Supplementary Methods

Immunohistochemistry Staining
Immunohistochemistry (IHC) staining was performed on human colorectal biopsies. After overnight incubation with anti-Ki67 antibody (Proteintech, Rosemont, IL), anti-p21 antibody (Proteintech, Rosemont, IL), anti-p27 antibody (Proteintech, Rosemont, IL), anti-RB1 antibody (Proteintech, Rosemont, IL), anti-PRMT6 antibody (Cell Signaling Technology, Danvers, MA), anti-DNMT1 antibody (Abcam, Cambridge, MA) or anti-PPAR-α antibody (Abcam, Cambridge, MA), the slides were incubated for 1 hour with horseradish peroxidase-conjugated secondary antibodies (DAKO, Santa Clara, CA). The intensity of indicated proteins were detected using the DAB kit (BioGenex, San Ramon, CA).

Quantitative Real-time PCR
Total RNA was extracted using Trizol (Invitrogen, Carlsbad, CA). cDNA was synthesized from 1 μg total RNA using qScript cDNA SuperMix (Gaithersburg, MD). Real-time PCR primer sequences are included in the Supplementary Table 6. The relative amount of each mRNA was calculated after normalizing to their corresponding *Actb* or *Gapdh* mRNA, and the results expressed as fold change relative to the control group.

Macroscopic and Histopathologic Analysis
Colons were excised from the ileocecal junction to the anal verge and flushed with PBS. Colon length was measured from the colocecal junction to the rectum. The colons were opened longitudinally, tumors were counted and tumor diameter measured under a stereo microscope (ZEISS Stemi 2000-C, Germany) equipped with a Jenoptik camera and television monitor and interfaced to ProgRes analysis software. For histologic analysis, the colon tissues were fixed in 10% formalin for 24 hours, followed by paraffin embedding, and processed for standard H&E staining. H&E-stained slides were evaluated independently by two pathologists to calculate the prevalence of low-grade adenomas, high grade adenomas and adenocarcinomas.

BrdU Staining
To assess cell proliferation in the colon, mice were intraperitoneally injected with 20 mg/kg.bw bromodeoxyuridine (BrdU) (Sigma, St. Louis, MO). Two hours later, the mice were killed, and the colon dissected and fixed in 10% PBS-buffered formalin before embedding in paraffin. BrdU immunostaining was carried out using a BrdU Detection Kit (BD Biosciences, San Diego, CA). The BrdU labeling index was determined by calculating the percentage of BrdU-positive nuclei in 9 random 40× microscopic fields per mouse.

TUNEL Staining
Apoptosis was detected by TUNEL staining by the DeadEnd^{TM} Colorimetric TUNEL kit obtained from Promega (Madison, WI) following the manufacture's instruction.

Western Blotting
Colons or cultured cells were lysed with RIPA lysis buffer with protease inhibitors. Protein concentrations were determined by the BCA protein assay kit (Pierce Chemical, Rockford, IL). The samples were subjected to SDS-polyacrylamide gel electrophoresis, transferred to polyvinylfluoride membranes, and incubated overnight at 4°C with antibodies against PPARα

(Abcam, Cambridge, MA), ACOX1 (Proteintech, Rosemont, IL), DNMT1 (Abcam, Cambridge, MA), PRMT6 (Cell Signaling Technology, Danvers, MA), p21 (Proteintech, Rosemont, IL), p27 (Proteintech, Rosemont, IL), H3R2me2a (Abcam, Cambridge, MA), Histone H3 (Abcam, Cambridge, MA), RB1 (Cell Signaling Technology, Danvers, MA), phospho-RB1 (S807/811) (Cell Signaling Technology, Danvers, MA), and ACTB (Cell Signaling Technology, Danvers, MA). Proteins were visualized using the femto signal chemiluminescent substrate (Pierce) under the image analyzer (Alpha Innotech Corp., San Leandro, CA).

Luciferase Reporter Assays

Peroxisome proliferator responsive elements (PPREs) in the promoter region of *Rb1* were predicted by Genomatix software. The *Rb1* promoter fragments containing different PPREs were synthesized by IDT DNA Technologies (Coralville, IA). The fragments were cloned into the pGL4.10 luciferase vector (Promega, Madison, WI). Rb1 reporter vectors and phRL-TK Renilla luciferase control vector (Promega, Madison, WI) were co-transfected into HCT116 cells (ATCC CCL-247) by use of Lipofectamine 3000 transfection reagent (Thermo Fisher Scientific, Waltham, MA). In addition, either PPARα expression vector[1] or the empty backbone vector (pSG5) were co-transfected into the cells and a final concentration of 100 μM Wy-14643 or together with 5 μM GW-6471 was added to the culture medium to activate or inhibit PPARα activity, respectively. Empty vector (pGL4.10) was used as a negative control and a validated PPRE reporter vector from Addgene[2] served as a positive control. 24 hours after the transfection, luciferase assays were performed by use of the dual-luciferase assay system (Promega, Madison, WI). Firefly and Renilla luciferase activities were measured by Veritas microplate luminometer (Turner Biosystems, Sunnyvale, CA).

Production of Recombinant Adenovirus Overexpressing Mouse PPARα

The coding region of mouse PPARα was obtained by PCR with the forward primer (5'-CACCATGGTGGACACAGAGAGCCCCATC-3') and reverse primer (5'-TTAGTACATGTCTCTGTAGATCTC -3'), using pUC57-TAP-Pparα (Genescript, Piscataway, NJ) as template. The PCR product was inserted into pENTR/D-TOPO® to generate pENTR-PPARα. The adenovirus vector producing process was carried out as previously described[3] and in accordance with the protocols of ViraPower™ Adenoviral Expression System (Thermo Fisher Scientific, Waltham, MA), pENTR Directional TOPO Cloning Kits (Thermo Fisher Scientific, Waltham, MA) and GATEWAY LR clonase II™ EnzymeMIX (Thermo Fisher Scientific, Waltham, MA). The titer of recombinant adenoviruses was determined using Adeno-X™ Rapid Titer Kit (Clontech, Mountain View, CA).

Cell Culture and Treatment

HCT116 cells were maintained in McCoy's 5A modified medium supplemented with 10% FBS and 1% antibiotic and seeded in 12-well plates (for gene expression analysis) or 6-well plates (for protein expression analysis). Cells were treated with 5 μM 5-Aza for 72 h, or 20 μM EPZ020411 for 48h, or transfected with plasmid overexpressing DNMT1 (Addgene)[4] or PRMT6 (Origene, RC229177) for 48h. For ChIP assays, HCT116 cells were transfected with pSG5-PPARα expression vector and 48h later, the cells were exposed to a final concentration of 100 μM Wy-14643 or together with 5 μM GW-6471 for an additional 24h. MC38 cells were maintained in Dulbecco's modified Eagle's medium (DMEM) supplemented with 10% FBS and 1% antibiotic. For ChIP assay, MC38 cells were infected with adenovirus overexpressing

PPARα (MOI 20) and 48h later, the cells were exposed to a final concentration of 100 μM Wy-14643 or together with 5 μM GW-6471 for an additional 24h. Primary intestinal epithelial cells were isolated using a protocol adapted from a published method.[5] Briefly, intestinal and colonic tissues were removed from new-born mice (postnatal 5-7 days) and opened longitudinally and washed with ice-cold HBSS. Placed the intestine in Dissociation reagent #1 (30 mM EDTA and 1.5 mM DTT in PBS, add 10 μM Y27632 just prior to use) and incubated on ice for 20 min, then changed to dissociation reagent #2 (30 mM EDTA in PBS, add 10 μM Y27632 just prior to use) and incubated at 37°C for 10 min. The tube was agitated for 30s to release epithelial cells from basement membrane and remnants of intestinal tissue removed. The cell solution was centrifuged at 1000 × g for 5 min at 4°C and washed once with 10% FBS/PBS. The supernatant was removed and the pellet resuspended in 10 ml of a digestion buffer containing 8 mg dispase (Gibco). The cell solution was incubated at 37°C for 10 min and shaken every 2 min. 10% FBS and 50 μl 10 mg/ml DNase were added to the cell solution and the resulting digestion mixture was passed over a 70 μm filter. The cell solution was centrifuged at 1000 × g for 5 min at 4°C and the pellet washed once with 10% FBS/PBS. The supernatant was removed and the pellet resuspended in complete growth media (DMEM/F12 containing 50 ng/ml EGF, 500 ng/ml R-spondin 1, 100 ng/ml Noggin, 0.25 U/ml insulin, 5 μg/ml transferrin, 10% FBS and 1% antibiotic, with 10 μM Y27632 added just prior to use). The cells were seeded in type I collagen-coated culture dishes and the medium was changed every 3 days. Primary intestinal epithelial cells were treated with 500 nM PD0332991 for 48 h, or infected with control adenovirus (Ad-GFP) or adenovirus overexpressing PPARα (MOI 100) for 60 h.

Knockdown of RB1, DNMT1 and PRMT6

HCT116 cells were transfected with siRNA targeting *Rb1* (5'-GGAUAGCAAAACAACUAGAtt-3'), or with siRNA targeting *Dnmt1* (5'-GCACCUCAUUUGCCGAAUAtt-3'), or with siRNA targeting *Prmt6* (5'-GAAAUAGUAUGGAUUUUUAtt-3'), or with a control siRNA (5'-UUGUUCGAACGUGUCACGUtt-3') using RNAiMAX (Invitrogen, Carlsbad, CA) according to the manufacture's instruction. siRNAs were purchased from Thermo Fisher Scientific (Waltham, MA). Cells were collected at 48h after transfection for RNA analysis and at 72 h after transfection for protein analysis.

MeDIP

Methyl-DNA immunoprecipitation (MeDIP) was performed using a protocol adapted from a published method.[6] Genomic DNA of HCT116 cells or mouse colon tissues was isolated using QIAamp® mini DNA kit (QIAGEN, Germantown, MD) following the manufacture's instruction and was sheared by sonication to between 200 and 500 bp. The sonicated DNA was denatured at 95°C for 10 min. Denatured DNA (2 μg) was saved for the total input control. For each IP, 2 μg of denatured DNA was diluted in 500 μl IP buffer (0.05% Triton X-100 and 140 mM NaCl) with 3 μg anti-m^5C monoclonal antibody (Abcam, Cambridge, MA) or normal mouse IgG (Cell Signaling Technology, Danvers, MA) and incubated overnight at 4°C. To collect the immune complex, 50 μl of protein G Dynal beads (Invitrogen, Carlsbad, CA) were added to each IP reaction mixture and incubate at room temperature for additional 2 h. Beads were immobilized using the magnetic rack and washed three times with IP buffer. The immune complexes were eluted by incubation in 500 μl proteinase K digestion buffer containing 5 μl/ml proteinase K solution (stock concentration, 20 mg/ml) at 50°C for 2 h. DNA was purified using MinElute®

Reaction Cleanup Kit (QIAGEN, Germantown, MD) and subjected to real-time qPCR using IP primers listed in Supplementary Table 6. Relative quantification of PCR products was based on the value differences between the bound and input using the ΔΔCt method.

ChIP Assays

ChIP for H3R2me2a or PPARα was performed in accordance with the manufacture's protocol of ChIP-IT High Sensitivity ® Kit (Active Motif, Carlsbad, CA). Chromatins were prepared from isolated nuclei of formaldehyde cross-linked HCT116 cells or MC38 cells or mouse colon tissues and sheared to between 200 and 500 bp. Sheared chromatins were immunoprecipitated with anti-H3R2me2a Ab (Abcam, Cambridge, MA), or anti-PPARα Ab (Abcam, Cambridge, MA), or anti-pan-H3 antibody (Cell Signaling Technology, Danvers, MA), or normal rabbit IgG (Cell Signaling Technology, Danvers, MA). The precipitated DNA samples were incubated with RNase A and proteinase K, purified using MinElute ® Reaction Cleanup Kit (QIAGEN, Germantown, MD), and subjected to real-time PCR using IP primers listed in Supplementary Table 6.

Metabolomics

Deproteinated urine samples and tissue extracts were analyzed by ultra-high performance liquid chromatography/Xevo G2 quadrupole-time-of-flight mass spectrometry (UPLC/QTOFMS) with an electrospray ionization source equipped with Acquity UPLC BEH C18 or amide column (Waters Corp., Milford, MA) for reverse-phase (RP) or hydrophilic interaction liquid chromatography (HILIC) analysis, respectively, as previously described.[7] The multivariate data matrix was analyzed by SIMCA-P+15 software (Umetrics, Kinnelon, NJ). Data quality inspection as well as distribution and unsupervised segregation of different groups on global metabolomic space were checked by principal components analysis (PCA) of the Pareto-scaled data. The supervised orthogonal projection to latent structures (OPLS) model was used to identify ions contributing to discrimination of metabolic traits. Candidate ions were identified on the basis of accurate mass measurement using metabolomic databases such as METLIN (http://metlin.scripps.edu/) or HMDB (http://www.hmdb.ca/) and MS/MS fragmentation pattern. Finally, the identity was confirmed by comparison of retention time and fragmentation pattern with authentic standards.

Targeted Urinary Metabolite Quantitation

Metabolites in the deproteinated urine samples were quantified in multiple reactions monitoring mode on a XEVO triple quadruple mass spectrometer (Waters Corp., Milford, MA). α-Aminopimelic acid (5 μM) was used as internal standard. The following metabolites were quantified by monitoring characteristic fragmentation reactions (in bracket); α-aminopimelic acid (176.244→112.152, ESI+), creatinine (113.963→86.006, ESI+), betaine (117.983→42.127, ESI+), carnitine (162.201→102.777, ESI+), 1-methylnicotinamide (137.032→94.478, ESI+), S-adenosylmethionine (399.24→250.038, ESI+), and 5-methylcytosine (126.091→108.566, ESI+). Asymmetric dimethylarginine (ADMA) (259.238→214.134, ESI+) and symmetric dimethylarginine (SDMA) (259.238→228.166, ESI+) were quantified using a derivatizing method described in detail in a publish paper.[8] All data were processed using TargetLynx software (Waters Corp., Milford, MA). Internal standard-normalized area under the peak (response) from serially diluted authentic standard solution was used to build calibration curve

for each metabolite. The metabolite concentrations were determined from the calibration curve and normalized by creatinine.

Exome sequencing and data analysis

Genomic DNA was isolated using QIAamp ® mini DNA kit (QIAGEN, Germantown, MD) and subjected to exome-sequencing on HiSeq4000 using the Agilent SureSelect XT Mouse All Exon kit and paired-end sequencing. Reads were trimmed for adapters and low-quality bases using Trimmomatic software before alignment to the mouse mm10 reference genome using BWA mapping software.[9] Mapped reads were then de-duplicated using Picard Tools (http://broadinstitute.github.io/picard), re-aligned, and base quality score recalibration was performed using the Genome Analysis Toolkit (GATK).[10] Variant calling was performed using Mutect2 in tumor-normal mode and joint genotyping was performed on all samples together, following the best practices guidelines for exome-seq analysis provided by the GATK authors.[11] Variants were hard filtered for quality, annotated with funcational and consequence prediction using Ensembl's Variant Effect Predictor (VEP)[12] and converted to Mutation Annotation Format (MAF). The combined MAF files were further analyzed and visualized using the 'maftools' package (version 1.8.10)[13] and custom scripts in R version 3.5.1.[14] Frequently mutated genes in exome data identified by Shyr et al.[15] were converted to mouse IDs using the Homologene database[16] and removed from the data. Variants not predicted as "high" or "moderate" impact by VEP were also removed. Gene mutation data were then summarized separately for the KO and WT mice. Genes common between and unique to KO and WT samples were then separately tested for enrichment among Disease Ontology (DO) data available from the Mouse Genome Informatics database.[17] A Fisher's Exact Test was performed for each DO term, and the p-value adjusted using the Benjamini-Hochberg correction.

Supplementary Discussion

To determine whether intestinal PPARα depletion affects genetic mutations under carcinogen administration, genomic DNA of the colon tumors derived from AOM and DSS-administered *Ppara*$^{fl/fl}$ and similarly administered *Ppara*$^{\Delta IE}$ mice (n=5/group, one sample from one individual mouse) were subjected to exome-sequencing together with the genomic DNA of the normal colon from vehicle-administered *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice (n=1/group, one sample is a pooled sample from 5 mice) that served as genetic background. By analyzing the data, 2214 genes were found mutated in at least one of the tumors derived from AOM and DSS-administered *Ppara*$^{fl/fl}$ mice and 3050 genes were found mutated in at least one of the tumors derived from AOM and DSS-administered *Ppara*$^{\Delta IE}$ mice. Among those genes, 544 genes were commonly mutated in both tumors from AOM and DSS-administered *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice (Supplementary Figure 13). Next, disease ontology analysis was performed for 5 groups of genes: 2214 genes mutated in *Ppara*$^{fl/fl}$ mice, 3050 genes mutated in *Ppara*$^{\Delta IE}$ mice, 544 genes mutated in both *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice, 1670 genes mutated only in *Ppara*$^{fl/fl}$ mice, 2506 genes mutated only in *Ppara*$^{\Delta IE}$ mice. The complete somatic mutation gene list and disease ontology list can be found in Supplementary Table 7 and 8.

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Author names in bold designate shared co-first authorship.

Supplementary Tables

Table S1. Data from AOM-induced colon cancer mouse model

Table S2. Data from AOM and DSS-induced colon cancer mouse model

Table S3. Methylation related metabolites identified from urine metabolome

Table S4. Data from AOM and DSS-induced colon cancer model of human *PPARA* transgenic mice

Table S5. Gender and age of colon cancer patients

Table S6. Sequences of primers used in qPCR analysis

Table S7. Somatic mutations of tumors derived from AOM and DSS-induced colon cancer mouse model (Included in a separate Excel file)

Table S8. Disease ontology analysis (Included in a separate Excel file)

Supplementary Table 1. Data from AOM-induced colon cancer mouse model

	Ppara$^{fl/fl}$ AOM	*Ppara*$^{\Delta IE}$ AOM	*Ppara*$^{fl/fl}$ ctrl	*Ppara*$^{\Delta IE}$ ctrl
Total incidence	36.8% (7/19)	57.9% (11/19)	0% (0/12)	0% (0/8)
Total multiplicity	0.58	1.47	0	0
> 3mm incidence	15.8% (3/19)	52.6% (10/19)	0% (0/12)	0% (0/8)
> 3mm multiplicity	0.21	0.84	0	0
≤ 3mm incidence	31.6% (6/19)	42.1% (8/19)	0% (0/12)	0% (0/8)
≤ 3mm multiplicity	0.37	0.63	0	0
Low grade	57.1% (4/7)	45.4% (5/11)	0%	0%
High grade	28.6% (2/7)	27.3% (3/11)	0%	0%
Adenocarcinoma	14.3% (1/7)	27.3% (3/11)	0%	0%

Supplementary Table 2. Data from AOM and DSS-induced colon cancer mouse model

	Ppara$^{fl/fl}$ AOM/DSS	*Ppara*$^{\Delta IE}$ AOM/DSS	*Ppara*$^{fl/fl}$ ctrl	*Ppara*$^{\Delta IE}$ ctrl
Total incidence	100% (11/11)	100% (12/12)	0% (0/7)	0% (0/6)
Prolapse	0% (0/11)	33.3% (4/12)	0% (0/7)	0% (0/6)
Multiplicity	8.73	18	0	0
Low grade	9.1% (1/11)	0% (0/12)	0%	0%
High grade	45.5% (5/11)	41.7% (5/12)	0%	0%
Adenocarcinoma	45.4% (5/11)	58.3% (7/12)	0%	0%

Supplementary Table 3. Methylation related metabolites identified from urine metabolome

Rt (min)	Measured *m/z*	Ion form	Mass error (*ppm*)	Elemental composition	Putative metabolite	VIP
1.38	126.067	$[M+H]^+$	2.379693	C5H7N3O	Methylcytosine	1.71726
5.28	203.151	$[M+H]^+$	0.98449	C8H18N4O2	Dimethylarginine	5.28682
2.57	137.071	$[M+H]^+$	-3.64773	C7H8N2O	Methylnicotinamide	1.81217
3.76	162.113	$[M+H]^+$	0	C7H15NO3	Carnitine	3.97987
2.33	118.087	$[M+H]^+$	1.693669	C5H11NO2	Betaine	6.54432
5.33	399.151	$[M+H]^+$	14.78159	C15H22N6O5S	SAM	0.367886

Supplementary Table 4. Data from AOM and DSS-induced colon cancer model of human *PPARA* transgenic mice

	Chow	Fenofibrate
Total incidence	100% (15/15)	100% (15/15)
Prolapse	40% (6/15)	0% (0/15)
Multiplicity	10.13	4.07
Low grade	0% (0/15)	20% (3/15)
High grade	40% (6/15)	53.3% (8/15)
Adenocarcinoma	60% (9/15)	26.7% (4/15)

Supplementary Table 5. Gender and age of colon cancer patients

		Low grade adenoma	High grade adenoma	Adenomcarcinoma in adenoma	Adenocarcinoma	Hyperplastic polyp
Gender	M	63.2% (12/19)	70.6% (12/17)	80% (8/10)	62.5% (10/16)	80% (4/5)
	F	36.8% (7/19)	29.4% (5/17)	20% (2/10)	37.5% (6/16)	20% (1/5)
Age (y)	M	56.9	64.2	65.6	69.3	61.8
	F	63.4	66.4	67	68	64
	mean	59.3	64.8	65.9	68.8	62.2

Supplementary Table 6. Sequences of primers used in qPCR analysis

Mouse primers	Forward sequence	Reverse sequence
Ppara	CCCTGAACATCGAGTGTCGAA	TTCGCCGAAAGAAGCCCTTA
Acox1	GGGCACGGCTATTCTCACAG	CATCAAGAACCTGGCCGTCT
Acot1	CGATGACCTCCCCAAGAACAT	CTTTTACCTCGGGGTGGCT
Dnmt1	TGTTCTGTCGTCTGCAACCT	GCCATCTCTTTCCAAGTCTTT
Dnmt3a	CCATGCCAAGACTCACCTTC	GCTTTCTTCTCAGCCTCCCT
Dnmt2	CACGCGCTGCGAAAAAGTC	CCCTGTAGGCCAATTCTTGTG
Nsun2	ACACTGAGAATCACTGGGTACA	CCAGCTTAGTGGTTGTGGAACT
Nsun4	TGGGATAGTGTGAGTGCTAAGC	AAGCATCGAAGATTTGGGCTG
Mettl1	CAGACCACACACTGCGCTA	CATCCTTTGGATCATCATGGCTC
Mettl3	CTGGGCACTTGGATTTAAGGAA	TGAGAGGTGGTGTAGCAACTT
Prmt1	GACTCGGGTGAAGATGGC	GAAACTTCTTCAAGAGGCGG
Prmt3	CCCTGAGAACCACAAAGACG	GCCAGTAGAGAACACGACCC
Prmt5	ACATGGATGTGGTGGCATAA	TGATTAGACGGGAGGTCAGC
Prmt6	ACCGCTCCAGACTTCATTTG	ACCCTGTGGCATACATTGCT
Prmt7	GCACTCCACTGAGGTGACAG	CCCAATCAGCTCTGTGTCAA
Prmt8	CCCTGAGAACCACAAAGACG	GCCAGTAGAGAACACGACCC
Rb1	TGCATCTTTATCGCAGCAGTT	GTTCACACGTCCGTTCTAATTTG
c-Myc	TGAAGTTCACGTTGAGGGG	AGAGCTCCTCGAGCTGTTTG
p53	GCGTAAACGCTTCGAGATGTT	TTTTTATGGCGGGAAGTAGACTG
Pten	TGGATTCGACTTAGACTTGACCT	GCGGTGTCATAATGTCTCTCAG
p21	CCTGGTGATGTCCGACCTG	CCATGAGCGCATCGCAATC
p27	GACGTAAACAGCTCCGAATTAAG	GGCAGATGGTTTAAGAGTGCC
Bcl2	GTCGCTACCGTCGTGACTTC	CAGACATGCACCTACCCAGC
Apc	CTTGTGGCCCAGTTAAAATCTGA	CGCTTTTGAGGGTTGATTCCT
β-catenin	ATGGAGCCGGACAGAAAAGC	CTTGCCACTCAGGGAAGGA
β-actin	GGCTGTATTCCCCTCCATCG	CCAGTTGGTAACAATGCCATGT
Gapdh	AGGTCGGTGTGAACGGATTTG	TGTAGACCATGTAGTTGAGGTCA
Human primers		
Ppara	TCATCACGGACACGCTTTCA	TCAATGCTCCACTGGGAGAC
Dnmt1	CCTAGCCCCAGGATTACAAGG	ACTCATCCGATTTGGCTCTTTC
Prmt6	GGAGTCGGAGAAACCCCTG	TGAAACGTCCGTGTCTTGCTC
p21	CGATGGAACTTCGACTTTGTCA	GCACAAGGGTACAAGACAGTG
p27	GTACGAGTGGCAAGAGGTGG	TAGAAGAATCGTCGGTTGCAGG
β-actin	CATGTACGTTGCTATCCAGGC	CTCCTTAATGTCACGCACGAT
Gapdh	GGAGCGAGATCCCTCCAAAAT	GGCTGTTGTCATACTTCTCATGG
IP primers		
Mouse p21	GAAGGAGTGGGTTGGTCCTG	GATCTGCGCCTGACTCCAAT
Human p21	CCGAAGTCAGTTCCTTGTGG	CGCTCTCTCACCTCCTCTGA
Mouse p27	GCCGAGACCAATGGAGct	AAACACCCCAAAAGCACGAG
Human p27	ACTCGCCGTGTCAATCATTT	AACACCCCGAAAAGACGAG
Mouse Rb1	GTACCAGCAGAGATGACCGG	GGCCAATTGATGCCACCTTG
Human Rb1	TCTTCCCTATCAGACCCCGG	GGTGCACTTAACGGGGCTAT
Mouse Acox1	TACCTTGCTTTCCTTGGCGA	CAATCCCCGACGCTGGTA
Human Acox1	ACGCCTCTGCCAGTAAAGAC	CTTTTGCCAAATCCACCCGG
Mouse Acot1	CACCGGAGTCACCTGATAGAGTC	GCCAGGGTGCACAGACTTT
Human Pdk4	TCGGGAGAGGAAAAGGAGGT	GACCCTGTCTGATGCAGCTT

Hugo_Sym	Frame_Shi	Frame_Shi	In_Frame_	In_Frame_	Missense_	Nonsense_	Nonstop_M	Splice_Site	Translatior	total	MutatedSa	AlteredSamples
Sfi1	0	0	0	0	13	1	0	0	0	14	5	5
Vmn2r114	0	0	0	0	9	0	0	0	0	9	5	5
Pisd	0	0	0	0	7	0	0	0	0	7	5	5
Muc6	0	0	0	0	7	0	0	0	0	7	4	4
Eppk1	0	0	0	0	4	0	0	0	0	4	4	4
Fn1	0	0	0	0	4	0	0	0	0	4	3	3
Vmn2r116	0	0	0	0	3	1	0	0	0	4	3	3
Asxl3	0	0	0	0	3	0	0	0	0	3	3	3
Chd8	0	0	0	0	3	0	0	0	0	3	3	3
Col9a1	0	0	0	0	3	0	0	0	0	3	3	3
Copb2	0	0	0	0	3	0	0	0	0	3	3	3
Ctnnb1	0	0	0	0	3	0	0	0	0	3	3	3
Gm5458	0	0	0	0	3	0	0	0	0	3	3	3
Helz2	0	0	0	0	3	0	0	0	0	3	3	3
Kalrn	0	0	0	0	2	0	0	1	0	3	3	3
Spef2	0	0	0	0	3	0	0	0	0	3	3	3
Vmn2r115	0	0	0	0	3	0	0	0	0	3	3	3
Bptf	0	0	0	0	4	0	0	0	0	4	2	2
Smg1	0	0	0	0	4	0	0	0	0	4	2	2
Arhgef5	0	0	0	0	3	0	0	0	0	3	2	2
Ctnnd2	0	0	0	0	3	0	0	0	0	3	2	2
Dst	0	0	0	0	3	0	0	0	0	3	2	2
Lamc2	0	0	0	0	3	0	0	0	0	3	2	2
Lrp5	0	0	0	0	3	0	0	0	0	3	2	2
Myo18b	0	0	0	0	3	0	0	0	0	3	2	2
Olfr810	1	1	0	0	1	0	0	0	0	3	2	2
Ugt1a8	1	1	0	0	1	0	0	0	0	3	2	2
Vmn2r97	0	0	0	0	3	0	0	0	0	3	2	2
Zfat	0	0	0	0	3	0	0	0	0	3	2	2
1700061G1	0	0	0	0	2	0	0	0	0	2	2	2
4932438A1	0	0	0	0	2	0	0	0	0	2	2	2
5830411N(	0	0	0	0	2	0	0	0	0	2	2	2

Abi1	0	0	0	0	2	0	0	0	0	2	2	2
Acsl5	0	0	0	0	2	0	0	0	0	2	2	2
Adgrb1	0	0	0	0	2	0	0	0	0	2	2	2
Afdn	0	0	0	0	2	0	0	0	0	2	2	2
Aff2	0	0	0	0	2	0	0	0	0	2	2	2
Agtr1a	0	0	0	0	2	0	0	0	0	2	2	2
Aknad1	0	0	0	0	2	0	0	0	0	2	2	2
Alms1	0	0	0	0	2	0	0	0	0	2	2	2
Arf1	0	0	0	0	2	0	0	0	0	2	2	2
Arsb	0	0	0	0	2	0	0	0	0	2	2	2
Aspm	0	0	0	0	2	0	0	0	0	2	2	2
Atp8b4	0	0	0	0	2	0	0	0	0	2	2	2
Babam2	0	0	0	0	2	0	0	0	0	2	2	2
Brpf1	0	0	0	0	2	0	0	0	0	2	2	2
Btaf1	0	0	0	0	2	0	0	0	0	2	2	2
Btd	0	0	0	0	2	0	0	0	0	2	2	2
C2cd3	0	0	0	0	2	0	0	0	0	2	2	2
Cacna1c	0	0	0	0	2	0	0	0	0	2	2	2
Cacna1f	0	0	0	0	2	0	0	0	0	2	2	2
Casp8ap2	0	0	0	0	2	0	0	0	0	2	2	2
Cbln4	0	0	0	0	2	0	0	0	0	2	2	2
Ccdc173	0	0	0	0	2	0	0	0	0	2	2	2
Cchcr1	0	0	0	0	2	0	0	0	0	2	2	2
Cdon	0	0	0	0	1	1	0	0	0	2	2	2
Cebpz	0	0	0	0	2	0	0	0	0	2	2	2
Cemip	0	0	0	0	2	0	0	0	0	2	2	2
Cep68	0	0	0	0	2	0	0	0	0	2	2	2
Chil5	0	0	0	0	2	0	0	0	0	2	2	2
Col12a1	0	0	0	0	2	0	0	0	0	2	2	2
Col22a1	0	0	0	0	2	0	0	0	0	2	2	2
Col5a2	0	0	0	0	2	0	0	0	0	2	2	2
Col6a6	0	0	0	0	2	0	0	0	0	2	2	2
Cpd	0	0	0	0	2	0	0	0	0	2	2	2

Cutal	0	0	0	0	2	0	0	0	0	2	2	2
Cyp2c50	0	0	0	0	2	0	0	0	0	2	2	2
Dact2	0	0	0	0	2	0	0	0	0	2	2	2
Dchs1	0	0	0	0	2	0	0	0	0	2	2	2
Dlg5	0	0	0	0	2	0	0	0	0	2	2	2
Dnah7a	0	0	0	0	2	0	0	0	0	2	2	2
Dnah7c	0	0	0	0	2	0	0	0	0	2	2	2
Dpyd	0	0	0	0	2	0	0	0	0	2	2	2
Dsg1c	0	0	0	0	2	0	0	0	0	2	2	2
Dync1h1	0	0	0	0	2	0	0	0	0	2	2	2
Efcab6	0	0	0	0	1	1	0	0	0	2	2	2
Ermard	0	0	0	0	2	0	0	0	0	2	2	2
Faim2	0	0	0	0	2	0	0	0	0	2	2	2
Fam120b	0	0	0	0	2	0	0	0	0	2	2	2
Fam171a1	0	0	0	0	2	0	0	0	0	2	2	2
Fan1	0	0	0	0	1	0	0	1	0	2	2	2
Fbn2	0	0	0	0	2	0	0	0	0	2	2	2
Fgd5	0	0	0	0	2	0	0	0	0	2	2	2
Flvcr2	0	0	0	0	2	0	0	0	0	2	2	2
Fndc3a	0	0	0	0	2	0	0	0	0	2	2	2
Garem2	0	0	0	0	1	1	0	0	0	2	2	2
Ggnbp2	0	0	0	0	2	0	0	0	0	2	2	2
Gm11487	0	0	0	0	2	0	0	0	0	2	2	2
Gmeb2	0	0	0	0	1	0	0	1	0	2	2	2
Golga4	0	0	0	0	2	0	0	0	0	2	2	2
Gpbp1	0	0	0	0	2	0	0	0	0	2	2	2
Guf1	0	0	0	0	2	0	0	0	0	2	2	2
Hdac10	0	0	0	0	2	0	0	0	0	2	2	2
Herc1	0	0	0	0	2	0	0	0	0	2	2	2
Herc2	0	0	0	0	2	0	0	0	0	2	2	2
Hmcn2	0	0	0	0	2	0	0	0	0	2	2	2
Hnrnpul2	0	0	0	0	1	1	0	0	0	2	2	2
Insr	0	0	0	0	2	0	0	0	0	2	2	2

Iws1	0	0	0	0	2	0	0	0	0	2	2	2
Lats1	0	0	0	0	2	0	0	0	0	2	2	2
Lemd3	0	0	0	0	2	0	0	0	0	2	2	2
Lrit1	0	0	0	0	2	0	0	0	0	2	2	2
Lrrcc1	0	0	0	0	1	1	0	0	0	2	2	2
Lrrk2	0	0	0	0	2	0	0	0	0	2	2	2
March7	0	0	0	0	2	0	0	0	0	2	2	2
Mettl15	0	0	0	0	2	0	0	0	0	2	2	2
Muc20	0	0	0	0	1	1	0	0	0	2	2	2
Muc4	0	0	0	0	2	0	0	0	0	2	2	2
Myh15	0	0	0	0	2	0	0	0	0	2	2	2
Myom2	0	0	0	0	1	0	0	1	0	2	2	2
Nek10	0	0	0	0	1	0	0	1	0	2	2	2
Nlrc5	0	0	0	0	2	0	0	0	0	2	2	2
Npepl1	0	0	0	0	2	0	0	0	0	2	2	2
Nrip1	0	0	0	0	2	0	0	0	0	2	2	2
Nsd2	0	0	0	0	2	0	0	0	0	2	2	2
Nup85	0	0	0	0	1	0	0	1	0	2	2	2
Olfr352	0	0	0	0	2	0	0	0	0	2	2	2
Olfr566	0	0	0	0	2	0	0	0	0	2	2	2
Olfr881	1	0	0	0	1	0	0	0	0	2	2	2
Olfr963	0	0	0	0	2	0	0	0	0	2	2	2
Parg	0	0	0	0	2	0	0	0	0	2	2	2
Pcdhb4	0	0	0	0	2	0	0	0	0	2	2	2
Pclo	0	0	0	0	2	0	0	0	0	2	2	2
Pdzd7	0	0	0	0	2	0	0	0	0	2	2	2
Pla2r1	0	0	0	0	2	0	0	0	0	2	2	2
Plxna4	0	0	0	0	2	0	0	0	0	2	2	2
Poc1a	0	0	0	0	2	0	0	0	0	2	2	2
Psme4	0	0	0	0	1	1	0	0	0	2	2	2
Psrc1	0	0	0	0	2	0	0	0	0	2	2	2
Pzp	0	0	0	0	2	0	0	0	0	2	2	2
Rab3gap2	0	0	0	0	2	0	0	0	0	2	2	2

Rftn1	0	0	0	0	2	0	0	0	0	2	2	2
Rheb	0	0	0	0	0	0	0	2	0	2	2	2
S1pr1	0	0	0	0	2	0	0	0	0	2	2	2
Sall4	0	0	0	0	2	0	0	0	0	2	2	2
Sec63	0	0	0	0	0	2	0	0	0	2	2	2
Serpind1	0	0	0	0	2	0	0	0	0	2	2	2
Sh3pxd2a	0	0	0	0	2	0	0	0	0	2	2	2
Shc3	0	0	0	0	2	0	0	0	0	2	2	2
Six4	0	0	0	0	2	0	0	0	0	2	2	2
Skint6	0	0	0	0	1	0	0	1	0	2	2	2
Slc17a7	0	0	0	0	2	0	0	0	0	2	2	2
Slc39a6	0	0	0	0	2	0	0	0	0	2	2	2
Slco2a1	0	0	0	0	0	2	0	0	0	2	2	2
Snapc4	0	0	0	0	2	0	0	0	0	2	2	2
Snx19	0	0	0	0	1	0	0	1	0	2	2	2
Spen	0	0	0	0	2	0	0	0	0	2	2	2
Spry1	0	0	0	0	2	0	0	0	0	2	2	2
Synm	0	0	0	0	2	0	0	0	0	2	2	2
Tanc1	0	0	0	0	2	0	0	0	0	2	2	2
Tenm3	0	0	0	0	2	0	0	0	0	2	2	2
Thsd7b	0	0	0	0	2	0	0	0	0	2	2	2
Tinag	0	0	0	0	2	0	0	0	0	2	2	2
Tnxb	0	0	0	0	2	0	0	0	0	2	2	2
Traf3	0	0	0	0	2	0	0	0	0	2	2	2
Trip11	0	0	0	0	2	0	0	0	0	2	2	2
Trmt5	0	0	0	0	2	0	0	0	0	2	2	2
Tro	0	0	0	0	2	0	0	0	0	2	2	2
Usp6nl	0	0	0	0	2	0	0	0	0	2	2	2
Utp20	0	0	0	0	1	1	0	0	0	2	2	2
Vcan	0	0	0	0	2	0	0	0	0	2	2	2
Vmn2r14	0	0	0	0	1	1	0	0	0	2	2	2
Vmn2r16	0	0	0	0	2	0	0	0	0	2	2	2
Vmn2r17	0	0	0	0	2	0	0	0	0	2	2	2

Vmn2r32	1	0	0	0	1	0	0	0	0	2	2	2
Vmn2r33	0	0	0	0	2	0	0	0	0	2	2	2
Vps13b	0	0	0	0	2	0	0	0	0	2	2	2
Wdfy4	0	0	0	0	2	0	0	0	0	2	2	2
Wwc1	0	0	0	0	2	0	0	0	0	2	2	2
Zan	0	0	0	0	2	0	0	0	0	2	2	2
Zbtb7b	0	0	0	0	2	0	0	0	0	2	2	2
Zfpm2	0	0	0	0	2	0	0	0	0	2	2	2
Zgrf1	0	0	0	0	1	0	0	1	0	2	2	2
Zmynd8	0	0	0	0	2	0	0	0	0	2	2	2
Cic	0	0	0	0	3	0	0	0	0	3	1	1
Abcc3	0	0	0	0	2	0	0	0	0	2	1	1
Acta2	0	0	0	0	1	0	0	1	0	2	1	1
Ago3	0	0	0	0	1	1	0	0	0	2	1	1
Amotl1	0	0	0	0	2	0	0	0	0	2	1	1
Arfgef1	0	0	0	0	1	1	0	0	0	2	1	1
Arhgap17	0	0	0	0	2	0	0	0	0	2	1	1
Chd2	0	0	0	0	1	0	0	1	0	2	1	1
Cpsf1	0	0	0	0	2	0	0	0	0	2	1	1
Csmd3	0	0	0	0	1	0	0	1	0	2	1	1
Cwf19l2	0	0	0	0	2	0	0	0	0	2	1	1
Fry	0	0	0	0	2	0	0	0	0	2	1	1
Fsip2	0	0	0	0	2	0	0	0	0	2	1	1
Gins1	0	0	0	0	2	0	0	0	0	2	1	1
Gpr22	0	0	0	0	2	0	0	0	0	2	1	1
Hcfc2	0	0	0	0	2	0	0	0	0	2	1	1
Hcn1	0	0	0	0	2	0	0	0	0	2	1	1
Helq	0	0	0	0	2	0	0	0	0	2	1	1
Hoxb3	0	0	0	0	2	0	0	0	0	2	1	1
Hps5	0	0	0	0	2	0	0	0	0	2	1	1
Itpr2	0	0	0	0	2	0	0	0	0	2	1	1
Jam2	0	0	0	0	2	0	0	0	0	2	1	1
Jarid2	0	0	0	0	2	0	0	0	0	2	1	1

Kdsr	0	0	0	0	2	0	0	0	0	2	1	1
Lilra6	0	0	0	0	2	0	0	0	0	2	1	1
Magi3	0	0	0	0	1	0	0	1	0	2	1	1
Mroh2a	0	0	0	0	1	1	0	0	0	2	1	1
Mtor	0	0	0	0	1	0	0	1	0	2	1	1
Nol11	0	0	0	0	2	0	0	0	0	2	1	1
Psg28	0	0	0	0	2	0	0	0	0	2	1	1
R3hdm2	0	0	0	0	2	0	0	0	0	2	1	1
Scg2	0	0	0	0	2	0	0	0	0	2	1	1
Setd5	0	1	0	0	0	1	0	0	0	2	1	1
Slco1a5	0	0	0	0	2	0	0	0	0	2	1	1
Spata31d1	0	0	0	0	2	0	0	0	0	2	1	1
Srcap	0	0	0	0	2	0	0	0	0	2	1	1
Stab1	0	0	0	0	1	0	0	1	0	2	1	1
Thbs4	0	0	0	0	2	0	0	0	0	2	1	1
Tmem208	0	0	0	0	1	1	0	0	0	2	1	1
Vit	0	0	0	0	1	0	0	1	0	2	1	1
Vmn1r226	0	0	0	0	2	0	0	0	0	2	1	1
Vmn2r117	0	0	1	0	0	0	0	1	0	2	1	1
Vmn2r52	0	1	0	0	1	0	0	0	0	2	1	1
Whamm	0	0	0	0	2	0	0	0	0	2	1	1
Zfp352	0	0	0	0	2	0	0	0	0	2	1	1
Zfp800	0	0	0	0	2	0	0	0	0	2	1	1
1110059E2	0	0	0	0	1	0	0	0	0	1	1	1
1700001C1	0	0	0	0	1	0	0	0	0	1	1	1
1700001L1	0	0	0	0	1	0	0	0	0	1	1	1
1700007G1	0	0	0	0	1	0	0	0	0	1	1	1
1700009N1	0	0	0	0	1	0	0	0	0	1	1	1
1700012B0	0	0	0	0	1	0	0	0	0	1	1	1
1700020N0	0	0	0	0	1	0	0	0	0	1	1	1
1700029J0	0	0	0	0	1	0	0	0	0	1	1	1
1700031F0	0	0	0	0	1	0	0	0	0	1	1	1
1810013L2	0	0	0	0	1	0	0	0	0	1	1	1

2010300C(	0	0	0	0	1	0	0	0	0	1	1	1
2210408I2	0	0	0	0	1	0	0	0	0	1	1	1
2310035C2	0	0	0	0	1	0	0	0	0	1	1	1
2410089E(	0	0	0	0	1	0	0	0	0	1	1	1
3110035E1	0	0	0	0	1	0	0	0	0	1	1	1
4833420G1	0	0	0	0	1	0	0	0	0	1	1	1
4930453N2	0	0	0	0	1	0	0	0	0	1	1	1
4930474N(	0	0	0	0	1	0	0	0	0	1	1	1
4930503L1	0	0	0	0	1	0	0	0	0	1	1	1
4930505A(	0	0	0	0	1	0	0	0	0	1	1	1
4930516K2	0	0	0	0	1	0	0	0	0	1	1	1
4930572O(	0	0	0	0	1	0	0	0	0	1	1	1
4931400O(	0	0	0	0	1	0	0	0	0	1	1	1
4931423N1	0	0	0	0	1	0	0	0	0	1	1	1
4932411N2	0	0	0	0	1	0	0	0	0	1	1	1
4933409G(	0	0	0	0	1	0	0	0	0	1	1	1
4933421I0	0	0	0	0	1	0	0	0	0	1	1	1
5730455P1	0	0	0	0	1	0	0	0	0	1	1	1
6430571L1	0	0	0	0	1	0	0	0	0	1	1	1
A2m	0	0	0	0	1	0	0	0	0	1	1	1
A430105I1	0	0	0	0	1	0	0	0	0	1	1	1
A530064D(	0	0	0	0	1	0	0	0	0	1	1	1
AI182371	0	0	0	0	1	0	0	0	0	1	1	1
AU018091	0	0	0	0	1	0	0	0	0	1	1	1
AW822073	0	0	0	0	1	0	0	0	0	1	1	1
Aak1	0	0	0	0	1	0	0	0	0	1	1	1
Abca4	0	0	0	0	1	0	0	0	0	1	1	1
Abca5	0	0	0	0	1	0	0	0	0	1	1	1
Abca7	0	0	0	0	1	0	0	0	0	1	1	1
Abca8b	0	0	0	0	0	0	0	1	0	1	1	1
Abcb10	0	0	0	0	1	0	0	0	0	1	1	1
Abcb5	0	0	0	0	1	0	0	0	0	1	1	1
Abcb7	0	0	0	0	1	0	0	0	0	1	1	1

Abcc12	0	0	0	0	1	0	0	0	0	1	1	1
Abcc4	0	0	0	0	1	0	0	0	0	1	1	1
Acacb	0	0	0	0	1	0	0	0	0	1	1	1
Acadm	0	0	0	0	1	0	0	0	0	1	1	1
Acads	0	0	0	0	1	0	0	0	0	1	1	1
Aco2	0	0	0	0	1	0	0	0	0	1	1	1
Acot6	0	0	0	0	1	0	0	0	0	1	1	1
Acrv1	0	0	0	0	1	0	0	0	0	1	1	1
Acsl3	0	0	0	0	1	0	0	0	0	1	1	1
Acsl6	0	0	0	0	1	0	0	0	0	1	1	1
Acss2	0	0	0	0	1	0	0	0	0	1	1	1
Acss3	0	0	0	0	1	0	0	0	0	1	1	1
Actb	0	0	0	0	1	0	0	0	0	1	1	1
Actl11	0	0	0	0	1	0	0	0	0	1	1	1
Actr6	0	0	0	0	1	0	0	0	0	1	1	1
Acvr2b	0	0	0	0	1	0	0	0	0	1	1	1
Adam20	0	0	0	0	1	0	0	0	0	1	1	1
Adam24	0	0	0	0	1	0	0	0	0	1	1	1
Adam4	0	0	0	0	1	0	0	0	0	1	1	1
Adam6b	0	0	0	0	1	0	0	0	0	1	1	1
Adam7	0	0	0	0	0	0	0	1	0	1	1	1
Adam9	0	0	0	0	1	0	0	0	0	1	1	1
Adamts10	0	0	0	0	1	0	0	0	0	1	1	1
Adamts14	0	0	0	0	1	0	0	0	0	1	1	1
Adamts18	0	0	0	0	1	0	0	0	0	1	1	1
Adamts20	0	0	0	0	1	0	0	0	0	1	1	1
Adamts7	0	0	0	0	1	0	0	0	0	1	1	1
Adamts8	0	0	0	0	1	0	0	0	0	1	1	1
Adamtsl1	0	0	0	0	1	0	0	0	0	1	1	1
Adck2	0	0	0	0	1	0	0	0	0	1	1	1
Adcy10	0	0	0	0	1	0	0	0	0	1	1	1
Adcy9	0	0	0	0	0	1	0	0	0	1	1	1
Add2	0	0	0	0	1	0	0	0	0	1	1	1

Adgra2	0	0	0	0	1	0	0	0	0	1	1	1
Adgre1	0	0	0	0	0	1	0	0	0	1	1	1
Adgrf3	0	0	0	0	1	0	0	0	0	1	1	1
Adgrg4	0	0	0	0	1	0	0	0	0	1	1	1
Adgrg7	0	0	0	0	1	0	0	0	0	1	1	1
Adgrl1	0	0	0	0	0	1	0	0	0	1	1	1
Adgrl2	0	0	0	0	1	0	0	0	0	1	1	1
Adgrl3	0	0	0	0	1	0	0	0	0	1	1	1
Adh6a	0	0	0	0	1	0	0	0	0	1	1	1
Adh7	0	0	0	0	1	0	0	0	0	1	1	1
Adi1	0	0	0	0	1	0	0	0	0	1	1	1
Adpgk	0	0	0	0	1	0	0	0	0	1	1	1
Aebp1	0	0	0	0	1	0	0	0	0	1	1	1
Aff1	0	0	0	0	1	0	0	0	0	1	1	1
Agbl1	0	0	0	0	1	0	0	0	0	1	1	1
Ahsa1	0	0	0	0	1	0	0	0	0	1	1	1
Akap10	0	0	0	0	1	0	0	0	0	1	1	1
Akap12	0	0	0	0	1	0	0	0	0	1	1	1
Akap6	0	0	0	0	1	0	0	0	0	1	1	1
Akap9	0	0	0	0	1	0	0	0	0	1	1	1
Akna	0	0	0	0	1	0	0	0	0	1	1	1
Akr1b10	0	0	0	0	1	0	0	0	0	1	1	1
Aldh1b1	0	0	0	0	1	0	0	0	0	1	1	1
Alk	0	0	0	0	1	0	0	0	0	1	1	1
Alox15	0	0	0	0	0	1	0	0	0	1	1	1
Amfr	0	0	0	0	1	0	0	0	0	1	1	1
Amot	0	0	0	0	1	0	0	0	0	1	1	1
Ank1	0	0	0	0	1	0	0	0	0	1	1	1
Ank2	0	0	0	0	1	0	0	0	0	1	1	1
Ankdd1b	0	0	0	0	1	0	0	0	0	1	1	1
Ankmy1	0	0	0	0	1	0	0	0	0	1	1	1
Ankra2	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd12	0	0	0	0	1	0	0	0	0	1	1	1

Ankrd17	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd23	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd24	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd34a	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd34c	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd36	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd44	0	0	0	0	1	0	0	0	0	1	1	1
Ankrd6	0	0	0	0	1	0	0	0	0	1	1	1
Anks3	0	0	0	0	1	0	0	0	0	1	1	1
Ankub1	0	0	0	0	1	0	0	0	0	1	1	1
Aoah	0	0	0	0	1	0	0	0	0	1	1	1
Ap1g1	0	0	0	0	1	0	0	0	0	1	1	1
Ap2b1	0	0	0	0	1	0	0	0	0	1	1	1
Ap3m1	0	0	0	0	1	0	0	0	0	1	1	1
Apaf1	0	0	0	0	1	0	0	0	0	1	1	1
Apba1	0	0	0	0	1	0	0	0	0	1	1	1
Apbb2	0	0	0	0	0	0	0	1	0	1	1	1
Apc	0	0	0	0	1	0	0	0	0	1	1	1
Apoa5	0	0	0	0	0	1	0	0	0	1	1	1
Apobr	0	0	0	0	1	0	0	0	0	1	1	1
Apoc4	0	0	0	0	1	0	0	0	0	1	1	1
Appl1	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap12	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap22	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap28	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap29	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap31	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap32	0	0	0	0	1	0	0	0	0	1	1	1
Arhgap42	0	0	0	0	1	0	0	0	0	1	1	1
Arhgdib	0	0	0	0	1	0	0	0	0	1	1	1
Arhgef1	0	0	0	0	1	0	0	0	0	1	1	1
Arhgef10	0	0	0	0	1	0	0	0	0	1	1	1
Arhgef19	0	0	0	0	1	0	0	0	0	1	1	1

Arid1a	0	0	0	0	1	0	0	0	0	1	1	1
Arid2	0	0	0	0	1	0	0	0	0	1	1	1
Arid5b	0	0	0	0	1	0	0	0	0	1	1	1
Arl14	0	0	0	0	1	0	0	0	0	1	1	1
Arl6ip6	0	0	0	0	1	0	0	0	0	1	1	1
Armcx4	0	0	0	0	1	0	0	0	0	1	1	1
Armt1	0	0	0	0	0	1	0	0	0	1	1	1
Arnt2	0	0	0	0	1	0	0	0	0	1	1	1
Arpp21	0	0	0	0	1	0	0	0	0	1	1	1
Asb2	0	0	0	0	1	0	0	0	0	1	1	1
Ash1l	0	0	0	0	1	0	0	0	0	1	1	1
Asic3	0	0	0	0	1	0	0	0	0	1	1	1
Asnsd1	0	0	0	0	1	0	0	0	0	1	1	1
Atf1	0	0	0	0	1	0	0	0	0	1	1	1
Atf2	0	0	0	0	1	0	0	0	0	1	1	1
Atf3	0	0	0	0	1	0	0	0	0	1	1	1
Atg14	0	0	0	0	1	0	0	0	0	1	1	1
Atg2a	0	0	0	0	1	0	0	0	0	1	1	1
Atg9b	0	0	0	0	1	0	0	0	0	1	1	1
Atl2	0	0	0	0	1	0	0	0	0	1	1	1
Atp10a	0	0	0	0	1	0	0	0	0	1	1	1
Atp11b	0	0	0	0	1	0	0	0	0	1	1	1
Atp1b1	0	0	0	0	1	0	0	0	0	1	1	1
Atp1b3	0	0	0	0	1	0	0	0	0	1	1	1
Atp6ap1	0	0	0	0	1	0	0	0	0	1	1	1
Atp6v1b1	0	0	0	0	1	0	0	0	0	1	1	1
Atp6v1h	0	0	0	0	1	0	0	0	0	1	1	1
Atp8a1	0	0	0	0	1	0	0	0	0	1	1	1
Atpaf2	0	0	0	0	1	0	0	0	0	1	1	1
Atxn2	0	0	0	0	1	0	0	0	0	1	1	1
Atxn2l	0	0	0	0	0	0	0	1	0	1	1	1
Atxn7l1	0	0	0	0	1	0	0	0	0	1	1	1
Aup1	0	0	0	0	1	0	0	0	0	1	1	1

Azin2	0	0	0	0	1	0	0	0	0	1	1	1
B3gat3	0	0	0	0	1	0	0	0	0	1	1	1
B4gat1	0	0	0	0	1	0	0	0	0	1	1	1
BC005561	0	0	0	0	0	1	0	0	0	1	1	1
BC027072	0	0	0	0	1	0	0	0	0	1	1	1
BC030867	0	0	0	0	1	0	0	0	0	1	1	1
BC048403	0	0	0	0	1	0	0	0	0	1	1	1
BC048562	0	0	0	0	0	1	0	0	0	1	1	1
Babam1	0	0	0	0	1	0	0	0	0	1	1	1
Bag3	0	0	0	0	1	0	0	0	0	1	1	1
Bag4	0	0	0	0	0	1	0	0	0	1	1	1
Bahcc1	0	0	0	0	1	0	0	0	0	1	1	1
Banp	0	0	0	0	1	0	0	0	0	1	1	1
Bard1	0	0	0	0	1	0	0	0	0	1	1	1
Baz1b	0	0	0	0	1	0	0	0	0	1	1	1
Bbs10	0	0	0	0	1	0	0	0	0	1	1	1
Bbs5	1	0	0	0	0	0	0	0	0	1	1	1
Bcar3	0	0	0	0	1	0	0	0	0	1	1	1
Bcl2l13	0	0	0	0	1	0	0	0	0	1	1	1
Bcl9l	0	0	0	0	1	0	0	0	0	1	1	1
Bclaf1	0	0	0	0	1	0	0	0	0	1	1	1
Bco1	0	0	0	0	1	0	0	0	0	1	1	1
Bcorl1	0	0	0	0	1	0	0	0	0	1	1	1
Bend3	0	0	0	0	1	0	0	0	0	1	1	1
Bicral	0	0	0	0	1	0	0	0	0	1	1	1
Birc6	0	0	0	0	1	0	0	0	0	1	1	1
Blm	0	0	0	0	1	0	0	0	0	1	1	1
Bloc1s1	0	0	0	0	0	1	0	0	0	1	1	1
Blvrb	0	0	0	0	0	1	0	0	0	1	1	1
Bmp2	0	0	0	0	1	0	0	0	0	1	1	1
Bmp4	0	0	0	0	1	0	0	0	0	1	1	1
Bmper	0	0	0	0	1	0	0	0	0	1	1	1
Bmpr2	0	0	0	0	1	0	0	0	0	1	1	1

Bms1	0	0	0	0	1	0	0	0	0	1	1	1
Bok	0	0	0	0	1	0	0	0	0	1	1	1
Bpifa5	0	0	0	0	0	0	0	1	0	1	1	1
Bpifb1	0	0	0	0	1	0	0	0	0	1	1	1
Brca1	0	0	0	0	1	0	0	0	0	1	1	1
Brd2	0	0	0	0	1	0	0	0	0	1	1	1
Brd8	0	0	0	0	1	0	0	0	0	1	1	1
Brdt	0	0	0	0	1	0	0	0	0	1	1	1
Brf1	0	0	0	0	0	0	0	1	0	1	1	1
Bsn	0	0	0	0	1	0	0	0	0	1	1	1
Bst1	0	0	0	0	1	0	0	0	0	1	1	1
Btbd35f1	0	0	0	0	1	0	0	0	0	1	1	1
Btbd35f7	0	0	0	0	1	0	0	0	0	1	1	1
Bub1b	0	0	0	0	1	0	0	0	0	1	1	1
C1galt1	0	0	0	0	1	0	0	0	0	1	1	1
C1galt1c1	0	0	0	0	1	0	0	0	0	1	1	1
C1rb	0	0	0	0	1	0	0	0	0	1	1	1
C2cd2l	0	0	0	0	1	0	0	0	0	1	1	1
C2cd5	0	0	0	0	1	0	0	0	0	1	1	1
C3	0	0	0	0	1	0	0	0	0	1	1	1
C530008M	0	0	0	0	0	0	0	1	0	1	1	1
C8g	0	0	0	0	1	0	0	0	0	1	1	1
Cab39l	0	0	0	0	1	0	0	0	0	1	1	1
Cacna1a	0	0	0	0	1	0	0	0	0	1	1	1
Cacna2d2	0	0	0	0	1	0	0	0	0	1	1	1
Cacna2d3	0	0	0	0	1	0	0	0	0	1	1	1
Cacul1	0	0	0	0	1	0	0	0	0	1	1	1
Cadm1	0	0	0	0	1	0	0	0	0	1	1	1
Cadps2	0	0	0	0	0	1	0	0	0	1	1	1
Camk1	0	0	0	0	1	0	0	0	0	1	1	1
Camkk2	0	0	0	0	1	0	0	0	0	1	1	1
Capn1	0	0	0	0	1	0	0	0	0	1	1	1
Capn15	0	0	0	0	1	0	0	0	0	1	1	1

Car10	0	0	0	0	0	1	0	0	0	1	1	1
Carnmt1	0	0	0	0	1	0	0	0	0	1	1	1
Cast	0	0	0	0	1	0	0	0	0	1	1	1
Catsper1	0	0	0	0	1	0	0	0	0	1	1	1
Catsper3	0	0	0	0	1	0	0	0	0	1	1	1
Cav1	0	0	0	0	1	0	0	0	0	1	1	1
Cbx8	0	0	0	0	1	0	0	0	0	1	1	1
Cc2d2a	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc127	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc141	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc149	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc150	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc154	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc170	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc190	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc191	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc27	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc33	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc40	0	0	0	0	0	0	0	1	0	1	1	1
Ccdc8	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc88b	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc88c	0	0	0	0	1	0	0	0	0	1	1	1
Ccdc96	0	0	0	0	1	0	0	0	0	1	1	1
Ccnj	0	0	0	0	1	0	0	0	0	1	1	1
Cct5	0	0	0	0	1	0	0	0	0	1	1	1
Cct8	0	0	0	0	0	0	0	1	0	1	1	1
Cd101	0	0	0	0	1	0	0	0	0	1	1	1
Cd163	0	0	0	0	1	0	0	0	0	1	1	1
Cd200r3	0	0	0	0	1	0	0	0	0	1	1	1
Cd300c	0	0	0	0	1	0	0	0	0	1	1	1
Cd300e	0	0	0	0	1	0	0	0	0	1	1	1
Cd300lb	0	0	0	0	1	0	0	0	0	1	1	1
Cd36	0	0	0	0	1	0	0	0	0	1	1	1

Cd40	0	0	0	0	1	0	0	0	0	1	1	1
Cd7	0	0	0	0	1	0	0	0	0	1	1	1
Cd80	0	0	0	0	1	0	0	0	0	1	1	1
Cdc37	0	0	0	0	1	0	0	0	0	1	1	1
Cdc42bpb	0	0	0	0	1	0	0	0	0	1	1	1
Cdca2	0	0	0	0	1	0	0	0	0	1	1	1
Cdh13	0	0	0	0	1	0	0	0	0	1	1	1
Cdh19	0	0	0	0	1	0	0	0	0	1	1	1
Cdh2	0	0	0	0	0	1	0	0	0	1	1	1
Cdh3	0	0	0	0	1	0	0	0	0	1	1	1
Cdk12	0	0	0	0	1	0	0	0	0	1	1	1
Cdkn2aip	0	0	0	0	1	0	0	0	0	1	1	1
Cdkn2c	0	0	0	0	1	0	0	0	0	1	1	1
Cdr2	0	0	0	0	1	0	0	0	0	1	1	1
Cdv3	0	0	0	0	1	0	0	0	0	1	1	1
Cdyl	0	0	0	0	1	0	0	0	0	1	1	1
Ceacam18	0	0	0	0	1	0	0	0	0	1	1	1
Celsr3	0	0	0	0	1	0	0	0	0	1	1	1
Cenpf	0	0	0	0	1	0	0	0	0	1	1	1
Cep112	0	0	0	0	1	0	0	0	0	1	1	1
Cep170	0	0	0	0	1	0	0	0	0	1	1	1
Cep192	0	0	0	0	1	0	0	0	0	1	1	1
Cep250	0	0	0	0	1	0	0	0	0	1	1	1
Cep290	0	0	0	0	1	0	0	0	0	1	1	1
Cep350	0	0	0	0	1	0	0	0	0	1	1	1
Cep70	0	0	0	0	1	0	0	0	0	1	1	1
Cep97	0	0	0	0	1	0	0	0	0	1	1	1
Cers1	0	0	0	0	0	0	0	1	0	1	1	1
Cers2	0	0	0	0	1	0	0	0	0	1	1	1
Ces1b	0	0	0	0	1	0	0	0	0	1	1	1
Ces2c	0	0	0	0	1	0	0	0	0	1	1	1
Ces2e	0	0	0	0	0	1	0	0	0	1	1	1
Cetn2	0	0	0	0	0	0	0	1	0	1	1	1

Cetn3	0	0	0	0	1	0	0	0	0	1	1	1
Cfap46	0	0	0	0	1	0	0	0	0	1	1	1
Cfh	0	0	0	0	0	1	0	0	0	1	1	1
Cfhr1	0	0	0	0	1	0	0	0	0	1	1	1
Cgn	0	0	0	0	1	0	0	0	0	1	1	1
Cgnl1	0	0	0	0	1	0	0	0	0	1	1	1
Ch25h	0	0	0	0	1	0	0	0	0	1	1	1
Champ1	0	0	0	0	1	0	0	0	0	1	1	1
Chd1l	0	0	0	0	1	0	0	0	0	1	1	1
Chd4	0	0	0	0	1	0	0	0	0	1	1	1
Chd6	0	0	0	0	1	0	0	0	0	1	1	1
Chd9	0	0	0	0	1	0	0	0	0	1	1	1
Chia1	0	0	0	0	1	0	0	0	0	1	1	1
Chmp1a	0	0	0	0	1	0	0	0	0	1	1	1
Chst12	0	0	0	0	1	0	0	0	0	1	1	1
Chst2	0	0	0	0	1	0	0	0	0	1	1	1
Chsy3	0	0	0	0	1	0	0	0	0	1	1	1
Cited2	0	0	0	0	1	0	0	0	0	1	1	1
Ckmt2	0	0	0	0	1	0	0	0	0	1	1	1
Clasp2	0	0	0	0	0	0	0	1	0	1	1	1
Clca3b	0	0	0	0	0	1	0	0	0	1	1	1
Clca4b	0	0	0	0	1	0	0	0	0	1	1	1
Clic1	0	0	0	0	1	0	0	0	0	1	1	1
Clmn	0	0	0	0	1	0	0	0	0	1	1	1
Clmp	0	0	0	0	1	0	0	0	0	1	1	1
Clns1a	0	0	0	0	1	0	0	0	0	1	1	1
Clpb	0	0	0	0	1	0	0	0	0	1	1	1
Clstn3	0	0	0	0	1	0	0	0	0	1	1	1
Cltc	0	0	0	0	1	0	0	0	0	1	1	1
Cluh	0	0	0	0	1	0	0	0	0	1	1	1
Cndp2	0	0	0	0	1	0	0	0	0	1	1	1
Cnga4	0	0	0	0	1	0	0	0	0	1	1	1
Cnksr1	0	0	0	0	1	0	0	0	0	1	1	1

Cnn3	0	0	0	0	1	0	0	0	0	1	1	1
Cntn6	0	0	0	0	1	0	0	0	0	1	1	1
Cntnap4	0	0	0	0	0	0	0	1	0	1	1	1
Cntnap5c	0	0	0	0	1	0	0	0	0	1	1	1
Cntrl	0	0	0	0	1	0	0	0	0	1	1	1
Cog1	0	0	0	0	1	0	0	0	0	1	1	1
Cog2	0	0	0	0	0	0	0	1	0	1	1	1
Cog3	0	0	0	0	0	1	0	0	0	1	1	1
Cog4	0	0	0	0	1	0	0	0	0	1	1	1
Cog5	0	0	0	0	1	0	0	0	0	1	1	1
Col11a1	0	0	0	0	1	0	0	0	0	1	1	1
Col11a2	0	0	0	0	1	0	0	0	0	1	1	1
Col13a1	0	0	0	0	1	0	0	0	0	1	1	1
Col14a1	0	0	0	0	1	0	0	0	0	1	1	1
Col18a1	0	0	0	0	1	0	0	0	0	1	1	1
Col1a1	0	0	0	0	1	0	0	0	0	1	1	1
Col1a2	0	0	0	0	1	0	0	0	0	1	1	1
Col25a1	0	0	0	0	1	0	0	0	0	1	1	1
Col27a1	0	0	0	0	1	0	0	0	0	1	1	1
Col28a1	0	0	0	0	1	0	0	0	0	1	1	1
Col2a1	0	0	0	0	1	0	0	0	0	1	1	1
Col4a2	0	0	0	0	1	0	0	0	0	1	1	1
Col5a3	0	0	0	0	1	0	0	0	0	1	1	1
Col6a2	0	0	0	0	1	0	0	0	0	1	1	1
Col7a1	0	0	0	0	0	0	0	1	0	1	1	1
Col9a2	0	0	0	0	1	0	0	0	0	1	1	1
Colec10	0	0	0	0	1	0	0	0	0	1	1	1
Colec11	0	0	0	0	0	0	0	1	0	1	1	1
Copa	0	0	0	0	1	0	0	0	0	1	1	1
Coro2b	0	0	0	0	1	0	0	0	0	1	1	1
Cox14	0	0	0	0	1	0	0	0	0	1	1	1
Cox18	0	0	0	0	0	0	0	1	0	1	1	1
Cox7c	0	0	0	0	0	0	0	1	0	1	1	1

Cp	0	0	0	0	1	0	0	0	0	1	1	1
Cped1	0	0	0	0	0	1	0	0	0	1	1	1
Cpt1a	0	0	0	0	1	0	0	0	0	1	1	1
Cpt1b	0	0	0	0	1	0	0	0	0	1	1	1
Cpt1c	0	0	0	0	1	0	0	0	0	1	1	1
Cramp1l	0	0	0	0	1	0	0	0	0	1	1	1
Crb2	0	0	0	0	1	0	0	0	0	1	1	1
Crot	0	0	0	0	1	0	0	0	0	1	1	1
Crtac1	0	0	0	0	1	0	0	0	0	1	1	1
Cry1	0	0	0	0	1	0	0	0	0	1	1	1
Crybb1	0	0	0	0	1	0	0	0	0	1	1	1
Crygd	0	0	0	0	1	0	0	0	0	1	1	1
Csf3r	0	0	0	0	0	1	0	0	0	1	1	1
Csmd2	0	0	0	0	1	0	0	0	0	1	1	1
Csnk1e	0	0	0	0	1	0	0	0	0	1	1	1
Cst10	0	0	0	0	1	0	0	0	0	1	1	1
Ctbp1	0	0	0	0	1	0	0	0	0	1	1	1
Ctc1	0	0	0	0	1	0	0	0	0	1	1	1
Ctdspl2	0	0	0	0	1	0	0	0	0	1	1	1
Ctr9	0	0	0	0	1	0	0	0	0	1	1	1
Cts6	0	0	0	0	0	1	0	0	0	1	1	1
Cts7	0	0	0	0	1	0	0	0	0	1	1	1
Cts8	0	0	0	0	1	0	0	0	0	1	1	1
Ctsa	0	0	0	0	1	0	0	0	0	1	1	1
Cttnbp2	0	0	0	0	1	0	0	0	0	1	1	1
Cttnbp2nl	0	0	0	0	1	0	0	0	0	1	1	1
Cul1	0	0	0	0	1	0	0	0	0	1	1	1
Cul7	0	0	0	0	1	0	0	0	0	1	1	1
Cul9	0	0	0	0	1	0	0	0	0	1	1	1
Cwc22	0	0	0	0	1	0	0	0	0	1	1	1
Cxcl1	0	0	0	0	1	0	0	0	0	1	1	1
Cyb5r4	0	0	0	0	1	0	0	0	0	1	1	1
Cylc2	0	0	0	0	1	0	0	0	0	1	1	1

Cyp26b1	0	0	0	0	1	0	0	0	0	1	1	1
Cyp2a4	0	0	0	0	1	0	0	0	0	1	1	1
Cyp2c68	0	0	0	0	1	0	0	0	0	1	1	1
Cyp2d9	0	0	0	0	1	0	0	0	0	1	1	1
Cyp2e1	0	0	0	0	0	0	0	1	0	1	1	1
Cyp2j7	0	0	0	0	1	0	0	0	0	1	1	1
Cyp2r1	0	0	0	0	1	0	0	0	0	1	1	1
Cyp3a59	0	0	0	0	1	0	0	0	0	1	1	1
Cyp51	0	0	0	0	1	0	0	0	0	1	1	1
D11Wsu47	0	0	0	0	1	0	0	0	0	1	1	1
D17Wsu92	0	0	0	0	1	0	0	0	0	1	1	1
D1Pas1	0	0	0	0	1	0	0	0	0	1	1	1
D430042O	0	0	0	0	1	0	0	0	0	1	1	1
D5Ertd579	0	0	0	0	1	0	0	0	0	1	1	1
D6Wsu163	0	0	0	0	1	0	0	0	0	1	1	1
Dab2	0	0	0	0	1	0	0	0	0	1	1	1
Dagla	0	0	0	0	1	0	0	0	0	1	1	1
Daglb	0	0	0	0	1	0	0	0	0	1	1	1
Dcaf5	0	0	0	0	1	0	0	0	0	1	1	1
Dcaf8	0	0	0	0	1	0	0	0	0	1	1	1
Dcbld2	0	0	0	0	1	0	0	0	0	1	1	1
Dcp1a	0	0	0	0	1	0	0	0	0	1	1	1
Dcp2	0	0	0	0	1	0	0	0	0	1	1	1
Dct	0	0	0	0	1	0	0	0	0	1	1	1
Dcun1d4	0	0	0	0	1	0	0	0	0	1	1	1
Ddx1	0	0	0	0	1	0	0	0	0	1	1	1
Ddx50	0	0	0	0	1	0	0	0	0	1	1	1
Ddx51	0	0	0	0	0	0	0	1	0	1	1	1
Ddx56	0	0	0	0	1	0	0	0	0	1	1	1
Defa21	0	0	0	0	1	0	0	0	0	1	1	1
Defa30	0	0	0	0	1	0	0	0	0	1	1	1
Dennd1a	0	0	0	0	1	0	0	0	0	1	1	1
Dennd1c	0	0	0	0	1	0	0	0	0	1	1	1

Dennd5a	0	0	0	0	1	0	0	0	0	1	1	1
Depdc5	0	0	0	0	1	0	0	0	0	1	1	1
Dgkb	0	0	0	0	1	0	0	0	0	1	1	1
Dgkg	0	0	0	0	1	0	0	0	0	1	1	1
Dhdds	0	0	0	0	1	0	0	0	0	1	1	1
Dhx38	0	0	0	0	1	0	0	0	0	1	1	1
Diaph3	0	0	0	0	1	0	0	0	0	1	1	1
Dido1	0	0	0	0	1	0	0	0	0	1	1	1
Dis3	0	0	0	0	1	0	0	0	0	1	1	1
Dixdc1	0	0	0	0	1	0	0	0	0	1	1	1
Dkc1	0	0	0	0	1	0	0	0	0	1	1	1
Dkk2	0	0	0	0	1	0	0	0	0	1	1	1
Dlat	0	0	0	0	1	0	0	0	0	1	1	1
Dld	0	0	0	0	1	0	0	0	0	1	1	1
Dlg2	0	0	0	0	1	0	0	0	0	1	1	1
Dlgap1	0	0	0	0	1	0	0	0	0	1	1	1
Dlgap2	0	0	0	0	1	0	0	0	0	1	1	1
Dmbt1	0	0	0	0	1	0	0	0	0	1	1	1
Dmgdh	0	0	0	0	1	0	0	0	0	1	1	1
Dmrt2	0	0	0	0	1	0	0	0	0	1	1	1
Dmrt3	0	0	0	0	1	0	0	0	0	1	1	1
Dmxl1	0	0	0	0	1	0	0	0	0	1	1	1
Dmxl2	0	0	0	0	1	0	0	0	0	1	1	1
Dnaaf3	0	0	0	0	1	0	0	0	0	1	1	1
Dnah6	0	0	0	0	1	0	0	0	0	1	1	1
Dnajc13	0	0	0	0	1	0	0	0	0	1	1	1
Dnajc21	0	0	0	0	0	0	0	1	0	1	1	1
Dnajc4	0	0	0	0	1	0	0	0	0	1	1	1
Dnajc6	0	0	0	0	1	0	0	0	0	1	1	1
Dnase2b	0	0	0	0	1	0	0	0	0	1	1	1
Dnm3	0	0	0	0	1	0	0	0	0	1	1	1
Dnmt3a	0	0	0	0	1	0	0	0	0	1	1	1
Dock1	0	0	0	0	1	0	0	0	0	1	1	1

Dock10	0	0	0	0	1	0	0	0	0	1	1	1
Dock6	0	0	0	0	1	0	0	0	0	1	1	1
Dock8	0	0	0	0	1	0	0	0	0	1	1	1
Dok6	0	0	0	0	1	0	0	0	0	1	1	1
Dpp6	0	0	0	0	1	0	0	0	0	1	1	1
Dppa2	0	0	0	0	1	0	0	0	0	1	1	1
Dppa5a	0	0	0	0	1	0	0	0	0	1	1	1
Dpy19l1	0	0	0	0	1	0	0	0	0	1	1	1
Dpy19l4	0	0	0	0	1	0	0	0	0	1	1	1
Dpysl3	0	0	0	0	1	0	0	0	0	1	1	1
Drc7	0	0	0	0	1	0	0	0	0	1	1	1
Dsc3	0	0	0	0	1	0	0	0	0	1	1	1
Dscc1	0	0	0	0	1	0	0	0	0	1	1	1
Dsg1a	0	0	0	0	1	0	0	0	0	1	1	1
Dsg1b	0	0	0	0	1	0	0	0	0	1	1	1
Dtna	0	0	0	0	0	0	0	1	0	1	1	1
Dvl1	0	0	0	0	1	0	0	0	0	1	1	1
Dync1li2	0	0	0	0	1	0	0	0	0	1	1	1
Dync2h1	0	0	0	0	1	0	0	0	0	1	1	1
Dynlrb1	0	0	0	0	1	0	0	0	0	1	1	1
Dysf	0	0	0	0	0	1	0	0	0	1	1	1
Dzip3	0	0	0	0	1	0	0	0	0	1	1	1
E130308A1	0	0	0	0	1	0	0	0	0	1	1	1
E330034G1	0	0	0	0	0	1	0	0	0	1	1	1
Ebag9	0	0	0	0	1	0	0	0	0	1	1	1
Ebf1	0	0	0	0	1	0	0	0	0	1	1	1
Ebna1bp2	0	0	0	0	1	0	0	0	0	1	1	1
Ebpl	0	0	0	0	1	0	0	0	0	1	1	1
Ecel1	0	0	0	0	1	0	0	0	0	1	1	1
Echdc1	0	0	0	0	1	0	0	0	0	1	1	1
Ecm1	0	0	0	0	1	0	0	0	0	1	1	1
Ecm2	0	0	0	0	1	0	0	0	0	1	1	1
Edar	0	0	0	0	1	0	0	0	0	1	1	1

Eea1	0	0	0	0	0	0	0	1	0	1	1	1
Eef1a1	0	0	0	0	0	0	0	1	0	1	1	1
Eef2	0	0	0	0	1	0	0	0	0	1	1	1
Efcab14	0	0	0	0	1	0	0	0	0	1	1	1
Efl1	0	0	0	0	1	0	0	0	0	1	1	1
Efnb1	0	0	0	0	1	0	0	0	0	1	1	1
Efr3b	0	0	0	0	1	0	0	0	0	1	1	1
Eftud2	0	0	0	0	1	0	0	0	0	1	1	1
Egln1	0	0	0	0	1	0	0	0	0	1	1	1
Egr1	0	0	0	0	1	0	0	0	0	1	1	1
Ehbp1	0	0	0	0	1	0	0	0	0	1	1	1
Ehd1	0	0	0	0	1	0	0	0	0	1	1	1
Ehhadh	0	0	0	0	1	0	0	0	0	1	1	1
Ei24	0	0	0	0	0	1	0	0	0	1	1	1
Eif3b	0	0	0	0	1	0	0	0	0	1	1	1
Eif3g	0	0	0	0	0	0	0	1	0	1	1	1
Eif4enif1	0	0	0	0	1	0	0	0	0	1	1	1
Eif4g1	0	0	0	0	1	0	0	0	0	1	1	1
Eif5b	0	0	0	0	1	0	0	0	0	1	1	1
Elf4	0	0	0	0	1	0	0	0	0	1	1	1
Elp2	0	0	0	0	1	0	0	0	0	1	1	1
Eme2	0	0	0	0	1	0	0	0	0	1	1	1
Eml2	0	0	0	0	1	0	0	0	0	1	1	1
Eml6	0	0	0	0	1	0	0	0	0	1	1	1
Endou	0	0	0	0	1	0	0	0	0	1	1	1
Eno1b	0	0	0	0	1	0	0	0	0	1	1	1
Enpp2	0	0	0	0	0	1	0	0	0	1	1	1
Ep300	0	0	0	0	0	1	0	0	0	1	1	1
Ep400	0	0	0	0	1	0	0	0	0	1	1	1
Epb41l2	0	0	0	0	1	0	0	0	0	1	1	1
Epha5	0	0	0	0	1	0	0	0	0	1	1	1
Epha6	0	0	0	0	1	0	0	0	0	1	1	1
Ephb3	0	0	0	0	1	0	0	0	0	1	1	1

Epm2aip1	0	0	0	0	1	0	0	0	0	1	1	1
Eps8l3	0	0	0	0	1	0	0	0	0	1	1	1
Erbb2	0	0	0	0	0	0	0	1	0	1	1	1
Erbin	0	0	0	0	0	0	0	1	0	1	1	1
Ercc2	0	0	0	0	1	0	0	0	0	1	1	1
Ercc4	0	0	0	0	1	0	0	0	0	1	1	1
Eri1	0	0	0	0	0	0	0	1	0	1	1	1
Ern2	0	0	0	0	1	0	0	0	0	1	1	1
Erp44	0	0	0	0	1	0	0	0	0	1	1	1
Esco1	0	0	0	0	1	0	0	0	0	1	1	1
Esrp2	0	0	0	0	1	0	0	0	0	1	1	1
Esrra	0	0	0	0	1	0	0	0	0	1	1	1
Etd	0	0	0	0	1	0	0	0	0	1	1	1
Evi5	0	0	0	0	1	0	0	0	0	1	1	1
Ewsr1	0	0	0	0	1	0	0	0	0	1	1	1
Exd2	0	0	0	0	1	0	0	0	0	1	1	1
Exoc7	0	0	0	0	1	0	0	0	0	1	1	1
Exog	0	0	0	0	1	0	0	0	0	1	1	1
Extl3	0	0	0	0	1	0	0	0	0	1	1	1
Eya2	0	0	0	0	1	0	0	0	0	1	1	1
Ezh1	0	0	0	0	1	0	0	0	0	1	1	1
F11	0	0	0	0	1	0	0	0	0	1	1	1
F2rl1	0	0	0	0	1	0	0	0	0	1	1	1
Faah	0	0	0	0	1	0	0	0	0	1	1	1
Fabp12	0	0	0	0	1	0	0	0	0	1	1	1
Fabp7	0	0	0	0	1	0	0	0	0	1	1	1
Faf1	0	0	0	0	1	0	0	0	0	1	1	1
Fam102a	0	0	0	0	1	0	0	0	0	1	1	1
Fam117b	0	0	0	0	1	0	0	0	0	1	1	1
Fam122a	0	0	0	0	1	0	0	0	0	1	1	1
Fam133b	0	0	0	0	1	0	0	0	0	1	1	1
Fam160a1	0	0	0	0	1	0	0	0	0	1	1	1
Fam170b	0	0	0	0	1	0	0	0	0	1	1	1

Fam171b	0	0	0	0	1	0	0	0	0	1	1	1
Fam187b	0	0	0	0	1	0	0	0	0	1	1	1
Fam196a	0	0	0	0	1	0	0	0	0	1	1	1
Fam198a	0	0	0	0	1	0	0	0	0	1	1	1
Fam208a	0	0	0	0	1	0	0	0	0	1	1	1
Fam208b	0	0	0	0	1	0	0	0	0	1	1	1
Fam214a	0	0	0	0	1	0	0	0	0	1	1	1
Fam229b	0	0	0	0	0	0	0	1	0	1	1	1
Fam26d	0	0	0	0	1	0	0	0	0	1	1	1
Fam69b	0	0	0	0	1	0	0	0	0	1	1	1
Fam76a	0	0	0	0	1	0	0	0	0	1	1	1
Fancf	0	0	0	0	1	0	0	0	0	1	1	1
Farp1	0	0	0	0	1	0	0	0	0	1	1	1
Fasl	0	0	0	0	1	0	0	0	0	1	1	1
Fasn	0	0	0	0	1	0	0	0	0	1	1	1
Fat3	0	0	0	0	1	0	0	0	0	1	1	1
Fbln1	0	0	0	0	1	0	0	0	0	1	1	1
Fbln5	0	0	0	0	0	0	0	1	0	1	1	1
Fbn1	0	0	0	0	1	0	0	0	0	1	1	1
Fbrsl1	0	0	0	0	1	0	0	0	0	1	1	1
Fbxl2	0	0	0	0	0	0	0	1	0	1	1	1
Fbxl3	0	0	0	0	1	0	0	0	0	1	1	1
Fbxo34	0	0	0	0	1	0	0	0	0	1	1	1
Fbxo38	0	0	0	0	1	0	0	0	0	1	1	1
Fbxo40	0	0	0	0	1	0	0	0	0	1	1	1
Fbxo8	0	0	0	0	1	0	0	0	0	1	1	1
Fbxw18	0	0	0	0	0	1	0	0	0	1	1	1
Fcf1	0	0	0	0	1	0	0	0	0	1	1	1
Fcgr2b	0	0	0	0	1	0	0	0	0	1	1	1
Fer	0	0	0	0	0	0	0	1	0	1	1	1
Fermt2	0	0	0	0	1	0	0	0	0	1	1	1
Fes	0	0	0	0	1	0	0	0	0	1	1	1
Fez2	0	0	0	0	1	0	0	0	0	1	1	1

Fezf1	0	0	0	0	1	0	0	0	0	1	1	1
Fezf2	0	0	0	0	1	0	0	0	0	1	1	1
Fgb	0	0	0	0	1	0	0	0	0	1	1	1
Fgr	0	0	0	0	1	0	0	0	0	1	1	1
Fhl4	0	0	0	0	1	0	0	0	0	1	1	1
Filip1	0	0	0	0	1	0	0	0	0	1	1	1
Fip1l1	0	0	0	0	1	0	0	0	0	1	1	1
Fkbp10	0	0	0	0	1	0	0	0	0	1	1	1
Fkbp15	0	0	0	0	1	0	0	0	0	1	1	1
Fkbp3	0	0	0	0	1	0	0	0	0	1	1	1
Fkbp5	0	0	0	0	1	0	0	0	0	1	1	1
Flg2	0	0	0	0	1	0	0	0	0	1	1	1
Flnb	0	0	0	0	1	0	0	0	0	1	1	1
Fmo4	0	0	0	0	1	0	0	0	0	1	1	1
Focad	0	0	0	0	1	0	0	0	0	1	1	1
Foxd1	0	0	0	0	1	0	0	0	0	1	1	1
Foxk2	0	0	0	0	1	0	0	0	0	1	1	1
Foxm1	0	0	0	0	1	0	0	0	0	1	1	1
Foxo6	0	0	0	0	1	0	0	0	0	1	1	1
Fpr-rs7	0	0	0	0	1	0	0	0	0	1	1	1
Frem2	0	0	0	0	1	0	0	0	0	1	1	1
Frmd3	0	0	0	0	1	0	0	0	0	1	1	1
Frrs1	0	0	0	0	1	0	0	0	0	1	1	1
Fscb	0	0	0	0	1	0	0	0	0	1	1	1
Ftmt	0	0	0	0	1	0	0	0	0	1	1	1
Fundc2	0	0	0	0	1	0	0	0	0	1	1	1
Fut10	0	0	0	0	1	0	0	0	0	1	1	1
Fyb	0	0	0	0	1	0	0	0	0	1	1	1
Fzd10	0	0	0	0	1	0	0	0	0	1	1	1
Gabrb3	0	0	0	0	1	0	0	0	0	1	1	1
Gad1	0	0	0	0	1	0	0	0	0	1	1	1
Gak	0	0	0	0	1	0	0	0	0	1	1	1
Galnt12	0	0	0	0	1	0	0	0	0	1	1	1

Galnt17	0	0	0	0	0	1	0	0	0	1	1	1
Galnt9	0	0	0	0	1	0	0	0	0	1	1	1
Garnl3	0	0	0	0	1	0	0	0	0	1	1	1
Gas2	0	0	0	0	1	0	0	0	0	1	1	1
Gata2	0	0	0	0	1	0	0	0	0	1	1	1
Gatad2a	0	0	0	0	1	0	0	0	0	1	1	1
Gatad2b	0	0	0	0	1	0	0	0	0	1	1	1
Gbf1	0	0	0	0	1	0	0	0	0	1	1	1
Gbgt1	0	0	0	0	1	0	0	0	0	1	1	1
Gcg	0	0	0	0	1	0	0	0	0	1	1	1
Gcm1	0	0	0	0	1	0	0	0	0	1	1	1
Gcn1l1	0	0	0	0	1	0	0	0	0	1	1	1
Gdpd4	0	0	0	0	0	1	0	0	0	1	1	1
Gemin5	0	0	0	0	1	0	0	0	0	1	1	1
Gen1	0	0	0	0	0	1	0	0	0	1	1	1
Gfm2	0	0	0	0	1	0	0	0	0	1	1	1
Ggn	0	0	0	0	1	0	0	0	0	1	1	1
Ghr	0	0	0	0	1	0	0	0	0	1	1	1
Gigyf1	0	0	0	0	1	0	0	0	0	1	1	1
Gja8	0	0	0	0	1	0	0	0	0	1	1	1
Gjb2	0	0	0	0	1	0	0	0	0	1	1	1
Glg1	0	0	0	0	1	0	0	0	0	1	1	1
Glmp	0	0	0	0	1	0	0	0	0	1	1	1
Gm10377	0	0	0	0	1	0	0	0	0	1	1	1
Gm11564	0	0	0	0	1	0	0	0	0	1	1	1
Gm13088	0	0	0	0	1	0	0	0	0	1	1	1
Gm13271	0	0	0	0	1	0	0	0	0	1	1	1
Gm13762	0	0	0	0	1	0	0	0	0	1	1	1
Gm14085	0	0	0	0	1	0	0	0	0	1	1	1
Gm14410	0	0	0	0	0	0	0	1	0	1	1	1
Gm14496	0	1	0	0	0	0	0	0	0	1	1	1
Gm20730	0	0	0	0	1	0	0	0	0	1	1	1
Gm3550	0	0	0	0	1	0	0	0	0	1	1	1

Gm364	0	0	0	0	1	0	0	0	0	1	1	1
Gm436	0	0	0	0	1	0	0	0	0	1	1	1
Gm438	0	0	0	0	1	0	0	0	0	1	1	1
Gm45736	0	0	0	0	1	0	0	0	0	1	1	1
Gm45844	0	0	0	0	1	0	0	0	0	1	1	1
Gm5592	0	0	0	0	1	0	0	0	0	1	1	1
Gm5965	0	0	0	0	0	1	0	0	0	1	1	1
Gm597	0	0	0	0	1	0	0	0	0	1	1	1
Gm6205	0	0	0	0	1	0	0	0	0	1	1	1
Gm6358	0	0	0	0	1	0	0	0	0	1	1	1
Gm8369	0	0	0	0	1	0	0	0	0	1	1	1
Gm906	0	0	0	0	1	0	0	0	0	1	1	1
Gm9268	0	0	0	0	1	0	0	0	0	1	1	1
Gm9758	0	0	0	1	0	0	0	0	0	1	1	1
Gm996	0	0	0	0	1	0	0	0	0	1	1	1
Gnai2	0	0	0	0	1	0	0	0	0	1	1	1
Gnao1	0	0	0	0	0	0	0	1	0	1	1	1
Gnat3	0	0	0	0	1	0	0	0	0	1	1	1
Gnptg	0	0	0	0	1	0	0	0	0	1	1	1
Gpaa1	0	0	0	0	1	0	0	0	0	1	1	1
Gpatch4	0	0	0	0	0	1	0	0	0	1	1	1
Gpbp1l1	0	0	0	0	1	0	0	0	0	1	1	1
Gpc5	0	0	0	0	1	0	0	0	0	1	1	1
Gpr108	0	0	0	0	1	0	0	0	0	1	1	1
Gpr142	0	0	0	0	0	1	0	0	0	1	1	1
Gpr155	0	0	0	0	1	0	0	0	0	1	1	1
Gpr19	0	0	0	0	1	0	0	0	0	1	1	1
Gpr87	0	0	0	0	1	0	0	0	0	1	1	1
Grasp	0	0	0	0	1	0	0	0	0	1	1	1
Grb10	0	0	0	0	1	0	0	0	0	1	1	1
Greb1	0	0	0	0	0	0	0	1	0	1	1	1
Greb1l	0	0	0	0	1	0	0	0	0	1	1	1
Gria4	1	0	0	0	0	0	0	0	0	1	1	1

Grik5	0	0	0	0	1	0	0	0	0	1	1	1
Grin1	0	0	0	0	1	0	0	0	0	1	1	1
Grip1	0	0	0	0	1	0	0	0	0	1	1	1
Grk5	0	0	0	0	0	0	0	1	0	1	1	1
Grm8	0	0	0	0	1	0	0	0	0	1	1	1
Grwd1	0	0	0	0	1	0	0	0	0	1	1	1
Gspt1	0	0	0	0	1	0	0	0	0	1	1	1
Gspt2	0	0	0	0	1	0	0	0	0	1	1	1
Gstm2	0	0	0	0	1	0	0	0	0	1	1	1
Gstp3	0	0	0	0	1	0	0	0	0	1	1	1
Gtf2a2	0	0	0	0	0	1	0	0	0	1	1	1
Gtf2e1	0	0	0	0	1	0	0	0	0	1	1	1
Gtf3c1	0	0	0	0	1	0	0	0	0	1	1	1
Gtf3c4	0	0	0	0	1	0	0	0	0	1	1	1
Gtf3c5	0	0	0	0	1	0	0	0	0	1	1	1
Gtpbp6	0	0	0	0	1	0	0	0	0	1	1	1
Gtse1	0	0	0	0	1	0	0	0	0	1	1	1
Gtsf1	0	0	0	0	0	0	0	1	0	1	1	1
Guca1b	0	0	0	0	1	0	0	0	0	1	1	1
Gucy1a2	0	0	0	0	1	0	0	0	0	1	1	1
Gvin1	0	0	0	0	1	0	0	0	0	1	1	1
Gzf1	0	0	0	0	1	0	0	0	0	1	1	1
Gzmd	0	0	0	0	1	0	0	0	0	1	1	1
H2afx	0	0	0	0	1	0	0	0	0	1	1	1
H2al1o	0	0	0	0	1	0	0	0	0	1	1	1
H6pd	0	0	0	0	1	0	0	0	0	1	1	1
Hars	0	0	0	0	1	0	0	0	0	1	1	1
Has1	0	0	0	0	1	0	0	0	0	1	1	1
Haus3	0	0	0	0	0	1	0	0	0	1	1	1
Hax1	0	0	0	0	1	0	0	0	0	1	1	1
Hc	0	0	0	0	1	0	0	0	0	1	1	1
Hdac1	0	0	0	0	1	0	0	0	0	1	1	1
Hdac11	0	0	0	0	1	0	0	0	0	1	1	1

Hdhd2	0	0	0	0	1	0	0	0	0	1	1	1
Heatr1	0	0	0	0	1	0	0	0	0	1	1	1
Heatr5b	0	0	0	0	1	0	0	0	0	1	1	1
Heatr6	0	0	0	0	1	0	0	0	0	1	1	1
Hectd1	0	0	0	0	1	0	0	0	0	1	1	1
Hectd4	0	0	0	0	1	0	0	0	0	1	1	1
Hecw2	0	0	0	0	1	0	0	0	0	1	1	1
Helb	0	0	0	0	1	0	0	0	0	1	1	1
Hephl1	0	0	0	0	1	0	0	0	0	1	1	1
Herc3	0	0	0	0	1	0	0	0	0	1	1	1
Herc4	0	0	0	0	1	0	0	0	0	1	1	1
Herc6	0	1	0	0	0	0	0	0	0	1	1	1
Hfm1	0	0	0	0	1	0	0	0	0	1	1	1
Hif1a	0	0	0	0	1	0	0	0	0	1	1	1
Hip1	0	0	0	0	1	0	0	0	0	1	1	1
Hira	0	0	0	0	1	0	0	0	0	1	1	1
Hist1h1d	0	0	0	0	1	0	0	0	0	1	1	1
Hist1h4j	0	0	0	0	1	0	0	0	0	1	1	1
Hnf4g	0	0	0	0	1	0	0	0	0	1	1	1
Hnrnpa3	0	0	0	0	1	0	0	0	0	1	1	1
Hnrnpf	0	0	0	0	1	0	0	0	0	1	1	1
Hnrnpul1	0	0	0	0	1	0	0	0	0	1	1	1
Hoxb6	0	0	0	0	1	0	0	0	0	1	1	1
Hpn	0	0	0	0	1	0	0	0	0	1	1	1
Hras	0	0	0	0	1	0	0	0	0	1	1	1
Hs3st4	0	0	0	0	1	0	0	0	0	1	1	1
Hs6st1	0	0	0	0	1	0	0	0	0	1	1	1
Hsd17b10	0	0	0	0	1	0	0	0	0	1	1	1
Hsd3b1	0	0	0	0	1	0	0	0	0	1	1	1
Hspa1a	0	0	0	0	1	0	0	0	0	1	1	1
Hspa1l	0	0	0	0	1	0	0	0	0	1	1	1
Hspa8	0	0	0	0	1	0	0	0	0	1	1	1
Hspb7	0	0	0	0	1	0	0	0	0	1	1	1

Hspd1	0	0	0	0	1	0	0	0	0	1	1	1
Htatip2	0	0	0	0	1	0	0	0	0	1	1	1
Htr2b	0	0	0	0	1	0	0	0	0	1	1	1
Htt	0	0	0	0	1	0	0	0	0	1	1	1
Hyou1	0	0	0	0	0	1	0	0	0	1	1	1
Ibsp	0	0	0	0	1	0	0	0	0	1	1	1
Ibtk	0	0	0	0	0	0	0	1	0	1	1	1
Icam4	0	0	0	0	1	0	0	0	0	1	1	1
Idh3b	0	0	0	0	1	0	0	0	0	1	1	1
Ifit3	0	0	0	0	1	0	0	0	0	1	1	1
Ifna5	0	0	0	0	1	0	0	0	0	1	1	1
Ifrd2	0	0	0	0	0	0	0	0	1	1	1	1
Ift140	0	0	0	0	0	1	0	0	0	1	1	1
Igfbp2	0	0	0	0	1	0	0	0	0	1	1	1
Ighv1-53	0	0	0	0	1	0	0	0	0	1	1	1
Ighv1-84	0	0	0	0	1	0	0	0	0	1	1	1
Ighv1-85	0	0	0	0	1	0	0	0	0	1	1	1
Ighv3-5	0	0	0	0	1	0	0	0	0	1	1	1
Ighv7-4	0	0	0	0	1	0	0	0	0	1	1	1
Igkv1-133	0	0	0	0	1	0	0	0	0	1	1	1
Igkv12-46	0	0	0	0	1	0	0	0	0	1	1	1
Igkv14-100	0	0	0	0	1	0	0	0	0	1	1	1
Igkv8-19	0	0	0	0	1	0	0	0	0	1	1	1
Igkv9-123	0	0	0	0	1	0	0	0	0	1	1	1
Igsf1	0	0	0	0	0	0	0	1	0	1	1	1
Igsf21	0	0	0	0	1	0	0	0	0	1	1	1
Ikzf2	0	0	0	0	1	0	0	0	0	1	1	1
Il16	0	0	0	0	1	0	0	0	0	1	1	1
Il17rc	0	0	0	0	1	0	0	0	0	1	1	1
Il1r2	0	0	0	0	1	0	0	0	0	1	1	1
Il1rap	0	0	0	0	0	1	0	0	0	1	1	1
Il1rl1	0	0	0	0	1	0	0	0	0	1	1	1
Il31	0	0	0	0	1	0	0	0	0	1	1	1

Il6st	0	0	0	0	1	0	0	0	0	1	1	1
Il9r	0	0	0	0	1	0	0	0	0	1	1	1
Ilf3	0	0	0	0	1	0	0	0	0	1	1	1
Ilvbl	0	0	0	0	1	0	0	0	0	1	1	1
Immp2l	0	0	0	0	1	0	0	0	0	1	1	1
Inpp1	0	0	0	0	1	0	0	0	0	1	1	1
Inpp4a	0	0	0	0	1	0	0	0	0	1	1	1
Inppl1	0	0	0	0	0	0	0	1	0	1	1	1
Ints14	0	0	0	0	1	0	0	0	0	1	1	1
Ints7	0	0	0	0	1	0	0	0	0	1	1	1
Ipcef1	0	0	0	0	1	0	0	0	0	1	1	1
Ipo7	0	0	0	0	1	0	0	0	0	1	1	1
Ipp	0	0	0	0	1	0	0	0	0	1	1	1
Irf2bp1	0	0	0	0	1	0	0	0	0	1	1	1
Irf2bpl	0	0	0	0	1	0	0	0	0	1	1	1
Irf4	0	0	0	0	1	0	0	0	0	1	1	1
Irgm2	0	0	0	0	1	0	0	0	0	1	1	1
Irs1	0	0	0	0	1	0	0	0	0	1	1	1
Itfg1	0	0	0	0	1	0	0	0	0	1	1	1
Itgad	0	0	0	0	1	0	0	0	0	1	1	1
Itgal	0	0	0	0	1	0	0	0	0	1	1	1
Itgb6	0	0	0	0	1	0	0	0	0	1	1	1
Itgb8	0	0	0	0	0	0	0	1	0	1	1	1
Itih5	0	0	0	0	1	0	0	0	0	1	1	1
Itln1	0	0	0	0	1	0	0	0	0	1	1	1
Itm2c	0	0	0	0	1	0	0	0	0	1	1	1
Itpr1	0	0	0	0	1	0	0	0	0	1	1	1
Itpripl2	0	0	0	0	1	0	0	0	0	1	1	1
Itsn1	0	0	0	0	1	0	0	0	0	1	1	1
Itsn2	0	0	0	0	1	0	0	0	0	1	1	1
Iyd	0	0	0	0	1	0	0	0	0	1	1	1
Jak3	0	0	0	0	1	0	0	0	0	1	1	1
Jcad	0	0	0	0	1	0	0	0	0	1	1	1

Jph4	0	0	0	0	1	0	0	0	0	1	1	1
Jup	0	0	0	0	1	0	0	0	0	1	1	1
Kank2	0	0	0	0	1	0	0	0	0	1	1	1
Kars	0	0	0	0	1	0	0	0	0	1	1	1
Kat6a	0	0	0	0	1	0	0	0	0	1	1	1
Kat7	0	0	0	0	1	0	0	0	0	1	1	1
Kcnc2	0	0	0	0	1	0	0	0	0	1	1	1
Kcnd2	0	0	0	0	0	1	0	0	0	1	1	1
Kcnh8	0	0	0	0	1	0	0	0	0	1	1	1
Kcnj16	0	0	0	0	1	0	0	0	0	1	1	1
Kcnj3	0	0	0	0	1	0	0	0	0	1	1	1
Kcnj5	0	0	0	0	1	0	0	0	0	1	1	1
Kcnj8	0	0	0	0	1	0	0	0	0	1	1	1
Kcnk13	0	0	0	0	1	0	0	0	0	1	1	1
Kcnk4	0	0	0	0	0	1	0	0	0	1	1	1
Kcnmb2	0	0	0	0	1	0	0	0	0	1	1	1
Kcnq1	0	0	0	0	1	0	0	0	0	1	1	1
Kcnq2	0	0	0	0	1	0	0	0	0	1	1	1
Kcnq3	0	0	0	0	1	0	0	0	0	1	1	1
Kcnq4	0	0	0	0	1	0	0	0	0	1	1	1
Kctd19	0	0	0	0	1	0	0	0	0	1	1	1
Kdm2a	0	0	0	0	1	0	0	0	0	1	1	1
Kdm4b	0	0	0	0	1	0	0	0	0	1	1	1
Kdm6b	0	0	0	0	1	0	0	0	0	1	1	1
Kdr	0	0	0	0	1	0	0	0	0	1	1	1
Kel	0	0	0	0	1	0	0	0	0	1	1	1
Khdrbs1	0	0	0	0	1	0	0	0	0	1	1	1
Khk	0	0	0	0	0	1	0	0	0	1	1	1
Kif13b	0	0	0	0	1	0	0	0	0	1	1	1
Kif14	0	0	0	0	1	0	0	0	0	1	1	1
Kif1a	0	0	0	0	1	0	0	0	0	1	1	1
Kif1b	0	0	0	0	1	0	0	0	0	1	1	1
Kif21a	0	0	0	0	0	1	0	0	0	1	1	1

Kif26b	0	0	0	0	1	0	0	0	0	1	1	1
Kif4	0	0	0	0	1	0	0	0	0	1	1	1
Kifc3	0	0	0	0	1	0	0	0	0	1	1	1
Kifc5b	0	0	0	0	1	0	0	0	0	1	1	1
Kirrel3	0	0	0	0	1	0	0	0	0	1	1	1
Klhl22	0	0	0	0	1	0	0	0	0	1	1	1
Klhl25	0	0	0	0	1	0	0	0	0	1	1	1
Klhl29	0	0	0	0	1	0	0	0	0	1	1	1
Klk11	0	0	0	0	1	0	0	0	0	1	1	1
Klk1b21	0	0	0	0	1	0	0	0	0	1	1	1
Klra9	0	0	0	0	1	0	0	0	0	1	1	1
Klrb1	0	0	0	0	1	0	0	0	0	1	1	1
Klrc1	0	0	0	0	0	1	0	0	0	1	1	1
Kmt2a	0	0	0	0	1	0	0	0	0	1	1	1
Kmt2c	0	0	0	0	1	0	0	0	0	1	1	1
Kmt5a	0	0	0	0	1	0	0	0	0	1	1	1
Kndc1	0	0	0	0	1	0	0	0	0	1	1	1
Kpna7	0	0	0	0	1	0	0	0	0	1	1	1
Krt19	0	0	0	0	1	0	0	0	0	1	1	1
Krt20	0	0	0	0	1	0	0	0	0	1	1	1
Krt222	0	0	0	0	1	0	0	0	0	1	1	1
Krt42	0	0	0	0	1	0	0	0	0	1	1	1
Krt6b	0	0	0	0	1	0	0	0	0	1	1	1
Krt75	0	0	0	0	1	0	0	0	0	1	1	1
Krt76	0	0	0	0	1	0	0	0	0	1	1	1
Krt78	0	0	0	0	1	0	0	0	0	1	1	1
Lacc1	0	0	0	0	1	0	0	0	0	1	1	1
Lama3	0	0	0	0	1	0	0	0	0	1	1	1
Lama4	0	0	0	0	1	0	0	0	0	1	1	1
Lamb2	0	0	0	0	1	0	0	0	0	1	1	1
Larp4b	0	0	0	0	1	0	0	0	0	1	1	1
Lats2	0	0	0	0	1	0	0	0	0	1	1	1
Lbr	0	0	0	0	1	0	0	0	0	1	1	1

Lcorl	0	0	0	0	1	0	0	0	0	1	1	1
Lct	0	0	0	0	1	0	0	0	0	1	1	1
Ldb1	0	0	0	0	1	0	0	0	0	1	1	1
Lgals8	0	0	0	0	1	0	0	0	0	1	1	1
Lgi3	0	0	0	0	1	0	0	0	0	1	1	1
Lhx3	0	0	0	0	1	0	0	0	0	1	1	1
Lhx4	0	0	0	0	1	0	0	0	0	1	1	1
Lingo4	0	0	0	0	1	0	0	0	0	1	1	1
Lipc	0	0	0	0	1	0	0	0	0	1	1	1
Lipi	0	0	0	0	1	0	0	0	0	1	1	1
Lipo1	0	0	0	0	1	0	0	0	0	1	1	1
Llgl1	0	0	0	0	1	0	0	0	0	1	1	1
Lmbr1l	0	0	0	0	1	0	0	0	0	1	1	1
Lmo7	0	0	0	0	0	1	0	0	0	1	1	1
Lnx1	0	0	0	0	1	0	0	0	0	1	1	1
Lnx2	0	0	0	0	0	1	0	0	0	1	1	1
Loxl4	0	0	0	0	1	0	0	0	0	1	1	1
Lpcat1	0	0	0	0	1	0	0	0	0	1	1	1
Lpp	0	0	0	0	1	0	0	0	0	1	1	1
Lrba	0	0	0	0	1	0	0	0	0	1	1	1
Lrfn4	0	0	0	0	1	0	0	0	0	1	1	1
Lrit2	0	0	0	0	1	0	0	0	0	1	1	1
Lrmp	0	0	0	0	1	0	0	0	0	1	1	1
Lrpap1	0	0	0	0	1	0	0	0	0	1	1	1
Lrrc17	0	0	0	0	1	0	0	0	0	1	1	1
Lrrc28	0	0	0	0	1	0	0	0	0	1	1	1
Lrrc30	0	0	0	0	1	0	0	0	0	1	1	1
Lrrc49	0	0	0	0	1	0	0	0	0	1	1	1
Lrrc66	0	0	0	0	1	0	0	0	0	1	1	1
Lrrd1	0	0	0	0	1	0	0	0	0	1	1	1
Lrriq1	0	0	0	0	1	0	0	0	0	1	1	1
Lrrtm4	0	0	0	0	1	0	0	0	0	1	1	1
Lrtm1	0	0	0	0	1	0	0	0	0	1	1	1

Lsm12	0	0	0	0	1	0	0	0	0	1	1	1
Ltbp1	0	0	0	0	1	0	0	0	0	1	1	1
Ltbp4	0	0	0	0	1	0	0	0	0	1	1	1
Lurap1	0	0	0	0	1	0	0	0	0	1	1	1
Luzp1	0	0	0	0	1	0	0	0	0	1	1	1
Ly6g	0	0	0	0	1	0	0	0	0	1	1	1
Ly9	0	0	0	0	1	0	0	0	0	1	1	1
Lyar	0	0	0	0	1	0	0	0	0	1	1	1
Lysmd4	0	0	0	0	1	0	0	0	0	1	1	1
Macc1	0	0	0	0	1	0	0	0	0	1	1	1
Macf1	0	0	0	0	1	0	0	0	0	1	1	1
Madd	0	0	0	0	1	0	0	0	0	1	1	1
Magi1	0	0	0	0	1	0	0	0	0	1	1	1
Magi2	0	0	0	0	1	0	0	0	0	1	1	1
Maip1	0	0	0	0	0	0	0	1	0	1	1	1
Malt1	0	0	0	0	1	0	0	0	0	1	1	1
Maml2	0	0	0	0	1	0	0	0	0	1	1	1
Mamstr	0	0	0	0	1	0	0	0	0	1	1	1
Man1a	0	0	0	0	0	1	0	0	0	1	1	1
Man2a2	0	0	0	0	1	0	0	0	0	1	1	1
Man2b2	0	0	0	0	1	0	0	0	0	1	1	1
Map1a	0	0	0	0	1	0	0	0	0	1	1	1
Map2	0	0	0	0	1	0	0	0	0	1	1	1
Map2k1	0	0	0	0	1	0	0	0	0	1	1	1
Map3k10	0	0	0	0	0	1	0	0	0	1	1	1
Map3k11	0	0	0	0	1	0	0	0	0	1	1	1
Map3k15	0	0	0	0	0	1	0	0	0	1	1	1
Map4k2	0	0	0	0	0	0	0	1	0	1	1	1
Map4k5	0	0	0	0	1	0	0	0	0	1	1	1
Mapk9	0	0	0	0	1	0	0	0	0	1	1	1
March10	0	0	0	0	1	0	0	0	0	1	1	1
March6	0	0	0	0	1	0	0	0	0	1	1	1
Marcksl1	0	0	0	0	1	0	0	0	0	1	1	1

Marf1	0	0	0	0	1	0	0	0	0	1	1	1
Mark2	0	0	0	0	1	0	0	0	0	1	1	1
Mars2	0	0	0	0	1	0	0	0	0	1	1	1
Mast1	0	0	0	0	0	1	0	0	0	1	1	1
Mat1a	0	0	0	0	1	0	0	0	0	1	1	1
Matr3	0	0	0	0	1	0	0	0	0	1	1	1
Mb21d2	0	1	0	0	0	0	0	0	0	1	1	1
Mbd6	0	0	0	0	1	0	0	0	0	1	1	1
Mboat1	0	0	0	0	1	0	0	0	0	1	1	1
Mccc1	0	0	0	0	1	0	0	0	0	1	1	1
Mchr1	0	0	0	0	1	0	0	0	0	1	1	1
Mcidas	0	0	0	0	1	0	0	0	0	1	1	1
Mcm4	0	0	0	0	1	0	0	0	0	1	1	1
Mcmbp	0	0	0	0	1	0	0	0	0	1	1	1
Mdga2	0	0	0	0	1	0	0	0	0	1	1	1
Mdp1	0	0	0	0	1	0	0	0	0	1	1	1
Med16	0	0	0	0	1	0	0	0	0	1	1	1
Med18	0	0	0	0	1	0	0	0	0	1	1	1
Med6	0	0	0	0	1	0	0	0	0	1	1	1
Megf6	0	0	0	0	1	0	0	0	0	1	1	1
Men1	0	0	0	0	1	0	0	0	0	1	1	1
Mettl17	0	0	0	0	1	0	0	0	0	1	1	1
Mfsd13b	0	0	0	0	1	0	0	0	0	1	1	1
Mgat2	0	0	0	0	1	0	0	0	0	1	1	1
Mgat4b	0	0	0	0	1	0	0	0	0	1	1	1
Mgll	0	0	0	0	1	0	0	0	0	1	1	1
Mgst2	0	0	0	0	1	0	0	0	0	1	1	1
Micall2	0	0	0	0	1	0	0	0	0	1	1	1
Mier1	0	0	0	0	1	0	0	0	0	1	1	1
Mipep	0	0	0	0	1	0	0	0	0	1	1	1
Mipol1	0	0	0	0	1	0	0	0	0	1	1	1
Mitf	0	0	0	0	1	0	0	0	0	1	1	1
Mkks	0	0	0	0	1	0	0	0	0	1	1	1

Mknk1	0	0	0	0	1	0	0	0	0	1	1	1
Mlip	0	0	0	0	0	0	0	1	0	1	1	1
Mmp1b	0	0	0	0	1	0	0	0	0	1	1	1
Mogs	0	0	0	0	1	0	0	0	0	1	1	1
Mok	0	0	0	0	0	0	0	1	0	1	1	1
Morc2a	0	0	0	0	1	0	0	0	0	1	1	1
Morc3	0	0	0	0	1	0	0	0	0	1	1	1
Moxd2	0	0	0	0	1	0	0	0	0	1	1	1
Mphosph9	0	0	0	0	1	0	0	0	0	1	1	1
Mrgpra4	0	0	0	0	0	1	0	0	0	1	1	1
Mrgprb1	0	1	0	0	0	0	0	0	0	1	1	1
Mrgprb4	0	0	0	0	1	0	0	0	0	1	1	1
Mrpl39	0	0	0	0	1	0	0	0	0	1	1	1
Mrpl45	0	0	0	0	1	0	0	0	0	1	1	1
Mrpl47	0	0	0	0	1	0	0	0	0	1	1	1
Mrpl48	0	0	0	0	1	0	0	0	0	1	1	1
Mrps12	0	0	0	0	1	0	0	0	0	1	1	1
Mrps22	0	0	0	0	1	0	0	0	0	1	1	1
Mrps30	0	0	0	0	1	0	0	0	0	1	1	1
Mrps34	0	0	0	0	1	0	0	0	0	1	1	1
Ms4a1	0	0	0	0	1	0	0	0	0	1	1	1
Ms4a14	0	0	0	0	1	0	0	0	0	1	1	1
Ms4a5	0	0	0	0	1	0	0	0	0	1	1	1
Ms4a7	0	0	0	0	1	0	0	0	0	1	1	1
Msh4	0	0	0	0	1	0	0	0	0	1	1	1
Msln	0	0	0	0	0	1	0	0	0	1	1	1
Msra	0	0	0	0	1	0	0	0	0	1	1	1
Msx3	0	0	0	0	1	0	0	0	0	1	1	1
Mta2	0	0	0	0	1	0	0	0	0	1	1	1
Mtcl1	0	0	0	0	1	0	0	0	0	1	1	1
Mterf1b	0	0	0	0	1	0	0	0	0	1	1	1
Mtg1	0	0	0	0	1	0	0	0	0	1	1	1
Mthfd1	0	0	0	0	1	0	0	0	0	1	1	1

Mthfd2l	0	0	0	0	1	0	0	0	0	1	1	1
Mtmr11	0	0	0	0	1	0	0	0	0	1	1	1
Mul1	0	0	0	0	1	0	0	0	0	1	1	1
Mup3	0	0	0	0	1	0	0	0	0	1	1	1
Musk	0	0	0	0	1	0	0	0	0	1	1	1
Mybl1	0	0	0	0	1	0	0	0	0	1	1	1
Myh1	0	0	0	0	1	0	0	0	0	1	1	1
Myh4	0	0	0	0	1	0	0	0	0	1	1	1
Myh7b	0	0	0	0	1	0	0	0	0	1	1	1
Myh8	0	0	0	0	1	0	0	0	0	1	1	1
Mylk4	0	0	0	0	1	0	0	0	0	1	1	1
Mynn	0	0	0	0	1	0	0	0	0	1	1	1
Myo15	0	0	0	0	1	0	0	0	0	1	1	1
Myo18a	0	0	0	0	1	0	0	0	0	1	1	1
Myo5a	0	0	0	0	1	0	0	0	0	1	1	1
Myo5b	0	1	0	0	0	0	0	0	0	1	1	1
Myo7a	0	0	0	0	1	0	0	0	0	1	1	1
Myog	0	0	0	0	1	0	0	0	0	1	1	1
Myom1	0	0	0	0	1	0	0	0	0	1	1	1
Myrf	0	0	0	0	1	0	0	0	0	1	1	1
N4bp2l2	0	0	0	0	1	0	0	0	0	1	1	1
Naa15	0	0	0	0	1	0	0	0	0	1	1	1
Naaa	0	0	0	0	1	0	0	0	0	1	1	1
Naca	0	0	0	0	1	0	0	0	0	1	1	1
Nacc1	0	0	0	0	1	0	0	0	0	1	1	1
Nadk2	0	0	0	0	1	0	0	0	0	1	1	1
Nags	0	0	0	0	1	0	0	0	0	1	1	1
Nalcn	0	0	0	0	1	0	0	0	0	1	1	1
Nav3	0	0	0	0	1	0	0	0	0	1	1	1
Nbas	0	0	0	0	1	0	0	0	0	1	1	1
Nbea	0	0	0	0	1	0	0	0	0	1	1	1
Nbr1	0	0	0	0	0	0	0	1	0	1	1	1
Ncapd2	0	0	0	0	1	0	0	0	0	1	1	1

Ncapd3	0	0	0	0	1	0	0	0	0	1	1	1
Ncapg	0	0	0	0	1	0	0	0	0	1	1	1
Ncbp2	0	0	0	0	1	0	0	0	0	1	1	1
Ncoa1	0	0	0	0	1	0	0	0	0	1	1	1
Ncor2	0	0	0	0	1	0	0	0	0	1	1	1
Ncstn	0	0	0	0	1	0	0	0	0	1	1	1
Ndrg1	0	0	0	0	1	0	0	0	0	1	1	1
Ndrg2	0	0	0	0	1	0	0	0	0	1	1	1
Ndufa10	0	0	0	0	1	0	0	0	0	1	1	1
Nedd9	0	0	0	0	1	0	0	0	0	1	1	1
Nefh	0	0	0	0	1	0	0	0	0	1	1	1
Nek5	0	0	0	0	1	0	0	0	0	1	1	1
Nelfb	0	0	0	0	1	0	0	0	0	1	1	1
Nell1	0	0	0	0	1	0	0	0	0	1	1	1
Neo1	0	0	0	0	1	0	0	0	0	1	1	1
Nes	0	0	0	0	1	0	0	0	0	1	1	1
Net1	0	0	0	0	0	0	0	1	0	1	1	1
Neurl3	0	0	0	0	1	0	0	0	0	1	1	1
Neurog3	0	0	0	0	1	0	0	0	0	1	1	1
Nexmif	0	0	0	0	1	0	0	0	0	1	1	1
Nf1	0	0	0	0	0	1	0	0	0	1	1	1
Ngly1	0	0	0	0	1	0	0	0	0	1	1	1
Nhej1	0	0	0	0	1	0	0	0	0	1	1	1
Nhlrc3	0	0	0	0	1	0	0	0	0	1	1	1
Nhsl2	0	0	0	0	1	0	0	0	0	1	1	1
Nid2	0	0	0	0	1	0	0	0	0	1	1	1
Nipal1	0	0	0	0	1	0	0	0	0	1	1	1
Nlgn1	0	0	0	0	1	0	0	0	0	1	1	1
Nlrp4c	0	0	0	0	1	0	0	0	0	1	1	1
Nlrp5	0	0	0	0	1	0	0	0	0	1	1	1
Nme5	0	0	0	0	1	0	0	0	0	1	1	1
Nmt2	0	0	0	0	1	0	0	0	0	1	1	1
Nol8	0	0	0	0	1	0	0	0	0	1	1	1

Nolc1	0	0	0	0	1	0	0	0	0	1	1	1
Nos2	0	0	0	0	0	0	0	1	0	1	1	1
Notch1	0	0	0	0	1	0	0	0	0	1	1	1
Notch3	0	0	0	0	1	0	0	0	0	1	1	1
Notch4	0	0	0	0	1	0	0	0	0	1	1	1
Nova1	0	0	0	0	1	0	0	0	0	1	1	1
Npy5r	0	0	0	0	1	0	0	0	0	1	1	1
Nr1d2	0	0	0	0	1	0	0	0	0	1	1	1
Nr4a2	0	0	0	0	1	0	0	0	0	1	1	1
Nr4a3	0	0	0	0	1	0	0	0	0	1	1	1
Nrde2	0	0	0	0	1	0	0	0	0	1	1	1
Nrp2	0	0	0	0	1	0	0	0	0	1	1	1
Nsun4	0	0	0	0	1	0	0	0	0	1	1	1
Nsun5	0	0	0	0	1	0	0	0	0	1	1	1
Nt5c1b	0	0	0	0	1	0	0	0	0	1	1	1
Nt5c3	0	0	0	0	1	0	0	0	0	1	1	1
Ntm	0	0	0	0	1	0	0	0	0	1	1	1
Nudcd2	0	0	0	0	1	0	0	0	0	1	1	1
Nudt12	0	0	0	0	1	0	0	0	0	1	1	1
Nuf2	0	0	0	0	1	0	0	0	0	1	1	1
Nup160	0	0	0	0	1	0	0	0	0	1	1	1
Nup214	0	0	0	0	1	0	0	0	0	1	1	1
Nup93	0	0	0	0	1	0	0	0	0	1	1	1
Nutm1	0	0	0	0	1	0	0	0	0	1	1	1
Nvl	0	0	0	0	1	0	0	0	0	1	1	1
Nxpe2	0	0	0	0	1	0	0	0	0	1	1	1
Nxpe5	0	0	0	0	1	0	0	0	0	1	1	1
Nxt2	0	0	0	0	1	0	0	0	0	1	1	1
Nyap2	0	0	0	0	0	1	0	0	0	1	1	1
Nynrin	0	0	0	0	1	0	0	0	0	1	1	1
Ofd1	0	0	0	0	0	1	0	0	0	1	1	1
Ogdhl	0	0	0	0	1	0	0	0	0	1	1	1
Ogfr	0	0	0	0	1	0	0	0	0	1	1	1

Oit3	0	0	0	0	0	0	0	1	0	1	1	1
Olfml3	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1036	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1044	0	0	0	0	1	0	0	0	0	1	1	1
Olfr105-ps	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1093	0	0	0	0	0	1	0	0	0	1	1	1
Olfr1141	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1154	0	0	0	0	1	0	0	0	0	1	1	1
Olfr116	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1161	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1202	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1233	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1247	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1260	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1263	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1264	0	0	1	0	0	0	0	0	0	1	1	1
Olfr1269	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1283	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1288	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1290	0	0	0	0	0	1	0	0	0	1	1	1
Olfr1338	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1368	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1389	0	0	0	0	1	0	0	0	0	1	1	1
Olfr140	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1413	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1419	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1426	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1434	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1442	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1445	0	0	0	0	1	0	0	0	0	1	1	1
Olfr1471	0	0	0	0	1	0	0	0	0	1	1	1
Olfr150	0	0	0	0	1	0	0	0	0	1	1	1
Olfr151	0	0	0	0	1	0	0	0	0	1	1	1

Olfr154	0	0	0	0	1	0	0	0	0	1	1	1
Olfr164	0	0	0	0	1	0	0	0	0	1	1	1
Olfr165	0	0	0	0	1	0	0	0	0	1	1	1
Olfr195	0	0	0	0	1	0	0	0	0	1	1	1
Olfr229	0	0	0	0	1	0	0	0	0	1	1	1
Olfr239	0	0	0	0	1	0	0	0	0	1	1	1
Olfr273	0	0	0	0	1	0	0	0	0	1	1	1
Olfr275	0	0	0	0	1	0	0	0	0	1	1	1
Olfr282	0	0	0	0	1	0	0	0	0	1	1	1
Olfr303	0	0	0	0	1	0	0	0	0	1	1	1
Olfr328	0	0	0	0	1	0	0	0	0	1	1	1
Olfr329-ps	0	0	0	0	1	0	0	0	0	1	1	1
Olfr331	0	0	0	0	1	0	0	0	0	1	1	1
Olfr353	0	0	0	0	1	0	0	0	0	1	1	1
Olfr358	0	0	0	0	1	0	0	0	0	1	1	1
Olfr361	0	0	0	0	1	0	0	0	0	1	1	1
Olfr389	0	0	0	0	1	0	0	0	0	1	1	1
Olfr450	0	0	0	0	1	0	0	0	0	1	1	1
Olfr461	0	0	0	0	1	0	0	0	0	1	1	1
Olfr467	0	0	0	0	1	0	0	0	0	1	1	1
Olfr469	0	0	0	0	1	0	0	0	0	1	1	1
Olfr477	0	0	0	0	1	0	0	0	0	1	1	1
Olfr48	0	0	0	0	1	0	0	0	0	1	1	1
Olfr507	0	0	0	0	1	0	0	0	0	1	1	1
Olfr516	0	0	0	0	1	0	0	0	0	1	1	1
Olfr525	0	0	0	0	0	1	0	0	0	1	1	1
Olfr561	0	0	0	0	1	0	0	0	0	1	1	1
Olfr564	0	0	0	0	1	0	0	0	0	1	1	1
Olfr575	0	0	0	0	1	0	0	0	0	1	1	1
Olfr576	0	0	0	0	1	0	0	0	0	1	1	1
Olfr589	0	0	0	0	1	0	0	0	0	1	1	1
Olfr594	0	0	0	0	0	1	0	0	0	1	1	1
Olfr597	0	0	0	0	1	0	0	0	0	1	1	1

Olfr61	0	0	0	0	1	0	0	0	0	1	1	1
Olfr619	0	0	0	0	1	0	0	0	0	1	1	1
Olfr628	0	0	0	0	1	0	0	0	0	1	1	1
Olfr675	0	0	0	0	1	0	0	0	0	1	1	1
Olfr68	0	0	0	0	1	0	0	0	0	1	1	1
Olfr688	0	0	0	0	1	0	0	0	0	1	1	1
Olfr698	0	0	0	0	1	0	0	0	0	1	1	1
Olfr727	0	0	0	0	1	0	0	0	0	1	1	1
Olfr749	0	0	0	0	1	0	0	0	0	1	1	1
Olfr8	0	0	0	0	1	0	0	0	0	1	1	1
Olfr801	0	0	0	0	1	0	0	0	0	1	1	1
Olfr806	0	0	0	0	1	0	0	0	0	1	1	1
Olfr809	0	0	0	0	1	0	0	0	0	1	1	1
Olfr822	0	0	0	0	1	0	0	0	0	1	1	1
Olfr829	0	0	0	0	1	0	0	0	0	1	1	1
Olfr90	0	0	0	0	1	0	0	0	0	1	1	1
Olfr902	0	0	0	0	1	0	0	0	0	1	1	1
Olfr908	0	0	0	0	1	0	0	0	0	1	1	1
Olfr913	0	0	0	0	1	0	0	0	0	1	1	1
Olfr926	0	0	0	0	1	0	0	0	0	1	1	1
Olfr930	0	0	0	0	1	0	0	0	0	1	1	1
Olfr945	0	0	0	0	1	0	0	0	0	1	1	1
Olfr951	0	0	0	0	1	0	0	0	0	1	1	1
Olfr992	0	0	0	0	1	0	0	0	0	1	1	1
Orc1	0	0	0	0	1	0	0	0	0	1	1	1
Osbp2	0	0	0	0	1	0	0	0	0	1	1	1
Osbpl5	0	0	0	0	1	0	0	0	0	1	1	1
Osbpl8	0	0	0	0	0	0	0	1	0	1	1	1
Osbpl9	0	0	0	0	1	0	0	0	0	1	1	1
Oser1	0	0	0	0	1	0	0	0	0	1	1	1
Otop1	0	0	0	0	1	0	0	0	0	1	1	1
Otud1	0	0	0	0	0	1	0	0	0	1	1	1
Ovgp1	0	0	0	0	1	0	0	0	0	1	1	1

Ovol2	0	0	0	0	1	0	0	0	0	1	1	1
P2rx6	0	0	0	0	1	0	0	0	0	1	1	1
P3h2	0	0	0	0	1	0	0	0	0	1	1	1
Pabpc1	0	0	0	0	0	1	0	0	0	1	1	1
Pabpc1l	0	0	0	0	1	0	0	0	0	1	1	1
Pacs2	0	0	0	0	1	0	0	0	0	1	1	1
Pak7	0	0	0	0	1	0	0	0	0	1	1	1
Palld	0	0	0	0	1	0	0	0	0	1	1	1
Pard3b	0	0	0	0	1	0	0	0	0	1	1	1
Parp8	0	0	0	0	1	0	0	0	0	1	1	1
Pate2	0	0	0	0	1	0	0	0	0	1	1	1
Pax2	0	0	0	0	1	0	0	0	0	1	1	1
Pbx3	0	0	0	0	1	0	0	0	0	1	1	1
Pcdh10	0	0	0	0	1	0	0	0	0	1	1	1
Pcdh8	0	0	0	0	1	0	0	0	0	1	1	1
Pcdha3	0	0	0	0	1	0	0	0	0	1	1	1
Pcdha6	0	0	0	0	1	0	0	0	0	1	1	1
Pcdha7	0	0	0	0	1	0	0	0	0	1	1	1
Pcdha9	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhac1	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb10	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb12	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb13	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb14	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb22	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb5	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb6	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhb9	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhgb4	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhgb8	0	0	0	0	1	0	0	0	0	1	1	1
Pcdhgc3	0	0	0	0	1	0	0	0	0	1	1	1
Pcf11	0	0	0	0	1	0	0	0	0	1	1	1
Pcif1	0	0	0	0	1	0	0	0	0	1	1	1

Pcnx	0	0	0	0	1	0	0	0	0	1	1	1
Pcnx2	0	0	0	0	1	0	0	0	0	1	1	1
Pcsk5	0	0	0	0	1	0	0	0	0	1	1	1
Pdcd10	0	0	0	0	1	0	0	0	0	1	1	1
Pdcd11	0	0	0	0	1	0	0	0	0	1	1	1
Pde4c	0	0	0	0	0	0	0	1	0	1	1	1
Pde4d	0	0	0	0	1	0	0	0	0	1	1	1
Pdgfra	0	0	0	0	1	0	0	0	0	1	1	1
Pdgfrb	0	0	0	0	1	0	0	0	0	1	1	1
Pdk1	0	0	0	0	1	0	0	0	0	1	1	1
Pdlim7	0	0	0	0	1	0	0	0	0	1	1	1
Pdp1	0	0	0	0	1	0	0	0	0	1	1	1
Pdzd2	0	0	0	0	1	0	0	0	0	1	1	1
Pdzd8	0	0	0	0	1	0	0	0	0	1	1	1
Pdzrn4	0	0	0	0	1	0	0	0	0	1	1	1
Pear1	0	0	0	0	1	0	0	0	0	1	1	1
Peg3	0	0	0	0	1	0	0	0	0	1	1	1
Pelp1	0	0	0	0	1	0	0	0	0	1	1	1
Per1	0	0	0	0	1	0	0	0	0	1	1	1
Perm1	0	0	0	0	1	0	0	0	0	1	1	1
Pet117	0	0	0	0	1	0	0	0	0	1	1	1
Pfpl	0	0	0	0	1	0	0	0	0	1	1	1
Pgam2	0	0	0	0	1	0	0	0	0	1	1	1
Pgap3	0	0	0	0	1	0	0	0	0	1	1	1
Pgk2	0	0	0	0	1	0	0	0	0	1	1	1
Pgr15l	0	0	0	0	1	0	0	0	0	1	1	1
Phactr3	0	0	0	0	1	0	0	0	0	1	1	1
Phc1	0	0	0	0	1	0	0	0	0	1	1	1
Phf10	0	0	0	0	1	0	0	0	0	1	1	1
Phf12	0	0	0	0	1	0	0	0	0	1	1	1
Phf14	0	0	0	0	1	0	0	0	0	1	1	1
Phf21a	0	0	0	0	1	0	0	0	0	1	1	1
Phf21b	0	0	0	0	1	0	0	0	0	1	1	1

Phf3	0	0	0	0	1	0	0	0	0	1	1	1
Phkb	0	0	0	0	1	0	0	0	0	1	1	1
Phlda3	0	0	0	0	1	0	0	0	0	1	1	1
Phldb2	0	0	0	0	1	0	0	0	0	1	1	1
Pigc	0	0	0	0	1	0	0	0	0	1	1	1
Pign	0	0	0	0	0	0	0	1	0	1	1	1
Pigp	0	0	0	0	1	0	0	0	0	1	1	1
Pik3c2g	0	0	0	0	1	0	0	0	0	1	1	1
Pik3ca	0	0	0	0	1	0	0	0	0	1	1	1
Pikfyve	0	0	0	0	1	0	0	0	0	1	1	1
Pip5kl1	0	0	0	0	1	0	0	0	0	1	1	1
Pja2	0	0	0	0	1	0	0	0	0	1	1	1
Pkd2l1	0	0	0	0	1	0	0	0	0	1	1	1
Pkp3	0	0	0	0	1	0	0	0	0	1	1	1
Plch1	0	0	0	0	1	0	0	0	0	1	1	1
Plekha3	0	0	0	0	1	0	0	0	0	1	1	1
Plekha4	0	0	0	0	1	0	0	0	0	1	1	1
Plin5	0	0	0	0	1	0	0	0	0	1	1	1
Plk2	0	0	0	0	1	0	0	0	0	1	1	1
Plod2	0	0	0	0	0	0	0	1	0	1	1	1
Plppr2	0	0	0	0	1	0	0	0	0	1	1	1
Plxna1	0	0	0	0	1	0	0	0	0	1	1	1
Plxna2	0	0	0	0	1	0	0	0	0	1	1	1
Pmfbp1	0	0	0	0	1	0	0	0	0	1	1	1
Pml	0	0	0	0	1	0	0	0	0	1	1	1
Pnliprp2	0	0	0	0	1	0	0	0	0	1	1	1
Pnpt1	0	0	0	0	1	0	0	0	0	1	1	1
Podxl	0	0	0	0	1	0	0	0	0	1	1	1
Pola2	0	0	0	0	1	0	0	0	0	1	1	1
Pold3	0	0	0	0	1	0	0	0	0	1	1	1
Pole	0	0	0	0	1	0	0	0	0	1	1	1
Polg2	0	0	0	0	1	0	0	0	0	1	1	1
Polq	0	0	0	0	1	0	0	0	0	1	1	1

Polr2c	0	0	0	0	1	0	0	0	0	1	1	1
Polr2m	0	0	0	0	1	0	0	0	0	1	1	1
Polr3d	0	0	0	0	1	0	0	0	0	1	1	1
Pom121	0	0	0	0	1	0	0	0	0	1	1	1
Por	0	0	0	0	1	0	0	0	0	1	1	1
Postn	0	0	0	0	1	0	0	0	0	1	1	1
Pou4f1	0	0	0	0	1	0	0	0	0	1	1	1
Ppa2	0	0	0	0	1	0	0	0	0	1	1	1
Ppfia3	0	0	0	0	0	1	0	0	0	1	1	1
Pphln1	0	0	0	0	1	0	0	0	0	1	1	1
Ppic	0	0	0	0	1	0	0	0	0	1	1	1
Ppil2	0	0	0	0	1	0	0	0	0	1	1	1
Ppm1g	0	0	0	0	0	0	0	1	0	1	1	1
Ppm1k	0	0	0	0	1	0	0	0	0	1	1	1
Ppme1	0	0	0	0	1	0	0	0	0	1	1	1
Ppp1r13l	0	0	0	0	1	0	0	0	0	1	1	1
Ppp1r15b	0	0	0	0	1	0	0	0	0	1	1	1
Ppp1r26	0	0	0	0	1	0	0	0	0	1	1	1
Ppp1r37	0	0	0	0	1	0	0	0	0	1	1	1
Ppp1r9a	0	0	0	0	1	0	0	0	0	1	1	1
Ppp2r3a	0	0	0	0	1	0	0	0	0	1	1	1
Ppp2r5a	0	0	0	0	0	0	0	1	0	1	1	1
Ppp3cb	0	0	0	0	1	0	0	0	0	1	1	1
Ppp3cc	0	0	0	0	1	0	0	0	0	1	1	1
Ppp5c	0	0	0	0	0	0	0	1	0	1	1	1
Pramef12	0	0	0	0	1	0	0	0	0	1	1	1
Pramef25	0	0	0	0	1	0	0	0	0	1	1	1
Prdm4	0	0	0	0	1	0	0	0	0	1	1	1
Prdm9	0	0	0	0	1	0	0	0	0	1	1	1
Prelid3a	0	0	0	0	1	0	0	0	0	1	1	1
Prelp	0	0	0	0	1	0	0	0	0	1	1	1
Prex2	0	0	0	0	1	0	0	0	0	1	1	1
Prg4	0	0	0	0	1	0	0	0	0	1	1	1

Prickle2	0	0	0	0	1	0	0	0	0	1	1	1
Prkag2	0	0	0	0	1	0	0	0	0	1	1	1
Prkag3	0	0	0	0	1	0	0	0	0	1	1	1
Prkar1b	0	0	0	0	1	0	0	0	0	1	1	1
Prkar2a	0	0	0	0	1	0	0	0	0	1	1	1
Prkcd	0	0	0	0	1	0	0	0	0	1	1	1
Prkd3	0	0	0	0	1	0	0	0	0	1	1	1
Prkg2	0	0	0	0	1	0	0	0	0	1	1	1
Prl3d2	0	0	0	0	1	0	0	0	0	1	1	1
Prl7b1	0	0	0	0	1	0	0	0	0	1	1	1
Prmt3	0	0	0	0	1	0	0	0	0	1	1	1
Prmt7	0	0	0	0	1	0	0	0	0	1	1	1
Prmt9	0	0	0	0	1	0	0	0	0	1	1	1
Proca1	0	0	0	0	1	0	0	0	0	1	1	1
Prpf39	0	0	0	0	1	0	0	0	0	1	1	1
Prpmp5	0	0	1	0	0	0	0	0	0	1	1	1
Prr23a1	0	0	0	0	1	0	0	0	0	1	1	1
Prrg2	0	0	0	0	1	0	0	0	0	1	1	1
Prss36	0	0	0	0	1	0	0	0	0	1	1	1
Prss53	0	0	0	0	1	0	0	0	0	1	1	1
Psg17	0	0	0	0	1	0	0	0	0	1	1	1
Psg18	0	0	0	0	0	1	0	0	0	1	1	1
Psg19	0	0	0	0	1	0	0	0	0	1	1	1
Psg20	0	0	0	0	1	0	0	0	0	1	1	1
Psg29	0	0	0	0	1	0	0	0	0	1	1	1
Psmc5	0	0	0	0	0	0	0	1	0	1	1	1
Ptch1	0	0	0	0	1	0	0	0	0	1	1	1
Ptchd3	0	0	0	0	0	0	0	1	0	1	1	1
Ptchd4	0	0	0	0	1	0	0	0	0	1	1	1
Pten	0	0	0	0	1	0	0	0	0	1	1	1
Ptgfrn	0	0	0	0	1	0	0	0	0	1	1	1
Pth	0	0	0	0	1	0	0	0	0	1	1	1
Pth1r	0	0	0	0	0	1	0	0	0	1	1	1

Ptov1	0	0	0	0	1	0	0	0	0	1	1	1
Ptpn20	0	0	0	0	1	0	0	0	0	1	1	1
Ptpn23	0	0	0	0	1	0	0	0	0	1	1	1
Ptpn3	0	0	0	0	1	0	0	0	0	1	1	1
Ptpn6	0	0	0	0	1	0	0	0	0	1	1	1
Ptprq	0	0	0	0	1	0	0	0	0	1	1	1
Ptprr	0	0	0	0	1	0	0	0	0	1	1	1
Puf60	0	0	0	0	1	0	0	0	0	1	1	1
Pum2	0	0	0	0	1	0	0	0	0	1	1	1
Pwp1	0	0	0	0	1	0	0	0	0	1	1	1
Qrich1	0	0	0	0	1	0	0	0	0	1	1	1
Qrsl1	0	0	0	0	1	0	0	0	0	1	1	1
Qtrt1	0	0	0	0	1	0	0	0	0	1	1	1
Rab11fip1	0	0	0	0	1	0	0	0	0	1	1	1
Rab22a	0	0	0	0	1	0	0	0	0	1	1	1
Rab3c	0	0	0	0	1	0	0	0	0	1	1	1
Rab6b	0	0	0	0	0	0	0	1	0	1	1	1
Rab8a	0	0	0	0	1	0	0	0	0	1	1	1
Rab9	0	0	0	0	1	0	0	0	0	1	1	1
Rabep1	0	0	0	0	1	0	0	0	0	1	1	1
Rabgap1l	0	0	0	0	0	0	0	1	0	1	1	1
Rad21l	0	0	0	0	1	0	0	0	0	1	1	1
Rad9b	0	0	0	0	1	0	0	0	0	1	1	1
Radil	0	0	0	0	1	0	0	0	0	1	1	1
Raet1d	0	0	0	0	1	0	0	0	0	1	1	1
Raf1	0	0	0	0	1	0	0	0	0	1	1	1
Rai1	0	0	0	0	1	0	0	0	0	1	1	1
Ralgapa2	0	0	0	0	1	0	0	0	0	1	1	1
Ralgapb	0	0	0	0	0	0	0	1	0	1	1	1
Ralyl	0	0	0	0	1	0	0	0	0	1	1	1
Ranbp2	0	0	0	0	1	0	0	0	0	1	1	1
Rapgef1	0	0	0	0	0	0	0	1	0	1	1	1
Rapgef4	0	0	0	0	1	0	0	0	0	1	1	1

Rapgef5	0	0	0	0	0	1	0	0	0	1	1	1
Raph1	0	0	0	0	1	0	0	0	0	1	1	1
Rasa3	0	0	0	0	1	0	0	0	0	1	1	1
Rasd2	0	0	0	0	1	0	0	0	0	1	1	1
Rasgrf1	0	0	0	0	1	0	0	0	0	1	1	1
Rasip1	0	0	0	0	1	0	0	0	0	1	1	1
Rassf4	0	0	0	0	1	0	0	0	0	1	1	1
Raver1	0	0	0	0	1	0	0	0	0	1	1	1
Rax	0	0	0	0	1	0	0	0	0	1	1	1
Rb1	0	0	0	0	1	0	0	0	0	1	1	1
Rb1cc1	0	0	0	0	1	0	0	0	0	1	1	1
Rbbp6	0	0	0	0	1	0	0	0	0	1	1	1
Rbfa	0	0	0	0	1	0	0	0	0	1	1	1
Rbm10	0	0	0	0	1	0	0	0	0	1	1	1
Rbm22	0	0	0	0	1	0	0	0	0	1	1	1
Rbm46	0	0	0	0	1	0	0	0	0	1	1	1
Rc3h1	0	0	0	0	0	0	0	1	0	1	1	1
Rcn2	0	0	0	0	0	1	0	0	0	1	1	1
Rdh12	0	0	0	0	1	0	0	0	0	1	1	1
Reep4	0	0	0	0	1	0	0	0	0	1	1	1
Reln	0	0	0	0	1	0	0	0	0	1	1	1
Rere	0	0	0	0	1	0	0	0	0	1	1	1
Rerg	0	0	0	0	1	0	0	0	0	1	1	1
Retreg3	0	0	0	0	1	0	0	0	0	1	1	1
Rfwd3	0	0	0	0	1	0	0	0	0	1	1	1
Rgs10	0	0	0	0	1	0	0	0	0	1	1	1
Rgs3	0	0	0	0	1	0	0	0	0	1	1	1
Rgs6	0	0	0	0	0	0	0	1	0	1	1	1
Rhbdf1	0	0	0	0	1	0	0	0	0	1	1	1
Rhbdl2	0	0	0	0	1	0	0	0	0	1	1	1
Rhno1	0	0	0	0	1	0	0	0	0	1	1	1
Rhot2	0	0	0	0	1	0	0	0	0	1	1	1
Ric1	0	0	0	0	1	0	0	0	0	1	1	1

Rin3	0	0	0	0	1	0	0	0	0	1	1	1
Ripor3	0	0	0	0	1	0	0	0	0	1	1	1
Rnase2a	0	0	0	0	1	0	0	0	0	1	1	1
Rnase6	0	0	0	0	0	1	0	0	0	1	1	1
Rnasel	0	0	0	0	1	0	0	0	0	1	1	1
Rnf113a2	0	0	0	0	1	0	0	0	0	1	1	1
Rnf17	0	0	0	0	1	0	0	0	0	1	1	1
Rnf19b	0	0	0	0	1	0	0	0	0	1	1	1
Rnf4	0	0	0	0	1	0	0	0	0	1	1	1
Rnf41	0	0	0	0	1	0	0	0	0	1	1	1
Rnf43	0	0	0	0	1	0	0	0	0	1	1	1
Robo1	0	0	0	0	1	0	0	0	0	1	1	1
Robo2	0	0	0	0	1	0	0	0	0	1	1	1
Robo3	0	0	0	0	0	0	0	1	0	1	1	1
Rock2	0	0	0	0	1	0	0	0	0	1	1	1
Rogdi	0	0	0	0	1	0	0	0	0	1	1	1
Rp9	0	0	0	0	1	0	0	0	0	1	1	1
Rpgrip1l	0	0	0	0	1	0	0	0	0	1	1	1
Rpl3	0	0	0	0	1	0	0	0	0	1	1	1
Rpl4	0	0	0	0	1	0	0	0	0	1	1	1
Rpn1	0	0	0	0	1	0	0	0	0	1	1	1
Rpp14	0	0	0	0	1	0	0	0	0	1	1	1
Rps2	0	0	0	0	1	0	0	0	0	1	1	1
Rps6ka2	0	0	0	0	1	0	0	0	0	1	1	1
Rps6kb2	0	0	0	0	1	0	0	0	0	1	1	1
Rps6kc1	0	0	0	0	1	0	0	0	0	1	1	1
Rrp8	0	0	0	0	1	0	0	0	0	1	1	1
Rrp9	0	0	0	0	1	0	0	0	0	1	1	1
Rsbn1	0	0	0	0	1	0	0	0	0	1	1	1
Rsbn1l	0	0	0	0	1	0	0	0	0	1	1	1
Rsl24d1	0	0	0	0	1	0	0	0	0	1	1	1
Rsph10b	0	0	0	0	1	0	0	0	0	1	1	1
Rsrc2	0	0	0	0	1	0	0	0	0	1	1	1

Rtl9	0	0	0	0	1	0	0	0	0	1	1	1
Rundc1	0	0	0	1	0	0	0	0	0	1	1	1
Sall1	0	0	0	0	1	0	0	0	0	1	1	1
Satb1	0	0	0	0	1	0	0	0	0	1	1	1
Sbsn	0	0	0	0	1	0	0	0	0	1	1	1
Sc5d	1	0	0	0	0	0	0	0	0	1	1	1
Scaf1	0	0	0	0	1	0	0	0	0	1	1	1
Scaf11	0	0	0	0	1	0	0	0	0	1	1	1
Scap	0	0	0	0	1	0	0	0	0	1	1	1
Scel	0	0	0	0	1	0	0	0	0	1	1	1
Scgb2b20	0	0	0	0	1	0	0	0	0	1	1	1
Scgb3a2	0	0	0	0	1	0	0	0	0	1	1	1
Scgn	0	0	0	0	0	0	0	1	0	1	1	1
Scml2	0	0	0	0	1	0	0	0	0	1	1	1
Scn3b	0	0	0	0	1	0	0	0	0	1	1	1
Scn9a	0	0	0	0	1	0	0	0	0	1	1	1
Scp2	0	0	0	0	0	1	0	0	0	1	1	1
Sdad1	0	0	0	0	1	0	0	0	0	1	1	1
Sdk1	0	0	0	0	1	0	0	0	0	1	1	1
Sdk2	0	0	0	0	1	0	0	0	0	1	1	1
Sec16a	0	0	0	0	1	0	0	0	0	1	1	1
Sec24a	0	0	0	0	1	0	0	0	0	1	1	1
Sec24b	0	0	0	0	0	0	0	1	0	1	1	1
Sectm1b	0	0	0	0	1	0	0	0	0	1	1	1
Selenbp2	0	0	0	0	1	0	0	0	0	1	1	1
Sema3a	0	0	0	0	1	0	0	0	0	1	1	1
Sema3c	0	0	0	0	0	1	0	0	0	1	1	1
Sema3f	0	0	0	0	1	0	0	0	0	1	1	1
Sema4f	0	0	0	0	1	0	0	0	0	1	1	1
Sema5b	0	0	0	0	1	0	0	0	0	1	1	1
Sema6a	0	0	0	0	1	0	0	0	0	1	1	1
Sergef	0	0	0	0	1	0	0	0	0	1	1	1
Serpina16	0	0	0	0	1	0	0	0	0	1	1	1

Serpina1e	0	0	0	0	1	0	0	0	0	1	1	1
Serpinb7	0	0	0	0	1	0	0	0	0	1	1	1
Sertad4	0	0	0	0	1	0	0	0	0	1	1	1
Sesn1	0	0	0	0	1	0	0	0	0	1	1	1
Sez6l2	0	0	0	0	1	0	0	0	0	1	1	1
Sf3b1	0	0	0	0	1	0	0	0	0	1	1	1
Sgip1	0	0	0	0	1	0	0	0	0	1	1	1
Sh2d5	0	0	0	0	1	0	0	0	0	1	1	1
Sh3bp4	0	0	0	0	1	0	0	0	0	1	1	1
Sh3tc1	1	0	0	0	0	0	0	0	0	1	1	1
Shank2	0	0	0	0	1	0	0	0	0	1	1	1
Shank3	0	0	0	0	1	0	0	0	0	1	1	1
Shmt1	0	0	0	0	1	0	0	0	0	1	1	1
Shq1	0	0	0	0	1	0	0	0	0	1	1	1
Sidt2	0	0	0	0	1	0	0	0	0	1	1	1
Sik3	0	0	0	0	1	0	0	0	0	1	1	1
Sipa1l3	0	0	0	0	1	0	0	0	0	1	1	1
Skap1	0	0	0	0	1	0	0	0	0	1	1	1
Skida1	0	0	0	0	1	0	0	0	0	1	1	1
Skint4	0	0	0	0	1	0	0	0	0	1	1	1
Skint5	0	0	0	0	0	0	0	1	0	1	1	1
Skor2	0	0	0	0	1	0	0	0	0	1	1	1
Slamf7	0	0	0	0	1	0	0	0	0	1	1	1
Slc12a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc14a1	0	0	0	0	0	1	0	0	0	1	1	1
Slc16a10	0	0	0	0	1	0	0	0	0	1	1	1
Slc17a1	0	0	0	0	1	0	0	0	0	1	1	1
Slc17a2	0	0	0	0	0	1	0	0	0	1	1	1
Slc19a2	0	0	0	0	1	0	0	0	0	1	1	1
Slc1a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc1a4	0	0	0	0	1	0	0	0	0	1	1	1
Slc22a15	0	0	0	0	1	0	0	0	0	1	1	1
Slc24a1	0	0	0	0	1	0	0	0	0	1	1	1

Slc24a4	0	0	0	0	1	0	0	0	0	1	1	1
Slc25a14	0	0	0	0	1	0	0	0	0	1	1	1
Slc25a17	0	0	0	0	1	0	0	0	0	1	1	1
Slc25a27	0	0	0	0	1	0	0	0	0	1	1	1
Slc25a3	0	0	0	0	0	1	0	0	0	1	1	1
Slc25a39	0	0	0	0	1	0	0	0	0	1	1	1
Slc25a48	0	0	0	0	1	0	0	0	0	1	1	1
Slc26a4	0	0	0	0	1	0	0	0	0	1	1	1
Slc2a9	0	0	0	0	1	0	0	0	0	1	1	1
Slc30a1	0	0	0	0	1	0	0	0	0	1	1	1
Slc30a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc34a2	0	0	0	0	0	1	0	0	0	1	1	1
Slc35e2	0	0	0	0	1	0	0	0	0	1	1	1
Slc37a2	0	0	0	0	0	1	0	0	0	1	1	1
Slc39a11	0	0	0	0	1	0	0	0	0	1	1	1
Slc44a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc44a5	0	0	0	0	0	0	0	1	0	1	1	1
Slc45a1	0	0	0	0	1	0	0	0	0	1	1	1
Slc52a2	0	0	0	0	0	0	1	0	0	1	1	1
Slc5a4b	0	0	0	0	1	0	0	0	0	1	1	1
Slc6a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc7a15	0	0	0	0	1	0	0	0	0	1	1	1
Slc8a1	0	0	0	0	1	0	0	0	0	1	1	1
Slc8a3	0	0	0	0	1	0	0	0	0	1	1	1
Slc9a2	0	0	0	0	1	0	0	0	0	1	1	1
Slc9a9	0	0	0	0	1	0	0	0	0	1	1	1
Slfn3	0	0	0	0	1	0	0	0	0	1	1	1
Slfn5	0	0	0	0	1	0	0	0	0	1	1	1
Slit2	0	0	0	0	1	0	0	0	0	1	1	1
Slk	0	0	0	0	1	0	0	0	0	1	1	1
Slx4ip	0	0	0	0	1	0	0	0	0	1	1	1
Smarcc2	0	0	0	0	1	0	0	0	0	1	1	1
Smchd1	0	0	0	0	1	0	0	0	0	1	1	1

Smcr8	0	0	0	0	1	0	0	0	0	1	1	1
Smg6	0	0	0	0	1	0	0	0	0	1	1	1
Smpd3	0	0	0	0	0	0	0	1	0	1	1	1
Smurf1	0	0	0	0	1	0	0	0	0	1	1	1
Sncaip	0	0	0	0	1	0	0	0	0	1	1	1
Snd1	0	0	0	0	0	1	0	0	0	1	1	1
Snip1	0	0	0	0	1	0	0	0	0	1	1	1
Snrnp200	0	0	0	0	1	0	0	0	0	1	1	1
Sntb1	0	0	0	0	1	0	0	0	0	1	1	1
Sntg1	0	0	0	0	1	0	0	0	0	1	1	1
Snu13	0	0	0	0	1	0	0	0	0	1	1	1
Snx8	0	0	0	0	1	0	0	0	0	1	1	1
Soat1	0	0	0	0	1	0	0	0	0	1	1	1
Sorcs2	0	0	0	0	1	0	0	0	0	1	1	1
Sort1	0	0	0	0	1	0	0	0	0	1	1	1
Sos2	0	0	0	0	1	0	0	0	0	1	1	1
Sowahc	0	0	0	0	1	0	0	0	0	1	1	1
Sox10	0	0	0	0	1	0	0	0	0	1	1	1
Sox9	0	0	0	0	1	0	0	0	0	1	1	1
Sp110	0	0	0	0	1	0	0	0	0	1	1	1
Sp3	0	0	0	0	1	0	0	0	0	1	1	1
Spag17	0	0	0	0	1	0	0	0	0	1	1	1
Spag4	0	0	0	0	1	0	0	0	0	1	1	1
Spag6	0	0	0	0	0	0	0	1	0	1	1	1
Spata1	0	0	0	0	1	0	0	0	0	1	1	1
Spata18	0	0	0	0	1	0	0	0	0	1	1	1
Spata31d1	0	0	0	0	1	0	0	0	0	1	1	1
Spata31d1	0	0	0	0	1	0	0	0	0	1	1	1
Spata5	0	0	0	0	1	0	0	0	0	1	1	1
Spatc1	0	0	0	0	0	0	0	1	0	1	1	1
Spcs3	0	0	0	0	0	1	0	0	0	1	1	1
Specc1	0	0	0	0	1	0	0	0	0	1	1	1
Spg11	0	0	0	0	1	0	0	0	0	1	1	1

Sphk2	0	0	0	0	1	0	0	0	0	1	1	1
Spink5	0	0	0	0	1	0	0	0	0	1	1	1
Spinkl	0	0	0	0	1	0	0	0	0	1	1	1
Spire1	0	0	0	0	1	0	0	0	0	1	1	1
Sprr2e	0	0	0	0	1	0	0	0	0	1	1	1
Sprtn	0	0	0	0	0	0	0	1	0	1	1	1
Sptan1	0	0	0	0	1	0	0	0	0	1	1	1
Sptb	0	0	0	0	1	0	0	0	0	1	1	1
Sptbn1	0	0	0	0	1	0	0	0	0	1	1	1
Sptbn4	0	0	0	0	1	0	0	0	0	1	1	1
Sptlc2	0	0	0	0	1	0	0	0	0	1	1	1
Sra1	0	0	0	0	1	0	0	0	0	1	1	1
Srcin1	0	0	0	0	1	0	0	0	0	1	1	1
Srpk2	0	0	0	0	1	0	0	0	0	1	1	1
Srrm4	0	0	0	0	1	0	0	0	0	1	1	1
Srsf5	0	0	0	0	1	0	0	0	0	1	1	1
Srsf6	0	0	0	0	1	0	0	0	0	1	1	1
Ssbp2	0	0	0	0	1	0	0	0	0	1	1	1
Ssh1	0	0	0	0	1	0	0	0	0	1	1	1
Ssh2	0	0	0	0	1	0	0	0	0	1	1	1
Sspo	0	0	0	0	0	1	0	0	0	1	1	1
Ssr3	0	0	0	0	1	0	0	0	0	1	1	1
Sstr5	0	0	0	0	1	0	0	0	0	1	1	1
St6galnac2	0	0	0	0	1	0	0	0	0	1	1	1
Stab2	0	0	0	0	1	0	0	0	0	1	1	1
Stard10	0	0	0	0	1	0	0	0	0	1	1	1
Stard13	0	0	0	0	1	0	0	0	0	1	1	1
Stard3nl	0	0	0	0	1	0	0	0	0	1	1	1
Stard9	0	0	0	0	1	0	0	0	0	1	1	1
Stat4	0	0	0	0	1	0	0	0	0	1	1	1
Stc1	0	0	0	0	1	0	0	0	0	1	1	1
Steap3	0	0	0	0	1	0	0	0	0	1	1	1
Steap4	0	0	0	0	1	0	0	0	0	1	1	1

Stfa2l1	0	0	0	0	1	0	0	0	0	1	1	1
Stkld1	0	0	0	0	1	0	0	0	0	1	1	1
Ston2	0	0	0	0	1	0	0	0	0	1	1	1
Stub1	0	0	0	0	1	0	0	0	0	1	1	1
Stx2	0	0	0	0	1	0	0	0	0	1	1	1
Stxbp3	0	0	0	0	1	0	0	0	0	1	1	1
Sufu	0	0	0	0	1	0	0	0	0	1	1	1
Sult1c2	0	0	0	0	0	1	0	0	0	1	1	1
Sult2a1	0	0	0	0	1	0	0	0	0	1	1	1
Sult2a3	0	0	0	0	0	1	0	0	0	1	1	1
Sult2a4	0	0	0	0	1	0	0	0	0	1	1	1
Sun2	0	0	0	0	1	0	0	0	0	1	1	1
Sun3	0	0	0	0	1	0	0	0	0	1	1	1
Svs6	0	0	0	0	1	0	0	0	0	1	1	1
Sybu	0	0	0	0	1	0	0	0	0	1	1	1
Sycp2	0	0	0	0	0	0	0	1	0	1	1	1
Syde2	0	0	0	0	1	0	0	0	0	1	1	1
Synpo2	0	0	0	0	1	0	0	0	0	1	1	1
Syt10	0	0	0	0	1	0	0	0	0	1	1	1
Syt4	0	0	0	0	1	0	0	0	0	1	1	1
Sytl2	0	0	0	0	1	0	0	0	0	1	1	1
Szt2	0	0	0	0	1	0	0	0	0	1	1	1
Tacc2	0	0	0	0	1	0	0	0	0	1	1	1
Tacc3	0	0	0	0	1	0	0	0	0	1	1	1
Taco1	0	0	0	0	1	0	0	0	0	1	1	1
Tacr1	0	0	0	0	1	0	0	0	0	1	1	1
Tada1	0	0	0	0	1	0	0	0	0	1	1	1
Taf1	0	0	0	0	1	0	0	0	0	1	1	1
Taf6l	0	0	0	0	1	0	0	0	0	1	1	1
Tagap	0	0	0	0	1	0	0	0	0	1	1	1
Tap1	0	0	0	0	1	0	0	0	0	1	1	1
Tapbpl	0	0	0	0	1	0	0	0	0	1	1	1
Tas2r123	0	0	0	0	1	0	0	0	0	1	1	1

Tas2r125	0	0	0	0	1	0	0	0	0	1	1	1
Tas2r135	0	0	0	0	1	0	0	0	0	1	1	1
Tat	0	0	0	0	0	0	0	1	0	1	1	1
Tbc1d22b	0	0	0	0	1	0	0	0	0	1	1	1
Tbc1d4	0	0	0	0	1	0	0	0	0	1	1	1
Tbx22	0	0	0	0	1	0	0	0	0	1	1	1
Tbx6	0	0	0	0	1	0	0	0	0	1	1	1
Tcaf2	0	0	0	0	1	0	0	0	0	1	1	1
Tcam1	0	0	0	0	1	0	0	0	0	1	1	1
Tchh	0	0	0	0	1	0	0	0	0	1	1	1
Tcn2	0	0	0	0	1	0	0	0	0	1	1	1
Tcof1	0	0	0	0	1	0	0	0	0	1	1	1
Tdpoz1	0	0	0	0	1	0	0	0	0	1	1	1
Tdrd6	0	0	0	0	1	0	0	0	0	1	1	1
Tec	0	0	0	0	1	0	0	0	0	1	1	1
Tecpr1	0	0	0	0	1	0	0	0	0	1	1	1
Tek	0	0	0	0	1	0	0	0	0	1	1	1
Tenm1	0	0	0	0	1	0	0	0	0	1	1	1
Tenm2	0	0	0	0	1	0	0	0	0	1	1	1
Tenm4	0	0	0	0	1	0	0	0	0	1	1	1
Tes3-ps	0	0	0	0	1	0	0	0	0	1	1	1
Tespa1	0	0	0	0	1	0	0	0	0	1	1	1
Tfip11	0	0	0	0	1	0	0	0	0	1	1	1
Tg	0	0	0	0	1	0	0	0	0	1	1	1
Tgm3	0	0	0	0	1	0	0	0	0	1	1	1
Thap12	0	0	0	0	1	0	0	0	0	1	1	1
Thbs2	0	0	0	0	1	0	0	0	0	1	1	1
Thbs3	0	0	0	0	1	0	0	0	0	1	1	1
Thegl	0	0	0	0	1	0	0	0	0	1	1	1
Themis	0	0	0	0	1	0	0	0	0	1	1	1
Thpo	0	0	0	0	1	0	0	0	0	1	1	1
Thsd4	0	0	0	0	1	0	0	0	0	1	1	1
Thy1	0	0	0	0	1	0	0	0	0	1	1	1

Tiam1	0	0	0	0	1	0	0	0	0	1	1	1
Ticrr	0	0	0	0	1	0	0	0	0	1	1	1
Tjp2	0	0	0	0	1	0	0	0	0	1	1	1
Tkt	0	0	0	0	1	0	0	0	0	1	1	1
Tldc2	0	0	0	0	1	0	0	0	0	1	1	1
Tlk2	0	0	0	0	1	0	0	0	0	1	1	1
Tln2	0	0	0	0	1	0	0	0	0	1	1	1
Tlr11	0	0	0	0	1	0	0	0	0	1	1	1
Tlr4	0	0	0	0	1	0	0	0	0	1	1	1
Tm4sf5	0	0	0	0	1	0	0	0	0	1	1	1
Tm9sf4	0	0	0	0	0	1	0	0	0	1	1	1
Tmbim1	0	0	0	0	1	0	0	0	0	1	1	1
Tmc5	0	0	0	0	0	0	0	1	0	1	1	1
Tmc7	0	0	0	0	1	0	0	0	0	1	1	1
Tmed8	0	0	0	0	1	0	0	0	0	1	1	1
Tmem102	0	0	0	0	1	0	0	0	0	1	1	1
Tmem131l	0	0	0	0	1	0	0	0	0	1	1	1
Tmem151b	0	0	0	0	1	0	0	0	0	1	1	1
Tmem171	0	0	0	0	1	0	0	0	0	1	1	1
Tmem173	0	0	0	0	1	0	0	0	0	1	1	1
Tmem181a	0	0	0	0	0	0	0	1	0	1	1	1
Tmem182	0	0	0	0	1	0	0	0	0	1	1	1
Tmem207	0	0	0	0	1	0	0	0	0	1	1	1
Tmem253	0	0	0	0	1	0	0	0	0	1	1	1
Tmem45a	0	0	0	0	1	0	0	0	0	1	1	1
Tmem56	0	0	0	0	1	0	0	0	0	1	1	1
Tmem63a	0	0	0	0	1	0	0	0	0	1	1	1
Tmem8	0	0	0	0	1	0	0	0	0	1	1	1
Tmem94	0	0	0	0	1	0	0	0	0	1	1	1
Tmigd3	0	0	0	0	1	0	0	0	0	1	1	1
Tmod3	0	0	0	0	1	0	0	0	0	1	1	1
Tmprss11d	0	0	0	0	0	0	0	1	0	1	1	1
Tmprss11g	0	0	0	0	1	0	0	0	0	1	1	1

Tmprss9	0	0	0	0	1	0	0	0	0	1	1	1
Tmub1	0	0	0	0	1	0	0	0	0	1	1	1
Tmx2	0	0	0	0	0	0	0	1	0	1	1	1
Tnc	0	0	0	0	0	1	0	0	0	1	1	1
Tnn	0	0	0	0	1	0	0	0	0	1	1	1
Tnpo3	0	0	0	0	1	0	0	0	0	1	1	1
Tom1	0	0	0	0	1	0	0	0	0	1	1	1
Top1mt	0	0	0	0	1	0	0	0	0	1	1	1
Topors	0	0	0	0	1	0	0	0	0	1	1	1
Tor1aip1	0	0	0	0	1	0	0	0	0	1	1	1
Tpcn1	0	0	0	0	1	0	0	0	0	1	1	1
Tpcn2	0	0	0	0	1	0	0	0	0	1	1	1
Tph1	0	0	0	0	1	0	0	0	0	1	1	1
Tpr	1	0	0	0	0	0	0	0	0	1	1	1
Tpt1	0	0	0	0	1	0	0	0	0	1	1	1
Trank1	0	0	0	0	1	0	0	0	0	1	1	1
Trav15-1-d	0	0	0	0	0	1	0	0	0	1	1	1
Trav19	0	0	0	0	1	0	0	0	0	1	1	1
Trim12c	0	0	0	0	0	1	0	0	0	1	1	1
Trim25	0	0	0	0	1	0	0	0	0	1	1	1
Trim28	0	0	0	0	1	0	0	0	0	1	1	1
Trim37	0	0	0	0	1	0	0	0	0	1	1	1
Trim43a	0	0	0	0	1	0	0	0	0	1	1	1
Trim56	0	0	0	0	1	0	0	0	0	1	1	1
Triml2	0	0	0	0	0	0	0	1	0	1	1	1
Trmt44	0	0	0	0	0	1	0	0	0	1	1	1
Trmt6	0	0	0	0	1	0	0	0	0	1	1	1
Trp53	0	0	0	0	1	0	0	0	0	1	1	1
Trp73	0	0	0	0	1	0	0	0	0	1	1	1
Trpm2	0	0	0	0	1	0	0	0	0	1	1	1
Trpm3	0	0	0	0	1	0	0	0	0	1	1	1
Trub1	0	0	0	0	1	0	0	0	0	1	1	1
Try4	0	0	0	0	1	0	0	0	0	1	1	1

Try5	0	0	0	0	1	0	0	0	0	1	1	1
Tsga10	0	0	0	0	0	0	0	1	0	1	1	1
Tshz3	0	0	0	0	1	0	0	0	0	1	1	1
Tspan32	0	0	0	0	1	0	0	0	0	1	1	1
Tspan5	0	0	0	0	1	0	0	0	0	1	1	1
Tspan9	0	0	0	0	1	0	0	0	0	1	1	1
Tssk1	0	0	0	0	0	1	0	0	0	1	1	1
Ttc1	0	0	0	0	0	1	0	0	0	1	1	1
Ttc16	0	0	0	0	1	0	0	0	0	1	1	1
Ttc21b	0	0	0	0	1	0	0	0	0	1	1	1
Ttc27	0	0	0	0	1	0	0	0	0	1	1	1
Ttc28	0	0	0	0	1	0	0	0	0	1	1	1
Ttc3	0	0	0	0	1	0	0	0	0	1	1	1
Ttc34	0	0	0	0	1	0	0	0	0	1	1	1
Ttc41	0	0	0	0	1	0	0	0	0	1	1	1
Ttc6	0	0	0	0	0	0	0	1	0	1	1	1
Ttc7	0	0	0	0	1	0	0	0	0	1	1	1
Ttf2	0	0	0	0	1	0	0	0	0	1	1	1
Tti2	0	0	0	0	1	0	0	0	0	1	1	1
Ttk	0	0	0	0	1	0	0	0	0	1	1	1
Ttll12	0	0	0	0	1	0	0	0	0	1	1	1
Ttll6	0	0	0	0	0	0	0	1	0	1	1	1
Ttll9	0	0	0	0	1	0	0	0	0	1	1	1
Tubb1	0	0	0	0	1	0	0	0	0	1	1	1
Tubb2a	0	0	0	0	1	0	0	0	0	1	1	1
Tubb6	0	1	0	0	0	0	0	0	0	1	1	1
Txndc2	0	0	0	0	1	0	0	0	0	1	1	1
Tyk2	0	0	0	0	1	0	0	0	0	1	1	1
U2surp	0	0	0	0	0	1	0	0	0	1	1	1
Uaca	0	0	0	0	0	1	0	0	0	1	1	1
Ubap2l	0	0	0	0	1	0	0	0	0	1	1	1
Ubash3b	0	0	0	0	1	0	0	0	0	1	1	1
Ubc	0	0	0	0	1	0	0	0	0	1	1	1

Ube2c	0	0	0	0	1	0	0	0	0	1	1	1
Ube2k	0	0	0	0	1	0	0	0	0	1	1	1
Ube2l6	0	0	0	0	1	0	0	0	0	1	1	1
Ube3c	0	0	0	0	0	0	0	1	0	1	1	1
Ubox5	0	0	0	0	1	0	0	0	0	1	1	1
Ubqln1	0	0	0	0	0	1	0	0	0	1	1	1
Uggt2	0	0	0	0	1	0	0	0	0	1	1	1
Ugt2b34	0	0	0	0	1	0	0	0	0	1	1	1
Ulk2	0	0	0	0	1	0	0	0	0	1	1	1
Ulk4	0	0	0	0	1	0	0	0	0	1	1	1
Unc13a	0	0	0	0	0	0	0	1	0	1	1	1
Unc45a	0	0	0	0	1	0	0	0	0	1	1	1
Unc5a	0	0	0	0	1	0	0	0	0	1	1	1
Unc5cl	0	0	0	0	1	0	0	0	0	1	1	1
Unc79	0	0	0	0	1	0	0	0	0	1	1	1
Upk3b	0	0	0	0	1	0	0	0	0	1	1	1
Urb1	0	0	0	0	1	0	0	0	0	1	1	1
Uri1	0	0	0	0	0	0	0	1	0	1	1	1
Usf3	0	0	0	0	1	0	0	0	0	1	1	1
Uso1	0	0	0	0	1	0	0	0	0	1	1	1
Usp11	0	0	0	0	1	0	0	0	0	1	1	1
Usp17le	0	0	0	0	1	0	0	0	0	1	1	1
Usp21	0	0	0	0	1	0	0	0	0	1	1	1
Usp28	0	0	0	0	0	0	0	1	0	1	1	1
Usp33	0	0	0	0	1	0	0	0	0	1	1	1
Usp34	0	0	0	0	1	0	0	0	0	1	1	1
Usp35	0	0	0	0	1	0	0	0	0	1	1	1
Usp37	0	0	0	0	1	0	0	0	0	1	1	1
Usp38	0	0	0	0	1	0	0	0	0	1	1	1
Usp4	0	0	0	0	1	0	0	0	0	1	1	1
Usp48	0	0	0	0	0	1	0	0	0	1	1	1
Usp5	0	0	0	0	1	0	0	0	0	1	1	1
Usp8	0	0	0	0	1	0	0	0	0	1	1	1

Utp11	0	0	0	0	0	0	0	1	0	1	1	1
Utp18	0	0	0	0	1	0	0	0	0	1	1	1
Utrn	0	0	0	0	1	0	0	0	0	1	1	1
Uty	0	0	0	0	1	0	0	0	0	1	1	1
Vamp4	0	0	0	0	1	0	0	0	0	1	1	1
Vapb	0	0	0	0	1	0	0	0	0	1	1	1
Vegfc	0	0	0	0	0	0	0	1	0	1	1	1
Vldlr	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r125	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r14	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r174	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r178	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r194	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r200	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r216	0	0	0	0	1	0	0	0	0	1	1	1
Vmn1r38	0	0	1	0	0	0	0	0	0	1	1	1
Vmn1r74	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r107	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r108	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r110	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r111	0	0	0	0	0	1	0	0	0	1	1	1
Vmn2r121	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r13	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r28	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r31	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r41	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r44	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r50	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r59	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r6	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r61	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r62	0	0	0	0	0	1	0	0	0	1	1	1
Vmn2r66	0	0	0	0	1	0	0	0	0	1	1	1

Vmn2r68	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r70	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r80	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r81	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r84	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r88	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r94	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r95	0	0	0	0	1	0	0	0	0	1	1	1
Vmn2r96	1	0	0	0	0	0	0	0	0	1	1	1
Vps11	0	0	0	0	1	0	0	0	0	1	1	1
Vps13c	0	0	0	0	0	1	0	0	0	1	1	1
Vps33b	0	0	0	0	1	0	0	0	0	1	1	1
Vps35	0	0	0	0	1	0	0	0	0	1	1	1
Vps39	0	0	0	0	1	0	0	0	0	1	1	1
Vps51	0	0	0	0	1	0	0	0	0	1	1	1
Vps9d1	0	0	0	0	0	0	0	1	0	1	1	1
Vrk1	0	0	0	0	1	0	0	0	0	1	1	1
Vsig2	0	0	0	0	1	0	0	0	0	1	1	1
Vsnl1	0	0	0	0	1	0	0	0	0	1	1	1
Vwa5a	0	0	0	0	1	0	0	0	0	1	1	1
Vwa8	0	0	0	0	1	0	0	0	0	1	1	1
Vwce	0	0	0	0	1	0	0	0	0	1	1	1
Wars	0	0	0	0	0	1	0	0	0	1	1	1
Wbp2	0	0	0	0	1	0	0	0	0	1	1	1
Wdpcp	0	0	0	0	1	0	0	0	0	1	1	1
Wdr25	0	0	0	0	1	0	0	0	0	1	1	1
Wdr33	0	0	0	0	1	0	0	0	0	1	1	1
Wdr54	0	0	0	0	1	0	0	0	0	1	1	1
Wdr6	0	0	0	0	1	0	0	0	0	1	1	1
Wdr91	0	0	0	0	1	0	0	0	0	1	1	1
Wfikkn1	0	0	0	0	1	0	0	0	0	1	1	1
Wisp3	0	0	0	0	1	0	0	0	0	1	1	1
Wnk1	0	0	0	0	1	0	0	0	0	1	1	1

Wnk2	0	0	0	0	1	0	0	0	0	1	1	1
Wscd2	0	0	0	0	1	0	0	0	0	1	1	1
Wtap	0	0	0	0	1	0	0	0	0	1	1	1
Wwp1	0	0	0	0	1	0	0	0	0	1	1	1
Xiap	0	0	0	0	1	0	0	0	0	1	1	1
Xk	0	0	0	0	1	0	0	0	0	1	1	1
Xlr4b	0	0	0	0	1	0	0	0	0	1	1	1
Xrcc4	0	0	0	0	1	0	0	0	0	1	1	1
Yeats2	0	0	0	0	1	0	0	0	0	1	1	1
Ylpm1	0	0	0	0	1	0	0	0	0	1	1	1
Ythdc1	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb10	0	0	1	0	0	0	0	0	0	1	1	1
Zbtb17	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb2	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb34	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb40	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb44	0	0	0	0	1	0	0	0	0	1	1	1
Zbtb5	0	0	0	0	1	0	0	0	0	1	1	1
Zc3h7b	0	0	0	0	1	0	0	0	0	1	1	1
Zc4h2	0	0	0	0	1	0	0	0	0	1	1	1
Zdhhc13	0	0	0	0	1	0	0	0	0	1	1	1
Zdhhc17	0	0	0	0	1	0	0	0	0	1	1	1
Zdhhc2	0	0	0	0	0	0	0	1	0	1	1	1
Zdhhc22	0	0	0	0	1	0	0	0	0	1	1	1
Zdhhc6	0	0	0	0	1	0	0	0	0	1	1	1
Zeb1	0	0	0	0	1	0	0	0	0	1	1	1
Zfc3h1	0	0	0	0	1	0	0	0	0	1	1	1
Zfhx2	0	0	0	0	1	0	0	0	0	1	1	1
Zfp12	0	0	0	0	1	0	0	0	0	1	1	1
Zfp202	0	0	0	0	1	0	0	0	0	1	1	1
Zfp263	0	0	0	0	1	0	0	0	0	1	1	1
Zfp273	0	0	0	0	1	0	0	0	0	1	1	1
Zfp282	0	0	0	0	1	0	0	0	0	1	1	1

Zfp318	0	0	0	0	1	0	0	0	0	1	1	1
Zfp366	0	0	0	0	1	0	0	0	0	1	1	1
Zfp369	0	0	0	0	1	0	0	0	0	1	1	1
Zfp36l2	0	0	1	0	0	0	0	0	0	1	1	1
Zfp385a	0	0	0	0	1	0	0	0	0	1	1	1
Zfp429	0	0	0	0	1	0	0	0	0	1	1	1
Zfp438	0	0	0	0	1	0	0	0	0	1	1	1
Zfp451	0	0	0	0	1	0	0	0	0	1	1	1
Zfp458	0	0	0	0	0	1	0	0	0	1	1	1
Zfp507	0	0	0	0	1	0	0	0	0	1	1	1
Zfp513	0	0	0	0	1	0	0	0	0	1	1	1
Zfp536	0	0	0	0	1	0	0	0	0	1	1	1
Zfp563	0	0	0	0	1	0	0	0	0	1	1	1
Zfp574	0	0	0	0	1	0	0	0	0	1	1	1
Zfp609	0	0	0	0	1	0	0	0	0	1	1	1
Zfp61	0	0	0	0	1	0	0	0	0	1	1	1
Zfp687	0	0	0	0	1	0	0	0	0	1	1	1
Zfp697	0	0	0	0	1	0	0	0	0	1	1	1
Zfp729b	0	0	0	0	1	0	0	0	0	1	1	1
Zfp777	0	0	0	0	1	0	0	0	0	1	1	1
Zfp787	0	0	0	0	1	0	0	0	0	1	1	1
Zfp804b	0	0	0	0	1	0	0	0	0	1	1	1
Zfp846	0	0	0	0	1	0	0	0	0	1	1	1
Zfp981	0	0	0	0	1	0	0	0	0	1	1	1
Zfy2	0	0	0	0	1	0	0	0	0	1	1	1
Zfyve16	0	0	0	0	1	0	0	0	0	1	1	1
Zfyve26	0	0	0	0	1	0	0	0	0	1	1	1
Zfyve9	0	0	0	0	1	0	0	0	0	1	1	1
Zhx2	0	0	0	0	1	0	0	0	0	1	1	1
Zkscan2	0	0	0	0	1	0	0	0	0	1	1	1
Zmynd12	0	0	0	0	1	0	0	0	0	1	1	1
Zmynd15	0	0	0	0	1	0	0	0	0	1	1	1
Zp3r	0	0	0	0	1	0	0	0	0	1	1	1

Zpbp	0	0	0	0	1	0	0	0	0	1	1	1
Zscan10	0	0	0	0	1	0	0	0	0	1	1	1
Zswim8	0	0	0	0	1	0	0	0	0	1	1	1
Zzz3	0	0	0	0	1	0	0	0	0	1	1	1

Hugo_Sym	Frame_Shi	Frame_Shi	In_Frame_	In_Frame_	Missense_	Nonsense_	Splice_Site	Translatior	total	MutatedSa	AlteredSamples
Muc6	0	0	0	0	10	0	0	0	10	5	5
Sfi1	0	0	0	0	17	0	0	0	17	4	4
2410089E(	0	0	0	0	5	1	1	0	7	4	4
Pisd	0	0	0	0	6	0	0	0	6	4	4
Vmn2r114	0	0	0	0	5	0	0	0	5	4	4
Gm9758	0	0	0	1	3	0	0	0	4	4	4
Nup205	0	0	0	0	4	0	0	0	4	4	4
Pkd1l1	0	0	0	0	3	1	0	0	4	4	4
Speer4e	0	0	0	0	4	0	0	0	4	4	4
Tdpoz1	0	0	0	0	4	0	0	0	4	4	4
Vmn1r3	0	0	0	0	4	0	0	0	4	4	4
Adamts4	0	0	0	0	4	0	0	0	4	3	3
Ctnnd1	0	0	0	0	4	0	0	0	4	3	3
Golgb1	0	0	0	0	4	0	0	0	4	3	3
Otog	0	0	0	0	4	0	0	0	4	3	3
Rc3h1	0	0	0	0	4	0	0	0	4	3	3
Sdk1	0	0	0	0	3	0	1	0	4	3	3
Utrn	0	0	0	0	3	0	1	0	4	3	3
Vmn2r117	0	0	0	0	4	0	0	0	4	3	3
1110059E2	0	0	0	0	0	0	3	0	3	3	3
Adgrv1	0	0	0	0	3	0	0	0	3	3	3
Alpk3	0	0	0	3	0	0	0	0	3	3	3
Ank1	0	0	0	0	2	0	1	0	3	3	3
Ccdc88a	0	0	0	0	3	0	0	0	3	3	3
Clcn1	0	0	0	0	3	0	0	0	3	3	3
Dmxl1	0	0	0	0	3	0	0	0	3	3	3
Gm5862	0	0	0	0	3	0	0	0	3	3	3
Helz2	0	0	0	0	3	0	0	0	3	3	3
Klkb1	0	0	0	0	3	0	0	0	3	3	3
Lrrk2	0	0	0	0	3	0	0	0	3	3	3
Pdzd2	0	0	0	0	3	0	0	0	3	3	3
Phka2	0	0	0	0	3	0	0	0	3	3	3

Plxnb1	0	0	0	0	2	0	1	0	3	3	3
Prkdc	0	0	0	0	2	0	1	0	3	3	3
Rimbp3	0	0	0	0	2	1	0	0	3	3	3
Rxrg	0	0	0	0	3	0	0	0	3	3	3
Tacc2	0	0	0	0	3	0	0	0	3	3	3
Tmem132c	0	0	0	0	3	0	0	0	3	3	3
Tpr	0	0	0	0	3	0	0	0	3	3	3
Vmn2r121	0	0	0	0	3	0	0	0	3	3	3
Zfpm2	0	0	0	0	3	0	0	0	3	3	3
Ankrd12	0	0	0	0	3	0	0	0	3	2	2
Ankrd26	0	0	0	0	3	0	0	0	3	2	2
Atxn2l	0	0	1	0	2	0	0	0	3	2	2
C4b	0	0	0	0	2	0	1	0	3	2	2
Cacna1d	0	0	0	0	2	0	1	0	3	2	2
Caskin1	0	0	0	0	3	0	0	0	3	2	2
Ccdc129	0	0	0	0	3	0	0	0	3	2	2
Col4a5	0	0	0	0	3	0	0	0	3	2	2
Cwc22	0	0	0	0	3	0	0	0	3	2	2
Dnah7c	0	0	0	0	3	0	0	0	3	2	2
Evpl	0	0	0	0	3	0	0	0	3	2	2
Fat3	0	0	0	0	3	0	0	0	3	2	2
Fsip2	0	0	0	0	3	0	0	0	3	2	2
Gtf3c1	0	0	0	0	3	0	0	0	3	2	2
Hmcn2	0	0	0	0	3	0	0	0	3	2	2
Iws1	0	0	0	0	3	0	0	0	3	2	2
Lmtk2	0	0	0	0	2	1	0	0	3	2	2
Lyst	0	0	0	0	3	0	0	0	3	2	2
Mga	0	0	0	0	3	0	0	0	3	2	2
Nos1	0	0	0	0	2	0	1	0	3	2	2
Npas4	0	0	0	0	3	0	0	0	3	2	2
Plce1	0	0	0	0	2	1	0	0	3	2	2
Ptgfrn	0	0	0	0	3	0	0	0	3	2	2
Rars	0	0	0	0	3	0	0	0	3	2	2

Sgms1	0	0	0	0	3	0	0	0	3	2	2
Ttc39c	1	1	0	0	0	1	0	0	3	2	2
Ubr4	0	0	0	0	3	0	0	0	3	2	2
Vwc2l	0	0	0	0	2	0	1	0	3	2	2
Zfp992	0	0	2	0	1	0	0	0	3	2	2
1190002N1	0	0	0	0	2	0	0	0	2	2	2
2700049A(	0	0	0	0	2	0	0	0	2	2	2
4931408C2	0	0	0	0	2	0	0	0	2	2	2
A2m	0	0	0	0	2	0	0	0	2	2	2
Aatk	0	0	0	0	2	0	0	0	2	2	2
Abca1	0	0	0	0	1	0	1	0	2	2	2
Abcc9	0	0	0	0	1	0	1	0	2	2	2
Acacb	0	0	0	0	2	0	0	0	2	2	2
Actr8	0	0	0	0	2	0	0	0	2	2	2
Adcy3	0	0	0	0	2	0	0	0	2	2	2
Adnp	0	0	0	0	2	0	0	0	2	2	2
Adrb1	0	0	0	0	2	0	0	0	2	2	2
Ago1	0	0	0	0	2	0	0	0	2	2	2
Akap1	0	0	0	0	2	0	0	0	2	2	2
Akap6	0	0	0	0	2	0	0	0	2	2	2
Ankar	0	0	0	0	2	0	0	0	2	2	2
Arhgef26	0	0	0	0	1	0	1	0	2	2	2
Arid4b	0	0	0	0	0	0	2	0	2	2	2
Ash1l	0	0	0	0	2	0	0	0	2	2	2
Asxl2	0	0	0	0	2	0	0	0	2	2	2
Asxl3	0	0	0	0	2	0	0	0	2	2	2
Atp11b	0	0	0	0	2	0	0	0	2	2	2
Atp2a2	0	0	0	0	2	0	0	0	2	2	2
Atp9b	0	0	0	0	2	0	0	0	2	2	2
Baz2b	0	0	0	0	2	0	0	0	2	2	2
Bcl2l10	0	0	0	0	2	0	0	0	2	2	2
Bcl6	0	0	0	0	2	0	0	0	2	2	2
Birc6	0	0	0	0	2	0	0	0	2	2	2

Brca2	0	0	0	0	2	0	0	0	2	2	2
Bricd5	0	0	0	0	2	0	0	0	2	2	2
Brwd1	0	0	0	0	2	0	0	0	2	2	2
Brwd3	0	0	0	0	2	0	0	0	2	2	2
Caly	0	0	0	0	2	0	0	0	2	2	2
Ccdc57	0	0	0	0	2	0	0	0	2	2	2
Cct8l1	0	0	0	0	2	0	0	0	2	2	2
Cdc42bpa	0	0	0	0	2	0	0	0	2	2	2
Cdk11b	0	0	0	0	2	0	0	0	2	2	2
Celf1	0	0	0	0	2	0	0	0	2	2	2
Chil4	0	0	0	0	1	0	1	0	2	2	2
Chmp6	0	0	0	0	2	0	0	0	2	2	2
Chst12	0	0	0	0	2	0	0	0	2	2	2
Col5a2	0	0	0	0	2	0	0	0	2	2	2
Col7a1	0	0	0	0	2	0	0	0	2	2	2
Cpeb3	0	0	0	0	2	0	0	0	2	2	2
Cpne9	0	0	0	0	0	2	0	0	2	2	2
Cpsf1	0	0	0	0	2	0	0	0	2	2	2
Csmd3	0	0	0	0	1	1	0	0	2	2	2
Csnk1g1	0	0	0	0	0	2	0	0	2	2	2
D430042O	0	0	0	0	1	0	1	0	2	2	2
Dag1	0	0	0	0	2	0	0	0	2	2	2
Dcc	0	0	0	0	2	0	0	0	2	2	2
Dchs1	0	0	0	0	1	1	0	0	2	2	2
Dhx9	0	0	0	0	1	1	0	0	2	2	2
Dlg5	0	0	0	0	2	0	0	0	2	2	2
Dmc1	0	2	0	0	0	0	0	0	2	2	2
Dnm3	0	0	0	0	2	0	0	0	2	2	2
Dock7	0	0	0	0	2	0	0	0	2	2	2
Dopey1	0	0	0	0	2	0	0	0	2	2	2
Dsg1b	0	0	0	0	1	1	0	0	2	2	2
Dst	0	0	0	0	2	0	0	0	2	2	2
Eef2	0	0	0	0	2	0	0	0	2	2	2

Ep300	0	0	0	0	1	0	1	0	2	2	2
Eps8l3	0	0	0	0	2	0	0	0	2	2	2
Etf1	0	0	0	0	1	0	1	0	2	2	2
F5	0	0	0	0	2	0	0	0	2	2	2
F8	0	0	0	0	2	0	0	0	2	2	2
Fam208a	0	0	0	0	2	0	0	0	2	2	2
Fanca	0	0	0	0	2	0	0	0	2	2	2
Fgd1	0	0	0	0	1	0	1	0	2	2	2
Foxk2	0	0	0	0	2	0	0	0	2	2	2
Frmpd1	0	0	0	0	2	0	0	0	2	2	2
Fryl	0	0	0	0	2	0	0	0	2	2	2
Gk2	0	0	0	0	2	0	0	0	2	2	2
Gm10220	0	0	0	0	2	0	0	0	2	2	2
Gm20547	0	0	0	0	2	0	0	0	2	2	2
Gm4788	0	0	0	0	2	0	0	0	2	2	2
Grid2	0	0	0	0	2	0	0	0	2	2	2
Gtf2i	0	0	0	0	2	0	0	0	2	2	2
Henmt1	0	0	0	0	2	0	0	0	2	2	2
Herc1	0	0	0	0	2	0	0	0	2	2	2
Hgfac	0	0	0	0	2	0	0	0	2	2	2
Hif1a	0	0	0	0	2	0	0	0	2	2	2
Hmgxb3	0	0	0	0	2	0	0	0	2	2	2
Hnrnpu	0	0	0	0	2	0	0	0	2	2	2
Hr	0	0	0	0	2	0	0	0	2	2	2
Ice1	0	0	0	0	2	0	0	0	2	2	2
Igsf10	0	0	0	0	2	0	0	0	2	2	2
Ildr1	0	0	0	0	2	0	0	0	2	2	2
Immt	0	0	0	0	2	0	0	0	2	2	2
Ints1	0	0	0	0	1	0	1	0	2	2	2
Itga4	0	0	0	0	2	0	0	0	2	2	2
Itga8	0	0	0	0	2	0	0	0	2	2	2
Kcna7	0	0	0	0	2	0	0	0	2	2	2
Kcnn4	0	0	0	0	2	0	0	0	2	2	2

Kif13b	0	0	0	0	2	0	0	0	2	2	2
Kif5c	0	0	0	0	2	0	0	0	2	2	2
Klhl23	0	0	0	0	2	0	0	0	2	2	2
Kmt2b	0	0	0	0	2	0	0	0	2	2	2
Kmt2c	0	0	0	0	2	0	0	0	2	2	2
Kyat1	0	0	0	0	1	0	1	0	2	2	2
Lad1	0	0	0	0	2	0	0	0	2	2	2
Lama3	0	0	0	0	1	1	0	0	2	2	2
Limk1	0	0	0	0	2	0	0	0	2	2	2
Lrrc37a	0	1	0	0	1	0	0	0	2	2	2
Malt1	0	0	0	0	1	0	1	0	2	2	2
Map3k13	0	0	0	0	2	0	0	0	2	2	2
Mbd2	0	0	0	0	2	0	0	0	2	2	2
Mcc	0	0	0	0	2	0	0	0	2	2	2
Mcm3ap	0	0	0	0	1	0	1	0	2	2	2
Med12l	0	0	0	0	1	1	0	0	2	2	2
Med13	0	0	0	1	1	0	0	0	2	2	2
Megf8	0	0	0	0	2	0	0	0	2	2	2
Mfsd4b5	0	0	0	0	2	0	0	0	2	2	2
Mmp14	0	0	0	0	2	0	0	0	2	2	2
Mmrn1	0	0	0	0	2	0	0	0	2	2	2
Mon2	0	0	0	0	1	1	0	0	2	2	2
Mpv17	0	0	0	0	2	0	0	0	2	2	2
Mroh1	0	0	0	0	2	0	0	0	2	2	2
Mybbp1a	0	0	0	0	2	0	0	0	2	2	2
Myh7b	0	0	0	0	1	1	0	0	2	2	2
Myh9	0	0	0	0	2	0	0	0	2	2	2
Myo16	0	0	0	0	2	0	0	0	2	2	2
Naa25	0	0	0	0	2	0	0	0	2	2	2
Naa35	0	0	0	0	2	0	0	0	2	2	2
Naca	0	0	0	0	2	0	0	0	2	2	2
Nat9	0	0	0	0	0	1	1	0	2	2	2
Nav3	0	0	0	0	2	0	0	0	2	2	2

Ndc80	0	0	0	0	1	1	0	0	2	2	2
Nfe2l2	0	0	0	0	2	0	0	0	2	2	2
Nfia	0	0	0	0	2	0	0	0	2	2	2
Nin	0	0	0	0	1	1	0	0	2	2	2
Nlrc4	1	0	0	0	0	0	1	0	2	2	2
Nudcd1	0	0	0	0	2	0	0	0	2	2	2
Nufip2	0	0	0	0	2	0	0	0	2	2	2
Olfr1131	0	0	0	0	2	0	0	0	2	2	2
Olfr1197	0	0	0	0	2	0	0	0	2	2	2
Olfr1247	0	0	0	0	2	0	0	0	2	2	2
Olfr344	0	0	0	0	2	0	0	0	2	2	2
Osbpl6	0	0	0	0	2	0	0	0	2	2	2
Parp4	0	0	0	0	2	0	0	0	2	2	2
Pax4	0	0	0	0	2	0	0	0	2	2	2
Pcdh7	0	0	0	0	2	0	0	0	2	2	2
Pcdhb12	0	0	0	0	2	0	0	0	2	2	2
Pcdhga9	0	0	0	0	2	0	0	0	2	2	2
Pclo	0	0	0	0	1	1	0	0	2	2	2
Pcnx2	0	0	0	0	2	0	0	0	2	2	2
Pcsk6	0	0	0	0	1	0	1	0	2	2	2
Pdcd1	0	0	0	0	1	0	1	0	2	2	2
Peg3	0	0	0	0	2	0	0	0	2	2	2
Pgm1	0	0	0	0	2	0	0	0	2	2	2
Pik3c2a	0	0	0	0	2	0	0	0	2	2	2
Pik3r5	0	0	0	0	2	0	0	0	2	2	2
Pip4k2a	0	0	0	0	2	0	0	0	2	2	2
Pla2g6	0	0	0	0	2	0	0	0	2	2	2
Plch1	0	0	0	0	2	0	0	0	2	2	2
Plekhg2	0	0	0	0	2	0	0	0	2	2	2
Plekhh2	0	0	0	0	2	0	0	0	2	2	2
Plpp5	0	0	0	0	1	1	0	0	2	2	2
Pnpla2	0	0	0	0	2	0	0	0	2	2	2
Polq	0	0	0	0	1	1	0	0	2	2	2

Prdm9	0	0	1	0	1	0	0	0	2	2	2
Prex2	0	0	0	0	2	0	0	0	2	2	2
Prg4	0	0	0	0	2	0	0	0	2	2	2
Prrc2c	0	0	0	0	2	0	0	0	2	2	2
Psg22	0	0	0	0	2	0	0	0	2	2	2
Psip1	0	0	0	0	2	0	0	0	2	2	2
Psmd1	0	0	0	0	2	0	0	0	2	2	2
Ptk2	0	0	0	0	2	0	0	0	2	2	2
Ptpn2	0	0	0	0	1	0	1	0	2	2	2
Ptprc	0	0	0	0	2	0	0	0	2	2	2
Pzp	0	0	0	0	1	0	1	0	2	2	2
R3hdm2	0	0	0	0	2	0	0	0	2	2	2
Rexo1	0	0	0	0	2	0	0	0	2	2	2
Rhox2h	0	0	0	0	2	0	0	0	2	2	2
Rnf103	0	0	0	0	1	1	0	0	2	2	2
Robo1	0	0	0	0	2	0	0	0	2	2	2
Ros1	0	0	0	0	0	2	0	0	2	2	2
Rps6	0	0	0	0	2	0	0	0	2	2	2
Scyl3	0	0	0	0	1	0	1	0	2	2	2
Sel1l3	0	0	0	0	1	1	0	0	2	2	2
Sema4b	0	0	0	0	2	0	0	0	2	2	2
Sergef	0	0	0	0	1	0	1	0	2	2	2
Setd1a	0	0	0	0	2	0	0	0	2	2	2
Setdb1	0	0	0	0	2	0	0	0	2	2	2
Sgcb	0	0	0	0	2	0	0	0	2	2	2
Sh3d21	0	0	0	0	2	0	0	0	2	2	2
Slc17a5	0	0	0	0	2	0	0	0	2	2	2
Slc2a9	0	0	0	0	1	1	0	0	2	2	2
Slc46a3	0	0	0	0	2	0	0	0	2	2	2
Slco2a1	0	0	0	0	0	2	0	0	2	2	2
Snx25	0	0	0	0	1	1	0	0	2	2	2
Son	0	0	0	0	2	0	0	0	2	2	2
Sorcs2	0	0	0	0	2	0	0	0	2	2	2

Sptbn1	0	0	0	0	1	1	0	0	2	2	2
Sptbn4	0	0	0	0	2	0	0	0	2	2	2
Srpr	0	0	0	0	1	0	1	0	2	2	2
Ssh2	0	0	0	0	0	0	2	0	2	2	2
Sspo	0	0	0	0	1	1	0	0	2	2	2
Stk10	0	0	0	0	2	0	0	0	2	2	2
Sympk	0	0	0	0	2	0	0	0	2	2	2
Synrg	0	0	0	0	2	0	0	0	2	2	2
Tapbp	0	0	0	0	2	0	0	0	2	2	2
Tarbp1	0	0	0	0	2	0	0	0	2	2	2
Tenm2	0	0	0	0	1	1	0	0	2	2	2
Tert	0	0	0	0	2	0	0	0	2	2	2
Ticam2	0	0	0	0	2	0	0	0	2	2	2
Tln2	0	0	0	0	2	0	0	0	2	2	2
Tmem232	0	0	0	0	2	0	0	0	2	2	2
Tnks1bp1	0	0	0	0	1	1	0	0	2	2	2
Tnr	0	0	0	0	2	0	0	0	2	2	2
Trappc12	0	0	0	0	2	0	0	0	2	2	2
Trim33	0	0	0	0	2	0	0	0	2	2	2
Ttc3	0	0	0	0	1	0	1	0	2	2	2
Txndc2	0	0	0	0	2	0	0	0	2	2	2
U2af1l4	0	0	0	0	2	0	0	0	2	2	2
Ubac1	0	0	0	0	1	0	1	0	2	2	2
Ubxn7	0	0	0	0	2	0	0	0	2	2	2
Ugt2a1	0	0	0	0	2	0	0	0	2	2	2
Ugt2b37	0	0	0	0	2	0	0	0	2	2	2
Unk	0	0	0	0	2	0	0	0	2	2	2
Usp34	0	0	0	0	2	0	0	0	2	2	2
Usp40	0	0	0	0	2	0	0	0	2	2	2
Virma	0	0	0	0	2	0	0	0	2	2	2
Vmn1r32	0	0	0	0	2	0	0	0	2	2	2
Vmn2r104	0	0	0	0	2	0	0	0	2	2	2
Vmn2r107	0	0	0	0	2	0	0	0	2	2	2

Vmn2r8	0	0	0	0	2	0	0	0	2	2	2
Vmn2r85	0	0	2	0	0	0	0	0	2	2	2
Vps13a	0	0	0	0	2	0	0	0	2	2	2
Wdr33	0	0	0	0	2	0	0	0	2	2	2
Zdhhc13	0	0	0	0	2	0	0	0	2	2	2
Zeb2	0	0	0	0	2	0	0	0	2	2	2
Zfp169	0	0	0	0	2	0	0	0	2	2	2
Zfp292	0	0	0	0	2	0	0	0	2	2	2
Zfyve26	0	0	0	0	2	0	0	0	2	2	2
Zswim4	0	0	0	0	2	0	0	0	2	2	2
H2afy2	0	0	0	0	2	0	1	0	3	1	1
Macf1	0	0	0	0	2	1	0	0	3	1	1
Sec23a	0	0	0	0	3	0	0	0	3	1	1
Shank1	0	0	0	0	3	0	0	0	3	1	1
2310050C(	0	0	0	0	2	0	0	0	2	1	1
2810474O1	0	0	0	0	1	1	0	0	2	1	1
Aars	0	0	0	0	2	0	0	0	2	1	1
Acaca	0	0	0	0	2	0	0	0	2	1	1
Adamts9	0	0	0	0	2	0	0	0	2	1	1
Adcy1	0	0	0	0	2	0	0	0	2	1	1
Adgrl2	0	0	0	0	2	0	0	0	2	1	1
Afg3l1	0	0	0	0	2	0	0	0	2	1	1
Akap9	0	0	0	0	2	0	0	0	2	1	1
Arfgef3	0	0	0	0	2	0	0	0	2	1	1
Baz1b	0	0	0	0	2	0	0	0	2	1	1
Bcor	0	0	0	0	2	0	0	0	2	1	1
Btbd1	0	0	0	0	1	0	1	0	2	1	1
Cacna1g	0	0	0	0	1	1	0	0	2	1	1
Cacng2	0	0	0	0	2	0	0	0	2	1	1
Card6	0	0	0	0	2	0	0	0	2	1	1
Catsperb	0	0	0	0	2	0	0	0	2	1	1
Cbfa2t2	0	0	0	0	2	0	0	0	2	1	1
Cel	0	0	0	0	2	0	0	0	2	1	1

Cenpf	0	0	0	0	2	0	0	0	2	1	1
Col4a3	0	0	0	0	2	0	0	0	2	1	1
Ctsm	0	0	0	0	2	0	0	0	2	1	1
Cul3	0	0	0	0	1	0	1	0	2	1	1
D430041D	0	0	0	0	2	0	0	0	2	1	1
Dsg1a	0	0	0	0	2	0	0	0	2	1	1
Ect2	0	0	0	0	2	0	0	0	2	1	1
Eppk1	0	0	0	0	2	0	0	0	2	1	1
Exoc6	0	0	0	0	1	1	0	0	2	1	1
Fam91a1	0	0	0	0	2	0	0	0	2	1	1
Fancc	0	0	0	0	2	0	0	0	2	1	1
Farp2	0	0	0	0	2	0	0	0	2	1	1
Fn1	0	0	0	0	2	0	0	0	2	1	1
Gm6367	0	0	0	0	2	0	0	0	2	1	1
Haus6	0	0	0	0	1	1	0	0	2	1	1
Hgd	0	0	0	0	2	0	0	0	2	1	1
Hnrnpr	0	0	0	0	1	0	1	0	2	1	1
Icos	0	0	0	0	2	0	0	0	2	1	1
Jak1	0	0	0	0	2	0	0	0	2	1	1
Kmt2d	0	0	0	0	2	0	0	0	2	1	1
Lama2	0	0	0	0	2	0	0	0	2	1	1
Lca5	0	0	0	0	2	0	0	0	2	1	1
Lrp1b	0	0	0	0	2	0	0	0	2	1	1
Mrap2	0	0	0	0	1	0	1	0	2	1	1
Mthfd2l	0	0	0	0	2	0	0	0	2	1	1
Mybl1	0	0	0	0	1	0	1	0	2	1	1
Myh11	0	0	0	0	2	0	0	0	2	1	1
Myo18b	0	0	0	0	2	0	0	0	2	1	1
Mypn	0	0	0	0	2	0	0	0	2	1	1
Nbeal1	0	0	0	0	2	0	0	0	2	1	1
Nfat5	0	0	0	0	2	0	0	0	2	1	1
Ninl	0	0	0	0	1	1	0	0	2	1	1
Npr2	0	0	0	0	1	1	0	0	2	1	1

Nsd3	0	0	0	0	1	1	0	0	2	1	1
Numa1	0	0	0	0	1	0	1	0	2	1	1
Nup210	0	0	0	0	2	0	0	0	2	1	1
Nwd2	0	0	0	0	2	0	0	0	2	1	1
Olfr301	0	0	0	0	2	0	0	0	2	1	1
Olfr516	0	0	0	0	1	1	0	0	2	1	1
Oxsm	0	0	0	0	2	0	0	0	2	1	1
Pcdhb19	0	0	0	0	2	0	0	0	2	1	1
Pdcd6ip	0	0	0	0	2	0	0	0	2	1	1
Phlpp2	0	0	0	0	2	0	0	0	2	1	1
Phtf1	0	0	0	0	2	0	0	0	2	1	1
Pi4kb	0	0	0	0	1	0	1	0	2	1	1
Ppm1j	0	0	0	0	1	0	1	0	2	1	1
Rai1	0	0	0	0	1	0	1	0	2	1	1
Ralgapa1	0	0	0	0	1	0	1	0	2	1	1
Rgl2	0	0	0	0	2	0	0	0	2	1	1
Satb1	0	0	0	0	2	0	0	0	2	1	1
Six4	0	0	0	0	2	0	0	0	2	1	1
Ski	0	0	0	0	2	0	0	0	2	1	1
Slc4a7	0	0	0	0	2	0	0	0	2	1	1
Slit2	0	0	0	0	2	0	0	0	2	1	1
Srebf1	0	0	0	0	2	0	0	0	2	1	1
Srgap2	0	0	0	0	2	0	0	0	2	1	1
Sun1	0	0	0	0	2	0	0	0	2	1	1
Supt5	0	0	0	0	2	0	0	0	2	1	1
Teddm2	0	0	0	0	1	1	0	0	2	1	1
Tlr12	0	0	0	0	2	0	0	0	2	1	1
Tmprss11a	0	0	0	0	2	0	0	0	2	1	1
Trpm6	0	0	0	0	2	0	0	0	2	1	1
Unc80	0	0	0	0	2	0	0	0	2	1	1
Vcan	0	0	0	0	2	0	0	0	2	1	1
Vmn2r97	0	0	0	0	2	0	0	0	2	1	1
Zcchc2	0	0	0	0	2	0	0	0	2	1	1

Zfhx2	0	0	0	0	2	0	0	0	2	1	1
Zfp518b	0	0	0	0	1	1	0	0	2	1	1
Zfp551	0	0	0	0	2	0	0	0	2	1	1
0610009O	0	0	0	0	1	0	0	0	1	1	1
0610040J0	0	0	0	0	1	0	0	0	1	1	1
1700021F(	0	0	0	0	1	0	0	0	1	1	1
1700022I1	0	0	0	0	1	0	0	0	1	1	1
1700029I1	0	0	0	0	1	0	0	0	1	1	1
1700031F(	0	0	0	0	1	0	0	0	1	1	1
1700037H(	0	0	0	0	1	0	0	0	1	1	1
1700109H(	0	0	0	0	1	0	0	0	1	1	1
2010300C(	0	0	0	0	1	0	0	0	1	1	1
2300003K(	0	0	0	0	1	0	0	0	1	1	1
2310003L0	0	0	0	0	1	0	0	0	1	1	1
2310035C2	0	0	0	0	0	0	1	0	1	1	1
2310057J1	0	0	0	0	1	0	0	0	1	1	1
2310079G1	0	0	0	0	1	0	0	0	1	1	1
2610507B1	0	0	0	0	1	0	0	0	1	1	1
2810403A(	0	0	0	0	1	0	0	0	1	1	1
2810408A1	0	0	0	0	1	0	0	0	1	1	1
3110001I2	0	0	0	0	1	0	0	0	1	1	1
3110062M	0	0	0	0	1	0	0	0	1	1	1
4833423E2	0	0	0	0	1	0	0	0	1	1	1
4921509C1	0	0	0	0	1	0	0	0	1	1	1
4930407I1(	0	0	0	0	0	0	1	0	1	1	1
4930430A1	0	0	0	0	1	0	0	0	1	1	1
4930432M	0	0	0	0	0	1	0	0	1	1	1
4930438A(	0	0	0	0	1	0	0	0	1	1	1
4930447F(	0	0	0	0	1	0	0	0	1	1	1
4930452B(	0	0	0	0	1	0	0	0	1	1	1
4930539E(	0	0	0	0	1	0	0	0	1	1	1
4930548H2	0	0	0	0	1	0	0	0	1	1	1
4930553J1	0	0	0	0	1	0	0	0	1	1	1

4930595D1	0	0	0	0	0	0	1	0	1	1	1
4932438A1	0	0	0	0	1	0	0	0	1	1	1
4933402N(	0	0	0	0	1	0	0	0	1	1	1
4933405L1	0	0	0	0	1	0	0	0	1	1	1
5031439G(	0	0	0	0	1	0	0	0	1	1	1
5430403G1	0	0	0	0	1	0	0	0	1	1	1
6430573F1	0	0	0	0	0	0	1	0	1	1	1
9130023H2	0	0	0	0	1	0	0	0	1	1	1
9330159F1	0	0	0	0	1	0	0	0	1	1	1
A2ml1	0	0	0	0	0	0	1	0	1	1	1
A4gnt	0	0	0	0	1	0	0	0	1	1	1
A730049H(	0	0	0	0	1	0	0	0	1	1	1
AA792892	0	0	0	0	1	0	0	0	1	1	1
AC132392.	0	0	0	0	1	0	0	0	1	1	1
AI837181	0	0	0	0	1	0	0	0	1	1	1
AU018091	0	0	0	0	1	0	0	0	1	1	1
AW551984	0	0	0	0	1	0	0	0	1	1	1
AW554918	0	0	0	0	1	0	0	0	1	1	1
AW822073	0	0	0	0	1	0	0	0	1	1	1
Aamdc	0	0	0	0	1	0	0	0	1	1	1
Abca14	0	0	0	0	1	0	0	0	1	1	1
Abca16	0	0	0	0	1	0	0	0	1	1	1
Abca17	0	0	0	0	1	0	0	0	1	1	1
Abca6	0	0	0	0	1	0	0	0	1	1	1
Abca8b	0	0	0	0	1	0	0	0	1	1	1
Abca9	0	0	0	0	1	0	0	0	1	1	1
Abcb11	0	0	0	0	1	0	0	0	1	1	1
Abcb1b	0	0	0	0	1	0	0	0	1	1	1
Abcb7	0	0	0	0	1	0	0	0	1	1	1
Abcc3	0	0	0	0	1	0	0	0	1	1	1
Abcc6	0	0	0	0	1	0	0	0	1	1	1
Abcd2	0	0	0	0	1	0	0	0	1	1	1
Abcd3	0	0	0	0	0	0	1	0	1	1	1

Abcg2	0	0	0	0	1	0	0	0	1	1	1
Abhd13	0	0	0	0	1	0	0	0	1	1	1
Abhd6	0	0	0	0	1	0	0	0	1	1	1
Abi1	0	0	0	0	1	0	0	0	1	1	1
Abi3bp	0	0	0	0	1	0	0	0	1	1	1
Abl2	0	0	0	0	1	0	0	0	1	1	1
Ablim1	0	0	0	0	1	0	0	0	1	1	1
Ablim2	0	0	0	0	1	0	0	0	1	1	1
Abtb2	0	0	0	0	1	0	0	0	1	1	1
Acad12	0	0	0	0	1	0	0	0	1	1	1
Acad9	0	0	0	0	0	0	1	0	1	1	1
Acadsb	0	0	0	0	1	0	0	0	1	1	1
Acap3	0	0	0	0	1	0	0	0	1	1	1
Acat3	0	0	0	0	1	0	0	0	1	1	1
Acbd3	0	0	0	0	1	0	0	0	1	1	1
Acbd5	0	0	0	0	1	0	0	0	1	1	1
Acbd6	0	0	0	0	1	0	0	0	1	1	1
Acer2	0	0	0	0	1	0	0	0	1	1	1
Acnat1	0	0	0	0	1	0	0	0	1	1	1
Aco1	0	0	0	0	1	0	0	0	1	1	1
Acod1	0	0	0	0	1	0	0	0	1	1	1
Acot10	0	0	0	0	1	0	0	0	1	1	1
Acot11	0	0	0	0	1	0	0	0	1	1	1
Acot2	0	0	0	0	1	0	0	0	1	1	1
Acp1	0	0	0	0	1	0	0	0	1	1	1
Acsbg1	0	0	0	0	1	0	0	0	1	1	1
Acsl4	0	0	0	0	1	0	0	0	1	1	1
Acsm4	0	0	0	0	1	0	0	0	1	1	1
Acss2	0	0	0	0	1	0	0	0	1	1	1
Acta2	0	0	0	0	1	0	0	0	1	1	1
Actl11	0	0	0	0	1	0	0	0	1	1	1
Actl6b	0	0	0	0	1	0	0	0	1	1	1
Actl9	0	0	0	0	1	0	0	0	1	1	1

Actn1	0	0	0	0	1	0	0	0	1	1	1
Actrt2	0	0	0	0	1	0	0	0	1	1	1
Adad1	0	0	0	0	1	0	0	0	1	1	1
Adam15	0	0	0	0	0	1	0	0	1	1	1
Adam20	0	0	0	0	1	0	0	0	1	1	1
Adam25	0	0	0	0	1	0	0	0	1	1	1
Adam3	0	0	0	0	1	0	0	0	1	1	1
Adam5	0	0	0	0	1	0	0	0	1	1	1
Adam6a	0	0	0	0	1	0	0	0	1	1	1
Adam9	0	0	0	0	1	0	0	0	1	1	1
Adamdec1	0	0	0	0	1	0	0	0	1	1	1
Adamts14	0	0	0	0	1	0	0	0	1	1	1
Adamts15	0	0	0	0	1	0	0	0	1	1	1
Adamts18	0	0	0	0	1	0	0	0	1	1	1
Adamts2	0	0	0	0	1	0	0	0	1	1	1
Adamtsl3	0	0	0	0	1	0	0	0	1	1	1
Adcy7	0	0	0	0	1	0	0	0	1	1	1
Add1	0	0	0	0	1	0	0	0	1	1	1
Add3	0	0	0	0	1	0	0	0	1	1	1
Adgra3	0	0	0	0	1	0	0	0	1	1	1
Adgrb1	0	0	0	0	1	0	0	0	1	1	1
Adgrb2	0	0	0	0	1	0	0	0	1	1	1
Adgrf5	0	0	0	0	1	0	0	0	1	1	1
Adgrg3	0	0	0	0	1	0	0	0	1	1	1
Adgrg7	0	0	0	0	1	0	0	0	1	1	1
Adgrl3	0	0	0	0	1	0	0	0	1	1	1
Adprm	0	0	0	0	1	0	0	0	1	1	1
Adsl	0	0	0	0	0	0	1	0	1	1	1
Afap1l1	0	0	0	0	0	0	1	0	1	1	1
Afap1l2	0	0	0	0	1	0	0	0	1	1	1
Afdn	0	0	0	0	1	0	0	0	1	1	1
Aga	0	0	0	0	1	0	0	0	1	1	1
Agmat	0	0	0	0	1	0	0	0	1	1	1

Ago2	0	0	0	0	1	0	0	0	1	1	1
Ago4	0	0	0	0	1	0	0	0	1	1	1
Agtr1a	0	0	0	0	1	0	0	0	1	1	1
Agxt	0	0	0	0	1	0	0	0	1	1	1
Ahctf1	0	0	0	0	1	0	0	0	1	1	1
Ahsa2	0	0	0	0	1	0	0	0	1	1	1
Ahsg	0	0	0	0	0	1	0	0	1	1	1
Aim2	0	0	0	0	1	0	0	0	1	1	1
Aire	0	0	0	0	1	0	0	0	1	1	1
Ak1	0	0	0	0	0	0	1	0	1	1	1
Akap10	0	0	0	0	1	0	0	0	1	1	1
Akap12	0	0	0	0	1	0	0	0	1	1	1
Akap13	0	0	0	0	1	0	0	0	1	1	1
Akna	0	0	0	0	1	0	0	0	1	1	1
Akr1b3	0	0	0	0	1	0	0	0	1	1	1
Akr1c12	0	0	0	0	1	0	0	0	1	1	1
Akr1c13	0	0	0	0	1	0	0	0	1	1	1
Akr1cl	0	0	0	0	0	0	1	0	1	1	1
Alas1	0	0	0	0	1	0	0	0	1	1	1
Alas2	0	0	0	0	1	0	0	0	1	1	1
Alb	0	0	0	0	1	0	0	0	1	1	1
Aldh5a1	0	0	0	0	1	0	0	0	1	1	1
Alg1	0	0	0	0	1	0	0	0	1	1	1
Alg11	0	0	0	0	1	0	0	0	1	1	1
Alg13	0	0	0	0	1	0	0	0	1	1	1
Alkbh5	0	0	0	0	1	0	0	0	1	1	1
Alkbh6	0	0	0	0	1	0	0	0	1	1	1
Alox12	0	0	0	0	1	0	0	0	1	1	1
Alox15	0	0	0	0	1	0	0	0	1	1	1
Alox5	0	0	0	0	1	0	0	0	1	1	1
Alpk2	0	0	0	0	1	0	0	0	1	1	1
Als2	0	0	0	0	1	0	0	0	1	1	1
Ambn	0	0	0	0	1	0	0	0	1	1	1

Ambra1	0	0	0	0	1	0	0	0	1	1	1
Amd1	0	0	0	0	1	0	0	0	1	1	1
Amer1	0	0	0	0	1	0	0	0	1	1	1
Amer2	0	0	0	0	1	0	0	0	1	1	1
Amfr	0	0	0	0	1	0	0	0	1	1	1
Amph	0	0	0	0	1	0	0	0	1	1	1
Anapc15	0	0	0	0	1	0	0	0	1	1	1
Anapc2	0	0	0	0	1	0	0	0	1	1	1
Ang6	0	0	0	0	1	0	0	0	1	1	1
Angel1	0	0	0	0	1	0	0	0	1	1	1
Ank2	0	0	0	0	1	0	0	0	1	1	1
Ank3	0	0	0	0	1	0	0	0	1	1	1
Ankrd13c	0	0	0	0	1	0	0	0	1	1	1
Ankrd17	0	0	0	0	1	0	0	0	1	1	1
Ankrd33b	0	0	0	0	1	0	0	0	1	1	1
Ankrd42	0	0	0	0	1	0	0	0	1	1	1
Ankrd49	0	0	0	0	1	0	0	0	1	1	1
Ankub1	0	0	0	0	1	0	0	0	1	1	1
Anln	0	0	0	0	1	0	0	0	1	1	1
Ano1	0	0	0	0	1	0	0	0	1	1	1
Ano6	0	0	0	0	0	0	1	0	1	1	1
Ano7	0	0	0	0	0	1	0	0	1	1	1
Aoah	0	0	0	0	1	0	0	0	1	1	1
Aox2	0	0	0	0	1	0	0	0	1	1	1
Aox4	0	0	0	0	1	0	0	0	1	1	1
Ap1ar	0	0	0	0	1	0	0	0	1	1	1
Ap1b1	0	0	0	0	1	0	0	0	1	1	1
Ap2b1	0	0	0	0	1	0	0	0	1	1	1
Ap3b2	0	0	0	0	1	0	0	0	1	1	1
Ap3d1	0	0	0	0	1	0	0	0	1	1	1
Apba1	0	0	0	0	1	0	0	0	1	1	1
Apobec1	0	0	0	0	1	0	0	0	1	1	1
Apol11b	0	0	0	0	1	0	0	0	1	1	1

Apol6	0	1	0	0	0	0	0	0	1	1	1
Appbp2	0	0	0	0	1	0	0	0	1	1	1
Aqp8	0	0	0	0	1	0	0	0	1	1	1
Araf	0	0	0	0	1	0	0	0	1	1	1
Arap2	0	0	0	0	1	0	0	0	1	1	1
Arap3	0	0	0	0	1	0	0	0	1	1	1
Arf5	0	0	0	0	1	0	0	0	1	1	1
Arhgap17	0	0	0	0	1	0	0	0	1	1	1
Arhgap28	0	0	0	0	1	0	0	0	1	1	1
Arhgap30	0	0	0	0	1	0	0	0	1	1	1
Arhgap33	0	0	0	0	0	1	0	0	1	1	1
Arhgap39	0	0	0	0	1	0	0	0	1	1	1
Arhgap40	0	0	0	0	1	0	0	0	1	1	1
Arhgdib	0	0	0	0	1	0	0	0	1	1	1
Arhgef12	0	0	0	0	1	0	0	0	1	1	1
Arhgef15	0	0	0	0	1	0	0	0	1	1	1
Arhgef25	0	0	0	0	1	0	0	0	1	1	1
Arhgef6	0	0	0	0	1	0	0	0	1	1	1
Arid4a	0	0	0	0	1	0	0	0	1	1	1
Armc4	0	0	0	0	1	0	0	0	1	1	1
Armc8	0	0	0	0	1	0	0	0	1	1	1
Armcx1	0	0	0	0	1	0	0	0	1	1	1
Asap2	0	0	0	0	1	0	0	0	1	1	1
Asap3	0	0	0	0	1	0	0	0	1	1	1
Asb12	0	0	0	0	1	0	0	0	1	1	1
Asb14	0	0	0	0	1	0	0	0	1	1	1
Asb15	0	0	0	0	1	0	0	0	1	1	1
Asb3	0	0	0	0	1	0	0	0	1	1	1
Ascc3	0	0	0	0	1	0	0	0	1	1	1
Asic3	0	0	0	0	1	0	0	0	1	1	1
Aspm	0	0	0	0	1	0	0	0	1	1	1
Aste1	0	0	0	0	1	0	0	0	1	1	1
Astn1	0	0	0	0	1	0	0	0	1	1	1

Astn2	0	0	0	0	1	0	0	0	1	1	1
Asxl1	0	0	0	0	1	0	0	0	1	1	1
Atf1	0	0	0	0	1	0	0	0	1	1	1
Atf2	0	0	0	0	1	0	0	0	1	1	1
Atf4	0	0	0	0	1	0	0	0	1	1	1
Atf5	0	0	0	0	1	0	0	0	1	1	1
Atg13	0	0	0	0	1	0	0	0	1	1	1
Atg2b	0	0	0	0	1	0	0	0	1	1	1
Atg9a	0	0	0	0	1	0	0	0	1	1	1
Atp10b	0	0	0	0	0	0	1	0	1	1	1
Atp10d	0	0	0	0	1	0	0	0	1	1	1
Atp12a	0	0	0	0	1	0	0	0	1	1	1
Atp13a4	0	0	0	0	1	0	0	0	1	1	1
Atp13a5	0	0	0	0	1	0	0	0	1	1	1
Atp5b	0	0	0	0	1	0	0	0	1	1	1
Atp6v0a2	0	0	0	0	1	0	0	0	1	1	1
Atp6v0d1	0	0	0	0	1	0	0	0	1	1	1
Atp7a	0	0	0	0	1	0	0	0	1	1	1
Atpif1	0	0	0	0	0	1	0	0	1	1	1
Atrip	0	0	0	0	1	0	0	0	1	1	1
Atrnl1	0	0	0	0	1	0	0	0	1	1	1
Atxn10	0	0	0	0	1	0	0	0	1	1	1
Atxn7l3	0	0	0	0	1	0	0	0	1	1	1
Axdnd1	0	0	0	0	0	0	1	0	1	1	1
B230118H(	0	0	0	0	1	0	0	0	1	1	1
B230219D2	0	0	0	0	1	0	0	0	1	1	1
B3galnt2	0	0	0	0	1	0	0	0	1	1	1
B3galt1	0	0	0	0	1	0	0	0	1	1	1
B3galt6	0	0	0	0	1	0	0	0	1	1	1
B3gat3	0	0	0	0	1	0	0	0	1	1	1
B3gnt3	0	0	0	0	1	0	0	0	1	1	1
B3gnt7	0	0	0	0	1	0	0	0	1	1	1
B4galnt4	0	0	0	0	0	0	1	0	1	1	1

B4galt4	0	0	0	0	1	0	0	0	1	1	1
BC005561	0	0	0	0	1	0	0	0	1	1	1
BC027072	0	0	0	0	0	1	0	0	1	1	1
BC030500	0	0	0	0	1	0	0	0	1	1	1
BC037034	0	0	0	0	1	0	0	0	1	1	1
BC048562	0	0	0	0	1	0	0	0	1	1	1
BC049715	0	0	0	0	1	0	0	0	1	1	1
BC055324	0	0	0	0	1	0	0	0	1	1	1
Baat	0	0	0	0	1	0	0	0	1	1	1
Bag4	0	0	0	0	1	0	0	0	1	1	1
Bambi	0	0	0	0	1	0	0	0	1	1	1
Baz1a	0	0	0	0	1	0	0	0	1	1	1
Bbof1	0	0	0	0	1	0	0	0	1	1	1
Bbs12	0	0	0	0	1	0	0	0	1	1	1
Bbs9	0	0	0	0	1	0	0	0	1	1	1
Bbx	0	0	0	0	1	0	0	0	1	1	1
Bcan	0	0	0	0	1	0	0	0	1	1	1
Bcar1	0	0	0	0	1	0	0	0	1	1	1
Bcar3	0	0	0	0	1	0	0	0	1	1	1
Bcl2a1b	0	0	0	0	1	0	0	0	1	1	1
Bcl2l1	0	0	0	0	1	0	0	0	1	1	1
Bcl2l13	0	0	0	0	1	0	0	0	1	1	1
Bcl9	0	0	0	0	1	0	0	0	1	1	1
Bclaf1	0	0	0	0	1	0	0	0	1	1	1
Bco2	0	0	0	0	1	0	0	0	1	1	1
Bdp1	0	0	0	0	1	0	0	0	1	1	1
Bicra	0	0	0	0	0	0	1	0	1	1	1
Bid	0	0	0	0	1	0	0	0	1	1	1
Bik	0	0	0	0	1	0	0	0	1	1	1
Bin1	0	0	0	0	1	0	0	0	1	1	1
Bin3	0	0	0	0	1	0	0	0	1	1	1
Birc3	0	0	0	0	1	0	0	0	1	1	1
Blmh	0	0	0	0	1	0	0	0	1	1	1

Bmper	0	0	0	0	1	0	0	0	1	1	1
Bmpr2	0	0	0	0	1	0	0	0	1	1	1
Bmx	0	0	0	0	1	0	0	0	1	1	1
Bnc2	0	0	0	0	0	1	0	0	1	1	1
Bod1l	0	0	0	0	1	0	0	0	1	1	1
Bpifb3	0	0	0	0	1	0	0	0	1	1	1
Bpifb4	0	0	0	0	1	0	0	0	1	1	1
Bpifb5	0	0	0	0	0	1	0	0	1	1	1
Bpifb9a	0	0	0	0	1	0	0	0	1	1	1
Bptf	0	0	0	0	1	0	0	0	1	1	1
Brinp1	0	0	0	0	1	0	0	0	1	1	1
Brinp2	0	0	0	0	1	0	0	0	1	1	1
Brip1	0	0	0	0	1	0	0	0	1	1	1
Brpf1	0	0	0	0	0	0	1	0	1	1	1
Bscl2	0	0	0	0	0	0	1	0	1	1	1
Btbd35f6	0	0	0	0	1	0	0	0	1	1	1
Btbd7	0	0	0	0	1	0	0	0	1	1	1
Btnl4	0	0	0	0	1	0	0	0	1	1	1
Bud31	0	0	0	0	1	0	0	0	1	1	1
Bzw2	0	0	0	0	1	0	0	0	1	1	1
C130026I2	0	0	0	0	1	0	0	0	1	1	1
C1qtnf2	0	0	0	0	1	0	0	0	1	1	1
C1rb	0	0	0	0	1	0	0	0	1	1	1
C2	0	0	0	0	1	0	0	0	1	1	1
C2cd2l	0	0	0	0	1	0	0	0	1	1	1
C2cd3	0	0	0	0	1	0	0	0	1	1	1
C2cd4c	0	0	0	0	0	1	0	0	1	1	1
C3	0	0	0	0	1	0	0	0	1	1	1
C330027C(	0	0	0	0	1	0	0	0	1	1	1
C87977	0	0	0	0	1	0	0	0	1	1	1
Cab39	0	0	0	0	0	1	0	0	1	1	1
Cabin1	0	0	0	0	1	0	0	0	1	1	1
Cacna1f	0	0	0	0	1	0	0	0	1	1	1

Cacna1h	0	0	0	0	1	0	0	0	1	1	1
Cacna2d1	0	0	0	0	1	0	0	0	1	1	1
Cacna2d3	0	0	0	0	1	0	0	0	1	1	1
Cactin	0	0	0	0	0	1	0	0	1	1	1
Cad	0	0	0	0	1	0	0	0	1	1	1
Cadm4	0	0	0	0	1	0	0	0	1	1	1
Cadps	0	0	0	0	1	0	0	0	1	1	1
Cadps2	0	0	0	0	1	0	0	0	1	1	1
Calm5	0	0	0	0	1	0	0	0	1	1	1
Calml4	0	0	0	0	1	0	0	0	1	1	1
Camkmt	0	0	0	0	1	0	0	0	1	1	1
Camp	0	0	0	0	1	0	0	0	1	1	1
Canx	0	0	0	0	1	0	0	0	1	1	1
Capn2	0	0	0	0	0	0	1	0	1	1	1
Capn7	0	0	1	0	0	0	0	0	1	1	1
Caprin1	0	0	0	0	1	0	0	0	1	1	1
Car14	0	0	0	0	1	0	0	0	1	1	1
Car2	0	0	0	0	1	0	0	0	1	1	1
Car5a	0	0	0	0	1	0	0	0	1	1	1
Carmil3	0	0	0	0	0	0	1	0	1	1	1
Cars	0	0	0	0	1	0	0	0	1	1	1
Casc1	0	0	0	0	1	0	0	0	1	1	1
Casc3	0	0	0	0	1	0	0	0	1	1	1
Cask	0	0	0	0	1	0	0	0	1	1	1
Caskin2	0	0	0	0	1	0	0	0	1	1	1
Cast	0	0	0	0	0	0	1	0	1	1	1
Cavin2	0	0	0	0	1	0	0	0	1	1	1
Cblb	0	0	0	0	1	0	0	0	1	1	1
Cblc	0	0	0	0	0	0	1	0	1	1	1
Cbln4	0	0	0	0	1	0	0	0	1	1	1
Cbx2	0	0	0	0	1	0	0	0	1	1	1
Cc2d1a	0	0	0	0	1	0	0	0	1	1	1
Ccdc110	0	0	0	0	1	0	0	0	1	1	1

Ccdc127	0	0	0	0	1	0	0	0	1	1	1
Ccdc138	0	0	0	0	1	0	0	0	1	1	1
Ccdc141	0	0	0	0	1	0	0	0	1	1	1
Ccdc148	0	0	0	0	1	0	0	0	1	1	1
Ccdc151	0	0	0	0	0	1	0	0	1	1	1
Ccdc154	0	0	0	0	0	0	1	0	1	1	1
Ccdc157	0	0	0	0	1	0	0	0	1	1	1
Ccdc158	0	0	0	0	1	0	0	0	1	1	1
Ccdc162	0	0	0	0	1	0	0	0	1	1	1
Ccdc180	0	0	0	0	1	0	0	0	1	1	1
Ccdc24	0	0	0	0	1	0	0	0	1	1	1
Ccdc33	0	0	0	0	1	0	0	0	1	1	1
Ccdc54	0	0	0	0	1	0	0	0	1	1	1
Ccdc61	0	0	0	0	1	0	0	0	1	1	1
Ccdc7a	0	0	0	0	1	0	0	0	1	1	1
Ccdc7b	0	0	0	0	1	0	0	0	1	1	1
Ccdc8	0	0	0	0	1	0	0	0	1	1	1
Ccdc81	0	0	0	0	1	0	0	0	1	1	1
Ccdc85c	0	0	0	0	1	0	0	0	1	1	1
Ccdc9	0	0	0	0	1	0	0	0	1	1	1
Ccdc90b	0	0	0	0	0	0	1	0	1	1	1
Ccin	0	0	0	0	1	0	0	0	1	1	1
Ccl24	0	0	0	0	1	0	0	0	1	1	1
Ccnt2	0	0	0	0	0	1	0	0	1	1	1
Ccr4	0	0	0	0	1	0	0	0	1	1	1
Ccr9	0	0	0	0	1	0	0	0	1	1	1
Cct2	0	0	0	0	1	0	0	0	1	1	1
Cct6b	0	0	0	0	1	0	0	0	1	1	1
Cd101	0	0	0	0	1	0	0	0	1	1	1
Cd19	0	0	0	0	1	0	0	0	1	1	1
Cd209g	0	0	0	0	1	0	0	0	1	1	1
Cd300lg	0	0	0	0	1	0	0	0	1	1	1
Cd34	0	0	0	0	1	0	0	0	1	1	1

Cd44	0	0	0	0	1	0	0	0	1	1	1
Cd84	0	0	0	0	1	0	0	0	1	1	1
Cd9	0	0	0	0	0	1	0	0	1	1	1
Cdan1	0	0	0	0	1	0	0	0	1	1	1
Cdc20	0	0	0	0	1	0	0	0	1	1	1
Cdc20b	0	0	0	0	1	0	0	0	1	1	1
Cdc27	0	0	0	0	1	0	0	0	1	1	1
Cdc37l1	0	0	0	0	1	0	0	0	1	1	1
Cdh12	0	0	0	0	1	0	0	0	1	1	1
Cdh19	0	0	0	0	1	0	0	0	1	1	1
Cdh2	0	0	0	0	1	0	0	0	1	1	1
Cdh6	0	0	0	0	1	0	0	0	1	1	1
Cdhr3	0	0	0	0	1	0	0	0	1	1	1
Cdk12	0	0	0	0	1	0	0	0	1	1	1
Cdk2	0	0	0	0	1	0	0	0	1	1	1
Cdk5rap3	0	0	0	0	1	0	0	0	1	1	1
Cdkl2	0	0	0	0	1	0	0	0	1	1	1
Cdkn3	0	0	0	0	1	0	0	0	1	1	1
Cdr1	0	0	0	0	1	0	0	0	1	1	1
Cdt1	0	0	0	0	1	0	0	0	1	1	1
Cdyl2	0	0	0	0	1	0	0	0	1	1	1
Ceacam5	0	0	0	0	1	0	0	0	1	1	1
Cebpz	0	0	0	0	1	0	0	0	1	1	1
Cela3a	0	0	0	0	1	0	0	0	1	1	1
Celsr2	0	0	0	0	1	0	0	0	1	1	1
Cemip	0	0	0	0	1	0	0	0	1	1	1
Cenpe	0	0	0	0	1	0	0	0	1	1	1
Cenpj	0	0	0	0	1	0	0	0	1	1	1
Cenpm	0	0	0	0	1	0	0	0	1	1	1
Cenpt	0	0	0	0	1	0	0	0	1	1	1
Cep104	0	0	0	0	1	0	0	0	1	1	1
Cep120	0	0	0	0	1	0	0	0	1	1	1
Cep126	0	0	0	0	1	0	0	0	1	1	1

Cep162	0	0	0	0	1	0	0	0	1	1	1
Cep164	0	0	0	0	1	0	0	0	1	1	1
Cep250	0	0	0	0	1	0	0	0	1	1	1
Cep350	0	0	0	0	1	0	0	0	1	1	1
Cep68	0	0	0	0	1	0	0	0	1	1	1
Cep89	0	0	0	0	0	1	0	0	1	1	1
Cer1	0	0	0	0	1	0	0	0	1	1	1
Cers2	0	0	0	0	1	0	0	0	1	1	1
Cers3	0	0	0	0	0	1	0	0	1	1	1
Ces2b	0	0	0	0	1	0	0	0	1	1	1
Ces2g	0	0	0	0	1	0	0	0	1	1	1
Cfap157	0	0	0	0	1	0	0	0	1	1	1
Cfap97	0	0	0	0	1	0	0	0	1	1	1
Cfl2	0	0	0	0	1	0	0	0	1	1	1
Cflar	0	0	0	0	1	0	0	0	1	1	1
Cftr	0	0	0	0	1	0	0	0	1	1	1
Cgn	0	0	0	0	1	0	0	0	1	1	1
Cgnl1	0	0	0	0	1	0	0	0	1	1	1
Chadl	1	0	0	0	0	0	0	0	1	1	1
Chd6	0	0	0	0	1	0	0	0	1	1	1
Chd8	0	0	0	0	1	0	0	0	1	1	1
Chd9	0	0	0	0	1	0	0	0	1	1	1
Cherp	0	0	0	0	1	0	0	0	1	1	1
Chic2	0	0	0	0	1	0	0	0	1	1	1
Chil1	0	0	0	0	0	0	1	0	1	1	1
Chml	0	0	0	0	1	0	0	0	1	1	1
Chpf2	0	0	0	0	1	0	0	0	1	1	1
Chrd	0	0	0	0	1	0	0	0	1	1	1
Chrm1	0	0	0	0	1	0	0	0	1	1	1
Chrm3	0	0	0	0	1	0	0	0	1	1	1
Chrna7	0	0	0	0	1	0	0	0	1	1	1
Chrnb4	0	0	0	0	1	0	0	0	1	1	1
Chst2	0	0	0	0	1	0	0	0	1	1	1

Ciart	0	0	0	0	1	0	0	0	1	1	1
Clcn5	0	0	0	0	1	0	0	0	1	1	1
Clcnkb	0	0	0	0	1	0	0	0	1	1	1
Cldn12	0	0	0	0	1	0	0	0	1	1	1
Cldn18	0	0	0	0	1	0	0	0	1	1	1
Cldn5	0	0	0	0	1	0	0	0	1	1	1
Cldn8	0	0	0	0	1	0	0	0	1	1	1
Clec1b	0	0	0	0	1	0	0	0	1	1	1
Clec4e	0	0	0	0	1	0	0	0	1	1	1
Clip3	0	0	0	0	1	0	0	0	1	1	1
Clmn	0	0	0	0	1	0	0	0	1	1	1
Cln3	0	0	0	0	1	0	0	0	1	1	1
Clpb	0	0	0	0	1	0	0	0	1	1	1
Clspn	0	0	0	0	1	0	0	0	1	1	1
Clstn2	0	0	0	0	1	0	0	0	1	1	1
Cltc	0	0	0	0	1	0	0	0	1	1	1
Clu	0	0	0	0	1	0	0	0	1	1	1
Cluh	0	0	0	0	1	0	0	0	1	1	1
Cmya5	0	0	0	0	1	0	0	0	1	1	1
Cnot11	0	0	0	0	1	0	0	0	1	1	1
Cnot3	0	0	0	0	1	0	0	0	1	1	1
Cnot8	0	0	0	0	1	0	0	0	1	1	1
Cnpy4	0	0	0	0	1	0	0	0	1	1	1
Cntln	0	0	0	0	1	0	0	0	1	1	1
Cntn1	0	0	0	0	1	0	0	0	1	1	1
Cntn2	0	0	0	0	1	0	0	0	1	1	1
Cntn4	0	0	0	0	1	0	0	0	1	1	1
Cntnap3	0	0	0	0	1	0	0	0	1	1	1
Cntrl	0	0	0	0	0	1	0	0	1	1	1
Coil	0	0	0	0	1	0	0	0	1	1	1
Col12a1	0	0	0	0	1	0	0	0	1	1	1
Col13a1	0	0	0	0	1	0	0	0	1	1	1
Col15a1	0	0	0	0	1	0	0	0	1	1	1

Col16a1	0	0	0	0	1	0	0	0	1	1	1
Col22a1	0	0	0	0	1	0	0	0	1	1	1
Col24a1	0	0	0	0	1	0	0	0	1	1	1
Col26a1	0	0	0	0	1	0	0	0	1	1	1
Col2a1	0	0	0	0	1	0	0	0	1	1	1
Col4a4	0	0	0	0	1	0	0	0	1	1	1
Col5a1	0	0	0	0	1	0	0	0	1	1	1
Col6a4	0	0	0	0	1	0	0	0	1	1	1
Col6a5	0	0	0	0	1	0	0	0	1	1	1
Colec12	0	0	0	0	1	0	0	0	1	1	1
Colgalt2	0	0	0	0	1	0	0	0	1	1	1
Commd3	0	0	0	0	1	0	0	0	1	1	1
Cope	0	0	0	0	1	0	0	0	1	1	1
Cops4	0	0	0	0	1	0	0	0	1	1	1
Cops7b	0	0	0	0	1	0	0	0	1	1	1
Coq2	0	0	0	0	1	0	0	0	1	1	1
Coq5	0	0	0	0	0	0	1	0	1	1	1
Coq8a	0	0	0	0	1	0	0	0	1	1	1
Cox15	0	0	0	0	0	1	0	0	1	1	1
Cpa2	0	0	0	0	1	0	0	0	1	1	1
Cpd	0	0	0	0	1	0	0	0	1	1	1
Cplx2	0	0	0	0	1	0	0	0	1	1	1
Cpped1	0	0	0	0	1	0	0	0	1	1	1
Cps1	0	0	0	0	1	0	0	0	1	1	1
Cpsf6	0	0	0	0	1	0	0	0	1	1	1
Cpxm1	0	0	0	0	1	0	0	0	1	1	1
Cr1l	0	0	0	0	0	0	1	0	1	1	1
Crb1	0	0	0	0	1	0	0	0	1	1	1
Creb3l1	0	0	0	0	1	0	0	0	1	1	1
Creb3l3	0	0	0	0	0	1	0	0	1	1	1
Crebbp	0	0	0	0	1	0	0	0	1	1	1
Crlf3	0	0	0	0	1	0	0	0	1	1	1
Crocc	0	0	0	0	1	0	0	0	1	1	1

Crtc2	0	0	0	0	1	0	0	0	1	1	1
Cry1	0	0	0	0	1	0	0	0	1	1	1
Crygb	0	0	0	0	1	0	0	0	1	1	1
Csde1	0	0	0	0	0	0	1	0	1	1	1
Csf2rb	0	0	0	0	1	0	0	0	1	1	1
Csn2	0	0	0	0	1	0	0	0	1	1	1
Csnk1e	0	0	0	0	1	0	0	0	1	1	1
Cspg4	0	0	0	0	1	0	0	0	1	1	1
Cspp1	0	0	0	0	1	0	0	0	1	1	1
Csrnp1	0	0	0	0	1	0	0	0	1	1	1
Cstf2t	0	0	0	0	1	0	0	0	1	1	1
Ctbp2	0	0	0	0	1	0	0	0	1	1	1
Ctcf	0	0	0	0	1	0	0	0	1	1	1
Ctif	0	0	0	0	1	0	0	0	1	1	1
Ctnna1	0	0	0	0	1	0	0	0	1	1	1
Ctnnb1	0	0	0	0	1	0	0	0	1	1	1
Ctps	0	0	0	0	0	1	0	0	1	1	1
Ctps2	0	0	0	0	1	0	0	0	1	1	1
Ctsr	0	0	0	0	1	0	0	0	1	1	1
Cttn	0	0	0	0	1	0	0	0	1	1	1
Cttnbp2	0	0	0	0	1	0	0	0	1	1	1
Cul2	0	0	0	0	0	0	1	0	1	1	1
Cutal	0	0	0	0	1	0	0	0	1	1	1
Cxcl16	0	0	0	0	1	0	0	0	1	1	1
Cxcl2	0	0	0	0	1	0	0	0	1	1	1
Cxcr2	0	0	0	0	1	0	0	0	1	1	1
Cxcr5	0	0	0	0	0	0	1	0	1	1	1
Cylc1	0	0	0	0	1	0	0	0	1	1	1
Cyp1a1	0	0	0	0	1	0	0	0	1	1	1
Cyp26b1	0	0	0	0	1	0	0	0	1	1	1
Cyp2a4	0	0	0	0	1	0	0	0	1	1	1
Cyp2a5	0	0	0	0	1	0	0	0	1	1	1
Cyp2b23	0	0	0	0	0	1	0	0	1	1	1

Cyp2c37	0	0	0	0	1	0	0	0	1	1	1
Cyp2c50	0	0	0	0	1	0	0	0	1	1	1
Cyp2c68	0	0	0	0	1	0	0	0	1	1	1
Cyp2c69	0	0	0	0	1	0	0	0	1	1	1
Cyp2c70	0	0	0	0	1	0	0	0	1	1	1
Cyp2d11	0	0	0	0	1	0	0	0	1	1	1
Cyp2d34	0	0	0	0	1	0	0	0	1	1	1
Cyp2g1	0	0	0	0	0	1	0	0	1	1	1
Cyp2r1	0	0	0	0	1	0	0	0	1	1	1
Cyp3a11	0	0	0	0	1	0	0	0	1	1	1
Cyp3a25	0	0	0	0	1	0	0	0	1	1	1
Cyp4a29	0	0	0	0	1	0	0	0	1	1	1
Cyp4a32	0	0	0	0	1	0	0	0	1	1	1
Cyp4f13	0	0	0	0	0	0	1	0	1	1	1
Cyp4v3	0	0	0	0	0	0	1	0	1	1	1
Cyp4x1	0	0	0	0	1	0	0	0	1	1	1
D130052B(	0	0	0	0	1	0	0	0	1	1	1
Dach1	0	0	0	0	1	0	0	0	1	1	1
Dach2	0	0	0	0	1	0	0	0	1	1	1
Dact3	0	0	0	0	1	0	0	0	1	1	1
Dapp1	0	0	0	0	1	0	0	0	1	1	1
Dars	0	0	0	0	1	0	0	0	1	1	1
Dars2	0	0	0	0	1	0	0	0	1	1	1
Dbr1	0	0	0	0	1	0	0	0	1	1	1
Dcaf17	0	0	0	0	0	0	1	0	1	1	1
Dcaf6	0	0	0	0	1	0	0	0	1	1	1
Dclk3	0	0	0	0	1	0	0	0	1	1	1
Dclre1a	0	0	0	0	1	0	0	0	1	1	1
Dclre1b	0	0	0	0	1	0	0	0	1	1	1
Dcp2	0	0	0	0	0	0	1	0	1	1	1
Ddhd1	0	0	0	0	1	0	0	0	1	1	1
Ddx10	0	0	0	0	0	1	0	0	1	1	1
Ddx18	0	0	0	0	1	0	0	0	1	1	1

Ddx20	0	0	0	0	1	0	0	0	1	1	1
Ddx23	0	0	0	0	1	0	0	0	1	1	1
Ddx3y	0	0	0	0	1	0	0	0	1	1	1
Ddx4	0	0	0	0	1	0	0	0	1	1	1
Ddx41	0	0	0	0	1	0	0	0	1	1	1
Ddx5	0	0	0	0	1	0	0	0	1	1	1
Ddx50	0	0	0	0	1	0	0	0	1	1	1
Ddx51	0	0	0	0	1	0	0	0	1	1	1
Ddx56	0	0	0	0	1	0	0	0	1	1	1
Deaf1	0	0	0	0	1	0	0	0	1	1	1
Dedd	0	0	0	0	1	0	0	0	1	1	1
Defb21	0	0	0	0	1	0	0	0	1	1	1
Dennd1b	0	0	0	0	0	0	1	0	1	1	1
Dennd1c	0	0	0	0	1	0	0	0	1	1	1
Dennd3	0	0	0	0	1	0	0	0	1	1	1
Dennd6a	0	0	0	0	1	0	0	0	1	1	1
Depdc5	0	0	0	0	1	0	0	0	1	1	1
Dgcr2	0	0	0	0	1	0	0	0	1	1	1
Dgcr8	0	0	0	0	1	0	0	0	1	1	1
Dgkd	0	0	0	0	1	0	0	0	1	1	1
Dgke	0	0	0	0	1	0	0	0	1	1	1
Dhrs9	0	0	0	0	1	0	0	0	1	1	1
Dhx15	0	0	0	0	1	0	0	0	1	1	1
Dhx38	0	0	0	0	1	0	0	0	1	1	1
Diaph1	0	0	0	0	1	0	0	0	1	1	1
Dicer1	0	0	0	0	1	0	0	0	1	1	1
Dip2a	0	0	0	0	0	0	1	0	1	1	1
Dip2b	0	0	0	0	1	0	0	0	1	1	1
Dip2c	0	0	0	0	1	0	0	0	1	1	1
Dis3	0	0	0	0	1	0	0	0	1	1	1
Dis3l2	0	0	0	0	1	0	0	0	1	1	1
Dixdc1	0	0	0	0	1	0	0	0	1	1	1
Dlc1	0	0	0	0	1	0	0	0	1	1	1

Dlg1	0	0	0	0	1	0	0	0	1	1	1
Dlk2	0	0	0	0	0	0	1	0	1	1	1
Dmd	0	0	0	0	1	0	0	0	1	1	1
Dmpk	0	0	0	0	1	0	0	0	1	1	1
Dmrtc2	0	0	0	0	0	1	0	0	1	1	1
Dnaaf2	0	0	0	0	1	0	0	0	1	1	1
Dnaaf3	0	0	0	0	1	0	0	0	1	1	1
Dnah12	0	0	0	0	0	0	1	0	1	1	1
Dnah14	0	0	0	0	1	0	0	0	1	1	1
Dnah7b	0	0	0	0	1	0	0	0	1	1	1
Dnajb13	0	0	0	0	1	0	0	0	1	1	1
Dnajb3	0	0	0	0	1	0	0	0	1	1	1
Dnajc1	0	0	0	0	1	0	0	0	1	1	1
Dnajc22	0	0	0	0	1	0	0	0	1	1	1
Dnajc24	0	0	0	0	0	0	1	0	1	1	1
Dnajc28	0	0	0	0	1	0	0	0	1	1	1
Dnajc7	0	0	0	0	1	0	0	0	1	1	1
Dnm1l	0	0	0	0	1	0	0	0	1	1	1
Dnm2	0	0	0	0	1	0	0	0	1	1	1
Dntt	0	0	0	0	1	0	0	0	1	1	1
Dock10	0	0	0	0	0	0	1	0	1	1	1
Dock2	0	0	0	0	1	0	0	0	1	1	1
Dock3	0	0	0	0	0	0	1	0	1	1	1
Dock9	0	0	0	0	1	0	0	0	1	1	1
Dot1l	0	0	0	0	1	0	0	0	1	1	1
Dpf1	0	0	0	0	1	0	0	0	1	1	1
Dpf2	0	0	0	0	1	0	0	0	1	1	1
Dpf3	0	0	0	0	1	0	0	0	1	1	1
Dpm1	0	0	0	0	1	0	0	0	1	1	1
Dppa4	0	0	0	0	1	0	0	0	1	1	1
Dpy19l2	0	0	0	0	0	0	1	0	1	1	1
Drosha	0	0	0	0	1	0	0	0	1	1	1
Drp2	0	0	0	0	1	0	0	0	1	1	1

Dscaml1	0	0	0	0	1	0	0	0	1	1	1
Dsg1c	0	0	0	0	1	0	0	0	1	1	1
Dsg4	0	0	0	0	1	0	0	0	1	1	1
Dtna	0	0	0	0	0	1	0	0	1	1	1
Dtx3l	0	0	0	0	1	0	0	0	1	1	1
Duox1	0	0	0	0	1	0	0	0	1	1	1
Duox2	0	0	0	0	1	0	0	0	1	1	1
Dus2	0	0	0	0	1	0	0	0	1	1	1
Dus3l	0	0	0	0	1	0	0	0	1	1	1
Dusp11	0	0	0	0	1	0	0	0	1	1	1
Dusp14	0	0	0	0	1	0	0	0	1	1	1
Dusp27	0	0	0	0	1	0	0	0	1	1	1
Dvl3	0	0	0	0	1	0	0	0	1	1	1
Dync1h1	0	0	0	0	1	0	0	0	1	1	1
Dync1li1	0	0	0	0	1	0	0	0	1	1	1
Dyrk1a	0	0	0	0	1	0	0	0	1	1	1
E2f7	0	0	0	0	1	0	0	0	1	1	1
E430018J2	0	0	0	0	1	0	0	0	1	1	1
Eci3	0	0	0	0	1	0	0	0	1	1	1
Edc4	0	0	0	0	1	0	0	0	1	1	1
Edem3	0	0	0	0	1	0	0	0	1	1	1
Eef2kmt	0	0	0	0	1	0	0	0	1	1	1
Eepd1	0	0	0	0	1	0	0	0	1	1	1
Efl1	0	0	0	0	1	0	0	0	1	1	1
Efnb1	0	0	0	0	1	0	0	0	1	1	1
Efr3a	0	0	0	0	0	0	1	0	1	1	1
Ehhadh	0	0	0	0	1	0	0	0	1	1	1
Eif2a	0	0	0	0	0	0	1	0	1	1	1
Eif2ak2	0	0	0	0	1	0	0	0	1	1	1
Eif2ak3	0	0	0	0	1	0	0	0	1	1	1
Eif2b1	0	0	0	0	1	0	0	0	1	1	1
Eif4g3	0	0	0	0	1	0	0	0	1	1	1
Elf3	0	0	0	0	1	0	0	0	1	1	1

Elmo2	0	0	0	0	1	0	0	0	1	1	1
Elmod1	0	0	0	0	1	0	0	0	1	1	1
Elmod3	0	0	0	0	1	0	0	0	1	1	1
Eloa	0	0	0	0	1	0	0	0	1	1	1
Elovl4	0	0	0	0	1	0	0	0	1	1	1
Elp3	0	0	0	0	1	0	0	0	1	1	1
Emc8	0	0	0	0	1	0	0	0	1	1	1
Eme1	0	0	0	0	1	0	0	0	1	1	1
Emid1	0	0	0	0	1	0	0	0	1	1	1
Eml2	0	0	0	0	1	0	0	0	1	1	1
Eng	0	0	0	0	1	0	0	0	1	1	1
Enkur	0	0	0	0	1	0	0	0	1	1	1
Eno2	0	0	0	0	1	0	0	0	1	1	1
Enox2	0	0	0	0	1	0	0	0	1	1	1
Enpep	0	0	0	0	1	0	0	0	1	1	1
Enpp2	0	0	0	0	1	0	0	0	1	1	1
Ensa	0	0	0	0	1	0	0	0	1	1	1
Entpd8	0	0	0	0	1	0	0	0	1	1	1
Ep400	0	0	0	0	1	0	0	0	1	1	1
Epb41l2	0	0	0	0	1	0	0	0	1	1	1
Epb41l5	0	0	0	0	0	0	1	0	1	1	1
Epha7	0	0	0	0	1	0	0	0	1	1	1
Ephx4	0	0	0	0	1	0	0	0	1	1	1
Eps15l1	0	0	0	0	1	0	0	0	1	1	1
Epx	0	0	0	0	1	0	0	0	1	1	1
Erap1	0	0	0	0	1	0	0	0	1	1	1
Ercc6	0	0	0	0	1	0	0	0	1	1	1
Ercc6l2	0	0	0	0	1	0	0	0	1	1	1
Erg	0	0	0	0	1	0	0	0	1	1	1
Ergic2	0	0	0	0	1	0	0	0	1	1	1
Eri2	0	0	0	0	1	0	0	0	1	1	1
Erlin2	0	0	0	0	1	0	0	0	1	1	1
Esf1	1	0	0	0	0	0	0	0	1	1	1

Esrra	0	0	0	0	1	0	0	0	1	1	1
Etaa1	0	0	0	0	1	0	0	0	1	1	1
Ets2	0	0	0	0	1	0	0	0	1	1	1
Etv4	0	0	0	0	1	0	0	0	1	1	1
Exoc3	0	0	0	0	1	0	0	0	1	1	1
Exoc3l4	0	0	0	0	1	0	0	0	1	1	1
Exph5	0	0	0	0	1	0	0	0	1	1	1
Ezh2	0	0	0	0	1	0	0	0	1	1	1
Fahd1	0	0	0	0	1	0	0	0	1	1	1
Faiml	0	0	0	0	1	0	0	0	1	1	1
Fam107a	0	0	0	0	1	0	0	0	1	1	1
Fam110b	0	0	0	0	1	0	0	0	1	1	1
Fam111a	0	0	0	0	1	0	0	0	1	1	1
Fam120b	0	0	0	0	1	0	0	0	1	1	1
Fam120c	0	0	0	0	1	0	0	0	1	1	1
Fam129a	0	0	0	0	1	0	0	0	1	1	1
Fam129b	0	0	0	0	0	0	1	0	1	1	1
Fam134b	0	0	0	0	1	0	0	0	1	1	1
Fam135a	0	0	0	0	1	0	0	0	1	1	1
Fam160a2	0	0	0	0	1	0	0	0	1	1	1
Fam160b1	0	0	0	0	1	0	0	0	1	1	1
Fam161b	0	0	0	0	1	0	0	0	1	1	1
Fam184b	0	0	0	0	1	0	0	0	1	1	1
Fam185a	0	0	0	0	1	0	0	0	1	1	1
Fam208b	0	0	0	0	1	0	0	0	1	1	1
Fam222a	0	0	0	0	1	0	0	0	1	1	1
Fam3c	0	0	0	0	1	0	0	0	1	1	1
Fam45a	0	0	0	0	1	0	0	0	1	1	1
Fam50b	0	0	0	0	1	0	0	0	1	1	1
Fam71d	0	0	0	0	1	0	0	0	1	1	1
Fam98c	0	0	0	0	1	0	0	0	1	1	1
Fan1	0	0	0	0	1	0	0	0	1	1	1
Fancg	0	0	0	0	1	0	0	0	1	1	1

Fanci	0	0	0	0	1	0	0	0	1	1	1
Fancm	0	0	0	0	1	0	0	0	1	1	1
Fank1	0	0	0	0	1	0	0	0	1	1	1
Fas	0	0	0	0	1	0	0	0	1	1	1
Fasn	0	0	0	0	1	0	0	0	1	1	1
Fastkd2	0	0	0	0	1	0	0	0	1	1	1
Fastkd3	0	0	0	0	1	0	0	0	1	1	1
Fbn2	0	0	0	0	1	0	0	0	1	1	1
Fbxl18	0	0	0	0	1	0	0	0	1	1	1
Fbxl3	0	0	0	0	1	0	0	0	1	1	1
Fbxo16	0	0	0	0	1	0	0	0	1	1	1
Fbxo27	0	0	0	0	1	0	0	0	1	1	1
Fbxo31	0	0	0	0	0	0	1	0	1	1	1
Fbxo38	0	0	0	0	1	0	0	0	1	1	1
Fbxo45	0	0	0	0	1	0	0	0	1	1	1
Fbxo5	0	0	0	0	1	0	0	0	1	1	1
Fbxw10	0	0	0	0	1	0	0	0	1	1	1
Fbxw9	0	0	0	0	1	0	0	0	1	1	1
Fcer2a	0	0	0	0	1	0	0	0	1	1	1
Fcgr4	0	0	0	0	1	0	0	0	1	1	1
Fchsd2	0	0	0	0	1	0	0	0	1	1	1
Fcrlb	0	0	0	0	1	0	0	0	1	1	1
Fcrls	0	0	0	0	0	1	0	0	1	1	1
Fdxacb1	0	0	0	0	0	1	0	0	1	1	1
Fem1a	0	0	0	0	1	0	0	0	1	1	1
Fem1c	0	0	0	0	1	0	0	0	1	1	1
Ffar1	0	0	0	0	1	0	0	0	1	1	1
Fgd5	0	0	0	0	1	0	0	0	1	1	1
Fgf14	0	0	0	0	1	0	0	0	1	1	1
Fgf4	0	0	0	0	1	0	0	0	1	1	1
Fgfbp1	0	0	0	0	1	0	0	0	1	1	1
Fgfr3	0	0	0	0	1	0	0	0	1	1	1
Fgfr4	0	0	0	0	1	0	0	0	1	1	1

Fggy	0	0	0	0	1	0	0	0	1	1	1
Fhl2	0	0	0	0	1	0	0	0	1	1	1
Fhod1	0	0	0	0	1	0	0	0	1	1	1
Filip1l	0	0	0	0	1	0	0	0	1	1	1
Fip1l1	0	0	0	0	1	0	0	0	1	1	1
Fkbp11	0	0	0	0	1	0	0	0	1	1	1
Fmnl2	0	0	0	0	1	0	0	0	1	1	1
Fmnl3	0	0	0	0	1	0	0	0	1	1	1
Fn3k	0	0	0	0	1	0	0	0	1	1	1
Fndc3b	0	0	0	0	1	0	0	0	1	1	1
Fndc5	0	0	0	0	1	0	0	0	1	1	1
Fnip1	0	0	0	0	1	0	0	0	1	1	1
Fntb	0	0	0	0	1	0	0	0	1	1	1
Fopnl	0	0	0	0	1	0	0	0	1	1	1
Foxl2	0	0	0	0	1	0	0	0	1	1	1
Foxm1	0	0	0	0	1	0	0	0	1	1	1
Foxp3	0	0	0	0	1	0	0	0	1	1	1
Frk	0	0	0	0	0	1	0	0	1	1	1
Frmpd2	0	0	0	0	1	0	0	0	1	1	1
Fsbp	0	0	0	0	1	0	0	0	1	1	1
Fsd1	0	0	0	0	0	0	1	0	1	1	1
Fstl4	0	0	0	0	1	0	0	0	1	1	1
Ftsj3	0	0	0	0	1	0	0	0	1	1	1
Fubp3	0	0	0	0	1	0	0	0	1	1	1
Fuca1	0	0	0	0	1	0	0	0	1	1	1
Fuk	0	0	0	0	1	0	0	0	1	1	1
Furin	0	0	0	0	1	0	0	0	1	1	1
Fus	0	0	0	0	1	0	0	0	1	1	1
Fxyd1	0	0	0	0	1	0	0	0	1	1	1
Fyb2	0	0	0	0	0	0	1	0	1	1	1
Fyn	0	0	0	0	1	0	0	0	1	1	1
Fzd10	0	0	0	0	1	0	0	0	1	1	1
G2e3	0	0	0	0	1	0	0	0	1	1	1

Gab1	0	0	0	0	1	0	0	0	1	1	1
Gabbr2	0	0	0	0	1	0	0	0	1	1	1
Gabrb1	0	0	0	0	1	0	0	0	1	1	1
Gabrg3	0	0	0	0	0	1	0	0	1	1	1
Gabrq	0	0	0	0	1	0	0	0	1	1	1
Gabrr1	0	0	0	0	1	0	0	0	1	1	1
Gabrr2	0	0	0	0	1	0	0	0	1	1	1
Gadd45gip	0	0	0	0	1	0	0	0	1	1	1
Gadl1	0	0	0	0	1	0	0	0	1	1	1
Gak	0	0	0	0	1	0	0	0	1	1	1
Galnt1	0	0	0	0	1	0	0	0	1	1	1
Gamt	0	0	0	0	1	0	0	0	1	1	1
Ganab	0	0	0	0	1	0	0	0	1	1	1
Ganc	0	0	0	0	1	0	0	0	1	1	1
Garnl3	0	0	0	0	1	0	0	0	1	1	1
Gatad2a	0	0	0	0	1	0	0	0	1	1	1
Gbf1	0	0	0	0	1	0	0	0	1	1	1
Gbp11	0	0	0	0	1	0	0	0	1	1	1
Gbp4	0	0	0	0	1	0	0	0	1	1	1
Gbp7	0	0	0	0	1	0	0	0	1	1	1
Gcm2	0	0	0	0	1	0	0	0	1	1	1
Gcn1l1	0	0	0	0	1	0	0	0	1	1	1
Gcnt1	0	0	0	0	1	0	0	0	1	1	1
Gcnt3	0	0	0	0	1	0	0	0	1	1	1
Gdap1	0	0	0	0	1	0	0	0	1	1	1
Gdf7	0	0	0	0	1	0	0	0	1	1	1
Gdi2	0	0	0	0	1	0	0	0	1	1	1
Gfap	0	0	0	0	1	0	0	0	1	1	1
Gfi1	0	0	0	0	1	0	0	0	1	1	1
Gfra3	0	0	0	0	1	0	0	0	1	1	1
Gga1	0	0	0	0	1	0	0	0	1	1	1
Gga3	0	0	0	0	1	0	0	0	1	1	1
Ggcx	0	0	0	0	1	0	0	0	1	1	1

Ggt6	0	0	0	0	1	0	0	0	1	1	1
Ggt7	0	0	0	0	1	0	0	0	1	1	1
Gimap3	0	0	0	0	1	0	0	0	1	1	1
Gins2	0	0	0	0	0	1	0	0	1	1	1
Gja8	0	0	0	0	1	0	0	0	1	1	1
Gjb1	0	0	0	0	1	0	0	0	1	1	1
Gk	0	0	0	0	1	0	0	0	1	1	1
Glce	0	0	0	0	1	0	0	0	1	1	1
Gldc	0	0	0	0	1	0	0	0	1	1	1
Gli3	0	0	0	0	1	0	0	0	1	1	1
Glis3	0	0	0	0	1	0	0	0	1	1	1
Glmn	0	0	0	0	1	0	0	0	1	1	1
Glrx2	0	0	0	0	1	0	0	0	1	1	1
Glt8d1	0	0	0	0	1	0	0	0	1	1	1
Glyr1	0	0	0	0	1	0	0	0	1	1	1
Gm10277	0	0	0	0	1	0	0	0	1	1	1
Gm10354	0	0	0	0	1	0	0	0	1	1	1
Gm10424	0	0	0	0	1	0	0	0	1	1	1
Gm10471	0	0	0	0	1	0	0	0	1	1	1
Gm10961	0	0	0	0	1	0	0	0	1	1	1
Gm11596	0	0	0	0	1	0	0	0	1	1	1
Gm11639	0	0	0	0	1	0	0	0	1	1	1
Gm12185	0	0	0	0	1	0	0	0	1	1	1
Gm12355	0	0	0	0	1	0	0	0	1	1	1
Gm12800	0	0	0	0	1	0	0	0	1	1	1
Gm13078	1	0	0	0	0	0	0	0	1	1	1
Gm13088	0	0	0	0	1	0	0	0	1	1	1
Gm13757	1	0	0	0	0	0	0	0	1	1	1
Gm14496	0	0	0	0	1	0	0	0	1	1	1
Gm14698	0	0	0	0	1	0	0	0	1	1	1
Gm1527	0	0	0	0	1	0	0	0	1	1	1
Gm15293	0	0	0	0	1	0	0	0	1	1	1
Gm20498	0	0	0	0	1	0	0	0	1	1	1

Gm20721	0	0	0	0	1	0	0	0	1	1	1
Gm2a	0	0	0	0	1	0	0	0	1	1	1
Gm43302	0	0	0	0	1	0	0	0	1	1	1
Gm4841	0	0	0	0	1	0	0	0	1	1	1
Gm4884	0	0	0	0	1	0	0	0	1	1	1
Gm4981	0	0	0	0	1	0	0	0	1	1	1
Gm5096	0	0	0	0	1	0	0	0	1	1	1
Gm527	0	0	0	0	1	0	0	0	1	1	1
Gm5415	0	0	0	0	0	1	0	0	1	1	1
Gm5592	0	0	0	0	1	0	0	0	1	1	1
Gm5640	0	0	0	0	1	0	0	0	1	1	1
Gm7324	0	0	0	0	1	0	0	0	1	1	1
Gm7579	0	0	0	0	1	0	0	0	1	1	1
Gm884	0	0	0	0	1	0	0	0	1	1	1
Gm8994	0	0	0	0	1	0	0	0	1	1	1
Gm973	0	0	0	0	1	0	0	0	1	1	1
Gm9745	0	0	0	0	1	0	0	0	1	1	1
Gm996	0	0	0	0	1	0	0	0	1	1	1
Gmppb	0	0	0	0	1	0	0	0	1	1	1
Gna12	0	0	0	0	1	0	0	0	1	1	1
Gnai2	0	0	0	0	1	0	0	0	1	1	1
Gnb4	0	0	0	0	1	0	0	0	1	1	1
Gnpat	0	0	0	0	1	0	0	0	1	1	1
Gnptg	0	0	0	0	1	0	0	0	1	1	1
Golga1	0	0	0	0	1	0	0	0	1	1	1
Golga3	0	0	0	0	1	0	0	0	1	1	1
Golga4	0	0	0	0	1	0	0	0	1	1	1
Gon4l	0	0	0	0	1	0	0	0	1	1	1
Got2	0	0	0	0	1	0	0	0	1	1	1
Gpaa1	0	0	0	0	1	0	0	0	1	1	1
Gpat2	0	0	0	0	1	0	0	0	1	1	1
Gpat3	0	0	0	0	1	0	0	0	1	1	1
Gpatch1	0	0	0	0	1	0	0	0	1	1	1

Gpatch4	0	0	0	0	1	0	0	0	1	1	1
Gpatch8	0	0	0	0	1	0	0	0	1	1	1
Gpc2	0	0	0	0	1	0	0	0	1	1	1
Gpd2	0	0	0	0	1	0	0	0	1	1	1
Gpld1	0	0	0	0	1	0	0	0	1	1	1
Gpr139	0	0	0	0	0	1	0	0	1	1	1
Gpr161	0	0	0	0	1	0	0	0	1	1	1
Gpr182	0	0	0	0	1	0	0	0	1	1	1
Gpr68	0	0	0	0	1	0	0	0	1	1	1
Gpr82	0	0	0	0	1	0	0	0	1	1	1
Gprasp1	0	0	0	0	1	0	0	0	1	1	1
Gprin1	0	0	0	0	1	0	0	0	1	1	1
Gpt2	0	0	0	0	1	0	0	0	1	1	1
Gramd3	0	0	0	0	0	1	0	0	1	1	1
Grik2	0	0	0	0	1	0	0	0	1	1	1
Grik5	0	0	0	0	1	0	0	0	1	1	1
Grin2c	0	0	0	0	1	0	0	0	1	1	1
Grin2d	0	0	0	0	0	1	0	0	1	1	1
Grin3a	0	0	0	0	0	0	1	0	1	1	1
Grm5	0	0	0	0	1	0	0	0	1	1	1
Grm7	0	0	0	0	1	0	0	0	1	1	1
Grp	0	0	0	0	0	0	1	0	1	1	1
Gsdma	0	0	0	0	1	0	0	0	1	1	1
Gsk3a	0	0	0	0	1	0	0	0	1	1	1
Gsk3b	0	0	0	0	1	0	0	0	1	1	1
Gspt1	0	0	0	0	1	0	0	0	1	1	1
Gsr	0	0	0	0	1	0	0	0	1	1	1
Gstm1	0	0	0	0	1	0	0	0	1	1	1
Gstm3	0	0	0	0	1	0	0	0	1	1	1
Gstm7	0	0	0	0	1	0	0	0	1	1	1
Gtf2ird2	0	0	0	0	1	0	0	0	1	1	1
Gtf3c2	0	0	0	0	1	0	0	0	1	1	1
Gucy1a1	0	0	0	0	1	0	0	0	1	1	1

Gucy1b2	0	0	0	0	1	0	0	0	1	1	1
Gucy2d	0	0	0	0	1	0	0	0	1	1	1
Gucy2f	0	0	0	0	1	0	0	0	1	1	1
Gykl1	0	0	0	0	1	0	0	0	1	1	1
H2-Aa	0	0	0	0	1	0	0	0	1	1	1
H2-K1	0	0	0	0	1	0	0	0	1	1	1
H2-M10.4	0	0	0	0	1	0	0	0	1	1	1
H2-M2	0	0	0	0	1	0	0	0	1	1	1
H2-Ob	0	0	0	0	1	0	0	0	1	1	1
H2-T10	0	0	0	0	1	0	0	0	1	1	1
Hace1	0	0	0	0	1	0	0	0	1	1	1
Hap1	0	0	0	0	1	0	0	0	1	1	1
Has3	0	0	0	0	0	1	0	0	1	1	1
Hbs1l	0	0	0	0	1	0	0	0	1	1	1
Hcrtr2	0	0	0	0	0	1	0	0	1	1	1
Hdac11	0	0	0	0	0	0	1	0	1	1	1
Hdac4	0	0	0	0	1	0	0	0	1	1	1
Hdac9	0	0	0	0	1	0	0	0	1	1	1
Hdc	0	0	0	0	1	0	0	0	1	1	1
Hdgf	0	0	0	0	1	0	0	0	1	1	1
Hdgfl2	0	0	0	0	1	0	0	0	1	1	1
Hdlbp	0	0	0	0	1	0	0	0	1	1	1
Heatr5a	0	0	0	0	1	0	0	0	1	1	1
Heatr5b	0	0	0	0	1	0	0	0	1	1	1
Heatr6	0	0	0	0	0	1	0	0	1	1	1
Hectd1	0	0	0	0	0	0	1	0	1	1	1
Hectd2	0	0	0	0	1	0	0	0	1	1	1
Hectd4	0	0	0	0	1	0	0	0	1	1	1
Hecw2	0	0	0	0	1	0	0	0	1	1	1
Heg1	0	0	0	0	1	0	0	0	1	1	1
Herc2	0	0	0	0	1	0	0	0	1	1	1
Herc3	0	0	0	0	0	0	1	0	1	1	1
Hes6	0	0	0	0	1	0	0	0	1	1	1

Hexim2	0	0	0	0	1	0	0	0	1	1	1
Hfm1	0	0	0	0	1	0	0	0	1	1	1
Hgf	0	0	0	0	0	0	1	0	1	1	1
Hhat	0	0	0	0	1	0	0	0	1	1	1
Hhipl1	0	0	0	0	1	0	0	0	1	1	1
Hibch	0	0	0	0	1	0	0	0	1	1	1
Hic2	0	0	0	0	1	0	0	0	1	1	1
Hipk2	0	0	0	0	0	1	0	0	1	1	1
Hirip3	0	0	0	0	1	0	0	0	1	1	1
Hist1h4n	0	0	0	0	1	0	0	0	1	1	1
Hivep3	0	0	0	0	1	0	0	0	1	1	1
Hjurp	0	0	0	0	1	0	0	0	1	1	1
Hkdc1	0	0	0	0	1	0	0	0	1	1	1
Hlx	0	0	0	0	1	0	0	0	1	1	1
Hmbox1	0	0	0	0	1	0	0	0	1	1	1
Hmgcs2	0	0	0	0	1	0	0	0	1	1	1
Hnf1b	0	0	0	0	1	0	0	0	1	1	1
Hnrnpm	0	0	0	0	1	0	0	0	1	1	1
Homer1	0	0	0	0	1	0	0	0	1	1	1
Hoxa11	0	0	0	0	1	0	0	0	1	1	1
Hoxd3	0	0	0	0	1	0	0	0	1	1	1
Hp	0	0	0	0	1	0	0	0	1	1	1
Hpdl	0	0	0	0	0	1	0	0	1	1	1
Hprt	0	0	0	0	1	0	0	0	1	1	1
Hpse2	0	0	0	0	1	0	0	0	1	1	1
Hpx	0	0	0	0	1	0	0	0	1	1	1
Hrg	0	0	0	0	1	0	0	0	1	1	1
Hs6st2	0	0	0	0	1	0	0	0	1	1	1
Hsd17b3	0	0	0	0	0	1	0	0	1	1	1
Hsp90aa1	0	0	0	0	1	0	0	0	1	1	1
Hspa5	0	0	0	0	1	0	0	0	1	1	1
Hspa8	0	0	0	0	1	0	0	0	1	1	1
Htatsf1	0	0	0	0	0	1	0	0	1	1	1

Huwe1	0	0	0	0	1	0	0	0	1	1	1
Hyou1	0	0	0	0	1	0	0	0	1	1	1
I830077J02	0	0	0	0	1	0	0	0	1	1	1
Iars2	0	0	0	0	1	0	0	0	1	1	1
Icam2	0	0	0	0	1	0	0	0	1	1	1
Idnk	0	0	0	0	1	0	0	0	1	1	1
Ido2	0	0	0	0	1	0	0	0	1	1	1
Ifi204	0	0	0	0	1	0	0	0	1	1	1
Ifih1	0	0	0	0	1	0	0	0	1	1	1
Ifngr1	0	0	0	0	1	0	0	0	1	1	1
Ift172	0	0	0	0	0	1	0	0	1	1	1
Ift80	0	0	0	0	0	0	1	0	1	1	1
Igbp1b	0	0	0	0	1	0	0	0	1	1	1
Ighv1-5	0	0	0	0	1	0	0	0	1	1	1
Ighv1-54	0	0	0	0	1	0	0	0	1	1	1
Ighv1-82	0	0	0	0	1	0	0	0	1	1	1
Ighv5-17	0	0	0	0	0	1	0	0	1	1	1
Ighv8-6	0	0	0	0	1	0	0	0	1	1	1
Igkv1-133	0	0	0	0	1	0	0	0	1	1	1
Igkv3-2	0	0	0	0	1	0	0	0	1	1	1
Igkv4-53	0	0	0	0	1	0	0	0	1	1	1
Igkv4-58	0	0	0	0	1	0	0	0	1	1	1
Igkv8-28	0	0	0	0	1	0	0	0	1	1	1
Igsf8	0	0	0	0	1	0	0	0	1	1	1
Ikbkg	0	0	0	0	1	0	0	0	1	1	1
Il10ra	0	0	0	0	1	0	0	0	1	1	1
Il13ra1	0	0	0	0	0	1	0	0	1	1	1
Il17ra	0	0	0	0	0	1	0	0	1	1	1
Il1rapl1	0	0	0	0	1	0	0	0	1	1	1
Il20	0	0	0	0	1	0	0	0	1	1	1
Il22ra1	0	0	0	0	1	0	0	0	1	1	1
Il3ra	0	0	0	0	1	0	0	0	1	1	1
Ilk	0	0	0	0	1	0	0	0	1	1	1

Imp4	0	0	0	0	1	0	0	0	1	1	1
Ing2	0	0	0	0	1	0	0	0	1	1	1
Inhba	0	0	0	0	1	0	0	0	1	1	1
Inhbb	0	0	0	0	1	0	0	0	1	1	1
Inhbc	0	0	0	0	1	0	0	0	1	1	1
Ino80d	0	0	0	0	0	1	0	0	1	1	1
Inppl1	0	0	0	0	1	0	0	0	1	1	1
Insr	0	0	0	0	1	0	0	0	1	1	1
Insrr	0	0	0	0	0	0	1	0	1	1	1
Ints11	0	0	0	0	1	0	0	0	1	1	1
Ints12	0	0	0	0	1	0	0	0	1	1	1
Ints2	0	0	0	0	1	0	0	0	1	1	1
Ints7	0	0	0	0	1	0	0	0	1	1	1
Ipo13	0	0	0	0	1	0	0	0	1	1	1
Ipo7	0	0	0	0	0	1	0	0	1	1	1
Ippk	0	0	0	0	1	0	0	0	1	1	1
Iqck	0	0	0	0	1	0	0	0	1	1	1
Irak4	0	0	0	0	1	0	0	0	1	1	1
Irf2bp1	0	0	0	0	1	0	0	0	1	1	1
Irgm1	0	0	0	0	1	0	0	0	1	1	1
Irs2	0	0	0	0	1	0	0	0	1	1	1
Irs3	0	0	0	0	1	0	0	0	1	1	1
Irx6	0	0	0	0	1	0	0	0	1	1	1
Ist1	0	0	0	0	1	0	0	0	1	1	1
Isyna1	0	0	0	0	1	0	0	0	1	1	1
Itga2b	0	0	0	0	1	0	0	0	1	1	1
Itga3	0	0	0	0	1	0	0	0	1	1	1
Itga5	0	0	0	0	1	0	0	0	1	1	1
Itgad	0	0	0	0	1	0	0	0	1	1	1
Itgb1	0	0	0	0	1	0	0	0	1	1	1
Itgb4	0	0	0	0	0	0	1	0	1	1	1
Itgb7	0	0	0	0	1	0	0	0	1	1	1
Itih4	0	0	0	0	1	0	0	0	1	1	1

Itih5	0	0	0	0	1	0	0	0	1	1	1
Itpkb	0	0	0	0	1	0	0	0	1	1	1
Itpr2	0	0	0	0	1	0	0	0	1	1	1
Itpripl2	0	0	0	0	1	0	0	0	1	1	1
Itsn1	0	0	0	0	1	0	0	0	1	1	1
Itsn2	0	0	0	0	0	1	0	0	1	1	1
Ivns1abp	0	0	0	0	1	0	0	0	1	1	1
Jak3	0	0	0	0	1	0	0	0	1	1	1
Jakmip3	0	0	0	0	1	0	0	0	1	1	1
Jaml	0	0	0	0	1	0	0	0	1	1	1
Jarid2	0	0	0	0	1	0	0	0	1	1	1
Jcad	0	0	0	0	1	0	0	0	1	1	1
Jhy	0	0	0	0	1	0	0	0	1	1	1
K230010J2	0	0	0	0	1	0	0	0	1	1	1
Kank2	0	0	0	0	1	0	0	0	1	1	1
Kansl2	0	0	0	0	1	0	0	0	1	1	1
Kat6a	0	0	0	0	1	0	0	0	1	1	1
Kat6b	0	0	0	0	1	0	0	0	1	1	1
Kazald1	0	0	0	0	1	0	0	0	1	1	1
Kbtbd11	0	0	0	0	1	0	0	0	1	1	1
Kbtbd4	0	0	0	0	1	0	0	0	1	1	1
Kcmf1	0	0	0	0	1	0	0	0	1	1	1
Kcna1	0	0	0	0	1	0	0	0	1	1	1
Kcna3	0	0	0	0	1	0	0	0	1	1	1
Kcnab1	1	0	0	0	0	0	0	0	1	1	1
Kcnab2	0	0	0	0	1	0	0	0	1	1	1
Kcnab3	0	0	0	0	1	0	0	0	1	1	1
Kcnb1	0	0	0	0	1	0	0	0	1	1	1
Kcnc3	0	0	0	0	1	0	0	0	1	1	1
Kcne1l	0	0	0	0	1	0	0	0	1	1	1
Kcng2	0	0	0	0	1	0	0	0	1	1	1
Kcng4	0	0	0	0	1	0	0	0	1	1	1
Kcnh3	0	0	0	0	0	0	1	0	1	1	1

Kcnh8	0	0	0	0	1	0	0	0	1	1	1
Kcnj13	0	0	0	0	1	0	0	0	1	1	1
Kcnk18	0	0	0	0	1	0	0	0	1	1	1
Kcnk5	0	0	0	0	1	0	0	0	1	1	1
Kcnmb1	0	0	0	0	1	0	0	0	1	1	1
Kcnn1	0	0	0	0	1	0	0	0	1	1	1
Kcnt2	0	0	0	0	1	0	0	0	1	1	1
Kctd13	0	0	0	0	1	0	0	0	1	1	1
Kctd3	0	0	0	0	1	0	0	0	1	1	1
Kctd8	0	0	0	0	1	0	0	0	1	1	1
Kdelr2	0	0	0	0	0	0	1	0	1	1	1
Kdm3a	0	0	0	0	1	0	0	0	1	1	1
Kdm3b	0	0	0	0	1	0	0	0	1	1	1
Kdm4b	0	0	0	0	1	0	0	0	1	1	1
Kdm6b	0	0	0	0	1	0	0	0	1	1	1
Kdm7a	0	0	0	0	1	0	0	0	1	1	1
Kdr	0	0	0	0	1	0	0	0	1	1	1
Khk	0	0	0	0	1	0	0	0	1	1	1
Kif19a	0	0	0	0	1	0	0	0	1	1	1
Kif1b	0	0	0	0	1	0	0	0	1	1	1
Kif20b	0	0	0	0	1	0	0	0	1	1	1
Kif21a	0	0	0	0	0	0	1	0	1	1	1
Kif22	0	0	0	0	0	0	1	0	1	1	1
Kif26b	0	0	0	0	1	0	0	0	1	1	1
Kif3c	0	0	0	0	0	1	0	0	1	1	1
Kifap3	0	0	0	0	1	0	0	0	1	1	1
Kifc5b	0	0	0	0	1	0	0	0	1	1	1
Kir3dl1	0	0	0	0	1	0	0	0	1	1	1
Kiz	0	0	0	0	1	0	0	0	1	1	1
Klf3	0	0	0	0	1	0	0	0	1	1	1
Klhl15	0	0	0	0	1	0	0	0	1	1	1
Klhl3	0	0	0	0	0	0	1	0	1	1	1
Klhl41	0	0	0	0	1	0	0	0	1	1	1

Klk1	0	0	0	0	1	0	0	0	1	1	1
Klk1b11	0	0	0	0	1	0	0	0	1	1	1
Klk1b24	0	0	0	0	1	0	0	0	1	1	1
Klk1b8	0	0	0	0	1	0	0	0	1	1	1
Klra5	0	0	0	0	1	0	0	0	1	1	1
Klre1	0	0	0	0	0	0	1	0	1	1	1
Kmo	0	0	0	0	0	0	1	0	1	1	1
Kmt2a	0	0	0	0	0	1	0	0	1	1	1
Kmt5b	0	0	0	0	0	0	1	0	1	1	1
Kng2	0	0	0	0	1	0	0	0	1	1	1
Kntc1	0	0	0	0	1	0	0	0	1	1	1
Kpnb1	0	0	0	0	1	0	0	0	1	1	1
Krit1	0	0	0	0	0	0	1	0	1	1	1
Krt1	0	0	0	0	0	1	0	0	1	1	1
Krt27	0	0	0	0	1	0	0	0	1	1	1
Krt34	0	0	0	0	1	0	0	0	1	1	1
Krt4	0	0	0	0	1	0	0	0	1	1	1
Krt42	0	0	0	0	1	0	0	0	1	1	1
Krt6b	0	0	0	0	0	0	1	0	1	1	1
Krt72	0	0	0	0	1	0	0	0	1	1	1
Krt78	0	0	0	0	1	0	0	0	1	1	1
Krt84	0	0	0	0	1	0	0	0	1	1	1
Krt86	0	0	0	0	1	0	0	0	1	1	1
Krt88	0	0	0	0	1	0	0	0	1	1	1
Ksr2	0	0	0	0	1	0	0	0	1	1	1
Ktn1	0	0	0	0	1	0	0	0	1	1	1
Ky	0	0	0	0	1	0	0	0	1	1	1
L3hypdh	0	0	0	0	1	0	0	0	1	1	1
Lactb2	0	0	0	0	0	0	1	0	1	1	1
Lamb1	0	0	0	0	1	0	0	0	1	1	1
Lamb2	0	0	0	0	1	0	0	0	1	1	1
Lamc1	0	0	0	0	1	0	0	0	1	1	1
Large2	0	0	0	0	1	0	0	0	1	1	1

Lars	0	0	0	0	1	0	0	0	1	1	1
Lats1	0	0	0	0	1	0	0	0	1	1	1
Lcn5	0	0	0	0	1	0	0	0	1	1	1
Lcor	0	0	0	0	1	0	0	0	1	1	1
Lct	0	0	0	0	1	0	0	0	1	1	1
Lgi1	0	0	0	0	1	0	0	0	1	1	1
Lgi2	0	0	0	0	1	0	0	0	1	1	1
Lgi3	0	0	0	0	1	0	0	0	1	1	1
Lhx4	0	0	0	0	1	0	0	0	1	1	1
Lifr	0	0	0	0	0	1	0	0	1	1	1
Lilr4b	0	0	0	0	1	0	0	0	1	1	1
Limch1	0	0	0	0	1	0	0	0	1	1	1
Llgl2	0	0	0	0	1	0	0	0	1	1	1
Lmf2	0	0	0	0	1	0	0	0	1	1	1
Lmln	0	0	0	0	1	0	0	0	1	1	1
Lmnb1	0	0	0	0	1	0	0	0	1	1	1
Lmx1a	0	0	0	0	1	0	0	0	1	1	1
Lnpep	0	0	0	0	1	0	0	0	1	1	1
Lonp1	0	0	0	0	1	0	0	0	1	1	1
Loxhd1	0	0	0	0	1	0	0	0	1	1	1
Lrba	0	0	0	0	1	0	0	0	1	1	1
Lrfn5	0	0	0	0	1	0	0	0	1	1	1
Lrig3	0	0	0	0	1	0	0	0	1	1	1
Lrit2	0	0	0	0	1	0	0	0	1	1	1
Lrmp	0	0	0	0	1	0	0	0	1	1	1
Lrp1	0	0	0	0	1	0	0	0	1	1	1
Lrp11	0	0	0	0	1	0	0	0	1	1	1
Lrrc14b	0	0	0	0	1	0	0	0	1	1	1
Lrrc31	0	0	0	0	1	0	0	0	1	1	1
Lrrc4	0	0	0	0	1	0	0	0	1	1	1
Lrrc4c	0	0	0	0	1	0	0	0	1	1	1
Lrrc56	0	0	0	0	1	0	0	0	1	1	1
Lrriq1	0	0	0	0	1	0	0	0	1	1	1

Lrrtm1	0	0	0	0	1	0	0	0	1	1	1
Lsm14a	0	0	0	0	1	0	0	0	1	1	1
Ltbp2	0	0	0	0	0	1	0	0	1	1	1
Ltbp4	0	0	0	0	1	0	0	0	1	1	1
Ltk	0	0	0	0	1	0	0	0	1	1	1
Lypd1	0	0	0	0	1	0	0	0	1	1	1
Lztr1	0	0	0	0	1	0	0	0	1	1	1
Maats1	0	0	0	0	1	0	0	0	1	1	1
Mad2l1	0	0	0	0	1	0	0	0	1	1	1
Maged1	0	0	0	0	1	0	0	0	1	1	1
Mak	0	0	0	0	1	0	0	0	1	1	1
Maml1	0	0	0	0	1	0	0	0	1	1	1
Mamld1	0	0	0	0	1	0	0	0	1	1	1
Man2b1	0	0	0	0	1	0	0	0	1	1	1
Manba	0	0	0	0	1	0	0	0	1	1	1
Maoa	0	0	0	0	1	0	0	0	1	1	1
Map2k1	0	0	0	0	1	0	0	0	1	1	1
Map3k12	0	0	0	0	1	0	0	0	1	1	1
Map3k19	0	0	0	0	1	0	0	0	1	1	1
Map3k2	0	0	0	0	0	0	1	0	1	1	1
Map4	0	0	0	0	1	0	0	0	1	1	1
Map4k4	0	0	1	0	0	0	0	0	1	1	1
Map7	0	0	0	0	1	0	0	0	1	1	1
Map9	0	0	0	0	1	0	0	0	1	1	1
Mapk14	0	0	0	0	1	0	0	0	1	1	1
March11	0	0	0	0	1	0	0	0	1	1	1
Marco	0	0	0	0	1	0	0	0	1	1	1
Matr3	0	0	0	0	1	0	0	0	1	1	1
Mbd1	0	0	0	0	0	1	0	0	1	1	1
Mbtps1	0	0	0	0	1	0	0	0	1	1	1
Mc1r	0	0	0	0	1	0	0	0	1	1	1
Mccc1	0	0	0	0	1	0	0	0	1	1	1
Mcm4	0	0	0	0	1	0	0	0	1	1	1

Mcm5	0	0	0	0	1	0	0	0	1	1	1
Mcm6	0	0	0	0	1	0	0	0	1	1	1
Mcm7	0	0	0	0	1	0	0	0	1	1	1
Mcm8	0	0	0	0	1	0	0	0	1	1	1
Mcph1	0	0	0	0	1	0	0	0	1	1	1
Mcpt9	0	0	0	0	1	0	0	0	1	1	1
Mctp1	0	0	0	0	1	0	0	0	1	1	1
Mdga2	0	0	0	0	1	0	0	0	1	1	1
Mdm2	0	0	0	0	1	0	0	0	1	1	1
Me1	0	0	0	0	1	0	0	0	1	1	1
Med1	0	0	0	0	1	0	0	0	1	1	1
Med13l	0	0	0	0	1	0	0	0	1	1	1
Mef2a	0	0	0	0	1	0	0	0	1	1	1
Mefv	0	0	0	0	1	0	0	0	1	1	1
Metap1d	0	0	0	0	1	0	0	0	1	1	1
Mettl14	0	0	0	0	1	0	0	0	1	1	1
Mettl18	0	0	0	0	1	0	0	0	1	1	1
Mettl25	0	0	0	0	1	0	0	0	1	1	1
Mettl3	0	0	0	0	1	0	0	0	1	1	1
Mettl6	0	0	0	0	1	0	0	0	1	1	1
Mettl7a2	0	0	0	0	1	0	0	0	1	1	1
Mff	0	0	0	0	1	0	0	0	1	1	1
Mfn2	0	0	0	0	0	0	1	0	1	1	1
Mfsd4b2	0	0	0	0	1	0	0	0	1	1	1
Mfsd6	0	0	0	0	1	0	0	0	1	1	1
Mgat4e	0	0	0	0	1	0	0	0	1	1	1
Mgme1	0	0	0	0	1	0	0	0	1	1	1
Mical3	0	0	0	0	1	0	0	0	1	1	1
Micu1	0	0	0	0	1	0	0	0	1	1	1
Milr1	0	0	0	0	1	0	0	0	1	1	1
Mindy2	0	0	0	0	1	0	0	0	1	1	1
Mindy4b-p	0	0	0	0	0	1	0	0	1	1	1
Mink1	0	0	0	0	1	0	0	0	1	1	1

Minpp1	0	0	0	0	1	0	0	0	1	1	1
Mios	0	0	0	0	1	0	0	0	1	1	1
Mis18a	0	0	0	0	1	0	0	0	1	1	1
Mis18bp1	0	0	0	0	1	0	0	0	1	1	1
Mkl1	0	0	0	0	1	0	0	0	1	1	1
Mkrn2	0	0	0	0	1	0	0	0	1	1	1
Mkrn2os	0	0	0	0	1	0	0	0	1	1	1
Mlh3	0	0	0	0	1	0	0	0	1	1	1
Mlkl	0	0	0	0	1	0	0	0	1	1	1
Mmp1a	0	0	0	0	1	0	0	0	1	1	1
Mmp1b	0	0	0	0	1	0	0	0	1	1	1
Mms19	0	0	0	0	1	0	0	0	1	1	1
Mns1	0	0	0	0	1	0	0	0	1	1	1
Mob3b	0	0	0	0	1	0	0	0	1	1	1
Mok	0	0	0	0	1	0	0	0	1	1	1
Mpc2	0	0	0	0	1	0	0	0	1	1	1
Mphosph8	0	0	0	0	1	0	0	0	1	1	1
Mphosph9	0	0	0	0	1	0	0	0	1	1	1
Mpp4	0	0	0	0	1	0	0	0	1	1	1
Mr1	0	0	0	0	1	0	0	0	1	1	1
Mrc2	0	0	0	0	1	0	0	0	1	1	1
Mrgprb4	0	0	0	0	1	0	0	0	1	1	1
Mrm2	0	0	0	0	1	0	0	0	1	1	1
Mroh2a	0	0	0	0	1	0	0	0	1	1	1
Mroh2b	0	0	0	0	1	0	0	0	1	1	1
Mrpl21	0	0	0	0	1	0	0	0	1	1	1
Mrpl47	0	0	0	0	1	0	0	0	1	1	1
Mrpl9	0	0	0	0	0	1	0	0	1	1	1
Mrps11	0	0	0	0	1	0	0	0	1	1	1
Mrps22	0	0	0	0	1	0	0	0	1	1	1
Mrps31	0	0	0	0	1	0	0	0	1	1	1
Mrrf	0	0	0	0	1	0	0	0	1	1	1
Mrvi1	0	0	0	0	1	0	0	0	1	1	1

Ms4a15	0	0	0	0	1	0	0	0	1	1	1
Ms4a4d	0	0	0	0	1	0	0	0	1	1	1
Ms4a6d	0	0	0	0	1	0	0	0	1	1	1
Msantd1	0	0	0	0	1	0	0	0	1	1	1
Msantd2	0	0	0	0	1	0	0	0	1	1	1
Msh2	0	0	0	0	1	0	0	0	1	1	1
Msi2	0	0	0	0	1	0	0	0	1	1	1
Msl1	0	0	0	0	1	0	0	0	1	1	1
Msl3l2	0	0	0	0	1	0	0	0	1	1	1
Msmo1	0	0	0	0	1	0	0	0	1	1	1
Msn	0	0	0	0	1	0	0	0	1	1	1
Mterf1a	0	0	0	0	1	0	0	0	1	1	1
Mthfr	0	0	0	0	1	0	0	0	1	1	1
Mtmr7	0	0	0	0	1	0	0	0	1	1	1
Mtor	0	0	0	0	1	0	0	0	1	1	1
Mtss1	0	0	0	0	1	0	0	0	1	1	1
Muc1	0	0	0	0	1	0	0	0	1	1	1
Muc13	0	0	0	0	1	0	0	0	1	1	1
Muc2	0	0	0	0	0	0	1	0	1	1	1
Muc20	0	0	0	0	1	0	0	0	1	1	1
Muc4	0	0	0	0	1	0	0	0	1	1	1
Mvb12b	0	0	0	0	1	0	0	0	1	1	1
Mvp	0	0	0	0	1	0	0	0	1	1	1
Mybpc2	0	0	0	0	1	0	0	0	1	1	1
Mybpc3	0	0	0	0	1	0	0	0	1	1	1
Mybph	0	0	0	0	1	0	0	0	1	1	1
Mybphl	0	0	0	0	1	0	0	0	1	1	1
Myef2	0	0	0	0	1	0	0	0	1	1	1
Myh1	0	0	0	0	1	0	0	0	1	1	1
Myh4	0	0	0	0	1	0	0	0	1	1	1
Myh6	0	0	0	0	1	0	0	0	1	1	1
Myl12a	0	0	0	0	1	0	0	0	1	1	1
Myl2	0	0	0	0	1	0	0	0	1	1	1

Mylk3	0	0	0	0	1	0	0	0	1	1	1
Mylpf	0	0	0	0	0	0	1	0	1	1	1
Myo10	0	0	0	0	1	0	0	0	1	1	1
Myo15b	0	0	0	0	1	0	0	0	1	1	1
Myo3b	0	0	0	0	1	0	0	0	1	1	1
Myo5b	0	0	0	0	1	0	0	0	1	1	1
Myo7a	0	0	0	0	1	0	0	0	1	1	1
Myof	0	0	0	0	1	0	0	0	1	1	1
Myom1	0	0	0	0	1	0	0	0	1	1	1
Mysm1	0	0	0	0	1	0	0	0	1	1	1
N4bp2	0	0	0	0	1	0	0	0	1	1	1
N4bp2l2	0	0	0	0	1	0	0	0	1	1	1
Nabp1	0	0	0	0	1	0	0	0	1	1	1
Nacad	0	0	0	0	1	0	0	0	1	1	1
Nacc2	0	0	0	0	1	0	0	0	1	1	1
Nalcn	0	0	0	0	1	0	0	0	1	1	1
Nap1l5	0	0	0	0	1	0	0	0	1	1	1
Napsa	0	0	0	0	1	0	0	0	1	1	1
Nars	0	0	0	0	1	0	0	0	1	1	1
Nasp	0	0	0	0	1	0	0	0	1	1	1
Nat10	0	0	0	0	1	0	0	0	1	1	1
Nat6	0	0	0	0	1	0	0	0	1	1	1
Nat8f1	0	0	0	0	1	0	0	0	1	1	1
Nat8l	0	0	0	0	1	0	0	0	1	1	1
Nav2	0	0	0	0	1	0	0	0	1	1	1
Ncam2	0	0	0	0	1	0	0	0	1	1	1
Ncapd2	0	0	0	0	1	0	0	0	1	1	1
Ncaph2	0	0	0	0	1	0	0	0	1	1	1
Nckap5	0	0	0	0	1	0	0	0	1	1	1
Nckipsd	0	0	0	0	0	1	0	0	1	1	1
Ncln	0	0	0	0	1	0	0	0	1	1	1
Ncoa4	0	0	0	0	0	1	0	0	1	1	1
Ncor2	0	0	0	0	1	0	0	0	1	1	1

Ndor1	0	0	0	0	1	0	0	0	1	1	1
Ndrg1	0	0	0	0	0	0	1	0	1	1	1
Ndufa8	0	0	0	0	1	0	0	0	1	1	1
Ndufs3	0	0	0	0	1	0	0	0	1	1	1
Ndufs8	0	0	0	0	1	0	0	0	1	1	1
Nectin2	0	0	0	0	1	0	0	0	1	1	1
Nectin3	0	0	0	0	1	0	0	0	1	1	1
Nefh	0	0	0	0	1	0	0	0	1	1	1
Nek11	0	0	0	0	1	0	0	0	1	1	1
Nelfa	0	0	0	0	1	0	0	0	1	1	1
Nell1	0	0	0	0	1	0	0	0	1	1	1
Nes	0	0	0	0	1	0	0	0	1	1	1
Neurl4	0	0	0	0	1	0	0	0	1	1	1
Neurod6	0	0	0	0	1	0	0	0	1	1	1
Nexmif	0	0	0	0	1	0	0	0	1	1	1
Nfatc2	0	0	0	0	1	0	0	0	1	1	1
Nfkb1	0	0	0	0	1	0	0	0	1	1	1
Nfx1	0	0	0	0	1	0	0	0	1	1	1
Nhlrc1	0	0	0	0	1	0	0	0	1	1	1
Nhlrc2	0	0	0	0	1	0	0	0	1	1	1
Nhsl1	0	0	0	0	1	0	0	0	1	1	1
Nid2	0	0	0	0	1	0	0	0	1	1	1
Nipa2	0	0	0	0	0	1	0	0	1	1	1
Nipal1	0	0	0	0	1	0	0	0	1	1	1
Nipal3	0	0	0	0	1	0	0	0	1	1	1
Nipbl	0	0	0	0	1	0	0	0	1	1	1
Nkapl	0	0	0	0	1	0	0	0	1	1	1
Nkiras1	0	0	0	0	1	0	0	0	1	1	1
Nkiras2	0	0	0	0	1	0	0	0	1	1	1
Nktr	0	0	0	0	0	1	0	0	1	1	1
Nkx2-2	0	0	0	0	1	0	0	0	1	1	1
Nlrp12	0	0	0	0	1	0	0	0	1	1	1
Nlrp6	0	0	0	0	1	0	0	0	1	1	1

Nlrp9a	0	0	0	0	1	0	0	0	1	1	1
Nod2	0	0	0	0	1	0	0	0	1	1	1
Nolc1	0	0	0	0	1	0	0	0	1	1	1
Nop53	0	0	0	0	0	0	1	0	1	1	1
Nos1ap	0	0	0	0	1	0	0	0	1	1	1
Notch2	0	0	0	0	1	0	0	0	1	1	1
Notch4	0	0	0	0	1	0	0	0	1	1	1
Nova1	0	0	0	0	1	0	0	0	1	1	1
Nox4	0	0	0	0	1	0	0	0	1	1	1
Npas2	0	0	0	0	0	1	0	0	1	1	1
Npas3	0	0	0	0	1	0	0	0	1	1	1
Npat	0	0	0	0	1	0	0	0	1	1	1
Npc1l1	0	0	0	0	1	0	0	0	1	1	1
Npepps	0	0	0	0	1	0	0	0	1	1	1
Npffr1	0	0	0	0	1	0	0	0	1	1	1
Npffr2	0	0	0	0	0	1	0	0	1	1	1
Npr3	0	0	0	0	1	0	0	0	1	1	1
Npy4r	0	0	0	0	1	0	0	0	1	1	1
Nr2f2	0	0	0	0	1	0	0	0	1	1	1
Nr3c2	0	0	0	0	1	0	0	0	1	1	1
Nr4a1	0	0	0	0	1	0	0	0	1	1	1
Nrde2	0	0	0	0	1	0	0	0	1	1	1
Nrg2	0	0	0	0	1	0	0	0	1	1	1
Nrk	0	0	0	0	1	0	0	0	1	1	1
Nrp2	0	0	0	0	1	0	0	0	1	1	1
Nrxn1	0	0	0	0	1	0	0	0	1	1	1
Nsl1	0	0	0	0	1	0	0	0	1	1	1
Nsmaf	0	0	0	0	1	0	0	0	1	1	1
Nsun3	0	0	0	0	1	0	0	0	1	1	1
Nsun7	0	0	0	0	1	0	0	0	1	1	1
Nt5c2	0	0	0	0	1	0	0	0	1	1	1
Nt5e	0	0	0	0	1	0	0	0	1	1	1
Nthl1	0	0	0	0	1	0	0	0	1	1	1

Ntn1	0	0	0	0	1	0	0	0	1	1	1
Ntpcr	0	0	0	0	1	0	0	0	1	1	1
Nts	0	0	0	0	1	0	0	0	1	1	1
Nuak1	0	0	0	0	1	0	0	0	1	1	1
Nubp1	0	0	0	0	1	0	0	0	1	1	1
Nudt5	0	0	0	0	1	0	0	0	1	1	1
Nuf2	0	0	0	0	1	0	0	0	1	1	1
Nufip1	0	0	0	0	1	0	0	0	1	1	1
Nuggc	0	0	0	0	0	0	1	0	1	1	1
Nup210l	0	0	0	0	1	0	0	0	1	1	1
Nup35	0	0	0	0	1	0	0	0	1	1	1
Nup50	0	0	0	0	1	0	0	0	1	1	1
Nup85	0	0	0	0	1	0	0	0	1	1	1
Nupl2	0	0	0	0	1	0	0	0	1	1	1
Nus1	0	0	0	0	1	0	0	0	1	1	1
Nvl	0	0	0	0	0	1	0	0	1	1	1
Nxpe3	0	0	0	0	1	0	0	0	1	1	1
Nxt2	0	0	0	1	0	0	0	0	1	1	1
Oacyl	0	0	0	0	1	0	0	0	1	1	1
Oas1g	0	0	0	0	0	1	0	0	1	1	1
Obox2	0	0	0	0	1	0	0	0	1	1	1
Ogdhl	0	0	0	0	0	1	0	0	1	1	1
Oit3	0	0	0	0	1	0	0	0	1	1	1
Olfr1002	0	0	0	0	1	0	0	0	1	1	1
Olfr1013	0	0	0	0	1	0	0	0	1	1	1
Olfr1051	0	0	0	0	1	0	0	0	1	1	1
Olfr1052	0	0	0	0	1	0	0	0	1	1	1
Olfr1058	0	0	0	0	1	0	0	0	1	1	1
Olfr1085	0	0	0	0	1	0	0	0	1	1	1
Olfr1090	0	0	0	0	1	0	0	0	1	1	1
Olfr1097	0	0	0	0	1	0	0	0	1	1	1
Olfr1105	0	0	0	0	1	0	0	0	1	1	1
Olfr1120	0	0	0	0	1	0	0	0	1	1	1

Olfr1123	0	0	0	0	1	0	0	0	1	1	1
Olfr1126	0	0	0	0	1	0	0	0	1	1	1
Olfr1130	0	0	0	0	1	0	0	0	1	1	1
Olfr1145	0	0	0	0	1	0	0	0	1	1	1
Olfr1180	0	0	0	0	1	0	0	0	1	1	1
Olfr1202	0	0	0	0	1	0	0	0	1	1	1
Olfr121	0	0	0	0	1	0	0	0	1	1	1
Olfr1226	0	0	0	0	1	0	0	0	1	1	1
Olfr1228	0	0	0	0	0	1	0	0	1	1	1
Olfr1238	0	0	0	0	1	0	0	0	1	1	1
Olfr1240	0	0	0	0	1	0	0	0	1	1	1
Olfr1248	0	0	0	0	1	0	0	0	1	1	1
Olfr1249	0	1	0	0	0	0	0	0	1	1	1
Olfr1264	0	0	0	0	1	0	0	0	1	1	1
Olfr1271	0	0	0	0	0	1	0	0	1	1	1
Olfr1276	0	0	0	0	1	0	0	0	1	1	1
Olfr1281	0	0	0	0	1	0	0	0	1	1	1
Olfr1282	0	0	0	0	1	0	0	0	1	1	1
Olfr131	0	0	0	0	1	0	0	0	1	1	1
Olfr1313	0	0	0	0	1	0	0	0	1	1	1
Olfr133	0	0	0	0	1	0	0	0	1	1	1
Olfr1330	0	0	0	0	1	0	0	0	1	1	1
Olfr1347	0	0	0	0	1	0	0	0	1	1	1
Olfr1349	0	0	0	0	1	0	0	0	1	1	1
Olfr1364	0	0	0	0	1	0	0	0	1	1	1
Olfr1389	0	0	0	0	1	0	0	0	1	1	1
Olfr1395	0	0	0	0	1	0	0	0	1	1	1
Olfr1406	0	0	0	0	1	0	0	0	1	1	1
Olfr1412	0	0	0	0	1	0	0	0	1	1	1
Olfr1413	0	0	0	0	1	0	0	0	1	1	1
Olfr1417	0	0	0	0	1	0	0	0	1	1	1
Olfr1418	0	0	0	0	1	0	0	0	1	1	1
Olfr142	0	0	0	0	1	0	0	0	1	1	1

Olfr1426	0	0	0	0	1	0	0	0	1	1	1
Olfr1448	0	0	0	0	1	0	0	0	1	1	1
Olfr1454	0	0	1	0	0	0	0	0	1	1	1
Olfr156	0	0	0	0	1	0	0	0	1	1	1
Olfr159	0	0	0	0	1	0	0	0	1	1	1
Olfr170	0	0	0	0	1	0	0	0	1	1	1
Olfr171	0	0	0	0	1	0	0	0	1	1	1
Olfr183	0	0	0	0	1	0	0	0	1	1	1
Olfr193	0	0	0	0	1	0	0	0	1	1	1
Olfr197	0	0	0	0	1	0	0	0	1	1	1
Olfr201	0	0	0	0	1	0	0	0	1	1	1
Olfr212	0	0	0	0	1	0	0	0	1	1	1
Olfr243	0	0	0	0	1	0	0	0	1	1	1
Olfr250	0	0	0	0	1	0	0	0	1	1	1
Olfr270	0	0	0	0	1	0	0	0	1	1	1
Olfr298	0	0	0	0	1	0	0	0	1	1	1
Olfr314	0	0	0	0	1	0	0	0	1	1	1
Olfr325	0	0	0	0	1	0	0	0	1	1	1
Olfr331	0	0	0	0	1	0	0	0	1	1	1
Olfr338	0	0	0	0	1	0	0	0	1	1	1
Olfr348	0	0	0	0	1	0	0	0	1	1	1
Olfr362	0	0	0	0	1	0	0	0	1	1	1
Olfr372	0	0	0	0	1	0	0	0	1	1	1
Olfr391-ps	0	0	0	0	1	0	0	0	1	1	1
Olfr434	0	0	0	0	1	0	0	0	1	1	1
Olfr435	0	0	0	0	1	0	0	0	1	1	1
Olfr449	0	0	0	0	1	0	0	0	1	1	1
Olfr457	0	0	0	0	1	0	0	0	1	1	1
Olfr460	0	0	0	0	1	0	0	0	1	1	1
Olfr469	0	0	0	0	1	0	0	0	1	1	1
Olfr470	0	0	0	0	1	0	0	0	1	1	1
Olfr472	0	0	0	0	1	0	0	0	1	1	1
Olfr473	0	0	0	0	1	0	0	0	1	1	1

Olfr478	0	0	0	0	1	0	0	0	1	1	1
Olfr493	0	0	0	0	1	0	0	0	1	1	1
Olfr506	0	0	0	0	1	0	0	0	1	1	1
Olfr510	0	0	0	0	1	0	0	0	1	1	1
Olfr514	0	0	0	0	1	0	0	0	1	1	1
Olfr517	0	0	0	0	1	0	0	0	1	1	1
Olfr52	0	0	0	0	1	0	0	0	1	1	1
Olfr53	0	0	0	0	1	0	0	0	1	1	1
Olfr532	0	0	0	0	1	0	0	0	1	1	1
Olfr536	0	0	0	0	1	0	0	0	1	1	1
Olfr543	0	0	0	0	1	0	0	0	1	1	1
Olfr561	0	0	0	0	0	1	0	0	1	1	1
Olfr575	0	0	0	0	1	0	0	0	1	1	1
Olfr601	0	0	0	0	1	0	0	0	1	1	1
Olfr615	0	0	0	0	1	0	0	0	1	1	1
Olfr629	0	0	0	0	1	0	0	0	1	1	1
Olfr644	0	0	0	0	1	0	0	0	1	1	1
Olfr648	0	0	0	0	1	0	0	0	1	1	1
Olfr66	0	0	0	0	1	0	0	0	1	1	1
Olfr663	0	0	0	0	0	1	0	0	1	1	1
Olfr664	0	0	0	0	1	0	0	0	1	1	1
Olfr672	0	0	0	0	1	0	0	0	1	1	1
Olfr677	0	0	0	0	1	0	0	0	1	1	1
Olfr679	0	0	0	0	1	0	0	0	1	1	1
Olfr685	0	0	0	0	1	0	0	0	1	1	1
Olfr691	0	0	0	0	1	0	0	0	1	1	1
Olfr695	0	0	0	0	1	0	0	0	1	1	1
Olfr700	0	0	0	0	1	0	0	0	1	1	1
Olfr704	0	0	0	0	1	0	0	0	1	1	1
Olfr710	0	0	0	0	1	0	0	0	1	1	1
Olfr722	0	0	0	0	1	0	0	0	1	1	1
Olfr773	0	0	0	0	1	0	0	0	1	1	1
Olfr774	0	0	0	0	0	0	0	1	1	1	1

Olfr781	0	0	0	0	1	0	0	0	1	1	1
Olfr810	0	0	0	0	1	0	0	0	1	1	1
Olfr834	0	0	0	0	1	0	0	0	1	1	1
Olfr854	0	0	0	0	1	0	0	0	1	1	1
Olfr870	0	0	0	0	1	0	0	0	1	1	1
Olfr891	0	0	0	0	1	0	0	0	1	1	1
Olfr901	0	0	0	0	0	1	0	0	1	1	1
Olfr951	1	0	0	0	0	0	0	0	1	1	1
Olfr957	0	0	0	0	1	0	0	0	1	1	1
Olfr967	0	0	0	0	1	0	0	0	1	1	1
Olfr969	0	0	0	0	1	0	0	0	1	1	1
Onecut1	0	0	0	0	1	0	0	0	1	1	1
Oplah	0	0	0	0	1	0	0	0	1	1	1
Optc	0	0	0	0	1	0	0	0	1	1	1
Orc1	0	0	0	0	1	0	0	0	1	1	1
Ormdl3	0	0	0	0	1	0	0	0	1	1	1
Osbpl1a	0	0	0	0	0	0	1	0	1	1	1
Osbpl7	0	0	0	0	1	0	0	0	1	1	1
Otoa	0	0	0	0	1	0	0	0	1	1	1
Otof	0	0	0	0	1	0	0	0	1	1	1
Otop3	0	0	0	0	1	0	0	0	1	1	1
Ovgp1	0	0	0	0	1	0	0	0	1	1	1
Oxct2a	0	0	0	0	1	0	0	0	1	1	1
Oxsr1	0	0	0	0	1	0	0	0	1	1	1
P2ry1	0	0	0	0	1	0	0	0	1	1	1
P2ry2	0	0	0	0	1	0	0	0	1	1	1
P2ry6	0	0	0	0	1	0	0	0	1	1	1
P4ha1	0	0	0	0	0	1	0	0	1	1	1
Pabpc1	0	0	0	0	0	0	1	0	1	1	1
Pabpc2	0	0	0	1	0	0	0	0	1	1	1
Pabpc4l	0	0	0	0	1	0	0	0	1	1	1
Pabpc6	0	0	0	0	1	0	0	0	1	1	1
Padi3	0	0	0	0	1	0	0	0	1	1	1

Padi6	0	0	0	0	1	0	0	0	1	1	1
Pag1	0	0	0	0	1	0	0	0	1	1	1
Paip2b	0	0	0	0	1	0	0	0	1	1	1
Pak7	0	0	0	0	1	0	0	0	1	1	1
Pakap	0	0	0	0	0	1	0	0	1	1	1
Palm3	0	0	0	0	1	0	0	0	1	1	1
Palmd	0	0	0	0	1	0	0	0	1	1	1
Pappa	0	0	0	0	1	0	0	0	1	1	1
Pappa2	0	0	0	0	1	0	0	0	1	1	1
Paqr9	0	0	0	0	1	0	0	0	1	1	1
Pard3	0	0	0	0	0	0	1	0	1	1	1
Pard3b	0	0	0	0	1	0	0	0	1	1	1
Parg	0	0	0	0	1	0	0	0	1	1	1
Parl	0	0	0	0	1	0	0	0	1	1	1
Parm1	0	0	0	0	1	0	0	0	1	1	1
Parn	0	0	0	0	0	0	1	0	1	1	1
Parp9	0	0	0	0	0	1	0	0	1	1	1
Parvb	0	0	0	0	0	0	1	0	1	1	1
Patl2	0	0	0	0	0	1	0	0	1	1	1
Pawr	0	0	0	0	1	0	0	0	1	1	1
Pax1	0	0	0	0	1	0	0	0	1	1	1
Pbx1	0	0	0	0	0	0	1	0	1	1	1
Pbx3	0	0	0	1	0	0	0	0	1	1	1
Pcbp1	0	0	0	0	1	0	0	0	1	1	1
Pcbp3	0	0	0	0	1	0	0	0	1	1	1
Pcbp4	0	0	0	0	0	0	1	0	1	1	1
Pcca	0	0	0	0	1	0	0	0	1	1	1
Pcdh1	0	0	0	0	1	0	0	0	1	1	1
Pcdh10	0	0	0	0	0	1	0	0	1	1	1
Pcdh12	0	0	0	0	1	0	0	0	1	1	1
Pcdha1	0	0	0	0	1	0	0	0	1	1	1
Pcdha11	0	0	0	0	1	0	0	0	1	1	1
Pcdha2	0	0	0	0	1	0	0	0	1	1	1

Pcdha3	0	0	0	0	1	0	0	0	1	1	1
Pcdha6	0	0	0	0	1	0	0	0	1	1	1
Pcdha7	0	0	0	0	1	0	0	0	1	1	1
Pcdha9	0	0	0	0	1	0	0	0	1	1	1
Pcdhac1	0	0	0	0	1	0	0	0	1	1	1
Pcdhb13	0	0	0	0	1	0	0	0	1	1	1
Pcdhb16	0	0	0	0	1	0	0	0	1	1	1
Pcdhb20	0	0	0	0	1	0	0	0	1	1	1
Pcdhb22	0	0	0	0	1	0	0	0	1	1	1
Pcdhb8	0	0	0	0	1	0	0	0	1	1	1
Pcdhb9	0	0	0	0	1	0	0	0	1	1	1
Pcdhga10	0	0	0	0	1	0	0	0	1	1	1
Pcdhga5	0	0	0	0	1	0	0	0	1	1	1
Pcdhga6	0	0	0	0	1	0	0	0	1	1	1
Pcdhga7	0	0	0	0	1	0	0	0	1	1	1
Pcdhgb4	0	0	0	0	1	0	0	0	1	1	1
Pcdhgb5	0	0	0	0	1	0	0	0	1	1	1
Pcdhgb7	0	0	0	0	1	0	0	0	1	1	1
Pcdhgc4	0	0	0	0	1	0	0	0	1	1	1
Pcf11	0	0	0	0	1	0	0	0	1	1	1
Pcgf3	0	0	0	0	0	1	0	0	1	1	1
Pcnx	0	0	0	0	1	0	0	0	1	1	1
Pcsk1	0	0	0	0	1	0	0	0	1	1	1
Pcsk7	0	0	0	0	0	0	1	0	1	1	1
Pctp	0	0	0	0	1	0	0	0	1	1	1
Pcyox1l	0	0	0	0	1	0	0	0	1	1	1
Pcyt1a	0	0	0	0	1	0	0	0	1	1	1
Pdcd4	0	0	0	0	1	0	0	0	1	1	1
Pde10a	0	0	0	0	1	0	0	0	1	1	1
Pde4dip	0	0	0	0	1	0	0	0	1	1	1
Pde5a	0	0	0	0	1	0	0	0	1	1	1
Pde6b	0	0	0	0	1	0	0	0	1	1	1
Pds5a	0	0	0	0	1	0	0	0	1	1	1

Pdzd11	0	0	0	0	1	0	0	0	1	1	1
Pdzd8	0	0	0	0	1	0	0	0	1	1	1
Pemt	0	0	0	0	0	1	0	0	1	1	1
Pepd	0	0	0	0	1	0	0	0	1	1	1
Per1	0	0	0	0	1	0	0	0	1	1	1
Per3	0	0	0	0	1	0	0	0	1	1	1
Pes1	0	0	0	0	1	0	0	0	1	1	1
Pex10	0	0	0	0	1	0	0	0	1	1	1
Pfkp	0	0	0	0	0	0	1	0	1	1	1
Pfn1	0	0	0	0	1	0	0	0	1	1	1
Pgam1	0	0	0	0	1	0	0	0	1	1	1
Pgap2	0	0	0	0	1	0	0	0	1	1	1
Pgm2l1	0	0	0	0	0	1	0	0	1	1	1
Phf3	0	0	0	0	1	0	0	0	1	1	1
Phkb	0	0	0	0	0	0	1	0	1	1	1
Phkg2	0	0	0	0	1	0	0	0	1	1	1
Phlpp1	0	0	0	0	1	0	0	0	1	1	1
Phrf1	0	0	0	0	1	0	0	0	1	1	1
Phtf2	0	0	0	0	1	0	0	0	1	1	1
Pi4ka	0	0	0	0	1	0	0	0	1	1	1
Pid1	0	0	0	0	1	0	0	0	1	1	1
Pidd1	0	0	0	0	1	0	0	0	1	1	1
Pigm	0	0	0	0	1	0	0	0	1	1	1
Pign	0	0	0	0	0	0	1	0	1	1	1
Pigo	0	0	0	0	1	0	0	0	1	1	1
Pigq	0	0	0	0	1	0	0	0	1	1	1
Pigz	0	0	0	0	1	0	0	0	1	1	1
Pik3c2g	0	0	0	0	1	0	0	0	1	1	1
Pim3	0	0	0	0	1	0	0	0	1	1	1
Pip5k1a	0	0	0	0	0	0	1	0	1	1	1
Pip5k1c	0	0	0	0	1	0	0	0	1	1	1
Pirb	0	0	0	0	1	0	0	0	1	1	1
Pitpnm3	0	0	0	0	1	0	0	0	1	1	1

Pkd1l3	0	0	0	0	1	0	0	0	1	1	1
Pkdrej	0	0	0	0	1	0	0	0	1	1	1
Pkm	0	0	0	0	1	0	0	0	1	1	1
Pkn2	0	0	0	0	1	0	0	0	1	1	1
Pknox2	0	0	0	0	1	0	0	0	1	1	1
Pkp4	0	0	0	0	1	0	0	0	1	1	1
Pla1a	0	0	0	0	1	0	0	0	1	1	1
Pla2g4d	0	0	0	0	1	0	0	0	1	1	1
Plau	0	0	0	0	1	0	0	0	1	1	1
Plcd3	0	0	0	0	1	0	0	0	1	1	1
Plcg1	0	0	0	0	1	0	0	0	1	1	1
Plch2	0	0	0	0	1	0	0	0	1	1	1
Plcl2	0	0	0	0	1	0	0	0	1	1	1
Plcz1	0	0	0	0	1	0	0	0	1	1	1
Plekha8	0	0	0	0	1	0	0	0	1	1	1
Plin4	0	0	0	0	1	0	0	0	1	1	1
Plk3	0	0	0	0	1	0	0	0	1	1	1
Plod3	0	0	0	0	1	0	0	0	1	1	1
Plp1	0	0	0	0	1	0	0	0	1	1	1
Plppr5	0	0	0	0	0	1	0	0	1	1	1
Plxdc2	0	0	0	0	1	0	0	0	1	1	1
Plxna4	0	0	0	0	1	0	0	0	1	1	1
Pmch	0	0	0	0	1	0	0	0	1	1	1
Pmepa1	0	0	0	0	0	1	0	0	1	1	1
Pmpca	0	0	0	0	1	0	0	0	1	1	1
Pms2	0	0	0	0	1	0	0	0	1	1	1
Pmvk	0	0	0	0	1	0	0	0	1	1	1
Pnkp	0	0	0	0	1	0	0	0	1	1	1
Pnmal2	0	0	0	0	1	0	0	0	1	1	1
Pno1	0	0	0	0	0	1	0	0	1	1	1
Podnl1	0	0	0	0	1	0	0	0	1	1	1
Pofut1	0	0	0	0	1	0	0	0	1	1	1
Pogz	0	0	0	0	0	1	0	0	1	1	1

Pola2	0	0	0	0	1	0	0	0	1	1	1
Poldip2	0	0	0	0	1	0	0	0	1	1	1
Pole	0	0	0	0	1	0	0	0	1	1	1
Pole2	0	0	0	0	1	0	0	0	1	1	1
Poln	0	0	0	0	1	0	0	0	1	1	1
Polr1a	0	0	0	0	1	0	0	0	1	1	1
Polr2a	0	0	0	0	1	0	0	0	1	1	1
Polr2d	0	0	0	0	1	0	0	0	1	1	1
Polr3e	0	0	0	0	1	0	0	0	1	1	1
Pop7	0	0	0	0	1	0	0	0	1	1	1
Por	0	0	0	0	1	0	0	0	1	1	1
Pot1b	0	0	0	0	1	0	0	0	1	1	1
Pou4f1	0	0	0	0	1	0	0	0	1	1	1
Ppa1	0	0	0	0	1	0	0	0	1	1	1
Ppat	0	0	0	0	1	0	0	0	1	1	1
Ppfia1	0	0	0	0	1	0	0	0	1	1	1
Ppfia3	0	0	0	0	1	0	0	0	1	1	1
Ppfibp1	0	0	0	0	1	0	0	0	1	1	1
Ppfibp2	0	0	0	0	1	0	0	0	1	1	1
Ppie	0	0	0	0	1	0	0	0	1	1	1
Ppm1b	0	0	0	0	1	0	0	0	1	1	1
Ppp1cb	0	0	0	0	1	0	0	0	1	1	1
Ppp1r10	0	0	0	0	1	0	0	0	1	1	1
Ppp1r12b	0	0	0	0	0	0	1	0	1	1	1
Ppp1r16b	0	0	0	0	1	0	0	0	1	1	1
Ppp1r1a	0	0	0	0	1	0	0	0	1	1	1
Ppp1r26	0	0	0	0	1	0	0	0	1	1	1
Ppp1r37	0	0	0	0	1	0	0	0	1	1	1
Ppp1r3a	0	0	0	0	1	0	0	0	1	1	1
Ppp1r42	0	0	0	0	1	0	0	0	1	1	1
Ppp2r1b	0	0	0	0	1	0	0	0	1	1	1
Ppp4r3a	0	0	0	0	1	0	0	0	1	1	1
Ppp4r4	0	0	0	0	1	0	0	0	1	1	1

Ppp6r1	0	0	0	0	1	0	0	0	1	1	1
Pramel6	0	0	0	0	0	0	1	0	1	1	1
Prb1	0	0	0	0	1	0	0	0	1	1	1
Prcp	0	0	0	0	1	0	0	0	1	1	1
Prdm12	0	0	0	0	1	0	0	0	1	1	1
Prdm16	0	0	0	0	1	0	0	0	1	1	1
Prdm2	0	0	0	0	0	0	1	0	1	1	1
Prdx3	0	0	0	0	1	0	0	0	1	1	1
Prg3	0	0	0	0	0	0	1	0	1	1	1
Prim1	0	0	0	0	1	0	0	0	1	1	1
Prkaa1	0	0	0	0	1	0	0	0	1	1	1
Prkab2	0	0	0	0	1	0	0	0	1	1	1
Prkci	0	0	0	0	1	0	0	0	1	1	1
Prkcsh	0	0	0	0	1	0	0	0	1	1	1
Prkd3	0	0	0	0	0	0	1	0	1	1	1
Prmt3	0	0	0	0	1	0	0	0	1	1	1
Prob1	0	0	0	0	1	0	0	0	1	1	1
Prokr2	0	0	0	0	1	0	0	0	1	1	1
Prox1	0	0	0	0	1	0	0	0	1	1	1
Prox2	0	0	0	0	1	0	0	0	1	1	1
Prpf4	0	0	0	0	1	0	0	0	1	1	1
Prr11	0	0	0	0	1	0	0	0	1	1	1
Prr19	0	0	0	0	1	0	0	0	1	1	1
Prr23a1	0	0	0	0	1	0	0	0	1	1	1
Prr5	0	0	0	0	1	0	0	0	1	1	1
Prrc1	0	0	0	0	1	0	0	0	1	1	1
Prrg4	0	0	0	0	1	0	0	0	1	1	1
Prss29	0	0	0	0	1	0	0	0	1	1	1
Prss35	0	0	0	0	1	0	0	0	1	1	1
Prss46	0	0	0	0	1	0	0	0	1	1	1
Prtg	0	0	0	0	1	0	0	0	1	1	1
Psapl1	0	0	0	0	1	0	0	0	1	1	1
Psd3	0	0	0	0	1	0	0	0	1	1	1

Psg25	0	0	0	0	1	0	0	0	1	1	1
Psg26	0	0	0	0	1	0	0	0	1	1	1
Psg28	0	0	0	0	1	0	0	0	1	1	1
Psma5	0	0	0	0	1	0	0	0	1	1	1
Psma8	0	0	0	0	1	0	0	0	1	1	1
Psmd5	0	0	0	0	0	0	1	0	1	1	1
Psme3	0	0	0	0	0	0	1	0	1	1	1
Ptbp3	0	0	0	0	1	0	0	0	1	1	1
Ptger3	0	0	0	0	1	0	0	0	1	1	1
Pth1r	0	0	0	0	1	0	0	0	1	1	1
Ptpdc1	0	0	0	0	1	0	0	0	1	1	1
Ptpn13	0	0	0	0	1	0	0	0	1	1	1
Ptpn22	0	0	0	0	1	0	0	0	1	1	1
Ptpn23	0	0	0	0	1	0	0	0	1	1	1
Ptpn5	0	0	0	0	0	1	0	0	1	1	1
Ptpn6	0	0	0	0	1	0	0	0	1	1	1
Ptprg	0	0	0	0	1	0	0	0	1	1	1
Ptprn	0	0	0	0	1	0	0	0	1	1	1
Ptprn2	0	0	0	0	1	0	0	0	1	1	1
Ptprr	0	0	0	0	1	0	0	0	1	1	1
Ptpru	0	0	0	0	1	0	0	0	1	1	1
Pudp	0	0	0	0	1	0	0	0	1	1	1
Pum3	0	0	0	0	1	0	0	0	1	1	1
Purg	0	0	0	0	1	0	0	0	1	1	1
Pus3	0	0	0	0	1	0	0	0	1	1	1
Pus7	0	0	0	0	1	0	0	0	1	1	1
Pxdc1	0	0	0	0	1	0	0	0	1	1	1
Pxmp2	0	0	0	0	1	0	0	0	1	1	1
Pycr1	0	0	0	0	1	0	0	0	1	1	1
Pygm	0	0	0	0	1	0	0	0	1	1	1
Qrsl1	0	0	0	0	1	0	0	0	1	1	1
Qsox1	0	0	0	0	0	1	0	0	1	1	1
R3hdm1	0	0	0	0	1	0	0	0	1	1	1

Rab11fip1	0	0	0	0	1	0	0	0	1	1	1
Rab11fip5	0	0	0	0	1	0	0	0	1	1	1
Rab3a	0	0	0	0	0	1	0	0	1	1	1
Rabac1	0	0	0	0	1	0	0	0	1	1	1
Rabep1	0	0	0	0	1	0	0	0	1	1	1
Rabgap1	1	0	0	0	0	0	0	0	1	1	1
Rad50	0	0	0	0	1	0	0	0	1	1	1
Rad54b	0	0	0	0	1	0	0	0	1	1	1
Radil	0	0	0	0	1	0	0	0	1	1	1
Rag1	0	0	0	0	1	0	0	0	1	1	1
Ralgapa2	0	0	0	0	1	0	0	0	1	1	1
Ralgapb	0	0	0	0	1	0	0	0	1	1	1
Ralgps1	0	0	0	0	1	0	0	0	1	1	1
Ran	0	0	0	0	1	0	0	0	1	1	1
Rapgef2	0	0	0	0	1	0	0	0	1	1	1
Rapgef3	1	0	0	0	0	0	0	0	1	1	1
Rapgefl1	0	0	0	0	1	0	0	0	1	1	1
Rasa2	0	0	0	0	1	0	0	0	1	1	1
Rasal1	0	0	0	0	1	0	0	0	1	1	1
Rasal2	0	0	0	0	1	0	0	0	1	1	1
Rasef	0	0	0	0	1	0	0	0	1	1	1
Rasgef1b	0	0	0	0	1	0	0	0	1	1	1
Rasgrf2	0	0	0	0	1	0	0	0	1	1	1
Rassf10	0	0	0	0	1	0	0	0	1	1	1
Rassf6	0	0	0	0	1	0	0	0	1	1	1
Rb1cc1	0	0	0	0	1	0	0	0	1	1	1
Rbbp4	0	0	0	0	1	0	0	0	1	1	1
Rbbp6	0	0	0	0	1	0	0	0	1	1	1
Rbl1	0	0	0	0	1	0	0	0	1	1	1
Rbm12b1	0	0	0	0	1	0	0	0	1	1	1
Rbm12b2	0	0	0	0	1	0	0	0	1	1	1
Rbm15b	0	0	0	0	1	0	0	0	1	1	1
Rbm17	0	0	0	0	1	0	0	0	1	1	1

Rbm39	0	0	0	0	0	0	1	0	1	1	1
Rbm4	0	0	0	0	1	0	0	0	1	1	1
Rbm42	0	0	0	0	1	0	0	0	1	1	1
Rbm6	0	0	0	0	1	0	0	0	1	1	1
Rbm7	0	0	0	0	1	0	0	0	1	1	1
Rbpj	0	0	0	0	1	0	0	0	1	1	1
Rc3h2	0	0	0	0	1	0	0	0	1	1	1
Rchy1	0	0	0	0	1	0	0	0	1	1	1
Rcn2	0	0	0	0	1	0	0	0	1	1	1
Rdh11	0	0	0	0	1	0	0	0	1	1	1
Rec8	0	0	0	0	1	0	0	0	1	1	1
Recql4	0	0	0	0	1	0	0	0	1	1	1
Reln	0	0	0	0	1	0	0	0	1	1	1
Rergl	0	0	0	0	1	0	0	0	1	1	1
Ret	0	0	0	0	1	0	0	0	1	1	1
Retn	0	0	0	0	1	0	0	0	1	1	1
Rev3l	0	0	0	0	0	1	0	0	1	1	1
Rfc2	0	0	0	0	1	0	0	0	1	1	1
Rfx2	0	0	0	0	1	0	0	0	1	1	1
Rfx6	0	0	0	0	1	0	0	0	1	1	1
Rfxank	0	0	0	0	1	0	0	0	1	1	1
Rgl1	0	0	0	0	1	0	0	0	1	1	1
Rgmb	0	0	0	0	1	0	0	0	1	1	1
Rgs11	0	0	0	0	1	0	0	0	1	1	1
Rgs9	0	0	0	0	1	0	0	0	1	1	1
Rhbdf2	0	0	0	0	1	0	0	0	1	1	1
Rhbg	0	0	0	0	1	0	0	0	1	1	1
Rhd	0	0	0	0	1	0	0	0	1	1	1
Rhoa	0	0	0	0	1	0	0	0	1	1	1
Rhobtb2	0	0	0	0	1	0	0	0	1	1	1
Rhog	0	0	0	0	1	0	0	0	1	1	1
Rhot1	0	0	0	0	1	0	0	0	1	1	1
Rhox2d	0	0	0	0	1	0	0	0	1	1	1

Rhox3f	0	0	0	0	1	0	0	0	1	1	1
Ribc2	0	0	0	0	1	0	0	0	1	1	1
Ric1	0	0	0	0	1	0	0	0	1	1	1
Ric8b	0	0	0	0	1	0	0	0	1	1	1
Rif1	0	0	0	0	1	0	0	0	1	1	1
Rims2	0	0	0	0	1	0	0	0	1	1	1
Riox2	0	0	0	0	1	0	0	0	1	1	1
Ripk1	0	0	0	0	1	0	0	0	1	1	1
Rit1	0	0	0	0	1	0	0	0	1	1	1
Rnaseh2b	0	0	0	0	1	0	0	0	1	1	1
Rnf114	0	0	0	0	1	0	0	0	1	1	1
Rnf123	0	0	0	0	1	0	0	0	1	1	1
Rnf144b	0	0	0	0	1	0	0	0	1	1	1
Rnf152	0	0	0	0	1	0	0	0	1	1	1
Rnf167	0	0	0	0	1	0	0	0	1	1	1
Rnf214	0	0	0	0	0	1	0	0	1	1	1
Rnf32	0	0	0	0	0	0	1	0	1	1	1
Rnf8	0	0	0	0	1	0	0	0	1	1	1
Rngtt	0	0	0	0	1	0	0	0	1	1	1
Rnpc3	0	0	0	0	1	0	0	0	1	1	1
Rnpepl1	0	0	0	0	1	0	0	0	1	1	1
Robo3	0	0	0	0	1	0	0	0	1	1	1
Ror2	0	0	0	0	1	0	0	0	1	1	1
Rp1	0	0	0	0	1	0	0	0	1	1	1
Rpap2	0	0	0	0	1	0	0	0	1	1	1
Rpgrip1	0	0	0	0	1	0	0	0	1	1	1
Rph3a	0	0	0	0	1	0	0	0	1	1	1
Rpl19	0	0	0	0	1	0	0	0	1	1	1
Rpl23	0	0	0	0	1	0	0	0	1	1	1
Rpl5	0	0	0	0	1	0	0	0	1	1	1
Rprd2	0	0	0	0	1	0	0	0	1	1	1
Rps29	0	0	0	0	1	0	0	0	1	1	1
Rps3	0	0	0	0	1	0	0	0	1	1	1

Rps6kc1	0	0	0	0	1	0	0	0	1	1	1
Rps7	0	0	0	0	1	0	0	0	1	1	1
Rps8	0	0	0	0	1	0	0	0	1	1	1
Rptn	0	0	0	0	1	0	0	0	1	1	1
Rptor	0	0	0	0	0	0	1	0	1	1	1
Rpusd3	0	0	0	0	1	0	0	0	1	1	1
Rrbp1	0	0	0	0	1	0	0	0	1	1	1
Rrs1	0	0	0	0	1	0	0	0	1	1	1
Rsad2	0	0	0	0	1	0	0	0	1	1	1
Rslcan18	0	0	0	0	0	0	1	0	1	1	1
Rspo3	0	0	0	0	1	0	0	0	1	1	1
Rtn3	0	0	0	0	1	0	0	0	1	1	1
Rtn4	0	0	0	0	1	0	0	0	1	1	1
Rubcn	0	0	0	0	1	0	0	0	1	1	1
Ryk	0	0	0	0	1	0	0	0	1	1	1
S1pr2	0	0	0	0	0	0	1	0	1	1	1
Sac3d1	0	0	0	0	1	0	0	0	1	1	1
Sacs	0	0	0	0	1	0	0	0	1	1	1
Sall2	0	0	0	0	1	0	0	0	1	1	1
Samd10	0	0	0	0	0	1	0	0	1	1	1
Samd3	0	0	0	0	1	0	0	0	1	1	1
Samd4	0	0	0	0	1	0	0	0	1	1	1
Samd7	0	0	0	0	1	0	0	0	1	1	1
Sap18b	0	0	0	0	1	0	0	0	1	1	1
Sardh	0	0	0	0	1	0	0	0	1	1	1
Sarm1	0	0	0	0	1	0	0	0	1	1	1
Sart3	0	0	0	0	1	0	0	0	1	1	1
Sass6	0	0	0	0	1	0	0	0	1	1	1
Satb2	0	0	0	0	1	0	0	0	1	1	1
Sbds	0	0	0	0	1	0	0	0	1	1	1
Sbf1	0	0	0	0	1	0	0	0	1	1	1
Sbf2	0	0	0	0	1	0	0	0	1	1	1
Sbk1	0	0	0	0	1	0	0	0	1	1	1

Sbk2	0	0	0	0	1	0	0	0	1	1	1
Sbsn	0	0	0	0	1	0	0	0	1	1	1
Scaf11	0	0	0	0	1	0	0	0	1	1	1
Scaf4	0	0	0	0	1	0	0	0	1	1	1
Scamp3	0	0	0	0	1	0	0	0	1	1	1
Scamp4	0	0	0	0	1	0	0	0	1	1	1
Scamp5	0	0	0	0	1	0	0	0	1	1	1
Scd2	0	0	0	0	1	0	0	0	1	1	1
Scly	0	0	0	0	1	0	0	0	1	1	1
Scn10a	0	0	0	0	0	1	0	0	1	1	1
Scn3a	0	0	0	0	1	0	0	0	1	1	1
Scn5a	0	0	0	0	1	0	0	0	1	1	1
Scn8a	0	0	0	0	1	0	0	0	1	1	1
Scnn1a	0	0	0	0	1	0	0	0	1	1	1
Sdc3	0	0	0	0	1	0	0	0	1	1	1
Sde2	0	0	0	0	1	0	0	0	1	1	1
Sdk2	0	0	0	0	1	0	0	0	1	1	1
Sdsl	0	0	0	0	1	0	0	0	1	1	1
Sec14l5	0	0	0	0	1	0	0	0	1	1	1
Sec16b	0	0	0	0	1	0	0	0	1	1	1
Sec24b	0	0	0	0	0	1	0	0	1	1	1
Sec31b	0	0	0	0	1	0	0	0	1	1	1
Sec63	0	0	0	0	0	1	0	0	1	1	1
Secisbp2l	0	0	0	0	1	0	0	0	1	1	1
Selenov	0	0	0	0	1	0	0	0	1	1	1
Selp	0	0	0	0	1	0	0	0	1	1	1
Selplg	0	0	0	0	1	0	0	0	1	1	1
Sema3b	0	0	0	0	1	0	0	0	1	1	1
Sema3c	0	0	0	0	1	0	0	0	1	1	1
Sema3g	0	0	0	0	1	0	0	0	1	1	1
Sema4f	0	0	0	0	1	0	0	0	1	1	1
Sema5b	0	0	0	0	1	0	0	0	1	1	1
Sema6a	0	0	0	0	1	0	0	0	1	1	1

Senp5	0	0	0	0	1	0	0	0	1	1	1
Senp8	0	0	0	0	1	0	0	0	1	1	1
Serbp1	0	0	0	0	0	0	1	0	1	1	1
Serpina11	0	0	0	0	1	0	0	0	1	1	1
Serpina1e	0	0	1	0	0	0	0	0	1	1	1
Serpina7	0	0	0	0	1	0	0	0	1	1	1
Serpinb11	0	0	0	0	1	0	0	0	1	1	1
Serpinb13	0	0	0	0	1	0	0	0	1	1	1
Serpinb3c	0	0	0	0	1	0	0	0	1	1	1
Serpinb3d	0	0	0	0	1	0	0	0	1	1	1
Serpinb6e	0	0	0	0	1	0	0	0	1	1	1
Serpinb9b	0	0	0	0	1	0	0	0	1	1	1
Serpinh1	0	0	0	0	1	0	0	0	1	1	1
Serpini2	0	0	0	0	1	0	0	0	1	1	1
Setd1b	0	0	0	0	1	0	0	0	1	1	1
Setd5	0	0	0	0	1	0	0	0	1	1	1
Sfmbt2	0	0	0	0	0	1	0	0	1	1	1
Sfswap	0	0	0	0	1	0	0	0	1	1	1
Sgpl1	0	0	0	0	0	0	1	0	1	1	1
Sgsm3	0	0	0	0	0	0	1	0	1	1	1
Sh2b2	0	0	0	0	1	0	0	0	1	1	1
Sh2b3	0	0	0	0	1	0	0	0	1	1	1
Sh2d2a	0	0	0	0	0	0	1	0	1	1	1
Sh3bp4	0	0	0	0	1	0	0	0	1	1	1
Sh3rf2	0	0	0	0	1	0	0	0	1	1	1
Sh3tc1	0	0	0	0	1	0	0	0	1	1	1
Sh3yl1	0	0	0	0	1	0	0	0	1	1	1
Shbg	0	0	0	0	1	0	0	0	1	1	1
Shkbp1	0	0	0	0	1	0	0	0	1	1	1
Shroom3	0	0	0	0	1	0	0	0	1	1	1
Shroom4	0	0	0	0	1	0	0	0	1	1	1
Shtn1	0	0	0	0	1	0	0	0	1	1	1
Siah1b	0	0	0	0	1	0	0	0	1	1	1

Sidt1	0	0	0	0	1	0	0	0	1	1	1
Siglec1	0	0	0	0	1	0	0	0	1	1	1
Siglec5	0	0	0	0	1	0	0	0	1	1	1
Sik3	0	0	0	0	1	0	0	0	1	1	1
Sin3b	0	0	0	0	1	0	0	0	1	1	1
Sipa1l2	0	0	0	0	1	0	0	0	1	1	1
Sipa1l3	0	0	0	0	1	0	0	0	1	1	1
Sirpb1b	0	0	0	0	1	0	0	0	1	1	1
Sirt3	0	0	0	0	1	0	0	0	1	1	1
Six5	0	0	0	0	1	0	0	0	1	1	1
Skor2	0	0	0	0	1	0	0	0	1	1	1
Slc10a4	0	0	0	0	1	0	0	0	1	1	1
Slc12a4	0	0	0	0	1	0	0	0	1	1	1
Slc12a7	0	0	0	0	1	0	0	0	1	1	1
Slc12a9	0	0	0	0	1	0	0	0	1	1	1
Slc14a2	0	0	0	0	1	0	0	0	1	1	1
Slc15a1	0	0	0	0	1	0	0	0	1	1	1
Slc15a2	0	0	0	0	1	0	0	0	1	1	1
Slc16a10	0	0	0	0	1	0	0	0	1	1	1
Slc17a3	0	0	0	0	0	0	1	0	1	1	1
Slc1a2	0	0	0	0	1	0	0	0	1	1	1
Slc20a1	0	0	0	0	1	0	0	0	1	1	1
Slc22a13b-	0	0	0	0	0	0	1	0	1	1	1
Slc22a15	0	0	0	0	1	0	0	0	1	1	1
Slc22a2	0	0	0	0	1	0	0	0	1	1	1
Slc22a23	0	0	0	0	1	0	0	0	1	1	1
Slc22a4	0	0	0	0	1	0	0	0	1	1	1
Slc25a11	0	0	0	0	1	0	0	0	1	1	1
Slc25a30	0	0	0	0	1	0	0	0	1	1	1
Slc26a3	0	0	0	0	1	0	0	0	1	1	1
Slc26a4	0	0	0	0	1	0	0	0	1	1	1
Slc26a6	0	0	0	0	1	0	0	0	1	1	1
Slc26a9	0	0	0	0	1	0	0	0	1	1	1

Slc27a2	0	0	0	0	1	0	0	0	1	1	1
Slc28a2	0	0	0	0	1	0	0	0	1	1	1
Slc29a3	0	0	0	0	1	0	0	0	1	1	1
Slc2a7	0	0	0	0	1	0	0	0	1	1	1
Slc34a2	0	0	0	0	1	0	0	0	1	1	1
Slc34a3	0	0	0	0	1	0	0	0	1	1	1
Slc35a5	0	0	0	0	1	0	0	0	1	1	1
Slc35b3	0	0	0	0	1	0	0	0	1	1	1
Slc36a3	0	0	0	0	0	0	1	0	1	1	1
Slc38a10	0	0	0	0	1	0	0	0	1	1	1
Slc38a6	0	0	0	0	1	0	0	0	1	1	1
Slc39a6	0	0	0	0	1	0	0	0	1	1	1
Slc39a8	0	0	0	0	1	0	0	0	1	1	1
Slc41a3	0	0	0	0	1	0	0	0	1	1	1
Slc44a5	0	0	0	0	1	0	0	0	1	1	1
Slc47a1	0	0	0	0	1	0	0	0	1	1	1
Slc4a1	0	0	0	0	1	0	0	0	1	1	1
Slc4a5	0	0	0	0	1	0	0	0	1	1	1
Slc4a9	0	0	0	0	1	0	0	0	1	1	1
Slc5a10	0	0	0	0	1	0	0	0	1	1	1
Slc5a5	0	0	0	0	1	0	0	0	1	1	1
Slc6a12	0	0	0	0	1	0	0	0	1	1	1
Slc6a7	0	0	0	0	1	0	0	0	1	1	1
Slc7a11	0	0	0	0	1	0	0	0	1	1	1
Slc7a13	0	0	0	0	1	0	0	0	1	1	1
Slc7a6	0	0	0	0	1	0	0	0	1	1	1
Slc8a3	0	0	0	0	1	0	0	0	1	1	1
Slc9b2	0	0	0	0	1	0	0	0	1	1	1
Slco1a4	0	0	0	0	1	0	0	0	1	1	1
Slf1	0	0	0	0	0	0	1	0	1	1	1
Slf2	0	0	0	0	1	0	0	0	1	1	1
Slfn14	0	0	0	0	0	1	0	0	1	1	1
Slitrk4	0	0	0	0	1	0	0	0	1	1	1

Slk	0	0	0	0	1	0	0	0	1	1	1
Slx1b	0	0	0	0	1	0	0	0	1	1	1
Smarca2	0	0	0	0	1	0	0	0	1	1	1
Smarca4	0	0	0	0	1	0	0	0	1	1	1
Smarcad1	0	0	0	0	1	0	0	0	1	1	1
Smarcal1	0	0	0	0	1	0	0	0	1	1	1
Smarcc1	0	0	0	0	1	0	0	0	1	1	1
Smarcd1	0	0	0	0	1	0	0	0	1	1	1
Smarcd2	0	0	0	0	1	0	0	0	1	1	1
Smc4	0	0	0	0	1	0	0	0	1	1	1
Smc5	0	0	0	0	1	0	0	0	1	1	1
Smg1	0	0	0	0	1	0	0	0	1	1	1
Smok2b	0	0	0	0	1	0	0	0	1	1	1
Smpd1	0	0	0	0	1	0	0	0	1	1	1
Smpd4	0	0	0	0	0	0	1	0	1	1	1
Smyd5	0	0	0	0	1	0	0	0	1	1	1
Snapc2	0	0	0	0	1	0	0	0	1	1	1
Snca	0	0	0	0	1	0	0	0	1	1	1
Snrnp48	0	0	0	0	1	0	0	0	1	1	1
Snrpd2	0	0	0	0	1	0	0	0	1	1	1
Snx19	0	0	0	0	1	0	0	0	1	1	1
Snx29	0	0	0	0	1	0	0	0	1	1	1
Snx4	0	0	0	0	1	0	0	0	1	1	1
Snx9	0	0	0	0	1	0	0	0	1	1	1
Sos2	0	0	0	0	1	0	0	0	1	1	1
Sowahd	0	0	0	0	1	0	0	0	1	1	1
Sox5	0	0	0	0	1	0	0	0	1	1	1
Sp110	0	0	0	0	1	0	0	0	1	1	1
Sp140	0	0	0	0	1	0	0	0	1	1	1
Sp7	0	0	0	0	1	0	0	0	1	1	1
Spag11	0	0	0	0	1	0	0	0	1	1	1
Spag16	0	0	0	0	0	0	1	0	1	1	1
Spag17	0	0	0	0	1	0	0	0	1	1	1

Spast	0	0	0	0	0	1	0	0	1	1	1
Spata17	0	0	0	0	1	0	0	0	1	1	1
Spata18	0	0	0	0	1	0	0	0	1	1	1
Spata19	0	0	0	0	1	0	0	0	1	1	1
Spata21	0	0	0	0	1	0	0	0	1	1	1
Spata2l	0	0	0	0	1	0	0	0	1	1	1
Spata31d1	0	0	0	0	1	0	0	0	1	1	1
Spata45	0	0	0	0	1	0	0	0	1	1	1
Spats2l	0	0	0	0	1	0	0	0	1	1	1
Speer4a	0	0	0	0	1	0	0	0	1	1	1
Speer4c	0	0	0	0	1	0	0	0	1	1	1
Spef2	0	0	0	0	1	0	0	0	1	1	1
Sphkap	0	0	0	0	1	0	0	0	1	1	1
Spidr	0	0	0	0	1	0	0	0	1	1	1
Spink10	0	0	0	0	0	0	1	0	1	1	1
Spon1	0	0	0	0	1	0	0	0	1	1	1
Sppl2a	0	0	0	0	1	0	0	0	1	1	1
Spred2	0	0	0	0	1	0	0	0	1	1	1
Sprn	0	0	0	0	1	0	0	0	1	1	1
Sptb	0	0	0	0	1	0	0	0	1	1	1
Sptlc1	0	0	0	0	1	0	0	0	1	1	1
Sptlc3	0	0	0	0	1	0	0	0	1	1	1
Sqor	0	0	0	0	1	0	0	0	1	1	1
Sra1	0	0	0	0	1	0	0	0	1	1	1
Srbd1	0	0	0	0	0	1	0	0	1	1	1
Srcap	0	0	0	0	1	0	0	0	1	1	1
Srcin1	0	0	0	0	1	0	0	0	1	1	1
Srfbp1	0	0	0	0	1	0	0	0	1	1	1
Srgap1	0	0	0	0	1	0	0	0	1	1	1
Srgap3	0	0	0	0	0	0	1	0	1	1	1
Srp72	0	0	0	0	1	0	0	0	1	1	1
Srpk1	0	0	0	0	0	0	1	0	1	1	1
Srpk3	0	0	0	0	0	0	1	0	1	1	1

Srrd	0	0	0	0	0	1	0	0	1	1	1
Srrm1	0	0	0	0	1	0	0	0	1	1	1
Srrt	0	0	0	0	1	0	0	0	1	1	1
Ssx2ip	0	0	0	0	1	0	0	0	1	1	1
Ssxb3	0	0	0	1	0	0	0	0	1	1	1
St3gal6	0	0	0	0	1	0	0	0	1	1	1
St5	0	0	0	0	1	0	0	0	1	1	1
St6gal2	0	0	0	0	1	0	0	0	1	1	1
St6galnac3	0	0	0	0	1	0	0	0	1	1	1
St6galnac5	0	0	0	0	1	0	0	0	1	1	1
St6galnac6	0	0	0	0	1	0	0	0	1	1	1
St8sia3	0	0	0	0	1	0	0	0	1	1	1
Stab1	0	0	0	0	1	0	0	0	1	1	1
Stab2	0	0	0	0	1	0	0	0	1	1	1
Stac3	0	0	0	0	1	0	0	0	1	1	1
Stag3	0	0	0	0	1	0	0	0	1	1	1
Stambpl1	0	0	0	0	1	0	0	0	1	1	1
Stap1	0	0	0	0	1	0	0	0	1	1	1
Stard3nl	0	0	0	0	1	0	0	0	1	1	1
Stard6	0	0	0	0	1	0	0	0	1	1	1
Stard8	0	0	0	0	1	0	0	0	1	1	1
Stard9	0	0	0	0	1	0	0	0	1	1	1
Stat2	0	0	0	0	1	0	0	0	1	1	1
Stau1	0	0	0	0	1	0	0	0	1	1	1
Stim1	0	0	0	0	1	0	0	0	1	1	1
Stim2	0	0	0	0	1	0	0	0	1	1	1
Stk24	0	0	0	0	1	0	0	0	1	1	1
Stk32c	0	0	0	0	1	0	0	0	1	1	1
Stn1	0	0	0	0	1	0	0	0	1	1	1
Ston2	0	0	0	0	1	0	0	0	1	1	1
Stox2	0	0	0	0	1	0	0	0	1	1	1
Stxbp5l	0	0	0	0	1	0	0	0	1	1	1
Styx	0	0	0	0	1	0	0	0	1	1	1

Suclg1	0	0	0	0	1	0	0	0	1	1	1
Suco	0	0	0	0	1	0	0	0	1	1	1
Sulf1	0	0	0	0	1	0	0	0	1	1	1
Sult1a1	0	0	0	0	1	0	0	0	1	1	1
Sult1e1	0	0	0	0	1	0	0	0	1	1	1
Sun2	0	0	0	0	1	0	0	0	1	1	1
Supv3l1	0	0	0	0	1	0	0	0	1	1	1
Sv2a	0	0	0	0	1	0	0	0	1	1	1
Svil	0	0	0	0	0	1	0	0	1	1	1
Sycp1	0	0	1	0	0	0	0	0	1	1	1
Sycp2	0	0	0	0	1	0	0	0	1	1	1
Syde2	0	0	0	0	0	1	0	0	1	1	1
Syndig1	0	0	0	0	1	0	0	0	1	1	1
Syne4	0	0	0	0	1	0	0	0	1	1	1
Synpo2	0	0	0	0	1	0	0	0	1	1	1
Sys1	0	0	0	0	1	0	0	0	1	1	1
Syt15	0	0	0	0	1	0	0	0	1	1	1
Syt16	0	0	0	0	1	0	0	0	1	1	1
Sytl1	0	0	0	0	1	0	0	0	1	1	1
Sytl2	0	0	0	0	1	0	0	0	1	1	1
Taar7b	0	0	0	0	0	1	0	0	1	1	1
Taar7e	0	0	0	0	1	0	0	0	1	1	1
Tacc3	0	0	0	0	1	0	0	0	1	1	1
Taf6l	0	0	0	0	1	0	0	0	1	1	1
Tagap1	0	0	0	0	1	0	0	0	1	1	1
Tal1	0	0	0	0	1	0	0	0	1	1	1
Tanc2	0	0	0	0	1	0	0	0	1	1	1
Tapbpl	0	0	0	0	1	0	0	0	1	1	1
Tarsl2	0	0	0	0	1	0	0	0	1	1	1
Tas2r110	0	0	0	0	1	0	0	0	1	1	1
Tas2r113	0	0	0	0	1	0	0	0	1	1	1
Tbc1d10b	0	0	0	0	1	0	0	0	1	1	1
Tbc1d12	0	0	0	0	1	0	0	0	1	1	1

Tbc1d13	0	0	0	0	1	0	0	0	1	1	1
Tbc1d22a	0	0	0	0	1	0	0	0	1	1	1
Tbc1d22b	0	0	0	0	1	0	0	0	1	1	1
Tbc1d31	0	0	0	0	1	0	0	0	1	1	1
Tbc1d32	0	0	0	0	1	0	0	0	1	1	1
Tbc1d8	0	0	0	0	1	0	0	0	1	1	1
Tbck	0	0	0	0	1	0	0	0	1	1	1
Tbr1	0	0	0	0	1	0	0	0	1	1	1
Tbx18	0	0	0	0	0	1	0	0	1	1	1
Tbx21	0	0	0	0	0	0	1	0	1	1	1
Tbx22	0	0	0	0	1	0	0	0	1	1	1
Tbx6	0	0	0	0	1	0	0	0	1	1	1
Tcaim	0	0	0	0	1	0	0	0	1	1	1
Tceal3	0	0	0	0	1	0	0	0	1	1	1
Tcf20	0	0	0	0	1	0	0	0	1	1	1
Tcp11x2	0	0	0	0	1	0	0	0	1	1	1
Tcrg-C1	0	0	0	0	1	0	0	0	1	1	1
Tdrd1	0	0	0	0	0	0	1	0	1	1	1
Tdrd6	0	0	0	0	1	0	0	0	1	1	1
Tecpr1	0	0	0	0	0	1	0	0	1	1	1
Tecrl	0	0	0	0	1	0	0	0	1	1	1
Tedc2	0	0	0	0	0	0	1	0	1	1	1
Teddm3	0	0	0	0	1	0	0	0	1	1	1
Tefm	0	0	0	0	1	0	0	0	1	1	1
Tek	0	0	0	0	0	1	0	0	1	1	1
Tenm3	0	0	0	0	1	0	0	0	1	1	1
Tenm4	0	0	0	0	0	1	0	0	1	1	1
Terb2	0	0	0	0	1	0	0	0	1	1	1
Terf1	0	0	0	0	0	1	0	0	1	1	1
Terf2	0	0	0	0	1	0	0	0	1	1	1
Tesk1	0	0	0	0	1	0	0	0	1	1	1
Tesk2	0	0	0	0	1	0	0	0	1	1	1
Tet1	0	0	0	0	1	0	0	0	1	1	1

Tet3	0	0	0	0	1	0	0	0	1	1	1
Tex13c3	0	0	0	0	1	0	0	0	1	1	1
Tex24	0	0	0	0	1	0	0	0	1	1	1
Tex29	0	0	0	0	1	0	0	0	1	1	1
Tex30	0	0	0	0	1	0	0	0	1	1	1
Tfap2a	0	0	0	0	1	0	0	0	1	1	1
Tfap2b	0	0	0	0	1	0	0	0	1	1	1
Tfec	0	0	0	0	0	0	1	0	1	1	1
Tfrc	0	0	0	0	1	0	0	0	1	1	1
Tgfbr3	0	0	0	0	1	0	0	0	1	1	1
Tgm6	0	0	0	0	1	0	0	0	1	1	1
Tgoln1	0	0	0	0	1	0	0	0	1	1	1
Thap3	0	0	0	0	0	0	1	0	1	1	1
Thbs2	0	0	0	0	1	0	0	0	1	1	1
Thnsl1	0	0	0	0	1	0	0	0	1	1	1
Thrap3	0	0	0	0	1	0	0	0	1	1	1
Thsd7a	0	0	0	0	0	1	0	0	1	1	1
Tiam1	0	0	0	0	1	0	0	0	1	1	1
Ticrr	0	0	0	0	1	0	0	0	1	1	1
Tigit	0	0	0	0	1	0	0	0	1	1	1
Timd4	0	0	0	0	0	1	0	0	1	1	1
Tle1	0	0	0	0	0	0	1	0	1	1	1
Tle6	0	0	0	0	1	0	0	0	1	1	1
Tln1	0	0	0	0	1	0	0	0	1	1	1
Tlr1	0	0	0	0	1	0	0	0	1	1	1
Tlr4	0	0	0	0	1	0	0	0	1	1	1
Tm4sf19	0	0	0	0	1	0	0	0	1	1	1
Tma16	0	0	0	0	1	0	0	0	1	1	1
Tmc1	0	0	0	0	1	0	0	0	1	1	1
Tmc4	0	0	0	0	0	0	1	0	1	1	1
Tmc5	0	0	0	0	1	0	0	0	1	1	1
Tmc7	1	0	0	0	0	0	0	0	1	1	1
Tmco6	0	0	0	0	0	1	0	0	1	1	1

Tmem116	0	0	0	0	1	0	0	0	1	1	1
Tmem132e	0	0	0	0	1	0	0	0	1	1	1
Tmem135	0	0	0	0	1	0	0	0	1	1	1
Tmem158	0	0	0	0	1	0	0	0	1	1	1
Tmem160	0	0	0	0	1	0	0	0	1	1	1
Tmem165	0	0	0	0	1	0	0	0	1	1	1
Tmem167b	0	0	0	0	1	0	0	0	1	1	1
Tmem173	0	0	0	0	1	0	0	0	1	1	1
Tmem182	0	0	0	0	1	0	0	0	1	1	1
Tmem184a	0	0	0	0	1	0	0	0	1	1	1
Tmem191c	0	0	0	0	1	0	0	0	1	1	1
Tmem198b	0	0	0	0	1	0	0	0	1	1	1
Tmem200a	0	0	0	0	1	0	0	0	1	1	1
Tmem215	0	0	0	0	1	0	0	0	1	1	1
Tmem245	0	0	0	0	1	0	0	0	1	1	1
Tmem248	0	0	0	0	1	0	0	0	1	1	1
Tmem41b	0	0	0	0	1	0	0	0	1	1	1
Tmem45b	0	0	0	0	1	0	0	0	1	1	1
Tmem55b	0	0	0	0	1	0	0	0	1	1	1
Tmem59l	0	0	0	0	1	0	0	0	1	1	1
Tmem63a	0	0	0	0	1	0	0	0	1	1	1
Tmem63b	0	0	0	0	1	0	0	0	1	1	1
Tmem68	0	0	0	0	1	0	0	0	1	1	1
Tmem71	0	0	0	0	1	0	0	0	1	1	1
Tmem86b	0	0	0	0	1	0	0	0	1	1	1
Tmem92	0	0	0	0	1	0	0	0	1	1	1
Tmpo	0	0	0	0	1	0	0	0	1	1	1
Tmprss15	0	0	0	0	1	0	0	0	1	1	1
Tmtc4	0	0	0	0	0	1	0	0	1	1	1
Tnfrsf1a	0	0	0	0	1	0	0	0	1	1	1
Tnfrsf21	0	0	0	0	1	0	0	0	1	1	1
Tnik	0	0	0	0	1	0	0	0	1	1	1
Tnip3	0	0	0	0	0	0	1	0	1	1	1

Tnk2	0	0	0	0	1	0	0	0	1	1	1
Tnpo1	0	0	0	0	1	0	0	0	1	1	1
Tnrc6b	0	0	0	0	1	0	0	0	1	1	1
Tnrc6c	0	0	0	0	1	0	0	0	1	1	1
Tns2	0	0	0	0	1	0	0	0	1	1	1
Tnxb	0	0	0	0	1	0	0	0	1	1	1
Togaram1	0	0	1	0	0	0	0	0	1	1	1
Tomm40l	0	0	0	0	1	0	0	0	1	1	1
Top1	0	0	0	0	1	0	0	0	1	1	1
Top2a	0	0	0	0	1	0	0	0	1	1	1
Top3a	0	0	0	0	1	0	0	0	1	1	1
Topbp1	0	0	0	0	1	0	0	0	1	1	1
Topors	0	0	0	0	1	0	0	0	1	1	1
Toporsl	0	0	0	0	1	0	0	0	1	1	1
Tox	0	0	0	0	1	0	0	0	1	1	1
Tox2	0	0	0	0	1	0	0	0	1	1	1
Tpgs2	0	0	0	0	1	0	0	0	1	1	1
Tpo	0	0	0	0	1	0	0	0	1	1	1
Tpp1	0	0	0	0	1	0	0	0	1	1	1
Tra2a	0	0	0	0	1	0	0	0	1	1	1
Traf3ip2	0	0	0	0	1	0	0	0	1	1	1
Traf7	0	0	0	0	1	0	0	0	1	1	1
Traj12	0	0	0	0	1	0	0	0	1	1	1
Traj53	0	0	0	0	1	0	0	0	1	1	1
Trappc10	0	0	0	0	1	0	0	0	1	1	1
Trappc3l	0	0	0	0	1	0	0	0	1	1	1
Trappc9	0	0	0	0	1	0	0	0	1	1	1
Trav16	0	0	0	0	1	0	0	0	1	1	1
Trav2	0	0	0	0	0	0	1	0	1	1	1
Trav3-3	0	0	0	0	1	0	0	0	1	1	1
Trbd1	0	0	0	0	1	0	0	0	1	1	1
Trbv15	0	0	0	0	1	0	0	0	1	1	1
Trbv31	0	0	0	0	0	1	0	0	1	1	1

Trcg1	0	0	0	0	1	0	0	0	1	1	1
Trhr	0	0	0	0	1	0	0	0	1	1	1
Trhr2	0	0	0	0	1	0	0	0	1	1	1
Tril	0	0	0	0	1	0	0	0	1	1	1
Trim26	0	0	0	0	1	0	0	0	1	1	1
Trim30c	0	0	0	0	0	1	0	0	1	1	1
Trim39	0	0	0	0	1	0	0	0	1	1	1
Trim41	0	0	0	0	1	0	0	0	1	1	1
Trim45	0	0	0	0	1	0	0	0	1	1	1
Trim50	0	0	0	0	1	0	0	0	1	1	1
Trim65	0	0	0	0	1	0	0	0	1	1	1
Trim66	0	0	0	0	1	0	0	0	1	1	1
Trim71	0	0	0	0	1	0	0	0	1	1	1
Trio	0	0	0	0	1	0	0	0	1	1	1
Triobp	0	0	0	0	1	0	0	0	1	1	1
Trip11	0	0	0	0	1	0	0	0	1	1	1
Trmt2a	0	0	0	0	1	0	0	0	1	1	1
Troap	0	0	0	0	1	0	0	0	1	1	1
Trp53inp2	0	0	0	0	1	0	0	0	1	1	1
Trpc6	0	0	0	0	1	0	0	0	1	1	1
Trpm1	0	0	0	0	1	0	0	0	1	1	1
Trpm4	0	0	0	0	1	0	0	0	1	1	1
Try5	0	0	0	0	1	0	0	0	1	1	1
Tsc2	0	0	0	0	1	0	0	0	1	1	1
Tsc22d1	0	0	0	0	1	0	0	0	1	1	1
Tsen2	0	0	0	0	1	0	0	0	1	1	1
Tsnax	0	0	0	0	1	0	0	0	1	1	1
Tsnaxip1	0	0	0	0	1	0	0	0	1	1	1
Tspan31	0	0	0	0	1	0	0	0	1	1	1
Tspan4	0	0	0	0	0	0	1	0	1	1	1
Tspan8	0	0	0	0	1	0	0	0	1	1	1
Tspyl2	0	0	0	0	1	0	0	0	1	1	1
Tspyl3	0	0	0	0	1	0	0	0	1	1	1

Tssc4	0	0	0	0	1	0	0	0	1	1	1
Tstd3	0	0	0	0	1	0	0	0	1	1	1
Ttc19	0	0	0	0	1	0	0	0	1	1	1
Ttc23	0	0	0	0	1	0	0	0	1	1	1
Ttc28	0	0	0	0	1	0	0	0	1	1	1
Ttc30b	0	0	0	0	1	0	0	0	1	1	1
Ttc34	0	0	0	0	1	0	0	0	1	1	1
Ttc39b	0	0	0	0	1	0	0	0	1	1	1
Ttc4	0	0	0	0	1	0	0	0	1	1	1
Ttc8	0	0	0	0	0	1	0	0	1	1	1
Ttf1	0	0	0	0	1	0	0	0	1	1	1
Tti1	0	0	0	0	1	0	0	0	1	1	1
Ttll6	0	0	0	0	1	0	0	0	1	1	1
Ttpa	0	0	0	0	1	0	0	0	1	1	1
Tuba8	0	0	0	0	1	0	0	0	1	1	1
Tubb4b	0	0	0	0	1	0	0	0	1	1	1
Tuft1	0	0	0	0	1	0	0	0	1	1	1
Tulp2	0	0	0	0	1	0	0	0	1	1	1
Tulp4	0	0	0	0	1	0	0	0	1	1	1
Txndc11	0	0	0	0	1	0	0	0	1	1	1
Txndc16	0	0	0	0	1	0	0	0	1	1	1
Txnrd3	0	0	0	0	1	0	0	0	1	1	1
Tyk2	0	0	0	0	1	0	0	0	1	1	1
U2surp	0	0	0	0	1	0	0	0	1	1	1
Uaca	0	0	0	0	1	0	0	0	1	1	1
Ube2e2	0	0	0	0	1	0	0	0	1	1	1
Ube2u	0	0	0	0	1	0	0	0	1	1	1
Ube3b	0	0	0	0	0	0	1	0	1	1	1
Ube3c	0	0	0	0	1	0	0	0	1	1	1
Ubfd1	0	0	0	0	1	0	0	0	1	1	1
Ubqln3	0	0	0	0	1	0	0	0	1	1	1
Ubr3	0	0	0	0	1	0	0	0	1	1	1
Ubxn10	0	0	0	0	1	0	0	0	1	1	1

Ubxn11	0	0	0	0	1	0	0	0	1	1	1
Ubxn2a	0	0	0	0	1	0	0	0	1	1	1
Ufl1	0	0	0	0	1	0	0	0	1	1	1
Ugt1a1	0	0	0	0	1	0	0	0	1	1	1
Ugt2b38	0	0	0	0	1	0	0	0	1	1	1
Ugt3a2	0	0	0	0	1	0	0	0	1	1	1
Uhrf1	0	0	0	0	1	0	0	0	1	1	1
Uhrf1bp1l	0	0	0	0	1	0	0	0	1	1	1
Ulk4	0	0	0	0	1	0	0	0	1	1	1
Umps	0	0	0	0	1	0	0	0	1	1	1
Unc13a	0	0	0	0	1	0	0	0	1	1	1
Unc13c	0	0	0	0	1	0	0	0	1	1	1
Unc13d	0	0	0	0	1	0	0	0	1	1	1
Unc5d	0	0	0	0	1	0	0	0	1	1	1
Upf2	0	0	0	0	1	0	0	0	1	1	1
Upk3a	0	0	0	0	1	0	0	0	1	1	1
Upp2	0	0	0	0	1	0	0	0	1	1	1
Uprt	0	0	0	0	1	0	0	0	1	1	1
Urgcp	0	0	0	0	1	0	0	0	1	1	1
Uros	0	0	0	0	1	0	0	0	1	1	1
Ush1c	0	0	0	0	1	0	0	0	1	1	1
Usp1	0	0	0	0	1	0	0	0	1	1	1
Usp10	0	0	0	0	1	0	0	0	1	1	1
Usp11	0	0	0	0	1	0	0	0	1	1	1
Usp12	0	0	0	0	0	0	1	0	1	1	1
Usp17la	0	0	0	0	1	0	0	0	1	1	1
Usp17lc	0	0	0	0	1	0	0	0	1	1	1
Usp17ld	0	0	0	0	0	1	0	0	1	1	1
Usp21	0	0	0	0	1	0	0	0	1	1	1
Usp24	0	0	0	0	0	0	1	0	1	1	1
Usp26	0	0	0	0	1	0	0	0	1	1	1
Usp29	0	0	0	0	1	0	0	0	1	1	1
Usp32	0	0	0	0	1	0	0	0	1	1	1

Usp48	0	0	0	0	1	0	0	0	1	1	1
Usp9y	0	0	0	0	1	0	0	0	1	1	1
Uspl1	0	0	0	0	1	0	0	0	1	1	1
Utp6	0	0	0	0	1	0	0	0	1	1	1
Vamp4	0	0	0	0	1	0	0	0	1	1	1
Vars2	0	0	0	0	1	0	0	0	1	1	1
Vasp	0	0	0	0	1	0	0	0	1	1	1
Vav3	0	0	0	0	1	0	0	0	1	1	1
Vcpip1	0	0	0	0	1	0	0	0	1	1	1
Vdac2	0	0	0	0	1	0	0	0	1	1	1
Vegfd	0	0	0	0	1	0	0	0	1	1	1
Vldlr	0	0	0	0	1	0	0	0	1	1	1
Vmn1r192	0	0	0	0	1	0	0	0	1	1	1
Vmn1r2	0	0	0	0	1	0	0	0	1	1	1
Vmn1r200	0	0	0	0	1	0	0	0	1	1	1
Vmn1r201	0	0	0	0	1	0	0	0	1	1	1
Vmn1r23	0	0	0	0	1	0	0	0	1	1	1
Vmn1r232	0	0	0	0	0	1	0	0	1	1	1
Vmn1r27	0	0	0	0	1	0	0	0	1	1	1
Vmn1r30	0	0	0	0	1	0	0	0	1	1	1
Vmn1r35	0	0	0	0	1	0	0	0	1	1	1
Vmn1r36	0	0	0	0	1	0	0	0	1	1	1
Vmn1r38	0	0	0	0	1	0	0	0	1	1	1
Vmn1r48	0	0	0	0	1	0	0	0	1	1	1
Vmn1r6	0	0	0	0	1	0	0	0	1	1	1
Vmn1r67	0	0	0	0	1	0	0	0	1	1	1
Vmn1r73	0	0	0	0	1	0	0	0	1	1	1
Vmn1r87	0	0	0	0	1	0	0	0	1	1	1
Vmn2r100	0	0	0	0	1	0	0	0	1	1	1
Vmn2r108	0	0	0	0	1	0	0	0	1	1	1
Vmn2r109	0	0	0	0	1	0	0	0	1	1	1
Vmn2r110	0	0	0	0	1	0	0	0	1	1	1
Vmn2r112	0	0	0	0	1	0	0	0	1	1	1

Vmn2r115	0	0	0	0	1	0	0	0	1	1	1
Vmn2r116	0	0	0	0	1	0	0	0	1	1	1
Vmn2r15	0	0	0	0	1	0	0	0	1	1	1
Vmn2r2	0	0	0	0	1	0	0	0	1	1	1
Vmn2r25	0	0	0	0	1	0	0	0	1	1	1
Vmn2r28	0	0	0	0	1	0	0	0	1	1	1
Vmn2r29	0	0	0	0	1	0	0	0	1	1	1
Vmn2r30	0	0	0	0	1	0	0	0	1	1	1
Vmn2r31	0	0	0	0	1	0	0	0	1	1	1
Vmn2r34	0	0	0	0	0	1	0	0	1	1	1
Vmn2r38	0	0	0	0	1	0	0	0	1	1	1
Vmn2r39	0	0	0	0	1	0	0	0	1	1	1
Vmn2r52	0	0	0	0	1	0	0	0	1	1	1
Vmn2r54	0	0	0	0	1	0	0	0	1	1	1
Vmn2r61	0	0	0	0	1	0	0	0	1	1	1
Vmn2r63	0	0	0	0	1	0	0	0	1	1	1
Vmn2r65	0	0	0	0	1	0	0	0	1	1	1
Vmn2r7	0	0	0	0	1	0	0	0	1	1	1
Vmn2r70	0	0	0	0	1	0	0	0	1	1	1
Vmn2r74	0	0	0	0	1	0	0	0	1	1	1
Vmn2r78	0	0	0	0	1	0	0	0	1	1	1
Vmn2r80	0	0	0	0	0	1	0	0	1	1	1
Vmn2r84	0	0	0	0	1	0	0	0	1	1	1
Vmn2r89	0	0	0	0	1	0	0	0	1	1	1
Vmn2r90	0	0	0	0	1	0	0	0	1	1	1
Vmn2r91	0	0	0	0	1	0	0	0	1	1	1
Vps11	0	0	0	0	1	0	0	0	1	1	1
Vps13d	0	0	0	0	1	0	0	0	1	1	1
Vps33b	0	0	0	0	1	0	0	0	1	1	1
Vps37b	0	0	0	0	1	0	0	0	1	1	1
Vps39	0	0	0	0	1	0	0	0	1	1	1
Vps54	0	0	0	0	1	0	0	0	1	1	1
Vsx1	0	0	0	0	1	0	0	0	1	1	1

Vtcn1	0	0	0	0	1	0	0	0	1	1	1
Vwa1	0	0	0	0	1	0	0	0	1	1	1
Vwa3a	0	0	0	0	1	0	0	0	1	1	1
Wapl	0	0	0	0	0	1	0	0	1	1	1
Wasf1	0	0	0	0	0	1	0	0	1	1	1
Wasf3	0	0	0	0	1	0	0	0	1	1	1
Washc1	0	0	0	0	1	0	0	0	1	1	1
Washc2	0	0	0	0	1	0	0	0	1	1	1
Wbp11	0	0	0	0	1	0	0	0	1	1	1
Wbp2	0	0	0	0	1	0	0	0	1	1	1
Wdfy4	0	0	0	0	1	0	0	0	1	1	1
Wdhd1	0	0	0	0	1	0	0	0	1	1	1
Wdr34	0	0	0	0	1	0	0	0	1	1	1
Wdr38	0	0	0	0	1	0	0	0	1	1	1
Wdr47	0	0	0	0	0	0	1	0	1	1	1
Wdr53	0	0	0	0	1	0	0	0	1	1	1
Wdr6	0	0	0	0	1	0	0	0	1	1	1
Wdr66	0	0	0	0	1	0	0	0	1	1	1
Wdr76	0	0	0	0	1	0	0	0	1	1	1
Wdr81	0	0	0	0	1	0	0	0	1	1	1
Wdr89	0	0	0	0	1	0	0	0	1	1	1
Wdr91	0	0	0	0	1	0	0	0	1	1	1
Wdr93	0	0	0	0	0	0	1	0	1	1	1
Wee1	0	0	0	0	1	0	0	0	1	1	1
Wipf2	0	0	0	0	1	0	0	0	1	1	1
Wls	0	0	0	0	0	1	0	0	1	1	1
Wnk1	0	0	0	0	1	0	0	0	1	1	1
Wnt1	0	0	0	0	1	0	0	0	1	1	1
Wnt7b	0	0	0	0	0	1	0	0	1	1	1
Wwc2	0	0	0	0	1	0	0	0	1	1	1
Wwp1	0	0	0	0	1	0	0	0	1	1	1
Xiap	0	0	0	0	0	1	0	0	1	1	1
Xk	0	0	0	0	1	0	0	0	1	1	1

Xkr4	0	0	0	0	0	1	0	0	1	1	1
Xkr8	0	0	0	0	1	0	0	0	1	1	1
Xntrpc	0	0	0	0	1	0	0	0	1	1	1
Xpc	0	0	0	0	1	0	0	0	1	1	1
Xpnpep3	0	0	0	0	1	0	0	0	1	1	1
Xpo4	0	0	0	0	1	0	0	0	1	1	1
Xylb	0	0	0	0	1	0	0	0	1	1	1
Xylt1	0	0	0	0	0	1	0	0	1	1	1
Yars	0	0	0	0	1	0	0	0	1	1	1
Ythdc1	0	0	0	0	0	0	1	0	1	1	1
Ythdc2	0	0	0	0	1	0	0	0	1	1	1
Ythdf2	0	0	0	0	0	1	0	0	1	1	1
Zan	0	0	0	0	1	0	0	0	1	1	1
Zbtb39	0	0	0	0	1	0	0	0	1	1	1
Zbtb40	0	0	0	0	1	0	0	0	1	1	1
Zbtb41	0	0	0	0	1	0	0	0	1	1	1
Zbtb8a	0	0	0	0	1	0	0	0	1	1	1
Zbtb8b	0	0	0	0	1	0	0	0	1	1	1
Zbtb9	0	0	0	0	1	0	0	0	1	1	1
Zc3h3	0	0	0	0	1	0	0	0	1	1	1
Zc3hav1	0	0	0	0	1	0	0	0	1	1	1
Zdhhc16	0	0	0	0	1	0	0	0	1	1	1
Zdhhc18	0	0	0	0	1	0	0	0	1	1	1
Zfand4	0	0	0	0	1	0	0	0	1	1	1
Zfhx3	0	0	0	0	1	0	0	0	1	1	1
Zfhx4	0	0	0	0	1	0	0	0	1	1	1
Zfp101	0	0	0	0	1	0	0	0	1	1	1
Zfp106	0	0	0	0	1	0	0	0	1	1	1
Zfp128	0	0	0	0	1	0	0	0	1	1	1
Zfp13	0	0	0	0	1	0	0	0	1	1	1
Zfp142	0	0	0	0	1	0	0	0	1	1	1
Zfp202	0	0	0	0	1	0	0	0	1	1	1
Zfp212	0	0	0	0	1	0	0	0	1	1	1

Zfp281	0	0	0	0	1	0	0	0	1	1	1
Zfp318	0	0	0	0	1	0	0	0	1	1	1
Zfp345	0	0	0	0	1	0	0	0	1	1	1
Zfp354b	0	0	0	0	1	0	0	0	1	1	1
Zfp36	0	0	0	0	1	0	0	0	1	1	1
Zfp366	0	0	0	0	1	0	0	0	1	1	1
Zfp36l3	0	0	0	0	1	0	0	0	1	1	1
Zfp385c	0	0	0	0	1	0	0	0	1	1	1
Zfp407	0	0	0	0	1	0	0	0	1	1	1
Zfp42	0	0	0	0	1	0	0	0	1	1	1
Zfp426	0	0	0	0	1	0	0	0	1	1	1
Zfp428	0	0	0	0	1	0	0	0	1	1	1
Zfp438	0	0	0	0	1	0	0	0	1	1	1
Zfp472	0	0	0	0	1	0	0	0	1	1	1
Zfp474	0	0	0	0	0	1	0	0	1	1	1
Zfp512b	0	0	0	0	1	0	0	0	1	1	1
Zfp516	0	0	0	0	1	0	0	0	1	1	1
Zfp574	0	0	0	0	1	0	0	0	1	1	1
Zfp61	0	0	0	0	1	0	0	0	1	1	1
Zfp638	0	0	0	0	1	0	0	0	1	1	1
Zfp64	0	0	0	0	1	0	0	0	1	1	1
Zfp652	0	0	0	0	1	0	0	0	1	1	1
Zfp687	0	0	0	0	1	0	0	0	1	1	1
Zfp775	0	0	0	0	1	0	0	0	1	1	1
Zfp787	0	0	0	0	1	0	0	0	1	1	1
Zfp804a	0	0	0	0	1	0	0	0	1	1	1
Zfp821	0	0	0	0	1	0	0	0	1	1	1
Zfp831	0	0	0	0	1	0	0	0	1	1	1
Zfp839	0	0	0	0	1	0	0	0	1	1	1
Zfp87	0	0	0	0	1	0	0	0	1	1	1
Zfp874a	0	0	0	0	1	0	0	0	1	1	1
Zfp978	0	0	0	0	1	0	0	0	1	1	1
Zfp981	0	0	0	0	1	0	0	0	1	1	1

Zfr	0	0	0	0	1	0	0	0	1	1	1
Zfy1	0	0	0	0	1	0	0	0	1	1	1
Zfyve1	0	0	0	0	1	0	0	0	1	1	1
Zic1	0	0	0	0	1	0	0	0	1	1	1
Zic4	0	0	0	0	1	0	0	0	1	1	1
Zkscan3	0	0	0	0	1	0	0	0	1	1	1
Zkscan4	0	0	0	0	1	0	0	0	1	1	1
Zkscan7	0	0	0	0	1	0	0	0	1	1	1
Zmym1	0	0	0	0	1	0	0	0	1	1	1
Znfx1	0	0	0	0	1	0	0	0	1	1	1
Znhit6	1	0	0	0	0	0	0	0	1	1	1
Zscan10	0	0	0	0	1	0	0	0	1	1	1
Zscan22	0	0	0	0	1	0	0	0	1	1	1
Zyx	0	0	0	0	1	0	0	0	1	1	1
Zzz3	0	0	0	0	1	0	0	0	1	1	1

DO	p_val_FET	p_val_adj	n_genes	genes_mutated
breast cancer	0.000829497	0.099947882	7	Apc,Bard1,Brca1,Cav1,Erbb2,Pik3ca,Trp53
osteogenesis imperfecta type 3	0.001030391	0.099947882	3	Col1a1,Col1a2,Smpd3
urinary bladder cancer	0.001030391	0.099947882	3	Ctnnb1,Ncstn,Pten
aceruloplasminemia	0.101045461	0.162454305	1	Cp
achondrogenesis type IA	0.101045461	0.162454305	1	Trip11
achondrogenesis type II	0.101045461	0.162454305	1	Col2a1
acute lymphocytic leukemia	0.00880707	0.162454305	3	Kmt2a,Notch3,Pten
age related macular degeneration 4	0.101045461	0.162454305	1	Cfh
age related macular degeneration 9	0.101045461	0.162454305	1	C3
aggressive periodontitis	0.101045461	0.162454305	1	Postn
Alstrom syndrome	0.101045461	0.162454305	1	Alms1
arrhythmogenic right ventricular dysplasia 12	0.101045461	0.162454305	1	Jup
asphyxiating thoracic dystrophy 1	0.101045461	0.162454305	1	Ift140
astrocytoma	0.101045461	0.162454305	1	Hras
autism spectrum disorder	0.00520876	0.162454305	4	Chd8,Gabrb3,Grin1,Slc9a9
autistic disorder	0.033646487	0.162454305	9	Arhgap32,Cadps2,Ctnnb1,Gabrb3,Nbea,Nrp2,Pten,Shank2,Shank
autosomal dominant auditory neuropathy 1	0.101045461	0.162454305	1	Diaph3
autosomal dominant keratitis-ichthyosis-deafness syndrome	0.101045461	0.162454305	1	Gjb2
autosomal dominant nonsyndromic deafness 13	0.101045461	0.162454305	1	Col11a2
autosomal dominant Parkinson's disease 8	0.101045461	0.162454305	1	Lrrk2
autosomal recessive limb-girdle muscular dystrophy type 2B	0.101045461	0.162454305	1	Dysf
autosomal recessive nonsyndromic deafness	0.101045461	0.162454305	1	Atp6v1b1
autosomal recessive nonsyndromic deafness 2	0.101045461	0.162454305	1	Myo7a
autosomal recessive nonsyndromic deafness 3	0.101045461	0.162454305	1	Myo15
autosomal recessive spinocerebellar ataxia 16	0.101045461	0.162454305	1	Stub1
Axenfeld-Rieger syndrome type 3	0.101045461	0.162454305	1	Bmp4
Bannayan-Riley-Ruvalcaba syndrome	0.101045461	0.162454305	1	Pten
Bardet-Biedl syndrome 10	0.101045461	0.162454305	1	Bbs10
Bardet-Biedl syndrome 6	0.101045461	0.162454305	1	Mkks
basal cell carcinoma	0.101045461	0.162454305	1	Ptch1
benign neonatal seizures	0.010205888	0.162454305	2	Kcnq2,Kcnq3
biotinidase deficiency	0.101045461	0.162454305	1	Btd
brain disease	0.101045461	0.162454305	1	Pten
Brugada syndrome 7	0.101045461	0.162454305	1	Scn3b
CADASIL 1	0.101045461	0.162454305	1	Notch3
campomelic dysplasia	0.101045461	0.162454305	1	Sox9
Camurati-Engelmann disease	0.101045461	0.162454305	1	Mitf
carnitine palmitoyltransferase I deficiency	0.101045461	0.162454305	1	Cpt1a
cataract 1 multiple types	0.101045461	0.162454305	1	Gja8
cataract 4 multiple types	0.101045461	0.162454305	1	Crygd
cerebellar ataxia	0.101045461	0.162454305	1	Cacna1a
cerebral cavernous malformation 3	0.101045461	0.162454305	1	Pdcd10
Charcot-Marie-Tooth disease axonal type 2O	0.101045461	0.162454305	1	Dync1h1
Charcot-Marie-Tooth disease type 2A1	0.101045461	0.162454305	1	Kif1b
Charcot-Marie-Tooth disease type 4D	0.101045461	0.162454305	1	Ndrg1
CHARGE syndrome	0.028556883	0.162454305	2	Chd2,Trp53
childhood electroclinical syndrome	0.101045461	0.162454305	1	Cacna1a
cleft palate-lateral synechia syndrome	0.101045461	0.162454305	1	Bmp4
CLOVES syndrome	0.101045461	0.162454305	1	Pik3ca
Coffin-Siris syndrome	0.101045461	0.162454305	1	Arid1a
complement component 3 deficiency	0.101045461	0.162454305	1	C3
cone-rod dystrophy 3	0.101045461	0.162454305	1	Abca4
cone-rod dystrophy 9	0.101045461	0.162454305	1	Adam9
congenital disorder of glycosylation type II	0.101045461	0.162454305	1	Mgat2
congenital myasthenic syndrome 9	0.101045461	0.162454305	1	Musk
congenital stationary night blindness 1D	0.101045461	0.162454305	1	Slc24a1
congenital stationary night blindness 2A	0.101045461	0.162454305	1	Cacna1f
Costello syndrome	0.101045461	0.162454305	1	Hras
Cowden syndrome	0.101045461	0.162454305	1	Pten
craniofrontonasal syndrome	0.101045461	0.162454305	1	Efnb1
cutis laxa	0.028556883	0.162454305	2	Fbln5,Ltbp4
cystic kidney disease	0.008630401	0.162454305	4	Cep290,Robo1,Slit2,Ttc21b
diffuse large B-cell lymphoma	0.101045461	0.162454305	1	Trp53
dilated cardiomyopathy 1HH	0.101045461	0.162454305	1	Bag3
distal arthrogryposis	0.028556883	0.162454305	2	Ecel1,Fbn2
distal muscular dystrophy	0.101045461	0.162454305	1	Dysf
Duane-radial ray syndrome	0.101045461	0.162454305	1	Sall4
dyskeratosis congenita	0.028556883	0.162454305	2	Dkc1,Trp53
endometrial cancer	0.053304158	0.162454305	2	Pten,Trp53
enlarged vestibular aqueduct	0.101045461	0.162454305	1	Atp6v1b1
epidermal appendage tumor	0.101045461	0.162454305	1	Tmem207
epilepsy	0.071957457	0.162454305	3	Bsn,Cacna2d2,Cdyl
episodic ataxia type 2	0.101045461	0.162454305	1	Cacna1a
factor XI deficiency	0.101045461	0.162454305	1	F11
familial adenomatous polyposis	0.101045461	0.162454305	1	Apc
familial hemiplegic migraine	0.101045461	0.162454305	1	Cacna1a
Fraser syndrome	0.053304158	0.162454305	2	Frem2,Grip1
generalized dystonia	0.101045461	0.162454305	1	Cacna1a
glioblastoma multiforme	0.101045461	0.162454305	1	Trp53
granulosa cell tumor	0.101045461	0.162454305	1	Ctnnb1
Griscelli syndrome type 1	0.101045461	0.162454305	1	Myo5a
growth hormone secreting pituitary adenoma	0.101045461	0.162454305	1	Men1
heart disease	0.101045461	0.162454305	1	Fbn1
hemolytic-uremic syndrome	0.010205888	0.162454305	2	C3,Cfh
hepatocellular carcinoma	0.057298108	0.162454305	4	Apc,Foxm1,Pten,Uaca
hereditary neutrophilia	0.101045461	0.162454305	1	Csf3r
hereditary sensory and autonomic neuropathy type 6	0.101045461	0.162454305	1	Dst
hereditary spastic paraplegia 11	0.101045461	0.162454305	1	Spg11

hereditary spastic paraplegia 13	0.101045461	0.162454305	1	Hspd1
hereditary spastic paraplegia 15	0.101045461	0.162454305	1	Zfyve26
hereditary spastic paraplegia 30	0.101045461	0.162454305	1	Kif1a
hereditary spherocytosis type 1	0.053304158	0.162454305	2	Add2,Ank1
Hermansky-Pudlak syndrome 5	0.101045461	0.162454305	1	Hps5
holoprosencephaly 11	0.101045461	0.162454305	1	Cdon
Huntington's disease	0.00880707	0.162454305	3	Htt,Zdhhc13,Zdhhc17
hypopituitarism	0.053304158	0.162454305	2	Lhx3,Smpd3
ichthyosis vulgaris	0.101045461	0.162454305	1	Lbr
IGSF1 deficiency syndrome	0.101045461	0.162454305	1	Igsf1
infantile myofibromatosis	0.101045461	0.162454305	1	Pdgfrb
inflammatory bowel disease 12	0.101045461	0.162454305	1	Gnai2
isolated anhidrosis with normal sweat glands	0.101045461	0.162454305	1	Itpr2
Joubert syndrome 26	0.101045461	0.162454305	1	D430042O09Rik
Joubert syndrome 5	0.101045461	0.162454305	1	Cep290
Joubert syndrome 7	0.101045461	0.162454305	1	Rpgrip1l
junctional epidermolysis bullosa	0.101045461	0.162454305	1	Lama3
junctional epidermolysis bullosa non-Herlitz type	0.082968883	0.162454305	2	Lama3,Lamc2
karyomegalic interstitial nephritis	0.101045461	0.162454305	1	Fan1
Lambert-Eaton myasthenic syndrome	0.101045461	0.162454305	1	Cacna1a
Laron syndrome	0.101045461	0.162454305	1	Ghr
Leber congenital amaurosis 10	0.101045461	0.162454305	1	Cep290
Li-Fraumeni syndrome	0.101045461	0.162454305	1	Trp53
long QT syndrome 1	0.101045461	0.162454305	1	Kcnq1
lung cancer	0.082968883	0.162454305	2	Foxm1,Robo1
macrocephaly-autism syndrome	0.101045461	0.162454305	1	Pten
malignant glioma	0.101045461	0.162454305	1	Hras
meconium aspiration syndrome	0.101045461	0.162454305	1	Atf2
medium chain acyl-CoA dehydrogenase deficiency	0.101045461	0.162454305	1	Acadm
mitral valve prolapse	0.101045461	0.162454305	1	Dchs1
mosaic variegated aneuploidy syndrome 1	0.101045461	0.162454305	1	Bub1b
mucopolysaccharidosis VI	0.101045461	0.162454305	1	Arsb
mulibrey nanism	0.101045461	0.162454305	1	Trim37
multiple endocrine neoplasia type 1	0.101045461	0.162454305	1	Men1
myelodysplastic/myeloproliferative neoplasm	0.101045461	0.162454305	1	Dido1
myeloproliferative neoplasm	0.101045461	0.162454305	1	Pdgfrb
nephrosis	0.101045461	0.162454305	1	Lamb2
nevoid basal cell carcinoma syndrome	0.010205888	0.162454305	2	Ptch1,Sufu
Noonan syndrome 5	0.101045461	0.162454305	1	Raf1
ocular albinism with sensorineural deafness	0.101045461	0.162454305	1	Mitf
orofaciodigital syndrome I	0.101045461	0.162454305	1	Ofd1
osteochondrodysplasia	0.101045461	0.162454305	1	Atf2
osteogenesis imperfecta	0.028556883	0.162454305	2	Col1a2,Smpd3
osteogenesis imperfecta type 1	0.101045461	0.162454305	1	Col1a1
osteogenesis imperfecta type 2	0.010205888	0.162454305	2	Col1a1,Smpd3
osteogenesis imperfecta type 4	0.101045461	0.162454305	1	Col1a1
osteoporosis-pseudoglioma syndrome	0.101045461	0.162454305	1	Lrp5
osteosarcoma	0.101045461	0.162454305	1	Trp53
otospondylomegaepiphyseal dysplasia	0.101045461	0.162454305	1	Col11a2
ovarian cancer	0.010205888	0.162454305	2	Apc,Ctnnb1
Parkinson's disease 17	0.101045461	0.162454305	1	Vps35
Pelger-Huet anomaly	0.101045461	0.162454305	1	Lbr
peripheral T-cell lymphoma	0.101045461	0.162454305	1	Rc3h1
photosensitive trichothiodystrophy	0.101045461	0.162454305	1	Ercc2
physical disorder	0.101045461	0.162454305	1	Bmp4
platelet-type bleeding disorder 10	0.101045461	0.162454305	1	Cd36
Potocki-Lupski syndrome	0.101045461	0.162454305	1	Rai1
premature ovarian failure	0.101045461	0.162454305	1	Fancf
primary ciliary dyskinesia	0.091751965	0.162454305	3	Pcsk5,Slit2,Spef2
primary ciliary dyskinesia 2	0.101045461	0.162454305	1	Dnaaf3
prolactinoma	0.101045461	0.162454305	1	Men1
prostate cancer	0.039105947	0.162454305	3	Apc,Ctnnb1,Pten
pulmonary emphysema	0.05434372	0.162454305	3	Fbn1,Itgb6,Tlr4
recessive dystrophic epidermolysis bullosa	0.010205888	0.162454305	2	Col7a1,Grip1
renal coloboma syndrome	0.101045461	0.162454305	1	Pax2
retinitis pigmentosa 19	0.101045461	0.162454305	1	Abca4
schizophrenia	0.054108359	0.162454305	8	Grin1,Magi2,Ncstn,Nr4a2,Ppm1g,Reln,Shank3,Slc6a3
severe nonproliferative diabetic retinopathy	0.101045461	0.162454305	1	Pdgfrb
short chain acyl-CoA dehydrogenase deficiency	0.101045461	0.162454305	1	Acads
short-rib thoracic dysplasia 9 with or without polydactyly	0.101045461	0.162454305	1	Ift140
sick sinus syndrome	0.101045461	0.162454305	1	Hcn1
Smith-Magenis syndrome	0.101045461	0.162454305	1	Rai1
spinocerebellar ataxia type 2	0.101045461	0.162454305	1	Atxn2
spinocerebellar ataxia type 6	0.101045461	0.162454305	1	Cacna1a
spondylocarpotarsal synostosis syndrome	0.101045461	0.162454305	1	Flnb
spondyloepimetaphyseal dysplasia	0.101045461	0.162454305	1	Col2a1
Stickler syndrome	0.010205888	0.162454305	2	Col11a1,Col11a2
tetralogy of Fallot	0.035283408	0.162454305	4	Cited2,Dock1,Phc1,Zfpm2
thiamine-responsive megaloblastic anemia syndrome	0.101045461	0.162454305	1	Slc19a2
Tietz syndrome	0.101045461	0.162454305	1	Mitf
Timothy syndrome	0.101045461	0.162454305	1	Cacna1c
Townes-Brocks syndrome	0.101045461	0.162454305	1	Sall1
Treacher Collins syndrome	0.101045461	0.162454305	1	Tcof1
tricuspid atresia	0.101045461	0.162454305	1	Zfpm2
tropical spastic paraparesis	0.101045461	0.162454305	1	Zeb1
Usher syndrome type 1	0.101045461	0.162454305	1	Myo7a
visceral heterotaxy	0.057242421	0.162454305	6	Acvr2b,Cc2d2a,Cep290,Dnaaf3,Pcsk5,Slit2
Waardenburg syndrome type 2A	0.101045461	0.162454305	1	Mitf
Waardenburg syndrome type 4C	0.101045461	0.162454305	1	Sox10

Weill-Marchesani syndrome	0.010205888	0.162454305	2	Adamts10,Fbn1
xeroderma pigmentosum group D	0.101045461	0.162454305	1	Ercc2
xeroderma pigmentosum group F	0.101045461	0.162454305	1	Ercc4
X-linked cleft palate with or without ankyloglossia	0.101045461	0.162454305	1	Tbx22
atrioventricular septal defect	0.116305554	0.180988857	2	Bmp4,Nr1d2
attention deficit hyperactivity disorder	0.113502794	0.180988857	3	Per1,Slc6a3,Tacr1
Meckel syndrome	0.116305554	0.180988857	2	Cc2d2a,Rpgrip1l
microcephaly	0.116305554	0.180988857	2	Aspm,Copb2
psoriasis	0.116305554	0.180988857	2	Sptlc2,Ttc7
VACTERL association	0.116305554	0.180988857	2	Dync2h1,Pcsk5
age related macular degeneration 1	0.191885034	0.234615735	1	Vldlr
ARC syndrome	0.191885034	0.234615735	1	Vps33b
arrhythmogenic right ventricular cardiomyopathy	0.191885034	0.234615735	1	Ppp1r13l
asphyxiating thoracic dystrophy 3	0.191885034	0.234615735	1	Dync2h1
autoimmune lymphoproliferative syndrome	0.191885034	0.234615735	1	Fasl
autosomal recessive nonsyndromic deafness 1A	0.191885034	0.234615735	1	Gjb2
autosomal recessive osteopetrosis 1	0.191885034	0.234615735	1	Ccdc154
basal ganglia calcification	0.191885034	0.234615735	1	Pdgfrb
Beckwith-Wiedemann syndrome	0.191885034	0.234615735	1	Sptbn1
Bloom syndrome	0.191885034	0.234615735	1	Blm
bone structure disease	0.191885034	0.234615735	1	Postn
cardiofaciocutaneous syndrome	0.191885034	0.234615735	1	Map2k1
cataract 2 multiple types	0.191885034	0.234615735	1	Crygd
colorectal cancer	0.191885034	0.234615735	1	Apc
congenital fibrosis of the extraocular muscles	0.191885034	0.234615735	1	Kif21a
coronary artery disease	0.191885034	0.234615735	1	Kcnj8
Crohn's disease	0.191885034	0.234615735	1	Pikfyve
DiGeorge syndrome	0.18805163	0.234615735	3	Dock1,Kat6a,Zfp366
disease of mental health	0.191885034	0.234615735	1	Cic
fibrodysplasia ossificans progressiva	0.191885034	0.234615735	1	Bmp4
glycogen storage disease V	0.191885034	0.234615735	1	Hif1a
glycogen storage disease VII	0.191885034	0.234615735	1	Hif1a
hereditary lymphedema	0.191885034	0.234615735	1	Vegfc
hypertrophic cardiomyopathy	0.189991318	0.234615735	2	Cav1,Htr2b
intestinal pseudo-obstruction	0.191885034	0.234615735	1	Pten
Jervell-Lange Nielsen syndrome	0.191885034	0.234615735	1	Kcnq1
Kallmann syndrome	0.191885034	0.234615735	1	Sox10
lipodystrophy	0.191885034	0.234615735	1	Ebf1
malaria	0.152269975	0.234615735	2	Ank1,Fcgr2b
Marfan syndrome	0.191885034	0.234615735	1	Fbn1
membranoproliferative glomerulonephritis	0.191885034	0.234615735	1	Cfh
microvillus inclusion disease	0.191885034	0.234615735	1	Myo5b
nail-patella syndrome	0.191885034	0.234615735	1	Ldb1
Netherton syndrome	0.191885034	0.234615735	1	Spink5
neurofibromatosis	0.191885034	0.234615735	1	Nf1
Noonan syndrome	0.191885034	0.234615735	1	Apaf1
PCWH syndrome	0.191885034	0.234615735	1	Sox10
Pendred Syndrome	0.191885034	0.234615735	1	Slc26a4
persistent fetal circulation syndrome	0.191885034	0.234615735	1	Pten
Pierson syndrome	0.191885034	0.234615735	1	Lamb2
pigment dispersion syndrome	0.191885034	0.234615735	1	Col18a1
right atrial isomerism	0.191885034	0.234615735	1	Acvr2b
severe combined immunodeficiency, autosomal recessive, T cell-negative, B cell-positive, Nk cell-po	0.191885034	0.234615735	1	Jak3
spondyloepiphyseal dysplasia congenita	0.191885034	0.234615735	1	Col2a1
Stargardt disease	0.191885034	0.234615735	1	Abca4
stomach cancer	0.191885034	0.234615735	1	Il6st
syndromic intellectual disability	0.191885034	0.234615735	1	Brpf1
thyroid hormone resistance syndrome	0.191885034	0.234615735	1	Ncoa1
urinary system disease	0.191885034	0.234615735	1	Bmp4
Waardenburg syndrome type 1	0.191885034	0.234615735	1	Mitf
Wolf-Hirschhorn syndrome	0.191885034	0.234615735	1	Nsd2
systemic lupus erythematosus	0.235556576	0.286807379	5	Ep300,Fcgr2b,Lbr,Mta2,Rc3h1
arteriovenous malformations of the brain	0.27354911	0.309738486	1	Notch4
Ehlers-Danlos syndrome	0.27354911	0.309738486	1	Col1a1
epidermolytic hyperkeratosis	0.27354911	0.309738486	1	Jup
follicular thyroid carcinoma	0.27354911	0.309738486	1	Pten
Gitelman syndrome	0.27354911	0.309738486	1	Slc12a3
hereditary sensory neuropathy	0.27354911	0.309738486	1	Dst
hyperparathyroidism	0.27354911	0.309738486	1	Men1
hypohidrotic ectodermal dysplasia	0.27354911	0.309738486	1	Edar
idiopathic generalized epilepsy	0.27354911	0.309738486	1	Cacna2d2
junctional epidermolysis bullosa Herlitz type	0.27354911	0.309738486	1	Lamc2
low tension glaucoma	0.27354911	0.309738486	1	Slc1a3
maple syrup urine disease	0.27354911	0.309738486	1	Ppm1k
medulloblastoma	0.27354911	0.309738486	1	Ptch1
nephronophthisis	0.27354911	0.309738486	1	Cntrl
osteoarthritis	0.267945355	0.309738486	2	Col11a1,Col9a1
osteopetrosis	0.27354911	0.309738486	1	Mitf
spondylocostal dysostosis	0.27354911	0.309738486	1	Tbx6
type I Ehlers-Danlos syndrome	0.27354911	0.309738486	1	Col5a2
congenital diaphragmatic hernia	0.307099441	0.346379602	2	Pdgfra,Zfpm2
asthma	0.346964094	0.379573501	1	Itgb6
chronic myeloid leukemia	0.346964094	0.379573501	1	Ncstn
exudative vitreoretinopathy	0.346964094	0.379573501	1	Lrp5
Gilles de la Tourette syndrome	0.346964094	0.379573501	1	Slc6a3
juvenile myelomonocytic leukemia	0.346964094	0.379573501	1	Nf1
myelofibrosis	0.346964094	0.379573501	1	Ncor2
nonalcoholic fatty liver disease	0.346964094	0.379573501	1	Sidt2
Parkinson's disease	0.34581877	0.379573501	2	Adh7,Nr4a2

Kartagener syndrome	0.383791527	0.418289642	2	Dnaaf3,Slit2
muscular dystrophy-dystroglycanopathy	0.412962896	0.446736814	1	B4gat1
systemic scleroderma	0.412962896	0.446736814	1	Fbn1
type 1 diabetes mellitus	0.44769152	0.482511972	3	Fasl,Nos2,Stat4
clubfoot	0.472294365	0.5015973	1	Grip1
nephrotic syndrome	0.472294365	0.5015973	1	Itsn2
primary pulmonary hypertension	0.472294365	0.5015973	1	Bmpr2
rheumatoid arthritis	0.472294365	0.5015973	1	Il6st
acute myeloid leukemia	0.525631763	0.552197989	1	Kmt2a
cataract	0.525631763	0.552197989	1	Dnase2b
male infertility	0.525631763	0.552197989	1	Pmfbp1
type 2 diabetes mellitus	0.529849514	0.554626649	4	Cyb5r4,Foxm1,Irs1,Madd
obesity	0.538741316	0.561912986	4	Alms1,Mkks,Ncoa1,Tyk2
Alzheimer's disease	0.573580398	0.593992512	1	Cav1
congenital hypothyroidism	0.573580398	0.593992512	1	Tg
hydrocephalus	0.702582936	0.725005796	2	Nme5,Ulk4
dilated cardiomyopathy	1	1	3	Cenpf,Erbb2,Phc1
fatty liver disease	1	1	1	Pten
Hirschsprung's disease	1	1	1	Erbb2
myelodysplastic syndrome	1	1	1	Egr1
otitis media	1	1	2	Sall4,Trp73
platelet storage pool deficiency	1	1	1	Hps5
retinitis pigmentosa	1	1	1	Crb2
sinoatrial node disease	1	1	1	Ank2
Williams-Beuren syndrome	1	1	1	Baz1b

DO	p_val_FET	p_val_adj	n_genes	genes_mutated
achondrogenesis type IA	0.138275226	0.217906941	1	Trip11
achondrogenesis type II	0.138275226	0.217906941	1	Col2a1
achondroplasia	0.021243361	0.217906941	3	Fgfr3,Npr2,Spred2
acromesomelic dysplasia, Maroteaux type	0.138275226	0.217906941	1	Npr2
acute myeloid leukemia	0.060012371	0.217906941	3	Arid4a,Crebbp,Kmt2a
adult-onset autosomal dominant demyelinating leukodystrophy	0.138275226	0.217906941	1	Lmnb1
age related macular degeneration 14	0.138275226	0.217906941	1	C2
age related macular degeneration 9	0.138275226	0.217906941	1	C3
Alexander disease	0.138275226	0.217906941	1	Gfap
alkaptonuria	0.138275226	0.217906941	1	Hgd
alopecia universalis	0.138275226	0.217906941	1	Hr
alpha-mannosidosis	0.138275226	0.217906941	1	Man2b1
amyotrophic lateral sclerosis type 6	0.138275226	0.217906941	1	Fus
angle-closure glaucoma	0.138275226	0.217906941	1	Tfap2b
arteriovenous malformations of the brain	0.052060224	0.217906941	2	Eng,Notch4
aspartylglucosaminuria	0.138275226	0.217906941	1	Aga
asphyxiating thoracic dystrophy	0.138275226	0.217906941	1	Smarcad1
asphyxiating thoracic dystrophy 2	0.138275226	0.217906941	1	Ift80
autoimmune polyendocrine syndrome type 1	0.138275226	0.217906941	1	Aire
autosomal dominant disease	0.138275226	0.217906941	1	Fgfr3
autosomal dominant familial periodic fever	0.138275226	0.217906941	1	Tnfrsf1a
autosomal dominant nonsyndromic deafness 36	0.138275226	0.217906941	1	Tmc1
autosomal dominant Parkinson's disease 1	0.138275226	0.217906941	1	Snca
autosomal dominant Parkinson's disease 4	0.138275226	0.217906941	1	Snca
autosomal dominant Parkinson's disease 8	0.138275226	0.217906941	1	Lrrk2
autosomal dominant pseudohypoaldosteronism type 1	0.138275226	0.217906941	1	Nr3c2
autosomal recessive Alport syndrome	0.00264149	0.217906941	3	Col4a3,Col4a4,Mpv17
autosomal recessive limb-girdle muscular dystrophy type 2E	0.138275226	0.217906941	1	Sgcb
autosomal recessive limb-girdle muscular dystrophy type 2P	0.138275226	0.217906941	1	Dag1
autosomal recessive nonsyndromic deafness 18A	0.138275226	0.217906941	1	Ush1c
autosomal recessive nonsyndromic deafness 18B	0.138275226	0.217906941	1	Otog
autosomal recessive nonsyndromic deafness 2	0.138275226	0.217906941	1	Myo7a
autosomal recessive nonsyndromic deafness 22	0.138275226	0.217906941	1	Otoa
autosomal recessive nonsyndromic deafness 42	0.138275226	0.217906941	1	Ildr1
autosomal recessive nonsyndromic deafness 68	0.138275226	0.217906941	1	S1pr2
autosomal recessive nonsyndromic deafness 7	0.138275226	0.217906941	1	Tmc1
autosomal recessive nonsyndromic deafness 9	0.138275226	0.217906941	1	Otof
autosomal recessive osteopetrosis 3	0.138275226	0.217906941	1	Car2
autosomal recessive spinocerebellar ataxia 18	0.138275226	0.217906941	1	Grid2
Bardet-Biedl syndrome	0.138275226	0.217906941	1	Tbc1d32
Bardet-Biedl syndrome 8	0.138275226	0.217906941	1	Ttc8
Bartter disease	0.138275226	0.217906941	1	Clcnkb
Bartter disease type 3	0.138275226	0.217906941	1	Clcnkb
Becker muscular dystrophy	0.138275226	0.217906941	1	Dmd
beta-mannosidosis	0.138275226	0.217906941	1	Manba
Bietti crystalline corneoretinal dystrophy	0.138275226	0.217906941	1	Cyp4v3
blepharophimosis, ptosis, and epicanthus inversus syndrome	0.138275226	0.217906941	1	Foxl2
Bloch-Sulzberger syndrome	0.138275226	0.217906941	1	Ikbkg
bone development disease	0.138275226	0.217906941	1	Npr2
bone disease	0.138275226	0.217906941	1	Npr3
Brugada syndrome 1	0.138275226	0.217906941	1	Scn5a
Brunner Syndrome	0.138275226	0.217906941	1	Maoa
Budd-Chiari syndrome	0.138275226	0.217906941	1	F5
CAKUT	0.138275226	0.217906941	1	Lifr
carbamoyl phosphate synthetase I deficiency disease	0.138275226	0.217906941	1	Cps1
Carpenter syndrome	0.138275226	0.217906941	1	Megf8
cataract 1 multiple types	0.138275226	0.217906941	1	Gja8
cataract 39 multiple types	0.138275226	0.217906941	1	Crygb
cerebral cavernous malformation	0.138275226	0.217906941	1	Krit1
Charcot-Marie-Tooth disease axonal type 2K	0.138275226	0.217906941	1	Gdap1
Charcot-Marie-Tooth disease axonal type 2O	0.138275226	0.217906941	1	Dync1h1
Charcot-Marie-Tooth disease type 2A1	0.138275226	0.217906941	1	Kif1b
Charcot-Marie-Tooth disease type 2A2	0.138275226	0.217906941	1	Mfn2
Charcot-Marie-Tooth disease type 4B2	0.138275226	0.217906941	1	Sbf2
Charcot-Marie-Tooth disease type 4D	0.138275226	0.217906941	1	Ndrg1
Charcot-Marie-Tooth disease X-linked dominant 1	0.138275226	0.217906941	1	Gjb1
Char syndrome	0.138275226	0.217906941	1	Tfap2b
Chediak-Higashi syndrome	0.138275226	0.217906941	1	Lyst
chondrodysplasia-pseudohermaphroditism syndrome	0.138275226	0.217906941	1	Hhat
choreaacanthocytosis	0.138275226	0.217906941	1	Vps13a
cleft palate	0.138275226	0.217906941	1	Golgb1
complement component 2 deficiency	0.138275226	0.217906941	1	C2
complement component 3 deficiency	0.138275226	0.217906941	1	C3
Compton-North congenital myopathy	0.138275226	0.217906941	1	Cntn1
cone-rod dystrophy 9	0.138275226	0.217906941	1	Adam9
congenital bile acid synthesis defect 5	0.138275226	0.217906941	1	Abcd3
congenital hypothyroidism	0.086386999	0.217906941	3	Duox2,Tpo,Trhr
congenital merosin-deficient muscular dystrophy 1A	0.138275226	0.217906941	1	Lama2
congenital secretory chloride diarrhea 1	0.138275226	0.217906941	1	Slc26a3
congenital stationary night blindness 2A	0.138275226	0.217906941	1	Cacna1f
congenital stationary night blindness autosomal dominant 2	0.138275226	0.217906941	1	Pde6b
Cornelia de Lange syndrome	0.019114401	0.217906941	2	Nipbl,Pds5a
craniofrontonasal syndrome	0.138275226	0.217906941	1	Efnb1
cutaneous porphyria	0.138275226	0.217906941	1	Uros
cystic kidney disease	0.116693711	0.217906941	3	Dnm2,Robo1,Slit2
Dandy-Walker syndrome	0.052060224	0.217906941	2	Zic1,Zic4
Dent disease	0.138275226	0.217906941	1	Clcn5
dilated cardiomyopathy	0.029359148	0.217906941	10	Cenpf,Dag1,Dicer1,Dnm1l,Ilk,Med1,Myh6,Nr2f2,Pdcd1,Prox1

dilated cardiomyopathy 1E	0.138275226	0.217906941	1	Scn5a
dilated cardiomyopathy 1EE	0.138275226	0.217906941	1	Myh6
Down syndrome	0.138275226	0.217906941	1	Dyrk1a
episodic ataxia type 1	0.138275226	0.217906941	1	Kcna1
exfoliation syndrome	0.138275226	0.217906941	1	Lyst
factor V deficiency	0.138275226	0.217906941	1	F5
familial cold autoinflammatory syndrome 4	0.138275226	0.217906941	1	Nlrc4
familial hemophagocytic lymphohistiocytosis 3	0.138275226	0.217906941	1	Unc13d
familial isolated deficiency of vitamin E	0.138275226	0.217906941	1	Ttpa
familial Mediterranean fever	0.138275226	0.217906941	1	Mefv
familial temporal lobe epilepsy 1	0.138275226	0.217906941	1	Lgi1
Fanconi anemia	0.138275226	0.217906941	1	Usp1
Fanconi anemia complementation group A	0.138275226	0.217906941	1	Fanca
Fanconi anemia complementation group C	0.138275226	0.217906941	1	Fancc
Fanconi anemia complementation group D1	0.138275226	0.217906941	1	Brca2
focal segmental glomerulosclerosis 2	0.138275226	0.217906941	1	Trpc6
fucosidosis	0.138275226	0.217906941	1	Fuca1
gastroschisis	0.138275226	0.217906941	1	Lrp1
glycerol kinase deficiency	0.138275226	0.217906941	1	Gk
glycogen storage disease V	0.019114401	0.217906941	2	Hif1a,Pygm
GM2 gangliosidosis, AB variant	0.138275226	0.217906941	1	Gm2a
granulosa cell tumor	0.138275226	0.217906941	1	Ctnnb1
Greig cephalopolysyndactyly syndrome	0.138275226	0.217906941	1	Gli3
guanidinoacetate methyltransferase deficiency	0.138275226	0.217906941	1	Gamt
Hajdu-Cheney syndrome	0.138275226	0.217906941	1	Notch2
hereditary mucosal leukokeratosis	0.138275226	0.217906941	1	Krt4
hereditary sensory and autonomic neuropathy type 6	0.138275226	0.217906941	1	Dst
hereditary spastic paraplegia 15	0.138275226	0.217906941	1	Zfyve26
hereditary spastic paraplegia 2	0.138275226	0.217906941	1	Plp1
hereditary spastic paraplegia 4	0.138275226	0.217906941	1	Spast
hereditary spherocytosis type 4	0.138275226	0.217906941	1	Slc4a1
hypertrophic cardiomyopathy 14	0.138275226	0.217906941	1	Myh6
hypertrophic cardiomyopathy 4	0.138275226	0.217906941	1	Mybpc3
hypertrophic pyloric stenosis	0.138275226	0.217906941	1	Nos1
hypoparathyroidism	0.138275226	0.217906941	1	Gcm2
hypotonia-cystinuria syndrome	0.138275226	0.217906941	1	Camkmt
hypotrichosis 4	0.138275226	0.217906941	1	Hr
immune dysregulation-polyendocrinopathy-enteropathy-X-linked syndrome	0.138275226	0.217906941	1	Foxp3
inflammatory bowel disease 1	0.138275226	0.217906941	1	Nod2
inflammatory bowel disease 12	0.138275226	0.217906941	1	Gnai2
isolated anhidrosis with normal sweat glands	0.138275226	0.217906941	1	Itpr2
isolated cleft palate	0.138275226	0.217906941	1	Satb2
Joubert syndrome	0.138275226	0.217906941	1	Zic1
Joubert syndrome 26	0.138275226	0.217906941	1	D430042O09Rik
junctional epidermolysis bullosa	0.138275226	0.217906941	1	Lama3
junctional epidermolysis bullosa with pyloric atresia	0.138275226	0.217906941	1	Itgb4
Kabuki syndrome	0.138275226	0.217906941	1	Kmt2d
Kartagener syndrome	0.024742222	0.217906941	5	Ap1b1,Armc4,Ccdc151,Dnaaf3,Slit2
karyomegalic interstitial nephritis	0.138275226	0.217906941	1	Fan1
keratosis follicularis	0.138275226	0.217906941	1	Atp2a2
Leber congenital amaurosis 5	0.138275226	0.217906941	1	Lca5
Leber congenital amaurosis 6	0.138275226	0.217906941	1	Rpgrip1
Leber congenital amaurosis 8	0.138275226	0.217906941	1	Crb1
Lennox-Gastaut syndrome	0.138275226	0.217906941	1	Dgkd
Lesch-Nyhan syndrome	0.138275226	0.217906941	1	Hprt
long QT syndrome 3	0.138275226	0.217906941	1	Scn5a
lung cancer	0.021243361	0.217906941	3	Foxm1,Robo1,Xpc
lymphocytic leukemia	0.138275226	0.217906941	1	Tal1
lysosomal storage disease	0.138275226	0.217906941	1	Slc17a5
meconium aspiration syndrome	0.138275226	0.217906941	1	Atf2
megacystis-microcolon-intestinal hypoperistalsis syndrome	0.138275226	0.217906941	1	Chrm3
microcephaly	0.038152818	0.217906941	3	Aspm,Kif20b,Mcph1
mitochondrial DNA depletion syndrome 3	0.138275226	0.217906941	1	Mpv17
mitral valve prolapse	0.138275226	0.217906941	1	Dchs1
motor neuron disease	0.138275226	0.217906941	1	Rhot1
Mowat-Wilson syndrome	0.138275226	0.217906941	1	Zeb2
Muenke Syndrome	0.138275226	0.217906941	1	Fgfr3
multiple endocrine neoplasia type 2B	0.138275226	0.217906941	1	Ret
MYH-9 related disease	0.138275226	0.217906941	1	Myh9
myositis	0.138275226	0.217906941	1	H2-K1
myotonia congenita	0.138275226	0.217906941	1	Clcn1
myotonic dystrophy type 1	0.138275226	0.217906941	1	Dmpk
nemaline myopathy	0.138275226	0.217906941	1	Klhl41
neonatal diabetes mellitus with congenital hypothyroidism	0.138275226	0.217906941	1	Glis3
nephrosis	0.138275226	0.217906941	1	Lamb2
neurodegeneration with brain iron accumulation 2a	0.138275226	0.217906941	1	Pla2g6
neuronal ceroid lipofuscinosis 2	0.138275226	0.217906941	1	Tpp1
non-Hodgkin lymphoma	0.019114401	0.217906941	2	Mtss1,S1pr2
omphalocele	0.138275226	0.217906941	1	Lrp1
osteochondrodysplasia	0.138275226	0.217906941	1	Atf2
osteogenesis imperfecta type 10	0.138275226	0.217906941	1	Serpinh1
osteogenesis imperfecta type 5	0.138275226	0.217906941	1	Suco
osteopathia striata with cranial sclerosis	0.138275226	0.217906941	1	Amer1
ovarian disease	0.138275226	0.217906941	1	Patl2
Pallister-Hall syndrome	0.138275226	0.217906941	1	Gli3
patterned macular dystrophy 2	0.138275226	0.217906941	1	Ctnna1
Pelizaeus-Merzbacher disease	0.138275226	0.217906941	1	Plp1
peripheral T-cell lymphoma	0.138275226	0.217906941	1	Rc3h1
pheochromocytoma	0.138275226	0.217906941	1	Ret

Pierson syndrome	0.019114401	0.217906941	2	Lamb2,Tns2
platelet storage pool deficiency	0.116806029	0.217906941	4	Ap3d1,Dock7,Lyst,Slc7a11
polycystic liver disease	0.138275226	0.217906941	1	Prkcsh
Potocki-Lupski syndrome	0.138275226	0.217906941	1	Rai1
primary ciliary dyskinesia 2	0.138275226	0.217906941	1	Dnaaf3
primary ciliary dyskinesia 23	0.138275226	0.217906941	1	Armc4
primary ciliary dyskinesia 30	0.138275226	0.217906941	1	Ccdc151
primary open angle glaucoma	0.138275226	0.217906941	1	Gucy1a1
progressive familial heart block type IA	0.138275226	0.217906941	1	Scn5a
pseudohypoaldosteronism	0.138275226	0.217906941	1	Klhl3
pseudoxanthoma elasticum	0.138275226	0.217906941	1	Abcc6
retinitis pigmentosa 1	0.138275226	0.217906941	1	Rp1
retinitis pigmentosa 12	0.138275226	0.217906941	1	Crb1
retinitis pigmentosa 40	0.138275226	0.217906941	1	Pde6b
rhizomelic chondrodysplasia punctata type 2	0.138275226	0.217906941	1	Gnpat
Rothmund-Thomson syndrome	0.138275226	0.217906941	1	Recql4
Rubinstein-Taybi syndrome	0.138275226	0.217906941	1	Crebbp
salivary gland cancer	0.138275226	0.217906941	1	Gon4l
Schimke immuno-osseous dysplasia	0.138275226	0.217906941	1	Smarcal1
scoliosis	0.138275226	0.217906941	1	Fgfr3
severe congenital neutropenia	0.138275226	0.217906941	1	Gfi1
Shwachman-Diamond syndrome	0.019114401	0.217906941	2	Sbds,Serpini2
sialuria	0.138275226	0.217906941	1	Slc17a5
skin disease	0.138275226	0.217906941	1	Fyn
skin squamous cell carcinoma	0.138275226	0.217906941	1	Fyn
Smith-Magenis syndrome	0.138275226	0.217906941	1	Rai1
spinocerebellar ataxia type 27	0.138275226	0.217906941	1	Fgf14
spondyloepimetaphyseal dysplasia	0.138275226	0.217906941	1	Col2a1
systemic lupus erythematosus	0.030933221	0.217906941	9	C4b,Ep300,Fas,Ifih1,Jak1,Pdcd1,Ptprc,Rc3h1,Traf3ip2
Tangier disease	0.138275226	0.217906941	1	Abca1
T-cell adult acute lymphocytic leukemia	0.019114401	0.217906941	2	Cntn2,Zeb2
temporal lobe epilepsy	0.138275226	0.217906941	1	Kcna1
tricuspid atresia	0.138275226	0.217906941	1	Zfpm2
type I Ehlers-Danlos syndrome	0.052060224	0.217906941	2	Col5a1,Col5a2
urofacial syndrome	0.138275226	0.217906941	1	Hpse2
Usher syndrome type 1	0.138275226	0.217906941	1	Myo7a
Usher syndrome type 1C	0.138275226	0.217906941	1	Ush1c
Usher syndrome type 2C	0.019114401	0.217906941	2	Adgrv1,Slc4a7
uterine fibroid	0.138275226	0.217906941	1	Tsc2
VACTERL association	0.038152818	0.217906941	3	Ift172,Qsox1,Tbc1d32
vesicoureteral reflux	0.138275226	0.217906941	1	Upk3a
Weaver syndrome	0.138275226	0.217906941	1	Ezh2
Wolcott-Rallison syndrome	0.138275226	0.217906941	1	Eif2ak3
xeroderma pigmentosum	0.138275226	0.217906941	1	Terf2
xeroderma pigmentosum group C	0.138275226	0.217906941	1	Xpc
X-linked Alport syndrome	0.138275226	0.217906941	1	Col4a5
X-linked cleft palate with or without ankyloglossia	0.138275226	0.217906941	1	Tbx22
acute lymphocytic leukemia	0.143586556	0.223286583	2	Ezh2,Kmt2a
DiGeorge syndrome	0.142693378	0.223286583	4	Chrd,Dicer1,Kat6a,Zfp366
junctional epidermolysis bullosa non-Herlitz type	0.143586556	0.223286583	2	Itgb4,Lama3
epilepsy	0.15027472	0.231646184	3	Aldh5a1,Kcna1,Scn8a
Williams-Beuren syndrome	0.15027472	0.231646184	3	Baz1b,Gtf2i,Limk1
autistic disorder	0.174743244	0.268192891	9	Brinp1,Cadps2,Crebbp,Ctnnb1,Gstm1,Nrp2,Nrxn1,Tbr1,Tsc2
congenital diaphragmatic hernia	0.186449917	0.283693193	3	Lrp1,Nr2f2,Zfpm2
primary ciliary dyskinesia	0.186449917	0.283693193	3	Ap1b1,Slit2,Spef2
nephrotic syndrome	0.196303426	0.296132945	2	Itsn2,Mpv17
rheumatoid arthritis	0.196303426	0.296132945	2	Mmp14,Zfp36
abdominal obesity-metabolic syndrome	0.250819847	0.315537937	2	Prkci,Sirt3
age related macular degeneration 1	0.257436051	0.315537937	1	Vldlr
agnathia-otocephaly complex	0.257436051	0.315537937	1	Trappc10
ARC syndrome	0.257436051	0.315537937	1	Vps33b
asphyxiating thoracic dystrophy 3	0.257436051	0.315537937	1	Ift80
atrichia with papular lesions	0.257436051	0.315537937	1	Hr
autoimmune lymphoproliferative syndrome	0.257436051	0.315537937	1	Fas
autosomal recessive osteopetrosis 1	0.257436051	0.315537937	1	Ccdc154
autosomal recessive Robinow syndrome	0.257436051	0.315537937	1	Ror2
Beckwith-Wiedemann syndrome	0.257436051	0.315537937	1	Sptbn1
cardiofaciocutaneous syndrome	0.257436051	0.315537937	1	Map2k1
chromosome 1p36 deletion syndrome	0.257436051	0.315537937	1	Kcnab2
Cockayne syndrome	0.257436051	0.315537937	1	Ercc6
common variable immunodeficiency	0.257436051	0.315537937	1	Icos
congenital fibrosis of the extraocular muscles	0.257436051	0.315537937	1	Kif21a
congenital generalized lipodystrophy type 2	0.257436051	0.315537937	1	Bscl2
coronary artery disease	0.257436051	0.315537937	1	Abcc9
cystic fibrosis	0.257436051	0.315537937	1	Cftr
dilated cardiomyopathy 1A	0.257436051	0.315537937	1	Dot1l
Duchenne muscular dystrophy	0.257436051	0.315537937	1	Dmd
erythropoietic protoporphyria	0.257436051	0.315537937	1	Abcg2
Fanconi-like syndrome	0.257436051	0.315537937	1	Slx1b
glycine encephalopathy	0.257436051	0.315537937	1	Gldc
glycogen storage disease VII	0.257436051	0.315537937	1	Hif1a
Guillain-Barre syndrome	0.257436051	0.315537937	1	Aire
hemolytic-uremic syndrome	0.257436051	0.315537937	1	C3
hereditary hemorrhagic telangiectasia	0.257436051	0.315537937	1	Eng
Hermansky-Pudlak syndrome 2	0.257436051	0.315537937	1	Ap3d1
intestinal pseudo-obstruction	0.257436051	0.315537937	1	Nup35
Lafora disease	0.257436051	0.315537937	1	Nhlrc1
Lynch syndrome	0.257436051	0.315537937	1	Msh2
Menkes disease	0.257436051	0.315537937	1	Atp7a

microvillus inclusion disease	0.257436051	0.315537937	1	Myo5b
narcolepsy	0.257436051	0.315537937	1	Hcrtr2
Netherton syndrome	0.257436051	0.315537937	1	Dsg4
nonepidermolytic palmoplantar keratoderma	0.257436051	0.315537937	1	Rhbdf2
Noonan syndrome	0.257436051	0.315537937	1	Kat6b
orofacial cleft	0.257436051	0.315537937	1	Tfap2a
ovarian cancer	0.257436051	0.315537937	1	Ctnnb1
Pendred Syndrome	0.257436051	0.315537937	1	Slc26a4
platelet-type bleeding disorder 16	0.257436051	0.315537937	1	Itga2b
recessive dystrophic epidermolysis bullosa	0.257436051	0.315537937	1	Col7a1
restrictive cardiomyopathy	0.257436051	0.315537937	1	Mypn
Sertoli cell-only syndrome	0.257436051	0.315537937	1	Dmc1
severe combined immunodeficiency, autosomal recessive, T cell-negative, B cell-negative, Nk cell-po	0.257436051	0.315537937	1	Prkdc
severe combined immunodeficiency, autosomal recessive, T cell-negative, B cell-positive, Nk cell-pos	0.257436051	0.315537937	1	Jak3
spondyloepiphyseal dysplasia congenita	0.257436051	0.315537937	1	Col2a1
Stargardt disease	0.257436051	0.315537937	1	Elovl4
syndromic intellectual disability	0.257436051	0.315537937	1	Brpf1
thanatophoric dysplasia	0.257436051	0.315537937	1	Fgfr3
tuberous sclerosis	0.257436051	0.315537937	1	Tsc2
velocardiofacial syndrome	0.250819847	0.315537937	2	Chrd,Trappc10
Werdnig-Hoffmann disease	0.257436051	0.315537937	1	Vps54
Wiskott-Aldrich syndrome	0.257436051	0.315537937	1	Foxp3
visceral heterotaxy	0.266623125	0.325667693	6	Ap1b1,Armc4,Dnaaf3,Megf8,Slit2,Tbc1d32
breast cancer	0.279743604	0.34051549	4	Brca2,Hgf,Smarca4,Wnt1
obesity	0.294159819	0.356833046	6	Ankrd26,Kdm3a,Pcsk1,Prkci,Prox1,Tyk2
hydrocephalus	0.299685324	0.36229082	4	Add1,Ccdc85c,Celsr2,Ulk4
Alzheimer's disease	0.305630797	0.368217308	2	Lrp1,Plau
achalasia	0.360123964	0.411403752	1	Nos1
cutis laxa	0.360123964	0.411403752	1	Ltbp4
distal arthrogryposis	0.360123964	0.411403752	1	Fbn2
early infantile epileptic encephalopathy	0.360123964	0.411403752	1	Scn8a
epidermolytic hyperkeratosis	0.360123964	0.411403752	1	Krt1
hereditary sensory neuropathy	0.360123964	0.411403752	1	Dst
Hermansky-Pudlak syndrome 1	0.360123964	0.411403752	1	Ap3d1
Hirschsprung's disease	0.359612821	0.411403752	2	Itgb1,Ret
nephronophthisis	0.360123964	0.411403752	1	Cntrl
Niemann-Pick disease	0.360123964	0.411403752	1	Smpd1
pulmonary alveolar proteinosis	0.360123964	0.411403752	1	Csf2rb
renal tubular acidosis	0.360123964	0.411403752	1	Slc4a1
Seckel syndrome	0.360123964	0.411403752	1	Cenpj
spondylocostal dysostosis	0.360123964	0.411403752	1	Tbx6
type 1 diabetes mellitus	0.346521993	0.411403752	1	Ptprn2
urinary bladder cancer	0.360123964	0.411403752	1	Ctnnb1
amyotrophic lateral sclerosis	0.448615526	0.494879002	1	Zfp106
aortic valve disease	0.448615526	0.494879002	1	Rbpj
asthma	0.448615526	0.494879002	1	Tbx21
centronuclear myopathy	0.448615526	0.494879002	1	Dnm2
chronic myeloid leukemia	0.448615526	0.494879002	1	Sh2b3
endogenous depression	0.448615526	0.494879002	1	Hap1
Gilles de la Tourette syndrome	0.448615526	0.494879002	1	Hdc
hereditary spherocytosis type 1	0.448615526	0.494879002	1	Ank1
Leigh disease	0.448615526	0.494879002	1	Parl
myelofibrosis	0.448615526	0.494879002	1	Ncor2
neuronal ceroid lipofuscinosis 3	0.448615526	0.494879002	1	Cln3
hepatocellular carcinoma	0.451636545	0.496659503	3	Foxm1,Plau,Uaca
amyotrophic lateral sclerosis type 1	0.524872768	0.568343826	1	Vps54
cardiomyopathy	0.524872768	0.568343826	1	Lrp1
Huntington's disease	0.524872768	0.568343826	1	Zdhhc13
lissencephaly	0.524872768	0.568343826	1	Dag1
neural tube defect	0.524872768	0.568343826	1	Mthfr
atrioventricular septal defect	0.590586637	0.626057306	1	Ift172
clubfoot	0.590586637	0.626057306	1	Ret
Hermansky-Pudlak syndrome	0.590586637	0.626057306	1	Slc7a11
Meckel syndrome	0.590586637	0.626057306	1	Tbc1d32
pre-eclampsia	0.590586637	0.626057306	1	Notch2
primary pulmonary hypertension	0.590586637	0.626057306	1	Bmpr2
type 2 diabetes mellitus	0.587827163	0.626057306	5	Foxm1,Gadd45gip1,Irs2,Ppp1r3a,Prkci
fatty liver disease	0.637650377	0.673923902	2	Ikbkg,Plau
myelodysplastic syndrome	0.656537009	0.691813624	2	Asxl1,Crebbp
attention deficit hyperactivity disorder	0.677132256	0.711391924	2	Brinp1,Per1
atopic dermatitis	0.708189717	0.741812967	1	Traf3ip2
Sjogren's syndrome	0.72093939	0.752933742	3	Aire,Fas,Traf3ip2
schizophrenia	0.815134486	0.848797857	6	Chrna7,Cplx2,Lrrtm1,Nrxn1,Reln,Srgap3
autism spectrum disorder	1	1	1	Chd8
Charlevoix-Saguenay spastic ataxia	1	1	1	Sacs
congestive heart failure	1	1	1	Med1
hypertrophic cardiomyopathy	1	1	1	Pepd
inflammatory bowel disease	1	1	1	Muc2
malaria	1	1	1	Ank1
male infertility	1	1	1	Bscl2
osteoarthritis	1	1	1	Erg
osteoporosis	1	1	1	Ifngr1
prostate cancer	1	1	1	Ctnnb1
pulmonary emphysema	1	1	1	Tlr4
retinitis pigmentosa	1	1	1	Pde6b
sinoatrial node disease	1	1	1	Ank2
tetralogy of Fallot	1	1	1	Zfpm2

DO	p_val_FET	p_val_adj	n_genes	genes_mutated
breast cancer	0.000141446	0.032674127	7	Apc,Bard1,Brca1,Cav1,Erbb2,Pik3ca,Trp53
osteogenesis imperfecta type 3	0.000436939	0.050466505	3	Col1a1,Col1a2,Smpd3
aceruloplasminemia	0.075926014	0.128021234	1	Cp
acute lymphocytic leukemia	0.049362346	0.128021234	2	Notch3,Pten
age related macular degeneration 4	0.075926014	0.128021234	1	Cfh
aggressive periodontitis	0.075926014	0.128021234	1	Postn
Alstrom syndrome	0.075926014	0.128021234	1	Alms1
arrhythmogenic right ventricular dysplasia 12	0.075926014	0.128021234	1	Jup
asphyxiating thoracic dystrophy 1	0.075926014	0.128021234	1	Ift140
astrocytoma	0.075926014	0.128021234	1	Hras
atrioventricular septal defect	0.070375067	0.128021234	2	Bmp4,Nr1d2
autism spectrum disorder	0.018305326	0.128021234	3	Gabrb3,Grin1,Slc9a9
autosomal dominant auditory neuropathy 1	0.075926014	0.128021234	1	Diaph3
autosomal dominant keratitis-ichthyosis-deafness syndror	0.075926014	0.128021234	1	Gjb2
autosomal dominant nonsyndromic deafness 13	0.075926014	0.128021234	1	Col11a2
autosomal recessive limb-girdle muscular dystrophy type 1	0.075926014	0.128021234	1	Dysf
autosomal recessive nonsyndromic deafness	0.075926014	0.128021234	1	Atp6v1b1
autosomal recessive nonsyndromic deafness 3	0.075926014	0.128021234	1	Myo15
autosomal recessive spinocerebellar ataxia 16	0.075926014	0.128021234	1	Stub1
Axenfeld-Rieger syndrome type 3	0.075926014	0.128021234	1	Bmp4
Bannayan-Riley-Ruvalcaba syndrome	0.075926014	0.128021234	1	Pten
Bardet-Biedl syndrome 10	0.075926014	0.128021234	1	Bbs10
Bardet-Biedl syndrome 6	0.075926014	0.128021234	1	Mkks
basal cell carcinoma	0.075926014	0.128021234	1	Ptch1
benign neonatal seizures	0.00576144	0.128021234	2	Kcnq2,Kcnq3
biotinidase deficiency	0.075926014	0.128021234	1	Btd
brain disease	0.075926014	0.128021234	1	Pten
Brugada syndrome 7	0.075926014	0.128021234	1	Scn3b
CADASIL 1	0.075926014	0.128021234	1	Notch3
campomelic dysplasia	0.075926014	0.128021234	1	Sox9
Camurati-Engelmann disease	0.075926014	0.128021234	1	Mitf
carnitine palmitoyltransferase I deficiency	0.075926014	0.128021234	1	Cpt1a
cataract 4 multiple types	0.075926014	0.128021234	1	Crygd
cerebellar ataxia	0.075926014	0.128021234	1	Cacna1a
cerebral cavernous malformation 3	0.075926014	0.128021234	1	Pdcd10
CHARGE syndrome	0.016410442	0.128021234	2	Chd2,Trp53
childhood electroclinical syndrome	0.075926014	0.128021234	1	Cacna1a
cleft palate-lateral synechia syndrome	0.075926014	0.128021234	1	Bmp4
CLOVES syndrome	0.075926014	0.128021234	1	Pik3ca
Coffin-Siris syndrome	0.075926014	0.128021234	1	Arid1a
cone-rod dystrophy 3	0.075926014	0.128021234	1	Abca4
congenital disorder of glycosylation type II	0.075926014	0.128021234	1	Mgat2
congenital myasthenic syndrome 9	0.075926014	0.128021234	1	Musk
congenital stationary night blindness 1D	0.075926014	0.128021234	1	Slc24a1
Costello syndrome	0.075926014	0.128021234	1	Hras
Cowden syndrome	0.075926014	0.128021234	1	Pten
diffuse large B-cell lymphoma	0.075926014	0.128021234	1	Trp53
dilated cardiomyopathy 1HH	0.075926014	0.128021234	1	Bag3
distal muscular dystrophy	0.075926014	0.128021234	1	Dysf
Duane-radial ray syndrome	0.075926014	0.128021234	1	Sall4
dyskeratosis congenita	0.016410442	0.128021234	2	Dkc1,Trp53
endometrial cancer	0.03117248	0.128021234	2	Pten,Trp53
enlarged vestibular aqueduct	0.075926014	0.128021234	1	Atp6v1b1
epidermal appendage tumor	0.075926014	0.128021234	1	Tmem207
epilepsy	0.034987724	0.128021234	3	Bsn,Cacna2d2,Cdyl
episodic ataxia type 2	0.075926014	0.128021234	1	Cacna1a
factor XI deficiency	0.075926014	0.128021234	1	F11
familial adenomatous polyposis	0.075926014	0.128021234	1	Apc
familial hemiplegic migraine	0.075926014	0.128021234	1	Cacna1a
Fraser syndrome	0.03117248	0.128021234	2	Frem2,Grip1
generalized dystonia	0.075926014	0.128021234	1	Cacna1a
glioblastoma multiforme	0.075926014	0.128021234	1	Trp53
Griscelli syndrome type 1	0.075926014	0.128021234	1	Myo5a
growth hormone secreting pituitary adenoma	0.075926014	0.128021234	1	Men1

DO	p_val_FET	p_val_adj	n_genes	genes_mutated
achondroplasia	0.012129755	0.178699563	3	Fgfr3,Npr2,Spred2
acromesomelic dysplasia, Maroteaux type	0.113155778	0.178699563	1	Npr2
adult-onset autosomal dominant demyelinating leukodystrophy	0.113155778	0.178699563	1	Lmnb1
age related macular degeneration 14	0.113155778	0.178699563	1	C2
Alexander disease	0.113155778	0.178699563	1	Gfap
alkaptonuria	0.113155778	0.178699563	1	Hgd
alopecia universalis	0.113155778	0.178699563	1	Hr
alpha-mannosidosis	0.113155778	0.178699563	1	Man2b1
amyotrophic lateral sclerosis type 6	0.113155778	0.178699563	1	Fus
angle-closure glaucoma	0.113155778	0.178699563	1	Tfap2b
aspartylglucosaminuria	0.113155778	0.178699563	1	Aga
asphyxiating thoracic dystrophy	0.113155778	0.178699563	1	Smarcad1
asphyxiating thoracic dystrophy 2	0.113155778	0.178699563	1	Ift80
autoimmune polyendocrine syndrome type 1	0.113155778	0.178699563	1	Aire
autosomal dominant disease	0.113155778	0.178699563	1	Fgfr3
autosomal dominant familial periodic fever	0.113155778	0.178699563	1	Tnfrsf1a
autosomal dominant nonsyndromic deafness 36	0.113155778	0.178699563	1	Tmc1
autosomal dominant Parkinson's disease 1	0.113155778	0.178699563	1	Snca
autosomal dominant Parkinson's disease 4	0.113155778	0.178699563	1	Snca
autosomal dominant pseudohypoaldosteronism type 1	0.113155778	0.178699563	1	Nr3c2
autosomal recessive Alport syndrome	0.001447261	0.178699563	3	Col4a3,Col4a4,Mpv17
autosomal recessive limb-girdle muscular dystrophy type 2E	0.113155778	0.178699563	1	Sgcb
autosomal recessive limb-girdle muscular dystrophy type 2P	0.113155778	0.178699563	1	Dag1
autosomal recessive nonsyndromic deafness 18A	0.113155778	0.178699563	1	Ush1c
autosomal recessive nonsyndromic deafness 18B	0.113155778	0.178699563	1	Otog
autosomal recessive nonsyndromic deafness 22	0.113155778	0.178699563	1	Otoa
autosomal recessive nonsyndromic deafness 42	0.113155778	0.178699563	1	Ildr1
autosomal recessive nonsyndromic deafness 68	0.113155778	0.178699563	1	S1pr2
autosomal recessive nonsyndromic deafness 7	0.113155778	0.178699563	1	Tmc1
autosomal recessive nonsyndromic deafness 9	0.113155778	0.178699563	1	Otof
autosomal recessive osteopetrosis 3	0.113155778	0.178699563	1	Car2
autosomal recessive spinocerebellar ataxia 18	0.113155778	0.178699563	1	Grid2
Bardet-Biedl syndrome	0.113155778	0.178699563	1	Tbc1d32
Bardet-Biedl syndrome 8	0.113155778	0.178699563	1	Ttc8
Bartter disease	0.113155778	0.178699563	1	Clcnkb
Bartter disease type 3	0.113155778	0.178699563	1	Clcnkb
Becker muscular dystrophy	0.113155778	0.178699563	1	Dmd
beta-mannosidosis	0.113155778	0.178699563	1	Manba
Bietti crystalline corneoretinal dystrophy	0.113155778	0.178699563	1	Cyp4v3
blepharophimosis, ptosis, and epicanthus inversus syndrome	0.113155778	0.178699563	1	Foxl2
Bloch-Sulzberger syndrome	0.113155778	0.178699563	1	Ikbkg
bone development disease	0.113155778	0.178699563	1	Npr2
bone disease	0.113155778	0.178699563	1	Npr3
Brugada syndrome 1	0.113155778	0.178699563	1	Scn5a
Brunner Syndrome	0.113155778	0.178699563	1	Maoa
Budd-Chiari syndrome	0.113155778	0.178699563	1	F5
CAKUT	0.113155778	0.178699563	1	Lifr
carbamoyl phosphate synthetase I deficiency disease	0.113155778	0.178699563	1	Cps1
Carpenter syndrome	0.113155778	0.178699563	1	Megf8
cataract 39 multiple types	0.113155778	0.178699563	1	Crygb
cerebral cavernous malformation	0.113155778	0.178699563	1	Krit1
Charcot-Marie-Tooth disease axonal type 2K	0.113155778	0.178699563	1	Gdap1
Charcot-Marie-Tooth disease type 2A2	0.113155778	0.178699563	1	Mfn2
Charcot-Marie-Tooth disease type 4B2	0.113155778	0.178699563	1	Sbf2
Charcot-Marie-Tooth disease X-linked dominant 1	0.113155778	0.178699563	1	Gjb1
Char syndrome	0.113155778	0.178699563	1	Tfap2b
Chediak-Higashi syndrome	0.113155778	0.178699563	1	Lyst
chondrodysplasia-pseudohermaphroditism syndrome	0.113155778	0.178699563	1	Hhat
choreaacanthocytosis	0.113155778	0.178699563	1	Vps13a
cleft palate	0.113155778	0.178699563	1	Golgb1
complement component 2 deficiency	0.113155778	0.178699563	1	C2
Compton-North congenital myopathy	0.113155778	0.178699563	1	Cntn1
congenital bile acid synthesis defect 5	0.113155778	0.178699563	1	Abcd3
congenital hypothyroidism	0.052347526	0.178699563	3	Duox2,Tpo,Trhr
congenital merosin-deficient muscular dystrophy 1A	0.113155778	0.178699563	1	Lama2
congenital secretory chloride diarrhea 1	0.113155778	0.178699563	1	Slc26a3
congenital stationary night blindness autosomal dominant 2	0.113155778	0.178699563	1	Pde6b
Cornelia de Lange syndrome	0.012799483	0.178699563	2	Nipbl,Pds5a
cutaneous porphyria	0.113155778	0.178699563	1	Uros
Dandy-Walker syndrome	0.035503925	0.178699563	2	Zic1,Zic4
Dent disease	0.113155778	0.178699563	1	Clcn5
dilated cardiomyopathy	0.031409067	0.178699563	9	Dag1,Dicer1,Dnm1l,Ilk,Med1,Myh6,Nr2f2,Pdcd1,Prox1
dilated cardiomyopathy 1E	0.113155778	0.178699563	1	Scn5a
dilated cardiomyopathy 1EE	0.113155778	0.178699563	1	Myh6
Down syndrome	0.113155778	0.178699563	1	Dyrk1a
epilepsy	0.094575881	0.178699563	3	Aldh5a1,Kcna1,Scn8a
episodic ataxia type 1	0.113155778	0.178699563	1	Kcna1
exfoliation syndrome	0.113155778	0.178699563	1	Lyst
factor V deficiency	0.113155778	0.178699563	1	F5
familial cold autoinflammatory syndrome 4	0.113155778	0.178699563	1	Nlrc4
familial hemophagocytic lymphohistiocytosis 3	0.113155778	0.178699563	1	Unc13d
familial isolated deficiency of vitamin E	0.113155778	0.178699563	1	Ttpa
familial Mediterranean fever	0.113155778	0.178699563	1	Mefv
familial temporal lobe epilepsy 1	0.113155778	0.178699563	1	Lgi1
Fanconi anemia	0.113155778	0.178699563	1	Usp1
Fanconi anemia complementation group A	0.113155778	0.178699563	1	Fanca
Fanconi anemia complementation group C	0.113155778	0.178699563	1	Fancc
Fanconi anemia complementation group D1	0.113155778	0.178699563	1	Brca2

focal segmental glomerulosclerosis 2	0.113155778	0.178699563	1	Trpc6
fucosidosis	0.113155778	0.178699563	1	Fuca1
gastroschisis	0.113155778	0.178699563	1	Lrp1
glycerol kinase deficiency	0.113155778	0.178699563	1	Gk
GM2 gangliosidosis, AB variant	0.113155778	0.178699563	1	Gm2a
Greig cephalopolysyndactyly syndrome	0.113155778	0.178699563	1	Gli3
guanidinoacetate methyltransferase deficiency	0.113155778	0.178699563	1	Gamt
Hajdu-Cheney syndrome	0.113155778	0.178699563	1	Notch2
hereditary mucosal leukokeratosis	0.113155778	0.178699563	1	Krt4
hereditary spastic paraplegia 2	0.113155778	0.178699563	1	Plp1
hereditary spastic paraplegia 4	0.113155778	0.178699563	1	Spast
hereditary spherocytosis type 4	0.113155778	0.178699563	1	Slc4a1
hypertrophic cardiomyopathy 14	0.113155778	0.178699563	1	Myh6
hypertrophic cardiomyopathy 4	0.113155778	0.178699563	1	Mybpc3
hypertrophic pyloric stenosis	0.113155778	0.178699563	1	Nos1
hypoparathyroidism	0.113155778	0.178699563	1	Gcm2
hypotonia-cystinuria syndrome	0.113155778	0.178699563	1	Camkmt
hypotrichosis 4	0.113155778	0.178699563	1	Hr
immune dysregulation-polyendocrinopathy-enteropathy-X-linked syndrome	0.113155778	0.178699563	1	Foxp3
inflammatory bowel disease 1	0.113155778	0.178699563	1	Nod2
isolated cleft palate	0.113155778	0.178699563	1	Satb2
Joubert syndrome	0.113155778	0.178699563	1	Zic1
junctional epidermolysis bullosa with pyloric atresia	0.113155778	0.178699563	1	Itgb4
Kabuki syndrome	0.113155778	0.178699563	1	Kmt2d
keratosis follicularis	0.113155778	0.178699563	1	Atp2a2
Leber congenital amaurosis 5	0.113155778	0.178699563	1	Lca5
Leber congenital amaurosis 6	0.113155778	0.178699563	1	Rpgrip1
Leber congenital amaurosis 8	0.113155778	0.178699563	1	Crb1
Lennox-Gastaut syndrome	0.113155778	0.178699563	1	Dgkd
Lesch-Nyhan syndrome	0.113155778	0.178699563	1	Hprt
long QT syndrome 3	0.113155778	0.178699563	1	Scn5a
lymphocytic leukemia	0.113155778	0.178699563	1	Tal1
lysosomal storage disease	0.113155778	0.178699563	1	Slc17a5
megacystis-microcolon-intestinal hypoperistalsis syndrome	0.113155778	0.178699563	1	Chrm3
mitochondrial DNA depletion syndrome 3	0.113155778	0.178699563	1	Mpv17
motor neuron disease	0.113155778	0.178699563	1	Rhot1
Mowat-Wilson syndrome	0.113155778	0.178699563	1	Zeb2
Muenke Syndrome	0.113155778	0.178699563	1	Fgfr3
multiple endocrine neoplasia type 2B	0.113155778	0.178699563	1	Ret
MYH-9 related disease	0.113155778	0.178699563	1	Myh9
myositis	0.113155778	0.178699563	1	H2-K1
myotonia congenita	0.113155778	0.178699563	1	Clcn1
myotonic dystrophy type 1	0.113155778	0.178699563	1	Dmpk
nemaline myopathy	0.113155778	0.178699563	1	Klhl41
neonatal diabetes mellitus with congenital hypothyroidism	0.113155778	0.178699563	1	Glis3
neurodegeneration with brain iron accumulation 2a	0.113155778	0.178699563	1	Pla2g6
neuronal ceroid lipofuscinosis 2	0.113155778	0.178699563	1	Tpp1
non-Hodgkin lymphoma	0.012799483	0.178699563	2	Mtss1,S1pr2
omphalocele	0.113155778	0.178699563	1	Lrp1
osteogenesis imperfecta type 10	0.113155778	0.178699563	1	Serpinh1
osteogenesis imperfecta type 5	0.113155778	0.178699563	1	Suco
osteopathia striata with cranial sclerosis	0.113155778	0.178699563	1	Amer1
ovarian disease	0.113155778	0.178699563	1	Patl2
Pallister-Hall syndrome	0.113155778	0.178699563	1	Gli3
patterned macular dystrophy 2	0.113155778	0.178699563	1	Ctnna1
Pelizaeus-Merzbacher disease	0.113155778	0.178699563	1	Plp1
pheochromocytoma	0.113155778	0.178699563	1	Ret
platelet storage pool deficiency	0.064733704	0.178699563	4	Ap3d1,Dock7,Lyst,Slc7a11
polycystic liver disease	0.113155778	0.178699563	1	Prkcsh
primary ciliary dyskinesia 23	0.113155778	0.178699563	1	Armc4
primary ciliary dyskinesia 30	0.113155778	0.178699563	1	Ccdc151
primary open angle glaucoma	0.113155778	0.178699563	1	Gucy1a1
progressive familial heart block type IA	0.113155778	0.178699563	1	Scn5a
pseudohypoaldosteronism	0.113155778	0.178699563	1	Klhl3
pseudoxanthoma elasticum	0.113155778	0.178699563	1	Abcc6
retinitis pigmentosa 1	0.113155778	0.178699563	1	Rp1
retinitis pigmentosa 12	0.113155778	0.178699563	1	Crb1
retinitis pigmentosa 40	0.113155778	0.178699563	1	Pde6b
rhizomelic chondrodysplasia punctata type 2	0.113155778	0.178699563	1	Gnpat
Rothmund-Thomson syndrome	0.113155778	0.178699563	1	Recql4
Rubinstein-Taybi syndrome	0.113155778	0.178699563	1	Crebbp
salivary gland cancer	0.113155778	0.178699563	1	Gon4l
Schimke immuno-osseous dysplasia	0.113155778	0.178699563	1	Smarcal1
scoliosis	0.113155778	0.178699563	1	Fgfr3
severe congenital neutropenia	0.113155778	0.178699563	1	Gfi1
Shwachman-Diamond syndrome	0.012799483	0.178699563	2	Sbds,Serpini2
sialuria	0.113155778	0.178699563	1	Slc17a5
skin disease	0.113155778	0.178699563	1	Fyn
skin squamous cell carcinoma	0.113155778	0.178699563	1	Fyn
spinocerebellar ataxia type 27	0.113155778	0.178699563	1	Fgf14
systemic lupus erythematosus	0.078323023	0.178699563	7	C4b,Fas,Ifih1,Jak1,Pdcd1,Ptprc,Traf3ip2
Tangier disease	0.113155778	0.178699563	1	Abca1
T-cell adult acute lymphocytic leukemia	0.012799483	0.178699563	2	Cntn2,Zeb2
temporal lobe epilepsy	0.113155778	0.178699563	1	Kcna1
urofacial syndrome	0.113155778	0.178699563	1	Hpse2
Usher syndrome type 1C	0.113155778	0.178699563	1	Ush1c
Usher syndrome type 2C	0.012799483	0.178699563	2	Adgrv1,Slc4a7
uterine fibroid	0.113155778	0.178699563	1	Tsc2
VACTERL association	0.022228468	0.178699563	3	Ift172,Qsox1,Tbc1d32

vesicoureteral reflux	0.113155778	0.178699563	1	Upk3a
Weaver syndrome	0.113155778	0.178699563	1	Ezh2
Wolcott-Rallison syndrome	0.113155778	0.178699563	1	Eif2ak3
xeroderma pigmentosum	0.113155778	0.178699563	1	Terf2
xeroderma pigmentosum group C	0.113155778	0.178699563	1	Xpc
X-linked Alport syndrome	0.113155778	0.178699563	1	Col4a5
breast cancer	0.11756921	0.184660336	4	Brca2,Hgf,Smarca4,Wnt1
microcephaly	0.141029903	0.219127108	2	Kif20b,Mcph1
rheumatoid arthritis	0.141029903	0.219127108	2	Mmp14,Zfp36
abdominal obesity-metabolic syndrome	0.183176221	0.269454102	2	Prkci,Sirt3
acute myeloid leukemia	0.183176221	0.269454102	2	Arid4a,Crebbp
agnathia-otocephaly complex	0.213512074	0.269454102	1	Trappc10
asphyxiating thoracic dystrophy 3	0.213512074	0.269454102	1	Ift80
atrichia with papular lesions	0.213512074	0.269454102	1	Hr
autoimmune lymphoproliferative syndrome	0.213512074	0.269454102	1	Fas
autosomal recessive Robinow syndrome	0.213512074	0.269454102	1	Ror2
chromosome 1p36 deletion syndrome	0.213512074	0.269454102	1	Kcnab2
Cockayne syndrome	0.213512074	0.269454102	1	Ercc6
common variable immunodeficiency	0.213512074	0.269454102	1	Icos
congenital generalized lipodystrophy type 2	0.213512074	0.269454102	1	Bscl2
coronary artery disease	0.213512074	0.269454102	1	Abcc9
cystic fibrosis	0.213512074	0.269454102	1	Cftr
dilated cardiomyopathy 1A	0.213512074	0.269454102	1	Dot1l
Duchenne muscular dystrophy	0.213512074	0.269454102	1	Dmd
erythropoietic protoporphyria	0.213512074	0.269454102	1	Abcg2
Fanconi-like syndrome	0.213512074	0.269454102	1	Slx1b
glycine encephalopathy	0.213512074	0.269454102	1	Gldc
glycogen storage disease V	0.213512074	0.269454102	1	Pygm
Guillain-Barre syndrome	0.213512074	0.269454102	1	Aire
hereditary hemorrhagic telangiectasia	0.213512074	0.269454102	1	Eng
Hermansky-Pudlak syndrome 2	0.213512074	0.269454102	1	Ap3d1
intestinal pseudo-obstruction	0.213512074	0.269454102	1	Nup35
Kartagener syndrome	0.175336908	0.269454102	3	Ap1b1,Armc4,Ccdc151
Lafora disease	0.213512074	0.269454102	1	Nhlrc1
Lynch syndrome	0.213512074	0.269454102	1	Msh2
Menkes disease	0.213512074	0.269454102	1	Atp7a
narcolepsy	0.213512074	0.269454102	1	Hcrtr2
Netherton syndrome	0.213512074	0.269454102	1	Dsg4
nonepidermolytic palmoplantar keratoderma	0.213512074	0.269454102	1	Rhbdf2
Noonan syndrome	0.213512074	0.269454102	1	Kat6b
orofacial cleft	0.213512074	0.269454102	1	Tfap2a
Pierson syndrome	0.213512074	0.269454102	1	Tns2
platelet-type bleeding disorder 16	0.213512074	0.269454102	1	Itga2b
restrictive cardiomyopathy	0.213512074	0.269454102	1	Mypn
Sertoli cell-only syndrome	0.213512074	0.269454102	1	Dmc1
severe combined immunodeficiency, autosomal recessive, T cell-negative, B cell-negative, Nk cell-po	0.213512074	0.269454102	1	Prkdc
Stargardt disease	0.213512074	0.269454102	1	Elovl4
thanatophoric dysplasia	0.213512074	0.269454102	1	Fgfr3
tuberous sclerosis	0.213512074	0.269454102	1	Tsc2
velocardiofacial syndrome	0.183176221	0.269454102	2	Chrd,Trappc10
Werdnig-Hoffmann disease	0.213512074	0.269454102	1	Vps54
Wiskott-Aldrich syndrome	0.213512074	0.269454102	1	Foxp3
Alzheimer's disease	0.226785785	0.284961269	2	Lrp1,Plau
Hirschsprung's disease	0.270988242	0.33902858	2	Itgb1,Ret
achalasia	0.302516148	0.362768327	1	Nos1
arteriovenous malformations of the brain	0.302516148	0.362768327	1	Eng
early infantile epileptic encephalopathy	0.302516148	0.362768327	1	Scn8a
epidermolytic hyperkeratosis	0.302516148	0.362768327	1	Krt1
Hermansky-Pudlak syndrome 1	0.302516148	0.362768327	1	Ap3d1
Niemann-Pick disease	0.302516148	0.362768327	1	Smpd1
pulmonary alveolar proteinosis	0.302516148	0.362768327	1	Csf2rb
renal tubular acidosis	0.302516148	0.362768327	1	Slc4a1
Seckel syndrome	0.302516148	0.362768327	1	Cenpj
type I Ehlers-Danlos syndrome	0.302516148	0.362768327	1	Col5a1
fatty liver disease	0.315091333	0.374738252	2	Ikbkg,Plau
Williams-Beuren syndrome	0.315091333	0.374738252	2	Gtf2i,Limk1
congenital diaphragmatic hernia	0.358551759	0.422944728	2	Lrp1,Nr2f2
myelodysplastic syndrome	0.358551759	0.422944728	2	Asxl1,Crebbp
amyotrophic lateral sclerosis	0.381451679	0.432311903	1	Zfp106
aortic valve disease	0.381451679	0.432311903	1	Rbpj
asthma	0.381451679	0.432311903	1	Tbx21
centronuclear myopathy	0.381451679	0.432311903	1	Dnm2
chronic myeloid leukemia	0.381451679	0.432311903	1	Sh2b3
endogenous depression	0.381451679	0.432311903	1	Hap1
Gilles de la Tourette syndrome	0.381451679	0.432311903	1	Hdc
Leigh disease	0.381451679	0.432311903	1	Parl
neuronal ceroid lipofuscinosis 3	0.381451679	0.432311903	1	Cln3
obesity	0.378912033	0.432311903	5	Ankrd26,Kdm3a,Pcsk1,Prkci,Prox1
Sjogren's syndrome	0.430762268	0.486290217	3	Aire,Fas,Traf3ip2
acute lymphocytic leukemia	0.451457242	0.494208875	1	Ezh2
amyotrophic lateral sclerosis type 1	0.451457242	0.494208875	1	Vps54
cardiomyopathy	0.451457242	0.494208875	1	Lrp1
hydrocephalus	0.448612589	0.494208875	3	Add1,Ccdc85c,Celsr2
junctional epidermolysis bullosa non-Herlitz type	0.451457242	0.494208875	1	Itgb4
lissencephaly	0.451457242	0.494208875	1	Dag1
lung cancer	0.451457242	0.494208875	1	Xpc
neural tube defect	0.451457242	0.494208875	1	Mthfr
autistic disorder	0.468931862	0.511401163	6	Brinp1,Crebbp,Gstm1,Nrxn1,Tbr1,Tsc2
atrioventricular septal defect	0.51354271	0.547652558	1	Ift172

clubfoot	0.51354271	0.547652558	1	Ret
Hermansky-Pudlak syndrome	0.51354271	0.547652558	1	Slc7a11
Meckel syndrome	0.51354271	0.547652558	1	Tbc1d32
nephrotic syndrome	0.51354271	0.547652558	1	Mpv17
pre-eclampsia	0.51354271	0.547652558	1	Notch2
visceral heterotaxy	0.55077421	0.585197598	4	Ap1b1,Armc4,Megf8,Tbc1d32
type 2 diabetes mellitus	0.563466415	0.596490088	4	Gadd45gip1,Irs2,Ppp1r3a,Prkci
male infertility	0.568603792	0.597550894	1	Bscl2
osteoporosis	0.568603792	0.597550894	1	Ifngr1
DiGeorge syndrome	0.684005275	0.716222915	2	Chrd,Dicer1
type 1 diabetes mellitus	0.719755701	0.750936453	1	Ptprn2
schizophrenia	0.798230391	0.829815047	5	Chrna7,Cplx2,Lrrtm1,Nrxn1,Srgap3
atopic dermatitis	1	1	1	Traf3ip2
attention deficit hyperactivity disorder	1	1	1	Brinp1
Charlevoix-Saguenay spastic ataxia	1	1	1	Sacs
congestive heart failure	1	1	1	Med1
cystic kidney disease	1	1	1	Dnm2
hepatocellular carcinoma	1	1	1	Plau
hypertrophic cardiomyopathy	1	1	1	Pepd
inflammatory bowel disease	1	1	1	Muc2
osteoarthritis	1	1	1	Erg
primary ciliary dyskinesia	1	1	1	Ap1b1
retinitis pigmentosa	1	1	1	Pde6b

DO	p_val_FET	p_val_adj	n_genes	genes_mutated
achondrogenesis type IA	0.025119447	0.064592865	1	Trip11
achondrogenesis type II	0.025119447	0.064592865	1	Col2a1
age related macular degeneration 9	0.025119447	0.064592865	1	C3
autosomal dominant Parkinson's disease 8	0.025119447	0.064592865	1	Lrrk2
autosomal recessive nonsyndromic deafness 2	0.025119447	0.064592865	1	Myo7a
cataract 1 multiple types	0.025119447	0.064592865	1	Gja8
Charcot-Marie-Tooth disease axonal type 2O	0.025119447	0.064592865	1	Dync1h1
Charcot-Marie-Tooth disease type 2A1	0.025119447	0.064592865	1	Kif1b
Charcot-Marie-Tooth disease type 4D	0.025119447	0.064592865	1	Ndrg1
complement component 3 deficiency	0.025119447	0.064592865	1	C3
cone-rod dystrophy 9	0.025119447	0.064592865	1	Adam9
congenital stationary night blindness 2A	0.025119447	0.064592865	1	Cacna1f
craniofrontonasal syndrome	0.025119447	0.064592865	1	Efnb1
cystic kidney disease	0.020169655	0.064592865	2	Robo1,Slit2
granulosa cell tumor	0.025119447	0.064592865	1	Ctnnb1
hereditary sensory and autonomic neuropathy type 6	0.025119447	0.064592865	1	Dst
hereditary spastic paraplegia 15	0.025119447	0.064592865	1	Zfyve26
inflammatory bowel disease 12	0.025119447	0.064592865	1	Gnai2
isolated anhidrosis with normal sweat glands	0.025119447	0.064592865	1	Itpr2
Joubert syndrome 26	0.025119447	0.064592865	1	D430042O09Rik
junctional epidermolysis bullosa	0.025119447	0.064592865	1	Lama3
karyomegalic interstitial nephritis	0.025119447	0.064592865	1	Fan1
lung cancer	0.005988892	0.064592865	2	Foxm1,Robo1
meconium aspiration syndrome	0.025119447	0.064592865	1	Atf2
mitral valve prolapse	0.025119447	0.064592865	1	Dchs1
nephrosis	0.025119447	0.064592865	1	Lamb2
osteochondrodysplasia	0.025119447	0.064592865	1	Atf2
peripheral T-cell lymphoma	0.025119447	0.064592865	1	Rc3h1
Potocki-Lupski syndrome	0.025119447	0.064592865	1	Rai1
primary ciliary dyskinesia 2	0.025119447	0.064592865	1	Dnaaf3
Smith-Magenis syndrome	0.025119447	0.064592865	1	Rai1
spondyloepimetaphyseal dysplasia	0.025119447	0.064592865	1	Col2a1
tricuspid atresia	0.025119447	0.064592865	1	Zfpm2
Usher syndrome type 1	0.025119447	0.064592865	1	Myo7a
X-linked cleft palate with or without ankyloglossia	0.025119447	0.064592865	1	Tbx22
primary ciliary dyskinesia	0.029811054	0.074527635	2	Slit2,Spef2
age related macular degeneration 1	0.049609067	0.082681778	1	Vldlr
ARC syndrome	0.049609067	0.082681778	1	Vps33b
autosomal recessive osteopetrosis 1	0.049609067	0.082681778	1	Ccdc154
Beckwith-Wiedemann syndrome	0.049609067	0.082681778	1	Sptbn1
cardiofaciocutaneous syndrome	0.049609067	0.082681778	1	Map2k1
congenital fibrosis of the extraocular muscles	0.049609067	0.082681778	1	Kif21a
glycogen storage disease V	0.049609067	0.082681778	1	Hif1a
glycogen storage disease VII	0.049609067	0.082681778	1	Hif1a
hemolytic-uremic syndrome	0.049609067	0.082681778	1	C3
Kartagener syndrome	0.040906383	0.082681778	2	Dnaaf3,Slit2
microvillus inclusion disease	0.049609067	0.082681778	1	Myo5b
ovarian cancer	0.049609067	0.082681778	1	Ctnnb1
Pendred Syndrome	0.049609067	0.082681778	1	Slc26a4
Pierson syndrome	0.049609067	0.082681778	1	Lamb2
recessive dystrophic epidermolysis bullosa	0.049609067	0.082681778	1	Col7a1
severe combined immunodeficiency, autosomal recessive, T cell-negative, B cell-positive, Nk cell-pos	0.049609067	0.082681778	1	Jak3
spondyloepiphyseal dysplasia congenita	0.049609067	0.082681778	1	Col2a1
syndromic intellectual disability	0.049609067	0.082681778	1	Brpf1
DiGeorge syndrome	0.053288217	0.085641778	2	Kat6a,Zfp366
hepatocellular carcinoma	0.053288217	0.085641778	2	Foxm1,Uaca
arteriovenous malformations of the brain	0.073484621	0.103337748	1	Notch4
cutis laxa	0.073484621	0.103337748	1	Ltbp4
distal arthrogryposis	0.073484621	0.103337748	1	Fbn2
hereditary sensory neuropathy	0.073484621	0.103337748	1	Dst
nephronophthisis	0.073484621	0.103337748	1	Cntrl
spondylocostal dysostosis	0.073484621	0.103337748	1	Tbx6
type I Ehlers-Danlos syndrome	0.073484621	0.103337748	1	Col5a2
urinary bladder cancer	0.073484621	0.103337748	1	Ctnnb1
autistic disorder	0.088153425	0.122058588	3	Cadps2,Ctnnb1,Nrp2
hereditary spherocytosis type 1	0.096761479	0.129978106	1	Ank1
myelofibrosis	0.096761479	0.129978106	1	Ncor2
acute lymphocytic leukemia	0.119454625	0.153584518	1	Kmt2a
Huntington's disease	0.119454625	0.153584518	1	Zdhhc13
junctional epidermolysis bullosa non-Herlitz type	0.119454625	0.153584518	1	Lama3
microcephaly	0.141578672	0.174549047	1	Aspm
nephrotic syndrome	0.141578672	0.174549047	1	Itsn2
primary pulmonary hypertension	0.141578672	0.174549047	1	Bmpr2

visceral heterotaxy	0.155544765	0.189176066	2	Dnaaf3,Slit2
acute myeloid leukemia	0.163147863	0.193201417	1	Kmt2a
malaria	0.163147863	0.193201417	1	Ank1
autism spectrum disorder	0.18417609	0.209820862	1	Chd8
prostate cancer	0.18417609	0.209820862	1	Ctnnb1
systemic lupus erythematosus	0.182470735	0.209820862	2	Ep300,Rc3h1
pulmonary emphysema	0.204676894	0.230261506	1	Tlr4
Williams-Beuren syndrome	0.22466348	0.249626089	1	Baz1b
congenital diaphragmatic hernia	0.244148723	0.267968111	1	Zfpm2
attention deficit hyperactivity disorder	0.263145175	0.285338141	1	Per1
tetralogy of Fallot	0.281665074	0.301784008	1	Zfpm2
hydrocephalus	0.367523657	0.389142696	1	Ulk4
type 2 diabetes mellitus	0.522057467	0.546339209	1	Foxm1
obesity	0.534079612	0.55249615	1	Tyk2
dilated cardiomyopathy	0.610193493	0.624061527	1	Cenpf
schizophrenia	1	1	1	Reln
sinoatrial node disease	1	1	1	Ank2

Supplementary Figures

Figure S1. Validation of *Ppara*$^{\Delta IE}$ mice.

Figure S2. Intestine-specific knockout of PPARα increased AOM and DSS-induced colon carcinogenesis.

Figure S3. Several methylation related metabolites were increased in the urine of tumor-bearing *Ppara*$^{\Delta IE}$ mice.

Figure S4. Validation of metabolites by MS/MS fragmentation reactions.

Figure S5. The levels of ADMA and SDMA in the serum.

Figure S6. Silence DNMT1 and PRMT6 increased the expression of p21 and p27, respectively.

Figure S7. PPARα regulated the expression of p21 and p27 partially through DNMT1 and PRMT6 in the intestine.

Figure S8. Silence RB1 increased the expression of DNMT1 and PRMT6.

Figure S9. Intestinal PPARα regulated the expression of RB1.

Figure S10. PPARα bound to the *Rb1* promoter in HCT116 cells.

Figure S11. Fenofibrate decreased AOM and DSS-induced colon carcinogenesis in human *PPARA* transgenic mice.

Figure S12. The expression of PPARα, RB1, DNMT1, PRMT6, p21, p27 and Ki67 in human colon specimens.

Figure S13. High or moderate impact somatic mutations in tumors derived from AOM and DSS-administered *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice.

Figure S14. A schematic model of the mechanism by which intestinal PPARα protects against colon carcinogenesis.

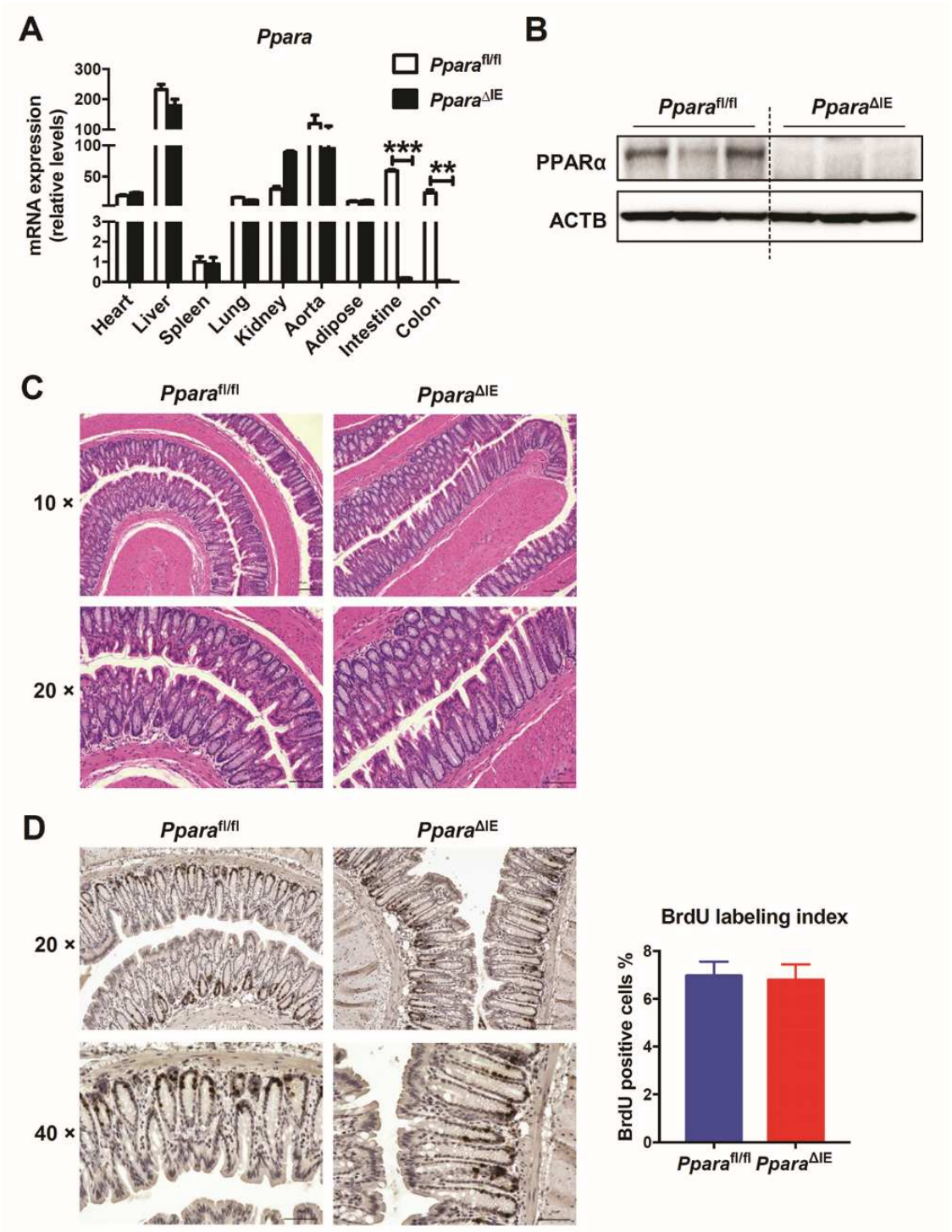

Figure S1. Validation of *Ppara*$^{\Delta IE}$ mice. (*A*) *Ppara* mRNA levels in different tissues of *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice (n=3 mice/group). ** P <0.01, *** P < 0.001. (*B*) PPARα protein levels in the colon of *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice. (*C*) Representative H&E staining of colon sections. Scale bars: 100 μm. (*D*) *Left*, Representative BrdU staining of colon sections. Scale bars: 50 μm. *Right*, BrdU labeling index.

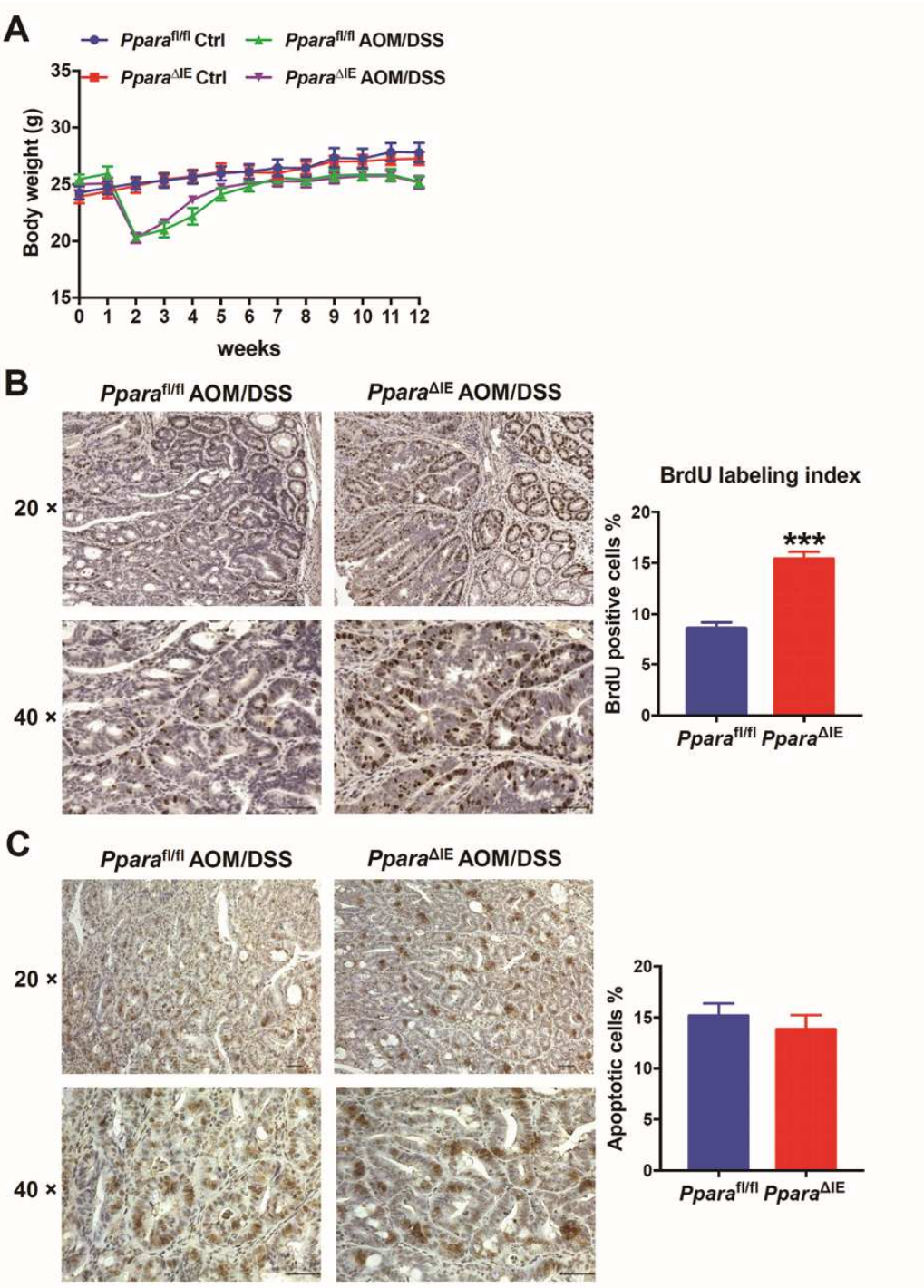

Figure S2. Intestine-specific knockout of PPARα increased AOM and DSS-induced colon carcinogenesis. (*A*) The body weight curves of four groups of mice: *Ppara*$^{fl/fl}$ Ctrl (n=7), *Ppara*$^{\Delta IE}$ Ctrl (n=6), *Ppara*$^{fl/fl}$ AOM/DSS (n=11), *Ppara*$^{\Delta IE}$ AOM/DSS (n=12). (*B*) *Left*, Representative BrdU staining of colon sections. Scale bars: 50 μm. *Right*, BrdU labeling index. (*C*) *Left*, Representative TUNEL staining of colon sections. Scale bars: 50 μm. *Right*, Percentage of apoptotic cells. *** $P < 0.001$.

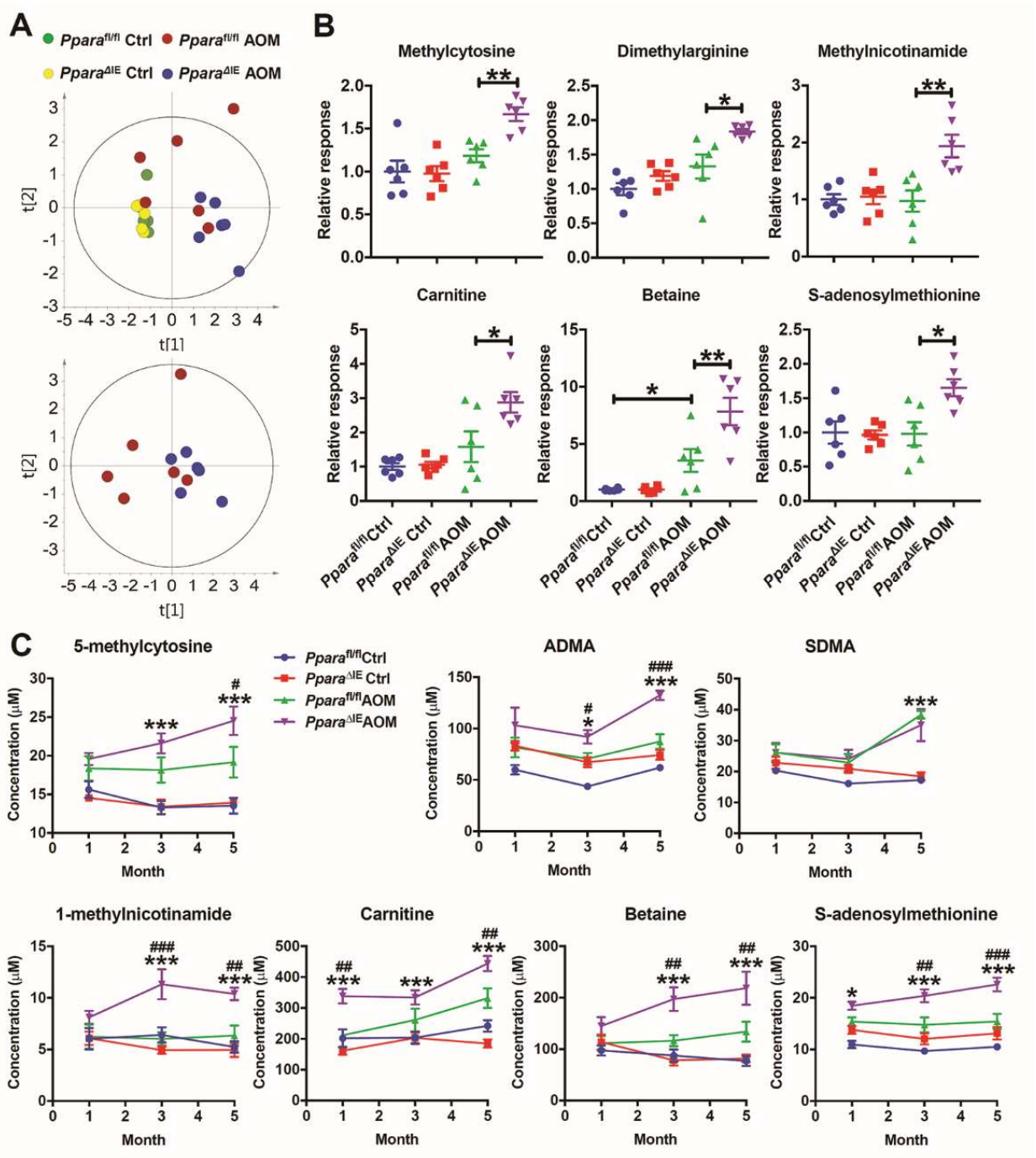

Figure S3. Several methylation related metabolites were increased in the urine of tumor-bearing *Ppara*$^{\Delta IE}$ mice. (*A*) Score scatter plot for principal components analysis of creatinine-normalized data obtained from hydrophilic interaction liquid chromatography (HILIC)-electrospray ionization (ESI)-mass spectrometry (MS) analysis of urine samples obtained 5 months after the last AOM injection. N=6 mice/group. (*B*) The relative levels of methylcytosine, dimethylarginine, methylnicotinamide, carnitine, betaine and S-adenosylmethionine in the urine samples obtained 5 months after the last AOM injection. * $P < 0.05$, ** $P < 0.01$. (*C*) The longitudinal variations in the creatinine-normalized urinary excretion of 5-methylcytosine, ADMA, SDMA, 1-methylnicotinamide, carnitine, betaine and S-adenosylmethionine. N=6 mice/group. * $P < 0.05$, *** $P < 0.001$ relative to *Ppara*$^{\Delta IE}$ Ctrl group; # $P < 0.05$, ## $P < 0.01$, ### $P < 0.001$ relative to *Ppara*$^{fl/fl}$ AOM group.

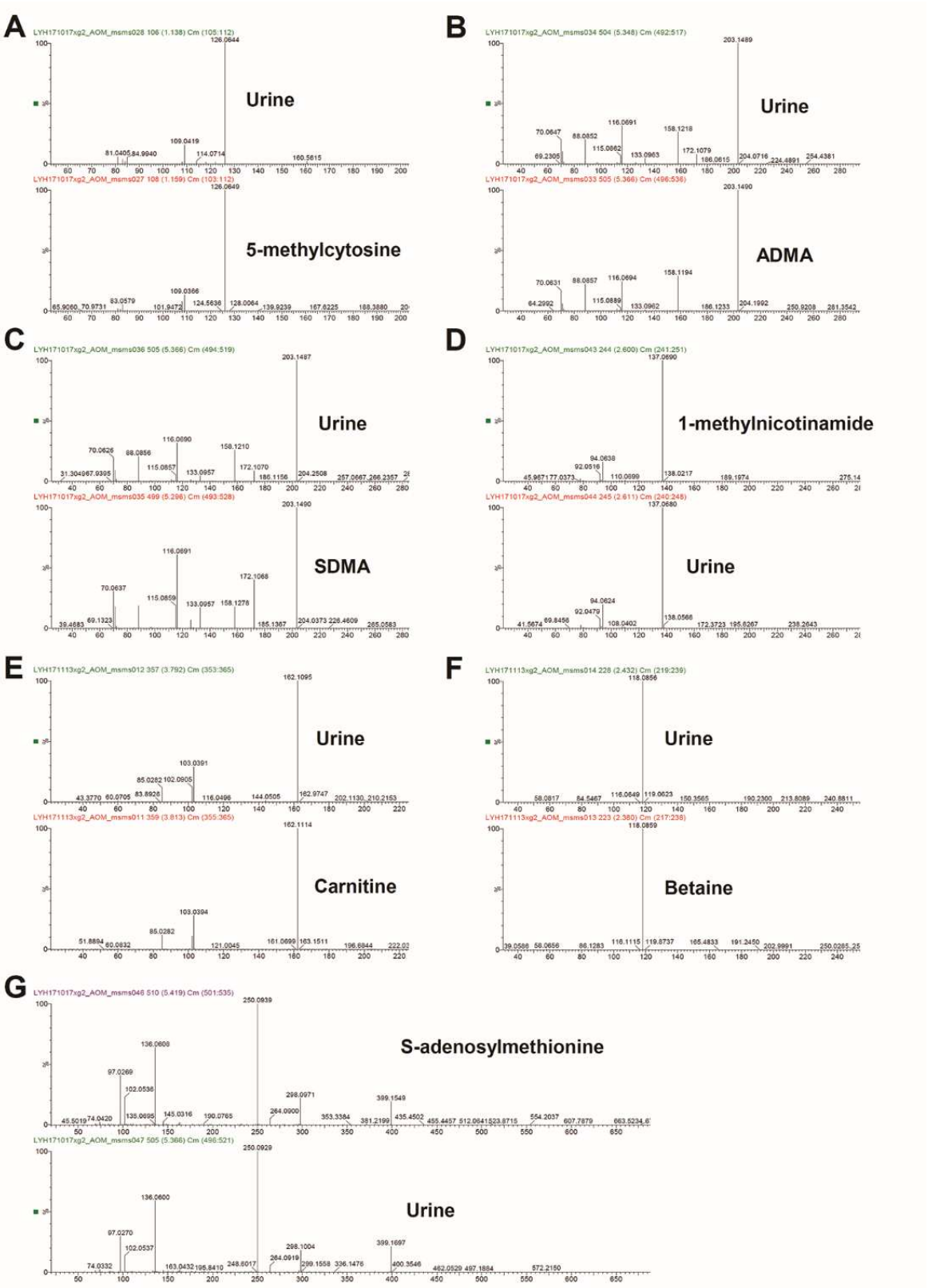

Figure S4. Validation of metabolites by MS/MS fragmentation reactions. Comparison of fragmentation patterns between urine sample and authentic standards 5-methylcytosine (*A*), ADMA (*B*), SDMA (*C*), 1-methylnicotinamide (*D*), carnitine (*E*), betaine (*F*) and S-adenosylmethionine (*G*).

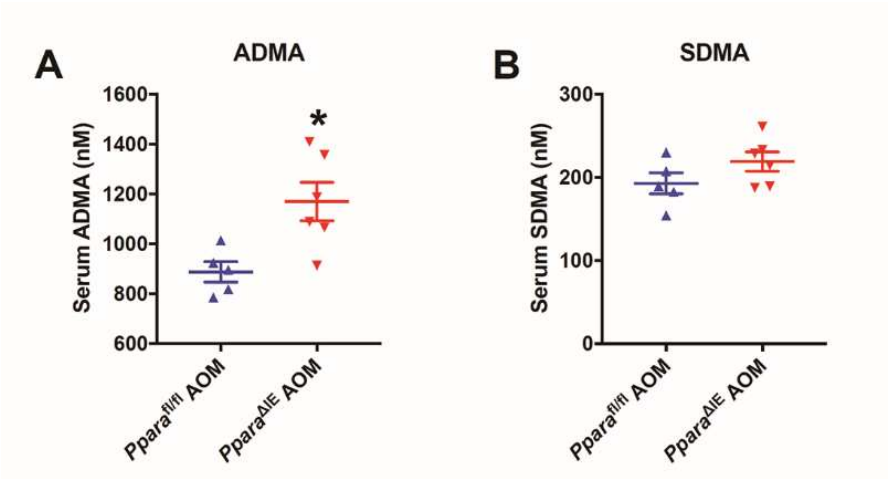

Figure S5. The levels of ADMA and SDMA in the serum. The levels of ADMA (*A*) and SDMA (*B*) in the serum of AOM-administered *Ppara*$^{fl/fl}$ (n=5) and *Ppara*$^{\Delta IE}$ (n=6) mice. * $P < 0.05$.

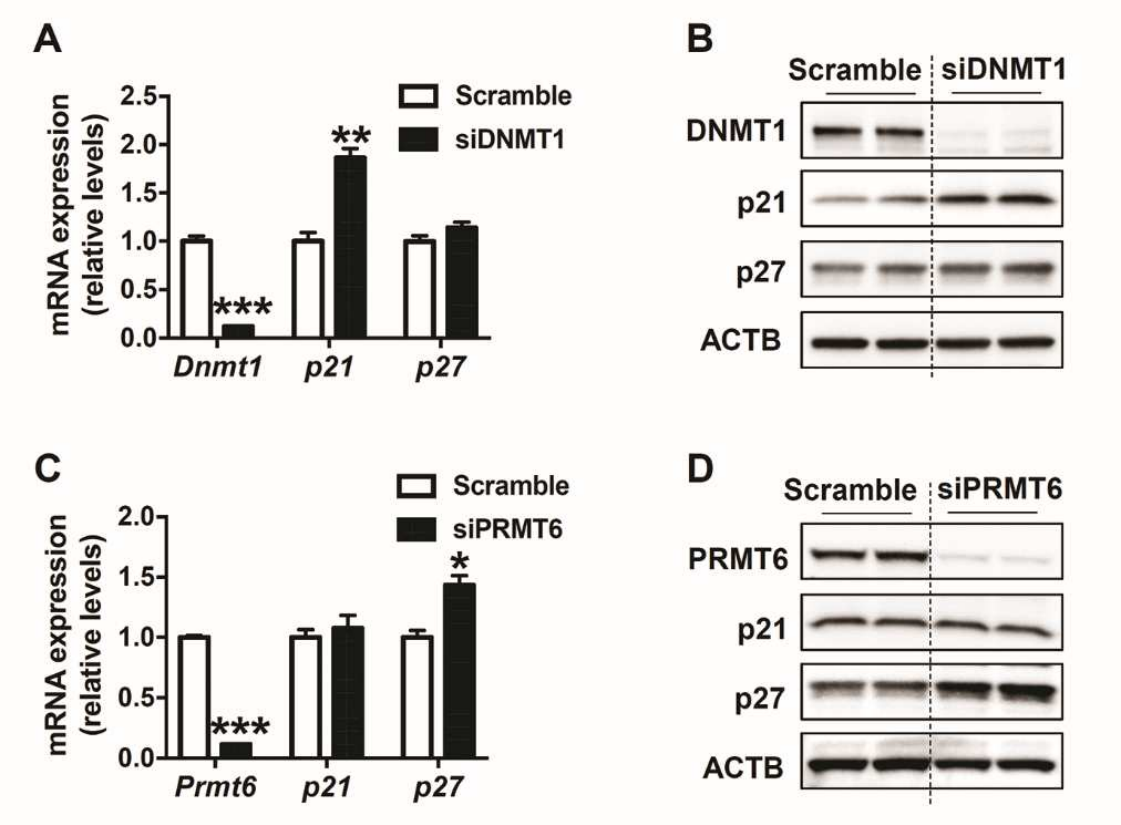

Figure S6. Silence DNMT1 and PRMT6 increased the expression of p21 and p27, respectively. (*A*) The mRNA levels of indicated genes in HCT116 cells transfected with control siRNA or siRNA targeting *Dnmt1* after 48h. N=3/group. (*B*) Western blot analysis of indicated proteins in HCT116 cells transfected with control siRNA or siRNA targeting *Dnmt1* after 72h. (*C*) The mRNA levels of indicated genes in HCT116 cells transfected with control siRNA or siRNA targeting *Prmt6* after 48h. N=3/group. (*D*) Western blot analysis of indicated proteins in HCT116 cells transfected with control siRNA or siRNA targeting *Prmt6* after 72h. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

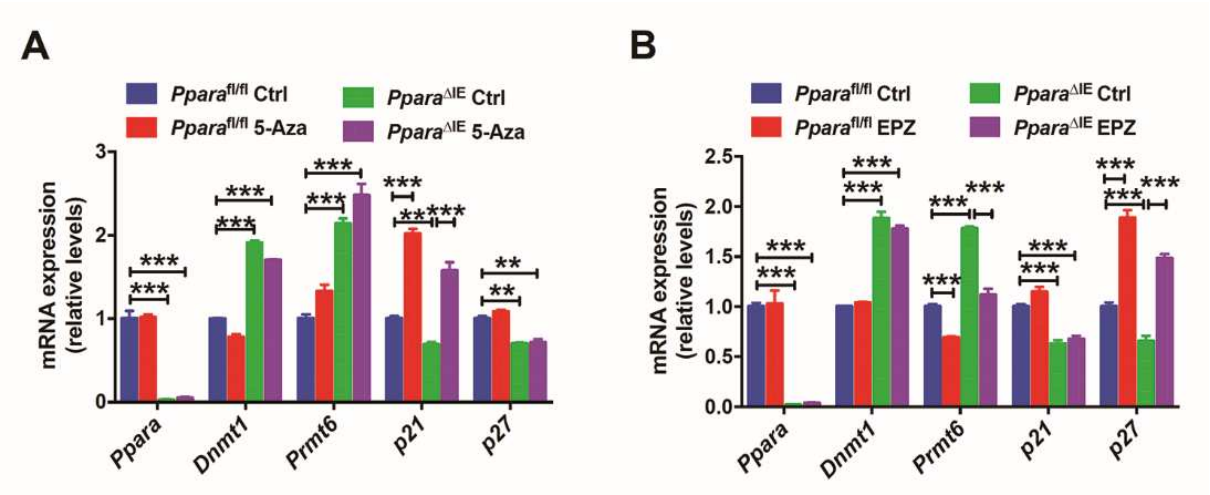

Figure S7. PPARα regulated the expression of p21 and p27 partially through DNMT1 and PRMT6 in the intestine. The mRNA levels of *Ppara*, *Dnmt1*, *Prmt6*, *p21* and *p27* in cultured primary intestinal epithelial cells isolated from *Ppara*$^{fl/fl}$ or *Ppara*$^{\Delta IE}$ mice and treated with 5 μM 5-Aza for 72h (*A*) or 20 μM EPZ020411 for 48h (*B*). ** $P < 0.01$, *** $P < 0.001$.

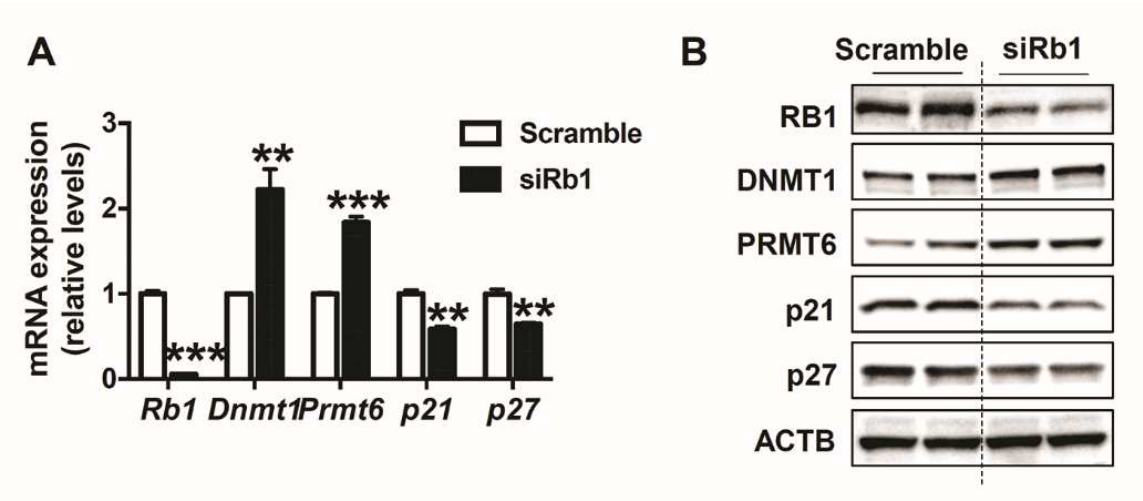

Figure S8. Silence RB1 increased the expression of DNMT1 and PRMT6. (*A*) The mRNA levels of the indicated genes in HCT116 cells transfected with control siRNA or siRNA targeting *Rb1* after 48h. N=3/group. (*B*) Western blot analysis of the indicated proteins in HCT116 cells transfected with control siRNA or siRNA targeting *Rb1* after 72h. ** $P < 0.01$, *** $P < 0.001$.

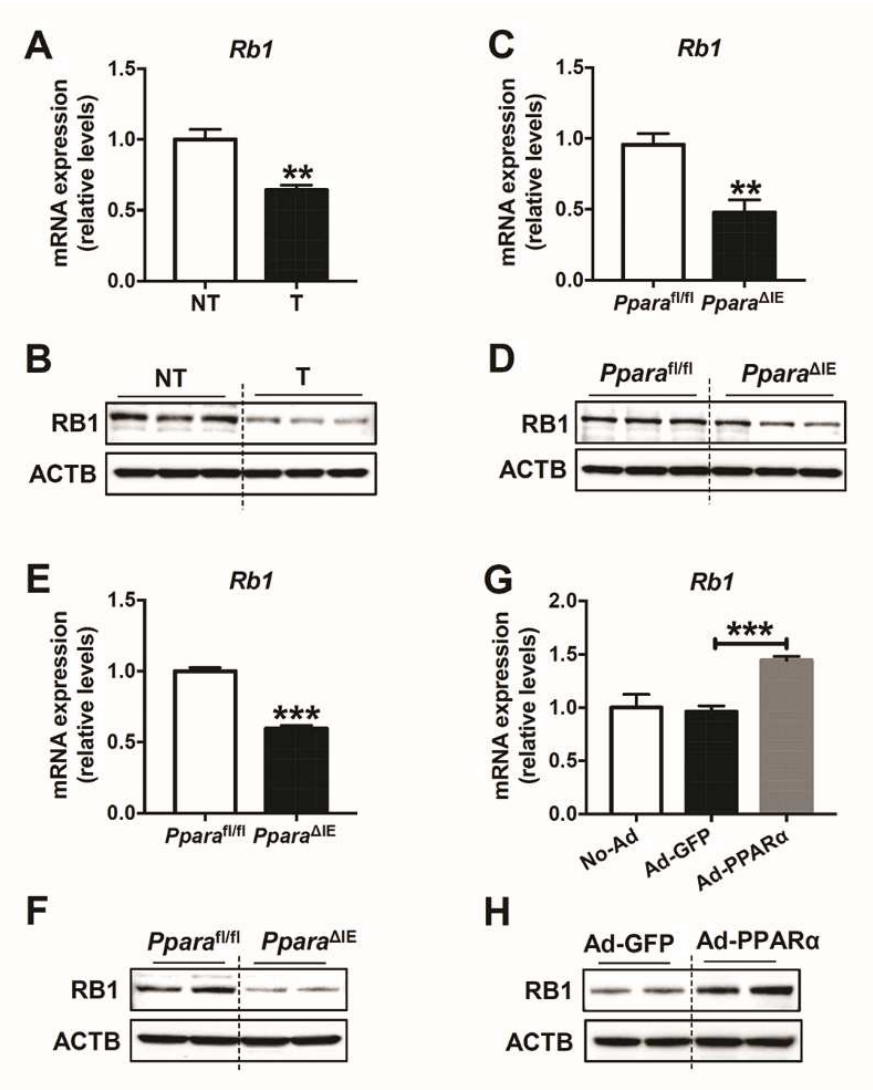

Figure S9. Intestinal PPARα regulated the expression of RB1. (*A*) The *Rb1* mRNA (n=5/group) and (*B*) RB1 protein levels mouse colon tumors (T) and adjacent non-tumor tissues (NT). (*C*) The *Rb1* mRNA (n=5/group) and (*D*) RB1 protein levels in the colon samples from *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice. (*E*) The *Rb1* mRNA (n=3/group) and (*F*) RB1 protein levels in primary intestinal epithelial cells isolated from *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice. (*G*) Primary intestinal epithelial cells isolated from wild-type C57BL/6N mice were cultured and infected with control adenovirus (Ad-GFP) or adenovirus overexpression PPARα (Ad-PPARα), or no infection (No-Ad) for 60 h. The *Rb1* mRNA (n=2 for No-Ad group, and n=4 for Ad-GFP group and Ad-PPARα group) and (*H*) RB1 protein levels were analyzed. ** $P < 0.01$, *** $P < 0.001$.

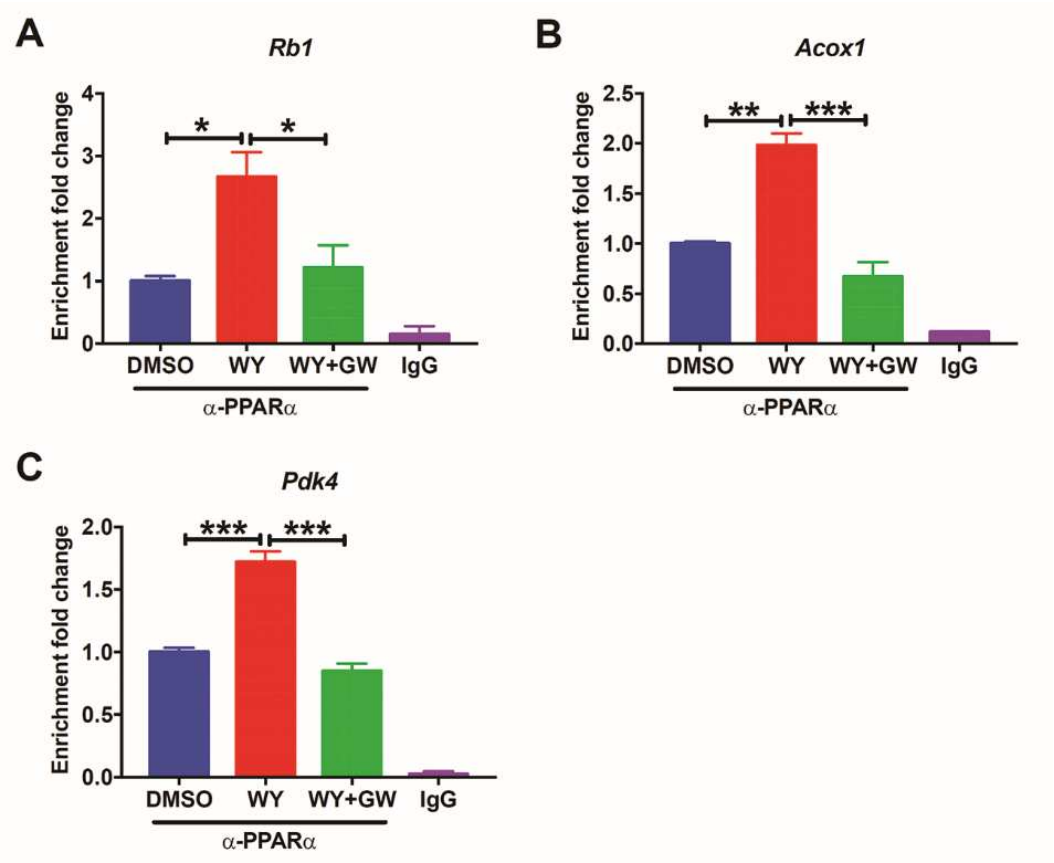

Figure S10. PPARα bound to the *Rb1* promoter in HCT116 cells. ChIP assays on chromatins isolated from HCT116 cells for *Rb1* (*A*), *Acox1* (*B*), *Pdk4* (*C*). N=3/group. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

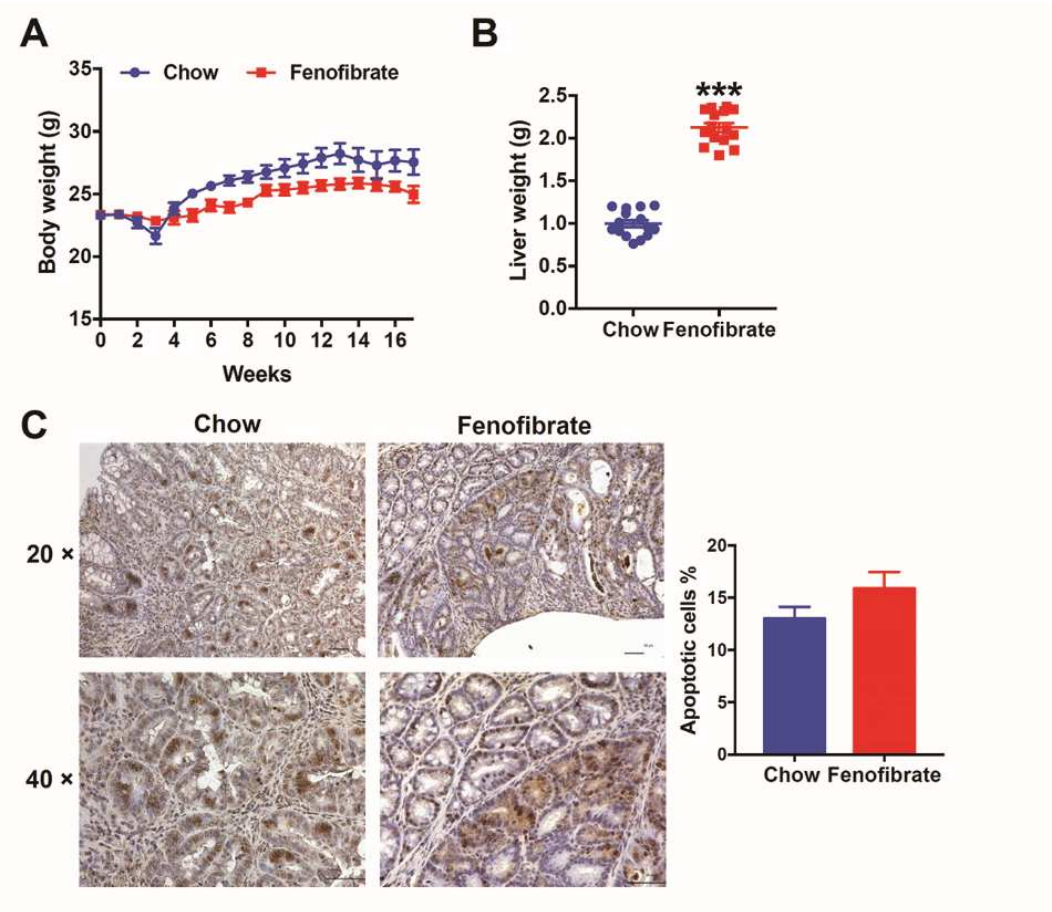

Figure S11. Fenofibrate decreased AOM and DSS-induced colon carcinogenesis in human *PPARA* transgenic mice. (*A*) The body weight curves of AOM and DSS-administered human *PPARA* transgenic mice fed on chow diet or fenofibrate diet (n=15 mice/group). (*B*) Liver weight. (*C*) *Left*, Representative TUNEL staining of colon sections. Scale bars: 50 μm. *Right*, Percentage of apoptotic cells. *** $P < 0.001$.

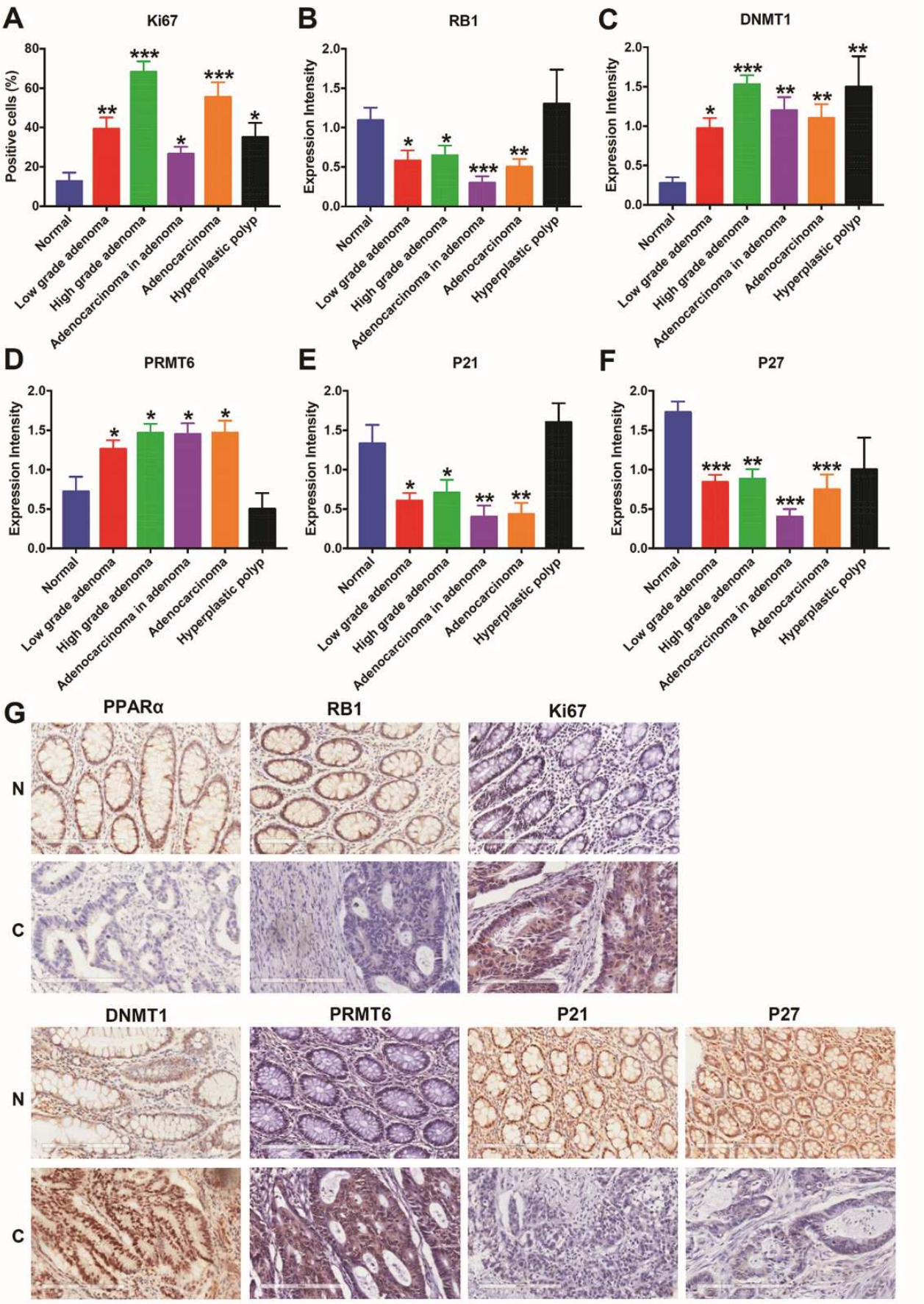
A
Ki67
Positive cells (%)
B
RB1
Expression Intensity
C
DNMT1
Expression Intensity
D
PRMT6
Expression Intensity
E
P21
Expression Intensity
F
P27
Expression Intensity
Normal
Low grade adenoma
High grade adenoma
Adenocarcinoma in adenoma
Adenocarcinoma
Hyperplastic polyp
G
PPARα
RB1
Ki67
DNMT1
PRMT6
P21
P27
N
C

Figure S12. The expression of PPARα, RB1, DNMT1, PRMT6, p21, p27 and Ki67 in human colon specimens. The IHC staining intensity of Ki67 (*A*), RB1 (*B*), DNMT1 (*C*), PRMT6 (*D*), p21 (*E*) and p27 (*F*) in human colon specimens. Normal mucosa, n=9-11; Low grade adenoma, n=19; High grade adenoma, n=16-17; Adenocarcinomas in adenomas, n=10; Adenocarcinomas, n=14-16; Hyperplastic polyp, n=4-5. (*G*) Representative images of PPARα, RB1, DNMT1, PRMT6, p21, p27 and Ki67 staining in human normal mucosa and adenocarcinomas. Scale bars: 200 μm. * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

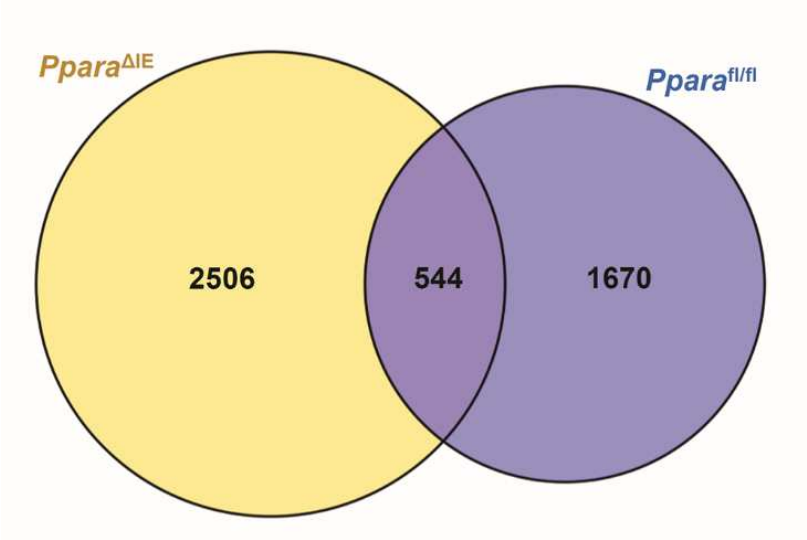

Figure S13. High or moderate impact somatic mutations in tumors derived from AOM and DSS-administered *Ppara*$^{fl/fl}$ and *Ppara*$^{\Delta IE}$ mice. Diagram of the somatic mutations.

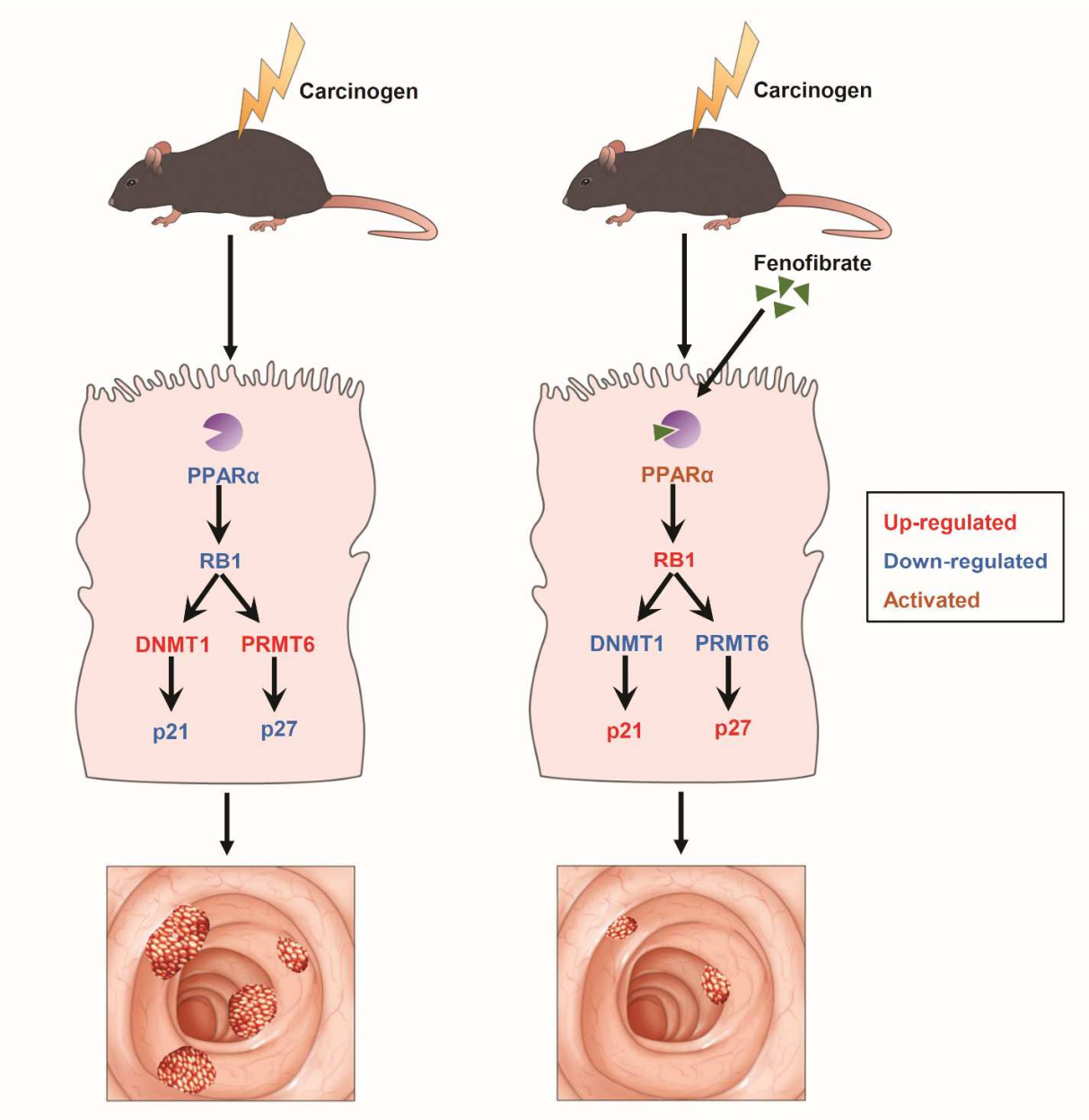

Figure S14. A schematic model of the mechanism by which intestinal PPARα protects against colon carcinogenesis. Upon activation by fenofibrate, intestinal PPARα down-regulates DNMT1 and PRMT6 by RB1/E2F pathway, which in turn increases the expression of p21 and p27 via release of DNA methylation- and histone H3R2 dimethylation-mediated transcriptional repression, respectively, thus protecting against colon carcinogenesis.