

Supplemental Table S3. Mmu-miR-381-3p *in silico* predicted targets.

TARGET GENE	GENE DESCRIPTION	VALIDATION	DIANA	MIRANDA	MIRBRIDGE	PICTAR	PITA	RNA22	TARGETSCAN	TOTAL_HIT
KLF12	Kruppel-like factor 12		V	V			V	V	V	5
LRRC4	leucine rich repeat containing 4		V	V			V	V	V	5
MBNL1	muscleblind-like splicing regulator 1		V	V		V	V		V	5
HIVEP2	human immunodeficiency virus type I enhancer binding protein 2		V	V			V	V	V	5
HIPK1	homeodomain interacting protein kinase 1		V	V			V	V	V	5
NR5A2	nuclear receptor subfamily 5, group A, member 2		V	V			V	V	V	5
NRP2	neuropilin 2		V	V			V	V	V	5
PCGF3	polycomb group ring finger 3		V	V			V	V	V	5
EPS8	epidermal growth factor receptor pathway substrate 8		V	V			V	V	V	5
EPB41L1	erythrocyte membrane protein band 4.1-like 1		V	V			V	V	V	5
EML1	echinoderm microtubule associated protein like 1		V	V			V	V	V	5
EIF2B5	eukaryotic translation initiation factor 2B, subunit 5 epsilon, 82kDa		V	V			V	V	V	5
RAC1	ras-related C3 botulinum toxin substrate 1 (rho family, small GTP binding protein Rac1)		V	V			V	V	V	5
KIF1B	kinesin family member 1B		V	V			V	V	V	5
YES1	v-yes-1 Yamaguchi sarcoma viral oncogene homolog 1		V	V			V	V	V	5
SEMA6D	sema domain, transmembrane domain (TM), and cytoplasmic domain, (semaphorin) 6D		V	V		V	V		V	5
SLC1A2	solute carrier family 1 (glial high affinity glutamate transporter), member 2		V	V			V	V	V	5
SLC6A8	solute carrier family 6 (neurotransmitter transporter), member 8		V	V			V	V	V	5
SRGAP2	SLIT-ROBO Rho GTPase activating protein 2		V	V			V	V	V	5
TEAD1	TEA domain family member 1 (SV40 transcriptional enhancer factor)		V	V			V	V	V	5
TMEM168	transmembrane protein 168		V	V			V	V	V	5
UBN1	ubiquitin 1		V	V			V	V	V	5
VCPIP1	valosin containing protein (p97)/p47 complex interacting protein 1		V	V			V	V	V	5
VAPA	VAMP (vesicle-associated membrane protein)-associated protein A, 33kDa		V	V			V	V	V	5
USP34	ubiquitin specific peptidase 34		V	V			V		V	4
ANO4	anoctamin 4		V	V			V		V	4
USP15	ubiquitin specific peptidase 15		V	V			V		V	4
SPPL3	Signal Peptide Peptidase Like 3		V	V			V		V	4
ARHGAP24	Rho GTPase activating protein 24		V	V			V		V	4
UBR5	ubiquitin protein ligase E3 component n-recognin 5		V	V			V		V	4
UBR1	ubiquitin protein ligase E3 component n-recognin 1		V	V			V		V	4
ANKRD12	ankyrin repeat domain 12		V	V			V		V	4
UBE4A	ubiquitination factor E4A		V	V			V		V	4
UBE3A	ubiquitin protein ligase E3A		V	V			V		V	4
ASXL2	additional sex combs like 2 (Drosophila)		V	V			V		V	4
ATP1B1	ATPase, Na ⁺ /K ⁺ transporting, beta 1 polypeptide		V	V			V		V	4

UBE2E2	ubiquitin-conjugating enzyme E2E 2	V	V	V	V	4
UBAP2L	ubiquitin associated protein 2-like	V	V	V	V	4
ATRN	attractin	V	V	V	V	4
TRIM63	tripartite motif containing 63, E3 ubiquitin protein ligase	V	V	V	V	4
AZIN1	antizyme inhibitor 1	V	V	V	V	4
TP53BP1	tumor protein p53 binding protein 1	V	V	V	V	4
VPS13B	vacuolar protein sorting 13 homolog B (yeast)	V	V	V	V	4
TET3	tet methylcytosine dioxygenase 3	V	V	V	V	4
WAPAL	wings apart-like homolog (Drosophila)	V	V	V	V	4
BCL11A	B-cell CLL/lymphoma 11A (zinc finger protein)	V	V	V	V	4
BCL11B	B-cell CLL/lymphoma 11B (zinc finger protein)	V	V	V	V	4
TANC2	tetratricopeptide repeat, ankyrin repeat and coiled-coil containing 2	V	V	V	V	4
SYNCRIP	synaptotagmin binding, cytoplasmic RNA interacting protein	V	V	V	V	4
BIRC6	baculoviral IAP repeat containing 6	V	V	V	V	4
BIVM	basic, immunoglobulin-like variable motif containing	V	V	V	V	4
SUV420H1	suppressor of variegation 4-20 homolog 1 (Drosophila)	V	V	V	V	4
BNC2	basonuclin 2	V	V	V	V	4
STX12	syntaxin 12	V	V	V	V	4
STK38L	serine/threonine kinase 38 like	V	V	V	V	4
ST8SIA2	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 2	V	V	V	V	4
BTBD7	BTB (POZ) domain containing 7	V	V	V	V	4
SSH2	slingshot protein phosphatase 2	V	V	V	V	4
WDR37	WD repeat domain 37	V	V	V	V	4
EMSY	EMSY, BRCA2 Interacting Transcriptional Repressor	V	V	V	V	4
SPTSSA	Serine Palmitoyltransferase Small Subunit A	V	V	V	V	4
KATNBL1	Katanin Regulatory Subunit B1 Like 1	V	V	V	V	4
SPRY4	sprouty homolog 4 (Drosophila)	V	V	V	V	4
C18ORF25	chromosome 18 open reading frame 25	V	V	V	V	4
SP1	Sp1 transcription factor	V	V	V	V	4
SOX4	SRY (sex determining region Y)-box 4	V	V	V	V	4
LURAP1L	Leucine Rich Adaptor Protein 1 Like	V	V	V	V	4
SOX2	SRY (sex determining region Y)-box 2	V	V	V	V	4
SORBS1	sorbin and SH3 domain containing 1	V	V	V	V	4
SOCS5	suppressor of cytokine signaling 5	V	V	V	V	4
SNX27	sorting nexin family member 27	V	V	V	V	4
SNRNP40	small nuclear ribonucleoprotein 40kDa (U5)	V	V	V	V	4
SNRK	SNF related kinase	V	V	V	V	4
SMEK2	SMEK homolog 2, suppressor of mek1 (Dictyostelium)	V	V	V	V	4
SLMAP	sarcolemma associated protein	V	V	V	V	4

WEE1	WEE1 G2 checkpoint kinase	V	V	V	V	4
CDC42BPA	CDC42 binding protein kinase alpha (DMPK-like)	V	V	V	V	4
CDC73	cell division cycle 73	V	V	V	V	4
SLC24A3	solute carrier family 24 (sodium/potassium/calcium exchanger), member 3	V	V	V	V	4
WNT5A	wingless-type MMTV integration site family, member 5A	V	V	V	V	4
CHD2	chromodomain helicase DNA binding protein 2	V	V	V	V	4
CHD4	chromodomain helicase DNA binding protein 4	V	V	V	V	4
CHD9	chromodomain helicase DNA binding protein 9	V	V	V	V	4
SLC16A14	solute carrier family 16, member 14	V	V	V	V	4
SIPA1L2	signal-induced proliferation-associated 1 like 2	V	V	V	V	4
CLCF1	cardiotrophin-like cytokine factor 1	V	V	V	V	4
SIAH1	siah E3 ubiquitin protein ligase 1	V	V	V	V	4
SHOX2	short stature homeobox 2	V	V	V	V	4
SHANK2	SH3 and multiple ankyrin repeat domains 2	V	V	V	V	4
SH2B3	SH2B adaptor protein 3	V	V	V	V	4
SFRP2	secreted frizzled-related protein 2	V	V	V	V	4
CNOT2	CCR4-NOT transcription complex, subunit 2	V	V	V	V	4
CNOT7	CCR4-NOT transcription complex, subunit 7	V	V	V	V	4
SEPT11	septin 11	V	V	V	V	4
SENP6	SUMO1/sentrin specific peptidase 6	V	V	V	V	4
COL11A1	collagen, type XI, alpha 1	V	V	V	V	4
XPO7	exportin 7	V	V	V	V	4
SEMA3C	sema domain, immunoglobulin domain (Ig), short basic domain, secreted, (semaphorin) 3C	V	V	V	V	4
SEC24A	SEC24 family member A	V	V	V	V	4
SATB1	SATB homeobox 1	V	V	V	V	4
CPNE4	copine IV	V	V	V	V	4
RYBP	RING1 and YY1 binding protein	V	V	V	V	4
CRISPLD1	cysteine-rich secretory protein LCCL domain containing 1	V	V	V	V	4
CRK	v-crk avian sarcoma virus CT10 oncogene homolog	V	V	V	V	4
RPS6KA3	ribosomal protein S6 kinase, 90kDa, polypeptide 3	V	V	V	V	4
RPRD1A	regulation of nuclear pre-mRNA domain containing 1A	V	V	V	V	4
CTNNA2	catenin (cadherin-associated protein), alpha 2	V	V	V	V	4
RPL22	ribosomal protein L22	V	V	V	V	4
PTBD3	Polypyrimidine Tract Binding Protein 3	V	V	V	V	4
ROCK2	Rho-associated, coiled-coil containing protein kinase 2	V	V	V	V	4
RNF2	ring finger protein 2	V	V	V	V	4
RNF144A	ring finger protein 144A	V	V	V	V	4
DCUN1D3	DCN1, defective in cullin neddylation 1, domain containing 3	V	V	V	V	4
RNF114	ring finger protein 114	V	V	V	V	4

RNF111	ring finger protein 111	V	V	V	V	4
RC3H1	ring finger and CCCH-type domains 1	V	V	V	V	4
RBPJ	recombination signal binding protein for immunoglobulin kappa J region	V	V	V	V	4
DDX6	DEAD (Asp-Glu-Ala-Asp) box helicase 6	V		V	V	4
SCAF8	SR-Related CTD Associated Factor 8	V	V	V	V	4
DENND4C	DENN/MADD domain containing 4C	V	V	V	V	4
RAPGEFL1	Rap guanine nucleotide exchange factor (GEF)-like 1	V	V	V	V	4
DLC1	deleted in liver cancer 1	V	V	V	V	4
DLGAP2	discs, large (Drosophila) homolog-associated protein 2	V	V		V	4
DMTF1	cyclin D binding myb-like transcription factor 1	V	V	V	V	4
RAPGEF6	Rap guanine nucleotide exchange factor (GEF) 6	V	V	V	V	4
YTHDC1	YTH domain containing 1	V	V	V	V	4
RAP1GDS1	RAP1, GTP-GDP dissociation stimulator 1	V	V	V	V	4
DPP6	dipeptidyl-peptidase 6	V	V	V	V	4
RALGPS1	Ral GEF with PH domain and SH3 binding motif 1	V	V	V	V	4
DVL2	dishevelled segment polarity protein 2	V	V	V	V	4
AFF1	AF4/FMR2 family, member 1	V	V	V	V	4
RAB6B	RAB6B, member RAS oncogene family	V	V		V	4
RAB39B	RAB39B, member RAS oncogene family	V	V	V	V	4
EFNB2	ephrin-B2	V	V	V	V	4
EIF1AX	eukaryotic translation initiation factor 1A, X-linked	V	V	V	V	4
YTHDF1	YTH domain family, member 1	V	V	V	V	4
RAB2A	RAB2A, member RAS oncogene family	V	V	V	V	4
EIF4G2	eukaryotic translation initiation factor 4 gamma, 2	V	V	V	V	4
R3HDM2	R3H domain containing 2	V	V	V	V	4
ELOVL7	ELOVL fatty acid elongase 7	V	V	V	V	4
ZBTB5	zinc finger and BTB domain containing 5	V	V	V	V	4
EN1	engrailed homeobox 1	V	V	V	V	4
R3HDM1	R3H domain containing 1	V	V	V	V	4
ZFAND3	zinc finger, AN1-type domain 3	V	V	V	V	4
PVRL1	poliovirus receptor-related 1 (herpesvirus entry mediator C)	V	V	V	V	4
ACVR2B	activin A receptor, type IIB	V	V	V	V	4
PTP4A1	protein tyrosine phosphatase type IVA, member 1	V	V	V	V	4
PSIP1	PC4 and SFRS1 interacting protein 1	V	V	V	V	4
PRDM12	PR domain containing 12	V	V	V	V	4
ETF1	eukaryotic translation termination factor 1	V	V	V	V	4
PPP1R14C	protein phosphatase 1, regulatory (inhibitor) subunit 14C	V	V	V	V	4
ETS1	v-ets avian erythroblastosis virus E26 oncogene homolog 1	V	V	V	V	4
POU4F1	POU class 4 homeobox 1	V	V	V	V	4

PNRC1	proline-rich nuclear receptor coactivator 1	V	V	V	V	4
FAM107B	family with sequence similarity 107, member B	V	V	V	V	4
PHF2	PHD finger protein 2	V	V	V	V	4
JADE2	Jade Family PHD Finger 2	V	V	V	V	4
PHACTR2	phosphatase and actin regulator 2	V	V	V	V	4
PDS5B	PDS5, regulator of cohesion maintenance, homolog B (<i>S. cerevisiae</i>)	V	V	V	V	4
PCSK2	proprotein convertase subtilisin/kexin type 2	V	V	V	V	4
FAM46A	family with sequence similarity 46, member A	V	V	V	V	4
FBXL19	F-box and leucine-rich repeat protein 19	V	V	V	V	4
FBXL3	F-box and leucine-rich repeat protein 3	V	V	V	V	4
ZFH3	zinc finger homeobox 3	V	V	V	V	4
PARD6B	par-6 family cell polarity regulator beta	V	V	V	V	4
PAPOLA	poly(A) polymerase alpha	V	V	V	V	4
PAN3	PAN3 poly(A) specific ribonuclease subunit homolog (<i>S. cerevisiae</i>)	V	V	V	V	4
PAFAH1B1	platelet-activating factor acetylhydrolase 1b, regulatory subunit 1 (45kDa)	V	V	V	V	4
FGF7	fibroblast growth factor 7	V	V	V	V	4
FGFR2	fibroblast growth factor receptor 2	V	V	V	V	4
FILIP1L	filamin A interacting protein 1-like	V	V	V	V	4
FLRT3	fibronectin leucine rich transmembrane protein 3	V	V	V	V	4
OSBPL3	oxysterol binding protein-like 3	V	V	V	V	4
OSBP	oxysterol binding protein	V	V	V	V	4
NRXN1	neurexin 1	V	V	V	V	4
ZFPM2	zinc finger protein, FOG family member 2	V	V	V	V	4
NRF1	nuclear respiratory factor 1	V	V	V	V	4
GABRB3	gamma-aminobutyric acid (GABA) A receptor, beta 3	V	V	V	V	4
GAD1	glutamate decarboxylase 1 (brain, 67kDa)	V	V	V	V	4
ACTG1	actin, gamma 1	V	V	V	V	4
NR3C1	nuclear receptor subfamily 3, group C, member 1 (glucocorticoid receptor)	V	V	V	V	4
NLK	nemo-like kinase	V	V	V	V	4
GAS2	growth arrest-specific 2	V	V	V	V	4
GBAS	glioblastoma amplified sequence	V	V	V	V	4
NHS	Nance-Horan syndrome (congenital cataracts and dental anomalies)	V	V	V	V	4
GFRA1	GDNF family receptor alpha 1	V	V	V	V	4
NFKBIA	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha	V	V	V	V	4
GNB4	guanine nucleotide binding protein (G protein), beta polypeptide 4	V	V	V	V	4
GOLGA1	golgin A1	V	V	V	V	4
NFIA	nuclear factor I/A	V	V	V	V	4
NFAT5	nuclear factor of activated T-cells 5, tonicity-responsive	V	V	V	V	4
NEUROD1	neuronal differentiation 1	V	V	V	V	4

GPR158	G protein-coupled receptor 158	V	V		V	V	4
NBEA	neurobeachin	V	V		V	V	4
NAP1L5	nucleosome assembly protein 1-like 5	V	V		V	V	4
GRM1	glutamate receptor, metabotropic 1	V	V			V	4
GRM8	glutamate receptor, metabotropic 8	V	V		V	V	4
GTF2E1	general transcription factor IIE, polypeptide 1, alpha 56kDa	V	V			V	4
NAMPT	nicotinamide phosphoribosyltransferase	V	V		V	V	4
NACC2	NACC family member 2, BEN and BTB (POZ) domain containing	V	V		V	V	4
HBP1	HMG-box transcription factor 1	V	V		V	V	4
KAT6B	Lysine Acetyltransferase 6B	V	V		V	V	4
MYH10	myosin, heavy chain 10, non-muscle	V	V		V	V	4
MYCN	v-myc avian myelocytomatosis viral oncogene neuroblastoma derived homolog	V	V			V	4
HIATL1	hippocampus abundant transcript-like 1	V	V		V	V	4
ACSL3	acyl-CoA synthetase long-chain family member 3	V	V		V	V	4
ZMYND11	zinc finger, MYND-type containing 11	V	V		V	V	4
MTMR12	myotubularin related protein 12	V	V		V	V	4
MSL2	male-specific lethal 2 homolog (Drosophila)	V	V		V	V	4
ZNF592	zinc finger protein 592	V	V		V	V	4
HNRNPR	heterogeneous nuclear ribonucleoprotein R	V	V		V	V	4
MMGT1	membrane magnesium transporter 1	V	V		V	V	4
KMT2C	Lysine Methyltransferase 2C	V	V		V	V	4
KMT2A	Lysine Methyltransferase 2A	V	V		V	V	4
MITF	microphthalmia-associated transcription factor	V	V		V	V	4
MEIS2	Meis homeobox 2	V	V		V	V	4
MEGF10	multiple EGF-like-domains 10	V	V		V	V	4
ID2	inhibitor of DNA binding 2, dominant negative helix-loop-helix protein	V	V		V	V	4
MED14	mediator complex subunit 14	V	V		V	V	4
MED13L	mediator complex subunit 13-like	V	V		V	V	4
MED13	mediator complex subunit 13	V	V		V	V	4
IL15RA	interleukin 15 receptor, alpha	V	V			V	4
ACBD5	acyl-CoA binding domain containing 5	V	V		V	V	4
INSIG2	insulin induced gene 2	V	V		V	V	4
MARK1	MAP/microtubule affinity-regulating kinase 1	V	V		V	V	4
IQSEC2	IQ motif and Sec7 domain 2	V	V		V	V	4
ITCH	itchy E3 ubiquitin protein ligase	V	V		V	V	4
MAG11	membrane associated guanylate kinase, WW and PDZ domain containing 1	V	V		V	V	4
LZTS2	leucine zipper, putative tumor suppressor 2	V	V		V	V	4
ZNF521	zinc finger protein 521	V	V		V	V	4
JAG2	jagged 2	V	V		V	V	4

LRRC16B	leucine rich repeat containing 16B	V	V		V	V	4
LRFN1	leucine rich repeat and fibronectin type III domain containing 1	V	V		V	V	4
JPH1	junctophilin 1	V	V		V	V	4
JPH3	junctophilin 3	V	V		V	V	4
KALRN	kalirin, RhoGEF kinase	V	V		V	V	4
LPHN1	latrophilin 1	V	V		V	V	4
LIN7C	lin-7 homolog C (C. elegans)	V	V		V	V	4
LDB2	LIM domain binding 2	V	V		V	V	4
LARP4	La ribonucleoprotein domain family, member 4	V	V		V	V	4
LARP1	La ribonucleoprotein domain family, member 1	V	V		V	V	4
KPNA6	karyopherin alpha 6 (importin alpha 7)	V	V		V	V	4
KCTD15	potassium channel tetramerization domain containing 15	V	V		V	V	4
KHDRBS1	KH domain containing, RNA binding, signal transduction associated 1	V	V		V	V	4
KPNA3	karyopherin alpha 3 (importin alpha 4)	V	V		V	V	4
ICE1	Interactor Of Little Elongation Complex ELL Subunit 1	V	V		V	V	4
KANSL1	KAT8 Regulatory NSL Complex Subunit 1	V	V		V	V	4
USF3	Upstream Transcription Factor Family Member 3	V	V		V	V	4
NEXMIF	Neurite Extension And Migration Factor	V	V		V	V	4
KIF11	kinesin family member 11	V			V	V	4
RAPGEF5	Rap guanine nucleotide exchange factor (GEF) 5	V	V		V	V	4
KLF4	Kruppel-like factor 4 (gut)	V	V		V	V	4
ZNF706	zinc finger protein 706	V	V		V	V	4
KIN	KIN, antigenic determinant of recA protein homolog (mouse)	V	V			V	3
KLF3	Kruppel-like factor 3 (basic)	V			V	V	3
KIF3B	kinesin family member 3B	V	V		V		3
ATG14	Autophagy Related 14	V	V		V		3
KCTD12	potassium channel tetramerization domain containing 12	V	V			V	3
KPNB1	karyopherin (importin) beta 1	V	V		V		3
LANCL3	LanC lantibiotic synthetase component C-like 3 (bacterial)	V			V	V	3
KCNMB2	potassium large conductance calcium-activated channel, subfamily M, beta member 2	V	V		V		3
KCNH5	potassium voltage-gated channel, subfamily H (eag-related), member 5	V	V		V		3
LCOR	ligand dependent nuclear receptor corepressor	V	V		V		3
KCNE3	potassium voltage-gated channel, Isk-related family, member 3	V	V			V	3
LEAP2	liver expressed antimicrobial peptide 2	V	V		V		3
LEF1	lymphoid enhancer-binding factor 1	V	V		V		3
LHX8	LIM homeobox 8	V	V		V		3
LIN28A	Lin-28 Homolog A	V	V			V	3
KCND2	potassium voltage-gated channel, Shal-related subfamily, member 2	V	V		V		3
LMO3	LIM domain only 3 (rhombotin-like 2)	V	V			V	3

LMO4	LIM domain only 4	V	V			V	3
KCNA4	potassium voltage-gated channel, shaker-related subfamily, member 4	V	V			V	3
LRCH1	leucine-rich repeats and calponin homology (CH) domain containing 1	V	V			V	3
JHDM1D	jumonji C domain containing histone demethylase 1 homolog D (<i>S. cerevisiae</i>)	V	V			V	3
LRP6	low density lipoprotein receptor-related protein 6	V				V	3
JAK2	Janus kinase 2	V	V			V	3
LRRC17	leucine rich repeat containing 17	V	V			V	3
JAG1	jagged 1	V	V			V	3
ITGB8	integrin, beta 8	V	V			V	3
ITGAV	integrin, alpha V	V	V			V	3
MAP3K7	Mitogen-Activated Protein Kinase Kinase Kinase 7	V	V			V	3
MAP4	microtubule-associated protein 4	V	V			V	3
INTS6	integrator complex subunit 6	V	V			V	3
INSIG1	insulin induced gene 1	V	V			V	3
MBNL2	muscleblind-like splicing regulator 2	V	V			V	3
IL13	interleukin 13	V	V			V	3
IKZF2	IKAROS family zinc finger 2 (Helios)	V	V			V	3
IGF1R	insulin-like growth factor 1 receptor	V	V			V	3
ID1	inhibitor of DNA binding 1, dominant negative helix-loop-helix protein	V	V			V	3
MEGF9	multiple EGF-like-domains 9	V	V			V	3
HSPA13	heat shock protein 70kDa family, member 13	V	V			V	3
MET	met proto-oncogene	V	V			V	3
MID1	midline 1 (Opitz/BBB syndrome)	V	V			V	3
MIER3	mesoderm induction early response 1, family member 3	V	V			V	3
HS6ST2	heparan sulfate 6-O-sulfotransferase 2	V	V			V	3
HS2ST1	heparan sulfate 2-O-sulfotransferase 1	V	V			V	3
HOXA9	homeobox A9	V				V	3
MLLT3	myeloid/lymphoid or mixed-lineage leukemia (trithorax homolog, <i>Drosophila</i>); translocated to, 3	V	V			V	3
HOOK3	hook microtubule-tethering protein 3	V	V			V	3
MNT	MNT, MAX dimerization protein	V	V			V	3
MOB1B	MOB Kinase Activator 1B	V	V			V	3
HNRNPD	heterogeneous nuclear ribonucleoprotein D (AU-rich element RNA binding protein 1, 37kDa)	V	V			V	3
MSL1	male-specific lethal 1 homolog (<i>Drosophila</i>)	V	V			V	3
HMGB1	high mobility group box 1	V	V			V	3
MTF1	metal-regulatory transcription factor 1	V	V			V	3
MTFMT	mitochondrial methionyl-tRNA formyltransferase	V	V			V	3
HMBOX1	homeobox containing 1	V	V			V	3
MTSS1	metastasis suppressor 1	V	V			V	3
MXD1	MAX dimerization protein 1	V	V			V	3

HECTD2	HECT domain containing E3 ubiquitin protein ligase 2	V	V	V			3
HCN1	hyperpolarization activated cyclic nucleotide-gated potassium channel 1	V	V	V			3
MYH9	myosin, heavy chain 9, non-muscle	V	V			V	3
HCCS	holocytochrome c synthase	V	V	V			3
HBEGF	heparin-binding EGF-like growth factor	V	V	V			3
GTF2H1	general transcription factor IIH, polypeptide 1, 62kDa	V	V	V			3
NAP1L2	nucleosome assembly protein 1-like 2	V	V	V			3
GRHL1	grainyhead-like 1 (Drosophila)	V	V			V	3
NASP	nuclear autoantigenic sperm protein (histone-binding)	V	V			V	3
GPR64	G protein-coupled receptor 64	V	V	V			3
NCAM1	neural cell adhesion molecule 1	V	V			V	3
NCKAP1	NCK-associated protein 1	V	V	V			3
NCOA6	nuclear receptor coactivator 6	V	V	V			3
NDUFAB1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1, 8kDa	V	V	V		V	3
GPR125	G protein-coupled receptor 125	V	V	V			3
NEUROG2	neurogenin 2	V	V			V	3
NFASC	neurofascin	V	V			V	3
GPC1	glypican 1	V		V		V	3
GORASP2	golgi reassembly stacking protein 2, 55kDa	V	V	V			3
NFIB	nuclear factor I/B	V	V	V			3
GNAI1	guanine nucleotide binding protein (G protein), alpha inhibiting activity polypeptide 1	V	V	V			3
NHLH2	nescient helix loop helix 2	V	V	V			3
GEM	GTP binding protein overexpressed in skeletal muscle	V	V			V	3
NIPBL	Nipped-B homolog (Drosophila)	V	V			V	3
NKRF	NFKB repressing factor	V	V	V			3
GAPVD1	GTPase activating protein and VPS9 domains 1	V	V			V	3
NLN	neurolysin (metallopeptidase M3 family)	V	V	V			3
NOC3L	nucleolar complex associated 3 homolog (S. cerevisiae)	V	V			V	3
GALNT7	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 7 (GalNAc-T7)	V	V			V	3
GALC	galactosylceramidase	V	V			V	3
FUBP3	far upstream element (FUSE) binding protein 3	V	V	V			3
FRYL	FRY-like	V	V	V			3
FRS2	fibroblast growth factor receptor substrate 2	V	V			V	3
NTN4	netrin 4	V	V	V			3
NUP153	nucleoporin 153kDa	V	V			V	3
ONECUT2	one cut homeobox 2	V	V	V			3
ORC2	Origin Recognition Complex Subunit 2	V	V			V	3
FOXP2	forkhead box P2	V		V		V	3
FOXF2	forkhead box F2	V	V	V			3

OTUD4	OTU domain containing 4	V	V			V	3
OTUD6B	OTU domain containing 6B	V	V		V		3
OTUD7B	OTU domain containing 7B	V	V		V		3
FGF1	fibroblast growth factor 1 (acidic)	V	V			V	3
FCHO2	FCH domain only 2	V	V		V		3
FBXO45	F-box protein 45	V			V	V	3
PAPOLG	poly(A) polymerase gamma	V	V		V		3
FBXO34	F-box protein 34	V	V		V		3
PARVA	parvin, alpha	V	V			V	3
PCDH11X	protocadherin 11 X-linked	V	V		V		3
PCDH11Y	protocadherin 11 Y-linked	V	V		V		3
PCDH17	protocadherin 17	V	V		V		3
PCDH8	protocadherin 8	V	V		V		3
FBXO21	F-box protein 21	V	V		V		3
PCLO	piccolo presynaptic cytomatrix protein	V	V			V	3
FAM178A	family with sequence similarity 178, member A	V	V			V	3
PDE7B	phosphodiesterase 7B	V	V		V		3
PDGFC	platelet derived growth factor C	V	V		V		3
PDIK1L	PDLIM1 interacting kinase 1 like	V	V		V		3
PDS5A	PDS5, regulator of cohesion maintenance, homolog A (<i>S. cerevisiae</i>)	V	V		V		3
FAM175A	family with sequence similarity 175, member A	V	V		V		3
PELI1	pellino E3 ubiquitin protein ligase 1	V	V		V		3
PGAP1	post-GPI attachment to proteins 1	V	V			V	3
FAM160B1	family with sequence similarity 160, member B1	V	V		V		3
FAM135B	family with sequence similarity 135, member B	V	V		V		3
FAM117A	family with sequence similarity 117, member A	V	V			V	3
PHTF2	putative homeodomain transcription factor 2	V	V		V		3
PI15	peptidase inhibitor 15	V	V			V	3
PLAG1	pleiomorphic adenoma gene 1	V	V			V	3
PLCXD3	phosphatidylinositol-specific phospholipase C, X domain containing 3	V	V		V		3
PMP22	peripheral myelin protein 22	V	V		V		3
PMPCB	peptidase (mitochondrial processing) beta	V	V		V		3
EXO1	exonuclease 1	V	V			V	3
POPDC3	popeye domain containing 3	V	V		V		3
ETS2	v-ets avian erythroblastosis virus E26 oncogene homolog 2	V				V	3
PPAP2B	phosphatidic acid phosphatase type 2B	V	V		V		3
PPFIA1	protein tyrosine phosphatase, receptor type, f polypeptide (PTPRF), interacting protein (liprin), alpha 1	V			V	V	3
PPM1D	protein phosphatase, Mg2+/Mn2+ dependent, 1D	V	V		V		3
PPM1E	protein phosphatase, Mg2+/Mn2+ dependent, 1E	V	V		V		3

ETNK1	ethanolamine kinase 1	V	V		V				3
PPP2R2C	protein phosphatase 2, regulatory subunit B, gamma	V	V					V	3
PPP6C	protein phosphatase 6, catalytic subunit	V	V		V				3
ESR1	estrogen receptor 1	V			V		V		3
PRDM16	PR domain containing 16	V	V		V				3
PRKACB	protein kinase, cAMP-dependent, catalytic, beta	V	V		V				3
PRKCE	protein kinase C, epsilon	V				V	V		3
PRPF38B	pre-mRNA processing factor 38B	V	V		V				3
PRPF8	pre-mRNA processing factor 8	V				V	V		3
PRPS2	phosphoribosyl pyrophosphate synthetase 2	V	V		V				3
PRRX1	paired related homeobox 1	V	V		V				3
ESM1	endothelial cell-specific molecule 1	V	V		V				3
PSMD3	proteasome (prosome, macropain) 26S subunit, non-ATPase, 3	V	V		V				3
PTBP1	polypyrimidine tract binding protein 1	V	V		V				3
PTCH1	patched 1	V			V		V		3
PTGFR	prostaglandin F receptor (FP)	V	V				V		3
PTK2	protein tyrosine kinase 2	V	V		V				3
ERO1L	ERO1-like (S. cerevisiae)	V	V		V				3
PURA	purine-rich element binding protein A	V	V		V				3
PURG	purine-rich element binding protein G	V	V		V				3
EPB41L5	erythrocyte membrane protein band 4.1 like 5	V	V		V				3
QKI	QKI, KH domain containing, RNA binding	V	V		V				3
EPB41	erythrocyte membrane protein band 4.1 (elliptocytosis 1, RH-linked)	V			V		V		3
EIF4G3	eukaryotic translation initiation factor 4 gamma, 3	V	V		V				3
RAB11FIP2	RAB11 family interacting protein 2 (class I)	V	V		V				3
RAB1B	RAB1B, member RAS oncogene family	V	V		V				3
RAB27A	RAB27A, member RAS oncogene family	V	V		V				3
EIF3A	eukaryotic translation initiation factor 3, subunit A	V	V		V				3
EBF3	early B-cell factor 3	V				V	V		3
DYRK1A	dual-specificity tyrosine-(Y)-phosphorylation regulated kinase 1A	V	V		V				3
DYNC1LI2	dynein, cytoplasmic 1, light intermediate chain 2	V	V		V				3
DUSP3	dual specificity phosphatase 3	V	V			V			3
DOCK4	dedicator of cytokinesis 4	V	V		V				3
RAP2C	RAP2C, member of RAS oncogene family	V			V		V		3
DNM3	dynamamin 3	V	V			V			3
DNAJB2	DnaJ (Hsp40) homolog, subfamily B, member 2	V	V		V				3
DGKD	diacylglycerol kinase, delta 130kDa	V	V		V				3
DEK	DEK oncogene	V	V				V		3
RBM24	RNA binding motif protein 24	V	V		V				3

RBM26	RNA binding motif protein 26	V	V		V				3
RBM7	RNA binding motif protein 7	V	V				V		3
DDX52	DEAD (Asp-Glu-Ala-Asp) box polypeptide 52	V	V				V		3
RBPMS2	RNA binding protein with multiple splicing 2	V			V		V		3
DDX4	DEAD (Asp-Glu-Ala-Asp) box polypeptide 4	V	V				V		3
RCAN2	regulator of calcineurin 2	V	V					V	3
REV3L	REV3-like, polymerase (DNA directed), zeta, catalytic subunit	V	V					V	3
RICTOR	RPTOR independent companion of MTOR, complex 2	V	V					V	3
RIT1	Ras-like without CAAX 1	V	V				V		3
DDIT3	DNA-damage-inducible transcript 3	V	V				V		3
DCX	doublecortin	V	V				V		3
RNF13	ring finger protein 13	V	V				V		3
DCBLD2	discoidin, CUB and LCCL domain containing 2	V	V					V	3
RNF19A	ring finger protein 19A, RBR E3 ubiquitin protein ligase	V					V	V	3
DAG1	dystroglycan 1 (dystrophin-associated glycoprotein 1)	V	V				V		3
RNF38	ring finger protein 38	V	V		V				3
CYB5B	cytochrome b5 type B (outer mitochondrial membrane)	V	V				V		3
CWC22	CWC22 spliceosome-associated protein homolog (<i>S. cerevisiae</i>)	V	V				V		3
CUL3	cullin 3	V					V	V	3
CTCF	CCCTC-binding factor (zinc finger protein)	V	V				V		3
RPRD1B	regulation of nuclear pre-mRNA domain containing 1B	V	V					V	3
CSNK1G3	casein kinase 1, gamma 3	V	V				V		3
RPS6KB1	ribosomal protein S6 kinase, 70kDa, polypeptide 1	V	V				V		3
RRN3	RRN3 RNA polymerase I transcription factor homolog (<i>S. cerevisiae</i>)	V	V					V	3
CREB5	cAMP responsive element binding protein 5	V	V				V		3
SALL1	spalt-like transcription factor 1	V	V				V		3
CPEB4	cytoplasmic polyadenylation element binding protein 4	V	V					V	3
SBF2	SET binding factor 2	V	V					V	3
CPEB3	cytoplasmic polyadenylation element binding protein 3	V	V					V	3
COL3A1	collagen, type III, alpha 1	V	V				V		3
COL19A1	collagen, type XIX, alpha 1	V	V					V	3
COBLL1	cordons-bleu WH2 repeat protein-like 1	V	V					V	3
CNR1	cannabinoid receptor 1 (brain)	V	V				V		3
SEPT9	septin 9	V	V					V	3
SFPQ	splicing factor proline/glutamine-rich	V	V				V		3
CNOT1	CCR4-NOT transcription complex, subunit 1	V					V	V	3
SGK3	serum/glucocorticoid regulated kinase family, member 3	V	V					V	3
CLIP3	CAP-GLY domain containing linker protein 3	V	V				V		3
CLIP1	CAP-GLY domain containing linker protein 1	V	V					V	3

CLDN1	claudin 1	V	V			V	3	
CLCN5	chloride channel, voltage-sensitive 5	V	V		V		3	
CIRBP	cold inducible RNA binding protein	V	V		V		3	
SIX4	SIX homeobox 4	V	V		V		3	
SLC12A6	solute carrier family 12 (potassium/chloride transporter), member 6	V	V		V		3	
CHL1	cell adhesion molecule L1-like	V	V		V		3	
SLC16A9	solute carrier family 16, member 9	V	V		V		3	
CGGBP1	CGG triplet repeat binding protein 1	V	V		V		3	
CEP76	centrosomal protein 76kDa	V			V	V	3	
SLC25A24	solute carrier family 25 (mitochondrial carrier; phosphate carrier), member 24	V	V		V		3	
SLC38A2	solute carrier family 38, member 2	V			V	V	3	
CDC37L1	cell division cycle 37-like 1	V	V		V		3	
CD2AP	CD2-associated protein	V	V		V		3	
SLTM	SAFB-like, transcription modulator	V	V		V		3	
CCNT2	cyclin T2	V	V		V		3	
SNCA	synuclein, alpha (non A4 component of amyloid precursor)	V	V			V	3	
CCDC85A	coiled-coil domain containing 85A	V	V		V		3	
CCDC47	coiled-coil domain containing 47	V	V		V		3	
CAND1	cullin-associated and neddylation-dissociated 1	V	V		V		3	
CAMLG	calcium modulating ligand	V	V			V	3	
CADPS2	Ca ⁺⁺ -dependent secretion activator 2	V				V	V	3
SOX11	SRY (sex determining region Y)-box 11	V				V	V	3
CAAP1	Caspase Activity And Apoptosis Inhibitor 1	V	V		V		3	
KIAA1456	KIAA1456	V	V		V		3	
SOX9	SRY (sex determining region Y)-box 9	V	V				V	3
CREBRF	CREB3 Regulatory Factor	V				V	V	3
SP4	Sp4 transcription factor	V	V		V		3	
SPOCK1	sparc/osteonectin, cwcv and kazal-like domains proteoglycan (testican) 1	V	V			V	3	
SPRY1	sprouty homolog 1, antagonist of FGF signaling (Drosophila)	V				V	V	3
SPRY3	sprouty homolog 3 (Drosophila)	V	V				V	3
C15ORF41	chromosome 15 open reading frame 41	V	V		V		3	
C10ORF12	chromosome 10 open reading frame 12	V	V		V		3	
SRRM1	serine/arginine repetitive matrix 1	V	V		V		3	
SS18	synovial sarcoma translocation, chromosome 18	V				V	V	3
BTG1	B-cell translocation gene 1, anti-proliferative	V	V		V		3	
ST18	suppression of tumorigenicity 18 (breast carcinoma) (zinc finger protein)	V	V				V	3
BST1	bone marrow stromal cell antigen 1	V	V			V	3	
ST8SIA3	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 3	V	V		V		3	
STAG1	stromal antigen 1	V	V		V		3	

STK24	serine/threonine kinase 24	V	V			V	3
BRWD1	bromodomain and WD repeat domain containing 1	V	V		V		3
BRD7	bromodomain containing 7	V	V		V		3
STX16	syntaxin 16	V	V		V		3
STXBPS	syntaxin binding protein 5 (tomosyn)	V	V		V		3
BMPR2	bone morphogenetic protein receptor, type II (serine/threonine kinase)	V	V			V	3
BHLHE22	Basic Helix-Loop-Helix Family Member E22	V	V		V		3
SYT14	synaptotagmin XIV	V	V		V		3
SYT14L	synaptotagmin XIV-like	V	V		V		3
SYVN1	synovial apoptosis inhibitor 1, synoviolin	V	V			V	3
TAF4B	TAF4b RNA polymerase II, TATA box binding protein (TBP)-associated factor, 105kDa	V	V			V	3
BDNF	brain-derived neurotrophic factor	V		V		V	3
TBC1D15	TBC1 domain family, member 15	V	V		V		3
TBC1D4	TBC1 domain family, member 4	V	V		V		3
PRRC2A	Proline Rich Coiled-Coil 2A	V	V			V	3
TEK	TEK tyrosine kinase, endothelial	V	V			V	3
TET2	tet methylcytosine dioxygenase 2	V				V	3
BAIAP2	BAI1-associated protein 2	V	V		V		3
THSD7B	thrombospondin, type I, domain containing 7B	V	V		V		3
THUMPD1	THUMP domain containing 1	V	V		V		3
TIMM8A	translocase of inner mitochondrial membrane 8 homolog A (yeast)	V	V		V		3
TLN2	talin 2	V	V			V	3
TM4SF1	transmembrane 4 L six family member 1	V	V		V		3
TMED7	transmembrane emp24 protein transport domain containing 7	V	V			V	3
TMEM14C	transmembrane protein 14C	V	V			V	3
TMEM161B	transmembrane protein 161B	V	V		V		3
B4GALT6	UDP-Gal:betaGlcNAc beta 1,4- galactosyltransferase, polypeptide 6	V	V			V	3
TMEM185A	transmembrane protein 185A	V	V		V		3
TNFRSF21	tumor necrosis factor receptor superfamily, member 21	V	V		V		3
TNFSF4	tumor necrosis factor (ligand) superfamily, member 4	V	V			V	3
B3GNT5	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 5	V	V		V		3
ATXN7L1	ataxin 7-like 1	V	V			V	3
TRIO	trio Rho guanine nucleotide exchange factor	V	V		V		3
CEP41	Centrosomal Protein 41	V	V		V		3
TSPAN2	tetraspanin 2	V	V		V		3
TXNDC5	thioredoxin domain containing 5 (endoplasmic reticulum)	V			V	V	3
ATP2B4	ATPase, Ca ⁺⁺ transporting, plasma membrane 4	V	V		V		3
ATP2A2	ATPase, Ca ⁺⁺ transporting, cardiac muscle, slow twitch 2	V	V		V		3
UBE2W	ubiquitin-conjugating enzyme E2W (putative)	V	V			V	3

ASPHD2	aspartate beta-hydroxylase domain containing 2	V		V	V	3
ART3	ADP-ribosyltransferase 3	V	V	V		3
UBL3	ubiquitin-like 3	V	V		V	3
UBLCP1	ubiquitin-like domain containing CTD phosphatase 1	V	V	V		3
ARRDC3	arrestin domain containing 3	V	V		V	3
ARMC8	armadillo repeat containing 8	V	V	V		3
UBR3	ubiquitin protein ligase E3 component n-recognin 3 (putative)	V	V	V		3
ARID4B	AT rich interactive domain 4B (RBP1-like)	V	V	V		3
UBXN7	UBX domain protein 7	V	V		V	3
ARAP2	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 2	V	V		V	3
USP1	ubiquitin specific peptidase 1	V	V	V		3
APPBP2	amyloid beta precursor protein (cytoplasmic tail) binding protein 2	V	V	V		3
ANKS1B	ankyrin repeat and sterile alpha motif domain containing 1B	V	V	V		3
USP6	ubiquitin specific peptidase 6 (Tre-2 oncogene)	V	V		V	3
UVRAG	UV radiation resistance associated	V	V	V		3
VAMP1	vesicle-associated membrane protein 1 (synaptobrevin 1)	V	V	V		3
ANKRD50	ankyrin repeat domain 50	V		V	V	3
VBP1	von Hippel-Lindau binding protein 1	V	V	V		3
ANKRD13A	ankyrin repeat domain 13A	V	V	V		3
VEGFA	vascular endothelial growth factor A	V	V	V		3
VEZF1	vascular endothelial zinc finger 1	V	V	V		3
VNN2	vanin 2	V	V		V	3
ANKHD1	ankyrin repeat and KH domain containing 1	V	V	V		3
VSNL1	visinin-like 1	V	V	V		3
ANK3	ankyrin 3, node of Ranvier (ankyrin G)	V		V	V	3
WDR26	WD repeat domain 26	V	V		V	3
AMOT	angiomin	V	V		V	3
WDR7	WD repeat domain 7	V	V	V		3
AKAP6	A kinase (PRKA) anchor protein 6	V	V		V	3
WIPI1	WD repeat domain, phosphoinositide interacting 1	V	V	V		3
AGPAT3	1-acylglycerol-3-phosphate O-acyltransferase 3	V	V		V	3
XIAP	X-linked inhibitor of apoptosis	V	V	V		3
AFF4	AF4/FMR2 family, member 4	V	V		V	3
AFF3	AF4/FMR2 family, member 3	V	V		V	3
AFF2	AF4/FMR2 family, member 2	V	V		V	3
ADNP	activity-dependent neuroprotector homeobox	V	V	V		3
YY1	YY1 transcription factor	V	V		V	3
ZAK	sterile alpha motif and leucine zipper containing kinase AZK	V	V	V		3
ZBTB22	zinc finger and BTB domain containing 22	V	V		V	3

ZBTB34	zinc finger and BTB domain containing 34	V	V	V			3
ZBTB39	zinc finger and BTB domain containing 39	V	V			V	3
ADAMTSL3	ADAMTS-like 3	V	V			V	3
ZC3H11A	zinc finger CCCH-type containing 11A	V	V	V			3
ZC3H12B	zinc finger CCCH-type containing 12B	V		V		V	3
ZC3H6	zinc finger CCCH-type containing 6	V	V	V			3
ZC3H7A	zinc finger CCCH-type containing 7A	V	V	V			3
ZCCHC11	zinc finger, CCHC domain containing 11	V	V	V			3
ZDHHC2	zinc finger, DHHC-type containing 2	V		V		V	3
ADAMTS3	ADAM metalloproteinase with thrombospondin type 1 motif, 3	V	V	V			3
ACVR2A	activin A receptor, type IIA	V	V	V			3
ZFP36	ZFP36 ring finger protein	V	V	V			3
ACVR1	activin A receptor, type I	V	V			V	3
ZFY	zinc finger protein, Y-linked	V	V	V			3
ZFYVE20	zinc finger, FYVE domain containing 20	V		V		V	3
ZIC5	Zic family member 5	V	V	V			3
ACE2	angiotensin I converting enzyme 2	V	V			V	3
ZNF292	zinc finger protein 292	V	V			V	3
ZBTB21	Zinc Finger And BTB Domain Containing 21	V	V	V			3
ABCD3	ATP-binding cassette, sub-family D (ALD), member 3	V	V	V			3
MPHOSPH9	M-phase phosphoprotein 9	V	V	V			3
ABCA1	ATP-binding cassette, sub-family A (ABC1), member 1	V	V	V			3
CACNA1C	calcium channel, voltage-dependent, L type, alpha 1C subunit		V	V		V	3
CEBPA	CCAAT/enhancer binding protein (C/EBP), alpha		V	V		V	3
DHX40	DEAH (Asp-Glu-Ala-His) box polypeptide 40		V	V		V	3
DIO2	deiodinase, iodothyronine, type II		V	V		V	3
EIF1	eukaryotic translation initiation factor 1		V	V		V	3
FNIP1	folliculin interacting protein 1		V	V		V	3
GABARAPL1	GABA(A) receptor-associated protein like 1		V	V		V	3
ARHGAP35	Rho GTPase Activating Protein 35		V	V		V	3
GTF2I	general transcription factor Iii		V	V		V	3
KDM5B	Lysine Demethylase 5B		V	V		V	3
PDAP1	PDGFA associated protein 1		V	V		V	3
PHF21A	PHD finger protein 21A		V	V		V	3
PURB	purine-rich element binding protein B		V	V		V	3
DCAF10	DDB1 And CUL4 Associated Factor 10		V	V		V	3
DCAF12	DDB1 And CUL4 Associated Factor 12		V	V		V	3
ZBTB38	zinc finger and BTB domain containing 38		V	V		V	3
ZNF532	zinc finger protein 532		V	V		V	3

PCDH7

protocadherin 7

V

V

V

3