nuclei (Kriaucionis, et al. (2009) Science 324, 929–930 and Mellén, M., et al. (2012) Cell 151, 1417–1430, each of which is hereby incorporated by reference in its entirety) were purified from specific cell types by gene expression using the TRAP methodology or by epigenetic characteristics after using fluorescence activated cell sorting (FACS). Previous studies have established that nuclear RNA profiles are also unique to each cell type, and that they are informative regarding cell function (Deal, et al. (2011) Nat Protoc 6, 56–68; Henry et al., Nucleic Acids Res. 2012 Oct;40(19):9691-704; Mo, et al. (2015) Neuron 86, 1369–1384; Steiner, et al. (2012) Genome Res 22, 766–777; each of which is hereby incorporated by reference herein in its entirety).

[0067] An important limitation of methods for cell-type specific molecular profiling developed previously to the cellular profiling technique described herein is that they require the use of transgenic animals to genetically target cell types of interest. To overcome this limitation, cell type specific expression of nuclear and endoplasmic reticulum proteins was investigated in order to purify and characterize nuclei from specific cell types in a broad range of species, including human postmortem brain samples.

[0068] In some embodiments of the present invention, nuclei were prepared from wild-type or transgenic tissue, fixed using formaldehyde, stained with fluorescent antibodies that are specific to a given cell type in the brain region of interest, sorted by flow cytometry (e.g. FACs), and then analyzed using RNAseq for discovery of species, cell type, or environmental specific expression profile characteristics.

[0069] The cellular profiling technique described herein may be applied to nuclei from any cell type or tissues associated with a particular disease, disorder, or condition. For example, nuclei from cells types that originate in basal ganglia tissue including: striatonigral medium-sized spiny neurons (MSNs), striatopallidal MSNs (caudate and accumbens), striatal cholinergic interneurons, subthalamic nucleus, dopaminergic neurons, and bed nucleus of the stria terminalis (BNST) neurons. For example, nuclei from cell types that originate in thalamus tissue including: thalamocortical neurons, thalamostriatal neurons, and thalamic reticular nucleus neurons. For example, nuclei from cell types that originate in cortex tissue including: entorhinal cortex layer 2/3 neurons, fast-spiking cortical interneurons, and layer 2/3 pyramidal cells from pre-frontal cortex tissue. For example, nuclei from cell types that originate in hippocampus tissue including cornu ammonis region 1 (CA1), cornu ammonis region 2 (CA2), cornu ammonis region 3 (CA3), and dentate gyrus cells.

[0070] The cell types may also be associated with the following tissues: medial habenula (cholinergic projection neurons to interpeduncular nucleus), brain stem (upper motor neurons), spinal cord (lower motor neurons), or all tissues (various classes of interneurons, astrocytes and oligodendrocytes). Cell types in human brains may also be associated with neurodegenerative conditions, such as ataxias, Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis (ALS). For example, Purkinje cells, granule cells, Bergmann glia, basket/stellate cells, and cerebellar deep nuclei associated with ataxias are profiled. Substantia nigra ventral tegmental area (VTA) dopaminergic neurons associated with Parkinson's disease or layer 2/3 entorhincortex, CA1 hippocampus, CA2/3 hippocampus neurons associated with Alzheimer disease may also be profiled. Alternatively, brain stem and spinal cord motor neurons associated with ALS are profiled.

A. Sorting cell types using the nuclear transcriptome

[0071] Nuclei may be sorted using antibodies, RNA probes, or DNA probes specific to endoplasmic reticulum (ER) protein, membrane proteins synthesized in the ER, or nuclear transcripts. To enrich for ER transcripts translated near the nuclear membrane, a polyA pulldown of nuclear transcripts may be performed. In some embodiments, nuclei originating from a cell type of interest were isolated from tissues of transgenic mice that had been previously profiled using the TRAP method to compare the cellular identity results from each technique. The profiling results for the transgenic animals developed for use with the TRAP method were based on the fact that the GFP-tagged ribosomal subunit is assembled in the nucleolus. Alternatively, the tissue that is the source of the nuclei to be sorted is dervied from a wild-type mammal, such as a human, a non-human primate, a mouse, or a rat.

[0072] FIG. 1 provides an embodiment of a sorting method that may be used with the cellular profiling technique described herein, which is also referred to as the NETSseq™ technique or INSPECTION™. "A" represents the cell type of interest, and "B" represents nuclei of the cell type of interest in FIG. 1.

[0073] In some embodiments, the strategy for isolating 3 cell types from the cerebellum in mice includes antibody-binding using Itpr1 (Inositol 1,4,5-Trisphosphate Receptor Type 1; an intracellular receptor of the endoplasmic reticulum (ER)) as a target to label Purkinje cells, NeuN (a gene encoded by a member of the RNA-binding Fox protein family; NeuN is a neronal antigen commonly used as a biomarker of neurons) as a target to label granule cells, and Gfap (Glial Fibrillary Acidic Protein; one of the major intermediate filament proteins of mature astrocytes used to distinguis astrocytes from glial cells) as a target to label glia to confirm the presence of these types of cells in the sample. Then, a combination of results for Itpr1 and NeuN may be used to isolate all 3 populations. Alternatively, nuclei from granule cells of wild-type mice may be sorted as positive for Itpr (Itpr+) and NeuN (NeuN+) and negative for Olig2 (Olig2-) and Sorcs3 (Sorcs3-). Nuclei from purkinkje cells may be sorted as Itpr1+ and NeuN+. Nuclei from basket cells may be identified as Sorcs3+ and medium NeuN-. Nuclei from astrocytes may be identified as Sorcs3- and NeuN-

[0074] Alternatively, Neuronal Differentiation 1 or Neurod1 (Neurod1+) may be used to sort granule cells; Purkinje Cell Protein 2 or Pcp2 (Pcp2+) may be used to sort Purkinje cells; Septin 4 or Sept4 (Sept4+) may be used to sort Bergmann glia; Collagen Beta(1-O)Galactosyltransferase 2 or Glt25d2, also known as Colgalt2, (Glt25d2+) was used to sort corticopontine pyramidal cells; and Neurotensin Receptor 1 or Ntsr1 (Ntsr+) was used to sort coticothalamic pyramidal cells. In some embodiments, the following nuclear transcripts may be used to identify the nuclei of each cell type: Alpha-2-Macroglobulin (A2m) for Sept4-positive cells (Bergmann glia), Pde1a and Colgalt2 for Colgalt2-postive cells (corticopontine pyramidal), Pde1a and Heparan Sulfate-Glucosamine 3-Sulfotransferase 4 (Hs3st4) for Excit-positive cells (excitatory neurons), Pde1a and Hs3st4 for Ntsr1-positive cells (corticothalamic pyramidal), Aristaless Related Homeobox (Arx) and Parvalbumin (Pvalb) for PV-positive cells (parvalbumin interneurons), Vasoactive Intestinal Peptide (Vip) for VIP-positive cells (VIP interneurons), Solute Carrier Family 9 Member A3 (Slc9a3) for Pcp2-positive cells (Purkinje), and Grin2c for NeuroD1-postive cells (granule).

[0075] In some embodiments, the nuclei of dopaminergic neurons from mice were sorted using forkhead Box A1 (FoxA1) and dopamine transporter solute carrier family 6 member 3 (Dat, also known as Slc6a3). Dopaminergic neurons are observed to be postive for both FoxA1 and Dat. In some embodiments, additional markers of dopaminergic neurons that may be used

for sorting include: tyrosine hydrolase (TH), forkhead box A2 (FoxA2), and dopamine receptor 2 (Drd2).

[0076] In some embodiments, downregulated genes in a sorted nuclei population may also be used as evidence of the identity of the cell type of the nuclei. For example, dopamine receptor D1 (Drd1) and glutamate decarboxylase (Gad) are not known to be expressed in dopaminergic neurons and therefore should be downregulated in a sorted population of nuclei from dopaminergic neurons.

[0077] In some embodiments, Wolframin ER Transmembrane Glycoprotein (Wfs1) and B-Cell CLL/Lymphoma 11B (Ctip2, also known as Bcl11b) may be used to sort nuclei of cortical cell types layer 2/3 pyramidal neurons and layer 5 and 6 pyramidal neurons from mice, respectively. In some embodiments, ETS Variant 1 (Etv1, also known as ER81) may be used to sort for nuclei of layer 5 pyramidal neurons. Etv1 had been previously observed to label both corticostriatal neurons, cortocopontine neurons, and potential others in layer 5 of the cortex. In some embodiments, Wfs1 may be used as a marker for Carbonic Anhydrase 1 (CA1)-positive neurons and Purkinje Cell Protein 4 (Pcp4) may be used as a marker for Carbonic Anhydrase 1 (CA2)-positive dentate gyrus.

[0078] In some embodiments, Solute Carrier Family 18 Member A3 (VaChT, also known as Slc18a3), Chondrolectin (Chodl), and Estrogen Related Receptor Beta (EsrrB) may be used as markers for nuclei from brainstem motor neurons in mice. Affinity labels specific to VaChT and ErrB label the motor neurons specifically, and Chodl labels everything except for these neurons. The antibody specific to Chodl may be replaced with one that directly labels the brainstem motor neurons.

[0079] In some embodiments, rat nuclei are sorted using at least one membrane protein or nuclear associated transcript. For example, nuclei from granule cells may be identified as Itpr negative (Itpr-), Olig2 negative (Olig2-), Sorcs negative (Sorcs-), and NeuN positive (NeuN+). Nuclei from purkinje cells may be identified as Itpr positive (Itpr+) and NeuN+. Nuclei from basket cells may be identified as Itpr+ and medium NeuN negative (med NeuN-). Nuclei from astrocytes may be identified as Sorcs3 positive (Sorcs3+) and med NeuN-. Nuclei from mature oligodendrocytes may be identified as Sorcs3- and NeuN-. Nuclei from a combination of mature oligodendrocytes and OPCs may be identified as Olig2 positive (Olig2+) and high NeuN negative (high NeuN-).

[0080] In some embodimentss, nuclei from purkinje cells derived from human samples may be identified as Itpr+ and Id2 positive (Id2+) or as FoxP4 positive (FoxP4+) and Itpr1+. In some embodiments, the nuclei of granule cells from human samples were identified as FoxP4+ and NeuN+. In some embodiments, nuclei from mature oligodendrocytes and OPCs may be

differentiated by the level of expression of Olig2. For example, low levels of expression of Olig2 (Olig2+ low) identify the nuclei as mature oligodendrocytes, and high levels of expression of Olig2 (Olig2+ high) identify the nuclei as OPCs.

[0081] The nuclei sorting strategies described herein may be applied to any species.

B. Profiling cell types in the sorted nuclei of different species

[0082] The genes expressed in each cell type define their function, their responses to internal and external cues, and their evolution across species. The cellular profiling technique described herein was demonstrated to be useful for highly accurate, cell-type specific gene expression profiling of neurons and glia from mouse, rat, and human brains.

[0083] In Mo, et al. (2015) Neuron 86, 1369–1384, which is hereby incorporated by reference herein in its entirety, nuclei from transgenic mice expressing a tagged nuclear membrane protein through a Cre-loxP system were profiled using RNAseq. Comparison of the RNAseq profiles of nuclei isolated from cell types in transgenic animals and wild type animals from different sources provides evidence that nuclear RNA profiles may be used to determine cellular identity and to measure the relatedness of different cell types. In some embodiments, the transgenic animal may express enhanced GFP (EGFP/L10a fusion protein) in the targeted cell type. In some embodiments, hieracrchical clustering from RNAseq results from nuclei sorted and characterized in Mo et al. and using the cellular profiling technique described herein provides groupings by cell types such as interneurons (e.g., VIP interneurons and parvalbumin interneurons) versus pyramidal cells (e.g., corticopyramidal, corticothalamic, and excitory).

[0084] Even classically defined, uniform cerebellar cell types are observed to differ between species by expression of hundreds of orthologous genes, and continued expression of human granule cell expressed genes were also commonly observed in other regions of the mouse brain. In fact, nuclear RNA profiles are sensitive enough to distinguish among different subtypes of neurons, such as mature oligodendrocytes (also referred to as conticopontine pyramidal neurons), and oligodendrocyte progenitor cells or OPCs (also referred to as corticothalamic pyramidal neurons).

1. Differences in the RNA profile in sorted nuclei from mice

[0085] In some embodiments, gene expression was analyzed by RNAseq to create a RNA profile. In some embodiments, results were normalized to the average expression across all samples for each gene. For example, the log2 fold change in RNAseq results from the nuclei purified by FACS for granule cells, purkinje cells, Bergmann glia, oligodendrocytes, and OPCs may be compared to the normalized RNAseq results for the 250 most variable genes across nuclei from all cell types. In mice, the most variable genes may be selected from 1700047M11Rik, 3110039M20Rik, 2410124H12Rik, 8030451O07Rik, 9530059O14Rik,

A230077H06Rik, A2m, A730036I17Rik, Aass, Acsm5, Actbl2, Adra2b, Afp, Aqp4, Arhgap25, Arx, Atp13a4, Atp1a2, Atp2a3, B230209E15Rik, B3gnt5, Barhl2, Bcl11b, Btbd17, Cacng3, Camk1g, Camkv, Car8, Casp12, Casq2, Cbln2, Cbln3, Cckbr, Cd70, Cd9, Cdc42ep1, Cdh19, Chrm1, Chrm3, Chsy3, Clic6, Cml5, Cnpy1, Cobl, Col1a2, Col4a5, Col6a1, Colgalt2, Corin, Coro6, Cpne7, Crym, Csta1, Ctxn3, Cxcl14, Cxcl5, Cxcr4, Cyp27a1, Cyp2j9, D430019H16Rik, Ddn, Ddx3y, Dlgap2, Dlx4os, Dlx6os1, Dmp1, E030003E18Rik, Ebf1, Ebf2, Ebf3, Ednrb, Egfr, Egr3, Eif2s3y, Elfn1, Emp2, En2, Enc1, Etnppl, Eva1a, F3, Fam107b, Fam19a1, Fat2, Fbln2, Fezf2, Fgd3, Flrt2, Folh1, Foxg1, Frem1, Gabra6, Galnt14, Gas1, Gda, Gdf10, Gja1, Gjb6, Gjc3, Gli1, Gli3, Glt25d2, Gm11549, Gm266, Gm5083, Gm5089, Gm5468, Gm5607, Gm8179, Gpr37l1, Grik1, Grm5, Hepacam, Hes3, Hs3st2, Hs3st4, Htr2a, Icam5, Icosl, Il22, Iltifb, Irx1, Irx2, Irx5, Itih3, Itpripl2, Kank1, Kcnc2, Kcnf1, Kcnj10, Kcnj16, Kcnj4, Kcnq5, Kcnt2, Kcnv1, Kctd12b, Kdm5d, Lama2, Lamp5, Lcat, Ldb2, Lfng, Lgr6, Lhx1, Lhx1os, Lhx5, Linc-md1, Lrrc7, Lyzl4, Mal2, March1, Megf10, Meis2, Mertk, Metrn, Mgst1, Miat, Mlc1, Mmp14, Mpped1, Msx2, Mybpc1, Myh6, Neto1, Nid1, Nkx2-2, Npr3, Npy1r, Nrgn, Nrk, Ntsr2, Nup62cl, Oprd1, P2ry1, Paqr6, Pax3, Pcsk6, Pde1a, Pde5a, Pdgfd, Pdzph1, Pih1h3b, Pkp3, Pla2g7, Plekhd1, Plekho2, Plpp3, Plscr1, Plscr4, Ppp1r17, Prkag3, Procr, Prr5, Ptk2b, Ptpn5, Ptprz1, Rab11fip1, Rab27b, Robo3, Rtn4rl2, Rxfp1, S1pr1, Scube1, Sdc4, Serpinh1, Skor2, Slc14a1, Slc1a3, Slc24a4, Slc2a10, Slc2a4, Slc30a3, Slc39a12, Slc6a7, Slc7a10, Slc9a3, Slco4c1, Smpx, Sod3, Sparc, Stac, Stk17b, Stk32a, Sycp1, Syt10, Tbr1, Tex36, Tlcd1, Tlr3, Tmem132b, Tmem179, Tmem200a, Tnc, Tox3, Tril, Trim30a, Trp53cor1, Ttpa, Uty, Vip, Vsig2, Vstm2b, Wif1, Zfp385c, Zfp831, Zic1, Zic2, Zic3, Zic4, and Zic5 or others identified herein.

[0086] In mice, genes whose expression may be used as markers to identify granule cells or their nuclei include genes that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 2510003B16Rik, 4930449E18Rik, 6430548M08Rik, 6530403H02Rik, 9230112J17Rik, Ablim1, Ablim3, Ackr1, Adamts18, Adcy1, Airn, Ak4, Als2, Atp1a1, Atp2b3, Barhl2, Bcl2l15, Boc, Brinp1, Bsn, Btg1, C130030K03Rik, Cacna1c, Cacna1e, Cacna2d1, Cadm3, Cadps2, Calb2, Caln1, Camk4, Camkk2, Car10, Car15, Car4, Cbln1, Cbln3, Ccdc120, Cd300a, Cdh15, Cdh7, Cdh8, Celf4, Cerkl, Cers6, Chgb, Chn2, Chrd, Cnksr2, Cnnm4, Cntn6, Cntnap1, Cntnap4, Cplx2, Crhr1, Crtam, Dab2ip, Des, Dgkd, Diras2, Dlgap3, Dpp6, Dpysl4, Dusp5, Eif4e3, Epb41, Epb41l4b, Epha3, Erc1, Ets2, Etv1, Exph5, Faap20, Fam135b, Fat2, Fgf14, Fzd7, Gabra6, Gabrb3, Gabrd, Galnt13, Gap43, Ggact, Gm2694, Gm7854, Gm9899, Gm996, Golga7b, Gprc5c, Grik2, Grin2a, Grin2c, Grm4, Ica1l, Igfbp5, Il16, Il20rb, Inadl, Itga7, Jph3, Jph4, Kank2, Kbtbd11, Kcnc1, Kcnd2, Kcnh1, Kcnip4, Kcnj12, Kcnj6, Kcnk1, Kcnk10, Kcnk12, Kcnk3, Kcnk9, Kcnt1, Khnyn, Kif26b, Lgi1, Lhfp, Lin7a, Lrrc3b, Lurap1, Maml3, Mapk11, Mapk12, Marveld2, Mctp1, Mir670, Mmp24, Mpp4, Msra, Ndrg3,

Ndst3, Nedd4l, Negr1, Neto2, Neurl1a, Neurod1, Nhsl2, Nrep, Nrip2, Nrm1, Ntn4, Nxn, Olfm1, Olfm3, Pagr1a, Panx2, Pclo, Pcsk2, Pde10a, Pde3b, Pgm2l1, Pkib, Plch2, Plcl2, Plcxd3, Pld5, Ppargc1b, Ppfia4, Pqlc3, Prkce, Prr16, Prss52, Ptchd1, Ptpn22, Pxylp1, Rab15, Rab37, Ralyl, Rapgef4, Rbfox1, Rbfox3, Rcan3, Reln, Rims1, Rims2, Rims3, Rnf112, Rnf152, Ror1, Rps6ka1, Rtn4r, Rtn4rl1, Ryr2, Scn2a1, Sel1l3, Sema4f, Sergef, Sgpp2, Sgsm1, Sh3gl2, Shf, Shisa8, Sidt1, Slc16a10, Slc17a7, Slc25a22, Slc29a4, Slc2a13, Slc35f3, Slc8a2, Slc9a5, Slit3, Slitrk4, Snap25, Snrk, Specc1, Speg, Sphkap, Sptb, St3gal5, Stap2, Stmn2, Stxbp1, Stxbp5l, Sv2b, Svep1, Svop, Syndig1l, Syt1, Syt12, Syt4, Tas2r143, Tbata, Tbc1d8, Tenm1, Tesc, Tiam1, Tll1, Tmem163, Tmem178, Tmem181c-ps, Tmem266, Tmem56, Tmem63c, Tmtc4, Trhde, Ubtd2, Unc13c, Uncx, Usp3, Vat1l, Vsnl1, Wscd2, Xkr6, Xkr7, Zdhhc2, Zfp385b, and Zic2.

[0087] In mice, genes whose expression may be used as markers to identify purkinje or their nuclei include that that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 1190002N15Rik, 1700008O03Rik, 1700124L16Rik, 2410124H12Rik, 9530052E02Rik, 9530059O14Rik, A330050F15Rik, Abhd3, Adam23, Adamts3, Adgrl2, Aff1, Ank1, Ankrd33b, Ankrd53, Anks1b, Apip, Arap1, Arhgap20, Arhgap26, Arhgef33, Arntl, Atl2, Atp2a3, Atp2b2, Atp6ap1l, Atp6v1b1, Atrnl1, Auts2, B3gnt5, Baiap2, Bcl11a, Bean1, Brinp2, Bzrap1, Cacna1a, Cacna1g, Cacna2d2, Calb1, Camk2a, Car7, Car8, Casq2, Ccdc107, Ccdc85a, Cck, Cds1, Cep126, Cep76, Clec2l, Clic6, Clstn3, Cntn3, Cntnap5b, Cntnap5c, Col18a1, Corin, Cpeb1, Cpne9, Csta1, Cyth3, D430036J16Rik, Dach1, Dagla, Defb23, Dgkg, Dgkh, Dgkz, Dlg2, Dlx4os, Dmd, Dner, Doc2b, Dpp10, Ebf1, Ebf2, Ece1, Etl4, Fam107b, Fam117a, Fam174b, Fam184b, Fam21, Fam78b, Far2, Fbxl21, Fgd3, Fhl5, Flt3, Fmnl1, Foxp2, Foxp4, Frmpd3, Gabbr2, Garnl3, Gfra2, Gm14169, Gm5083, Gm5803, Gng13, Gpr63, Grid2, Grid2ip, Grik1, Grip1, Grm1, H2-D1, Heatr5a, Hes3, Homer3, Hpcal1, Hrh2, Hspa12a, Htr1b, Icmt, Id2, Ifngr2, Il22, Iltifb, Inpp4a, Inpp5a, Itga3, Itpka, Itpr1, Kalrn, Kcnab1, Kcnab2, Kcnh7, Kcnip1, Kcnma1, Kctd12, Kitl, Ksr2, L3mbtl1, Large, Ldhd, Lhx1, Lhx1os, Lhx5, Linc-md1, Lpcat4, Lrfn5, Lrp8, Lrrfip1, Lsmem1, Magoh, Mcemp1, Mdfi, Mir124a-1hg, Mir138-1, Mir3470b, Mtss1, Myh10, Myo10, Nefh, Nefm, Nek2, Nell1, Nexn, Ninl, Nkiras2, Npr1, Nr2f2, Nrk, Nsg1, Nup93, Ociad2, Orai2, Paxbp1, Pcp2, Pcp4, Pde2a, Pde5a, Pde9a, Pih1h3b, Plcb3, Plekhd1, Plekhd1os, Plpp6, Plxdc1, Pnpla3, Polr1b, Ppp1r17, Ppp4r4, Prkag3, Prkcg, Prkg1, Prmt8, Psd2, Ptchd4, Ptprr, Rab43, Rbms1, Reep2, Retn, Rgs8, Rmdn3, Rnf19b, Rreb1, Rtel1, Ryr1, Scn4b, Serinc2, Sestd1, Sh2d4b, Shank1, Shisa6, Skor2, Slc16a9, Slc1a6, Slc20a1, Slc9a3, Smpx, Snhg11, Sorl1, Sos1, Sox5os3, Sptan1, Sptbn2, Stac, Steap2, Stil, Stk17b, Strip2, Strn3, Stxbp2, Svil, Sycp1, Syndig1, Syt7, Tenm4, Tex261, Thy1, Tm6sf1, Tmem255a, Trabd2b, Trpc3, Tspan11, Ttll5, Tuba8, Unc5d, Vax2, Vwa5b2, Ywhah, Zbtb46, Zfand4, Zfp385a, Zfp385c, and Znhit1.

[0088] In mice, genes whose expression may be used as markers to identify basket cells or their nuclei include that that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 1700024F13Rik, 1700080N15Rik, 9530026P05Rik, A530058N18Rik, Acot10, Adamts15, Adamts16, Adamts2, Adarb2, Adgrl3, Adrb2, Agl, AI504432, Aldh18a1, Aldh1l2, Aldob, Ankrd13b, Ar, Arl4a, Arl4c, Arrdc1, Asgr1, Asic2, Asl, Asns, Atp1b1, Atp2b1, Bex1, Bhlhe22, Btbd11, Bzw2, C1qtnf4, Cabp1, Cacna1b, Cacna1d, Cacna2d3, Cacng2, Camk1g, Camk2n1, Cars, Ccdc136, Ccdc74a, Cd59a, Cdkl1, Cebpb, Cep70, Cgn, Chac1, Chchd7, Chd3os, Chst1, Chst9, Clmp, Cnpy1, Cnr1, Cntn4, Coro6, Cryba2, Csmd1, Csrnp3, Cx3cl1, Cyld, Cyp4x1, Cyp7b1, Dnah11, Dock7, Efna5, Elavl4, Elmod1, Eml5, Enpp1, Ephb2, Erc2, Esrrg, Fam84a, Fev, Fgf13, Flrt2, Frmd3, Fuca2, Gabra1, Gabrg2, Gad1, Gad2, Galnt18, Gars, Gdpd5, Gfra4, Gjd2, Glce, Gldc, Gm11780, Gm14204, Gm15631, Gm15663, Gm2762, Gpr12, Gprasp2, Grb10, Gria3, Grid1, Grik3, Grin2d, Grm8, H2afz, H2-Bl, Haus4, Hcn1, Hecw1, Hnrnpa0, Hpca, Hpcal4, Hunk, Igsf3, Inhba, Inpp4b, Kcna2, Kcnab3, Kcns2, Kirrel, Kirrel3, Kit, Klhl33, Lamb1, Lrrc38, Lsm11, Ly6e, Lypd6, Maged1, Man2a1, March11, Mgat4c, Mgat5, Mir193b, Mir384, Mkx, Mpp7, Msantd4, Mtfp1, Mthfd2, Myo16, Myrip, Myt1l, Nap1l2, Nars, Ndn, Nefl, Neurod2, Neurod6, Nln, Nmt2, Nos1, Nos1ap, Nrxn3, Ntn1, Osbpl10, Osbpl5, Pam, Parm1, Penk, Pfkp, Pgrmc1, Phactr2, Phf24, Phyhip, Pja1, Pkp4, Pla2g4e, Plch1, Plcxd2, Plppr4, Plvap, Plxna4, Plxnc1, Pnck, Ppp1cc, Prdm8, Prkcd, Prrg3, Ptchd2, Purb, Rab10os, Rab3c, Rai2, Rasgrf1, Rasl10b, Rec8, Ret, Rmst, Rora, Rph3a, Rpl15, Scn9a, Sdk2, Sema3e, Serpini1, Sesn2, Sez6, Sgk1, Sgtb, Shank3, Skor1, Slc12a5, Slc19a2, Slc1a4, Slc24a3, Slc2a3, Slc32a1, Slc4a8, Slc6a7, Slc7a1, Slc7a3, Snph, Socs2, Sod2, Sorbs2, Sorcs3, Sp5, Stac2, Stard5, Stc2, Syt13, Tbc1d30, Tbc1d4, Tfap2a, Tfap2b, Tmem117, Tmem132e, Tmem151b, Tmem169, Tmem25, Tram1l1, Trib3, Trim67, Tro, Trpc5, Trpc7, Tspyl4, Ttc39b, Ttc9, Unc5c, Usp1, Vmn2r2, Wasf1, Wbscr17, Wfs1, Xkr4, Zbtb18, Zcchc16, and Zfp423.

[0089] In mice, genes whose expression may be used as markers to identify astrocytes or their nuclei include genes that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 1700066O22Rik, 2810032G03Rik, 3110082J24Rik, 9330188P03Rik, A2m, A330033J07Rik, Abi3bp, Acot11, Acsbg1, Actr3b, Adra1a, AI464131, Akt2, Aldh1l1, Alms1-ps2, Apoe, Aqp4, Arrb1, Atp13a4, Atp1a2, Atp1b2, AU022751, Axl, Baalc, Bcar3, Btbd17, Cables1, Cacnb1, Cacng5, Cacng8, Camk1, Camk2g, Caskin1, Cbs, Ccdc190, Ccdc78, Cd70, Cdc42ep1, Cdc42ep4, Cdh22, Cdh4, Celrr, Clcn2, Clu, Cml5, Cmya5, Cnn3, Cpne2, Ctxn3, Cxcl14, Cyp2d22, Cyp4f14, D330050G23Rik, Dao, Ddah1, Ddo, Dmp1, E030003E18Rik, Ednrb, Efhd2, Efnb2, Egfr, Elmo2, Elovl2, Emid1, Erich5, Etnppl, Etv4, Eva1a, F830045P16Rik, Fads2, Fam107a, Fam173a, Fam20a, Fam43a, Fam92b, Fgd6, Fgfr3, Frem1, Frmpd1, Fxyd1, Fxyd7, Fzd1, Gabra2, Gabra4, Gabrb1, Garem1, Gas2l3, Gdf10, Gja1,

Gjb6, Gli1, Gli2, Glipr2, Gm5089, Gm6277, Gpr153, Greb1l, Gria1, Gsap, Gstm1, Hif3a, Hk2, Hopx, Hrh1, Htra3, Icosl, Id4, Igdcc3, Igdcc4, Itih3, Itpkb, Kifc3, Klf15, Lama2, Lcat, Lfng, Lgi4, Lgr6, Lrig1, Lrp3, Lrrc8a, Man1c1, Map2k6, Mertk, Metrn, Mfge8, Micalcl, Mir3093, Mir6375, Mir6390, Mlc1, Mmd2, Mpp6, Mro, Msi1, Msx2, Mt1, Mt2, Mt3, Mxra8, Mybpc1, N4bp3, Nat8, Nbl1, Ndrg2, Nhsl1, Nkain4, Nr1d1, Ntsr2, Nudt14, Nwd1, Oplah, Paqr6, Paqr8, Pax3, Pbxip1, Pde8b, Pdlim4, Phf21b, Phka1, Phkg1, Phyhd1, Pitpnc1, Pitpnm2, Pla2g7, Plce1, Plekho2, Plpp3, Plscr4, Pltp, Plxnb1, Pnky, Pnpla7, Por, Ppm1m, Prex2, Proca1, Prodh, Prr5, Ptch1, Ptch2, Pxmp2, Pyroxd2, Rab34, Rab36, Ramp2, Rasl11a, Rbm24, Rdh5, Rfx2, Rfx4, Rgl1, Rgma, Rpph1, Rpusd3, Rras, S1pr1, Sdc4, Sfxn1, Sfxn5, Sh3pxd2b, Shisa9, Sirpa, Slc12a4, Slc13a5, Slc1a2, Slc1a3, Slc25a18, Slc27a1, Slc38a1, Slc38a3, Slc39a12, Slc41a1, Slc4a4, Slc7a10, Slc8b1, Slco4a1, Smad3, Smim23, Sned1, Sod3, Sox9, Sparc, Sparcl1, Stk32a, Synpo2, Syt10, Tapbpl, Tcf7l1, Tmem198b, Tnc, Tom1l1, Traf1, Trib2, Tril, Trp53cor1, Ttll3, Ttll8, Ttyh1, Ttyh3, Ucp2, Vim, Wwc1, Zfp467, Zfp641, Zic1, Zic4, and Zim1.

[0090] In mice, genes whose expression may be used as markers to identify oligodendrocytes or their nuclei include that that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 1500015L24Rik, 1700063D05Rik, 4930474G06Rik, 4933413G19Rik, 5031410I06Rik, 5031439G07Rik, 5430431A17Rik, 9330111N05Rik, 9330117O12Rik, A230001M10Rik, A330049N07Rik, Aatk, Abca8a, Adamtsl4, Adap1, Adipor2, Agpat4, Ankub1, Ano4, Apod, Arc, Arhgap23, Arhgef10, Arl4d, Arrdc2, Arrdc3, Arsg, Aspa, Asphd1, B3galt5, Bche, Bcl2l1, Bicd2, Bin1, Bpgm, C030029H02Rik, C630043F03Rik, Car14, Car2, Carns1, Ccdc152, Cep110, Cdh19, Cdk18, Cdk19, Cep97, Cers2, Chdh, Cldn11, Cnp, Cntn2, Cpm, Cpox, Creb5, Cryab, Cyp2j12, D16Ertd472e, D1Ertd622e, D7Ertd443e, Daam2, Ddit4, Ddr1, Degs1, Depdc7, Dnajb2, Dock10, Dock5, Dpy19l1, Dusp26, Edil3, Efnb3, Elovl7, Endod1, Enpp2, Enpp4, Erbb2ip, Erbb3, Ermn, Fa2h, Fam134b, Fam46a, Fbxo32, Fbxw15, Folh1, Frmd4b, Fth1, Gab1, Galnt5, Galnt6, Gatm, Gbp11, Gjb1, Gjc2, Glul, Gm10471, Gm1979, Gm21671, Gm5535, Gm5862, Gm7361, Gm9895, Gng11, Gng8, Gpr37, Gpt, Grm3, Gstm7, Hapln2, Hebp1, I730030J21Rik, Il33, Inf2, Insc, Josd2, Kcnj2, Kcnk13, Kctd13, Kctd3, Kif13b, Klhl2, Klk6, Kndc1, Lap3, Larp6, Lipa, Litaf, Lrrc8b, Lzts2, Mag, Mal, Map6d1, Map7, Mast3, Mast4, Mboat1, Mbp, Mcam, Mobp, Mog, Myo1d, Myrf, Ndrg1, Neat1, Nfe2l3, Nhlrc4, Nipal4, Nkain1, Nkain2, Nmral1, Olfml1, Opalin, Osbpl7, Pacrg, Pacs2, Pak7, Pde4b, Pde8a, Pex5l, Phlpp1, Piga, Pigz, Pik3c2b, Pim3, Pip4k2a, Pkd2l1, Pla2g16, Plcl1, Plekhg3, Plekhh1, Plp1, Pls1, Plxnb3, Ppfibp2, Ppp1r14a, Prickle2, Prima1, Prox1, Prr18, Prr5l, Prrg1, Psat1, Pstpip2, Ptgds, Ptma, Ptprd, Qdpr, Rasgrp3, Rcbtb1, Rffl, Rhob, Rhou, Rnf220, Rnf7, Rtn4, S1pr5, Sall1, Sccpdh, Sec11c, Sec14l5, Serpinb1a, Sez6l2, Sgk2, Sh3tc2, Shisa4, Shtn1, Slain1, Slc12a2, Slc25a13, Slc38a2, Slc48a1, Slc7a15, Smad7, Sox2ot, Speer4a, Spg20,

St18, St6galnac3, Stmn1, Stmn4, Stxbp6, Synj2, Sytl2, Tbc1d5, Thumpd1, Tmeff1, Tmeff2, Tmem125, Tmem151a, Tmem229a, Tmem258, Tmem63a, Tmem88b, Tmem98, Tmprss5, Tnfaip6, Tnni1, Tppp, Trf, Trim36, Trim59, Tspan2, Ttll7, Tubb4a, Ugt8a, Usp31, Usp54, Vmp1, Xaf1, and Zdhhc20.

[0091] In mice, genes whose expression may be used as markers to identify oligodendrocyte progenitor cells (OPCs) or their nuclei include that that have the greatest change in expression compared to normalized expression in unsorted nuclei include: 1700086L19Rik, 1810041L15Rik, 5730559C18Rik, 6330403K07Rik, 8030451O07Rik, A230077H06Rik, A730017C20Rik, Abcg2, Abhd2, Abtb2, Adam12, Adm, Alcam, Amz1, Arhgap24, Asap3, Ascl1, B3gat2, B9d1, Basp1, Bcas1, Bmp4, Brinp3, C1ql1, C1ql2, Cacng4, Calcrl, Cav1, Cav2, Ccnd1, Cd200, Cdh13, Cdh24, Cdo1, Cfap20, Chadl, Chst11, Chst2, Chst3, Chst5, Cobl, Col11a2, Col27a1, Csgalnact1, Csnk2a2, Cspg4, Cspg5, Ctxn1, Cysrt1, Dbpht2, Dcc, Dpm3, Dpysl3, Dscam, Ebf4, Eid2b, Elfn1, Elfn2, Enpp6, Epb41l2, Epn2, Eya1, Fam19a2, Fam3c, Fam89a, Fbn2, Fdps, Fhl3, Frrs1, Ftsj2, Fzd9, G0s2, Galnt3, Gfpt2, Gfra1, Gng4, Grm5, Gsx1, H2-K1, Has2, Hip1r, Hrk, Ick, Ifitm7, Igfbp3, Itga9, Itpr2, Kcnh5, Kcnh8, Khdrbs3, Klhl5, Lbh, Lhfpl3, Limd1, Lims2, Lmcd1, Lpcat2, Lrfn2, Lrrc4c, Lrrtm4, Marcks, Matn1, Matn4, Mex3b, Mfsd2a, Miat, Mir17, Mmp15, Mmp16, Mmp2, Mycl, Myt1, Ncan, Neto1, Neu4, Nova1, Nxph1, Olfm2, Olig2, Opcml, Oprl1, Pcdh15, Pcdh17, Pcdh7, Pdgfra, Pdzd2, Pfn2, Phlda1, Pmepa1, Ppfibp1, Ppp2r2b, Prr36, Prss23, Prss48, Ptgfrn, Ptpro, Pxdc1, Qpct, Rapgef3, Rasgef1b, Rcn1, Rep15, Rgcc, Rin2, Rlbp1, Rnd2, Rnf122, Rpl13, Rprm, S100a3, S100a4, S1pr2, Sapcd2, Scel, Scrg1, Sema3d, Sema5a, Sema5b, Serpine2, Sertm1, Sh3bp4, Sh3rf1, Slc1a1, Slc22a23, Slc35f1, Slc44a5, Slitrk3, Slitrk5, Slitrk6, Snhg5, Snx1, Snx22, Sox10, Sox4, Sox6, Spry4, Sstr1, Sulf2, Susd5, Tac1, Tes, Tgfa, Tmem100, Tmem132b, Tmem176b, Tnr, Tns3, Tox3, Tspan6, Vash1, Vcan, Vmn1r55, Vpreb1, Vstm2b, Vwc2, Xylt1, Zc3hav1l, Zdhhc23, Zfp365, and Zfp488.

[0092] In some embodiments, one, two, three, or more, including sets, subsets of 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 25, 30, 40, 50 or more markers listed may be used to identify nuclei of any one or more of granule cells, basket cells, astrocytes, oligodendrocytes, and OPCs from any of humans, mice, rats, or non-human primates. Hierarchical clustering may be used to visualize the degree of similarity among RNAseq profiles.

2. Differences in the RNA profile in sorted nuclei from rats

[0093] In some embodiments, nuclei from rat tissue are sorted into groups of nuclei from granule cells, purkinje cells, basket cells, astrocytes, oligodendrocytes, and OPCs. A gene that is differentially expressed compared to the normalized expression across granule cells, purkinje cells, astrocytes, oligodendrocytes, and OPCs may be used as a marker. For example, expression

or lack of expression of at least one of the differentially expressed genes selected from: AABR07001623.1, AABR07001734.1, AABR07006310.1, AABR07006713.1, AABR07006713.2, AABR07006727.1, AABR07013140.1, AABR07026032.2, AABR07030473.1, AABR07030880.1, AABR07046961.1, AABR07047823.1, AABR07049491.1, AABR07052897.1, AABR07058658.1, AABR07061428.1, AABR07070161.1, AABR07070161.6, AABR07070578.1, Abi3, Aqp9, Arhgef26, Arhgef33, Arl4a, B3gnt5, Bgn, C1ql1, C1ql2, Cacng5, Cadps2, Calb1, Calb2, Car4, Car8, Cav1, Cbln1, Ccnd1, Cdh15, Cdk2, Cep76, Cldn11, Clmp, Col12a1, Col5a3, Cspg4, Cyp2d5, Enpp1, Ermn, Fam107b, Fam89a, Fat2, Gabra6, Gabrd, Gdf10, Gjd2, Gldc, Gli1, Gpr37, Gpr63, Grm8, Hapln2, Hpcal4, Id4, Il16, Itga7, Itga9, Itih3, Itpr1, Kcnh1, Kcnj12, Klk6, Lama3, Lfng, Lgi4, Lims2, Lypd6, Mag, Mal, March11, Mobp, Mog, Msx2, Mt2A, Nkain4, Opalin, Pdgfra, Plch1, Plk2, Plxdc1, Pmel, Pou3f2, Ppfibp1, Ppp1r17, Prr5l, Prrt2, Qdpr, Rasgrp3, Rbfox3, RGD1561557, RGD1561849, Ribp1, Ryr1, S1pr1, Scara3, Selplg, Serpine2, Slc1a6, Slc25a18, Slc5a11, Slc7a10, Slc9a3, Snx22, Sorcs3, Sv2b, Tesc, Tmem255b, Tmem63a, Tmem88b, Tnc, and Zfp385c and may be used as a species specific and cell type specific marker.

[0094] In rats, genes whose expression may be used as markers to identify granule cells or their nuclei include significantly enriched expression of Fat2 and Rbfox3compared to normalized expression in unsorted nuclei. Genes that may be used as markers to identify purkinje cells or their nuclei include significantly enriched expression of Car8 and Calb1. Genes that may be used as markers to identify Bergmann glia or their nuclei include significantly enriched expression of Aldh1L1 and Slc1a3. Genes that may be used as markers to identify oligodendroctyes (corticopontine pyramidal cells) or their nuclei include significantly enriched expression of Colgalt2. Genes that may be used as markers to identify Bergmann glia or their nuclei include significantly enriched expression of Hs3st4 was observed to be specific to corticothalamic pyramidal cells, while Pde1a and Csmd1 were observed to be expressed in oligodendrocytes and OPCs (both cortical pyramidal cell types).

[0095] In some embodiments, expression of Itih3 may be used as a marker of both Bergmann glia, a type of astrocyte, and non-Bergmann glia astrocytes of the cerebellum. Additional markers for the nuclei of the 6 cell types may include: Tescalcin (Tesc) for granule cell nuclei, Carbonic Anhydrase 8 (Car8) for purkinje cell nuclei, March11 for basket cell nuclei, Inter-Alpha-Trypsin Inhibitor Heavy Chain 3 (Itih3) for astrocyte nuclei, Mog for oligodendrocyte nuclei, and Platelet Derived Growth Factor Receptor Alpha (Pdgfra) for oligodendrocyte progenitor cell nuclei.

[0096] In some embodiments, the Allen Mouse Brain Atlas *in situ* hybridization database was used to analyze the localization of the markers to confirm cell type.

[0097] In some embodiments, one, two, three, or more, including sets, subsets of 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 25, 30, 40, 50 or more markers listed may be used to identify nuclei of any one or more of granule cells, basket cells, astrocytes, oligodendrocytes, and OPCs from any of humans, mice, rats, or non-human primates. Hierarchical clustering may be used to visualize the degree of similarity among RNAseq profiles.

3. Differences in the RNA profile in sorted nuclei from humans

[0098] Analysis of samples from sixteen human postmortem brains revealed that the specific molecular consequences of aging, gender, autolysis time of the tissue sample, and stress differ between cell types, although in each case, expression of genes involved in synapse development and maintenance was diminished. A robust and cell-type specific molecular pathway was indicative of a pathophysiological response occurred in the brains of three of sixteen donors. Cerebellar granule cells the three brain samples were observed to exhibit robust induction of a set of 224 genes containing many immediate early genes and were enriched for GO categories (protein folding/refolding, apoptosis, transcriptional response to stress, response to external stimuli, ATPase activity, etc..) indicating an acute response to some external influence; yet no shared clinical conditions were apparent for these donors. As stated in the Examples, no correlation with autolysis time and no induction of glial markers indicative of stroke or brain damage has been evident. Although activity dependent gene expression changes have been characterized extensively in cultured mouse granule cells, the response identified in these three human samples was overlapping but distinctive. Results herein guideposts for experimental investigation of model systems or iPS cells aimed at identification of signals that elicited these responses in the human brain. The molecular profiling using the cellular profiling technique described herein can be applied to any species and provides an avenue for investigation of molecular events associated with human cell type function and dysfunction.

[0099] In some embodiments, increased expression for Rbfox3 and Fat2 may be used as markers for nuclei from granule cells in humans. Alternatively, increased expression for March11 may be used as a marker for nuclei from basket/stellate cells in humans. Alternatively, increased expression for Aldh1a1 and Slc1a3 may be used as markers for nuclei astrocytes in humans. Alternatively, increased expression for Mog may be used as a marker for mature oligodendrocytes. Alternateivly, increased expression for Pdgfra and chondroitin sulfate proteoglycan 4 (Cspg4) may be used as markers for OPCs.

[00100] In some embodiments, one, two, three, or more, including sets, subsets of 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 25, 30, 40, 50 or more markers listed may be used to identify nuclei of any one or more of granule cells, basket cells, astrocytes, oligodendrocytes, and

OPCs from any of humans, mice, rats, or non-human primates. Hierarchical clustering may be used to visualize the degree of similarity among RNAseq profiles.

[00101]

C. Directly defining human cell types

[00102] The cellular profiling technique described herein may be also used independently of the cell types that have been characterized in mice because there are differences between neurons from mouse and human, and there may be human-specific neuronal subtypes. Putative cell-type specific genes for sorting were identified by examining the transcriptional profile of unsorted nuclei from a region of interest. In mice, chromosomal associated transcripts (CATs) and polyA+ transcripts that were observed to be expressed at low levels in unsorted nuclei were often expressed at high levels in one or a few cell types. The differences between species were explored for different cell types, and the findings were supported by in situ hybridization and immunofluorescence. Human nuclear RNAs from specific cell types were profiled using the same strategy in the context of cellular profiling method described herein.

IV. COMPARATIVE ANALYSIS OF NUCLEAR PROFILES

[00103] The isolation and transcription profiling nuclei of multiple cell types from mice, rats, and humans are described herein. For example, the cell types originate in basal ganglia, thalamus, cerebellum, or hippocampus tissue. Cell types that originate in the cerebellum include: Purkinje cells, granule cells, Bergmann glia, basket/stellate cells, astrocytes, oligodendrocytes, and cerebellar deep nuclei cells. These samples were sequenced for analysis to determine differences between individuals and across species. In some embodiments, results are validated by *in situ* hybridization on tissue slices.

[00104] The driving force for development of an accurate and efficient nongenetic method for characterization of the molecular properties of defined CNS cell types is to enable direct investigation of human biology. Major differences are observed between gene expression in the same cell type between mice and humans. Given the tremendous explosion of studies identifying the genetic causes of human disease and the astounding demonstrations in both animal models and humans that these can include lesions that involve simple changes in gene dosage, exploration of details of cell types in normal and affected brains is imperative. Therefore, comparative analysis of data obtained in experimental systems using the cellular profiling technique described herein showing human cell type specific characteristics will advance understanding of the large variety of human disorders that impact CNS circuits.

[00105] A recent evolutionary model (Arendt, D. (2008). Nat Rev Genet 9, 868–882 and Arendt, et al. (2016) Nat Rev Genet 17, 744–757, each of which are hereby incorporated by reference herein in its entirety) was a helpful consensus definition of cell type for consideration

of the data generated using the cellular profiling technique described herein. According to this model, the specific characteristics of homologous cell types can vary as long as they remain defined by a distinctive, shared regulatory apparatus. For example, Purkinje cell, granule cell, or astrocyte gene expression profiles can vary between species, or even in individual cells of a type, without losing their cell type identity. This definition accommodates both functional changes in cell types between species and altered expression of genes within the cell type due to mutations in cis-regulatory sequences. The data herein documents major differences in the expression of orthologous genes in each cell type between rodent and human brains. Hundreds of these differences are cell-type specific and, in granule neurons, most of these genes remain expressed in other regions of the brain. These data demonstrate that the fine-tuned biochemistry of homologous human and mouse CNS cell types differs significantly.

[00106] The results presented here contribute two major insights into mammalian brain evolution. First, while they are consistent with previous published examples of cis-regulatory sequence divergence as a mechanism of evolution (Maricic, et al. (2012) Molecular Biology and Evolution 30, 844–852; Prud'homme, et al. (2006) Nature 440, 1050–1053; Weyer et al., Mol Biol Evol. 2016 Feb; 33(2): 316–322, 2015; each of which is hereby incorporated by reference herein in its entirety), the lack of highly enriched GO categories for most of the cell specific events documented herein suggests strongly that regulatory changes are major drivers of phenotypic variation between homologous cell types in mammalian brain. This is consistent with the evolutionary model presented above, since it allows substantial evolution of the functional properties of the cell while maintaining the core regulatory complex (CoRC) that defines a given cell type (Arendt, et al. (2016) Nat Rev Genet 17, 744–757, which is hereby incorporated by reference herein in its entirety). Second, the expression differences documented herein are large, and the analysis was restricted to high confidence orthologous genes. The data complement a previous study of progenitor cells that reported substantive changes in the expression of human genes that lack mouse orthologues (Florio et al, Science. 2015 Mar 27;347(6229):1465-70, which is hereby incorporated by reference herein in its entirety). If taken together, these datasets predict that the expressed differences between mouse and human cell types are extensive, cell-type specific, and phenotypically important.

[00107] In certain embodiments of profiling human samples using the methods herein, the correlation coefficients were between samples (r=0.98 – 1.0) indicating that the results are extremely reproducible, and that that the impact of autolysis time on the expression profile of nuclear RNAs is minor. Initial indications that gender and age impact gene expression differently in CNS cell types indicated that the cellular profiling technique described herein is sufficiently accurate for detailed investigation of both sexually dimorphic human behaviors and the aging of

specific brain circuitry. For example, comparative analysis of human brains by cellular profiling technique described herein provides insight into the impacts of aging on cell types that are selectively vulnerable into late-onset human disorders.

A. Identifying cell type specific functions differing among species

[00108] While the organization of the cells in the cerebellum is similar between mouse and human, many differences remain. For example, Purkinje cells are much more spread out and NeuN- cells are expanded in the Purkinje layer in human cells compared to mouse cells, which is evidence that the human cerebellum has a different organization compared to mouse. Additionally, the size of Purkinje cell bodies and nuclei are bigger in human compared to mouse. In some embodiments, RNAseq may be used to compare gene expression between species to identify specifies specific markers. For example, protein tyrosine kinase 2 beta (Ptk2b), solute carrier family 43 member 2 (Slc43a2), glutamate ionotropic receptor kainate type subunit 3 (Grik3), Itpr1, protocadherin 9 (Pcdh9), and RAS guanyl releasing ptotein 1 (Rasgrp1) nuclei from granule, stellate, and glia cells may be used to differentiate between human and mice nuclei. Because the cerebellum is one of the most conserved brain structures across species, more structural and molecular differences are more likely to be observed in other brain regions.

[00109] Although heterogeneity may be shown between samples from the same species, the genes most specific to each cell type in different species may be used as unique markers of the cell types. In some embodiments, expression of more than one gene may be used to identify a particular cell type. Genes differentially expressed compared to normalized expression across all cell types, such as granule cells, purkinje cells, astroctyes, oligodendrocytes, and OPCs, may be eliminated from analysis to identify at least one marker for the cell type of interest.

[00110] In some embodiments, the most specific genes are calculated using the algorithm for the Specificity Index (SI) as described herein. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of granule cells derived from human samples are Cadps2, Reln, Synpr, Galnt5, Ccm2l, Srrm4, Tmem266, Cckbr, Cerkl, Chn2, Grik2, Mal2, Fat2, Adamts16, Lcn8, Fstl5, Tll1, Vsnl1, Rit2, Slc8a2, Slc17a7, Zp2, Tspan18, Fgf5, Prag1, Slc6a7, Rims1, Cdh7, L1cam, Mical2, Ptk2b, Kcnh1, Arhgap29, Cdk15, Pde3b, Itga4, Etv1, Tmem178, Chgb, Col13a1, Rnf152, Kcnk1, Il16, Sstr2, Als2, Barhl1, Scn2a, Cbln1, Dusp5, Ndst3, Lurap1l, Kcnj12, Snai2, Ifnlr1, Neurod1, Cdyl2, Ppp1r1c, Jkamp, Neurl1a, Trhde, Mfsd9, Xkr7, Barhl2, Cbln3, Uncx, Ptchd1, Cblb, Runx1t1, Sphkap, Gabra6, Coro2a, Bmper, Dkk4, Camk4, Unc13c, Trp53i11, Ephb1, Glb1l3, Mdga1, Kcnc1, Tmem252, Mpp7, Hipk4, Tmem51, Cacnb3, Cyb5a, Tmem2, 6430573F11Rik, Rasgrp1, Rab37, Adarb1, Svop, Pgm5, Mthfd1l, Cdh15, Vwc2, Disp2, Tspan15, Slc26a5, and Lhfp. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of granule cells derived from mouse samples are Gabra6, Grin2c, Fat2,

Cadps2, Ptpn22, Chn2, Neurod1, Calb2, Trhde, Il16, Ppfia4, Cbln1, Sidt1, Tmem266, Gabrd, Reln, Kcnj12, Gprc5c, Rims3, Tll1, Cbln3, Olfm3, Slc17a7, Chgb, Kcnh1, Cdh15, Barhl2, Dusp5, Kcnc1, Camk4, Des, Cerkl, Svep1, Uncx, Slc8a2, Cacna2d1, Pxylp1, Ptchd1, Sel1l3, Rtn4r, Cacna1e, Patj, Atp2b3, Marveld2, Kcnk10, Rab15, Rapgef4, Rims1, Tmem178, Ak4, Lin7a, Igfbp5, Tesc, Neurl1a, Vat1l, Msra, Vsnl1, Rps6ka1, Lhfp, Kcnk3, Ryr2, Exph5, Kif26b, Adamts18, Cntnap4, Tspan18, Mmp24, Cdh8, Ablim3, Cadm3, Ntf3, Pld5, Syndig1l, Galnt15, Etv1, Sh2d1a, Scn2a, Panx2, Speg, Bsn, Rnf112, Il20rb, Slc16a10, Ntn4, Adcy1, Mapk12, Boc, Syt12, Fstl5, Tead4, Clcn1, Pde3b, Pgm2l1, Tmtc4, Abcc8, Olfm1, Nedd4l, Lurap1, Krt24, and Als2. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of granule cells derived from rat samples are Tesc, Itga7, Rbfox3, AABR07013140.1, Calb2, Kcnh1, Cdh15, AABR07030880.1, Prrt2, Gabrd, Il16, Scara3, Cbln1, AABR07026032.2, Cadps2, Sv2b, Fat2, Gabra6, Car4, Kcnj12, Nrep, AABR07043098.3, Rtn4r, Shisa8, Sel1l3, Grb7, Rgl3, Dusp5, Chn2, Lamp5, Pagr1, Cemip, Gprc5c, Shf, Wdr66, Tmem44, Reln, Tll1, Slc17a7, Pax6, Capn1, Calhm3, AABR07043098.1, Camk4, Selm, Sema3g, LOC100360491, Diras2, Agbl2, Mctp1, Mvp, Tmem51, Vsnl1, Plk5, Mrgprf, LOC100910401, Ak4, Wscd2, Grin2a, Cfap74, Rnf39, Cbln3, Fzd7, Golga7b, AABR07033679.1, Ptpn22, Grin2c, Ablim1, Kcnk1, Arpp21, C1rl, Zscan30, Maf, Rtn4rl1, Barhl2, Kcnk12, Actl6b, AABR07053850.1, Sdc1, Camkk2, Nudcd3, Ccdc155, Cbfa2t3, AABR07037151.1, Etv1, Jph3, Itga11, Rnf182, RGD1560784, Plcxd3, Ablim3, Rims1, Nyx, Uncx, AABR07034445.1, AABR07025051.3, Kcnk10, Kcnk3, Nol3, and Als2.

[00111] For example, the most specific genes (ordered by decreasing specificity) in the nuclei of purkinje cells derived from mouse samples are Car8, Calb1, Arhgef33, Atp2a3, Itpr1, Ppp1r17, Slc1a6, Slc9a3, Trpc3, Casq2, Clic6, Plekhd1, Ryr1, Cacna1g, Pcp2, Sycp1, Pde5a, Tspan11, Gpr63, Nell1, Cep76, Bcl11a, Grid2ip, Htr1b, Pet100, Strip2, Plxdc1, Skor2, Dagla, Garnl3, Itpka, Myo10, Gng13, Kcnip1, Trabd2b, Rnf207, Scn4b, Arhgap20, Grip1, Pde9a, Ppp4r4, Cck, Ebf1, Bean1, Tuba8, Smpx, Ebf2, Slc19a1, Ccdc85a, Flt3, Camk2a, Sh2d4b, Homer3, Stk17b, Clec2l, Hrh2, Ksr2, Chtf18, Vax2, Foxp4, Ankrd33b, Cpne9, Corin, Il22, Prkag3, Cep126, Slc20a1, Akain1, Nrk, Pih1h3b, Inpp5a, Lhx1, Sptbn2, Paxbp1, Dner, Doc2b, Tspoap1, Gfra2, Fhl5, Dmd, Kcnab2, Serinc2, Car7, Dnah6, Prmt8, Prkcg, Mdfi, Dgkh, Fam117a, Nek2, Fmnl1, Atl2, Cfap161, Lin28b, Cacna2d2, Ptchd4, Pkp3, Shank1, Grid2, Nefh. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of purkinje cells derived from rat samples are: Arhgef33, Car8, Slc1a6, Calb1, Ppp1r17, Itpr1, Zfp385c, Ryr1, AABR07030473.1, Slc9a3, AABR07006713.1, AABR07006713.2, RGD1561557, Gpr63, AABR07049491.1, AABR07006727.1, Plxdc1, Cep76, Fam107b, B3gnt5, Far2, AC108261.1, Grid2ip, AABR07072628.1, Kcnip1, AABR07006724.1, Trpc3, Phka2, Car7, Fam117a, Hes3,

Casq2, Dgkh, Arhgap26, Trabd2b, Nell1, Bcl11a, Col18a1, LOC100125362, Ptchd4, Camk2a, Dyrk4, Kitlg, Kcnab1, Nxnl2, Ltk, LOC689927, AABR07056156.1, Cpne8, Htr1b, AABR07033570.1, Icmt, AABR07047598.1, Cstf2t, Grik1, Itpka, LOC100910996, Hpcal1, Efna5, Myo10, Rgs8, Skor2, Il22, Slc12a3, Cpne9, AABR07007980.2, Cacna1g, Doc2b, Sptbn2, LOC108351705, AABR07035926.1, AABR07037943.1, Pcp2, AABR07061860.1, AABR07024820.1, Impg1, Nkiras2, Krtap12-2, Tmem123, AABR07044009.1, Ptprr, Homer3, Garnl3, Sos1, Kcnab1, Cntn3, LOC304725, Stk17b, AABR07047604.1, Zdhhc23, Scn4b, AC126640.1, Pde9a, Ptprb, Prkcg, Pcp4, AABR07056374.1, Fstl4, Ppp4r4, and Nup93.

[00112] For example, the most specific genes (ordered by decreasing specificity) in the nuclei of basket cells derived from human samples are: Bhlhe22, March11, Kit, Tfap2b, Clmp, Lbx1, Slc38a5, Frmd3, Btbd11, Lipg, Rab3b, Lrrc38, Galnt14, Cnr1, Tcerg1l, Cbln2, Siah3, Stac2, Scgn, Rspo1, Lmcd1, Lpl, Adra1b, Gad2, Chrna3, Socs2, Trpc6, Kcna3, Syn3, Eml5, Nefl, Fam84a, Trpc5, KIAA1644, Hrh3, Disp3, Tfap2a, Gjd2, Adamts2, Sorcs3, Ptprk, Timp3, Gjb4, Ehd3, Cxcl12, Actc1, Pnma2, Fam43a, Adam11, Dact2, Rgs16, Slc5a8, Exph5, Cfap221, Myo16, Megf10, Cacna1d, Pax2, Efna5, Plch1, Gabrg2, Prrt4, Itga5, Sp5, Nefm, Grik3, Cx3cl1, Fbxo24, Lect2, Nefh, Efnb3, Grk3, Mpz, Syt2, Scrt1, Cdc42ep3, Trim67, Grin2b, Rab3c, Plxna4, Fzd8, Elmod1, Smim17, Slc8a3, Nrip3, Plekhg5, Arl4a, Grm8, Cntnap5a, Maats1, Loxl2, Arap3, Dcx, Nyap2, Skor1, Pvalb, Ppm1j, Slc5a4a, Tmem132e, and Cygb. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of basket cells derived from mouse samples are: Adamts15, March11, Tfap2b, Socs2, Penk, Bhlhe22, Plch1, Adamts16, Adrb2, Frmd3, Clmp, Cacna2d3, Trpc7, Galnt18, Tbc1d4, Asgr1, Kit, Tfap2a, Fam84a, Gjd2, Grik3, Lrrc38, Chst9, Flrt2, Chac1, Grm8, Esrrg, Slc6a7, Pla2g4e, Stac2, Cabp1, Phf24, Camk1g, Btbd11, Stc2, Sorcs3, Lamb1, Trpc5, Coro6, Slc32a1, Kirrel, Cdkl1, Chst1, Asns, Sp5, Cryba2, Aldh1l2, Kcnab3, Tg, Plxna4, Prkcd, Cgn, Tcte1, Trim67, Osbpl10, Serpini1, Slc7a1, Gpr22, Cntn4, Skor1, Slc7a3, Atp1b1, Kcna2, Cebpb, Parm1, Dock7, Eml5, Cnih3, Asic2, Hpcal4, Adamts2, Masp1, Plxnc1, Gabrg2, Mtfp1, Ntn1, Ret, Zfp423, Nln, Man2a1, Neurod6, Grin2d, Angptl3, Cnr1, Tmem132e, Apcdd1, Rasgrf1, Hcn1, Scnn1g, Ly6e, Pax2, Rab3c, Rph3a, Rai2, Gad2, Mpp7, Arl4a, Igsf3, Tmem179, and Sorbs2. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of basket cells derived from rat samples are: Plch1, AABR07001734.1, Lypd6, Lama3, March11, Gldc, Grm8, AABR07047823.1, AABR07001623.1, Gjd2, Arl4a, AABR07070578.1, Hpcal4, AABR07061428.1, Col12a1, Enpp1, Sorcs3, Clmp, Plk2, Arhgef26, RGD1561667, Asic2, AABR07026472.1, AC124896.1, Trpc5, AABR07052084.1, AABR07059478.1, Kit, Nt5dc2, AABR07041885.1, Hcn1, Skor1, Prdm8, Phf24, Esrrg, Grik3, Bhlhe22, Mir346, Tmem200a, AABR07003600.7, Scn9a, Inpp4b, Ace, Kcna2, Adra1d, Slc32a1, Cntnap4, Grid1, Trpc7, Begain, AABR07049535.3, Frmpd4,

Tfap2b, Cnr1, AABR07054088.3, Zcchc16, Trpv6, Grb10, Pax2, Nrxn3, Tyms, Grid1, Myt1l, Disp3, AABR07063359.1, Btn1a1, Rn60_10_0565.6, AABR07041972.1, Osbpl10, Six4, Mir384, Tbc1d4, Cabp1, AABR07003600.2, AABR07057590.1, Adrb2, Cacna1d, Plxnc1, Dusp22, Hecw1, Gdpd4, rno-mir-344a-1, Lgi2, AABR07060291.2, Adarb2, Angpt1, Rspo4, Rn50_7_1158.3, Dcx, AABR07065531.31, Onecut1, Mkx, Rgs4, Kcnc2, Hgf, Fgf13, Itga8, AABR07070578.2, Apcdd1, and Trim15.

[00113] For example, the most specific genes (ordered by decreasing specificity) in the nuclei of astrocytes derived from human samples are: S1pr1, Gja1, Lgi4, Efemp1, Etnppl, Aqp4, Rgma, Lgr6, Lcat, Tril, Serpini2, Pgghg, Slc1a3, Gfap, Aldh1a1, Pla2g5, Fxyd1, Wdr49, Gli1, Nfatc4, Scara3, Slc4a4, Lama2, Cdc42ep4, Gabrg3, P2ry1, Gabra2, Colec12, Mlc1, Slc7a11, Aldh1l1, Sox9, Lgals3, Mgst1, Gatsl3, Ahnak, Pipox, Rhoj, Arhgef26, Arhgef28, Srpx, Mt3, Atp1a2, Fxyd7, Lfng, Lamb2, Gdf10, F3, Sdc4, Hspb1, Hes1, Slc12a4, Mertk, C3, AI464131, Id4, Vit, Fjx1, Ccdc80, Adora2b, Ryr3, Mfge8, Plekho2, Elovl2, Fam179a, Cebpb, Acss1, Slc13a5, Ednrb, Pltp, Il33, Tlr4, Fam198b, Isyna1, Glis3, Dao, Fgfr3, Ncan, Msx2, Spatc1, Pdgfrb, Tubb2b, Fat3, Fam167a, Col22a1, Tcf7l1, Ndrg2, Nhsl1, Ddit4l, Pbxip1, Rasl12, Sh3bp2, Aplnr, Robo3, Rubcnl, Rab34, Gtf2a1l, Fgfr2, Kank2, and Rfx4. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of astrocytes derived from mouse samples are: Gdf10, Slc1a3, Fxyd1, Dao, A2m, Lfng, Lgi4, Mybpc1, Cdc42ep4, Slco4a1, Fam20a, Lcat, Acot11, Vim, Nwd1, S1pr1, Tnc, Rbm24, Acsbg1, Ntsr2, Prex2, Cables1, Gli1, Etnppl, Pla2g7, Phkg1, Nhsl1, Slc14a1, Plekho2, Gjb6, Plce1, Itih3, Sdc4, Mertk, Prr5, Sparcl1, Id4, Mlc1, Pax3, Gpr153, Abi3bp, Pltp, Fxyd7, Rpusd3, Aqp4, Igdcc3, Fgfr3, Mt3, Atp1a2, Gabrb1, Ndrg2, Ucp2, Plpp3, Frem1, Elovl2, Gli2, Efhd2, Zic4, Oplah, Cxcl14, Mfge8, Sox9, Atp13a4, AI464131, Pdlim4, Rfx4, Traf1, Dmp1, Gabra4, Gja1, Etv4, Map2k6, Wwc1, Syt10, Sparc, Tril, Slc25a18, Aldh1l1, Eva1a, Mxra8, Lgr6, Rgma, Egfr, Slc39a12, Slc8b1, Glipr2, Axl, Aass, Hk2, Itpkb, Ramp2, Pyroxd2, Gabra2, Tcf7l1, Garem2, Wnt6, Dfna5, Fam92b, Plxnb1, and Vamp1. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of astrocytes derived from rat samples are: AABR07070161.1, Itih3, Gdf10, Gli1, Slc25a18, Nkain4, Tnc, Msx2, S1pr1, Slc7a10, Aqp9, Mt2A, Lgi4, Pou3f2, Id4, Cacng5, Cyp2d5, AABR07058658.1, AABR07070161.6, Lfng, AABR07070161.3, Fam107a, Nat8f3, Ctxn3, Aldh1l1, Entpd2, Rbm24, Slc1a3, Mlc1, Cxcl14, Hif3a, Fxyd1, Acsbg1, AABR07070161.7, Notch3, Il33, Nwd1, Cdc42ep4, Samd9l, Gabrb1, Plpp3, Cxcr4, Rgma, Itm2a, Ednrb, Pdlim4, Sgca, Sncaip, Prodh1, Agt, Slc14a1, AABR07032343.1, AABR07035782.1, Marc1, Fgfr3, AABR07070161.5, AC109886.1, Prr5, Aqp4, Plekho2, AABR07035780.2, Sh2b2, F3, Sparcl1, Eva1a, Pltp, Gfap, Cyp2d4, Crlf1, Sdc4, Sod3, Dao, Chst1, AABR07001555.1, AABR07063346.1, Mpp6, Ptch2, AABR07031767.1, AC105604.1, Grin2b, Pygm, Etnppl, Slc15a2, Casp4, Gria1, Slc4a4,

Camk2g, Cbs, AABR07035175.1, Ntsr2, Gja1, Aspg, Sfxn5, Ccbe1, Ahnak, Gramd3, Ndrg2, Mt3, Shroom3, and Myh11.

[00114] For example, the most specific genes (ordered by decreasing specificity) in the nuclei of oligodendrocytes derived from mouse samples are: Klk6, Mog, Gldn, Cndp1, Gm20425, Tmem98, Slc5a11, Mag, Cams1, Gpr37, Cdk18, Hhatl, Anln, Enpp2, Folh1, Sec14l5, Myrf, Plp1, Mal, Gjb1, Itga2, Cpm, Plpp2, Cntn2, Ermn, Opalin, Abca8b, Lpar1, Pld1, Sall1, Cercam, Dock5, Pi16, Man2a1, Pex5l, Tmem63a, Tmem125, Gipr, Sh3tc2, D7Ertd443e, Kel, Ldb3, Ccdc152, Cldn11, Synj2, Lrp2, Ninj2, Psrc1, Ndrg1, Actn2, Sgk2, Trim59, Plekhg3, Larp6, Slc45a3, Cnp, Col4a5, Pde8a, Rhobtb1, D16Ertd472e, Qdpr, Enpp6, Rhou, Sema3c, Gsn, Cyr61, Capn3, Hoxd1, Frmd4b, Tmem144, Galnt6, Pkmyt1, Fbxo32, Pla2g16, Dpyd, Sh3gl3, Prima1, Rasal1, Fa2h, Fam124a, Treh, Paqr4, Azgp1, Plekhh1, Dapk2, Knop1, Sema3b, Elovl1, Shroom4, Car2, Necab1, Aspa, Gab1, Kif6, Hhip, Ugt8a, Iqgap1, Map6d1, Eln, and Plp. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of oligodendrocytes derived from mouse samples are: Gpr37, Pex5l, Hapln2, Apod, Ermn, Prr5l, Aspa, Efnb3, Anln, Mog, Plp1, Plekhh1, Tmem63a, Il33, D7Ertd443e, Sec14l5, Carns1, Tnfaip6, Galnt6, Galnt5, Ndrg1, Cldn11, Gjc2, Pla2g16, Fth1, Opalin, Car2, Dock5, Gm20425, Sall1, Pkd2l1, Kcnk13, Ppp1r14a, Gatm, Serpinb1a, Pde8a, Tnni1, Glul, Tmprss5, Nipal4, Trim59, Mal, Slc12a2, Qdpr, Litaf, Gjb1, Edil3, Pls1, Mboat1, St6galnac3, Gng11, Enpp2, Cpm, Pstpip2, Trim36, Klk6, Myo1d, Tmem98, Synj2, 4933413G19Rik, Mag, Insc, Pigh, Pik3c2b, Ninj2, Trpv3, Car14, Tmem125, Map7, Cdk18, Depdc7, Aatk, Myrf, Cnp, Stmn4, Chdh, Nek4, Frmd4b, Ugt8a, Palm2, Arsg, Ccdc152, Efemp1, Piga, Rftn1, Itgb4, Emilin2, Enpp4, Nkain2, Adamtsl4, Hcn2, Plxnb3, Dpy19l1, Arhgap23, Prima1, Gipr, Sh3tc2, Tubb4a, Map6d1, and Kctd13. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of oligodendrocytes derived from rat samples are: Gpr37, Pex5l, Hapln2, Apod, Ermn, Prr5l, Aspa, Efnb3, Anln, Mog, Plp1, Plekhh1, Tmem63a, Il33, D7Ertd443e, Sec14l5, Carns1, Tnfaip6, Galnt6, Galnt5, Ndrg1, Cldn11, Gjc2, Pla2g16, Fth1, Opalin, Car2, Dock5, Gm20425, Sall1, Pkd2l1, Kcnk13, Ppp1r14a, Gatm, Serpinb1a, Pde8a, Tnni1, Glul, Tmprss5, Nipal4, Trim59, Mal, Slc12a2, Qdpr, Litaf, Gjb1, Edil3, Pls1, Mboat1, St6galnac3, Gng11, Enpp2, Cpm, Pstpip2, Trim36, Klk6, Myo1d, Tmem98, Synj2, 4933413G19Rik, Mag, Insc, Pigh, Pik3c2b, Ninj2, Trpv3, Car14, Tmem125, Map7, Cdk18, Depdc7, Aatk, Myrf, Cnp, Stmn4, Chdh, Nek4, Frmd4b, Ugt8a, Palm2, Arsg, Ccdc152, Efemp1, Piga, Rftn1, Itgb4, Emilin2, Enpp4, Nkain2, Adamtsl4, Hcn2, Plxnb3, Dpy19l1, Arhgap23, Prima1, Gipr, Sh3tc2, Tubb4a, Map6d1, Kctd13, Mog, Opalin, Mobp, Tmem63a, AABR07006310.1, Hapln2, Klk6, Qdpr, Selplg, Cldn11, Mal, Ermn, AABR07046961.1, Abi3, Gpr37, Tmem88b, Rasgrp3, Prr5l, Slc5a11, Mag, LOC100362909, Tmem176b, LOC100302465, Cx3cr1, Ctss, Cams1, Tmem125, Tmem176a,

Sec14l5, Tf, C1qb, Apod, S1pr5, Rn60_5_1374.5, Plp1, Insc, Mbp, Pls1, Tmem98, Anln, Ndrg1, Pafah1B1, Pex5l, LOC361016, Galnt6, Trim36, AABR07017693.1, Gpatch4, Plekhg3, Hamp, Csf1r, Gjc2, Car14, Trim59, AABR07053870.1, Gpr84, Plekhh1, Ghr, Kndc1, Slco2b1, Cd74, Aspa, Trpv3, AABR07008030.1, Aplp1, Tgfbr2, Gjb1, Ptp4a3, Prima1, Pik3c2b, AABR07036035.1, Sall1, Plpp2, Pld4, Fam102b, Cd33, Cdkn1a, Nkd1, Elovl7, Piga, Inf2, Blnk, Enpp4, Il18, Spata13, Mettl7a, Inpp5d, Myrf, Gjc3, Trim2, AABR07012039.1, AABR07033887.1, Enpp2, Pacs2, C1qa, Trem2, Slc45a3, Hhip, Anxa3, and AABR07022098.1.

[00115] For example, the most specific genes (ordered by decreasing specificity) in the nuclei of OPCs derived from human samples are: Fermt1, Lims2, C1ql1, Sstr1, Olig1, Bambi, Usp43, B3gnt7, Pdgfra, C1ql2, Olig2, Fmo3, Cspg5, Galr1, Gpc2, Fibin, Cspg4, Col11a1, Bche, Col9a1, Afap1l2, Cldn1, Plpp4, Sox13, Plat, Neu4, D630023F18Rik, Col20a1, Pxylp1, Asic4, Spsb4, Prelp, Gpr34, Best3, Stk32b, Akr1c14, Susd5, Ophn1, Mmp16, Sulf2, Prkg2, Tns3, B3galt4, Fgfbp3, Nkain3, Ntn1, Ascl1, Sema5a, Hrasls, Gal3st4, Ebf4, Tmem132d, Nt5e, Jag1, Megf11, Ildr2, Plppr1, Dcc, Ntn4, Sox6, Cacng4, Pxdn, Sapcd2, Tnk2, Slc43a3, Adamts6, Vsig8, Itm2a, Marcksl1, Alk, Smoc1, Cacna2d3, Tm4sf1, Bgn, Pdgfc, Atp2c2, Aldh1a3, Prrx1, Meis3, Cxxc4, Cd27, Sema3e, Adamts17, Akr1c20, Arhgap10, Crispld2, Sipa1l2, Ppp1r36, Gng12, Syt17, Midn, Gadd45a, Khdrbs3, Thbs4, Vipr2, Ccnd1, Iffo1, Atoh8, Exosc4, and Pde7b. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of OPCs derived from mouse samples are: Neu4, C1ql1, Ppfibp1, 3110035E14Rik, Pdgfra, Rgcc, Susd5, Itga9, Tes, Rprm, Rep15, Cspg4, Matn4, Amz1, 1810041L15Rik, Pxdc1, Tox3, Sh3bp4, Elfn1, Galnt3, Lmcd1, Serpine2, C1ql2, Neto1, Grm5, Mmp2, Col11a2, Sema3d, Lims2, Cav1, Sapcd2, Rcn1, Ptpro, Ccnd1, Ptgfrn, Ncan, 5730559C18Rik, Lpcat2, Olig2, Fhl3, Tspan6, Rin2, Ascl1, Basp1, Pmepa1, Fzd9, Fam114a1, Abhd2, Ctxn1, Cspg5, Cfap20, Vwc2, Cdo1, Cdh13, Marcks, Gsx1, Sertm1, Slc1a1, Matn1, Has2, Lama4, Mycl, Klhl5, Kcnh5, Kcnh8, Sema5a, Enpp6, Slc5a7, Cav2, Lbh, Adm, Adam12, S100a4, Mfsd2a, Igfbp3, Midn, Asap3, Prkg2, Rlbp1, Abcg2, Vstm2b, Dock6, Fbn1, Frrs1, Khdrbs3, Slitrk6, Chst11, Ptpn14, Dpysl3, Slc44a5, Eya1, Sox6, Phox2a, Col11a1, Swap70, Fam89a, Mrm2, Lypd1, Shisa7, and Pcdh17. For example, the most specific genes (ordered by decreasing specificity) in the nuclei of OPCs derived from rat samples are: Fam89a, Pdgfra, RGD1561849, Rlbp1, Ccnd1, Tmem255b, C1ql1, Bgn, Itga9, Ppfibp1, Snx22, Col5a3, Pmel, Cav1, Serpine2, Cspg4, Lims2, AABR07052897.1, C1ql2, Cdk2, AABR07010022.1, Cacng4, Matn4, AABR07049948.1, Susd5, Prkg2, Pxdc1, RGD1566029, AABR07003304.1, Sapcd2, Cspg5, Mmp15, Rgcc, Slc22a6, Sema5b, Qprt, Pnlip, Slc6a12, RGD1311892, AABR07003306.1, AABR07044671.1, Rbpjl, Chst5, Traf4, Sox6, Cox6b2, Pcdh15, Cd101, Xylt1, AABR07003304.2, Calcrl, Col1a1, Lama4, Elfn1, Ampd3, Fam212b, Slc6a13, Sstr1, Sema3d, AC141997.1, Cpne7, Ptgfrn, Wbscr28, Ryr3, Gpsm2, Neto1, Chst11,

Slc22a8, Pstpip2, AABR07044668.1, Bcas1, Igf2, Lbh, Olfm2, Ndnf, Vstm2b, AABR07058656.1, Rep15, Vtn, Eln, Ramp1, Pmepa1, Gpnmb, Ptpro, Limd1, Cdh13, Nrxn2, Mgp, Myt1, Marcks, LOC100362216, AABR07043601.4, LOC102553018, Masp1, Sulf2, Tle6, Fam114a1, Tmem100, Ccnd2, and Rasgef1b.

[00116] In some embodiments, the specificity rank was observed to be more conserved between mouse and rat than mouse and human. In some embodiments, Geno Ontology (GO) analysis may be performed for genes considered specific for each cell type or species to determine whether the genes fuction in the same pathway. In some embodiments, changes in expression of cell type or species-specific markers are observed in alternative family members in a given cell type. For example, Pde1c may be used for mouse cell types in the cerebellum or the nuclei thereof and Pde1a expression may be used for human cell types in the cerebellum or the nuclei thereof.

[00117] In some embodiments, differences in expression levels of protein tyrosine kinase 2 beta (Ptk2b), solute carrier family 43 member 2 (Slc43a2), glutamate ionotropic receptor kainate type subunit 3 (Grik3), Itpr1, protocadherin 9 (Pcdh9), and Ras guanyl releasing protein 1 (Rasgrp1) are used to differentiate between nuclei from granule, glia, and basket/stellate cells derived from humans and mice.

B. Analyzing cell type specific and species-specific gene expression of cross-species analysis

[00118] In some embodiments, the most variable genes are identified from a comparison of the RNAseq results from sorted nuclei from each cell type compared to normalized RNAseq results across the three species. In some embodiments, cell type specific and species specific genes may be identified by the genes having either or both of the largest variation among cell types and the largest variation among analyzed species. In some embodiments, genes observed to have the most variation in expression among species may be further differentiated by cell type. For example, nuclei may have greater differentiation among species than among cell types. In some embodiments, hierarchical clustering may be used to observe the degree of separation provided by each component of variation.

[00119] In some embodiments, Pcsk2, Pcsk6, and Pcsk8 are used to catergorize nuclei by both cell type and species. Alternatively, Pcsk1 and Pcsk3 are used to categorize nuclei by cell type.

[00120] In some embodiments, nuclear structure may be compared to differences across each cell type in gene expression regulation or in disease susceptibility.

C. Effects of clinical attributes in human samples

[00121] In some embodiments, differences in the profiles of nuclei due to clinical attributes may be analyzed to identify markers of the attribute. For example, profile differences were observed in different periods of autolysis time, gender, age, and stress.

[00122] Autolysis was observed to only have minor effects on gene expression in previous studies. (Gupta et al., 2012, BMC Genomics 13, 26, which is hereby incorporated by reference herein in its entirety). In some embodiments, expression of at least four genes in the sorted nuclei may be used to define granule cells derived from human samples at varying stages of autolysis. In some embodiments, expression of at least one gene may be used to define basket/stellate cells or glia derived from human samples at varying stages of autolysis. In some embodiments, the level of expression of kinesin family member 19 (Kif19) may be measured to determine autolysis time. For example, a higer level of expression of Kif19 indicates a higher autolysis time, and a lower level of expression of Kif19 indicates a lower autolysis time. The level of expression may be compared to normalized expression across all samples. In some embodiments, a higher level of expression of FosB proto-oncogene, AP-1 transcription factor subunit (FosB) indicates an intermediate autolysis time of between about 5 hours and about 24 hours.

[00123] Gender-specific and cell-type specific gene expression may also be identified to determine the effects of gender on gene expression. Xist is a gene on the X-chromosome that is involved in X-chromosome inactivation and expressed exclusively in females. Next, we analyzed whether gender affects gene expression in specific cell types. Tsix, the gene running antisense to Xist, was observed to be expressed only in glia of females. This is an example of gender-specific and cell-type specific gene expression.

[00124] In some embodiments, the profiles for nuclei isolated from male and female samples may be compared to determine gender-specific markers. For example, an increase in expression of KDM5D, RPS4Y1, ZFY, DDX3Y, TTTY15, TTTY14, USP9Y, UTY, GYG2P1, NLGN4Y, TXLNGY, LINC00278, PRKY, and/or TTTY10 compared to normalized expression across unsorted nuclei may be used as markers for nuclei from male samples. Further, a decrease in expression of ZFX, PUDP, KDM5C, LOC389906, PIN4, MTRNR2L8, MTRNR2L6, COL4A1, DHFR, LOC101929541, TSIX, MIR6723, and/or XIST may be used as markers for nuclei from female samples. In some embodiments, expression results are further analyzed to identify cell-type and gender-specific markers. For example, increased expression of long intergenic non-protein coding RNA 278 (LINC00278) may be used to differentiate glia from male samples from glia from female samples. Further, an increase in expression of family with sequence similarity 8 member A4, psuedogene (Fam8a4p), arylsulfatase D pseudogene 1 (Arsdp1), and Gyg2p1 compared to normalized expression across unsorted nuclei may be used as markers for nuclei from stellate cells derived from male samples.

[00125] To determine whether age effects cell types uniformly, differentially expressed genes may be identified among samples from humans of varying ages. In some embodiments, differences in expression of the following genes in the nuclei: ABCC10, ACAP3, ACHE,

ATF6B, ATP6V0B, CACNA2D3, CUL7, DNAJB5, EGR1, FZR1, GBAP1, GPR107, GRK5, KCTD21-AS1, KLHL22, LINC00499, LINGO2, LOC100132077, LOC100506990, LOC101927592, MIR9-3HG, MPND, MTRF1, POLR2J3, PPP6R2, PRSS55, PTMS, RNF17, SNAI3-AS1, SPHK2, ST3GAL2, TAOK2, TRDN, WASH7P, ZFPM1, ZNF404, ZNF496, ZNF580, ZNF585A, ZNF607, ZNF84, and ZSCAN29 may be used to determine the age of a subject from which a sample was derived.

[00126] In some embodiments, further analysis of the profiles may provide age specific and cell type specific markers. For example, differential expression of the following genes: KCNQ3, SCHLAP1, UGGT2, PLXDC2, ITGB5, DCLK1, AQP7, PTPN3, FAT1, CMTM8, FARP1, PIP4K2A, NEDD4, CATSPERG, LOC101926, 941, WWC2, MPP6, SDK1, NAB2, NTNG2, LMNTD2, PLCH2, PTPRJ, MRAP2, PTMS, CDH23, SYT7, SPRED3, PLXNA1, GRK5, ZYX, FGF3, LINC01544, PCYT1B, RHBG, HCN2, ACAP3, MGAT3, C1orf61, SURF2, AHRR, FAM131A, CHGB, PLXNA4, ACHE, DYRK1B, CDK5R2, GDPD5, ZNF703, FHDC1, LOC101927, 078, CREB3L2, AP1S3, DYSF, MAMSTR, KIAA0895L, TP73, PDE3A, LINC00963, ELAVL3, TTYH3, HPN, PTPRE, SLC17A7, GRIN2C, PXN, TMEM130, LRPAP1, GRM4, STEAP3, CHRD, SBNO2, ZDHHC23, GACAT2, MAP6D1, FAM53A, KIAA1549L, SLC38A7, CDK16, CALY, LPCAT4, SLC25A6, SRCIN1, ELMO1, GRAMD4, RIMS3, CPLX2, PIP5K1C, SDC3, CBLN3, PDZD7, VWA5B2, ZNF219, FAM212B, RASIP1, GYS1, ATP6V0B, NKD1, ST3GAL2, PTK7, ACOT7, ATXN7L2, DAO, SYT12, ADAM19, HIP1, GABBR1, SYT3, TP53INP2, KCNK3, TPM4, RNF152, KCNK10, EPB41L1, ABCC10, NAV2, ERGIC1, BAD, KIF3B, RAI2, XKR7, PTK2B, CHST12, TRIM67, DHDDS, NUMBL, KCND3, LRRC1, RAB37, KCNIP2, RAB6B, PC, TCEAL2, MEG8, FMNL3, MAPK4, DGCR5, REEP1, GTPBP2, KIF26B, NRXN2, ZNRF1, C14orf132, FLNB, EFR3B, RBFOX3, PPP2R2C, KLHDC4, PILRA, CLSTN3, CABIN1, NHSL2, LYRM1, KCNA2, SLC38A10, DGKA, TMEM266, FAM135B, ATP2B2, TMEM163, UNC5B, TPM3, MICAL2, GNAO1, GABBR2, KCNK1, USP4, TEX2, PRKAG2, APBA2, SUSD6, HDHD2, NAA20, CRIPT, KNTC1, RPS6KA5, PHF10, PCGF5, DPY19L4, APH1B, ZNF546, ABCA17P, CDH26, CBWD6, ZNF736, CFAP70, UBE4A, TTC32, CFAP53, PXDNL, CPVL, GLIPR1, COL25A1, MTHFD2L, LSM5, LOC100505, 715, NR3C2, TOM1L1, ANKRD42, SLC8A1, -AS1, ATAD2, GAB1, CCDC146, ELMOD1, CFAP74, C1orf146, P4HA2, RANBP3L, OTUD6B, -AS1, EYS, ALS2CR11, LECT1, BHLHE40 -AS1, STAB2, PXYLP1, LOC101929, 710, LINC00499, RHOBTB3, CRYBG3, NPY6R, RGS20, C2orf73, YIPF7, BUB1B, CFAP43, LOC102724, 623, LRRC69, STK3, CLIC5, CACNA2D3, C2orf27A, LOC105378, 385, BEST3, EPHA6, LOC100506, 393, MEF2C, GTSCR1, ELOVL2, SPATA9, PLSCR4, GCK, LINC01032, MEF2C-AS1, BMS1P21, CASP12, CLMP, ERBIN, TMC3-AS1, CXXC4, DCBLD1, GSTO2,

PLOD2, P4HA2-AS1, TTC23L, CPLX3, SOX13, PRDM1, RSPO2, TSG1, MIR31HG, CTB-12O2.1, PLCH1, JAML, SEMA3G, LOC101928, 203, GLRA1, SYT16, SYN3, ARHGAP32, MIR646HG, ALCAM, SCGN, LINC01515, and LOC101929415 compared to normalized expression across samples of varying age may be used as markers to identify granule cells.

[00127] For example, differential expression of the following genes: ACER3, ACSS3, ADAMTS2, ADAMTS9, ADAMTSL3, ADD2, ADGRL3, AKAP13, ALOX5, ALS2CR11, ARHGEF10L, ARHGEF6, ASIC1, ASIC2, ATP6V0B, BMP3, BTBD11, C11orf87, C14orf1, C4orf22, C9orf135, CA7, CACNA1D, CACNA2D3, CACNB4, CADM3, CADPS, CALR, CDK15, CFAP46, CLSTN3, CNTN3, CPNE8, CYYR1, DBH, DCC, DDO, DGKH, DISP3, DLG1, DLG4, DMGDH, DNAH6, DNER, E2F3, ECHDC2, ELOVL2, ENPP1, EPHB1, ERC2, FAM135B, FAM46C, FBXL21, FGF5, FHOD3, FKBP5, FRMPD4, GABBR2, GALNT18, GAP43, GBAP1, GDF11, GPR161, GPR63, GREB1, HCN4, HECTD2-AS1, IQSEC3, KCNA4, KIF26B, KRT222, LACTB2-AS1, LHFPL3, LINC00457, LINC00499, LINC01158, LOC105377448, LOC285692, LOC653602, LPCAT4, MARC2, MARCH11, MASP1, MEGF10, MTHFSD, MYRIP, NHS, NOS1, NPL, NPY6R, NTNG1, NXNL2, PAQR6, PARM1, PCP4, PEBP4, PHACTR2-AS1, PHKA1, PLPPR4, PLXNA4, PRKCG, RGMB, RNF212, RNF215, RORA, RPH3A, RPS6KA5, SCN2B, SEPSECS, SEPSECS-AS1, SHANK1, SHANK2, SLC12A5, SLC17A4, SLC25A29, SLC26A8, SLC35F4, SLC8A3, SPARCL1, SPHK2, SPON2, ST6GAL2, ST6GALNAC5, STAT5A, STK33, SV2C, SYT17, TEX9, TFAP2B, THSD7B, TMEM178B, TRAF5, TRIM67, TTC23L, TUNAR, UBASH3B, UNC5D, ZNF124, and ZYG11A compared to normalized expression across samples of varying age may be used as markers to identify basket cells.

[00128] For example, differential expression of the following genes: ADAMTS7, ANKRD33B, AOX1, C1orf95, CACNG4, CACNG8, CAPN9, CRTAC1, DACH1, EFHD2, EGF, ETS1, FRAS1, IMPA2, LINC00499, LINC00844, LINC01208, LOC101927078, LOC102724360, PKDCC, PLXNA4, PRR5, RHCG, ROBO2, SEMA5B, SHROOM2, SLIT2, TRDN, TXNIP, VWA5A, and WNT7B compared to normalized expression across samples of varying age may be used as markers to identify glia.

[00129] In some embodiments, gene expression in nuclei

D. Selecting markers and targets

[00130] In some embodiments, analysis of altered expression associated with sorted nuclei occurs between gene orthologs among different species. For example, expression of 1:1 orthologs are compared to ensure that results are due to altered expression rather than differences in gene annotation among species.

[00131] In some embodiments, further analysis may be performed to ensure that altered expression is not due to differences in annotation among species. For example, only genes having a 1:1 ortholog may be used to determine expression levels. Analysis may be additionally limited to genes greater than 1kb in length and/or having a less than 2-fold difference in length among species, such as mouse, rat, and human. In some embodiments, a cell type specific gene or species specific gene may be selected from the 250 most variable genes across mouse, rat, and human nuclei including: 1810041L15Rik, 2810459M11Rik, 3110035E14Rik, A2m, Adamts15, Adra1a, AI593442, Aldh1a1, Anln, Apcdd1, Apod, Aqp4, Arhgef33, Ascl1, Asgr1, Aspa, Atp1a2, Atp2a3, B3gnt5, B3gnt7, Bcl11a, Bhlhe22, C1ql1, C1ql2, Cacna1g, Cacng4, Calb1, Camk1g, Car8, Cams1, Casq2, Cbln2, Ccdc152, Ccdc180, Cend2, Cd82, Cd9, Cdh19, Cdhr1, Cldn11, Clec7a, Clmn, Cmtm5, Cntn3, Cntnap5a, Cobl, Col5a3, Col6a1, Cpm, Cryab, Cspg4, Csrp1, D7Ertd443e, Ddx3y, Dock5, Dpy19l2, Ebf2, Echdc2, Efna5, Enpp2, Erbb3, Ermn, Etnppl, Fa2h, Fam46a, Fgfr2, Flrt2, Fmo3, Folh1, Foxh1, Fsip2, Fxyd1, Fxyd7, Gad2, Gal3st1, Galnt5, Galnt6, Galr1, Gdf10, Gfap, Gja1, Gjb1, Gjc2, Gldn, Gli1, Glp2r, Glul, Gm136, Gnb3, Gng11, Gpr37, Gpr37l1, Gpr63, Gpx2, Gramd3, Grb14, Gria3, Grik3, Grm1, Grm5, Gsn, Hapln2, Hepacam, Hhatl, Hspa1b, Htr1b, Id4, Igsf11, Il22, Il33, Insc, Itgb8, Itih3, Itpr1, Kcnc2, Kcnj10, Kif19a, Kit, Kitl, Klk6, Leng9, Lfng, Lgi4, Lims2, Mag, Mak, Mal, March11, Marcksl1, Mcam, Mff, Mfge8, Mlc1, Mog, mt-Co1, mt-Nd4, Mybpc1, Myot, Myrf, Ndrg1, Nell1, Neto1, Neu4, Ninj2, Nkx2-2, Notch1, Nrk, Olig1, Olig2, Opalin, Pax3, Pcp2, Pdc, Pdgfra, Pdzd3, Penk, Pex5l, Pgghg, Phyhip, Pkp3, Pla2g16, Plch1, Plekhd1, Plekhg3, Pllp, Plp1, Plpp3, Plpp4, Plscr1, Plxnb3, Pmp2, Pmp22, Ppfibp1, Ppp1r14a, Ppp1r17, Prex1, Prex2, Prima1, Prkcg, Prr5, Prrg3, Prrx1, Ptchd4, Ptprk, Ptprz1, Pttg1, Pvalb, Pxdc1, Qk, Rapgef3, Rassf2, Rbp2, Rbpjl, Rgcc, Rgma, Ryr1, S100b, S1pr1, Sall1, Sec14l5, Serpine2, Shisa6, Skor2, Slc1a3, Slc1a6, Slc26a3, Slc32a1, Slc4a4, Slc5a11, Slc9a3, Slitrk6, Socs2, Sorcs3, Sox10, Sox2, Sox6, Sox8, Stag3, Stk32a, Sulf2, Susd5, Tceal7, Tfap2b, Thbs2, Tmem125, Tmem132d, Tmem63a, Tmem98, Tnc, Tnfrsf13c, Tns3, Trabd2b, Tril, Trpc3, Trpc7, Tshb, Tspan11, Tspan2, Tuba8, Tubb2b, Txnip, Ube2b, Ugt8a, Upp1, Vstm2b, Wfdc1, Xrra1, Zcchc24, Zeb2, and Zfp36l1.

V. MODULATING IDENTIFIED TARGETS

[00132] In some embodiments, at least one gene selected from one of Tables 2-4 is associated with at least one disease, disorder, or condition. A gene or expression thereof associated with a disease disorder or condition may also be referred to as a disease target. In some embodiments, a method of treating the disease, disorder, condition comprises using a therapeutic modality to modulate expression of the disease target. In some embodiments, the therapeutic modality targets at least one transcript selected from Tables 2-4. In some embodiments, the therapeutic modality targets at least one protein selected from Tables 2-4. In some embodiments, the therapeutic

modality is pharmaceutical composition such as a small molecule drug or an RNA interference (RNAi) molecule (such as siRNA), gene therapy, or cell therapy.

VI. DEFINITIONS

[00133] The following is a non-limiting list of term definitions.

[00134] As used herein, the term "about," as applied to one or more values of interest, refers to a value that is similar to a stated reference value. In certain embodiments, the term "approximately" or "about" refers to a range of values that fall within 25%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%, 11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1%, 0.9%, 0.8%, 0.7%, 0.6%, 0.5%, 0.4%, 0.3%, 0.2%, 0.1%, or less in either direction (greater than or less than) of the stated reference value unless otherwise stated or otherwise evident from the context (except where such number would exceed 100% of a possible value).

[00135] As used herein, the term "antibody" refers to an immunoglobulin molecule capable of specific binding to a target, such as a polynucleotide, polypeptide, protein etc., through at least one antigen recognition site, located in the variable region of the immunoglobulin molecule. The term "antibody" encompasses not only intact (e.g., full-length) polyclonal or monoclonal antibodies, but also antigen-binding fragments thereof (such as Fab, Fab', F(ab')2, Fv), single chain (scFv), mutants thereof, fusion proteins comprising an antibody portion, humanized antibodies, chimeric antibodies, diabodies, linear antibodies, single chain antibodies, multispecific antibodies (e.g., bispecific antibodies) and any other modified configuration of the immunoglobulin molecule that comprises an antigen recognition site of the required specificity, including glycosylation variants of antibodies, amino acid sequence variants of antibodies, and covalently modified antibodies. An antibody includes an antibody of any class, such as IgD, IgE, IgG, IgA, or IgM (or sub-class thereof), and the antibody need not be of any particular class.

[00136] As used herein, the term "cell specific profiling" refers to using the nuclear transcriptome to accurately define cellular identity.

[00137] As used herein, the term "chromosomal associated transcript (CAT)" refers to transcripts held at the chromosome while being synthesized.

[00138] As used herein, the term "diseased tissue" or "diseased sample" refers to a sample taken from a subject experiencing a disease state.

[00139] As used herein, the term "DNA probe" or "RNA probe" refers to a fragment of DNA or RNA (usually 100–1000 bases long) which hybridizes to nucleotide sequences that are complementary to the sequence of the probe. The probe may be radioactively, fluorescently, or chemically (e.g. biotin) labeled for visualization.

[00140] As used herein, the term "drug target" or "targets for therapeutics" refers to a nucleotide sequence that may be acted on by a drug or therapeutic to modulate gene expression in a cell type.

[00141] As used herein, the term "factor" refers to a nucleotide sequence that is hybridized by a DNA or RNA probe or is specifically bound by an antibody to allow accurate sorting of nuclei of a particular cell type.

[00142] As used herein, the term "gene expression" or "expression" refers to the level of one or more of the following events: (1) production of an RNA template from a DNA sequence (*e.g.*, by transcription); (2) processing of an RNA transcript (*e.g.*, by splicing, editing, 5′ cap formation, and/or 3′ end processing); (3) translation of an RNA into a polypeptide or protein; (4) folding of a polypeptide or protein; and (5) post-translational modification of a polypeptide or protein.

[00143] As used herein, the term "cellular profiling technique" refers to non-genetic methodology for molecular profiling of a population of a cell type in post-mortem tissue.

[00144] As used herein, the term "polyA transcript" refers to a chain of adenine nucleotides that is added to a messenger RNA (mRNA) molecule during RNA processing to increase the stability of the molecule.

[00145] As used herein, the term "label" refers to one or more markers, signals, or moieties which are attached, incorporated, or associated with another entity, which markers, signals or moieties are readily detected by methods known in the art including radiography, fluorescence, chemiluminescence, enzymatic activity, absorbance, and the like. Detectable affinity labels include radioisotopes, fluorophores, chromophores, enzymes, dyes, metal ions, ligands such as biotin, avidin, streptavidin and haptens, quantum dots, and the like. Detectable affinity labels may be located at any position in the entity with which they are attached, incorporated or associated. For example, when attached, incorporated in or associated with a peptide or protein, they may be within the amino acids, the peptides, or proteins, or located at the N- or C- termini.

[00146] As used herein, the term "most specific gene(s)" refers to a gene(s) having a lower Specificity Index (SI) value compared to the SI value of other analyzed genes, which is calculated using the algorithm described in Example 1.

[00147] As used herein, the term "tissue sample" refers to an aliquot or portion taken from a source and provided for analysis or processing. In some embodiments, a sample is from a biological source such as a tissue, cell, or component part (e.g. a body fluid, including but not limited to blood, mucus, lymphatic fluid, synovial fluid, cerebrospinal fluid, saliva, amniotic fluid, amniotic cord blood, urine, vaginal fluid, and semen). In some embodiments, a sample may be or comprise a homogenate, lysate, or extract prepared from a whole organism or a subset of its tissues, cells or component parts, or a fraction or portion thereof, including but not limited to, for

example, plasma, serum, spinal fluid, lymph fluid, the external sections of the skin, respiratory, intestinal, and genitourinary tracts, tears, saliva, milk, blood cells, tumors, organs. In some embodiments, a sample is a or comprises a medium, such as a nutrient broth or gel, which may contain cellular components, such as proteins or nucleic acid molecule. In some embodiments, a sample is subjected to one or more processing (e.g., separation, purification, etc.) steps to prepare a sample for analysis or other use.

[00148] As used herein, the term "transgenic animal" refers to an animal having a foreign gene inserted into its genome.

[00149] As used herein, the term "translating ribosomal affinity purification (TRAP)" refers to the method that defines the molecular signature of diverse cell types in a single tissue derived from a transgenic animal.

[00150] Described herein are methods for molecular profiling of a population of a cell type in post-mortem tissue. The details of one or more embodiments of the invention are set forth in the accompanying description below. Although any materials and methods similar or equivalent to those described herein can be used in the practice or testing of the present invention, the preferred materials and methods are now described. Other features, objects and advantages of the invention will be apparent from the description. In the description, the singular forms also include the plural unless the context clearly dictates otherwise. Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. In the case of conflict, the present description will control.

[00151] The present invention is further illustrated by the following non-limiting examples.

EXAMPLES

Example 1. Experimental procedures

[00152] The following experimental procedures were used to perform the experiments described in Examples 2-23 herein.

A. Buffer preparation

[00153] The buffers were prepared as described in Kriaucionis et al., Science, 324 (5929): 929-930 (2009). RNase free water was used if included in Buffer involved in the protocol for isolating RNA, otherwise MilliQ water was used.

[00154] Buffer A used in the examples herein is 60% iodixanol (Optiprep, Sigma-Aldrich, St. Louis, MO; Catalog no. D1556-250ML). Buffer A was kept covered in foil until used. Buffer B as used in the examples herein contains 900 mM KCl, 30mM $MgCl_2$, 120mM Tricine-KOH (pH 7.8). Buffers A and B were stored at room temperature (RT).

[00155] Buffer C used in the examples herein contained 50% iodixanol (5 volumes Buffer A and 1 volume Buffer B), 0.5mM spermidine, 0.15mM spermine, EDTA-free protease inhibitor cocktail (Roche Holding AG, Basel, Switzerland; distributed by Sigma-Aldrich, St. Louis, MO; Catalog no. 11836170001), 1mM DTT, and 200 units/mL Superasin (Thermo Fisher Scientific, Waltham, MA; Catalog no. AM2696). Buffer D used in the examples herein contained 0.25M sucrose, 150mM KCl, 5mM $MgCl_2$, 20mM Tricine-KOH (pH 7.8), 0.5mM spermidine, 0.15mM spermine, EDTA-free protease inhibitor cocktail, 50 µL of 1mM DTT, 200 units/mL Superasin, and 400 units/mL RNasin (Promega, Madison, WI; Catalog no. N2515).

[00156] Buffer E used in the examples herein contained 27% iodixanol (1.174 volume Buffer C to 1 volume Buffer D). Wash/Block buffer used for analysis in the examples herein contained 3% BSA in PBS with 0.05% TritonX-100; BSA obtained from Jackson ImmunoResearch Laboratories, Inc., Code no. 001-000-162. The Wash buffer for RNA used in the examples herein contained 50ng/mL RNase-free BSA in PBS, with 0.05% TritonX-100, 1mM DTT, and 100 units/mL of Superasin. The Block buffer for RNA used in the examples herein contained the Wash buffer for RNA supplemented with an additional 50 ng/mL BSA. The Cushion buffer used in the examples herein contained 500 µL of Buffer D, 250 µL of 50% Glycerol, and 5 µL of 10% NP-40.

B. Nuclei isolation

[00157] Nuclei isolation was adapted from the protocol described in previous publications (Kriaucionis, et al. (2009) Science 324, 929–930 and Mellén, et al. (2012) Cell 151, 1417–1430, each of which is hereby incorporated by reference herein in its entirety). For mouse experiments, cortex and cerebella were dissected as described previously. All tissue from C57BL/6J animals were flash frozen using liquid nitrogen. Tissue from mice developed for use in the bacTRAP method were freshly dissected and directly used for homogenization. Rat and human tissue were obtained frozen. All frozen tissues were thawed on ice for a minimum of 30 minutes before use. To isolate nuclei, fresh or thawed tissue were transferred to 5mL of homogenization medium (0.25 M sucrose, 150 mM KCl, 5 mM MgCl2, 20 mM Tricine pH 7.8, 0.15 mM spermine, 0.5 mM spermidine, EDTA-free protease inhibitor cocktail, 1mM DTT, 20U/mL Superase-In RNase inhibitor, 40U/mL RNasin ribonuclease inhibitor). Tissue were homogenized by 30 strokes of loose (A) followed by 30 strokes of tight (B) glass dounce. Homogenate was supplemented with 4.6mL of a 50% iodixanol solution (50% Iodixanol/Optiprep, 150 mM KCl, 5 mM MgCl2, 20 mM Tricine pH 7.8, 0.15 mM spermine, 0.5 mM spermidine, EDTA-free protease inhibitor cocktail, 1mM DTT, 20U/mL Superase-In RNase inhibitor, 40U/mL RNasin ribonuclease inhibitor), and laid on a 27% iodixanol cushion. Nuclei were pelleted by centrifugation 30 min, 10,000 rpm, 4°C in swinging bucket rotor (SW41) in a Beckman Coulter XL-70 ultracentrifuge.

For mouse, rat, and human cytoplasmic fractions, 175uL of the top layer was added to 175uL QIAGEN® Buffer RLT and stored at -80°C. The nuclear pellet was resuspended in homogenization buffer.

C. Antibodies

[00158] Primary and secondary antibodies were diluted in Block Buffer. Secondary antibodies were purchased from Life Technologies or Jackson Immunoresearch and were used at 1:500 dilution. Primary antibodies and the dilution factors are shown in Table 5. In the Table, NeuN stands for Neuronal Nuclei Antigen, Itpr stands for Inositol 1,4,5-Trisphosphate Receptor Type 1, Sorcs3 stands for Sortilin Related VPS10 Domain Containing Receptor 3, EEAT1 stands for Excitatory Amino Acid Transporter 1, and Olig2 stands for Oligodendrocyte Transcription Factor 2.

Table 5. Antibodies

Antigen	Species	Vendor	Cat. #	Dilution
NeuN	Rabbit	Abcam	ab177487	1:250
NeuN	Mouse	Millipore	MAB377	1:250
Itpr1	Mouse	Abcam	ab190239	1:500
Sorcs3	Goat	Thermo	PA5-48023	1:250
EEAT1	Rabbit	Abcam	ab416	1:250
Olig2	Goat	R&D	AF2418	1:250

[00159] The cell type specificities for antibodies used for isolating all cell types are shown in Table 6. Unless indicated, NeuN refers to the rabbit antibody.

Table 6. Antibody Specificities

	Granule	Purkinje	Basket	Astrocyte	Oligodendrocytes (progenitor & mature)
Mouse	Itpr1, Sorcs3, Olig2, NeuN	Itpr1, NeuN	Sorcs3, NeuN	EEAT1, NeuN (mouse)	Olig2, NeuN
Rat	Itpr1, Sorcs3, Olig2	Itpr1, NeuN	Itpr1, NeuN	Sorcs3, NeuN	Olig2 (progenitors only), NeuN, Sorcs3
Human	Itpr1, NeuN (also used for glia cells)	Not applicable	Itpr1, NeuN (also used for glia cells)	Itpr1, Olig2, NeuN	Olig2, NeuN

D. Nuclei fixation and staining

[00160] After isolation, nuclei were fixed by adding formaldehyde (formaldehyde without methanol; Electron Microscopy Sciences, Hatfield, PA; Catalog no. 15710) to 1% final concentration and incubated at room temperature for 8 minutes with gentle rotation. The formaldehyde was quenched by adding glycine to a final concentration of 125 mM. The sample was incubated at room temperature for 5 minutes with gentle rotation. The sample was spun for 4 minutes at 1000g in 4°C to pellet the nuclei. The supernatant was poured out and the pellet was resuspended in Buffer D. The sample was again spun for 4 minutes at 1000g at 4°C. The supernatant was poured out, and the pellet was resuspended in wash buffer (PBS, 0.05% TritonX-100, 50ng/mL BSA, 1mM DTT, 10U/uL Superase-In RNase Inhibitor). The nuclei were

then transferred to a new tube, and then spun for 4 minutes at 1000g at 4°C. The supernatant was poured out, and the nuclei were resuspended in block buffer and allowed to block with gentle rotation at room temperature (RT) for 30 minutes. Antibodies were added to nuclei in block buffer and incubated at RT for 1 hour with gentle rotation. Alternatively, this incubation step was performed at 4°C overnight (O/N).

[00161] A small aliquot of the nuclei was taken at this stage to be used as an unstained control for flow cytometry. The nuclei were pelleted for 3 minutes at 1000g at 4°C and washed with wash buffer (PBS, 0.05% TritonX-100, 50ng/mL BSA, 1mM DTT, 10U/uL Superase-In RNase Inhibitor). This was repeated two more times. Following the last wash, a 1:500 dilution of the appropriate secondary antibodies in block buffer was added. The nuclei were covered with foil and incubated at RT for 30 minutes with gentle rotation. Following the incubation, the nuclei were pelleted for 3 minutes at 1000g at 4°C and washed with wash buffer. This was repeated two more times. The pellet was then resuspended in an appropriate amount of block buffer for analysis or sorting. If immediate analysis was not planned, the nuclei were stored on ice.

E. Flow cytometry analysis/sorting

[00162] DyeCycle™ Ruby (dcRuby) (Thermo Fisher Scientific, Waltham, MA; Catalog no. V10273) was added to samples: 1-2 µL per mouse cerebellum and 5-7 µL for 200 mg of human tissue, which was based on the number of nuclei in the sample, volume of buffer, and whether the nuclei were from mouse or human. Variation in the concentration of dcRuby was allowed depending on the voltage on the flow cytometer.

[00163] Prior to flow cytometry, nuclei were co-stained with DyeCycle™ Ruby to a 20µM final concentration. Nuclei were analyzed using a BD LSRII (BD Biosciences, San Jose, CA, USA) flow cytometer using the 488nm, 561nm, and 640nm lasers. Nuclei were sorted using a BD FACS Aria cell sorter using the 488nm, 561nm, and 635/640nm lasers. All samples were first gated using DyeCycle™ Ruby to determine singlets. Analysis was performed using FACS Diva (BD) or FlowJo software. QIAGEN® Buffer RLT (unfixed samples) or QIAGEN® Buffer PKD (fixed samples) were added to the sorted nuclei and the samples were stored at -80ºC.

[00164] Following sorting, the nuclei were stored for RNA isolation. For storage, proteinase K digestion buffer (QIAGEN® AllPrep® FFPE RNA kit, QIAGEN®, Catalog no. 80234) was added to the sorted nuclei and the resulting mixture was stored at -80°C.

[00165] Measurements of forward-scattered light (FSC) were plotted against measurements of side-scattered light (SSC), and gating was performed on the general scatter. The dcRuby intensity was plotted linearly and voltage was adjusted for singlets. Singlets were gated. The samples were plotted based on the colors used and populations were gated based on expected

staining pattern. The percentage of the gated population was compared to the expected percentage of the cell type of interest.

F. RNA and DNA isolation and purification

[00166] The QIAGEN® AllPrep® FFPE kit was utilized to isolate both DNA and RNA from the same sample. Isolation was performed according to the kit protocol, except for the following modification: prior to the 80°C heating step, the RNA was incubated at 65°C for 30 minutes and then 70°C for an additional 30 minutes.

[00167] RNA from cytoplasmic fractions or fresh nuclei were purified using the QIAGEN® RNeasy® Micro kit with on-column DNase digestion. RNA from fixed nuclei were purified using the protocol QIAGEN® RNeasy® FFPE kit with the following modifications – after Proteinase K digestion, RNA was spun at max speed for 15 minutes. The supernatant was removed and incubated at 65°C for 30 minutes, 70°C for 30 minutes, and 80°C for 15 minutes. An on-column DNase digestion was performed in place of the in-solution DNAase digestion. RNA quantity was determined using the QUBIT® RNA HS Assay kit and RNA quality was determined using Agilent 2100 Bioanalyzer with RNA 6000 Pico chips.

[00168] Purified DNA and RNA were quantified using QUBIT® (Thermo Fisher Scientific, Waltham, MA; Catalog no. Q32854 and Q32855). Purified RNA samples were also run on AGILENT® Bioanalyzer chip (Agilent Technologies, Santa Clara, CA; Catalog no. 5067-1513) for quantification and sizing. DNA was stored at -20°C and used for sequencing or epigenetic analysis. RNA was stored at -80°C and used for cDNA synthesis.

G. cDNA production using Nugen Ovation® RNAseq V2 kit and library production

[00169] cDNA was generated from purified nuclear RNA using the Nugen Ovation® RNAseq V2 kit according to the kit protocol. The final cDNA was purified using the QIAGEN® MinElute® Reaction Cleanup Kit (Catalog no. 28206) according to the Nugen Ovation® RNAseq V2 kit protocol. cDNA quality was assessed using an AGILENT® TapeStation using a D1000 ScreenTape (Agilent Technologies; Santa Clara, CA; Catalog no. 5067-5582, ScreenTape Catalog no. 5067-5583). A 1:40 dilution of the cDNA was prepared for qPCR and enrichment or depletion of expected markers was checked. The cDNA was quantified using NanoDrop™.

[00170] Libraries were prepared using the Illumina TruSeq DNA LT Library Preparation Kit or the NEBNext Ultra DNA Library Prep Kit for Illumina with NEBNext Multiplex Oligos for Illumina. The quality of the libraries was assessed using the Agilent 2200 TapeStation system with D1000 High Sensitivity ScreenTapes. Libraries were sequenced at The Rockefeller University Genomics Resource Center on the Illumina HiSeq 2500 machine to obtain 50bp single-end reads or on the Illumina NextSeq 500 to obtain 75bp paired-end reads. All datasets have been deposited in GEO: accession-numbers-pending.

H. Oxidative bisulfite (oxBS) conversion reaction

[00171] Genomic DNA (gDNA) is isolated from sorted nuclei as described in the User Guide for the TrueMethyl® Whole Genome Kit from Cambridge Epigenetix Limited.

I. Immunofluorescence

[00172] Mice were deeply anesthetized and transcardially perfused with phosphate buffered saline (PBS) followed by 4% formaldehyde (w/v) in PBS. Brains were dissected and post-fixed overnight at 4°C, cryoprotected in 30% sucrose in PBS, OCT TissueTeck embedded, and cut with a Leica CM3050 S cryostat into 20µm sections that were directly mounted on slides. Slides were stored at -20°C. Antigen retrieval was performed by immersing slides into sodium citrate buffer (10mM sodium citrate, 0.05% Tween 20, pH 6.0) at 95-100°C and simmering for 10 minutes in the microwave. The slides were cooled to room temperature and then washed with PBS. Immunofluorescence was performed by blocking for 30 minutes in IF Block Buffer (3% BSA in PBS with 0.1% TritonX-100), incubated with primary antibody overnight, washed 3 times with PBS, incubated with secondary antibody for one hour, washed with PBS, stained with DAPI solution (1ug/mL in PBS) for 15 minutes, washed two times with PBS, and cover-slipped with Prolong Diamond mounting media. For some samples, Tyramide signal amplification was performed as follows: slides were incubated with secondary antibody conjugated to horseradish peroxidase for 1 hour, washed 3 times with PBS, incubated with Cy3 in Amplification Buffer from the TSA Cyanine 3 detection kit for 10 minutes, washed with PBS, and DAPI stained as above. All steps were performed at room temperature. Slides were imaged on a Zeiss LSM700 confocal microscope using the same acquisition settings for mouse and human slides. Brightness and contrast adjustments were made in ImageJ post-acquisition with the same adjustments applied to mouse and human images. In addition to the antibodies listed above for nuclei staining, the following primary antibodies in Table 7 were used for immunostaining.

[00173] In Table 7, GFAP stands for Glial Fibrillary Acidic Protein, Mog stands for Myelin Oligodendrocyte Glycoprotein, Mag stands for Myelin Associated Glycoprotein, Pde1a stands for Phosphodiesterase 1A and Pde1c stands for Phosphodiesterase 1C.

Table 7. Primary antibodies

Antigen	Species	Vendor	Cat. #	Dilution	Antigen	Species	Vendor	Cat. #	Dilution
GFAP	Goat	Abcam	ab53554	1:500	Pde1a	Goat	Acris	TA311317	1:200
Mog	Goat	Thermo	PA5-47319	1:500	Pde1c	Rabbit	Santa Cruz	sc-376474	1:200
Mag	Rabbit	Cell Signaling	9043S	1:500					

[00174] Antibodies described herein may be produced, tested, and/or characterized using a variety of methods. Such methods may be used to determine a variety of characteristics that may

include, but are not limited to, antibody affinity; specificity; and activity (e.g. activation or inhibition of cellular signaling pathways, or other cellular or biological activities).

[00175] Once an antibody molecule of the present disclosure has been produced by an animal, a cell line, chemically synthesized, or recombinantly expressed, it can be purified (i.e., isolated) by any method known in the art for the purification of an immunoglobulin or polypeptide molecule, for example, by chromatography (e.g., ion exchange, affinity, particularly by affinity for the specific antigen, Protein A, and sizing column chromatography), centrifugation, differential solubility, or by any other standard technique for the purification of proteins. In addition, the antibodies of the present disclosure or fragments thereof can be fused to heterologous polypeptide sequences described herein or otherwise known in the art, to facilitate purification.

[00176] The affinity between an antibody and a target or ligand (such as an antigen used to generate a given antibody) may be measured in terms of KD using one or more binding assays known in the art. Depending on the desired target for a given antibody, varying KD values may be desirable. High affinity antibodies typically form ligand bonds with a KD of about 10^{-5} M or less, e.g. about 10^{-6} M or less, about 10^{-7} M or less, about 10^{-8} M or less, about 10^{-9} M or less, about 10^{-10} M or less, about 10^{-11} M or less or about 10^{-12} M or less.

J. DNA and RNA probes

[00177] Alternatively or used in conjunction to antibodies, RNA and DNA probes may be designed and produced according to David et al. Biotechniques 30, 769-772, 2001 using polymerase chain reaction (PCR) to produce antisense fragments of the region of interest in the genome.

K. Real time PCR and primer list

[00178] Independent RNA samples were purified from the cytoplasmic fraction from mouse and human cerebellum, and purified RNA was converted to cDNA and amplified using the Nugen Ovation® RNAseq System V2 as described above. Quantitative real-time PCR was performed using TAQMAN® probes and LIGHTCYCLER® 480 Probe Master mix on a LIGHTCYCLER® 480II system (Roche). Two biological replicates were used for both mouse and human, and three technical replicates were performed for each biological replicate. Cq values were calculated using second derivative maximum method in the LIGHTCYCLER® 480 software. Normalization was performed with the delta Cq method with the geometric mean of three housekeeping genes: Actin Beta (Actb), Glyceraldehyde-3-Phosphate Dehydrogenase (GAPDH), and RNA Polymerase II Subunit A (Polr2a). Technical replicates were averaged (arithmetic mean) before performing statistical analysis using a two-tailed t-test assuming equal variance. Primers are listed in Table 8. In Table 8, and as used herein, the genes referred to are

Actb, GAPDH, Polr2a, Von Willebrand Factor C Domain Containing 2 (Vwc2), Coiled-Coil Domain Containing 175 (Ccdc175), Clavesin 2 (Clvs2), Pde1a, Pde1c, Endothelin Converting Enzyme 1 (Ece1), CNKSR Family Member 3 (Cnksr3). Also given in the Table are the mouse and human IDs from Integrated DNA Technologies (IDT) and Thermo Fisher (Thermo).

Table 8. Primers

Gene	Mouse Source	Mouse ID	Mouse Exons	Human Source	Human ID	Mouse Exons
Actb	IDT	Mm.PT.58.33257376.gs	4-5	IDT	Hs.PT.56a.41086380.g	4
Gapdh	Thermo	Mm03302249_g1	7-7	IDT	Hs.PT.58.589810.g	10-10
Polr2a	IDT	Mm.PT.58.10668225.g	27-28	IDT	Hs.PT.58.1609228.g	27-28
Vwc2	IDT	Mm.PT.58.28838117	3-4	IDT	Hs.PT.58.4006889	3-4
Ccdc175	IDT	Mm.PT.56a.30819491	19-20	IDT	Hs.PT.58.40158488	19-20
Clvs2	IDT	Mm.PT.58.29272566	4-5	IDT	Hs.PT.58.28152553	4-5
Pde1a	IDT	Mm.PT.58.9352231	13-14	IDT	Hs.PT.58.25631488	13-14
Pde1c	IDT	Mm.PT.58.12812140	11-12	Thermo	Hs01095682_m1	12-13
Ece1	IDT	Mm.PT.58.41658219	19-20	IDT	Hs.PT.58.19105582	18-20
Cnksr3	IDT	Mm.PT.58.14312874	12-13	IDT	Hs.PT.58.19494243	12-13

L. Software used for analysis

[00179] Data processing steps made use of Linux tools in addition to custom perl scripts. In addition to standard Linux commands (e.g. awk, cut, sort, uniq), the following packages were used: Trim Galore! (v0.4.1) for adapter trimming of ATACseq samples, STAR (v2.4.2a) and Bowtie2 (v2.1.0) for read alignment, SAMtools (v0.1.19-44428cd) for indexing and removal of duplicates, igvtools (v2.3.32) for generating files for browser visualization, and featureCounts (v1.5.2) for read summerization. Data analysis was performed using R Studio (v 1.0.143, R: v3.4.0). In addition to base R (for data wrangling, Pearson correlations, hierarchical clustering, etc.) and custom R functions, use of the following packages was extensive: tidyverse (v1.1.1, which contains ggplot2, reshape2, etc.) for data wrangling and visualization, DESeq2 (v1.16.1) for raw count normalization, differential expression analysis, and principle components analysis, gplots (v3.0.1) and pheatmap (v1.0.8) for heatmaps, RColorBrewer (v1.1-2) for color palettes, and clusterProfiler (v3.4.3) for GO analysis.

M. ATACseq library construction and sequencing

[00180] Nuclei from mouse, rat and human cerebellum were isolated as described above, and 50,000 were washed in ice-cold PBS. ATACseq libraries were prepared as described previously in Buenrostro, et al. (2013). Nat Methods 10, 1213–1218 and Buenrostro, et al. (2015). Curr Protoc Mol Biol 109, 21.29.1–.29.9, both of which are hereby incorporated by reference in their entireties, with the following modifications from Chen, et al. (2016). Nature Methods. 13(12):1013-1024, which is hereby incorporated by reference in its entirety: nuclei were resuspended in ice cold lysis buffer, omitting incubation step on ice and centrifuged. Libraries were generated using the Nextera DNA Library Preparation Kit. Transposition reaction was

performed for 30 minutes at 37°C using Tn5 transposase from Nextera. 200μL of a reverse-crosslinked solution (50 mM Tris–Cl, 1 mM EDTA, 1% SDS, 0.2 M NaCl, 5 ng/ml proteinase K) was added and the mixture was incubated at 65°C at 1000rpm shaking in a heat block overnight, then purified with QIAGEN® MINELUTE® kit.DNA fragments were purified and size selected using AMPure XP beads to yield 100-700bp fragments. ATACseq libraries from mouse and human cerebellum were sequenced on the Illumina HiSeq2500 to obtain 50bp paired-end reads, and libraries generated from rat cerebellum were sequenced on Illumina NextSeq500 to obtain 75bp paired-ended reads. All libraries were sequenced to yield at least 55M reads per sample.

N. ATACseq read mapping and visualization

[00181] Adapter sequences were trimmed and reads were filtered depending on quality using Trim Galore! (trim_galore --stringency 3 --fastqc --paired *_R1_2.fastq.gz *_R2_2.fastq.gz). Reads that passed the filter were aligned using Bowtie2 (Langmead, et al. (2012). Nat Methods 9, 357–359, which is hereby incorporated by reference herein in its entirety) to hg38, mm10 or custom rat genome. Duplicate reads were removed using SAMtools (Li, et al. (2009) Bioinformatics 25, 2078–2079, which is hereby incorporated by reference herein in its entirety). For data visualization, tdf files were generated using igvtools.

O. RNAseq read mapping, visualization, and read summarization

[00182] RNAseq reads were aligned using STAR (Dobin, et al. (2013). Bioinformatics 29, 15–21, which is hereby incorporated by reference herein in its entirety) and genome assemblies from ENSEMBL. In addition to default STAR parameters, the following parameters were used for single end (--outFilterMismatchNmax 999 --outFilterScoreMinOverLread 0 --outFilterMatchNminOverLread 0 --outFilterMatchNmin 35 --outFilterMismatchNoverLmax 0.05) and paired-end data (--outFilterMismatchNmax 999 --alignMatesGapMax 1000000 --outFilterScoreMinOverLread 0 --outFilterMatchNminOverLread 0 --outFilterMatchNmin 60 --outFilterMismatchNoverLmax 0.05). Aligned bam files were converted to tdf format for visualization using igvtools. Raw counts were generated using featureCounts (Liao, et al. (2014) Bioinformatics 30, 923–930, which is hereby incorporated by reference herein in its entirety). Refseq or ENSEMBL gene model annotations for whole genes were downloaded using the UCSC Table Browser tool. Refseq (Zhao, et al. (2015). BMC Genomics 16, 97, which is hereby incorporated by reference herein in its entirety) annotations were used. ENSEMBL was chosen for annotation for within species comparisons. For comparative analysis across species, ENSEMBL annotation was used for all species in order to match the list of orthologous transcripts obtained from ENSEMBL. The following parameters were used in addition in addition to the default in featureCounts: for paired-end data, fragments are counted instead of

reads (-p), chimeric fragments are not counted (-C). For comparative analysis across species, reads are allowed to be assigned to more than one matched metafeature (-O) in order to avoid problems when genes overlap in one species but not in another. For within-species comparisons, reads that map to more than one matched meta-feature are not counted (default). Annotations are shown in Table 9.

Table 9. Genome/Gene Annotations

Purpose	Program	Species	Annotations	Source	Genome
Genome alignment	STAR/Bowtie2	Mouse	ENSEMBL	ENSEMBL	mm10
Genome alignment	STAR/Bowtie2	Rat	ENSEMBL	ENSEMBL	rn6
Genome alignment	STAR/Bowtie2	Human	ENSEMBL	ENSEMBL	hg38
Read quantification	featureCounts	Mouse	Refseq	UCSC	mm10
Read quantification	featureCounts	Rat	ENSEMBL	UCSC	rn6
Read quantification	featureCounts	Human	Refseq	UCSC	hg38
Ortholog read quantification	featureCounts	Mouse	ENSEMBL	ENSEMBL	mm10
Ortholog read quantification	featureCounts	Rat	ENSEMBL	ENSEMBL	rn6
Ortholog read quantification	featureCounts	Human	ENSEMBL	ENSEMBL	hg38

P. Generation of Ortholog Annotations

[00183] The method for generating annotations for mouse, rat, and human orthologs, and mouse-human high confidence orthologs may be summarized as follows: 1) ortholog annotation across species were downloaded from ENSEMBL BioMart (release 88), 2) filtered to include only: high confidence pairs (ENSEMBL ortholog confidence = 0), 1:1 orthologs (transcript that is annotated to be orthologous to more than one transcript in another species), genes greater than 1kb in total length (including untranslated regions), and genes that change by less than 2-fold in length across species. For each gene, the longest orthologous transcript was used for annotation.

[00184] Because the rat genome is incompletely annotated, almost 3,000 more genes were identified as orthologous between mouse and human, than among genes that are orthologous among mouse, human, and rat.

Q. Gene count normalization, differential expression analysis, and principle components analysis

[00185] Raw gene count tables were loaded into R and differential expression analysis was performed using DESeq2 (Love, et al. (2014). Genome Biology 15, 550, which is hereby incorporated by reference herein in its entirety). For age and autolysis time, numerical covariates were used for modeling. Statistically significant genes were defined as having an adjusted p-value of less than 0.01. Fold change cutoffs were not used unless otherwise noted. The rlog function was used to generate normalized counts for downstream analysis (e.g. heatmaps, clustering). The plotPCA function was used to perform principle components analysis. No methods were used to remove batch effects clustering based on expected biology was observed throughout, and never by batch. For example, clustering was observed by cell type between

Egfp+ and nuclei sorted using cellular profiling technique described herein despite numerous differences: date of preparation, tissue state (fresh vs. flash frozen and thawed), nuclei state (unfixed vs. fixed), nuclei processing (none vs. antibody stained), library prep kits (Illumina vs. NEB), sequencer (HiSeq 2500 vs NextSeq 500), and read type (50bp single end vs. 75bp paired end).

R. Hierarchical Clustering

[00186] Hierarchical clustering was performed using normalized gene counts produced by the rlog function from DESeq2 (Love, et al. (2014) Genome Biology 15, 550, which is hereby incorporated by reference herein in its entirety). Unless specified, the top 250 most variable genes across samples, as computed by the rowVars function, were used for clustering. Default parameters (Euclidean distance and complete linkage) were used with the dist and hclust functions to produce clusters.

S. Specificity Index Algorithm

[00187] The specificity index (SI) algorithm was previously developed to find genes that are specific in a dataset of interest as compared to other datasets (Dougherty, et al. (2010) Nucleic Acids Res 38, 4218–4230, which is hereby incorporated by reference herein in its entirety). Because the algorithm in Dougherty was designed for microarray data, it was adapted to accept RNAseq data as input. A feature was added that incorporates information from biological replicates for calculations. Fpkms were calculated from raw counts to avoid biases toward long genes, and genes less than 1kb were excluded to avoid biases from extremely short genes. Next, fpkm values were logged, and log10(fpkm) values were bottomed out at -2 to avoid biases from long, non-expressed genes. To take into account sample replicates, the mean and standard deviation were calculated for all genes within a cell type.

[00188] SI values are calculated as described previously, but instead of using mean gene expression values as input, sample were randomly selected from a normal distribution with the mean and standard deviation of gene expression. This process was performed 1000 times and final ranks were averaged across all iterations. For analysis of the distribution of highly specific genes in the mouse cerebellum, images for each gene from the Allen Mouse Brain Atlas (Lein, et al. (2007) Nature 445, 168–176, which is hereby incorporated by reference herein in its entirety) were examined. Genes that were not in the Atlas at the time of analysis, or genes that showed no staining in any region of the brain were excluded from analysis. The percentage of genes showing proper distribution for the cell type analyzed were calculated and presented herein.

T. GO analysis

[00189] Significant differentially expressed genes were split into up- and down-regulated (or mouse and human enriched) genes and gene ontology enrichment analysis for granule cells,

basket cells, and glia was performed using clusterProfiler (Yu, et al. (2012) Journal of Integrative Biology 16, 284–287, which is hereby incorporated by reference herein in its entirety). Significant ontologies were defined as having a q-value of less than 0.01 (default). GO analysis results including significant ontologies were gathered for the three domains (biological process (BP), molecular function (MF), cellular component). For simplicity of visualization, only biological process ontologies were used. Additionally, when many ontologies were found, the simplify function was used to remove redundant terms for visualization. Network based enrichment maps were generated using the enrichMap function. To simplify visualization of the enrichment maps, groups of related ontologies were summarized into one label.

Example 2. Defining cellular identity using nuclear transcriptomes

[00190] Nuclei may be sorted using antibodies specific to constitutive endoplasmic reticulum (ER) proteins or membrane proteins synthesized in the ER. First nuclear RNA was isolated from GFP+ nuclei as described in Example 1. To enrich for ER transcripts translated near the nuclear membrane in wild-type mice, a polyA pulldown of nuclear transcripts was performed. Most of these transcripts were not observed to be nuclear but were fully mature nucleic acid transcripts being translated in the ER surrounding the nucleus. Not all transcripts for membrane proteins are found in this nuclear polyA+ fraction, but knowledge of the ones that are synthesized proximal to the nucleus resulted in a dramatic increase in the number of factors that can be targets for nuclei labeling. After performing immunofluoresce, staining was observed in the ER around the nucleus, which confirms that a nucleus may be labeled using an antibody against a membrane protein.

[00191] The intial strategy for isolating 3 cell types from the cerebellum included antibody-binding using Itpr1 (Inositol 1,4,5-Trisphosphate Receptor Type 1; an intracellular receptor of the endoplasmic reticulum (ER)) as a target to label Purkinje cells, NeuN (a gene encoded by a member of the RNA-binding FOX protein family; NeuN is a neronal antigen commonly used as a biomarker of neurons) as a target to label granule cells, and GFAP (Glial Fibrillary Acidic Protein; one of the major intermediate filament proteins of mature astrocytes used to distinguis astrocytes from glial cells) as a target to label glia to confirm the presence of these types of cell in the sample. Then, a combination of results for Itpr1 and NeuN was used to isolate all 3 populations.

[00192] Nuclei originating from a cell type of interest were isolated from tissues of transgenic mice that had been previously profiled using the TRAP method to determine whether the nuclear transcriptome may be used to accurately define cellular identity. The profiling results for the transgenic animals developed for use with the TRAP method were based on the fact that the

GFP-tagged ribosomal subunit is assembled in the nucleolus. Using immunofluorescense, GFP was observed to be distributed primarily in the cytoplasm of tissue slices of cerebellum tissue from a transgenic animal with Purkinje cell protein 2 (pcp2)-GFP expressed exclusively in Purkinje cells, but was also observed in one spot (the nucleolus) in the nucleus. Further, staining results showed the isolated nuclei from the cerebellum of the pcp2-GFP animals to be labeled with DAPI, and one out of the seven nuclei was observed to be a Purkinje nucleus (GFP+).

Example 3. Using flow cytometry to profile cells derived from transgenic animals developed for use in the TRAP method

[00193] Flow cytometry results for EGFP+ nuclei from each of the five cell lines derived form transgenic animals developed for use in the TRAP method is shown in Table 10.

Table 10. FACS purification results

Region	Cell Type	BAC Driver	Strain	Gender	Percentage
Cerebellum	Granule	NeuroD1	JP241	Female	91.1%
Cerebellum	Granule	NeuroD1	JP241	Female	90.5%
Cerebellum	Granule	NeuroD1	JP241	Female	90.5%
Cerebellum	Purkinje	Pcp2	DR168	Both	0.54%
Cerebellum	Purkinje	Pcp2	DR168	Both	0.39%
Cerebellum	Purkinje	Pcp2	DR168	Both	0.32%
Cerebellum	Purkinje	Pcp2	DR168	Both	0.36%
Cerebellum	Bergmann Glia	Sept4	DS152	Male	1.92%
Cerebellum	Bergmann Glia	Sept4	DS152	Male	1.85%
Cerebellum	Bergmann Glia	Sept4	DS152	Male	1.84%
Cerebellum	Bergmann Glia	Sept4	DS152	Male	1.91%
Cortex	Corticopontine Pyramidal	Glt25d2	DU9	Female	0.99%
Cortex	Corticopontine Pyramidal	Glt25d2	DU9	Female	1.68%
Cortex	Corticopontine Pyramidal	Glt25d2	DU9	Female	1.33%
Cortex	Corticothalamic Pyramidal	Ntsr1	TS16	Female	2.33%
Cortex	Corticothalamic Pyramidal	Ntsr1	TS16	Female	3.15%
Cortex	Corticothalamic Pyramidal	Ntsr1	TS16	Female	2.94%

[00194] Additional flow cytometry was performed on the nuclei isolated from 5 different transgenic mouse lines that had been previously profiled using the TRAP method. From the prior profile generated by the TRAP method, Purkinje Cell Protein 2 (Pcp2) was targeted to identify nuclei originating from Purkinje cells, and about 0.4% of the nuclei were observed to be Pcp2 positive. Neurod1 (Neuronal Differentiation 1) was targeted to identify nuclei originating from granule cells, and about 91% of the nuclei were observed to be Neurod1 positive. Sept4 (Septin 4) was targeted to identify nuclei originating from Bergmann glia, and about 2% of the nuclei were observed to be Sept4 positive. Glt25d2 or Colgalt2 (Collagen Beta(1-O)Galactosyltransferase 2) was targeted to identify nuclei originating from layer 5 cortical-pontine pyramidal neurons, and about 0.5% of the nuclei were observed to be Glt25d2 positive. Neurotensin Receptor 1 (Ntsr1) was targeted to identify nuclei originating from layer 6

corticothalamic projecting pyramidal neurons, and about 1.8% of the nuclei were observed to be Ntsr1 positive.

[00195] Values in Table 10 were based on a conservative gating of positive populations for sorting during flow cytometry, while the percentages in the previous paragraph were based on less conservative analysis of the flow data.

Example 4. Profile expression of cell lines derived from transgenic animals developed for use in the TRAP method

[00196] To determine whether nuclear RNA profiles are sensitive enough to distinguish among different subtypes of neurons, RNAseq was used to generate nuclear expression profiles from FACS purified EGFP+ nuclei from transgenic mouse lines expressing the EGFP-L10a ribosomal fusion protein separately targeted to five different cell types – cerebellar Purkinje cells, granule cells, Bergmann glia, corticopontine pyramidal neurons, or corticothalamic pyramidal neurons. Neurod1, Pcp2, and Sept4 were known to drive expression in granule cells, Purkinje cells, and Bergmann glia of the cerebellum, respectively. Colgalt2 (alternatively referred to as Glt25d2) and Ntsr1 were known to drive expression in corticopontine and corticothalamic pyramidal cells of the cortex. The known markers were confirmed to be specific for the nuclei of each cell type.

[00197] Table 11 provides a summary of nuclear RNAseq datasets from the transgenic mice developed for use in the TRAP method.

Table 11. Summary of nuclear RNAseq datasets

Marker	NeuroD1	Pcp2	Sept4	Glt25d2	Ntsr1
Cell Type (abbreviation)	Granule cells (Granule)	Purkinje cells (Purkinje)	Bergmann glia (Glia)	Corticopontine pyramidal (Oligo)	Corticothalamic pyramidal (OPC)
Location	Cerebellum	Cerebellum	Cerebellum	Cortex	Cortex
Percentage of nuclei	95%	0.1%	1-2%	0.5%	2-3%
Replicates	3	4	4	3	3

[00198] Hierarchical clustering of nuclear RNAseq data was performed for the nuclei of the five cell types presented in Table 11. Additionally, three published nuclear RNAseq datasets from Mo et al. (Neuron 2015) were included in the hierarchical clustering: excitatory neurons from Camk2a-cre animals (labeled excit), PV interneurons from PV-cre animals (labeled pv), and VIP interneurons from VIP-cre animals (labeled vip). The pyramidal neurons were observed to be clustered together.

[00199] Expression calculated by RNAseq results was normalized to the average expression across all samples for each gene. The log2 fold change in RNAseq results from the nuclei purified by FACS for each of the five cell types compared to the normalized RNAseq results for the 250 most variable genes are shown in Table 12. The log2 change in expression was

calculated for 3 replicates for the nuclei from each cell type. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 12. Log2 fold change of expression of the 250 most variable genes across all samples

	Log2 Fold Change in Expression (by cell type)																
	Granule			Purkinje				Glia				Oligo			OPC		
Gene																	
1700047M11Rik	-0.62	-2.99	-2.2	-2.19	-1.75	-0.31	-1.25	6.9	6.9	6.46	6.31	-2.87	-1.1	-1.28	-1.32	-1.2	-2.35
3110039M20Rik	-3.65	-3.24	-3.64	-3.19	-3.41	-3.23	-3.39	-3.59	-3.46	-3.44	-3.51	3.33	3.64	3.87	4.08	4.11	4.02
2410124H12Rik	-2.58	-2.07	-2.58	8.84	8.64	9.21	8.21	0.42	-2.28	-2.26	-2.37	-1.89	-1.58	-2.03	-0.36	0.19	-1.18
8030451O07Rik	-2.98	-3.12	-2.98	-2.39	-2.66	-0.71	-2.64	-2.89	-2.72	-2.7	-2.8	3.8	2.88	3.86	1.49	1.71	0.93
9530059O14Rik	-3.52	-2.76	-3.68	3.29	3.14	3.36	3.09	-3.85	-3.5	-3.75	-3.8	2.06	1.73	2.12	0.87	0.68	0.85
A230077H06Rik	-2.64	-3.47	-3.35	-2.82	-1.94	-2.29	-2.18	-3.28	-3.13	-3.11	-2.72	2.57	2.64	2.87	0.89	0.89	0.68
A2m	-2.8	-0.99	-2.35	-0.05	-0.04	0.55	0.09	9.35	9.52	9.77	9.67	-1.41	-2.37	-1.91	-2.96	-2.86	-3.13
A730036I17Rik	0.12	0.46	-2.07	5.83	5.85	5.86	5.57	-1.11	-1.79	-1.77	-1.87	0.42	-0.32	-2.21	-1.42	-1.32	0.01
Aass	-2.31	-3.05	-2.87	-1.17	-0.43	-0.6	-0.12	5.41	6.18	6.68	5.61	0.3	0.52	-1.32	-1.67	-1.97	-2.31
Acsm5	-1.95	-2.12	-1.95	-1.28	-0.54	-0.21	-1.57	6.77	7.89	7.43	7.34	-1.08	-2.09	-1.23	-1.25	-1.14	-1.45
Actbl2	-1.69	-1.85	-1.69	-1	-1.32	-1.06	-1.29	7.18	6.67	7.16	5.73	-1.72	-1.82	-1.83	-0.97	-0.86	-1.17
Adra2b	-1.7	-1.85	-1.69	4.51	6.18	6.2	5.16	-1.6	-1.43	-1.41	-1.5	-1.73	1.75	-1.83	-1	-0.9	0.58
Afp	-1.42	-1.58	-1.41	6.44	6.19	6.27	6.61	-1.31	-1.1	-1.07	-1.19	-1.45	-1.55	-1.56	-0.67	-0.56	-0.87
Aqp4	0.13	-0.52	-0.75	-2.36	-1.2	-0.97	-0.89	5.81	6.1	5.82	6.36	-0.61	0.01	-0.35	-2.45	-2.19	-2.17
Arhgap25	-2.01	-2.35	-2.41	-2.97	-2.15	-1.83	-1.74	-0.83	-2.8	-2.46	-2.34	3.17	1.78	2.24	4.63	4.55	4.48
Arx	-2.19	-2.35	-2.18	2.21	-1.83	-1.6	-1.81	-2.09	-1.9	-1.88	-1.98	-2.22	0.47	-2.33	-1.52	-1.43	-0.71
Atp13a4	-2.53	-0.42	-2.89	-1.06	-0.7	-0.3	-0.53	6.36	5.86	6.12	6.29	-1.87	-0.62	-1.72	-1.01	-1.58	-1.24
Atp1a2	-0.99	-0.57	-1.69	-2.85	-1.78	-2.01	-2.09	6.15	6.62	6.58	7.29	0.13	-0.84	-0.72	-1.85	-2.25	-1.88
Atp2a3	0.18	0.54	0.44	7.15	7.32	7.28	7.66	1.37	0.54	1.32	0.9	-3.65	-2.55	-3.72	-2.11	-2.37	-2.7
B230209E15Rik	-3.56	-3.95	-3.98	0.28	0.71	0.61	0.54	-3.68	-3.26	-3.64	-3.33	3.78	3.26	3.43	3.45	3.5	3.38
B3gnt5	-0.94	-1.11	-2.46	6.27	6.33	5.6	5.64	1.13	-0.2	1.51	0.99	-0.31	-0.16	-2.86	-1.12	-1.41	-1.58
Barhl2	4.96	5.98	5.26	-0.58	-0.97	-0.65	1.27	1.81	1.21	4.08	2.94	-2.25	-2.34	-2.35	0.05	-1.47	-1.74
Bcl11b	-3.39	-3.72	-2.42	-1.51	-1.41	-1.59	-1.34	-3.01	-3.26	-3.24	-2.99	3.33	2.94	3.33	2.99	2.91	2.79
Btbd17	0.62	0.75	0.21	-1.78	-2.77	-2.54	-2.11	5.27	5.84	5.46	5.46	-3.12	-0.51	-1.36	-1.75	-1.16	-1.24
Cacng3	-0.91	-3.2	-4	-3.25	-2.83	-2.25	-2.88	-3.67	-3.71	-3.69	-3.75	4	3.62	4.05	3.07	3.01	3
Camk1g	-1.58	-2.95	-2.36	-2.93	-3.17	-2.97	-3.15	-3.37	-2.76	-2.74	-3.29	2.96	2.98	3.14	0.98	0.72	0.33
Camkv	-2.9	-3.63	-3.52	-3.03	-3.27	-3.08	-2.79	-3.07	-3.32	-3.3	-0.23	2.19	2.85	2.41	2.11	2.05	2.25
Car8	0.24	0.61	0.05	7.76	6.99	7.72	7.86	0.52	1.18	1.73	1.21	-2.65	-3.24	-1.78	-3.27	-2.61	-2.95
Casp12	-1.17	-0.68	-1.69	-1.28	-0.06	-0.86	-0.83	5.25	5.13	5.62	5.34	2.41	-1.36	-1.02	-0.73	0.48	0.01
Casq2	-0.62	0.27	-1.18	7.08	6.93	7.27	7.03	1.4	-0.51	-0.02	0.15	-3.84	-3.2	-3.06	-1.25	-1.9	-1.98
Cbln2	-2.98	-3.12	-2.97	-2.38	-2.65	-2.43	-2.63	-2.89	-2.72	-2.7	-0.78	1.98	2.26	1.92	0.95	1.65	1.09
Cbln3	5.83	6.65	6.72	0.86	1.97	2.1	1.47	3.71	3.26	4.06	4.02	-3.97	-3.49	-3.8	-3.56	-3.49	-3.33
Cckbr	-3.75	-3.26	-3.48	-3.35	-3.55	-2.97	-3.17	0.23	-0.4	-0.84	-1.17	2.94	3.06	3.1	2.86	2.95	2.99
Cd70	2.34	-2.35	-2.18	-1.55	0.35	-0.56	-0.29	6.44	5.51	6.72	6.66	-2.22	-1.55	-2.33	-1.52	-1.42	-1.7
Cd9	-2.1	-3.44	-2.09	-1.73	-1.68	-3.2	-1.65	7.18	7.87	8.03	7.61	1.33	0.21	0.64	-1.19	-2.06	-1.15
Cdc42ep1	-0.64	1.99	-1.25	-2.01	-2.3	-2.06	-2.27	5.13	5.88	6.11	5.71	-1.61	-2.15	-2.78	-1.98	-0.97	-2.16
Cdh19	-2.17	-1.88	-2.74	-0.72	-1.47	-0.2	-0.17	5.93	6.62	5.95	5.77	0.58	0.79	0.08	-2.07	-0.91	-1.26
Chrm1	-3.42	-3.34	-3.71	-3.28	-3.11	-2.88	-2.41	-3.34	-1.94	-2.68	-2.99	2.79	3.18	2.88	3.02	2.99	3.2
Chrm3	-1.32	-0.96	-2.16	-3.02	-3.15	-2.76	-2.65	-3.58	-3.6	-3.28	-2.83	3.23	2.34	2.98	2.98	3.14	3.23
Chsy3	-3.34	-3.77	-3.69	-2.39	-2.35	-1.74	-1.86	-3.17	-3.02	-1.58	-3.57	3.61	2.95	3.49	3.44	3.66	3.69

Clic6	0.32	-0.16	-1.77	6.67	6.57	7.14	6.33	-1.27	0.66	-0.41	-0.35	-0.66	-2.11	-1.54	-2.08	-1.52	-2.92
Cml5	-2.31	-1.74	-2.3	-1.66	-1.94	-0.7	-1.92	6.87	7.06	7.34	7.13	-0.25	-1.69	-2.45	-1.63	-1.53	-1.81
Cnpy1	5.29	5.38	5.54	-0.56	-0.1	0.51	0.62	4.32	4.48	4.27	4.01	-2.88	-2.46	-2.99	-2.96	-1.9	-2.26
Cobl	-2.3	-3.21	-2.61	-2.36	-2.19	-2.09	-2.31	-3.14	-3.33	-3.48	-3.26	3.85	3.78	4.23	2.89	3.06	2.62
Col1a2	-2.48	-2.66	-3.01	-1.68	-1.08	0.09	-2.01	5.31	5.23	5.55	5.59	3.34	1.56	0.85	-1.64	-2.29	-1.44
Col4a5	-2.98	-2.19	-2.7	3.94	4.08	4	3.82	2.59	2.85	2.31	2.77	0.58	0.27	-0.95	-0.93	-2.08	-2.25
Col6a1	-2.81	-0.42	-3.25	-2.71	-2.05	-2.75	-2.94	-3.18	-3.02	-3.01	-1.6	2.93	3.27	2.87	2.93	2.65	3.08
Colgalt2	-3.22	-3.3	-3.64	-2.3	-2.3	-2.27	-2.4	1.98	1.9	1.95	1.72	5.27	5.16	5.37	-0.84	-0.85	-0.66
Corin	-0.8	-1.36	-2.1	5.71	5.7	5.91	5.53	-2.04	-1.08	-1.97	0.16	-1.36	-1.43	-1.39	-1.54	-1.4	-2.04
Coro6	-1.16	-3.84	-3.76	0.68	0.57	0.48	1.01	-3.72	-3.29	-3.6	-3.66	2.02	2.16	1.88	-0.29	-1.09	-1.13
Cpne7	-3.14	-2.81	-3.14	-2.33	-2.32	-1.79	-1.2	-2.58	-2.67	-3.01	-2.73	1.9	2.83	2.51	1.3	1.23	1.18
Crym	-3.25	-2.95	-2.78	-2.68	-2.38	-2.1	-2.92	-3.16	-3	-2.98	-3.07	3.98	4.01	4.06	4.28	4.3	4.19
Csta1	0.79	-2.34	0.52	6.35	5.83	6.19	6.07	-2.96	-0.68	-2.76	-1.85	-1.33	-1.12	-0.29	-1.19	-1.53	-1.13
Ctxn3	0.22	-1.98	-0.04	-2.5	-0.85	-2.55	-1.71	5.53	5.32	6.08	5.13	-1.61	-1.15	-2.14	1.01	0.95	1.62
Cxcl14	-3.23	-2.63	-1.8	-2.66	-2.92	-2.07	-2.33	3.67	4.22	3.93	4.59	-1.27	-0.28	0.11	-0.8	-2.54	-1.8
Cxcl5	-0.88	-1.95	-1.79	-1.15	-1.46	-1.21	-1.43	6.37	6.19	4.89	4.19	-1.83	-1.92	-0.55	0.05	-1.01	0.85
Cxcr4	-2.01	-1.4	-2.01	-1.4	-1.66	-1.44	-1.64	5.66	4.95	6.7	7.52	-2.05	1.06	-2.15	-1.37	-0.14	-1.54
Cyp27a1	-2.29	-3.02	-2.86	5.25	5.43	5.22	5.08	1.27	0.03	2	1.09	0.16	-1.58	-2.09	-2.22	-1.31	-2.4
Cyp2j9	-1.54	-3.54	-2.34	-0.8	-2.11	0.51	-0.66	7.77	8.43	8.05	8.42	-1.64	-0.66	-1.09	-2.32	-2.57	-2.56
D430019H16Rik	-2.93	-2.81	-2.62	-2.22	-2.55	-2.28	-1.21	-3.27	-3.12	-3.1	-2.71	2.39	2.98	3.23	2.77	3.02	2.88
Ddn	-3.04	-3.17	-3.03	-2.45	-2.72	-2.5	-2.7	-2.95	-2.79	-2.77	-2.86	1.54	2.39	1.85	3.34	3.31	3.11
Ddx3y	-3.5	-3.61	-3.76	2.13	2.25	1.66	2.46	3.94	3.14	3.67	3.3	-3.78	-3.83	-3.83	-2.9	-2.24	-2.8
Dlgap2	-3.15	-3.89	-3.66	-1.12	-1.23	-1.02	-1.31	-3.89	-4.04	-3.96	-3.88	2.59	2.07	2.65	2.29	2.27	2.34
Dlx4os	-0.68	-1.54	1.18	5.5	5.88	5.72	5.37	1.87	-2.39	-2.37	-2.47	-2.06	-2.79	-1.8	0.45	0.62	1.53
Dlx6os1	-2.17	-3.15	-3.01	-1.75	-1.7	-1.81	-2.68	-2.4	-2.76	-2.74	-2.83	1.5	1.34	2.2	-1.27	0.47	0.16
Dmp1	-2.89	-1.58	-2.88	-1.43	-1.81	-2.3	-1.32	6.91	6.83	7.37	6.73	0.8	-3.01	0.39	-0.25	-2.12	-1.16
E030003E18Rik	-3.25	-3.58	-3.24	-1.48	-1.81	-1.09	-2.18	5.27	4.7	5.38	4.57	1.54	1.6	1.77	-0.13	0.37	-0.57
Ebf1	3.07	2.93	2.55	6.1	5.65	6.17	5.55	-1.4	-0.25	-1.2	-0.74	-0.46	-0.79	-1.1	-2.9	-2.99	-2.9
Ebf2	-0.86	-2.2	-1.25	6.5	6.35	6.76	6.13	0.45	0.14	1.04	-0.17	-0.12	-0.8	-0.03	-2.36	-2.6	-1.47
Ebf3	0.46	-1.99	0.7	5.27	5.19	5.23	5.22	0.44	-0.42	-0.96	0.26	0.06	-0.18	-1.42	-1.46	-2.68	-2.38
Ednrb	-2.41	-1.31	-2.06	-2.56	-1.17	-2.01	-1.65	7.99	8.28	8.28	8.63	-1.72	-1.09	-0.85	-1.4	-2.02	-1.48
Egfr	-2.9	-2.59	-2.5	-3.03	-2.94	-2.21	-2.15	4	3.78	4.25	3.82	0.87	-0.82	-0.61	-0.7	0.47	0.59
Egr3	-2.89	-3.44	-3.32	-2.17	-1.48	-2.83	-3.01	-3.25	-3.09	-3.07	-3.16	2.31	3.02	2.48	2.69	3.3	3.39
Eif2s3y	-3.93	-3.98	-3.73	2.7	2.92	2.67	3.04	3.51	3.23	3.93	2.86	-3.94	-3.97	-3.98	-3.25	-3.53	-3.7
Elfn1	-2.78	-2.95	-3.05	-2.93	-1.59	-1.8	-2.33	-2.67	-2.2	-2.74	-2.85	3.36	2.82	4.02	0.17	-0.14	-0.3
Emp2	-1.62	-2.6	-2.14	-1.24	-1.24	-0.2	-0.77	5.46	5.12	4.95	5.37	-1.32	-3.31	-0.78	-0.29	0.1	-0.59
En2	4.67	5.17	5.02	0.06	0.88	0.17	1.32	3.06	3.5	3	3.89	-2.76	-2.84	-2.85	-2.07	-1.98	-1.49
Enc1	-2.15	-2.98	-2.79	-2.61	-2.91	-3.16	-3.32	-3.52	-3.39	-3.38	-3.45	2.7	3.25	3	2.78	3.24	3.18
Entpp1	0.92	-3.15	-1.54	-2.86	-0.47	-1.89	-2.17	7.33	7.3	6.62	7.46	-2.26	-1.11	-0.84	-1.47	-1.33	-2.03
Eva1a	-3.44	-2.68	-3.43	-1.61	-1.1	0.05	-0.78	6.26	5.46	5.7	5.47	0.45	-0.51	0.81	-1.57	-1.43	-1.83
F3	-2.6	-3.9	-4.03	-2.62	-2.25	-2.86	-2.14	6.66	7.01	7.57	7.39	1.31	-0.04	0.22	-0.47	-0.68	-1.21
Fam107b	1.1	1.18	0.74	5.97	5.57	6.23	5.9	-2.54	0.31	-0.07	-0.51	-1.69	-2.04	-1.69	-2.66	-2.78	-2.5
Fam19a1	-3.32	-3.65	-3.6	-1.74	-1.76	-1.43	-1.5	-3.25	-3.39	-2.26	-2.12	5.06	4.36	5.09	1.48	1.72	1.36
Fat2	6.74	7.11	7.14	0.45	0.51	1.17	0.88	2.25	1.78	2.7	2.22	-1.97	-2.75	-2.44	-2.44	-2.15	-1.64
Fbln2	-2.62	-2.48	-3.11	-1.42	-1.81	-2.58	-2.78	-3.03	-2.29	-2.85	-2.94	1.17	2.18	1.96	2.85	2.58	2.74
Fezf2	-2.84	-2.98	-2.83	-2.24	-2.51	-2.29	-2.49	-2.75	-2.58	-2.56	-2.65	3.1	3.94	3.54	2.5	2.52	2.3
Fgd3	-3.56	-3.63	-1.45	4.52	4.27	4.54	4.19	-2.23	-2.09	-2.53	-2.48	-1.14	-0.14	-0.7	-1.7	-1.56	-2.55
Flrt2	-2.72	-3.91	-3.83	-2.17	-2.12	-1.9	-2.26	-3.49	-2.25	-1.96	-2.52	2.91	2.71	3.07	3.43	3.69	3.49
Folh1	0.34	-3.14	-2.54	-3.11	-0.95	1.25	-0.59	8.44	7.91	7.9	7.57	0	-1.44	-0.83	-3.08	-2.99	-2.36
Foxg1	-3.33	-3.06	-3.32	-2.78	-3.04	-2.83	-3.02	-3.25	-3.1	-3.08	-3.16	2.66	2.83	2.7	2.99	3.25	3.06
Frem1	-1.23	-0.74	-2.48	-2.1	-2.09	-1.67	-1.97	4.85	4.71	4.54	4.41	-0.16	0.09	0.13	-2.53	-1.69	-1.99
Gabra6	7.01	7.08	7.52	1.09	2.13	1.79	1.72	3.55	3.09	3.46	3.66	-3.78	-3.83	-3.54	-3.25	-2.63	-2.94
Galnt14	-2.29	-3.02	-3.33	-1.39	-1.17	-0.5	-1.19	-2.65	-3.95	-3.38	-3.57	3.2	2.97	3.25	0.47	0.64	0.25
Gas1	-2.56	-3.27	-3.11	-2.49	-0.94	-1.82	-1.66	6.99	7.31	7.56	7.4	-0.91	-1.07	-1.09	-1.71	-2.36	-0.93
Gda	-1.49	-1.95	-2.4	-2.7	-2.23	-2.29	-1.93	-3.68	-3.38	-2.94	-2.62	3.19	3.22	3.64	3.78	3.86	3.96
Gdf10	-0.34	-0.83	-0.59	-3.39	-2.66	-1.11	-1.88	9.43	9.69	10.04	9.95	-2.08	-2.61	-3.66	-2.5	-2.11	-2.73
Gja1	-2.54	-2.96	-2.38	-0.77	-1.66	-1.22	-1.82	8.38	8.84	9.06	9.06	0.36	-0.42	-1.59	-1.69	-1.79	-1.78

Gjb6	-3.04	-2.46	-0.96	-3.33	-2.28	-1.03	-2.4	6.97	6.6	7.11	6.96	0.96	0.75	0.2	-2.81	-1.87	-1.95
Gjc3	-1.5	-1.23	-0.56	-1.47	-1.07	-1.29	-1.36	7.86	7.96	8.03	7.82	-1.2	-1.72	-0.9	-2.41	-2.42	-1.98
Gli1	-2.36	-1.06	-0.79	-1.72	-2	-1.77	-1.97	5.82	6.3	6.05	5.39	-2.39	-2.48	-1.34	-1.69	-1.59	-1.87
Gli3	-3.13	-3.65	-2.04	-1.19	-1.84	-0.59	-1.25	6.35	5.79	6.39	5.21	0.47	-0.57	-0.17	-1.24	-1.55	-1.26
Glt25d2	-3.33	-3.45	-2.9	3.96	4.21	3.8	3.79	-3.25	-2.6	-3.08	-2.69	2.66	0.95	1.69	1.93	1.49	2.02
Gm11549	-3.08	-3.22	-3.08	-2.5	-2.77	-2.55	-2.74	-3	-2.24	-2.81	-2.9	3.46	3.35	3.22	4.11	4.53	4.35
Gm266	-2.29	-2.46	-1.52	-1.66	0.58	-1.71	0.19	6.31	5.65	6.23	4.89	-2.32	-1.69	-1.25	-0.61	0.53	-1.8
Gm5083	-2.64	0.35	0.66	8.14	7.82	7.37	7.8	-2.54	-1.55	-2.32	0.83	-2.67	-2.77	-0.35	-1.95	-0.89	-2.14
Gm5089	1.21	1.23	1.53	-1.5	-1.26	-0.98	-0.84	5.3	4.88	5.12	5.1	0.13	-1.22	-1.64	-1.45	-1.06	-2.14
Gm5468	-3.09	-2.79	-3.47	-1.77	-1.95	-3.01	-1.92	-3.4	-3.26	-2.46	-2.35	2.65	2.34	2.23	4.28	4.34	4.52
Gm5607	-2.96	-3.49	-3.37	-2.84	-1.76	-2.31	-1.93	3.49	3.44	3.75	3.93	-1.2	-1.71	0.33	-1.3	-2.1	-2.06
Gm8179	-2.09	-3.69	-3.01	-2.29	-1.48	0.32	-1.44	-3.54	-3.41	-3.39	-3.46	3.46	2.37	3.28	3.01	3.03	2.79
Gpr37l1	-0.67	-0.8	-1.02	-0.04	0.73	0.32	0.46	7.4	7.37	7.49	8.1	-2.75	-2.53	-3.31	-3.3	-3.21	-3.22
Grik1	-2.49	-2.75	-2.59	4.78	4.31	4.85	4.5	-3.37	-2.77	-1.61	-2.54	-1.2	-0.56	0.23	-1.81	-1.62	-1.77
Grm5	-2.95	-3.04	-2.52	-2.72	-3.2	-2.54	-2.82	-2.12	-3	-2.41	-1.51	3.92	3.4	3.88	2.82	3.04	2.97
Hepacam	-1.02	-1.05	-2.29	-2.37	-2.32	-2.08	-1.75	6.43	6.54	7.01	7.02	-0.61	-0.69	-1.09	-2.08	-1.73	-2.13
Hes3	-1.33	-1.42	-2.03	6.39	6.46	6.58	6.89	-2.9	-1.63	-1.6	-2.8	-0.73	-0.8	-0.81	-1.56	-0.93	-2.52
Hs3st2	-1.35	-2.3	-1.67	-2.95	-3.12	-2.21	-3	-3.81	-3.3	-3.4	-2.6	3.43	2.91	3.39	3.41	3.29	3.11
Hs3st4	-1.83	-2.44	-3.01	-2.54	-2.86	-2.93	-2.83	-2.94	-2.51	-3.58	-3.76	2.06	1.83	2.39	5.07	5.24	5.32
Htr2a	-3.62	-3.21	-2.85	-2.33	-2.67	-1.17	-1.49	-2.95	-2.75	-3.01	-3.49	2.72	3.13	3.24	1.43	1.96	0.91
Icam5	-2.06	-3.39	-3.26	-2.71	-2.42	-2.76	-2.95	-3.19	-3.03	-3.01	-3.1	2.7	3.38	2.97	3.04	2.85	2.79
Icosl	-0.14	-3.08	-1.26	-2.31	-1.16	-0.8	-2.56	4.73	5.78	5.62	6.01	0.44	-0.13	-3.05	-0.68	-0.88	-1.74
Il22	-1.83	-1.12	-1.82	6.23	6.67	5.84	6.76	0.21	-1.55	-1.53	1.32	-1.86	-1.96	-1.97	-1.13	-1.02	-1.33
Iltifb	0.2	1.08	-0.28	7.43	7.47	6.43	7.24	-2.27	-0.68	-0.27	-2.16	-1.17	-2.5	-2.51	-1.68	-0.53	-0.37
Irx1	-0.62	-1.8	-1.63	-0.94	-1.26	-1	1.01	6.28	6.97	6.68	5.97	-1.67	-1.76	-1.77	-0.91	-0.8	-1.11
Irx2	-1.3	-1.45	-1.3	-0.59	-0.91	-0.65	-0.89	5.89	5	4.5	7.92	-1.33	-1.42	-1.43	-0.56	-0.45	-0.76
Irx5	-1.26	-1.43	-1.25	-0.55	-0.86	-0.61	-0.84	6.78	5.39	5.31	5.12	-1.29	-1.4	-1.4	-0.52	-0.42	-0.72
Itih3	-1.03	-1.71	-3.09	-2.47	-1.34	-0.72	-0.85	7.36	7.97	7.78	7.8	-1.69	-1.23	-3.23	-2.44	-2.34	-2.62
Itpripl2	-2.59	-2.74	-0.75	-1.96	-2.24	-2.01	-0.97	3.72	5.54	4.53	5.63	3.16	1.08	0.47	-1.06	-0.93	-0.81
Kank1	-1.2	-2.76	-3.47	3.64	3.72	3.91	3.61	3.67	3.34	3.2	3.16	-1.44	-1.6	-1.05	-1.86	-1.9	-2.07
Kcnc2	-3.06	-3.94	-3.28	-1.63	-1.69	-1.76	-2.05	-3.64	-3.83	-3.42	-2.45	2.35	2.04	2.47	1.53	1.91	1.67
Kcnf1	-3.17	-3.3	-2.69	-2.6	-2.87	-2.65	-2.85	-3.09	-2.93	-2.91	-3	2.64	3.57	3.04	3.15	3.53	3.5
Kcnj10	-0.43	-1.24	-0.8	-1.92	-1.35	-1.41	-1.69	7.22	7.44	7.58	7.74	-1.81	-1.54	-2.32	-1.87	-2.23	-2.87
Kcnj16	-2.65	-3.22	-2.82	-2.63	-1.85	-2.05	-1.26	8.02	8.42	9.13	8.66	-0.18	-1.47	-1.8	-0.62	-0.94	-0.92
Kcnj4	-3.25	-2.97	-3.25	-2.08	-2.96	-2.75	-2.02	-1.92	-3.02	-1.29	-3.09	2.64	2.99	2.59	2.8	3.08	3.11
Kcnq5	-1.99	-2.99	-2.33	-2.94	-2.91	-2.45	-2.7	-2.84	-2.85	-3.07	-3.45	3.98	3.21	3.95	1.78	2.14	1.96
Kcnt2	-3.04	-3.97	-3.7	-2.8	-2.59	-2.8	-2.71	-3.1	-3.68	-3.41	-3.26	3.83	3.56	3.86	3.87	4.16	4.02
Kcnv1	-2.9	-1.6	-3.33	-2.79	-3.05	-2.84	-3.02	-3.26	-2.59	-3.09	-3.17	3.39	3.09	3.39	4.45	5.1	4.73
Kctd12b	-2.28	-2.44	-2.27	-1.64	-0.48	-1.69	0.46	6.46	6.53	4.27	5.81	1.51	-0.88	-2.41	-1.61	0.15	-0.84
Kdm5d	-3.67	-3.61	-3.88	1.75	1.7	2.17	2.34	3.03	3.26	3.79	3.43	-3.89	-3.74	-3.59	-3.52	-2.77	-3.31
Lama2	-2.78	-2.52	-3.46	-1.63	-0.66	-0.75	-1.15	5.63	5.46	5.81	5.14	0.88	-0.63	-0.05	-1.08	-0.77	-0.96
Lamp5	-0.76	-3.68	-0.6	-2.6	-2.91	-3.15	-1.97	-3.52	-2.98	-3.37	-3.45	3.64	3.93	3.58	2.65	2.86	2.66
Lcat	-1.74	-0.24	-0.91	-2.33	-1.59	-2.14	-1.07	6.63	7.33	7.06	7.6	-1.79	-2.6	-2.88	-1.33	-1.32	-1.74
Ldb2	-1.15	-1.3	-1.47	-2.82	-2.85	-2.73	-2.74	-2.52	-3.71	-3.56	-2.82	3.92	3.54	4.08	2.66	2.95	3.03
Lfng	-1.33	-3.04	-2.88	-2.25	-0.38	-1.5	-1.78	6.67	6.99	7.17	7.03	-0.1	-0.59	-2.06	-2.21	-2.12	-2.4
Lgr6	-2.01	-1.32	-3.31	0.85	-1.13	-1.69	-1.45	6.89	6.65	7.07	7.39	-2.06	-1.53	-2.97	-1.25	-0.31	-0.77
Lhx1	3.35	4.51	3.83	4.89	4.82	4.54	4.98	1.4	0.21	-0.71	-1.65	-2.59	-2.68	-2.69	-1.91	-1.82	-2.09
Lhx1os	4.03	3.81	3.8	7.59	7.08	7.22	7.24	-0.59	-0.66	0.73	-2.7	-3.44	-3.52	-3.52	-2.8	-2.7	-2.37
Lhx5	-1.29	-0.67	0.73	5.36	5.06	4.62	5.17	-1.14	2.77	2.28	-0.51	-0.9	-1.05	-0.76	-0.62	-0.48	-1.38
Linc-md1	-2.34	0.53	-2.33	8.05	7.97	7.74	7.98	-1.4	-2.04	-2.01	-2.12	-0.26	-2.47	-1.73	0	-1.55	-1.83
Lrrc7	-2.15	-2.36	-1.95	-2.49	-2.54	-2.24	-2.57	-3.33	-3.2	-3.22	-3.46	3.49	2.95	3.6	3.14	3.22	3.16
Lyzl4	-0.09	-0.84	-1.73	-2.74	-3.43	-3.25	-3	-3.26	-2.6	-3.46	-3.17	3.57	3.11	3.89	3.44	2.9	2.41
Mal2	-3.22	-2.95	-3.21	-3.04	-2.32	-2.81	-2.66	-1.2	-2.93	-2.11	-3.02	2.95	3.51	3.05	3.24	3.86	3.55
March1	-3.03	-3.16	-3.46	-2.38	-2.12	-1.84	-2.14	-2.85	-2.61	-2.6	-2.16	3.33	2.88	3.4	3.41	3.57	3.53
Megf10	-0.89	-0.08	-1.93	-2.23	-1.27	-1.01	-1.29	5.87	5.43	6.03	5.97	-0.26	-0.76	-0.61	-1.82	-2.06	-1.66
Meis2	-1.84	-3.74	-3.52	-2.43	-2.47	-2.09	-2.37	-2.99	-3.3	-2.75	-2.87	4.23	3.8	4.29	4.23	4.44	4.53
Mertk	-2.35	-2.89	-2.5	-2.14	-2.44	-1.49	-1.39	5.43	4.91	5.19	4.92	1.77	0.93	0.94	-2.53	-2.06	-1.73
Metrn	-0.86	-1.32	-0.85	-1.19	-2.34	-2.11	-0.72	6.38	6.28	6.18	5.89	-2.08	0.03	-2.83	-1.15	-1.93	-2.21
Mgst1	-1.37	-1.61	-2.53	-1.88	-1.34	-0.48	-0.8	5.66	6.39	7.26	7.27	0.89	-0.79	-1.01	-1.85	-1.76	-1.16

Miat	-2.51	-2.92	-4.04	-3.57	-3.15	-3.85	-3.22	-4.02	-2.09	-3.96	-3.99	3.13	3.03	3.17	2.84	2.66	2.91
Mlc1	0.19	-2.12	-0.65	-1.5	-0.6	-1.58	-1.55	6.67	7.29	6.95	7.65	-2.87	-1.88	-1.73	-2.97	-2.88	-3.14
Mmp14	-2.16	-2.92	-2.15	-1.33	-0.12	1.33	0.07	5.36	5.53	4.96	5.93	0.31	-0.79	-1.66	-2.11	-2.02	-1.53
Mpped1	-3.91	-3.96	-3.53	-3.22	-2.78	-2.5	-2.64	-2.06	-3.3	-3.77	-3.57	3.81	3.53	3.74	3.2	3.11	3.24
Msx2	-2.75	-0.55	-2.74	-0.76	0.35	-0.83	1.38	5.54	5.77	6.65	6.09	-1.44	-1.15	-2.28	-0.35	-1.1	0.04
Mybpc1	-3.03	-2.68	-2.85	-2.39	-2.62	-2.21	-2.39	4.96	4.98	5.24	4.53	-0.54	-0.74	-1.28	-1.73	-2.23	-1.43
Myh6	-1.01	-2.79	-2.63	-2	-2.29	-1.21	-0.67	5.42	4.96	6	5.48	-0.18	-0.34	-0.17	-1.1	-1.88	-2.15
Neto1	-3.04	-3.3	-4.08	-3.52	-4	-2.21	-3.22	-2.49	-3.55	-3.63	-3.31	4.08	3.71	4.08	4.29	4.47	4.32
Nid1	-0.48	-2.75	-2.56	-1.47	-1.07	-0.01	-2.1	5.3	5.27	5.97	5.32	1.89	-0.04	0.21	-0.7	-0.86	-1.28
Nkx2-2	-0.39	-1.46	-1.24	1.22	-0.76	-1.5	-0.73	5	5.88	4.37	6.17	-2.1	-2.2	0.06	-1.42	-1.33	-1.59
Npr3	-2.56	-3.22	-3.06	-2	-2.7	-2.43	-1.87	-3.39	-2.45	-2.75	-3.3	4.91	4.69	4.67	3.37	3.55	3.79
Npy1r	-2.49	-3.51	-3.4	-0.48	-1.36	-1.99	-0.74	-3.33	-2.7	-3.16	-3.25	1.67	1.89	1.85	2.62	3.15	3.36
Nrgn	-3.46	-3.57	-3.46	-2.95	-2.38	-2.99	-3.17	-3.39	-2.78	-3.23	-2.87	2.49	2.89	2.84	3.02	2.71	2.8
Nrk	-1.88	-0.43	-0.33	7.87	7.64	7.31	7.48	-0.27	-0.49	-0.17	-1.43	-1.39	-2.21	-1.34	-1.2	-1.62	-2.4
Ntsr2	-1.18	-3.62	-3.5	-2.41	-2.4	-1.42	-2.37	5.58	5.46	5.49	6.12	-0.83	0.11	-0.54	-1.48	-1.87	-2.24
Nup62cl	0.12	-2.48	-1.53	6.5	6.67	6.42	6.33	-0.91	-2.02	-2	-0.38	-2.35	-0.92	-2.45	0.93	0.54	0.37
Oprd1	-3.39	-3.5	-2.97	-2.27	-2.26	-1.96	-1.75	-3.31	-2.34	-2.65	-2.19	2.25	2.39	2.89	2.38	2.16	2.17
P2ry1	0.41	-3.3	-0.74	-2.55	-1.27	-0.71	-2.81	5.38	6.44	6.19	5.93	0.73	-1.81	-1.83	-1.04	-0.42	0.01
Paqr6	-1.31	-1.98	-2.48	-1.84	-2.13	-1.89	-0.38	6.76	5.77	6.34	6.38	-2.52	-1.5	-0.95	-1.81	-1.72	-0.21
Pax3	-0.92	-2.42	0.2	-2.02	-1.08	0.89	-1.94	9.17	8.98	9.69	8.75	-2.24	-2.96	-2	-1.2	-0.8	-1.79
Pcsk6	-1.66	-2.09	-2.44	4.47	4.38	4.64	4.38	3.08	3.08	3.06	3.12	-1.72	-2.43	-1.61	-1.72	-2.07	-2.11
Pde1a	-2.33	-3.37	-3.3	-2.47	-2.15	-2.83	-2.62	-3	-3.58	-2.1	-3.69	4.29	3.71	4.27	4.01	4.21	4.22
Pde5a	-1.72	-1.71	-2.38	4.89	4.54	4.93	4.74	-2.91	-1.89	-2.42	-0.47	0.02	-1.18	-1.23	-2.19	-2.08	-1.88
Pdgfd	-1.65	-2.29	-2.3	0.32	-0.83	0.37	-0.56	5.57	5.35	5.62	5.4	2.41	-0.03	-0.05	-1.61	-1.71	-1.39
Pdzph1	-1.13	-1.9	-1.36	5.35	5.2	5.86	5.48	-1.53	-1.26	-1.69	-1.38	-2.12	-1.33	-1.86	-1.21	-0.56	-0.62
Pih1h3b	-0.92	0.61	-1.93	8.06	7.83	8.09	7.41	-2.54	-2.35	-2.33	-2.43	-0.76	-1.12	-2.12	-0.48	-0.89	-2.14
Pkp3	-0.14	-1.86	-1.69	5.9	6.57	6.66	6.79	-1.6	0.32	-1.38	-1.49	-0.75	-1.82	-1.83	-0.97	-0.87	-1.18
Pla2g7	-1.36	-1.74	-1.76	-2.5	-1.74	-1.63	-2.05	6.14	6.52	6.82	7.16	-0.4	-1.11	-0.6	-2.46	-1.87	-1.96
Plekhd1	-1.03	-0.41	-0.97	5.51	5.35	5.56	5.43	0.18	-0.21	-0.76	-1.5	-1.57	-2.29	-2.3	-2.61	-2.31	-2.65
Plekho2	-0.01	0.12	-0.5	-2.1	-0.41	-1.22	-0.44	5.92	5.77	5.53	5.41	-1.06	-2.98	-0.41	-2.06	-1.94	-1.61
Plpp3	-2.3	-3.08	-2.36	-2.26	-2.83	-2.01	-2.19	6.9	6.86	7.38	7.29	0.46	-0.4	-0.57	-2.04	-1.62	-1.7
Plscr1	-2.56	-2.72	-2.55	-1.92	-2.2	0.11	-1.36	6.83	7.21	6.18	7	1.84	0.98	-2.04	-0.43	-0.84	-2.07
Plscr4	-1.22	-3.82	-2.13	-1.27	-0.66	-1.24	-0.71	7.3	6.59	6.99	6.69	-0.11	0.13	-0.32	-1.11	-1.68	-0.85
Ppp1r17	0.41	1.4	0.3	7.02	6.72	6.77	6.83	1.89	1.23	2.02	1.22	-3.43	-3.5	-3.51	-2.79	-1.59	-2.97
Prkag3	-1.98	-2.15	-1.97	6.98	5.99	6.04	5.86	-1.88	-1.69	0.3	-1.77	0.62	2.59	-2.12	-1.3	-1.2	-0.42
Procr	-0.11	-1.82	0.3	6.43	5.71	6.23	5.82	-1.56	0.77	-1.35	-1.46	-1.69	-0.85	-1.79	-0.95	-0.84	-1.15
Prr5	-2.89	-1.59	-2.88	-1.6	-0.8	-2.38	-1.93	5.31	4.73	4.47	4.54	-1.24	-2.18	-2.99	-2.3	-2.21	-2.47
Ptk2b	-3.04	-3.53	-2.99	-1.34	-1.25	-1.33	-1.38	-1.52	-3.78	-3.29	-3.29	3.42	3.28	3.61	2.8	2.85	2.83
Ptpn5	-2.49	-2.34	-1.79	-3.27	-3.02	-3.31	-3.21	-3.97	-3.29	-3.53	-3.17	2.7	2.91	2.88	2.42	2.33	2.35
Ptprz1	-2.08	-1.9	-1.95	-2.52	-2.22	-2.03	-2.25	5.61	5.67	5.77	5.64	-1.09	-0.54	-0.44	-1.39	-1.32	-1.47
Rab11fip1	-0.47	-2.58	-1.25	5.58	5.16	5.38	5.15	0.78	-2.14	0.54	-0.12	-2.45	-1.87	0.19	-0.81	-1.67	-1.94
Rab27b	-1.52	-3.63	-3.38	-2.44	-2.3	-1.64	-2.88	-2.39	-2.26	-3.48	-2.84	3.18	3.13	3.24	1.88	2.19	2.05
Robo3	-3.27	-3.39	-2.82	-2.72	-2.43	-2.77	-2.4	-3.19	-3.04	-2.49	-3.1	3.3	3.62	3.17	2.86	2.76	1.77
Rtn4rl2	-2.89	-3.03	-2.88	-2.28	-1.89	-0.79	-2.53	-2.79	-2.62	-2.6	-2.7	3.54	3.47	3.99	0.91	1.16	-0.15
Rxfp1	-3.55	-2.28	-3.54	-3.06	-1.92	-3.1	-1.89	-2.82	-3.34	-2.89	-1.76	3.77	3.02	3.29	2.25	2.54	2.59
S1pr1	-1.93	-1.33	-2.32	-2.18	-1.53	-0.28	-1.82	8.26	7.76	8.58	8.08	-0.67	-0.84	-2.9	-2.36	-1.8	-1.81
Scube1	-0.78	-3.51	-3.68	-2.47	-2.24	-2.53	-2.77	-3.31	-1.56	-1.94	-3.56	3.04	3.08	3.75	2.41	2.24	2.28
Sdc4	-0.68	-1.36	-0.61	-0.08	-0.58	-0.84	-0.88	7.1	6.87	7.34	7	-0.78	-1.24	-1.11	-2.99	-2.56	-2.88
Serpinh1	-2.61	-2.77	-1.92	-1.07	-2.25	-1.14	-1.42	6.14	6.4	6.42	6.25	1.38	-0.92	-0.93	-0.49	-1.84	-0.76
Skor2	-1.02	-0.75	-2.03	9.62	9.31	9.36	9.2	-2.62	-1.65	-2.41	-1.28	-2.76	-2.2	-1.03	-1.11	-1.93	-1.37
Slc14a1	-2.32	-2.96	-1.24	-2.33	-1.09	-0.82	-2.28	8.6	8.67	8.81	9	-0.08	-1.11	-2.51	-2.92	-1.75	-2.52
Slc1a3	-0.86	-0.84	-1.04	-2.52	-1.36	-1.3	-1.72	6.89	7.07	7.21	7.43	-0.41	-1.2	-1.09	-1.38	-1.54	-1.93
Slc24a4	-3.11	-3.39	-1.46	-2.56	-2.16	-1.45	-1.9	-3.15	-2.1	-2.64	-2.89	3.41	3.28	3.64	2.76	2.61	2.7
Slc2a10	-1.59	-1.65	-3.06	-0.57	-1.03	-0.25	-1.56	6.94	8.16	8.38	8.52	-0.45	-2	-1.61	-1.62	-1.49	-2.58
Slc2a4	-1.92	-2.08	-1.91	-1.26	0.81	-1.32	-1.54	6.66	6.71	6.3	6.26	0.14	-2.05	-2.06	-1.22	-1.12	-1.43
Slc30a3	-2.25	-0.72	-3.07	-2.03	-1.93	-3	-3.17	-3.39	-3.25	-3.23	-3.31	1.93	2.53	2.13	1.02	1.33	0.59
Slc39a12	-3.1	-2.64	-2.23	-1.99	-1.59	-0.45	-1.3	7.09	6.36	6.99	6.32	-0.12	0.09	-0.7	-0.29	-0.63	-0.54
Slc6a7	-3.12	-3.56	-2.63	-2.38	-2.31	-2.15	-1.78	-3.66	-2.92	-1.46	-3.6	2.69	2.81	2.72	2.29	2.04	2.21
Slc7a10	-0.49	-2.87	0.07	-2.6	-1.37	-1.26	-1.86	5.18	5.25	5.47	5.34	-2.73	-2.07	-0.83	-1.46	-2.48	-1.17

Slc9a3	0.06	-1.78	-1.55	6.3	5.74	6.04	5.97	-0.91	-2.32	-2.63	-0.21	-1.18	-1.76	-0.35	-2.01	-2.02	-1.94
Slco4c1	-2.1	-3.29	-2.87	-2.48	-2.47	-2.18	-2.44	-2.08	-2.56	-2.84	-2.95	3.52	3.65	3.67	3.66	3.74	3.75
Smpx	-1.6	-3.15	-2.78	5.51	5.06	5.24	5.02	0.01	0.4	2	-1.05	0.34	-1	-0.68	-0.83	0.34	-0.22
Sod3	-0.17	-1.88	-2.31	-1.51	-1.12	-1.1	-2.54	5.57	4.73	6.18	5.58	-0.63	-2.11	-1.62	-0.98	-0.49	-1.25
Sparc	-0.16	-1.34	-1.02	-0.16	0.41	-0.35	-0.06	5.75	6.59	6.09	7.02	0.29	-0.45	-1.35	-2.42	-3.2	-2.73
Stac	-0.42	-2.17	-2.73	6.25	6.2	6.5	5.85	-3.36	-2.69	-3.46	-3.26	1.83	1.46	1.44	-2.18	-1.21	-1.17
Stk17b	-0.87	-1.16	-1.89	4.47	4.47	4.32	4.39	2.05	1.74	1.41	2.15	0.52	0.79	0.15	-2.58	-2.35	-2.02
Stk32a	-1.75	-3.56	-2.78	-1.83	-1.31	-1.02	-1.55	6.44	6.07	5.9	5.51	-0.71	0.01	0.89	-1.59	-1.88	-2.55
Sycp1	-1.38	-1.98	-2.69	7.86	7.73	8.13	7.87	-1.72	0.47	-1.14	-2.56	-1.87	-2.5	-2.51	-1.22	-1.37	-1.22
Syt10	-3.36	-2.78	-2.52	-2.54	-1.59	-2.32	-2.3	4.59	4.56	4.47	4.52	-0.2	-0.04	-0.22	1.74	1.93	2.22
Tbr1	-3.07	-1.2	-1.46	-0.91	-2.71	-2.45	-2.35	-3.38	-3.24	-3.22	-3.3	2.26	2.05	1.9	4.35	4.48	4.31
Tex36	-1.92	-0.36	-1.91	-0.11	0.5	-1.32	-0.48	6.48	7.29	4.54	7.49	-0.52	-2.05	-1.2	-1.23	-1.12	-1.43
Tlcd1	0.04	-3.19	-0.04	-2.45	-0.93	-1.02	-2.05	4.92	5.48	5.32	5.98	-1.53	-2.06	0	-1.68	-1.56	-1.92
Tlr3	-0.83	0.39	-3	-2.89	-2.26	-1.95	-1.03	6.19	6.34	5.75	6.41	0.36	0.75	-0.4	-1.54	-1.71	-1.39
Tmem132b	-2.99	-3.75	-3.71	-2.39	-2.4	-2.19	-2.29	-3.01	-2.49	-1.41	-2.35	2.8	2.5	2.87	2.51	2.62	2.74
Tmem179	-1.56	-1.37	-2.47	-2.26	-3.33	-2.32	-2.33	-3.51	-3.38	-3.37	-3.44	1.95	2.34	2.26	1.73	1.68	1.81
Tmem200a	-3.26	-2.79	-2.49	-2.13	-2.29	-2.2	-2.33	-2.69	-1.51	-2.13	-2.95	4.59	4.02	4.63	0.66	1.36	0.58
Tnc	-3.7	-1.99	-2.11	-1.04	-1.81	-1.74	-1.07	6.99	6.45	6.78	6.47	-0.5	-1.62	-3.23	-1.8	-1.89	-1.04
Tox3	-3.17	-2.98	-3.02	-1.75	-1.46	-2.05	-1.28	-3.25	-3.64	-2.42	-3.68	3.07	2.89	3.18	1.28	1.73	1.8
Tril	-0.3	-0.9	-1.45	-2.45	-1.18	-1.58	-2.53	7.36	7.65	7.9	8.19	-1.6	-1.95	-1.38	-2.41	-3.19	-2.01
Trim30a	-1.53	-1.65	-1.85	-0.9	-0.98	-0.78	-0.67	-0.38	-0.06	0.26	1.78	1.87	0.43	0.75	5.84	7.25	6.61
Trp53cor1	-2	-2.81	-2.65	-1.16	-1.54	-2.07	-1.03	6.81	6.13	5.53	5.84	-0.32	-0.59	-0.12	-1.99	-0.46	-0.88
Ttpa	-2.62	-3.26	-3.11	0.87	0.92	0.4	-0.38	5.11	5.15	5.18	5.04	-0.74	-1.66	-2.77	-2.5	-0.9	-0.43
Uty	-3.8	-3.75	-3.8	2.74	2.95	2.84	2.84	3.75	3.14	3.31	3	-3.31	-3.44	-3.2	-3.21	-3	-3.37
Vip	-2.37	-2.52	-2.36	-1.74	-1.2	-1.79	-1.99	-2.27	-2.08	-2.06	-2.16	1.44	2.04	-0.09	0.15	1.04	0.87
Vsig2	-3.19	-3.31	-3.18	-2.61	-2.88	-2.66	-2.86	-0.74	-2.94	-2.92	-3.01	3.93	3.57	4.2	3.69	3.64	3.6
Vstm2b	-3.04	-2.93	-3.42	-2.91	-2.67	-2.03	-1.83	-2.94	-3.21	-3.19	-3.27	2.61	2.78	2.53	0.93	1.07	0.54
Wif1	-2.64	-3.11	-2.94	-2.22	-0.5	-0.87	-1.2	4.52	5.33	5.85	5.73	-2.44	-1.86	-2.23	1.95	2.32	2.12
Zfp385c	-1.41	-0.14	-0.28	5.69	5.8	6.35	5.65	-0.56	-1.71	-0.5	-0.49	-2.64	-1.48	-1.76	-2.38	-2.26	-1.41
Zfp831	-3.7	-3.53	-3.7	-2.25	-3.49	-2.12	-2.4	-3.09	-1.6	-1.64	-0.11	3.58	3.54	3.6	3.57	3.61	3.61
Zic1	3.69	3.86	3.86	0.22	0.16	0.03	0.16	4.28	4.27	4.39	4.54	0.41	-2.13	-1.29	-2.62	-2.51	-3.27
Zic2	3.14	3.59	3.58	-1.09	-0.43	-0.86	-0.16	3.98	4.06	4.26	4.25	0.64	-0.97	-1.67	-1.77	-1.64	-2.38
Zic3	2.22	1.69	2.53	-1.63	-1.9	-0.15	0.61	4.43	4.87	4.86	5.26	-1.54	-0.9	-1.68	-1.6	-1.51	-1.78
Zic4	2.90	2.82	2.69	-0.22	-0.88	-0.71	-0.58	4.55	5.33	5.14	6.17	0.33	-1.94	-0.68	-2.78	-2.04	-2.38
Zic5	3.13	3.07	2.89	-0.69	-1.11	-1.26	-0.48	4.67	4.61	3.90	5.00	-0.37	-1.50	-1.28	-1.16	-1.03	-2.18

[00200] The log2 fold change in expression from the RNAseq results for the same 250 most variable genes genes as found in Table 12 for the RNAseq data from Mo, et al. (2015) Neuron 86, 1369–1384, which is hereby incorporated by reference herein in its entirety, compared the normalized expression for nuclei from all cell types analyzed are shown in Table 13. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 13. Log2 fold expression change for samples from Mo et al.

	Log2 fold change in expression							Log2 fold change in expression					
Cell Type	excitory		pv		vip		Gene	excitory		pv		vip	
Gene													
1700047M11Rik	-1.55	-0.54	-1.79	-0.79	0.15	-0.65	Itpripl2	-1.48	-2.29	-1.99	-1.83	-0.35	-0.13
2410124H12Rik	-2.1	-1.81	-2.94	-2.22	-2.77	-2.5	Kank1	-1.92	-1.89	-1.86	-1.72	-1.45	-2.03
3110039M20Rik	2.25	2.33	2.14	2.12	2.95	2.91	Kcnc2	2.07	1.68	4.46	3.93	3.3	3.33
8030451O07Rik	0.55	0.2	2.73	2.43	3.99	4.02	Kcnf1	2.95	2.59	0.17	1.32	2.64	2.99
9530059O14Rik	1.87	1.95	0.43	0.28	-0.42	-0.44	Kcnj10	-1.23	-1.38	-2.08	-0.94	-1.29	-1.61
A230077H06Rik	2.87	3	4.46	4.25	2.72	3.11	Kcnj16	-1.53	-1.21	-3.07	-2.17	-1.67	-2.18

A2m	-3.03	-3.41	-3.47	-3.67	-1.63	-2.86	Kcnj4	2.9	2.85	2.26	2.28	0.77	0.33
A730036I17Rik	-2.27	-1.17	-2.42	-0.67	-1.79	-1.9	Kcnq5	2.85	2.57	1.39	1.16	2.66	2.86
Aass	-1.4	-1.26	-0.49	-0.48	-1.58	-1.7	Kcnt2	2.7	2.61	-0.85	-0.71	4.01	3.99
Acsm5	-2.15	-0.94	-1.52	-2.55	-2.7	-1.73	Kcnv1	3.49	3.54	-0.42	0.33	0.31	0.23
Actbl2	-1.88	-1.1	-2.04	-2.27	-0.65	-0.54	Kctd12b	-0.72	-1.44	-1.95	-1.56	-1.55	-1.44
Adra2b	-0.47	0.01	-1.21	-1.51	-2.39	-2.18	Kdm5d	1.72	1.82	1.57	1.35	1.89	2.16
Afp	-1.6	-1.7	-1.76	-1.98	-0.84	-1.9	Lama2	-0.8	-0.7	-2.22	-1.89	-0.43	-0.44
Aqp4	-1.44	-1.52	-2.07	-1.69	-0.87	-2.16	Lamp5	3.37	3.22	0.63	1.44	0.64	0.37
Arhgap25	2.7	3.22	-0.94	-0.67	-0.35	-0.92	Lcat	-0.95	-1.21	-1.83	-1.76	-0.65	-0.54
Arx	0.47	0.63	6.84	7.06	5.38	4.94	Ldb2	2.5	2.23	-0.07	0.08	1.35	1.37
Atp13a4	-0.71	-0.61	-1.81	-1.75	-1.49	-1.77	Lfng	-0.69	-1.29	-1.26	-1.43	0.11	-0.67
Atp1a2	-0.55	-0.67	-1.87	-1.33	-1.09	-1.72	Lgr6	-0.68	-2.11	-1.18	-1.66	-1.57	-1.85
Atp2a3	-2.94	-2.75	-3.12	-2.39	-3.5	-2.89	Lhx1	-2.74	-2.82	-2.87	-1.8	-3.16	-2.99
B230209E15Rik	1.33	1.39	-0.16	-0.51	0.18	0.2	Lhx1os	-3.14	-3.24	-2.34	-3.08	-3.63	-3.78
B3gnt5	-2.52	-2.5	-3.09	-2.99	-1.87	-2.35	Lhx5	-2.82	-2.36	-2.97	-3.17	-3.28	-2.6
Barhl2	-2.4	-2.5	-2.55	-2.18	-2.9	-2.7	Linc-md1	-2.53	-2.63	-1	-1.37	-2.49	-2.2
Bcl11b	1.92	2.13	2.69	2.58	0.02	0.25	Lrrc7	2.37	2.25	0.77	0.71	1.88	1.94
Btbd17	-0.25	-0.21	-1.58	-1.21	-0.47	-1.55	Lyzl4	2.91	2.79	-0.11	0.31	1.14	1.21
Cacng3	3.77	3.73	1.36	1.38	1.59	1.56	Mal2	2.19	2.26	0.34	0.83	1.73	1.96
Camk1g	3.21	3.59	2.52	2.74	4.19	3.92	Megf10	-1.99	-1.66	-2.15	-2.03	0.13	0.25
Camkv	3.39	3.38	2.46	2.55	3.4	3.09	Meis2	2.97	2.92	-0.48	-0.19	0.08	-0.45
Car8	-2.99	-2.81	-3.22	-3.15	-3.52	-3.66	Mertk	-0.61	-0.46	-0.12	-0.23	-0.27	-0.87
Casp12	-0.62	-1.12	-3.05	-3.24	-3.36	-3.18	Metrn	-1.16	-2.02	-0.87	-0.37	-0.5	-0.23
Casq2	-3.26	-2.99	-2.53	-3.5	-0.23	-0.05	Mgst1	-1.09	-2.19	-2.88	-1.51	-1.44	-1.79
Cbln2	3.03	2.57	1.03	1.78	5.01	4.96	Miat	4.15	4.18	2.49	2.71	2.96	3.07
Cbln3	-3.54	-3.1	-2.71	-3.19	-2.88	-3.59	Mlc1	-0.53	-1.05	-1.47	-0.73	-0.57	-0.94
Cckbr	2.87	2.83	1.64	1.86	-0.47	-0.93	Mmp14	-0.89	-0.84	-1.27	-1.41	-0.8	-1.5
Cd70	-2.38	-2.48	-1.39	-2.13	-0.67	-1.3	Mpped1	3.44	3.48	3.55	3.37	0.53	0.24
Cd9	-2.19	-2.41	-2.41	-1.95	-1.68	-1.9	Msx2	-1.96	-0.29	-3.07	-2.21	-1.67	-2.7
Cdc42ep1	-1.11	-1.45	-0.82	-0.32	0.72	0.36	Mybpc1	-1.5	-1.44	2.09	1.86	2.53	2.86
Cdh19	-1.77	-1.5	-2.72	-2.85	-1.51	-1.77	Myh6	-0.8	-0.52	-1.05	-1.3	0.38	-0.17
Chrm1	3.21	3.34	1.78	2.23	2.31	2.16	Neto1	2.36	2.38	1.78	1.74	1.56	1.58
Chrm3	2.43	2.15	0.87	0.67	2.57	2.74	Nid1	-1.55	-1.62	-2.58	-2.11	-1.46	-1.33
Chsy3	2.23	2.06	0.81	0.5	1.95	2.06	Nkx2-2	-1.03	-1.17	-2.41	-1.59	-0.33	-1.47
Clic6	-2.36	-2.19	-1.78	-1.44	-2.77	-2.37	Npr3	2.74	2.64	0.35	0.7	-0.77	-0.91
Cml5	-0.17	-0.68	-1.98	-1.58	-0.84	-1.22	Npy1r	2.63	2.67	-1.06	-0.81	4.2	4.21
Cnpy1	-3.04	-3.38	-2.61	-2.55	-3.69	-3.03	Nrgn	4.32	4	2.17	3.24	2.03	1.74
Cobl	3.73	3.62	-0.12	0.38	1.12	1.12	Nrk	-2.45	-2.76	-3.32	-2.3	-2.03	-2.27
Col11a2	-1.89	-0.89	-1.68	-1.49	-2.02	-1.23	Ntsr2	0.57	0.27	-0.99	-0.45	1.23	0.49
Col4a5	-2.02	-2.07	-1.84	-1.8	-2.62	-2.78	Nup62cl	-1.79	-1.48	-2.66	-1.61	-2.47	-2.81
Col6a1	3.87	3.75	1.06	1.31	0.45	-0.4	Oprd1	2.53	2.6	4.79	4.91	-0.04	-0.44
Colgalt2	0.5	0.59	-1.11	-1.05	-0.3	-0.21	P2ry1	-2.52	-2.64	-1.99	-1.83	0.1	0.26
Corin	-1.98	-1.88	0.48	0.72	-0.95	-0.89	Paqr6	-0.04	-0.53	-0.91	-0.91	-0.65	-1.51
Coro6	2.58	2.79	4.87	4.38	1.25	0.87	Pax3	-2.45	-3.57	-2.89	-3.43	-3.12	-2.85
Cpne7	2.53	2.66	-0.03	0.8	5.44	5.37	Pcsk6	-2.69	-2.66	-2.58	-2.48	-1.04	-0.88
Crym	3.08	3.32	-0.27	0.26	0.18	-0.11	Pde1a	3	2.93	0.01	0.2	0.43	0.18
Csta1	-1.12	-1.19	-1.13	-1.65	-2.13	-1.37	Pde5a	-1.7	-1.76	1.77	1.47	1.63	1.52
Ctxn3	-0.15	-0.84	-2.96	-2.03	-3.07	-2.27	Pdgfd	-2.27	-2.19	-2.06	-1.84	-1.86	-2.4
Cxcl14	-0.11	-0.02	-1.39	-0.57	5.05	4.85	Pdzph1	0.02	-0.09	-1.32	-1.82	-0.29	-0.46
Cxcl5	-1.98	-0.77	-1.34	-0.62	-1.1	-1.54	Pih1h3b	-1.77	-1.38	-2.39	-2.67	-1.86	-1.92
Cxcr4	-1.44	-1.57	-1.64	-1.53	-0.58	-0.33	Pkp3	-0.97	-1.98	-2.04	-2.27	-1.24	-2.19
Cyp27a1	-3.04	-2.28	-0.55	0.08	-0.91	-1.05	Pla2g7	-1.9	-1.7	0.47	0.44	-1.36	-1.43
Cyp2j9	-2.25	-1.8	-2.55	-1.94	-1.36	-1.45	Plekhd1	-2.75	-2.67	0.74	0.71	0.1	0.44
D430019H16Rik	3.56	3.29	0.92	1.4	1.33	1.04	Plekho2	-1.38	-0.95	-1.77	-1.51	-0.85	-1.57
Ddn	3.31	3.09	2.4	2.98	1.96	1.71	Plpp3	-0.92	-1.05	-2.19	-1.51	0.1	0.01
Ddx3y	1.23	1.22	1.07	1.1	1.58	1.5	Plscr1	-1.4	-1.54	-2.9	-2.23	-1.28	-2.12
Dlgap2	3.16	2.89	3.64	2.96	2.07	2.22	Plscr4	-1.49	-1.36	-2.61	-3.15	-2.05	-1.93
Dlx4os	0.17	-0.48	-3	-2.71	-2.87	-3.13	Ppp1r17	-3.13	-3.23	-3.02	-3.26	-2.83	-2.55
Dlx6os1	-0.46	0.44	4.73	4.42	6.7	6.77	Prkag3	-2.17	-1.49	-2.33	-1.88	-2.7	-1.32

Dmp1	-1.85	-1.58	-1.85	-1.43	-1.01	-0.57	Procr	-1.84	-1.94	-1.15	-2.23	-2.37	-2.15
E030003E18Rik	0.21	0.33	-2.09	-1.95	-1.84	-2.53	Prr5	-0.29	-0.51	1.61	1.8	3.03	2.79
Ebf1	-2.91	-2.96	-2.72	-2.66	-3.1	-2.94	Ptk2b	3.11	3.28	-0.18	0.46	0.58	0.71
Ebf2	-2.38	-1.82	-3.04	-2.75	-2.6	-2.93	Ptpn5	3.31	3.42	2.33	2.27	3.27	3.2
Ebf3	-2.83	-1.8	-2.36	-2.55	-0.89	-0.91	Ptprz1	-1.89	-1.82	-1.02	-1.04	2.1	2.17
Ednrb	-1.79	-1.86	-2.2	-1.51	-1.71	-2.36	Rab11fip1	-0.77	-0.62	-1.45	-1.57	-1.99	-1.1
Egfr	-1.67	-1.58	-1.56	-1.46	4.41	4.52	Rab27b	1.85	1.81	2.21	2.04	2.41	2.76
Egr3	3.98	4.13	0.71	1.79	2.04	1.88	Robo3	4.83	4.38	1.63	1.77	1	0.53
Eif2s3y	1.45	1.44	1.27	1.27	1.85	1.87	Rtn4rl2	4.58	4.69	1.81	2.13	0.92	-0.05
Elfn1	1.82	1.65	1.64	1.86	5.5	5.48	Rxfp1	2.73	2.92	-0.47	-0.3	3.88	3.93
Emp2	-1.3	-1.25	-2.59	-1.65	0.9	0.99	S1pr1	-1.71	-1.51	-2.07	-1.47	-1.95	-2.21
En2	-2.9	-2.99	-2.52	-2.78	-2.4	-3.17	Scube1	4.64	4.2	0.61	1.14	0.81	0.16
Enc1	4.03	4	1.1	2.17	2.18	2.03	Sdc4	-2.04	-1.87	-2.27	-1.92	-1.61	-2.01
Entpp1	-1.15	-0.87	-1.83	-1.12	-1.62	-1.93	Serpinh1	-0.7	-1.89	-1.69	-1.63	-1.24	-1.34
Eva1a	-1.01	-1.21	-0.68	-0.42	-0.99	-1.51	Skor2	-2.92	-3.02	-3.08	-1.92	-2.6	-1.8
F3	-1.74	-1.51	-1.86	-1.8	-0.18	-0.28	Slc14a1	-2.05	-1.71	-2.28	-1.57	-1.45	-2.1
Fam107b	-2.55	-2.31	-2.76	-3.05	0.1	0.05	Slc1a3	-1.58	-1.6	-2.56	-1.97	-1.73	-2
Fam19a1	3.43	3.16	1.1	1.15	0.23	-0.1	Slc24a4	3.71	3.57	0.47	0.76	0.2	-0.29
Fat2	-3.2	-3.01	-2.49	-3.17	-3.82	-3.87	Slc2a10	-1.27	-2.22	-2.56	-1.88	-2.32	-2.31
Fbln2	2.93	2.65	-1.34	-0.38	5.38	5.19	Slc2a4	-0.76	-1.4	-2.27	-0.23	-2.64	-1.69
Fezf2	3.33	3.36	1.43	2.33	0.68	-0.33	Slc30a3	4.31	4.11	3.33	3.22	2.6	2.24
Fgd3	-0.42	-0.95	2.86	2.6	1.97	2.16	Slc39a12	-0.99	-0.93	-2.54	-2.71	-1.76	-2.35
Flrt2	1.94	1.63	1.09	1.01	2.16	2.01	Slc6a7	2.47	2.61	2.6	2.46	2.44	2.23
Folh1	-1.89	-1.7	-2.97	-1.98	-1.59	-2.28	Slc7a10	0.22	0.02	-0.2	-0.32	0.15	-0.03
Foxg1	2.89	2.84	2.31	2.54	3.13	2.75	Slc9a3	-0.81	-0.85	-1.76	-1.65	-0.28	-0.1
Frem1	-0.12	-0.37	-2.75	-2.49	2.66	3.01	Slco4c1	1.46	1.36	0.6	0.52	1.18	1.15
Gabra6	-3.87	-3.92	-2.97	-3.68	-3.66	-4.02	Smpx	-1.46	-2.34	-2.5	-1.83	-2.05	-2.43
Galnt14	2.28	2.12	1.65	1.39	4.03	4.18	Sod3	-0.49	-0.8	-1.47	-0.97	-0.22	-0.39
Gas1	-1.79	-1.93	-1.11	-0.74	0.2	0.03	Sparc	-2.02	-2.03	-2.38	-1.9	-2.36	-2.22
Gda	2.69	2.48	-0.31	0.12	0.47	0.5	Stac	-0.87	-0.78	-2.81	-2.66	-0.11	0.35
Gdf10	-3.14	-2.66	-2.37	-1.6	-1.27	-1.58	Stk17b	-2.18	-2.24	-3.03	-2.74	-2.5	-2.91
Gja1	-2.37	-2.43	-3.18	-2.52	-1.99	-2.6	Stk32a	-1.46	-1.64	-2.09	-1.96	1.31	1.54
Gjb6	-0.65	-0.73	-1.93	-1.25	-1.27	-1.59	Sycp1	-0.94	-1.02	-1.13	-3.46	-1.7	-1.64
Gjc3	-2.16	-2.35	-2.54	-1.87	-1.67	-2	Syt10	-0.21	-0.27	-3.16	-3.19	0.3	0.37
Gli1	-0.64	-0.22	-1.09	-0.96	1.24	1.1	Tbr1	3	2.87	0.12	1.06	0.69	0.23
Gli3	-0.55	-0.68	-1.22	-1.12	-0.86	-1.31	Tex36	-1.27	-2.21	-2.27	-2.5	-1.98	-2.42
Glt25d2	0.16	0.44	-0.91	-1.05	-1.77	-2.1	Tlcd1	-0.48	-0.34	-0.8	-0.58	-0.51	-0.57
Gm11549	3.13	2.79	-0.02	0.86	0.61	0.51	Tlr3	-2.12	-1.89	-1.6	-1.02	-1.33	-1.21
Gm266	-1	-0.38	-2.63	-1.01	-0.29	-1.77	Tmem132b	2.3	2.26	1.95	1.71	2.3	2.42
Gm5083	-2.83	-1.37	-2.99	-3.2	-1.07	-1.69	Tmem179	2.79	2.66	3.05	3.18	2.95	2.94
Gm5089	-2.04	-2.39	-2.26	-1.87	-1.68	-2.2	Tmem200a	2.1	1.96	0.48	0.53	2.86	3
Gm5468	2.74	2.82	-0.73	-0.19	2.09	2.4	Tnc	-0.21	-0.44	-1.75	-1.27	0.4	0.12
Gm5607	-1.23	-0.86	3.22	3.17	3.9	3.88	Tox3	2.2	2.09	4.44	4.03	1.03	0.97
Gm8179	3.3	2.99	1.03	0.95	0.65	0.62	Tril	-1.53	-1.56	-1.81	-0.79	-1.17	-1.32
Gpr37l1	-1.46	-2.36	-2.23	-1.6	-1.43	-1.9	Trim30a	-2.56	-2.98	-3.04	-2.05	-2.17	-3.19
Grik1	-0.35	-0.61	1.85	1.62	1.93	1.96	Trp53cor1	-0.97	-1.47	-1.38	-0.8	-0.75	-1.32
Grm5	1.79	1.66	1.57	1.26	1.18	1.33	Ttpa	-1.41	-1.3	0.19	0.37	-1.18	-0.98
Hepacam	-0.74	-0.72	-1.96	-1.19	-0.51	-0.67	Uty	1.01	0.9	1.21	0.89	1.15	1.16
Hes3	-1.2	-1.77	1.31	1.24	-1.84	-2.99	Vip	-0.3	0.73	0.14	0.56	8.04	7.9
Hs3st2	2.67	2.81	-0.13	0.13	2.21	2.46	Vsig2	3.35	3.37	0.35	1.05	-0.17	-0.26
Hs3st4	3.39	3.25	0.23	0.02	1.2	1.25	Vstm2b	3.08	3.17	4.4	4.34	2.82	3.19
Htr2a	3.38	3.04	3.1	2.81	1.75	2.05	Wif1	-2.86	-2.58	0.94	1	-2.51	-1.82
Icam5	4.24	3.93	1.32	1.48	1.88	1.31	Zfp385c	-0.62	-1.68	-0.25	-0.27	-1.84	-1.81
Icosl	-1.4	-1.7	-2.75	-1.86	1.32	1.61	Zfp831	3.08	2.85	-0.08	0.42	0.1	-0.25
Il22	-1.15	-0.79	-2.18	-1.68	-2.55	-1.57	Zic1	-3.04	-3.14	-3.06	-2.85	-2.64	-3.33
Iltifb	-1.85	-1.98	-2.72	-2.95	-3.08	-2.87	Zic2	-2.61	-3.19	-2.49	-2.46	-2.64	-3.14
Irx1	-1.82	-1.92	-1.98	-2.21	-1.61	-2.13	Zic3	-1.74	-2.53	-1.94	-2.8	-2.04	-2.73
Irx2	-1.48	-1.57	-1.62	-1.84	-1.98	-1.77	Zic4	-2.61	-2.94	-3.26	-2.9	-3.06	-2.97
Irx5	-1.45	-1.54	-1.59	-1.81	-1.94	-1.73	Zic5	-2.83	-2.92	-1.81	-2.7	-2.85	-3.1

Itih3	-0.87	-0.28	-1.83	-1.44	-0.82	-0.91		1.88	1.82	0.48	0.18	1.91	1.98

[00201] Additional cell-type specific nuclear transcripts were identified from genes that were observed to have increased expression: Alpha-2-Macroglobulin (A2m) for Sept4-positive cells (Bergmann glia), Pde1a and Colgalt2 for Colgalt2-postive cells (corticopontine pyramidal), Pde1a and Heparan Sulfate-Glucosamine 3-Sulfotransferase 4 (Hs3st4) for Excit-positive cells (excitatory neurons), Pde1a and Hs3st4 for Ntsr1-positive cells (corticothalamic pyramidal), Aristaless Related Homeobox (Arx) and Parvalbumin (Pvalb) for PV-positive cells (parvalbumin interneurons), Vasoactive Intestinal Peptide (Vip) for VIP-positive cells (VIP interneurons), Solute Carrier Family 9 Member A3 (Slc9a3) for Pcp2-positive cells (Purkinje), and Grin2c for NeuroD1-postive cells (granule). Results in the Examples herein provide evidence that nuclear RNA is sufficient to define cell types.

[00202] Hierarchical clustering was performed using the genes above across these eight cell types to determine whether nuclear RNA profiles can group the samples based on expected biology. Clustering occurred not only by cell type but also by groups of related cell types. For example, the two classes of interneurons (VIP and PV) clustered with each other, while three types of pyramidal cells (corticopontine and corticothalamic from the data herein and all excitatory from Mo et. al.) clustered together. The robustness of this clustering, even across samples prepared using different methods and from different labs, indicates the utility of nuclear RNA profiles for specifying cellular identity, and for measuring the relatedness of different types of cells.

Example 5. Developing a method for isolating specific nuclei from wild-type animals

[00203] Previous cell profiling techniques required breeding a disease model in a transgenic animal. Some disease models are difficult to breed, and a study of aging would require maintaining specific transgenic strains for years. Such methods were not adaptable to organisms where transgenesis is difficult or unethical, such as humans. Therefore, there is a need to develop a generalizable method that enable molecular studies of defined cell types in wild-type animals.

[00204] FIG. 2A shows a sort of nuclei from mouse cerebellum using the strategy described in Example 2. Itpr1 is on the x-axis, and NeuN is on the y-axis. The Itpr1+ population was the nuclei of Purkinje cells, and the NeuN+ population was the nuclei of glia. The NeuN+/Itpr1- nuclei (largest group) represent granule cells.

[00205] FIG. 2B shows gene expression profiling from RNAseq data comparing the groups of Purkinje nuclear RNA from transgenic animals from a GFP sort to Itpr1+ nuclei sorted with the cellular profiling technique described herein. Pcp4 is a Purkinje marker, which was observed to be enriched in the Pcp2-GFP+ nuclei and the wildtype (WT) Itpr1+ nuclei compared to

cerebellar unsorted nuclei (Pcp2 uns and WT uns). Calb2 is a granule cell marker, which was observed to be enriched in the unsorted samples (Pcp2 unsorted and WT unsorted) compared to the sorted Purkinje nuclei (Pcp2-GFP+ or WT Itpr1+).

[00206] Table 14 provides Pearson correlations showing that the number of Purkinje nuclei from GFP and antibody sorts are highly correlated (R=0.99).

Table 14. Pearson correlations

Driver	Pcp2 uns	Pcp2- GFP+	WT uns	WT Itpr+
Pcp2 uns	1.00	0.93	0.99	0.95
Pcp2- GFP+		1.00	0.92	0.99
WT uns			1.00	0.94
WT Itpr+				1.00

[00207] Antibodies specific to these factors will result in an increase in the number of cell types expressing these factors to be isolated.

[00208] Dopaminergic neurons in the midbrain were also stained by a combination of two antibodies: one against transcription factor FoxA1 and the other was against the membrane localized dopamine transporter (DAT). Staining against FoxA1 was observed in the nucleus of dopaminergic neurons. Staining against DAT was observed primarily in axons, although at high magnification, it was also observed in cell bodies, likely being synthesized in the endoplasmic reticulum.

[00209] Nuclei staining and sorting for dopaminergic neuronal nuclei by flow cytometry is shown in FIG. 3A. The double positive (DP) population (positive for FoxA1 and DAT) was isolated for RNAseq analysis. FIG. 3B compares RNAseq tracks from unsorted midbrain nuclei and sorted dopaminergic nuclei. The dopaminergic nuclei were observed to be positive for known markers - Solute Carrier Family 6 Member 3 (DAT, also known as Slc6a3), Tyrosine Hydroxylase (TH), Forkhead Box A1 (FoxA1), Forkhead Box A2 (FoxA2), and Dopamine Receptor D2 (Drd2). Meanwhile, genes that are known to not be expressed in these neurons (Drd1 and Glutamate Decarboxylase (Gad)) were observed to be depleted in the unsorted population. Therefore, dopaminergic neurons were observed to be successfully isolated in mice. This strategy can also be used for human samples.

[00210] Wolframin ER Transmembrane Glycoprotein (Wfs1) and B-Cell CLL/Lymphoma 11B (Ctip2, also known as Bcl11b) were observed from staining to be putative markers for cortical cell types layer 2/3 pyramidal neurons and layer 5 and 6 pyramidal neurons, respectively. Another putative marker for cortical cell types observed from staining was ETS Variant 1 (Etv1, also known as ER81), which labels layer 5 pyramidal neurons. Etv1 has been previously observed to label both corticostriatal neurons, cortocopontine neurons, and potential others in layer 5 of the cortex. Two putative markers for the hypocampus were also identified by staining:

Wfs1 for Carbonic Anhydrase 1 (CA1)-positive neurons and Purkinje Cell Protein 4 (Pcp4) for Carbonic Anhydrase 1 (CA2)-positive dentate gyrus.

[00211] Putative markers for brainstem motor neurons were observed to be Solute Carrier Family 18 Member A3 (VaChT, also known as Slc18a3), Chondrolectin (Chodl), and EsrrB. Antibodies specific for the 3 genes VaChT, Chodl, and ErrB were observed by *in situ* hybridization to label this population of neurons in the brain stem. The Allen Brain Atlas gene expression database was used as reference. VaChT and ErrB label the motor neurons specifically, and Chodl labels everything except for these neurons. The antibody specific to Chodl may be replaced with one that directly labels the brainstem motor neurons.

Example 6. Applying antibody-sorting methods to nuclei from wild-type mice

[00212] To determine whether the cellular profiling technique described herein could be used productively for cell type specific studies in wild-type animals, the cellular profiling technique described herein was applied to processed tissue from the mouse cerebellum, a structure that is composed of several classically defined neuronal and glial cell types that exhibit unique morphology and distribution.

[00213] Candidate antibodies specificities were chosen from expression profiles from each cell type generated from data obtained from transgenic animals developed for use in the TRAP method expressing an EGFP/L10a fusion protein (Dougherty, et al. (2010) Nucleic Acids Res 38, 4218–4230 and Doyle, et al. (2008) Cell 135, 749–762, each of which is hereby incorporated by reference herein in its entirety). Data were collected from three neuronal cell types (granule, Purkinje, and basket) and two glial cell types (astrocytes and oligodendrocytes) in the cerebellum of wild-type mice.

[00214] Immunofluorescence staining was performed on the five distinct cell types in the cerebellum using a similar strategy to that applied to the cells from transgenic animals. The specificities of antibodies used for each cell type to confirm differences among the nuclei were NeuN for granule cells, Itpr1 for Purkinje cells, Sorcs3 for basket cells, Gfap labels for the cell bodies and process of astrocytes, and MOG labels for the cell bodies and process of oligodendrocytes.

[00215] To sort, a combination of at least two antibodies was used: NeuN (a splicing factor localized at euchromatin inside the nucleus), which labels neuronal nuclei, and cell-type specific antibodies: Itpr1, an endoplasmic reticulum membrane protein localized at the nuclear membrane, and basket cell marker Sorcs3 and astrocyte marker Eeat1 (also referred to as Glast), which are two cellular membrane proteins labeled in the nuclear membrane. Antibodies against the oligodendrocyte marker and transcription factor Olig2 showed labeling in euchromatin.

[00216] In cerebellar tissue, NeuN has been known in the art to label the nuclei of granule neurons, but not Purkinje and basket neurons, or glia. Immunofluorescence results on tissue sections using NeuN confirmed this result. However, staining of nuclei using NeuN revealed that while basket cells, astrocytes, and oligodendrocytes nuclei have lower levels of NeuN as expected, Purkinje nuclei unexpectedly were observed to have elevated levels. This is not due to spectral overlap from the Purkinje specific marker because confocal imaging revealed bright expression of NeuN in Purkinje nuclei in euchromatin – the expected distribution for a splicing factor. Therefore, the exposure of NeuN epitopes was observed to be different in isolated nuclei and tissue sections.

[00217] To isolate nuclei from oligodendrocytes, an antibody against the transcription factor Olig2 was used. Immunofluorescence was used to confirm the effectiveness of these antibodies. To isolate nuclei from granule cells, NeuN was used in addition to a combination of Itpr1, Sorcs3, and Olig2 to remove contaminating nuclei from other cell types. Nuclei were counterstained with DAPI, which is also a marker for heterochromatin. FACS results are shown in Table 15.

Table 15. FACS results for samples from wild-type mice

Cell Type	Population	Percentage of Population
Granule	Itpr1- Olig2- Sorcs3- NeuN+	90.5%
Purkinje	Itpr1+ NeuN+	0.1%
Basket	Itpr1+ med NeuN-	3.03%
Astrocytes	Sorcs3+ med NeuN-	1.94%
Oligodendrocytes	Sorcs3- NeuN-	1.95%

[00218] Therefore, the sorting strategy used for isolation of nuclei in cell types from the transgenic animals developed for use with the TRAP method was observed to also be effective in nuclei from the same cell types in wild-type mice.

Example 7. Correlation of results from different cell sorting methods

[00219] Results were analyzed at a genome-wide level by computing the pairwise Pearson's correlation coefficient (r) of normalized gene expression as shown in Table 16 among the GFP+ sorted nuclei samples from animals developed for use in the TRAP method and nuclei samples sorted using the cellular profiling technique described herein. ".g" samples were the GFP+ sorted samples from animals developed for use with the TRAP method, and ".a" samples sorted by the cellular profiling technique described herein.

Table 16. Pearson's correlation values

	Granule.g			Purkinje.g				Bglia.g				Granule.a		
Gra	1.00	0.97	0.98	0.85	0.85	0.86	0.86	0.79	0.80	0.80	0.79	0.95	0.96	0.98

	0.97	1.00	0.97	0.84	0.84	0.84	0.85	0.78	0.79	0.79	0.79	0.95	0.95	0.97
	0.98	0.97	1.00	0.83	0.84	0.84	0.85	0.78	0.79	0.79	0.79	0.95	0.95	0.97
Purkinje.g	0.85	0.84	0.83	1.00	0.98	0.98	0.99	0.78	0.79	0.79	0.78	0.85	0.85	0.85
	0.85	0.84	0.84	0.98	1.00	0.99	0.99	0.79	0.80	0.80	0.79	0.86	0.85	0.85
	0.86	0.84	0.84	0.98	0.99	1.00	0.99	0.79	0.80	0.79	0.79	0.86	0.86	0.86
	0.86	0.85	0.85	0.99	0.99	0.99	1.00	0.79	0.80	0.79	0.79	0.86	0.86	0.86
Bglia.g	0.79	0.78	0.78	0.78	0.79	0.79	0.79	1.00	0.95	0.94	0.94	0.80	0.79	0.81
	0.80	0.79	0.79	0.79	0.80	0.80	0.80	0.95	1.00	0.95	0.96	0.81	0.80	0.81
	0.80	0.79	0.79	0.79	0.80	0.79	0.79	0.94	0.95	1.00	0.95	0.81	0.80	0.81
	0.79	0.79	0.79	0.78	0.79	0.79	0.79	0.94	0.96	0.95	1.00	0.80	0.79	0.81
Granule.a	0.95	0.95	0.95	0.85	0.86	0.86	0.86	0.80	0.81	0.81	0.80	1.00	0.97	0.97
	0.96	0.95	0.95	0.85	0.85	0.86	0.86	0.79	0.80	0.80	0.79	0.97	1.00	0.97
	0.98	0.97	0.97	0.85	0.85	0.86	0.86	0.81	0.81	0.81	0.81	0.97	0.97	1.00
Purkinje.a	0.82	0.80	0.80	0.96	0.96	0.96	0.97	0.76	0.76	0.76	0.75	0.85	0.84	0.83
	0.81	0.79	0.79	0.95	0.95	0.95	0.96	0.75	0.75	0.76	0.74	0.84	0.84	0.82
	0.88	0.87	0.87	0.96	0.96	0.96	0.96	0.79	0.79	0.79	0.78	0.88	0.88	0.89
Basket.a	0.91	0.90	0.90	0.89	0.89	0.89	0.89	0.81	0.82	0.81	0.81	0.91	0.91	0.92
	0.89	0.88	0.88	0.88	0.89	0.89	0.89	0.79	0.80	0.80	0.79	0.91	0.91	0.90
	0.89	0.88	0.88	0.88	0.89	0.89	0.89	0.80	0.81	0.81	0.79	0.91	0.91	0.90
Astrocyte.a	0.80	0.79	0.79	0.76	0.77	0.77	0.77	0.91	0.92	0.91	0.91	0.81	0.80	0.83
	0.78	0.77	0.77	0.77	0.77	0.78	0.77	0.91	0.91	0.90	0.91	0.81	0.80	0.82
Oligo.all.a	0.85	0.84	0.84	0.82	0.83	0.83	0.83	0.84	0.85	0.85	0.84	0.86	0.86	0.87
Oligo.a	0.82	0.81	0.80	0.81	0.81	0.82	0.82	0.83	0.84	0.83	0.83	0.85	0.84	0.84
	0.81	0.80	0.80	0.80	0.81	0.81	0.81	0.82	0.83	0.83	0.82	0.84	0.84	0.83
OPC.a	0.82	0.80	0.80	0.81	0.82	0.82	0.82	0.83	0.83	0.83	0.82	0.85	0.84	0.84
	0.82	0.80	0.80	0.81	0.82	0.82	0.82	0.83	0.83	0.83	0.82	0.85	0.84	0.84

	Purkinje.a			Basket.a			Astrocyte.a		Oligo.all.a	Oligo.a		OPC.a		
Granule.g	0.82	0.81	0.88	0.91	0.89	0.89	0.80	0.78	0.85	0.82	0.81	0.82	0.82	
	0.80	0.79	0.87	0.90	0.88	0.88	0.79	0.77	0.84	0.81	0.80	0.80	0.80	
	0.80	0.79	0.87	0.90	0.88	0.88	0.79	0.77	0.84	0.80	0.80	0.80	0.80	
Purkinje.g	0.96	0.95	0.96	0.89	0.88	0.88	0.76	0.77	0.82	0.81	0.80	0.81	0.81	
	0.96	0.95	0.96	0.89	0.89	0.89	0.77	0.77	0.83	0.81	0.81	0.82	0.82	
	0.96	0.95	0.96	0.89	0.89	0.89	0.77	0.78	0.83	0.82	0.81	0.82	0.82	
	0.97	0.96	0.96	0.89	0.89	0.89	0.77	0.77	0.83	0.82	0.81	0.82	0.82	
Bglia.g	0.76	0.75	0.79	0.81	0.79	0.80	0.91	0.91	0.84	0.83	0.82	0.83	0.83	
	0.76	0.75	0.79	0.82	0.80	0.81	0.92	0.91	0.85	0.84	0.83	0.83	0.83	
	0.76	0.76	0.79	0.81	0.80	0.81	0.91	0.90	0.85	0.83	0.83	0.83	0.83	
	0.75	0.74	0.78	0.81	0.79	0.79	0.91	0.91	0.84	0.83	0.82	0.82	0.82	
Granule.a	0.85	0.84	0.88	0.91	0.91	0.91	0.81	0.81	0.86	0.85	0.84	0.85	0.85	
	0.84	0.84	0.88	0.91	0.91	0.91	0.80	0.80	0.86	0.84	0.84	0.84	0.84	
	0.83	0.82	0.89	0.92	0.90	0.90	0.83	0.82	0.87	0.84	0.83	0.84	0.84	
Purkinje	1.00	0.98	0.96	0.88	0.88	0.88	0.76	0.77	0.82	0.81	0.81	0.82	0.83	
	0.98	1.00	0.95	0.87	0.87	0.88	0.76	0.77	0.81	0.81	0.81	0.82	0.83	

	0.96	0.95	1.00	0.92	0.92	0.92	0.80	0.80	0.86	0.84	0.83	0.85	0.85
Basket.a	0.88	0.87	0.92	1.00	0.99	0.99	0.82	0.81	0.88	0.85	0.84	0.87	0.87
	0.88	0.87	0.92	0.99	1.00	0.99	0.80	0.80	0.86	0.85	0.84	0.86	0.87
	0.88	0.88	0.92	0.99	0.99	1.00	0.80	0.80	0.87	0.85	0.84	0.86	0.87
Astrocyte.a	0.76	0.76	0.80	0.82	0.80	0.80	1.00	0.97	0.86	0.83	0.83	0.83	0.84
	0.77	0.77	0.80	0.81	0.80	0.80	0.97	1.00	0.85	0.84	0.83	0.84	0.84
Oligo.all.a	0.82	0.81	0.86	0.88	0.86	0.87	0.86	0.85	1.00	0.97	0.96	0.94	0.94
Oligo.a	0.81	0.81	0.84	0.85	0.85	0.85	0.83	0.84	0.97	1.00	0.98	0.92	0.92
	0.81	0.81	0.83	0.84	0.84	0.84	0.83	0.83	0.96	0.98	1.00	0.91	0.91
OPC.a	0.82	0.82	0.85	0.87	0.86	0.86	0.83	0.84	0.94	0.92	0.91	1.00	0.96
	0.83	0.83	0.85	0.87	0.87	0.87	0.84	0.84	0.94	0.92	0.91	0.96	1.00

[00220] From this analysis, the correlation between different cell types in the cerebellum was observed to be high: r=0.91-0.94, and the correlation across biological replicates was observed to be very high: r=0.98-1. For the gene expression profiles from the EGFP-L10a labeled nuclei from granule cells, Purkinje cells, and Bergmann glia, very high correlations were observed between the genetically defined cell types and cellular profiling defined cell types: r=0.98 for granule cells, r=0.99 for Purkinje cells, and r=0.96-0.97 between Bergmann glia purified from Sept4/EGFP-L10a animals and astrocytes purified by the cellular profiling technique described herein. Since Bergmann glia are a subpopulation of cerebellar astrocytes, it makes sense that these two datasets are not perfectly correlated with each other.

[00221] Hierarchical clustering of the samples reveals clustering according to known biology. For example, in the first split, neuronal and glial samples were separated from each other. At the second split, the five cell types separate from each other regardless of whether the nuclei were purified using genetic labeling or antibody labeling. Taken together, results herein demonstrate that the cellular profiling technique described herein allows cell-type specific gene expression profiling in mice without the requirement for transgenic animals.

Example 8. Antibody-based sorting of cell types in rats

[00222] Nuclei were isolated from rat cerebellum, fixed, and stained using the same antibodies used in mice, and the results were analyzed by flow cytometry. FACS results are shown in Table 17 for nuclei samples from Sprague Dawley rats.

Table 17. FACS results for samples from Sprague Dawley rats

Cell Type	Population	Gender	Percentage
Granule	Itpr1- Olig2- Sorcs3- NeuN+	Male	89.700%
Granule	Itpr1- Olig2- Sorcs3- NeuN+	Female	90.100%

Purkinje	Itpr1+ NeuN+	Male	0.096%
Purkinje	Itpr1+ NeuN+	Female	0.089%
Basket	Itpr1+ med NeuN-	Male	2.750%
Basket	Itpr1+ med NeuN-	Female	2.390%
Astrocytes	Sorcs3+ med NeuN-	Male	3.140%
Astrocytes	Sorcs3+ med NeuN-	Female	2.870%
Oligodendrocytes - Mature	Sorcs3- NeuN-	Male	2.250%
Oligodendrocytes - Mature	Sorcs3- NeuN-	Female	2.170%
Oligodendrocytes - Precursor + Mature	Olig2+ High NeuN-	Male	0.400%
Oligodendrocytes - Precursor + Mature	Olig2+ High NeuN-	Female	0.420%
Cytoplasmic	-	Male	-
Cytoplasmic	-	Female	-

[00223] The staining profiles of rat nuclei resembled those of mice. Although there were differences, for example, in the rat cerebellum, NeuN staining resulted in more distinct positive and negative populations than was evident in the mouse cerebellum. As a result, additional populations of nuclei were revealed by flow cytometry analysis, and these were isolated and characterized by RNAseq. Nuclei were isolated from basket cells, astrocytes, and oligodendrocytes by staining with antibodies specific to Sorcs3 and NeuN. This flexibility allowed for purification of all six cell types using four methods of staining. For cell types that were isolated from more than one type of staining, the population identified by RNAseq to be most enriched for known markers and depleted for markers of other cerebellar cell types was chosen.

[00224] To determine the group of genes that are specific to each of the rat cell types, differential gene expression analysis (DESeq2) was performed as described in Example 1 to compare the nuclear expression profile for each cell type to unsorted cerebellar nuclei. The log2 fold change in expression for 120 differentially expressed genes (adjusted $p < 0.01$, fold change > 2) between the normalized RNAseq results from the nuclei of the six cells types compared to the RNAseq results for the sorted nuclei from each individual cell type is shown in Table 18. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed. Two replicate samples of nuclei from each cell type was analyzed.

Table 18. Log2 fold change of gene expression in rat nuclei

	Log2 fold change in expression											
Cell Type	**granule**		**purkinje**		**basket**		**astocyte**		**oligo**		**opc**	
Gene												
AABR07001623.1	-0.64	-0.53	-0.42	-0.64	2.32	1.15	1.30	-0.53	-0.42	-0.64	-0.53	-0.42
AABR07001734.1	-0.72	-1.26	0.64	0.81	1.53	1.18	0.85	0.22	-0.77	-0.84	-1.41	-0.23
AABR07006310.1	-0.34	-0.33	-0.64	-0.94	-0.33	0.12	-0.72	0.05	2.25	1.70	-0.93	0.12
AABR07006713.1	-0.64	-0.56	1.88	2.18	-0.56	-0.48	0.52	-0.56	-0.48	-0.64	-0.19	-0.48
AABR07006713.2	-0.33	-0.66	1.76	2.15	-0.50	-0.29	0.34	0.07	-0.88	-0.44	-0.07	-1.15
AABR07006727.1	-0.47	-0.38	1.83	2.39	-0.38	-0.56	-0.07	-0.38	-0.56	-0.47	-0.38	-0.56
AABR07013140.1	2.02	1.94	-0.44	-0.51	-0.40	-0.58	-0.71	-0.86	-0.44	-0.71	0.46	0.22

AABR07026032.2	1.67	2.33	-0.65	-0.37	-0.21	-0.08	-0.94	-0.21	0.07	-0.94	-0.57	-0.08
AABR07030473.1	-0.76	-0.82	1.87	1.75	0.43	0.65	-0.47	-0.13	-0.78	-1.01	-0.82	0.11
AABR07030880.1	1.76	1.89	-0.53	-0.90	0.18	-0.02	-0.52	-0.59	0.31	-0.90	-1.20	0.51
AABR07046961.1	-1.10	-1.11	-1.10	-0.91	-0.27	-0.45	0.55	0.21	1.78	1.53	0.48	0.38
AABR07047823.1	-0.36	0.02	-1.24	-1.15	1.91	1.20	1.08	0.63	-0.74	-0.36	-0.77	-0.23
AABR07049491.1	-0.38	-0.45	2.00	2.25	-0.45	-0.21	-0.38	-0.45	-0.39	-0.38	-0.45	-0.70
AABR07052897.1	-0.46	-0.67	-0.57	-0.46	-0.67	-0.57	-0.46	-0.67	0.19	0.30	2.12	1.93
AABR07058658.1	-1.32	-0.35	-0.55	-1.32	0.14	0.15	1.59	1.95	0.34	-0.10	0.21	-0.74
AABR07061428.1	-1.02	-0.93	-1.10	-1.02	1.70	1.37	0.52	-0.14	0.57	0.23	-0.93	0.74
AABR07070161.1	-1.04	-0.81	-0.81	-1.04	0.20	0.32	1.64	1.98	0.21	-0.56	-0.51	0.41
AABR07070161.6	-0.40	-0.79	-0.29	-0.40	-0.79	0.49	2.40	1.55	-0.29	-0.40	-0.79	-0.29
AABR07070578.1	-0.90	-0.15	-0.69	0.10	1.55	1.16	1.25	0.89	-1.30	-1.29	-0.48	-0.14
Abi3	-0.36	0.08	-0.77	-1.02	-0.11	-0.42	-0.36	-0.21	2.20	1.89	-0.34	-0.57
Aqp9	-0.93	-0.54	-0.55	-1.07	0.13	-0.08	1.97	1.93	0.07	-0.20	0.11	-0.85
Arhgef26	-1.01	-0.70	-1.34	-1.33	1.28	1.28	0.91	1.01	0.00	-0.57	-0.20	0.66
Arhgef33	-0.55	-0.66	2.12	1.99	-0.60	-0.49	-0.66	-0.43	-0.04	-0.70	-0.22	0.25
Arl4a	-0.61	-1.62	0.04	0.68	1.51	1.33	0.61	0.20	0.28	-0.09	-0.79	-1.54
B3gnt5	-0.71	-0.23	2.13	2.01	-0.51	-0.50	-0.44	-0.23	-0.50	-0.71	-0.51	0.21
Bgn	-0.50	-0.61	-0.97	-0.58	-0.20	-0.33	0.69	0.49	-0.30	-1.28	1.54	2.04
C1ql1	-0.96	-0.78	-0.91	-0.96	-0.36	-0.07	0.92	0.81	-0.23	-0.73	1.38	1.89
C1ql2	-0.90	-0.82	-0.98	-0.90	0.53	-0.01	0.35	0.58	-0.39	-0.90	1.53	1.92
Cacng5	-0.69	-0.67	-0.92	-0.69	0.21	0.44	2.12	1.65	0.12	0.01	-0.67	-0.92
Cadps2	1.51	2.04	-0.96	-1.22	-0.16	-0.54	-0.62	-0.25	0.58	-0.91	0.50	0.03
Calb1	-0.77	-0.58	2.13	2.03	-0.48	-0.13	-0.31	-0.17	0.02	-0.60	-0.52	-0.63
Calb2	1.90	1.91	-0.49	-0.80	-0.61	-1.03	0.31	0.45	-0.10	-0.98	-0.30	-0.26
Car4	2.01	1.38	-1.82	0.10	-0.74	-0.07	0.38	0.32	-0.17	-0.80	-0.47	-0.10
Car8	-0.30	-0.62	1.86	2.19	-0.85	-0.71	-0.36	-0.57	-0.43	-0.54	0.01	0.32
Cav1	-0.98	-0.92	-0.69	-0.80	-0.92	-0.32	0.46	0.63	0.47	-0.40	1.50	1.97
Cbln1	2.13	1.78	-1.11	-0.66	-0.58	-0.69	0.00	-0.08	0.39	-0.06	-0.45	-0.66
Ccnd1	-0.87	-0.95	-0.43	-0.61	-0.83	-0.65	0.27	0.78	0.38	-0.66	1.62	1.95
Cdh15	2.06	1.93	-1.28	-0.36	0.06	-0.20	-0.16	-0.22	-0.27	-0.90	-0.17	-0.49
Cdk2	-0.54	-0.80	-0.98	-0.86	-1.31	-0.47	0.64	0.71	0.60	-0.15	1.36	1.81
Cep76	-0.55	-0.49	2.10	2.09	-0.59	-0.62	-0.42	-0.32	-0.15	-0.77	0.01	-0.28
Cldn11	-0.99	-1.14	-0.82	-1.06	-0.66	-0.43	0.56	0.15	1.75	1.51	0.64	0.50
Clmp	-0.94	-0.83	-1.42	-1.23	1.39	1.14	1.16	0.97	-0.26	-0.37	-0.02	0.40
Col12a1	-0.85	-0.19	-1.06	-1.65	1.23	1.64	0.64	0.54	-0.16	-0.86	-0.13	0.84
Col5a3	-0.72	-0.62	-1.04	-1.30	-0.48	-0.30	0.62	0.95	0.08	-0.50	1.61	1.70
Cspg4	-1.18	-1.11	-1.13	-1.00	-0.44	-0.38	0.68	0.73	0.66	0.26	1.35	1.56
Cyp2d5	-0.68	-0.27	-0.19	-1.32	0.30	-0.07	1.88	1.92	0.21	-0.28	-0.50	-1.00
Enpp1	-1.40	-0.79	-0.86	-1.17	1.59	1.55	-0.27	0.02	0.54	-0.23	0.02	0.98
Ermn	-0.37	-0.74	-0.47	-0.68	-0.72	-0.59	0.86	-0.77	1.99	1.85	-0.22	-0.16
Fam107b	-0.63	-0.37	2.15	1.90	-0.18	0.00	-0.13	-0.20	-0.17	-1.00	-0.96	-0.41
Fam89a	-0.69	-0.28	-1.02	-0.61	-0.41	-0.65	0.56	0.95	-0.65	-0.73	1.85	1.69
Fat2	1.72	2.01	-1.21	-1.00	-0.44	-0.22	-0.04	-0.26	0.64	-0.87	-0.10	-0.23
Gabra6	1.98	1.90	-0.45	-0.31	-0.25	-0.39	-0.31	-0.58	0.51	-0.29	-0.42	-1.41
Gabrd	1.94	1.93	-0.18	-0.46	-0.42	-0.13	-0.28	-0.16	0.46	-1.02	-0.47	-1.22
Gdf10	-0.44	-1.20	-0.43	-0.85	0.34	0.57	1.72	1.81	0.34	-0.11	-0.61	-1.14
Gjd2	-0.24	0.33	-1.06	-1.16	1.31	1.35	1.17	0.39	-0.35	-0.76	-1.52	0.53
Gldc	-1.06	-0.64	-1.05	-0.76	1.44	1.48	0.71	0.75	-0.88	-0.91	0.00	0.92
Gli1	-1.09	-0.76	-0.83	-1.09	0.23	0.58	1.68	1.77	0.45	-0.42	-0.76	0.25
Gpr37	-0.98	-1.15	-0.31	-1.11	-0.72	-0.33	0.49	0.49	2.10	1.36	0.06	0.11
Gpr63	-0.85	-0.67	1.94	2.14	-0.05	-0.15	-0.60	-0.36	0.18	-0.32	-0.72	-0.54
Grm8	-0.84	-0.47	-0.66	-0.90	1.68	1.62	0.40	0.64	-0.72	-1.22	-0.35	0.82
Hapln2	-0.76	-1.26	-1.22	-1.02	0.17	0.30	0.87	0.43	1.66	1.50	-0.40	-0.26
Hpcal4	-1.01	-0.84	-0.69	-1.01	1.25	1.59	0.91	0.96	-0.13	-0.55	-1.10	0.63
Id4	-1.30	-0.76	0.13	0.60	0.05	-0.07	1.52	2.04	0.02	-0.42	-1.07	-0.75
Il16	1.46	1.87	-1.25	-1.24	0.20	-0.56	-0.03	-0.02	0.42	-0.42	0.65	-1.08
Itga7	1.69	1.88	-1.64	-0.73	-0.05	-0.34	0.34	0.56	-0.29	-0.58	-0.24	-0.59
Itga9	-0.70	-0.67	-0.98	-1.06	-0.88	-0.63	0.37	0.59	-0.02	0.51	1.75	1.73

Itih3	-0.95	-0.87	-1.19	-0.95	0.43	0.27	1.80	1.78	0.20	0.23	-0.28	-0.45
Itpr1	-0.42	-0.13	2.13	1.96	-0.16	0.02	-0.48	-0.60	-0.33	-1.10	-0.64	-0.25
Kcnh1	1.81	1.95	-1.21	-0.98	-0.35	-0.86	0.10	0.34	0.00	-0.71	0.01	-0.11
Kcnj12	1.92	1.74	-0.31	-0.62	-0.93	-0.87	-0.53	-0.82	0.16	-0.73	0.19	0.80
Klk6	-0.82	-0.78	-1.01	-0.82	-0.43	0.03	0.89	0.54	1.97	1.48	-0.78	-0.28
Lama3	-0.45	-1.07	-0.63	0.03	1.66	1.70	0.59	0.26	-1.27	-0.90	-0.56	0.65
Lfng	-1.07	-1.54	-0.92	0.19	0.02	0.24	1.59	1.51	0.53	-0.03	0.55	-1.08
Lgi4	-0.05	-0.09	-1.43	-1.54	-0.18	-0.09	1.69	1.72	0.47	0.30	-0.18	-0.62
Lims2	-0.87	-0.70	-1.05	-0.68	-0.52	-0.76	0.55	1.08	-0.16	-0.28	1.76	1.64
Lypd6	-0.69	-0.62	-0.88	-0.47	1.60	1.87	0.12	0.01	-0.57	-0.87	-0.70	1.23
Mag	-0.54	-0.62	-1.36	-1.41	-0.58	-0.42	0.47	0.39	1.82	1.37	0.47	0.42
Mal	-0.85	-0.82	-1.22	-1.38	0.14	-0.16	0.46	0.10	1.75	1.63	0.44	-0.09
March11	-0.67	-0.37	-0.04	0.31	1.74	1.44	-0.16	0.04	-1.28	-1.79	0.34	0.45
Mobp	-1.01	-0.93	-1.41	-1.05	-0.39	-0.11	0.73	0.18	1.72	1.39	0.41	0.48
Mog	-1.14	-0.58	-0.84	-0.88	-0.41	-0.53	0.47	0.03	2.05	1.69	0.34	-0.19
Msx2	-0.79	-1.14	-0.58	-0.32	0.29	-0.05	2.02	1.95	-0.13	-0.32	-0.22	-0.70
Mt2A	-0.54	-0.43	-0.64	-0.54	0.49	-0.17	1.92	2.14	-0.64	-0.54	-0.43	-0.64
Nkain4	-1.00	-1.11	-1.34	-0.87	0.17	0.42	1.61	1.79	0.32	-0.09	-0.19	0.28
Opalin	-1.14	-0.31	-1.20	-1.14	-0.35	-0.39	0.31	0.18	1.91	1.59	0.04	0.50
Pdgfra	-0.69	-0.90	-0.97	-0.79	-0.27	-0.14	0.62	0.88	-0.38	-0.82	1.67	1.81
Plch1	-0.89	-1.11	-0.73	-0.60	1.56	1.73	0.64	0.38	-0.37	-0.74	-0.78	0.92
Plk2	-1.00	-0.99	-1.54	-1.00	1.35	1.04	0.83	0.90	-0.13	-0.51	0.07	0.97
Plxdc1	-0.67	-0.80	1.95	2.09	-0.56	-0.11	0.24	-0.03	-0.12	-0.67	-0.57	-0.75
Pmel	-0.02	-0.91	-1.24	-0.84	-0.58	-0.65	0.68	0.88	0.00	-0.65	1.64	1.68
Pou3f2	-0.64	-0.03	-1.06	-1.00	0.18	-0.70	1.78	1.95	-0.50	-0.64	0.09	0.58
Ppfibp1	-0.85	-0.85	-1.27	-1.16	-0.36	-0.24	0.60	0.64	0.27	-0.12	1.58	1.75
Ppp1r17	0.12	0.43	1.74	1.95	-0.71	-1.03	-1.06	-0.29	0.16	-0.36	0.08	-1.03
Prr5l	-0.51	-0.51	-1.10	-1.09	-0.62	-0.66	0.73	0.34	1.86	1.65	0.43	-0.52
Prrt2	1.55	1.95	-1.55	-0.56	-0.08	-0.22	0.12	0.29	-0.80	-0.99	0.51	-0.22
Qdpr	-1.30	-0.43	-0.92	-0.39	-0.19	-0.55	0.00	0.20	2.16	1.73	-0.02	-0.29
Rasgrp3	-0.75	-0.45	-1.01	-1.15	-0.19	-0.36	0.89	0.56	1.83	1.64	-0.29	-0.71
Rbfox3	1.96	1.72	-1.66	-0.65	-0.52	-0.46	0.06	-0.31	-0.27	-0.35	0.48	0.00
RGD1561557	-0.47	-0.76	1.91	2.27	-0.04	-0.39	-0.11	-0.40	-0.39	-0.47	-0.76	-0.39
RGD1561849	-0.70	-0.69	-1.27	-0.84	-0.29	-0.20	0.83	0.84	-0.53	-0.51	1.68	1.68
Rlbp1	-0.62	-0.21	-0.88	-1.03	-0.51	-0.69	0.65	0.76	-0.69	-0.37	1.75	1.83
Ryr1	-0.43	-0.67	1.91	2.27	-0.36	-0.37	-0.21	-0.34	-0.49	-0.72	0.02	-0.62
S1pr1	-0.81	-0.62	-1.13	-1.07	0.51	0.47	1.55	1.71	0.59	0.16	-1.14	-0.21
Scara3	1.82	1.65	-1.80	-0.67	-0.43	-0.50	0.18	-0.41	0.42	-0.53	-0.14	0.41
Selplg	-0.79	-0.52	-0.85	0.30	0.21	0.09	-0.43	-0.52	2.35	1.52	-0.52	-0.85
Serpine2	-0.97	-1.08	-1.01	-1.13	-0.48	-0.16	0.94	0.66	0.06	0.02	1.35	1.79
Slc1a6	-0.46	-0.39	2.17	2.03	-0.27	-0.56	-0.63	-0.44	-0.30	-0.84	-0.24	-0.06
Slc25a18	-0.50	-0.72	-1.95	-0.13	0.01	-0.19	1.81	1.74	-0.07	0.07	-0.22	0.14
Slc5a11	-1.08	-1.53	-0.27	0.02	-0.76	-0.51	0.71	-0.03	1.84	1.53	-0.37	0.45
Slc7a10	-0.42	0.34	-0.98	-1.19	-0.11	-0.34	1.77	2.08	-0.05	-0.28	-0.01	-0.81
Slc9a3	-0.23	-0.71	1.92	2.04	-1.09	-0.92	-0.13	-0.26	0.33	-0.04	-0.42	-0.48
Snx22	-1.27	-0.59	-1.14	-1.27	-0.07	0.35	0.64	0.62	-0.28	-0.17	1.57	1.61
Sorcs3	-0.73	-0.64	-0.91	-1.11	1.42	1.41	0.17	0.43	-0.79	-1.14	0.76	1.13
Sv2b	1.71	1.84	-1.13	-0.94	-0.10	-0.40	0.49	0.02	0.46	-0.37	-0.28	-1.30
Tesc	1.60	1.90	-1.21	-1.41	-0.06	0.06	-0.33	-0.01	0.01	-1.06	0.14	0.37
Tmem255b	-1.24	-0.09	-0.67	-0.12	-0.51	-0.49	0.55	0.93	-0.76	-0.98	1.86	1.53
Tmem63a	-0.79	-0.81	-1.29	-0.88	-0.26	-0.60	0.77	0.48	1.71	1.74	0.17	-0.24
Tmem88b	-0.31	-0.75	-1.30	-1.23	-0.75	-0.37	0.64	0.35	1.85	1.48	-0.13	0.53
Tnc	-1.21	-1.14	-0.49	-1.39	0.00	0.34	1.89	1.34	0.27	-0.32	0.10	0.61
Zfp385c	-0.51	-0.91	1.62	2.03	0.54	0.37	0.09	-0.16	-1.12	-0.96	-0.50	-0.50

[00225] A general enrichment was observed in Table 18 for known markers for each cell type and a depletion for markers for all other cell types. Nuclear expression of Fat2 and Rbfox3 was observed to be significantly enriched in granule cells. Nuclear expression of Car8 and Calb1 was

observed to be specific to purkinje cells. Nuclear expression of Aldh1L1 and Slc1a3 was observed to be specific to bergmann glia. Nuclear expression of Colgalt2 was observed to be specific to corticopontine pyramidal cells. Nuclear expression of Hs3st4 was observed to be specific to corticothalamic pyramidal cells, while Pde1a and Csmd1 were observed to be expressed in both cortical pyramidal cell types. In addition to the 120 genes in Table 18, the data also identified 700 to 1,600 expressed genes that are significantly enriched in each of the rat cell types.

[00226] Genes were also identified that are most specific for each cell type by implementing an updated version of the specificity index (SI) algorithm (Dougherty, et al. (2010) Nucleic Acids Res 38, 4218–4230, which is hereby incorporated by reference herein in its entirety). An advantage of the SI is that it can identify specifically expressed genes even in cell types that are very abundant in the region of interest (e.g. cerebellar granule cells).

[00227] To validate both the cell-type specific rat data and the updated SI algorithm, the expression of genes identified as being specific to each cell type were confirmed using the Allen Mouse Brain Atlas *in situ* hybridization database. For the top 20 most specific genes calculated by the SI algorithm in Example 1 for all cell types, labeling was observed specifically in the defined cell type on average 93% of the time. Percentages of top 20 SI genes with Allen Mouse Brain Atlas images that showed expected distribution for each cell type were: granule 93%, Purkinje 100%, basket 85%, astrocyte 93%, oligodendrocyte 100%, and OPC 80%. Distribution of the astrocyte-specific gene Itih3 was also observed to be characteristic of both Bergmann glia, a type of astrocyte, and non-Bergmann glia astrocytes of the cerebellum. The following genes were chosen as additional markers for the nuclei of the 6 cell types: Tescalcin (Tesc) for granule cell nuclei, Carbonic Anhydrase 8 (Car8) for Purkinje cell nuclei, March11 for basket cell nuclei, Inter-Alpha-Trypsin Inhibitor Heavy Chain 3 (Itih3) for astrocyte nuclei, Mog for oligodendrocyte nuclei, and Platelet Derived Growth Factor Receptor Alpha (Pdgfra) for oligodendrocyte progenitor nuclei.

[00228] These results demonstrate that the cellular profiling technique described herein is a generalizable method that can easily be adapted for use in any species.

Example 9. Identifying and comparing the most specific genes in each species

[00229] To gain insight into cell-type specific functions that have changed across species, the specificity index for all genes in each species was calculated. The 100 most specific genes for each species is shown for each cell type in Tables 19-24. A lower SI value indiciates a gene expressed more specifically in one species over another.

[00230] Table 19 provides the the 100 most specific genes measured by the specificity index (SI) as described in Example 1 for granule cells in human, rat, and mouse samples.

Table 19. 100 most specific genes measured by SI for each species in granule cells

Rank	Human	SI	Rat	SI	Mouse	SI
1	Cadps2	64.6	Tesc	27.0	Gabra6	16.0
2	Reln	112.8	Itga7	36.6	Grin2c	17.3
3	Synpr	113.6	Rbfox3	39.2	Fat2	25.2
4	Galnt5	114.2	AABR07013140.1	43.4	Cadps2	31.0
5	Ccm2l	163.1	Calb2	53.8	Ptpn22	35.2
6	Srrm4	176.1	Kcnh1	55.8	Chn2	52.6
7	Tmem266	178.5	Cdh15	60.5	Neurod1	58.7
8	Cckbr	209.9	AABR07030880.1	77.6	Calb2	63.1
9	Cerkl	213.3	Prrt2	91.0	Trhde	64.3
10	Chn2	241.0	Gabrd	99.8	Il16	70.6
11	Grik2	243.5	Il16	104.7	Ppfia4	71.8
12	Mal2	244.1	Scara3	119.2	Cbln1	78.2
13	Fat2	248.1	Cbln1	120.8	Sidt1	82.2
14	Adamts16	264.1	AABR07026032.2	128.9	Tmem266	86.6
15	Lcn8	265.2	Cadps2	131.5	Gabrd	88.3
16	Fstl5	272.9	Sv2b	133.5	Reln	89.2
17	Tll1	274.1	Fat2	138.6	Kcnj12	95.9
18	Vsnl1	276.9	Gabra6	146.0	Gprc5c	98.8
19	Rit2	284.7	Car4	155.4	Rims3	103.9
20	Slc8a2	299.5	Kcnj12	172.1	Tll1	105.4
21	Slc17a7	307.5	Nrep	175.8	Cbln3	105.8
22	Zp2	331.6	AABR07043098.3	182.4	Olfm3	113.7
23	Tspan18	334.6	Rtn4r	187.8	Slc17a7	115.8
24	Fgf5	351.5	Shisa8	188.7	Chgb	120.7
25	Prag1	356.2	Sel1l3	189.4	Kcnh1	122.2
26	Slc6a7	371.1	Grb7	196.2	Cdh15	124.2
27	Rims1	375.5	Rgl3	200.3	Barhl2	124.5
28	Cdh7	378.6	Dusp5	207.6	Dusp5	124.7
29	L1cam	379.3	Chn2	218.3	Kcnc1	130.3
30	Mical2	388.1	Lamp5	221.3	Camk4	132.3
31	Ptk2b	390.3	Pagr1	221.3	Des	138.2
32	Kcnh1	402.0	Cemip	223.2	Cerkl	140.2
33	Arhgap29	404.9	Gprc5c	225.6	Svep1	142.8
34	Cdk15	410.7	Shf	233.9	Uncx	143.7
35	Pde3b	414.1	Wdr66	234.9	Slc8a2	151.4
36	Itga4	416.5	Tmem44	240.1	Cacna2d1	152.0
37	Etv1	425.6	Reln	245.4	Pxylp1	155.9
38	Tmem178	426.5	Tll1	258.2	Ptchd1	163.2
39	Chgb	429.8	Slc17a7	258.2	Sel1l3	167.7
40	Col13a1	431.0	Pax6	258.7	Rtn4r	183.3
41	Rnf152	444.4	Capn1	259.9	Cacna1e	185.3
42	Kcnk1	449.5	Calhm3	263.7	Patj	187.1
43	Il16	450.0	AABR07043098.1	270.3	Atp2b3	188.1
44	Sstr2	463.9	Camk4	283.7	Marveld2	191.7
45	Als2	464.2	Selm	284.5	Kcnk10	195.2
46	Barhl1	464.5	Sema3g	285.7	Rab15	195.9
47	Scn2a	466.8	LOC100360491	287.3	Rapgef4	198.4

48	Cbln1	471.6	Diras2	292.9	Rims1	208.6
49	Dusp5	471.7	Agbl2	303.2	Tmem178	216.5
50	Ndst3	477.7	Mctp1	310.5	Ak4	219.6
51	Lurap1l	481.0	Mvp	312.7	Lin7a	220.8
52	Kcnj12	491.9	Tmem51	312.9	Igfbp5	229.0
53	Snai2	501.7	Vsnl1	322.6	Tesc	233.4
54	Ifnlr1	503.3	Plk5	328.1	Neurl1a	234.0
55	Neurod1	514.3	Mrgprf	329.2	Vat1l	236.3
56	Cdyl2	521.2	LOC100910401	337.4	Msra	236.4
57	Ppp1r1c	524.2	Ak4	342.1	Vsnl1	237.2
58	Jkamp	526.0	Wscd2	350.2	Rps6ka1	238.8
59	Neurl1a	529.6	Grin2a	360.2	Lhfp	239.9
60	Trhde	539.3	Cfap74	363.1	Kcnk3	241.1
61	Mfsd9	543.0	Rnf39	376.2	Ryr2	243.4
62	Xkr7	550.6	Cbln3	385.9	Exph5	248.3
63	Barhl2	564.0	Fzd7	387.2	Kif26b	249.8
64	Cbln3	572.1	Golga7b	389.4	Adamts18	261.7
65	Uncx	577.0	AABR07033679.1	392.9	Cntnap4	263.7
66	Ptchd1	584.0	Ptpn22	394.9	Tspan18	276.0
67	Cblb	596.7	Grin2c	394.9	Mmp24	278.7
68	Runx1t1	599.3	Ablim1	400.9	Cdh8	280.9
69	Sphkap	603.8	Kcnk1	401.5	Ablim3	282.7
70	Gabra6	603.9	Arpp21	408.5	Cadm3	290.3
71	Coro2a	611.9	C1rl	413.8	Ntf3	301.2
72	Bmper	618.4	Zscan30	418.0	Pld5	305.0
73	Dkk4	618.7	Maf	431.7	Syndig1l	307.7
74	Camk4	620.4	Rtn4rl1	433.7	Galnt15	308.4
75	Unc13c	620.8	Barhl2	437.6	Etv1	310.1
76	Trp53i11	624.3	Kcnk12	441.8	Sh2d1a	311.9
77	Ephb1	625.0	Actl6b	441.8	Scn2a	314.5
78	Glb1l3	626.9	AABR07053850.1	448.3	Panx2	325.0
79	Mdga1	627.5	Sdc1	462.0	Speg	329.4
80	Kcnc1	633.0	Camkk2	470.8	Bsn	335.6
81	Tmem252	639.3	Nudcd3	477.6	Rnf112	335.9
82	Mpp7	642.2	Ccdc155	490.3	Il20rb	343.3
83	Hipk4	644.6	Cbfa2t3	490.3	Slc16a10	345.5
84	Tmem51	651.0	AABR07037151.1	494.1	Ntn4	349.9
85	Cacnb3	665.3	Etv1	499.3	Adcy1	354.5
86	Cyb5a	674.5	Jph3	502.6	Mapk12	357.3
87	Tmem2	676.2	Itga11	511.4	Boc	357.5
88	6430573F11Rik	677.3	Rnf182	520.8	Syt12	358.6
89	Rasgrp1	680.8	RGD1560784	521.9	Fstl5	359.7
90	Rab37	685.8	Plcxd3	529.7	Tead4	360.2
91	Adarb1	686.4	Ablim3	543.8	Clcn1	366.2
92	Svop	690.5	Rims1	548.4	Pde3b	366.2
93	Pgm5	694.1	Nyx	550.9	Pgm2l1	367.9
94	Mthfd1l	694.4	Uncx	551.3	Tmtc4	368.9
95	Cdh15	695.6	AABR07034445.1	553.6	Abcc8	370.2
96	Vwc2	696.0	AABR07025051.3	556.7	Olfm1	372.1
97	Disp2	701.0	Kcnk10	557.2	Nedd4l	372.6
98	Tspan15	713.3	Kcnk3	560.6	Lurap1	379.7
99	Slc26a5	716.3	Nol3	562.3	Krt24	384.2
100	Lhfp	723.0	Als2	563.2	Als2	385.7

[00231] Table 20 provides the the 100 most specific genes measured by the specificity index (SI) for purkinje cells in human, rat, and mouse samples.

Table 20. 100 most specific genes measured by SI for each species in purkinje cells

Rank	Rat	SI	Mouse	SI
1	Arhgef33	6.0	Car8	5.4
2	Car8	9.0	Calb1	9.8
3	Slc1a6	13.0	Arhgef33	10.2
4	Calb1	25.8	Atp2a3	11.2
5	Ppp1r17	26.5	Itpr1	16.4
6	Itpr1	27.2	Ppp1r17	20.6
7	Zfp385c	28.0	Slc1a6	21.1
8	Ryr1	28.6	Slc9a3	25.4
9	AABR07030473.1	35.6	Trpc3	30.4
10	Slc9a3	40.4	Casq2	37.4
11	AABR07006713.1	45.6	Clic6	40.2
12	AABR07006713.2	49.2	Plekhd1	41.6
13	RGD1561557	63.9	Ryr1	44.4
14	Gpr63	64.5	Cacna1g	48.0
15	AABR07049491.1	70.2	Pcp2	50.5
16	AABR07006727.1	71.4	Sycp1	51.8
17	Plxdc1	71.8	Pde5a	51.8
18	Cep76	72.5	Tspan11	52.7
19	Fam107b	77.0	Gpr63	53.5
20	B3gnt5	81.8	Nell1	58.2
21	Far2	82.4	Cep76	60.4
22	AC108261.1	85.2	Bcl11a	61.2
23	Grid2ip	85.9	Grid2ip	63.8
24	AABR07072628.1	90.2	Htr1b	66.6
25	Kcnip1	95.9	Pet100	68.6
26	AABR07006724.1	96.2	Strip2	73.4
27	Trpc3	96.8	Plxdc1	76.2
28	Phka2	100.3	Skor2	77.0
29	Car7	100.7	Dagla	78.0
30	Fam117a	103.0	Garnl3	82.2
31	Hes3	106.8	Itpka	83.1
32	Casq2	107.0	Myo10	83.6
33	Dgkh	109.5	Gng13	84.6
34	Arhgap26	112.8	Kcnip1	85.0
35	Trabd2b	114.4	Trabd2b	87.5
36	Nell1	115.7	Rnf207	106.0
37	Bcl11a	116.3	Scn4b	108.8
38	Col18a1	125.9	Arhgap20	113.4
39	LOC100125362	126.5	Grip1	118.4
40	Ptchd4	129.8	Pde9a	118.5
41	Camk2a	132.5	Ppp4r4	119.9
42	Dyrk4	132.5	Cck	120.0
43	Kitlg	132.6	Ebf1	121.2
44	Kcnab1	135.5	Bean1	124.5
45	Nxnl2	135.7	Tuba8	124.5
46	Ltk	137.8	Smpx	126.1
47	LOC689927	138.2	Ebf2	126.2
48	AABR07056156.1	141.0	Slc19a1	126.5
49	Cpne8	142.1	Ccdc85a	128.4
50	Htr1b	144.4	Flt3	129.9
51	AABR07033570.1	145.8	Camk2a	133.9
52	Icmt	147.6	Sh2d4b	142.2

53	AABR07047598.1	150.8	Homer3	144.5
54	Cstf2t	156.3	Stk17b	151.6
55	Grik1	157.6	Clec2l	158.1
56	Itpka	159.9	Hrh2	160.7
57	LOC100910996	163.9	Ksr2	161.6
58	Hpcal1	165.7	Chtf18	161.6
59	Efna5	176.1	Vax2	162.5
60	Myo10	177.8	Foxp4	162.9
61	Rgs8	180.8	Ankrd33b	166.6
62	Skor2	182.8	Cpne9	179.2
63	Il22	183.8	Corin	179.6
64	Slc12a3	186.2	Il22	179.8
65	Cpne9	188.8	Prkag3	180.8
66	AABR07007980.2	197.7	Cep126	180.9
67	Cacna1g	198.1	Slc20a1	182.2
68	Doc2b	198.6	Akain1	185.2
69	Sptbn2	199.3	Nrk	190.6
70	LOC108351705	207.0	Pih1h3b	194.0
71	AABR07035926.1	209.4	Inpp5a	195.2
72	AABR07037943.1	209.5	Lhx1	196.1
73	Pcp2	209.5	Sptbn2	196.3
74	AABR07061860.1	214.6	Paxbp1	203.4
75	AABR07024820.1	214.9	Dner	206.2
76	Impg1	215.2	Doc2b	210.0
77	Nkiras2	216.4	Tspoap1	210.7
78	Krtap12-2	217.7	Gfra2	212.9
79	Tmem123	218.4	Fhl5	214.7
80	AABR07044009.1	219.9	Dmd	215.1
81	Ptprr	221.2	Kcnab2	220.3
82	Homer3	221.3	Serinc2	220.4
83	Garnl3	226.4	Car7	230.8
84	Sos1	228.3	Dnah6	232.8
85	Kcnab1	230.1	Prmt8	240.0
86	Cntn3	231.2	Prkcg	241.0
87	LOC304725	236.5	Mdfi	243.4
88	Stk17b	236.6	Dgkh	244.9
89	AABR07047604.1	239.1	Fam117a	252.5
90	Zdhhc23	241.9	Nek2	254.9
91	Scn4b	242.1	Fmnl1	259.3
92	AC126640.1	246.4	Atl2	263.6
93	Pde9a	247.2	Cfap161	263.8
94	Ptprb	251.5	Lin28b	267.2
95	Prkcg	257.7	Cacna2d2	267.6
96	Pcp4	258.1	Ptchd4	269.5
97	AABR07056374.1	259.1	Pkp3	272.9
98	Fstl4	262.8	Shank1	278.3
99	Ppp4r4	262.9	Grid2	278.3
100	Nup93	264.5	Nefh	284.1

[00232] Table 21 provides the the 100 most specific genes measured by the specificity index (SI) for basket cells in human, rat, and mouse samples.

Table 21. 100 most specific genes measured by SI for each species in basket cells

Rank	Human	SI	Rat	SI	Mouse	SI
1	Bhlhe22	44.1	Plch1	74.3	Adamts15	16.6
2	March11	45.9	AABR07001734.1	145.0	March11	22.6
3	Kit	66.8	Lypd6	176.5	Tfap2b	29.8
4	Tfap2b	67.1	Lama3	186.5	Socs2	32.1

5	Clmp	72.3	March11	193.2	Penk	33.4
6	Lbx1	78.4	Gldc	194.7	Bhlhe22	56.7
7	Slc38a5	81.8	Grm8	252.4	Plch1	57.5
8	Frmd3	92.1	AABR07047823.1	267.2	Adamts16	71.3
9	Btbd11	103.9	AABR07001623.1	286.7	Adrb2	75.4
10	Lipg	119.4	Gjd2	302.4	Frmd3	77.6
11	Rab3b	154.7	Arl4a	334.9	Clmp	79.4
12	Lrrc38	175.1	AABR07070578.1	358.6	Cacna2d3	83.7
13	Galnt14	186.6	Hpcal4	379.1	Trpc7	84.8
14	Cnr1	188.6	AABR07061428.1	382.7	Galnt18	99.9
15	Tcerg1l	190.6	Col12a1	384.5	Tbc1d4	104.5
16	Cbln2	202.0	Enpp1	384.9	Asgr1	106.4
17	Siah3	208.1	Sorcs3	402.3	Kit	106.8
18	Stac2	220.0	Clmp	458.9	Tfap2a	123.2
19	Scgn	230.8	Plk2	462.7	Fam84a	123.8
20	Rspo1	233.5	Arhgef26	464.3	Gjd2	124.1
21	Lmcd1	247.4	RGD1561667	465.7	Grik3	126.0
22	Lpl	248.4	Asic2	518.6	Lrrc38	132.2
23	Adra1b	255.4	AABR07026472.1	520.8	Chst9	137.5
24	Gad2	256.6	AC124896.1	525.2	Flrt2	138.0
25	Chrna3	258.7	Trpc5	560.0	Chac1	138.1
26	Socs2	270.2	AABR07052084.1	577.8	Grm8	140.0
27	Trpc6	278.1	AABR07059478.1	580.5	Esrrg	143.4
28	Kcna3	294.7	Kit	589.1	Slc6a7	147.4
29	Syn3	302.1	Nt5dc2	596.7	Pla2g4e	149.4
30	Eml5	344.4	AABR07041885.1	610.5	Stac2	149.7
31	Nefl	346.5	Hcn1	624.7	Cabp1	151.1
32	Fam84a	353.0	Skor1	630.9	Phf24	155.2
33	Trpc5	363.0	Prdm8	701.1	Camk1g	161.8
34	KIAA1644	373.4	Phf24	702.1	Btbd11	161.8
35	Hrh3	376.1	Esrrg	704.7	Stc2	172.0
36	Disp3	378.7	Grik3	706.3	Sorcs3	172.5
37	Tfap2a	433.3	Bhlhe22	720.2	Lamb1	175.7
38	Gjd2	436.7	Mir346	736.2	Trpc5	201.1
39	Adamts2	437.1	Tmem200a	742.7	Coro6	209.7
40	Sorcs3	446.6	AABR07003600.7	753.8	Slc32a1	217.8
41	Ptprk	454.0	Scn9a	755.6	Kirrel	227.8
42	Timp3	464.6	Inpp4b	764.8	Cdkl1	231.3
43	Gjb4	481.4	Ace	773.3	Chst1	231.7
44	Ehd3	481.7	Kcna2	776.0	Asns	236.3
45	Cxcl12	496.9	Adra1d	792.2	Sp5	240.7
46	Actc1	510.1	Slc32a1	799.8	Cyba2	241.2
47	Pnma2	511.8	Cntnap4	820.3	Aldh1l2	241.4
48	Fam43a	512.8	Grid1	851.2	Kcnab3	245.8
49	Adam11	516.7	Trpc7	853.3	Tg	253.4
50	Dact2	522.4	Begain	864.8	Plxna4	253.9
51	Rgs16	524.5	AABR07049535.3	921.5	Prkcd	260.1
52	Slc5a8	527.5	Frmpd4	925.2	Cgn	260.1
53	Exph5	532.6	Tfap2b	925.4	Tcte1	262.3
54	Cfap221	540.5	Cnr1	931.9	Trim67	264.0
55	Myo16	553.4	AABR07054088.3	988.5	Osbpl10	267.4
56	Megf10	555.8	Zcchc16	990.2	Serpini1	286.7
57	Cacna1d	557.6	Trpv6	1002.2	Slc7a1	286.8
58	Pax2	566.6	Grb10	1006.5	Gpr22	293.5
59	Efna5	575.9	Pax2	1040.2	Cntn4	294.7
60	Plch1	576.2	Nrxn3	1055.5	Skor1	298.0
61	Gabrg2	580.3	Tyms	1062.3	Slc7a3	300.2
62	Prrt4	591.2	Grid1	1083.5	Atp1b1	309.4
63	Itga5	591.5	Myt1l	1088.5	Kcna2	318.7

64	Sp5	593.2	Disp3	1090.4	Cebpb	331.8
65	Nefm	599.4	AABR07063359.1	1093.8	Parm1	340.9
66	Grik3	601.6	Btn1a1	1105.1	Dock7	342.3
67	Cx3cl1	607.8	Rn60_10_0565.6	1119.6	Eml5	343.5
68	Fbxo24	613.6	AABR07041972.1	1141.2	Cnih3	355.4
69	Lect2	615.7	Osbpl10	1155.3	Asic2	358.1
70	Nefh	617.0	Six4	1156.4	Hpcal4	361.8
71	Efnb3	621.8	Mir384	1164.1	Adamts2	363.9
72	Grk3	631.3	Tbc1d4	1170.8	Masp1	364.0
73	Mpz	646.3	Cabp1	1177.4	Plxnc1	368.6
74	Syt2	648.4	AABR07003600.2	1178.2	Gabrg2	368.7
75	Scrt1	666.5	AABR07057590.1	1204.1	Mtfp1	370.8
76	Cdc42ep3	670.5	Adrb2	1204.5	Ntn1	373.5
77	Trim67	670.8	Cacna1d	1205.2	Ret	377.7
78	Grin2b	683.8	Plxnc1	1213.6	Zfp423	378.3
79	Rab3c	684.3	Dusp22	1214.0	Nln	386.1
80	Plxna4	691.0	Hecw1	1217.7	Man2a1	386.3
81	Fzd8	708.3	Gdpd4	1224.6	Neurod6	392.1
82	Elmod1	719.1	rno-mir-344a-1	1234.3	Grin2d	396.4
83	Smim17	728.0	Lgi2	1236.7	Angptl3	404.5
84	Slc8a3	730.9	AABR07060291.2	1242.9	Cnr1	405.7
85	Nrip3	745.4	Adarb2	1277.7	Tmem132e	405.9
86	Plekhg5	755.1	Angpt1	1293.0	Apcdd1	428.5
87	Arl4a	762.5	Rspo4	1309.9	Rasgrf1	445.7
88	Grm8	775.9	Rn50_7_1158.3	1318.3	Hcn1	453.2
89	Cntnap5a	784.2	Dcx	1338.4	Scnn1g	459.4
90	Maats1	803.4	AABR07065531.31	1338.5	Ly6e	462.4
91	Loxl2	805.6	Onecut1	1338.7	Pax2	462.6
92	Arap3	810.3	Mkx	1367.1	Rab3c	469.8
93	Dcx	825.0	Rgs4	1374.8	Rph3a	473.7
94	Nyap2	837.7	Kcnc2	1403.0	Rai2	475.5
95	Skor1	844.3	Hgf	1404.5	Gad2	475.7
96	Pvalb	846.0	Fgf13	1408.7	Mpp7	477.2
97	Ppm1j	848.4	Itga8	1410.0	Arl4a	483.3
98	Slc5a4a	851.9	AABR07070578.2	1421.3	Igsf3	486.3
99	Tmem132e	852.0	Apcdd1	1434.5	Tmem179	502.4
100	Cygb	874.9	Trim15	1449.8	Sorbs2	506.1

[00233] Table 22 provides the the 100 most specific genes measured by the specificity index (SI) for astrocytes in human, rat, and mouse samples.

Table 22. 100 most specific genes measured by SI for each species in astrocytes

Rank	Human	SI	Rat	SI	Mouse	SI
1	S1pr1	57.5	AABR07070161.1	23.8	Gdf10	9.0
2	Gja1	127.7	Itih3	25.4	Slc1a3	14.8
3	Lgi4	141.6	Gdf10	37.4	Fxyd1	18.8
4	Efemp1	142.2	Gli1	50.6	Dao	19.2
5	Etnppl	163.0	Slc25a18	75.8	A2m	21.8
6	Aqp4	170.3	Nkain4	96.0	Lfng	23.3
7	Rgma	170.3	Tnc	105.4	Lgi4	23.6
8	Lgr6	176.2	Msx2	108.8	Mybpc1	27.6
9	Lcat	179.9	S1pr1	117.4	Cdc42ep4	29.0
10	Tril	181.4	Slc7a10	120.6	Slco4a1	29.8
11	Serpini2	181.6	Aqp9	127.8	Fam20a	33.0
12	Pgghg	192.3	Mt2A	139.2	Lcat	33.4
13	Slc1a3	198.8	Lgi4	140.0	Acot11	33.8
14	Gfap	208.4	Pou3f2	142.7	Vim	36.2
15	Aldh1a1	219.0	Id4	143.4	Nwd1	36.2

16	Pla2g5	222.3	Cacng5	145.2	S1pr1	38.8
17	Fxyd1	228.9	Cyp2d5	146.4	Tnc	42.4
18	Wdr49	244.4	AABR07058658.1	147.0	Rbm24	43.3
19	Gli1	248.8	AABR07070161.6	148.4	Acsbg1	43.6
20	Nfatc4	249.7	Lfng	158.0	Ntsr2	45.0
21	Scara3	251.9	AABR07070161.3	165.5	Prex2	47.2
22	Slc4a4	255.7	Fam107a	169.5	Cables1	47.4
23	Lama2	255.8	Nat8f3	171.2	Gli1	55.2
24	Cdc42ep4	260.4	Ctxn3	173.3	Etnppl	56.8
25	Gabrg3	263.9	Aldh1l1	184.8	Pla2g7	63.6
26	P2ry1	273.0	Entpd2	188.5	Phkg1	64.0
27	Gabra2	274.6	Rbm24	218.2	Nhsl1	69.9
28	Colec12	276.1	Slc1a3	221.2	Slc14a1	74.5
29	Mlc1	280.6	Mlc1	223.3	Plekho2	75.4
30	Slc7a11	285.4	Cxcl14	224.2	Gjb6	76.2
31	Aldh1l1	312.5	Hif3a	232.5	Plce1	76.4
32	Sox9	314.6	Fxyd1	235.7	Itih3	79.2
33	Lgals3	323.2	Acsbg1	242.4	Sdc4	83.0
34	Mgst1	323.4	AABR07070161.7	254.2	Mertk	83.0
35	Gatsl3	339.8	Notch3	267.2	Prr5	101.7
36	Ahnak	341.2	Il33	271.9	Sparcl1	102.9
37	Pipox	364.0	Nwd1	273.5	Id4	103.3
38	Rhoj	376.4	Cdc42ep4	295.3	Mlc1	105.8
39	Arhgef26	393.6	Samd9l	296.6	Pax3	106.2
40	Arhgef28	397.4	Gabrb1	300.9	Gpr153	106.8
41	Srpx	400.0	Plpp3	305.7	Abi3bp	111.5
42	Mt3	404.0	Cxcr4	308.9	Pltp	115.9
43	Atp1a2	414.4	Rgma	309.7	Fxyd7	119.1
44	Fxyd7	415.7	Itm2a	311.7	Rpusd3	120.4
45	Lfng	416.9	Ednrb	311.8	Aqp4	121.0
46	Lamb2	422.3	Pdlim4	325.1	Igdcc3	122.6
47	Gdf10	426.5	Sgca	327.4	Fgfr3	122.6
48	F3	439.4	Sncaip	333.7	Mt3	123.0
49	Sdc4	441.6	Prodh1	336.7	Atp1a2	128.8
50	Hspb1	449.9	Agt	348.6	Gabrb1	129.0
51	Hes1	451.9	Slc14a1	350.2	Ndrg2	129.9
52	Slc12a4	453.2	AABR07032343.1	351.5	Ucp2	130.9
53	Mertk	457.0	AABR07035782.1	356.5	Plpp3	131.9
54	C3	477.4	Marc1	360.7	Frem1	134.2
55	AI464131	480.5	Fgfr3	360.7	Elovl2	141.3
56	Id4	481.7	AABR07070161.5	368.5	Gli2	143.6
57	Vit	483.1	AC109886.1	368.8	Efhd2	144.8
58	Fjx1	483.1	Prr5	371.1	Zic4	147.8
59	Ccdc80	495.9	Aqp4	383.9	Oplah	149.6
60	Adora2b	498.3	Plekho2	388.7	Cxcl14	150.0
61	Ryr3	503.0	AABR07035780.2	393.0	Mfge8	154.3
62	Mfge8	506.7	Sh2b2	393.0	Sox9	154.8
63	Plekho2	510.4	F3	415.7	Atp13a4	155.0
64	Elovl2	510.7	Sparcl1	423.3	AI464131	156.0
65	Fam179a	514.1	Eva1a	425.7	Pdlim4	157.0
66	Cebpb	514.9	Pltp	425.8	Rfx4	167.4
67	Acss1	520.1	Gfap	427.0	Traf1	168.9
68	Slc13a5	530.2	Cyp2d4	428.3	Dmp1	171.7
69	Ednrb	533.0	Crlf1	458.7	Gabra4	172.8
70	Pltp	536.7	Sdc4	477.1	Gja1	173.3
71	Il33	541.5	Sod3	480.6	Etv4	175.3
72	Tlr4	561.8	Dao	482.7	Map2k6	176.4
73	Fam198b	568.0	Chst1	492.9	Wwc1	177.2
74	Isyna1	570.9	AABR07001555.1	504.1	Syt10	177.4

75	Glis3	575.8	AABR07063346.1	504.2	Sparc	177.6
76	Dao	577.5	Mpp6	507.6	Tril	178.1
77	Fgfr3	577.9	Ptch2	509.2	Slc25a18	184.1
78	Ncan	579.8	AABR07031767.1	522.7	Aldh1l1	185.4
79	Msx2	580.5	AC105604.1	537.0	Eva1a	186.6
80	Spatc1	582.3	Grin2b	537.6	Mxra8	187.1
81	Pdgfrb	585.9	Pygm	547.1	Lgr6	190.6
82	Tubb2b	587.6	Etnppl	558.8	Rgma	191.5
83	Fat3	592.8	Slc15a2	586.7	Egfr	197.6
84	Fam167a	593.1	Casp4	588.1	Slc39a12	198.8
85	Col22a1	605.2	Gria1	589.6	Slc8b1	200.0
86	Tcf7l1	611.9	Slc4a4	598.0	Glipr2	200.6
87	Ndrg2	614.1	Camk2g	599.5	Axl	201.7
88	Nhsl1	617.4	Cbs	603.8	Aass	202.3
89	Ddit4l	622.4	AABR07035175.1	612.4	Hk2	205.0
90	Pbxip1	627.8	Ntsr2	630.0	Itpkb	217.6
91	Rasl12	633.6	Gja1	649.2	Ramp2	226.7
92	Sh3bp2	641.8	Aspg	650.3	Pyroxd2	227.8
93	Aplnr	646.7	Sfxn5	664.4	Gabra2	230.8
94	Robo3	655.7	Ccbe1	665.0	Tcf7l1	232.2
95	Rubcnl	660.6	Ahnak	675.9	Garem2	232.4
96	Rab34	663.3	Gramd3	677.4	Wnt6	232.6
97	Gtf2a1l	665.6	Ndrg2	682.1	Dfna5	234.6
98	Fgfr2	669.5	Mt3	695.1	Fam92b	236.3
99	Kank2	673.4	Shroom3	708.7	Plxnb1	238.0
100	Rfx4	680.3	Myh11	709.7	Vamp1	239.3

[00234] Table 23 provides the the 100 most specific genes measured by the specificity index (SI) for oligodendrocytes in human, rat, and mouse samples.

Table 23. 100 most specific genes measured by SI for each species in oligodendrocytes

Rank	Human	SI	Rat	SI	Mouse	SI
1	Klk6	46.1	Mog	51.6	Gpr37	26.2
2	Mog	46.9	Opalin	60.4	Pex5l	28.8
3	Gldn	53.3	Mobp	62.8	Hapln2	38.6
4	Cndp1	61.5	Tmem63a	65.0	Apod	42.8
5	Gm20425	64.6	AABR07006310.1	76.5	Ermn	45.6
6	Tmem98	73.2	Hapln2	93.3	Prr5l	49.8
7	Slc5a11	80.3	Klk6	101.0	Aspa	57.4
8	Mag	80.3	Qdpr	101.5	Efnb3	57.4
9	Carns1	87.2	Selplg	110.6	Anln	59.2
10	Gpr37	91.8	Cldn11	111.9	Mog	63.0
11	Cdk18	98.2	Mal	112.9	Plp1	63.2
12	Hhatl	101.9	Ermn	113.1	Plekhh1	67.7
13	Anln	107.8	AABR07046961.1	113.4	Tmem63a	72.8
14	Enpp2	114.4	Abi3	122.8	Il33	77.7
15	Folh1	134.1	Gpr37	126.0	D7Ertd443e	79.4
16	Sec14l5	135.6	Tmem88b	133.2	Sec14l5	81.8
17	Myrf	138.4	Rasgrp3	137.6	Carns1	92.8
18	Plp1	160.3	Prr5l	138.4	Tnfaip6	101.2
19	Mal	176.8	Slc5a11	141.9	Galnt6	101.4
20	Gjb1	186.0	Mag	146.4	Galnt5	102.6
21	Itga2	189.8	LOC100362909	150.9	Ndrg1	103.5
22	Cpm	192.6	Tmem176b	157.1	Cldn11	104.5
23	Plpp2	212.3	LOC100302465	157.2	Gjc2	106.0
24	Cntn2	214.9	Cx3cr1	157.3	Pla2g16	107.2
25	Ermn	215.9	Ctss	160.2	Fth1	115.0
26	Opalin	227.7	Carns1	172.2	Opalin	117.4

27	Abca8b	247.1	Tmem125	174.1	Car2	120.0
28	Lpar1	256.3	Tmem176a	175.1	Dock5	122.0
29	Pld1	256.8	Sec14l5	180.4	Gm20425	122.1
30	Sall1	274.5	Tf	183.4	Sall1	122.2
31	Cercam	278.1	C1qb	188.6	Pkd2l1	125.4
32	Dock5	286.4	Apod	194.8	Kcnk13	126.3
33	Pi16	288.8	S1pr5	195.5	Ppp1r14a	127.8
34	Man2a1	296.5	Rn60_5_1374.5	198.4	Gatm	128.6
35	Pex5l	298.2	Plp1	211.2	Serpinb1a	138.0
36	Tmem63a	321.4	Insc	215.2	Pde8a	144.8
37	Tmem125	321.7	Mbp	217.2	Tnni1	145.2
38	Gipr	321.7	Plst	224.1	Glul	147.3
39	Sh3tc2	331.4	Tmem98	232.3	Tmprss5	150.4
40	D7Ertd443e	364.8	Anln	234.5	Nipal4	151.2
41	Kel	365.2	Ndrg1	240.0	Trim59	151.2
42	Ldb3	371.4	Pafah1B1	248.8	Mal	151.3
43	Ccdc152	377.2	Pex5l	249.9	Slc12a2	151.3
44	Cldn11	383.2	LOC361016	250.0	Qdpr	156.9
45	Synj2	385.8	Galnt6	253.9	Litaf	160.3
46	Lrp2	401.5	Trim36	258.7	Gjb1	160.3
47	Ninj2	405.0	AABR07017693.1	262.2	Edil3	162.6
48	Psrc1	406.3	Gpatch4	271.2	Pls1	166.8
49	Ndrg1	406.3	Plekhg3	274.9	Mboat1	167.0
50	Actn2	409.5	Hamp	281.3	St6galnac3	168.0
51	Sgk2	412.8	Csf1r	293.7	Gng11	173.1
52	Trim59	423.5	Gjc2	295.1	Enpp2	178.6
53	Plekhg3	432.5	Car14	295.7	Cpm	180.2
54	Larp6	434.5	Trim59	297.5	Pstpip2	181.9
55	Slc45a3	438.4	AABR07053870.1	299.1	Trim36	186.4
56	Cnp	444.0	Gpr84	300.0	Klk6	188.7
57	Col4a5	446.8	Plekhh1	302.4	Myo1d	189.6
58	Pde8a	449.1	Ghr	310.7	Tmem98	192.2
59	Rhobtb1	464.7	Kndc1	311.3	Synj2	197.4
60	D16Ertd472e	479.6	Slco2b1	316.5	4933413G19Rik	197.8
61	Qdpr	482.2	Cd74	323.5	Mag	200.1
62	Enpp6	483.0	Aspa	323.5	Insc	200.3
63	Rhou	484.6	Trpv3	327.0	Pigh	201.6
64	Sema3c	487.5	AABR07008030.1	335.2	Pik3c2b	204.7
65	Gsn	489.1	Aplp1	336.1	Ninj2	206.0
66	Cyr61	491.6	Tgfbr2	345.9	Trpv3	209.8
67	Capn3	501.9	Gjb1	346.6	Car14	213.4
68	Hoxd1	504.8	Ptp4a3	347.0	Tmem125	220.7
69	Frmd4b	507.5	Prima1	347.3	Map7	220.8
70	Tmem144	509.9	Pik3c2b	347.6	Cdk18	221.6
71	Galnt6	510.0	AABR07036035.1	359.6	Depdc7	223.7
72	Pkmyt1	515.5	Sall1	371.4	Aatk	227.4
73	Fbxo32	527.0	Pipp2	373.1	Myrf	227.8
74	Pla2g16	531.3	Pld4	375.5	Cnp	232.2
75	Dpyd	534.7	Fam102b	380.4	Stmn4	232.6
76	Sh3gl3	540.0	Cd33	381.2	Chdh	237.7
77	Prima1	544.8	Cdkn1a	383.3	Nek4	244.3
78	Rasal1	545.0	Nkd1	383.4	Frmd4b	250.7
79	Fa2h	549.9	Elovl7	384.3	Ugt8a	253.3
80	Fam124a	556.2	Piga	384.7	Palm2	256.3
81	Treh	562.6	Inf2	385.2	Arsg	258.0
82	Paqr4	568.8	Blnk	386.1	Ccdc152	258.1
83	Azgp1	573.6	Enpp4	387.5	Efemp1	258.4
84	Plekhh1	586.8	Il18	394.1	Piga	261.4
85	Dapk2	588.8	Spata13	398.7	Rftn1	262.5

86	Knop1	589.4	Mettl7a	401.6	Itgb4	263.0
87	Sema3b	590.9	Inpp5d	402.1	Emilin2	263.6
88	Elovl1	593.8	Myrf	402.3	Enpp4	263.7
89	Shroom4	611.7	Gjc3	404.5	Nkain2	265.5
90	Car2	615.4	Trim2	419.0	Adamtsl4	268.0
91	Necab1	616.2	AABR07012039.1	431.2	Hcn2	272.8
92	Aspa	620.2	AABR07033887.1	431.8	Plxnb3	273.8
93	Gab1	623.3	Enpp2	432.4	Dpy19l1	274.9
94	Kif6	637.3	Pacs2	432.4	Arhgap23	276.5
95	Hhip	644.8	C1qa	435.7	Prima1	280.8
96	Ugt8a	648.8	Trem2	441.0	Gipr	281.5
97	Iqgap1	653.5	Slc45a3	441.1	Sh3tc2	284.0
98	Map6d1	656.7	Hhip	447.3	Tubb4a	285.4
99	Eln	658.9	Anxa3	450.9	Map6d1	285.8
100	Pllp	662.4	AABR07022098.1	451.6	Kctd13	286.9

[00235] Table 24 provides the the 100 most specific genes measured by the specificity index (SI) for OPCs in human, rat, and mouse samples.

Table 24. 100 most specific genes measured by SI for each species in OPCs

Rank	Human	SI	Rat	SI	Mouse	SI
1	Fermt1	102.7	Fam89a	22.2	Neu4	5.4
2	Lims2	151.6	Pdgfra	57.3	C1ql1	16.4
3	C1ql1	191.5	RGD1561849	78.4	Ppfibp1	25.6
4	Sstr1	232.5	Ribp1	80.4	3110035E14Rik	28.2
5	Olig1	233.0	Ccnd1	81.8	Pdgfra	29.0
6	Bambi	238.9	Tmem255b	94.6	Rgcc	35.4
7	Usp43	254.1	C1ql1	102.0	Susd5	37.2
8	B3gnt7	258.0	Bgn	110.2	Itga9	50.2
9	Pdgfra	305.9	Itga9	114.3	Tes	52.6
10	C1ql2	311.3	Ppfibp1	119.3	Rprm	55.6
11	Olig2	311.7	Snx22	123.4	Rep15	59.5
12	Fmo3	316.6	Col5a3	127.1	Cspg4	82.7
13	Cspg5	351.8	Pmel	137.6	Matn4	84.2
14	Galr1	353.8	Cav1	146.7	Amz1	94.8
15	Gpc2	374.2	Serpine2	153.4	1810041L15Rik	103.0
16	Fibin	400.1	Cspg4	155.4	Pxdc1	106.0
17	Cspg4	407.8	Lims2	168.2	Tox3	109.6
18	Col11a1	428.5	AABR07052897.1	177.0	Sh3bp4	115.3
19	Bche	434.9	C1ql2	189.5	Elfn1	117.8
20	Col9a1	451.3	Cdk2	193.4	Galnt3	121.9
21	Afap1l2	475.4	AABR07010022.1	195.6	Lmcd1	123.8
22	Cldn1	475.7	Cacng4	197.2	Serpine2	124.4
23	Plpp4	476.0	Matn4	202.8	C1ql2	131.0
24	Sox13	484.6	AABR07049948.1	203.2	Neto1	140.6
25	Plat	492.1	Susd5	214.6	Grm5	141.2
26	Neu4	517.4	Prkg2	215.3	Mmp2	145.0
27	D630023F18Rik	517.4	Pxdc1	219.9	Col11a2	155.3
28	Col20a1	545.7	RGD1566029	225.7	Sema3d	157.6
29	Pxylp1	555.5	AABR07003304.1	248.3	Lims2	160.3
30	Asic4	559.7	Sapcd2	262.0	Cav1	186.5
31	Spsb4	562.5	Cspg5	263.0	Sapcd2	187.0
32	Prelp	584.2	Mmp15	267.8	Rcn1	191.6
33	Gpr34	596.3	Rgcc	295.4	Ptpro	201.9
34	Best3	598.0	Slc22a6	298.1	Ccnd1	205.9
35	Stk32b	600.2	Sema5b	306.6	Ptgfrn	207.0
36	Akr1c14	600.2	Qprt	307.6	Ncan	210.5
37	Susd5	604.3	Pnlip	309.2	5730559C18Rik	210.6

38	Ophn1	607.5	Slc6a12	312.6	Lpcat2	239.8
39	Mmp16	613.8	RGD1311892	315.7	Olig2	247.2
40	Sulf2	629.8	AABR07003306.1	316.5	Fhl3	248.8
41	Prkg2	630.9	AABR07044671.1	319.5	Tspan6	260.3
42	Tns3	635.8	Rbpjl	324.7	Rin2	265.0
43	B3galt4	640.7	Chst5	348.3	Ascl1	267.2
44	Fgfbp3	643.2	Traf4	352.3	Basp1	273.1
45	Nkain3	648.2	Sox6	359.3	Pmepa1	279.3
46	Ntn1	663.5	Cox6b2	360.5	Fzd9	280.1
47	Ascl1	677.9	Pcdh15	362.2	Fam114a1	281.9
48	Sema5a	689.3	Cd101	371.9	Abhd2	285.7
49	Hrasls	692.5	Xylt1	372.0	Ctxn1	294.4
50	Gal3st4	710.2	AABR07003304.2	374.2	Cspg5	295.7
51	Ebf4	717.7	Calcrl	379.6	Cfap20	296.7
52	Tmem132d	723.2	Col1a1	387.2	Vwc2	311.3
53	Nt5e	729.2	Lama4	388.6	Cdo1	318.0
54	Jag1	739.1	Elfn1	388.8	Cdh13	325.1
55	Megf11	744.4	Ampd3	391.3	Marcks	338.1
56	Ildr2	749.1	Fam212b	422.4	Gsx1	342.0
57	Plppr1	754.8	Slc6a13	428.6	Sertm1	342.1
58	Dcc	768.5	Sstr1	438.3	Slc1a1	345.6
59	Ntn4	768.7	Sema3d	442.1	Matn1	349.0
60	Sox6	769.4	AC141997.1	449.4	Has2	351.8
61	Cacng4	775.0	Cpne7	463.5	Lama4	353.2
62	Pxdn	776.4	Ptgfrn	474.4	Mycl	358.0
63	Sapcd2	777.9	Wbscr28	489.9	Klhl5	358.7
64	Tnk2	798.9	Ryr3	500.5	Kcnh5	372.5
65	Slc43a3	803.9	Gpsm2	503.1	Kcnh8	382.4
66	Adamts6	807.1	Neto1	507.6	Sema5a	385.3
67	Vsig8	813.6	Chst11	510.1	Enpp6	386.3
68	Itm2a	816.8	Slc22a8	512.0	Slc5a7	392.1
69	Marcksl1	816.9	Pstpip2	520.2	Cav2	396.0
70	Alk	835.0	AABR07044668.1	524.1	Lbh	404.3
71	Smoc1	835.8	Bcas1	525.4	Adm	413.2
72	Cacna2d3	848.6	Igf2	527.8	Adam12	414.2
73	Tm4sf1	853.5	Lbh	528.3	S100a4	416.2
74	Bgn	863.3	Olfm2	531.1	Mfsd2a	425.5
75	Pdgfc	870.5	Ndnf	534.1	Igfbp3	431.9
76	Atp2c2	871.7	Vstm2b	537.2	Midn	433.5
77	Aldh1a3	871.8	AABR07058656.1	548.8	Asap3	436.2
78	Prrx1	881.5	Rep15	549.5	Prkg2	437.4
79	Meis3	887.1	Vtn	555.5	Rlbp1	445.0
80	Cxxc4	891.0	Eln	565.4	Abcg2	445.1
81	Cd27	905.0	Ramp1	566.8	Vstm2b	448.6
82	Sema3e	908.3	Pmepa1	568.8	Dock6	469.2
83	Adamts17	908.4	Gpnmb	571.7	Fbn1	471.8
84	Akr1c20	916.6	Ptpro	572.9	Frrs1	472.3
85	Arhgap10	925.8	Limd1	590.0	Khdrbs3	483.8
86	Crispld2	926.6	Cdh13	590.2	Slitrk6	490.0
87	Sipa1l2	941.5	Nrxn2	590.7	Chst11	496.4
88	Ppp1r36	946.5	Mgp	597.2	Ptpn14	498.3
89	Gng12	947.1	Myt1	597.4	Dpysl3	500.6
90	Syt17	955.8	Marcks	600.0	Slc44a5	501.3
91	Midn	964.5	LOC100362216	600.7	Eya1	501.7
92	Gadd45a	965.5	AABR07043601.4	601.9	Sox6	503.8
93	Khdrbs3	969.5	LOC102553018	609.8	Phox2a	504.8
94	Thbs4	971.6	Masp1	623.4	Col11a1	506.2
95	Vipr2	971.8	Sulf2	627.7	Swap70	510.3
96	Ccnd1	978.9	Tle6	628.9	Fam89a	514.6

97	Iffo1	981.5	Fam114a1	629.9	Mrm2	515.3
98	Atoh8	988.8	Tmem100	633.1	Lypd1	517.5
99	Exosc4	989.8	Ccnd2	635.5	Shisa7	519.5
100	Pde7b	992.5	Rasgef1b	640.5	Pcdh17	519.7

[00236] The rank of the 100 most specific genes was compared for each cell type in mouse with their ranks in rat or human as shown in Table 25.

Table 25. Comparision of the ranking of the top 100 most specific genes in mice

	Astrocytes		Basket		Granule		Oligodendrocytes		OPC		Purkinje
mouse	rat	human	rat	human	rat	human	rat	human	rat	human	rat
1	1	47	264	4357	15	70	45	10	600	27	1
2	12	13	2	2	37	265	26	35	1	3	6
3	20	17	126	4	7	13	29	104	13	227	2
4	28	76	23	26	6	1	20	142	6	852	5
5	1722	1090	204	8824	64	2253	8	25	7	9	11
6	23	45	15	1	34	10	5	143	50	990	16
7	3	3	1	60	35	55	105	92	18	37	4
8	1308	3783	293	4383	3	379	8863	7340	5	206	9
9	21	24	328	972	111	60	37	13	4703	2538	29
10	522	6650	372	8	11	43	3	2	7430	510	22
11	133	4139	100	5	46	102	42	18	34	404	8235
12	673	9	389	5538	24	48	38	84	11	17	103
13	106	111	114	3927	134	108	6	36	37	2309	3
14	40	5048	167	124	20	7	6435	8267	28	393	39
15	1460	740	175	110	9	256	10	40	32	8158	13
16	6	1	78	862	27	2	49	16	31	394	104
17	11	792	30	3	19	52	12	9	205	215	3873
18	13	4842	77	37	31	198	581	6889	167	176	299
19	15	163	295	32	354	290	51	71	56	842	23
20	72	1332	5	38	51	17	297	8969	988	376	21
21	206	212	7	66	21	64	28	48	1363	5522	27
22	78	130	38	12	309	118	25	44	10	942	10
23	10	19	3822	8712	30	21	50	282	36	10	17
24	43	5	251	243	114	39	121	74	46	556	35
25	116	9402	5703	261	2	32	140	504	135	532	41
26	49	567	3	88	4	95	1	26	343	406	115
27	409	88	142	210	28	63	71	90	677	1507	8
28	19	1960	2328	10814	17	49	44	32	30	170	32
29	48	63	376	8814	530	80	9	5	8	2	84
30	80	277	265	18	63	74	21	30	24	3271	70
31	1427	3174	24	105	1754	6156	3939	3733	17	63	30
32	2	1242	25	940	173	9	216	5681	168	178	18
33	135	53	73	9	83	112	143	103	25	218	28
34	34	49	440	546	23	65	147	728	4	96	12
35	36	334	5797	7520	116	20	5801	1381	40	245	7
36	42	119	8	40	88	625	127	58	67	2759	259
37	7	56	107	1145	163	9842	5690	3895	19	732	85
38	8	29	36	33	112	66	426	532	1642	7662	265
39	154	229	64	1009	14	220	122	5578	179	11	194
40	6269	8709	37	170	40	215	43	484	4013	1426	90
41	91	857	247	195	181	1702	39	52	367	1584	87
42	39	70	61	10523	361	179	18	19	284	102	4308
43	71	44	1388	7060	195	585	189	578	868	47	142
44	5262	6687	4638	1390	796	7672	7	61	649	5147	1343
45	27	6	291	64	25	160	65	20	110	7420	187
46	46	77	3908	7424	438	570	135	129	4851	776	111
47	844	4527	9153	1207	106	610	480	216	92	1597	57

48	121	42	163	258	120	27	16	8691	342	283	2074
49	107	43	42	4247	227	38	9461	275	403	1115	160
50	35	117	86	80	33	202	88	422	52	13	290
51	111	87	322	1772	283	139	3729	5037	80	1307	26
52	2510	866	315	111	194	152	117	14	160	561	176
53	14	510	686	361	5	6832	184	22	2295	1371	135
54	7903	961	147	77	142	59	1791	7297	98	571	76
55	245	64	20	7121	424	4012	35	1865	114	531	2751
56	119	129	1007	10147	539	174	2	1	3540	649	583
57	142	669	1368	1201	97	18	304	121	4627	3243	72
58	902	552	46	208	92	1645	46	6	416	1204	175
59	609	529	719	684	655	100	229	45	379	1053	358
60	16	619	10	95	44	187	19	386	253	211	54
61	463	62	2364	7818	2380	239	11	7	39	610	380
62	262	32	194	159	191	687	31	3559	93	7046	64
63	3965	276	99	277	6504	756	136	228	262	1118	108
64	38	55	7929	3329	857	126	79	400	1654	380	51
65	29	152	128	4321	2183	3867	94	47	753	311	9464
66	139	100	1010	448	900	23	48	248	145	48	92
67	####	6607	486	30	128	199	22	259	556	5275	192
68	3210	2430	187	851	362	10149	17	38	6616	2501	388
69	415	101	16	144	75	148	134	246	61	3906	37
70	32	2	12	113	818	426	264	11	154	207	4697
71	335	3239	113	39	1712	234	34	1146	378	3535	74
72	74	200	8240	1044	1593	325	854	141	3172	601	166
73	221	127	143	1623	5608	8368	83	17	5945	3157	59
74	8281	3977	97	61	4575	2835	72	56	3107	3621	236
75	164	249	633	9775	93	37	418	1483	9799	6801	102
76	144	10	402	2003	2534	2970	9635	6045	289	91	44
77	4	643	281	330	119	47	8154	7468	300	355	1030
78	22	31	355	279	3891	2291	318	69	15	41	1554
79	31	5791	2634	502	174	3874	123	96	3	4330	140
80	1740	691	69	4200	108	792	392	295	7959	208	153
81	143	8	162	8045	160	435	5860	11188	100	287	323
82	59	7	193	849	1940	933	155	43	113	3334	158
83	4611	727	208	3878	1184	135	2751	6855	2299	1195	42
84	1295	1264	72	14	7925	9944	27	2119	2774	3890	4391
85	311	1401	151	99	228	1966	709	9289	1524	93	56
86	3028	597	119	11044	50	5724	7658	7379	1734	681	101
87	62	250	245	3903	1118	1458	197	4043	59	135	9072
88	277	439	82	191	336	1032	24	288	147	169	33
89	1222	558	3237	9174	100	16	226	1471	538	318	31
90	607	151	2576	346	1207	5396	6314	10145	254	145	136
91	1329	796	31	58	1556	2075	493	303	701	3045	489
92	180	762	170	79	6095	35	668	170	26	60	69
93	89	27	285	272	1122	1884	58	1538	7641	4408	2335
94	88	86	311	1523	677	8020	169	226	720	18	201
95	96	115	127	24	311	143	81	77	387	3902	95
96	962	4060	172	10414	379	3235	154	37	2	374	19
97	426	166	11	87	71	842	432	39	1932	5835	120
98	155	3563	2531	157	290	4104	201	761	209	348	156
99	340	288	299	1962	5142	8316	182	98	75	122	82
100	5745	1281	1498	1174	109	45	4319	6562	699	411	122

[00237] The specificity rank was observed to be more conserved between mouse and rat than mouse and human.

Example 10. Determining the extent that cell-type specific genes vary across species

[00238] To explore further the extent to which cell-type specific genes change across species, the comparative analysis was focused on the data from mouse and human nuclei samples because the annotation of the rat genome is less complete. By excluding rat genes, the number of high confidence orthologs that could be used for comparison increased from 11,443 to 14,273 by filtering the ENSEMBL orthologs.

[00239] Furthermore, to focus on differentially expressed genes that are most likely to impact cellular function, genes were selected that passed a stringent adjusted p-value cutoff of <0.01, that changed by at least 4-fold between species, and that are expressed at significant levels in each cell type (average number of counts > 400 and fpkm>0). The number that were left after filtering for expression levels (baseMean > 50, log10(fpkm) > 0), and the number that were left after filtering for genes that are differentially expressed across all cell types between mouse and human were broken down into human and mouse enriched genes as shown in Table 26.

Table 26. Enriched genes

Cell Type	p<0.01 fc>4	baseMean>50 log_{10}(rpkm)>0	Exclude general species genes	Human enriched	Mouse enriched
Granule	1776	710	202	74	128
Basket	2372	823	236	103	133
Astrocyte	1570	778	293	117	176
Oligo	1326	667	182	104	78
OPC	1013	490	133	73	60

[00240] According to Table 26, between 490 and 823 genes were identified that are mouse- or human-enriched in these cell types.

[00241] To identify cell-type and species differences rather than general differences between mouse and human, genes that were observed to be differentially expressed in all cell types analyzed (adjusted p <0.01, fold change > 2) were removed from the analysis. Filtering in this way yielded between 133 and 293 cell-type and species specific differentially expressed genes that were approximately equally distributed between those enriched in mouse and those enriched in human.

[00242] To confirm these data, the abundance of granule cell neurons relative to all other cell types in the cerebellum allowed two types of validation that could not be obtained for less abundant cell types: first, in addition to assaying the expression of nascent nuclear RNAs, the expression of mature cytoplasmic RNAs was examined; second, given the high fraction of granule cell genomes present in cerebellar nuclear preparations, chromatin accessibility was assessed using unsorted cerebellar nuclei. Since previous studies have demonstrated that ATACseq peaks are typically found in the promoters and gene bodies of expressed genes and severely reduced or absent from genes that are not expressed (Buenrostro, et al. (2013) Nat Methods 10, 1213–1218; Mo, et al. (2015) Neuron 86, 1369–1384; Su, et al. (2017) Nat.

Neurosci. 20, 476–483, each of which is hereby incorporated by reference herein in its entirety), ATACseq data from mouse, rat and human cerebellar nuclei was used to confirm the expression data.

[00243] As expected, protein coding genes that were identified as expressed in the data from the cellular profiling technique described herein from all three species were accompanied by the presence of spliced cytoplasmic mRNAs, and ATACseq peaks were evident in their promoters and gene bodies. For example, the housekeeping gene Gapdh and the granule-specific gene Etv1 are strongly expressed in granule cells of mouse, rat, and human. As expected, the presence of nuclear RNA, cytoplasmic RNA, and ATACseq peaks over these genes were observed. But for the human-enriched genes Clvs2 and Vwc2, while these three independent measures of active expression were present in the human data, no expression or chromatin accessibility was evident in the mouse data. Conversely, for the mouse-enriched genes Cnksr3 and Ece1, nuclear and cytoplasmic RNA expression and ATACseq peaks were observed in the mouse data, but not the human data. As expected, expression of these genes in rat was similar to a mouse, although low levels of the human-enriched genes Clvs2 and Vwc2 were observed to be present in rats.

[00244] Two additional features of expression between mouse and human were identified. Changes in expression may involve more than one gene at a given genomic interval. For example, in the locus containing G Protein-Coupled Receptor 135 (Gpr135), Trans-L-3-Hydroxyproline Dehydratase (L3hypdh), JNK1/MAPK8-Associated Membrane Protein (Jkamp), Ccdc175, and Reticulon 1 (Rtn1), all five genes were expressed in human granule cells as revealed by nuclear and cytoplasmic gene expression and the presence of ATACseq peaks in FIG. 4. Jkamp, L3hypdh, and Gpr135 were also observed to be expressed in mouse and rat, as supported by the presence of promoter DNA accessibility sites shown by the ATACseq peaks, but were expressed at much lower levels relative to their human orthologs. Rtn1 was observed to be expressed at a lower level in mice than in rats and humans, although different patterns of ATACseq peaks were observed for each sample. In mouse and rat, Ccdc175 was not observed to be expressed and no ATACseq peaks were observed. This indicates that the genes in this region form two distinct domains – one containing Rtn1 and the other containing Gpr135, L3hypdh, Jkamp, and Ccdc175. Gpr135, L3hypdh, and Jkamp are equally accessible to ATACseq in the rodent data. Therefore, the reduced nuclear and cytoplasmic RNA levels of these genes was likely due to changes in chromatin structure of the neighboring and non-expressed gene, Ccdc175.

[00245] A second feature of the expression between mouse and human data showed that changes sometimes involve expression of alternative family members in a given cell type. For instance, the Pde1 gene family contains the three calcium and calmodulin-dependent

phosphodiesterase Pde1a, Pde1b, and Pde1c. These enzymes catalyze the hydrolysis of cAMP or cGMP, and play important roles in modulation of neuronal activity. ATACseq was used to confirm that mouse granule cells mouse express only Pde1c, whereas granule cells from human express high levels of Pde1a and low levels of Pde1c. These results matched previous findings that Pde1a is expressed in the human but not mouse cerebellum in Loughney, K., & Ferguson, K. (1996) Phosphodiesterase inhibitors (pp. 1-19); Loughney, et al. (1996) J Biol Chem 271, 796–806; and Sonnenburg, et al. (1993) J Biol Chem 268, 645–652; each of which is herby incorporated by reference herein in its entirety. Since Pde1a preferentially hydrolyzes cGMP while Pde1c hydrolyzes both cAMP and cGMP with equal efficiencies (Takimoto, E. (2009) Circ. Res. 105, 931–933, which is hereby incorporated by reference herein in its entirety), these differences may result in slightly different biochemical consequences in mouse and human cerebellum.

[00246] To confirm the presence or absence of these mRNAs in the mouse brain, publicly available gene expression data from the Allen Mouse Brain Atlas and GENSAT Project (Gong, et al. (2003) Nature 425, 917–925; Lein, et al. (2007) Nature 445, 168–176, each of which is herby incorporated by reference herein in its entirety) was analyzed. These data confirmed expression in the granule layer of the cerebellum for granule-specific marker Etv1 and the mouse-enriched genes Cnksr3, Ece1, and Pde1c, and the absence of expression of the human-enriched genes Ccdc175, Clvs2, Vwc2, and Pde1a. Interestingly, while Clvs2 and Pde1a are absent from the cerebellum, they are expressed in other regions in the mouse brain, suggesting that alterations in cell specific regulatory sequences might underlie these species differences (Carroll, S.B. (2005) PLoS Biol 3, e245; Carroll, S.B. (2008) Cell 134(11), 25–36; each of which is hereby incorporated by reference herein in its entirety). Ece1 expression is also observed in the Purkinje layer of the cerebellum. Expression of the human enriched genes Ccdc175, Clvs2, Vwc2, and Pde1a was observed in the mouse brain. No staining was detected in any region for Ccdc175 and Vwc2. Strong staining of Clvs2 was observed in the dentate gyrus and of Pde1a in layers 5 and 6 of the cortex and CA1-3 of the hippocampus.

[00247] To further validate the data, qPCR was used to determine the relative expression of mouse- and human-enriched genes. qPCR analysis of gene expression was performed for housekeeping, human enriched, and mouse enriched genes using human and mouse cerebellar cytoplasmic cDNA. Two biological replicates, each with three technical replicates were used for each species. Expression was normalized to the arithmetic mean of expression from the three housekeeping genes. Fold change was calculated relative to expression in the human XK sample. p-values were calculated using two-tailed students t-test assuming unequal variance with the mean normalized values for the biological replicates (technical replicates averaged), and are as

follows: 1) housekeeping genes - Actb=0.334, Gapdh=0.141, and Polr2a=0.109; 2) human-enriched genes - Clvs2=0.0195, Vwc2=0.0161, and Pde1a=0.00086; and mouse-enriched gene - Pde1c=0.0696. p-values could not be calculated for Ccdc175, Cnksr3, and Ece1 because all technical replicates of at least one biological replicate failed to amplify.

[00248] In all but one case, the qPCR results confirmed the RNAseq and ATACseq data. In the outlier case, Pde1c showed no significant changes in expression between mouse and human. To understand this discrepancy, expression of Pde1a and Pde1c was assayed in mouse and human cerebellar sections by immunofluorescence. Staining was performed at least two times each using sections from two separate mice and two human donors. NeuN was the marker for granule cells. Consistent with the RNAseq and ATACseq data, both Pde1c and Pde1a members were observed to be primarily localized in the granule layer, with Pde1c expression predominant in mouse and Pde1a expression predominant in human cerebellum. Mouse cerebellum showed Pde1c specifically in granule cells and background labeling for Pde1a, while human cerebellum showed Pde1a specifically in granule cells and background labeling for Pde1c.

[00249] To understand whether these genes might reflect changes in expression that occur independently, or transcriptional programs that are altered between species, Gene Ontology (GO) analysis was performed for the ten categories of species-specific genes. Four groups of genes resulted in significant GO groups: human-enriched astrocyte, human-enriched oligodendrocyte, human-enriched OPC, and mouse-enriched granule genes. The remaining 6 gene sets were not observed to have any significantly associated GO categories suggesting that species differences in these cell types contribute to a wide range of pathways and functions. GO analysis of human-enriched genes from astrocytes, oligodendrocytes, or OPCs revealed that these genes are involved in cellular structure, size regulation, and nervous system function, potentially reflecting known differences in morphology between mouse and human glial cells. Granule cell mouse-enriched genes are involved in nervous system function and the metabolism of polysaccharides that may play a role in cell-cell interactions.

[00250] Taken together, these data demonstrate that cellular profiling technique described herein can be employed with nuclei to accurately assess cell-type specific gene expression in rodent and human brains, and gene expression in the nervous system. Gene expression in the brain was observed to be highly conserved in specific cell types across species. Accordingly, most abundant and cell specific markers of well-characterized cell types were observed to be shared between the rodent and human brain. Despite this shared identity, there were a significant number of genes in each cell type whose expression was not conserved between species. This group of genes does not generally conform to known GO categories, and in many cases their expression is found in other brain regions. Cell type and species-specific expression can reflect

altered regulation of adjacent genes within a locus, or selective expression of functionally related yet distinct members of a given gene family. Although the consequences of these gene expression changes will have to be interrogated in future studies, the data herein demonstrate that functionally important differences in gene expression in specific CNS cell types occur between species and suggest that they may result in important differences in the biochemical functions of rodent and human cell types.

Example 11. Comparing the nuclear transcriptome of mice and humans

[00251] Immunofluorescence was used to determine whether sorting resulted in pure populations in human samples. The nuclear structure was observed to be quite different between the three populations, and the nuclei in each of the populations was different in size. NEUN+ granule neurons were observed to be small and highly heterochromatic. The size of NEUN- nuclei was observed to be mixed between larger nuclei likely from Bergmann glia and smaller nuclei likely from oligodendrocytes. ITPR1+ nuclei were observed to be bigger and more euchromatic than the nuclei in the other two groups. FIG. 6 shows flow cytometry sorting results to approximate the size of the nuclei with the combination of forward-scattered light (FSC) and side-scattered light (SSC). (DP =double positive). These results show that nuclei from different cell types are distinct in nuclear structure, which may result in differences across each cell type in gene expression regulation or in disease susceptibility.

[00252] Although, heterogeneity of nuclei sorted from two different human subjects (Person 1 and Person 2) was observed in the flow cytometry results in FIG. 5A and FIG. 5B, respectively. Species specific markers may be identified to differentiate nuclei from different cell types.

[00253] FIG. 7A, FIG. 7B, FIG. 7C, and FIG. 7D provides flow cytometry results for 4 different staining strategies for human cerebellar nuclei developed from strategies used to sort nuclei in mice. FIG. 7A shows flow cytometry results from gating with Itpr1 and Id2 for purkinje cells, i.e., Itpr+ and Id2+. FIG. 7B shows gating with Forkhead Box P4 (FoxP4) and Itpr1 for purkinje cells, i.e., FoxP4+ and Itpr+. FIG. 7C shows gating with NeuN and Itpr1 for granule cells using the same sorting strategy used in mice, i.e. Itpr- and NeuN+. FIG. 7D shows gating with Foxp4 and NeuN. The lightest gray population in all four staining strategies provided the same population of nuclei as shown by gene expression profiling from RNAseq that is shown in Table 37.

[00254] Gene expression profiles from RNAseq results from mouse and human sorted nuclei are shown in Examples 15 and 17, respectively. The granule cell nuclei population in Table 37 of Example 17 was observed to have a similar profile to the granule cells from a mouse, as shown in Table 31 of Example 15. The glia nuclei population in Table 37 was observed to have a

similar profile to the glia from a mouse (Tables 33 and 34). The basket nuclei population from human samples in Table 37 was observed to have a similar profile to basket/stellate cells from mice in Table 32. These similarities were particularly noticeable in the RNAseq results for Rbfox3 (also known as NeuN), Fat2, Ryanodine Receptor 1 (Ryr1), Pvalb, Glutathione S-Transferase Mu 1 (Gstm1), and Pleiotrophin (Ptn).

[00255] In constrast, significant variations were observed bewteen a mouse and a human in the RNAseq data in Tables 31-34 and 37 for Protein Tyrosine Kinase 2 Beta (Ptk2b), Solute Carrier Family 43 Member 2 (Slc43a2), Glutamate Ionotropic Receptor Kainate Type Subunit 3 (Grik3), Itpr1, Protocadherin 9 (Pcdh9), and RAS Guanyl Releasing Protein 1 (Rasgrp1)-positive nuclei from granule, basket/stellate, and glia cells.

[00256] Hierarchical clustering (first by species, and then by cell type) of nuclear RNAseq data from the top 500 genes that contribute to the greatest variation between the samples, hence best differentiate one sample from another showed some groups of genes that differentiate between cell types and other groups of genes that differentiate between species. This analysis reveals genes that are conserved and divergent between mice and human.

[00257] A principle component analysis of the mouse and human cerebellar samples allows visualization of clustering by cell type and by species. The first principle component (x-axis) represents the largest variation between the samples, and the second principle component represents the second largest source of variation between the samples and how they separate by cell type. The analysis herein showed that cell type contributes to X% of the variance between samples while species contributes to Y% of the variance between samples.

Example 12. Identifying cell type and species-specific genes from cross-species comparisons

[00258] Given the high quality of the cell specific expression profiles described above, the extent of gene expression changes between species in these cerebellar cell types was analyzed. To ensure that the results reflected altered expression rather than differences in annotation between species, the analysis was limited to high confidence 1:1 orthologs between mouse, rat, and human. To define ortholog annotations for mouse, rat, and human genes, ortholog annotation across species were downloaded from ENSEMBL (304,147 transcripts vs. 19,197 genes), and filtered to include only: high confidence pairs (76,172 transcripts vs 14,541 genes)→ 1:1 orthologs (67,522 transcripts vs.13,242 genes)→ genes greater than 1kb in total length and that change by less than 2-fold in length across species (30,497 transcripts vs. 11,443 genes). For each gene, the longest orthologous transcript was used for annotation resulting in 11,443 transcripts and 11,443 genes.

[00259] The log2 fold change in expression for the 250 most variable genes across mouse, rat, and human nuclei between the normalized RNAseq results from the nuclei of the seven cells types compared to the RNAseq results for the sorted nuclei from each individual cell type is shown in Table 27. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed. Two replicate samples of nuclei from each cell type was analyzed.

Table 27. Log2 fold change of expression for nuclei from rat samples

Cell types	Granule		Purkinje		Basket		Astrocytes		Oligodendrocytes		Oligodendrocytes & OPCs	
Gene	Log2 fold change in expression											
1810041L15Rik	1.19	0.19	-2.21	-1.89	1.56	1.79	2.87	3.64	2.42	4	8.39	6
2810459M11Rik	-1.87	-2.02	-2.3	-2.18	-1.68	-1.65	0.16	-0.23	-1.76	-2.52	1.47	1.23
3110035E14Rik	-2.28	-2.15	-3.05	-2.71	-1.63	-0.98	0.71	0.86	-2.04	-1.72	4.07	4.27
A2m	-2.89	-2.47	-1.33	-1.55	-2.91	-2.17	-0.7	0.49	-2.38	-2.03	-2.43	-2.81
Adamts15	0.23	-1.13	-1.44	-1.21	3.42	3.8	2.77	2.98	-0.48	0.17	1.13	2.4
Adra1a	-1.04	-1.28	-2.07	-1.83	-1.2	-0.87	1.55	1.61	-0.71	-0.62	1.01	1.17
AI593442	-1.5	-2.54	3.52	3.57	-0.43	-1.32	0.27	-0.85	-2.36	-2.38	-0.52	-0.77
Aldh1a1	-2.46	-1.56	-2.11	-1.98	-2.49	-1.2	0.95	0.1	0.35	0.64	-1.51	-2
Anln	1.19	1.14	-2.07	-2.13	-0.76	-0.79	0.82	-0.1	3.91	3.88	0.28	-1.69
Apcdd1	-1.48	-2.27	-2.44	-2.42	1.69	1.42	0.36	-0.22	-1.54	-1.82	-0.47	0.39
Apod	-0.76	-0.56	-0.92	-1.05	0.31	0.76	2.53	2.03	4.94	5.15	2.74	2
Aqp4	-1.01	-1.27	-1.73	-1.54	1.06	1.03	4.34	3.59	1.55	2.08	1.26	-0.24
Arhgef33	-1.65	-1.97	7.41	7.38	-2.03	-2.29	-2.43	-2.2	-1.67	-2.04	-1.3	-0.78
Ascl1	-1.85	-1.35	-1.96	-2.09	-0.81	-0.22	-1.32	1.34	-2.16	-1.75	1.51	-0.46
Asgr1	-2.55	-2.24	-2.24	-2.38	1.46	1.14	0.35	1.83	-1.33	-0.74	-2.62	0.28
Aspa	-1.4	-2.09	-1.62	-1.63	-0.99	-0.87	0.13	-0.99	3.66	3.02	1.59	0.26
Atp1a2	-2.63	-2.39	-2.36	-2.34	0.41	0.43	3.29	3.34	0.36	0.38	2.43	2.45
Atp2a3	-0.3	-0.36	5.82	5.86	-0.73	-0.79	-1.15	-0.17	0.68	0.28	-0.1	-0.55
B3gnt5	-2.93	-2.34	2.81	2.77	-2.95	-2.94	-2.76	-2.88	-3.11	-2.86	-2.98	-2.14
B3gnt7	1.65	1.97	-1.88	-1.4	-0.66	0.34	1.43	1.25	0.46	-0.92	3.59	3.78
Bcl11a	-0.01	-0.03	6.76	6.55	-1.16	-1.58	-1.72	-0.69	-0.94	-0.97	-0.19	-0.97
Bhlhe22	-1.16	-2.23	-1.69	-2.35	2.83	2.54	1.27	1.01	-0.49	-1.41	-2.2	0.49
C1ql1	-1.82	-1.57	-2.26	-2.78	-0.6	-0.49	2.24	2.65	-1.27	-1.69	5.84	5.17
C1ql2	-1.41	-1.52	-1.51	-1.65	1.62	0.8	0.71	1.14	-0.24	-1.31	3.86	5.15
Cacna1g	1.48	1.57	4.57	4.75	1.7	1.72	-0.09	0	-1.26	-1.4	-0.56	0.06
Cacng4	-2.16	-2.25	-2.84	-2.83	-1.48	-1.11	1.64	1.71	-0.89	-1.19	3.54	3.52
Calb1	-1.69	-1.98	6.9	6.88	-1.64	-0.74	-1.37	-1.39	-0.98	-1.25	-1.82	-2.29
Camk1g	-0.11	0.82	-1.54	-1.44	4.12	4.13	3.71	4.04	1.26	1.32	3.78	3.72
Car8	-1.15	-1.57	7.24	7.51	-2.22	-1.99	-2.17	-2.03	-1.78	-1.82	-0.12	0.3
Carns1	-2.58	-2	-1.77	-2.42	-1.17	-1.87	0.19	0.96	3.57	3.56	-2.64	-2.18
Casq2	0.81	0.5	5.41	5.45	-1.44	-1.32	-1.27	-0.32	-1.25	-0.8	0.17	-0.97
Cbln2	-1.07	-1.18	-1.18	-1.3	-0.13	0.48	-1.42	-1.36	-1.37	-0.98	-0.2	0.06
Ccdc152	-0.11	-1.44	-1.43	-1.75	-1.3	-2.08	0.09	-0.09	2.34	2.01	-2.16	-1.06
Ccdc180	-0.2	-0.25	-0.69	-0.98	-0.83	-1.52	-1.27	-0.77	-1.36	-0.77	-0.16	-1.38
Ccnd2	-1.11	-1.18	-1.02	-1.36	-1.32	-1.41	-0.59	-0.31	-1.07	-0.07	2.05	2.15
Cd82	1.13	0.88	0.33	0.15	-0.48	-0.57	1.08	1.32	3.61	3.73	1.52	-0.35
Cd9	-1.96	-1.73	-2.23	-1.7	-1.07	-0.97	1.56	1.66	2.43	2.77	3.24	3.83
Cdh19	-1.46	-1.5	-1.45	-1.7	-1.97	-1.48	-0.52	-0.78	2.23	2.09	-1.4	-1.54
Cdhr1	-0.19	-2.09	-0.82	-1.68	-2.01	-0.41	0.24	-0.32	-1.76	-0.78	3.02	3.03
Cldn11	-1.76	-2.05	-1.6	-2.35	-0.98	-0.54	1.09	0.47	5.2	5.34	2.29	1.33
Clec7a	2.43	0.82	0.43	0.58	1.29	-1.02	-0.53	-1.33	1.63	0.16	-1.11	0.17
Clmn	-2.26	-2.39	2.76	2.65	-1.47	-1.64	0.85	0.89	2.55	2.48	0.71	-0.59
Cmtm5	-2.78	-2.07	-2.83	-2.89	-0.11	0.35	3.59	4.14	4.36	4.51	3.44	2.62

Cntn3	-1.77	-1.79	3.87	3.83	-1.85	-1.55	-0.17	-0.69	-2.16	-2.45	-1.07	-0.8
Cntnap5a	0.76	0.43	2.79	2.7	-1.23	-1.29	-1.44	-0.91	-1	-0.79	-0.18	-0.78
Cobl	-1.52	-1.82	-0.99	-0.93	-2.02	-2.09	-1.32	-1.27	1.99	1.59	0.9	1.1
Col5a3	-1.13	-1.13	-2.29	-2.52	-1.14	-0.73	1.25	2.22	-0.44	-0.88	4.74	4.54
Col6a1	-0.41	-1.72	3.91	-0.81	-0.47	-1.01	-0.69	0.87	-1.24	-1.73	2.16	0.49
Cpm	-0.66	-0.78	-1.35	-1.57	-0.98	-0.9	0.38	0.21	3.39	3.66	3.05	2.33
Cryab	-2.69	-2.42	-2.77	-2.3	-1.48	-2.01	0.42	-0.24	2.78	2.45	1.63	1.45
Cspg4	-2.17	-2.1	-2.09	-2.16	-0.71	-0.62	1.57	2.19	1.8	1.26	4.68	4.86
Csrp1	-1.99	-1.59	-2.37	-2.35	-0.98	-0.69	2.1	2.29	3.63	3.69	1.28	-0.43
D7Ertd443e	-1.36	-1.65	0.31	0.08	-1.35	-1.2	-1.08	-1.52	3.92	3.76	0.24	-0.85
Ddx3y	1.49	-2.38	2.03	-2.53	1.64	-2.96	1.4	-2.46	2.15	-2.56	2.16	-2.88
Dock5	-1.2	-1.34	-1.92	-1.31	-0.99	-0.82	0.91	0.2	3.71	3.64	1.89	-0.52
Dpy19l2	-1	-1.28	-1.23	-1.53	-1.84	-1.42	-1.65	-1.31	-0.84	-0.65	-0.66	-1.68
Ebf2	0.49	0	4.96	4.73	-0.5	-0.28	-0.16	0.03	-0.36	-0.28	0.95	0.92
Echdc2	-2.05	-2.44	-2.44	-1.65	-1.98	-1.33	-1.98	-2.51	-2.76	-2.6	-2.27	-2.47
Efna5	-0.72	-0.48	2.57	2.59	-0.71	-0.88	-0.8	-0.81	-2.29	-1.55	-0.98	-1.54
Enpp2	-2.15	-2.12	-1.57	-1.12	-0.36	-0.07	1.33	0.94	3.9	3.99	1.3	1.39
Erbb3	-1.1	-1.58	-2.59	-2.33	-1.51	-1.23	-0.31	0.55	2.92	2.65	3.12	2.67
Ermn	-2.61	-1.56	-1.55	-2.43	-0.87	-0.32	1.24	-1.16	4.52	4.42	-1.34	-0.23
Etnppl	-0.93	0.43	-1.47	-1.66	-0.01	-0.68	3.06	2.73	1.11	1.34	0.09	-1.68
Fa2h	-1.94	-2.17	-2	-2.28	-1.22	-0.94	0.67	-0.02	3.65	3.62	1.81	2.38
Fam46a	-1.39	-1.55	-2.11	-2.24	0.36	0.04	-1.27	-2.3	1.01	1.05	-1.5	-0.08
Fgfr2	-2.49	-2.54	-2.18	-3.01	0.38	0.32	1.92	2.05	3.52	3.5	1.18	0.76
Flrt2	-1.36	-1.25	-1.31	-1.5	1.93	1.87	-0.14	0.06	-2.38	-1.74	1.23	1.67
Fmo3	-0.52	-0.5	-1.01	-1.23	-1.54	-1.51	-1.06	-1.19	-0.96	-1.73	-0.54	-0.76
Folh1	-1.98	-1.65	-0.42	-0.59	-0.52	-0.29	2.44	2.04	2.44	2.17	0.87	1.26
Foxh1	2.18	2.29	3.51	3.05	2.67	2.39	2.1	2.45	0.57	0.29	1.32	1.11
Fsip2	-0.42	-0.71	-1.48	-1.69	-1.52	-1.49	-1.87	-1.78	-1.36	-0.65	-0.18	-0.83
Fxyd1	2.44	1.78	-2.6	-1.44	0.62	0.83	4.27	5.25	0.58	0.86	1.8	0.25
Fxyd7	3.03	3.49	-0.76	-0.74	-0.52	-0.03	3.25	4.03	-0.44	0.31	1.14	1.6
Gad2	-1.77	-1.95	2.11	1.85	2.84	2.8	1.71	1.51	-0.77	-0.93	1.59	2.36
Gal3st1	-0.87	-1.35	-1.8	-1.44	-1.34	-1.17	0.94	1.84	3.42	3.92	4.71	3.49
Galnt5	-1.52	-1.16	-2.13	-1.37	-2.24	-2.85	-1.45	-1.47	2.16	2.25	-1.33	-1.71
Galnt6	-0.78	-0.48	-0.86	-1.39	-1.71	-0.68	0.62	-0.26	4.15	4.13	0.92	0.72
Galr1	-0.5	-1.12	-0.88	-1.58	-2.22	-1.23	-1.13	-1.41	-0.53	0.25	-0.64	-1.61
Gdf10	-0.65	-1.82	-1.07	-1.76	1.37	1.91	4.69	4.91	0.64	0.47	-1.33	-2.28
Gfap	-0.66	-1.04	-1.65	-1.02	0.97	1.07	4.31	4.76	1.91	2.86	3.03	0.26
Gja1	-2.41	-1.54	-2.28	-1.84	0.38	1.13	3.61	3.7	1.49	1.93	1.63	1.5
Gjb1	-0.95	-1.14	-0.73	-1.59	-2.2	0.35	0.83	-0.37	3.97	3.8	0.05	2.09
Gjc2	0.35	-0.11	-2.31	-0.2	-0.17	0.83	1.36	1.42	4.07	4.66	1.47	0.68
Gldn	-0.7	-0.62	-0.9	-0.8	0.6	0.12	-1.34	-0.86	-1.55	-1.5	-1.27	-1.55
Gli1	-1.52	-1.43	-2.48	-1.86	0.67	0.87	3.84	4.12	-0.02	-0.69	-1.38	-0.34
Glp2r	-1.23	-1.74	-1.93	-2.27	-1.99	-2.06	-1.81	-1.02	-2.02	-2.48	-1.09	-0.49
Glul	-1.82	-2.14	-1.95	-2.16	-0.6	-0.49	2.04	2.31	3.18	3.28	1.16	-0.18
Gm136	-1.2	-0.95	-1.57	-0.08	0.51	0.28	0.33	1.28	-0.9	0.02	-1.16	-0.41
Gnb3	2.45	0.53	-0.36	0.05	2.16	1.76	1.43	1.06	-1.65	0.74	0.56	1.13
Gng11	-1.12	-0.35	-1.22	-1.35	-1.14	-1.13	-0.7	-1.41	-1.41	-1.02	-1.19	-1.36
Gpr37	-0.75	-1.26	-0.37	-1.48	-0.47	-0.15	1.49	1.51	5.01	4.93	1.03	0.2
Gpr37l1	-2.4	-2.53	-2.27	-2.95	-0.56	-0.17	3.14	3.57	0	0.02	3.64	2.54
Gpr63	-0.91	-1.26	4.72	4.71	-0.1	0.42	-1.15	-1.14	0.44	0.21	-1.37	-0.78
Gpx2	0.63	0.63	-1.22	-1.01	-1.8	-1.78	-0.69	0.26	-1.5	-1.66	-1.18	0.62
Gramd3	-2.44	-2.82	-2.7	-2.89	-0.28	-0.17	2.42	2.39	0.91	0.94	0.83	0.42
Grb14	-0.58	-0.8	2.06	1.95	1.42	1.47	0.64	0.9	2.39	2.85	2.34	2.3
Gria3	-2.79	-2.97	2.31	1.97	2.18	2.13	1.13	0.51	-1.3	-1.09	-0.06	0.8
Grik3	-1.75	-1.94	-2.31	-2.34	3.39	3.41	1.97	2.17	-0.63	-0.23	1.43	2.09
Grm1	0.14	0.29	2.75	2.65	1.42	1.42	0.29	-0.15	-1.5	-1.57	-1.83	-0.84
Grm5	-1.39	-1.63	-1.61	-1.75	-2.06	-1.96	-0.49	-0.46	-2.09	-1.98	1.26	1.52
Gsn	-1.82	-1.74	-1.42	-1.21	-1.32	-1.21	0.29	0.38	2.98	3.23	2.56	1.84
Hapln2	-2.36	-1.58	-2.48	-2.93	0.38	0.73	1.04	0.6	4.18	4.03	-0.9	-1.21

Hepacam	-2.77	-2.52	-3.05	-3.04	-0.87	-0.69	2.01	1.88	2.82	2.56	1.87	1.42
Hhatl	-2.58	-2.99	2.42	2.43	-2.61	-2.92	-1.52	-0.27	1.48	0.8	-2.07	-1.58
Hspa1b	-1.47	-0.8	-1.59	-1.73	-1.51	-1.49	-1.86	-0.61	-1.8	-1.37	-1.56	-1.75
Htr1b	-0.08	-1.18	4.23	5.25	-1.1	-0.1	2.14	1.21	-0.02	-0.97	0.36	0.06
Id4	-2.25	-1.51	0.03	1.48	0.02	-0.25	3.58	4.42	-0.6	-0.31	-2.33	-2.03
Igsf11	-1.58	-0.84	-2.78	-2.73	-1.06	-0.49	1.95	1.8	2.78	2.86	1.04	0.91
Il22	-0.77	-1.68	4.05	5.14	-1.59	-0.3	-1.29	-1.2	-1.21	-1.46	-0.89	-0.7
Il33	-0.54	-0.81	-1.67	-1.54	0.2	0.29	3.83	3.88	0.96	-0.09	0.88	1.05
Insc	-0.48	-0.94	-1.82	-1.79	-0.95	-1	1.22	0.09	5.42	4.97	1.19	0.71
Itgb8	-1.56	-2.55	-2.62	-2.28	-1.41	-1.01	1.25	0.6	2.17	1.83	0.98	1.88
Itih3	-1.4	-1.47	-2.24	-2.21	1.69	1.84	6.54	5.13	0.94	1.1	-0.54	-0.74
Itpr1	-0.01	0.29	6.26	6.3	0.39	0.27	-0.86	-1.08	-1.06	-1.25	-0.74	-0.79
Kcnc2	-1	-1.16	-1.29	-0.78	4.91	4.87	4.54	4.32	2.04	2.37	2.79	3.62
Kcnj10	-1.79	-2.13	-2.15	-2.04	-1.61	-1.66	1.01	1.22	1.94	2.05	1.68	1.08
Kif19a	1.99	1.96	-1.73	-1.56	4.46	4.08	3.78	4.21	1.24	1.28	1.91	2.65
Kit	-2.25	-2.35	-3.05	-2.92	3.32	3.34	2.35	2.19	-0.14	0.04	0.62	1.03
Kitl	-1.86	-2.4	4.43	4.38	-1.83	-2.04	0.59	-0.01	1.38	0.26	-1.23	-1.88
Klk6	-1.22	-1.13	-2.29	-0.94	-0.26	0.31	2.67	1.7	4.92	5.14	-1.35	-0.68
Leng9	-3.11	-2.96	-2.08	-3.3	-2.97	-2.88	-2.71	-2.86	-2.52	-2.17	-3.35	-2.54
Lfng	-0.53	-1.88	-1.53	1.21	1.77	1.87	5.85	5.13	2.09	1.3	3.28	-1.5
Lgi4	1.39	1.37	-1.7	-2.01	1.29	1.45	4.7	5.11	2.14	2.45	1.14	-0.31
Lims2	-0.59	-0.85	-1.53	-1.57	-1.14	-0.83	1.81	2.61	0.17	0.48	4.75	4.69
Mag	-0.16	-0.77	-2.36	-2.4	-0.55	-0.24	1.57	1.32	5.86	5.98	2.06	1.33
Mak	-0.79	-1.04	-1.8	-1.45	-1.89	-1.81	-2.21	-0.88	-1.56	-1.21	0.07	-1.47
Mal	-1.88	-1.62	-2.33	-2.89	-0.06	-0.15	-0.09	-0.56	4.13	3.91	0.72	-0.35
March11	-0.99	-0.72	0.38	0.2	3.41	3.46	-0.85	-0.41	-1.94	-2.35	0.55	0.97
Marcksl1	-1.21	-2.27	-2.26	-2.39	-1.26	-1.61	-1.74	-1.66	-0.37	-0.77	-2.23	-1.92
Mcam	-2.49	-2.1	-3.02	-2.95	-1.82	-1.9	-1	-0.27	2.63	2.94	1.2	1.11
Mff	-2.83	-2.4	-2.99	-3.14	-2.86	-2.65	-3.05	-2.68	-2.88	-2.25	-3.34	-2.93
Mfge8	-1.34	-1.25	-1.75	-2.07	-0.81	-0.77	2.24	2.62	0.59	0.6	2.95	2.84
Mlc1	-0.81	-1.45	-1.63	-1.12	0.68	1.02	4.24	4.36	0.84	1.38	0.12	-1.05
Mog	-1.17	-0.58	-0.83	-1.31	-0.18	-0.01	1.09	0.11	5.52	5.43	1.22	0.23
mt-Co1	-1.48	-0.89	-1.53	-0.89	-1.19	-0.92	-0.81	-1.42	0.89	0.89	-0.57	-0.87
mt-Nd4	-2.72	-2.54	-2.72	-2.79	-2.68	-2.62	-2.66	-2.99	-1.75	-1.73	-2.3	-2.41
Mybpc1	-0.36	-0.78	0.96	0.03	-1.33	-0.9	0.72	0.95	-0.21	-0.03	0.61	-0.72
Myot	-0.7	-0.47	-1.55	-1.72	-2.05	-2.03	-2.37	-1.8	-2.32	-1.91	-1.12	-2.27
Myrf	-1.83	-2.06	-0.01	0.18	-0.84	-0.35	1	0.98	4.6	4.51	3.25	2.55
Ndrg1	-0.92	-1.79	-1.71	-1.5	-0.83	-0.6	1.23	0.88	4.09	4.36	0.42	0.81
Nell1	-0.39	-0.57	4.77	4.64	-1.15	-1.12	0.6	0.18	0.13	0.28	-0.05	-0.95
Neto1	-0.64	-0.45	-0.7	-0.46	-0.91	-1.21	0.73	0.89	-1.31	-0.58	4.06	4.1
Neu4	-1.77	-1.89	-1.89	-2.02	-1.81	-1.1	-1.59	-0.25	-2.09	-1.67	1.94	0.51
Ninj2	-0.69	-0.68	-1.91	-1.4	-1.49	-1.11	0.14	0.07	3.91	3.87	2.6	2.42
Nkx2-2	-2.42	-2.87	-2.87	-2.96	-2.19	-1.78	1.18	1.97	1.1	1.08	0.95	1.14
Notch1	-0.9	-1.7	-1.64	-2.33	-0.45	-0.45	2.45	3.22	1.02	0.85	4.05	3.5
Nrk	-1.07	-1.27	6.94	6.45	-2.31	-2.72	-1.92	-2.62	-2.36	-1.82	-0.82	-1.91
Olig1	-1.87	-2.01	-1.42	-2.59	-1.9	-0.88	0.47	0.93	2.28	2.24	2.57	3.4
Olig2	-1.49	-1.23	-2.18	-2.15	-0.91	-0.54	0.83	1.2	3.18	3.23	3.43	4.06
Opalin	-2.14	-0.68	-2.47	-2.45	-0.88	-0.69	0.2	-0.11	5.59	5.32	-0.03	1.09
Pax3	-1.45	-1.75	-2.64	-2.42	-0.56	-0.35	2.3	2.24	-0.92	-0.24	1.44	1.38
Pcp2	-1.72	-1.14	4.57	4.71	-1	-0.96	-0.62	-1.73	-0.29	0.28	0.37	-1.51
Pdc	-0.04	0.21	2.05	1.59	0.76	0.57	0.06	0.18	-0.12	-0.97	-0.36	-0.28
Pdgfra	-1.1	-1.69	-2.13	-1.65	-0.2	0.01	1.69	2.44	-1.22	-1.23	6.44	6.13
Pdzd3	4.91	4.97	0.85	0.46	2.29	1.45	2.89	3.99	2.26	4.11	2.79	1.46
Penk	0.67	1.36	-0.57	-2.04	3.69	3.35	2.94	2.86	1.15	1.08	-1	-0.14
Pex5l	-2.01	-2.16	-2.63	-2.82	0.5	0.29	0.92	0.37	3.92	3.71	0.42	-0.43
Pgghg	-1.37	-1.53	-1.52	-0.86	-0.5	-0.46	2.66	3.05	2.47	1.05	3.36	1.9
Phyhip	-0.59	-1.22	-2.38	-2.95	-0.79	-0.81	-2.15	-1.47	-2.43	-1.94	-2.58	-2.38
Pkp3	-1.53	-0.89	5.36	4.98	-1.57	-1.54	-0.51	-0.4	-1.85	-1.43	-0.01	-1.8
Pla2g16	-1.56	-2.13	-2.68	-2.44	0.09	0.26	1.3	1.29	2.8	3.34	1.7	-0.59

Plch1	-1.69	-1.97	-1.6	-1.73	3.43	3.71	0.27	0.18	-1.39	-1.46	-1.53	1.3
Plekhd1	-1.75	-2.05	3.4	3.19	1.77	1.53	1.21	0.88	-0.96	-0.66	-2.23	-1.15
Plekhg3	-1.08	-1.69	-2.42	-2.39	-1.7	-1.47	0.18	-0.06	3.51	3.52	1.23	1.43
Pllp	-1.48	-1.28	-0.94	-1.59	-1.27	-0.93	0.68	0.79	3.25	3.14	3.75	3.3
Plp1	-1.76	-1.53	-2.27	-1.65	-0.92	-0.66	1.05	0.33	4.27	4.26	1.37	1.18
Plpp3	-2.77	-2.31	-2.19	-2.17	-0.13	0.17	3.13	3.05	0.56	0.68	1.34	1.13
Plpp4	1.23	1.26	-2.03	-2.3	-1.14	-1.41	0.01	-0.19	-1.96	-1.77	2.12	2.74
Plscr1	-1.78	-0.8	-2.4	-0.13	-2.33	-2.31	-1.51	-1.26	-2.16	-1.65	-0.37	-1.18
Plxnb3	-2.49	-2.86	-3	-2.95	-1.72	-0.48	1.83	2.32	2.8	2.62	3.31	2.69
Pmp2	-1.43	-1.56	-1.55	0.43	-1.46	-1.44	-1.09	-1.76	-0.54	-1.33	-0.66	-0.93
Pmp22	-2.6	-2.54	-2.93	-2.01	-1.12	-1.11	1.06	0.82	2.25	2.1	1.46	1.91
Ppfibp1	-0.68	-0.8	-1.72	-1.78	0.09	0.25	1.32	1.89	0.81	0.68	5.09	4.84
Ppp1r14a	-1.05	-1.41	1.49	0.53	0.01	-0.67	0.84	0.97	4.59	4.73	3.24	1.07
Ppp1r17	1.41	1.42	5.37	5.5	-1.32	-1.29	-2.07	-0.78	0.93	0.31	0.57	-1.56
Prex1	-1.86	-2.03	-1.98	-2.06	-0.91	-0.61	2.11	2.83	2.14	2.18	2.55	2.33
Prex2	-1.79	-2.05	-2.63	-2.6	0.59	0.66	2.88	2.9	1.85	1.8	1.62	1.08
Prima1	-1.14	-1.84	-2.13	-2.2	-1.17	-1.19	1.27	0.63	3.65	3.82	1.08	0.94
Prkcg	-2.07	-2.09	4.48	4.47	2.4	2.48	0.77	0.84	-1.25	-1.19	-1.24	0.26
Prr5	-1.02	-1.28	-2.45	-2.15	1.08	1.36	4.22	4.78	0.44	0.17	3.06	2.2
Prrg3	-1.59	-1.92	-2.68	-2.76	-2.63	-2.27	-2.58	-2.54	-2.54	-2.15	-1.88	-2.5
Prrx1	-0.93	-1.1	-1.35	-2	-0.63	-0.62	1.38	1.02	-1.4	-1.06	1.55	2.31
Ptchd4	0.7	0.53	4.27	4.12	-0.45	-0.67	-0.6	-1.26	-1.96	-2.06	-1.61	-1.26
Ptprk	-1.87	-2.1	-2.37	-2.62	1.78	1.84	-0.64	-0.74	0.14	0.16	0.93	1.33
Ptprz1	-2.77	-2.64	-1.77	-2.28	0.95	1.03	1.57	1.28	-1.32	-1.37	2.05	2.41
Pttg1	0.38	-2.17	-1.86	-2.7	-2.52	-2.5	-2.18	-1.72	-1.91	-2.4	-1.58	0.62
Pvalb	-1.97	-1.65	2.42	2.95	3.11	3.09	2.27	2.41	-0.42	0.04	-1.54	1.08
Pxdc1	-1.68	-1.66	0.41	1.68	0.1	-0.46	1.23	1.53	-0.6	-0.89	4.35	4.39
Qk	-3.06	-2.98	-3.15	-3.15	-2.98	-2.84	-1.96	-1	-0.8	-0.42	-1.41	-1.73
Rapgef3	-1.67	-1.99	-2.88	-2.39	-0.45	-0.47	1.81	2.08	3.11	2.91	3.98	3.49
Rassf2	-2.79	-2.82	-2.82	-3.04	-0.94	-0.71	1.95	2.28	1.86	1.87	1.03	0.18
Rbp2	-0.55	-0.35	-1.2	-1.1	-1.55	-1.87	-1.18	-2.22	-1.52	-1.08	-0.57	-1.27
Rbpjl	-0.29	-0.85	-1.05	-0.88	-0.93	-0.17	2.53	3.13	3.54	3.75	5.03	4.91
Rgcc	-2.1	-2.5	-0.38	-1.75	-1.16	-1	1.15	0.89	-0.67	0.12	2.53	3.09
Rgma	0.42	-0.44	-2.24	-2.1	0.36	0.55	3.84	3.87	1.69	1.76	1.72	1.02
Ryr1	-0.83	-1.28	4.88	6.48	-1.06	-0.61	-1.36	-1.31	-1.35	-1.43	-0.29	-1.41
S100b	-1.92	-1.95	-2.41	-1.27	-1.36	-0.33	2.45	2.5	2.47	2.84	-1.3	0.4
S1pr1	-1.5	-1.68	-2.67	-2.38	1.66	1.58	5.41	5.46	1.26	1.47	-2.64	-0.82
Sall1	-1.45	-1.87	-2.16	-2.32	-0.85	-0.6	0.42	-0.1	4.11	3.86	0.86	0.89
Sec14l5	-1.19	-1.39	-1.41	-1.51	-1.39	-1.28	0.22	-0.25	3.53	3.35	0.69	-1.87
Serpine2	-2	-2.03	-2.41	-2.57	-1.01	-0.92	1.35	1.3	-0.85	-0.09	3.79	3.81
Shisa6	-2.56	-2.75	3.71	3.72	2.31	2.34	0.98	1.36	-1.38	-1.14	0.96	1.03
Skor2	0.35	0.15	7.17	6.26	-1.51	-1.74	-1.67	-0.93	-1.45	-2.46	-1.38	-1.24
Slc1a3	-2.31	-2.8	-2.96	-3	0.14	0.51	3.28	3.19	1.2	1.09	0.35	0.17
Slc1a6	-2.02	-2.38	4.33	4.24	-1.94	-2.53	-2.64	-2.58	-2.26	-2.2	-1.96	-1.95
Slc26a3	-0.7	-0.67	-0.74	-0.08	-0.83	-0.97	-1.03	-0.69	-1.54	-1.37	-0.13	-1.18
Slc32a1	-1.37	-1.88	1.69	2.07	3.5	3.22	2.42	1.78	-0.49	0.68	-2.05	0.22
Slc4a4	1.7	1.95	-2.56	-2.39	-0.06	0.1	3.03	2.85	0.14	0.29	-0.33	-1.75
Slc5a11	-1.51	-2.17	-0.76	-0.36	-1.14	-1.03	0.95	-0.09	4.19	4.32	-0.39	0.57
Slc9a3	-1.13	-1.66	6.68	6.81	-2.33	-2.5	-1.32	-0.78	-0.23	-0.55	-0.97	-2.23
Slitrk6	-1.62	-1.73	-1.73	-1.86	-1.65	-1.63	1.32	-0.35	4.02	3.92	1.54	2.06
Socs2	-2.24	-2.35	0.3	0.04	3.43	3	1.79	1.3	0.61	0.18	-0.38	1.22
Sorcs3	-1.54	-1.89	-2.4	-2.56	3.06	3.04	-0.4	-0.16	-2.46	-2.18	1.13	1.7
Sox10	-2.29	-2.29	-2.79	-2.32	-1.36	-1.62	0.57	0.82	2.6	2.72	3.21	3.03
Sox2	-2.45	-2.11	-2.55	-2.67	-1.68	-1.65	1.23	0.45	2.38	2.36	0.55	0.7
Sox6	-2.63	-2.66	-2.63	-2.92	-1.17	-0.91	1.66	1.55	-1.23	-1.28	2.89	3.26
Sox8	-2.26	-2.76	-2.38	-2.28	-1.31	-0.86	1.03	0.94	2.81	2.8	2.57	2.43
Stag3	-2.41	-2.75	-2.36	-2.86	-2.45	-2.66	-2.3	-2.57	-1.78	-2.89	-3.01	-2.68
Stk32a	-2.57	-2.47	-2.58	-2.83	-0.85	-0.5	2.36	2.02	-0.65	-0.38	1.9	1.99
Sulf2	-1.68	-1.86	-2.41	-2.64	-0.4	-0.91	1.07	1.09	1.99	1.71	3.51	3.6

Susd5	-0.99	-1.02	-1.65	-1.55	-1.32	-1.67	0.55	1.15	-1.52	-0.81	3.65	3.85
Tceal7	-1.46	-0.36	-1.57	-1.01	-0.22	-1.47	-1.17	-1.76	-1.77	-1.36	-1.54	-1.72
Tfap2b	-0.01	-0.31	-1.49	-1.7	3.88	4.08	2.84	2.81	0.11	0.68	-0.5	1.62
Thbs2	-0.08	-0.15	-0.7	-0.94	-0.48	-0.52	-0.53	0.7	-1.22	0.63	1.5	1.59
Tmem125	-0.83	-1.74	-1.73	-1.87	-0.88	-1.63	1.19	-0.53	5.17	6.33	-0.95	1.41
Tmem132d	-0.47	-0.67	2.04	2.07	-1.42	-1.4	0.02	0.36	-1.45	-1.2	2.96	3.08
Tmem63a	-1.3	-1.61	-2	-1.85	-0.8	-0.96	0.81	0.25	3.82	4.16	0.02	-0.68
Tmem98	-1.28	-1.11	-1.87	-1.27	-1.09	-1.13	1.02	-0.2	3.93	4.2	2.23	-0.19
Tnc	-1.46	-1.08	-0.3	-2.19	1.81	1.92	4.93	4.56	1.08	0.67	1.94	2.06
Tnfrsf13c	-1.8	-1.92	-1.91	-2.05	-1.83	-1.81	-2.17	-2.11	-0.14	-0.97	-1.89	-2.07
Tns3	-1.12	-1.52	-1.94	-2.45	-1.37	-1.07	1.48	1.47	2.19	2.38	3.19	3.07
Trabd2b	-0.13	-0.19	5.23	6.9	-0.5	-0.85	-0.62	-0.67	-1.49	-1.5	0.25	0.44
Tril	-1.54	-1.72	-2.84	-1.78	-0.28	-0.24	3.54	3.6	0.75	0.34	4.03	3.63
Trpc3	-2.35	-2.37	6.43	6.09	1.13	0.98	1.94	1.4	-0.99	-1.21	-1.19	0.17
Trpc7	-0.9	-0.88	1.04	0.86	3.85	3.74	2.17	2.28	0.32	0.61	0.44	1.91
Tshb	-1.96	-2.08	0.55	0.2	-1.99	-0.64	-0.54	-1.12	2.99	2.73	-2.04	1.44
Tspan11	-0.91	-0.82	2.89	2.89	-1.8	-2.1	0.43	0.02	-1.88	-2.65	2.37	2.18
Tspan2	-1.46	-1.6	2.28	2.19	-0.88	-0.59	0.79	0.54	4.2	4.19	2.77	3.08
Tuba8	0.61	-0.36	4.24	4.29	2.15	1.64	1.6	2.44	-0.13	0.21	-0.48	0.97
Tubb2b	-2.38	-2.03	-2.48	-2.6	-0.95	-1.09	1.25	1.33	1.37	2.46	2.62	2.12
Txnip	-2.28	-1.48	-2.4	-2.85	0.17	-0.41	1.18	0.92	3.71	3.72	2.75	2.05
Ube2b	-2.67	-2.45	-2.62	-2.63	-2.92	-2.75	-3.03	-2.59	-3	-2.81	-2.95	-3.01
Ugt8a	-2.09	-2.14	-1.72	-2.23	-0.18	0.01	0.37	-0.47	3.01	3.07	1.31	1.17
Upp1	-0.63	-1.51	-2.09	-2.22	-0.98	-0.65	1.65	0.49	-0.92	-1.21	-0.33	-0.49
Vstm2b	-2.23	-0.18	-1.26	-1.24	0.33	-0.04	-0.12	0.19	-2.58	-2.1	2.44	2.15
Wfdc1	-0.97	-0.59	3.43	3.16	3.72	3.91	0.85	1.81	-1.21	0.02	-0.75	2.01
Xrra1	-1.26	-1.14	-1.77	-1.68	-1.15	-1.28	-1.54	-1.29	-1.19	-0.79	-1.26	-0.45
Zcchc24	-1.92	-2.07	-2.53	-2.71	-0.92	-0.46	2.29	2.96	2.65	2.78	4.36	3.62
Zeb2	-3.05	-2.13	-2.14	-1.92	-1.28	-1.03	1.26	1.19	3.01	3.04	1.58	1.66
Zfp36l1	0.18	-2.41	-2.4	-1.94	-1.48	-1.19	0.82	1.18	1.04	0.41	1.6	1.36

[00260] The log2 fold change in expression for the 250 most variable genes across mouse, rat, and human nuclei between the normalized RNAseq results from the nuclei of the seven cells types compared to the RNAseq results for the sorted nuclei from each individual cell type is shown in Table 28. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed. Two replicate samples of nuclei from each cell type was analyzed.

Table 28. Log2 fold change in expression for nuclei from mouse samples

Cell type	Granule			Purkinje			Basket			Astrocytes		Oligo		OPCs	
Replicate	861	862	996	327	329	639	640	859	860	993	994	855	856	857	858
3110035E14Rik	-2.30	-0.70	-1.74	-1.70	-1.46	-1.41	-0.51	-0.68	-1.09	-2.44	-2.36	0.95	0.21	4.34	4.46
1810041L15Rik	-2.34	-2.52	-2.21	-2.10	-1.78	-0.67	-1.99	-1.76	-1.89	-2.53	-2.23	-0.98	-1.48	2.72	2.53
2810459M11Rik	-2.01	-1.23	-1.91	-1.48	0.01	-0.78	-2.12	-1.52	-1.58	1.25	0.90	-1.06	-2.04	1.31	0.63
A2m	0.71	-0.85	0.73	-0.60	-0.30	-0.28	-0.71	-1.59	-1.65	5.43	5.45	-0.89	-0.28	-1.64	-1.44
Adamts15	-1.30	-1.09	-1.23	-0.90	-1.53	-0.02	4.30	4.17	4.24	-0.76	0.50	-1.42	-1.73	-0.89	-1.68
Adra1a	-1.45	-1.88	-1.23	-1.04	-0.94	-1.73	-1.49	-1.61	-1.96	3.26	3.77	-0.90	-0.89	1.94	1.93
AI593442	-0.21	-1.44	-1.50	3.52	3.41	2.83	2.43	2.43	2.72	-1.53	-0.83	-1.68	-0.59	0.62	1.10
Aldh1a1	-0.11	-2.77	0.23	-1.22	-0.89	-0.07	-0.68	-0.38	-2.07	4.35	4.78	1.65	1.69	1.32	2.02
Anln	-0.51	-0.50	-0.79	-0.01	-0.10	-1.21	-1.23	-1.11	-1.14	-1.43	-1.06	3.86	4.03	0.07	0.18
Apcdd1	-0.61	-2.01	-0.49	-1.58	-1.85	-1.18	1.99	1.87	1.79	0.07	-0.37	-0.99	-1.77	0.02	-0.61

Apod	-2.02	-2.36	-1.40	-2.36	-2.57	-2.25	-1.94	-2.44	-2.02	-0.73	-0.49	2.81	2.93	-0.55	-0.61
Aqp4	-0.18	-0.84	-0.39	-1.56	-1.33	0.15	-0.60	-0.88	-0.56	3.93	3.85	0.47	0.60	-2.11	-1.21
Arhgef33	-1.92	-1.77	-1.87	6.78	6.81	6.28	-1.11	-1.54	-1.33	0.42	0.41	-1.75	-1.66	-2.04	-2.03
Ascl1	-0.70	-2.20	-2.17	-0.39	-0.80	-0.59	0.65	0.64	0.24	1.45	0.46	-1.15	-0.71	3.36	2.93
Asgr1	-2.54	-1.07	-2.46	-1.86	-1.23	-2.56	1.34	2.02	1.76	-2.40	-2.17	-2.39	-1.97	-0.04	-1.75
Aspa	-2.08	-2.16	-1.86	-1.28	-1.01	-1.44	-2.23	-1.89	-2.11	0.35	0.39	4.71	4.67	2.27	2.44
Atp1a2	-1.21	-1.25	-0.92	-2.55	-2.65	-1.09	-1.39	-1.77	-1.76	4.43	4.42	0.12	0.07	1.83	1.66
Atp2a3	-1.32	-1.66	-2.00	7.64	7.26	6.62	-1.64	-1.99	-1.68	-2.25	-1.63	-0.65	-1.57	-1.94	-1.89
B3gnt5	-1.34	-1.27	-2.04	2.76	3.11	2.02	-0.05	-0.31	0.10	-1.35	-1.03	-0.46	-0.08	1.15	0.66
B3gnt7	-1.23	-1.55	-2.09	-1.99	-1.10	-2.19	-2.24	-0.79	-1.07	-2.03	-2.06	-1.01	-0.78	-0.25	0.17
Bcl11a	-0.56	-0.87	-1.49	5.76	5.60	5.16	-0.60	-0.01	-0.31	-1.90	-1.37	-0.61	-0.31	-0.71	-0.92
Bhlhe22	-1.49	1.13	-0.15	-0.83	-0.91	-0.68	2.99	3.48	3.73	-1.28	-2.40	-1.27	-1.92	-0.66	-0.49
C1ql1	-1.32	-1.53	-2.03	-1.71	-0.99	-1.74	-1.01	-1.17	-1.11	-0.86	0.39	0.15	-0.99	4.35	4.16
C1ql2	-1.79	-1.07	-1.72	-0.07	-0.60	-1.82	-1.24	-1.18	-0.82	-1.66	-1.69	-0.93	0.05	3.86	3.12
Cacna1g	-0.44	-0.33	0.35	3.85	3.63	3.89	-0.49	-0.44	-0.50	-1.89	-1.16	-1.53	-2.05	-1.14	-0.70
Cacng4	-1.91	-2.05	-1.82	-1.66	-1.86	-1.57	-0.43	-0.38	-0.51	2.45	2.81	-0.18	-0.78	3.35	3.42
Calb1	0.54	0.42	-0.48	5.59	7.47	7.10	-0.93	-1.70	-1.01	-1.31	-1.62	-1.50	-1.68	-2.10	-1.92
Camk1g	-2.25	-2.20	-1.50	-2.15	-1.51	0.34	2.86	2.80	2.69	-2.35	-2.77	-1.45	-2.39	-1.24	0.59
Car8	-1.82	-1.74	-2.36	8.03	7.72	6.68	-1.24	-2.01	-1.92	-2.43	-2.46	-1.62	-1.56	0.43	0.31
Carns1	-2.15	-0.65	-1.16	-1.60	-0.92	-0.69	-1.42	-1.59	-1.05	-0.62	-0.73	3.38	3.78	1.10	0.06
Casq2	-1.15	-1.75	-2.23	6.55	5.98	6.25	-1.24	-1.38	-1.45	0.93	0.66	-0.29	-0.08	-1.58	-0.90
Cbln2	-1.45	-0.60	-1.38	-1.28	-1.10	0.98	-1.53	-0.23	-1.53	-1.32	-1.35	-0.45	-1.35	-0.26	0.24
Ccdc152	-2.20	-2.97	-1.66	-0.60	-0.84	-1.28	-2.44	-2.76	-1.06	1.83	1.92	3.74	3.87	-2.21	-0.48
Ccdc180	-1.40	-1.53	-1.97	-0.74	-0.54	-2.02	-2.16	-1.71	-1.66	-1.88	-1.69	-1.03	-0.85	-1.43	-1.55
Ccnd2	-1.68	-1.93	-2.46	-0.85	-0.55	-1.26	0.61	1.20	0.99	-2.95	-2.17	-1.33	-1.33	-0.39	0.62
Cd82	-2.16	-1.41	-2.29	-1.82	-1.53	-2.68	-2.59	-2.03	-2.01	-1.88	-2.40	2.55	2.71	0.73	0.96
Cd9	-1.85	-2.21	-2.06	-2.25	-1.89	-2.64	-2.30	-2.35	-1.94	1.54	0.94	2.16	2.45	3.02	3.07
Cdh19	-0.84	-1.44	-0.71	-1.19	-0.94	-1.39	-0.29	-1.34	-0.89	3.36	4.10	5.06	5.79	4.56	4.07
Cdhr1	-1.87	-1.81	-0.94	-2.19	-0.98	-2.38	-1.97	-0.67	-0.62	-1.06	-1.11	-1.32	-1.38	-1.51	1.34
Cldn11	-2.42	-1.66	-2.12	-2.03	-1.31	-1.97	-2.25	-2.16	-2.29	-1.56	-2.35	5.02	5.31	3.56	3.03
Clec7a	-1.42	-1.37	-1.34	-0.31	-1.04	-1.44	-1.50	-1.45	-0.69	-1.28	0.12	-0.36	-1.31	-1.15	-1.39
Clmn	-2.46	-2.67	-2.36	2.92	3.14	2.53	-2.61	-2.71	-2.76	2.20	2.40	2.53	2.67	0.81	0.79
Cmtm5	-1.31	-1.06	-1.27	-1.54	-1.48	-2.13	-2.69	-2.54	-2.28	3.59	3.72	2.42	2.79	1.08	1.50
Cntn3	-2.21	-1.99	-1.91	4.75	4.25	3.77	2.77	2.59	2.78	-2.19	-1.75	1.59	1.77	1.18	1.05
Cntnap5a	-1.54	-1.64	-1.82	2.79	2.49	2.42	-1.71	-0.92	-1.42	-2.15	-1.56	-1.46	-1.32	-1.65	-1.61
Cobl	-2.73	-2.86	-2.74	-1.64	-1.13	0.17	-1.61	-1.83	-1.67	-3.11	-2.60	2.45	2.33	2.67	2.81
Col5a3	-1.69	-2.14	-2.48	-2.06	-1.50	-2.37	-2.15	-1.82	-1.96	2.42	2.57	-0.61	-0.77	1.58	1.63
Col6a1	-2.37	-1.50	-2.46	-1.86	-1.58	-0.22	-2.01	-0.70	-1.21	-2.91	-2.93	-1.79	-2.10	-2.82	-2.19
Cpm	-1.91	-1.91	-1.86	-1.18	-0.82	-1.77	-1.53	-1.13	-1.40	-2.10	-2.06	3.73	3.65	2.03	1.94
Ctyab	-1.46	-1.83	-1.49	-2.52	-2.32	-2.99	-3.02	-2.34	-1.90	-0.21	0.18	3.00	3.07	1.61	1.46
Cspg4	-1.64	-1.89	-2.11	-2.29	-1.99	-2.34	-1.02	-1.36	-1.33	-1.76	-0.87	0.35	0.38	3.61	3.62
Csrp1	-1.79	-1.84	-1.79	-0.94	-0.78	-1.52	-2.12	-2.14	-1.77	3.33	3.44	2.98	2.97	0.73	1.25
D7Ertd443e	-2.00	-1.97	-2.48	-1.30	-1.22	-0.61	-2.23	-1.88	-1.75	-1.66	-0.83	4.84	4.69	2.01	2.27
Ddx3y	1.94	2.23	-2.92	2.53	0.73	2.27	-2.88	2.14	2.17	-2.41	-2.90	2.74	2.72	2.58	2.55
Dock5	-2.14	-2.24	-1.93	-0.88	-0.60	-1.14	-2.25	-2.33	-1.97	-1.07	-0.50	3.37	3.43	0.20	0.04
Dpy19l2	-1.57	-1.44	-2.00	-0.25	-0.04	-1.67	-1.82	-1.33	-1.49	-1.72	-1.15	-0.32	-0.20	-0.83	-0.84
Ebf2	-1.08	-1.53	-2.18	5.10	4.81	4.58	-1.38	-0.95	-0.83	-0.49	0.05	-0.22	-0.01	-0.68	-0.92
Echdc2	0.86	1.15	0.28	-0.41	-0.17	-1.56	0.30	0.64	0.52	-0.93	0.36	-0.95	-1.46	-1.35	-1.28
Efna5	-1.34	-1.36	-1.41	2.65	2.47	2.57	3.31	2.98	3.11	-1.19	-1.28	-1.13	-1.18	-1.59	-1.46
Enpp2	-1.93	-1.81	-1.59	-0.69	-0.58	-0.41	-1.11	-1.54	-1.13	-1.92	-1.44	4.97	4.93	3.37	3.36
Erbb3	-1.94	-1.40	-1.42	-1.21	-0.96	-2.15	-2.42	-1.89	-2.05	-2.72	-2.20	3.17	3.49	2.48	3.00
Ermn	-0.02	-1.09	-1.47	-0.58	-0.34	-2.01	-1.62	-1.03	-1.61	-2.45	-2.22	5.69	5.67	2.63	2.25
Etnppl	-1.33	-0.62	0.32	-1.50	-1.89	-0.27	-0.51	-1.20	-1.85	4.88	4.77	1.39	1.04	-0.19	-0.73
Fa2h	0.62	0.10	0.27	-1.59	-1.50	-1.40	-2.05	-1.87	-1.94	-1.97	-2.13	3.79	3.68	2.50	2.29
Fam46a	-2.38	-1.51	-1.81	-2.22	-1.42	-1.15	-2.00	-1.62	-0.92	-2.25	-0.47	3.58	3.33	2.47	2.11
Fgfr2	-1.29	-1.18	-1.83	-1.94	-1.09	-1.77	-2.43	-1.55	-1.44	2.95	2.51	2.88	2.95	0.92	0.88
Flrt2	-2.33	-2.70	-2.58	-0.14	-0.08	0.32	3.47	3.09	3.29	-2.18	-1.40	-0.54	-0.24	0.64	0.83
Fmo3	0.22	-1.14	-1.72	0.48	0.11	-1.86	-2.44	-0.75	-0.97	-0.49	-0.22	0.72	0.21	-0.32	-0.02

Folh1	-0.81	-1.86	-0.99	-1.24	-0.99	-1.38	-1.92	-2.37	-2.57	3.04	3.76	4.35	4.54	0.68	0.91
Foxh1	-2.61	-2.57	-2.86	-2.78	-2.63	-2.41	-2.68	-2.64	-2.14	-2.81	-2.84	-2.01	-1.33	-2.71	-2.00
Fsip2	-1.26	-1.51	-2.88	-1.40	-1.35	-1.94	-1.80	-1.39	-1.26	-2.84	-1.24	-1.17	-1.76	-1.66	-0.96
Fxyd1	-1.67	-0.83	-0.64	-1.74	-2.04	-1.71	-2.10	-2.25	-2.30	5.16	5.67	-1.45	0.33	-2.16	-1.78
Fxyd7	-2.20	-1.62	-1.12	-1.04	0.06	-0.98	-1.80	-2.05	-1.67	3.96	3.16	-2.31	-1.86	-0.88	-0.32
Gad2	-2.05	-2.08	-2.22	2.04	1.74	1.78	2.50	2.47	2.52	-2.09	-2.37	-1.62	-1.72	-1.81	-0.78
Gal3st1	-1.68	-1.91	-2.29	-0.67	-0.77	0.08	-1.44	-1.33	-1.30	-1.52	-1.46	3.72	3.74	3.67	3.23
Galnt5	-1.68	-1.37	-1.56	-0.22	-0.09	-1.33	-1.47	-1.50	-1.14	-1.62	-1.45	5.74	5.65	2.87	2.74
Galnt6	-0.54	-0.56	-2.00	-0.86	-0.76	-1.55	-1.69	-0.39	-0.56	-2.03	-1.04	4.60	4.68	2.53	2.26
Galr1	0.54	0.76	0.29	-0.08	0.46	-1.39	-0.57	-1.61	-0.82	-1.60	0.06	1.51	1.93	0.79	0.14
Gdf10	1.03	0.71	0.85	-1.54	-0.80	-1.35	-0.55	-0.60	-1.64	5.78	5.79	-0.73	-0.67	-0.86	-1.61
Gfap	-1.80	-1.53	-2.11	-0.46	-0.99	-1.54	-2.03	-1.75	-1.47	1.91	1.61	-1.27	-1.18	-0.96	-1.64
Gja1	-1.29	-1.32	-0.65	-0.84	-0.88	-0.26	-1.63	-1.02	-1.33	3.93	3.83	0.54	0.25	-0.66	-0.51
Gjb1	-1.20	-1.13	-1.69	-1.29	-0.42	-1.60	-2.20	-1.85	-0.95	-1.94	-1.66	3.26	3.84	1.50	1.05
Gjc2	-1.66	-2.32	-1.92	-1.78	-1.91	-1.80	-0.99	-1.45	-0.45	-1.16	-2.05	3.48	3.83	2.00	1.90
Gldn	-0.82	-0.40	-0.58	0.61	0.25	-0.67	-0.93	-0.29	-0.46	-1.16	-0.52	-0.03	-1.22	-0.58	-0.66
Gli1	-1.14	-0.72	0.09	-0.95	-0.61	-2.37	-1.95	-0.79	-1.18	4.92	5.16	-0.79	-0.12	-0.92	-0.74
Gip2r	3.65	3.73	3.82	4.68	4.90	3.13	-0.06	-0.58	-0.85	3.03	3.34	2.74	3.33	2.76	2.49
Glul	-0.99	-1.15	-1.83	-2.38	-2.37	-1.80	-2.41	-2.33	-2.46	1.38	1.70	3.31	3.53	0.42	0.27
Gm136	-1.52	-1.46	-2.36	-1.38	-0.92	-2.82	-2.28	-2.03	-2.08	-2.69	-1.36	-1.78	-2.72	-1.83	-1.94
Gnb3	-1.99	-1.52	-2.18	-2.06	-1.48	-2.02	-1.88	-1.64	-2.08	-2.54	-2.15	-2.11	-2.57	-1.95	-2.23
Gng11	1.46	-0.20	-1.42	-1.32	-1.14	-1.52	-1.57	-0.33	-0.39	3.61	3.19	5.37	5.74	3.01	4.52
Gpr37	-1.98	-1.37	-2.32	-2.19	-1.81	-2.02	-2.35	-2.10	-2.51	-0.14	0.43	6.04	6.36	2.59	2.85
Gpr37l1	-1.67	-1.50	-2.05	-0.47	0.12	-0.30	-2.20	-2.87	-2.32	3.07	2.48	-1.11	-1.43	1.56	1.57
Gpr63	-0.13	-0.79	-0.41	4.79	4.58	4.54	0.76	0.44	0.55	0.02	-0.35	-0.25	-0.60	-0.05	-0.23
Gpx2	-2.15	-1.17	-1.12	-1.98	-1.79	-2.18	-2.23	-0.62	-2.23	-2.02	-2.05	-1.02	-1.47	-1.89	-1.57
Gramd3	-1.82	-2.10	-1.83	-1.94	-1.95	-1.96	-2.22	-2.25	-2.11	2.89	2.99	1.94	1.80	1.76	1.56
Grb14	-1.83	-2.10	-1.61	1.49	1.71	1.35	0.20	0.26	0.31	-2.61	-2.45	3.26	3.19	2.56	2.43
Gria3	-2.85	-2.94	-3.11	3.02	2.61	2.27	2.70	2.53	2.62	-2.75	-2.97	-1.81	-2.22	0.68	0.60
Grik3	-2.29	-2.64	-2.33	-2.11	-2.13	-0.01	2.87	2.64	2.62	-2.33	-2.47	-1.14	-1.10	0.98	0.90
Grm1	1.50	1.49	1.29	3.30	3.09	2.58	1.79	1.53	1.63	-2.59	-2.16	-2.21	-2.38	-2.68	-2.60
Grm5	-1.30	-1.34	-1.52	-0.90	-0.43	1.84	-0.64	-0.28	-0.35	-1.50	-1.48	0.25	-0.14	3.84	3.94
Gsn	-2.38	-2.33	-2.45	-2.12	-1.26	-2.59	-2.35	-1.79	-1.66	-0.45	-1.00	3.08	3.62	2.85	2.96
Hapln2	-2.37	-2.50	-2.00	-2.59	-1.73	-1.26	-0.59	-0.91	-0.56	-1.79	-1.55	3.73	3.69	-0.73	-0.22
Hepacam	-1.75	-1.64	-1.46	-2.68	-2.62	-1.84	-1.94	-2.53	-2.58	3.68	3.73	3.12	3.15	1.40	1.64
Hhatl	-1.57	-2.10	-1.96	1.12	1.42	0.98	-2.82	-2.05	-2.18	-0.73	-0.16	1.26	1.63	-0.68	-0.04
Hspa1b	-1.20	-1.84	-1.09	-1.70	-1.50	-1.91	-0.89	-1.26	-0.89	-1.74	-1.78	0.08	-1.05	0.05	-1.86
Htr1b	-1.44	-1.40	-1.37	5.67	4.23	5.79	-1.52	-1.48	-0.76	-0.45	-1.34	-1.31	-1.35	-1.18	-0.11
Id4	1.40	-0.67	-1.05	-0.03	0.92	0.30	-1.08	-1.95	-0.72	4.98	4.12	-0.69	-0.76	-1.25	-2.16
Igsf11	-1.44	-2.33	-1.65	-2.04	-2.05	-1.36	-2.28	-2.55	-2.57	2.34	2.75	3.45	3.25	1.84	1.43
Il22	-1.96	-0.85	-1.22	5.89	5.31	3.94	2.12	2.73	2.34	-1.82	-1.86	-1.82	-1.19	-1.68	-1.29
Il33	-1.68	-1.90	-2.44	0.14	-0.42	-1.23	-1.73	-1.25	-1.42	-1.56	-1.53	4.72	4.70	1.85	2.76
Insc	-1.35	-1.12	-1.57	-1.11	-1.52	-1.69	-1.91	-1.41	-1.30	-1.57	-0.88	4.98	4.84	2.57	2.47
Itgb8	-1.41	-1.96	-1.76	-2.48	-2.45	-1.19	-1.40	-1.68	-1.60	2.23	2.35	2.87	2.82	2.52	2.57
Itih3	-0.76	0.38	-0.09	-1.87	-1.44	-2.28	-1.40	-1.50	-0.97	6.46	6.34	1.54	1.58	0.26	0.89
Itpr1	-1.40	-1.45	-1.11	5.48	5.02	5.10	0.12	-0.19	-0.15	-1.06	-1.07	-1.00	-1.31	-1.18	-1.00
Kcnc2	-1.35	-1.86	-2.15	0.07	0.06	2.06	-1.98	-0.18	-1.74	-1.15	-1.35	-1.00	-1.28	1.42	1.69
Kcnj10	-1.50	-1.40	-1.68	-2.65	-2.62	-2.48	-2.37	-2.45	-2.56	3.16	3.07	2.71	2.71	1.64	1.49
Kif19a	-0.62	-1.02	-0.41	-1.78	-2.25	-2.86	-2.45	-2.28	-1.84	1.47	1.08	-1.65	-1.56	1.03	1.35
Kit	-1.48	-1.68	-1.79	-1.60	-1.36	-1.34	3.58	3.44	3.48	-1.68	-1.57	0.31	0.34	0.90	1.09
Kitl	-1.67	-1.31	-1.46	5.60	5.71	4.10	-1.13	-1.08	-1.07	3.16	3.49	-1.39	-1.12	-1.55	-1.62
Klk6	-1.56	-2.51	-1.69	-0.60	-0.01	-1.40	-1.91	-0.77	-1.32	-2.43	-1.19	2.55	3.05	-1.13	-1.00
Leng9	1.57	1.44	0.05	2.70	2.84	1.33	0.67	1.40	1.37	0.85	1.47	2.10	2.19	1.47	1.61
Lfng	-1.35	-2.59	-1.58	-1.43	-1.41	-1.54	-2.69	-1.97	-2.02	4.64	4.59	-0.35	-0.60	-0.90	-1.03
Lgi4	-0.73	-1.20	-1.45	-2.43	-2.22	-1.88	-2.20	-2.06	-3.08	4.55	4.50	-0.50	-0.79	-1.98	-2.42
Lims2	-1.66	-1.56	-1.72	-0.79	-0.59	-1.58	-1.03	-1.38	-1.24	-1.26	-2.01	1.95	2.17	3.71	3.55
Mag	-0.60	-3.06	-2.49	-2.37	-1.90	-1.99	-2.36	-2.84	-2.50	-1.50	-2.57	4.87	5.13	2.78	2.76
Mak	-1.30	-2.28	-2.06	-1.45	-1.07	-2.13	-1.33	-0.81	-1.31	0.06	0.56	-0.86	-0.63	-0.49	-0.74
Mal	-1.41	-2.34	-2.30	-2.74	-1.52	-1.41	-2.14	-2.43	-2.33	-2.42	-2.53	4.25	4.31	2.53	2.81

March11	-0.38	-0.93	-0.66	0.85	0.86	1.40	4.33	4.00	4.21	-1.98	-1.84	-1.33	-1.61	-1.02	-1.77
Marcksl1	-0.52	-0.44	-2.00	-1.53	-1.25	-1.81	-1.66	-1.83	-0.93	1.91	-0.41	-0.44	1.03	0.23	0.75
Mcam	0.78	0.89	0.16	0.58	1.71	-0.91	-2.50	-2.34	-2.09	-2.27	-2.96	3.89	4.44	3.12	3.36
Mff	1.58	1.68	1.22	1.91	1.47	1.51	1.85	1.92	2.01	0.78	0.78	2.17	2.20	1.55	1.23
Mfge8	-1.37	-1.31	-1.43	-1.33	-1.50	-1.88	-2.63	-2.08	-2.62	3.48	3.41	-0.88	-0.47	0.43	0.66
Mlc1	-0.06	0.56	-0.43	-1.60	-1.13	-1.23	-1.83	-1.53	-1.32	5.14	4.42	0.42	-0.16	-2.62	-1.54
Mog	-2.20	-1.55	-1.84	-2.18	-0.87	-1.92	-1.27	-1.21	-1.55	-2.23	-2.75	5.21	5.25	3.42	2.78
mt-Co1	-0.81	-1.91	-1.66	-2.41	-2.45	-2.37	-2.59	-2.02	-1.76	-2.54	-2.26	-0.79	-0.92	-1.48	-1.28
mt-Nd4	-0.86	-1.43	-1.56	-1.74	-1.75	-2.20	-2.31	-1.95	-1.41	-2.18	-1.54	-0.42	-0.05	-0.87	-0.89
Mybpc1	1.07	-0.34	1.30	-0.41	-0.11	-0.74	-0.39	-1.08	-1.25	5.64	8.71	0.30	0.21	1.28	1.65
Myot	-0.80	-0.88	-1.82	0.33	0.26	-1.16	-1.45	-0.62	-0.69	-1.11	-0.77	-1.11	-1.17	-0.67	-0.61
Myrf	-2.72	-2.31	-2.00	-1.05	-1.16	-1.15	-2.33	-1.22	-2.18	-1.55	-2.78	3.14	3.23	1.61	1.48
Ndrg1	-1.96	-2.34	-1.80	-1.81	-2.56	-2.04	-2.56	-1.92	-1.39	-2.06	-2.67	3.79	3.75	1.27	1.47
Nell1	-1.38	-1.44	-2.04	5.37	5.43	4.59	-1.37	-0.98	-1.33	-1.52	-1.03	-1.15	-1.02	-0.99	-0.99
Neto1	-2.23	-1.55	-2.32	-0.77	-0.72	1.69	-0.09	-0.39	-0.02	-0.12	-1.66	0.79	0.25	4.78	4.81
Neu4	-0.98	-0.91	-2.10	-0.99	-1.80	-2.20	1.83	1.12	0.67	-1.44	-1.49	3.23	2.53	6.68	7.15
Ninj2	-1.54	-1.64	-2.03	-1.05	-1.16	-2.04	-1.73	-1.67	-1.64	-1.95	-1.81	3.91	4.15	3.06	2.93
Nkx2-2	-2.17	-2.00	-2.07	-0.56	-0.82	-2.46	-2.39	-1.03	-1.42	3.53	4.19	2.48	2.82	3.14	3.49
Notch1	-1.69	-1.69	-1.32	-1.40	-1.41	-1.51	-1.42	-1.44	-1.55	3.42	2.85	-1.28	-0.90	1.58	1.47
Nrk	-1.10	-0.92	-1.03	6.91	6.30	5.61	-1.14	-0.83	-0.82	-0.09	0.07	-0.68	-0.33	-0.67	-0.50
Olig1	-1.51	-1.44	-2.25	-1.39	-1.90	-1.55	-0.88	-1.03	-0.43	-2.60	-1.92	3.38	3.45	3.28	3.43
Olig2	-2.33	-2.13	-2.94	-1.39	-1.17	-1.88	-2.43	-1.58	-1.79	-2.36	-2.21	2.80	2.16	3.64	3.32
Opalin	-1.05	-2.20	-2.27	-2.26	-1.61	-1.96	-2.36	-2.66	-2.27	-3.13	-2.88	5.76	5.77	3.97	3.49
Pax3	-1.15	-1.97	-1.17	-1.86	-1.73	-2.29	-0.35	-0.49	-0.32	3.87	3.97	-0.81	-1.06	1.59	1.57
Pcp2	-0.25	-0.76	-0.10	5.21	4.67	6.46	0.25	-1.10	-0.21	0.51	0.23	0.49	0.14	-1.15	-1.67
Pdc	-1.23	-1.82	-2.87	-1.26	-1.67	-2.21	-2.46	-2.64	-1.67	-0.21	-2.25	-1.67	-2.85	-1.63	-2.34
Pdgfra	-2.50	-2.23	-2.57	-2.33	-2.01	-2.87	-0.51	-0.93	-1.01	-2.63	-2.42	0.63	-0.48	4.48	4.76
Pdzd3	-1.99	-1.33	-0.88	-1.15	-1.63	-2.02	-1.12	-1.44	-2.07	-1.20	-1.89	-1.20	-1.89	-1.02	-1.96
Penk	-1.69	-0.89	-0.19	-1.68	-2.30	1.99	4.23	4.99	4.95	-0.27	-2.09	0.06	-0.27	0.20	-0.28
Pex5l	-1.76	-1.88	-1.73	-2.13	-2.11	-0.22	-0.94	-1.06	-0.99	-1.50	-1.32	4.71	4.50	2.00	1.80
Pgghg	-0.53	-1.81	-1.44	-1.65	-1.98	-1.58	-1.94	-1.16	-1.22	3.25	3.19	-1.35	0.03	1.26	1.91
Phyhip	2.41	1.76	2.88	-1.27	-1.94	0.36	2.80	2.52	2.33	-0.18	-0.27	-1.65	-0.77	-1.37	-1.46
Pkp3	0.22	-0.23	-0.75	5.60	5.12	5.70	-0.99	-0.62	-0.45	-1.80	-0.38	-0.31	0.55	0.59	0.12
Pla2g16	-2.37	-2.18	-1.88	-1.96	-1.67	-2.27	-2.37	-2.32	-2.28	1.57	1.51	3.86	3.95	1.33	1.10
Plch1	-1.68	-2.04	-2.10	-0.22	-0.14	0.42	3.87	3.67	3.72	-1.63	-1.05	-1.21	-1.59	-2.20	-2.02
Plekhd1	-2.32	-2.41	-2.71	4.87	4.87	4.18	1.26	1.24	1.05	-2.44	-2.25	-1.09	-1.73	-1.09	-1.76
Plekhg3	0.08	0.39	0.40	-1.70	-1.28	-1.89	-2.25	-2.09	-2.35	-2.33	-2.37	3.56	3.67	1.76	1.99
Pllp	-1.38	-1.69	-1.63	-1.72	-1.65	-1.68	-1.53	-1.36	-1.45	-1.18	-1.30	2.83	2.89	2.45	2.53
Plp1	-1.92	-1.95	-1.53	-1.88	-1.63	-1.73	-1.82	-1.97	-1.95	-1.17	-1.01	4.80	4.84	3.25	3.07
Plpp3	-1.12	-2.03	-1.17	-2.02	-1.79	-2.02	-1.98	-1.97	-1.95	4.14	4.08	0.41	0.54	1.45	1.68
Plpp4	-2.56	-2.22	-2.39	-1.61	-1.47	-0.83	3.10	2.94	2.90	-0.25	-0.51	-0.29	-0.98	3.24	3.41
Plscr1	-0.10	-0.68	-0.71	-1.73	-0.97	-1.78	-1.52	-1.61	-2.34	4.30	4.29	-1.78	-1.59	1.27	-0.48
Plxnb3	-2.65	-2.75	-1.97	-2.81	-2.41	-2.31	-2.19	-2.46	-2.29	2.27	1.98	3.98	3.78	3.07	2.69
Pmp2	-1.13	-1.81	-1.77	-1.66	-0.58	-1.88	-1.94	-1.89	-1.94	-1.71	-1.74	-0.43	-1.74	-1.56	-1.09
Pmp22	-1.14	-0.91	-1.54	-1.90	-1.68	-2.28	-1.97	-1.78	-2.08	2.92	3.09	2.50	2.33	0.95	0.63
Ppfibp1	-2.49	-2.08	-2.66	-2.20	-2.01	-2.12	-0.64	-1.33	-1.11	-0.88	-0.75	0.63	0.27	4.72	4.78
Ppp1r14a	-2.81	-1.94	-1.31	-1.56	-2.04	-1.86	-2.10	-1.61	-2.54	-2.31	-2.35	2.84	2.44	-0.17	0.05
Ppp1r17	-1.43	-1.17	-2.34	4.86	4.47	4.45	-1.97	-0.74	-1.26	-1.07	-1.71	-0.56	-0.76	-1.46	-1.32
Prex1	-1.53	-2.02	-2.07	-2.06	-1.91	-1.69	-1.82	-2.16	-2.17	3.14	2.73	0.86	0.80	1.35	1.20
Prex2	-0.86	-1.70	-1.22	-1.99	-2.17	-1.59	-1.99	-2.39	-2.32	3.72	3.88	-1.73	-1.61	-0.28	-0.41
Prima1	-1.61	-2.49	-2.05	-1.87	-1.54	-2.03	-2.91	-2.24	-2.23	-1.68	-2.26	3.14	3.13	1.73	1.62
Prkcg	-2.29	-1.47	-1.95	3.69	3.63	3.45	1.97	1.98	1.98	-1.21	-1.32	-2.30	-2.05	-1.06	-1.26
Prr5	-1.57	-1.66	-1.40	-0.82	-1.13	-0.55	-0.93	-0.90	-1.02	4.39	4.48	-1.03	-1.26	-1.50	0.70
Prrg3	1.20	1.20	1.11	-1.24	-1.33	0.91	2.48	2.19	2.28	-1.39	-1.63	-1.15	-1.16	1.32	1.88
Prrx1	-1.48	-2.08	-1.36	-1.29	-1.13	-1.69	-1.70	-2.07	-1.76	3.10	2.97	-0.46	-0.81	1.82	1.93
Ptchd4	1.66	1.58	1.41	4.16	3.75	3.73	1.55	1.33	1.50	0.24	0.47	-1.96	-1.87	-1.37	-1.10
Ptprk	-2.34	-2.55	-2.42	-1.92	-1.88	-1.45	2.58	2.40	2.52	-2.05	-1.90	2.68	2.43	1.67	1.71
Ptprz1	-1.60	-1.99	-1.77	-2.94	-2.96	-2.27	1.88	1.66	1.77	2.67	2.83	-1.00	-1.49	2.04	2.06
Pttg1	2.97	0.89	0.10	2.50	2.55	2.93	2.46	3.34	3.49	2.04	2.04	4.21	4.17	2.17	2.47

Pvalb	-2.10	-2.19	-2.71	2.82	2.66	2.53	2.39	2.52	2.26	-1.21	-1.78	-2.30	-1.27	-1.87	-2.26
Pxdc1	-1.28	-1.86	-2.31	-1.66	-2.65	-1.26	-1.29	-0.74	-1.63	-2.49	-2.53	-0.15	-1.11	3.90	3.56
Qk	-0.36	-0.29	-0.43	-1.11	-1.21	-1.06	-0.09	-0.26	-0.16	2.29	2.65	3.43	3.43	2.91	2.77
Rapgef3	-2.41	-2.59	-2.66	-2.27	-1.78	-1.27	-2.14	-2.22	-2.22	0.15	-0.72	2.04	2.15	2.26	2.71
Rassf2	-1.72	-2.31	-1.93	-0.18	-0.28	-1.70	-2.32	-2.33	-2.15	2.66	2.86	3.46	3.48	1.74	2.03
Rbp2	-1.12	-1.58	-1.53	-0.93	-0.36	-1.39	-1.94	-2.09	-1.25	-1.86	-1.91	-1.86	-1.49	-0.90	-1.60
Rbpjl	-0.86	-0.78	-1.95	-1.83	-0.69	-1.77	-1.12	-0.30	-0.52	-1.88	-1.92	0.11	-0.19	2.05	2.82
Rgcc	-1.26	-0.42	0.35	-1.28	-0.55	-1.52	-1.31	-2.03	-1.73	-1.95	-2.28	-0.43	-0.71	3.39	3.34
Rgma	-0.60	-0.54	0.11	-1.48	-1.41	-1.16	-1.96	-1.66	-1.47	4.14	3.88	1.62	1.46	0.99	1.16
Ryr1	-2.32	-2.18	-2.79	4.50	4.53	4.51	-1.14	-1.11	-1.21	-2.27	-2.24	-1.68	-1.76	-1.72	-1.87
S100b	-1.55	-0.99	-1.86	-1.33	-1.07	-0.69	-1.59	-2.10	-2.32	1.91	1.81	0.03	0.50	1.01	1.17
S1pr1	-0.38	1.20	0.35	-2.05	-2.59	-0.74	-1.28	-1.28	-2.01	6.26	5.73	-0.10	-0.26	-1.93	0.55
Sall1	-1.46	-1.19	-2.13	-1.29	-0.97	-1.50	-1.59	-1.24	-1.23	-2.72	-1.88	3.59	3.22	0.75	0.81
Sec14l5	-1.69	-1.71	-1.81	-1.14	-0.87	-1.73	-1.30	-1.61	-1.51	-1.75	-1.70	4.53	4.37	1.83	1.63
Serpine2	-2.21	-2.14	-2.33	-2.02	-1.37	-1.63	-1.05	-1.80	-1.29	1.92	2.05	0.63	-0.02	3.76	3.90
Shisa6	-2.95	-3.04	-3.02	3.83	3.53	3.12	2.46	2.13	2.23	-1.87	-1.74	-2.05	-2.31	-0.65	-0.95
Skor2	-0.04	0.02	-1.04	6.47	7.18	5.92	-0.90	0.30	-0.08	-1.85	-1.29	-0.12	-0.04	-0.88	-0.58
Slc1a3	-0.20	-1.10	-0.57	-1.87	-1.98	-2.07	-1.72	-2.28	-1.87	4.59	5.19	0.73	0.57	-0.12	0.09
Slc1a6	0.45	0.69	0.35	5.78	5.57	4.60	1.26	1.19	1.53	-0.34	-1.04	-0.34	-0.52	0.86	0.28
Slc26a3	-2.11	-2.15	-2.59	-1.21	-1.20	-2.47	-2.36	-1.67	-1.65	-2.44	-1.92	-1.77	-1.54	-1.96	-1.90
Slc32a1	-0.54	-1.77	-1.52	2.08	2.50	1.59	3.01	3.52	3.63	-2.06	-2.54	-0.78	-0.85	-1.88	-0.75
Slc4a4	2.49	2.42	2.43	-1.94	-1.86	-1.08	-1.19	-2.32	-2.18	4.19	4.36	-0.03	-0.32	-1.04	-1.10
Slc5a11	-1.43	-1.66	-2.18	-1.17	-1.02	-1.94	-1.00	-0.94	-0.97	-1.04	-1.36	1.72	1.65	-0.70	-0.45
Slc9a3	-0.76	-0.76	-1.62	6.99	6.23	6.06	-0.69	-0.69	-1.02	-0.99	-0.41	0.34	0.39	-0.54	-0.85
Slitrk6	-1.42	-1.96	-1.32	-1.83	-0.45	-0.78	-0.65	-0.38	-2.08	-1.87	-1.90	-1.23	-1.91	3.21	3.39
Socs2	-1.47	-1.10	-1.55	0.45	0.20	0.59	4.10	4.04	4.18	-2.48	-2.06	-0.48	-0.65	-1.04	-1.26
Sorcs3	-2.81	-2.82	-2.96	-1.94	-2.03	-1.55	3.81	3.70	3.76	-2.36	-2.02	0.99	0.98	1.68	1.64
Sox10	-2.72	-1.86	-2.64	-2.18	-2.50	-3.21	-2.04	-1.83	-2.41	-2.73	-3.15	3.04	3.07	3.05	3.00
Sox2	-2.42	-2.75	-2.73	-1.51	-2.00	-2.45	-2.51	-2.21	-2.25	0.09	1.26	1.77	2.68	2.41	1.63
Sox6	-1.56	-2.08	-1.76	-1.27	-0.99	-1.89	-0.97	-1.35	-1.32	2.64	3.07	0.59	0.12	3.99	4.08
Sox8	-2.11	-2.40	-2.02	-1.60	-0.98	-2.69	-1.49	-1.92	-2.73	2.14	2.13	2.09	2.42	2.94	2.43
Stag3	-2.03	-1.90	-2.35	-1.26	-0.88	-0.69	1.12	0.71	1.01	-0.24	-0.22	-0.48	-0.83	0.81	-1.28
Stk32a	-1.32	-1.98	-1.20	-1.64	-1.55	-1.66	-1.46	-1.72	-2.06	3.50	3.90	-0.28	-0.42	2.23	2.27
Sulf2	-1.27	-1.67	-2.27	-1.39	-1.20	-0.10	-1.02	-0.81	-1.11	-1.52	-1.44	2.05	1.84	2.52	2.42
Susd5	-1.42	-1.58	-2.76	-1.01	-1.31	-2.32	-0.72	-1.14	-0.95	-2.55	-1.85	-0.15	-0.40	4.07	4.19
Tceal7	-1.85	-0.43	-1.77	-1.67	-0.21	-1.25	-1.93	-1.27	-1.32	-1.71	-1.75	-0.26	-0.64	-0.84	-0.75
Tfap2b	-1.70	-1.47	-2.36	-1.56	-1.54	0.01	2.95	2.99	3.17	-2.77	-2.28	-1.74	-1.70	-1.38	-1.22
Thbs2	-0.93	-1.87	-2.46	-2.35	-1.22	-2.89	-2.20	-1.51	-1.13	-0.32	0.67	1.16	2.04	-1.95	-0.94
Tmem	-2.29	-2.36	-2.80	2.07	2.06	1.14	-1.55	-1.75	-1.88	-2.49	-1.98	2.68	2.62	2.95	3.00
Tmem	-1.92	-1.73	-1.66	-1.33	-0.96	-1.39	-2.06	-2.05	-1.69	-0.59	-0.50	4.37	4.47	1.64	2.20
Tmem125	-1.40	-1.34	-0.87	-1.15	-0.87	-2.05	-2.10	-1.05	-2.10	-1.20	-1.92	4.30	4.28	2.68	1.95
Tmem98	-1.89	-2.45	-2.42	-1.80	-1.02	-2.53	-1.69	-1.34	-1.07	-2.20	-1.82	3.23	3.19	1.16	1.06
Tnc	0.24	-1.35	-0.18	-0.87	-0.66	-1.73	-1.47	-1.78	-2.01	6.16	5.00	-1.69	-1.70	-0.75	-0.04
Tnfrsf13c	-0.78	-0.09	-0.65	-2.02	-0.71	-1.69	-1.40	-1.34	-1.40	-2.06	-1.51	-1.07	0.73	0.77	0.81
Tns3	-2.19	-2.18	-2.11	-2.54	-2.28	-1.81	-2.42	-2.50	-2.54	1.57	1.80	1.37	1.20	2.84	2.65
Trabd2b	-2.09	-1.93	-2.70	6.27	5.47	5.86	-1.51	-2.14	-1.69	0.98	0.72	-1.32	-1.48	-1.90	-0.20
Tril	-0.28	-0.67	-1.38	-2.59	-2.77	-1.04	-1.84	-2.28	-1.91	4.10	3.69	-0.66	0.02	2.94	1.41
Trpc3	-2.04	-2.32	-2.29	6.07	5.61	5.07	0.89	0.77	0.95	-1.74	-1.91	-1.62	-1.88	-0.27	-0.84
Trpc7	-1.92	-1.96	-2.21	0.40	0.76	1.35	3.71	3.62	3.70	-2.06	-2.04	-0.82	-1.18	-1.90	-2.03
Tshb	0.91	0.82	-0.22	3.91	3.49	3.63	-1.01	0.12	0.41	-1.68	-0.28	3.42	3.75	2.99	1.90
Tspan11	-2.50	-2.65	-2.53	4.06	4.14	2.78	-2.04	-1.54	-1.75	-2.30	-1.67	-1.68	-1.67	-0.68	-0.59
Tspan2	-0.95	-1.04	-1.06	2.65	2.39	2.26	-1.95	-1.81	-1.53	-2.44	-1.00	4.18	4.15	2.91	2.89
Tuba8	-2.05	-2.74	-3.23	2.29	2.32	1.93	0.52	0.41	0.34	-2.77	-2.94	-2.76	-2.62	-2.64	-2.75
Tubb2b	-2.35	-2.69	-2.66	-1.11	-1.12	-2.11	-2.43	-1.24	-1.13	2.12	2.19	-1.31	-0.91	1.33	1.70
Txnip	-0.72	-2.92	-2.61	-2.51	-2.31	-2.49	-2.74	-2.50	-2.23	0.98	0.21	0.25	0.51	0.25	-0.54
Ube2b	1.88	1.78	1.32	2.05	2.26	2.29	2.06	1.95	2.06	1.18	1.10	2.10	2.23	1.39	1.44
Ugt8a	-2.28	-2.57	-2.24	0.49	0.55	0.47	-1.55	-1.81	-1.66	-2.40	-2.60	4.14	4.12	2.86	2.80
Upp1	-1.53	-2.32	-2.29	-0.98	-1.38	-0.92	-2.44	-1.58	-1.64	-1.33	-1.74	-0.82	-1.38	-1.12	-1.22
Vstm2b	-2.48	-2.28	-2.97	-2.74	-2.77	-0.65	0.33	0.48	0.37	-2.53	-2.81	-1.10	-0.54	2.17	1.99

Wfdc1	-2.82	-2.79	-2.55	-1.21	-0.42	-1.55	-1.63	-1.32	-2.20	0.70	1.51	-2.48	-1.40	-1.71	-1.72
Xrra1	-1.41	-0.94	-1.06	-0.92	-1.56	-1.10	-1.54	-1.16	-1.04	-0.53	0.48	-1.25	-1.91	-1.92	-1.70
Zcchc24	-2.41	-2.29	-2.05	-2.88	-2.90	-2.38	-2.11	-2.56	-2.43	2.57	2.70	1.24	0.82	1.76	1.82
Zeb2	-1.99	-2.01	-1.89	-1.54	-1.67	-2.13	-2.13	-2.33	-2.43	2.77	2.97	3.13	3.10	2.72	2.55
Zfp36l1	-2.01	-2.24	-1.49	-1.16	-1.33	-2.49	-2.00	-1.67	-0.93	2.09	1.80	-1.15	-1.36	2.35	1.82

[00261] Examination of the first eight principle components, Proprotein Convertase Subtilisin/Kexin Type 1 (PCSK1, also known as PC1) through Proprotein Convertase Subtilisin/Kexin Type 8 (PCSK8, also known as (Pc1 through Pc8), which collectively account for 90.5% of the variability across all samples, revealed that expression of Pc1 and Proprotein Convertase Subtilisin/Kexin Type 3 (PCSK3, also known as PC3) categorize samples by cell type, while Pc2, Proprotein Convertase Subtilisin/Kexin Type 6 (PCSK6, also known as PC6), and PC8 split samples by species. The other principle components organize samples by both cell type and species. Because Pc1 and Pc3 account for 47% of the variability across samples, while Pc2, PCc6, and Pc8 account for only 22% of variability, the most important differences between the profiles were determined to result from cell-type specific expressed genes that are shared among species. However, it is apparent that genome-wide quantitative differences in expression profiles between species should also be considered when assessing the functional properties of a given cell type in different species.

[00262] Hierarchical clustering was used to explore the similarities and differences across species of mouse, rat, and human cell-type specific datasets based on expression in all genes outside of the 250 most variable genes revealed clustering primarily by species. However, when clustering was performed using only the 250 most variable genes across species, clustering was observed to occur primarily by cell type.

Example 13. Profiling three cell types from sixteen post-mortem human brains

[00263] Given the genetic heterogeneity of human populations, the variations in human tissue processing times, and the difficulties cited in previous studies of total RNAs isolated from human tissue (McCall, et al. (2016) Am. J. Hum. Genet. 99, 624–635.; Webster, M.J. (2006). Functional Genomics and Proteomics in the Clinical Neurosciences, (Elsevier), pp. 3–14, each of which is hereby incorporated by reference herein in its entirety), sources of variability across samples from different individuals were also of interest to assess whether the changes that are observed in a disease are caused by the disease itself or are a result of variability across individuals. To better understand the source of this variability, the cellular profiling technique described herein was used to analyze cell-type specific gene expression in an additional 14 human brain samples. In total, samples were obtained from 16 control donors, roughly equally split between genders (7 males and 9 females), and across ages (4 individuals each in the following age groups: 20-30, 40-50, 60-70, 80-90 years). All samples were obtained from unaffected subjects that received a

neuropathological diagnosis of "normal adult brain". Table 29 provides additional details regarding each donor.

Table 29. Donor details

ID	Tissue	Gender	Age (years)	Race/Ethnicity	Autolysis (hours)	Neuropathy Diagnosis	Cause of Death
XK	frozen	male	23	Caucasian/White	19.5	Normal brain	Gunshot wounds
TM	frozen	female	23	Black/African American	10.5	Normal brain	Pulmonary thromboembolus
WO	frozen	female	25	Black/African American	10	Normal brain	Gunshot wounds
WC	frozen	male	27	Caucasian/White	19.1	Normal brain	Multiple blunt trauma injuries - motor vehicle accident
WI	frozen	female	42	Hispanic/Latino and Caucasian/White	16.5	Normal brain	Complications of Myxoid heart disease
PK	frozen	female	44	Hispanic/Latino and Caucasian/White	14.8	Normal brain	Cardiac problems
VM	frozen	male	45	Hispanic/Latino and Caucasian/White	15.5	Normal brain	Cardiomegaly, hypertensive type
WL	frozen	male	46	Hispanic/Latino and Caucasian/White	13.5	Normal brain	Coronary artery thrombosis
SG	frozen	male	63	Caucasian/White	12	Normal brain	Atherosclerotic and hypertensive heart disease
OR	frozen	female	64	Caucasian/White	8	Normal brain	Ruptured atherosclerotic abdominal aortic aneurysm
LT	frozen	male	65	Caucasian/White	10.5	Normal brain	Myocardial infarction
ZH	frozen	female	65	Caucasian/White	19.4	Normal brain	Hypertensive and arteriosclerotic cardiovascular disease
KO	frozen	female	82	Caucasian/White	5.5	Normal brain	Congestive heart failure, emphysema
KQ	frozen	female	83	Caucasian/White	13	Normal brain	Renal failure
KE	frozen	male	84	Caucasian/White	24	Normal brain	Dissecting abdominal aortic aneurysm
AI	frozen	female	89	Caucasian/White	5.13	Normal brain	Lung cancer
AW	fixed	male	25	Black/African American	22.5	Normal brain	Satus asthmaticus; asthma
AI	fixed	female	89	Caucasian/White	5.13	Normal brain	Lung cancer

[00264] Nuclei were isolated from all 16 samples and stained using antibodies against ITPR1 and NEUN to purify the nuclei from three different cell types in a single sort: granule cells, basket cells, and total glia. Table 30 provides the percentages of each cell type from FACS analysis of the nuclei.

Table 30. FACS results

Cell Type	Population	Individual	Percentage	Cell Type	Population	Individual	Percentage
Granule	Itpr1 - NeuN+	TM	87.10%	Basket	Itpr1+ NeuN-	OR	0.70%
Granule	Itpr1 - NeuN+	WC	77.90%	Basket	Itpr1+ NeuN-	SG	0.49%
Granule	Itpr1 - NeuN+	WO	89.80%	Basket	Itpr1+ NeuN-	ZH	0.95%
Granule	Itpr1 - NeuN+	VM	94.20%	Basket	Itpr1+ NeuN-	LT	0.52%
Granule	Itpr1 - NeuN+	WI	89.50%	Basket	Itpr1+ NeuN-	KO	1.61%
Granule	Itpr1 - NeuN+	WL	91.00%	Basket	Itpr1+ NeuN-	KE	0.42%
Granule	Itpr1 - NeuN+	OR	92.10%	Basket	Itpr1+ NeuN-	KQ	1.04%
Granule	Itpr1 - NeuN+	SG	92.90%	Basket	Itpr1+ NeuN-	AI	0.83%
Granule	Itpr1 - NeuN+	ZH	93.30%	Glia	Itpr1 - NeuN-	TM	8.24%

Granule	Itpr1- NeuN+	LT	93.10%	Glia	Itpr1- NeuN-	VM	3.19%
Granule	Itpr1- NeuN+	KO	90.80%	Glia	Itpr1- NeuN-	WI	4.84%
Granule	Itpr1- NeuN+	KE	91.60%	Glia	Itpr1- NeuN-	WL	4.49%
Granule	Itpr1- NeuN+	KQ	92.20%	Glia	Itpr1- NeuN-	OR	3.44%
Granule	Itpr1- NeuN+	AI	93.10%	Glia	Itpr1- NeuN-	SG	2.44%
Basket	Itpr1+ NeuN-	TM	0.78%	Glia	Itpr1- NeuN-	ZH	3.87%
Basket	Itpr1+ NeuN-	WC	1.21%	Glia	Itpr1- NeuN-	LT	3.56%
Basket	Itpr1+ NeuN-	WO	0.69%	Glia	Itpr1- NeuN-	KO	2.43%
Basket	Itpr1+ NeuN-	VM	0.48%	Glia	Itpr1- NeuN-	KE	2.95%
Basket	Itpr1+ NeuN-	WI	1.15%	Glia	Itpr1- NeuN-	KQ	2.42%
Basket	Itpr1+ NeuN-	WL	0.48%	Glia	Itpr1- NeuN-	AI	2.60%

[00265] Although the staining pattern varied slightly between samples, the ITPR1- NEUN+ population containing granule cells, the ITPR1+ NEUN- population containing basket cells, and the ITPR1- NEUN- population containing total glia were easily distinguishable. The only exceptions were the glial populations from individuals WC and WO in which the ITPR1- NEUN- population did not separate well from the ITPR1- NEUN+ population. Gene expression analysis of these two samples revealed that the sorts failed to effectively separate granule cells from glia, and the samples were excluded from further analysis. RNAseq was used to analyze the 46 human datasets: 16 from granule cells, 16 from basket cells, and 14 from glia.

[00266] The cellular profiling technique described herein was observed to reduce variability caused by differences in cell type composition, which reduced overall variability. Little variability was observed across samples analyzed herein because in a normal analysis of whole tissue, variability is due to both differences in tissue composition and variability in each cell type.

[00267] As shown in Examples 8-14, RNAseq analysis of these datasets demonstrated the high purity of each nuclei sample, as each sample was enriched for the appropriate markers for that cell type, and depleted for markers of other cerebellar cell types. For example, only samples from female individuals expressed the X-inactive specific transcript (XIST), while only samples from males expressed Y chromosome genes, such as Lysine Demethylase 5D (KDM5D). Additionally, pairwise Pearson correlation coefficients between biological replicates for each cell type were observed to be between 0.98 and 1 (FIG. 8). These data demonstrated that despite small differences between individuals in the abundance of each cell type, the cell-type specific human expression data obtained by the cellular profiling technique described herein is reproducible.

Example 14. Summarizing differences in cell-type specific nuclear RNA profiles between mice and humans

[00268] Gene expression profiles were produced for each of the five cerebellar cell types (granule, Purkinje, basket, astrocyte, and oligodendrocyte) in mice and humans by isolating RNA from the sorted nuclei and performing RNAseq.

[00269] Tables 31-34 show differences in gene expression between mouse and human. To focus on differentially expressed genes that are most likely to impact cellular function, genes with an adjusted p-value < 10E-5 that changed by at least 4-fold between species, and that are expressed at significant levels in each cell type (average number of normalized counts/DEseq2 baseMean > 400 and log2(fpkm) > 0). Between 119 and 410 genes that are mouse- or human-enriched were observed. To identify cell-type and species differences rather than general differences between mouse and human, genes that are differentially expressed (adjusted p < 10e-5 and fold change > 2) between mouse and human in all cell types analyzed were removed from the analysis. Filtering in this way yielded between 67 and 277 cell-type and species specific differentially expressed genes that were approximately equally distributed between those enriched in mouse and those enriched in human.

[00270] The log2 fold change for markers of granule cells in sorted nuclei from human granule cells compared to the normalized RNAseq results from the nuclei of granule cells from mice are shown in Table 31. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value for the nuclei of granule cells from mice analyzed, and a positive value indicates increased expresssion compared to the normalized value for the nuclei of granule cells from mice analyzed.

Table 31. Log2 fold change of expression in granule cells

Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change
Nectin3	11.56	Slc44a5	5.20	St3gal5	3.52	Lrfn2	-4.63
Ybx3	9.24	Eml1	5.08	Rasa3	3.52	Agbl3	-4.67
Cdh8	9.22	D930015E06Rik	5.01	Nxn	3.47	Spag16	-4.68
Plppr4	9.14	Mcc	4.99	Pcdh9	3.37	Itga9	-4.70
Cnksr3	8.88	Slc1a3	4.97	Pde4d	3.19	Col13a1	-4.71
Chst15	8.82	Abca8b	4.96	Them4	-3.14	Dkk3	-4.76
Heg1	8.58	Gpc6	4.96	BC003331	-3.17	Fnbp1l	-4.86
Tbata	8.56	Ptpn22	4.95	Flt3	-3.29	Prkd3	-4.87
Sema6d	8.51	Aifm3	4.91	Tgfbr1	-3.33	Rapgef5	-4.87
Wnt7a	8.46	Cux2	4.90	Trpm2	-3.38	Zcwpw1	-4.89
Mbp	8.40	Mapk12	4.79	Chd1l	-3.40	Kank1	-4.90
Ptprt	8.19	Fgd4	4.76	Wdsub1	-3.42	Ddah1	-4.91
Osbpl3	8.06	Slc9a9	4.72	Nin	-3.44	Slc25a13	-4.94
Fyco1	8.06	Hs3st5	4.70	Dpy19l1	-3.45	Cdk15	-4.95
Ece1	7.99	Lgi3	4.69	Tpm4	-3.46	Ppp1r16b	-5.01
Yes1	7.84	Bcl2l15	4.67	Cdk14	-3.46	Sh3pxd2b	-5.06
Trps1	7.75	Parp8	4.62	Khdrbs3	-3.49	Epha4	-5.12
Ttyh2	7.44	Utrn	4.61	Slc1a4	-3.51	Zfp618	-5.13
Ncam2	7.35	Stk3	4.59	Slc35f4	-3.57	Sncaip	-5.17

Epha3	7.24	Phf21b	4.55	Shroom3	-3.60	Glis1	-5.19
Adamts10	7.21	Etv6	4.54	Ptprb	-3.62	Fggy	-5.22
Pls3	7.03	Diaph2	4.49	Lingo2	-3.62	Frem1	-5.24
Ncald	6.96	Sipa1l2	4.49	Cflar	-3.65	Pacsin2	-5.33
Clstn2	6.94	Fmn1	4.46	Glra2	-3.67	Cdh11	-5.40
Ano3	6.93	Dcc	4.41	Slc36a1	-3.67	Dok6	-5.47
Prom1	6.83	Tesc	4.34	Tubb4a	-3.75	Slc26a5	-5.58
Daam2	6.75	Scn9a	4.28	Pam	-3.77	Arhgap29	-5.71
Ntn4	6.74	Tshz3	4.25	Palld	-3.78	Map3k21	-5.78
Arhgap10	6.71	Slc29a4	4.24	Rnf43	-3.78	Slc41a3	-5.78
Kank2	6.71	Btbd11	4.23	Skap2	-3.78	Hacl1	-5.80
Tgfbr3	6.59	Lrrtm4	4.22	Ctdspl	-3.78	Kcnh7	-5.80
Mitf	6.55	Ttyh1	4.20	Rnls	-3.78	Colgalt2	-5.93
Cgnl1	6.55	Dgkz	4.15	Ell2	-3.82	Spats2l	-6.06
Cdh4	6.47	Brinp2	4.06	Crtac1	-3.84	Mal2	-6.09
Kcnb2	6.44	Rasgef1b	4.05	Tenm3	-3.87	Sgcz	-6.32
Ephb2	6.27	Slc24a3	4.05	Slc16a9	-3.89	Nkain2	-6.45
Fgf13	6.20	Mpp6	4.04	Vipr1	-3.90	Iqsec3	-6.66
Rgl3	6.19	Lgr5	4.03	Acmsd	-3.97	Dab1	-6.67
D630045J12Rik	6.11	Cdc14b	3.98	Mob3b	-3.99	Stac	-6.71
Vipr2	6.09	Kcnq3	3.95	Ankrd6	-4.01	Sh3gl3	-7.10
Angpt1	5.93	Kcnip3	3.94	Rai14	-4.03	Adamts16	-7.23
Tmem150c	5.86	Dpysl4	3.93	Gpsm2	-4.09	Rasgrp1	-7.36
Gria1	5.84	Gpsm1	3.87	Lima1	-4.09	Pde5a	-7.79
Dpp10	5.76	Timp3	3.78	Me1	-4.12	Clip4	-7.83
Fat3	5.74	Tango2	3.75	Gatm	-4.14	Basp1	-7.85
Bmp5	5.55	Ltbp2	3.69	Gk5	-4.19	Ifit2	-8.21
Ptchd4	5.48	Plec	3.69	Cdh10	-4.23	Galnt5	-8.22
Pard3	5.48	Tmtc4	3.68	Antxr1	-4.23	Cobl	-8.89
Frmpd4	5.38	Syn3	3.65	Sfmbt2	-4.38	Meis2	-8.97
Pxylp1	5.37	Mmd2	3.65	Cep112	-4.39	Clvs2	-9.10
Man2a1	5.35	Tecpr1	3.61	Zdhhc15	-4.57	Pde1a	-10.26
Nfatc2	5.33	Hcfc2	3.60	Epb41l5	-4.62	Vwc2	-10.39
Inpp4b	5.23	Gramd4	3.54	Efna5	-4.62		

[00271] Granule cell markers RNA Binding Protein, Fox-1 Homolog 3 (Rbfox3, also known as NeuN) and FAT Atypical Cadherin 2 (Fat2) were observed to be highly expressed in granule cells and were not observed to be significantly expressed in the other four cell types. Genes having greater value of the log2 fold change in expression between nuclei of granule cells in humans and mice would be more effective as a marker for nuclei from human granule cells.

[00272] The log2 fold change in expression in sorted nuclei from human basket cells compared to the normalized expression results for the sorted nuclei from mice basket cells are shown in Table 32. Negative values indicate reduced expression in the nuclei of the human basket cells compared to the normalized value for nuclei from mice basket cells, and a positive value indicates increased expresssion compared to the normalized value from nuclei from mice basket cells.

Table 32. Log2 fold change of expression in basket cells

Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change
Cntn3	7.56	Chl1	4.12	Appl2	-2.93	Sema5a	-4.05
Luzp2	7.28	Pld5	4.12	St6gal2	-2.95	Runx2	-4.07
Plpp4	6.83	Rsrp1	4.09	Ccdc138	-3.01	Capn5	-4.07
Gldc	6.62	Osbpl10	4.05	Phyhipl	-3.01	Ehd3	-4.13
Mpp7	6.43	Adamtsl1	3.98	Faim2	-3.03	Cep112	-4.13
Slc6a7	6.39	Sla	3.98	Fam65b	-3.07	Mamdc2	-4.17
Ccdc88c	6.24	Brinp3	3.98	Nefh	-3.07	Kitl	-4.19
Mkx	6.18	Peli1	3.98	Gsap	-3.08	Tub	-4.24
Gng12	6.16	Caln1	3.98	Epb41l5	-3.10	Ift122	-4.25
Prom1	6.14	Farp1	3.95	Grk4	-3.10	Ak4	-4.39
Syt4	6.14	Trpc7	3.91	Dnaja4	-3.11	Mob3b	-4.40
Nkain1	6.03	Ipcef1	3.91	Itgav	-3.11	Scrg1	-4.45
Ust	6.02	Tle4	3.90	Wdpcp	-3.11	Adcyap1r1	-4.51
Arhgef26	6.01	Sema4a	3.83	Camk2b	-3.11	Tnfrsf19	-4.55
Adamts15	5.97	Pfkp	3.79	Atp1a1	-3.14	Prkd3	-4.59
Trpm2	5.95	Pcsk5	3.79	Pappa	-3.16	Abca6	-4.61
Vav2	5.84	Serpini1	3.78	Rgmb	-3.16	Pde9a	-4.61
Nrp2	5.84	Blm	3.76	Amotl1	-3.17	Map3k20	-4.64
Ar	5.81	Cnpy1	3.76	Qsox1	-3.17	Kalrn	-4.65
Lrrc7	5.79	Hacd1	3.74	Traf5	-3.18	Col26a1	-4.69
Rit2	5.75	Ntn1	3.68	Angpt1	-3.18	Basp1	-4.80
Fyco1	5.73	Gpr171	3.66	Hpcal4	-3.20	Cmya5	-4.85
Lrrc1	5.73	Gdpd5	3.65	Arhgef33	-3.21	Susd1	-4.88
Lrtm1	5.71	Dpp10	3.65	Sidt1	-3.21	Cdh22	-4.88
Cacna1e	5.69	Etl4	3.62	Ntng1	-3.23	Fam19a2	-4.93
Lingo2	5.67	Cachd1	3.61	Eml1	-3.26	Fam135b	-4.93
Atp11c	5.65	Phf24	3.60	Fut10	-3.27	Ap1s3	-4.96
Lrrtm4	5.62	Mfsd4a	3.56	Lzts3	-3.28	Rin2	-5.03
Dcc	5.41	Rasa3	3.55	Kcnip1	-3.30	Tns1	-5.09
Kcnip3	5.39	Dgkq	3.54	Cntfr	-3.33	Abca9	-5.20
Adamts3	5.37	Rreb1	3.54	Sh3rf1	-3.36	Ccdc146	-5.28
Notch3	5.25	Smad3	3.52	Itga9	-3.39	Zfp804b	-5.28
Cdh4	5.24	Cxxc4	3.50	Col23a1	-3.39	Thsd7b	-5.34
Pgr	5.24	Tmx1	3.50	Lrrk2	-3.39	Garnl3	-5.34
L3mbtl4	5.23	Arhgef37	3.47	Psd3	-3.40	Clstn2	-5.36
Lats2	5.21	Rdh10	3.45	Sfmbt2	-3.40	Iqca	-5.39
Sdk2	5.15	Pcsk6	3.41	Coro2b	-3.41	Cemip	-5.42
Ntn4	5.11	Nrcam	3.38	Tanc1	-3.44	Rhbdl2	-5.42
Chchd7	5.10	Prkca	3.37	Spg20	-3.46	Baz1a	-5.46
Sphkap	5.10	Cotl1	3.37	Mgll	-3.46	Antxr1	-5.46
Ebf4	5.04	Dok6	3.37	Gpsm2	-3.47	Kcnb1	-5.46
D930015E06Rik	4.97	Igsf9b	3.34	Slc12a8	-3.48	Mei1	-5.52
Tmem47	4.94	Abtb2	3.30	Plekhh1	-3.48	Exph5	-5.54
Dab1	4.90	Shc4	3.25	Ptprf	-3.49	Spag16	-5.57
Chrna7	4.87	Zkscan2	3.24	Slc25a13	-3.51	Golm1	-5.60
Frmd6	4.86	Arhgap10	3.24	Tgfbr1	-3.52	Epb41l4b	-5.73
Ivd	4.78	Cdh11	3.23	Wwc2	-3.54	Ptprb	-5.76
Foxo1	4.76	Kcnt1	3.20	Tubb4a	-3.55	Pkd1l1	-5.84
Prickle2	4.74	Ccdc15	3.19	Unc5a	-3.55	Spats2l	-5.86
Fah	4.59	Pparg	3.19	Arhgef10l	-3.57	Wdsub1	-5.88
Mbp	4.56	Kcnc1	3.18	Jph4	-3.58	Unc5d	-5.97
Chst9	4.51	Arhgef2	3.17	Efhc1	-3.61	Arsg	-6.00
Cacna2d3	4.46	Kirrel3	3.16	Hhip	-3.61	Ano5	-6.01
Trpc3	4.46	Eaf2	3.15	Cobll1	-3.64	Slc13a3	-6.02
Sh3rf3	4.45	Mei4	3.12	Slc22a4	-3.65	1810041L15Rik	-6.05
St6gal1	4.44	Tmem2	3.12	Tcerg1l	-3.66	Galntl6	-6.08
Inhba	4.28	Tgfbr3	3.09	Ccnd2	-3.69	Adra1b	-6.08

Tmem196	4.24	Scn9a	3.07	Rnf213	-3.70	Ky	-6.16
Prtg	4.23	Fndc3b	3.06	Ttc28	-3.71	Timp2	-6.16
Bcat1	4.23	Zfp385b	3.01	Pdzrn3	-3.73	Lrfn2	-6.23
Tmtc1	4.20	Pcdh9	2.96	Klhl5	-3.73	Galnt14	-6.26
Ano3	4.19	Vsnl1	2.90	Ano4	-3.83	Smoc2	-6.33
Rarb	4.17	Vldlr	2.76	Slc35f4	-3.89	Maats1	-6.38
Cdh1	4.17	Ica1l	-2.76	Stard13	-3.89	Graund3	-6.56
Zdhhc2	4.17	Atp8a2	-2.76	Gucy1a3	-3.89	Bean1	-6.66
Cstf2	4.16	Klhl3	-2.79	Cdon	-3.92	Slc37a1	-7.30
Ablim1	4.16	Il15	-2.85	Trim66	-3.92	Tctex1d1	-7.80
Vegfa	4.15	Ubxn2b	-2.90	Vcan	-4.02	Siah3	-8.02
Ddo	4.14	Tarbp1	-2.93	Rab3b	-4.04	Lmcd1	-8.36

[00273] Basket cell markers Sorcs3 and Membrane Associated Ring-CH-Type Finger 11 (March11) were observed to be enriched in basket cells and were not observed to be significantly expressed in the other four cell types.

[00274] The log2 fold change in expression in sorted nuclei from human astrocytes compared to the normalized expression results for the sorted nuclei from mice astrocytes are shown in Table 33. Negative values indicate reduced expression in the nuclei of the human astrocytes compared to the normalized value for nuclei from mice astrocytes, and a positive value indicates increased expresssion compared to the normalized value from nuclei from mice astrocytes.

Table 33. Log2 fold change of expression in astrocytes

Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change
Pla2g7	11.22	Adam11	5.06	Matn2	-4.71	Pdzd2	-6.14
Folh1	10.51	Plekhg1	5.04	Alk	-4.72	Ntng1	-6.17
Cdh19	10.00	Plcb4	5.02	St8sia1	-4.74	Sh3bp2	-6.18
Mybpc1	9.98	Zfp467	4.98	Crmp1	-4.76	Masp1	-6.19
Slco4a1	9.10	Fam234b	4.79	Ppp4r4	-4.81	Lrp1b	-6.19
Syt10	8.56	Tspan15	4.71	Snca	-4.82	Prkcq	-6.22
Nwd1	8.15	Kcnj3	4.60	Cemip	-4.86	Adamtsl1	-6.24
Itih3	8.13	Gdf10	4.59	Slc7a11	-4.93	Sntb1	-6.28
Adgra1	8.06	Irak2	4.58	Vav3	-4.94	Adamtsl3	-6.31
Eva1a	7.73	Gas2l3	4.58	Rftn1	-4.95	Prkar1b	-6.33
Gpr153	7.50	Slc14a1	4.56	Dscam	-4.95	Ryr3	-6.38
Micalcl	7.14	Whrn	4.54	Ldb2	-4.98	Asb18	-6.38
Ttll8	6.94	Pde7b	4.51	Galnt13	-4.99	Dlgap2	-6.40
Fam20a	6.92	Slc7a10	4.46	Pde8a	-5.01	Dgkg	-6.42
Slc14a2	6.89	Tsc22d3	4.44	Pde1a	-5.02	Shtn1	-6.46
Luzp2	6.83	Mfn1	4.42	Arhgef28	-5.10	Aif1l	-6.55
Rgs7bp	6.36	Arrb1	4.38	Fstl5	-5.14	Pdzrn3	-6.60
Cdc42ep1	6.11	Gsap	4.36	Dpp6	-5.17	Inpp5d	-6.62
Cmtm5	6.03	Gjb6	4.35	Pde5a	-5.21	Scn3a	-6.63
Plce1	5.98	Dok5	4.34	Fmnl3	-5.23	Frmpd2	-6.73
Afap1l2	5.95	Clmn	4.27	Fam135b	-5.23	Lmo3	-6.75
Gpld1	5.94	Man1c1	4.22	Rgs6	-5.23	Mrvi1	-6.77
Adamts20	5.77	Cdh22	4.21	Plxdc2	-5.25	Tmem108	-6.79
Ntsr2	5.73	Ppm1h	4.19	Syt17	-5.29	Col22a1	-6.80
Ddo	5.68	Cacng7	4.15	Apcdd1	-5.32	Nrg3	-6.84
Drp2	5.67	Actr3b	4.11	Dcc	-5.37	Tub	-6.90
Frmpd1	5.62	Stox2	4.07	Elmo1	-5.45	Grm5	-6.91
Igdcc4	5.62	Rgs7	-4.17	Plch1	-5.53	Kcnt2	-7.14
Tmc7	5.59	Dner	-4.36	Angpt1	-5.55	Trim66	-7.15

Prickle1	5.44	Slc25a13	-4.48	Rerg	-5.57	Il17d	-7.38
Cspg5	5.43	Fam171b	-4.54	Dock2	-5.58	Mal	-7.43
Rarb	5.43	Fgf14	-4.55	Grik3	-5.66	Lrrc7	-7.50
Plcb1	5.38	Pik3c2b	-4.56	Efemp1	-5.70	Vat1l	-7.54
Kcnip3	5.30	Rnf144b	-4.59	Gas6	-5.73	Fam198b	-7.57
Grhl1	5.26	Mdfic	-4.60	Etl4	-5.79	Fign	-7.80
Col9a3	5.19	Sh3bgrl2	-4.61	Faim2	-5.81	Lrrtm4	-7.84
Stard8	5.18	Pcsk5	-4.67	Ncan	-5.85	Lmo2	-8.08
Tnc	5.17	2900011O08Rik	-4.68	Lama4	-5.87	Rgcc	-8.10
Chst8	5.15	Dab2	-4.69	Lrrc3b	-5.89	Smtn	-8.25
Efhd1	5.07	Srpx	-4.71	Ndrg4	-5.97	C3	-8.27
						Ccnd2	-8.81

[00275] Aldehyde Dehydrogenase 1 Family Member L1 (Aldh1L1) and Slc1a3 was observed to be enriched in astrocytes and were not observed to be significantly expressed in the other four cell types. The log2 fold change in expression in sorted nuclei from human oligodendrocytes compared to the normalized expression results for the sorted nuclei from mice oligodendrocytes are shown in Table 34. Negative values indicate reduced expression in the nuclei of the human oligodendrocytes compared to the normalized value for nuclei from mice oligodendrocytes, and a positive value indicates increased expresssion compared to the normalized value from nuclei from mice oligodendrocytes.

Table 34. Log2 fold change of expression in oligodendrocytes

Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change
Kcnk13	8.44	Gdpd5	4.81	Rgcc	-5.04	Plppr1	-5.73
Il33	8.23	Rcbtb1	4.77	Atp2b4	-5.04	Ajap1	-5.74
Pkd2l1	7.46	Epha4	4.63	L3mbtl4	-5.05	Tcfl5	-5.75
Insc	7.39	Adamts20	4.59	Slc35d2	-5.06	Rai14	-5.78
Rtkn2	7.16	Tle1	4.57	Cpne2	-5.09	Ppp2r2b	-5.84
Efnb3	6.88	Arsg	4.53	Myh11	-5.10	Necab1	-5.85
Asah2	6.77	Arhgef28	4.49	Fbxl7	-5.12	Man2a1	-5.94
Kndc1	6.76	Cacna2d1	-4.35	Shroom4	-5.14	Hhatl	-5.96
Galnt5	6.61	Pld5	-4.41	Syndig1	-5.18	Grb10	-6.14
Cobll1	6.60	Dlc1	-4.52	Galnt15	-5.24	Vstm2b	-6.18
Pls1	6.36	Ttll11	-4.53	Prune2	-5.26	Hs3st5	-6.23
Adamtsl4	6.36	Rhobtb1	-4.62	Fam196b	-5.28	Lrp2	-6.35
Tenm2	6.31	Arfgef3	-4.62	Glra2	-5.31	Ephx1	-6.41
Pter	6.08	Capn3	-4.63	Snph	-5.32	Pde1a	-6.51
Mbp	6.03	Suclg2	-4.64	Cemip	-5.33	Colgalt2	-6.54
Pla2g4a	6.01	Piezo2	-4.77	Aass	-5.34	Itga2	-6.55
Rnf43	6.01	Dpysl5	-4.80	Kcnh8	-5.35	D630003M21Rik	-6.78
Fah	5.99	Ttl	-4.81	Slc39a11	-5.37	Fam124a	-6.98
Bfsp2	5.68	Col9a2	-4.88	Prex2	-5.41	Eln	-7.10
Il18	5.26	Ak5	-4.97	Cntnap4	-5.42	Baiap2	-7.30
Kcnq3	5.25	Dock2	-4.98	Mcf2l	-5.46	Hpn	-7.35
Jph1	5.20	Tyms	-5.01	Shisa7	-5.48	Clip4	-7.42
Shroom3	5.19	Col18a1	-5.01	Slc13a3	-5.67	Cd22	-7.54
Sez6l2	5.04	Pde5a	-5.01	Whrn	-5.68	Zic4	-7.65
Skap2	4.94	L3mbtl1	-5.02	Trim66	-5.69	Gldn	-9.14

[00276] The log2 fold change for gene expression of differentially expressed genes in nuclei from human OPCs compared to normalized gene expression for OPCs in mice nuclei is shown in

Table 35. Negative values indicate a reduced gene expression in the nuclei of human OPCs, and positive values indicate increased gene expression in the nuclei of human OPCs compared to nuclei from mice OPCs.

Table 35. Log2 fold change of expression in OPCs

Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change	Gene	Log2 fold change
Tes	7.74	Prr16	5.27	Etl4	-4.67	Ntng1	-5.85
Lpcat2	7.58	Synpr	5.26	Hecw1	-4.68	Kcnip4	-5.86
1810041L15Rik	7.01	Sdc2	5.24	Golm1	-4.76	Slc25a43	-5.90
Eya1	6.66	Sulf1	5.10	Htr2c	-4.84	Nos1	-5.91
Fli1	6.60	Nkain2	5.09	Rgmb	-4.90	Apcdd1	-5.95
Scel	6.32	Tenm2	5.07	9030617O03Rik	-4.98	Chst9	-6.01
Foxp2	6.27	Arhgap24	5.06	Atp13a4	-5.05	Tmem132c	-6.01
Mro	6.15	Nedd4l	4.89	Pou6f2	-5.09	Snph	-6.07
Angpt1	5.97	Kndc1	4.88	Dgkg	-5.17	Egfr	-6.26
Rgs20	5.64	Mbp	4.66	Col15a1	-5.22	Ankrd55	-6.29
Bfsp2	5.64	Neu4	4.63	Pde5a	-5.36	Cacng2	-6.30
Nrg1	5.57	Plekhg1	4.58	Cemip	-5.40	Ano5	-6.38
Rorb	5.56	Fmn1	4.52	Cedc146	-5.41	Cmya5	-6.54
Kcnk13	5.56	Cobll1	4.50	Acacb	-5.42	Scn9a	-6.84
Enpp6	5.52	Kcnb2	4.46	Dab1	-5.44	Crispld1	-6.87
Nkain1	5.31	Sel1l3	-4.47	Cdkl1	-5.57	Thbs2	-7.56
Epha4	5.28	Fgfr1	-4.64	Apod	-5.65		

[00277] Olig2 and Mog were observed to be enriched in both mature oligodendrocytes and oligodendrocyte progenitor cells (OPCs) and were not observed to be significantly expressed in the other four cell types. Hierarchical clustering of nuclear RNAseq profiles from all cerebellar cell types confirmed that the oligodendrocyte lineage splits into two groups, mature oligodendrocytes and OPCs, with the set of all oligodendrocytes clustering with mature oligodendrocytes.

Example 15. Identifying factors that impact human cell-type specific gene expression

[00278] A main reason for development of the cellular profiling technique described herein was to enable direct examination of human cell-type specific expression and its relationship to biological and clinical factors that might influence cellular function. Although the characterized nuclei were obtained from normal cerebellar samples, differences in gender, age, and the time between death and tissue preservation (autolysis time) may influence the expression data. Table 36 provides the number of genes observed to significantly change (adjusted p-value < 0.01, baseMean > 50) in the nuclei as a result of autolysis, gender, and age.

Table 36. Number of genes with significantly changed expression

	All	Granule	Basket	Glia
Autolysis	12	4	1	1
Gender	27	15	35	25
Age	42	274	139	31

[00279] Age was observed to affect significant changes in expression in the most genes.

Example 16. Applying antibody-based sorting of cell types to post-mortem human tissue

[00280] Imbred animals have been used previously for these types of studies, but heterogenetity has been observed across human individuals. To determine whether the cellular profiling technique described herein was effective for analysis of cell types in the human brain, post-mortem human cerebellar tissue from two donors (codes XK and PK), then isolated and stained nuclei using the cell-type specific antibodies defined previously. FACS of granule, basket, all glial, astrocyte, mature oligodendrocyte, and oligodendrocyte progenitor cell (OPC) nuclei from the cerebellum of the two individuals (XK and PK) was performed. Percentage of population in each gate is indicated in Table 37.

Table 37. FACS results for post-mortem human tissue

Cell Type	Population	Individual	Percentage
Granule	Itpr1- NeuN+	XK	91.40%
Basket	Itpr1+ NeuN-	XK	0.85%
Glia	Itpr1- NeuN-	XK	3.36%
Astrocytes	Itpr1- Olig2- NeuN-	XK	3.05%
Oligodendrocytes - Mature	Olig2+ Low	XK	1.18%
Oligodendrocytes - Precursors	Olig2+ High	XK	0.40%
Cytoplasmic	-	XK	-
Granule	Itpr1- NeuN+	PK	92.00%
Basket	Itpr1+ NeuN-	PK	0.75%
Glia	Itpr1- NeuN-	PK	3.58%
Astrocytes	Itpr1- Olig2- NeuN-	PK	1.33%
Oligodendrocytes - Mature	Olig2+ Low	PK	3.07%
Oligodendrocytes - Precursors	Olig2+ High	PK	0.23%
Cytoplasmic	-	PK	-

[00281] Further analysis of the expression profiling from the results in Table 37 revealed two distinct populations: OLIG2+ low nuclei coming from mature oligodendrocytes and OLIG2+ high nuclei come from both oligodendrocyte precursor cells (OPCs) and mature oligodendrocytes.

[00282] After further flow cytometry analysis of oligodendrocytes, the OLIG2+ population appeared subdividable based on its level. Approximately 20% of all OLIG2+ nuclei have high levels of OLIG2 (High) while 80% have lower levels (Low).

[00283] Although the profile of stained human cerebellar nuclei was generally similar to rodent data, there were differences. For example, the conditions used to sort granule and basket neurons, astrocytes, oligodendrocytes, and OPCs were directly transferrable to human postmortem tissue, whereas those used to sort mouse and rat Purkinje cell nuclei were not successful for isolation of human Purkinje cell nuclei. Slight differences in staining were

observed between the two postmortem human samples: in XK the oligodendrocyte and OPC populations were well separated, whereas they are more difficult to distinguish in individual PK.

[00284] To assess whether these differences would prevent cell type specific analysis of human postmortem samples, gene expression of nuclei isolated from five cell types (granule, basket, astrocyte, oligodendrocyte, OPC) was analyzed in these two individual brains using RNAseq. Examination of known markers from each of these cell types established that relevant cell specific markers were enriched for each cell type and depleted from the other cell types.

[00285] The log2 fold change between the normalized RNAseq results from the nuclei of unsorted nuclei from mice, rat, and human samples compared to the RNAseq results for the sorted nuclei from granule cells, basket cells, astrocytes, oligodendrocytes, and OPCs cells from 2 human samples are shown in Table 38. Negative values indicate reduced expression in the nuclei of the cell type compared to the normalized value across nuclei from all cell types analyzed, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed. Table 38 shows the RNAseq results for the 250 most differentially expressed genes across all species for 2 post-mortem human samples.

Table 38. Log2 fold change in expression in 2 post-mortem human samples

	Log2 fold change of expression in XK					Log2 fold change of expression in PK				
Gene	**Granule**	**Basket**	**Astro**	**Oligo**	**OPC**	**Granule**	**Basket**	**Astro**	**Oligo**	**OPC**
A2m	2.41	1.36	3.86	0.99	0.66	2.65	1.44	2.45	2.57	2.73
Adamts15	-2.61	-0.51	-0.64	-0.72	-1.50	-2.43	-0.26	-2.45	-1.26	-0.92
Adra1a	-2.41	-2.40	3.14	-0.23	2.91	-2.23	-1.26	4.46	2.68	3.83
AI593442	0.83	2.50	-1.57	-1.63	-2.32	0.21	2.32	-2.05	-2.04	-2.20
Aldh1a1	-1.90	-0.45	4.81	0.15	-0.88	-1.96	0.39	7.46	-0.34	-1.84
Anln	-2.38	-1.95	-2.05	4.71	-0.26	-1.90	-1.04	-2.06	3.84	0.36
Apcdd1	-2.35	-1.62	3.37	1.71	4.22	-2.40	-1.00	4.50	3.52	4.55
Apod	-3.07	-1.83	-2.15	3.12	3.18	-2.92	-1.94	-2.83	3.28	4.01
Aqp4	-3.01	-1.95	2.79	-1.84	-2.37	-2.01	-0.63	3.97	-0.68	-2.69
Arhgef33	0.21	1.04	0.48	-1.25	-0.66	-0.01	0.87	0.74	-0.48	-1.03
Ascl1	-2.03	-2.17	0.41	1.89	3.80	-2.08	-2.05	3.36	4.11	4.87
Asgr1	1.53	2.81	3.77	1.12	3.31	2.43	4.46	2.58	0.65	3.71
Aspa	-2.60	-2.42	0.96	3.46	-1.94	-2.00	-0.89	2.42	3.37	1.79
Atp1a2	-3.04	-2.46	2.88	-2.44	0.94	-2.94	-1.05	4.37	0.75	1.71
Atp2a3	-1.80	-0.11	-1.03	-0.43	-0.93	-1.54	0.20	-1.32	-1.79	-1.02
B3gnt5	2.23	2.79	3.43	0.75	-0.09	2.60	2.96	1.15	2.28	2.34
B3gnt7	-1.95	-0.60	-0.07	2.42	5.26	-2.00	-0.38	-2.02	3.98	5.95
Bcl11a	-2.16	-0.08	-1.62	-1.37	-0.99	-2.32	-0.52	-2.02	-0.60	-0.22
Bhlhe22	-2.29	4.50	1.94	0.45	-0.57	-0.70	4.65	-2.36	0.79	-2.26
C1ql1	-1.66	-2.24	-1.40	0.37	4.31	-2.13	-1.86	-0.60	2.85	4.35
C1ql2	-1.58	-1.73	-1.29	-1.33	5.46	-1.63	-1.60	-1.65	3.45	3.83
C2orf72	-0.17	2.68	2.49	2.83	4.01	-1.10	2.57	4.69	3.25	3.71
C8orf46	-0.49	-0.08	0.85	2.85	1.66	-0.55	-0.03	2.12	3.31	3.44
Cacna1g	-2.86	-0.09	-1.63	-1.49	-0.21	-2.64	-1.13	-3.21	-0.52	0.22
Cacng4	-2.92	-1.09	1.58	-0.37	3.35	-2.99	-0.66	2.57	2.29	3.70
Calb1	-1.05	1.28	-1.13	-1.82	-1.41	-0.74	1.14	-0.08	-0.48	-1.21
Camk1g	-1.48	0.55	-1.86	-2.41	-2.30	-0.10	1.40	-2.52	-2.18	-2.40
Car8	-0.67	-1.26	-1.71	-1.20	1.97	-0.68	-2.91	0.09	0.62	1.56
Carns1	-0.92	-0.05	-0.15	5.08	1.53	-1.37	0.67	-0.90	5.63	3.11
Casq2	-1.41	-0.49	-2.05	-0.96	-0.99	-1.11	-0.50	-2.52	-0.87	-2.39

Cbln2	-1.24	5.79	1.69	2.28	1.55	-0.42	7.34	4.37	2.12	-1.20
Ccdc152	-0.49	-0.03	1.92	4.77	-0.08	-0.55	0.69	2.25	3.43	2.24
Ccdc180	3.52	3.48	2.82	2.78	3.11	3.12	3.25	3.46	3.44	3.37
Ccnd2	-2.30	3.76	3.20	-1.64	2.71	-2.17	4.06	3.55	3.24	4.31
Cd82	-2.45	-2.44	-0.47	3.52	4.42	-2.33	-1.69	-0.51	2.75	2.70
Cd9	-2.66	-2.72	0.59	3.09	2.05	-2.17	-2.17	1.33	1.89	1.23
Cdh19	-2.44	-2.51	-2.34	3.25	-0.53	-2.85	-1.92	-2.86	2.50	1.26
Cdhr1	-0.93	4.68	1.09	3.02	1.04	-1.29	3.82	2.46	4.17	4.19
Cldn11	-2.94	-2.13	0.42	4.50	-0.81	-2.85	-1.85	1.38	2.79	0.23
Clec7a	-1.21	0.43	10.56	1.18	1.38	-1.25	0.97	2.78	-1.26	-1.17
Clmn	-3.08	-2.35	-0.82	2.88	-1.27	-3.21	-2.22	-0.80	2.22	-0.31
Cmtm5	-2.87	-2.44	-1.92	0.30	-0.60	-2.89	-2.87	-0.39	1.79	0.75
Cntn3	-2.51	-2.47	-1.79	-1.52	1.81	-2.53	-2.26	-1.18	0.68	1.91
Cntnap5a	-2.16	4.27	0.75	0.18	2.67	-2.04	4.40	-1.68	2.26	3.37
Cobl	2.98	-1.71	-0.27	4.05	3.26	2.78	-1.15	0.19	4.00	3.74
Col5a3	-2.44	-0.81	3.56	0.85	3.37	-2.04	-0.19	3.09	0.82	2.66
Col6a1	2.85	3.11	2.76	3.48	2.62	2.23	2.77	3.54	2.57	3.35
Cpm	-1.87	-2.19	-0.51	3.99	0.06	-1.79	-1.49	-0.77	3.15	0.97
Cryab	1.42	0.27	1.05	3.91	-1.31	1.36	0.66	2.77	3.93	1.88
Cspg4	-1.04	-2.06	-1.06	-1.04	3.65	-1.18	-1.96	1.83	2.85	4.10
Csrp1	-2.74	-2.27	1.46	2.02	-0.46	-2.70	-2.10	2.33	1.82	0.03
D7Ertd443e	-2.77	-1.25	-1.26	4.86	2.99	-2.91	-0.87	-1.99	4.25	3.80
Ddx3y	0.89	1.06	1.36	1.69	0.90	-2.85	-2.63	-2.87	-3.09	-3.04
Dock5	-2.58	-2.02	2.11	4.77	0.92	-2.35	-1.12	3.09	4.05	0.87
Dpy19l2	3.23	4.93	1.87	0.84	4.99	3.17	4.75	0.42	3.13	4.45
Ebf2	-1.85	-2.39	-1.00	-0.23	-0.79	-1.76	-1.74	-1.99	-1.64	-1.41
Echdc2	3.68	3.01	3.72	1.22	3.45	3.14	2.67	3.64	2.55	3.38
Efna5	2.31	3.69	-0.13	-2.00	-1.62	1.26	3.52	-2.28	-1.34	-2.95
Enpp2	-3.16	-1.20	-2.64	3.57	-0.53	-3.10	-1.25	-3.29	3.16	0.49
Erbb3	-1.74	-0.32	0.27	2.98	2.63	-1.53	-0.70	-0.31	3.43	2.22
Ermn	-1.03	-2.26	-2.00	5.41	-1.92	-0.30	-1.27	-2.44	4.04	1.87
Etnppl	-2.06	-1.77	3.56	-1.04	-0.87	-1.64	-1.36	4.68	-2.31	-1.82
Fa2h	-1.41	-2.44	-1.69	3.82	1.65	-2.35	-1.81	-1.54	3.21	2.20
Fam46a	2.20	-2.32	4.19	-1.29	1.64	2.15	-0.44	4.17	2.28	3.67
Fgfr2	-3.05	-2.83	2.84	2.78	-2.01	-3.25	-1.63	3.67	1.97	-0.45
Flrt2	-3.08	3.26	0.41	-1.63	2.09	-2.69	3.01	-2.89	1.93	3.04
Fmo3	-1.13	-0.98	1.07	2.39	6.18	-1.21	-1.00	0.78	6.05	8.59
Folh1	-3.04	-2.23	-2.45	4.57	-2.77	-3.25	-1.45	-3.25	3.85	1.11
Foxh1	2.19	1.78	1.91	-0.80	1.73	2.31	1.48	2.06	-0.11	0.55
Fsip2	2.31	4.18	3.53	4.22	3.88	3.08	4.64	4.04	3.91	4.58
Fxyd1	-2.23	-2.40	2.43	0.51	-0.30	-1.58	-1.95	3.01	-0.43	-2.18
Fxyd7	-1.93	-1.90	3.07	-0.78	0.34	-1.77	-1.38	3.20	-0.65	-1.88
Gad2	-2.78	4.02	0.22	-1.66	-2.40	-2.43	4.13	-2.30	-1.48	-2.97
Gal3st1	-2.77	-1.52	-2.22	1.10	-1.25	-2.61	-1.47	-2.33	1.51	1.16
Galnt5	4.41	-1.44	1.19	-1.28	2.73	5.32	-1.16	0.08	0.33	-0.94
Galnt6	-1.80	-1.34	-1.82	2.72	-1.25	-2.12	-1.38	-1.90	3.05	-0.64
Galr1	-2.37	0.00	-1.44	1.58	4.83	-0.90	-0.84	-1.94	5.66	7.65
Gdf10	-2.59	-2.34	2.65	-1.29	-1.13	-2.63	-1.92	2.74	-0.51	-1.85
Gfap	-2.78	-1.96	3.97	-1.81	0.03	-2.21	-1.27	4.28	0.74	1.43
Gja1	-2.60	-2.34	3.59	-0.45	-1.32	-2.08	-0.52	3.80	-0.63	-2.89
Gjb1	-2.35	-1.26	-1.45	4.60	2.11	-0.65	-0.58	-1.60	3.31	0.02
Gjc2	-1.03	-0.99	-1.72	2.19	2.77	-1.65	-1.74	-2.00	0.76	-2.34
Gldn	-1.53	-0.27	2.48	9.37	0.28	-1.51	0.90	-0.29	5.65	2.75
Gli1	0.44	-0.83	2.86	-0.73	-0.55	0.41	-1.04	4.76	-0.98	-2.04
Glp2r	-2.75	-2.29	-1.99	-1.26	-0.66	-2.53	-1.80	-2.45	-2.44	-1.83
Glul	-1.90	-1.71	2.11	2.13	-0.55	-1.14	-0.75	3.79	2.18	0.35
Gm136	2.77	3.74	3.36	2.23	1.81	3.02	3.90	4.40	3.58	4.21
Gnb3	3.39	4.09	0.67	-0.35	1.45	3.14	3.73	1.88	1.41	1.14
Gng11	-1.29	-1.43	0.99	-1.05	-0.95	0.00	-1.30	2.01	-1.34	-1.25

Gpr37	-2.52	-3.22	-1.98	4.85	-0.68	-2.93	-1.74	-3.19	2.70	-0.47
Gpr37l1	-2.04	-2.04	1.65	0.88	2.47	-2.14	-1.30	3.10	1.80	2.70
Gpr63	-2.62	-0.49	-1.62	-1.83	-0.90	-2.96	-1.46	-1.87	-1.76	-1.17
Gpx2	3.29	3.11	2.80	3.10	3.40	3.71	3.28	4.46	4.05	3.00
Gramd3	-2.95	2.52	0.90	1.57	0.98	-2.99	1.82	2.25	2.09	2.41
Grb14	-2.22	-2.20	-1.97	-2.35	-2.22	-2.58	-2.36	-2.54	-2.02	-2.63
Gria3	-3.12	2.38	-0.89	-0.68	1.21	-3.02	2.36	-1.79	0.80	1.56
Grik3	-3.18	2.77	0.74	-1.49	1.37	-3.18	2.85	1.54	0.44	1.42
Grm1	1.03	2.32	-0.68	-2.27	-2.98	1.13	2.07	-1.96	-2.22	-3.10
Grm5	-1.58	-1.68	3.29	1.40	3.53	-1.61	-1.15	3.72	2.82	3.92
Gsn	-2.00	-2.33	2.05	4.20	2.19	-2.22	-1.63	1.52	2.49	1.03
Hapln2	0.41	1.73	0.78	3.25	-0.98	0.22	1.70	0.56	2.98	1.23
Hepacam	-3.19	-2.84	2.06	2.98	0.65	-2.70	-1.80	3.28	2.63	1.63
Hhatl	-1.39	-1.36	2.34	8.76	0.31	-1.25	-0.10	3.39	5.15	1.44
Hspa1b	2.20	3.24	8.76	5.40	6.45	3.24	3.50	1.56	1.27	0.52
Htr1b	-1.24	-1.38	-0.94	-1.00	-0.88	-1.29	-1.25	-1.30	-1.29	-1.20
Id4	-0.56	-2.55	2.72	-1.22	-1.47	1.25	-0.58	3.53	-0.37	-2.38
Igsf11	-1.91	-2.07	1.35	2.67	-0.37	-1.34	-0.79	1.60	1.64	0.57
Il22	-1.75	1.98	-1.44	0.49	-1.38	-1.80	0.54	-1.82	0.12	-1.70
Il33	-2.08	-2.26	2.09	-0.83	-1.59	-1.99	-1.67	3.67	-1.36	0.56
Insc	0.59	-2.21	-0.62	-1.20	0.22	-0.44	-1.78	-0.66	-0.81	0.87
Itgb8	-2.85	-2.42	1.33	1.91	2.88	-3.17	-1.78	2.21	2.34	2.84
Itih3	-0.95	-1.14	-1.71	-2.00	-1.62	-1.55	-1.98	-0.49	-2.04	-2.28
Itpr1	-1.85	0.63	-1.29	-1.70	-2.17	-1.80	-0.03	-1.37	-1.59	-1.34
Kcnc2	-2.39	-0.02	-1.21	-1.09	-1.15	-2.27	-0.22	-2.97	-2.52	-2.67
Kcnj10	-2.18	-2.58	2.11	3.23	2.38	-2.43	-1.29	3.09	2.66	2.33
Kiaa1644	-1.40	1.86	0.88	-2.16	-2.15	-1.50	2.78	-2.86	-1.95	-2.21
Kif19a	-1.73	-2.27	-1.37	-1.12	-0.42	-2.48	-1.41	-0.09	0.25	0.15
Kit	-3.23	3.60	0.01	-1.09	0.23	-2.93	3.64	-2.11	-0.35	-0.64
Kitl	-3.12	1.96	1.64	-2.53	-2.65	-2.84	1.95	1.84	-2.06	-2.65
Klk6	-2.36	-0.93	-0.73	7.59	-0.94	-1.91	-0.23	-1.13	4.87	0.81
Leng9	0.00	-0.23	2.39	2.70	2.40	0.95	0.56	0.63	0.19	0.84
Lfng	-1.63	-2.14	2.80	-0.97	-0.80	-1.08	-1.65	2.77	-1.71	-2.40
Lgi4	-2.39	-2.54	3.54	1.63	-1.96	-1.99	-1.72	4.07	0.60	-2.35
Lims2	-3.14	-2.00	-2.29	-0.06	3.86	-2.67	-2.41	-2.47	2.89	3.73
Mag	-2.74	-2.16	-2.22	4.46	-0.79	-2.97	-1.36	-2.41	4.79	2.41
Mak	3.71	3.16	2.58	2.09	2.87	3.91	3.32	3.56	3.00	3.69
Mal	-2.84	-2.57	1.76	5.43	2.66	-2.76	-1.37	2.55	4.79	3.19
March11	-1.83	4.42	0.50	-1.87	-2.54	-1.93	4.23	-3.13	-1.61	-2.11
Marcksl1	1.55	2.26	2.02	4.82	4.50	1.48	1.85	1.78	3.76	4.56
Mcam	0.45	-0.41	-0.87	1.32	1.96	0.50	-1.08	-1.96	1.46	0.45
Mff	0.80	0.77	0.51	1.28	0.83	1.05	0.79	1.33	1.27	1.52
Mfge8	-1.73	-2.18	3.64	2.95	0.98	-1.70	-1.64	4.40	0.96	0.04
Mlc1	-2.26	-2.15	3.43	-0.67	-1.19	-1.32	-1.41	4.45	-1.63	-0.94
Mog	-2.53	-2.69	-2.16	4.30	-1.38	-2.81	-1.68	-2.61	4.03	0.91
mt-Co1	2.94	3.32	1.79	2.88	2.79	3.88	4.61	3.85	5.43	4.54
mt-Nd4	3.62	3.90	3.53	4.81	4.63	4.91	7.50	4.65	6.23	7.28
Mybpc1	-2.18	-1.80	-1.23	-0.85	-1.22	-1.66	-0.95	-1.08	-2.14	-1.65
Myot	3.17	2.62	2.75	4.10	4.61	3.03	2.90	2.57	3.36	3.44
Myrf	-1.61	-1.46	-1.85	3.71	-0.77	-1.96	-0.99	-1.29	4.02	1.17
Ndrg1	-3.13	-0.72	0.71	4.48	2.96	-2.28	-0.34	1.48	3.30	1.92
Nell1	-1.82	-1.49	-0.68	-0.86	1.11	-1.52	-1.29	-1.58	0.48	1.11
Neto1	-2.79	-2.45	-1.87	0.86	2.37	-2.83	-2.60	-2.85	2.81	3.38
Neu4	-1.96	-2.10	-0.45	0.07	3.45	-1.01	-1.97	-0.32	2.79	3.83
Ninj2	-1.94	-0.97	-0.57	3.23	0.66	-1.85	-1.31	-1.14	2.41	-0.03
Nkx2-2	-2.92	-2.74	2.51	2.93	3.70	-2.95	-2.62	2.29	1.32	1.39
Notch1	-2.76	-2.66	0.87	0.05	2.69	-3.09	-2.44	2.22	1.69	2.12
Nrk	-2.87	-2.18	2.06	-0.29	-0.52	-1.46	-0.80	3.49	-1.59	-1.20
Olig1	-2.09	-2.65	-0.84	3.55	4.71	-2.58	-1.55	-2.59	2.55	3.62

Olig2	-2.27	-2.95	-1.16	4.16	5.20	-2.57	-2.53	-2.90	3.56	4.31
Opalin	-2.78	-2.54	-1.08	5.29	2.73	-2.28	-1.03	-2.18	5.00	1.78
Pax3	-2.05	-2.66	2.92	-0.57	2.55	-2.26	-1.70	4.08	1.79	3.10
Pcp2	-1.74	-1.16	-0.36	0.84	0.25	-1.81	-1.98	-2.73	-2.33	-2.64
Pdc	2.65	2.93	1.60	1.96	5.97	3.00	2.87	0.74	1.70	1.71
Pdgfra	-2.12	-1.63	-0.94	1.02	4.77	-1.60	-1.28	-1.97	3.68	5.24
Pdzd3	-0.09	-1.92	-1.48	-0.24	-1.42	-0.18	-1.12	-0.77	-1.84	-0.59
Penk	-1.96	-1.59	-1.57	-2.20	-1.49	-2.49	-2.46	-2.51	-1.46	-2.40
Pex5l	-2.56	-0.46	-0.67	3.35	1.42	-2.65	-0.46	-0.38	3.17	1.78
Pgghg	-2.11	-2.22	4.45	-1.27	1.58	-2.15	-1.62	3.35	-1.67	-1.55
Phyhip	2.84	3.78	0.56	-1.80	2.33	2.24	3.40	1.10	1.43	-0.37
Pkp3	-0.52	-1.87	-0.02	-0.09	-1.35	-1.06	-1.73	-1.09	-1.78	-1.68
Pla2g16	-1.14	-1.56	0.86	3.61	-0.06	-0.83	-1.03	1.23	2.77	0.75
Plch1	-1.51	4.35	2.55	-0.52	-0.73	-1.76	4.00	2.93	-0.94	-1.67
Plekhd1	1.47	3.20	0.43	-2.37	-2.40	0.45	2.91	-2.29	-1.58	-2.65
Plekhg3	0.41	-2.15	0.10	3.81	1.29	-0.18	-1.49	-0.09	2.34	1.31
Pllp	-2.33	-2.69	-2.41	3.43	2.91	-2.22	-1.60	-2.70	2.98	3.09
Plp1	-1.44	-0.64	-2.18	3.38	-1.12	-1.05	-0.39	-1.39	2.94	0.79
Plpp3	-3.04	-1.43	2.24	1.27	1.60	-2.75	-1.70	3.26	1.64	2.15
Plpp4	-2.72	-2.34	-0.50	0.45	3.55	-1.82	-1.48	-0.47	2.69	3.61
Plscr1	1.91	3.22	3.21	0.29	2.00	2.64	3.63	1.59	1.55	3.28
Plxnb3	-0.44	-2.33	-0.24	1.42	-0.20	-0.62	-2.17	1.73	2.86	2.00
Pmp2	-0.82	-1.03	2.73	7.15	6.88	-0.40	1.29	5.89	7.26	7.23
Pmp22	-2.04	-2.68	1.23	3.34	2.40	-1.95	-1.73	2.49	2.74	1.75
Ppfibp1	-2.73	-2.15	-1.44	2.96	1.84	-2.53	-1.59	-1.83	2.64	2.73
Ppp1r14a	-2.22	-1.90	-1.24	3.87	1.45	-1.99	-0.43	-1.80	3.62	3.55
Ppp1r17	-0.65	-2.01	-2.53	1.60	-0.22	-1.62	-2.78	-0.88	1.58	1.05
Prex1	-3.30	-2.72	2.75	2.26	1.13	-3.15	-1.87	3.05	2.17	2.34
Prex2	-3.07	-0.31	3.06	2.25	2.39	-3.15	-0.81	3.36	2.03	2.57
Prima1	1.17	-0.57	1.41	3.97	0.08	0.75	-1.03	1.71	2.93	1.14
Prkcg	-3.31	2.38	-0.69	-2.45	-0.83	-2.72	2.30	-2.41	-1.38	-0.57
Prr5	-2.07	0.39	1.24	-1.36	-1.19	-1.92	0.08	2.39	-2.03	-1.70
Prrg3	0.78	0.83	4.51	4.67	4.51	1.33	1.82	0.98	0.80	1.18
Prrx1	-0.87	-2.28	2.61	-0.21	3.56	-2.53	-2.13	3.09	3.14	4.46
Ptchd4	-1.96	2.17	-1.08	-2.66	-2.40	-2.25	2.11	-3.03	-2.71	-3.03
Ptprk	-3.02	3.05	-0.27	2.24	0.48	-3.13	3.27	-0.50	1.60	0.96
Ptprz1	-3.08	0.57	0.72	-0.97	2.44	-2.82	0.48	1.74	1.79	3.10
Pttg1	-1.72	-0.90	-1.53	0.35	-2.33	-2.01	-2.66	-2.32	-2.02	-2.62
Pvalb	-2.69	3.17	-0.09	-2.29	-2.31	-2.74	2.81	-2.76	-0.55	-1.84
Pxdc1	-2.14	-1.59	1.57	0.50	1.98	-1.44	-0.42	1.41	2.10	3.10
Qk	-1.35	0.30	2.02	3.33	2.10	-1.04	0.60	2.17	2.58	2.25
Rapgef3	-2.15	-1.31	1.14	3.22	0.93	-2.57	-0.73	2.17	2.45	0.29
Rassf2	-0.45	-2.43	0.90	2.03	0.80	-1.05	-1.86	1.53	1.88	1.30
Rbp2	3.10	4.06	2.78	2.44	3.23	3.38	3.82	4.93	4.26	4.27
Rbpj1	-1.78	-1.39	-1.38	-0.01	-0.58	-1.24	-1.80	-1.07	-1.85	1.19
Rgcc	-2.71	-1.82	3.45	3.46	2.67	-2.92	-1.44	3.69	3.08	2.72
Rgma	-3.15	-2.86	1.50	-1.67	-1.38	-2.78	-2.25	3.11	-2.17	-1.88
Ryr1	-0.51	3.88	2.16	-0.89	0.17	-0.52	3.98	-0.35	-0.13	0.53
S100b	-2.84	-2.35	3.12	3.41	2.58	-3.01	-1.80	3.36	2.53	1.93
S1pr1	-2.31	-1.39	3.17	-1.99	-2.39	-2.77	-1.30	5.33	-1.03	-1.95
Sall1	-2.25	-2.14	1.98	4.65	1.19	-2.70	-1.13	1.35	4.40	2.70
Sec14l5	-0.57	-0.07	-0.37	4.65	-0.46	-0.79	0.46	0.01	3.72	0.39
Serpine2	-2.58	-0.89	2.34	-0.66	1.38	-2.88	-0.19	4.15	2.08	2.47
Shisa6	-3.31	2.04	0.23	-2.18	-1.75	-3.24	1.94	0.86	-1.28	-0.62
Skor2	-1.74	-1.05	-0.04	-0.78	-1.17	-2.05	-0.81	-2.37	-2.36	-2.24
Slc1a3	-3.01	-2.31	3.60	1.34	0.51	-2.90	-0.86	4.60	1.57	1.22
Slc1a6	0.42	0.81	-0.88	-1.49	-1.92	0.38	0.98	-2.28	-1.39	-1.06
Slc26a3	2.32	2.47	7.99	6.23	5.77	2.96	2.83	3.07	2.63	2.59
Slc32a1	-2.78	2.32	-1.54	-1.84	-1.70	-2.81	1.64	-2.25	-1.73	-2.75

Slc4a4	0.50	-2.75	3.17	-1.65	-2.15	0.56	-1.84	3.40	-2.46	-2.57
Slc5a11	-1.31	-0.76	0.30	7.86	0.54	-1.46	-0.56	-0.87	4.64	1.51
Slc9a3	-1.15	-1.58	-1.67	-0.93	-1.58	-0.48	-1.58	-0.02	-0.99	-1.49
Slitrk6	3.16	-1.94	-1.50	-1.54	1.70	3.66	-1.15	-0.26	2.71	4.04
Socs2	-2.41	2.72	-1.54	-0.93	-0.77	-2.46	3.10	-1.25	-2.46	-2.37
Sorcs3	-2.79	3.68	0.56	0.21	2.21	-2.54	3.88	-2.07	1.08	2.33
Sox10	0.30	0.19	-1.32	2.37	2.74	-0.09	0.55	0.92	4.44	4.74
Sox2	-2.61	-1.27	3.23	4.07	4.33	-2.24	-1.17	4.05	3.95	4.09
Sox6	-2.80	-2.46	1.64	0.72	3.53	-2.68	-1.95	2.13	2.68	3.94
Sox8	-2.80	-2.37	1.00	3.60	2.23	-2.51	-2.22	1.18	2.59	2.37
Stag3	4.19	3.01	3.18	4.59	3.98	4.26	3.50	4.05	4.13	4.32
Stk32a	-2.24	-2.59	2.86	0.49	3.14	-2.17	-1.40	3.71	2.45	3.72
Sulf2	-2.64	1.55	-1.54	-0.29	3.18	-2.55	0.56	-2.34	2.48	3.48
Susd5	-0.39	0.94	-0.94	1.31	3.55	-0.16	1.13	-0.58	2.78	3.58
Tceal7	2.95	3.03	3.95	4.01	4.71	3.35	2.90	2.14	3.93	2.05
Tfap2b	-3.00	4.27	0.56	-2.53	-0.23	-3.03	4.14	-1.26	-0.41	0.08
Thbs2	-2.31	-1.08	2.27	4.41	4.32	-2.37	-0.40	2.42	4.46	4.37
Tmem125	-1.10	-0.88	-1.49	6.09	-0.57	-1.85	-1.12	-1.87	2.71	-1.04
Tmem132d	-2.17	-2.32	-1.26	-0.05	3.41	-1.90	-1.83	-2.54	2.02	3.33
Tmem63a	-1.69	-1.10	0.54	3.69	-1.49	-1.72	-0.63	1.90	3.72	0.14
Tmem98	-0.31	-2.16	1.38	5.10	-0.89	-0.06	-1.37	1.08	4.56	1.05
Tnc	-2.88	-2.98	1.48	-0.74	-0.92	-2.47	-2.43	1.17	-1.19	-0.17
Tnfrsf13c	2.29	2.17	6.91	5.64	5.16	2.16	2.56	2.18	1.70	2.34
Tns3	-0.95	-2.56	2.26	-0.22	3.18	-0.80	-2.36	2.08	1.17	3.02
Trabd2b	-2.47	-0.95	-0.47	-0.60	0.21	-2.26	-1.29	-0.50	-0.06	-0.82
Tril	-2.31	-2.70	2.89	-1.05	0.04	-2.37	-1.71	3.19	-0.59	0.37
Trpc3	-3.25	-1.84	-0.98	-2.17	0.27	-3.35	-2.36	-1.73	-0.26	1.17
Trpc7	-2.19	0.47	-1.20	-1.48	-1.35	-1.86	0.70	-2.16	-1.71	-2.09
Tshb	-2.14	-1.76	-1.84	-1.89	-1.78	-2.19	-2.15	-2.20	-1.65	-2.10
Tspan11	0.28	0.70	1.39	-1.67	0.99	0.15	0.22	3.74	1.47	2.72
Tspan2	-2.96	-3.35	-2.38	-2.13	-2.41	-2.63	-2.65	-3.10	-1.33	-2.20
Tuba8	0.92	1.20	-0.70	-2.06	0.89	0.41	0.99	-0.85	-0.63	-0.67
Tubb2b	-0.31	-0.45	4.05	-1.44	4.03	-0.62	0.50	3.82	1.62	0.90
Txnip	-0.03	-1.79	2.51	2.45	2.28	1.77	-1.29	2.32	2.84	3.25
Ube2b	1.08	0.52	0.59	1.08	-0.08	1.24	0.86	0.38	0.40	0.25
Ugt8a	-1.09	-1.48	-1.94	3.83	1.77	-1.30	-1.52	-1.15	2.84	1.63
Upp1	3.95	5.09	3.54	-0.04	1.73	3.95	4.50	2.99	2.13	3.73
Vstm2b	2.04	0.41	0.02	4.35	4.22	2.53	0.86	-0.99	3.35	3.37
Wfdc1	-2.94	-0.50	3.60	-0.63	2.28	-1.99	-1.62	4.45	1.32	2.29
Xrra1	3.12	2.91	3.26	3.87	3.29	3.33	3.08	3.28	3.22	3.00
Zcchc24	-3.21	-2.59	1.32	2.51	3.14	-3.16	-2.14	1.58	2.50	3.08
Zeb2	-3.40	-3.14	1.72	2.88	1.47	-3.39	-2.03	1.85	2.78	1.95
Zfp36l1	-2.48	-0.30	4.35	-1.90	3.68	-2.08	-0.02	4.68	2.67	4.00

[00286] RBFOX3 (also known as NeuN) and FAT2 were observed to be significantly enriched in granule cells for both samples. MARCH11 was observed to be significantly enriched in basket cells from both samples. ALDH1L1 and SLC1A3 were observed to be significantly enriched in astrocytes from both samples. Olig2 was observed to be significantly enriched in oligodendrocytes and OPCs from both samples. MOG was observed to be significantly enriched in oligodendrocytes from both samples. PDGFRA was observed to be significantly enriched in OPCs from both samples. Only Olig2+ High nuclei express genes such as Pdgfra and Chondroitin Sulfate Proteoglycan 4 (Cspg4) that mark oligodendrocyte precursor cells (OPCs). Olig2+ Low nuclei were from mature oligodendrocytes, while Olig2+ High nuclei were from a

mixture of mature oligodendrocytes and immature OPCs. In all cases, high expression of markers only in the expected cell type was observed. Therefore, Olig2 (all oligodendrocytes), Pdgra and Cspg4 (OPCs), Mag and Mog (mature oligodendrocytes) were identified as effective for performing cellular profiling technique described herein.

[00287] These results highlight the utility of the cellular profiling technique described herein for identification of unexpected subpopulations as a result of its highly quantitative nature. Heterogeneity in the results may be used to identify biomarkers in patients. For example, heterogeneity may be able to predict how different individuals respond to drugs or identify therapeutic targets.

Example 17. Correlation between the RNAseq results for each sample

[00288] Table 39 shows Pearson coefficients between the 2 post-mortem human samples, XK and PK for each cell type.

Table 39. Pearson coefficients between XK and PK samples

	granule		basket		astrocyte		oligo		opc	
	xk	pk	xk	pk	xk	pk	xk	pk	xk	pk
xk.granule	1.00	0.99	0.96	0.97	0.94	0.94	0.93	0.95	0.93	0.94
pk.granule	0.99	1.00	0.96	0.97	0.94	0.94	0.93	0.95	0.93	0.94
xk.basket	0.96	0.96	1.00	0.99	0.94	0.94	0.93	0.95	0.94	0.94
pk.basket	0.97	0.97	0.99	1.00	0.95	0.95	0.94	0.96	0.94	0.95
xk.astrocyte	0.94	0.94	0.94	0.95	1.00	0.97	0.94	0.95	0.94	0.94
pk.astrocyte	0.94	0.94	0.94	0.95	0.97	1.00	0.93	0.95	0.94	0.95
xk.oligo	0.93	0.93	0.93	0.94	0.94	0.93	1.00	0.97	0.95	0.95
pk.oligo	0.95	0.95	0.95	0.96	0.95	0.95	0.97	1.00	0.96	0.97
xk.opc	0.93	0.93	0.94	0.94	0.94	0.94	0.95	0.96	1.00	0.96
pk.opc	0.94	0.94	0.94	0.95	0.94	0.95	0.95	0.97	0.96	1.00

[00289] FIG. 9 provides a dot plot showing pairwise Pearson's correlation coefficient for each sample, broken down by cell type to compare results among human, rat, and mouse samples. Calculation of pairwise Pearson correlation coefficient across the ten datasets revealed that the two neuronal cell types (granule and basket) were highly correlated between samples (r=0.99 for both), while the glial data had slightly lower correlations (r=0.96-0.97). Furthermore, hierarchical clustering revealed separation by cell type, indicating that the variation across cell types is stronger than variation among individual samples. The range of correlation coefficients between the samples for the same cell type across species was observed to be similar to clustering for cell types isolated from the same species, suggesting that both cell type and species are important properties of the expression profiles.

Example 18. Determining effects of autolysis on human cell-type specific gene expression

[00290] Prior literature how shown that autolysis time, defined as the time between death and when the tissue is frozen, does not correlate with RNA quality and has only minor effects on gene expression (Gupta et al., 2012, BMC Genomics13, 26, which is hereby incorporated by reference herein in its entirety). Because post-mortem human samples have been previously observed to vary widely in autolysis time, the effect of autolysis time on gene expression in the nuclear samples from the 16 human subjects previously characterized to determine whether clinical attributes affect gene expression.

[00291] The shortest autolysis time among the samples was 5.13 hours and the longest autolysis time among the samples was 24 hours as shown in Table 40.

Table 40. Autolysis time in human samples

Sample	Autolysis (h)	Sample	Autolysis (h)
XK	19.5	SG	12
TM	10.5	OR	8
WO	10	LT	10.5
WC	19.1	ZH	19.4
WI	16.5	KO	5.5
PK	14.8	KQ	13
VM	15.5	KE	24
WL	13.5	AI	5.13

[00292] Only a few genes were observed have significantly altered expression with autolysis time: 12 across all post-mortem human tissue samples, four in granule cells, one in basket cells, and one in glia. The log2 fold change for differentially expressed genes across the human samples with differing autolysis times. Table 41 provides analysis of differentially expressed genes (adjusted p <0.01, baseMean > 50) due to autolysis time across all samples.

Table 41. Differentially expressed genes across all human samples

Gene	baseMean	log2FoldChange	p-value	p-adj
NPAS4	509.499	0.901	1.31E-18	2.72E-14
FOSB	128.225	0.748	5.09E-16	3.51E-12
EGR1	470.894	0.469	1.58E-11	8.18E-08
NR4A1	374.351	0.403	1.08E-10	4.46E-07
FOS	369.433	0.373	5.78E-07	1.10E-03
HSPA1A	967.333	0.336	9.07E-08	2.35E-04
PPP1R15A	79.021	0.272	1.36E-08	4.02E-05
NR4A3	552.102	0.242	5.85E-07	1.10E-03
DNAJB1	383.949	0.216	8.56E-07	1.48E-03
BCAS2	321.395	0.183	2.91E-06	3.61E-03
LINC01515	262.569	-0.283	2.96E-06	3.61E-03
MIR6723	5535.414	-0.733	8.02E-17	8.30E-13

[00293] Npas4 was observed to have the greatest fold change in expression across nuclei compared to normalized expression in unsorted nuclei from the same samples.

[00294] Table 42 provides the genes in granule cells that are differentially expressed (adjusted p <0.01, fold change > 2) compared to normalized expression across human samples with differing autolysis times.

Table 42. Differentially expressed genes in granule cells

Gene	baseMean	log2 Fold Change	p-value	p-adj
NPAS4	1337.014	0.925	2.46E-10	3.93E-06
FOSB	305.432	0.827	9.37E-09	4.98E-05
FOS	689.775	0.812	1.06E-09	8.49E-06
EGR1	1085.415	0.505	2.32E-06	9.24E-03

[00295] The four genes observed to be differentially expressed in the nuclei of granule cells were also differentially expressed in unsorted nuclei from all samples as shown in Table 42.

[00296] Inhibin Beta A Subunit (Inhba) was observed to be the only gene in the nuclei of basket cells being differentially expressed (baseMean: 6.673; $\log_2$ Fold Change: 0.466; p-value: 1.15E-08; padj: 2.18E-04).

[00297] Only Kinesin Family Member 19 (Kif19) in glia (baseMean: 126.311, $\log_2$ Fold Change: -0.160, p-value: 7.76E-09, padj: 1.25E-04) was observed to change linearly with autolysis time. Additional genes, such as FosB Proto-Oncogene, AP-1 Transcription Factor Subunit (FosB) (p-adj = 3.51E-12), were observed to have increased expression with intermediate autolysis times in all 3 cell types (FIG. 10).

Example 19. Determining effects of gender on human cell-type specific gene expression

[00298] To examine the effect of gender on the expression probile, gene expression was compared among samples from males and females to identify genes that are differentially expressed (adjusted p-value < 0.01, baseMean > 50). As expected, a majority of gender-specific genes identified herein resided on the X or Y chromosomes, with expression of X-chromosome genes enriched in female samples and Y-chromosome genes enriched in male samples. Twenty-seven genes exhibiting gender specific differential expression (adjusted p-value < 0.01, baseMean > 50) in males compared to females are shown in Table 43.

Table 43. Genes exhibiting gender specific differential expression

Gene	baseMean	log2 Fold Change	p-value	p-adj
KDM5D	920.33	9.42	0	0
RPS4Y1	252.82	9.37	5.16E-198	1.01E-194
ZFY	329.53	8.81	0	0
DDX3Y	187.3	8.67	2.67E-152	4.82E-149
TTTY15	213.46	8.33	1.07E-234	2.57E-231
TTTY14	6136.13	8.05	0	0
USP9Y	1725.45	7.99	0	0
UTY	3612.95	7.89	0	0
GYG2P1	65.6	7.28	6.25E-26	7.51E-23
NLGN4Y	4612.32	7.19	0	0
TXLNGY	383.6	7.1	3.04E-258	8.23E-255

LINC00278	342.2	6.37	3.61E-28	4.59E-25
PRKY	87.03	4.71	1.26E-29	1.81E-26
TTTY10	547.65	4.57	9.79E-233	2.12E-229
ZFX	1438.28	-0.54	5.98E-06	4.17E-03
PUDP	502.81	-0.57	4.51E-11	4.64E-08
KDM5C	726.02	-0.66	1.44E-11	1.56E-08
LOC389906	288.35	-0.68	4.34E-09	4.09E-06
PIN4	334.45	-0.73	2.61E-08	2.35E-05
MTRNR2L8	621.81	-1.78	2.21E-07	1.77E-04
MTRNR2L6	123.59	-1.78	8.09E-07	6.03E-04
COL4A1	51.32	-1.83	1.63E-07	1.36E-04
DHFR	699.43	-1.91	5.75E-07	4.44E-04
LOC101929541	63.31	-2.02	1.78E-10	1.75E-07
TSIX	60.52	-3.88	3.49E-28	4.59E-25
MIR6723	603.22	-5.15	3.27E-14	3.73E-11
XIST	20369.6	-10.61	0	0

[00299] Seven of these genes are located on the X chromosome, 14 are on Y, and 6 are on autosomes. In some cases, gender-specific genes can be more differentially expressed in some cell types than in others. For example, Long Intergenic Non-Protein Coding RNA 278 (LINC00278) was observed to be male-enriched, and was even more differentially expressed in glia than in granule or basket cells. Further, expression of Protein Kinase, Y-Linked, Pseudogene (Prky) was observed to be highest in granule cells, at intermediate levels in glia, and low in basket cells.

[00300] In contrast, Glycogenin 2 Pseudogene 1 (GYG2P1) was identified as a male-enriched gene across all samples ($p = 3.74E-42$), although it was more male-enriched in basket cells than granule cells and glia. This is not due to mis-mapped reads from duplication because Glycogenin 2 (GYG2) was significantly expressed only in glia and does not exhibit gender-specific expression. Examination of the Y chromosome locus containing GYG2P1 revealed male-specific basket cell expression across a large region, including GYG2P1 and approximately 300kb downstream. The nearby genes testis-specific transcript Y 15 (Tty15) and Ubiquitin Specific Peptidase 9, Y-Linked (Usp9y) were also male-enriched but were not observed to be cell type specific in results form glia, basket, and granule cells. Additionally, Y-Linked Zinc Finger Protein (Zfy) and KDM5D were also observed to be male-enriched but not cell-type specific, and XIST was observed to be female-enriched in Table 43 but not cell-type specific among glia, basket, and granule cells. Genes that exhibit gender and cell-type specific expression in both glia and granule cells were also evident. Results herein provide a potential source of sexually dimorphic, cell specific function in the mammalian brain.

[00301] Transcription was observed only in males and only in stellate/basket cells for genes: Family With Sequence Similarity 8 Member A4, Pseudogene (Fam8a4p), Arylsulfatase D Pseudogene 1 (Arsdp1), and Gyg2p1.

[00302] Therefore, gender specific gene expression was observed to confirm the known gender of the individual, and cell-type specific gender-specific gene expression was also observed.

Example 20. Determining effects of age on human cell-type specific gene expression

[00303] A fundamental question in aging research is whether aging occurs uniformly across the brain, or whether some cell types are more susceptible to the effects of aging than others. To address this issue, the effects of age on gene expression in each of the three cerebellar cell types was examined. DESeq2 (Love, et al. (2014) Genome Biology 15, 550, which is hereby incorporated by reference herein in its entirety) was used as described in Example 1 to identify genes that were differentially expressed (adjusted $p < 0.01$, fold change > 2) with age in all samples, or specifically in granule cells, basket cells, or glia. Two hundred seventy-four genes with differential expression were identified in granule cells, 139 in basket cells, 31 in glia, and 42 across all samples regardless of cell type.

[00304] The RNAseq results for the 274 genes in granule cells with significantly altered expression with age are shown in Table 44. The log2 fold change for the sorted nuclei from granule cells from each human sample compared to the normalized expression of sorted nuclei from granule cells from all samples are shown in Table 44. Negative values indicate reduced expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 44. Log2 fold change of expression for genes in granule cells

	Log2 fold change of expression															
Subject	**xk**	**tm**	**wo**	**wc**	**wi**	**pk**	**vm**	**wl**	**sg**	**or**	**lt**	**zh**	**ko**	**kq**	**ke**	**ai**
Gene																
KCNQ3	0.51	0.04	1.63	1.08	2.20	0.45	0.22	-1.07	-0.86	-0.27	0.32	0.38	-1.32	-1.06	-1.25	-1.02
SCHLAP1	2.39	0.66	0.21	1.22	-0.53	1.63	0.58	-0.67	-0.78	-0.87	-0.21	-0.55	-0.97	-0.72	-0.89	-0.47
UGGT2	2.15	1.34	0.92	1.19	0.12	0.86	-0.14	-0.04	-1.01	-1.41	-0.32	0.71	-1.06	-1.64	-1.41	-0.25
PLXDC2	2.02	0.67	0.77	0.92	-0.86	0.60	1.26	-0.08	-1.01	-0.90	-0.78	0.34	-0.29	-0.98	-1.05	-0.63
ITGB5	1.83	-0.09	1.42	0.98	0.27	0.10	-0.11	-0.36	-0.10	-0.13	-0.26	-0.81	-0.92	-0.23	-0.51	-1.06
DCLK1	0.88	0.31	0.72	0.38	0.39	0.01	1.69	0.45	-0.46	-0.34	0.04	0.58	-1.90	-1.02	-0.30	-1.43
AQP7	0.63	0.60	1.17	0.67	0.65	-0.14	-0.57	0.49	0.06	-0.17	0.16	-0.08	-1.01	-0.89	-0.54	-1.03
PTPN3	1.18	0.53	0.69	0.75	-0.01	0.44	0.43	-0.14	0.01	-0.57	0.14	0.10	-0.69	-1.22	-0.31	-1.31
FAT1	1.31	0.45	0.40	0.67	0.51	0.21	1.45	-0.06	-1.00	0.16	-1.22	0.10	-1.10	-1.05	-0.27	-0.56
CMTM8	0.99	1.66	1.02	0.25	0.61	-0.31	-0.75	0.17	-0.82	0.03	-0.69	-0.56	-0.12	-0.95	-0.37	-0.16
FARP1	1.10	0.52	0.53	0.56	0.68	-0.03	-0.61	0.56	-0.46	-0.38	0.52	0.34	-1.06	-0.42	-0.98	-0.86
PIP4K2A	0.64	0.67	0.60	0.36	0.12	0.34	0.52	0.51	-0.15	-0.78	0.11	0.35	-0.98	-1.10	-0.55	-0.67
NEDD4	0.95	0.11	0.40	0.58	-0.53	0.57	0.95	0.43	-0.48	-0.78	-0.04	0.43	-0.85	-0.79	-0.65	-0.29
CATSPERG	0.05	0.70	1.02	1.01	0.20	-0.26	0.10	0.20	0.04	-0.12	-0.12	-0.15	-1.02	-0.53	0.00	-1.11
LOC101926941	0.36	0.43	0.77	0.90	-0.07	-0.69	0.25	0.66	-0.05	-0.36	-0.32	0.76	-0.76	-0.81	0.05	-1.12
WWC2	1.00	0.47	0.37	0.66	0.21	0.18	0.58	0.49	-0.12	-0.42	-0.73	-0.19	-1.06	-0.26	-1.07	-0.12

MPP6	1.17	-0.12	0.28	0.70	0.42	0.04	0.04	-0.12	0.32	-0.61	-0.41	0.18	-0.70	-0.61	-0.51	-0.08
SDK1	0.04	0.64	0.81	0.34	0.56	0.33	0.35	0.05	0.16	-0.25	-0.37	0.40	-1.45	-0.71	-0.74	-0.17
NAB2	0.22	0.22	0.92	0.53	0.46	-0.16	-0.01	-0.04	-0.08	0.40	-0.19	0.02	-0.60	-0.61	-0.19	-0.88
NTNG2	0.29	-0.18	1.32	0.57	-0.19	0.00	-0.01	0.09	0.41	-0.62	0.17	0.49	-0.90	-0.47	-0.30	-0.67
LMNTD2	0.36	0.86	0.48	0.36	0.34	0.07	-0.20	0.05	-0.01	0.10	-0.21	-0.44	-0.89	-0.41	0.11	-0.57
PLCH2	0.24	0.83	0.78	0.81	0.23	-0.24	-0.36	0.02	-0.35	0.41	-0.10	-0.47	-0.55	0.04	-0.30	-0.98
PTPRJ	0.33	0.30	0.90	0.55	0.38	-0.18	0.28	-0.06	-0.01	-0.23	-0.07	0.46	-0.84	-0.79	-0.15	-0.88
MRAP2	0.48	0.58	0.41	0.12	0.22	0.29	0.56	0.24	-0.47	-0.17	0.18	0.39	-1.09	-0.84	-0.34	-0.55
PTMS	0.22	0.53	1.38	0.66	0.25	-0.13	-0.27	-0.38	-0.23	0.04	-0.52	-0.35	0.26	-0.02	-0.59	-0.86
CDH23	0.24	0.28	0.91	0.63	0.24	0.03	0.14	-0.05	-0.30	0.26	-0.19	0.20	-0.83	-0.79	-0.20	-0.56
SYT7	0.51	0.41	0.86	0.51	0.23	-0.16	-0.11	0.05	0.07	0.21	-0.39	-0.15	-0.45	-0.20	-0.30	-1.10
SPRED3	0.25	0.66	0.51	0.65	0.00	-0.37	0.19	0.41	0.23	-0.28	-0.35	-0.09	-0.77	-0.15	0.03	-0.92
PLXNA1	0.05	0.18	0.98	0.67	0.54	-0.49	-0.16	0.03	-0.17	0.12	-0.15	0.23	-0.46	-0.35	-0.28	-0.74
GRK5	0.61	0.19	0.66	0.63	0.01	0.24	0.16	-0.14	-0.27	-0.19	0.06	0.19	-0.55	-0.66	-0.05	-0.89
ZYX	0.28	0.07	1.28	0.86	0.09	-0.14	-0.37	-0.05	-0.08	-0.02	-0.22	-0.33	-0.34	-0.71	-0.06	-0.25
FGF3	0.06	0.09	0.66	0.59	0.22	0.40	-0.11	0.27	0.05	0.31	-0.32	-0.18	-0.75	-0.52	-0.27	-0.50
LINC01544	0.49	0.96	0.35	0.25	0.16	0.37	-0.48	0.12	-0.43	0.03	0.00	-0.25	-0.67	-0.63	-0.08	-0.19
PCYT1B	0.69	0.45	0.38	0.25	0.18	0.16	0.13	-0.04	-0.32	-0.14	0.22	-0.32	-0.46	-0.65	-0.42	-0.10
RHBG	0.72	0.33	0.42	0.34	0.12	0.01	-0.04	0.14	0.05	0.67	-0.03	-0.49	-0.70	-0.53	0.00	-1.02
HCN2	0.16	0.39	1.02	0.39	0.03	-0.20	-0.10	-0.20	-0.14	0.15	-0.14	-0.18	0.08	-0.41	-0.45	-0.41
ACAP3	0.10	0.42	0.95	0.71	0.34	-0.17	-0.24	-0.14	-0.11	0.27	-0.57	-0.26	-0.28	-0.32	-0.28	-0.43
MGAT3	0.18	0.50	0.87	0.69	0.19	-0.27	-0.34	-0.01	-0.06	0.28	-0.29	-0.22	-0.30	-0.40	-0.11	-0.71
C1orf61	0.45	0.39	0.68	0.55	-0.02	-0.06	0.09	-0.02	-0.02	-0.05	-0.08	-0.03	-0.66	-0.26	0.00	-0.95
SURF2	0.27	0.23	0.85	0.61	-0.31	-0.13	0.17	-0.07	-0.07	-0.19	-0.06	-0.25	-0.27	0.00	-0.20	-0.57
AHRR	0.25	0.30	0.22	0.36	0.32	0.44	0.37	-0.19	-0.04	-0.12	-0.26	-0.24	-0.17	-0.35	-0.41	-0.47
FAM131A	0.16	0.36	1.02	0.28	0.24	-0.57	0.31	-0.10	-0.21	-0.05	-0.28	0.17	-0.14	-0.22	-0.31	-0.67
CHGB	0.19	-0.02	0.47	0.20	0.43	-0.07	1.03	-0.03	0.07	0.01	-0.18	0.21	-0.79	-0.66	-0.23	-0.64
PLXNA4	0.19	0.13	0.43	0.46	0.62	0.03	0.00	0.14	-0.04	0.12	0.06	0.41	-0.93	-0.37	-0.17	-1.09
ACHE	0.08	0.43	0.84	0.38	0.15	-0.14	-0.07	-0.23	0.01	0.17	-0.24	0.00	-0.09	-0.54	-0.28	-0.47
DYRK1B	0.26	0.44	0.83	0.77	-0.06	-0.13	-0.22	-0.16	-0.10	0.07	-0.27	-0.53	-0.03	-0.18	-0.25	-0.43
CDK5R2	0.03	0.15	1.04	0.36	0.10	0.15	0.17	-0.12	0.15	-0.18	-0.34	-0.17	-0.32	-0.32	-0.06	-0.64
GDPD5	0.24	0.45	0.68	0.55	-0.10	-0.34	0.09	0.11	-0.04	0.23	-0.14	0.08	-0.38	-0.45	-0.18	-0.80
ZNF703	0.07	0.22	0.80	0.57	-0.09	0.21	-0.08	0.01	-0.12	-0.09	-0.30	-0.10	-0.13	-0.07	-0.15	-0.75
FHDC1	0.53	0.00	0.64	0.36	0.08	-0.11	0.30	0.08	-0.50	-0.01	0.00	0.59	-0.91	-0.23	-0.42	-0.41
LOC101927078	0.34	0.54	0.31	0.85	-0.03	-0.08	-0.09	-0.35	-0.13	-0.27	-0.01	0.20	-0.56	-0.14	-0.38	-0.23
CREB3L2	0.24	-0.02	0.95	0.11	0.32	0.02	0.16	-0.17	-0.03	-0.14	0.25	0.31	-0.52	-0.71	-0.07	-0.70
AP1S3	0.52	-0.18	0.80	0.14	-0.01	0.10	0.30	-0.06	0.16	-0.01	0.12	0.12	-0.55	-0.52	-0.21	-0.72
DYSF	0.89	-0.42	0.48	0.55	-0.39	0.22	0.17	0.23	-0.29	-0.15	0.04	0.30	-0.59	-0.60	-0.15	-0.31
MAMSTR	0.27	0.73	0.47	0.26	0.00	0.05	-0.30	0.16	-0.15	-0.08	-0.34	-0.05	-0.07	-0.26	0.04	-0.72
KIAA0895L	0.42	0.24	0.40	0.64	0.17	-0.04	0.10	0.00	-0.03	0.16	-0.32	0.03	-0.24	-0.46	-0.14	-0.93
TP73	0.13	0.13	0.95	0.38	-0.06	0.41	-0.08	0.03	-0.30	-0.15	0.01	-0.14	-0.34	-0.21	-0.09	-0.68
PDE3A	0.44	0.42	0.05	0.04	0.30	0.00	0.66	0.36	-0.10	-0.42	0.01	0.43	-0.84	-0.78	-0.11	-0.44
LINC00963	-0.16	0.27	0.54	0.52	0.11	0.11	0.03	-0.06	-0.19	0.17	-0.06	-0.01	-0.39	-0.05	-0.37	-0.46
ELAVL3	0.11	0.34	0.94	0.56	-0.04	-0.02	-0.17	-0.17	-0.12	0.11	-0.16	-0.14	-0.13	-0.20	-0.20	-0.70
TTYH3	0.19	0.49	0.69	0.53	0.09	-0.18	-0.33	-0.09	0.03	0.47	-0.28	-0.12	-0.13	-0.15	-0.28	-0.91
HPN	0.30	0.29	0.64	0.49	0.16	-0.14	-0.25	-0.21	-0.15	0.20	-0.05	-0.16	-0.51	0.09	-0.13	-0.58
PTPRE	0.41	0.45	0.27	0.46	0.15	0.08	0.00	-0.04	-0.11	-0.13	-0.09	0.14	-0.58	-0.35	-0.15	-0.50
SLC17A7	0.32	0.32	0.47	-0.02	0.31	0.20	0.17	0.10	0.20	0.20	-0.22	0.01	-0.41	-0.55	0.00	-1.08
GRIN2C	0.16	0.46	0.81	0.58	0.17	-0.37	-0.25	0.02	-0.20	0.24	-0.31	-0.18	-0.10	-0.32	-0.15	-0.53
PXN	0.34	0.61	0.47	0.38	-0.19	0.16	-0.17	0.07	-0.06	0.14	-0.18	-0.33	-0.18	-0.30	0.02	-0.80
TMEM130	0.37	0.19	0.81	0.46	-0.19	0.07	-0.04	0.00	-0.10	0.12	-0.09	-0.47	-0.26	-0.22	-0.17	-0.47
LRPAP1	0.23	0.35	0.95	0.36	-0.03	-0.12	-0.39	-0.11	-0.04	0.21	0.01	-0.15	-0.13	-0.21	-0.16	-0.78

GRM4	0.02	0.14	0.97	0.57	0.02	0.24	-0.15	-0.28	-0.17	-0.07	-0.07	0.05	-0.43	-0.30	-0.29	-0.25
STEAP3	0.37	0.66	0.39	0.44	-0.34	0.04	-0.05	0.23	-0.28	0.18	-0.06	-0.51	-0.37	-0.38	0.00	-0.33
CHRD	0.60	-0.17	0.64	0.61	0.04	-0.03	-0.15	-0.05	-0.16	0.18	-0.17	-0.27	-0.15	-0.33	-0.11	-0.48
SBNO2	0.02	0.15	0.85	0.43	0.09	0.10	-0.05	-0.23	-0.21	0.12	-0.23	-0.11	-0.10	-0.16	-0.36	-0.31
ZDHHC23	0.33	-0.17	0.44	0.16	0.50	0.07	-0.06	0.40	0.00	0.05	-0.36	0.22	-0.48	-0.44	-0.10	-0.55
GACAT2	0.53	0.55	0.04	0.33	-0.26	0.04	0.24	0.12	0.05	-0.11	0.26	-0.43	-0.19	-0.43	-0.28	-0.45
MAP6D1	0.26	-0.01	0.80	0.50	-0.02	-0.08	-0.17	0.12	0.06	0.24	-0.07	-0.25	-0.30	-0.32	-0.07	-0.69
FAM53A	0.50	0.11	0.61	0.10	0.10	-0.43	0.10	0.17	-0.21	-0.07	-0.02	0.17	-0.27	-0.30	-0.21	-0.35
KIAA1549L	0.47	0.45	-0.04	0.02	0.05	0.40	0.46	0.18	-0.11	-0.26	0.11	-0.08	-0.76	-0.26	-0.02	-0.61
SLC38A7	0.18	0.50	0.45	0.33	0.14	-0.20	-0.24	0.05	0.04	0.42	-0.15	-0.29	-0.44	-0.06	-0.28	-0.46
CDK16	0.09	0.26	0.73	0.73	-0.04	-0.30	-0.01	-0.10	-0.15	0.08	-0.15	-0.07	-0.26	-0.24	-0.17	-0.40
CALY	0.00	0.45	0.50	0.12	0.63	-0.06	-0.13	0.03	0.02	0.07	-0.13	0.04	-0.38	-0.38	0.00	-0.78
LPCAT4	0.39	0.14	0.74	0.74	-0.10	-0.07	-0.26	-0.06	-0.01	-0.05	-0.22	-0.42	0.14	-0.35	-0.10	-0.53
SLC25A6	0.40	0.43	0.41	0.48	0.14	-0.43	0.09	-0.02	-0.17	0.25	-0.33	-0.35	-0.20	0.02	-0.19	-0.51
SRCIN1	0.24	0.42	0.65	0.48	0.02	-0.06	-0.24	0.00	-0.12	0.21	-0.18	-0.27	-0.17	-0.20	-0.16	-0.60
ELMO1	0.37	0.35	0.10	0.07	0.46	0.19	0.34	-0.01	-0.11	-0.34	-0.02	0.31	-0.68	-0.33	-0.17	-0.53
GRAMD4	0.02	0.44	0.48	0.35	0.18	-0.21	0.00	0.03	0.06	-0.01	-0.05	0.12	-0.44	-0.54	-0.09	-0.32
RIMS3	0.16	0.28	0.58	0.21	0.10	-0.33	0.33	0.20	-0.17	0.20	-0.09	0.09	-0.19	-0.35	-0.17	-0.84
CPLX2	0.11	0.42	0.78	0.42	0.18	-0.21	-0.14	-0.03	-0.22	0.01	-0.16	-0.09	-0.42	-0.04	-0.23	-0.37
PIP5K1C	0.21	0.41	0.75	0.34	0.24	-0.24	-0.28	-0.04	-0.17	0.18	-0.33	0.11	-0.07	-0.10	-0.23	-0.76
SDC3	0.15	0.14	0.42	0.38	0.26	0.16	-0.02	-0.02	0.22	0.34	-0.17	-0.34	-0.47	-0.35	-0.04	-0.65
CBLN3	0.48	0.06	0.50	0.32	0.05	-0.13	-0.02	0.19	0.09	0.37	-0.03	-0.18	-0.43	-0.66	0.01	-0.62
PDZD7	0.32	0.60	0.39	0.21	-0.12	0.05	-0.28	-0.01	0.20	0.24	-0.03	-0.09	-0.22	-0.45	-0.02	-0.78
VWA5B2	0.24	0.65	0.41	0.38	0.10	-0.22	-0.12	0.14	-0.21	0.13	-0.52	-0.19	-0.07	-0.16	0.00	-0.57
ZNF219	0.27	0.62	0.59	0.16	0.10	-0.18	-0.31	0.10	-0.07	-0.04	-0.34	0.06	0.03	-0.35	-0.07	-0.57
FAM212B	0.46	0.38	0.49	0.45	-0.02	-0.07	-0.20	0.00	-0.43	-0.11	-0.27	0.05	0.01	-0.05	-0.13	-0.56
RASIP1	0.19	0.27	0.53	0.10	0.08	0.09	-0.13	0.11	-0.16	0.22	-0.12	-0.01	-0.46	-0.22	-0.06	-0.43
GYS1	0.04	0.28	0.72	0.39	0.23	-0.39	0.24	-0.13	-0.11	-0.06	-0.31	0.17	-0.15	-0.19	-0.22	-0.52
ATP6V0B	0.49	-0.23	0.43	0.39	0.31	-0.09	-0.06	0.02	-0.04	0.15	0.07	-0.04	-0.09	-0.66	-0.15	-0.50
NKD1	0.42	0.56	0.36	0.59	-0.35	-0.32	0.03	-0.11	0.04	-0.05	0.07	-0.31	-0.16	-0.25	0.05	-0.55
ST3GAL2	0.24	0.34	0.60	0.38	0.15	-0.03	-0.35	-0.03	0.00	0.22	-0.15	-0.23	-0.06	-0.33	-0.13	-0.62
PTK7	0.30	0.30	0.25	0.57	-0.13	0.03	-0.05	0.08	-0.03	-0.07	-0.08	-0.15	-0.17	-0.18	0.06	-0.74
ACOT7	0.16	0.45	0.66	0.42	0.08	-0.37	-0.24	-0.05	-0.03	0.19	-0.11	-0.09	-0.17	-0.20	-0.06	-0.66
ATXN7L2	0.11	0.45	0.53	0.34	0.17	-0.22	-0.14	0.01	-0.07	0.19	-0.26	-0.26	-0.17	-0.28	0.05	-0.43
DAO	0.06	0.47	0.43	0.09	0.10	0.10	0.23	0.01	0.17	-0.26	-0.21	0.19	-0.32	-0.46	-0.19	-0.40
SYT12	0.36	0.38	0.28	0.41	0.03	-0.30	-0.12	0.13	0.12	0.32	-0.14	-0.12	-0.29	-0.16	-0.16	-0.75
ADAM19	0.02	0.32	0.46	0.42	0.35	-0.10	-0.02	-0.19	-0.12	-0.04	0.01	0.25	-0.16	-0.55	-0.18	-0.47
HIP1	0.03	0.12	0.79	0.54	-0.03	0.19	-0.13	-0.32	-0.11	-0.09	-0.03	0.02	-0.11	-0.33	-0.25	-0.28
GABBR1	0.19	0.10	0.68	0.40	0.06	0.00	-0.04	-0.02	-0.02	0.00	-0.20	-0.11	-0.09	-0.35	-0.09	-0.52
SYT3	0.29	0.00	0.57	0.40	-0.01	0.10	0.20	-0.07	0.07	-0.16	-0.28	-0.14	-0.02	-0.35	-0.06	-0.54
TP53INP2	0.24	0.21	0.33	0.08	0.25	-0.24	0.37	-0.09	0.00	-0.07	-0.04	0.25	-0.28	-0.15	-0.30	-0.58
KCNK3	0.15	0.46	0.47	0.48	0.04	-0.18	-0.16	0.10	-0.11	0.00	-0.39	0.03	-0.22	0.02	-0.08	-0.61
TPM4	0.16	0.16	0.52	0.32	0.15	0.16	-0.15	0.02	0.01	0.02	-0.09	-0.01	-0.32	-0.27	-0.19	-0.48
RNF152	0.39	0.43	0.13	0.06	0.18	0.24	-0.04	0.10	-0.05	-0.10	-0.04	0.02	-0.35	-0.56	0.09	-0.51
KCNK10	0.59	0.38	0.08	0.38	-0.42	-0.02	-0.02	0.35	-0.20	-0.03	0.01	-0.07	-0.34	-0.35	0.09	-0.43
EPB41L1	0.40	0.39	0.26	0.09	-0.02	0.10	0.06	0.10	0.03	0.14	-0.01	-0.31	-0.14	-0.31	-0.09	-0.69
ABCC10	0.23	0.31	0.45	0.35	0.07	-0.37	0.05	0.13	-0.07	0.29	-0.44	-0.09	-0.10	-0.11	-0.23	-0.46
NAV2	0.25	0.37	0.44	0.10	0.08	0.00	0.03	0.16	-0.08	-0.16	0.00	0.01	-0.50	-0.21	-0.01	-0.48
ERGIC1	0.12	0.40	0.54	0.40	0.11	-0.25	-0.14	-0.03	-0.11	0.07	-0.06	0.00	-0.03	-0.25	-0.07	-0.72
BAD	0.23	0.46	0.42	0.32	-0.01	-0.23	-0.21	0.12	-0.15	0.21	-0.11	-0.20	0.00	-0.12	-0.19	-0.53
KIF3B	0.12	0.14	0.45	0.18	-0.05	0.39	0.01	0.04	-0.01	0.06	0.04	0.04	-0.24	-0.42	-0.15	-0.60
RAI2	0.43	0.39	0.26	0.17	-0.04	0.00	0.16	0.15	-0.22	-0.40	-0.07	0.20	-0.47	-0.28	0.05	-0.33
XKR7	0.11	0.37	0.52	0.34	0.13	0.25	-0.13	-0.11	-0.01	-0.25	-0.27	-0.21	-0.20	-0.04	-0.06	-0.45

PTK2B	0.14	0.27	0.50	0.19	0.17	-0.01	0.00	0.02	-0.05	0.04	0.02	-0.04	-0.38	-0.39	-0.05	-0.46
CHST12	0.07	0.50	0.46	0.36	0.02	-0.22	0.16	-0.17	-0.31	-0.11	-0.04	0.14	-0.24	-0.02	-0.17	-0.43
TRIM67	0.59	0.35	0.20	0.28	0.04	0.09	-0.16	-0.14	0.12	-0.06	-0.29	-0.11	-0.19	-0.29	0.03	-0.45
DHDDS	0.45	0.08	0.33	0.18	-0.05	0.22	-0.01	0.10	0.02	0.16	-0.02	-0.20	-0.38	-0.16	-0.08	-0.64
NUMBL	0.17	0.49	0.52	0.13	-0.13	0.36	-0.14	0.07	-0.02	-0.11	-0.44	-0.20	-0.23	0.01	-0.24	-0.25
KCND3	0.24	0.45	0.21	0.17	0.07	0.09	-0.04	0.16	-0.13	-0.03	-0.12	0.10	-0.49	-0.19	-0.08	-0.42
LRRC1	0.41	0.30	0.19	0.08	0.33	0.08	0.03	-0.01	-0.43	-0.17	-0.09	0.32	-0.03	-0.37	-0.38	-0.27
RAB37	0.27	0.24	0.64	0.15	0.16	0.03	-0.16	-0.10	-0.07	-0.11	-0.14	-0.01	-0.16	-0.35	-0.15	-0.23
KCNIP2	0.23	0.34	0.59	0.39	-0.01	0.00	-0.22	-0.10	0.01	-0.11	-0.31	-0.22	-0.06	-0.17	-0.04	-0.32
RAB6B	0.22	0.13	0.48	0.38	0.09	-0.16	-0.07	-0.07	0.03	0.05	-0.08	0.11	-0.31	-0.34	-0.15	-0.32
PC	0.10	0.36	0.51	0.31	0.09	-0.38	-0.14	0.13	-0.01	0.17	-0.05	-0.03	-0.12	-0.35	-0.09	-0.48
TCEAL2	-0.10	0.21	0.50	0.12	0.34	0.04	0.29	0.08	-0.25	-0.14	-0.13	0.00	-0.20	-0.13	-0.50	-0.14
MEG8	0.33	0.19	0.39	0.27	0.01	-0.13	-0.04	0.10	0.10	0.16	-0.07	-0.17	-0.29	-0.16	-0.01	-0.67
FMNL3	0.12	0.15	0.50	0.38	0.14	-0.39	0.15	0.05	-0.12	-0.01	0.01	0.06	-0.14	-0.35	-0.05	-0.48
MAPK4	0.49	0.38	0.05	0.15	0.10	-0.03	-0.11	0.06	-0.03	0.12	-0.14	0.09	-0.31	-0.31	-0.19	-0.31
DGCR5	0.12	0.24	0.29	0.20	0.21	0.00	0.01	0.05	0.03	-0.04	-0.12	0.32	-0.42	-0.17	-0.24	-0.50
REEP1	0.30	0.22	0.41	0.22	0.05	-0.06	-0.14	-0.01	0.11	-0.05	0.04	0.02	-0.29	-0.36	0.05	-0.50
GTPBP2	0.26	0.29	0.30	0.30	0.17	-0.11	0.09	-0.07	-0.02	0.04	-0.30	-0.23	-0.09	0.00	-0.02	-0.60
KIF26B	0.39	0.19	-0.03	0.29	0.03	0.09	0.13	0.23	-0.22	-0.08	0.07	0.04	-0.53	-0.04	-0.10	-0.46
NRXN2	0.13	0.39	0.51	0.27	0.08	-0.10	-0.22	0.00	-0.04	0.08	-0.26	-0.14	-0.08	-0.23	-0.03	-0.37
ZNRF1	0.16	0.20	0.31	0.24	0.13	-0.12	0.03	0.15	-0.02	-0.05	-0.16	0.27	-0.29	-0.42	-0.01	-0.43
C14orf132	0.20	0.33	0.43	0.29	0.06	-0.15	-0.35	0.12	-0.03	0.13	-0.09	-0.12	-0.18	-0.11	-0.11	-0.42
FLNB	0.43	0.34	0.08	0.14	0.04	0.10	-0.07	-0.01	-0.13	-0.18	0.15	0.09	-0.24	-0.23	-0.03	-0.47
EFR3B	0.22	0.26	0.28	0.21	0.11	-0.15	0.10	0.02	-0.08	0.10	-0.15	0.13	-0.23	-0.20	-0.01	-0.60
RBFOX3	0.01	0.42	0.32	0.20	0.17	0.05	-0.03	-0.05	-0.12	0.09	-0.20	0.03	-0.35	-0.05	-0.11	-0.38
PPP2R2C	0.17	0.47	0.30	0.40	0.01	-0.28	-0.06	-0.01	-0.24	0.00	-0.22	0.08	-0.28	-0.15	0.01	-0.21
KLHDC4	0.19	0.38	0.35	0.34	0.16	-0.09	-0.09	-0.15	-0.20	0.11	-0.14	-0.30	-0.13	-0.03	-0.30	-0.11
PILRA	0.20	0.34	0.30	0.07	0.03	0.06	-0.03	0.21	0.15	-0.02	-0.03	-0.35	-0.44	-0.16	0.08	-0.39
CLSTN3	0.13	0.01	0.46	0.39	-0.10	0.07	0.11	-0.08	-0.17	0.05	-0.10	0.09	-0.12	-0.35	-0.11	-0.27
CABIN1	0.11	0.19	0.43	0.24	-0.01	-0.05	-0.10	0.07	0.07	0.18	0.06	-0.16	-0.24	-0.45	-0.01	-0.34
NHSL2	0.23	0.36	0.11	0.13	0.04	0.11	0.03	0.07	-0.05	-0.09	-0.03	-0.01	-0.34	-0.22	0.06	-0.41
LYRM1	0.13	0.30	0.32	0.37	0.12	-0.20	-0.07	-0.11	0.01	0.08	-0.02	-0.22	-0.21	-0.29	-0.15	-0.05
KCNA2	0.39	0.03	0.24	0.10	-0.05	0.04	-0.03	0.25	0.12	0.08	-0.15	-0.07	-0.13	-0.13	-0.13	-0.56
SLC38A10	0.17	0.32	0.40	0.24	0.09	-0.10	0.01	-0.14	-0.17	0.01	-0.22	-0.14	-0.03	-0.04	-0.14	-0.25
DGKA	0.25	0.26	0.19	0.31	-0.13	-0.07	0.20	0.05	-0.11	0.01	-0.20	-0.11	-0.31	-0.05	-0.02	-0.27
TMEM266	0.14	0.26	0.25	0.40	-0.04	-0.04	-0.24	0.12	0.04	0.03	-0.04	-0.08	-0.32	-0.17	-0.05	-0.25
FAM135B	0.31	0.05	0.12	0.30	0.20	0.00	0.11	-0.06	-0.15	-0.10	0.04	0.08	-0.33	-0.27	-0.10	-0.18
ATP2B2	0.31	0.24	0.30	0.15	0.18	-0.14	-0.17	0.01	-0.02	0.11	-0.23	-0.01	-0.23	-0.01	-0.11	-0.38
TMEM163	0.15	0.08	0.27	0.18	0.16	0.06	0.15	0.02	-0.03	-0.37	0.01	0.23	-0.18	-0.34	-0.12	-0.28
UNC5B	0.20	0.35	0.23	0.16	0.00	-0.01	-0.09	0.11	-0.20	0.13	-0.23	0.10	-0.22	-0.18	-0.01	-0.33
TPM3	0.17	0.05	0.26	0.30	0.06	0.01	-0.09	0.05	-0.04	0.00	0.12	0.08	-0.21	-0.34	-0.06	-0.37
MICAL2	0.09	0.28	0.38	0.13	-0.01	0.02	-0.22	0.11	0.02	0.04	0.02	-0.06	-0.20	-0.20	0.00	-0.40
GNAO1	0.14	0.30	0.19	0.08	0.13	-0.09	0.22	0.02	-0.13	-0.09	-0.11	0.10	-0.19	-0.17	-0.07	-0.31
GABBR2	0.16	0.33	0.15	0.14	0.08	0.03	0.02	0.09	-0.14	-0.09	-0.07	0.05	-0.35	-0.12	0.03	-0.30
KCNK1	0.27	0.38	0.09	0.13	0.17	-0.06	-0.14	0.01	-0.03	-0.16	0.09	-0.08	-0.18	-0.22	-0.09	-0.18
USP4	0.20	0.23	0.24	0.13	0.03	0.02	-0.05	0.08	-0.11	0.02	-0.04	-0.03	-0.35	-0.13	0.02	-0.28
TEX2	0.20	0.25	0.12	0.18	0.08	-0.22	0.04	0.11	-0.02	0.00	0.08	0.02	-0.20	-0.26	0.01	-0.39
PRKAG2	0.04	0.30	0.17	0.00	0.20	0.18	0.04	-0.05	-0.08	-0.06	0.02	0.03	-0.24	-0.19	-0.06	-0.29
APBA2	0.01	0.10	0.21	0.21	-0.04	0.01	0.12	0.03	-0.09	-0.05	-0.04	0.05	-0.15	-0.21	-0.04	-0.12
SUSD6	0.10	0.16	0.12	0.13	0.05	-0.07	-0.06	0.05	-0.06	0.05	-0.01	0.03	-0.10	-0.09	-0.08	-0.24
HDHD2	-0.18	-0.05	-0.30	-0.20	-0.02	0.00	-0.01	0.09	0.02	-0.02	0.14	-0.07	0.04	0.21	0.11	0.25
NAA20	-0.23	-0.24	-0.20	-0.07	-0.12	0.05	-0.02	0.00	0.11	-0.08	0.18	-0.02	0.22	0.11	0.17	0.14
CRIPT	-0.06	-0.35	-0.30	-0.29	-0.24	0.15	0.06	-0.03	0.11	0.15	0.17	-0.03	0.26	0.05	-0.02	0.37

KNTC1	-0.06	-0.06	-0.26	-0.30	-0.15	0.03	0.02	-0.09	-0.06	-0.06	-0.07	0.06	0.27	0.22	0.14	0.39
RPS6KA5	-0.25	-0.17	-0.43	-0.31	-0.13	0.25	0.13	-0.01	0.07	-0.05	0.10	0.02	0.17	0.17	0.08	0.37
PHF10	-0.25	-0.45	-0.32	-0.13	-0.09	0.12	0.18	0.03	0.13	0.05	-0.01	-0.01	0.20	0.16	0.07	0.32
PCGF5	-0.27	-0.12	-0.38	-0.15	0.00	-0.06	0.05	-0.02	0.11	-0.22	0.02	0.17	0.06	0.17	0.08	0.55
DPY19L4	-0.05	-0.26	-0.40	-0.36	-0.02	0.05	-0.05	0.06	0.03	-0.06	0.26	0.01	0.37	-0.07	0.18	0.30
APH1B	-0.08	-0.37	-0.44	-0.29	-0.23	0.21	0.12	0.05	0.06	0.03	0.20	-0.09	0.36	0.18	0.26	0.03
ZNF546	-0.04	-0.23	-0.47	-0.29	-0.13	0.11	0.01	0.02	0.09	-0.02	0.09	-0.04	0.13	0.39	0.09	0.28
ABCA17P	-0.38	-0.14	-0.18	-0.15	-0.10	0.03	-0.10	-0.03	-0.01	-0.16	0.25	-0.04	0.35	0.09	0.19	0.38
CDH26	-0.26	-0.15	-0.47	-0.26	-0.01	0.23	0.06	-0.04	0.00	-0.02	-0.11	0.23	0.09	0.07	0.19	0.45
CBWD6	-0.09	-0.26	-0.25	-0.19	-0.19	0.03	-0.12	0.20	0.04	-0.07	-0.05	-0.30	0.42	0.11	0.26	0.46
ZNF736	-0.05	-0.32	-0.46	-0.26	-0.11	0.07	0.10	0.02	0.08	-0.16	0.11	-0.04	0.10	0.24	0.02	0.65
CFAP70	-0.09	-0.30	-0.40	-0.20	-0.35	0.07	0.17	-0.10	0.05	-0.13	0.31	0.02	0.08	0.29	0.08	0.51
UBE4A	-0.02	-0.14	-0.49	-0.43	-0.01	-0.17	-0.19	0.09	0.03	0.15	0.02	-0.03	0.25	0.43	0.23	0.29
TTC32	-0.24	-0.23	-0.61	-0.36	0.05	0.08	0.05	0.14	0.14	-0.10	0.28	-0.07	0.23	-0.02	0.22	0.44
CFAP53	-0.57	-0.14	-0.14	0.02	-0.25	-0.12	0.01	-0.17	0.06	-0.02	0.08	-0.06	0.23	0.66	0.02	0.37
PXDNL	-0.45	-0.21	-0.19	-0.16	-0.32	0.07	0.14	0.04	-0.11	-0.04	0.02	-0.02	0.41	0.58	-0.22	0.46
CPVL	-0.17	-0.32	-0.52	-0.27	-0.34	0.24	0.24	-0.11	-0.08	0.13	0.16	0.03	-0.03	0.43	0.07	0.55
GLIPR1	-0.25	-0.27	-0.48	-0.09	-0.23	0.13	0.14	-0.12	-0.04	-0.17	-0.07	0.20	0.25	0.56	-0.05	0.47
COL25A1	-0.34	-0.13	-0.77	-0.36	0.00	0.19	0.30	-0.09	0.10	-0.07	0.16	-0.04	0.15	0.25	0.22	0.43
MTHFD2L	-0.24	-0.24	-0.65	-0.42	-0.05	0.30	0.06	0.10	-0.03	-0.06	0.12	0.17	-0.02	0.36	-0.03	0.63
LSM5	-0.18	-0.36	-0.28	-0.12	0.04	-0.30	0.01	-0.06	0.13	0.02	0.15	-0.21	0.69	-0.14	0.22	0.39
LOC100505715	-0.22	-0.38	-0.35	-0.57	0.04	0.19	-0.03	0.00	0.23	-0.07	0.21	0.03	0.04	0.51	0.20	0.17
NR3C2	-0.27	-0.20	-0.61	-0.44	-0.14	0.08	0.18	0.05	0.08	-0.17	-0.04	0.40	0.14	0.20	0.17	0.56
TOM1L1	-0.28	0.03	-0.62	-0.42	-0.07	0.01	-0.06	0.10	-0.05	-0.14	-0.10	0.12	0.32	0.35	0.21	0.62
ANKRD42	-0.07	-0.11	-0.61	-0.33	-0.10	-0.35	0.24	-0.21	0.07	-0.06	-0.10	0.28	0.52	0.09	0.15	0.58
SLC8A1-AS1	-0.30	-0.38	-0.18	-0.26	-0.19	0.14	0.05	-0.14	-0.14	0.32	-0.24	-0.19	0.70	0.62	-0.11	0.32
ATAD2	0.02	-0.52	-0.41	-0.36	-0.50	0.03	0.11	0.03	0.14	-0.09	0.09	0.19	0.64	0.16	0.14	0.32
GAB1	-0.61	0.04	-0.36	-0.39	0.18	-0.05	-0.30	-0.09	-0.08	-0.01	0.06	0.09	0.58	0.42	-0.01	0.53
CCDC146	-0.28	-0.16	-0.43	-0.24	-0.20	0.04	-0.03	0.01	0.09	-0.21	-0.18	-0.02	0.34	0.59	-0.03	0.72
ELMOD1	-0.14	-0.43	-0.42	-0.47	0.12	0.02	0.20	-0.35	0.05	-0.23	0.10	0.14	0.50	0.12	0.22	0.55
CFAP74	-0.28	-0.14	-0.04	-0.79	-0.01	0.00	-0.50	-0.28	0.41	0.10	0.32	-0.07	0.25	0.50	0.15	0.36
C1orf146	-0.05	-0.29	-0.41	-0.37	-0.18	0.14	-0.01	0.01	0.21	-0.20	-0.18	-0.02	0.22	0.64	0.04	0.45
P4HA2	-0.40	-0.35	0.07	-0.56	0.05	-0.47	-0.04	-0.11	0.29	0.31	-0.08	-0.04	0.58	0.44	0.15	0.16
RANBP3L	-0.14	-0.17	-0.64	-0.38	-0.20	0.34	-0.06	-0.18	0.08	-0.14	0.05	0.14	0.14	0.68	0.09	0.39
OTUD6B-AS1	-0.31	-0.46	-0.50	-0.28	-0.12	-0.13	0.03	0.40	0.07	-0.16	0.03	0.20	0.50	-0.11	0.40	0.44
EYS	-0.39	-0.47	-0.38	-0.12	-0.30	0.26	0.11	0.02	0.07	-0.18	0.00	-0.12	0.26	0.58	-0.01	0.66
ALS2CR11	-0.13	-0.40	-0.61	-0.18	-0.44	0.16	0.29	-0.25	0.00	-0.17	0.25	-0.05	0.17	0.49	0.28	0.59
LECT1	-0.24	-0.19	-0.59	-0.17	-0.19	0.07	-0.02	0.04	0.03	-0.27	0.15	-0.03	0.66	0.44	-0.25	0.53
BHLHE40-AS1	-0.56	-0.21	-0.15	-0.33	0.05	-0.33	-0.11	-0.02	-0.06	0.14	-0.03	0.23	0.27	0.25	0.37	0.49
STAB2	-0.22	-0.62	-0.03	-0.14	-0.27	0.18	-0.22	-0.09	-0.03	-0.07	0.02	0.09	0.18	0.26	0.65	0.32
PXYLP1	-0.68	-0.34	0.12	-0.62	0.15	-0.22	-0.35	-0.14	0.29	0.49	-0.17	0.35	0.42	0.38	0.03	0.28
LOC101929710	-0.44	0.00	-0.56	-0.46	-0.16	-0.02	0.13	-0.26	0.12	-0.09	0.20	0.04	-0.02	0.78	0.07	0.69
LINC00499	0.02	-0.18	-0.68	-0.62	-0.42	0.02	0.24	-0.01	0.07	0.10	-0.15	0.07	0.53	0.50	0.12	0.41
RHOBTB3	-0.19	0.05	-0.60	-0.77	-0.26	0.05	0.03	0.21	-0.11	-0.15	-0.19	-0.10	0.65	0.30	0.11	0.96
CRYBG3	-0.12	-0.28	-0.68	-0.51	-0.26	0.05	0.37	0.03	0.25	-0.30	-0.27	0.01	0.49	0.47	0.09	0.67
NPY6R	-0.27	-0.11	-0.88	-0.26	-0.32	-0.01	0.07	-0.07	0.16	-0.03	0.16	0.12	0.69	0.17	0.05	0.54
RGS20	-0.36	-0.32	-0.27	-0.42	0.04	0.15	-0.29	-0.45	0.21	0.03	0.11	0.08	0.76	0.65	-0.16	0.23
C2orf73	-0.17	0.03	-0.81	-0.76	-0.26	0.30	0.04	0.00	0.05	0.14	-0.03	-0.03	0.11	0.61	0.40	0.39

YIPF7	-0.27	-0.09	-0.73	-0.39	-0.23	0.12	-0.02	0.12	0.06	-0.10	-0.16	-0.24	0.87	0.66	-0.10	0.50
BUB1B	-0.24	-0.36	-0.57	-0.56	0.08	0.09	-0.24	0.18	0.08	-0.08	0.13	0.00	-0.05	0.75	0.32	0.47
CFAP43	-0.25	0.07	-0.74	-0.55	-0.22	0.17	-0.07	-0.16	0.06	-0.09	0.11	-0.28	0.47	0.76	-0.03	0.77
LOC102724623	-0.27	-0.29	-0.34	-0.37	0.01	0.32	-0.33	-0.39	0.29	-0.40	0.40	-0.39	0.11	0.18	0.48	1.00
LRRC69	-0.38	-0.01	-0.46	-0.49	-0.34	0.14	0.01	-0.19	0.04	-0.17	-0.05	0.28	1.02	0.35	-0.09	0.33
STK3	-0.28	-0.22	0.00	-0.23	-0.16	-0.14	-0.01	-0.57	-0.23	-0.23	-0.27	0.03	-0.15	0.51	0.91	1.03
CLIC5	-0.17	0.17	-0.54	-0.29	-0.47	-0.17	-0.26	-0.17	0.10	-0.02	-0.06	0.26	0.76	0.51	-0.19	0.54
CACNA2D3	-0.12	-0.55	-0.88	-0.35	-0.47	0.44	-0.17	-0.23	0.79	0.08	-0.13	0.15	0.25	0.65	-0.17	0.72
C2orf27A	-0.09	-0.99	-0.35	-0.42	-0.26	0.19	0.18	-0.03	0.11	-0.13	0.27	-0.03	0.56	0.01	0.09	0.89
LOC105378385	-0.27	-0.45	-0.85	-0.39	-0.40	0.46	0.37	-0.27	0.37	-0.09	-0.04	-0.13	0.33	1.15	0.17	0.06
BEST3	-0.02	-0.63	-0.62	-0.54	-0.04	-0.12	-0.33	-0.09	0.22	0.11	0.46	-0.03	-0.05	0.86	0.20	0.62
EPHA6	-0.02	-0.23	-0.93	-0.91	-0.75	0.08	0.10	0.18	0.49	-0.04	-0.03	0.18	-0.04	0.70	0.39	0.84
LOC100506393	-0.23	-0.56	-0.35	-0.29	-0.42	0.27	-0.04	0.03	-0.41	-0.26	-0.08	0.23	0.58	0.65	0.26	0.62
MEF2C	-0.46	-0.49	-1.00	-0.82	0.37	0.05	0.46	0.01	0.01	-0.37	-0.04	0.48	0.21	0.49	0.27	0.83
GTSCR1	-0.21	-0.15	-1.11	-0.17	-0.32	-0.23	-0.18	-0.64	0.26	0.52	0.26	0.56	0.16	0.65	0.25	0.35
ELOVL2	0.10	-0.37	-0.75	-0.70	-0.51	0.09	0.17	-0.11	0.22	-0.23	0.08	-0.28	0.91	0.80	0.18	0.41
SPATA9	-0.19	-0.35	-0.66	-0.41	-0.59	0.24	0.21	-0.26	0.17	-0.14	-0.03	-0.10	0.78	0.46	0.18	0.69
PLSCR4	-0.62	-0.54	-0.42	-0.71	0.51	-0.16	-0.74	0.44	-0.46	0.32	0.09	0.69	-0.14	0.84	0.38	0.50
GCK	-0.51	-0.10	-0.60	-0.41	-0.01	0.05	-0.14	-0.09	0.16	0.38	0.15	-0.58	0.21	0.96	0.43	0.10
LINC01032	-0.02	-0.16	-0.95	-0.51	-0.96	0.24	0.18	-0.08	0.06	-0.13	-0.30	0.07	0.46	1.27	0.10	0.75
MEF2C-AS1	-0.47	-0.34	-0.72	-0.60	-0.07	0.05	0.00	0.02	0.04	-0.29	-0.01	0.17	0.78	0.26	0.27	0.90
BMS1P21	-0.14	-0.84	-0.74	-0.32	0.25	-0.35	-0.31	-0.06	0.29	-0.23	-0.26	1.08	0.17	0.50	0.49	0.46
CASP12	-0.31	-0.88	-1.20	-0.22	0.15	-0.34	0.56	-0.12	-0.07	-0.04	0.37	0.62	0.32	0.19	0.08	0.87
CLMP	-0.09	-0.21	-0.79	-0.47	-0.11	0.21	-0.11	-0.53	-0.02	0.06	-0.34	-0.06	0.58	1.50	0.30	0.09
ERBIN	-0.50	-0.62	-0.20	-0.49	0.47	-0.39	-0.22	-0.43	0.22	0.13	0.13	0.23	0.11	0.38	0.54	0.64
TMC3-AS1	-0.32	-0.20	-0.86	-0.64	-0.40	-0.45	0.17	0.14	-0.04	-0.01	0.02	0.13	0.58	0.86	0.01	1.02
CXXC4	-0.14	-0.80	-0.27	-1.37	0.18	0.01	-0.24	-0.02	-0.20	0.16	0.27	0.06	0.88	0.35	0.46	0.66
DCBLD1	0.09	-0.56	-0.61	-0.81	-0.36	-0.57	0.30	0.11	0.29	-0.32	-0.39	-0.11	0.64	0.76	0.54	0.99
GSTO2	-0.10	-0.66	-0.83	0.03	-0.31	0.00	-0.40	-0.65	0.34	0.10	0.81	0.20	0.65	0.14	-0.30	0.98
PLOD2	-0.46	-0.44	-0.76	-0.98	0.07	-0.26	-0.31	0.14	0.20	0.45	0.22	0.60	0.12	0.67	0.17	0.56
P4HA2-AS1	-0.61	-0.66	-0.45	-0.84	0.10	-0.13	0.04	-0.03	0.42	0.04	0.48	0.14	0.74	0.43	0.08	0.25
TTC23L	-0.30	-0.33	-0.84	-0.64	-0.42	0.19	0.13	-0.26	0.10	0.05	-0.32	0.00	0.74	1.20	0.16	0.54
CPLX3	-0.69	-0.20	-0.07	-0.48	-0.41	-0.93	-0.18	0.47	-0.42	0.03	0.26	0.31	0.03	0.82	-0.07	1.55
SOX13	-0.72	-0.31	-0.18	-0.24	-0.04	-0.49	-0.59	-0.29	0.16	0.16	0.44	-0.08	1.08	0.65	0.05	0.39
PRDM1	-0.78	-1.04	-0.22	-0.71	0.57	-0.57	-0.28	0.56	0.50	0.03	-0.19	-0.40	0.56	0.29	0.73	0.95
RSPO2	-0.40	-0.48	-0.18	-0.19	-0.29	-0.51	-0.26	-0.51	0.08	0.28	0.07	0.17	-0.21	0.94	0.78	0.72
TSG1	-0.29	-0.49	-0.96	-0.62	-0.91	0.38	0.45	-0.18	0.24	-0.11	-0.30	-0.14	0.55	1.28	0.18	0.90
MIR31HG	-0.23	-0.97	-0.89	-1.13	0.79	-0.45	-0.08	-0.80	0.07	0.78	-0.15	0.24	0.29	0.91	0.81	0.82
CTB-12O2.1	-0.52	-0.50	-0.46	-0.26	-0.46	-0.42	-0.19	-0.51	0.58	-0.28	-0.54	-0.05	1.14	0.70	0.93	0.84
PLCH1	-0.18	-0.64	-0.51	-0.29	-0.35	-0.52	-0.14	-0.26	-0.28	-0.34	-0.10	0.77	1.00	0.25	-0.06	1.66
JAML	-0.04	-0.59	-0.81	-0.34	-0.71	-0.59	-0.31	-0.06	-0.05	0.13	-0.21	0.03	1.45	0.59	0.84	0.67
SEMA3G	-1.33	-0.20	-0.18	-0.61	-0.18	-0.58	-0.78	0.00	0.12	0.40	0.29	-0.58	1.18	1.41	0.04	1.02
LOC101928203	-0.69	-0.54	-0.59	-0.87	-0.49	0.16	0.09	-0.16	0.24	-0.28	0.45	-0.09	1.43	0.70	0.18	0.44
GLRA1	-0.76	-0.46	-0.53	-0.74	-0.21	-0.44	-0.43	-0.54	0.55	-0.20	-0.40	0.13	1.32	0.77	1.05	0.92
SYT16	-1.18	-1.10	-0.98	-0.12	-0.33	-0.63	-0.11	0.16	0.48	-0.08	0.05	0.91	1.03	0.88	0.47	0.55
SYN3	-0.56	-1.54	-0.61	-0.89	0.11	-0.67	-0.08	-0.27	1.06	-0.82	0.68	1.24	-0.21	1.21	0.77	0.57
ARHGAP32	-1.79	-0.75	-0.55	-1.21	0.05	-0.41	0.14	-0.83	0.99	1.09	0.53	-0.33	1.04	0.61	0.58	0.85
MIR646HG	-0.70	-0.77	-0.75	-0.67	-0.56	-0.62	0.25	0.25	-0.50	1.54	-0.62	0.33	0.41	1.84	-0.17	0.73
ALCAM	-1.52	-0.55	-1.28	-1.18	0.91	-0.07	-1.13	-0.01	-0.74	1.98	-0.12	0.48	-0.17	1.56	0.64	1.22

SCGN	-1.04	-0.64	-0.61	-0.93	-0.59	-0.72	0.04	0.06	-0.59	0.11	0.20	-0.43	2.24	1.81	-0.54	1.62
LINC01515	-0.43	-0.30	-0.08	0.17	-0.47	-0.22	-0.22	-0.31	-0.27	-0.58	-0.35	-0.21	-0.23	-0.58	-0.47	4.54
LOC101929415	-1.11	-1.00	-1.02	-0.88	-0.95	-1.07	-1.03	-0.31	1.71	0.87	0.89	-0.17	1.50	1.48	1.33	-0.23

[00305] RNAseq results for the differentially expressed (adjusted p <0.01, baseMean > 50) genes in granule cells across all samples is shown in Table 45.

Table 45. Differentially expressed genes in granule cells across all samples

Gene	baseMean	Log2 Change	p-value	padj	Gene	base Mean	Log2 Change	p-value	p-adj
RBFOX3	50345.918	-0.011	1.05E-05	1.36E-03	DYSF	356.876	-0.020	1.67E-04	8.53E-03
GRM4	34287.674	-0.018	1.39E-05	1.67E-03	NKD1	352.577	-0.016	2.09E-04	9.74E-03
KCND3	21782.620	-0.014	2.56E-08	1.47E-05	TTYH3	348.038	-0.019	1.85E-04	9.08E-03
EPHA6	19340.255	0.023	3.39E-05	3.08E-03	PTPN3	344.790	-0.041	4.05E-12	1.58E-08
MICAL2	17163.764	-0.010	1.50E-04	7.94E-03	TP73	341.504	-0.020	3.97E-06	7.81E-04
ATP2B2	16799.649	-0.010	8.11E-05	5.36E-03	CBWD6	336.598	0.012	1.96E-04	9.32E-03
NHSL2	13970.170	-0.011	1.55E-06	4.00E-04	LRRC1	324.253	-0.014	1.07E-04	6.33E-03
TMEM163	13633.070	-0.010	1.19E-04	6.72E-03	TCEAL2	303.853	-0.013	1.18E-04	6.72E-03
NAV2	13031.701	-0.014	8.29E-08	3.79E-05	KCNQ3	303.479	-0.064	1.73E-06	4.35E-04
TMEM266	12010.373	-0.010	4.59E-05	3.68E-03	PDZD7	303.201	-0.016	1.11E-04	6.46E-03
GABBR2	11930.254	-0.009	4.67E-06	8.52E-04	FARP1	300.108	-0.037	1.03E-07	4.55E-05
PDE3A	10097.415	-0.020	1.86E-04	9.12E-03	GLIPR1	295.278	0.014	5.84E-05	4.30E-03
KCNK1	8298.470	-0.009	1.63E-05	1.86E-03	GACAT2	293.355	-0.018	3.45E-06	7.25E-04
ELMO1	7802.455	-0.017	1.09E-05	1.39E-03	TTC32	292.733	0.014	6.31E-05	4.50E-03
GNAO1	7579.076	-0.009	4.24E-06	8.14E-04	PTMS	286.939	-0.026	1.50E-04	7.94E-03
NRXN2	7570.331	-0.012	3.97E-05	3.37E-03	COL25A1	284.956	0.014	1.59E-04	8.26E-03
KIF26B	7517.804	-0.012	3.53E-05	3.14E-03	LYRM1	280.842	-0.011	1.99E-04	9.41E-03
RPS6KA5	7326.044	0.011	4.54E-05	3.66E-03	CFAP74	279.177	0.017	8.30E-05	5.43E-03
FAM135B	7266.658	-0.010	4.86E-06	8.54E-04	STEAP3	277.625	-0.018	1.31E-05	1.57E-03
PTK2B	6597.329	-0.014	2.75E-08	1.47E-05	PXN	276.469	-0.019	4.62E-06	8.52E-04
NR3C2	6543.803	0.015	8.86E-06	1.26E-03	AQP7	272.393	-0.042	7.30E-13	3.78E-09
SUSD6	6401.317	-0.006	6.73E-05	4.75E-03	OTUD6B-AS1	271.278	0.017	9.85E-06	1.33E-03
PRKAG2	6026.090	-0.009	3.19E-05	2.98E-03	CALY	269.823	-0.017	1.02E-04	6.14E-03
CPLX2	5765.403	-0.017	2.01E-06	4.65E-04	CTB-12O2.1	267.774	0.035	4.91E-10	6.27E-07
GABBR1	5382.344	-0.015	1.50E-06	4.00E-04	SLC38A10	262.838	-0.010	9.57E-05	5.92E-03
DGCR5	5322.686	-0.013	1.12E-05	1.40E-03	DPY19L4	259.504	0.012	9.07E-05	5.73E-03
CHGB	5041.537	-0.022	1.36E-04	7.51E-03	GTPBP2	257.879	-0.012	1.52E-04	7.99E-03
MAPK4	4866.091	-0.013	5.42E-07	1.83E-04	ZNF546	247.108	0.012	2.62E-05	2.64E-03
APBA2	4762.326	-0.006	1.59E-04	8.25E-03	YIPF7	244.173	0.020	4.95E-05	3.86E-03
RAB37	4690.790	-0.013	7.45E-07	2.27E-04	ANKRD42	242.006	0.016	6.32E-05	4.50E-03
SRCIN1	4017.605	-0.017	1.05E-06	3.01E-04	ATAD2	239.267	0.016	2.83E-05	2.71E-03
PPP2R2C	4002.023	-0.011	2.02E-04	9.51E-03	CHRD	237.780	-0.018	1.78E-05	2.00E-03
RNF152	3798.987	-0.014	5.37E-06	9.17E-04	CFAP70	234.603	0.013	7.67E-05	5.17E-03
C14orf132	3786.072	-0.012	6.94E-05	4.86E-03	ZNF219	231.429	-0.016	5.87E-05	4.30E-03
TPM4	3655.275	-0.015	2.87E-09	3.19E-06	CREB3L2	231.412	-0.021	1.17E-04	6.72E-03
PCGF5	3061.297	0.011	4.21E-05	3.46E-03	ALCAM	229.200	0.057	1.77E-04	8.81E-03
KIAA1549L	2987.063	-0.017	3.81E-05	3.29E-03	RGS20	223.121	0.020	7.17E-06	1.09E-03
CLSTN3	2943.629	-0.011	7.03E-05	4.88E-03	CHST12	220.202	-0.014	9.19E-05	5.78E-03
CBLN3	2714.596	-0.017	4.95E-05	3.86E-03	LINC01032	218.152	0.026	1.63E-04	8.35E-03
EFR3B	2684.868	-0.012	2.81E-05	2.71E-03	CFAP43	211.635	0.021	2.61E-05	2.64E-03
ERGIC1	2501.561	-0.014	7.49E-05	5.13E-03	CDK5R2	209.638	-0.021	5.82E-06	9.82E-04
SLC17A7	2381.760	-0.019	3.13E-05	2.97E-03	GLRA1	209.467	0.044	4.84E-16	7.52E-12
CABIN1	2325.960	-0.011	1.52E-04	7.99E-03	PLOD2	209.111	0.029	3.55E-09	3.44E-06
HIP1	2298.351	-0.015	1.02E-04	6.14E-03	CXXC4	207.138	0.028	3.60E-06	7.27E-04
SYT7	2297.082	-0.025	1.04E-08	8.07E-06	CDH26	206.569	0.012	1.87E-04	9.14E-03
DHDDS	2267.496	-0.014	6.86E-06	1.07E-03	SCHLAP1	198.829	-0.060	7.72E-07	2.31E-04
EPB41L1	2266.476	-0.014	1.81E-06	4.38E-04	PLCH2	196.686	-0.027	6.04E-06	9.98E-04

EYS	2247.457	0.017	8.38E-06	1.23E-03	VWA5B2	195.922	-0.016	8.40E-05	5.43E-03
KCNK10	2220.881	-0.014	1.73E-04	8.66E-03	PLSCR4	195.390	0.025	2.07E-04	9.68E-03
CDH23	2139.153	-0.026	2.33E-08	1.39E-05	DCBLD1	192.305	0.028	4.71E-06	8.52E-04
FLNB	2129.312	-0.012	1.64E-05	1.86E-03	ABCC10	180.066	-0.014	2.15E-04	9.90E-03
KIAA0895L	1941.088	-0.020	3.43E-08	1.72E-05	LINC01544	179.445	-0.023	4.04E-06	7.85E-04
XKR7	1857.510	-0.014	6.50E-06	1.05E-03	LOC100505715	175.345	0.015	1.99E-05	2.14E-03
UNC5B	1829.248	-0.010	5.12E-05	3.92E-03	FHDC1	174.815	-0.021	1.69E-04	8.55E-03
KCNA2	1738.999	-0.010	1.97E-04	9.36E-03	P4HA2	174.500	0.017	5.12E-05	3.92E-03
DCLK1	1729.006	-0.045	1.33E-04	7.36E-03	NPY6R	171.099	0.020	3.06E-06	6.52E-04
PLXNA4	1698.038	-0.021	7.97E-05	5.29E-03	LINC01515	170.511	0.091	1.23E-04	6.92E-03
PTPRE	1697.110	-0.019	6.95E-13	3.78E-09	FAM212B	169.731	-0.016	4.76E-05	3.77E-03
PILRA	1657.001	-0.011	1.92E-04	9.28E-03	SYT16	167.452	0.045	5.39E-11	1.40E-07
ELAVL3	1635.882	-0.019	5.97E-06	9.97E-04	TTC23L	166.748	0.030	7.76E-08	3.65E-05
TEX2	1535.488	-0.009	1.69E-04	8.55E-03	KNTC1	166.001	0.011	3.23E-05	2.98E-03
CACNA2D3	1429.407	0.022	8.87E-05	5.65E-03	ELOVL2	165.967	0.024	3.17E-05	2.98E-03
MIR31HG	1405.114	0.034	2.59E-06	5.76E-04	FAM131A	165.672	-0.022	3.05E-05	2.91E-03
CPVL	1345.623	0.014	8.67E-05	5.54E-03	CLMP	164.996	0.027	6.91E-05	4.86E-03
PC	1333.761	-0.013	1.40E-04	7.59E-03	ATP6V0B	163.595	-0.016	1.38E-04	7.52E-03
HDHD2	1305.106	0.008	7.66E-05	5.17E-03	LOC102724623	161.233	0.021	1.16E-04	6.71E-03
PTPRJ	1260.812	-0.027	1.47E-07	6.33E-05	STK3	156.730	0.022	2.13E-04	9.87E-03
GRK5	1235.398	-0.025	6.59E-09	5.81E-06	CASP12	153.275	0.027	1.10E-04	6.43E-03
TRIM67	1160.185	-0.014	8.80E-06	1.26E-03	PLXDC2	152.928	-0.054	2.97E-06	6.41E-04
PIP5K1C	1157.473	-0.017	1.01E-04	6.13E-03	GTSCR1	151.570	0.024	2.79E-05	2.71E-03
GRIN2C	1149.100	-0.019	1.89E-05	2.10E-03	PLCH1	150.075	0.036	7.00E-07	2.22E-04
ADAM19	1129.783	-0.015	2.33E-05	2.40E-03	SDC3	146.412	-0.017	9.34E-05	5.84E-03
C1orf61	1128.395	-0.022	2.16E-08	1.34E-05	SLC25A6	145.952	-0.017	6.49E-05	4.61E-03
ZNRF1	1032.971	-0.012	3.93E-05	3.36E-03	PXYLP1	144.017	0.019	2.09E-04	9.74E-03
TOM1L1	1029.393	0.016	5.37E-06	9.17E-04	TSG1	142.981	0.034	4.72E-06	8.52E-04
MEF2C	1008.824	0.024	2.82E-05	2.71E-03	CPLX3	142.821	0.031	7.62E-05	5.17E-03
GDPD5	1000.940	-0.021	2.38E-07	9.73E-05	ITGB5	142.534	-0.050	8.33E-11	1.85E-07
RAB6B	998.297	-0.013	2.00E-06	4.65E-04	PLXNA1	141.224	-0.025	9.56E-06	1.32E-03
RHOBTB3	971.326	0.019	1.26E-04	7.09E-03	PRDM1	139.036	0.031	3.52E-05	3.14E-03
REEP1	946.662	-0.012	2.11E-05	2.24E-03	CRYBG3	137.285	0.020	8.36E-05	5.43E-03
GAB1	945.797	0.017	1.10E-05	1.39E-03	C2orf27A	137.080	0.022	3.56E-05	3.14E-03
MTHFD2L	880.484	0.015	1.69E-04	8.55E-03	BMS1P21	135.301	0.027	5.39E-05	4.06E-03
NUMBL	858.624	-0.014	6.30E-05	4.50E-03	LSM5	134.670	0.015	1.43E-04	7.67E-03
TPM3	847.801	-0.010	5.02E-05	3.90E-03	PTK7	134.378	-0.016	4.11E-05	3.43E-03
FAT1	845.279	-0.041	2.55E-05	2.60E-03	NEDD4	134.199	-0.034	1.00E-05	1.33E-03
CRIPT	839.761	0.011	9.82E-05	6.04E-03	BHLHE40-AS1	131.914	0.018	3.28E-09	3.39E-06
MEG8	817.575	-0.013	4.34E-05	3.53E-03	LECT1	130.818	0.017	1.03E-04	6.14E-03
ST3GAL2	815.630	-0.016	1.64E-05	1.86E-03	BAD	128.868	-0.014	1.89E-04	9.18E-03
TMC3-AS1	774.822	0.028	1.35E-08	9.56E-06	SEMA3G	127.065	0.042	5.98E-07	1.98E-04
KLHDC4	731.377	-0.011	1.03E-04	6.14E-03	DYRK1B	126.604	-0.021	1.89E-05	2.10E-03
ZNF736	718.113	0.013	9.54E-05	5.92E-03	ZDHHC23	125.799	-0.018	1.38E-04	7.51E-03
SLC8A1-AS1	701.507	0.016	1.01E-04	6.11E-03	BUB1B	123.089	0.021	1.53E-06	4.00E-04
LOC101929710	701.122	0.019	3.54E-06	7.27E-04	RANBP3L	122.662	0.017	7.41E-05	5.12E-03
KIF3B	693.982	-0.014	6.69E-06	1.07E-03	FGF3	121.486	-0.024	5.08E-07	1.76E-04
CDK16	692.677	-0.017	9.52E-06	1.32E-03	NTNG2	118.478	-0.028	1.70E-04	8.55E-03
PIP4K2A	692.212	-0.035	1.57E-10	2.72E-07	SPRED3	117.627	-0.025	9.79E-06	1.33E-03
CCDC146	686.609	0.017	3.86E-06	7.69E-04	CMTM8	115.497	-0.039	8.39E-06	1.23E-03
SDK1	675.822	-0.029	6.84E-06	1.07E-03	LOC101927078	115.074	-0.021	1.17E-05	1.45E-03
TMEM130	662.918	-0.018	7.33E-07	2.27E-04	SPATA9	113.520	0.025	1.21E-06	3.36E-04
RIMS3	661.640	-0.017	2.72E-05	2.71E-03	TP53INP2	107.962	-0.015	1.50E-04	7.94E-03
MRAP2	651.226	-0.027	4.10E-07	1.57E-04	JAML	105.142	0.038	1.35E-08	9.56E-06
LPCAT4	643.659	-0.017	1.44E-04	7.70E-03	LRRC69	103.255	0.021	5.85E-05	4.30E-03
KCNK3	611.309	-0.015	5.76E-05	4.29E-03	PCYT1B	100.865	-0.023	1.49E-08	9.72E-06
USP4	606.876	-0.009	7.33E-06	1.10E-03	GRAMD4	93.623	-0.017	1.04E-05	1.36E-03
RAI2	599.661	-0.014	1.94E-05	2.13E-03	NAB2	92.518	-0.028	4.15E-07	1.57E-04
ABCA17P	597.623	0.012	1.95E-06	4.65E-04	LINC00499	92.305	0.019	6.23E-05	4.50E-03

SYN3	571.141	0.045	9.43E-06	1.32E-03	P4HA2-AS1	92.247	0.030	6.73E-09	5.81E-06
DAO	564.826	-0.015	1.26E-06	3.42E-04	LOC101929415	87.551	0.094	1.86E-11	5.79E-08
WWC2	562.806	-0.032	3.14E-08	1.62E-05	ATXN7L2	86.354	-0.016	1.71E-04	8.58E-03
FMNL3	542.089	-0.013	9.36E-05	5.84E-03	SLC38A7	83.233	-0.017	1.60E-04	8.28E-03
APH1B	539.205	0.012	1.95E-04	9.32E-03	SBNO2	82.451	-0.018	7.46E-05	5.13E-03
ACOT7	526.573	-0.016	1.32E-04	7.34E-03	C2orf73	82.230	0.020	1.95E-04	9.32E-03
MGAT3	523.255	-0.022	1.77E-06	4.38E-04	LOC101926941	81.438	-0.032	2.11E-04	9.78E-03
LOC105378385	510.612	0.022	2.07E-04	9.68E-03	MIR646HG	79.857	0.054	9.90E-06	1.33E-03
GYS1	499.337	-0.016	6.00E-05	4.35E-03	ACHE	78.961	-0.021	6.49E-06	1.05E-03
BEST3	490.054	0.023	1.70E-07	7.15E-05	LOC100506393	75.008	0.024	4.89E-06	8.54E-04
SYT12	489.549	-0.015	7.02E-05	4.88E-03	GSTO2	74.993	0.029	1.09E-04	6.43E-03
UGGT2	480.980	-0.057	2.64E-06	5.77E-04	ZNF703	73.641	-0.021	1.52E-05	1.79E-03
CATSPERG	464.091	-0.033	1.50E-08	9.72E-06	SCGN	72.334	0.075	7.18E-09	5.87E-06
ZYX	460.598	-0.024	2.12E-05	2.24E-03	C1orf146	71.399	0.017	1.14E-04	6.65E-03
MAP6D1	456.730	-0.018	3.62E-05	3.18E-03	FAM53A	71.116	-0.018	4.23E-05	3.46E-03
DGKA	453.066	-0.010	3.68E-05	3.21E-03	HPN	69.661	-0.019	1.53E-04	8.02E-03
UBE4A	446.905	0.014	1.13E-06	3.20E-04	LOC101928203	69.012	0.043	4.88E-10	6.27E-07
MEF2C-AS1	436.410	0.026	1.22E-10	2.36E-07	SOX13	67.867	0.031	4.91E-07	1.73E-04
PHF10	429.336	0.011	2.04E-05	2.19E-03	AHRR	67.783	-0.022	2.66E-08	1.47E-05
LRPAP1	421.084	-0.018	1.07E-04	6.33E-03	RASIP1	66.766	-0.016	4.03E-05	3.40E-03
CFAP53	416.274	0.014	5.43E-05	4.08E-03	SURF2	65.825	-0.022	1.27E-05	1.55E-03
ACAP3	404.604	-0.023	3.60E-06	7.27E-04	HCN2	65.312	-0.023	3.49E-05	3.13E-03
SYT3	399.161	-0.015	1.10E-05	1.39E-03	LINC00963	62.888	-0.019	1.47E-05	1.74E-03
ELMOD1	397.720	0.017	4.84E-06	8.54E-04	LMNTD2	62.775	-0.027	2.54E-06	5.73E-04
PXDNL	390.913	0.014	1.83E-04	9.05E-03	MAMSTR	60.729	-0.020	3.74E-05	3.24E-03
NAA20	379.461	0.009	1.12E-05	1.40E-03	GCK	59.850	0.025	2.15E-05	2.25E-03
ALS2CR11	367.106	0.017	1.96E-05	2.13E-03	MPP6	55.651	-0.031	2.74E-05	2.71E-03
ARHGAP32	366.765	0.051	3.52E-07	1.40E-04	STAB2	53.476	0.018	4.23E-05	3.46E-03
AP1S3	365.601	-0.020	8.69E-06	1.26E-03	RSPO2	52.630	0.032	6.17E-08	3.00E-05
KCNIP2	360.911	-0.013	5.06E-05	3.91E-03	ERBIN	51.559	0.028	1.57E-06	4.01E-04
RHBG	359.397	-0.023	8.18E-05	5.39E-03	CLIC5	50.025	0.022	2.00E-04	9.44E-03

[00306] The RNAseq results for the 139 genes in basket cells having significantly altered expression with age are shown in Table 46. The log2 fold changes for the sorted nuclei from basket cells from each human sample compared to the normalized expression for sorted nuclei from granule cells across all samples are shown in Table 46. Negative values indicate reduced expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 46. Log2 fold change of expression of genes in basket cells

	Log2 fold change of expression															
Subject	xk	tm	wo	wc	wi	pk	vm	wl	sg	or	lt	zh	ko	kq	ke	ai
Gene																
ACER3	-0.43	-0.46	-0.43	-0.01	-0.35	0.08	-0.27	-0.12	0.22	0.30	-0.12	0.05	0.00	0.33	0.75	0.46
ACSS3	-0.24	0.12	-0.47	-0.34	-0.80	-0.31	-0.33	-0.53	-0.93	0.03	-0.47	-0.10	0.35	1.28	0.87	1.90
ADAMTS2	0.55	0.00	0.36	0.67	0.22	0.20	0.00	0.12	0.00	0.30	-0.43	-0.04	-0.59	-0.28	-0.33	-0.76
ADAMTS9	0.78	0.64	0.17	0.64	-0.11	0.60	0.22	0.16	0.12	0.07	-0.03	-0.12	-1.01	-1.42	0.09	-0.80
ADAMTSL3	-0.57	0.05	-0.51	-0.54	-0.19	-0.21	0.06	-0.12	-0.04	0.40	-0.18	-0.08	0.76	0.27	0.37	0.53
ADD2	0.20	0.09	0.34	0.10	0.23	0.00	-0.10	0.00	0.01	-0.05	-0.02	0.10	-0.25	-0.11	-0.23	-0.30
ADGRL3	0.27	0.08	0.31	-0.05	0.20	0.28	0.29	0.08	-0.07	-0.08	-0.08	-0.25	-0.31	-0.38	-0.11	-0.20
AKAP13	-0.41	-0.06	-0.31	-0.12	-0.70	-0.14	-0.31	-0.12	-0.27	0.00	0.01	0.12	0.21	0.69	0.64	0.76
ALOX5	-0.35	-0.28	-0.95	-0.19	-0.23	-0.04	0.14	-0.12	-0.14	-0.18	-0.16	0.35	0.62	0.33	1.04	0.17

ALS2CR11	-0.40	-0.49	-0.26	-0.29	-0.49	0.06	0.36	-0.36	0.11	-0.08	0.61	-0.22	0.21	0.06	0.48	0.70
ARHGEF10L	0.18	0.06	0.31	0.23	0.17	0.06	-0.09	0.02	0.01	0.03	-0.10	0.12	-0.21	-0.29	-0.04	-0.45
ARHGEF6	-0.28	-0.11	-0.66	-0.30	-0.51	-0.09	-0.08	-0.28	-0.69	-0.05	-0.08	0.44	0.19	0.74	0.81	0.97
ASIC1	0.39	0.29	0.60	0.24	0.48	0.19	-0.03	0.16	0.02	-0.06	-0.15	-0.05	-0.70	-0.18	-0.37	-0.83
ASIC2	0.39	0.56	0.32	0.21	0.19	0.59	0.13	0.01	-0.02	0.12	-0.12	0.03	-0.89	-0.39	-0.29	-0.84
ATP6V0B	0.34	-0.08	0.70	0.09	0.41	0.00	-0.06	0.55	0.23	0.06	0.06	-0.22	-0.15	-0.79	-0.45	-0.68
BMP3	-0.38	-0.69	-0.78	-0.34	-0.16	-0.29	-0.13	0.33	0.77	0.06	-0.23	0.36	0.12	0.22	0.25	0.89
BTBD11	0.11	0.17	0.36	0.21	0.03	0.17	-0.01	-0.07	-0.12	0.02	-0.02	0.04	-0.31	-0.22	-0.27	-0.09
C11orf87	0.75	0.85	0.97	0.16	0.26	0.56	-0.31	-0.31	-0.13	0.00	0.20	-0.15	-0.45	-0.44	-0.95	-1.00
C14orf1	0.26	0.20	0.36	0.09	-0.01	0.20	-0.05	0.02	0.24	0.09	-0.08	-0.17	-0.13	-0.28	-0.33	-0.41
C4orf22	-0.79	-0.66	-0.96	-0.62	0.24	-0.30	0.02	0.39	0.44	0.24	0.02	0.20	0.20	0.13	0.15	1.29
C9orf135	-0.30	-0.39	-0.60	-0.50	0.03	0.25	-0.42	0.12	0.12	0.41	-0.63	-0.05	0.88	0.47	-0.36	0.96
CA7	0.62	0.30	0.54	0.23	0.06	-0.11	-0.16	0.39	-0.09	-0.21	-0.51	-0.01	0.02	0.01	-0.51	-0.57
CACNA1D	0.16	0.00	0.17	0.16	0.04	0.03	0.10	0.06	0.07	-0.07	-0.04	-0.05	-0.05	-0.23	-0.19	-0.18
CACNA2D3	-1.43	-0.73	-0.79	-1.41	-0.15	-1.36	0.04	-0.11	0.52	0.12	0.10	0.18	1.41	1.61	0.24	1.74
CACNB4	0.26	0.17	0.47	0.16	0.14	0.06	-0.06	0.03	-0.06	-0.14	-0.16	0.08	-0.21	-0.29	-0.21	-0.25
CADM3	0.44	0.22	0.15	0.03	0.21	0.10	0.00	0.11	0.25	-0.03	-0.04	-0.04	-0.59	-0.08	-0.19	-0.56
CADPS	0.28	0.12	0.13	0.10	0.08	0.28	0.18	0.06	-0.09	0.09	-0.01	-0.07	-0.45	-0.24	-0.15	-0.33
CALR	0.29	0.24	0.70	0.23	0.66	0.02	-0.06	0.28	-0.04	-0.30	0.42	-0.05	-0.46	-0.89	-0.13	-0.90
CDK15	-0.62	0.13	-0.61	-0.77	-0.61	-0.19	0.21	-0.18	-0.61	0.09	-0.69	0.54	0.03	1.76	0.31	1.21
CFAP46	-0.57	-0.57	-0.39	-0.07	-0.21	0.25	-0.09	-0.25	0.51	0.22	-0.28	0.36	0.04	0.50	-0.08	0.64
CLSTN3	0.09	0.01	0.72	0.30	0.51	-0.09	-0.11	0.11	0.04	-0.25	-0.07	0.09	-0.26	-0.32	-0.35	-0.43
CNTN3	-0.42	-0.40	-0.17	-0.32	-0.67	-0.28	-0.43	-0.08	0.52	0.28	0.31	-0.13	0.37	0.61	0.02	0.80
CPNE8	-0.26	-0.38	-0.05	-0.03	-0.68	-0.14	-0.31	-0.45	-0.37	0.05	-0.07	0.01	0.25	0.63	0.98	0.82
CYYR1	-0.44	-0.20	-0.64	-0.33	-0.31	0.30	-0.02	-0.16	0.35	-0.02	-0.08	0.05	0.45	0.71	-0.28	0.61
DBH	0.09	0.49	0.22	0.37	0.23	0.17	-0.35	0.31	0.08	-0.06	-0.21	0.20	-0.42	-0.16	-0.25	-0.72
DCC	-0.55	0.29	-0.46	-0.76	-1.12	-0.48	-0.64	-0.28	0.69	0.11	-0.73	0.28	0.44	0.87	1.11	1.22
DDO	-0.09	-0.46	-0.78	-0.84	-0.23	0.20	-0.08	-0.17	0.39	0.04	0.32	0.20	0.19	0.67	0.46	0.21
DGKH	0.31	0.08	0.34	0.12	0.06	0.37	0.11	0.12	-0.12	-0.12	-0.12	0.01	-0.18	-0.47	-0.27	-0.25
DISP3	0.25	0.15	0.41	0.28	0.10	0.17	0.00	0.16	0.14	-0.06	-0.17	-0.18	-0.55	-0.03	-0.47	-0.23
DLG1	-0.46	0.04	-0.59	-0.34	-0.13	-0.01	-0.16	-0.09	0.00	0.15	-0.04	0.08	0.19	-0.25	1.02	0.60
DLG4	-0.06	0.28	0.73	0.60	0.17	0.05	-0.06	-0.15	-0.02	-0.06	-0.22	0.00	-0.14	-0.25	0.00	-0.86
DMGDH	-0.36	-0.01	-0.90	-0.69	-0.44	0.06	0.27	0.11	-0.67	-0.07	-0.27	0.10	0.92	0.78	0.22	0.93
DNAH6	-0.51	-0.38	-0.16	-0.32	0.05	0.09	-0.04	-0.33	0.22	-0.11	0.19	0.25	0.18	0.19	-0.21	0.87
DNER	0.22	-0.01	0.44	0.03	0.22	0.14	0.05	0.08	-0.05	-0.04	-0.05	0.11	-0.29	-0.38	-0.31	-0.16
E2F3	0.32	0.12	0.23	0.10	0.22	0.03	0.05	0.17	0.03	-0.20	-0.19	0.20	-0.13	-0.48	-0.22	-0.25
ECHDC2	-0.16	-0.03	-0.50	-0.15	-0.14	-0.47	-0.11	-0.20	-0.06	0.14	-0.01	0.16	0.54	0.43	0.35	0.22
ELOVL2	-0.20	0.11	-1.06	-0.54	-0.26	0.11	-0.06	-0.18	-0.06	0.22	-0.27	-0.03	0.55	0.64	0.57	0.47
ENPP1	-0.71	-0.23	-0.30	-0.81	-0.10	-0.82	0.20	0.23	0.17	-0.09	0.39	-0.05	0.86	0.31	-0.03	0.98
EPHB1	0.17	0.28	0.40	0.17	0.58	-0.26	0.10	0.39	0.24	0.08	0.23	0.07	-0.62	-0.50	-0.32	-1.04
ERC2	0.19	0.02	0.29	0.17	0.09	0.10	0.04	0.02	-0.17	-0.11	-0.07	0.10	-0.22	-0.12	-0.19	-0.13
FAM135B	0.22	0.01	0.18	0.18	0.27	0.04	-0.01	0.02	-0.04	-0.09	-0.11	0.08	-0.15	-0.17	-0.22	-0.22
FAM46C	-0.77	-0.50	-0.39	-0.49	0.06	-0.44	0.15	-0.22	0.69	-0.03	0.02	0.27	0.99	0.37	-0.73	1.02
FBXL21	1.32	0.31	0.00	0.44	-0.31	0.69	-0.13	-0.20	0.60	-0.04	-0.21	-0.33	-0.54	-0.80	-0.30	-0.50
FGF5	-0.86	-0.35	-1.15	-0.64	0.40	-0.44	-0.16	0.02	0.31	0.32	0.29	0.21	0.62	0.37	0.03	1.01
FHOD3	0.15	0.61	0.29	0.23	0.09	0.19	-0.13	-0.08	0.10	0.47	-0.23	0.24	-0.56	-0.59	-0.30	-0.50
FKBP5	-1.16	0.08	-0.21	-1.12	-1.00	-1.09	-0.16	-0.85	-0.11	-0.04	-0.18	-0.09	2.01	1.39	0.19	2.35
FRMPD4	0.25	0.19	0.14	-0.01	0.21	0.21	0.15	0.09	-0.04	-0.12	-0.05	-0.13	-0.44	-0.07	-0.19	-0.19
GABBR2	0.14	0.17	0.18	0.04	0.18	0.07	0.01	0.07	0.05	-0.12	-0.10	0.07	-0.32	-0.02	-0.17	-0.25
GALNT18	0.23	0.15	0.18	0.17	0.07	0.20	-0.05	0.01	-0.05	-0.03	-0.16	0.02	-0.34	0.02	-0.16	-0.25
GAP43	0.28	0.40	0.40	-0.05	0.40	0.17	0.21	0.06	-0.04	-0.02	0.02	0.10	-0.46	-0.56	-0.30	-0.61
GBAP1	-0.03	0.73	0.81	0.59	-0.02	-0.17	-0.25	0.21	-0.32	0.27	-0.33	0.05	-0.76	-0.34	-0.07	-0.37
GDF11	0.32	0.27	0.33	0.16	0.17	0.16	0.03	-0.06	0.31	0.06	-0.08	-0.05	-0.47	-0.16	-0.56	-0.43

GPR161	0.33	0.11	0.39	0.35	-0.25	0.06	0.02	0.13	-0.22	0.01	-0.01	0.18	-0.17	-0.40	-0.22	-0.33
GPR63	0.76	0.30	0.27	0.62	-0.02	-0.21	0.39	0.47	-0.89	-0.08	-0.05	0.19	-0.33	-0.89	-0.43	-0.11
GREB1	-0.14	-0.21	-0.55	-0.23	-0.32	0.11	-0.34	-0.21	0.15	0.18	0.08	-0.10	0.49	0.57	0.28	0.24
HCN4	0.38	0.66	0.15	0.37	0.12	0.17	-0.17	-0.15	0.06	0.09	0.01	0.07	-0.29	0.05	-0.63	-0.88
HECTD2-AS1	-0.44	-0.17	0.04	-0.30	-0.15	-0.20	-0.06	-0.40	-0.03	-0.22	0.19	-0.12	-0.11	0.75	0.61	0.61
IQSEC3	0.20	0.23	0.50	0.16	0.36	0.00	-0.13	0.03	-0.02	0.00	-0.18	0.35	-0.41	-0.22	-0.17	-0.69
KCNA4	-0.17	-0.44	0.15	-0.51	-0.36	-0.24	-0.38	-0.52	0.07	-0.13	0.52	-0.28	0.38	0.27	0.88	0.75
KIF26B	0.11	0.42	0.51	0.12	0.25	-0.01	0.06	0.09	-0.28	0.01	0.16	0.23	-0.73	-0.37	-0.10	-0.47
KRT222	0.41	0.12	0.21	-0.05	0.13	0.58	0.26	0.23	-0.18	0.03	0.06	-0.11	-0.50	-0.59	-0.35	-0.25
LACTB2-AS1	-0.40	-0.14	-0.37	-0.32	-0.18	0.17	-0.16	-0.48	-0.21	0.50	0.22	0.06	-0.01	0.28	0.30	0.75
LHFPL3	0.46	0.30	0.61	0.14	0.29	0.17	-0.09	-0.10	0.05	-0.14	-0.33	-0.07	-0.71	-0.12	-0.36	-0.10
LINC00457	-0.43	-0.31	-0.87	-0.44	-0.40	-0.29	0.21	-0.34	0.74	0.18	-0.36	0.04	0.37	0.81	-0.03	1.10
LINC00499	-0.37	-0.34	-0.51	-0.39	-0.73	-0.01	-0.11	-0.20	-0.01	-0.13	-0.20	-0.17	0.94	0.21	0.13	1.90
LINC01158	-0.55	-0.06	-0.88	-0.37	0.19	-0.65	0.15	-0.24	0.33	0.38	-0.63	0.40	0.58	0.37	0.53	0.45
LOC105377448	-0.64	0.11	-0.52	-0.36	-0.24	0.07	-0.29	0.06	-0.29	0.33	-0.18	0.12	0.93	0.12	0.40	0.38
LOC285692	-0.51	-0.44	-1.15	-0.57	0.01	-0.10	-0.28	0.04	-0.14	0.48	-0.75	0.07	1.63	0.51	-0.14	1.33
LOC653602	0.81	0.36	-0.09	0.03	-0.18	0.58	0.24	0.21	0.14	0.24	0.06	-0.09	-0.81	-0.47	-0.36	-0.70
LPCAT4	0.28	-0.10	0.51	0.48	0.53	-0.04	-0.04	0.22	-0.03	-0.14	-0.30	0.02	-0.43	-0.33	-0.08	-0.57
MARC2	-0.27	-0.18	-0.34	-0.49	-0.33	0.26	-0.25	-0.09	0.15	0.28	0.01	0.06	0.25	0.24	0.28	0.43
MARCH11	0.41	0.12	0.15	0.05	0.23	0.21	0.17	0.12	-0.09	-0.26	-0.11	-0.03	-0.29	-0.26	-0.18	-0.24
MASP1	0.50	-0.08	0.47	0.38	0.37	0.39	0.33	-0.17	-0.25	0.06	0.49	-0.22	-0.68	-0.45	-0.27	-0.87
MEGF10	0.27	0.13	0.15	-0.06	0.08	0.27	0.13	0.05	-0.05	-0.16	0.00	-0.06	-0.11	-0.27	-0.20	-0.15
MTHFSD	0.38	0.22	0.64	0.15	0.24	-0.34	-0.08	0.12	-0.16	-0.25	-0.07	0.16	-0.32	-0.19	-0.23	-0.28
MYRIP	-0.62	-0.10	-0.48	-0.57	0.03	0.02	0.06	-0.04	0.24	0.36	-0.10	0.31	-0.15	0.03	0.13	0.89
NHS	0.29	0.24	0.39	0.16	0.17	-0.03	-0.03	0.10	-0.03	0.00	-0.17	0.05	-0.39	-0.35	-0.31	-0.10
NOS1	0.17	0.17	0.27	0.13	0.24	0.13	0.03	-0.05	-0.02	-0.08	0.06	-0.07	-0.12	-0.13	-0.09	-0.63
NPL	-0.36	-0.12	-0.17	-0.54	-0.31	-0.56	0.09	-0.15	-0.17	0.10	0.11	0.10	0.57	0.53	0.28	0.59
NPY6R	-0.15	-0.19	-0.45	-0.20	-0.09	-0.02	-0.12	-0.12	-0.05	-0.03	0.37	-0.02	0.35	0.31	0.08	0.33
NTNG1	0.77	0.46	0.12	0.30	0.19	0.26	-0.03	0.10	0.06	-0.28	-0.54	-0.19	-0.54	-0.31	-0.09	-0.29
NXNL2	1.10	-0.41	1.75	1.11	-0.19	-0.35	-0.04	-0.39	-0.54	-0.49	-0.01	-0.25	-0.08	-0.25	-0.71	-0.25
PAQR6	-0.12	-0.33	-0.51	-0.18	-0.28	-0.40	-0.23	-0.16	0.07	0.15	-0.40	-0.16	-0.04	0.92	1.22	0.46
PARM1	0.38	0.26	1.16	0.42	0.87	-0.34	-0.18	0.29	0.09	0.39	-0.47	0.00	-1.49	-0.49	-0.35	-0.55
PCP4	0.95	0.96	0.28	0.85	-0.46	0.49	-0.32	-0.33	-0.39	-0.05	-0.70	0.60	-0.13	-0.67	-0.89	-0.18
PEBP4	-0.08	-0.45	-0.58	-0.59	-0.82	-0.56	-0.19	-0.52	0.23	0.21	0.02	-0.19	0.46	1.30	0.67	1.11
PHACTR2-AS1	0.20	0.34	0.24	-0.06	0.38	0.05	0.22	0.04	-0.10	-0.17	-0.10	0.14	-0.28	-0.19	-0.06	-0.64
PHKA1	-0.59	-0.22	-0.41	-0.46	0.13	0.13	-0.18	-0.20	0.09	0.36	0.02	0.11	-0.23	-0.18	0.29	1.34
PLPPR4	0.40	0.27	0.31	0.61	0.31	0.85	0.62	-0.21	0.21	-0.12	0.18	-0.48	-1.41	-0.78	-0.70	-0.05
PLXNA4	0.48	0.46	0.32	0.35	0.05	0.25	-0.19	-0.11	-0.20	0.01	-0.21	0.10	-0.28	-0.25	-0.44	-0.35
PRKCG	0.22	-0.02	0.97	0.25	0.26	0.11	-0.21	-0.05	-0.16	0.23	-0.22	0.01	-0.24	-0.30	-0.29	-0.57
RGMB	0.46	0.22	0.58	0.09	0.27	0.36	-0.09	0.07	0.16	0.06	0.32	-0.07	-0.50	-0.46	-0.71	-0.76
RNF212	-0.32	-0.13	-0.35	-0.44	-0.07	-0.16	-0.03	-0.40	0.19	0.58	-0.02	0.21	-0.12	0.26	0.42	0.38
RNF215	0.29	0.41	0.78	0.13	0.62	-0.26	-0.08	0.07	0.15	-0.36	0.00	-0.46	-0.17	-0.08	-0.62	-0.42
RORA	0.19	0.28	0.09	0.09	0.25	0.32	0.23	0.08	0.10	-0.08	-0.01	-0.07	-0.59	-0.24	-0.18	-0.46
RPH3A	0.37	0.51	0.49	0.13	0.37	0.65	-0.47	0.05	0.02	0.17	-0.51	0.07	-0.68	-0.27	-0.45	-0.43
RPS6KA5	-0.49	-0.17	-0.53	-0.35	-0.38	0.27	0.37	-0.37	-0.13	0.27	0.10	-0.09	0.47	0.03	0.32	0.67
SCN2B	0.05	0.49	0.56	0.08	0.53	-0.13	-0.07	0.22	-0.10	-0.05	0.10	0.01	0.11	-0.41	-0.74	-0.65
SEPSECS	-0.07	-0.39	-0.12	-0.32	0.06	-0.36	-0.08	-0.29	0.30	-0.06	0.08	-0.06	0.33	0.19	0.08	0.71
SEPSECS-AS1	0.16	-0.97	-0.79	-1.06	0.11	0.10	-0.19	0.14	0.22	0.12	0.30	0.23	-0.01	0.28	0.61	0.78
SHANK1	0.23	0.01	0.92	0.43	0.38	-0.04	-0.28	0.05	-0.16	-0.11	-0.21	0.22	-0.38	-0.15	-0.15	-0.76
SHANK2	0.08	0.12	0.42	0.18	0.33	0.11	-0.03	-0.08	-0.07	-0.02	-0.06	0.08	-0.29	-0.06	-0.20	-0.52
SLC12A5	0.19	0.07	0.37	0.15	0.10	-0.04	0.07	0.15	0.10	0.16	0.17	-0.07	-0.19	-0.38	-0.40	-0.44
SLC17A4	-0.41	-0.08	-0.28	-0.93	0.08	-0.57	-0.09	-0.02	0.23	-0.15	0.00	-0.26	0.52	0.81	-0.28	1.42
SLC25A29	0.27	0.50	0.28	0.43	0.05	-0.18	-0.19	0.15	0.01	-0.15	-0.10	0.20	-0.23	-0.20	-0.11	-0.74

SLC26A8	-0.06	-0.49	-0.14	-0.60	-0.33	0.04	-0.36	0.05	-0.12	0.26	0.33	-0.19	0.14	0.73	0.36	0.38
SLC35F4	0.55	0.29	0.42	0.58	-0.11	0.14	-0.07	0.11	-0.37	0.00	-0.41	0.29	-0.49	-0.58	-0.30	-0.07
SLC8A3	0.65	0.18	0.19	0.13	0.37	0.31	-0.01	0.07	-0.09	-0.02	-0.15	-0.01	-0.64	-0.08	-0.24	-0.67
SPARCL1	-0.77	-0.10	-0.57	-0.72	-0.59	-0.52	-0.18	-0.20	-0.21	0.30	0.14	-0.02	0.74	1.26	0.32	1.12
SPHK2	0.15	-0.02	0.80	0.68	0.33	-0.27	-0.20	0.06	-0.25	-0.09	0.10	-0.07	-0.13	-0.23	-0.38	-0.49
SPON2	-0.29	-0.33	-0.11	-0.56	0.05	-0.21	0.13	-0.26	0.21	-0.34	-0.09	-0.31	0.12	0.45	0.88	0.67
ST6GAL2	0.51	0.31	0.32	0.13	0.33	0.25	0.02	0.10	-0.13	-0.20	-0.02	-0.16	-0.37	-0.38	-0.22	-0.47
ST6GALNAC5	-0.58	-0.85	-1.38	-0.75	-0.70	-0.75	-0.29	0.23	0.75	0.25	0.09	0.54	0.58	0.52	0.53	1.79
STAT5A	-0.65	-0.39	-0.73	-0.24	-0.65	-0.32	-0.09	0.21	-0.45	-0.06	-0.19	-0.66	1.51	1.76	0.04	0.91
STK33	-0.29	0.17	-0.69	-0.59	-0.48	-0.13	-0.06	-0.28	0.24	0.16	0.10	0.20	-0.17	0.30	0.51	1.02
SV2C	0.22	-0.68	-0.22	-0.51	0.04	-0.49	-0.65	-0.44	0.20	0.03	-0.10	-0.19	0.73	0.88	-0.05	1.22
SYT17	-0.91	0.01	-0.50	-0.62	0.37	-0.48	-0.53	-0.63	0.39	0.16	0.31	0.68	-0.26	0.55	0.76	0.69
TEX9	-0.39	-0.56	-1.01	-0.33	-0.63	0.29	0.20	-0.16	-0.08	0.37	0.17	-0.08	0.30	0.37	-0.10	1.63
TFAP2B	0.62	0.07	0.30	0.19	0.28	0.47	-0.08	0.03	-0.04	-0.12	-0.15	0.09	-0.68	-0.09	-0.24	-0.64
THSD7B	0.71	1.09	1.30	0.78	-0.43	0.78	0.39	0.17	0.19	-0.23	-0.76	0.52	-0.76	-1.36	-0.45	-1.95
TMEM178B	0.15	0.14	0.21	0.02	0.13	0.03	0.10	0.10	0.00	-0.13	-0.06	0.05	-0.32	-0.07	-0.16	-0.20
TRAF5	0.40	0.02	0.66	0.13	-0.09	0.22	0.05	0.04	-0.19	-0.06	-0.23	-0.10	-0.18	-0.09	-0.21	-0.38
TRIM67	0.54	0.00	0.33	0.46	0.17	0.22	-0.17	0.04	-0.09	-0.24	-0.25	0.23	-0.61	-0.06	-0.29	-0.30
TTC23L	-0.28	-0.06	-0.54	-0.42	0.00	0.09	-0.20	-0.42	0.03	0.22	-0.14	0.04	0.37	0.43	0.31	0.56
TUNAR	0.73	0.28	0.47	0.49	0.29	0.07	-0.65	-0.05	-0.21	-0.07	-0.44	0.01	-0.24	-0.20	-0.20	-0.27
UBASH3B	0.23	0.41	0.58	0.00	0.37	-0.11	0.12	0.06	0.03	-0.17	-0.02	0.08	-0.38	-0.30	-0.03	-0.88
UNC5D	0.23	0.20	0.36	-0.02	0.20	0.01	0.24	-0.05	-0.14	-0.18	-0.08	0.06	-0.30	-0.32	-0.14	-0.07
ZNF124	-0.59	-0.10	-0.02	-0.16	-0.31	0.00	-0.18	-0.14	-0.11	-0.31	-0.23	0.29	0.54	0.33	0.34	0.64
ZYG11A	-0.68	-0.08	-0.28	-0.47	-0.11	-0.33	-0.28	0.04	0.51	0.36	0.03	0.05	0.23	0.71	-0.04	0.35

[00307] The RNAseq results for the differentially expressed genes (adjusted p <0.01, baseMean > 50) in basket cells across all samples is shown in Table 47.

Table 47. Differentially expressed genes in basket cells across all samples

Gene	Base Mean	Log2 Change	p-value	p-adj	Gene	Base Mean	Log2 Change	p-value	p-adj
RORA	329335.261	-0.013	4.09E-06	1.41E-03	LOC285692	593.698	0.038	1.16E-07	1.03E-04
FRMPD4	61047.625	-0.010	2.01E-05	4.10E-03	ACER3	516.515	0.019	6.18E-07	3.29E-04
UNC5D	46606.506	-0.010	7.14E-05	8.17E-03	TEX9	507.648	0.031	1.42E-06	6.29E-04
ADGRL3	36661.187	-0.011	2.59E-05	4.56E-03	SPARCL1	482.042	0.035	1.28E-11	5.42E-08
CADPS	34807.226	-0.011	3.51E-06	1.29E-03	DNAH6	452.114	0.017	5.40E-05	6.74E-03
BTBD11	33267.028	-0.009	1.09E-05	2.65E-03	CALR	447.022	-0.023	7.00E-06	1.92E-03
CACNA1D	33174.962	-0.007	5.34E-05	6.73E-03	LINC00457	433.253	0.029	2.14E-07	1.58E-04
SHANK2	27271.658	-0.011	5.02E-05	6.47E-03	LINC01158	428.457	0.022	3.53E-05	5.52E-03
MARCH11	25430.282	-0.012	3.05E-07	1.98E-04	GREB1	412.201	0.017	6.99E-07	3.58E-04
ASIC2	24222.474	-0.023	4.63E-09	7.83E-06	CYYR1	391.236	0.020	1.89E-05	3.90E-03
DNER	21146.088	-0.011	2.15E-05	4.19E-03	ST6GALNAC5	391.080	0.049	6.41E-15	5.41E-11
ERC2	21084.069	-0.008	2.76E-05	4.68E-03	DCC	380.998	0.032	2.18E-05	4.19E-03
GALNT18	18181.019	-0.009	3.47E-05	5.52E-03	STK33	380.653	0.021	2.63E-05	4.59E-03
LHFPL3	17505.419	-0.016	4.33E-06	1.46E-03	HCN4	341.112	-0.018	2.45E-05	4.50E-03
CACNB4	17319.515	-0.012	8.89E-09	1.37E-05	TTC23L	341.095	0.018	3.21E-07	2.01E-04
PLXNA4	16464.759	-0.017	6.77E-10	1.43E-06	SCN2B	327.526	-0.018	9.11E-05	9.39E-03
MEGF10	15961.668	-0.008	1.01E-04	9.92E-03	FGF5	318.878	0.031	1.39E-08	1.81E-05
CACNA2D3	15563.645	0.056	2.62E-17	4.43E-13	SLC25A29	309.817	-0.016	2.56E-05	4.55E-03
FAM135B	13722.346	-0.008	1.45E-05	3.30E-03	SLC26A8	298.198	0.018	1.89E-05	3.90E-03
GABBR2	12619.017	-0.008	7.93E-05	8.65E-03	PCP4	295.208	-0.027	1.02E-04	9.92E-03
UBASH3B	11127.363	-0.016	9.47E-06	2.40E-03	ZNF124	293.931	0.017	7.07E-05	8.17E-03
NOS1	9457.029	-0.010	8.23E-05	8.85E-03	C14orf1	284.530	-0.012	3.47E-05	5.52E-03
FHOD3	9184.114	-0.016	9.66E-05	9.83E-03	ATP6V0B	278.929	-0.021	3.70E-05	5.64E-03

EPHB1	9178.939	-0.019	5.50E-05	6.74E-03	AKAP13	271.132	0.021	2.73E-06	1.02E-03
DGKH	8792.452	-0.013	2.15E-07	1.58E-04	LOC105377448	269.320	0.020	8.34E-05	8.86E-03
SLC8A3	8748.612	-0.017	4.19E-07	2.53E-04	ELOVL2	269.171	0.021	3.72E-05	5.64E-03
TMEM178B	8437.776	-0.008	3.51E-05	5.52E-03	GDF11	259.292	-0.016	4.81E-06	1.53E-03
NHS	6608.789	-0.012	6.00E-08	6.34E-05	FKBP5	245.242	0.054	1.41E-05	3.26E-03
ST6GAL2	5752.944	-0.017	2.90E-14	1.63E-10	SLC17A4	240.415	0.028	2.11E-05	4.19E-03
ARHGEF10L	5712.202	-0.010	5.11E-05	6.55E-03	CFAP46	234.408	0.019	7.15E-05	8.17E-03
SLC12A5	5584.536	-0.012	3.85E-05	5.73E-03	SEPSECS-AS1	233.299	0.024	7.38E-05	8.37E-03
RPH3A	5375.584	-0.020	6.48E-06	1.82E-03	SPHK2	199.137	-0.019	4.66E-05	6.47E-03
SLC35F4	5210.716	-0.018	6.43E-06	1.82E-03	SEPSECS	195.301	0.016	8.10E-05	8.77E-03
THSD7B	5096.653	-0.046	2.52E-10	6.08E-07	CA7	193.559	-0.018	4.89E-05	6.47E-03
TFAP2B	4968.006	-0.017	2.71E-06	1.02E-03	MTHFSD	171.780	-0.016	4.28E-05	6.13E-03
PRKCG	4856.433	-0.017	2.93E-05	4.90E-03	C11orf87	161.139	-0.037	7.92E-11	2.68E-07
IQSEC3	4704.333	-0.014	6.89E-05	8.03E-03	PAQR6	159.437	0.026	1.33E-05	3.14E-03
TRIM67	4700.260	-0.015	2.21E-05	4.20E-03	SV2C	156.283	0.027	8.76E-05	9.16E-03
SHANK1	4236.325	-0.018	3.74E-05	5.64E-03	PEBP4	155.122	0.037	3.22E-09	6.05E-06
NTNG1	4180.841	-0.018	2.64E-07	1.86E-04	NPY6R	138.962	0.015	1.10E-05	2.65E-03
ADD2	3972.399	-0.009	2.77E-05	4.68E-03	DBH	136.969	-0.018	4.02E-05	5.86E-03
C4orf22	3964.435	0.029	5.07E-08	5.71E-05	GBAP1	130.842	-0.023	4.59E-05	6.47E-03
CADM3	3945.047	-0.013	6.41E-05	7.68E-03	PARM1	123.887	-0.034	3.47E-05	5.52E-03
KIF26B	3802.618	-0.015	2.98E-05	4.94E-03	NXNL2	117.958	-0.036	4.78E-05	6.47E-03
ADAMTS2	3668.272	-0.021	7.10E-08	7.06E-05	ALOX5	112.642	0.026	7.49E-06	1.99E-03
DISP3	2826.472	-0.014	1.94E-06	7.94E-04	RNF215	111.104	-0.022	4.52E-05	6.41E-03
ASIC1	2581.734	-0.022	1.45E-10	4.08E-07	SPON2	109.953	0.023	3.03E-05	4.98E-03
CLSTN3	2169.950	-0.016	1.74E-05	3.77E-03	FBXL21	109.841	-0.031	3.59E-05	5.57E-03
DLG4	2165.740	-0.016	8.27E-05	8.85E-03	LACTB2-AS1	100.333	0.021	2.75E-05	4.68E-03
DLG1	1987.619	0.018	4.83E-05	6.47E-03	DDO	100.015	0.026	1.97E-06	7.94E-04
GAP43	1873.289	-0.018	1.00E-08	1.41E-05	CPNE8	95.089	0.026	3.96E-05	5.82E-03
GPR161	1857.336	-0.012	2.18E-05	4.19E-03	GPR63	93.412	-0.026	1.01E-04	9.92E-03
ECHDC2	1823.789	0.014	9.51E-06	2.40E-03	HECTD2-AS1	90.251	0.021	8.61E-05	9.10E-03
PHACTR2-AS1	1789.213	-0.012	7.64E-05	8.49E-03	DMGDH	86.861	0.031	5.27E-05	6.70E-03
E2F3	1603.013	-0.011	2.54E-05	4.55E-03	ACSS3	82.085	0.040	7.61E-05	8.49E-03
MYRIP	1564.146	0.018	6.76E-05	7.94E-03	PHKA1	80.159	0.028	5.79E-05	7.04E-03
RPS6KA5	1280.007	0.017	4.92E-05	6.47E-03	ARHGEF6	77.670	0.031	3.69E-06	1.32E-03
ADAMTS9	1075.470	-0.028	1.96E-06	7.94E-04	CNTN3	73.987	0.029	5.68E-07	3.20E-04
RGMB	1072.126	-0.021	1.53E-07	1.23E-04	BMP3	64.437	0.033	3.75E-06	1.32E-03
TUNAR	929.869	-0.017	4.71E-05	6.47E-03	LINC00499	64.160	0.044	2.86E-07	1.93E-04
PLPPR4	910.096	-0.026	7.63E-05	8.49E-03	CDK15	63.210	0.043	4.68E-05	6.47E-03
LOC653602	876.620	-0.021	1.34E-05	3.14E-03	FAM46C	61.914	0.038	4.67E-06	1.52E-03
KRT222	871.255	-0.016	1.72E-05	3.77E-03	MARC2	60.031	0.021	4.40E-06	1.46E-03
LPCAT4	754.741	-0.017	5.12E-06	1.57E-03	ZYG11A	58.807	0.026	1.49E-05	3.35E-03
MASP1	722.999	-0.021	9.89E-06	2.46E-03	STAT5A	58.388	0.053	4.61E-07	2.68E-04
TRAF5	666.436	-0.014	1.51E-05	3.35E-03	KCNA4	56.857	0.028	6.05E-05	7.30E-03
ADAMTSL3	659.193	0.020	6.24E-07	3.29E-04	C9orf135	53.429	0.032	9.81E-05	9.90E-03
NPL	636.916	0.019	1.27E-07	1.08E-04	RNF212	51.986	0.022	6.47E-05	7.71E-03
ENPP1	631.265	0.026	2.45E-06	9.62E-04	SYT17	51.828	0.037	5.49E-05	6.74E-03
ALS2CR11	608.480	0.019	3.87E-05	5.73E-03					

[00308] The RNAseq results for the 31 genes in glia having significantly altered expression with age are shown in Table 48. The log2 fold change for the sorted nuclei from glia (astrocytes and oligodendrocytes) from each human sample compared to the normalized expression data from sorted glia from all samples are shown in Table 48. Negative values indicate reduced

expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 48. Log2 fold change of expression of genes in glia

Subject	xk	tm	wi	pk	vm	wl	sg	or	lt	zh	ko	kq	ke	ai
Gene	Log2 fold change in expression													
ADAMTS7	1.20	-0.13	0.48	0.44	0.02	-0.19	0.28	0.17	-0.07	0.00	-0.32	-0.89	-0.52	-0.48
ANKRD33B	-0.95	-0.39	-0.16	-0.07	-0.32	-0.16	-0.57	-0.15	-0.25	0.24	1.25	0.52	0.32	0.69
AOX1	-0.65	-0.62	-0.45	-0.12	-0.01	-0.20	-0.14	0.69	0.21	-0.12	0.65	0.79	0.03	-0.06
C1orf95	0.16	0.83	0.67	0.96	0.01	-0.23	0.51	0.02	-0.08	-0.13	-0.56	-0.99	-0.14	-1.02
CACNG4	0.52	0.27	0.28	0.66	-0.11	0.12	0.32	0.12	-0.08	0.02	-0.67	-0.29	-0.27	-0.89
CACNG8	0.96	0.78	0.27	0.94	0.71	-0.19	0.35	0.09	-0.78	-0.46	-0.74	-0.78	-0.73	-0.43
CAPN9	-0.52	-0.18	-0.24	-0.38	-0.36	-0.12	-0.23	0.08	-0.03	0.14	0.21	0.96	0.03	0.64
CRTAC1	0.46	0.47	0.33	0.36	-0.32	0.27	0.09	0.15	-0.14	-0.09	-0.51	-0.65	-0.01	-0.41
DACH1	0.45	0.90	0.96	0.93	0.55	0.36	-0.13	-1.16	-0.29	-0.55	-1.04	-0.28	-0.57	-0.14
EFHD2	0.88	0.44	0.35	0.13	-0.09	-0.09	0.39	-0.04	-0.10	0.05	-0.23	-0.73	-0.13	-0.81
EGF	-0.98	-0.28	-0.42	0.13	-0.30	-0.24	-0.36	-0.01	0.11	-0.12	0.72	0.59	0.18	0.98
ETS1	0.60	0.45	0.12	0.37	0.08	0.17	0.11	-0.23	-0.12	0.24	-0.31	-0.92	-0.19	-0.36
FRAS1	1.29	1.66	0.31	0.05	0.03	0.37	-0.47	-0.54	-0.79	-0.47	-0.70	-0.64	-0.17	0.07
IMPA2	0.63	0.54	0.17	0.01	0.44	0.32	-0.60	-0.07	-0.17	0.13	-0.56	-0.23	-0.45	-0.15
LINC00499	-0.96	-1.27	-0.35	-0.56	-0.55	-1.12	1.50	-0.17	-0.98	-0.63	2.26	-0.20	-0.14	3.16
LINC00844	-0.41	-0.35	-0.36	-0.22	-0.14	-0.14	-0.20	0.11	0.01	-0.42	0.62	0.77	-0.03	0.76
LINC01208	-1.15	-0.50	-0.23	-0.82	0.32	-0.43	-0.44	-0.19	0.19	0.28	0.53	1.15	0.15	1.12
LOC101927078	0.88	0.61	0.28	0.41	0.45	0.85	0.04	-0.04	-0.35	0.34	-1.73	-0.80	-0.67	-0.28
LOC102724360	0.98	0.93	0.31	0.88	0.01	-0.22	0.60	-0.69	-0.59	-0.13	-0.57	-0.67	-0.06	-0.78
PKDCC	0.85	0.69	0.91	0.11	-0.46	0.43	-0.14	-0.02	-0.43	0.68	-0.69	-0.71	-0.55	-0.67
PLXNA4	0.37	0.52	0.51	0.55	-0.31	-0.08	0.31	-0.12	-0.01	0.07	-0.40	-0.69	-0.20	-0.52
PRR5	0.83	0.82	0.56	0.03	-0.20	0.28	0.18	-0.31	-0.40	0.09	-0.86	-0.37	-0.12	-0.55
RHCG	0.57	0.44	0.14	0.68	-0.39	0.40	0.05	0.24	0.33	-0.43	-0.40	-0.45	-0.55	-0.62
ROBO2	2.13	2.13	0.86	1.11	0.55	1.02	-0.56	-1.59	-0.08	-0.89	-0.62	-1.77	-1.38	-0.89
SEMA5B	0.62	0.56	0.63	0.74	-0.56	0.28	0.58	-0.07	-0.11	-0.10	-0.72	-0.95	-0.18	-0.72
SHROOM2	0.57	0.65	0.22	0.38	-0.36	0.05	0.15	-0.03	-0.06	0.13	-0.85	-0.43	-0.22	-0.22
SLIT2	-0.89	-0.81	-0.86	-0.25	0.17	0.00	0.03	0.28	0.79	0.27	-0.31	0.48	1.07	0.04
TRDN	-1.52	-0.76	-0.92	0.09	0.19	-0.51	-0.22	-0.20	-0.42	0.46	-0.05	2.22	-0.55	2.19
TXNIP	-0.91	-0.21	-0.26	-0.13	-0.29	-0.30	-0.25	-0.30	-0.08	-0.19	-0.33	1.56	0.44	1.24
VWA5A	-0.46	-0.57	-0.19	-0.03	-0.11	-0.21	-0.15	-0.08	0.04	-0.28	1.15	0.13	-0.12	0.90
WNT7B	0.36	0.73	0.51	0.65	0.21	-0.25	0.21	-0.08	-0.14	0.03	-0.92	-0.70	-0.10	-0.50

[00309] RNAseq results for the differentially expressed genes (adjusted p <0.01, baseMean > 50) in glia cells across all samples is shown in Table 49.

Table 49. Differentially expressed genes in glia across all samples

Gene	baseMean	Log2 Fold Change	p-value	p-adj	Gene	baseMean	Log2 Fold Change	p-value	p-adj
LINC00499	1007.858	0.081	2.49E-06	2.89E-03	CACNG4	2522.614	-0.024	7.83E-06	6.03E-03
TRDN	681.94	0.063	8.98E-06	6.03E-03	RHCG	305.832	-0.027	8.29E-06	6.03E-03
ANKRD33B	60.594	0.043	1.03E-06	1.79E-03	IMPA2	61.909	-0.028	4.84E-06	4.68E-03
EGF	58.431	0.04	4.16E-07	1.03E-03	WNT7B	266.308	-0.029	1.61E-06	2.15E-03
LINC01208	2713.563	0.038	1.63E-07	5.65E-04	ADAMTS7	304.863	-0.03	5.79E-06	5.04E-03
TXNIP	514.271	0.036	1.73E-05	9.40E-03	EFHD2	64.367	-0.031	8.49E-06	6.03E-03
SLIT2	1055.584	0.033	1.56E-05	8.74E-03	SEMA5B	561.896	-0.032	9.46E-06	6.09E-03
VWA5A	192.057	0.029	1.87E-05	9.40E-03	PRR5	144.719	-0.032	9.78E-08	4.25E-04
LINC00844	119.148	0.028	4.41E-06	4.51E-03	C1orf95	477.416	-0.034	1.01E-05	6.29E-03
AOX1	321.131	0.027	1.80E-05	9.40E-03	DACH1	751.135	-0.036	1.12E-05	6.72E-03
CAPN9	196.571	0.025	9.02E-06	6.03E-03	LOC101927078	692.246	-0.039	2.03E-06	2.52E-03

CRTAC1	533.293	-0.021	1.49E-05	8.62E-03	FRAS1	335.281	-0.039	5.39E-06	4.93E-03
PLXNA4	1899.075	-0.022	1.95E-05	9.40E-03	CACNG8	504.043	-0.041	3.68E-09	3.20E-05
ETS1	688.087	-0.022	1.55E-06	2.15E-03	LOC102724360	92.952	-0.041	3.44E-06	3.74E-03
SHROOM2	294.202	-0.023	1.91E-05	9.40E-03	PKDCC	81.676	-0.042	8.67E-07	1.67E-03
					ROBO2	1689.394	-0.079	5.11E-17	8.88E-13

[00310] Results showed less variation in expression due to age compared to genes having differential expression due to the other clinical attibutes analyzed herein. Previous studies of aging in the cerebellum had found fewer genes to have differntial expression suggesting that profiling gene expression in the nuclei of specific cell types provides much more sensitivity compared to using bulk tissue.

Example 21. Overlapping changes in differential expression due to age

[00311] The differentially expressed genes (adjusted p <0.01, baseMean > 50) were about equally split between those that increase in expression and those that decrease in expression with age as shown in Table 50. Table 50 shows the number of genes that are in common between eight groups of differentially expressed aging genes.

Table 50. Number of genes with overlapping changes in expression

	All up	Granule up	Basket up	Glia up	All down	Granule down	Basket down	Glia down
All up	12	2	2	2	0	0	0	0
Granule up	2	103	7	1	0	0	0	0
Basket up	2	7	60	1	0	0	0	0
Glia up	2	1	1	1	0	0	0	0
All down	0	0	0	0	30	7	3	0
Granule down	0	0	0	0	7	171	8	2
Basket down	0	0	0	0	3	8	79	1
Glia down	0	0	0	0	0	2	1	20

[00312] No overlaps were found between age up-regulated genes from any cell type and down-regulated genes from any other cell type.

[00313] Expression of only a few genes significantly change with age in more than one cell type. For example, the 42 genes that are identified as differentially expressed with age across all cell types appear heterogeneous across conditions, and most of these do not reach significance when tested in each cell type individually (Table 51).

Table 51. Genes with differential expression across all samples

Gene	baseMean	log2 Fold Change	p-value	p-adj
LINC00499	340.71	0.07	3.61E-11	6.82E-07
TRDN	216.05	0.06	6.35E-07	1.20E-03
CACNA2D3	7555.87	0.04	3.19E-06	3.37E-03
PRSS55	115.56	0.03	6.23E-06	4.90E-03
LOC101927592	70.01	0.02	1.63E-05	6.98E-03
ZNF404	138.97	0.02	1.61E-05	6.98E-03
LOC100506990	1233.04	0.01	1.76E-06	2.37E-03

MTRF1	184.51	0.01	2.65E-05	9.46E-03
ZNF585A	648.16	0.01	9.81E-07	1.62E-03
ZNF607	335.61	0.01	1.98E-06	2.49E-03
ZNF84	1094.03	0.01	7.63E-06	5.39E-03
ZSCAN29	197.53	0.01	1.33E-06	1.94E-03
ATF6B	389.47	-0.01	7.71E-06	5.39E-03
CUL7	224.23	-0.01	2.21E-05	8.53E-03
GPR107	1554.09	-0.01	2.30E-05	8.70E-03
KLHL22	1099.58	-0.01	2.07E-05	8.17E-03
PPP6R2	1793.04	-0.01	1.31E-05	6.17E-03
SPHK2	205.56	-0.01	1.19E-05	6.15E-03
ST3GAL2	646.6	-0.01	1.94E-05	8.14E-03
TAOK2	509.4	-0.01	3.50E-06	3.48E-03
ZNF496	628.69	-0.01	1.20E-05	6.15E-03
ZNF580	79.81	-0.01	2.52E-05	9.32E-03
ABCC10	189.96	-0.02	9.81E-06	5.65E-03
ACAP3	331.85	-0.02	3.03E-07	8.19E-04
ACHE	78.69	-0.02	1.31E-05	6.17E-03
ATP6V0B	219.38	-0.02	5.91E-06	4.90E-03
DNAJB5	393.29	-0.02	1.03E-06	1.62E-03
FZR1	202.22	-0.02	2.57E-05	9.32E-03
GBAP1	129.18	-0.02	8.64E-06	5.65E-03
GRK5	940.31	-0.02	1.48E-05	6.66E-03
KCTD21-AS1	57.46	-0.02	1.23E-05	6.15E-03
LOC100132077	54.79	-0.02	9.56E-06	5.65E-03
MIR9-3HG	1566.54	-0.02	5.20E-06	4.90E-03
MPND	61.58	-0.02	6.20E-06	4.90E-03
POLR2J3	137.56	-0.02	2.08E-05	8.17E-03
SNAI3-AS1	97.33	-0.02	8.86E-06	5.65E-03
ZFPM1	386.55	-0.02	1.39E-05	6.38E-03
PTMS	230.79	-0.03	9.87E-06	5.65E-03
WASH7P	52.51	-0.03	2.02E-07	6.37E-04
RNF17	117.06	-0.05	9.14E-08	3.45E-04
LINGO2	7101.71	-0.07	1.14E-05	6.15E-03
EGR1	470.89	-0.08	9.80E-06	5.65E-03

[00314] The RNAseq results in granule cells for the 42 genes having differential expression with age across the three cell types are shown in Table 52. The log2 fold change of expression for the sorted nuclei from glia from each human sample compared to normalized expresssion from sorted nuclei from granule cells in all samples are shown in Table 52. Negative values indicate reduced expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 52. Log2 fold change of expression in granule cells

	Log2 fold change of expression															
Subject	xk	tm	wo	wc	wi	pk	vm	wl	sg	or	lt	zh	ko	kq	ke	ai
Gene																
ABCC10	0.28	0.42	0.56	0.42	0.08	-0.42	0.09	0.16	-0.08	0.33	-0.54	-0.10	-0.13	-0.11	-0.27	-0.55
ACAP3	0.34	0.76	1.34	1.05	0.61	0.06	-0.04	0.06	0.10	0.52	-0.46	-0.08	-0.12	-0.14	-0.10	-0.27
ACHE	0.20	0.69	1.15	0.59	0.28	-0.07	0.03	-0.21	0.11	0.29	-0.22	0.10	-0.04	-0.67	-0.27	-0.54
ATF6B	-0.06	0.18	0.90	0.54	-0.03	-0.43	-0.25	-0.28	-0.18	0.10	-0.41	-0.43	-0.08	-0.15	-0.22	-0.79
ATP6V0B	0.32	-0.51	0.28	0.20	0.10	-0.33	-0.31	-0.23	-0.30	-0.10	-0.16	-0.29	-0.38	-1.07	-0.44	-0.85
CACNA2D3	-1.28	-1.71	-2.06	-1.52	-1.65	-0.66	-1.31	-1.39	-0.33	-1.09	-1.27	-0.99	-0.90	-0.46	-1.33	-0.38

CUL7	0.35	0.56	0.71	0.45	0.20	0.09	0.08	0.27	0.24	0.30	-0.27	-0.36	0.06	0.06	0.06	-0.44
DNAJB5	0.28	0.87	0.54	0.14	0.43	-0.24	1.05	0.08	0.08	-0.16	-0.31	0.63	-0.28	0.07	-0.14	-0.33
EGR1	0.47	0.56	1.28	-0.02	5.30	-0.36	6.92	0.85	1.00	0.72	0.85	4.75	-0.85	0.31	0.33	-0.65
FZR1	-0.02	0.83	0.93	0.62	0.52	-0.42	-0.02	-0.20	0.00	0.33	-0.10	0.18	0.04	-0.11	-0.07	-0.66
GBAP1	-0.01	0.71	-0.04	-0.18	-0.07	-0.59	-0.86	-0.10	-0.30	-0.10	-0.50	-0.19	-1.06	-0.46	0.20	-0.40
GPR107	0.01	0.32	0.29	0.05	-0.04	0.15	0.03	0.06	0.03	0.10	0.02	0.03	0.04	-0.10	-0.02	-0.45
GRK5	1.10	0.66	1.19	1.13	0.41	0.72	0.61	0.24	0.08	0.16	0.50	0.64	-0.28	-0.38	0.35	-0.66
KCTD21-AS1	0.02	0.69	0.08	0.14	-0.61	-0.04	-0.40	-0.02	-0.01	-0.58	-0.33	-1.31	-0.11	-1.44	-0.27	-0.66
KLHL22	0.25	0.46	0.62	0.55	0.06	0.06	-0.31	0.04	0.05	0.17	0.04	-0.17	-0.30	0.12	0.05	-0.21
LINC00499	-0.17	-0.40	-1.13	-1.05	-0.76	-0.14	0.13	-0.20	-0.10	-0.09	-0.38	-0.09	0.44	0.45	-0.03	0.33
LINGO2	0.51	4.67	3.73	-0.63	0.51	1.24	4.72	5.21	4.23	3.85	0.91	0.87	-1.68	-0.69	-0.85	0.15
LOC100132077	0.20	0.10	0.89	0.97	-0.39	-0.50	-0.27	-0.58	-0.60	0.70	-0.24	0.09	-0.21	-0.31	-0.53	-0.54
LOC100506990	0.03	-0.21	-0.52	-0.10	-0.24	0.16	0.24	0.01	-0.01	-0.02	0.24	0.29	0.30	0.69	0.25	0.11
LOC101927592	-0.07	-0.77	-0.58	-0.68	-0.70	-0.21	0.40	-0.32	-0.63	-0.69	-0.24	-0.50	0.53	0.43	-0.50	0.49
MIR9-3HG	0.03	0.14	0.64	0.53	-0.34	-0.14	-0.27	-0.10	-0.08	-0.05	-0.07	-0.36	-0.10	-0.30	-0.24	-0.91
MPND	0.26	1.16	0.94	0.49	0.32	-0.51	0.02	0.34	-0.06	0.37	0.10	-0.02	0.34	-0.05	-0.03	-0.16
MTRF1	-0.27	-0.46	-0.56	-0.31	-0.31	-0.03	-0.03	-0.15	-0.16	-0.21	0.09	-0.06	-0.16	0.13	-0.09	0.33
POLR2J3	-0.13	0.72	0.13	-0.23	0.38	-0.58	-0.31	0.16	0.10	0.57	-0.60	-0.39	-0.60	-1.02	-0.04	-1.08
PPP6R2	0.07	0.13	0.55	0.39	-0.06	-0.14	-0.21	-0.19	-0.11	0.05	-0.03	-0.09	-0.02	-0.23	-0.09	-0.54
PRSS55	-0.55	-1.22	-0.96	-0.45	-0.63	-0.61	0.24	1.63	-0.41	0.26	1.57	-0.24	0.09	1.64	-0.84	1.64
PTMS	0.60	1.02	1.96	1.13	0.63	0.22	0.04	-0.13	0.06	0.37	-0.30	-0.08	0.65	0.34	-0.39	-0.74
RNF17	2.14	0.47	3.32	-0.44	-0.73	-0.43	-0.15	0.49	-0.52	-0.60	1.91	-0.09	-0.94	-0.05	-0.61	0.09
SNAI3-AS1	0.17	0.54	0.66	0.71	0.66	0.34	-0.07	0.47	0.40	0.49	0.39	0.02	-0.09	-0.09	0.26	-0.65
SPHK2	-0.04	-0.14	0.75	0.61	-0.02	-0.29	-0.35	-0.22	-0.15	0.04	-0.09	-0.29	0.00	0.15	-0.21	-0.42
ST3GAL2	0.57	0.72	1.00	0.73	0.46	0.28	-0.10	0.25	0.29	0.52	0.13	0.02	0.20	-0.09	0.13	-0.44
TAOK2	0.14	0.29	0.55	0.33	-0.02	-0.20	-0.32	-0.05	-0.01	0.08	-0.21	-0.29	-0.07	-0.33	0.03	-0.88
TRDN	-1.43	-1.20	-0.98	-0.66	-1.08	-1.25	-0.98	-1.39	-1.29	-1.17	-0.95	-0.66	-0.88	-0.92	-1.29	-0.35
WASH7P	-0.21	0.86	1.05	0.63	-0.01	0.16	-0.05	-1.02	0.22	-0.09	-1.17	-0.68	-0.07	-0.42	-0.41	-1.51
ZFPM1	0.02	0.33	1.32	0.48	0.32	0.64	0.09	-0.09	0.20	0.07	0.09	-0.03	0.42	-0.03	0.22	-0.19
ZNF404	-0.57	-0.08	-0.86	-0.82	-0.37	0.27	0.29	0.25	0.02	-0.46	-0.20	-0.07	-0.03	1.02	0.10	0.71
ZNF496	0.17	0.24	0.04	0.17	0.09	0.09	0.00	0.01	0.09	0.27	-0.12	0.15	-0.24	0.11	-0.08	-0.50
ZNF580	0.07	0.30	0.89	0.70	0.18	-0.03	-0.64	-0.31	0.02	-0.18	-0.47	-0.29	-0.05	-0.42	-0.27	-0.12
ZNF585A	-0.17	-0.34	-0.07	-0.27	-0.17	0.37	0.17	0.00	0.21	-0.13	0.08	0.05	0.20	0.07	0.08	0.70
ZNF607	-0.16	-0.18	-0.07	-0.18	-0.18	0.15	0.16	-0.12	0.12	0.05	0.21	0.02	0.28	-0.07	0.11	0.24
ZNF84	-0.18	-0.31	-0.34	-0.28	-0.14	0.23	-0.02	0.07	0.05	-0.14	0.19	0.09	0.06	0.18	0.01	0.21
ZSCAN29	-0.04	-0.19	-0.42	-0.52	-0.14	-0.06	-0.10	0.15	0.15	0.00	0.07	-0.39	-0.11	0.27	-0.04	0.54

[00315] The RNAseq results in basket cells for the 42 most differentially expressed genes due to age are shown in Table 53. The log2 fold change between the RNAseq results for the sorted nuclei from basket cells from each human sample compared to normalized expresssion from unsorted nuclei from all samples are shown in Table 53. Negative values indicate reduced expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 53. Log2 fold change of expression in basket cells

	Log2 fold change of expression															
Subject	xk	tm	wo	wc	wi	pk	vm	wl	sg	or	lt	zh	ko	kq	ke	ai
Gene																
ACER3	-0.43	-0.46	-0.43	-0.01	-0.35	0.08	-0.27	-0.12	0.22	0.30	-0.12	0.05	0.00	0.33	0.75	0.46
ACSS3	-0.24	0.12	-0.47	-0.34	-0.80	-0.31	-0.33	-0.53	-0.93	0.03	-0.47	-0.10	0.35	1.28	0.87	1.90
ADAMTS2	0.55	0.00	0.36	0.67	0.22	0.20	0.00	0.12	0.00	0.30	-0.43	-0.04	-0.59	-0.28	-0.33	-0.76
ADAMTS9	0.78	0.64	0.17	0.64	-0.11	0.60	0.22	0.16	0.12	0.07	-0.03	-0.12	-1.01	-1.42	0.09	-0.80
ADAMTSL3	-0.57	0.05	-0.51	-0.54	-0.19	-0.21	0.06	-0.12	-0.04	0.40	-0.18	-0.08	0.76	0.27	0.37	0.53

ADD2	0.20	0.09	0.34	0.10	0.23	0.00	-0.10	0.00	0.01	-0.05	-0.02	0.10	-0.25	-0.11	-0.23	-0.30
ADGRL3	0.27	0.08	0.31	-0.05	0.20	0.28	0.29	0.08	-0.07	-0.08	-0.08	-0.25	-0.31	-0.38	-0.11	-0.20
AKAP13	-0.41	-0.06	-0.31	-0.12	-0.70	-0.14	-0.31	-0.12	-0.27	0.00	0.01	0.12	0.21	0.69	0.64	0.76
ALOX5	-0.35	-0.28	-0.95	-0.19	-0.23	-0.04	0.14	-0.12	-0.14	-0.18	-0.16	0.35	0.62	0.33	1.04	0.17
ALS2CR11	-0.40	-0.49	-0.26	-0.29	-0.49	0.06	0.36	-0.36	0.11	-0.08	0.61	-0.22	0.21	0.06	0.48	0.70
ARHGEF10L	0.18	0.06	0.31	0.23	0.17	0.06	-0.09	0.02	0.01	0.03	-0.10	0.12	-0.21	-0.29	-0.04	-0.45
ARHGEF6	-0.28	-0.11	-0.66	-0.30	-0.51	-0.09	-0.08	-0.28	-0.69	-0.05	-0.08	0.44	0.19	0.74	0.81	0.97
ASIC1	0.39	0.29	0.60	0.24	0.48	0.19	-0.03	0.16	0.02	-0.06	-0.15	-0.05	-0.70	-0.18	-0.37	-0.83
ASIC2	0.39	0.56	0.32	0.21	0.19	0.59	0.13	0.01	-0.02	0.12	-0.12	0.03	-0.89	-0.39	-0.29	-0.84
ATP6V0B	0.34	-0.08	0.70	0.09	0.41	0.00	-0.06	0.55	0.23	0.06	0.06	-0.22	-0.15	-0.79	-0.45	-0.68
BMP3	-0.38	-0.69	-0.78	-0.34	-0.16	-0.29	-0.13	0.33	0.77	0.06	-0.23	0.36	0.12	0.22	0.25	0.89
BTBD11	0.11	0.17	0.36	0.21	0.03	0.17	-0.01	-0.07	-0.12	0.02	-0.02	0.04	-0.31	-0.22	-0.27	-0.09
C11orf87	0.75	0.85	0.97	0.16	0.26	0.56	-0.31	-0.31	-0.13	0.00	0.20	-0.15	-0.45	-0.44	-0.95	-1.00
C14orf1	0.26	0.20	0.36	0.09	-0.01	0.20	-0.05	0.02	0.24	0.09	-0.08	-0.17	-0.13	-0.28	-0.33	-0.41
C4orf22	-0.79	-0.66	-0.96	-0.62	0.24	-0.30	0.02	0.39	0.44	0.24	0.02	0.20	0.20	0.13	0.15	1.29
C9orf135	-0.30	-0.39	-0.60	-0.50	0.03	0.25	-0.42	0.12	0.12	0.41	-0.63	-0.05	0.88	0.47	-0.36	0.96
CA7	0.62	0.30	0.54	0.23	0.06	-0.11	-0.16	0.39	-0.09	-0.21	-0.51	-0.01	0.02	0.01	-0.51	-0.57
CACNA1D	0.16	0.00	0.17	0.16	0.04	0.03	0.10	0.06	0.07	-0.07	-0.04	-0.05	-0.05	-0.23	-0.19	-0.18
CACNA2D3	-1.43	-0.73	-0.79	-1.41	-0.15	-1.36	0.04	-0.11	0.52	0.12	0.10	0.18	1.41	1.61	0.24	1.74
CACNB4	0.26	0.17	0.47	0.16	0.14	0.06	-0.06	0.03	-0.06	-0.14	-0.16	0.08	-0.21	-0.29	-0.21	-0.25
CADM3	0.44	0.22	0.15	0.03	0.21	0.10	0.00	0.11	0.25	-0.03	-0.04	-0.04	-0.59	-0.08	-0.19	-0.56
CADPS	0.28	0.12	0.13	0.10	0.08	0.28	0.18	0.06	-0.09	0.09	-0.01	-0.07	-0.45	-0.24	-0.15	-0.33
CALR	0.29	0.24	0.70	0.23	0.66	0.02	-0.06	0.28	-0.04	-0.30	0.42	-0.05	-0.46	-0.89	-0.13	-0.90
CDK15	-0.62	0.13	-0.61	-0.77	-0.61	-0.19	0.21	-0.18	-0.61	0.09	-0.69	0.54	0.03	1.76	0.31	1.21
CFAP46	-0.57	-0.57	-0.39	-0.07	-0.21	0.25	-0.09	-0.25	0.51	0.22	-0.28	0.36	0.04	0.50	-0.08	0.64
CLSTN3	0.09	0.01	0.72	0.30	0.51	-0.09	-0.11	0.11	0.04	-0.25	-0.07	0.09	-0.26	-0.32	-0.35	-0.43
CNTN3	-0.42	-0.40	-0.17	-0.32	-0.67	-0.28	-0.43	-0.08	0.52	0.28	0.31	-0.13	0.37	0.61	0.02	0.80
CPNE8	-0.26	-0.38	-0.05	-0.03	-0.68	-0.14	-0.31	-0.45	-0.37	0.05	-0.07	0.01	0.25	0.63	0.98	0.82
CYYR1	-0.44	-0.20	-0.64	-0.33	-0.31	0.30	-0.02	-0.16	0.35	-0.02	-0.08	0.05	0.45	0.71	-0.28	0.61
DBH	0.09	0.49	0.22	0.37	0.23	0.17	-0.35	0.31	0.08	-0.06	-0.21	0.20	-0.42	-0.16	-0.25	-0.72
DCC	-0.55	0.29	-0.46	-0.76	-1.12	-0.48	-0.64	-0.28	0.69	0.11	-0.73	0.28	0.44	0.87	1.11	1.22
DDO	-0.09	-0.46	-0.78	-0.84	-0.23	0.20	-0.08	-0.17	0.39	0.04	0.32	0.20	0.19	0.67	0.46	0.21
DGKH	0.31	0.08	0.34	0.12	0.06	0.37	0.11	0.12	-0.12	-0.12	-0.12	0.01	-0.18	-0.47	-0.27	-0.25
DISP3	0.25	0.15	0.41	0.28	0.10	0.17	0.00	0.16	0.14	-0.06	-0.17	-0.18	-0.55	-0.03	-0.47	-0.23
DLG1	-0.46	0.04	-0.59	-0.34	-0.13	-0.01	-0.16	-0.09	0.00	0.15	-0.04	0.08	0.19	-0.25	1.02	0.60
DLG4	-0.06	0.28	0.73	0.60	0.17	0.05	-0.06	-0.15	-0.02	-0.06	-0.22	0.00	-0.14	-0.25	0.00	-0.86
DMGDH	-0.36	-0.01	-0.90	-0.69	-0.44	0.06	0.27	0.11	-0.67	-0.07	-0.27	0.10	0.92	0.78	0.22	0.93
DNAH6	-0.51	-0.38	-0.16	-0.32	0.05	0.09	-0.04	-0.33	0.22	-0.11	0.19	0.25	0.18	0.19	-0.21	0.87
DNER	0.22	-0.01	0.44	0.03	0.22	0.14	0.05	0.08	-0.05	-0.04	-0.05	0.11	-0.29	-0.38	-0.31	-0.16
E2F3	0.32	0.12	0.23	0.10	0.22	0.03	0.05	0.17	0.03	-0.20	-0.19	0.20	-0.13	-0.48	-0.22	-0.25
ECHDC2	-0.16	-0.03	-0.50	-0.15	-0.14	-0.47	-0.11	-0.20	-0.06	0.14	-0.01	0.16	0.54	0.43	0.35	0.22
ELOVL2	-0.20	0.11	-1.06	-0.54	-0.26	0.11	-0.06	-0.18	-0.06	0.22	-0.27	-0.03	0.55	0.64	0.57	0.47
ENPP1	-0.71	-0.23	-0.30	-0.81	-0.10	-0.82	0.20	0.23	0.17	-0.09	0.39	-0.05	0.86	0.31	-0.03	0.98
EPHB1	0.17	0.28	0.40	0.17	0.58	-0.26	0.10	0.39	0.24	0.08	0.23	0.07	-0.62	-0.50	-0.32	-1.04
ERC2	0.19	0.02	0.29	0.17	0.09	0.10	0.04	0.02	-0.17	-0.11	-0.07	0.10	-0.22	-0.12	-0.19	-0.13
FAM135B	0.22	0.01	0.18	0.18	0.27	0.04	-0.01	0.02	-0.04	-0.09	-0.11	0.08	-0.15	-0.17	-0.22	-0.22
FAM46C	-0.77	-0.50	-0.39	-0.49	0.06	-0.44	0.15	-0.22	0.69	-0.03	0.02	0.27	0.99	0.37	-0.73	1.02
FBXL21	1.32	0.31	0.00	0.44	-0.31	0.69	-0.13	-0.20	0.60	-0.04	-0.21	-0.33	-0.54	-0.80	-0.30	-0.50
FGF5	-0.86	-0.35	-1.15	-0.64	0.40	-0.44	-0.16	0.02	0.31	0.32	0.29	0.21	0.62	0.37	0.03	1.01
FHOD3	0.15	0.61	0.29	0.23	0.09	0.19	-0.13	-0.08	0.10	0.47	-0.23	0.24	-0.56	-0.59	-0.30	-0.50
FKBP5	-1.16	0.08	-0.21	-1.12	-1.00	-1.09	-0.16	-0.85	-0.11	-0.04	-0.18	-0.09	2.01	1.39	0.19	2.35
FRMPD4	0.25	0.19	0.14	-0.01	0.21	0.21	0.15	0.09	-0.04	-0.12	-0.05	-0.13	-0.44	-0.07	-0.19	-0.19
GABBR2	0.14	0.17	0.18	0.04	0.18	0.07	0.01	0.07	0.05	-0.12	-0.10	0.07	-0.32	-0.02	-0.17	-0.25
GALNT18	0.23	0.15	0.18	0.17	0.07	0.20	-0.05	0.01	-0.05	-0.03	-0.16	0.02	-0.34	0.02	-0.16	-0.25
GAP43	0.28	0.40	0.40	-0.05	0.40	0.17	0.21	0.06	-0.04	-0.02	0.02	0.10	-0.46	-0.56	-0.30	-0.61
GBAP1	-0.03	0.73	0.81	0.59	-0.02	-0.17	-0.25	0.21	-0.32	0.27	-0.33	0.05	-0.76	-0.34	-0.07	-0.37
GDF11	0.32	0.27	0.33	0.16	0.17	0.16	0.03	-0.06	0.31	0.06	-0.08	-0.05	-0.47	-0.16	-0.56	-0.43
GPR161	0.33	0.11	0.39	0.35	-0.25	0.06	0.02	0.13	-0.22	0.01	-0.01	0.18	-0.17	-0.40	-0.22	-0.33
GPR63	0.76	0.30	0.27	0.62	-0.02	-0.21	0.39	0.47	-0.89	-0.08	-0.05	0.19	-0.33	-0.89	-0.43	-0.11

GREB1	-0.14	-0.21	-0.55	-0.23	-0.32	0.11	-0.34	-0.21	0.15	0.18	0.08	-0.10	0.49	0.57	0.28	0.24
HCN4	0.38	0.66	0.15	0.37	0.12	0.17	-0.17	-0.15	0.06	0.09	0.01	0.07	-0.29	0.05	-0.63	-0.88
HECTD2-AS1	-0.44	-0.17	0.04	-0.30	-0.15	-0.20	-0.06	-0.40	-0.03	-0.22	0.19	-0.12	-0.11	0.75	0.61	0.61
IQSEC3	0.20	0.23	0.50	0.16	0.36	0.00	-0.13	0.03	-0.02	0.00	-0.18	0.35	-0.41	-0.22	-0.17	-0.69
KCNA4	-0.17	-0.44	0.15	-0.51	-0.36	-0.24	-0.38	-0.52	0.07	-0.13	0.52	-0.28	0.38	0.27	0.88	0.75
KIF26B	0.11	0.42	0.51	0.12	0.25	-0.01	0.06	0.09	-0.28	0.01	0.16	0.23	-0.73	-0.37	-0.10	-0.47
KRT222	0.41	0.12	0.21	-0.05	0.13	0.58	0.26	0.23	-0.18	0.03	0.06	-0.11	-0.50	-0.59	-0.35	-0.25
LACTB2-AS1	-0.40	-0.14	-0.37	-0.32	-0.18	0.17	-0.16	-0.48	-0.21	0.50	0.22	0.06	-0.01	0.28	0.30	0.75
LHFPL3	0.46	0.30	0.61	0.14	0.29	0.17	-0.09	-0.10	0.05	-0.14	-0.33	-0.07	-0.71	-0.12	-0.36	-0.10
LINC00457	-0.43	-0.31	-0.87	-0.44	-0.40	-0.29	0.21	-0.34	0.74	0.18	-0.36	0.04	0.37	0.81	-0.03	1.10
LINC00499	-0.37	-0.34	-0.51	-0.39	-0.73	-0.01	-0.11	-0.20	-0.01	-0.13	-0.20	-0.17	0.94	0.21	0.13	1.90
LINC01158	-0.55	-0.06	-0.88	-0.37	0.19	-0.65	0.15	-0.24	0.33	0.38	-0.63	0.40	0.58	0.37	0.53	0.45
LOC105377448	-0.64	0.11	-0.52	-0.36	-0.24	0.07	-0.29	0.06	-0.29	0.33	-0.18	0.12	0.93	0.12	0.40	0.38
LOC285692	-0.51	-0.44	-1.15	-0.57	0.01	-0.10	-0.28	0.04	-0.14	0.48	-0.75	0.07	1.63	0.51	-0.14	1.33
LOC653602	0.81	0.36	-0.09	0.03	-0.18	0.58	0.24	0.21	0.14	0.24	0.06	-0.09	-0.81	-0.47	-0.36	-0.70
LPCAT4	0.28	-0.10	0.51	0.48	0.53	-0.04	-0.04	0.22	-0.03	-0.14	-0.30	0.02	-0.43	-0.33	-0.08	-0.57
MARC2	-0.27	-0.18	-0.34	-0.49	-0.33	0.26	-0.25	-0.09	0.15	0.28	0.01	0.06	0.25	0.24	0.28	0.43
MARCH11	0.41	0.12	0.15	0.05	0.23	0.21	0.17	0.12	-0.09	-0.26	-0.11	-0.03	-0.29	-0.26	-0.18	-0.24
MASP1	0.50	-0.08	0.47	0.38	0.37	0.39	0.33	-0.17	-0.25	0.06	0.49	-0.22	-0.68	-0.45	-0.27	-0.87
MEGF10	0.27	0.13	0.15	-0.06	0.08	0.27	0.13	0.05	-0.05	-0.16	0.00	-0.06	-0.11	-0.27	-0.20	-0.15
MTHFSD	0.38	0.22	0.64	0.15	0.24	-0.34	-0.08	0.12	-0.16	-0.25	-0.07	0.16	-0.32	-0.19	-0.23	-0.28
MYRIP	-0.62	-0.10	-0.48	-0.57	0.03	0.02	0.06	-0.04	0.24	0.36	-0.10	0.31	-0.15	0.03	0.13	0.89
NHS	0.29	0.24	0.39	0.16	0.17	-0.03	-0.03	0.10	-0.03	0.00	-0.17	0.05	-0.39	-0.35	-0.31	-0.10
NOS1	0.17	0.17	0.27	0.13	0.24	0.13	0.03	-0.05	-0.02	-0.08	0.06	-0.07	-0.12	-0.13	-0.09	-0.63
NPL	-0.36	-0.12	-0.17	-0.54	-0.31	-0.56	0.09	-0.15	-0.17	0.10	0.11	0.10	0.57	0.53	0.28	0.59
NPY6R	-0.15	-0.19	-0.45	-0.20	-0.09	-0.02	-0.12	-0.12	-0.05	-0.03	0.37	-0.02	0.35	0.31	0.08	0.33
NTNG1	0.77	0.46	0.12	0.30	0.19	0.26	-0.03	0.10	0.06	-0.28	-0.54	-0.19	-0.54	-0.31	-0.09	-0.29
NXNL2	1.10	-0.41	1.75	1.11	-0.19	-0.35	-0.04	-0.39	-0.54	-0.49	-0.01	-0.25	-0.08	-0.25	-0.71	-0.25
PAQR6	-0.12	-0.33	-0.51	-0.18	-0.28	-0.40	-0.23	-0.16	0.07	0.15	-0.40	-0.16	-0.04	0.92	1.22	0.46
PARM1	0.38	0.26	1.16	0.42	0.87	-0.34	-0.18	0.29	0.09	0.39	-0.47	0.00	-1.49	-0.49	-0.35	-0.55
PCP4	0.95	0.96	0.28	0.85	-0.46	0.49	-0.32	-0.33	-0.39	-0.05	-0.70	0.60	-0.13	-0.67	-0.89	-0.18
PEBP4	-0.08	-0.45	-0.58	-0.59	-0.82	-0.56	-0.19	-0.52	0.23	0.21	0.02	-0.19	0.46	1.30	0.67	1.11
PHACTR2-AS1	0.20	0.34	0.24	-0.06	0.38	0.05	0.22	0.04	-0.10	-0.17	-0.10	0.14	-0.28	-0.19	-0.06	-0.64
PHKA1	-0.59	-0.22	-0.41	-0.46	0.13	0.13	-0.18	-0.20	0.09	0.36	0.02	0.11	-0.23	-0.18	0.29	1.34
PLPPR4	0.40	0.27	0.31	0.61	0.31	0.85	0.62	-0.21	0.21	-0.12	0.18	-0.48	-1.41	-0.78	-0.70	-0.05
PLXNA4	0.48	0.46	0.32	0.35	0.05	0.25	-0.19	-0.11	-0.20	0.01	-0.21	0.10	-0.28	-0.25	-0.44	-0.35
PRKCG	0.22	-0.02	0.97	0.25	0.26	0.11	-0.21	-0.05	-0.16	0.23	-0.22	0.01	-0.24	-0.30	-0.29	-0.57
RGMB	0.46	0.22	0.58	0.09	0.27	0.36	-0.09	0.07	0.16	0.06	0.32	-0.07	-0.50	-0.46	-0.71	-0.76
RNF212	-0.32	-0.13	-0.35	-0.44	-0.07	-0.16	-0.03	-0.40	0.19	0.58	-0.02	0.21	-0.12	0.26	0.42	0.38
RNF215	0.29	0.41	0.78	0.13	0.62	-0.26	-0.08	0.07	0.15	-0.36	0.00	-0.46	-0.17	-0.08	-0.62	-0.42
RORA	0.19	0.28	0.09	0.09	0.25	0.32	0.23	0.08	0.10	-0.08	-0.01	-0.07	-0.59	-0.24	-0.18	-0.46
RPH3A	0.37	0.51	0.49	0.13	0.37	0.65	-0.47	0.05	0.02	0.17	-0.51	0.07	-0.68	-0.27	-0.45	-0.43
RPS6KA5	-0.49	-0.17	-0.53	-0.35	-0.38	0.27	0.37	-0.37	-0.13	0.27	0.10	-0.09	0.47	0.03	0.32	0.67
SCN2B	0.05	0.49	0.56	0.08	0.53	-0.13	-0.07	0.22	-0.10	-0.05	0.10	0.01	0.11	-0.41	-0.74	-0.65
SEPSECS	-0.07	-0.39	-0.12	-0.32	0.06	-0.36	-0.08	-0.29	0.30	-0.06	0.08	-0.06	0.33	0.19	0.08	0.71
SEPSECS-AS1	0.16	-0.97	-0.79	-1.06	0.11	0.10	-0.19	0.14	0.22	0.12	0.30	0.23	-0.01	0.28	0.61	0.78
SHANK1	0.23	0.01	0.92	0.43	0.38	-0.04	-0.28	0.05	-0.16	-0.11	-0.21	0.22	-0.38	-0.15	-0.15	-0.76
SHANK2	0.08	0.12	0.42	0.18	0.33	0.11	-0.03	-0.08	-0.07	-0.02	-0.06	0.08	-0.29	-0.06	-0.20	-0.52
SLC12A5	0.19	0.07	0.37	0.15	0.10	-0.04	0.07	0.15	0.10	0.16	0.17	-0.07	-0.19	-0.38	-0.40	-0.44
SLC17A4	-0.41	-0.08	-0.28	-0.93	0.08	-0.57	-0.09	-0.02	0.23	-0.15	0.00	-0.26	0.52	0.81	-0.28	1.42
SLC25A29	0.27	0.50	0.28	0.43	0.05	-0.18	-0.19	0.15	0.01	-0.15	-0.10	0.20	-0.23	-0.20	-0.11	-0.74
SLC26A8	-0.06	-0.49	-0.14	-0.60	-0.33	0.04	-0.36	0.05	-0.12	0.26	0.33	-0.19	0.14	0.73	0.36	0.38
SLC35F4	0.55	0.29	0.42	0.58	-0.11	0.14	-0.07	0.11	-0.37	0.00	-0.41	0.29	-0.49	-0.58	-0.30	-0.07
SLC8A3	0.65	0.18	0.19	0.13	0.37	0.31	-0.01	0.07	-0.09	-0.02	-0.15	-0.01	-0.64	-0.08	-0.24	-0.67
SPARCL1	-0.77	-0.10	-0.57	-0.72	-0.59	-0.52	-0.18	-0.20	-0.21	0.30	0.14	-0.02	0.74	1.26	0.32	1.12
SPHK2	0.15	-0.02	0.80	0.68	0.33	-0.27	-0.20	0.06	-0.25	-0.09	0.10	-0.07	-0.13	-0.23	-0.38	-0.49
SPON2	-0.29	-0.33	-0.11	-0.56	0.05	-0.21	0.13	-0.26	0.21	-0.34	-0.09	-0.31	0.12	0.45	0.88	0.67
ST6GAL2	0.51	0.31	0.32	0.13	0.33	0.25	0.02	0.10	-0.13	-0.20	-0.02	-0.16	-0.37	-0.38	-0.22	-0.47
ST6GALNAC5	-0.58	-0.85	-1.38	-0.75	-0.70	-0.75	-0.29	0.23	0.75	0.25	0.09	0.54	0.58	0.52	0.53	1.79

STAT5A	-0.65	-0.39	-0.73	-0.24	-0.65	-0.32	-0.09	0.21	-0.45	-0.06	-0.19	-0.66	1.51	1.76	0.04	0.91
STK33	-0.29	0.17	-0.69	-0.59	-0.48	-0.13	-0.06	-0.28	0.24	0.16	0.10	0.20	-0.17	0.30	0.51	1.02
SV2C	0.22	-0.68	-0.22	-0.51	0.04	-0.49	-0.65	-0.44	0.20	0.03	-0.10	-0.19	0.73	0.88	-0.05	1.22
SYT17	-0.91	0.01	-0.50	-0.62	0.37	-0.48	-0.53	-0.63	0.39	0.16	0.31	0.68	-0.26	0.55	0.76	0.69
TEX9	-0.39	-0.56	-1.01	-0.33	-0.63	0.29	0.20	-0.16	-0.08	0.37	0.17	-0.08	0.30	0.37	-0.10	1.63
TFAP2B	0.62	0.07	0.30	0.19	0.28	0.47	-0.08	0.03	-0.04	-0.12	-0.15	0.09	-0.68	-0.09	-0.24	-0.64
THSD7B	0.71	1.09	1.30	0.78	-0.43	0.78	0.39	0.17	0.19	-0.23	-0.76	0.52	-0.76	-1.36	-0.45	-1.95
TMEM178B	0.15	0.14	0.21	0.02	0.13	0.03	0.10	0.10	0.00	-0.13	-0.06	0.05	-0.32	-0.07	-0.16	-0.20
TRAF5	0.40	0.02	0.66	0.13	-0.09	0.22	0.05	0.04	-0.19	-0.06	-0.23	-0.10	-0.18	-0.09	-0.21	-0.38
TRIM67	0.54	0.00	0.33	0.46	0.17	0.22	-0.17	0.04	-0.09	-0.24	-0.25	0.23	-0.61	-0.06	-0.29	-0.30
TTC23L	-0.28	-0.06	-0.54	-0.42	0.00	0.09	-0.20	-0.42	0.03	0.22	-0.14	0.04	0.37	0.43	0.31	0.56
TUNAR	0.73	0.28	0.47	0.49	0.29	0.07	-0.65	-0.05	-0.21	-0.07	-0.44	0.01	-0.24	-0.20	-0.20	-0.27
UBASH3B	0.23	0.41	0.58	0.00	0.37	-0.11	0.12	0.06	0.03	-0.17	-0.02	0.08	-0.38	-0.30	-0.03	-0.88
UNC5D	0.23	0.20	0.36	-0.02	0.20	0.01	0.24	-0.05	-0.14	-0.18	-0.08	0.06	-0.30	-0.32	-0.14	-0.07
ZNF124	-0.59	-0.10	-0.02	-0.16	-0.31	0.00	-0.18	-0.14	-0.11	-0.31	-0.23	0.29	0.54	0.33	0.34	0.64
ZYG11A	-0.68	-0.08	-0.28	-0.47	-0.11	-0.33	-0.28	0.04	0.51	0.36	0.03	0.05	0.23	0.71	-0.04	0.35

[00316] The RNAseq results in glia cells for the 42 genes having significantly altered expression due to age in the three cell types are shown in Table 54. The log2 fold change between the RNAseq results for the sorted nuclei from glia from each human sample compared to normalized expresssion from unsorted nuclei from all samples are shown in Table 54. Negative values indicate reduced expression in the nuclei of the subject compared to the normalized value across nuclei from all samples, and a positive value indicates increased expresssion compared to the normalized value across nuclei from all cell types analyzed.

Table 54. Log2 fold change of expression in glia

	Log2 fold change of expression													
Subject	xk	tm	wi	pk	vm	wl	sg	or	lt	zh	ko	kq	ke	ai
Gene														
ABCC10	0.53	-0.23	0.38	-0.26	-0.97	0.42	0.31	0.19	-0.02	-0.15	-0.51	-0.45	0.11	-0.96
ACAP3	0.17	-0.41	0.49	0.17	-0.68	0.34	0.03	0.50	-0.03	-0.52	-0.41	-0.57	0.04	-1.00
ACHE	-0.34	-0.44	-0.37	0.22	-0.75	-0.51	-0.47	-0.72	-0.92	-0.20	-0.13	-0.98	-0.62	-1.63
ATF6B	0.49	0.00	0.48	0.08	-0.44	0.27	0.17	0.10	0.10	-0.34	-0.03	-0.10	0.22	-0.92
ATP6V0B	0.04	0.03	-0.13	-0.16	0.20	0.43	-0.37	-0.14	0.29	0.13	0.04	-0.75	0.12	-0.74
CACNA2D3	0.00	-0.05	0.09	0.44	-0.03	0.02	-0.07	-0.19	0.05	0.22	-0.24	0.13	-0.02	0.65
CUL7	-0.12	-0.58	-0.21	-0.28	-0.72	-0.29	-0.53	-0.19	-0.40	-0.56	-0.38	-0.77	-0.44	-1.18
DNAJB5	-0.40	0.29	0.06	-0.22	0.02	-0.18	-0.26	-0.12	-0.50	0.04	-0.53	-1.11	-0.51	-1.06
EGR1	-0.37	-1.68	3.58	-0.10	3.53	-1.56	-0.54	0.22	-0.52	2.95	-0.66	-1.22	-0.52	-2.16
FZR1	0.51	0.31	0.38	-0.16	-0.70	0.36	-0.24	0.16	-0.09	0.09	-0.09	-0.88	-0.16	-1.40
GBAP1	0.64	0.72	0.78	0.28	-0.10	0.62	0.43	0.37	0.04	0.24	-0.57	-0.15	0.36	-0.46
GPR107	0.09	0.15	0.06	0.01	0.00	-0.09	0.00	0.18	0.05	0.04	0.12	-0.17	-0.05	-0.40
GRK5	-0.60	-0.75	-0.37	-0.76	-1.12	-0.19	-0.64	-0.73	-0.86	-0.65	-0.88	-1.57	-0.85	-1.33
KCTD21-AS1	0.21	0.70	-0.31	1.03	-0.22	0.40	0.49	0.13	0.50	-0.70	-0.38	-0.62	-0.26	-0.13
KLHL22	-0.09	0.15	0.05	-0.09	-0.54	-0.17	-0.21	-0.14	-0.31	-0.04	-0.21	-0.17	-0.24	-0.41
LINC00499	0.00	-0.49	0.87	0.63	0.59	-0.22	3.04	1.06	-0.03	0.49	3.88	1.05	1.12	4.88
LINGO2	-1.09	0.54	0.44	-0.81	-0.24	1.43	-0.23	-1.10	-1.03	-0.72	-1.45	-1.10	-0.43	-0.07
LOC100132077	0.26	-0.27	-0.25	-0.23	0.06	-0.27	-0.12	0.29	-0.09	-0.47	-0.55	-0.54	-0.37	-0.66
LOC100506990	-0.27	0.31	0.08	0.22	-0.29	-0.23	0.10	-0.07	-0.27	0.02	0.14	0.95	0.06	0.82
LOC101927592	-0.67	-0.18	-0.29	0.19	0.42	-0.31	-0.33	0.01	-0.37	-0.46	0.50	0.35	-0.32	1.12
MIR9-3HG	0.40	-0.06	0.34	0.49	-0.46	0.13	0.36	0.04	-0.35	-0.01	-0.67	-0.97	-0.67	-1.74
MPND	0.33	0.68	0.07	-0.09	-0.78	-0.09	0.05	-0.14	-0.31	0.00	-0.25	-0.56	-0.39	-1.20

MTRF1	0.12	-0.01	-0.17	0.41	0.40	0.17	-0.48	0.16	0.09	0.17	0.04	0.82	0.15	0.68
POLR2J3	0.31	0.74	0.35	0.01	0.10	0.33	0.49	0.66	-0.27	0.05	-0.29	-0.88	0.19	-0.99
PPP6R2	0.20	-0.02	-0.03	0.01	-0.12	0.05	0.20	-0.08	-0.01	-0.02	-0.06	-0.13	-0.24	-0.59
PRSS55	0.04	-1.98	-0.13	-0.46	-1.29	0.45	0.25	0.07	-0.53	-0.74	0.36	-0.25	-0.93	0.26
PTMS	-0.26	-0.69	-0.17	-0.29	-1.03	-0.62	-0.62	-0.57	-1.38	-0.40	-0.83	-1.22	-1.29	-2.14
RNF17	0.63	0.54	-1.43	-0.89	-0.92	-0.25	-1.04	-1.07	1.04	-1.37	-0.75	-0.79	-0.63	-0.02
SNAI3-AS1	0.20	-0.28	0.40	0.53	0.29	0.13	0.24	0.07	0.00	-0.01	-0.24	-0.58	-0.35	-0.65
SPHK2	0.46	-0.13	0.07	0.30	-0.29	0.53	0.08	0.11	0.06	-0.09	0.05	0.08	0.05	-0.50
ST3GAL2	0.11	-0.03	0.03	-0.21	-0.65	-0.12	-0.30	-0.36	-0.43	-0.22	-0.54	-0.59	-0.23	-0.98
TAOK2	0.36	0.01	0.33	0.00	-0.30	0.02	0.16	0.32	-0.02	-0.11	0.00	-0.32	-0.07	-0.52
TRDN	-0.42	0.85	0.63	2.04	2.11	1.20	1.58	1.59	1.32	2.45	1.80	4.47	1.16	4.44
WASH7P	0.45	0.36	0.39	0.20	-0.30	-0.08	0.54	0.32	0.00	-0.19	-0.05	-0.58	-0.18	-1.77
ZFPM1	0.15	-0.11	0.25	0.24	-0.28	0.13	-0.06	-0.21	-0.25	-0.21	-0.30	-1.08	-0.14	-0.44
ZNF404	-0.45	0.18	-0.07	0.51	0.56	-0.06	-0.29	-0.53	-0.17	0.01	-0.23	0.37	0.11	1.26
ZNF496	0.14	0.12	-0.05	0.00	-0.23	-0.16	-0.17	0.10	-0.15	-0.16	-0.16	-0.10	-0.06	-0.45
ZNF580	-0.18	0.44	0.32	0.94	-0.29	0.03	0.02	0.01	0.03	-0.14	0.45	-0.30	-0.02	-0.12
ZNF585A	-0.24	-0.18	-0.01	-0.21	-0.06	-0.23	-0.13	-0.26	-0.03	-0.13	-0.01	-0.05	0.08	0.61
ZNF607	-0.09	-0.01	-0.13	-0.24	0.36	-0.13	0.17	0.16	0.25	-0.13	0.32	0.28	0.07	0.20
ZNF84	0.01	0.02	-0.14	0.13	0.31	0.07	0.09	0.03	0.21	0.16	0.04	0.36	0.26	0.37
ZSCAN29	0.07	0.17	0.02	0.11	-0.28	0.00	0.34	0.05	0.19	0.08	0.47	0.72	0.23	1.02

[00317] These data suggest that the specific molecular consequences of aging, at least in the cerebellum, differ according to cell type. Despite differences in the genes impacted by aging in each cell types, it remained possible that the cellular processes altered by these changes are related between cell types.

[00318] The genes down-regulated with age in all three cell types, despite containing different specific genes, were enriched for synaptic genes. For example, Aquaporin 7 (Aqp7) (p-adj = 3.78E-9) and Acid Sensing Ion Channel Subunit 1 (Asic1) (p-adj = 4.07E-7) were observed to be down-regulated with age in granule cells as shown in FIG. 11A and FIG. 11B, respectively. FIG. 11C shows that Roundabout Guidance Receptor 2 (Robo2) was downregulated in both glia in basket cells. The finding that genes encoding synaptic components decline in expression with age is consistent with previous findings that axons and dendrites atrophy in the brains of older individuals (Burke, et al. (2006) Nat Rev Neurosci 7, pages 30–40 (2006); Dickstein, et al. (2013) Neuroscience 251, 21–32; Freeman, et al. (2008) J. Neuropathol. Exp. Neurol. 67, 1205–1212; each of which is herby incorporated by reference herein in its entirety). However, the data herein extend these observations to establish that this general process impacts distinct genes in each cell type.

[00319] To test this hypothesis, GO analysis was performed on the genes that are up- or down-regulated with age in each cell type. No significant GO categories for any group of aging up-regulated genes were observed, nor were significant GO categories identified for the aging up-downregulated genes from the "all cell types" group.

Example 22. Determining effects of stress on human cell-type specific gene expression

[00320] Transcriptional induction of immediate early genes such as Fos Proto-Oncogene, AP-1 Transcription Factor Subunit (Fos, also known as c-FOS) and JunB Proto-Oncogene, AP-1 Transcription Factor Subunit (Junb) is associated with neuronal activation, and can indicate normal behavioral responses or pathological influences (Okuno, H. (2011) Neuroscience Research 69, 175–186 and Pérez-Cadahía, et al. (2011) Biochem. Cell Biol. 89, 61–73, each of which is hereby incorporated by reference herein in its entirety). Although immediate early response genes associated with these events are often shared, the target genes and pathways induced by these factors reflect the nature of the event experienced by the cell or circuit (Duclot, et al. (2017) Front. Behav. Neurosci. 11, 717, which is hereby incorporated by reference herein in its entirety). A stress response was observed to induce a group of genes in three out of the 16 human samples and that are not explained by race, autolysis time, gender, or age. Table 55 provides the differentially expressed genes (adjusted p <0.01, baseMean > 50) across all samples compared to normalized expression for all cell types.

Table 55. Differentially expressed genes across all samples

Gene	Base Mean	Log2 Change	p-value	p-adj	Gene	Base Mean	Log2 Change	p-value	p-adj
HSP90AA1	6188.357	-2.067	9.64E-21	1.08E-17	DNAJB1	383.949	-3.687	8.95E-34	6.32E-30
ARIH1	4367.296	-0.583	5.64E-05	7.38E-03	HIST2H2BF	378.006	-2.354	8.62E-09	2.50E-06
ELOVL5	3827.847	-1.824	2.83E-17	2.07E-14	NR4A1	374.351	-5.233	3.98E-21	4.69E-18
HSD17B12	3577.832	-0.480	1.81E-05	2.71E-03	NR4A2	373.846	-3.427	4.39E-05	5.93E-03
ZNF331	3415.054	-3.451	3.53E-19	3.12E-16	ZNF184	373.550	-1.158	1.37E-06	2.77E-04
PDE7A	2643.373	-0.494	5.37E-05	7.11E-03	DNAJC27	373.271	-0.478	3.33E-05	4.64E-03
BTAF1	2229.841	-0.739	2.37E-06	4.61E-04	FOS	369.433	-6.017	1.06E-19	1.02E-16
HSPA8	2191.727	-1.558	1.46E-11	6.74E-09	HECA	368.497	-0.721	4.25E-08	1.13E-05
HSPH1	2090.803	-3.685	5.34E-16	3.23E-13	NKRF	355.175	-1.361	5.40E-09	1.61E-06
JMY	2019.885	-0.754	1.22E-05	1.90E-03	SNAPC1	347.452	-0.687	4.29E-07	9.68E-05
RANBP2	1752.608	-0.610	7.44E-05	9.50E-03	C2orf69	343.055	-0.932	7.88E-08	1.99E-05
TSC22D2	1601.991	-0.686	3.74E-08	1.03E-05	SLC2A3	342.277	-2.283	3.40E-06	6.38E-04
MXD1	1400.731	-1.631	1.10E-10	4.25E-08	ETF1	338.703	-0.538	8.16E-06	1.37E-03
P4HA1	1393.996	-1.058	7.76E-06	1.33E-03	DCUN1D3	330.486	-0.959	2.15E-07	5.17E-05
TRA2B	1262.337	-0.680	1.57E-05	2.39E-03	BCAS2	321.395	-3.293	7.30E-42	1.55E-37
RHEB	1238.794	-0.597	1.08E-05	1.71E-03	BTG2	313.734	-2.758	2.11E-11	9.30E-09
DNAJB4	1096.419	-1.263	8.49E-11	3.33E-08	CASP9	292.778	-0.856	1.33E-06	2.72E-04
PNPLA8	1054.161	-1.221	8.29E-09	2.44E-06	HIST1H2BD	292.613	-3.518	1.85E-22	3.02E-19
DNAJB6	991.014	-1.231	5.14E-09	1.56E-06	TOB1	288.226	-1.607	4.63E-17	3.17E-14
IFRD1	973.938	-1.187	1.64E-11	7.38E-09	SIAH2	280.639	-0.726	1.03E-05	1.64E-03
HSPA1A	967.333	-5.435	9.97E-29	4.23E-25	ZBTB21	264.251	-0.836	5.53E-08	1.43E-05
ZFAND5	967.094	-1.175	2.64E-05	3.81E-03	LINC00278	263.479	4.992	2.41E-07	5.68E-05
ST13	920.222	-0.616	3.45E-06	6.38E-04	TMEM198	261.699	-1.077	4.71E-07	1.05E-04
ZNF10	919.734	-1.805	6.26E-16	3.69E-13	UBC	253.145	-1.724	3.16E-17	2.23E-14
NDEL1	900.829	-1.315	1.30E-12	6.88E-10	KLHL15	252.472	-0.902	5.28E-07	1.15E-04
ZNF141	863.045	-1.026	2.84E-05	3.99E-03	STIP1	245.513	-1.267	8.29E-12	3.91E-09
DNAJA4	845.930	-1.533	3.23E-12	1.63E-09	JOSD1	234.644	-0.887	4.28E-10	1.54E-07
MORF4L2	840.065	-0.897	1.17E-08	3.34E-06	HSPE1-MOB	225.041	-3.154	6.16E-24	1.63E-20
CHORDC1	824.510	-1.208	8.27E-11	3.31E-08	SOD1	219.698	-0.721	5.44E-06	9.60E-04

EIF2AK3	788.209	-1.055	3.30E-06	6.24E-04	NUDC	218.371	-0.803	4.20E-07	9.57E-05
ERRFI1	782.244	-0.879	9.11E-06	1.49E-03	MCL1	217.860	-0.600	2.67E-05	3.82E-03
HSPA4	772.635	-0.998	1.47E-09	5.03E-07	HERPUD1	215.632	-0.928	1.41E-10	5.24E-08
TFRC	755.081	-1.881	1.51E-10	5.52E-08	DUSP1	201.332	-3.227	5.96E-19	5.05E-16
CCNH	740.080	-1.581	6.17E-11	2.57E-08	FOSL2	193.863	-3.422	1.25E-10	4.73E-08
USPL1	725.467	-0.902	3.17E-09	1.00E-06	LOC403323	187.003	1.765	3.88E-05	5.34E-03
PTGES3	719.883	-1.665	1.33E-12	6.88E-10	SPTY2D1	170.668	-0.616	6.16E-05	7.97E-03
ZNF131	718.183	-0.432	5.61E-07	1.21E-04	AHSA1	167.130	-0.966	1.61E-07	3.93E-05
HSPA9	657.744	-0.554	7.13E-07	1.53E-04	JUN	158.789	-2.706	4.89E-07	1.08E-04
NAMPT	651.933	-1.382	1.48E-06	2.93E-04	EIF4A3	154.036	-2.954	2.15E-23	5.06E-20
SRSF3	646.750	-1.051	1.27E-05	1.97E-03	MBOAT7	144.304	-0.826	3.89E-08	1.06E-05
PPP2CA	643.874	-0.623	2.68E-06	5.12E-04	ZNF891	142.869	-0.746	7.92E-05	9.99E-03
PRMT9	626.415	-1.450	3.13E-09	1.00E-06	HIST2H2BE	137.895	-2.236	2.78E-16	1.79E-13
HMGCS1	604.092	-2.002	1.82E-08	5.13E-06	TCEAL5	136.312	-1.343	5.70E-05	7.42E-03
TXNL4A	588.349	-0.581	8.54E-08	2.13E-05	SLC7A5	136.094	-1.629	5.59E-06	9.80E-04
JDP2	583.695	-0.896	4.40E-08	1.15E-05	COQ10B	135.024	-1.061	2.64E-09	8.61E-07
AZIN1	559.688	-0.646	4.91E-06	8.82E-04	TWISTNB	133.437	-1.081	1.33E-06	2.72E-04
NR4A3	552.102	-3.755	4.22E-20	4.47E-17	STK19	129.998	-0.704	2.70E-05	3.84E-03
HSPA1B	544.938	-4.841	2.79E-33	1.48E-29	FOSB	128.225	-7.806	3.14E-28	1.11E-24
INSIG1	534.902	-2.125	4.89E-06	8.82E-04	ZNF212	120.755	0.630	8.07E-06	1.37E-03
MTCH1	528.116	-0.865	2.33E-05	3.46E-03	ATF3	116.871	-4.132	2.75E-21	3.51E-18
CYSTM1	527.900	-1.100	1.57E-06	3.07E-04	HSPB1	116.181	-4.761	3.53E-09	1.09E-06
NPAS4	509.499	-8.309	5.23E-20	5.28E-17	PARD6G-AS	115.608	-1.268	2.43E-05	3.53E-03
NAF1	493.518	-0.741	7.25E-08	1.85E-05	SELK	113.826	-2.705	6.40E-28	1.94E-24
HSPD1	493.259	-1.688	2.70E-19	2.49E-16	ZFAND2A	110.276	-2.621	1.04E-22	1.84E-19
TMEM184C	486.387	-1.320	3.78E-14	2.11E-11	TCEAL7	103.902	-1.933	5.24E-16	3.23E-13
MSMO1	483.773	-1.860	8.48E-06	1.39E-03	PCBP1	103.325	-0.749	7.57E-06	1.31E-03
FKBP4	479.426	-1.090	1.80E-09	6.05E-07	TM2D2	102.869	-0.858	1.49E-05	2.30E-03
EGR1	470.894	-5.739	2.82E-21	3.51E-18	RGS2	98.031	-3.533	1.04E-22	1.84E-19
C4orf33	448.787	-1.376	4.28E-08	1.13E-05	CSRNP1	94.873	-2.292	1.60E-05	2.42E-03
UAP1	443.763	-2.461	9.88E-23	1.84E-19	UBB	94.686	-1.765	7.15E-12	3.45E-09
BAG3	439.711	-2.592	9.71E-06	1.57E-03	MRPL18	79.610	-0.847	2.56E-06	4.93E-04
UFSP2	438.073	-0.947	1.74E-05	2.62E-03	PPP1R15A	79.021	-4.230	1.87E-41	1.99E-37
CYCS	429.955	-2.118	5.75E-10	2.00E-07	SERPINH1	77.852	-4.809	4.41E-10	1.56E-07
HMGCR	429.914	-0.825	4.53E-06	8.28E-04	ZNRD1	72.879	-1.779	2.16E-09	7.16E-07
CACYBP	428.152	-1.296	8.36E-07	1.75E-04	PMVK	72.696	-1.044	1.44E-06	2.88E-04
DNAJA1	423.249	-1.569	8.79E-15	5.04E-12	RUVBL2	69.260	-1.045	3.67E-07	8.46E-05
PTP4A1	404.937	-1.551	1.72E-16	1.14E-13	AVPI1	68.283	-1.098	7.60E-06	1.31E-03
SYAP1	387.927	-1.546	6.78E-22	1.03E-18	TCEAL9	67.723	-1.793	4.89E-11	2.07E-08
IDI1	386.000	-1.639	3.72E-11	1.61E-08	ANKRD37	59.568	-2.551	2.17E-13	1.18E-10
GABARAPL1	384.301	-0.814	1.54E-07	3.79E-05	MIR3671	56.838	1.174	2.39E-07	5.68E-05

[00321] c-FOS was observed to be induced strongly in granule cells obtained from three (WI, VM, and ZH) of the sixteen individuals (FIG. 12). To further explore this difference, differential expression (adjusted $p < 0.01$, baseMean > 50) analysis was performed to identify additional genes that are significantly up- or down-regulated in these three individuals compared to the others, i.e, differential gene expression analysis of granule cells between three fos+ individuals versus the other 13 samples was performed. A very strong response was evident in granule cells

from individuals WI, VM, and TM, characterized by induction of 224 genes and diminished expression of 10 genes as shown in Table 56.

Table 56. Differentially expressed genes in granule cells

Gene	Base Mean	Log2 Change	p-value	p-adj	Gene	Base Mean	Log2 Change	p-value	p-adj
SEMA4G	102.715	0.992	4.10E-05	3.02E-03	MXD1	1605.354	-1.263	1.02E-06	1.13E-04
CKMT1B	1897.863	0.914	1.15E-04	7.19E-03	SNHG5	71.208	-1.276	8.33E-13	1.93E-10
STRC	326.503	0.885	1.42E-04	8.72E-03	SLC19A2	400.882	-1.277	2.65E-06	2.70E-04
FSD2	294.523	0.818	1.11E-06	1.22E-04	BDNF	698.573	-1.283	9.02E-06	8.05E-04
MRLN	197.882	0.729	5.20E-05	3.70E-03	ERRFI1	782.451	-1.285	3.66E-10	6.28E-08
TMEM175	506.049	0.706	4.84E-05	3.50E-03	DNAJB6	881.860	-1.286	3.95E-07	4.78E-05
LOC339874	706.183	0.667	1.05E-04	6.61E-03	ARMCX1	54.271	-1.289	1.88E-05	1.54E-03
LOC100131655	134.170	0.661	1.05E-04	6.62E-03	HSPA4	809.532	-1.293	3.57E-06	3.55E-04
ZNF253	553.671	0.631	6.73E-05	4.58E-03	HIST2H2BA	284.036	-1.293	1.64E-08	2.33E-06
TMEM254	155.920	0.615	8.88E-05	5.80E-03	ATP1B3	4314.169	-1.296	5.30E-07	6.29E-05
IKBKAP	1436.570	-0.388	2.86E-05	2.21E-03	APEX2	65.045	-1.302	4.00E-07	4.81E-05
RCAN2	6494.964	-0.497	5.84E-05	4.06E-03	SPTY2D1	205.806	-1.304	3.13E-19	1.41E-16
TOP1	2113.050	-0.500	3.87E-05	2.87E-03	RNF122	580.993	-1.319	3.67E-07	4.53E-05
METTL9	513.620	-0.527	1.23E-04	7.62E-03	STIP1	237.758	-1.319	2.05E-06	2.13E-04
SPAG9	5601.340	-0.552	1.01E-04	6.39E-03	ARL5B	305.291	-1.322	3.37E-08	4.64E-06
SIK3	9746.163	-0.566	5.90E-06	5.54E-04	FAM122C	97.552	-1.323	1.59E-05	1.33E-03
QKI	1423.676	-0.567	9.24E-05	5.95E-03	SERP1	113.793	-1.339	7.97E-10	1.33E-07
ESYT2	3476.907	-0.575	2.23E-05	1.75E-03	PMVK	67.643	-1.364	2.69E-06	2.73E-04
USP37	1315.358	-0.596	1.29E-04	8.01E-03	HTR5A-AS1	76.838	-1.376	5.16E-06	4.90E-04
ZNF131	744.578	-0.635	7.62E-06	6.94E-04	DYNLT3	133.963	-1.398	6.98E-06	6.42E-04
NEDD4L	7611.496	-0.641	6.96E-05	4.69E-03	RPL10	97.578	-1.421	1.08E-06	1.19E-04
ETF1	347.286	-0.659	1.07E-05	9.39E-04	SAT1	118.125	-1.428	5.15E-05	3.70E-03
ZSWIM6	8443.682	-0.675	1.34E-04	8.29E-03	PPP1R11	246.242	-1.432	1.24E-06	1.34E-04
OXSR1	1601.247	-0.693	7.85E-06	7.12E-04	MIR7-3HG	174.673	-1.433	1.36E-07	1.78E-05
TXNL4A	597.737	-0.699	1.32E-06	1.42E-04	DCUN1D3	408.667	-1.468	2.86E-07	3.60E-05
SIAH2	316.591	-0.702	6.92E-05	4.68E-03	CACYBP	637.420	-1.470	1.25E-07	1.65E-05
NUP58	1160.627	-0.708	5.76E-05	4.04E-03	ELOVL5	2843.838	-1.505	2.67E-09	4.12E-07
C6orf106	2991.322	-0.709	2.14E-06	2.20E-04	IDI1	362.780	-1.520	7.76E-17	2.80E-14
TRA2B	1340.864	-0.711	4.13E-05	3.03E-03	STK19	125.037	-1.536	3.38E-12	7.72E-10
ARIH1	5343.603	-0.715	3.46E-05	2.61E-03	TWISTNB	175.263	-1.540	9.94E-15	3.09E-12
TRIM26	770.020	-0.722	1.94E-05	1.56E-03	RHOB	220.468	-1.562	6.00E-09	8.80E-07
STK38L	1412.060	-0.727	9.07E-05	5.86E-03	UFSP2	498.172	-1.565	4.44E-11	8.70E-09
PROX1	1545.249	-0.734	1.67E-05	1.38E-03	GCH1	76.340	-1.572	4.23E-06	4.19E-04
ARHGEF3	1624.495	-0.739	5.06E-05	3.65E-03	PTGES3	619.522	-1.577	1.02E-10	1.90E-08
RLF	2115.267	-0.747	3.53E-06	3.55E-04	IFRD1	1111.665	-1.584	9.85E-12	2.09E-09
RNF139	191.619	-0.758	4.66E-06	4.54E-04	TMEM184C	530.230	-1.590	2.59E-10	4.59E-08
ABHD3	472.577	-0.768	7.30E-05	4.88E-03	TMEM198	357.453	-1.637	1.44E-11	2.99E-09
RBM22	165.448	-0.790	5.34E-06	5.04E-04	CCDC61	276.360	-1.655	3.14E-14	9.27E-12
HMCES	199.301	-0.799	3.45E-05	2.61E-03	DDIT4	67.106	-1.668	1.13E-05	9.92E-04
MTCH1	329.455	-0.800	1.38E-04	8.47E-03	COQ10B	117.908	-1.677	1.07E-10	1.98E-08
CLCN3	2147.890	-0.815	3.44E-05	2.61E-03	FTL	140.398	-1.694	1.48E-08	2.13E-06
TCEAL6	72.265	-0.819	7.72E-05	5.10E-03	HOMER1	3336.401	-1.714	8.36E-10	1.38E-07
TPT1	336.150	-0.822	6.11E-05	4.23E-03	EIF2AK3	1144.435	-1.718	2.97E-10	5.14E-08
ZBTB21	228.032	-0.823	9.51E-06	8.45E-04	INSIG1	349.355	-1.733	1.59E-09	2.52E-07
USP28	2229.297	-0.836	1.36E-05	1.15E-03	CHORDC1	771.156	-1.748	1.86E-11	3.77E-09
PDE7A	3084.356	-0.839	4.78E-06	4.63E-04	NCALD	129.180	-1.756	3.36E-05	2.57E-03

PPP2CA	777.730	-0.845	5.68E-09	8.46E-07	HSPD1	431.085	-1.772	2.95E-10	5.14E-08
PIGH	157.066	-0.845	3.58E-05	2.69E-03	CD83	176.355	-1.790	1.73E-15	5.67E-13
BZW1	145.806	-0.853	6.05E-06	5.65E-04	SYAP1	405.388	-1.793	1.65E-15	5.50E-13
ECD	585.982	-0.855	2.14E-05	1.70E-03	ZNF141	1183.540	-1.826	4.91E-13	1.20E-10
ZNF304	159.500	-0.857	3.31E-05	2.54E-03	UBB	57.668	-1.832	3.21E-08	4.46E-06
DNAJC27	373.056	-0.858	3.14E-07	3.93E-05	TCEAL9	86.349	-1.852	6.08E-10	1.02E-07
ARG2	1107.387	-0.868	3.78E-05	2.82E-03	DNAJB4	866.020	-1.858	7.27E-15	2.30E-12
FNDC3B	992.862	-0.871	5.16E-06	4.90E-04	NAMPT	1000.443	-1.863	8.91E-11	1.69E-08
FKBP4	494.688	-0.875	5.52E-05	3.89E-03	ABRA	130.046	-1.870	1.10E-09	1.75E-07
NARS2	1301.547	-0.878	7.08E-06	6.48E-04	PNPLA8	1338.913	-1.879	1.96E-14	5.99E-12
STMN4	659.070	-0.888	6.50E-06	6.04E-04	PTP4A1	447.034	-1.883	3.22E-13	8.18E-11
SBDS	163.743	-0.893	9.06E-05	5.86E-03	C4orf33	623.642	-1.897	9.59E-10	1.57E-07
CASP3	749.428	-0.896	1.92E-05	1.56E-03	NFIL3	103.369	-1.913	6.44E-12	1.40E-09
BTG1	342.032	-0.900	1.75E-05	1.44E-03	ZNF184	468.534	-1.923	6.10E-12	1.34E-09
RHEB	983.068	-0.901	1.40E-07	1.82E-05	NDEL1	848.764	-1.924	7.52E-13	1.78E-10
GNL3	177.223	-0.904	5.43E-12	1.22E-09	CTH	138.050	-1.963	9.00E-11	1.69E-08
MAGT1	145.958	-0.906	8.09E-05	5.33E-03	HSPA8	2197.083	-1.983	2.05E-13	5.44E-11
VPS37B	382.189	-0.916	4.92E-06	4.74E-04	CRYM-AS1	50.232	-2.006	1.42E-05	1.19E-03
HSD17B12	3765.986	-0.918	2.17E-05	1.72E-03	NKRF	459.367	-2.021	1.24E-15	4.29E-13
SF3B4	162.476	-0.922	4.41E-06	4.34E-04	DNAJA1	428.707	-2.042	8.05E-16	2.85E-13
MLLT11	525.918	-0.932	3.72E-07	4.57E-05	TCEAL5	183.612	-2.043	1.44E-28	1.08E-25
SRSF3	732.944	-0.941	3.91E-07	4.77E-05	DNAJA4	975.754	-2.057	1.27E-15	4.31E-13
HTR5A	248.180	-0.944	8.22E-05	5.39E-03	TOB1	300.715	-2.109	7.00E-20	3.51E-17
SGMS2	183.235	-0.962	1.91E-05	1.56E-03	NAMA	108.441	-2.135	8.34E-13	1.93E-10
MAPRE2	5188.446	-0.966	1.01E-09	1.65E-07	CCNH	1118.384	-2.176	1.15E-13	3.10E-11
NEAT1	5546.952	-0.971	5.83E-05	4.06E-03	UBC	239.133	-2.201	7.65E-17	2.80E-14
MBOAT7	127.492	-0.974	4.64E-05	3.37E-03	SLC7A5	188.435	-2.242	6.55E-06	6.06E-04
JDP2	564.347	-0.978	2.20E-05	1.73E-03	TIPARP	248.559	-2.253	1.02E-11	2.13E-09
RANBP2	2169.147	-0.978	1.47E-06	1.57E-04	HSP90AA1	6952.285	-2.356	6.65E-13	1.60E-10
MYLIP	179.061	-0.981	2.68E-05	2.08E-03	PRMT9	871.569	-2.480	2.82E-13	7.26E-11
HSPA4L	1163.520	-0.987	1.04E-04	6.61E-03	PDLIM3	186.650	-2.507	1.58E-06	1.68E-04
WDR45B	594.371	-0.993	4.51E-09	6.77E-07	TCEAL7	154.835	-2.535	1.84E-26	1.18E-23
ZFAND5	1078.857	-0.994	5.43E-05	3.85E-03	ZNF10	1231.938	-2.539	4.68E-19	1.97E-16
RRNAD1	171.158	-0.998	9.36E-07	1.05E-04	ZFAND2A	107.129	-2.573	5.99E-40	7.20E-37
TEX14	139.757	-1.000	9.77E-07	1.09E-04	HIST2H2BF	728.823	-2.593	4.35E-23	2.53E-20
NFKBID	127.328	-1.002	4.50E-05	3.29E-03	JUN	226.853	-2.650	7.88E-14	2.15E-11
TM2D2	114.394	-1.011	1.26E-06	1.36E-04	ZNRD1	104.925	-2.732	5.96E-43	1.08E-39
USPL1	849.648	-1.024	1.67E-08	2.35E-06	TNFSF9	57.260	-2.840	3.56E-29	2.79E-26
RAB33A	113.715	-1.025	1.99E-05	1.60E-03	TFRC	1085.953	-2.866	9.69E-19	3.97E-16
SLC2A13	1670.258	-1.026	3.09E-05	2.39E-03	HSPE1-MOB4	173.395	-2.904	4.42E-19	1.90E-16
PTPRN	667.045	-1.026	3.73E-05	2.79E-03	HIST2H2BE	193.981	-2.923	1.99E-19	9.18E-17
GTF2B	348.417	-1.028	2.03E-05	1.62E-03	CRYAB	386.801	-2.945	2.32E-34	1.99E-31
C14orf1	123.632	-1.031	9.22E-07	1.05E-04	BAG3	541.609	-2.955	4.93E-18	1.89E-15
CRY1	3023.061	-1.041	2.63E-06	2.70E-04	UAP1	679.176	-3.067	2.18E-35	2.07E-32
NUDC	203.649	-1.050	5.86E-07	6.91E-05	CSRNP1	83.832	-3.142	4.62E-15	1.49E-12
ZNF891	169.431	-1.052	5.11E-06	4.90E-04	SLC2A3	655.509	-3.214	7.27E-61	2.62E-57
JMY	2627.653	-1.053	1.57E-07	2.03E-05	SELK	146.632	-3.280	2.95E-38	3.13E-35
JOSD1	256.814	-1.057	3.55E-06	3.55E-04	BTG2	594.298	-3.307	1.71E-39	1.93E-36
HERPUD1	245.474	-1.062	7.29E-12	1.56E-09	CYCS	509.540	-3.438	2.55E-40	3.28E-37
ARF4	715.355	-1.068	7.92E-06	7.14E-04	NR4A2	986.740	-3.531	1.69E-21	9.24E-19
CYSTM1	416.800	-1.090	7.61E-05	5.05E-03	ANKRD37	93.425	-3.557	6.46E-27	4.32E-24
FEM1C	1909.695	-1.091	1.93E-05	1.56E-03	FOSL2	401.878	-3.704	5.92E-14	1.69E-11
RGS7BP	1867.009	-1.091	9.88E-07	1.10E-04	BCAS2	476.899	-3.888	.34E-101	2.01E-97

CLK1	849.898	-1.102	1.31E-05	1.13E-03	EIF4A3	278.631	-3.994	.02E-115	.72E-111
RASL11B	83.896	-1.113	4.42E-07	5.28E-05	PPP1R15A	96.321	-4.138	3.49E-66	1.57E-62
AHSA1	157.727	-1.128	1.32E-05	1.14E-03	DUSP1	363.240	-4.180	1.75E-31	1.44E-28
HECA	402.594	-1.146	1.86E-08	2.60E-06	RGS2	156.965	-4.187	1.20E-58	3.62E-55
C2orf69	371.958	-1.165	1.53E-08	2.20E-06	HIST1H2BD	575.717	-4.196	1.24E-55	3.20E-52
KLHL15	316.023	-1.168	4.70E-08	6.37E-06	NR4A3	1009.149	-4.337	4.69E-11	9.10E-09
CDADC1	366.944	-1.173	4.43E-06	4.34E-04	ZNF331	7274.277	-4.338	9.41E-28	6.79E-25
GOT1	817.945	-1.181	1.36E-05	1.15E-03	DNAJB1	575.178	-4.628	3.59E-44	7.19E-41
MORF4L2	956.904	-1.186	2.15E-10	3.84E-08	ATF3	104.384	-5.269	2.56E-36	2.56E-33
ZNF711	420.374	-1.187	1.34E-05	1.14E-03	NR4A1	697.801	-5.330	5.63E-12	1.25E-09
BTAF1	2714.626	-1.209	1.09E-10	1.98E-08	EGR1	1085.415	-6.047	1.06E-42	1.74E-39
DEDD2	146.087	-1.217	1.04E-05	9.21E-04	HSPA1B	1043.895	-6.097	1.06E-41	1.47E-38
ETV3	121.646	-1.217	1.96E-09	3.08E-07	HSPH1	2891.362	-6.265	3.37E-42	5.07E-39
PRNP	2239.768	-1.227	1.60E-05	1.33E-03	HSPA1A	1867.480	-7.238	.33E-121	.40E-117
P4HA1	1013.882	-1.229	5.85E-09	8.64E-07	FOS	689.775	-7.902	1.80E-19	8.54E-17
AVPI1	95.334	-1.237	2.63E-09	4.09E-07	FOSB	305.432	-8.230	1.84E-21	9.74E-19
RBM7	181.059	-1.241	5.04E-08	6.79E-06	NPAS4	1337.014	-9.059	1.73E-25	1.08E-22
NAF1	552.597	-1.254	1.07E-09	1.73E-07	HSPB1	54.110	-9.282	1.68E-45	3.79E-42

[00322] An overlapping but weaker response that included 136 differentially induced genes (adjusted p <0.01, baseMean > 50) was present in glial cells. Results are shown in Table 57.

Table 57. Differentially expressed genes in glia

Gene	Base Mean	Log2 Change	p-value	padj	Gene	Base Mean	Log2 Change	p-value	padj
HSP90AA1	8051.585	-2.662	9.43E-38	3.67E-34	HEY2	435.768	-1.292	2.01E-09	5.83E-07
ELOVL5	6044.686	-2.808	4.28E-21	4.63E-18	PTP4A1	410.695	-1.982	9.33E-13	4.43E-10
ARIH1	4282.811	-0.847	6.39E-05	8.07E-03	NR4A1	401.179	-5.257	1.40E-39	6.80E-36
GLUD1	3498.846	-0.698	5.66E-05	7.30E-03	UAP1	400.390	-2.781	8.72E-40	5.66E-36
FDFT1	2492.867	-1.303	3.12E-08	7.88E-06	SLC25A3	399.813	-0.863	6.57E-05	8.20E-03
P4HA1	2441.044	-1.274	9.81E-08	2.33E-05	TOB1	399.348	-1.711	1.04E-16	7.50E-14
ESYT2	2103.778	-0.804	2.51E-07	5.42E-05	FOS	395.865	-4.458	1.10E-06	2.01E-04
HSPH1	2050.224	-4.197	4.79E-41	4.66E-37	GABARAPL1	382.667	-1.262	1.93E-08	5.14E-06
MXD1	2034.515	-2.471	2.14E-23	2.98E-20	BCAS2	372.249	-3.587	1.12E-48	2.19E-44
HSPA8	2012.773	-2.201	1.29E-13	6.78E-11	PER1	356.725	-1.308	5.35E-07	1.09E-04
TSC22D2	1985.386	-0.864	9.32E-06	1.35E-03	CACYBP	348.147	-1.809	2.00E-08	5.26E-06
HSP90AB1	1905.769	-1.333	2.92E-06	4.95E-04	TCP1	338.679	-1.199	2.05E-08	5.31E-06
TRA2B	1669.907	-0.926	2.58E-06	4.40E-04	C4orf33	327.163	-1.597	3.30E-10	1.09E-07
ZFP36L1	1619.793	-1.104	1.62E-05	2.19E-03	ETF1	325.587	-0.701	4.53E-06	7.35E-04
DNAJB6	1547.866	-1.579	1.26E-07	2.93E-05	UBC	325.079	-2.040	3.83E-09	1.05E-06
ZFAND5	1496.257	-1.603	1.34E-07	3.03E-05	HSPB1	315.023	-4.552	5.44E-17	4.42E-14
CRYAB	1440.147	-1.641	7.16E-06	1.11E-03	STIP1	299.597	-1.774	3.42E-07	7.09E-05
ZNF331	1437.541	-2.455	7.15E-15	4.64E-12	SOD1	294.080	-1.146	8.79E-06	1.31E-03
HMGCS1	1402.003	-2.585	1.10E-16	7.64E-14	STRAP	285.147	-0.776	4.17E-05	5.45E-03
RHEB	1393.603	-0.802	6.14E-05	7.81E-03	SIAH2	283.467	-1.346	7.45E-07	1.44E-04
SLC25A33	1356.974	-1.881	3.82E-11	1.51E-08	HIST2H2BF	263.990	-2.974	2.53E-24	4.11E-21
DNAJB4	1337.044	-1.647	4.71E-17	3.98E-14	BTG2	263.276	-1.991	9.21E-06	1.34E-03
INSIG1	1317.230	-2.258	7.15E-13	3.57E-10	HIGD1A	263.273	-0.641	4.88E-05	6.34E-03
IFRD1	1258.393	-1.207	4.54E-11	1.70E-08	IOSD1	260.472	-1.051	3.06E-06	5.14E-04
PTGES3	1212.490	-2.293	5.55E-15	3.72E-12	CYCS	257.575	-2.697	9.54E-26	1.86E-22
MSMO1	1189.790	-2.226	8.83E-10	2.73E-07	HERPUD1	254.675	-1.091	5.85E-10	1.90E-07
SLC25A18	1154.904	-1.440	1.47E-05	2.02E-03	NKRF	253.510	-1.526	6.01E-07	1.18E-04

CHORDC1	1030.967	-1.386	4.58E-08	1.14E-05	EGR1	253.290	-5.076	2.03E-24	3.60E-21
ZNF10	1024.343	-1.541	5.32E-11	1.92E-08	ALDH6A1	252.530	-0.762	9.14E-06	1.34E-03
ST13	1014.370	-1.119	2.60E-07	5.57E-05	JUN	251.501	-2.789	7.30E-24	1.09E-20
NDEL1	989.537	-1.711	1.54E-14	8.55E-12	SERPINH1	246.958	-4.987	7.15E-23	9.29E-20
SRSF3	958.528	-1.412	3.73E-11	1.51E-08	ATF3	240.601	-4.238	1.03E-14	6.30E-12
HSPA1A	929.640	-3.816	8.62E-15	5.41E-12	HIST1H2BD	222.156	-2.898	2.14E-19	2.08E-16
ERRFI1	900.528	-1.185	1.93E-07	4.26E-05	CSRNP1	210.207	-1.863	1.84E-09	5.53E-07
CYSTM1	889.632	-1.359	6.51E-08	1.58E-05	KLHL15	208.914	-1.380	3.11E-10	1.04E-07
ATP1B3	866.638	-1.389	1.03E-07	2.41E-05	NRBF2	206.863	-1.041	2.21E-06	3.82E-04
USPL1	846.906	-1.220	2.39E-10	8.32E-08	PNP	206.849	-1.690	5.70E-06	9.09E-04
ACO2	845.377	-1.027	7.85E-06	1.18E-03	PARD6G-AS1	204.794	-2.172	2.59E-12	1.15E-09
TIPARP	821.606	-1.230	5.52E-07	1.11E-04	NAPA	198.513	-1.682	8.82E-11	3.12E-08
BAG3	816.785	-2.235	2.07E-08	5.31E-06	AHSA1	195.613	-1.482	2.60E-05	3.47E-03
HSPA4	768.062	-1.455	4.69E-13	2.40E-10	ZFAND2A	189.453	-3.281	6.38E-17	4.97E-14
DNAJA4	753.981	-2.101	8.05E-10	2.53E-07	DUSP1	183.073	-2.146	1.76E-06	3.11E-04
HSPA9	752.754	-0.941	1.03E-05	1.47E-03	SLFN11	169.934	-1.264	7.50E-05	9.31E-03
MTCH1	742.823	-1.374	2.68E-09	7.67E-07	HIST2H2BE	160.703	-1.890	2.35E-11	9.72E-09
JDP2	739.497	-1.293	7.24E-06	1.11E-03	MBOAT7	158.353	-1.158	1.25E-05	1.77E-03
AZIN1	713.479	-1.003	1.28E-05	1.78E-03	COQ10B	155.826	-1.330	1.32E-07	3.02E-05
TRIM26	704.464	-0.945	1.86E-06	3.27E-04	GZF1	155.696	-0.962	1.67E-05	2.24E-03
HSPD1	699.334	-2.391	3.83E-33	1.24E-29	UBB	150.735	-2.195	1.00E-09	3.05E-07
MORF4L2	694.829	-1.221	6.95E-10	2.22E-07	DDIT3	140.294	-1.498	1.60E-05	2.18E-03
IDI1	669.446	-2.121	1.73E-26	3.74E-23	SELK	130.261	-3.204	8.73E-21	8.95E-18
CTH	651.226	-1.197	1.16E-05	1.65E-03	PPP1R15A	127.270	-5.066	9.22E-28	2.25E-24
OAT	623.811	-1.474	9.83E-12	4.25E-09	EIF4A3	111.800	-2.025	4.64E-11	1.71E-08
CCNH	592.219	-1.433	2.97E-09	8.27E-07	CD83	102.602	-1.651	1.95E-07	4.27E-05
HSPA4L	591.874	-1.787	8.95E-07	1.68E-04	MRPL18	101.327	-1.277	3.42E-06	5.69E-04
FKBP4	588.315	-1.754	1.12E-06	2.03E-04	MAFF	97.510	-1.408	1.27E-05	1.77E-03
HMGCR	578.327	-1.477	9.79E-07	1.81E-04	RGS2	89.715	-4.306	2.28E-22	2.77E-19
TMEM184C	567.269	-1.817	1.13E-14	6.45E-12	TM2D2	87.430	-1.384	2.66E-05	3.51E-03
SYAP1	516.846	-1.874	2.02E-18	1.79E-15	TCEAL9	87.242	-2.121	1.91E-09	5.63E-07
NR4A3	499.418	-3.566	7.90E-13	3.84E-10	RUVBL2	79.176	-2.076	2.83E-09	7.97E-07
DNAJB1	485.312	-3.405	8.35E-19	7.74E-16	TCEAL7	78.191	-1.817	1.64E-12	7.59E-10
DNAJA1	477.992	-2.033	1.37E-08	3.72E-06	ANKRD37	67.735	-1.509	9.05E-08	2.17E-05
SLC19A2	475.606	-1.489	2.63E-07	5.58E-05	SRGN	63.289	-2.390	7.28E-06	1.11E-03
HSPA1B	473.354	-3.970	1.03E-13	5.59E-11	FOSB	60.342	-7.121	2.53E-12	1.14E-09
TFRC	470.015	-1.879	1.10E-14	6.45E-12	GEM	59.972	-3.182	2.30E-11	9.72E-09
SNAPC1	452.474	-1.089	5.60E-07	1.11E-04	NR4A2	59.691	-2.772	4.95E-08	1.22E-05
HSPE1-MOB4	451.895	-4.139	8.48E-30	2.36E-26	NFKBID	58.178	-1.579	6.34E-06	1.00E-03
C2orf69	440.376	-1.096	8.97E-06	1.32E-03	AVPI1	55.589	-1.640	6.76E-07	1.32E-04
CASP3	439.607	-0.869	1.33E-06	2.38E-04	PCK1	50.725	-4.568	8.34E-07	1.58E-04

[00323] The induction of these genes in glia is not due to contamination by granule cells as highly expressed markers for granule cells (e.g. FAT2) was not present in the glial data. This is interesting because induction c-FOS expression by glutamate in glia was thought to occur via a different mechanism than that induced by increased activity in cultured granule neurons (Edling, et al. (2007) Glia 55, 328–340, which is hereby incorporated by reference herein in its entirety). Only two differentially expressed genes were evident in the basket cell data: Heat Shock Protein Family A (Hsp70) Member 1A (HSPA1A) (Base Mean: 102.303, $\log_2$ Fold Change: -3.234, p-

value: 1.07E-12, padj: 1.06E-08) and Ring Finger Protein 122 (RNF122) (Base mean: 96.812, log2 Fold Change: -1.552, p-value: 4.20E-06, padj: 0.008).

[00324] A stress response was observed to induce a group of genes in three out of the 16 samples and that are not explained by race, autolysis time, gender, or age. Gene expression is shown for Activity Regulated Cytoskeleton Associated Protein (Arc), Early Growth Response 1 (Egr1), c-Fos, FosB, Jun Proto-Oncogene, AP-1 Transcription Factor Subunit (Jun), JunB, and JunD Proto-Oncogene, AP-1 Transcription Factor Subunit (JunD) in FIG. 13A. Induction of fos genes and stress-associated genes was observed to be subtly cell-type specific as it primarily occurred in granule cells, although it also occurred in glia. Few changes in expression were observed in stellate cells.

[00325] About 355 genes were observed to be induced in three samples of granule cells, while 25 genes were observed to be down-regulated. Many of these genes were intermediate early genes that mark neuronal activity but there were also many long-term stress response genes that are induced, as shown in FIG. 13B. Examples of affected groups of genes include those involved in: regulation of cellular metabolic process, positive regulation of macromolecule, response to unfolded protein, response to topologically incorrect protein, protein folding, protein refolding, regulation of cellular response to heat, regulation of apoptotic process, positive regulation of biological process, and response to chemical stimuli.

[00326] Stress response genes, such as the activated astrocyte markers GFAP, S100B, Nes, and Musashi RNA Binding Protein 1 (Msi1) in glia, are shown in FIG. 13C. The only significant change observed in expression was in GFAP in fos- nuclei.

[00327] Samples WI, VM, and ZH were observed to have fos and stress response genes induced in glia and granule neurons, and to a lesser extent, stellate neurons. The three individuals that were observed to have induced gene expression of fos genes did not appear to have much in common in their clinical histories. The data show reproducible activation of this stress response pathway, which provides details on the biology related to disease.

[00328] Given the robust response evident in the granule cell data, GO analysis was performed to determine whether the 224 induced genes in these neurons were enriched for specific functional categories. Significantly enriched GO categories were identifed for the up-regulated genes in fos+ individuals revealing enrichment for genes involved in stress response and protein folding. This analysis revealed categories associated with responses to external stimuli, protein folding/refolding, apoptosis, transcriptional response to stress, ATPase activity, and RNA splicing/metabolism as shown in Table 58.

Table 58. Gene ontology results for significantly upregulated genes in granule cells

ID	Description	q-value	Gene Symbol(s)

GO:0006457	protein folding	1.66E-10	BAG3/CHORDC1/CRYAB/DNAJA1/DNAJA4/DNAJB1/DNAJB4/DNAJB6/FKBP4/HSP90AA1/HSPA1A/HSPA1B/HSPA4L/HSPA8/HSPB1/HSPD1/HSPH1/NUDC/PTGES3/RANBP2/UBB/UBC
GO:1900034	regulation of cellular response to heat	4.86E-10	BAG3/CHORDC1/CRYAB/DNAJB1/DNAJB6/FKBP4/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPH1/NUP58/PTGES3/RANBP2
GO:0009408	response to heat	6.39E-10	BAG3/CHORDC1/CRYAB/DNAJA1/DNAJA4/DNAJB1/DNAJB4/DNAJB6/FKBP4/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPD1/HSPH1/NUP58/PTGES3/RANBP2
GO:0009266	response to temperature stimulus	1.33E-09	BAG3/CHORDC1/CRYAB/DNAJA1/DNAJA4/DNAJB1/DNAJB4/DNAJB6/EIF2AK3/FKBP4/FOS/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPD1/HSPH1/NUP58/PTGES3/RANBP2
GO:0035966	response to topologically incorrect protein	4.55E-09	ATF3/CTH/DNAJA1/DNAJB1/DNAJB4/EIF2AK3/HERPUD1/HSP90AA1/HSPA1A/HSPA4/HSPA4L/HSPA8/HSPB1/HSPD1/HSPH1/KLHL15/PPP1R15A/SERP1
GO:0006986	response to unfolded protein	7.15E-09	ATF3/CTH/DNAJA1/DNAJB1/DNAJB4/EIF2AK3/HERPUD1/HSP90AA1/HSPA1A/HSPA4/HSPA4L/HSPA8/HSPB1/HSPD1/HSPH1/PPP1R15A/SERP1
GO:0034605	cellular response to heat	2.91E-08	BAG3/CHORDC1/CRYAB/DNAJB1/DNAJB6/FKBP4/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPH1/NUP58/PTGES3/RANBP2
GO:0042026	protein refolding	6.81E-08	DNAJA4/DNAJB1/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPD1/PTGES3
GO:0090084	negative regulation of inclusion body assembly	2.71E-05	DNAJA4/DNAJB1/DNAJB6/HSPA1A/HSPA1B
GO:0097201	negative regulation of transcription from RNA polymerase II promoter in response to stress	6.66E-05	BAG3/DNAJB1/HSPA1A/JUN/PPP1R15A
GO:0006979	response to oxidative stress	1.06E-04	CASP3/CRYAB/CYCS/DUSP1/FOS/GCH1/HSPA1A/HSPA1B/HSPB1/HSPD1/HSPH1/JUN/NR4A2/NR4A3/OXSR1/PRNP/PTPRN/RHOB/TRA2B
GO:0033120	positive regulation of RNA splicing	1.64E-04	EIF4A3/HSPA1A/HSPA8/RBM22/SF3B4/TRA2B
GO:0090083	regulation of inclusion body assembly	1.69E-04	DNAJA4/DNAJB1/DNAJB6/HSPA1A/HSPA1B
GO:0061077	chaperone-mediated protein folding	1.73E-04	CHORDC1/DNAJB1/FKBP4/HSPA8/HSPB1/HSPD1/HSPH1/PTGES3
GO:0031647	regulation of protein stability	1.73E-04	ATP1B3/BAG3/CCNH/CRYAB/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPD1/MYLIP/PRNP/PTGES3/RNF139/USP28
GO:0097193	intrinsic apoptotic signaling pathway	2.25E-04	CASP3/CYCS/DDIT4/DNAJA1/EIF2AK3/HERPUD1/HSPA1A/HSPB1/HSPH1/JMY/MLLT11/PPP1R15A/TPT1/UBB/USP28
GO:0051131	chaperone-mediated protein complex assembly	2.48E-04	HSP90AA1/HSPA1A/HSPA4/HSPD1/PTGES3
GO:1903313	positive regulation of mRNA metabolic process	2.72E-04	BTG2/EIF4A3/HSPA1A/HSPA8/SF3B4/TOB1/TRA2B
GO:0000302	response to reactive oxygen species	4.71E-04	CASP3/CRYAB/CYCS/DUSP1/FOS/GCH1/HSPD1/HSPH1/JUN/NR4A3/PTPRN/RHOB/TRA2B
GO:0061469	regulation of type B pancreatic cell proliferation	4.74E-04	ERRFI1/NR4A1/NR4A3/PTPRN
GO:0043484	regulation of RNA splicing	5.68E-04	CLK1/EIF4A3/HSPA1A/HSPA8/RBM22/RBM7/SF3B4/SRSF3/TRA2B
GO:0070841	inclusion body assembly	5.68E-04	DNAJA4/DNAJB1/DNAJB6/HSPA1A/HSPA1B

GO:0050685	positive regulation of mRNA processing	8.59E-04	EIF4A3/HSPA1A/HSPA8/SF3B4/TRA2B
GO:0043618	regulation of transcription from RNA polymerase II promoter in response to stress	9.18E-04	ATF3/BAG3/DNAJB1/EGR1/HSPA1A/JUN/PPP1R15A/UBB/UBC
GO:0032781	positive regulation of ATPase activity	1.10E-03	AHSA1/ATP1B3/DNAJA1/DNAJB1/DNAJB4/DNAJB6
GO:0043620	regulation of DNA-templated transcription in response to stress	1.16E-03	ATF3/BAG3/DNAJB1/EGR1/HSPA1A/JUN/PPP1R15A/UBB/UBC
GO:0051085	chaperone mediated protein folding requiring cofactor	1.16E-03	DNAJB1/HSPA8/HSPD1/HSPH1
GO:0048545	response to steroid hormone	1.31E-03	CASP3/CRY1/DDIT4/DNAJA1/DUSP1/ERRFI1/FKBP4/FOS/FOSB/GOT1/HSPD1/NPAS4/NR4A1/NR4A2/NR4A3/UFSP2
GO:1903311	regulation of mRNA metabolic process	2.47E-03	BTG2/EIF4A3/HSPA1A/HSPA8/RBM7/SF3B4/SRSF3/TOB1/TRA2B
GO:0048026	positive regulation of mRNA splicing, via spliceosome	2.59E-03	EIF4A3/HSPA8/SF3B4/TRA2B
GO:1903320	regulation of protein modification by small protein conjugation or removal	2.79E-03	CRY1/DCUN1D3/DNAJA1/EGR1/GNL3/HERPUD1/HSP90AA1/HSPA1A/HSPA1B/RNF139/SIAH2/UBB/UBC
GO:2001233	regulation of apoptotic signaling pathway	3.11E-03	ATF3/CTH/DEDD2/DNAJA1/EIF2AK3/HERPUD1/HSPA1A/HSPA1B/HSPB1/HSPH1/MLLT11/NR4A2/SIAH2/TPT1/UBB
GO:0051084	'de novo' posttranslational protein folding	3.88E-03	DNAJB1/HSPA8/HSPD1/HSPH1
GO:0051384	response to glucocorticoid	4.41E-03	CASP3/DDIT4/DUSP1/ERRFI1/FOS/FOSB/GOT1/HSPD1/NPAS4
GO:0050821	protein stabilization	4.47E-03	ATP1B3/BAG3/CCNH/CRYAB/HSP90AA1/HSPA1A/HSPA1B/HSPD1/PTGES3
GO:0044342	type B pancreatic cell proliferation	4.47E-03	ERRFI1/NR4A1/NR4A3/PTPRN
GO:0010035	response to inorganic substance	4.93E-03	CACYBP/CASP3/CRYAB/DUSP1/EIF2AK3/EIF4A3/FOS/FOSB/GCH1/HOMER1/HSPD1/HSPH1/JUN/NEDD4L/NR4A3/PRNP/RHOB
GO:0043462	regulation of ATPase activity	5.51E-03	AHSA1/ATP1B3/DNAJA1/DNAJB1/DNAJB4/DNAJB6
GO:0036499	PERK-mediated unfolded protein response	6.25E-03	ATF3/EIF2AK3/HERPUD1/PPP1R15A
GO:0042542	response to hydrogen peroxide	7.78E-03	CASP3/CRYAB/DUSP1/HSPD1/HSPH1/JUN/NR4A3/RHOB
GO:0031960	response to corticosteroid	8.17E-03	CASP3/DDIT4/DUSP1/ERRFI1/FOS/FOSB/GOT1/HSPD1/NPAS4
GO:0051082	unfolded protein binding	3.24E-07	CRYAB/DNAJA1/DNAJA4/DNAJB1/DNAJB4/DNAJB6/HSP90AA1/HSPA1A/HSPA1B/HSPA8/HSPD1/NUDC/PTGES3
GO:0031072	heat shock protein binding	3.24E-07	CHORDC1/DNAJA1/DNAJA4/DNAJB1/DNAJB6/EIF2AK3/FKBP4/HSPA1A/HSPA1B/HSPA8/PTGES3/STIP1
GO:0060590	ATPase regulator activity	1.77E-06	AHSA1/ATP1B3/BAG3/DNAJA1/DNAJB1/DNAJB4/DNAJB6/HSPH1
GO:0051087	chaperone binding	8.72E-06	AHSA1/BAG3/DNAJA1/DNAJA4/DNAJB1/DNAJB4/DNAJB6/HSPD1/PRNP/STIP1

GO:0001671	ATPase activator activity	1.88E-05	AHSA1/ATP1B3/DNAJA1/DNAJB1/DNAJB4/DNAJB6

[00329] Analysis of immediate early gene expression indicated that their induction is also selective. For example, induction of EGR1, FOS, and FOSB occurs, but no difference in expression of ARC (a well-characterized immediate early gene) is evident (FIG. 12). Furthermore, although expression of immediate early genes such as c-FOS can become induced in response to damage such as ischemic stroke, no evidence was found for induction of glial genes such as GFAP and S100B that mark astrocyte activation in response to stroke and other forms of damage to the brain (Choudhury, et al. (2016) Neurobiology of Disease 85, 234–244; Ding, S. (2014) Neural Regen Res 9, 2048–2052; Dirnagl, et al. (1999) Trends in Neurosciences 22, 391–397; Kajihara, et al. (2001) Brain Research 909, 92–101; Pekny, M., et al. (2005) Glia 50, 427–434; each of which is hereby incorporated by reference herein in its entirety).

[00330] Finally, examination of the clinical records failed to reveal features (gender, age, cause of death) that distinguished these three individuals in FIG. 12 from the 13 other control donors. Although the cause or causes of these molecular events remain obscure, the discovery of this strong and highly reproducible stress response in select post-mortem human brain samples suggests the presence of an occult clinical condition and indicate that analysis of specific cell types using the cellular profiling technique described herein can be used to discover pathways and biomarkers associated with human pathophysiological conditions.

Example 23. Staining and sorting nuclei with RNA or DNA probes

[00331] Antibodies often have non-specific targets and may become rate-limiting for expanding the cellular profiling technique described herein to more cell types. An alternative to using antibodies for labeling is to use RNA probes against cell-type specific nucleic acid transcripts. RNA probes are faster and easier to synthesize than antibodies. RNA probes are designed against two classes of transcripts. The first are chromosomal associated transcripts (CATs) – transcripts held at the chromosome while being synthesized. The second class of nucleic acid transcripts are the polyA+ transcripts that are abundant in the ER adjacent to the nucleus. To characterize variability across individuals, gene expression profiles were generated for unsorted nuclei from a few regions of the human brain, and then candidate CAT and polyA+ transcripts were identified. Using in situ hybridization in tissue sections, genes that delineate specific cell types were identified by anatomy and morphology. Antibodies or RNA probes against these candidates were used to label and sort for nuclei from human cell types without the need for prior knowledge from mouse data to determine the amount of variation in gene expression across the population.

[00332] CATs have a unique labeling pattern of two spots at the two chromosomal sites of synthesis, which were observed to be highly specific with low background using *in situ* hybridization. FIG. 14 provides RNAseq results of CATs. A2m is a CAT specific to Bergmann glia, Itpr1 is a CAT specific to Purkinje cells, and Fat2 is a CAT specific to Granule cells. Therefore, cell-type specific CATs can be detected from a RNAseq profile from all cerebellar nuclei. Based on the *in situ* hybridization results for CATs and polyA+ transcripts labeled using RNA probes and extensive knowledge of labeling nuclei for FACS, RNA probes may be designed for any cell type.

Equivalents and Scope

[00333] Those skilled in the art will recognize or be able to ascertain using no more than routine experimentation, many equivalents to the specific embodiments in accordance with the invention described herein. The scope of the present invention is not intended to be limited to the above Description, but rather is as set forth in the appended claims.

[00334] In the claims, articles such as "a," "an," and "the" may mean one or more than one unless indicated to the contrary or otherwise evident from the context. Claims or descriptions that include "or" between one or more members of a group are considered satisfied if one, more than one, or all of the group members are present in, employed in, or otherwise relevant to a given product or process unless indicated to the contrary or otherwise evident from the context. The invention includes embodiments in which exactly one member of the group is present in, employed in, or otherwise relevant to a given product or process. The invention includes embodiments in which more than one, or the entire group members are present in, employed in, or otherwise relevant to a given product or process.

[00335] It is also noted that the term "comprising" is intended to be open and permits but does not require the inclusion of additional elements or steps. When the term "comprising" is used herein, the term "consisting of" is thus also encompassed and disclosed.

[00336] Where ranges are given, endpoints are included. Furthermore, it is to be understood that unless otherwise indicated or otherwise evident from the context and understanding of one of ordinary skill in the art, values that are expressed as ranges can assume any specific value or subrange within the stated ranges in different embodiments of the invention, to the tenth of the unit of the lower limit of the range, unless the context clearly dictates otherwise.

[00337] In addition, it is to be understood that any particular embodiment of the present invention that falls within the prior art may be explicitly excluded from any one or more of the claims. Since such embodiments are deemed to be known to one of ordinary skill in the art, they may be excluded even if the exclusion is not set forth explicitly herein. Any particular embodiment of the compositions of the invention (e.g., any antibiotic, therapeutic or active

ingredient; any method of production; any method of use; etc.) can be excluded from any one or more claims, for any reason, whether or not related to the existence of prior art.

[00338] It is to be understood that the words which have been used are words of description rather than limitation, and that changes may be made within the purview of the appended claims without departing from the true scope and spirit of the invention in its broader aspects.

[00339] While the present invention has been described at some length and with some particularity with respect to the several described embodiments, it is not intended that it should be limited to any such particulars or embodiments or any particular embodiment, but it is to be construed with references to the appended claims so as to provide the broadest possible interpretation of such claims in view of the prior art and, therefore, to effectively encompass the intended scope of the invention.

CLAIMS

1. A method profiling the gene expression of a nucleus, the method comprising:
   (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
   (b) labeling at least one nucleus from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein unique to the nucleus of at least one cell type contained in the tissue sample, wherein the nucleic acid transcript or protein is encoded by a gene selected from Tables 19-24;
   (c) purifying at least one labeled nucleus; and
   (d) collecting nucleic acid transcript and/or protein expression data for the labeled nucleus, thereby profiling the gene expression of the nucleus.

2. The method of claim 1, wherein the cell type originates in cerebellar tissue, and is selected from the group consisting of: granule cells, Purkinje cells, glia, Bergmann glia, dopaminergic neurons, basket/stellate cells, astrocytes, brainstem motor neurons, oligodendrocytes, upper motor neurons, lower motor neurons, and cerebellar deep nuclei.

3. The method of any one of claim 1 or 2, wherein the protein is a transcription factor localized within the nuclei.

4. The method of claim 1, wherein the cell type originates in basal ganglia tissue, and is selected from the group consisting of: striatonigral medium-sized spiny neurons (MSNs), striatopallidal MSNs, striatal cholinergic interneurons, subthalamic nucleus, dopaminergic neurons, and bed nucleus of the stria terminalis (BNST) neurons.

5. The method of claim 1, wherein the cell type originates in thalamus tissue, and is selected from the group consisting of: thalamocortical neurons, thalamostriatal neurons, and thalamic reticular nucleus neurons.

6. The method of claim 1, wherein the cell type originates in cortex tissue, and is selected from the group consisting of corticostriatal neurons, entorhinal cortex layer 2/3 neurons, fast-spiking cortical interneurons, and layer 2/3 pyramidal cells from pre-frontal cortex tissue.

7. The method of claim 1, wherein the cell type is cholinergic projection neurons from medial habenula tissue of a pineal gland.

8. The method of claim 1, wherein the cell type originates in hippocampus tissue, and is selected from the group consisting of: cornu ammonis region 1 (CA1), cornu ammonis region 2 (CA2), cornu ammonis region 3 (CA3), and dentate gyrus cells.

9. The method of claim 1, wherein the cell type originates in at least one tissue selected from the group consisting of: brain tissue, brain stem tissue, and spinal cord tissue.

10. A method of isolating granule cells, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by one of genes Itpr, NeuN, Cdh15, Calb2, Rbfox3, Neurod1, and Reln, wherein the nucleic acid transcript or protein is unique to the nuclei of granule cells; and
(c) purifying at least one labeled nucleus.

11. The method of claim 2, wherein the at least one labeled nucleus does not include a nucleic acid transcript encoded by Olig2.

12. A method of isolating Purkinje cells, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Pcp2, Pvalb, Cabl1, and Itpr1; and
(c) purifying at least one labeled nucleus.

13. A method of isolating Purkinje cells, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Lypd6, Pvalb, Kit, NeuN, Itpr, and Sorcs3; and
(c) purifying at least one labeled nucleus.

14. A method of isolating astrocytes and oligodendrocytes, the method comprising:
    (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
    (b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Olig2, Pdga, Cspg4, Mag, Mbp, and Mog; and
    (c) purifying at least one labeled nucleus.

15. A method of isolating astrocytes, the method comprising:
    (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
    (b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein encoded by one of genes Aldh1a1, Gfap, S110b, and Slc1a3; and
    (c) purifying at least one labeled nucleus.

16. A method of isolating basket cells, the method comprising:
    (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
    (b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by Sorcs3 and NeuN, wherein the combination of the nucleic acid transcript or protein encoded by Sorcs3 and is unique to the nuclei of basket cells; and
    (c) purifying at least one labeled nucleus.

17. A method of isolating dopaminergic neurons, the method comprising:
    (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
    (b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or protein encoded by FoxA1, Slc6a3, TH, FoxA2, or Drd2, wherein nucleic acid transcript or protein is unique to the nuclei of dopaminergic neurons; and
    (c) purifying at least one labeled nucleus.

18. A method of isolating brainstem motor neurons, the method comprising:
    (a) processing a tissue sample containing a plurality of cell types to expose nuclei;
    (b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with at least one affinity label that binds a nucleic acid transcript or

protein encoded by VaChT or ErrB, wherein nucleic acid transcript or protein is unique to the nuclei of brainstem motor neurons; and

(c) purifying at least one labeled nucleus.

19. The method of any one of claims 1-18, wherein the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe.

20. The method of any one of claims 10 or 12-18, further comprising:

(d) collecting nucleic acid transcript and/or protein transcript data for the labeled nucleus, thereby profiling the gene expression of the nucleus.

21. The method of any one of claims 1-9 or 20, further comprising:

(e) comparing gene expression of the nucleus to gene expression in at least one nucleus of the cell type from a different tissue sample to identify variability in gene expression, thereby obtaining a drug target.

22. The method of any one of claims 1-9 or 20, further comprising:

(e) comparing gene expression of the nucleus to gene expression in at least one nucleus of a different cell type to identify variability in gene expression, thereby obtaining a drug target.

23. The method of claim 19, the affinity label further comprising a fluorescent tag.

24. The method of claim 23, wherein fluorescence-activated cell sorting (FACS) is used to purify the nucleus.

25. The method of any one of claims 1-24, wherein the tissue sample is derived from a mammal.

26. The method of claim 25, wherein the mammal is selected from the group consisting of: a mouse, a human, a rat, and another non-human primate.

27. The method of any one of claim 21 or 22, wherein the tissue sample or the different tissue sample was frozen prior to isolation of the nucleus.

28. The method of any one of claim 21 or 22, wherein the tissue sample or the different tissue sample was fresh prior to isolation of the nuclei.

29. The method of any one of claim 21 or 22, wherein the tissue sample or the different tissue sample is derived from a female.

30. The method of any one of claim 21 or 22, wherein the tissue sample or the different tissue sample is derived from a male.

31. The method of any one of claims 1-18, wherein the nuclei is contiguous to an endoplasmic reticulum.

32. The method of any one of claims 1-18, wherein the protein is a membrane protein.

33. The method of claim 29, wherein the membrane protein is synthesized in the endoplasmic reticulum.

34. The method of claim 33, wherein the protein is localized in the endoplasmic reticulum.

35. The method of any one of claims 1-12, wherein the nucleic acid transcript is localized in the nuclei.

36. The method of claim 19, wherein the RNA probe specifically binds a chromosomal associated transcript (CAT) or a polyA transcript.

37. The method of claim 19, wherein the DNA probe specifically binds a transporter gene.

38. The method of claim 19, wherein the affinity label is more than one antibody, RNA probe, or DNA probe.

39. The method of claim 38, wherein each affinity label binds a different factor.

40. The method of claim 1-18, wherein the tissue sample is post-mortem.

41. The method of any one of claims 21 or 22, wherein the tissue sample or the different tissue sample originates from a diseased subject.

42. The method of any one of claims 21 or 22, wherein the tissue sample or the different tissue sample originates in a healthy subject.

43. The method of claim 41, wherein the diseased subject is affected by at least one condition selected from the group consisting of: ataxia, Parkinson's disease, Alzheimer's disease, and amyotrophic lateral sclerosis (ALS), and Huntington's disease.

44. The method of claim 43, wherein the cell type is associated with ataxia, and is selected from the group consisting of: Purkinje cells, granule cells, Bergmann glia, basket/stellate cells, astrocytes, oligodendrocytes, and cerebellar deep nuclei.

45. The method of claim 43, wherein the cell type is associated with Parkinson's Disease, and is selected from the group consisting of: substantia nigra and VTA dopaminergic neurons.

46. The method of claim 43, wherein the cell type is associated with Alzheimer's Disease, and is selected from: layer 2/3 entorhincortex, CA1 hippocampus, and CA2/3 hippocampus.

47. The method of claim 43, wherein the cell type is associated with ALS, and is selected from the group consisting of: brain stem, cortical motor neurons, and spinal cord motor neurons.

48. The method of claim 41, wherein the diseased subject is expressing a disease phenotype.

49. The method of claim 41, wherein the diseased subject is not expressing a disease phenotype.

50. The method of any one of claims 1-9 or 20, further comprising comparing profiling for a tissue sample originating from a diseased subject and a tissue sample from a healthy subject.

51. The method of any one of claims 1-9 or 20, further comprising comparing profiling for a tissue sample originating from at least two different healthy subjects.

52. The method of claim 19, wherein the more than one antibody, RNA probe, or DNA probe bind to the same factor.

53. The method of any one of claims 1-9 or 20, wherein profiling the gene expression is performed for a plurality of nuclei from a single cell type.

54. The method of any one of claims 1-9 or 20, wherein profiling the gene expression is performed for a plurality of nuclei from different cell types.

55. The method of claim 1, further comprising:
(e) identifying variability between disease stages by comparing profiling for a tissue sample from a diseased subject expressing a disease phenotype with profiling for a tissue sample from a diseased subject not expressing a disease phenotype.

56. The method of claim 21, further comprising:
(e) identifying variability among different subjects by comparing profiling for more than one tissue sample, wherein each tissue sample is from a different subject.

57. The method according to any one of claims 21 or 22, wherein the drug target is encoded by a gene selected from Tables 19-24.

58. A method of profiling epigenetic expression of a nucleus, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) isolating nuclei from the processed tissue sample by contacting the processed tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe;
(c) purifying at least one labeled nucleus; and
(d) collecting information regarding histone modifications, binding of transcription factors, and DNA modifications for the nucleus, thereby profiling the epigenetic expression.

59. A method of profiling nuclear architecture of a nucleus, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) isolating nuclei from the processed tissue sample by contacting the processed

tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is selected from the group consisting of an antibody, a RNA probe, and a DNA probe;

(c) purifying at least one labeled nucleus; and

(d) collecting information regarding chromosome conformation for the labeled nucleus, thereby profiling the nuclear architecture.

60. A method of profiling nuclear architecture of a nucleus, the method comprising:

(a) processing a tissue sample containing a plurality of cell types to expose nuclei;

(b) isolating nuclei from the processed tissue sample by contacting the processed tissue with an affinity label that binds a factor unique to at least one cell type, wherein the affinity label is an antibody;

(c) isolating gDNA from the nuclei;

(d) performing oxidative bisulfite sequencing;

(e) collecting chromosome conformation for the labeled nucleus, thereby profiling the nuclear architecture.

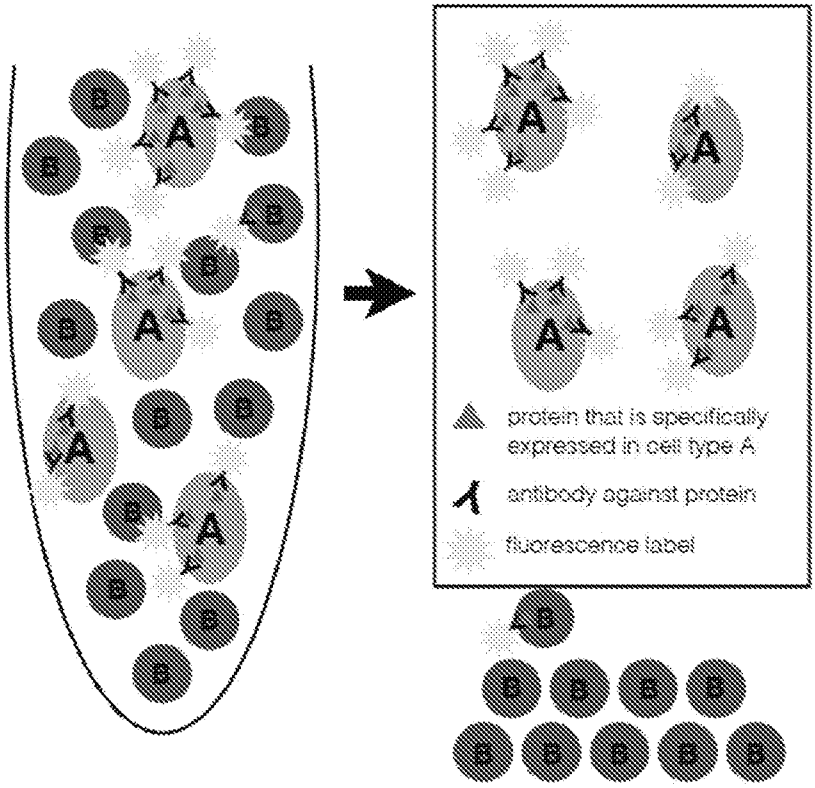
61. A method of isolating a nucleus from a single cell type, the method comprising:

(a) processing a tissue sample containing a plurality of cell types to expose nuclei;

(b) isolating nuclei from the processed tissue sample by contacting the processed tissue sample with more than two affinity labels specific to a unique combination of nucleic acid transcripts and/or proteins for the cell type, wherein each affinity label specifically binds a nucleic acid transcript comprising a sequence selected from SEQ ID NO: 1-28,815 or the affinity label specifically binds a protein comprising an amino acid sequence selected from 28,816-38,643; and

(c) purifying at least one labeled nucleus, thereby isolating the nucleus from the cell type.

FIG. 1


protein that is specifically expressed in cell type A
antibody against protein
fluorescence label

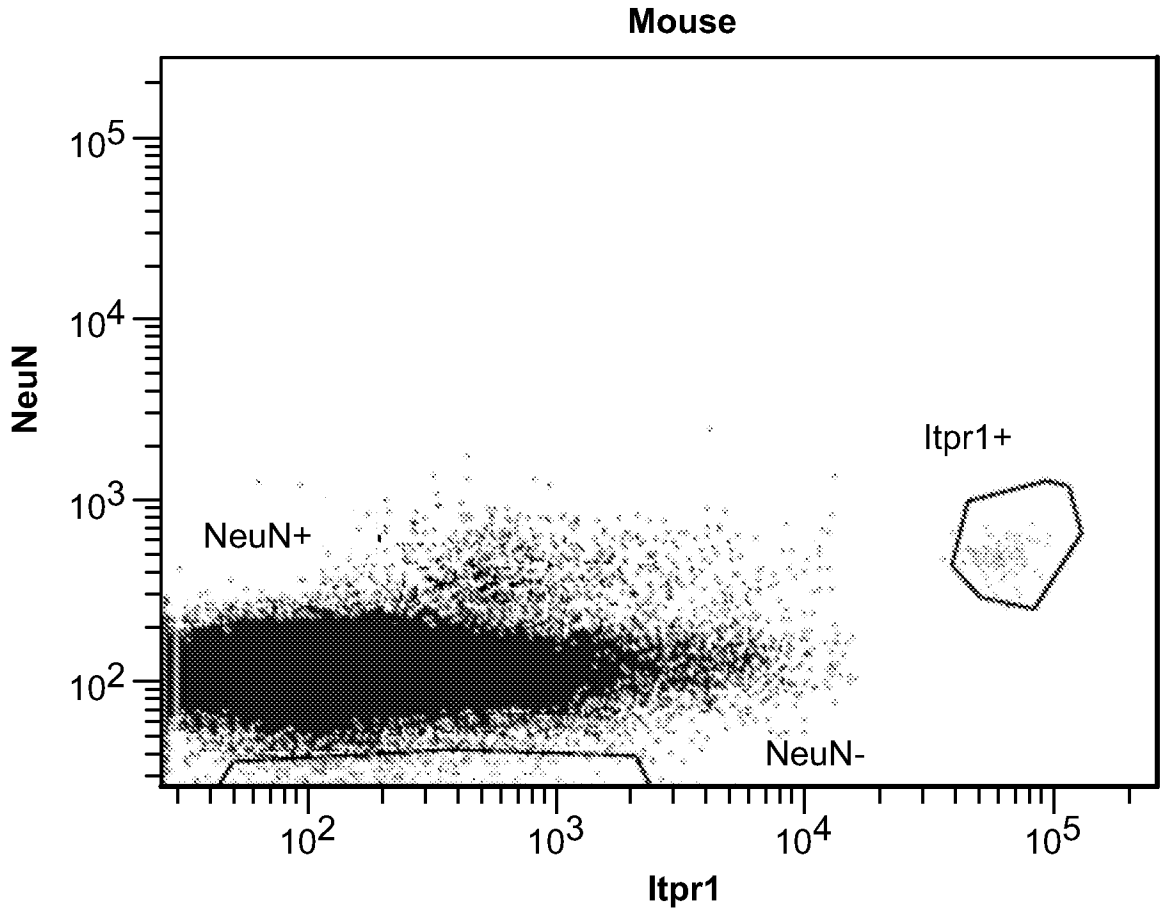
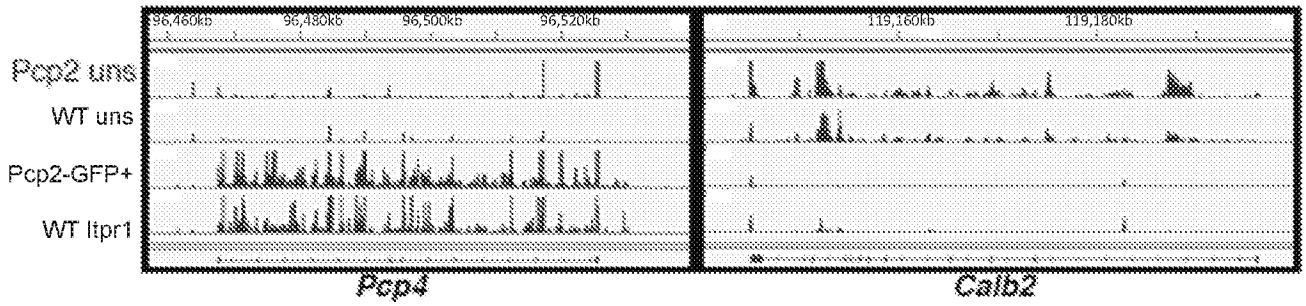


FIG. 2A

FIG. 2B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Pcp2-GFP+
WT Itpr1
Pcp4
Calb2

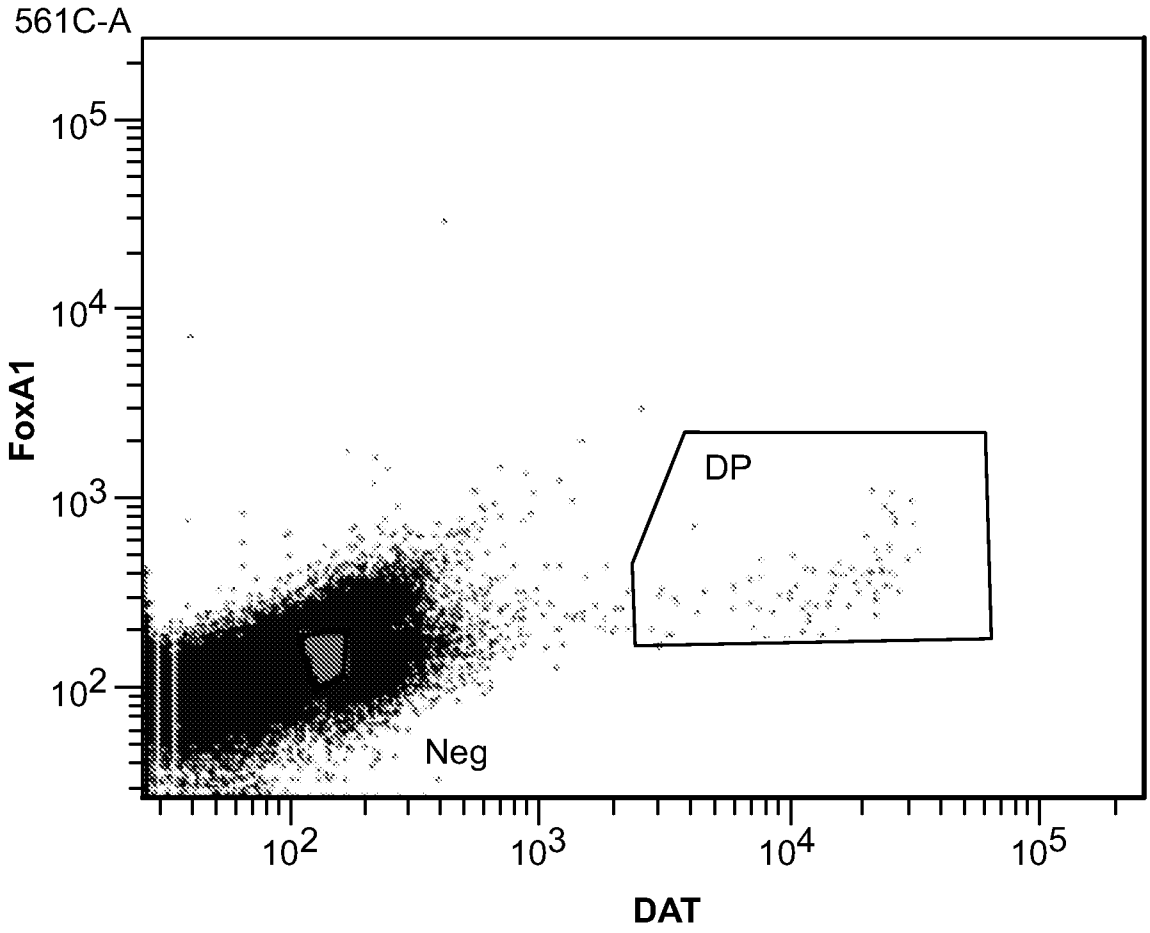


FIG. 3A

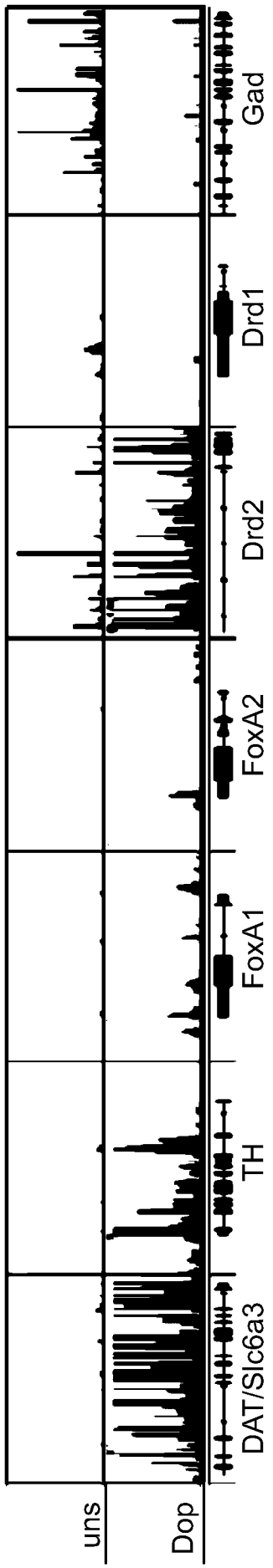
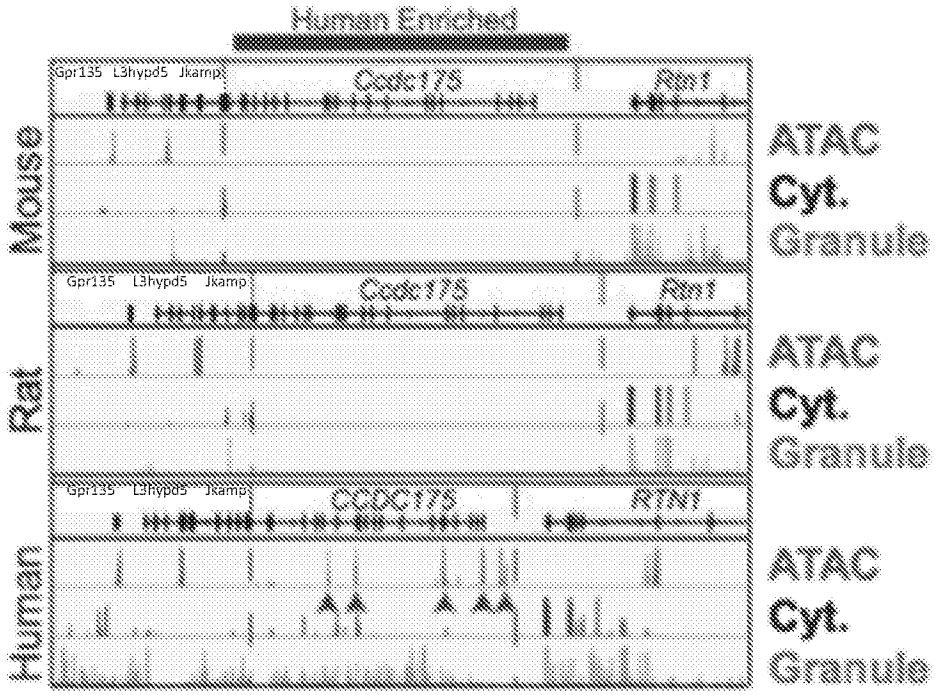


FIG. 3B

FIG. 4


Human Enriched
Gpr135 L3hypd5 Jkamp
Ccdc178
Ran1
Mouse
ATAC
Cyt.
Granule
Gpr135 L3hypd5 Jkamp
Ccdc178
Ran1
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Granule

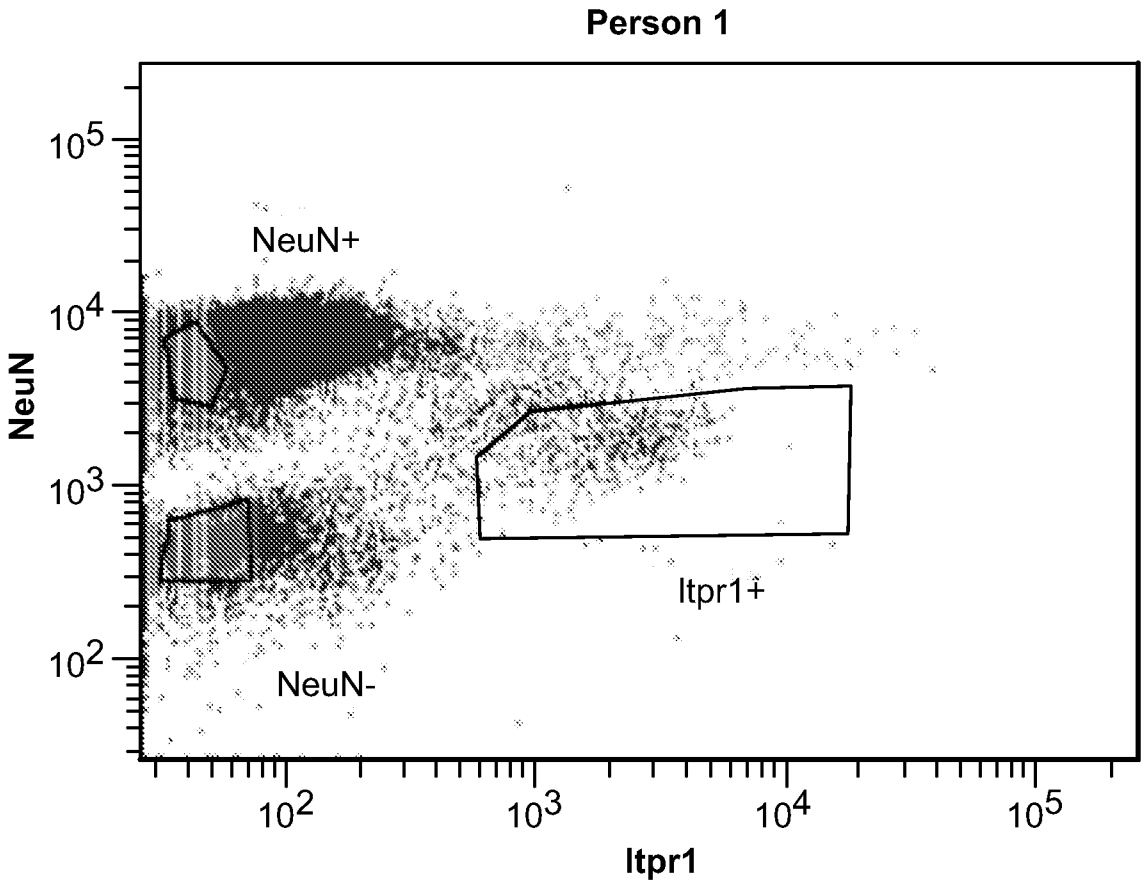

Person 1
NeuN
10^5
10^4
10^3
10^2
NeuN+
Itpr1+
NeuN-
10^2
10^3
10^4
10^5
Itpr1

FIG. 5A

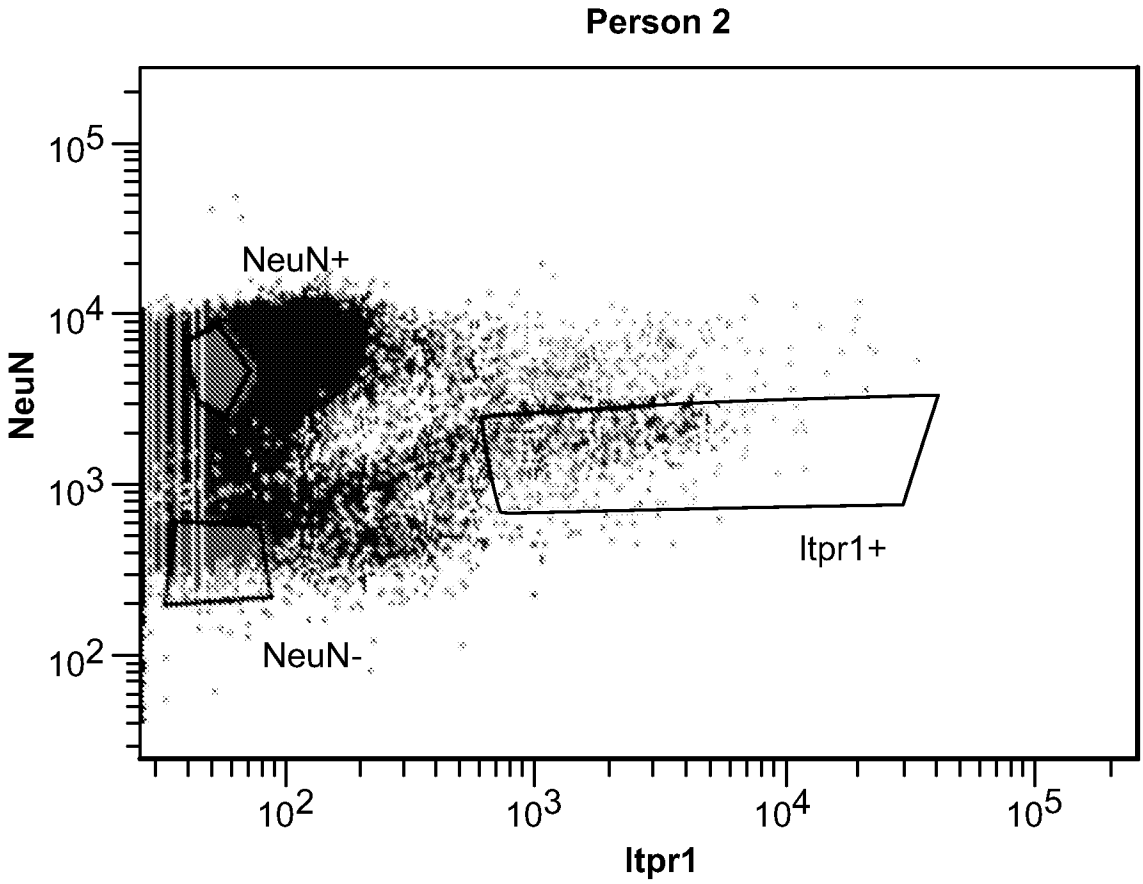


FIG. 5B

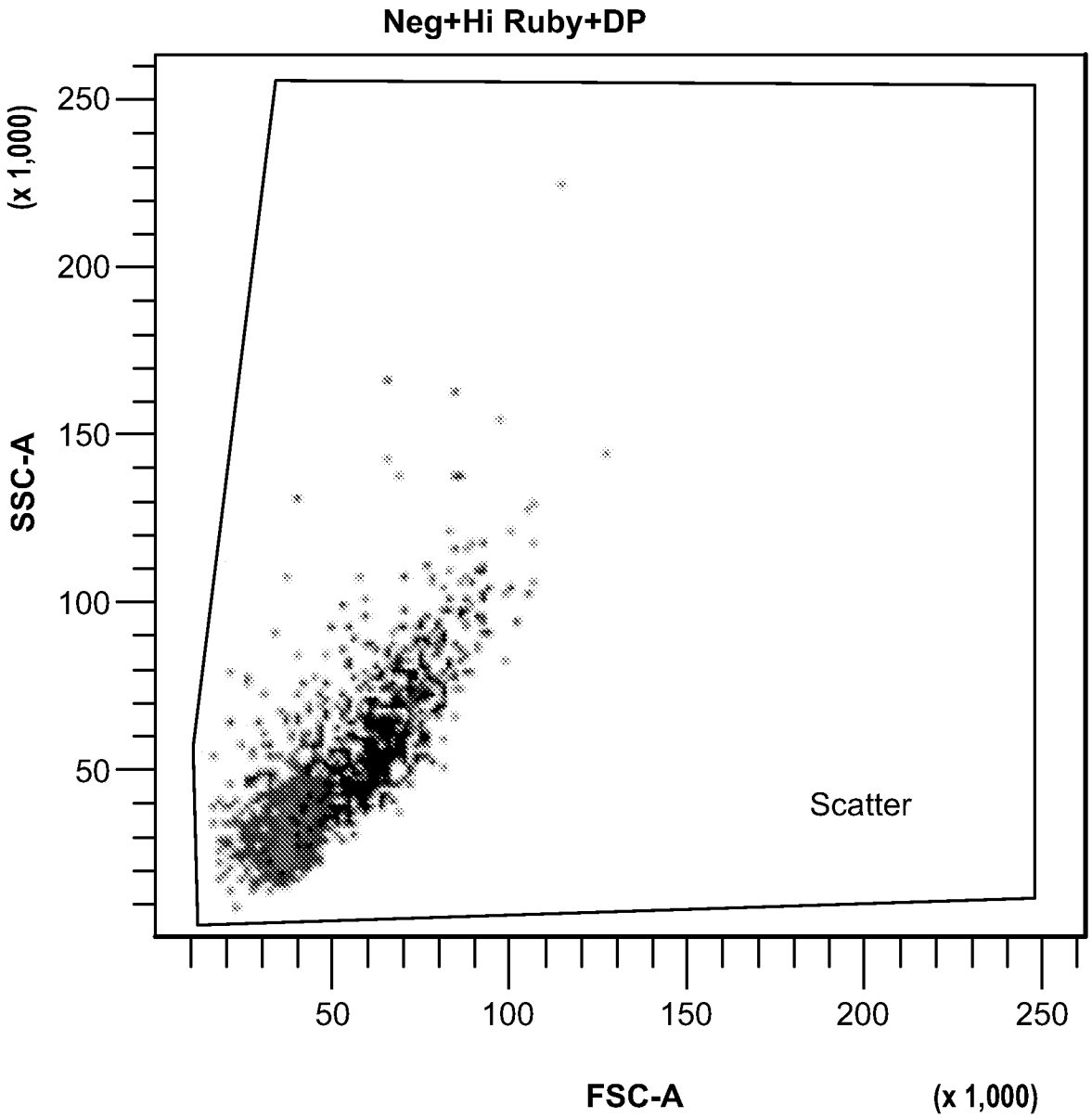

Neg+Hi Ruby+DP
SSC-A
(x 1,000)
250
200
150
100
50
Scatter
50
100
150
200
250
FSC-A
(x 1,000)

FIG. 6

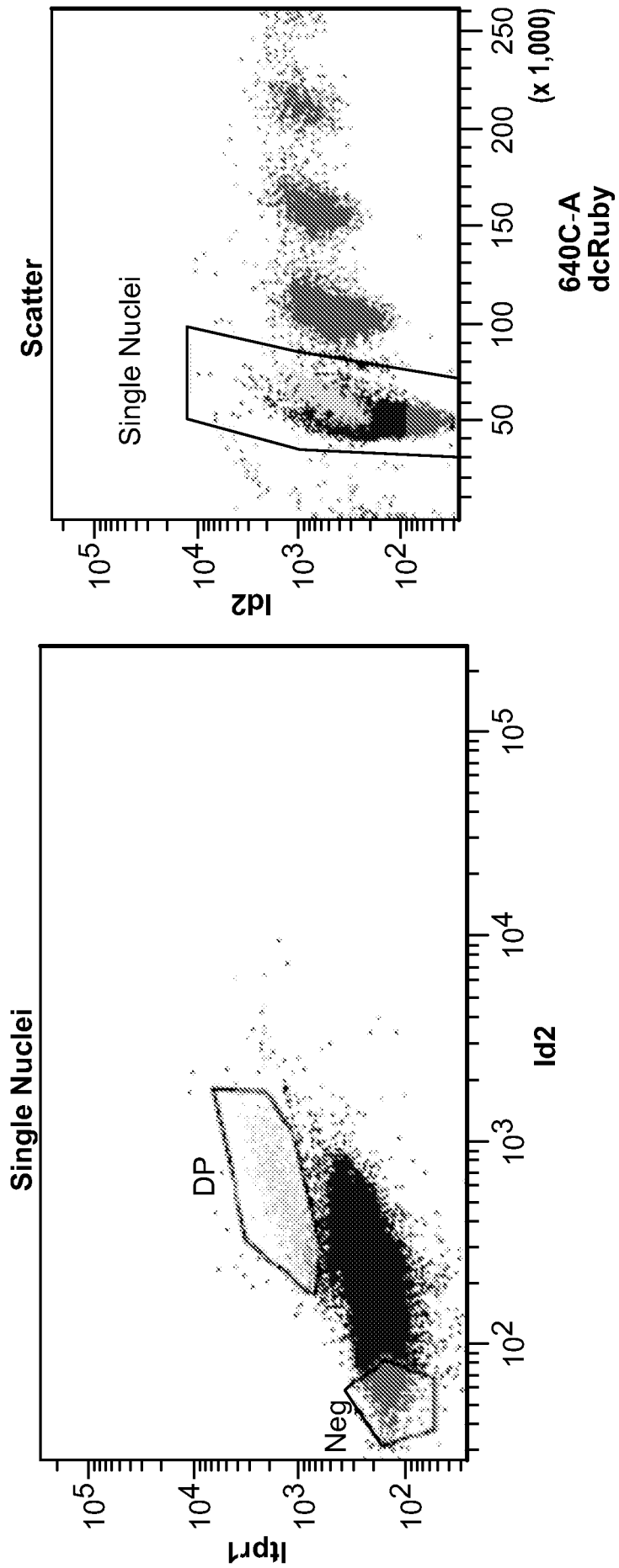
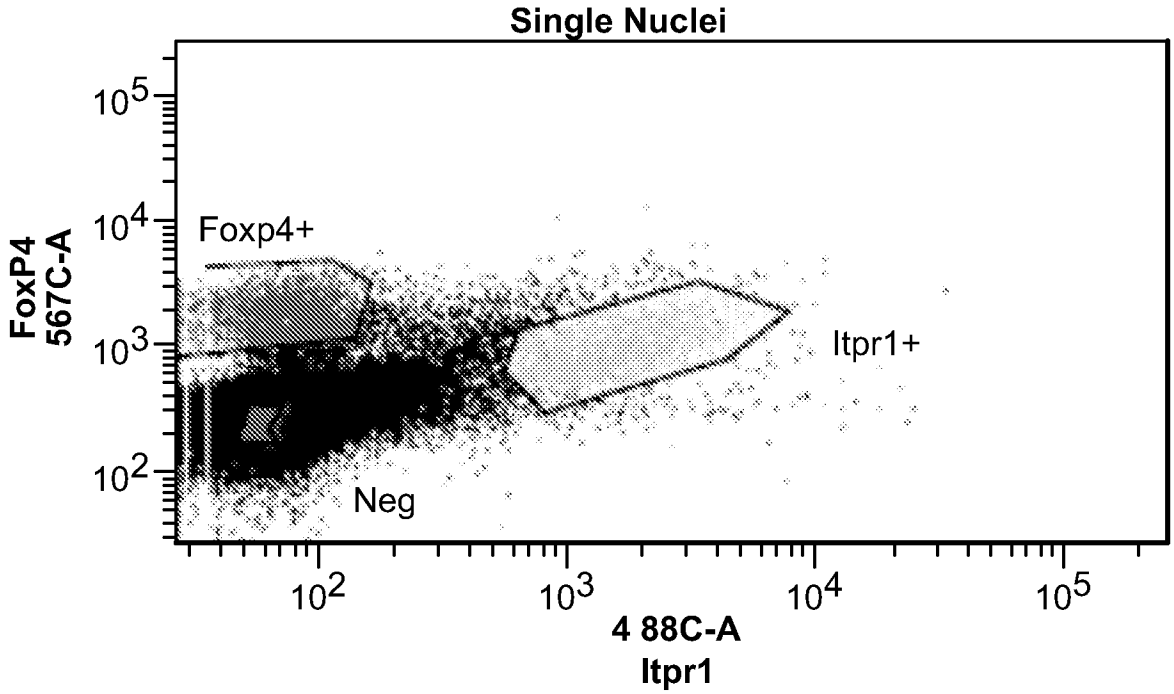
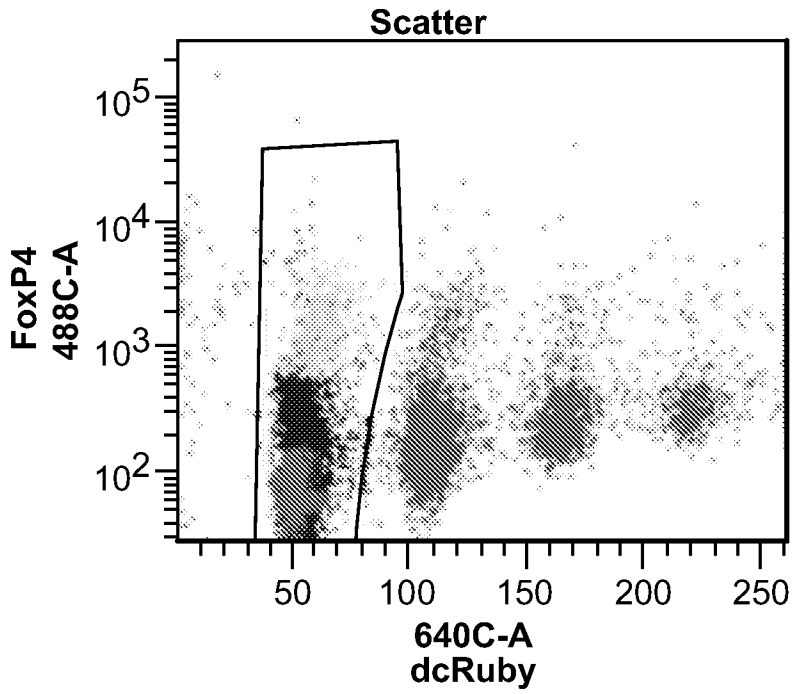

Scatter
Single Nuclei
Id2
640C-A
dcRuby
(x 1,000)
Single Nuclei
DP
Neg
Itpr1
Id2

FIG. 7A

FIG. 7B


Single Nuclei
FoxP4
567C-A
Foxp4+
Itpr1+
Neg
4 88C-A
Itpr1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FoxP4
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640C-A
dcRuby

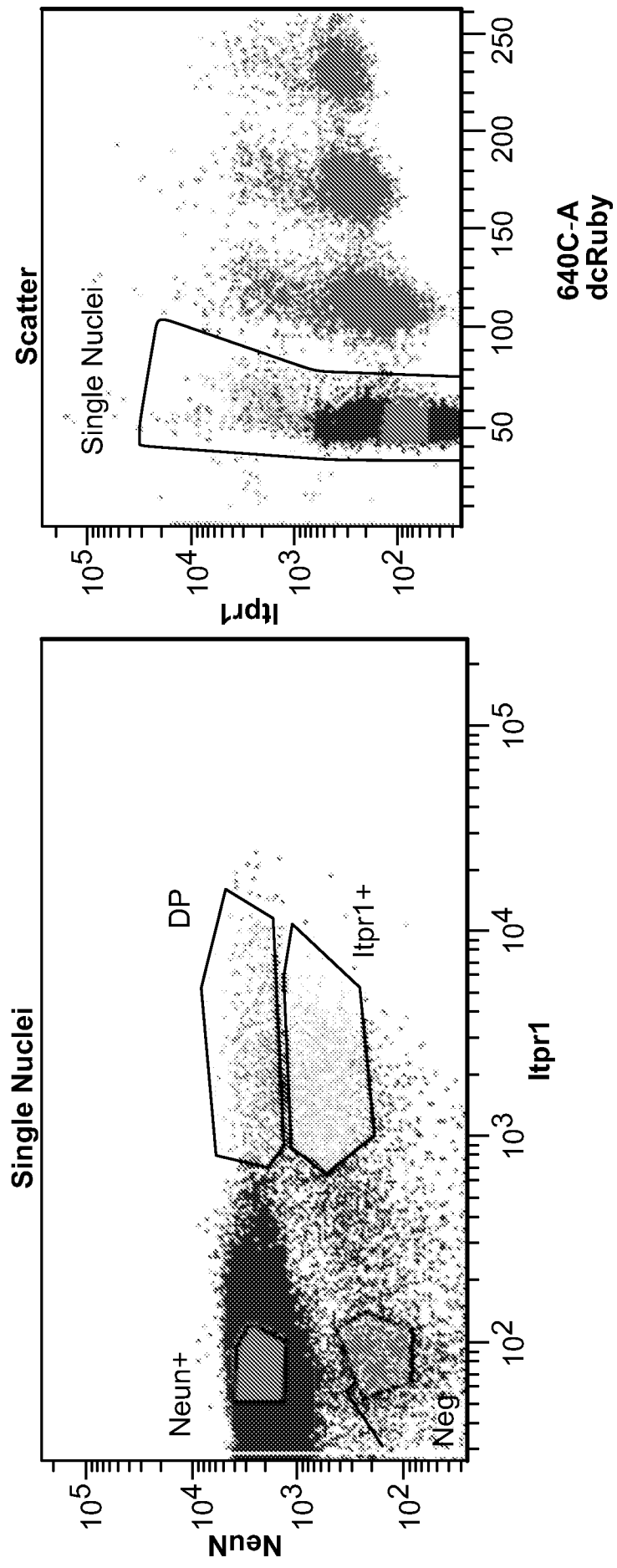

Scatter
Single Nuclei
640C-A
dcRuby
Itpr1
Single Nuclei
DP
Itpr1+
Neun+
Neg
Itpr1
NeuN

FIG. 7C

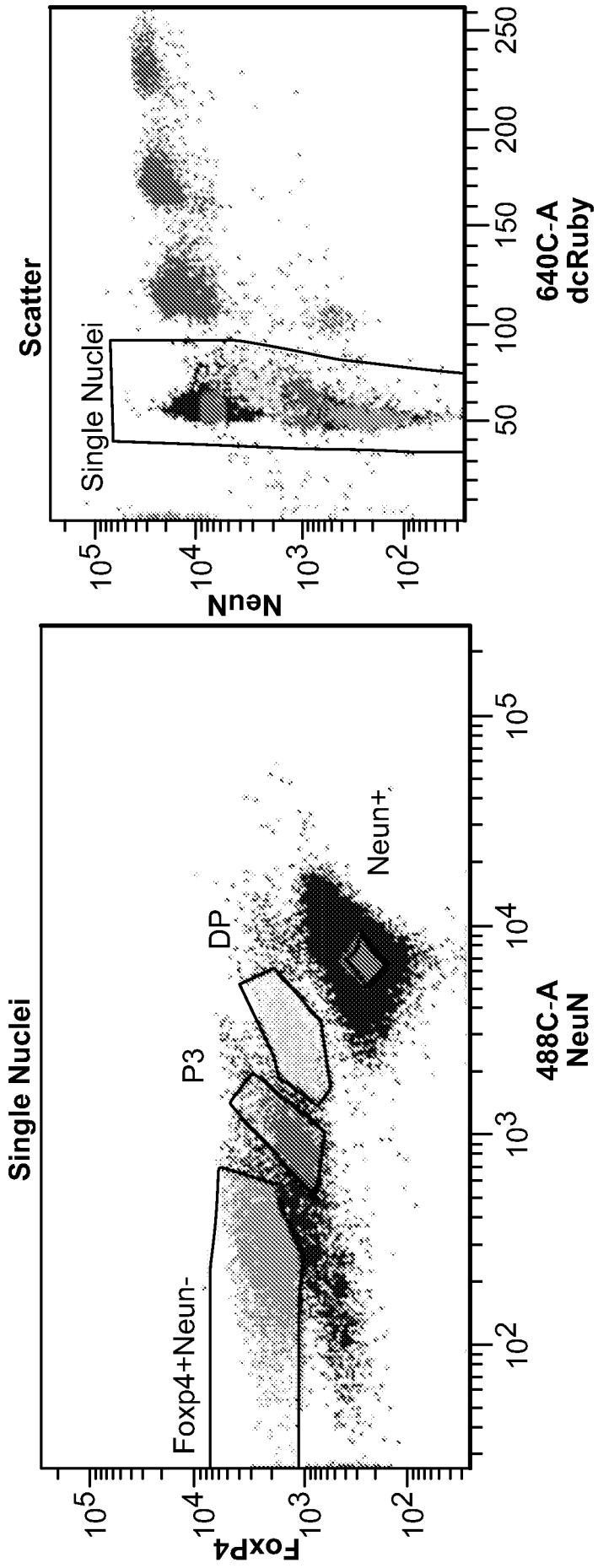

Scatter
Single Nuclei
640C-A
dcRuby
NeuN
Single Nuclei
P3
DP
Neun+
Foxp4+Neun-
488C-A
NeuN
FoxP4

FIG. 7D

FIG. 8

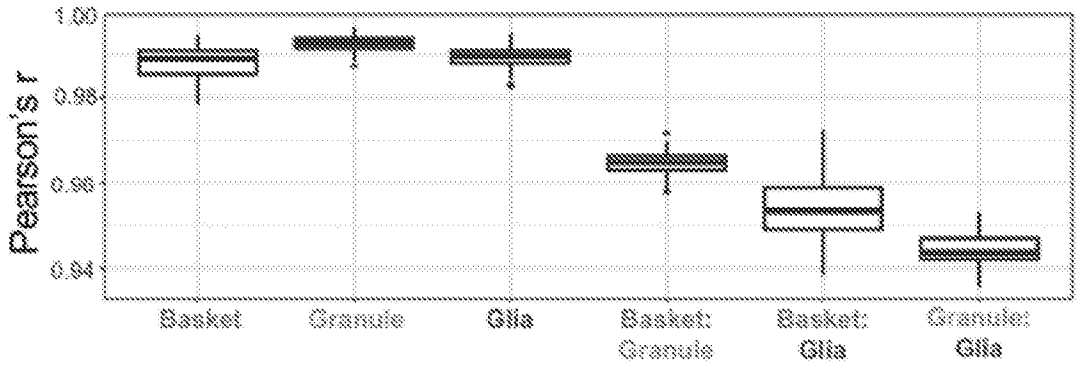

Pearson's r
1.00
0.98
0.96
0.94
Basket
Granule
Glia
Basket: Granule
Basket: Glia
Granule: Glia

FIG. 9

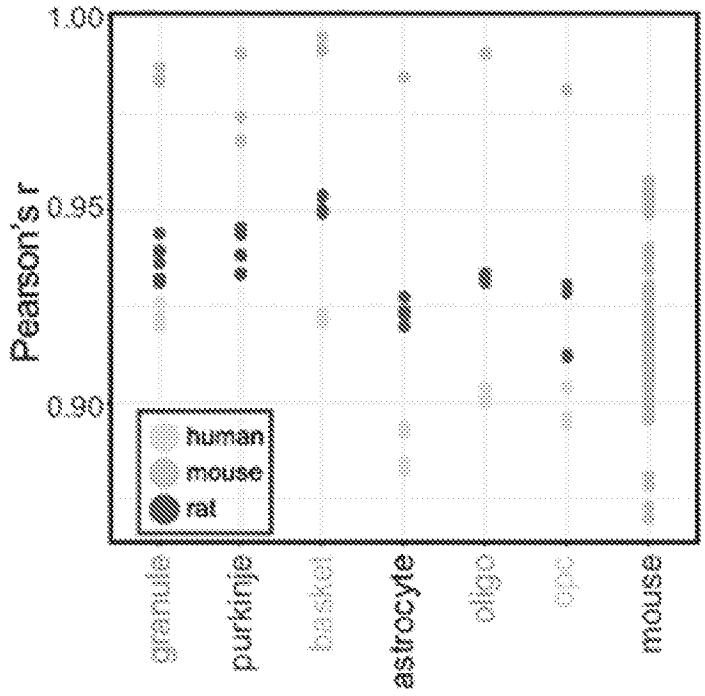

1.00
0.95
0.90
Pearson's r
human
mouse
rat
granule
purkinje
basket
astrocyte
oligo
opc
mouse

FIG. 10

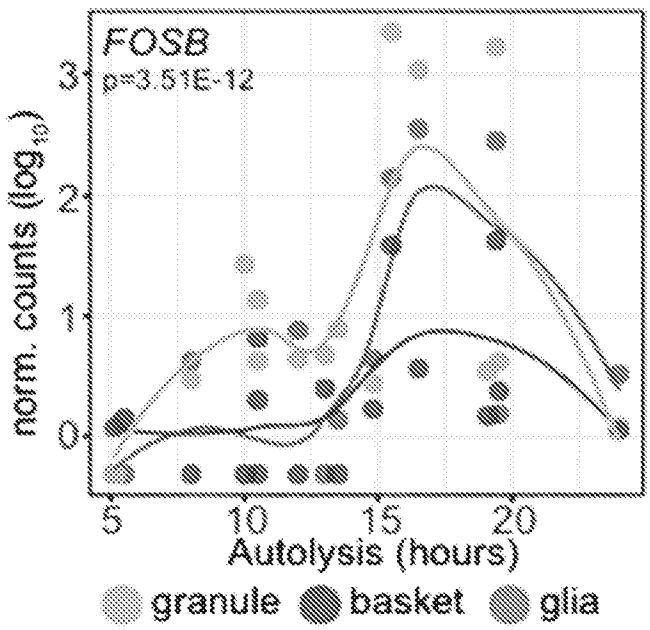

FOSB
p=3.51E-12
norm. counts (log10)
0
1
2
3
5
10
15
20
Autolysis (hours)
granule
basket
glia

FIG. 11A

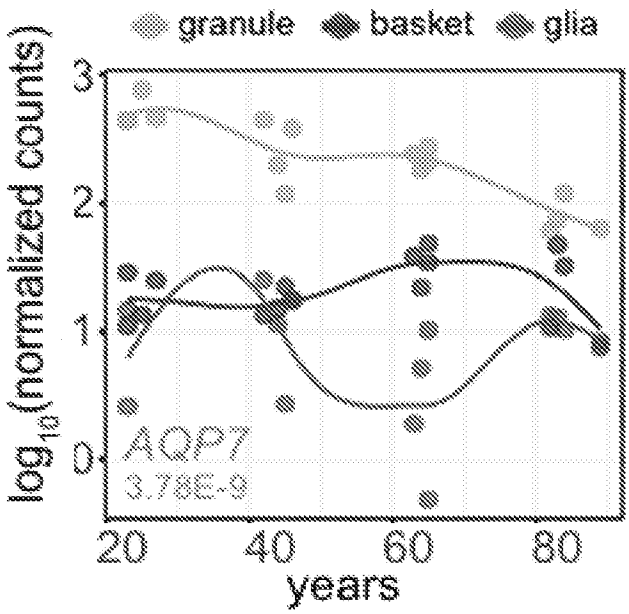

granule
basket
glia
log10(normalized counts)
3
2
1
0
AQP7
3.78E-9
20
40
60
80
years

FIG. 11B

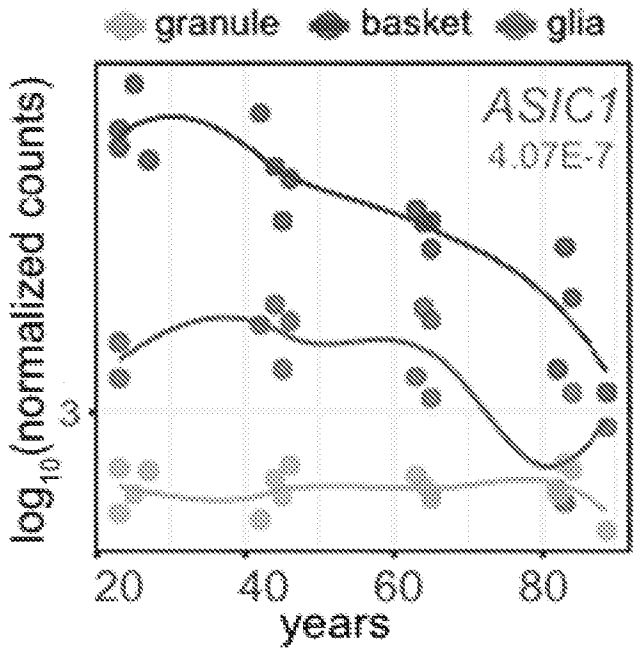

granule
basket
glia
ASIC1
4.07E-7
log10(normalized counts)
20
40
60
80
years

FIG. 11C

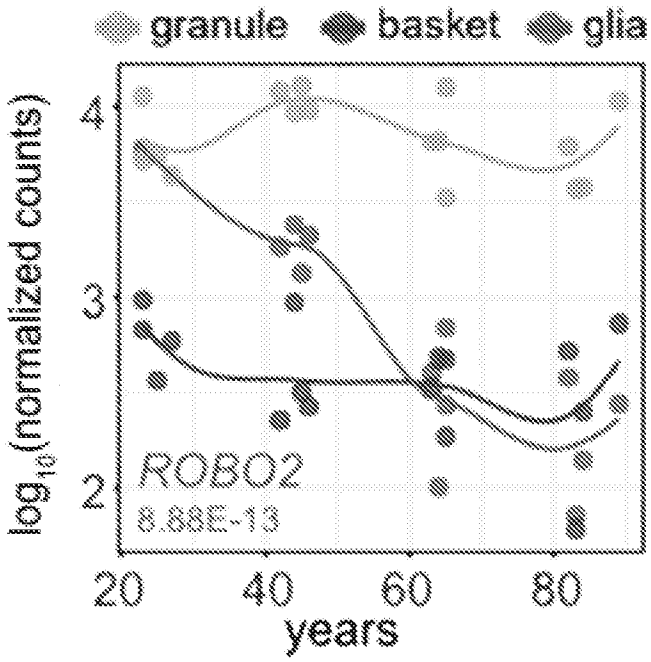

granule
basket
glia
log10(normalized counts)
4
3
2
ROBO2
8.88E-13
20
40
60
80
years

FIG. 12

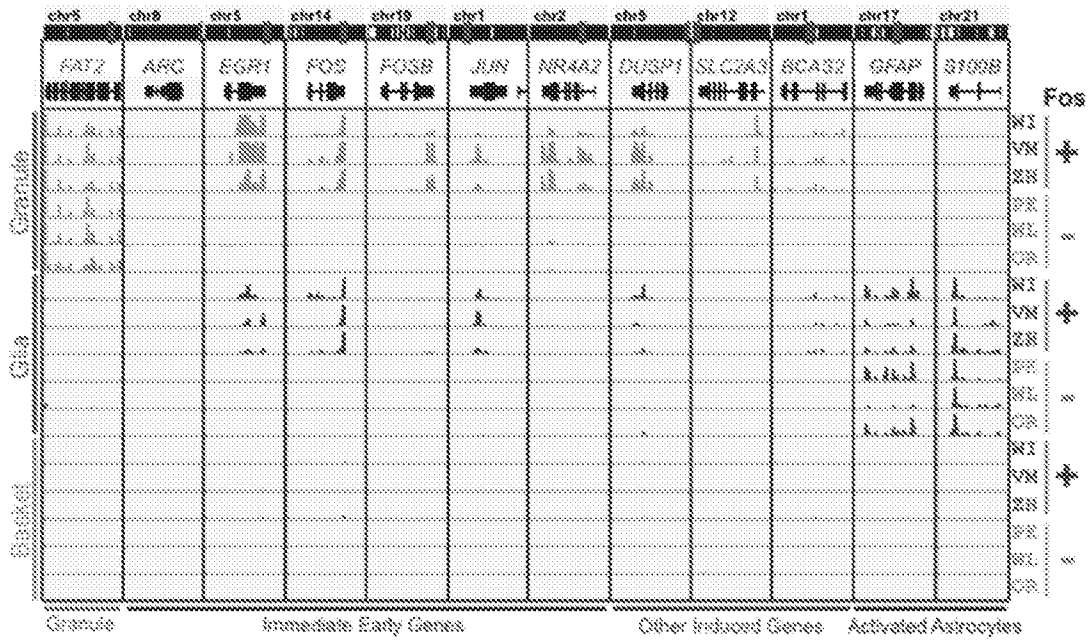

FAT2
ARC
EGR1
FOS
FOSB
JUN
NR4A2
DUSP1
SLC2A3
BCAS2
GFAP
S100B
Fos
Granule
Glia
Basket
Granule
Immediate Early Genes
Other Induced Genes
Activated Astrocytes

FIG. 13A

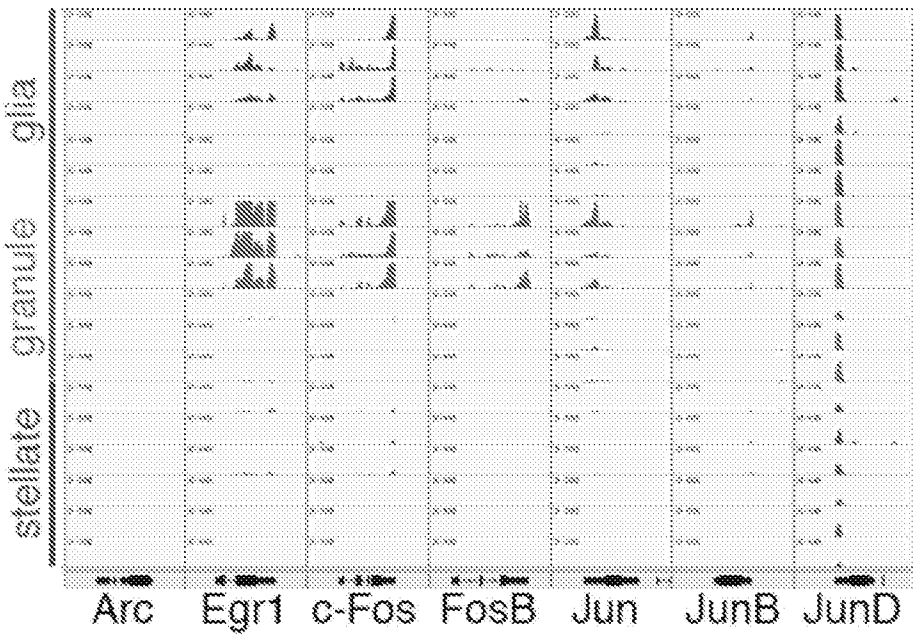


FIG. 13B

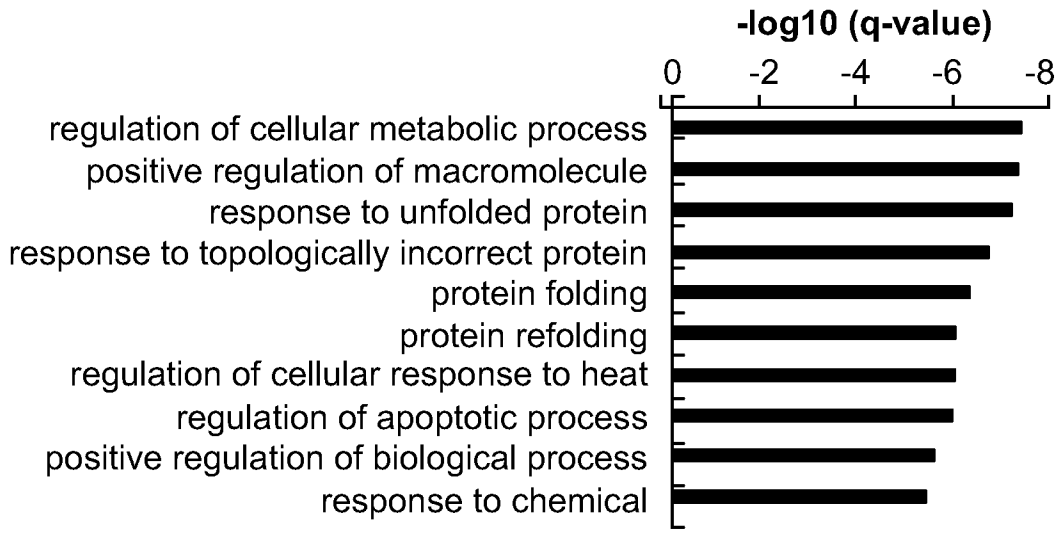

-log10 (q-value)
0
-2
-4
-6
-8
regulation of cellular metabolic process
positive regulation of macromolecule
response to unfolded protein
response to topologically incorrect protein
protein folding
protein refolding
regulation of cellular response to heat
regulation of apoptotic process
positive regulation of biological process
response to chemical

FIG. 13C

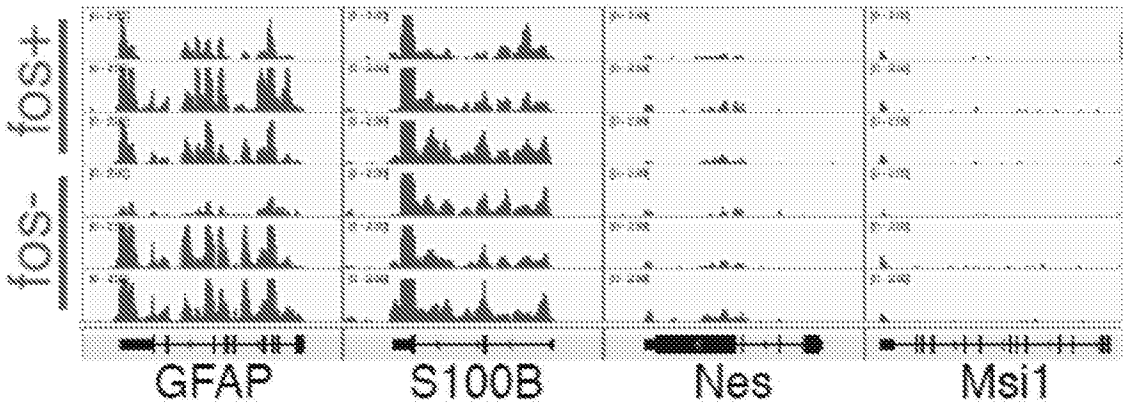
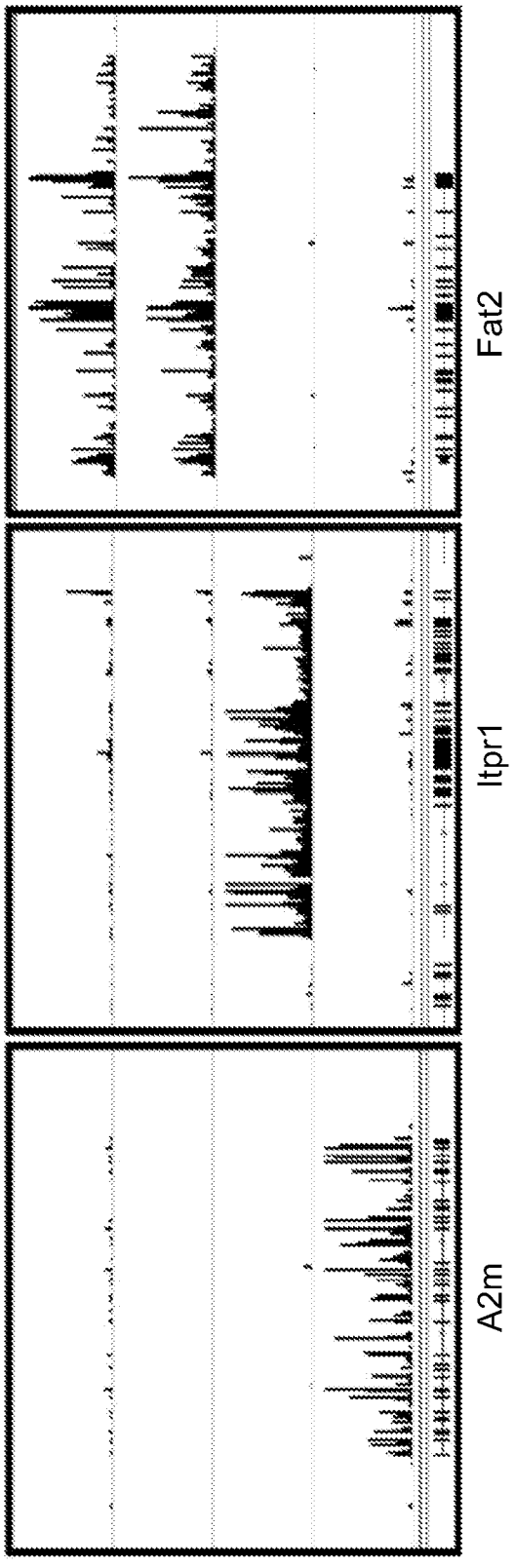


FIG. 14


CB nuclei
Granule cells
Purkinje cells
Bergmann glia
A2m
Itpr1
Fat2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/17556

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - C12N 15/11, C12Q 1/68 (2018.01)
CPC - C12Q 1/6841, G01N 33/502, C12N 15/111, G01N 33/5058, G01N 2800/285

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	PREISSL et al., Deciphering the Epigenetic Code of Cardiac Myocyte Transcription, Cir. Res., 14 August 2015, Vol. 117, No. 5, pages 413-423, Supplemental pages 1-16. Especially abstract; FIG.3; FIG.5, FIG.6, Online FIG. III, IV; pg 414, col 1, para 7; pg 415, col 1, para 2, col 2, para 2; pg 417, col 1, para 2 to col 2, para1; pg 420, col 2, para 3; Supplemental material pg 2-3.	58 --- 1-3, 9-11, 20/10, 55, 59-61
Y	US 2011/0071049 A1 (HEINTZ et al.) 24 March 2011 (24.03.2011) para [0010], [0095], [0204],.[0232], FIG. 9.	1-3, 9-11, 20/10, 55
Y	WO 2016/092070 A1 (MAX-DELBRUCK-CENTRUM FUR MOLEKULARE MEDIZING (MDC)) 16 June 2016 (16.06.2016) abstract; claim 1; pg 14, para 4; pg 15, para 8.	59-60
Y	RISCA et al., Unraveling the 3D genome: genomics tools for multi-scale exploration, Trends Genet., July 2015, Vol. 31, No. 7, pages 357-372 (1-29). Especialy abstract; pg 24, Table 1.	60
Y	US 8,299,233 B2 (ANDRE et al.) 30 October 2012 (30.11.2012) abstract; SEQ ID NO:5248.	61

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"I." document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 June 2018	02 JUL 2018

Name and mailing address of the ISA/US	Authorized officer:
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/17556

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☒ Claims Nos.: 19, 21-54 and 56-57
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

-----please see continuation on next supplemental sheet-----

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-3, 9-11, 20(in part), 55, 58-61 limited to granule cell nucleus

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 18/17556

Continued from: Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

Group I+: Claims 1-18, 20, 55, 58-61, directed to a method of profiling the gene expression of a nucleus. The method will be searched to the extent that the the cell type of interest encompasses granule cells. It is believed that claims 1-3, 9-11, 20(in part), 55, 58-61 encompass this first named invention, and thus these claims will be searched without fee to the extent that the method encompasses profiling the gene expression of a granule cell nucleus. Additional cell types will be searched upon the payment of additional fees. Applicants must specify the claims that encompass any additionally elected cell type(s). Applicants must further indicate, if applicable, the claims which encompass the first named invention, if different than what was indicated above for this group. Failure to clearly identify how any paid additional invention fees are to be applied to the "+" group(s) will result in only the first claimed invention to be searched. An exemplary election would be a method of profiling the gene expression of a Purkinje cell nucleus (claims 1-3, 9, 11-13, 20(in part), 55, 58-61).

The inventions listed as Groups I+ do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Special Technical Features

The technical feature of each of the inventions listed as Groups I+ is the specific cell types, recited therein. Each invention requires a specific cell type, not required by any of the other inventions.

Common Technical Features

The inventions of Groups I+ share the technical feature of a method profiling the gene expression of a nucleus, the method comprising:
(a) processing a tissue sample containing a plurality of cell types to expose nuclei;
(b) labeling at least one nucleus from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a nucleic acid transcript or protein unique to the nucleus of at least one cell type contained in the tissue sample,
(c) purifying at least one labeled nucleus; and
(d) collecting nucleic acid transcript and/or protein expression data for the labeled nucleus, thereby profiling the gene expression of the nucleus.

However, these shared technical feature does not represent a contribution over prior art, in view of the article entitled "Deciphering the Epigenetic Code of Cardiac Myocyte Transcription" by Preissl et al. (hereinafter 'Preissl')(Circulation Research (14 August 2015) vol 117, no 5, pp. 413-423).

Preissl teaches a method profiling the gene expression of a nucleus (abstract "The aim was to purify cardiac myocyte nuclei from hearts of different species by magnetic- or fluorescent-assisted sorting and to determine the nuclear and cellular RNA expression profiles and epigenetic marks in a cardiac myocyte-specific manner.", pg 417, col 1, para 2 "The heart consists of many different cell types, including cardiac myocytes, fibroblasts, endothelial cells, smooth muscle cells, and others") comprising (a) processing a tissue sample containing a plurality of cell types to expose nuclei (pg 420, col 2, para 3 "The initial step of the workflow is disruption of cardiac biopsies and purification of nuclei. The described tissue disruption and purification procedures ensure efficient and reliable isolation of nuclei from frozen and fresh cardiac biopsies. Isolated nuclei can be sorted by FACS");
(b) labeling at least one nucleus from the processed tissue sample by contacting the processed tissue sample with an affinity label that binds a protein unique to the nucleus of at least one cell type contained in the tissue sample (pg 415, col 1, para 2 "The basis of the presented method is the detection of PCM1, a protein which in the heart is specifically bound to cardiac myocyte nuclei.", pg 415, col 2, para 2 "Flow cytometry experiments showed that PCM1 staining also labeled isolated nuclei"); and
(c) purifying at least one labeled nucleus (pg 415, col 2, para 2 "purification of cardiac myocyte nuclei by magnetic-assisted nuclei sorting was highly reproducible as assessed by flow cytometry (>94% purity; Figure 3B). These results highlight that PCM1 enables isolation of cardiac myocyte nuclei from hearts of different species, including frozen clinical samples.");
(d) collecting nucleic acid transcript and/or protein expression data for the labeled nucleus, thereby profiling the gene expression of the nucleus (pg 417, col 1, para 2 to col 2, para 1, We postulated that data obtained from PCM1 - sorted nuclei were highly cardiac myocyte - specific. We compared our data from PCM1-positive cardiac myocyte nuclei with previously published data sets from cardiac tissue biopsies (Figure 5A-5D; Online Figure III). Figure 5 shows the results of the representative cardiac myocyte - specific gene myosin light chain 3 (Myl3) and the mesenchymal nonmyocyte gene vimentin (Vim). In cardiac myocyte nuclei, the promoter region of Myl3 was enriched for acetylation of lysine 27 of histone 3 (H3K27ac; Figure 6A). Acetylation of H3K27 is an epigenetic hallmark of active genomic regions. In contrast, no H3K27ac signal could be detected in the promoter region of Vim in cardiac myocyte nuclei (Figure 6B).).

As the technical feature was known in the art at the time of the invention, this cannot be considered a special technical feature that would otherwise unify the inventions

Groups I+ therefore lack unity under PCT Rule 13 because they do not share the same or corresponding special technical feature.