Supplementary Information for:

Brd4-bound enhancers drive cell intrinsic sex differences in glioblastoma

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Supplementary Materials and Methods

Mouse male and female GBM cells.
Male and female astrocytes were isolated from the neocortices of postnatal day 1 Nf1fl/fl GFAP Cre mice and genotyped for sex using Jarid1c and Jarid1d PCR. Male and female Nf1−/− astrocytes were then infected with retrovirus encoding a flag-tagged dominant-negative form of p53 (DNp53) and EGFP resulting in male and female astrocytes null for Nf1 and p53 function. The DNp53 plasmid consists of amino acids 1–14 of the transactivation domain followed by amino acids 303–393, thus lacking the DNA binding domain. Cells were grown in DMEM/F12 media supplemented with 10% FBS and 1% penicillin-streptomycin. These astrocytes serve as a model of GBM and are referred to throughout the text as male and female GBM astrocytes. Cell cycle analysis and metaphase spreads of male and female GBM astrocytes reveal similar aneuploidy with 2N and 4N subpopulations with varying and overlapping chromosome numbers that ranged between 50 and 120, and 41 and 111 respectively (1).

Chromatin immunoprecipitation sequencing (ChIP-seq) for H3K27ac.
10 million male and female GBM cells were treated with 0.05% DMSO or 500 nM JQ1 for 24 hours. Following treatment, cells were then prepared for various downstream analyses including ChIP-seq for H3K27ac. Briefly, cells were fixed in 1% formaldehyde prepared in DMEM/F12 and incubated for 10 minutes at room temperature with gentle rocking. Fixation was quenched by the addition of glycine to a final concentration of 125 mM and incubation for 10 minutes at room temperature with gentle rocking. Cells were then washed with cold PBS and harvested by scraping in 5 ml of cold PBS. Cells were transferred to 15 mL conical tubes and pelleted with a 5-minute spin (1,000g) at 4ºC. Sonication was performed on an Epishear probe-in sonicator (Active Motif) at 40% amplitude for 8 cycles of 30 seconds, with 30 seconds of rest between each cycle. ChIP-seq libraries were constructed as previously described (2), with an antibody that recognizes H3K27Ac (Active Motif, 39133, rabbit polyclonal). ChIP-seq libraries were constructed with sample-specific barcodes, and pooled before sequencing on a HiSeq 2500 (Illumina).

RNA-sequencing.
Male and female GBM cells (Nf1-/-;DNp53 astrocytes) were generated as previously reported (Sun et al., 2015) and grown in DMEM/F12 media supplemented with 10% FBS and 1% penicillin-streptomycin. Total RNA was isolated from male and female GBM cells that were treated with DMSO (0.05%) or JQ1 (500 nM for 24 hours) using the RNeasy Mini Kit from QIAGEN (Hilden, Germany), following the kit protocol. PolyA Selection was performed to create RNA Seq libraries. Cell mRNA was extracted from total RNA using a Dynal mRNA Direct kit. The quantity of RNA was measured using a spectrophotometer (NanoDrop 2000c; Thermo Scientific). Samples with an RNA concentration A260/A280 ≥1.8 ng/µl, and purity A230/A260 ≥ 2.0 ng/µl were selected. The Agilent 2100 Bioanalyzer was used to determine the RNA integrity number. The degradation level was identified using the RNA 6000 Nano LabChip kit (Agilent). Samples with RNA integrity number > 9.8 were further processed using TruSeq mRNA Library Preparation Kit (Illumina) and then sequenced on a HiSeq 25000 (Illumina).

Pathway analysis.
Pathway enrichment analysis for differentially regulated genes was performed using a combination of KEGG pathway and Genomatix Pathway System (GePS). GePS uses information extracted from public and proprietary databases to display canonical pathways and or to create and extend networks based on literature data. These sources include NCI-Nature Pathway Interaction Database, Biocarta, Reactome, Cancer Cell Map, and the ENCODE Transcription Factor project data. All data for pathway analyses are presented with adjusted corrected *p*-values.

Human glioblastoma stem cells (GSCs) gene expression data analysis.
RNA-sequencing data were derived from GSCs published in Mack et al., 2019 (3). Data from FASTQ files were trimmed with TrimGalore, which implements Cutadapt (4) and FastQC (5), to remove low quality reads and trim adapaters. Reads were aligned to Gencode v29 using Salmon (6) with correction for GC bias, positional bias and sequence-specific bias. The R/Bioconductor (7) package tximport (8) was used to generate TPM values. Low expressed genes without at least 1 count in 4 samples were excluded from analysis. Comparisons were performed using DESeq2 (9) on raw counts.

Quantitative Real-Time PCR.
Total RNA was isolated using QIAGEN RNeasy Mini Kit from male and female GBM cells (Nf1-/-;DNp53 astrocytes) infected with shRNA lentivirus against Brd2, Brd3 or Brd4. cDNA was generated using the QuantiTect Reverse Transcription Kit (Qiagen). Quantitative RT-PCR was performed using gene-specific primers and iTaq SYBR Green PCR master mix (Biorad, CA). Data was analyzed by standard ΔCq method (2-ΔΔCq) where ΔCq is the difference between the gene of interest and GAPDH control Cq value. Sequences for primers specific for each Brd family member are provided in *SI Appendix*, Table S5.

shRNA lentiviral infection and knockdown of Brd2, Brd3 and Brd4.
Brd2, Brd3 and Brd4 knockdown lines were generated by infecting male and female GBM cells (Nf1-/-;DNp53 astrocytes) with lentiviral shRNAs against Brd2, Brd3 or Brd4. All Knockdown lines were selected with puromycin (2.5 µg/ml) in media

for 1-2 weeks and the survivors were expanded for downstream target knockout analysis. Five different shRNAs specific to each of the Brd family members were evaluated and the shRNA with the most robust knockdown was used for the downstream functional experiments. Sequences for shRNAs are provided in *SI Appendix*, Table S5.

Clonogenic cell frequency assay: Extreme Limiting Dilution Assays (ELDA analysis).
Male and female mouse GBM cells (Nf1-/-;DNp53 astrocytes, 2 lots of male and female cells) or human male and female primary GBM cell lines (3 male and 3 female human primary GBM cell lines were kindly provided to us by Dr. Albert Kim) were treated with DMSO (0.05%), iBET762 (4 µM), CPI203 (0.5 µM), CPI0610 (1 µM), JQ1 (500 nM), OTX015 (2.5 µM), PFI1 (5 µM) or RVX-208 (5 µM) for 24 hours or with shRNAs against Brd2, Brd3, or Brd4. The timing and dosing of each drug was based on previously published data (10-14). Clonogenic capacity was then assessed by the Extreme Limiting Dilution Assay (ELDA). The frequency of clonogenic stem cells was evaluated by the cells' ability to form tumor-spheres in low-adherent conditions as previously reported (15). Briefly, cells were harvested into a single cell suspension and plated in neurosphere media containing EGF, FGF and mouse LIF on 96-well ultra-low attachment plates in a serial dilution ranging from 3000 cells/well to 1 cell/well (3000, 600, 120, 24, 5 and 1 cells; n=14-18 wells/cell density). Sphere formation was measured 7 days after plating. Clonogenic cell frequency was then analyzed using the Extreme Limiting Dilution Analysis software (16).

Growth assays.
Growth kinetics of male and female GBM cells (Nf-/-;DNp53 astrocytes) treated with DMSO (0.05%), JQ1 (500 nM), or RVX-208 (5µM) for 24 hours were examined by counting live cell number using an automated T4 cell counter as previously described with minor modifications (15). Briefly, cells were harvested and plated in a 6-well plate at a density of 2×10^4 cells/well (2 technical replicates per treatment/genotype/time point). 4 hours post plating, cells were harvested by trypsinization and counted in the presence of trypan blue. This time point was designated as the starting point (T0) of the time course. Cells were then harvested and counted every 24 hours for a total of 3 days (24, 48 and 72 hours). This experiment was repeated three times.

Cancer Therapeutic Response Portal data analysis.
Drug response data were derived from the Cancer Therapeutic Response Portal (CTRP). The outcome variable was area under the curve (AUC) for each cell line and drug treatment. Glioblastoma cell lines were segregated by male vs. female sex, and AUC for each drug was analyzed by sex using the R/Bioconductor package limma (17).

In vivo **tumorigenesis: flank implantation.**
Flank tumors were generated by implanting GBM astrocytes subcutaneously into left side flanks. These cells were treated with 0.05% DMSO, 500 nM JQ1 or 1 µM CPI0610 for 24 hours, followed by EGF treatment at 50ng/ml for one week. 1.5 million female cells or 5000 male cells treated with DMSO, JQ1 or CPI0610 were then harvested and resuspended in 100 µl of 1:1 media to matrigel (BD Biosciences) and injected into the flanks of mice. Mice were monitored weekly and tumor growth and formation were monitored blindly for 8-16 weeks with thrice weekly micrometer measurements in 3 dimensions. Animals were used in accordance with an animal studies protocol (no. 20180206) approved by the Animal Studies Committee of the Washington University School of Medicine per the recommendations of the Guide for the Care and Use of Laboratory Animals (NIH).

Bioinformatic motif analysis.
To identify DNA motifs that are associated with sex-biased Brd4 binding, we used the HOMER toolkit (v4.11) (18). Briefly, to find motifs enriched under male-biased peaks, we used the sequences under male-biased Brd4 peaks as input to HOMER, and used sequences from female-biased peaks, or all Brd4 peaks, as background. We used the following HOMER command: (findMotifsGenome.pl mm10 -nomotif -preparsedDir -bg). We found motifs enriched under female-biased peaks in a similar fashion using the corresponding sequence files.

Statistical analysis.

All experiments in this study were carried out at least three times. ELDA experiments with JQ1 and CPI0610 treatment were performed three times (n=3) in two or three different mouse GBM lots of cells, as indicated for each experiment. ANOVA, two-tailed Student's t-test and Fisher's exact test were used to compare the differences in all functional measurements between BET inhibitors and control group (DMSO), and a p-value < 0.05 was considered statistically significant.

To test if upregulated genes in male cells compared to female cells and vice versa are significantly enriched for H3K27ac binding, the normalized H3K27ac signal intensities (reads) from 1kb upstream of the gene start site to 1kb downstream of the end of the gene were used for the correlation analysis. A paired Mann-Whitney-Wilcoxon test was used to compare normalized H3K27ac signal intensities between male and female cells and a p-value less than 0.01 was considered statistically significant.

To investigate if Brd4-proximal genes are significantly downregulated upon JQ1 treatment compared to Brd4-distal genes, we first defined Brd4 proximal genes as the closest genes to Brd4 binding sites and Brd4 distal genes as genes

located near sites that are not enriched for Brd4 binding sites. Brd4 proximal and distal genes (500 genes each) were randomly selected. A Mann-Whitney-Wilcoxon test was used to compare the expression profiles before and after JQ1 treatment of Brd4 proximal and distal genes for male and female respectively and a p-value less than 0.01 was considered statistically significant.
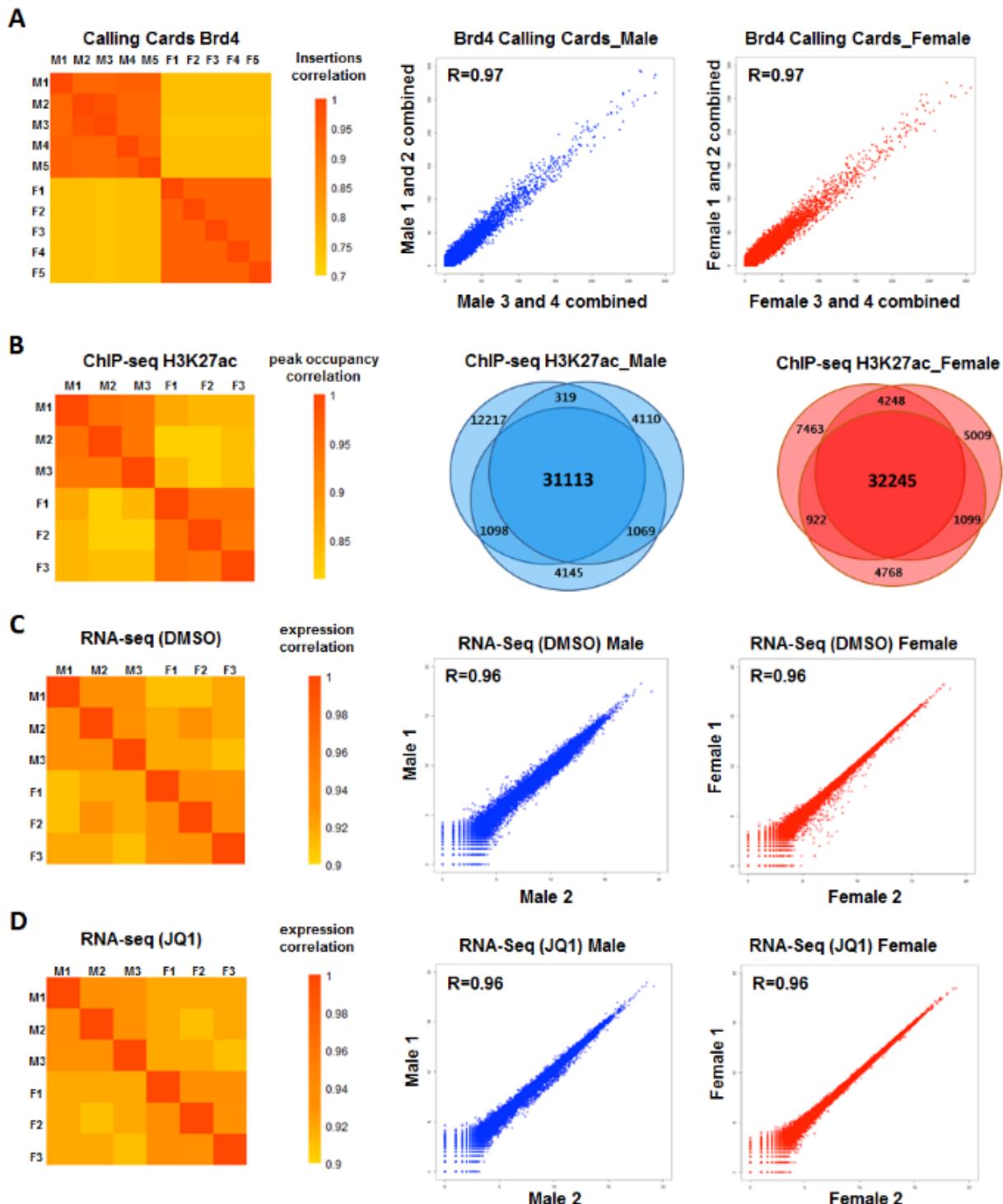
Fig. S1. Quality assessment of transposon Calling Card, H3K27ac ChIP-seq and RNA-seq experiments. Correlation heatmaps for transposon Calling Card *(A)*, H3K27ac ChIP-seq *(B)* and RNA-seq *(C, D)* were prepared using replicates of male and female GBM samples. Venn diagrams in *(B)* depict the shared H3K27ac-enriched peaks among replicates in male and female GBM cells.
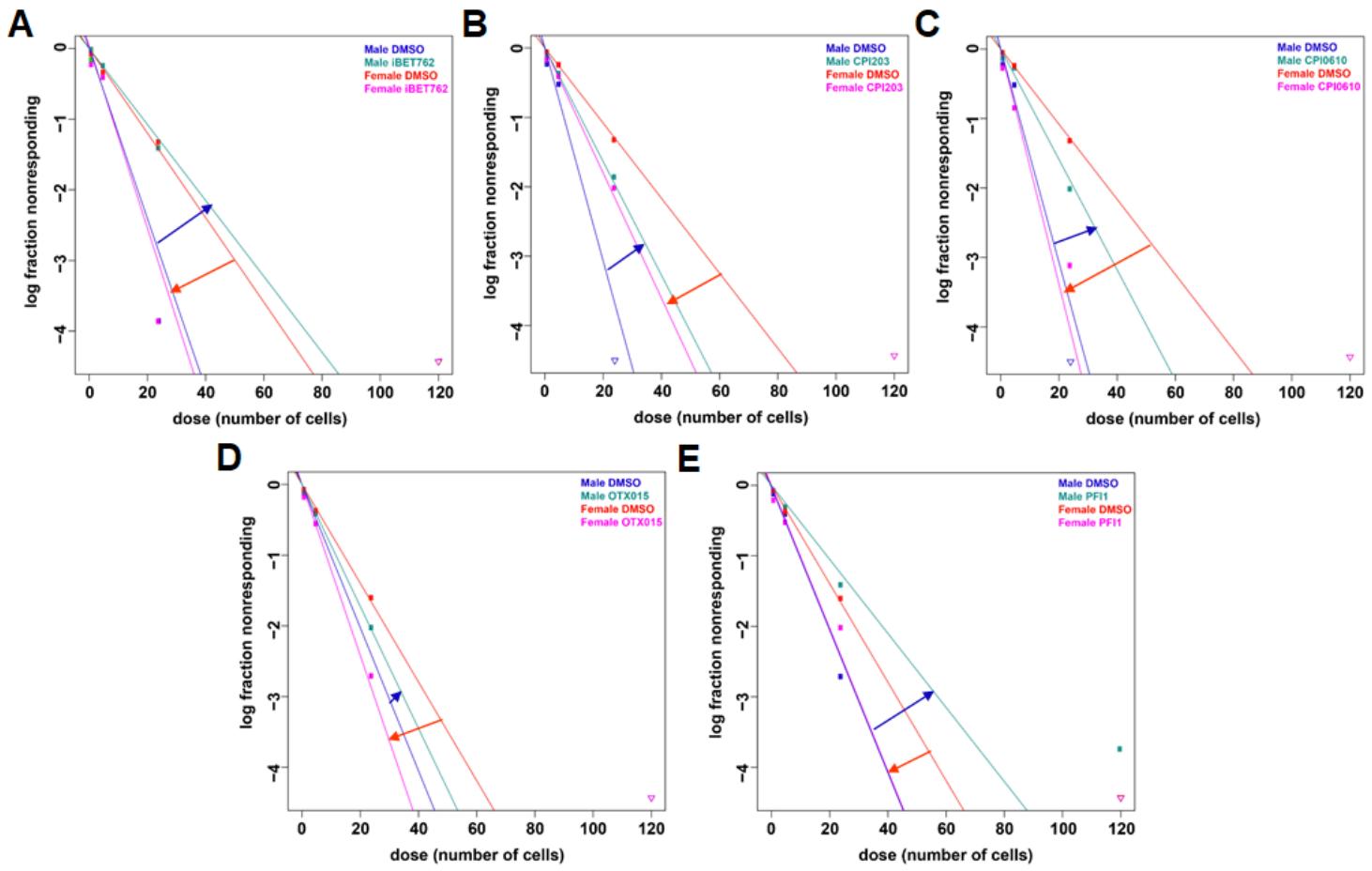
Fig. S2. BET inhibitors have differing effects on clonogenic stem cell frequency in male and female GBM cells. Frequency of clonogenic stem-like cells as determined by ELDA assay in male and female GBM cells treated with DMSO or *(A)* iBET762, *(B)* CPI203 *(C)* CPI0610 *(D)* OTX015 *(E)* PFI1. Male cells exhibited greater clonogenic cell activity than female cells under control conditions. BET inhibition reduced clonogenic cell frequency in male cells, while female cells exhibited an increase in their clonogenic cell frequency.
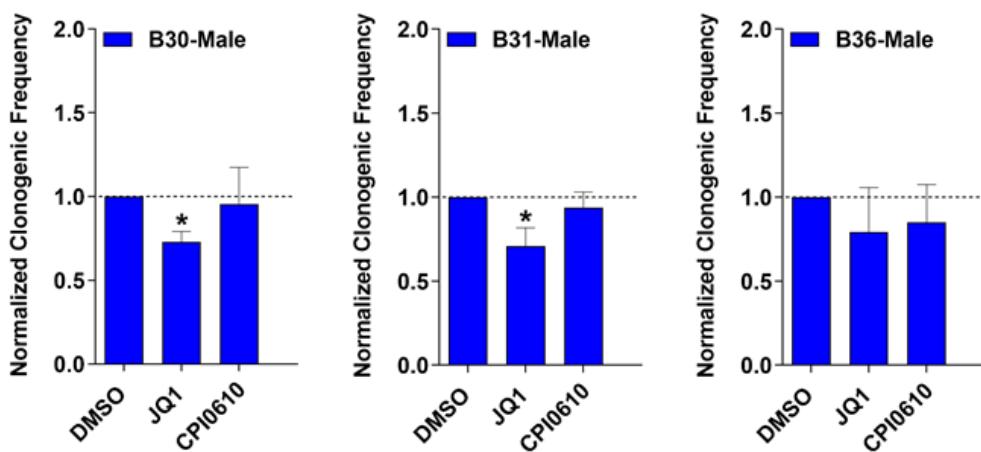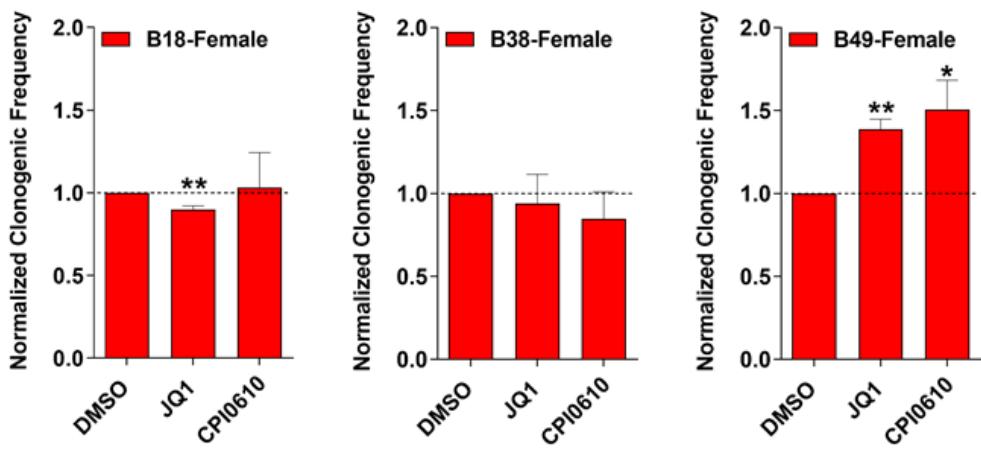
Fig. S3. Sex-specific response to BET inhibitor treatment is evident in human primary GBM cells. Normalized clonogenic cell frequency as determined by ELDA assay in male *(A)* and female *(B)* human primary GBM cells treated with DMSO (control), JQ1, or CPI0610. JQ1 treatment significantly reduced clonogenic cell frequency in human primary GBM male cells, and significantly increased clonogenic cell frequency in 1 out of 3 human primary GBM female cells. CPI0610 treatment had a similar response pattern as JQ1 in male and female human GBM primary cells. (*=*p* <0.05, **=*p* <0.01 as determined by unpaired two-tailed t-test).
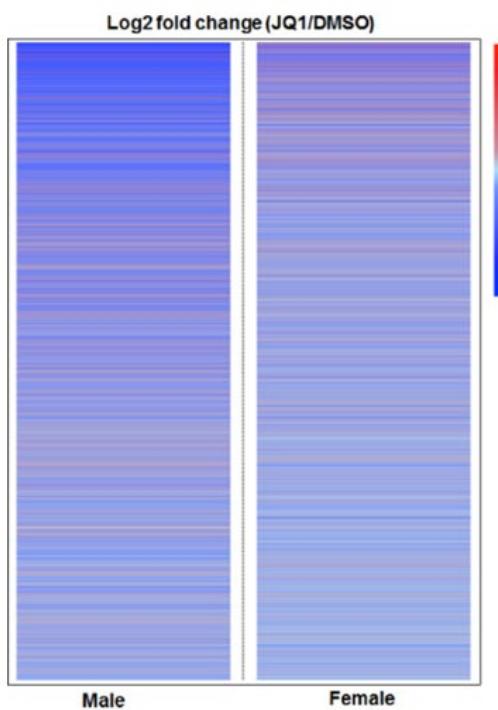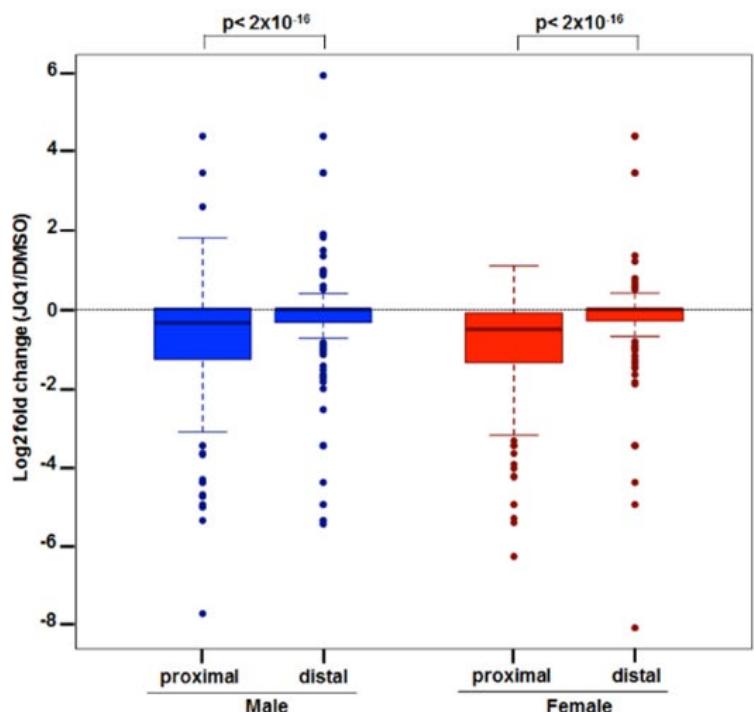
Fig. S4. JQ1 effect on gene expression in male and female GBM cells. *(A)* Heat map of gene expression changes (log2; upregulated in red and downregulated in blue) upon JQ1 treatment in male and female GBM cells. *(B)* Boxplot of gene expression changes (log2) of Brd4 proximal and distal genes following JQ1 treatment of male (blue) and female (red) GBM cells. The gene expression profile of genes in close proximity to Brd4 binding sites is compared to distal genes by a Mann-Whitney-Wilcoxon test. Brd4 proximal genes are significantly downregulated compared to Brd4 distal genes in both male and female GBM cells following JQ1 treatment ($p< 2$x10^{-16}).

A

Stem cell pathways regulated by sex-biased Brd4-bound enhancers in male and female GBM cells

Pathway description	Adjusted p-value	# of Genes
Male GBM Cells:		
Stem cells	< 0.0001	162
Embryonic stem cells	< 0.0001	152
Mesenchymal stem cells	< 0.0001	140
Neural stem cells	2.00E-03	96
Cancer stem cells	< 0.0001	67
Pluripotent stem cells	8.00E-03	48
Stem cell proliferation	1.00E-03	36
Neoplastic stem cells	6.00E-03	35
Stem cell division	5.00E-03	13
Female GBM Cells:		
Mesenchymal stem cells	< 0.0001	128
Neural stem cells	1.00E-03	92
Stem cell proliferation	2.00E-03	27

C

Female-Stem cell proliferation
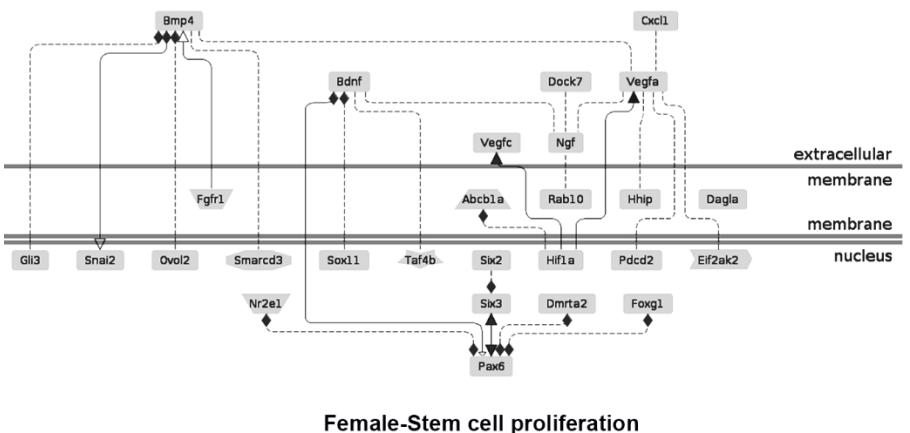
B

Male-Pluripotent stem cell pathway

D
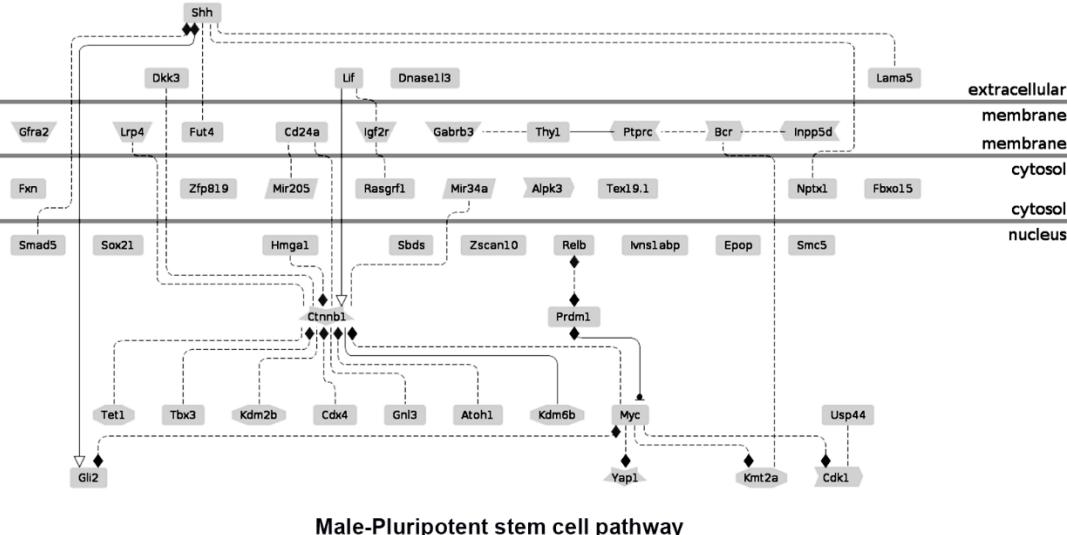
Cancer Stem Cell Pathway
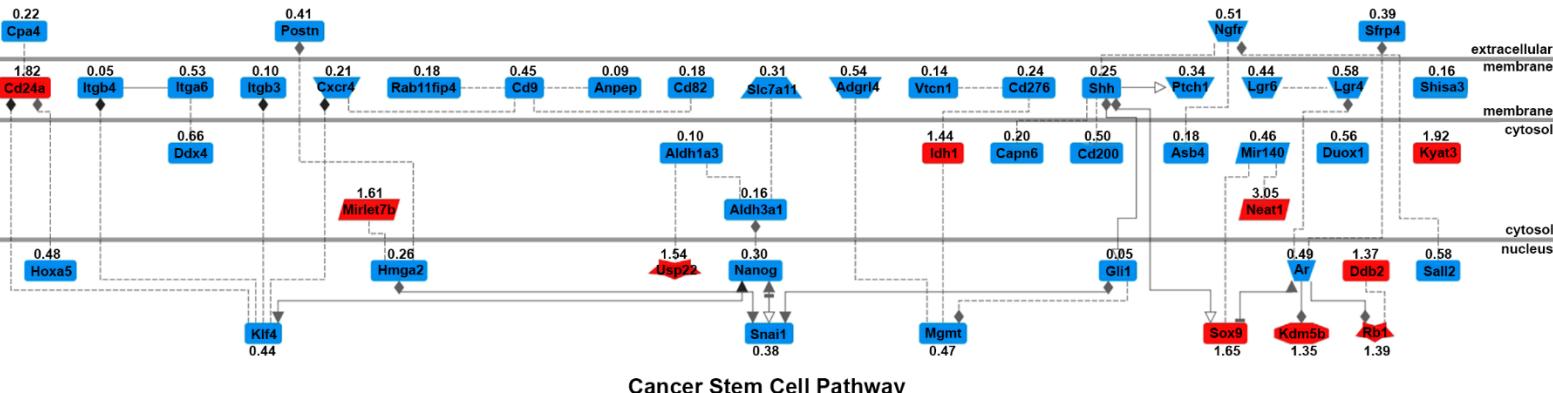
*Value above/below gene box indicates fold change expression of JQ1/DMSO in male or female GBM cells

Fig. S5. Stem cell pathways regulated by sex-biased Brd4-bound enhancers. *(A)* Pathway analysis of sex-biased Brd4-bound enhancers in male and female GBM astrocytes revealed an enrichment of stem cell pathways. Male GBM cells were highly enriched for cancer, neoplastic and pluripotent stem cell pathways. while female GBM cells were mainly enriched for neural stem cell pathways. Representative examples of these enriched pathways in male *(B)* and female *(C)* GBM astrocytes. Male-biased genes in stem cell pathways included oncogenes such as Myc, Tet1 and Lif, while female-biased genes included tumor suppressors such as Six 2 and Six 3. *(D)* Pathway analysis on sex-biased Brd4 regulated genes revealed that the cancer stem cell pathway was significantly affected by JQ1 treatment. Male genes (blue) were downregulated by JQ1 while female genes (red) were upregulated by JQ1. Value above/below gene box indicates the ratio of fold change expression of JQ1/DMSO in male (blue) or female (red) GBM cells.

9
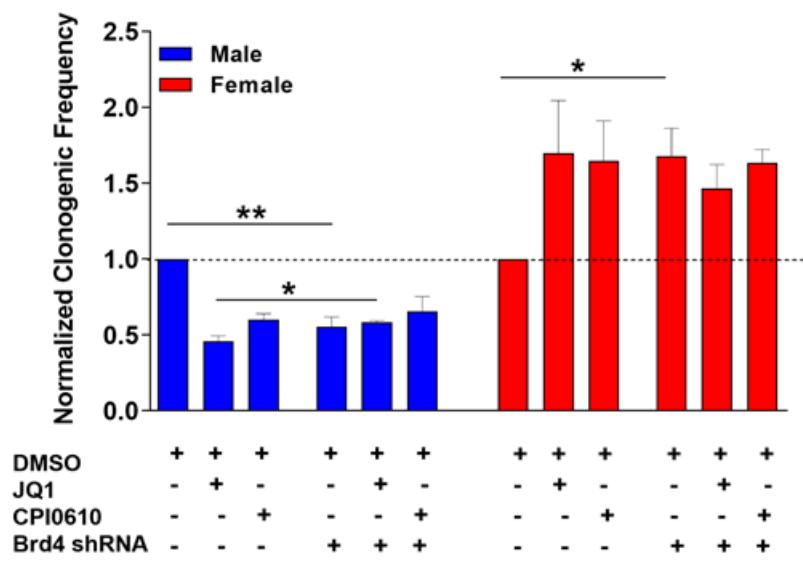
Fig. S6. Brd4 is the main Brd family member responsible for the sex-specific response to BETi treatment. Normalized clonogenic cell frequency as determined by ELDA assay in male and female GBM cells treated with DMSO or the indicated BET inhibitor, with or without Brd4 knockdown. No significant difference in the effect on clonogenic cell frequency is observed between control and Brd4 knockdown cells treated with BET inhibitors, indicating that Brd4 is the main Brd family member responsible for this sexually dimorphic response to BETi treatment in male and female cells. (*=p <0.05, **=p <0.01 as determined by unpaired two-tailed t-test).

SI Appendix Table S1. Pathway enrichment analysis for sex-biased Brd4-regulated genes in male and female GBM cells as identified by Brd4 calling cards and H3K27ac ChIP_seq*

Pathway description	Adjusted *p*-value	# of Genes
Male GBM Cells: 1740 genes		
Glioblastoma	< 0.0001	349
Cell proliferation	< 0.0001	224
Cell cycle	< 0.0001	152
Regulation of transcription	< 0.0001	113
Tumor angiogenesis	5.00E-03	70
Cancer stem cells	< 0.0001	41
Epidermal growth factor receptor signaling	2.00E-03	15
Female GBM Cells: 1604 genes		
Cell differentiation	< 0.0001	386
Glioblastoma	< 0.0001	320
Regulation of transcription	< 0.0001	181
Cell migration	< 0.0001	161
Neural stem cells	< 0.0001	72
Negative regulation of angiogenesis	1.00E-03	13
Kinase suppressor of Ras	1.00E-03	8

*Subset of pathway enrichment analysis

SI Appendix Table S2. Differentially regulated sex-biased Brd4-bound genes in male and female GBM cells

Sex-biased regulated genes	RNA-seq log2 fold change (male vs. female)	Adjusted *p-value*	Brd4 Calling cards enrichment ratio (male vs. female)	Adjusted *p-value*	H3K27ac log2 fold change (male vs. female)	Adjusted *p-value*
Col25a1	4.64	6E-09	21.28	1E-18	4.47	6E-25
Blnk	4.64	1E-19	5.64	4E-10	5.42	3E-17
Gm11549	4.60	3E-23	29.69	4E-125	3.73	4E-37
Rassf10	4.52	8E-13	2.44	4E-04	3.00	8E-18
Mlc1	4.38	1E-22	4.99	2E-06	1.98	3E-07
Klhl13	4.31	2E-20	35.28	2E-40	0.85	1E-02
Gng2	4.29	1E-23	22.64	2E-85	6.63	4E-28
Cntnap4	4.24	5E-10	9.40	3E-12	3.96	4E-05
Endou	4.22	5E-08	3.88	4E-03	1.96	6E-24
Adssl1	4.18	6E-29	4.99	2E-06	0.67	2E-03
Matn2	4.14	9E-32	4.16	3E-14	2.93	3E-04
Xdh	4.12	2E-08	3.18	1E-09	1.14	3E-03
Aldh1a3	4.04	2E-23	3.21	7E-18	1.31	2E-04
Grpr	4.03	8E-14	26.73	6E-27	3.52	2E-02
Pyroxd2	4.02	3E-06	2.99	4E-02	2.07	4E-04
Galnt15	4.01	4E-20	5.60	4E-13	2.44	3E-04
Foxl1	4.00	1E-11	3.18	4E-03	2.66	3E-25
Gria1	4.00	1E-16	5.95	3E-19	2.16	7E-20
Pir	3.99	1E-22	6.18	4E-10	1.72	2E-13
Scml4	3.95	6E-27	2.21	4E-16	3.96	1E-08
Ndp	3.93	4E-07	4.53	2E-74	1.41	2E-03
Ahr	3.85	1E-25	8.88	2E-48	3.07	1E-06
Lpar1	3.84	2E-24	5.40	2E-27	2.87	8E-05
Ces1f	3.83	6E-13	2.07	3E-02	2.29	2E-14
Ndnf	3.82	2E-08	3.86	7E-05	2.60	2E-03
Gm10421	3.81	7E-10	9.50	9E-34	4.11	3E-10
Fam167a	3.81	3E-16	4.76	2E-06	1.93	2E-14
Lgals3	3.80	5E-08	1.88	1E-12	1.27	8E-11
Fam19a2	3.79	2E-11	2.81	6E-37	1.21	3E-02
Car2	3.78	8E-08	3.65	3E-07	1.94	2E-03
Gprc5c	3.77	2E-06	5.16	2E-06	1.75	6E-04
Npepl1	3.72	6E-21	4.34	6E-25	0.52	4E-02
Mt1	3.72	6E-09	2.40	2E-02	0.84	4E-03
Peli2	3.69	4E-06	2.80	8E-04	0.79	2E-02
Fam83b	3.62	2E-06	58.36	1E-21	2.61	1E-04
Frmd5	3.55	2E-05	1.94	1E-04	0.78	2E-02
Cda	3.55	4E-15	3.14	4E-05	1.60	2E-03
Pou3f2	3.53	3E-06	1.41	2E-06	0.62	2E-03
Nalcn	3.52	1E-05	2.65	5E-77	1.49	5E-04
Shtn1	3.50	4E-28	30.62	7E-33	4.37	7E-08
Kcnn3	3.49	5E-21	3.57	2E-09	1.28	8E-12
Crabp1	3.48	9E-05	85.68	1E-36	5.83	2E-36
Pdk4	3.48	6E-26	1.59	2E-02	0.79	1E-02
Mt2	3.48	1E-08	2.40	2E-02	0.84	4E-03
Npy4r	3.48	1E-05	7.51	9E-10	0.74	3E-02

Pi15	3.46	3E-05	6.06	2E-15	1.92	6E-03
Cpa4	3.43	6E-10	4.61	9E-06	2.26	1E-13
Kazald1	3.43	2E-18	2.83	4E-13	0.79	4E-03
Alk	3.42	7E-10	8.94	2E-18	3.37	2E-15
Itga11	3.40	4E-06	4.30	1E-02	4.59	2E-12
Sucnr1	3.40	3E-26	1.43	4E-04	1.36	9E-06
Aqp1	3.39	4E-06	23.62	3E-21	5.81	3E-13
Dock8	3.38	4E-06	4.63	5E-93	4.13	5E-21
Loxl4	3.36	5E-33	2.99	4E-02	2.07	4E-04
Trpv4	3.33	5E-16	13.58	4E-53	2.66	8E-23
Cyp1b1	3.30	1E-04	10.80	3E-203	4.94	8E-19
Cxcl14	3.28	5E-08	6.02	1E-05	2.18	3E-18
Tgfbi	3.27	3E-18	9.74	2E-21	1.78	1E-12
Kcnk10	3.26	2E-19	18.17	1E-14	1.20	4E-05
Igf2bp3	3.25	8E-16	3.78	8E-15	1.99	1E-12
A830082K12Rik	3.24	2E-26	1.84	6E-11	0.76	1E-02
Trhr	3.23	2E-07	14.19	6E-186	4.03	5E-03
Aldh3a1	3.23	3E-13	7.84	3E-20	0.77	7E-03
Epha3	3.23	6E-18	4.10	4E-02	1.83	4E-04
Slc22a4	3.22	4E-05	3.65	3E-07	2.83	4E-09
Cdk18	3.20	1E-18	4.44	2E-07	1.67	6E-15
Ccdc122	3.18	1E-18	2.60	4E-23	1.82	5E-03
Meis1	3.17	6E-23	2.43	5E-04	4.64	9E-07
Slc5a7	3.16	1E-03	12.77	5E-62	1.98	2E-10
Tgm2	3.15	5E-23	10.14	4E-09	1.81	3E-14
Sorcs2	3.15	2E-33	11.32	2E-16	1.14	3E-04
Cgref1	3.11	7E-05	3.10	2E-12	1.45	3E-05
Gpr85	3.09	1E-16	17.72	3E-36	4.54	7E-17
Nr2f1	3.08	6E-30	2.58	6E-20	1.25	7E-07
C1qtnf1	3.08	3E-15	6.02	1E-05	1.03	3E-07
Gmpr	3.07	5E-19	2.82	3E-06	4.38	7E-10
Pdgfb	3.06	1E-25	3.93	3E-08	0.89	1E-04
Myo1d	3.06	1E-25	12.13	4E-38	1.86	2E-23
Fam110c	3.03	3E-10	7.14	9E-30	1.26	9E-06
Cd28	3.03	1E-04	2.98	3E-05	2.32	9E-04
Shh	3.02	2E-13	9.72	3E-12	3.38	5E-06
A230065H16Rik	3.01	1E-04	7.12	3E-11	1.21	2E-08
Psca	2.99	2E-13	2.37	4E-03	0.57	7E-03
Gprin3	2.98	4E-14	1.63	7E-03	0.84	2E-02
Lgals2	2.95	5E-24	2.09	1E-03	1.43	1E-13
Chst3	2.95	4E-16	2.96	5E-15	1.23	5E-13
Aspa	2.95	5E-18	2.40	3E-09	3.88	1E-03
Mettl24	2.92	2E-03	6.68	1E-28	6.49	2E-17
Snhg18	2.89	2E-18	2.73	1E-07	1.75	2E-05
Shisa3	2.88	3E-03	6.85	2E-30	1.65	6E-09
Rasgrf1	2.86	3E-03	7.09	1E-26	1.92	2E-03
Gsdmd	2.86	3E-12	2.13	2E-02	0.54	1E-02
Ccdc3	2.85	1E-04	4.82	1E-05	1.65	1E-02
Vtcn1	2.85	2E-04	3.11	1E-03	1.17	4E-02
Artn	2.84	3E-03	11.00	2E-16	4.29	2E-57
Ret	2.84	1E-04	3.40	1E-07	1.64	3E-09
Adh7	2.84	6E-31	2.99	1E-05	2.50	6E-05

Gene					
Foxd1	2.83	5E-05	4.04	1E-33	0.99	3E-07
Hapln1	2.83	2E-03	2.21	2E-05	1.09	8E-04
Tet1	2.82	2E-25	2.77	2E-07	3.53	2E-10
Aebp1	2.81	7E-30	3.01	6E-03	1.90	6E-06
Cd109	2.80	3E-35	2.55	2E-15	1.00	2E-03
Cd300lb	2.78	1E-09	2.48	5E-09	0.86	7E-05
Tmem200c	2.78	5E-03	4.15	2E-13	2.70	1E-33
Apbb1ip	2.76	3E-20	3.56	9E-05	0.90	5E-04
Sybu	2.75	3E-07	4.17	2E-04	5.41	1E-09
Lipg	2.74	2E-15	2.09	3E-02	1.89	3E-07
Sh2d4a	2.74	2E-03	3.44	2E-44	1.91	6E-03
Nrp2	2.74	6E-36	2.48	3E-06	1.32	8E-05
Krt80	2.71	2E-03	58.36	1E-21	2.05	2E-14
Ddx3y	2.67	7E-03	107.53	1E-50	6.62	4E-19
Agap2	2.65	1E-06	3.49	8E-13	1.34	1E-03
Ccbe1	2.64	3E-06	9.73	2E-17	4.59	3E-06
Tenm4	2.64	1E-21	6.02	1E-05	4.82	3E-37
Efemp1	2.63	2E-34	4.33	4E-09	1.29	5E-10
Krt87	2.62	7E-03	9.24	4E-48	4.17	2E-67
Atp8a1	2.61	1E-30	6.85	2E-30	1.65	6E-09
Crygs	2.61	6E-07	2.34	4E-08	0.68	2E-03
Slc6a15	2.60	9E-03	69.29	5E-27	3.16	1E-36
Traf1	2.60	1E-04	3.53	7E-11	2.88	8E-07
Chmp4c	2.59	4E-11	3.80	7E-13	1.47	4E-02
Dlx6os1	2.58	1E-06	3.40	4E-03	2.19	1E-06
Mlip	2.58	4E-04	2.50	4E-02	2.61	1E-04
Igfbp3	2.57	1E-19	3.63	1E-05	2.05	7E-23
Papln	2.56	4E-03	4.69	1E-15	1.60	3E-02
Nfatc2	2.56	8E-07	4.06	1E-04	1.80	6E-03
Syt8	2.55	2E-03	5.23	4E-10	1.49	5E-14
Gm4262	2.54	6E-05	1.74	5E-05	1.10	3E-07
Mn1	2.54	5E-15	12.65	3E-114	4.14	1E-05
Asb4	2.54	2E-03	3.61	2E-10	0.79	1E-02
Ano1	2.54	2E-20	5.93	3E-28	2.71	1E-15
Fam135b	2.53	8E-04	2.80	1E-10	2.21	3E-02
Arhgef19	2.53	3E-17	1.62	2E-02	0.44	2E-02
Mfsd6	2.52	1E-27	2.23	8E-03	1.37	3E-07
Oacyl	2.51	1E-02	4.46	4E-05	1.32	6E-03
Npas3	2.51	3E-35	1.87	4E-06	1.25	9E-09
Dlgap2	2.51	2E-03	2.79	3E-02	1.60	2E-05
Cd38	2.50	2E-05	2.16	3E-03	1.23	1E-04
A930001A20Rik	2.49	1E-02	4.82	1E-05	1.17	4E-02
Itgb8	2.48	2E-23	1.82	3E-07	0.68	2E-02
AA467197	2.48	1E-03	7.11	1E-16	2.08	1E-20
Sash1	2.48	1E-14	4.28	2E-15	3.24	4E-04
Col1a1	2.48	7E-27	1.81	4E-02	0.77	4E-05
Ttyh1	2.48	2E-06	7.26	9E-10	2.62	3E-05
Nebl	2.48	2E-30	2.96	1E-07	1.00	4E-05
A330074K22Rik	2.46	4E-12	3.28	8E-03	0.54	3E-02
Faim2	2.44	1E-04	4.32	4E-05	3.23	2E-44
Edn2	2.43	2E-02	6.02	1E-05	6.00	7E-14
Pantr1	2.41	4E-22	1.43	1E-15	0.76	5E-03

Gene					
Fgfrl1	2.40	6E-22	4.51	2E-03	1.84	3E-03
Txlnb	2.40	5E-12	3.37	1E-03	2.22	6E-03
Scd1	2.39	7E-21	5.52	7E-26	0.82	4E-04
C1ql3	2.38	2E-17	2.39	1E-35	2.39	2E-03
Edil3	2.38	3E-11	2.21	2E-05	1.09	8E-04
Adgrg6	2.38	2E-36	8.44	2E-09	1.56	2E-03
Sele	2.37	2E-03	9.23	4E-07	2.56	4E-05
Pde8a	2.36	1E-31	2.06	1E-03	1.16	2E-05
Hspb7	2.36	3E-04	3.53	2E-16	1.19	2E-05
Agmo	2.35	2E-02	72.02	7E-29	1.99	1E-02
Col1a2	2.32	8E-27	3.75	1E-67	1.44	6E-09
Kcnj16	2.31	2E-02	6.27	2E-06	1.20	5E-08
Plb1	2.30	4E-12	1.72	2E-02	1.27	5E-12
Fbn2	2.29	4E-17	18.17	1E-14	4.99	9E-15
Rem2	2.29	3E-03	1.86	3E-02	0.62	3E-03
Upp1	2.27	1E-09	3.35	1E-05	1.27	3E-03
Arhgef3	2.27	2E-03	9.07	7E-35	1.34	2E-04
Scube3	2.24	2E-14	80.21	1E-34	6.79	4E-29
Zkscan2	2.24	5E-03	7.93	8E-37	5.58	1E-10
Egr3	2.24	4E-29	3.11	1E-03	0.92	3E-06
Kif21a	2.24	1E-37	7.20	2E-14	1.80	4E-06
Klf12	2.22	8E-06	23.62	3E-21	1.92	3E-07
Pak6	2.22	8E-03	2.13	2E-03	1.69	3E-04
Ddit4	2.19	5E-11	2.16	3E-04	0.91	1E-02
Elmo1	2.18	3E-11	2.93	2E-06	0.88	8E-03
Sorbs2os	2.17	9E-05	2.02	2E-16	1.14	2E-08
Nov	2.16	2E-07	2.23	4E-03	3.01	2E-03
Adamtsl1	2.16	1E-21	3.45	5E-05	2.06	3E-02
Socs1	2.15	4E-12	4.64	1E-09	1.75	1E-07
Sema6a	2.15	6E-14	18.00	2E-60	4.33	5E-05
Galnt13	2.14	4E-07	5.87	4E-13	2.33	3E-05
Tnfrsf1b	2.14	3E-18	1.93	3E-02	1.03	6E-06
Elovl7	2.13	1E-04	7.16	1E-06	0.89	1E-02
Macrod1	2.11	2E-12	1.68	2E-02	0.59	1E-03
Insm1	2.10	2E-06	6.69	1E-12	4.41	3E-04
Nav1	2.10	6E-37	1.92	2E-02	1.05	3E-03
Msx3	2.10	2E-04	5.76	1E-17	6.50	1E-16
Tcn2	2.09	2E-06	2.64	2E-06	1.99	6E-05
Clip4	2.09	7E-26	8.94	2E-18	3.37	2E-15
Apoh	2.09	7E-03	5.66	7E-17	1.60	4E-07
Sox5	2.08	2E-13	22.06	6E-20	3.81	2E-03
Eef2k	2.08	9E-22	1.90	9E-04	1.68	1E-08
Slc7a7	2.07	9E-05	2.09	8E-08	0.92	1E-02
Idua	2.05	1E-08	4.51	2E-03	1.84	3E-03
Tspan11	2.04	1E-02	2.58	9E-08	1.79	3E-05
Gfra2	2.02	2E-05	3.13	9E-09	1.44	3E-04
Bin3	2.02	3E-26	3.11	1E-03	0.92	3E-06
Kdm5d	2.02	5E-02	74.75	9E-31	6.69	2E-20
Armc2	2.02	3E-05	11.22	1E-22	2.96	9E-11
Laptm4b	2.01	2E-19	5.11	8E-05	1.24	4E-02
Kcnn4	2.01	3E-02	2.15	4E-06	1.74	5E-08
Uty	2.01	5E-02	121.18	8E-59	6.78	9E-18

Cdk6	2.01	7E-15	7.80	2E-07	2.20	1E-02
Frmd4b	2.00	3E-19	4.34	1E-14	1.37	2E-05
Sema5a	2.00	1E-21	6.62	3E-23	4.38	1E-05
Lacc1	2.00	6E-22	2.60	4E-23	1.82	5E-03
Lix1	1.99	5E-02	3.59	3E-09	1.15	7E-04
Prr33	1.99	3E-05	2.91	4E-07	5.14	4E-82
Tex26	1.99	2E-02	2.74	4E-05	0.45	3E-02
Mr1	1.99	9E-14	3.18	3E-02	0.45	3E-02
Fam92b	1.98	4E-02	3.28	8E-03	0.54	3E-02
Slc25a30	1.96	3E-29	2.20	2E-02	1.69	8E-04
Lemd1	1.95	2E-05	3.14	4E-05	0.68	5E-04
Ank2	1.94	2E-21	4.22	7E-15	2.20	8E-06
Arhgef37	1.94	6E-05	7.56	1E-21	2.34	2E-14
Qrfpr	1.94	4E-03	3.28	6E-04	2.16	2E-04
Rgs8	1.93	4E-14	6.96	9E-16	0.58	1E-02
Map2	1.93	8E-23	5.28	5E-04	2.14	2E-03
Gadd45a	1.93	9E-05	6.02	1E-05	1.55	1E-07
Fam81a	1.92	2E-09	2.69	3E-05	1.40	9E-04
M1ap	1.91	6E-04	1.98	2E-05	1.21	3E-02
Adgrb1	1.91	4E-03	3.80	5E-04	2.53	9E-39
Rab7b	1.89	5E-07	3.66	7E-11	0.75	2E-03
Col14a1	1.88	3E-02	3.16	4E-07	0.69	4E-03
Fmo5	1.87	6E-05	19.66	3E-29	1.73	1E-08
Cdkn2b	1.87	7E-16	2.21	1E-10	1.97	2E-02
Ccdc65	1.87	7E-06	3.18	4E-03	1.37	5E-12
Gamt	1.87	2E-12	2.34	1E-03	1.53	7E-03
Fgfbp1	1.86	2E-04	2.16	3E-03	1.23	1E-04
Oaf	1.85	2E-09	13.88	4E-24	3.77	1E-12
Madd	1.84	4E-24	2.94	1E-09	1.96	1E-07
Syt13	1.84	2E-04	5.28	3E-25	1.93	6E-06
Wnt5b	1.83	5E-03	3.15	3E-06	1.49	1E-10
Cfap54	1.83	2E-08	2.35	5E-13	1.20	5E-06
Aqp5	1.83	1E-06	3.86	7E-05	2.73	3E-30
Inpp4b	1.82	2E-02	4.46	4E-05	0.96	1E-02
Hacl1	1.82	9E-17	1.44	2E-05	0.51	8E-03
Unc13c	1.82	2E-08	5.53	9E-05	1.63	1E-04
Rnls	1.81	3E-06	4.30	1E-02	4.72	3E-06
A730020E08Rik	1.80	5E-02	11.46	1E-22	1.99	6E-11
Sh3kbp1	1.80	1E-23	3.85	1E-06	1.97	9E-03
Gnpda1	1.80	5E-07	1.90	3E-05	2.05	1E-15
Arhgap24	1.80	4E-09	3.67	2E-03	4.88	3E-07
Tbx20	1.79	4E-07	2.51	6E-10	1.09	6E-07
Camk1d	1.78	3E-23	4.82	1E-05	1.65	1E-02
Serinc5	1.76	7E-20	15.13	3E-19	3.52	3E-17
Tor3a	1.76	4E-17	1.96	2E-06	1.93	2E-09
Ccser2	1.74	1E-36	8.00	1E-11	0.41	3E-02
Map2k6	1.74	4E-07	2.35	1E-08	1.66	2E-04
Tbx3	1.74	6E-12	11.38	4E-51	2.39	1E-19
Eml1	1.73	5E-13	19.21	5E-28	4.82	2E-36
Meis2	1.73	1E-26	3.61	4E-144	4.74	2E-14
Dpp6	1.72	1E-02	16.62	5E-12	4.62	9E-06
Nr1h5	1.72	5E-02	72.02	7E-29	3.18	4E-04

Lrrc7	1.70	3E-04	4.82	1E-05	2.13	2E-06
Inpp5k	1.70	5E-21	3.59	2E-04	2.46	2E-07
Pdzd7	1.69	1E-06	1.62	6E-03	0.79	4E-03
Cdk19	1.69	2E-20	2.04	2E-03	1.81	2E-05
Rai14	1.67	5E-29	3.49	6E-04	3.65	4E-05
Calcoco1	1.66	4E-08	2.54	1E-08	0.94	2E-06
Kalrn	1.66	1E-18	4.97	8E-18	1.09	4E-07
Vax1	1.65	8E-08	10.83	2E-73	5.82	7E-49
Apln	1.65	4E-08	2.20	6E-12	1.94	1E-02
Zfp13	1.63	8E-08	2.75	4E-02	1.25	7E-04
Dnm3	1.63	2E-02	2.85	4E-15	1.71	7E-09
Epb41l4a	1.63	2E-25	24.40	1E-22	2.79	2E-03
Rab3b	1.62	2E-06	20.51	3E-17	2.23	2E-16
Pld2	1.61	6E-06	5.12	1E-14	2.28	2E-07
Ropn1l	1.60	1E-04	8.12	2E-08	0.76	1E-02
Pak1	1.60	4E-18	5.11	8E-05	2.26	2E-02
Pde1b	1.59	5E-10	10.60	3E-10	4.61	1E-07
Os9	1.59	2E-11	3.49	8E-13	1.34	1E-03
Slc35b3	1.58	1E-12	2.39	9E-30	0.87	4E-03
Atp2a3	1.58	3E-02	4.14	6E-03	4.73	1E-05
Ociad2	1.57	2E-18	1.90	1E-03	1.87	2E-04
Hs1bp3	1.57	5E-09	3.97	6E-03	1.16	1E-03
Sox9	1.56	1E-07	2.21	1E-13	1.22	4E-04
Akap6	1.56	7E-12	6.58	2E-88	4.36	1E-03
Cryl1	1.56	5E-06	3.88	4E-03	1.38	1E-02
Ttll7	1.55	2E-21	3.63	1E-03	2.81	2E-07
Eno4	1.55	9E-04	2.19	1E-03	1.94	9E-03
Nadk2	1.54	9E-14	11.57	4E-47	1.92	8E-04
Eps8	1.54	9E-14	5.94	2E-15	2.63	3E-04
Skap2	1.53	4E-10	23.62	3E-21	2.75	8E-08
Tinagl1	1.52	6E-11	2.56	2E-02	1.01	6E-06
Rapgef5	1.51	1E-05	3.67	2E-03	1.17	2E-03
Fzd3	1.51	2E-13	4.13	1E-34	1.63	1E-02
Adamtsl4	1.51	2E-07	3.83	2E-15	1.35	1E-08
Adgrl3	1.51	4E-24	5.83	1E-14	3.07	2E-06
Cbr2	1.50	2E-06	5.53	9E-05	3.59	2E-13
Sorbs2	1.49	1E-27	2.02	2E-16	1.14	2E-08
Stard13	1.48	6E-19	1.98	3E-21	1.83	4E-03
Dcxr	1.47	8E-06	5.53	9E-05	3.59	2E-13
Cngb1	1.47	5E-03	9.69	4E-08	1.84	2E-03
Akap7	1.46	2E-13	2.54	8E-03	1.17	4E-02
Apol6	1.46	8E-03	2.61	7E-04	2.37	8E-22
Ank	1.46	9E-09	2.20	1E-07	1.14	1E-05
Gabrb3	1.46	1E-02	3.51	6E-09	1.47	4E-03
Mpzl1	1.46	1E-09	2.90	5E-03	2.18	9E-08
Epm2a	1.45	2E-06	2.68	4E-08	0.73	3E-02
Nanog	1.45	1E-03	2.99	4E-02	0.56	4E-02
Bcas3	1.45	2E-09	7.71	5E-17	2.70	6E-03
A930004D18Rik	1.44	9E-12	3.52	9E-36	1.16	6E-05
Stk10	1.43	7E-08	2.40	2E-02	1.37	6E-05
Lsp1	1.43	9E-07	2.91	4E-07	5.14	4E-82
Rb1	1.42	2E-13	1.29	5E-04	3.21	7E-12

Gene					
Synrg	1.42	5E-15	2.71	2E-02	1.30	1E-08
Ptgfr	1.42	7E-04	2.98	3E-05	1.79	1E-02
Bhlhe22	1.42	3E-04	3.50	1E-58	4.56	1E-12
Rufy1	1.42	3E-24	3.23	9E-25	1.01	3E-02
Litaf	1.42	9E-19	1.74	5E-05	1.10	3E-07
Upp2	1.41	5E-04	2.41	1E-06	1.47	1E-03
Mmp19	1.41	3E-04	2.49	4E-05	0.89	2E-04
Pink1	1.40	4E-08	3.14	4E-05	1.60	2E-03
Cp	1.40	2E-04	1.25	5E-03	1.77	1E-03
Polm	1.39	6E-08	3.45	3E-12	2.21	1E-02
Dlgap1	1.38	2E-02	1.39	1E-03	1.19	4E-09
Osr1	1.38	2E-10	3.37	2E-04	3.92	1E-06
St6gal1	1.37	2E-10	2.76	2E-05	0.69	2E-04
Prkar1b	1.37	2E-03	12.41	2E-13	1.30	5E-04
Rhobtb2	1.37	3E-07	4.32	6E-06	0.91	7E-03
Aig1	1.36	8E-12	6.27	2E-06	2.11	1E-05
Azin2	1.35	2E-06	3.11	7E-07	1.20	1E-06
Irx3	1.35	1E-10	10.72	2E-20	5.95	2E-13
Gsn	1.34	5E-09	2.53	6E-08	0.54	3E-02
Ctnnd2	1.33	3E-06	2.64	3E-04	3.86	5E-03
Tbc1d32	1.33	3E-18	3.50	4E-06	1.12	5E-03
Mitf	1.33	7E-04	11.71	1E-23	1.30	2E-06
Dubr	1.33	9E-06	9.53	8E-38	2.49	1E-17
Pax9	1.32	1E-09	5.35	6E-29	2.60	2E-03
Nemp2	1.32	2E-10	2.23	8E-03	1.37	3E-07
Gm10125	1.31	4E-03	2.86	3E-04	1.13	5E-02
Maml3	1.31	8E-08	3.08	2E-07	1.67	2E-12
Tbccd1	1.31	2E-10	3.60	2E-06	1.75	4E-02
Acaa2	1.31	6E-21	58.36	1E-21	4.76	1E-20
Rorb	1.31	1E-08	8.33	4E-26	1.57	8E-13
Kitl	1.30	1E-06	11.96	2E-12	1.53	2E-03
Gramd4	1.28	6E-19	3.11	7E-07	0.64	1E-03
Ift88	1.27	2E-10	2.12	1E-05	0.74	6E-05
Il34	1.27	7E-05	4.25	4E-10	1.35	3E-07
Scd2	1.26	3E-08	2.19	3E-06	0.90	1E-05
Dok1	1.25	5E-08	1.98	2E-05	1.21	3E-02
Ccser1	1.24	2E-04	11.46	1E-22	1.99	6E-11
Klhl8	1.24	7E-09	1.88	5E-15	0.46	3E-02
Ptprn2	1.24	2E-04	130.76	0E+00	8.23	2E-34
Pccb	1.23	3E-10	4.61	9E-06	2.33	2E-03
Nav3	1.23	5E-05	18.04	2E-37	1.89	7E-13
Pacrg	1.22	3E-02	5.11	8E-05	2.00	2E-05
Vamp4	1.22	1E-10	3.55	2E-29	2.19	2E-11
Raph1	1.22	5E-14	2.98	3E-05	2.32	9E-04
Ptgfrn	1.22	1E-11	7.76	1E-10	1.98	4E-10
Hint3	1.22	1E-06	1.89	6E-03	2.17	1E-08
Hbp1	1.22	8E-08	2.72	8E-28	1.83	3E-16
Xrcc5	1.20	2E-13	2.93	3E-14	0.85	1E-02
Dact2	1.18	1E-03	2.00	4E-03	0.58	9E-03
Itgbl1	1.18	5E-02	1.66	2E-09	1.49	5E-04
C030037D09Rik	1.18	2E-06	6.10	1E-17	2.60	1E-07
Plvap	1.17	5E-05	3.05	7E-11	1.86	4E-04

Sesn1	1.17	3E-09	4.63	3E-14	2.80	2E-09
Sptbn2	1.17	1E-02	3.84	1E-07	0.84	1E-02
Pibf1	1.16	2E-08	2.26	2E-06	3.24	6E-08
Gm16596	1.16	4E-02	3.94	6E-20	2.27	2E-10
Gpalpp1	1.16	3E-16	5.33	4E-07	3.02	2E-07
Lipa	1.14	9E-09	4.62	5E-15	1.31	4E-02
Sbno2	1.14	6E-09	2.18	3E-09	1.52	3E-13
Pthlh	1.14	3E-02	6.77	1E-38	5.51	7E-11
Mccc1	1.14	2E-07	2.16	2E-03	3.02	3E-04
Abr	1.14	2E-15	3.34	1E-06	1.82	2E-17
Syne2	1.14	3E-06	88.41	2E-38	2.69	1E-05
Lef1	1.13	1E-04	2.36	4E-07	0.57	2E-02
Kat6b	1.13	8E-10	4.13	1E-21	1.34	4E-02
Ctdsp2	1.13	1E-09	3.11	2E-10	1.68	1E-06
Tshz1	1.12	3E-17	8.58	8E-57	2.00	1E-07
Cerk	1.12	3E-05	3.11	7E-07	0.64	1E-03
Marcks	1.12	3E-04	5.53	9E-05	0.67	1E-02
Sugt1	1.12	2E-19	15.80	4E-30	2.41	6E-05
Trib2	1.11	8E-05	2.74	2E-04	1.42	2E-02
Tcf4	1.11	3E-13	1.38	3E-04	0.56	8E-03
Cyb5r3	1.10	7E-08	2.36	2E-03	0.61	8E-03
Tspan14	1.10	3E-09	2.14	1E-03	0.83	1E-04
Lhx9	1.09	2E-05	3.13	7E-05	2.20	5E-07
Zfyve26	1.09	2E-09	2.46	2E-07	1.19	2E-03
Ntn4	1.09	9E-09	2.11	1E-03	0.71	3E-02
Slit3	1.09	9E-05	2.74	4E-05	0.55	8E-03
Mtss1	1.08	2E-06	4.99	2E-06	2.54	1E-18
Daam1	1.08	2E-19	2.35	1E-04	2.36	2E-07
Zhx2	1.07	3E-10	80.21	1E-34	2.55	3E-14
Aqp11	1.07	2E-02	3.59	2E-04	1.38	3E-08
Psap	1.07	2E-08	3.10	6E-03	1.06	3E-02
Zfp286	1.07	6E-05	5.84	2E-09	0.88	5E-04
Limk2	1.06	1E-07	1.68	4E-02	0.96	2E-03
Sox21	1.06	2E-05	1.62	6E-03	1.42	5E-13
Lta4h	1.05	2E-19	2.39	3E-05	1.51	8E-07
Rab36	1.05	3E-04	2.23	4E-06	0.77	3E-05
Mecom	1.05	4E-05	5.11	8E-05	3.23	2E-07
Tsc22d3	1.05	1E-05	3.80	5E-04	2.68	8E-03
Rab32	1.04	7E-06	4.41	2E-11	1.44	2E-02
Pcnx	1.04	1E-10	3.03	3E-03	1.31	1E-02
Btg1	1.04	5E-05	3.43	2E-09	2.84	3E-26
Rabggta	1.04	3E-10	3.35	2E-13	1.15	1E-02
Pnpo	1.04	2E-02	2.10	6E-09	0.86	4E-05
Zadh2	1.03	3E-10	1.57	4E-03	0.72	5E-03
Foxc2	1.03	7E-07	3.18	4E-03	2.66	3E-25
Lrig3	1.03	3E-10	2.90	1E-51	2.56	9E-05
Rnaseh2b	1.01	1E-06	7.67	1E-28	5.44	9E-12
Rap1gap2	1.01	1E-06	17.40	3E-13	1.79	4E-02
Kif16b	1.01	9E-08	5.04	3E-03	0.88	4E-02
Ttc23	1.01	7E-12	6.52	7E-05	2.28	6E-07
Agpat3	1.01	9E-10	7.16	1E-06	0.93	5E-03
Trim66	1.00	2E-02	2.93	7E-08	2.36	8E-08

Sh3pxd2b	1.00	2E-06	2.93	2E-02	0.80	1E-03
Fbxo16	1.00	9E-03	7.80	2E-07	1.40	5E-03
Pcolce2	0.99	2E-07	2.66	1E-11	3.89	8E-24
Slc16a7	0.99	8E-04	8.33	1E-15	0.95	2E-04
Bach2	0.98	5E-05	5.05	3E-22	1.32	3E-03
Pter	0.98	9E-09	2.39	1E-35	2.39	2E-03
Osbpl6	0.98	5E-08	46.42	6E-102	5.61	4E-12
Syn1	0.98	8E-03	1.96	4E-22	1.10	3E-02
Zbtb20	0.97	1E-05	1.93	8E-09	0.65	2E-03
Arrdc3	0.97	2E-07	8.73	1E-21	0.70	3E-02
C430049B03Rik	0.97	1E-02	3.27	2E-05	2.77	2E-09
Tnfaip8	0.97	6E-11	2.88	2E-07	1.99	2E-05
Arhgap18	0.97	7E-05	2.63	1E-03	3.65	1E-04
Cacnb2	0.97	2E-09	4.65	6E-05	1.60	2E-02
Cd47	0.96	2E-06	2.56	2E-03	1.44	1E-02
Sirt5	0.96	1E-04	5.04	3E-03	4.34	3E-05
Decr1	0.96	1E-05	8.87	9E-26	3.75	2E-06
Borcs6	0.96	8E-06	5.38	7E-17	4.40	1E-09
Arid5b	0.96	4E-08	1.60	3E-02	2.06	2E-02
Fbln1	0.96	1E-03	5.85	2E-18	0.74	3E-02
Ndst3	0.95	6E-04	5.64	4E-10	0.89	1E-02
Cpq	0.95	4E-04	5.04	3E-03	4.03	4E-08
Cog3	0.95	9E-12	2.20	2E-02	1.69	8E-04
Cbr4	0.94	7E-07	3.07	1E-04	0.80	1E-03
Wasf1	0.93	7E-05	6.77	5E-08	2.01	1E-04
Lrp10	0.93	5E-06	1.86	3E-02	0.62	3E-03
Zscan2	0.93	7E-03	1.42	2E-02	0.49	2E-02
Eva1c	0.92	4E-08	2.42	6E-16	0.64	1E-03
Prcp	0.92	2E-10	4.20	1E-12	1.35	2E-02
Bbs10	0.92	7E-04	2.65	8E-05	1.04	5E-02
Cbx7	0.92	1E-03	1.72	1E-02	1.87	2E-02
Cfap61	0.92	2E-02	2.05	3E-20	1.47	5E-10
Cyp46a1	0.92	2E-02	4.90	1E-24	4.05	3E-27
Sms	0.91	2E-02	2.28	7E-05	1.58	1E-03
Btc	0.91	1E-02	2.11	1E-06	1.38	4E-02
Cdc40	0.90	9E-10	4.97	1E-08	1.75	4E-03
Perp	0.89	2E-03	5.49	7E-11	0.96	2E-02
Abcc4	0.89	2E-06	6.52	7E-05	2.25	7E-05
Nox4	0.89	2E-07	4.30	1E-02	0.95	4E-03
Ebf1	0.89	7E-05	2.16	2E-02	1.23	4E-07
Zfp827	0.88	3E-06	3.07	3E-02	1.69	5E-03
Msi2	0.88	7E-08	6.10	1E-17	2.60	1E-07
Spata13	0.88	1E-04	15.84	8E-11	2.43	2E-12
Skida1	0.87	3E-06	1.60	6E-19	1.97	2E-15
Runx3	0.87	2E-02	3.19	2E-03	3.04	2E-38
Cpne8	0.86	2E-06	3.05	1E-10	1.00	6E-03
Mtss1l	0.86	1E-02	4.25	4E-10	1.35	3E-07
Mbtd1	0.86	4E-04	2.94	8E-07	1.61	7E-05
Spry2	0.86	1E-10	4.24	3E-09	0.65	1E-02
Yeats4	0.86	3E-10	4.07	3E-15	1.65	2E-03
Slc29a3	0.85	9E-06	4.38	2E-22	1.74	2E-11
Wdr59	0.85	2E-09	5.13	7E-11	1.14	3E-02

Gene					
Pcyt1b	0.85	4E-04	3.12	1E-07	2.25	4E-04
Ralgapa2	0.85	2E-07	4.97	7E-27	1.56	1E-06
B130024G19Rik	0.85	3E-02	2.88	2E-10	1.81	9E-03
Fam181b	0.85	4E-02	4.20	1E-12	1.35	2E-02
Gmds	0.85	2E-09	2.90	2E-05	0.88	5E-02
Usp53	0.85	4E-04	1.96	7E-05	2.36	2E-02
Mtmr9	0.84	3E-07	4.09	2E-09	0.92	3E-05
Apobec3	0.84	1E-04	1.72	1E-02	1.87	2E-02
Bcr	0.84	6E-07	12.86	1E-14	1.00	7E-09
Mid2	0.84	9E-09	3.28	1E-02	2.68	8E-03
Heatr5a	0.83	1E-05	4.46	4E-05	2.15	2E-02
Micu1	0.83	1E-06	1.54	2E-05	1.62	3E-08
Stx8	0.83	3E-06	85.68	1E-36	1.57	9E-12
Epdr1	0.83	5E-05	2.22	1E-03	1.31	9E-03
Poli	0.83	2E-05	2.17	4E-09	1.19	4E-07
Arntl	0.83	8E-07	5.31	1E-05	3.18	3E-13
Ttc33	0.82	3E-08	2.56	2E-04	3.31	2E-12
Sfxn3	0.82	2E-04	1.62	6E-03	0.79	4E-03
Nufip1	0.82	2E-05	5.33	4E-07	3.02	2E-07
Slc35e3	0.81	2E-02	1.59	2E-08	0.94	3E-02
Tob1	0.81	2E-04	3.02	6E-05	1.56	1E-07
L3mbtl3	0.81	2E-09	2.68	7E-11	0.71	3E-02
Myo1e	0.80	4E-07	2.69	3E-05	1.40	9E-04
Pou3f3	0.80	7E-04	1.43	1E-15	0.76	5E-03
Dap	0.79	6E-03	1.99	6E-05	1.66	6E-04
Narf	0.79	7E-05	2.61	3E-02	0.89	4E-02
Akr1e1	0.79	1E-04	3.53	3E-21	2.59	8E-03
Suox	0.79	1E-03	9.46	1E-28	1.18	5E-04
Angptl2	0.79	8E-05	3.55	3E-17	0.78	1E-02
Snx13	0.79	2E-07	2.73	1E-07	1.38	2E-05
Frs2	0.79	8E-09	2.46	2E-53	1.04	3E-03
Slc7a11	0.79	5E-03	1.71	8E-03	0.87	4E-02
Trps1	0.78	6E-07	3.09	1E-02	0.71	7E-03
Fryl	0.78	5E-09	5.28	5E-04	1.44	5E-06
Casp6	0.78	3E-07	2.42	3E-02	4.02	6E-07
Gtf2f2	0.78	8E-06	6.27	2E-06	0.84	3E-02
Cyb561d1	0.77	6E-03	4.14	9E-08	1.14	2E-03
Elf1	0.77	2E-06	15.80	4E-30	2.41	6E-05
Lcmt1	0.77	5E-07	5.16	2E-12	1.47	7E-06
Cacna1a	0.77	2E-03	2.34	2E-02	1.72	5E-22
Mink1	0.76	2E-04	5.12	1E-14	2.28	2E-07
Zfp68	0.76	8E-05	1.96	1E-02	2.23	6E-03
Mapk1ip1l	0.76	4E-07	1.57	5E-02	1.62	4E-07
Mkrn1	0.76	7E-05	4.82	1E-05	1.18	1E-03
Akap17b	0.75	8E-04	2.52	3E-02	1.20	3E-03
Epb41l2	0.74	2E-07	3.27	2E-06	1.53	7E-07
Irf2bpl	0.74	2E-04	3.94	1E-26	3.45	9E-08
Fnip1	0.74	1E-03	11.05	3E-10	1.15	1E-02
Tm4sf1	0.74	2E-02	1.64	4E-29	4.78	5E-10
Pam	0.74	2E-06	2.56	2E-04	2.75	3E-03
Ube2b	0.74	6E-05	5.56	1E-17	3.49	2E-09
Clip3	0.73	1E-02	6.52	7E-05	0.55	5E-02

Mapre3	0.73	8E-03	1.60	2E-02	0.78	9E-03
Gdnf	0.73	5E-04	5.85	7E-56	1.81	9E-03
Radil	0.73	3E-03	2.09	7E-04	1.84	2E-17
Hexb	0.73	1E-02	3.19	2E-03	1.71	6E-10
Rab5b	0.73	4E-03	9.46	1E-28	1.18	5E-04
Cd9	0.73	1E-06	5.16	2E-06	1.81	4E-10
Lama5	0.73	6E-06	2.11	1E-03	0.88	4E-05
Arf6	0.72	3E-05	1.54	4E-02	0.52	1E-02
Ptger4	0.72	1E-02	3.27	8E-10	0.99	6E-04
Xkr6	0.71	6E-04	20.62	3E-73	3.90	7E-22
Nid2	0.71	6E-04	2.27	4E-05	0.95	3E-02
Spag9	0.71	3E-06	3.02	6E-05	1.56	1E-07
Wbp4	0.71	3E-06	2.94	1E-13	2.95	3E-07
Enpp5	0.71	4E-02	1.74	8E-04	0.76	7E-03
Bmper	0.70	2E-02	3.50	1E-51	2.10	2E-08
Fnip2	0.70	3E-04	6.23	2E-12	5.58	4E-28
Msra	0.70	3E-03	5.53	9E-05	1.80	1E-03
Mkl2	0.70	5E-04	11.96	2E-12	1.09	3E-03
Lif	0.69	2E-02	7.26	9E-10	1.55	5E-08
Dtd2	0.69	4E-04	4.46	4E-05	2.15	2E-02
Pttg1ip	0.69	7E-06	2.49	2E-02	1.18	5E-03
Cyb5a	0.69	8E-06	1.91	2E-10	0.71	5E-02
Notch2	0.68	5E-07	1.73	6E-06	1.37	3E-03
Prdm16	0.68	3E-03	10.72	4E-57	2.08	1E-20
Sh3pxd2a	0.68	1E-03	4.91	4E-04	1.95	2E-16
Unc119	0.67	2E-02	2.19	3E-06	1.69	5E-20
Tom1l2	0.67	3E-03	4.79	9E-09	0.58	4E-02
Mrpl52	0.67	3E-03	2.09	8E-08	0.92	1E-02
Acot13	0.67	4E-04	5.12	3E-58	1.77	5E-07
Vta1	0.67	2E-06	4.91	4E-04	2.03	4E-04
Sipa1l2	0.66	2E-04	3.37	1E-03	1.80	2E-15
Prex2	0.66	6E-04	3.73	1E-02	0.89	8E-04
Amigo1	0.66	5E-02	4.14	9E-08	1.14	2E-03
Zeb1	0.66	2E-06	2.86	3E-04	1.13	5E-02
Bbs9	0.65	7E-03	3.68	5E-07	2.69	2E-05
Ghitm	0.65	3E-07	2.48	6E-09	0.41	3E-02
Itpkb	0.65	2E-02	9.69	4E-08	1.40	5E-05
Mxi1	0.65	1E-04	3.28	1E-02	3.27	9E-08
Abhd2	0.65	1E-04	2.85	3E-11	2.47	7E-09
Ric8b	0.65	2E-06	23.62	3E-21	1.83	4E-06
Wwc1	0.65	8E-04	3.47	9E-27	3.11	1E-03
Shroom4	0.64	2E-05	3.02	3E-16	1.64	4E-02
Plekha7	0.64	6E-03	3.45	2E-08	1.48	7E-13
Lnpep	0.64	1E-06	3.59	3E-09	1.15	7E-04
Vcpkmt	0.63	1E-02	2.06	1E-14	0.54	5E-03
Tbce	0.63	5E-04	2.82	1E-04	1.43	3E-04
Hdac5	0.63	3E-03	2.61	1E-09	0.46	2E-02
Plekhb2	0.62	2E-04	20.19	1E-98	3.68	2E-42
Llgl1	0.62	7E-03	3.28	1E-03	1.41	1E-03
Cdh13	0.61	8E-04	3.12	9E-11	1.64	1E-15
Trim45	0.61	4E-03	3.11	1E-03	1.17	4E-02
Nprl3	0.61	2E-04	2.96	3E-13	1.73	4E-05

Plekha5	0.61	1E-04	2.39	7E-11	5.26	7E-10
Pyurf	0.61	1E-03	4.12	6E-16	1.77	5E-07
Sil1	0.61	2E-04	3.16	2E-31	1.99	1E-08
Cacnb3	0.60	2E-03	2.33	3E-04	1.71	2E-11
Runx2	0.59	6E-03	4.09	6E-21	2.63	9E-03
Sdccag8	0.59	7E-04	10.22	8E-43	3.28	5E-10
Xpo7	0.59	3E-03	4.02	9E-04	1.14	3E-03
Nceh1	0.59	4E-04	4.46	4E-05	3.66	8E-11
Ugp2	0.58	6E-04	2.43	3E-05	1.21	4E-02
Slc17a5	0.57	9E-03	2.71	4E-03	2.72	5E-33
Asap1	0.57	2E-04	3.34	9E-15	1.05	3E-08
Avpi1	0.57	2E-03	1.68	1E-03	0.94	1E-04
Sgms2	0.56	2E-04	2.28	5E-09	0.72	7E-03
Fibp	0.56	3E-03	1.73	3E-03	1.16	3E-05
Sgpl1	0.56	1E-04	2.73	6E-07	1.24	7E-04
St3gal4	0.56	4E-04	3.80	3E-02	0.79	2E-05
Zfyve21	0.55	9E-04	5.23	4E-10	1.25	3E-02
Aldh3a2	0.55	2E-04	7.84	3E-20	0.77	7E-03
Rreb1	0.55	7E-03	3.88	4E-09	2.87	1E-05
Dbnl	0.55	1E-02	18.30	1E-26	1.69	3E-07
Map3k13	0.55	1E-02	8.74	1E-17	1.53	1E-06
Ndfip2	0.54	2E-04	2.56	2E-02	1.41	7E-11
Wdr7	0.54	3E-04	7.80	2E-07	0.86	3E-02
Ccdc6	0.54	3E-03	2.14	2E-05	0.93	2E-03
Flii	0.54	9E-05	3.28	1E-03	1.41	1E-03
Pdxk	0.52	1E-02	2.35	4E-02	0.88	1E-06
Fam172a	0.52	9E-04	2.82	1E-04	0.95	1E-02
Kat7	0.51	5E-04	4.76	2E-06	1.21	7E-03
Akt3	0.51	3E-03	7.56	1E-24	3.28	5E-10
Fundc1	0.51	3E-03	2.47	2E-07	1.58	7E-05
Adck2	0.50	3E-02	2.54	8E-03	2.16	4E-06
Lancl2	0.50	2E-02	4.12	6E-16	1.77	5E-07
Prps1l3	0.50	7E-03	3.14	2E-14	1.48	2E-16
Heca	0.50	7E-03	3.37	1E-03	2.22	6E-03
Rnf32	0.49	3E-03	2.37	3E-04	1.59	2E-12
Btd	0.49	2E-02	1.46	6E-04	0.51	8E-03
Prkca	0.49	2E-03	5.66	7E-17	1.60	4E-07
Ube2e2	0.49	2E-03	3.10	3E-12	0.81	3E-02
Epn2	0.48	5E-03	5.13	7E-11	3.60	1E-04
Gab1	0.48	3E-02	2.18	2E-11	1.20	3E-03
Rab30	0.48	2E-03	1.81	4E-05	1.54	1E-03
Atxn10	0.48	2E-04	3.19	8E-47	5.06	3E-12
Kdm4a	0.48	4E-03	5.82	6E-20	4.30	4E-09
Nln	0.47	4E-04	1.75	4E-03	1.39	1E-11
Utrn	0.47	7E-04	2.05	7E-13	2.80	2E-05
Rapgef6	0.47	2E-02	11.05	3E-10	1.15	1E-02
Fam114a2	0.46	5E-03	5.95	3E-19	2.16	7E-20
Klf10	0.46	4E-03	3.73	1E-02	1.84	4E-04
Lrrc28	0.46	3E-02	6.52	7E-05	2.28	6E-07
Akap11	0.46	6E-03	2.51	2E-20	0.91	2E-03
Dnajc7	0.46	8E-04	5.58	1E-14	1.15	8E-05
Pbx1	0.46	1E-02	4.32	9E-07	1.13	2E-06

Commd1	0.46	3E-02	3.58	1E-06	1.78	2E-07
Cant1	0.45	2E-02	4.46	4E-05	1.03	3E-07
Ghr	0.45	3E-02	2.23	8E-03	1.56	7E-03
Pvt1	0.45	3E-02	2.71	6E-05	1.51	3E-08
Tns3	0.45	3E-02	2.63	1E-03	1.17	1E-06
Mcu	0.45	4E-02	1.54	2E-05	1.62	3E-08
Sec63	0.45	2E-03	2.21	4E-16	3.96	1E-08
Ppp3ca	0.45	9E-04	2.55	5E-14	2.02	7E-07
Sh2b3	0.44	4E-02	4.99	2E-06	1.70	2E-03
Specc1l	0.44	1E-03	12.86	1E-14	1.00	7E-09
Pde3b	0.44	1E-03	19.73	7E-16	1.35	1E-02
Trim16	0.44	3E-02	5.84	2E-09	0.88	5E-04
Atg7	0.44	1E-02	1.68	9E-05	1.27	2E-08
Nf1	0.44	7E-03	2.33	1E-02	2.90	3E-09
Fgd6	0.44	5E-03	7.48	2E-07	2.59	5E-04
Chmp6	0.43	5E-02	1.76	4E-03	1.50	2E-04
Fto	0.43	5E-02	10.72	2E-20	5.95	2E-13
Arid1b	0.43	4E-02	9.34	2E-19	1.75	3E-11
Lrp6	0.43	2E-03	4.61	9E-06	2.30	2E-10
Osbpl8	0.43	2E-02	2.46	7E-04	1.82	2E-04
Nrp1	0.42	1E-02	2.10	3E-02	0.78	4E-02
Tbcc	0.42	2E-02	2.37	7E-07	0.59	1E-02
Terf2	0.42	1E-02	4.33	1E-10	0.81	4E-02
Atg101	0.42	2E-02	2.15	2E-10	1.09	7E-06
Rabl3	0.42	3E-02	4.51	2E-03	2.31	1E-02
Klhl22	0.42	5E-02	5.02	4E-10	1.24	9E-06
Samd4	0.41	9E-03	3.21	2E-15	3.49	5E-05
Dym	0.41	2E-02	2.95	1E-02	1.24	2E-03
Sort1	0.41	5E-02	2.03	5E-04	2.06	3E-20
Stim2	0.41	3E-02	2.97	3E-34	0.56	1E-02
Rims2	0.40	2E-02	5.95	3E-19	3.45	2E-05
Tmem164	0.40	3E-02	3.73	1E-02	2.02	5E-02
Mon2	0.40	9E-04	1.89	5E-16	1.04	2E-03
Plekhh2	0.40	1E-02	2.58	3E-16	1.78	2E-09
Inf2	0.40	3E-02	4.99	2E-06	0.67	2E-03
Papolg	0.40	2E-02	16.62	5E-12	4.83	2E-13
Tmem2	0.40	2E-03	2.87	5E-08	1.21	1E-03
Nr2f2	0.40	3E-02	1.88	8E-30	1.07	5E-09
Jarid2	0.38	2E-02	3.63	1E-05	1.02	2E-03
Rnh1	0.38	3E-03	1.83	4E-02	0.61	2E-02
Fbxo4	0.37	2E-02	2.38	9E-03	0.88	3E-05
Dock5	0.37	2E-02	5.84	2E-09	0.54	2E-02
Btbd3	0.37	4E-03	3.58	2E-13	2.64	1E-11
Abl2	0.37	3E-02	1.68	5E-06	1.18	3E-03
Ppp1r12a	0.36	2E-02	2.52	3E-02	1.21	4E-02
Smad5	0.35	3E-02	29.06	7E-30	0.93	9E-04
Dnajb12	0.35	5E-02	2.16	3E-04	0.91	1E-02
Osbpl3	0.34	5E-02	2.50	1E-05	1.06	4E-02
Zc3h14	0.34	2E-02	2.47	3E-02	0.71	5E-04
Ifngr1	0.33	3E-02	12.60	9E-21	4.09	1E-08
Slc35d1	0.33	4E-02	2.47	3E-02	0.94	7E-03
Exoc4	0.33	2E-02	2.80	8E-04	1.81	9E-06

Ctnna1	0.32	2E-02	3.16	2E-31	1.99	1E-08
Camsap2	0.32	3E-02	3.12	5E-04	1.81	3E-03
Ak5	0.32	4E-02	1.89	2E-03	1.92	2E-02
Anxa5	0.32	8E-03	3.06	3E-09	0.95	5E-03
Exoc6b	0.32	4E-02	4.91	4E-04	1.86	1E-04
Oxr1	0.32	4E-02	5.67	1E-08	4.08	3E-05
Ino80c	0.31	5E-02	4.02	9E-04	1.59	4E-03
Tab2	0.30	5E-02	14.68	4E-18	2.15	4E-15
Nav2	0.30	3E-02	2.33	1E-02	1.43	2E-07
Dync1i2	0.28	3E-02	3.62	8E-39	1.83	1E-02
Zc2hc1a	-0.26	5E-02	0.13	1E-08	-5.68	8E-15
Tbc1d1	-0.28	4E-02	0.38	2E-05	-2.66	2E-07
Rnf111	-0.28	5E-02	0.22	8E-03	-1.92	3E-07
Sub1	-0.29	4E-02	0.01	2E-48	-6.85	4E-22
Abcd3	-0.29	4E-02	0.69	2E-02	-1.27	1E-03
Trim56	-0.30	2E-02	0.41	7E-09	-1.34	3E-04
Nbea	-0.31	3E-02	0.30	3E-07	-2.35	8E-03
Golph3	-0.31	5E-02	0.21	3E-04	-4.46	4E-06
Dnajc13	-0.31	3E-02	0.10	1E-09	-2.18	1E-05
Crk	-0.31	4E-02	0.21	3E-04	-1.16	5E-02
Parg	-0.31	3E-02	0.11	2E-15	-1.99	1E-05
Cdyl	-0.32	5E-02	0.10	2E-19	-1.51	3E-05
Sp3	-0.32	2E-02	0.53	7E-03	-3.89	2E-04
Igf1r	-0.32	3E-02	0.21	5E-07	-1.84	5E-09
Tapt1	-0.32	2E-02	0.25	3E-02	-5.72	6E-13
Map3k7	-0.33	8E-03	0.34	2E-16	-1.84	4E-09
Fam49b	-0.36	5E-02	0.34	2E-04	-2.17	2E-04
Pgrmc2	-0.36	2E-02	0.16	1E-11	-3.03	2E-21
Wwp1	-0.37	6E-03	0.22	9E-15	-1.94	1E-08
Mpdz	-0.37	3E-02	0.36	9E-03	-5.36	5E-10
Slmap	-0.37	2E-02	0.40	3E-12	-4.54	9E-06
Dhx30	-0.38	3E-02	0.44	4E-04	-5.11	4E-09
Six4	-0.38	2E-02	0.40	2E-10	-1.15	2E-04
Edrf1	-0.38	3E-02	0.01	2E-38	-3.77	5E-07
Mcc	-0.38	1E-02	0.48	2E-02	-1.76	6E-04
Pi4k2b	-0.39	5E-02	0.46	5E-04	-0.56	4E-03
Cops8	-0.39	3E-02	0.24	8E-06	-1.63	1E-02
Skil	-0.40	5E-02	0.50	3E-07	-1.71	1E-03
Ikzf2	-0.40	2E-02	0.17	1E-27	-3.08	2E-11
Esyt2	-0.40	8E-03	0.20	7E-10	-1.83	2E-02
Nup88	-0.40	3E-02	0.09	1E-10	-1.35	6E-03
Aco1	-0.40	4E-02	0.40	2E-09	-1.32	3E-02
Tmed8	-0.40	1E-02	0.21	6E-05	-0.85	5E-03
Uggt1	-0.40	2E-02	0.06	1E-11	-1.92	2E-02
Vps13a	-0.40	4E-02	0.28	4E-04	-2.39	1E-10
Prdm15	-0.41	2E-02	0.40	5E-04	-1.25	9E-04
Snx25	-0.41	2E-02	0.38	2E-12	-1.86	6E-03
Irak1bp1	-0.41	2E-02	0.47	4E-07	-4.09	1E-04
Fam120a	-0.41	2E-02	0.33	7E-08	-1.38	3E-02
Mttp	-0.42	5E-02	0.45	5E-08	-0.48	2E-02
Pomp	-0.42	2E-02	0.16	7E-11	-5.94	5E-14
Nepro	-0.43	2E-02	0.03	3E-69	-4.22	6E-10

Bhlhb9	-0.43	5E-03	0.04	5E-22	-2.62	7E-08
Me1	-0.44	7E-03	0.05	6E-18	-1.41	7E-05
Maea	-0.44	1E-02	0.09	1E-10	-1.39	1E-05
Smg7	-0.44	6E-04	0.50	1E-03	-0.99	3E-03
Trmt5	-0.44	1E-02	0.46	1E-10	-2.49	3E-03
Ubr3	-0.45	2E-03	0.24	7E-03	-2.98	1E-22
Tbc1d12	-0.45	1E-02	0.23	3E-04	-2.94	4E-07
Polr2m	-0.45	4E-03	0.31	6E-06	-1.92	2E-04
Slx4ip	-0.45	2E-02	0.01	1E-34	-3.24	2E-18
Gng12	-0.46	3E-04	0.01	7E-29	-3.36	1E-06
Cdh2	-0.46	2E-04	0.50	8E-09	-4.92	9E-08
Itpr1	-0.46	2E-02	0.07	3E-09	-1.56	7E-10
Kifap3	-0.46	2E-03	0.13	1E-08	-2.83	9E-03
Slc25a13	-0.46	3E-02	0.08	5E-69	-2.33	3E-04
Fbxo33	-0.47	6E-03	0.16	2E-04	-0.72	3E-02
Zbtb2	-0.47	3E-02	0.58	7E-03	-2.41	2E-06
Fndc3b	-0.47	1E-03	0.33	3E-03	-1.38	9E-12
Atrn	-0.47	8E-04	0.25	6E-06	-0.85	4E-02
Naa10	-0.48	4E-02	0.11	1E-06	-1.32	2E-06
Api5	-0.48	2E-02	0.02	9E-20	-3.87	6E-04
Armc8	-0.48	6E-04	0.14	6E-07	-1.05	3E-03
Zcchc2	-0.48	2E-03	0.01	2E-44	-1.37	4E-05
Rtfdc1	-0.49	5E-04	0.22	6E-12	-1.21	3E-02
Braf	-0.49	3E-04	0.24	2E-11	-2.94	2E-02
Mgat5	-0.50	1E-02	0.10	2E-18	-1	1E-03
Sec61a1	-0.50	3E-04	0.22	7E-10	-1.27	1E-05
Scaf4	-0.50	2E-02	0.35	7E-10	-1.52	2E-07
Cenpc1	-0.51	9E-03	0.43	6E-03	-1.83	1E-04
Snx18	-0.51	5E-03	0.43	1E-07	-3.08	2E-03
Fstl1	-0.51	1E-04	0.29	8E-03	-1.15	3E-02
Jade1	-0.51	5E-02	0.07	1E-27	-3.72	4E-05
Nfib	-0.51	2E-03	0.29	1E-74	-3.41	1E-08
Ptprk	-0.52	5E-04	0.27	6E-04	-2.7	1E-03
Fosl2	-0.53	6E-03	0.43	3E-03	-3.02	1E-11
Rnf6	-0.53	2E-04	0.35	3E-05	-2.28	4E-07
Bnip2	-0.53	8E-04	0.08	2E-47	-4.65	2E-05
Pdzd8	-0.55	6E-04	0.65	2E-06	-0.68	1E-03
Mto1	-0.56	3E-03	0.25	2E-04	-1.78	7E-12
Ksr1	-0.56	4E-02	0.12	1E-09	-1.84	8E-10
Dennd1a	-0.57	2E-02	0.16	2E-07	-1.67	5E-05
Mllt3	-0.57	9E-05	0.23	2E-06	-3.58	5E-04
Mavs	-0.57	5E-03	0.29	5E-06	-2.52	1E-04
Srfbp1	-0.57	4E-03	0.52	4E-05	-2.05	2E-08
Hdac4	-0.57	1E-04	0.15	2E-29	-1.5	2E-04
Ablim1	-0.58	1E-02	0.02	9E-20	-6.33	6E-16
Inip	-0.58	9E-03	0.21	7E-10	-5.34	2E-10
Map2k1	-0.59	1E-05	0.14	7E-16	-5.29	2E-25
Clpb	-0.59	6E-03	0.22	1E-10	-1.21	2E-04
Chordc1	-0.59	2E-04	0.01	9E-31	-1.08	2E-02
Nsun2	-0.59	4E-02	0.29	5E-02	-2.51	1E-04
Ppp6c	-0.60	2E-06	0.45	6E-03	-2.98	1E-10
Mrps28	-0.60	5E-03	0.27	5E-07	-0.9	1E-03

Prtg	-0.60	3E-04	0.08	8E-13	-0.96	1E-07
Prss23	-0.60	5E-03	0.47	5E-02	-2.56	6E-04
Etv6	-0.60	2E-04	0.25	2E-04	-1.43	9E-05
D5Ertd579e	-0.60	8E-06	0.31	2E-02	-1.21	2E-03
Mrps6	-0.61	1E-05	0.45	2E-02	-2.52	2E-04
Usp47	-0.61	1E-05	0.05	7E-49	-6.4	7E-17
Cxxc5	-0.62	5E-03	0.23	9E-20	-0.73	5E-02
Slc25a28	-0.62	8E-05	0.29	8E-03	-1.53	8E-05
Arpp19	-0.62	1E-05	0.12	1E-38	-1.68	4E-06
Hdac9	-0.62	2E-02	0.26	1E-15	-1.94	7E-04
Gle1	-0.62	5E-04	0.61	7E-03	-1.42	4E-03
Senp5	-0.63	2E-04	0.01	1E-32	-2.04	8E-04
Setbp1	-0.63	3E-06	0.31	6E-05	-1.42	3E-02
Lzic	-0.63	3E-06	0.23	1E-08	-1.23	5E-03
Tmem70	-0.64	3E-04	0.07	2E-10	-2.61	9E-04
Dagla	-0.64	2E-02	0.36	2E-02	-0.57	7E-03
Znhit6	-0.64	2E-03	0.40	1E-05	-2.49	3E-07
Bbs4	-0.64	4E-03	0.12	1E-09	-0.79	1E-02
Plekhm3	-0.65	2E-04	0.32	6E-08	-1.94	4E-14
Stam2	-0.65	7E-05	0.08	7E-21	-1.54	3E-13
Steap2	-0.65	3E-03	0.54	1E-02	-2.49	7E-03
Prkce	-0.66	1E-04	0.19	1E-08	-2.78	7E-13
Prkci	-0.66	1E-03	0.50	3E-07	-1.71	1E-03
Ptbp2	-0.66	1E-03	0.08	6E-14	-0.87	4E-02
Masp1	-0.66	1E-04	0.30	3E-06	-4.04	3E-07
Tdrkh	-0.67	3E-02	0.10	3E-25	-6.09	5E-16
Hes1	-0.67	1E-04	0.57	2E-03	-0.57	2E-02
Trabd2b	-0.67	3E-03	0.20	1E-05	-1.6	8E-09
Rab11a	-0.68	6E-05	0.21	9E-08	-2.81	5E-12
Antxr2	-0.68	2E-04	0.12	1E-10	-2.19	8E-04
Bmp2k	-0.68	2E-04	0.18	5E-05	-2.96	4E-02
Lrba	-0.69	9E-05	0.27	2E-02	-2.98	3E-04
Ryk	-0.69	6E-05	0.37	5E-03	-0.55	4E-03
Orc4	-0.69	2E-03	0.04	3E-26	-1.04	3E-02
Ctif	-0.69	1E-03	0.16	1E-08	-1.28	1E-03
Fam98b	-0.69	6E-04	0.26	4E-29	-2.67	7E-13
Zfx	-0.70	3E-03	0.57	7E-09	-0.94	1E-03
Neo1	-0.70	4E-09	0.41	4E-02	-4.96	6E-06
Six3	-0.70	2E-02	0.03	5E-35	-3.74	2E-34
Tmem161b	-0.71	2E-03	0.42	4E-36	-0.62	5E-03
Tmeff2	-0.71	2E-02	0.11	6E-81	-5.16	5E-20
Uchl5	-0.72	2E-02	0.21	5E-07	-2.97	3E-19
Usp6nl	-0.72	4E-07	0.31	2E-11	-1.81	5E-02
Nipa2	-0.72	8E-04	0.08	5E-15	-2.59	7E-10
Ercc6	-0.72	3E-07	0.38	3E-04	-1.16	7E-04
Tns1	-0.73	4E-03	0.11	2E-12	-4.58	7E-19
Xpnpep1	-0.73	1E-05	0.29	5E-06	-6.63	7E-20
Polh	-0.73	4E-02	0.34	2E-02	-1.14	2E-03
Limd2	-0.73	4E-04	0.37	8E-04	-2.28	3E-03
Atp6v0e	-0.74	1E-05	0.45	1E-11	-2.3	2E-02
Cdk8	-0.74	4E-04	0.26	2E-02	-2.28	4E-07
Pola1	-0.74	4E-02	0.06	6E-97	-2.98	1E-05

Rnf24	-0.75	7E-06	0.18	4E-07	-2.04	7E-07
Cox7a2	-0.75	2E-03	0.35	3E-03	-0.7	5E-02
Adpgk	-0.75	2E-06	0.12	1E-09	-0.79	1E-02
Tmem268	-0.75	2E-02	0.03	2E-33	-5.73	1E-12
Pygb	-0.75	2E-03	0.11	2E-12	-2.66	5E-07
Znfx1	-0.75	1E-04	0.29	8E-07	-4.04	1E-05
Hccs	-0.75	4E-08	0.10	1E-09	-4.08	1E-05
Efna5	-0.75	3E-04	0.26	1E-04	-1.23	3E-05
Zbtb21	-0.76	1E-06	0.11	1E-11	-3.59	2E-06
Col4a1	-0.76	3E-08	0.32	5E-15	-5.7	1E-15
B3galt1	-0.76	1E-04	0.05	2E-15	-1.36	1E-03
Il6st	-0.76	3E-06	0.16	2E-04	-1.47	3E-02
Rpp30	-0.76	1E-02	0.16	4E-18	-1.39	8E-05
Igfbp7	-0.76	8E-03	0.35	6E-07	-3.46	6E-27
Palld	-0.77	1E-03	0.49	2E-04	-2.17	3E-05
Paqr3	-0.77	1E-03	0.18	5E-05	-2.96	4E-02
Tspan3	-0.78	1E-09	0.50	5E-03	-0.76	1E-02
Scarb1	-0.78	4E-05	0.06	4E-14	-1.76	1E-11
Arfgap1	-0.78	6E-10	0.05	1E-16	-4.63	3E-18
Smyd4	-0.79	3E-05	0.47	1E-04	-0.53	2E-02
Plce1	-0.79	3E-03	0.01	1E-34	-5.18	3E-16
Setmar	-0.80	1E-02	0.02	3E-25	-1.56	7E-10
Ext1	-0.80	6E-09	0.13	8E-08	-1.3	6E-03
Pdia6	-0.80	8E-04	0.63	1E-04	-1.25	1E-02
Myef2	-0.80	3E-02	0.24	8E-06	-0.82	3E-04
Dbr1	-0.80	5E-04	0.14	6E-07	-1.05	3E-03
Tram2	-0.80	4E-04	0.13	1E-05	-1.42	4E-02
Mtpn	-0.81	4E-08	0.31	3E-03	-2.67	8E-03
Dph3	-0.82	1E-08	0.51	4E-03	-1.99	1E-05
Fam171a1	-0.82	2E-06	0.44	2E-08	-1.04	2E-02
E2f6	-0.82	8E-05	0.57	7E-04	-1.86	5E-04
Itga8	-0.82	1E-02	0.32	4E-11	-2.68	2E-03
Dab2	-0.82	8E-06	0.26	1E-04	-4.96	1E-07
Intu	-0.82	1E-04	0.11	2E-12	-2.21	1E-24
Tenm3	-0.82	4E-04	0.02	9E-20	-5.8	6E-13
Dkc1	-0.82	2E-02	0.11	2E-12	-4.58	1E-16
Cxadr	-0.83	1E-03	0.28	2E-03	-3.28	2E-06
Gbf1	-0.83	2E-05	0.22	3E-09	-0.85	2E-05
Pelo	-0.83	4E-05	0.04	9E-74	-1.79	2E-03
Znrf2	-0.83	2E-10	0.29	9E-04	-1.5	1E-03
Fgfr1op	-0.83	4E-05	0.14	6E-10	-1.25	2E-03
Fam98a	-0.84	5E-04	0.21	5E-72	-1.22	3E-02
Cxcl12	-0.84	2E-03	0.05	1E-20	-1.41	5E-03
Hebp2	-0.85	4E-02	0.17	6E-08	-3.12	2E-04
Mcm4	-0.85	5E-02	0.11	1E-11	-1.36	5E-04
Slc18a2	-0.86	6E-05	0.65	2E-06	-0.68	1E-03
Dner	-0.86	2E-02	0.13	1E-08	-2.04	2E-16
Col5a2	-0.86	5E-09	0.51	2E-04	-0.73	3E-02
Slc39a10	-0.86	9E-06	0.01	1E-52	-3.84	2E-03
Peak1	-0.86	2E-11	0.63	3E-02	-1.73	1E-03
Gm11266	-0.87	8E-03	0.29	1E-74	-3.41	1E-08
Smim13	-0.87	1E-08	0.51	9E-04	-0.9	1E-03

Ndc80	-0.87	9E-03	0.07	7E-37	-2.44	2E-09
Hmmr	-0.87	3E-03	0.16	3E-63	-1.75	1E-02
Fzd8	-0.88	6E-03	0.35	3E-02	-0.84	2E-03
Traip	-0.88	2E-02	0.01	9E-31	-0.57	2E-02
Uqcc1	-0.88	2E-10	0.26	3E-17	-1.92	8E-11
Col4a2	-0.89	3E-10	0.32	5E-15	-5.7	1E-15
Gulp1	-0.89	1E-06	0.25	4E-18	-1.24	3E-03
Wdr75	-0.90	2E-04	0.43	2E-18	-1.69	3E-04
Galc	-0.90	5E-13	0.39	1E-02	-2.02	6E-03
Anapc15	-0.90	5E-04	0.40	5E-04	-1.4	1E-05
Kcnf1	-0.90	6E-03	0.27	1E-04	-1.75	1E-09
Alcam	-0.90	1E-02	0.05	1E-134	-1.39	9E-03
Rb1cc1	-0.90	2E-06	0.09	1E-148	-2.05	5E-04
Coro1c	-0.91	2E-06	0.26	2E-02	-1.23	2E-02
Nup205	-0.91	7E-04	0.25	5E-03	-3.92	9E-08
Mettl15	-0.91	5E-06	0.28	1E-28	-0.87	1E-02
Tpbg	-0.92	1E-12	0.46	5E-06	-2.04	3E-03
Add3	-0.94	1E-06	0.12	3E-22	-2.38	2E-09
Shcbp1	-0.95	1E-02	0.07	2E-25	-1.38	1E-02
Cacna1c	-0.95	4E-07	0.24	7E-03	-3.04	4E-14
Topors	-0.95	7E-10	0.40	3E-02	-3.21	6E-04
Pdlim1	-0.96	8E-04	0.23	4E-02	-2.27	2E-04
Wdr1	-0.96	2E-13	0.17	1E-06	-2.22	1E-03
Pdlim5	-0.96	8E-09	0.12	3E-141	-3.02	6E-04
Tmem47	-0.96	5E-07	0.02	3E-25	-3.02	6E-13
Glis3	-0.97	3E-05	0.28	2E-03	-0.86	7E-04
Macf1	-0.97	3E-05	0.11	2E-12	-1.69	5E-05
Six2	-0.97	7E-05	0.03	5E-35	-3.74	2E-34
Kif11	-0.98	6E-03	0.23	4E-02	-1.75	5E-02
Snx24	-0.99	1E-06	0.40	7E-04	-0.92	4E-02
Tipin	-0.99	4E-03	0.14	7E-16	-5.29	2E-25
Tnnt2	-0.99	1E-03	0.41	6E-03	-0.96	9E-05
Dmd	-1.00	8E-11	0.09	8E-13	-3.02	6E-13
Arhgap26	-1.00	3E-05	0.06	8E-13	-1.45	3E-02
Prim2	-1.01	2E-03	0.29	5E-02	-2.22	1E-03
Cnn3	-1.01	2E-07	0.60	2E-02	-0.7	2E-02
Tanc2	-1.02	8E-05	0.09	1E-10	-3.92	3E-08
Kif18a	-1.02	2E-03	0.28	1E-28	-0.87	1E-02
Bbs5	-1.03	2E-06	0.13	2E-18	-2.53	1E-04
Phldb2	-1.03	1E-12	0.02	1E-102	-2.72	4E-04
Pkia	-1.04	8E-13	0.13	1E-08	-5.68	8E-15
Swap70	-1.04	1E-12	0.19	1E-10	-0.99	4E-02
Ctnnd1	-1.04	9E-07	0.38	1E-38	-0.89	3E-02
Lrr1	-1.06	2E-02	0.05	1E-16	-2.79	4E-04
Zfp229	-1.06	3E-08	0.12	1E-69	-0.59	7E-03
Snx7	-1.06	5E-09	0.17	9E-06	-5.4	1E-15
Atp11a	-1.06	6E-17	0.08	8E-28	-2.98	8E-15
Zfp697	-1.07	9E-07	0.37	2E-04	-1.06	2E-03
Nmnat1	-1.07	5E-10	0.23	1E-08	-1.23	5E-03
Mcm10	-1.07	1E-02	0.31	1E-06	-0.86	5E-02
Adamts5	-1.08	3E-06	0.08	6E-14	-3.41	1E-05
Crim1	-1.08	4E-07	0.43	5E-05	-2.69	2E-11

Mrc2	-1.08	6E-09	0.03	7E-85	-0.54	2E-02
Cenpk	-1.08	5E-04	0.24	2E-38	-1.16	2E-02
Atxn1	-1.09	7E-10	0.18	1E-08	-1.55	3E-03
Msx1	-1.09	1E-05	0.06	1E-33	-7.36	9E-27
Slc7a1	-1.10	1E-03	0.19	1E-05	-2.87	4E-05
Cyb561	-1.10	8E-05	0.19	1E-08	-3.92	3E-08
Mcts2	-1.10	3E-09	0.47	4E-05	-1.23	5E-06
Gins1	-1.12	7E-03	0.32	2E-05	-3.21	3E-02
Tsc22d2	-1.12	4E-13	0.44	2E-23	-2.55	4E-04
Mturn	-1.13	1E-03	0.29	9E-04	-1.5	1E-03
Phgdh	-1.13	1E-02	0.36	2E-14	-0.76	2E-02
Pcdh18	-1.14	8E-13	0.01	1E-36	-4.72	3E-05
Rif1	-1.14	4E-07	0.30	3E-02	-1.2	3E-04
Ptprd	-1.15	5E-03	0.26	9E-04	-1.89	3E-03
Taf4b	-1.15	2E-04	0.46	1E-02	-0.93	3E-02
Trmt61a	-1.16	1E-05	0.34	2E-09	-2.01	9E-03
Tnfaip3	-1.16	8E-06	0.47	4E-11	-0.92	1E-03
Hs6st1	-1.16	2E-06	0.06	1E-11	-1.92	2E-02
Nup160	-1.17	7E-06	0.16	3E-05	-3.12	4E-05
Snai2	-1.17	8E-05	0.30	5E-08	-0.78	1E-03
Arhgap29	-1.18	2E-10	0.32	1E-02	-1.32	3E-04
Atp1a1	-1.18	8E-12	0.36	2E-02	-0.76	6E-04
Gca	-1.18	3E-03	0.14	7E-19	-1.14	6E-03
Dut	-1.18	2E-03	0.48	2E-04	-4.3	2E-04
Rbms1	-1.18	1E-20	0.18	1E-08	-1.7	5E-05
Fendrr	-1.18	8E-03	0.08	7E-21	-2.71	2E-11
Clmp	-1.18	1E-05	0.37	5E-29	-1.37	2E-06
Srd5a1	-1.19	4E-05	0.29	5E-02	-2.51	1E-04
Il7	-1.20	3E-04	0.30	5E-03	-1.93	2E-06
Col4a6	-1.20	4E-09	0.40	6E-17	-0.88	1E-02
Zdhhc13	-1.21	4E-09	0.07	3E-09	-1.22	8E-06
Col3a1	-1.21	2E-09	0.51	2E-04	-0.73	3E-02
Adam9	-1.23	9E-13	0.51	3E-18	-1.35	7E-05
Nmt2	-1.23	8E-15	0.40	3E-02	-1.04	2E-02
Hells	-1.23	2E-03	0.23	3E-04	-2.94	4E-07
Pde4b	-1.24	7E-16	0.17	9E-06	-1.37	6E-03
Enpp1	-1.24	7E-04	0.43	1E-19	-1.48	2E-03
Cst3	-1.24	3E-05	0.09	2E-37	-1.79	1E-04
Cers6	-1.25	2E-11	0.04	8E-25	-4.84	2E-09
Gnao1	-1.25	8E-05	0.12	2E-14	-1.24	5E-03
Otx1	-1.26	9E-09	0.08	2E-56	-2.42	1E-08
Serp1	-1.26	7E-19	0.44	2E-23	-2.55	4E-04
Depdc1a	-1.26	8E-03	0.60	3E-02	-4.11	3E-03
Ergic1	-1.27	3E-08	0.45	1E-11	-2.3	2E-02
Fat1	-1.27	2E-09	0.11	1E-63	-2.03	2E-06
Agap1	-1.28	2E-15	0.32	6E-03	-1.45	2E-09
Glce	-1.28	1E-18	0.20	7E-46	-2.95	4E-05
Snx30	-1.28	7E-10	0.17	2E-14	-2.27	5E-05
Tpd52	-1.29	2E-03	0.26	3E-19	-2.66	1E-08
Hs6st2	-1.29	1E-08	0.02	3E-25	-5.13	2E-11
Bcl6	-1.30	2E-15	0.38	3E-02	-1.32	3E-03
Arap2	-1.31	1E-10	0.07	3E-09	-1.75	6E-03

Bmpr1b	-1.32	3E-03	0.07	2E-25	-5.86	2E-13
Mid1	-1.32	2E-18	0.02	6E-269	-4.73	3E-19
S1pr1	-1.32	3E-05	0.49	8E-08	-4.35	3E-06
C030034I22Rik	-1.33	1E-02	0.49	1E-03	-1.1	3E-02
Cask	-1.33	7E-28	0.35	3E-05	-2.58	4E-04
Tnfaip6	-1.33	5E-09	0.30	3E-02	-1.2	3E-04
Loxl1	-1.34	4E-10	0.19	8E-08	-0.83	8E-03
Dhfr	-1.34	5E-04	0.21	5E-07	-0.74	4E-02
Map4k3	-1.34	6E-23	0.64	5E-06	-1.39	4E-05
Ifitm3	-1.35	2E-09	0.49	1E-03	-1.86	2E-02
Plcb4	-1.35	2E-18	0.06	4E-14	-1.96	5E-05
Plcxd2	-1.37	1E-07	0.18	1E-22	-5.43	1E-10
Col4a5	-1.37	8E-12	0.20	3E-27	-1.72	4E-04
Entpd6	-1.38	1E-12	0.11	2E-12	-2.66	5E-07
Lhfp	-1.39	3E-23	0.20	3E-36	-2.18	4E-03
Plekha1	-1.40	2E-12	0.11	1E-06	-3.99	3E-04
Ptgs2os	-1.40	1E-03	0.29	3E-20	-2.98	1E-09
Fam72a	-1.41	7E-06	0.03	3E-57	-4.39	4E-07
Slit2	-1.41	4E-13	0.15	4E-06	-3.1	2E-04
Hspa5	-1.41	6E-16	0.47	3E-04	-2.88	4E-12
Pfkp	-1.41	1E-28	0.14	5E-23	-1.96	8E-03
Epha4	-1.42	3E-10	0.10	3E-85	-4.01	2E-05
Nhsl2	-1.43	1E-11	0.11	1E-06	-2.65	3E-21
Gm13889	-1.43	1E-03	0.19	5E-05	-1.74	1E-13
Slc7a5	-1.43	2E-05	0.29	2E-22	-0.74	2E-02
Tbx18	-1.45	2E-18	0.04	2E-179	-6.72	8E-21
Cenpi	-1.45	1E-05	0.40	8E-13	-4.52	1E-10
Myrf	-1.45	3E-04	0.36	2E-02	-0.57	7E-03
Six1	-1.46	5E-14	0.05	1E-182	-7.03	1E-50
B4galt4	-1.46	5E-20	0.11	3E-22	-2.52	2E-03
Pla2g4c	-1.47	3E-02	0.04	2E-23	-2.55	1E-05
Podxl	-1.48	2E-07	0.15	2E-23	-1.8	2E-08
Thsd7a	-1.49	2E-03	0.09	9E-12	-0.9	2E-02
Ptprg	-1.49	1E-29	0.31	6E-06	-3.85	2E-09
Chrm3	-1.50	2E-03	0.07	3E-09	-3.22	5E-03
Eif2ak4	-1.50	1E-22	0.63	2E-03	-1.82	4E-02
Prkaa2	-1.52	3E-07	0.34	1E-03	-1.63	7E-04
Fam83c	-1.54	3E-02	0.31	4E-11	-0.51	1E-02
Robo1	-1.54	1E-02	0.04	5E-22	-2.96	8E-07
Tln2	-1.54	1E-16	0.56	4E-03	-1.75	5E-05
Amot	-1.54	1E-38	0.19	3E-09	-5.06	4E-12
Rspo2	-1.55	1E-06	0.42	2E-05	-2.16	3E-08
Slco3a1	-1.55	4E-18	0.35	3E-05	-0.81	1E-02
Rhoj	-1.57	2E-22	0.47	1E-02	-4.06	1E-06
Sp8	-1.57	4E-11	0.18	4E-17	-1.22	4E-02
Sytl2	-1.58	3E-17	0.22	3E-25	-2.32	3E-02
Ifih1	-1.58	1E-05	0.14	7E-19	-1.14	6E-03
Cass4	-1.59	4E-02	0.22	6E-12	-1.21	3E-02
Jph2	-1.61	3E-03	0.06	3E-23	-1.5	1E-12
Slc24a3	-1.61	3E-15	0.12	2E-16	-1.45	3E-05
Rnd3	-1.63	5E-31	0.34	2E-02	-3.37	3E-05
Nedd9	-1.64	7E-27	0.04	5E-22	-2.06	2E-03

Cpd	-1.64	7E-31	0.08	4E-39	-1.19	9E-03
Manf	-1.64	8E-19	0.32	4E-07	-0.71	4E-03
Cald1	-1.64	2E-52	0.55	2E-03	-3.9	8E-10
Foxd2os	-1.65	2E-09	0.04	4E-29	-6.75	8E-21
Fabp5	-1.65	3E-04	0.15	4E-06	-4.58	4E-06
Zfp760	-1.65	7E-19	0.12	1E-69	-0.59	7E-03
Slc25a25	-1.65	9E-22	0.32	1E-05	-2.85	8E-05
Hunk	-1.65	4E-15	0.35	7E-10	-1.52	2E-07
Itgb1	-1.66	3E-39	0.20	4E-25	-2.25	2E-03
Tpm1	-1.66	1E-26	0.29	3E-18	-1.12	1E-03
Csrnp1	-1.66	6E-16	0.27	1E-13	-1.7	9E-03
Optc	-1.66	3E-04	0.30	3E-07	-0.97	2E-02
Gm12603	-1.67	1E-04	0.60	4E-11	-2.04	1E-03
Proser2	-1.68	8E-06	0.24	2E-06	-2.09	1E-02
Nod1	-1.69	4E-09	0.01	2E-40	-7.26	2E-25
Runx1	-1.69	3E-20	0.17	1E-06	-1.45	5E-03
Rora	-1.69	1E-03	0.01	2E-40	-2.04	1E-05
Col18a1	-1.69	2E-27	0.26	2E-02	-1.65	1E-05
Akap12	-1.72	2E-38	0.58	7E-03	-2.41	2E-06
Akip1	-1.73	8E-28	0.40	5E-04	-2.97	9E-03
Heg1	-1.73	3E-13	0.24	3E-04	-1.81	3E-02
Nectin1	-1.73	2E-15	0.24	1E-03	-1.29	2E-07
Ptprj	-1.73	3E-38	0.16	2E-04	-3.12	4E-05
Shroom3	-1.73	1E-12	0.25	3E-22	-2.78	3E-15
Pde1a	-1.74	6E-11	0.06	5E-27	-3.11	3E-07
Il1rapl1	-1.74	2E-02	0.13	1E-08	-1.7	3E-03
Apol9a	-1.74	1E-02	0.09	1E-18	-3.42	1E-10
Bnc2	-1.75	5E-16	0.13	1E-19	-5.14	1E-15
Plpp3	-1.76	2E-13	0.34	1E-03	-1.63	7E-04
Sulf1	-1.77	4E-11	0.21	2E-08	-2.26	4E-03
Dlx2	-1.78	2E-11	0.04	0E+00	-4.87	2E-09
Tox	-1.80	4E-04	0.01	9E-57	-5.44	5E-09
Gpsm1	-1.80	2E-34	0.24	7E-28	-1.32	3E-04
Hpse	-1.81	5E-02	0.01	8E-59	-1.31	3E-06
Fzd5	-1.81	8E-34	0.51	3E-07	-1.28	5E-02
Dhrs3	-1.82	4E-09	0.29	8E-03	-0.72	6E-03
Ezr	-1.82	5E-35	0.12	4E-28	-1.6	1E-14
Ccna1	-1.84	9E-04	0.08	6E-22	-2.79	8E-07
Sema3c	-1.84	3E-14	0.03	3E-57	-4.36	3E-05
Dusp19	-1.84	4E-19	0.37	5E-03	-0.77	8E-04
Lrch2	-1.88	2E-26	0.26	7E-10	-2.4	3E-05
Sh3gl3	-1.92	1E-08	0.73	9E-07	-1.09	5E-02
Adam12	-1.92	4E-20	0.10	2E-20	-2.85	4E-16
Dnah6	-1.94	5E-02	0.25	5E-08	-1.39	5E-04
Tpd52l1	-1.97	7E-04	0.19	1E-05	-3.85	7E-08
Tmem30b	-1.97	5E-02	0.20	2E-15	-3.96	5E-10
Hipk2	-1.98	1E-17	0.09	1E-18	-0.61	5E-02
Grk5	-1.99	2E-22	0.14	6E-07	-5.32	2E-07
Dusp4	-2.00	2E-22	0.55	9E-05	-0.81	8E-05
Adra1d	-2.01	4E-12	0.07	3E-32	-2.12	9E-05
Abi3bp	-2.01	2E-03	0.18	1E-03	-3.51	8E-06
Pmaip1	-2.03	1E-04	0.15	4E-06	-1.39	3E-02

Ccdc187	-2.03	1E-04	0.16	2E-10	-1.26	8E-05
Oasl2	-2.05	2E-03	0.01	3E-98	-0.67	5E-03
Gdf6	-2.06	2E-29	0.38	2E-04	-1.01	3E-02
Gm9767	-2.07	4E-02	0.15	4E-06	-5.65	2E-12
Ugcg	-2.07	3E-42	0.25	5E-26	-0.87	1E-03
Tmem200a	-2.08	5E-17	0.15	4E-06	-5.65	2E-12
Boc	-2.09	6E-33	0.20	1E-05	-1.9	3E-06
Acta2	-2.09	4E-33	0.68	6E-03	-0.8	8E-03
Clcn5	-2.11	3E-30	0.33	5E-23	-1.06	3E-02
Snai3	-2.12	9E-03	0.25	3E-02	-0.42	5E-02
Inhba	-2.16	4E-23	0.01	2E-42	-1.76	1E-03
Gm17750	-2.17	2E-04	0.20	6E-174	-1.19	2E-02
Serpine2	-2.17	6E-05	0.05	4E-41	-5.44	2E-10
Myzap	-2.18	8E-04	0.31	6E-06	-1.92	2E-04
Tll1	-2.19	4E-08	0.04	5E-22	-0.96	4E-03
Fam198a	-2.19	3E-04	0.25	3E-02	-1.27	1E-02
Sgcd	-2.21	2E-17	0.18	2E-11	-3.84	3E-06
Ngf	-2.22	1E-21	0.45	6E-03	-0.53	4E-03
Arl5a	-2.22	1E-39	0.09	3E-171	-5.92	8E-12
Igll1	-2.27	2E-02	0.35	6E-03	-2.36	3E-04
Pex5l	-2.29	2E-02	0.01	1E-50	-3.51	2E-15
Serpinf1	-2.31	6E-32	0.25	4E-05	-0.53	2E-02
Arhgef5	-2.31	5E-07	0.11	1E-11	-0.92	6E-03
Fibin	-2.32	3E-09	0.02	5E-18	-0.9	2E-04
Itih2	-2.33	7E-05	0.07	3E-09	-5.23	1E-09
Trpm3	-2.34	1E-11	0.10	3E-27	-6.06	7E-14
Tmem71	-2.36	2E-02	0.17	6E-08	-0.74	4E-02
Lin7a	-2.37	2E-02	0.02	9E-20	-5.08	1E-08
Prl2c3	-2.37	2E-02	0.60	2E-04	-1.25	2E-02
Dpyd	-2.37	6E-03	0.15	1E-38	-2.51	1E-02
Slc8a1	-2.38	1E-20	0.08	4E-23	-1.32	1E-02
Pag1	-2.40	3E-39	0.15	4E-06	-4.58	4E-06
Eya2	-2.40	2E-04	0.01	1E-54	-5.83	1E-13
Gpr1	-2.40	1E-02	0.05	7E-49	-0.78	3E-02
Camk4	-2.41	1E-10	0.24	2E-26	-2.07	2E-03
Pip4k2a	-2.42	2E-63	0.11	2E-43	-1.5	8E-05
Flrt2	-2.46	6E-41	0.07	7E-45	-5.97	2E-13
Lox	-2.49	2E-55	0.52	4E-05	-2.05	2E-08
Gnai1	-2.49	5E-11	0.02	5E-18	-2.52	1E-02
Dusp1	-2.50	1E-26	0.62	4E-02	-0.58	5E-02
Lyn	-2.51	7E-47	0.07	1E-35	-1.05	9E-03
Cttnbp2	-2.52	1E-08	0.22	1E-30	-1.17	3E-03
Ripk2	-2.53	1E-45	0.31	3E-03	-3.5	2E-05
Pappa	-2.53	5E-25	0.14	1E-25	-1.11	2E-04
Lgsn	-2.54	1E-02	0.23	4E-02	-2.93	4E-08
Il1rap	-2.55	3E-44	0.29	8E-07	-3.39	8E-06
Pitx3	-2.57	1E-02	0.22	3E-09	-0.85	2E-05
Pawr	-2.58	9E-29	0.13	4E-50	-1.62	9E-04
Ptprq	-2.58	1E-02	0.11	5E-28	-2.04	3E-02
Epha7	-2.60	8E-05	0.11	1E-07	-1.41	2E-04
Dock3	-2.62	1E-36	0.32	4E-07	-0.71	4E-03
Vgll3	-2.64	4E-29	0.24	5E-49	-4.61	1E-06

Palm2	-2.64	8E-11	0.10	2E-14	-1.28	1E-04
Irs1	-2.65	1E-49	0.24	6E-08	-1.32	3E-04
Cntnap2	-2.66	3E-04	0.01	2E-40	-3.34	4E-06
Ptgs2	-2.66	9E-15	0.29	3E-20	-2.98	1E-09
Lama2	-2.66	6E-28	0.22	4E-16	-2.3	1E-23
Apob	-2.69	7E-03	0.28	7E-05	-1.17	1E-03
Emx2	-2.72	1E-52	0.27	2E-63	-1.21	5E-07
Rsad2	-2.73	3E-03	0.01	9E-57	-0.89	3E-02
Lmcd1	-2.73	1E-47	0.18	2E-11	-0.97	2E-04
Lhx2	-2.74	4E-37	0.17	3E-29	-1.67	5E-05
Moxd1	-2.75	6E-03	0.37	1E-06	-1.93	2E-02
Efnb2	-2.77	8E-69	0.51	6E-07	-1.21	2E-04
Arhgap31	-2.78	9E-56	0.14	5E-23	-3.38	3E-06
Foxd2	-2.85	5E-15	0.04	4E-29	-6.75	8E-21
Ntf3	-2.85	7E-04	0.11	2E-16	-5.24	2E-11
Spats2l	-2.86	6E-11	0.06	1E-52	-3.59	2E-03
Tnc	-2.87	2E-64	0.19	4E-41	-2.32	5E-07
Carmn	-2.88	1E-09	0.25	6E-06	-1.27	4E-12
Rbfox1	-2.91	2E-03	0.16	1E-08	-2.89	2E-07
Aldh1a1	-2.94	4E-04	0.38	1E-02	-1.93	6E-03
Pax6	-2.95	5E-109	0.14	2E-40	-4.69	1E-10
Kcnq5	-2.98	7E-52	0.11	1E-08	-4.89	2E-07
Wbscr17	-2.98	8E-60	0.14	1E-36	-3.84	3E-07
Klf2	-2.98	2E-44	0.11	1E-06	-1.38	9E-05
Cxcl1	-2.98	3E-13	0.53	1E-04	-1.58	1E-02
Fbxl7	-2.99	1E-25	0.08	7E-21	-4.59	9E-10
Abcc12	-2.99	1E-35	0.26	1E-04	-1.54	2E-04
Spry1	-3.00	3E-40	0.17	1E-18	-0.89	3E-02
Chsy3	-3.01	2E-11	0.11	1E-08	-2.2	1E-04
Slco1a5	-3.02	2E-26	0.47	1E-24	-1.44	1E-02
Trank1	-3.03	3E-07	0.02	9E-20	-4	2E-12
Gabrg3	-3.03	2E-03	0.02	9E-20	-5.49	3E-18
Cdh11	-3.03	4E-116	0.00	1E-123	-4.91	7E-13
Grb10	-3.05	3E-21	0.30	5E-08	-5.59	9E-12
Dcn	-3.07	9E-07	0.02	9E-20	-4.65	1E-06
Vit	-3.09	9E-38	0.23	1E-24	-4.4	3E-13
Itga4	-3.12	1E-24	0.34	6E-16	-2.02	6E-03
Tspan12	-3.14	1E-25	0.18	1E-03	-2.73	7E-06
Gpr176	-3.16	6E-12	0.30	2E-14	-1.82	4E-02
Neb	-3.17	5E-13	0.01	6E-87	-5.95	4E-52
Steap1	-3.19	1E-37	0.23	4E-02	-2.49	7E-03
Opn5	-3.20	8E-04	0.15	2E-43	-1.95	2E-04
F3	-3.23	2E-127	0.69	2E-02	-1.27	1E-03
Cftr	-3.23	2E-26	0.22	1E-30	-1.17	3E-03
Hoxb9	-3.28	8E-05	0.06	1E-11	-6.72	2E-19
Nlgn1	-3.28	1E-04	0.13	1E-08	-3.43	1E-04
Tceal7	-3.32	2E-04	0.02	3E-86	-2.55	1E-05
Samd12	-3.37	1E-04	0.20	2E-03	-2.93	2E-03
Ascl2	-3.37	4E-04	0.06	1E-11	-3.07	8E-06
Ptgs2os2	-3.37	3E-04	0.20	2E-13	-4.06	4E-03
Nkain2	-3.39	7E-12	0.23	3E-41	-5.06	9E-09
Nova1	-3.39	2E-15	0.16	1E-19	-4.44	7E-22

Tslp	-3.39	5E-05	0.32	6E-19	-2.82	8E-16
Tnfsf18	-3.41	4E-10	0.28	1E-02	-4.89	6E-08
Nsg1	-3.42	1E-33	0.09	2E-39	-4.1	1E-08
Aass	-3.43	3E-04	0.01	1E-36	-6.61	9E-20
Luzp2	-3.46	2E-04	0.01	2E-48	-2.15	4E-20
Dkk2	-3.47	2E-10	0.01	0E+00	-5.73	9E-12
Akain1	-3.47	2E-04	0.11	2E-44	-1.1	3E-02
Samd5	-3.49	1E-08	0.02	9E-20	-2.97	4E-13
Mdga2	-3.52	2E-05	0.05	6E-18	-1.05	4E-02
Slc14a1	-3.54	2E-04	0.24	5E-10	-0.99	3E-02
Foxf1	-3.54	6E-40	0.08	7E-21	-2.71	2E-11
Ptprb	-3.55	2E-09	0.25	2E-27	-3.67	3E-08
Ptchd4	-3.55	3E-27	0.05	2E-114	-1.44	4E-03
Bmp6	-3.56	2E-22	0.30	5E-03	-1.36	4E-05
Cep126	-3.61	4E-28	0.26	6E-09	-2.89	2E-03
Hhip	-3.63	1E-15	0.23	1E-03	-1.74	8E-03
Itga1	-3.64	1E-90	0.03	9E-46	-3.66	3E-07
Dmrta2	-3.70	5E-66	0.04	4E-29	-1.86	5E-06
E330013P04Rik	-3.71	7E-09	0.35	1E-05	-2.39	4E-04
Has2	-3.74	8E-34	0.29	2E-11	-6.31	2E-15
Tusc1	-3.75	9E-19	0.04	5E-22	-7.06	9E-21
Fgf5	-3.78	2E-21	0.06	8E-13	-1.63	8E-07
Sema3a	-3.80	4E-52	0.09	1E-270	-5.77	8E-12
Adam19	-3.80	8E-52	0.01	2E-42	-3.4	1E-18
Mme	-3.88	8E-19	0.09	9E-12	-2.92	3E-03
Nkain4	-3.91	1E-07	0.05	1E-16	-4.63	3E-18
Gm16897	-3.91	1E-16	0.25	4E-47	-2.91	1E-02
Baiap2l1	-3.93	6E-40	0.01	3E-67	-5.59	6E-11
Syt1	-3.95	2E-21	0.06	8E-13	-2.56	3E-11
Zfhx4	-3.95	3E-96	0.08	3E-32	-5.07	2E-07
Brinp1	-3.96	9E-06	0.00	2E-255	-6.48	9E-19
Casp14	-4.03	6E-06	0.03	5E-35	-7.79	6E-31
Pax6os1	-4.07	4E-06	0.01	9E-31	-4.96	3E-08
Adcy1	-4.08	2E-36	0.28	2E-03	-1.68	4E-03
Gja5	-4.10	4E-08	0.29	8E-03	-1.83	7E-05
Ptprt	-4.14	9E-15	0.01	1E-36	-2.89	4E-05
Serpine1	-4.15	2E-53	0.41	7E-09	-1.34	3E-04
Igf1	-4.17	8E-59	0.16	2E-07	-1.5	2E-04
Zic5	-4.21	2E-55	0.12	3E-122	-0.57	5E-02
Mb21d1	-4.27	2E-24	0.25	2E-04	-1.78	7E-12
Lor	-4.27	8E-07	0.07	2E-10	-3.27	8E-04
Kcnh5	-4.32	1E-20	0.07	1E-19	-4.06	1E-06
Zic2	-4.34	2E-81	0.12	3E-122	-0.57	5E-02
Cyfip2	-4.39	5E-97	0.09	1E-10	-6.03	6E-15
Tacr1	-4.40	1E-13	0.29	3E-36	-1.38	2E-05
Ism1	-4.40	1E-26	0.14	6E-10	-3.95	3E-04
Wnt2	-4.49	9E-09	0.17	1E-30	-3.48	3E-13
Eva1a	-4.59	3E-35	0.02	9E-20	-1.79	2E-12
Itgb6	-4.65	8E-13	0.26	6E-09	-2.12	4E-03
Epas1	-4.66	2E-45	0.28	6E-08	-2.78	7E-13
Galnt18	-4.69	6E-77	0.06	1E-55	-4	3E-06
Jazf1	-4.77	1E-53	0.20	1E-05	-3.88	3E-07

Acss1	-4.84	1E-26	0.13	8E-08	-5.38	7E-10
Tmem56	-4.87	8E-50	0.15	1E-44	-3.92	1E-08
Zfp423	-4.94	2E-74	0.07	1E-27	-2.71	3E-02
Gm5089	-4.96	1E-21	0.23	2E-59	-0.86	3E-02
Stox2	-4.99	8E-58	0.07	3E-09	-1.07	3E-02
Pax2	-5.01	4E-66	0.07	2E-10	-6.16	2E-14
Cdh6	-5.06	4E-15	0.01	9E-31	-2.84	4E-04
Cd34	-5.19	2E-114	0.25	4E-47	-2.91	1E-02
Hgf	-5.24	5E-11	0.13	8E-08	-2.23	4E-02
Lrrc4c	-5.32	3E-23	0.07	2E-10	-0.9	2E-03
Mbnl3	-5.37	9E-14	0.07	2E-10	-5.16	5E-09
Rassf6	-5.39	2E-36	0.54	1E-06	-1.83	6E-15
Chrdl1	-5.46	3E-131	0.48	4E-07	-2.47	7E-03
A730020M07Rik	-5.46	7E-16	0.26	4E-22	-1.45	6E-04
Prdm8	-5.54	3E-30	0.06	8E-13	-1.63	8E-07
Wnk2	-5.60	4E-48	0.24	5E-05	-1.38	3E-02
Alx1	-5.62	3E-13	0.01	1E-54	-7.34	2E-36
Plxdc2	-5.73	4E-20	0.02	9E-20	-6.5	1E-17
Rasgrp3	-5.93	3E-107	0.04	8E-39	-1.55	1E-03
Chodl	-5.93	3E-21	0.12	1E-09	-1.53	2E-03
Dach1	-5.94	3E-15	0.02	8E-69	-1.18	2E-02
Prdm6	-5.97	2E-15	0.03	1E-39	-7.12	1E-24
Aff3	-5.98	6E-64	0.07	2E-10	-5.45	8E-11
Arx	-5.99	7E-71	0.08	2E-127	-5.33	2E-12
Cacnb4	-6.01	1E-116	0.03	3E-66	-2.52	1E-02
Oasl1	-6.05	1E-23	0.01	6E-259	-0.67	5E-03
Speer3	-6.15	3E-34	0.07	3E-09	-5.06	2E-10
Alx4	-6.21	2E-31	0.01	1E-54	-7.01	2E-23
Igsf11	-6.26	3E-32	0.02	9E-20	-3.9	7E-05
Grem2	-6.30	3E-24	0.01	1E-109	-6.57	7E-19
Rtn1	-6.34	2E-120	0.11	3E-23	-0.75	2E-03
Zic3	-6.39	3E-286	0.13	6E-95	-2.52	3E-04
Tmem45a	-6.46	7E-124	0.04	7E-53	-1.73	2E-04
Ptgis	-6.52	1E-39	0.01	1E-52	-1.68	9E-18
Igfbp2	-6.53	2E-176	0.05	3E-28	-1.88	9E-17
Rims1	-6.55	1E-19	0.11	1E-07	-4.89	2E-07
Svep1	-6.65	8E-75	0.02	3E-25	-5.02	6E-14
Adm	-6.66	2E-224	0.45	2E-08	-0.86	4E-02
Sema3e	-6.69	1E-85	0.02	2E-84	-1.35	3E-07
Eya1	-6.87	1E-159	0.04	1E-199	-1.46	2E-05
Plekhg1	-6.88	9E-36	0.71	3E-02	-0.76	1E-05
Cthrc1	-6.92	5E-38	0.26	1E-07	-1.23	3E-04
Crct1	-6.96	5E-84	0.45	3E-03	-5.36	2E-10
Pax3	-7.00	1E-31	0.62	4E-02	-2.68	1E-04
Lrp2	-7.03	9E-257	0.33	6E-06	-2.47	3E-18
Tmem163	-7.29	1E-87	0.10	2E-18	-1	1E-03
Slc35f1	-7.35	4E-196	0.02	3E-25	-6.48	3E-17
Ptprz1	-7.74	2E-34	0.01	2E-38	-6.17	2E-14
Slco4a1	-7.83	4E-44	0.10	1E-38	-2.08	2E-02
Zic4	-8.13	2E-177	0.11	6E-81	-2.22	2E-10
Zic1	-8.22	0E+00	0.08	2E-190	-2.21	3E-15
Frzb	-8.59	1E-91	0.01	1E-32	-1.44	1E-02

Tmem35a	-8.70	4E-98	0.40	8E-13	-4.52	1E-10
Npr3	-8.85	1E-181	0.01	1E-36	-5.38	1E-38
Neto1	-8.94	4E-76	0.02	1E-168	-1.79	2E-03

SI Appendix Table S3. Genes with concordant gene expression in human GSCs and mouse GBM cells

Genes	Human GSCs Linear Fold Change (M/F)	Human GSCs Adjusted *p*-value	Mouse GBM Cells Linear Fold Change (M/F)	Mouse GBM Cells Adjusted *p*-value
DDX3Y	1527.91	3.99E-271	6.37	6.92E-03
APBB1IP	59.00	4.01E-02	6.77	3.37E-20
NSG2	22.47	1.40E-04	19.41	7.01E-14
SYT13	18.46	6.74E-04	3.58	2.37E-04
CRABP1	18.01	3.86E-04	11.18	8.59E-05
GLT1D1	13.71	2.01E-03	13.94	1.11E-13
GPR37L1	10.02	6.59E-03	5.50	1.54E-02
RET	9.98	3.28E-04	7.16	9.57E-05
NRXN1	9.51	3.54E-02	4.70	9.20E-09
DOC2B	9.50	4.06E-03	5.42	4.08E-04
CAMK1G	7.97	4.31E-02	6.64	4.83E-03
ALDH1L1	7.01	5.14E-03	14.61	2.63E-05
GFRA1	6.97	2.40E-02	2.94	2.96E-06
TEK	6.68	4.10E-02	13.64	6.98E-09
FUT9	6.52	3.28E-02	13.66	6.15E-10
SCG3	6.00	2.34E-02	9.00	1.03E-04
GPD1	5.83	4.57E-03	5.21	8.43E-17
STXBP2	5.28	1.50E-02	3.82	4.74E-05
NOTUM	5.21	2.34E-02	5.37	1.33E-08
TMEM151B	4.66	1.50E-02	2.98	6.61E-03
KCNAB1	4.58	3.09E-03	5.94	5.19E-20
PHYHD1	4.51	4.10E-02	6.36	3.88E-05
ATP8A1	4.09	6.83E-03	6.09	1.15E-30
MYO7A	4.09	9.18E-03	12.17	9.78E-20
WNT10A	4.03	2.05E-02	9.58	5.30E-05
AOC3	3.33	1.70E-02	6.13	9.24E-10
HID1	3.26	2.28E-02	8.08	4.06E-38
PCDHB15	2.88	5.39E-03	3.69	4.72E-02
ADHFE1	2.86	2.09E-02	10.56	1.01E-17
RAPGEF5	2.85	4.76E-02	2.85	1.09E-05
ITGA10	0.27	4.66E-02	0.25	1.86E-08
CARMN	0.20	3.19E-02	0.14	1.35E-09
SERPINF1	0.10	1.70E-03	0.20	6.38E-32
XIST	0.0018	8.81E-112	0.0088	4.13E-49

SI Appendix Table S4. Pathway analysis for sex-biased Brd4-bound enhancer genes downregulated following JQ1 treatment in male and female GBM cells*

Pathway description	Subset of Genes	Adjusted *p*-value	# of Genes
Male GBM Cells: 330 genes			
Metabolic Diseases	Nupr1, Nrxn1, Tgfbi, Lgals2, Igfbp3, Mical1, Il33, Prcp, Ly6c1, Bdh2, Crhr1, Slc5a7, Aipl1, Kcnab1, Itgb2, Scd1, Sirt5, Kcnk10, Pax9, Nfatc2, Pcolce2, Pld2, Foxo6, Adh7, Slc16a7, Trhr, Btbd3, Ptx3, Matn2, Shh, Slit3, Fundc1, Foxl1, Ank2, Sspn, Traf1, Cngb1, Apln, C1qtnf1, Decr1, Fbxo7, Fbn2, Chst1, Aqp5, Ptgfr, Ets2, Edil3, Akap6, Nrn1, Lgals3, Mark1, Adam22, Fars2, Ano1, Neu2, Faim2, Fbln1, Kcna4, Rasgrf1, Col25a1, Map2k6, Ar, Arntl, Alk, Car2, Pde1b, Mapk10, Cd38, Aldh3a1, Slc7a7, Aldh1a3, Camk1d, Cdkn2b,Nf1, Cdk6, Cxcl14, Rad51d, Stat6, Pde8a	< 0.0001	200
Chromosome aberrations	Nrxn1, Nalcn, Adssl1, Nup210, Klf12, Crhr1, Itgb2, Scd1, Pax9, Nfatc2, Plscr2, Ctnnd2, Cntnap4, Ptx3, Cradd, Shh, Slit3, Foxl1, Ank2, Traf1, Nhs, Crabp1, Fbn2, Ptgfr, Ets2, Pcyt1b, Akap6, Nrn1, Lgals3, Fars2, Ano1, Neu2, Fbln1, Bcl3, Gria1, Lsp1, Sfrp2, Kcnn3, Chst3, Dap, Dock8, Nov, Fgfbp1, Irak4, Tcn2, Spp1, Alk, Car2, Syn3, Sgca, Mapk10, Tenm4, Cdh23, Nrp2, Nanog, Grpr, Lef1, Zhx2, Flii, Cbr2, Mecom, Nox4, Sema5a, Cyb5a, Fgd2, Socs1, Nf1, Trib2, Cdk6, Rad51d, Stat6, Steap3, Ndp, Eps8, Sh2d4a, Gipc2, Epha3, Ndst3, Nptx1, Ank	2.00E-03	132
Glioma/Glioblastoma	Tgfbi, Nupr1, Igfbp3, Ly6c1, Slc5a7, Eef2k, Itgb2, Nfatc2, Pld2, Adh7, Ctnnd2, Il13ra1, Ptx3, Shh, Apln, Chst1, Ets2, Cd109, Lgals3, Adam22, Ano1, Gria1, Adgrb1, Sall2, Nid1, Sfrp2, Aqp4, Dap, Map2k6, Tcn2, Spp1, Nav3, Ahr, Ar, Il34, Alk, Plxdc1, Nrp2, Nanog, Grpr, Lef1, Xrcc5, Mlkl, Rapgef4, Aldh3a1, Slc7a7, Aldh1a3, Cdkn2b, Nox4, Socs1, Nf1, Lpar1, Cdk6, Thsd4	< 0.0001	130/76
Regulation of transcription	Klf12, Pax9, Nfatc2, Shh, Nrde2, Ets2, Bcl3, Sall2, Sfrp2, Crym, Ahr, Ar, Msx3, Arntl, Mapk10, Nanog, Lef1, Mlip, Zhx2, Xrcc5, Sbno2, Wwp2, Tsc22d3, Bhlhe22, Mecom, Nfatc4, Stat6, Sorbs3	< 0.0001	31
Integrin signaling	Ly6c1, Itgb2, Slit3, Sele, Fbxo7, Edil3, Lgals3, Spp1, Vcam1, Slc7a11, Pde8a, Cd9, Cspg4	7.00E-03	13
Stem cell proliferation	Shh, Fbln1, Sfrp2, Nupr1, Lef1, Mecom, Nf1	4.00E-03	6
Female GBM Cells: 271 genes			
Glioma/Glioblastoma	Rgs4, Sema3e, Mme, Thbs1, Pcdh18, Tnfaip3, Hmmr, Pappa, Vsig2, Ada, Syt1, Acss1, Phex, Galc, Rsad2, Pdgfd, Ngf, Trmt61a, Plcb4, Cdc25a, Ltbp1, Cxcl1, Epha1, Adam12, Wnt5a, Igf1, Grb10, Cxcl12, Lpar4, Trpm3, Angpt2, Ect2, Kif18a, Has2, Adm, Ifih1, F2rl1, Hhip, Ccna1, Nek2, Isg15, S1pr1, Prkaa2, Grin2b, Kif11, Dkk2, Tmem163, Wnt2, Tacr1, Bmpr1b, Usp1, Sulf1, Col3a1, Prps1, Sema3a, Cthrc1, Melk, Hgf, Stc2, Mmp16, Ptprb, Aldh1a1, Usp46, Ptprm, Xbp1, Ptprd, Il7, Pde4b, Ptprz1	< 0.0001	116/75
Chromosome deletion	Mme, Thbs1, Setbp1, Negr1, Pcdh18, Tnfaip3, Pappa, Rhoj, Sox3, Gypc, Ada, Phex, Inhba, Cdh11, Mob3b, Ngf, Pde1a, Plcb4, Epha1, Prepl, Wnt5a, Igf1, Grb10, Gcnt2, Pax2, Alx4, Angpt2, Itga4, En1, Pkp2, Bdh1, Itgb6, Runx1t1, Grin2b, Kif11, Npr3, Wnt2, Boc, Otx2, Bmpr1b, Gja5, Col3a1, Prps1, Sema3a, Magi2, Ripk2, Tg, Tll1, Mmp16, Cftr, Ptprb, Arap2, Aldh1a1, Ptprm, Casp14, Dcn, Ptprd, Cacna1c, Acp6, Etv4, Pde4b, Ptprz1	< 0.0001	71
Immune system process	Raet1e, Thbs1, Sla, Tnfaip3, H60b, Ada, Inhba, Rsad2, Pdgfd, Ifitm3, Oasl2, Il31ra, Cxcl1, Wnt5a, Igf1, Cxcl12, Frk, Angpt2, Ptgs2os, Itga4, Arhgef5, Ifih1, F2rl1, Oasl1, Cysltr1, Masp1, Tacr1, Rrs1, Cftr, Usp46, Ptprd,Acp6, Il7, Pde4b, Ptprz1	< 0.0001	44
Cell cycle	Thbs1, Tnfaip3, Rprd1b, Anapc1, Inhba, Tpx2, Cdc25a, Haus7, Wnt5a, Igf1, Kcnh5, Map9, Kmt5a, Ect2, Kif18a, Cenpw, Map4k3, Cyp26b1, Ckap5, Stk39, Ccna1, Nek2, Kdm8, Smarcd3, Kif11, E2f8, Rrs1, Magi2, Melk, Anapc15	3.00E-03	30
TGF beta signaling	Thbs1, Sema6d, Lox, Inhba, Ltbp1, Adam19, Adam12, Grem2, Gcnt2, Pax2, Cenpw, Has2, Pkp2, Itgb6, Sgcd, Runx1t1, Chrdl1, Bmpr1b, Col3a1, Cthrc1, Melk	3.00E-03	23
Transcription corepressor activity	Sox3, Tbx18, Kmt5a, Runx1t1, E2f8, Jazf1, Lmcd1	1.10E-02	7

* Subset of enriched pathways for sex-specific genes in male and female GBM cells

SI Appendix Table S5. Real-time quantitative PCR primers and lentivirus shRNA target sequences

Target	Forward qPCR primer	Reverse qPCR primer	Mouse shRNA target sequence
Mouse Brd2	TGCTGCAAAACGTGACTC	GTAAAGCTGGTACAGAAGCC	CAGCCCAAGAAATCTAAGAAA
Mouse Brd3	GAAAAAGGCTCCCACCAAG	GCTAAGTTGTCGCTTTTCATC	CCTCTCCCTTAGTAACTTGAA
Mouse Brd4	GGAACTTCCTCCCAAAAAGAC	TGCCGCTTCTCCTCATAAG	GCCATCTACACTACGAGAGTT

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