

**SUPPLEMENTARY MATERIAL**

**Molecular Signature and Immune Landscape of HCV-Associated  
Hepatocellular Carcinoma (HCC):  
Differences and Similarities with HBV-HCC**

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## SUPPLEMENTARY TABLES

**Table S1.** Genes differentially expressed in HCV-HCC.

Gene Symbol	Entrez Gene Name	Fold change
HOXA13	homeobox A13	7.7
TRIM55	tripartite motif containing 55	5.37
DHRS2	dehydrogenase/reductase 2	4.89
CYP17A1	cytochrome P450 family 17 subfamily A member 1	4.38
GPC3	glypican 3	4.08
PI15	peptidase inhibitor 15	3.82
DUSP9	dual specificity phosphatase 9	3.61
TLX1	T cell leukemia homeobox 1	3.57
C2CD4D	C2 calcium dependent domain containing 4D	3.51
PURPL	p53 upregulated regulator of p53 levels	3.5
TSPEAR-AS2	TSPEAR antisense RNA 2	3.42
CENPF	centromere protein F	3.4
RP11_146E134		3.37
FBXO43	F-box protein 43	3.29
MAST1	microtubule associated serine/threonine kinase 1	3.26
CYP7A1	cytochrome P450 family 7 subfamily A member 1	3.19
AC002310.11		3.17
LOC148709	actin gamma 1 pseudogene	3.15
ANLN	anillin actin binding protein	3.09
NMRAL2P	NmrA like redox sensor 2, pseudogene	3.06
SIX4	SIX homeobox 4	3.06
NEK2	NIMA related kinase 2	3.04
ASPM	assembly factor for spindle microtubules	2.9
ZNF648	zinc finger protein 648	2.9
H3C10	H3 clustered histone 10	2.86
RP11_1151B144		2.86
TSPEAR-AS1	TSPEAR antisense RNA 1	2.84
NUF2	NUF2 component of NDC80 kinetochore complex	2.83
HOXA3	homeobox A3	2.81
MRAP2	melanocortin 2 receptor accessory protein 2	2.81
UBE2C	ubiquitin conjugating enzyme E2 C	2.78
RP11-106M3.5		2.76
SPC24	SPC24 component of NDC80 kinetochore complex	2.74
FAM83D	family with sequence similarity 83 member D	2.73
KIF20A	kinesin family member 20A	2.72
LOC100379224	uncharacterized LOC100379224	2.72
HJURP	Holliday junction recognition protein	2.71
MYCN	MYCN proto-oncogene, bHLH transcription factor	2.71
SP5	Sp5 transcription factor	2.71
TP73	tumor protein p73	2.71
CDKN3	cyclin dependent kinase inhibitor 3	2.68
ESM1	endothelial cell specific molecule 1	2.65
FGF21	fibroblast growth factor 21	2.64
TROAP	trophinin associated protein	2.63
TUBAP5	tubulin alpha pseudogene 5	2.63
TOP2A	DNA topoisomerase II alpha	2.62
MKI67	marker of proliferation Ki-67	2.61
UBE2T	ubiquitin conjugating enzyme E2 T	2.61
TRMT112P4	tRNA methyltransferase subunit 11-2 pseudogene 4	2.56
CDKN2A	cyclin dependent kinase inhibitor 2A	2.54

KIF4A	kinesin family member 4A	2.53
DLGAP5	DLG associated protein 5	2.52
TGM3	transglutaminase 3	2.51
LOC100507389	uncharacterized LOC100507389	2.5
PBK	PDZ binding kinase	2.47
KIF14	kinesin family member 14	2.46
UGT2B11	UDP glucuronosyltransferase family 2 member B11	2.46
C2CD4D-AS1	C2CD4D and THEM5 antisense RNA 1	2.45
CDC20	cell division cycle 20	2.45
HMMR	hyaluronan mediated motility receptor	2.45
RP11_6811810		2.45
DEPDC1	DEP domain containing 1	2.44
IRX3	iroquois homeobox 3	2.44
CAP2	cyclase associated actin cytoskeleton regulatory protein 2	2.41
ANKRD65	ankyrin repeat domain 65	2.4
KIF18B	kinesin family member 18B	2.4
CCNB2	cyclin B2	2.39
BUB1	BUB1 mitotic checkpoint serine/threonine kinase	2.36
E2F7	E2F transcription factor 7	2.34
CDKN2B-AS1	CDKN2B antisense RNA 1	2.33
PCOLCE2	procollagen C-endopeptidase enhancer 2	2.32
FIGNL2	fidgetin like 2	2.31
TDGF1	teratocarcinoma-derived growth factor 1	2.3
SKA3	spindle and kinetochore associated complex subunit 3	2.28
BUB1B	BUB1 mitotic checkpoint serine/threonine kinase B	2.27
FHAD1	forkhead associated phosphopeptide binding domain 1	2.27
H2BC15	H2B clustered histone 15	2.27
KCNJ5	potassium inwardly rectifying channel subfamily J member 5	2.27
MELK	maternal embryonic leucine zipper kinase	2.27
SHD	Src homology 2 domain containing transforming protein D	2.27
AC01584916		2.26
GLUL	glutamate-ammonia ligase	2.25
LINC02575		2.25
TTK	TTK protein kinase	2.25
CDK1	cyclin dependent kinase 1	2.24
LBX2	ladybird homeobox 2	2.24
DIAPH3	diaphanous related formin 3	2.23
CENPE	centromere protein E	2.22
DBNDD1	dysbindin domain containing 1	2.22
RP11_523H203		2.22
H3C14	H3 clustered histone 14	2.21
H3C15	H3 clustered histone 15	2.21
KIFC1	kinesin family member C1	2.21
NPM2	nucleophosmin/nucleoplasmin 2	2.21
PTTG1	PTTG1 regulator of sister chromatid separation, securin	2.21
CKAP2L	cytoskeleton associated protein 2 like	2.2
TMEM150B	transmembrane protein 150B	2.2
C1orf112	chromosome 1 open reading frame 112	2.19
CDCA8	cell division cycle associated 8	2.19
ELFN2	extracellular leucine rich repeat and fibronectin type III domain containing 2	2.19
CICP3	capicua transcriptional repressor pseudogene 3	2.18
KRTAP5-6	keratin associated protein 5-6	2.18
RBM24	RNA binding motif protein 24	2.16
BP_21264C11		2.15
KIF2C	kinesin family member 2C	2.15
SLC16A11	solute carrier family 16 member 11	2.15
IHH	Indian hedgehog signaling molecule	2.14

LINC00504		2.14
CELSR3	cadherin EGF LAG seven-pass G-type receptor 3	2.13
FAM72C/FAM72D	family with sequence similarity 72 member D	2.13
NDC80	NDC80 kinetochore complex component	2.13
USH2A	usherin	2.13
DUXAP9	double homeobox A pseudogene 9	2.12
H3C6	H3 clustered histone 6	2.12
ACSM1	acyl-CoA synthetase medium chain family member 1	2.11
ERCC6L	ERCC excision repair 6 like, spindle assembly checkpoint helicase	2.11
FOXM1	forkhead box M1	2.11
MDK	midkine	2.11
MYBL2	MYB proto-oncogene like 2	2.1
C21orf58	chromosome 21 open reading frame 58	2.09
E2F8	E2F transcription factor 8	2.09
LINC02363	long intergenic non-protein coding RNA 2363	2.09
CDCA5	cell division cycle associated 5	2.07
CES3	carboxylesterase 3	2.07
DUXAP8	double homeobox A pseudogene 8	2.07
CFHR5	complement factor H related 5	2.06
DUXAP10	double homeobox A pseudogene 10	2.06
LINC01124	long intergenic non-protein coding RNA 1124	2.06
GBAP1	glucosylceramidase beta pseudogene 1	2.05
PHYHIPL	phytanoyl-CoA 2-hydroxylase interacting protein like	2.05
PRC1	protein regulator of cytokinesis 1	2.05
THBS4	thrombospondin 4	2.05
LAMA3	laminin subunit alpha 3	2.04
CRIP3	cysteine rich protein 3	2.03
CHRM3	cholinergic receptor muscarinic 3	2.02
RP11_412D94		2.02
HRAT92	heart tissue-associated transcript 92	2.01
NCAPG	non-SMC condensin I complex subunit G	2.01
ROBO1	roundabout guidance receptor 1	2.01
EXO1	exonuclease 1	2
GTSE1	G2 and S-phase expressed 1	2
COL5A3	collagen type V alpha 3 chain	1.98
TBX3	T-box transcription factor 3	1.98
BMP4	bone morphogenetic protein 4	1.97
CDCA2	cell division cycle associated 2	1.97
CENPI	centromere protein I	1.96
RP11_196G1823		1.96
AURKB	aurora kinase B	1.95
ZSWIM5	zinc finger SWIM-type containing 5	1.94
RP11_326C313		1.93
SAPCD2	suppressor APC domain containing 2	1.93
SQLE	squalene epoxidase	1.93
GDNF-AS1	GDNF antisense RNA 1	1.91
CAPN11	calpain 11	1.9
GABRE	gamma-aminobutyric acid type A receptor subunit epsilon	1.9
HRCT1	histidine rich carboxyl terminus 1	1.9
ZNF517	zinc finger protein 517	1.89
OLFML2A	olfactomedin like 2A	1.88
SLC26A6	solute carrier family 26 member 6	1.88
CCNB1	cyclin B1	1.87
SKIDA1	SKI/DACH domain containing 1	1.87
GREB1	growth regulating estrogen receptor binding 1	1.86
ITPKA	inositol-trisphosphate 3-kinase A	1.84
MAPT	microtubule associated protein tau	1.84

SNX18P12	sorting nexin 18 pseudogene 12	1.84
CDKN2C	cyclin dependent kinase inhibitor 2C	1.83
HCN3	hyperpolarization activated cyclic nucleotide gated potassium channel 3	1.83
SGO1	shugoshin 1	1.83
AC073111.5		1.81
CMB9-55F22.1		1.81
DTL	denticleless E3 ubiquitin protein ligase homolog	1.81
H4C15	H4 clustered histone 15	1.81
IQGAP3	IQ motif containing GTPase activating protein 3	1.81
LINC01719	long intergenic non-protein coding RNA 1719	1.81
LOC105373159		1.81
DLG5	discs large MAGUK scaffold protein 5	1.8
RP11_506K64		1.8
HNF1A-AS1	HNF1A antisense RNA 1	1.79
FAM72A	family with sequence similarity 72 member A	1.78
SEMA6C	semaphorin 6C	1.78
SLC30A10	solute carrier family 30 member 10	1.78
ZNF726	zinc finger protein 726	1.78
ABCC6P2	ATP binding cassette subfamily C member 6 pseudogene 2	1.77
FGF13	fibroblast growth factor 13	1.77
CLDN15	claudin 15	1.76
MND1	meiotic nuclear divisions 1	1.76
CCDC73	coiled-coil domain containing 73	1.75
TMPO-AS1	TMPO antisense RNA 1	1.75
C20orf204	chromosome 20 open reading frame 204	1.74
PARD6G-AS1	PARD6G antisense RNA 1	1.74
ACNATP	acyl-CoA:amino acid N-acyltransferase pseudogene	1.73
CEP55	centrosomal protein 55	1.73
EFNA4	ephrin A4	1.73
RP11_156E81		1.73
RUSC1-AS1	RUSC1 antisense RNA 1	1.73
ARHGAP11A	Rho GTPase activating protein 11A	1.72
ZMIZ1-AS1	ZMIZ1 antisense RNA 1	1.72
CDT1	chromatin licensing and DNA replication factor 1	1.71
CSMD2	CUB and Sushi multiple domains 2	1.71
RP1_80N23		1.71
RP1_80N24		1.71
BIRC5	baculoviral IAP repeat containing 5	1.7
EEF1A1P14	eukaryotic translation elongation factor 1 alpha 1 pseudogene 14	1.69
ELF3-AS1	ELF3 antisense RNA 1	1.69
TBX6	T-box transcription factor 6	1.69
ADM2	adrenomedullin 2	1.68
CCNA2	cyclin A2	1.68
LINC01239	long intergenic non-protein coding RNA 1239	1.68
PARPBP	PARP1 binding protein	1.68
SOWAHA	soosondawah ankyrin repeat domain family member A	1.68
H4C14	H4 clustered histone 14	1.67
IL27	interleukin 27	1.67
RACGAP1	Rac GTPase activating protein 1	1.67
RP11_392O172		1.67
ACTBP11	ACTB pseudogene 11	1.66
BCL9	BCL9 transcription coactivator	1.66
CTC_471F35		1.66
E2F1	E2F transcription factor 1	1.66
MAP10	microtubule associated protein 10	1.66
RP11-704M14.1		1.66
TM4SF19-AS1	TM4SF19 antisense RNA 1	1.66

RP11_651L53		1.65
H2BC20P	H2B clustered histone 20, pseudogene	1.64
KIF15	kinesin family member 15	1.64
KIF18A	kinesin family member 18A	1.64
ZBTB18	zinc finger and BTB domain containing 18	1.64
MBNL3	muscleblind like splicing regulator 3	1.63
RP11_690I212		1.63
RP11_35N66		1.62
DNMT3B	DNA methyltransferase 3 beta	1.61
PTOV1-AS1	PTOV1 antisense RNA 1	1.61
SATB2	SATB homeobox 2	1.61
ARL4AP3	ADP ribosylation factor like GTPase 4A pseudogene 3	1.6
CAPN8	calpain 8	1.6
KIF11	kinesin family member 11	1.6
SRGAP2D	SLIT-ROBO Rho GTPase activating protein 2D (pseudogene)	1.6
FAM189B	family with sequence similarity 189 member B	1.59
LINC01126	long intergenic non-protein coding RNA 1126	1.59
ZKSCAN3	zinc finger with KRAB and SCAN domains 3	1.59
ZNF572	zinc finger protein 572	1.59
BSN	bassoon presynaptic cytomatrix protein	1.58
H4C11	H4 clustered histone 11	1.58
CD2BP2-DT	CD2BP2 divergent transcript	1.57
ARHGEF39	Rho guanine nucleotide exchange factor 39	1.56
KAZALD1	Kazal type serine peptidase inhibitor domain 1	1.56
LL22NC03-N14H11.1		1.56
LOC171391	uncharacterized LOC171391	1.56
HJV	hemojuvelin BMP co-receptor	1.55
PDZK1P1	PDZ domain containing 1 pseudogene 1	1.55
LHX4	LIM homeobox 4	1.54
LOC100133286	uncharacterized LOC100133286	1.54
RAD54B	RAD54 homolog B	1.54
CCDC34	coiled-coil domain containing 34	1.53
FAM78B	family with sequence similarity 78 member B	1.53
FDPS	farnesyl diphosphate synthase	1.53
GNRHR2	gonadotropin releasing hormone receptor 2 (pseudogene)	1.53
POLQ	DNA polymerase theta	1.53
PRUNE1	prune exopolyphosphatase 1	1.53
PTGES3P2	prostaglandin E synthase 3 pseudogene 2	1.53
GBA	glucosylceramidase beta	1.52
NOX4	NADPH oxidase 4	1.52
RP11_1055B84		1.52
RP11_326C311		1.52
PDZK1	PDZ domain containing 1	1.51
SPATA46	spermatogenesis associated 46	1.51
AC1380353		1.5
GREB1L	GREB1 like retinoic acid receptor coactivator	1.5
LINC01138	long intergenic non-protein coding RNA 1138	1.5
AC0742125		1.49
DRC7	dynein regulatory complex subunit 7	1.49
LOC101930100	uncharacterized LOC101930100	1.49
RNF43	ring finger protein 43	1.49
SEPSECS-AS1	SEPSECS antisense RNA 1 (head to head)	1.49
ZBTB12	zinc finger and BTB domain containing 12	1.49
AC068831.7		1.48
CENPL	centromere protein L	1.48
RECQL4	RecQ like helicase 4	1.48
TCF19	transcription factor 19	1.48

CCNF	cyclin F	1.47
ESPL1	extra spindle pole bodies like 1, separase	1.47
KIF23	kinesin family member 23	1.47
MEX3A	mex-3 RNA binding family member A	1.47
NOS1AP	nitric oxide synthase 1 adaptor protein	1.47
PLK1	polo like kinase 1	1.47
PRR11	proline rich 11	1.47
SCML2	Scm polycomb group protein like 2	1.47
TP53I3	tumor protein p53 inducible protein 3	1.47
ZNF252P-AS1	ZNF252P antisense RNA 1	1.47
HES6	hes family bHLH transcription factor 6	1.46
PKDREJ	polycystin family receptor for egg jelly	1.46
TPX2	TPX2 microtubule nucleation factor	1.46
UHRF1	ubiquitin like with PHD and ring finger domains 1	1.46
CDCA3	cell division cycle associated 3	1.45
H2BC18	H2B clustered histone 18	1.45
ONECUT2	one cut homeobox 2	1.45
RP11_61J195		1.45
ASF1B	anti-silencing function 1B histone chaperone	1.44
C1orf226	chromosome 1 open reading frame 226	1.44
LAGE3	L antigen family member 3	1.44
LINC01285	long intergenic non-protein coding RNA 1285	1.44
BNIP1	BCL2 interacting protein like	1.43
BOLA1	bolA family member 1	1.43
LRRC45	leucine rich repeat containing 45	1.43
LYSMD1	LysM domain containing 1	1.43
TONSL	tonsoku like, DNA repair protein	1.43
APC2	APC regulator of WNT signaling pathway 2	1.42
ASB16	ankyrin repeat and SOCS box containing 16	1.42
DBP	D-box binding PAR bZIP transcription factor	1.42
EME1	essential meiotic structure-specific endonuclease 1	1.42
RABEPK	Rab9 effector protein with kelch motifs	1.42
RP11_798K32		1.42
RRM2	ribonucleotide reductase regulatory subunit M2	1.42
C1orf35	chromosome 1 open reading frame 35	1.41
CTA_315H112		1.41
OAZ3	ornithine decarboxylase antizyme 3	1.41
ZBED8	zinc finger BED-type containing 8	1.41
LOC155060	AI894139 pseudogene	1.4
LOC730101	uncharacterized LOC730101	1.4
OIP5	Opa interacting protein 5	1.4
SH3RF2	SH3 domain containing ring finger 2	1.4
STRIP2	striatin interacting protein 2	1.4
ZWINT	ZW10 interacting kinetochore protein	1.4
GINS1	GINS complex subunit 1	1.39
GP1R	G protein-coupled estrogen receptor 1	1.39
LOC100129484	uncharacterized LOC100129484	1.39
MSTO1	misato mitochondrial distribution and morphology regulator 1	1.39
RP11_295G202		1.39
CPLX1	complexin 1	1.38
EFHD1	EF-hand domain family member D1	1.38
HOXA-AS2	HOXA cluster antisense RNA 2	1.38
NCAPH	non-SMC condensin I complex subunit H	1.38
ZNF563	zinc finger protein 563	1.38
MANEAL	mannosidase endo-alpha like	1.37
SMO	smoothened, frizzled class receptor	1.37
TMEM79	transmembrane protein 79	1.37



FRS3	fibroblast growth factor receptor substrate 3	1.36
ZNF221	zinc finger protein 221	1.36
C5orf34	chromosome 5 open reading frame 34	1.35
HNRNPCP7	heterogeneous nuclear ribonucleoprotein C pseudogene 7	1.35
RP11_565P226		1.35
SAC3D1	SAC3 domain containing 1	1.35
SGO2	shugoshin 2	1.35
TARBP1	TAR (HIV-1) RNA binding protein 1	1.35
TDRKH	tudor and KH domain containing	1.35
TICRR	TOPBP1 interacting checkpoint and replication regulator	1.35
AC0921714		1.34
CILK1	ciliogenesis associated kinase 1	1.34
FOXRED2	FAD dependent oxidoreductase domain containing 2	1.34
GOLPH3L	golgi phosphoprotein 3 like	1.34
PSMD4	proteasome 26S subunit, non-ATPase 4	1.34
RP11_715J226		1.34
ZBED6	zinc finger BED-type containing 6	1.34
FOXD2	forkhead box D2	1.33
GPR137C	G protein-coupled receptor 137C	1.33
LOC101926967	uncharacterized LOC101926967	1.33
STXBP6	syntaxin binding protein 6	1.33
XRCC2	X-ray repair cross complementing 2	1.33
C19orf57	chromosome 19 open reading frame 57	1.32
LIN9	lin-9 DREAM MuvB core complex component	1.32
RNASEH2A	ribonuclease H2 subunit A	1.32
THOP1	thimet oligopeptidase 1	1.32
FLVCR1-DT	FLVCR1 divergent transcript	1.31
LINC01011	long intergenic non-protein coding RNA 1011	1.31
LINC01127	long intergenic non-protein coding RNA 1127	1.31
SLC29A1	solute carrier family 29 member 1 (Augustine blood group)	1.31
C5orf66	chromosome 5 open reading frame 66	1.3
KLHDC7B	kelch domain containing 7B	1.3
LINC02542	long intergenic non-protein coding RNA 2542	1.3
MSH5-SAPCD1	MSH5-SAPCD1 readthrough (NMD candidate)	1.3
MSTO2P	misato family member 2, pseudogene	1.3
NECAB3	N-terminal EF-hand calcium binding protein 3	1.3
RP3_406P245		1.3
ZNRD1ASP	zinc ribbon domain containing 1 antisense, pseudogene	1.3
CTB_52I24		1.29
FLVCR1	FLVCR heme transporter 1	1.29
HSPB1	heat shock protein family B (small) member 1	1.29
KIF24	kinesin family member 24	1.29
KLHDC9	kelch domain containing 9	1.29
LOC100507437	uncharacterized LOC100507437	1.29
RP3_402G1126		1.29
C1orf53	chromosome 1 open reading frame 53	1.28
CRYZL2P	crystallin zeta like 2, pseudogene	1.28
FIGNL1	fidgetin like 1	1.28
HASPIN	histone H3 associated protein kinase	1.28
LINC01144	long intergenic non-protein coding RNA 1144	1.28
MTBP	MDM2 binding protein	1.28
NBPF10 (includes others)	NBPF member 19	1.28
PPOX	protoporphyrinogen oxidase	1.28
RGS5	regulator of G protein signaling 5	1.28
RP11_223I101		1.28
RP11_5A195		1.28

U731662		1.28
EFNA3	ephrin A3	1.27
PCLAF	PCNA clamp associated factor	1.27
RP11-472I20.4		1.27
RP11_486G152		1.27
TRIP13	thyroid hormone receptor interactor 13	1.27
WBP2NL	WBP2 N-terminal like	1.27
ZBED3	zinc finger BED-type containing 3	1.27
CEL	carboxyl ester lipase	1.26
HELLPAR	HELLP associated long non-coding RNA	1.26
INCENP	inner centromere protein	1.26
LINC00638	long intergenic non-protein coding RNA 638	1.26
LINC02177	long intergenic non-protein coding RNA 2177	1.26
PRLR	prolactin receptor	1.26
SLCO1A2	solute carrier organic anion transporter family member 1A2	1.26
TLL7	tubulin tyrosine ligase like 7	1.26
ACP6	acid phosphatase 6, lysophosphatidic	1.25
EHMT2	euchromatic histone lysine methyltransferase 2	1.25
EZH2	enhancer of zeste 2 polycomb repressive complex 2 subunit	1.25
LINC00528	long intergenic non-protein coding RNA 528	1.25
RNF187	ring finger protein 187	1.25
RP11_1109F113		1.25
RP11_337C188		1.25
TRAIIP	TRAF interacting protein	1.25
CDH13	cadherin 13	1.24
DOC2GP	double C2 domain gamma, pseudogene	1.24
DTNA	dystrobrevin alpha	1.24
GOLGA2P5	GOLGA2 pseudogene 5	1.24
NUSAP1	nucleolar and spindle associated protein 1	1.24
PCDHB13	protocadherin beta 13	1.24
AC025171.1		1.23
CEBPA-DT	CEBPA divergent transcript	1.23
FSBP	fibrinogen silencer binding protein	1.23
GVQW3	GVQW motif containing 3	1.23
KLHL13	kelch like family member 13	1.23
MSH5	mutS homolog 5	1.23
PSPH	phosphoserine phosphatase	1.23
RP11_6024		1.23
SLC25A21-AS1	SLC25A21 antisense RNA 1	1.23
UBQLN4	ubiquilin 4	1.23
ATOX1	antioxidant 1 copper chaperone	1.22
CECR2	CECR2 histone acetyl-lysine reader	1.22
CTD_2287O165		1.22
EFNA2	ephrin A2	1.22
MCMDC2	minichromosome maintenance domain containing 2	1.22
RP11_600F247		1.22
SCN8A	sodium voltage-gated channel alpha subunit 8	1.22
AC0048626		1.21
DIPK1B	divergent protein kinase domain 1B	1.21
KNL1	kinetochore scaffold 1	1.21
MTR	5-methyltetrahydrofolate-homocysteine methyltransferase	1.21
NHLRC1	NHL repeat containing E3 ubiquitin protein ligase 1	1.21
RHBDL1	rhomboid like 1	1.21
RP11_20I204		1.21
ZNF337-AS1	ZNF337 antisense RNA 1	1.21
ZNF687	zinc finger protein 687	1.21
FBXL22	F-box and leucine rich repeat protein 22	1.2

PRAP1	proline rich acidic protein 1	1.2
C2orf16	chromosome 2 open reading frame 16	1.19
CDKN2B	cyclin dependent kinase inhibitor 2B	1.19
RAD51AP1	RAD51 associated protein 1	1.19
RP11_552F312		1.19
SKP2	S-phase kinase associated protein 2	1.19
STIL	STIL centriolar assembly protein	1.19
ABCD1	ATP binding cassette subfamily D member 1	1.18
ARHGEF11	Rho guanine nucleotide exchange factor 11	1.18
C1orf74	chromosome 1 open reading frame 74	1.18
LOC105376805		1.18
PRKAB2	protein kinase AMP-activated non-catalytic subunit beta 2	1.18
PRKAR2A-AS1	PRKAR2A antisense RNA 1	1.18
RP11_77P62		1.18
WHRN	whirlin	1.18
CGREF1	cell growth regulator with EF-hand domain 1	1.17
CLTCL1	clathrin heavy chain like 1	1.17
CTD-220118.1	uncharacterized LOC101929215	1.17
HSD17B7	hydroxysteroid 17-beta dehydrogenase 7	1.17
LINC02606	long intergenic non-protein coding RNA 2606	1.17
RP11_106M33		1.17
RP11_16N112		1.17
RP11_94C2413		1.17
STMN1	stathmin 1	1.17
CCDC163	coiled-coil domain containing 163	1.16
GLMP	glycosylated lysosomal membrane protein	1.16
GPAA1	glycosylphosphatidylinositol anchor attachment 1	1.16
MAD2L1	mitotic arrest deficient 2 like 1	1.16
PIGC	phosphatidylinositol glycan anchor biosynthesis class C	1.16
SCAMP3	secretory carrier membrane protein 3	1.16
SH3BP5L	SH3 binding domain protein 5 like	1.16
SMYD2	SET and MYND domain containing 2	1.16
TMEM169	transmembrane protein 169	1.16
CH17-340M24.3	uncharacterized protein BC009467	1.15
CKAP2	cytoskeleton associated protein 2	1.15
DPM3	dolichyl-phosphate mannosyltransferase subunit 3, regulatory	1.15
FLJ46284	uncharacterized LOC441369	1.15
GOLGA2P7	GOLGA2 pseudogene 7	1.15
RP11_399B171		1.15
TEDC2	tubulin epsilon and delta complex 2	1.15
ZNF775	zinc finger protein 775	1.15
ACBD6	acyl-CoA binding domain containing 6	1.14
CITF22_92A61		1.14
CTC_351M121		1.14
ECT2	epithelial cell transforming 2	1.14
EMC3-AS1	EMC3 antisense RNA 1	1.14
FAM53A	family with sequence similarity 53 member A	1.14
HNRNPA1P16	heterogeneous nuclear ribonucleoprotein A1 pseudogene 16	1.14
KRTCAP2	keratinocyte associated protein 2	1.14
PAQR9-AS1	PAQR9 antisense RNA 1	1.14
PGBD1	piggyBac transposable element derived 1	1.14
RP5_908M1410		1.14
SRRM2-AS1	SRRM2 antisense RNA 1	1.14
TBCE	tubulin folding cofactor E	1.14
TSSK6	testis specific serine kinase 6	1.14
ZBTB41	zinc finger and BTB domain containing 41	1.14
DCST2	DC-STAMP domain containing 2	1.13

LOC112267983	uncharacterized LOC112267983	1.13
LRRC14	leucine rich repeat containing 14	1.13
RP5_1136G132		1.13
TK1	thymidine kinase 1	1.13
UBQLN4P1	ubiquilin 4 pseudogene 1	1.13
VPS45	vacuolar protein sorting 45 homolog	1.13
ZNF280C	zinc finger protein 280C	1.13
AC0093032		1.12
CCDC142	coiled-coil domain containing 142	1.12
CDHR5	cadherin related family member 5	1.12
DUSP23	dual specificity phosphatase 23	1.12
LOC100288637	OTU deubiquitinase 7A pseudogene	1.12
RP11_378J188		1.12
SETDB1	SET domain bifurcated histone lysine methyltransferase 1	1.12
USP21	ubiquitin specific peptidase 21	1.12
ZNF497	zinc finger protein 497	1.12
ZNF503-AS2	ZNF503 antisense RNA 2	1.12
CEP152	centrosomal protein 152	1.11
CTB_25B1312		1.11
CTD_2517M2214		1.11
FHIT	fragile histidine triad diadenosine triphosphatase	1.11
GGH	gamma-glutamyl hydrolase	1.11
HAUS4	HAUS augmin like complex subunit 4	1.11
RP11_175P133		1.11
SCNM1	sodium channel modifier 1	1.11
TOMM40L	translocase of outer mitochondrial membrane 40 like	1.11
VPS72	vacuolar protein sorting 72 homolog	1.11
AKR1C3	aldo-keto reductase family 1 member C3	1.1
CNIH4	cornichon family AMPA receptor auxiliary protein 4	1.1
ERBB3	erb-b2 receptor tyrosine kinase 3	1.1
F8A1 (includes others)	coagulation factor VIII associated 1	1.1
FAM91A2P	protein FAM91A1-like	1.1
FGD1	FYVE, RhoGEF and PH domain containing 1	1.1
FTOP1	FTO pseudogene 1	1.1
LOC100129917	uncharacterized LOC100129917	1.1
LOC107985305		1.1
PAQR9	progesterin and adipoQ receptor family member 9	1.1
RP11_316M112		1.1
SOX13	SRY-box transcription factor 13	1.1
TMEM81	transmembrane protein 81	1.1
ZFP41	ZFP41 zinc finger protein	1.1
ANO8	anoctamin 8	1.09
ARHGAP11B	Rho GTPase activating protein 11B	1.09
C7orf25	chromosome 7 open reading frame 25	1.09
KMT2E-AS1	KMT2E antisense RNA 1	1.09
LAMTOR2	late endosomal/lysosomal adaptor, MAPK and MTOR activator 2	1.09
METTL18	methyltransferase like 18	1.09
PIGM	phosphatidylinositol glycan anchor biosynthesis class M	1.09
PPP1R3E	protein phosphatase 1 regulatory subunit 3E	1.09
RP3_508I159		1.09
SSR4P1	signal sequence receptor subunit 4 pseudogene 1	1.09
DNM3	dynamamin 3	1.08
EIF2AK3-DT	EIF2AK3 divergent transcript	1.08
EIF2D	eukaryotic translation initiation factor 2D	1.08
NUAK1	NUAK family kinase 1	1.08
PYGO2	pygopus family PHD finger 2	1.08
RP11_713M152		1.08

SLC10A5	solute carrier family 10 member 5	1.08
SLC22A23	solute carrier family 22 member 23	1.08
ANKRD13B	ankyrin repeat domain 13B	1.07
CALML6	calmodulin like 6	1.07
IFT81	intraflagellar transport 81	1.07
LBX2-AS1	LBX2 antisense RNA 1	1.07
LOC102724064	uncharacterized LOC102724064	1.07
PLA2G6	phospholipase A2 group VI	1.07
RP11_197N182		1.07
SLC16A1-AS1	SLC16A1 antisense RNA 1	1.07
SRGAP2	SLIT-ROBO Rho GTPase activating protein 2	1.07
TMC3-AS1	TMC3 antisense RNA 1	1.07
USP49	ubiquitin specific peptidase 49	1.07
ESCO2	establishment of sister chromatid cohesion N-acetyltransferase 2	1.06
HMGCS1	3-hydroxy-3-methylglutaryl-CoA synthase 1	1.06
HSF4	heat shock transcription factor 4	1.06
LNCTAM34A	long non coding transcriptional activator of miR34a	1.06
POGZ	pogo transposable element derived with ZNF domain	1.06
RP11_10N232		1.06
RP11_111M223		1.06
RP11_439E199		1.06
ZNF692	zinc finger protein 692	1.06
CFHR2	complement factor H related 2	1.05
CTD_2006H142		1.05
DAPK2	death associated protein kinase 2	1.05
FAM83H	family with sequence similarity 83 member H	1.05
FBXL18	F-box and leucine rich repeat protein 18	1.05
GLI4	GLI family zinc finger 4	1.05
LRRC20	leucine rich repeat containing 20	1.05
MBLAC1	metallo-beta-lactamase domain containing 1	1.05
NTN3	netrin 3	1.05
PIK3C2B	phosphatidylinositol-4-phosphate 3-kinase catalytic subunit type 2 beta	1.05
PLK4	polo like kinase 4	1.05
PXMP4	peroxisomal membrane protein 4	1.05
RP11_1415C144		1.05
RP11_30L154		1.05
RP11_45A174		1.05
SF3B4	splicing factor 3b subunit 4	1.05
SNX27	sorting nexin 27	1.05
TAZ	tafazzin	1.05
TSEN15	tRNA splicing endonuclease subunit 15	1.05
UBE2S	ubiquitin conjugating enzyme E2 S	1.05
ADCK5	aarF domain containing kinase 5	1.04
BCAT2	branched chain amino acid transaminase 2	1.04
CLK2	CDC like kinase 2	1.04
CSPG4P10	chondroitin sulfate proteoglycan 4 pseudogene 10	1.04
DPY19L1P1	DPY19L1 pseudogene 1	1.04
EBF3	EBF transcription factor 3	1.04
FBXL8	F-box and leucine rich repeat protein 8	1.04
LINC01515	long intergenic non-protein coding RNA 1515	1.04
RP11_797H71		1.04
SAPCD1	suppressor APC domain containing 1	1.04
UBAP2L	ubiquitin associated protein 2 like	1.04
ASPSCR1	ASPSCR1 tether for SLC2A4, UBX domain containing	1.03
IRF6	interferon regulatory factor 6	1.03
LOC644656	uncharacterized LOC644656	1.03
S100A10	S100 calcium binding protein A10	1.03

SUV39H1	suppressor of variegation 3-9 homolog 1	1.03
ANGEL2	angel homolog 2	1.02
CENPK	centromere protein K	1.02
CHAD	chondroadherin	1.02
EPHX1	epoxide hydrolase 1	1.02
GOLGA8K (includes others)	golgin A8 family member K	1.02
INTS3	integrator complex subunit 3	1.02
LOC100996842	uncharacterized LOC100996842	1.02
MINDY1	MINDY lysine 48 deubiquitinase 1	1.02
MRPL24	mitochondrial ribosomal protein L24	1.02
NENF	neudesin neurotrophic factor	1.02
OBI1-AS1	OBI1 antisense RNA 1	1.02
PEX11B	peroxisomal biogenesis factor 11 beta	1.02
RASAL2	RAS protein activator like 2	1.02
TNFSF4	TNF superfamily member 4	1.02
AC0936279		1.01
DEGS2	delta 4-desaturase, sphingolipid 2	1.01
DLL4	delta like canonical Notch ligand 4	1.01
DVL2	dishevelled segment polarity protein 2	1.01
KDM5B	lysine demethylase 5B	1.01
LINC01006	long intergenic non-protein coding RNA 1006	1.01
MAP2	microtubule associated protein 2	1.01
MICB	MHC class I polypeptide-related sequence B	1.01
P3H4	prolyl 3-hydroxylase family member 4 (inactive)	1.01
RP11_3471197		1.01
RP11_546D63		1.01
RPS6KL1	ribosomal protein S6 kinase like 1	1.01
KHDC4	KH domain containing 4, pre-mRNA splicing factor	1
LOC105371450	uncharacterized LOC105371450	1
CD3E	CD3e molecule	-1
FANCC	FA complementation group C	-1
GYPC	glycophorin C (Gerbich blood group)	-1
ITPRIPL1	ITPRIP like 1	-1
MSANTD4	Myb/SANT DNA binding domain containing 4 with coiled-coils	-1
WIPF1	WAS/WASL interacting protein family member 1	-1
AIF1	allograft inflammatory factor 1	-1.01
ASNS	asparagine synthetase (glutamine-hydrolyzing)	-1.01
CCDC183	coiled-coil domain containing 183	-1.01
CYP2J2	cytochrome P450 family 2 subfamily J member 2	-1.01
DENND2A	DENN domain containing 2A	-1.01
FMNL1	formin like 1	-1.01
GALNT6	polypeptide N-acetylgalactosaminyltransferase 6	-1.01
GPX3	glutathione peroxidase 3	-1.01
IL17RE	interleukin 17 receptor E	-1.01
JAK3	Janus kinase 3	-1.01
LDLR	low density lipoprotein receptor	-1.01
NFATC2	nuclear factor of activated T cells 2	-1.01
PLEK	pleckstrin	-1.01
PLSCR1	phospholipid scramblase 1	-1.01
RPP25	ribonuclease P and MRP subunit p25	-1.01
SLC20A1	solute carrier family 20 member 1	-1.01
ABR	ABR activator of RhoGEF and GTPase	-1.02
ADGRL2	adhesion G protein-coupled receptor L2	-1.02
ATG2A	autophagy related 2A	-1.02
BTBD19	BTB domain containing 19	-1.02
C11orf21	chromosome 11 open reading frame 21	-1.02

C21orf91	chromosome 21 open reading frame 91	-1.02
CASP4	caspase 4	-1.02
CCDC88B	coiled-coil domain containing 88B	-1.02
FGR	FGR proto-oncogene, Src family tyrosine kinase	-1.02
GAS6	growth arrest specific 6	-1.02
GBP1	guanylate binding protein 1	-1.02
HOOK1	hook microtubule tethering protein 1	-1.02
NCF4	neutrophil cytosolic factor 4	-1.02
NLGN2	neuroligin 2	-1.02
RYR1	ryanodine receptor 1	-1.02
SIRPB2	signal regulatory protein beta 2	-1.02
SLC24A4	solute carrier family 24 member 4	-1.02
SP140	SP140 nuclear body protein	-1.02
TLE3	TLE family member 3, transcriptional corepressor	-1.02
GCLM	glutamate-cysteine ligase modifier subunit	-1.03
HS3ST3B1	heparan sulfate-glucosamine 3-sulfotransferase 3B1	-1.03
LOC554249	uncharacterized LOC554249	-1.03
LST1	leukocyte specific transcript 1	-1.03
NTN4	netrin 4	-1.03
POU2F2	POU class 2 homeobox 2	-1.03
RAB27A	RAB27A, member RAS oncogene family	-1.03
SERPINB9P1	serpin family B member 9 pseudogene 1	-1.03
SYNM	synemin	-1.03
TMEM273	transmembrane protein 273	-1.03
JDP2	Jun dimerization protein 2	-1.04
KRT18	keratin 18	-1.04
LILRB4	leukocyte immunoglobulin like receptor B4	-1.04
MAT1A	methionine adenosyltransferase 1A	-1.04
PEAR1	platelet endothelial aggregation receptor 1	-1.04
PHLDB2	pleckstrin homology like domain family B member 2	-1.04
RP11_116D21		-1.04
RP11_463O125		-1.04
RP4_734G223		-1.04
TNFSF13	TNF superfamily member 13	-1.04
TPD52L1	TPD52 like 1	-1.04
TTC39C	tetratricopeptide repeat domain 39C	-1.04
UGT2A3	UDP glucuronosyltransferase family 2 member A3	-1.04
ZDHHC1	zinc finger DHHC-type containing 1	-1.04
ARHGAP25	Rho GTPase activating protein 25	-1.05
CARMIL1	capping protein regulator and myosin 1 linker 1	-1.05
DUSP14	dual specificity phosphatase 14	-1.05
IGFBP4	insulin like growth factor binding protein 4	-1.05
PARVG	parvin gamma	-1.05
RAC2	Rac family small GTPase 2	-1.05
SLC35G1	solute carrier family 35 member G1	-1.05
TLE4	TLE family member 4, transcriptional corepressor	-1.05
ANGPTL4	angiopoietin like 4	-1.06
CDC37L1	cell division cycle 37 like 1	-1.06
GDA	guanine deaminase	-1.06
GJC3	gap junction protein gamma 3	-1.06
GNB4	G protein subunit beta 4	-1.06
HIC1	HIC ZBTB transcriptional repressor 1	-1.06
LDHAP4	lactate dehydrogenase A pseudogene 4	-1.06
LRG1	leucine rich alpha-2-glycoprotein 1	-1.06
MARVELD1	MARVEL domain containing 1	-1.06
NAALAD2	N-acetylated alpha-linked acidic dipeptidase 2	-1.06
PLEKHA4	pleckstrin homology domain containing A4	-1.06

SYTL1	synaptotagmin like 1	-1.06
TYROBP	transmembrane immune signaling adaptor TYROBP	-1.06
ZNF430	zinc finger protein 430	-1.06
C3AR1	complement C3a receptor 1	-1.07
GLIDR	glioblastoma down-regulated RNA	-1.07
HAVCR2	hepatitis A virus cellular receptor 2	-1.07
IFT57	intraflagellar transport 57	-1.07
LDHA	lactate dehydrogenase A	-1.07
LGI4	leucine rich repeat LGI family member 4	-1.07
LINC01123	long intergenic non-protein coding RNA 1123	-1.07
LONRF1	LON peptidase N-terminal domain and ring finger 1	-1.07
MAFK	MAF bZIP transcription factor K	-1.07
MYO1E	myosin IE	-1.07
RNASE6	ribonuclease A family member k6	-1.07
SIGLEC1	sialic acid binding Ig like lectin 1	-1.07
SPRY4	sprouty RTK signaling antagonist 4	-1.07
THSD4	thrombospondin type 1 domain containing 4	-1.07
TLR4	toll like receptor 4	-1.07
TUBA1A	tubulin alpha 1a	-1.07
ARAP2	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 2	-1.08
CPED1	cadherin like and PC-esterase domain containing 1	-1.08
DLC1	DLC1 Rho GTPase activating protein	-1.08
DNALI1	dynein axonemal light intermediate chain 1	-1.08
DOC2A	double C2 domain alpha	-1.08
ELF4	E74 like ETS transcription factor 4	-1.08
FCHSD1	FCH and double SH3 domains 1	-1.08
FRMD6	FERM domain containing 6	-1.08
FZD8	frizzled class receptor 8	-1.08
GPRC5B	G protein-coupled receptor class C group 5 member B	-1.08
LILRB3	leukocyte immunoglobulin like receptor B3	-1.08
MT-ND6	NADH dehydrogenase, subunit 6 (complex I)	-1.08
SDC3	syndecan 3	-1.08
STING1	stimulator of interferon response cGAMP interactor 1	-1.08
TMEM51	transmembrane protein 51	-1.08
TNFRSF10A-AS1		-1.08
WEE1	WEE1 G2 checkpoint kinase	-1.08
CA13	carbonic anhydrase 13	-1.09
CHSY1	chondroitin sulfate synthase 1	-1.09
CXorf21	chromosome X open reading frame 21	-1.09
DCHS1	dachsous cadherin-related 1	-1.09
FCER1G	Fc fragment of IgE receptor Ig	-1.09
FOLR2	folate receptor beta	-1.09
GATA6	GATA binding protein 6	-1.09
KRT8P3	keratin 8 pseudogene 3	-1.09
LCA5	lebercilin LCA5	-1.09
OSBPL5	oxysterol binding protein like 5	-1.09
PARP8	poly(ADP-ribose) polymerase family member 8	-1.09
SELENOW	selenoprotein W	-1.09
TEX14	testis expressed 14, intercellular bridge forming factor	-1.09
TNFRSF10A	TNF receptor superfamily member 10a	-1.09
TPK1	thiamin pyrophosphokinase 1	-1.09
ZEB2	zinc finger E-box binding homeobox 2	-1.09
CD55	CD55 molecule (Cromer blood group)	-1.1
DDR2	discoidin domain receptor tyrosine kinase 2	-1.1
DGKA	diacylglycerol kinase alpha	-1.1
EVA1C	eva-1 homolog C	-1.1
GK	glycerol kinase	-1.1



LILRA6	leukocyte immunoglobulin like receptor A6	-1.1
LIMCH1	LIM and calponin homology domains 1	-1.1
LRRC25	leucine rich repeat containing 25	-1.1
TSPAN12	tetraspanin 12	-1.1
ANTXR2	ANTXR cell adhesion molecule 2	-1.11
BTK	Bruton tyrosine kinase	-1.11
CCDC38	coiled-coil domain containing 38	-1.11
CD72	CD72 molecule	-1.11
CHST7	carbohydrate sulfotransferase 7	-1.11
CRYM	crystallin mu	-1.11
FLRT3	fibronectin leucine rich transmembrane protein 3	-1.11
GFAP	glial fibrillary acidic protein	-1.11
IL2RB	interleukin 2 receptor subunit beta	-1.11
JUN	Jun proto-oncogene, AP-1 transcription factor subunit	-1.11
KDM6B	lysine demethylase 6B	-1.11
KRT8	keratin 8	-1.11
LAPTM5	lysosomal protein transmembrane 5	-1.11
LINC00987	long intergenic non-protein coding RNA 987	-1.11
PIK3CD	phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit delta	-1.11
PTGS1	prostaglandin-endoperoxide synthase 1	-1.11
RCAN1	regulator of calcineurin 1	-1.11
SEMA6D	semaphorin 6D	-1.11
TMEM47	transmembrane protein 47	-1.11
VENTX	VENT homeobox	-1.11
ADGRG1	adhesion G protein-coupled receptor G1	-1.12
ARMCX6	armadillo repeat containing X-linked 6	-1.12
DENND2D	DENN domain containing 2D	-1.12
GALC	galactosylceramidase	-1.12
GLYATL1	glycine-N-acyltransferase like 1	-1.12
GPRASP1	G protein-coupled receptor associated sorting protein 1	-1.12
ID2	inhibitor of DNA binding 2	-1.12
KLF2	Kruppel like factor 2	-1.12
KLF6	Kruppel like factor 6	-1.12
KLRC4-KLRK1/KLRK1	killer cell lectin like receptor K1	-1.12
KRT8P45	keratin 8 pseudogene 45	-1.12
PIM2	Pim-2 proto-oncogene, serine/threonine kinase	-1.12
RP11_171I22		-1.12
STAB1	stabilin 1	-1.12
BCL11B	BAF chromatin remodeling complex subunit BCL11B	-1.13
ERRF1	ERBB receptor feedback inhibitor 1	-1.13
KDM8	lysine demethylase 8	-1.13
LONRF2	LON peptidase N-terminal domain and ring finger 2	-1.13
PTAFR	platelet activating factor receptor	-1.13
ARHGAP9	Rho GTPase activating protein 9	-1.14
DPEP2	dipeptidase 2	-1.14
HHIPL1	HHIP like 1	-1.14
HLA-DRB1	major histocompatibility complex, class II, DR beta 1	-1.14
ITPRIP	inositol 1,4,5-trisphosphate receptor interacting protein	-1.14
MCOLN2	mucolipin 2	-1.14
PIM3	Pim-3 proto-oncogene, serine/threonine kinase	-1.14
RP3_453C1214		-1.14
S100A4	S100 calcium binding protein A4	-1.14
SEPTIN1	septin 1	-1.14
ZNF506	zinc finger protein 506	-1.14
ADM	adrenomedullin	-1.15
BEAN1	brain expressed associated with NEDD4 1	-1.15
CCL14	C-C motif chemokine ligand 14	-1.15

CLEC10A	C-type lectin domain containing 10A	-1.15
FYB1	FYN binding protein 1	-1.15
GMFG	glia maturation factor gamma	-1.15
HERC5	HECT and RLD domain containing E3 ubiquitin protein ligase 5	-1.15
HLA-DPA1	major histocompatibility complex, class II, DP alpha 1	-1.15
LEAP2	liver enriched antimicrobial peptide 2	-1.15
MEAK7	MTOR associated protein, eak-7 homolog	-1.15
NCKAP1L	NCK associated protein 1 like	-1.15
PEMT	phosphatidylethanolamine N-methyltransferase	-1.15
PPP1R3D	protein phosphatase 1 regulatory subunit 3D	-1.15
SFMBT2	Scm like with four mbt domains 2	-1.15
TECTA	tectorin alpha	-1.15
TRABD2B	TraB domain containing 2B	-1.15
VSIR	V-set immunoregulatory receptor	-1.15
AK4	adenylate kinase 4	-1.16
ARHGEF26	Rho guanine nucleotide exchange factor 26	-1.16
BIN2	bridging integrator 2	-1.16
CD7	CD7 molecule	-1.16
CHIC1	cysteine rich hydrophobic domain 1	-1.16
FCGR3A/FCGR3B	Fc fragment of IgG receptor IIIa	-1.16
FES	FES proto-oncogene, tyrosine kinase	-1.16
HRH2	histamine receptor H2	-1.16
LETM2	leucine zipper and EF-hand containing transmembrane protein 2	-1.16
PRDM1	PR/SET domain 1	-1.16
RASSF2	Ras association domain family member 2	-1.16
ZNF549	zinc finger protein 549	-1.16
ACSBG1	acyl-CoA synthetase bubblegum family member 1	-1.17
CAB39L	calcium binding protein 39 like	-1.17
CCDC3	coiled-coil domain containing 3	-1.17
CD83	CD83 molecule	-1.17
GCSAM	germinal center associated signaling and motility	-1.17
HLA-DRA	major histocompatibility complex, class II, DR alpha	-1.17
IL4R	interleukin 4 receptor	-1.17
MS4A4A	membrane spanning 4-domains A4A	-1.17
NKX3-1	NK3 homeobox 1	-1.17
NXPE3	neurexophilin and PC-esterase domain family member 3	-1.17
RASGRP4	RAS guanyl releasing protein 4	-1.17
RIPK3	receptor interacting serine/threonine kinase 3	-1.17
ZNF462	zinc finger protein 462	-1.17
ZNF630	zinc finger protein 630	-1.17
CCL5	C-C motif chemokine ligand 5	-1.18
LPIN2	lipin 2	-1.18
NFIL3	nuclear factor, interleukin 3 regulated	-1.18
RAB31	RAB31, member RAS oncogene family	-1.18
RP1_232L22_B1		-1.18
SEMA6A	semaphorin 6A	-1.18
SLC7A8	solute carrier family 7 member 8	-1.18
SPRY2	sprouty RTK signaling antagonist 2	-1.18
SULT1A1	sulfotransferase family 1A member 1	-1.18
TMC6	transmembrane channel like 6	-1.18
VPS37B	VPS37B subunit of ESCRT-I	-1.18
AMD1	adenosylmethionine decarboxylase 1	-1.19
APBA1	amyloid beta precursor protein binding family A member 1	-1.19
C1QA	complement C1q A chain	-1.19
CD274	CD274 molecule	-1.19
CD53	CD53 molecule	-1.19
CYBB	cytochrome b-245 beta chain	-1.19

HCK	HCK proto-oncogene, Src family tyrosine kinase	-1.19
HLA-DQA1	major histocompatibility complex, class II, DQ alpha 1	-1.19
LOC100506585	uncharacterized LOC100506585	-1.19
OXCT1	3-oxoacid CoA-transferase 1	-1.19
PHC1P1	polyhomeotic homolog 1 pseudogene 1	-1.19
SH3BGRL	SH3 domain binding glutamate rich protein like	-1.19
SLC17A3	solute carrier family 17 member 3	-1.19
VAV1	vav guanine nucleotide exchange factor 1	-1.19
AC016831.7		-1.2
CALHM6	calcium homeostasis modulator family member 6	-1.2
CD27	CD27 molecule	-1.2
COL9A3	collagen type IX alpha 3 chain	-1.2
CYP2C9	cytochrome P450 family 2 subfamily C member 9	-1.2
DOCK2	dedicator of cytokinesis 2	-1.2
GCA	grancalcin	-1.2
GPSM3	G protein signaling modulator 3	-1.2
HLA-DPB1	major histocompatibility complex, class II, DP beta 1	-1.2
IL10RA	interleukin 10 receptor subunit alpha	-1.2
MASP1	mannan binding lectin serine peptidase 1	-1.2
PDCD1LG2	programmed cell death 1 ligand 2	-1.2
PHETA2	PH domain containing endocytic trafficking adaptor 2	-1.2
PLCG2	phospholipase C gamma 2	-1.2
RP11_750H95		-1.2
SELPLG	selectin P ligand	-1.2
STK31	serine/threonine kinase 31	-1.2
TIPARP	TCDD inducible poly(ADP-ribose) polymerase	-1.2
TRIM22	tripartite motif containing 22	-1.2
CCNJ	cyclin J	-1.21
DYNC2H1	dynein cytoplasmic 2 heavy chain 1	-1.21
FUZ	fuzzy planar cell polarity protein	-1.21
GAREM1	GRB2 associated regulator of MAPK1 subtype 1	-1.21
KLF7	Kruppel like factor 7	-1.21
LCP2	lymphocyte cytosolic protein 2	-1.21
LOC101927668	uncharacterized LOC101927668	-1.21
LY86	lymphocyte antigen 86	-1.21
NCF1C	neutrophil cytosolic factor 1C pseudogene	-1.21
RGS18	regulator of G protein signaling 18	-1.21
RHOH	ras homolog family member H	-1.21
TMC8	transmembrane channel like 8	-1.21
TMEM139	transmembrane protein 139	-1.21
BEGAIN	brain enriched guanylate kinase associated	-1.22
CARD11	caspase recruitment domain family member 11	-1.22
ITGA3	integrin subunit alpha 3	-1.22
ITGA4	integrin subunit alpha 4	-1.22
LINC00865	long intergenic non-protein coding RNA 865	-1.22
LINC02037	long intergenic non-protein coding RNA 2037	-1.22
LRRK1	leucine rich repeat kinase 1	-1.22
MTND6P4		-1.22
MYO1F	myosin IF	-1.22
PPP1R3B	protein phosphatase 1 regulatory subunit 3B	-1.22
SDC4	syndecan 4	-1.22
SLC27A2	solute carrier family 27 member 2	-1.22
SPOCK2	SPARC (osteonectin), cwcv and kazal like domains proteoglycan 2	-1.22
STK17B	serine/threonine kinase 17b	-1.22
TENT5A	terminal nucleotidyltransferase 5A	-1.22
TIMP2	TIMP metalloproteinase inhibitor 2	-1.22
TTN	titin	-1.22

USP2	ubiquitin specific peptidase 2	-1.22
ABCA8	ATP binding cassette subfamily A member 8	-1.23
ARID5A	AT-rich interaction domain 5A	-1.23
C1QC	complement C1q C chain	-1.23
CDC42EP2	CDC42 effector protein 2	-1.23
CPM	carboxypeptidase M	-1.23
GNA15	G protein subunit alpha 15	-1.23
KCNK6	potassium two pore domain channel subfamily K member 6	-1.23
LDHB	lactate dehydrogenase B	-1.23
PNRC1	proline rich nuclear receptor coactivator 1	-1.23
SLFNL1	schlafen like 1	-1.23
SRPX2	sushi repeat containing protein X-linked 2	-1.23
TNFRSF1B	TNF receptor superfamily member 1B	-1.23
B3GALT4	beta-1,3-galactosyltransferase 4	-1.24
CARMIL2	capping protein regulator and myosin 1 linker 2	-1.24
CCL3	C-C motif chemokine ligand 3	-1.24
CD244	CD244 molecule	-1.24
CD6	CD6 molecule	-1.24
CHST9	carbohydrate sulfotransferase 9	-1.24
HCG11	HLA complex group 11	-1.24
IKZF3	IKAROS family zinc finger 3	-1.24
LAT2	linker for activation of T cells family member 2	-1.24
LY75	lymphocyte antigen 75	-1.24
NMUR1	neuromedin U receptor 1	-1.24
ADGRE5	adhesion G protein-coupled receptor E5	-1.25
AHSG	alpha 2-HS glycoprotein	-1.25
ARHGAP10	Rho GTPase activating protein 10	-1.25
BHLHE40	basic helix-loop-helix family member e40	-1.25
CDKN1C	cyclin dependent kinase inhibitor 1C	-1.25
CELF2	CUGBP Elav-like family member 2	-1.25
DAB1	DAB adaptor protein 1	-1.25
DOCK10	dedicator of cytokinesis 10	-1.25
HPS5	HPS5 biogenesis of lysosomal organelles complex 2 subunit 2	-1.25
HSPA4L	heat shock protein family A (Hsp70) member 4 like	-1.25
NLRC4	NLR family CARD domain containing 4	-1.25
ORM1	orosomuroid 1	-1.25
POLR1E	RNA polymerase I subunit E	-1.25
RP11-186B7.4		-1.25
SLC16A4	solute carrier family 16 member 4	-1.25
SLC25A36	solute carrier family 25 member 36	-1.25
TNRC6C-AS1		-1.25
ATP2A3	ATPase sarcoplasmic/endoplasmic reticulum Ca <sup>2+</sup> transporting 3	-1.26
C8B	complement C8 beta chain	-1.26
CDKN1A	cyclin dependent kinase inhibitor 1A	-1.26
FETUB	fetuin B	-1.26
FGA	fibrinogen alpha chain	-1.26
FNDC4	fibronectin type III domain containing 4	-1.26
IKZF1	IKAROS family zinc finger 1	-1.26
MPEG1	macrophage expressed 1	-1.26
PLXNB3	plexin B3	-1.26
PPIEL	peptidylprolyl isomerase E like pseudogene	-1.26
RAB3IL1	RAB3A interacting protein like 1	-1.26
RASGEF1B	RasGEF domain family member 1B	-1.26
SERPINA3	serpin family A member 3	-1.26
SIGLEC9	sialic acid binding Ig like lectin 9	-1.26
C1QB	complement C1q B chain	-1.27
C1R	complement C1r	-1.27

CD14	CD14 molecule	-1.27
CD8A	CD8a molecule	-1.27
CHRM3-AS2	CHRM3 antisense RNA 2	-1.27
CSF2RB	colony stimulating factor 2 receptor subunit beta	-1.27
CST7	cystatin F	-1.27
ENTPD8	ectonucleoside triphosphate diphosphohydrolase 8	-1.27
HCLS1	hematopoietic cell-specific Lyn substrate 1	-1.27
KIAA0408	KIAA0408	-1.27
MGAT3	beta-1,4-mannosyl-glycoprotein 4-beta-N-acetylglucosaminyltransferase	-1.27
NAALADL2	N-acetylated alpha-linked acidic dipeptidase like 2	-1.27
PWAR5	Prader Willi/Angelman region RNA 5	-1.27
RARG	retinoic acid receptor gamma	-1.27
RSPH4A	radial spoke head component 4A	-1.27
SERP2	stress associated endoplasmic reticulum protein family member 2	-1.27
STMN3	stathmin 3	-1.27
AGPAT2	1-acylglycerol-3-phosphate O-acyltransferase 2	-1.28
CD48	CD48 molecule	-1.28
EGFR-AS1	EGFR antisense RNA 1	-1.28
GABARAPL1	GABA type A receptor associated protein like 1	-1.28
GP1BA	glycoprotein Ib platelet subunit alpha	-1.28
MAP2K3	mitogen-activated protein kinase kinase 3	-1.28
MBNL2	muscleblind like splicing regulator 2	-1.28
NDRG2	NDRG family member 2	-1.28
PPP1R16B	protein phosphatase 1 regulatory subunit 16B	-1.28
RASGRP1	RAS guanyl releasing protein 1	-1.28
RTL8B	retrotransposon Gag like 8B	-1.28
SEMA4D	semaphorin 4D	-1.28
SYK	spleen associated tyrosine kinase	-1.28
TF	transferrin	-1.28
USP51	ubiquitin specific peptidase 51	-1.28
ANXA4	annexin A4	-1.29
CYP4A22	cytochrome P450 family 4 subfamily A member 22	-1.29
FCGBP	Fc fragment of IgG binding protein	-1.29
ID3	inhibitor of DNA binding 3, HLH protein	-1.29
SLC25A15	solute carrier family 25 member 15	-1.29
UGT1A1	UDP glucuronosyltransferase family 1 member A1	-1.29
WTIP	WT1 interacting protein	-1.29
AKAP7	A-kinase anchoring protein 7	-1.3
ALDH1B1	aldehyde dehydrogenase 1 family member B1	-1.3
BDH2	3-hydroxybutyrate dehydrogenase 2	-1.3
CTBP2	C-terminal binding protein 2	-1.3
CTD_2562J176		-1.3
KCNQ1	potassium voltage-gated channel subfamily Q member 1	-1.3
NOVA1	NOVA alternative splicing regulator 1	-1.3
RIPK4	receptor interacting serine/threonine kinase 4	-1.3
S1PR3	sphingosine-1-phosphate receptor 3	-1.3
TNFSF13B	TNF superfamily member 13b	-1.3
ZNF287	zinc finger protein 287	-1.3
AMIGO2	adhesion molecule with Ig like domain 2	-1.31
CD180	CD180 molecule	-1.31
IPCEF1	interaction protein for cytohesin exchange factors 1	-1.31
PDE1B	phosphodiesterase 1B	-1.31
PDE4D	phosphodiesterase 4D	-1.31
PTPN22	protein tyrosine phosphatase non-receptor type 22	-1.31
SLC38A2	solute carrier family 38 member 2	-1.31
CD8B	CD8b molecule	-1.32
CUBN	cubilin	-1.32

DIO1	iodothyronine deiodinase 1	-1.32
HPSE	heparanase	-1.32
ISYNA1	inositol-3-phosphate synthase 1	-1.32
MBOAT2	membrane bound O-acyltransferase domain containing 2	-1.32
NFKBIZ	NFKB inhibitor zeta	-1.32
S1PR4	sphingosine-1-phosphate receptor 4	-1.32
SLCO1B1	solute carrier organic anion transporter family member 1B1	-1.32
SMAD9	SMAD family member 9	-1.32
SYNE1	spectrin repeat containing nuclear envelope protein 1	-1.32
TSPAN11	tetraspanin 11	-1.32
XDH	xanthine dehydrogenase	-1.32
ATP8B4	ATPase phospholipid transporting 8B4 (putative)	-1.33
CD79B	CD79b molecule	-1.33
CD96	CD96 molecule	-1.33
FAM229B	family with sequence similarity 229 member B	-1.33
GNG2	G protein subunit gamma 2	-1.33
LPAR5	lysophosphatidic acid receptor 5	-1.33
NCF1	neutrophil cytosolic factor 1	-1.33
PRAM1	PML-RARA regulated adaptor molecule 1	-1.33
SDR42E1	short chain dehydrogenase/reductase family 42E, member 1	-1.33
SLA2	Src like adaptor 2	-1.33
SLFN11	schlafen family member 11	-1.33
SPATA6L	spermatogenesis associated 6 like	-1.33
TES	testin LIM domain protein	-1.33
ZNF702P	zinc finger protein 702, pseudogene	-1.33
ACSL1	acyl-CoA synthetase long chain family member 1	-1.34
CERKL	ceramide kinase like	-1.34
DNAJA4	DnaJ heat shock protein family (Hsp40) member A4	-1.34
FEZ1	fasciculation and elongation protein zeta 1	-1.34
GRAMD1C	GRAM domain containing 1C	-1.34
IL15RA	interleukin 15 receptor subunit alpha	-1.34
KYNU	kynureninase	-1.34
OSBPL10	oxysterol binding protein like 10	-1.34
PDE4A	phosphodiesterase 4A	-1.34
RAB27B	RAB27B, member RAS oncogene family	-1.34
SLAMF7	SLAM family member 7	-1.34
TUBE1	tubulin epsilon 1	-1.34
UPP1	uridine phosphorylase 1	-1.34
AIM2	absent in melanoma 2	-1.35
AKR7A3	aldo-keto reductase family 7 member A3	-1.35
ALPL	alkaline phosphatase, biomineralization associated	-1.35
CCDC71L	coiled-coil domain containing 71 like	-1.35
CD5	CD5 molecule	-1.35
CYP4A11	cytochrome P450 family 4 subfamily A member 11	-1.35
EBI3	Epstein-Barr virus induced 3	-1.35
EVI2B	ecotropic viral integration site 2B	-1.35
GLDCP1	glycine decarboxylase pseudogene 1	-1.35
HK3	hexokinase 3	-1.35
INTS6L	integrator complex subunit 6 like	-1.35
KCNAB3	potassium voltage-gated channel subfamily A regulatory beta subunit 3	-1.35
MEFV	MEFV innate immunity regulator, pyrin	-1.35
PCP4L1	Purkinje cell protein 4 like 1	-1.35
PIWIL4	piwi like RNA-mediated gene silencing 4	-1.35
RAPGEF5	Rap guanine nucleotide exchange factor 5	-1.35
RNF125	ring finger protein 125	-1.35
RP11_823E83		-1.35
UGCG	UDP-glucose ceramide glucosyltransferase	-1.35

ULK2	unc-51 like autophagy activating kinase 2	-1.35
ADSS1	adenylosuccinate synthase 1	-1.36
C8orf31	chromosome 8 open reading frame 31	-1.36
CROCC2	ciliary rootlet coiled-coil, rootletin family member 2	-1.36
DAPP1	dual adaptor of phosphotyrosine and 3-phosphoinositides 1	-1.36
KLHL6	kelch like family member 6	-1.36
LBP	lipopolysaccharide binding protein	-1.36
PDE2A	phosphodiesterase 2A	-1.36
PIP4P2	phosphatidylinositol-4,5-bisphosphate 4-phosphatase 2	-1.36
AQP3	aquaporin 3 (Gill blood group)	-1.37
CBARP	CACN subunit beta associated regulatory protein	-1.37
CD226	CD226 molecule	-1.37
CD300C	CD300c molecule	-1.37
CDHR1	cadherin related family member 1	-1.37
FUT3	fucosyltransferase 3 (Lewis blood group)	-1.37
PGM5	phosphoglucomutase 5	-1.37
PPARGC1A	PPARG coactivator 1 alpha	-1.37
RASA3	RAS p21 protein activator 3	-1.37
SLAMF6	SLAM family member 6	-1.37
SLC16A5	solute carrier family 16 member 5	-1.37
SLC25A24	solute carrier family 25 member 24	-1.37
STON1	stonin 1	-1.37
TAF4B	TATA-box binding protein associated factor 4b	-1.37
TAMALIN	trafficking regulator and scaffold protein tamalin	-1.37
WDFY3-AS2	WDFY3 antisense RNA 2	-1.37
ASL	argininosuccinate lyase	-1.38
CCR1	C-C motif chemokine receptor 1	-1.38
CCR7	C-C motif chemokine receptor 7	-1.38
CD22	CD22 molecule	-1.38
EPOP	elongin BC and polycomb repressive complex 2 associated protein	-1.38
GPR180	G protein-coupled receptor 180	-1.38
IL1RAP	interleukin 1 receptor accessory protein	-1.38
KIAA0040	KIAA0040	-1.38
MAN1C1	mannosidase alpha class 1C member 1	-1.38
PDE4B	phosphodiesterase 4B	-1.38
PLPP3	phospholipid phosphatase 3	-1.38
PON3	paraoxonase 3	-1.38
RASSF6	Ras association domain family member 6	-1.38
STEAP3	STEAP3 metalloredutase	-1.38
ADGRG6	adhesion G protein-coupled receptor G6	-1.39
ANGPTL3	angiopoietin like 3	-1.39
APBA2	amyloid beta precursor protein binding family A member 2	-1.39
CFD	complement factor D	-1.39
FPR3	formyl peptide receptor 3	-1.39
HNF1B	HNF1 homeobox B	-1.39
KIF26A	kinesin family member 26A	-1.39
KLRB1	killer cell lectin like receptor B1	-1.39
PTPRC	protein tyrosine phosphatase receptor type C	-1.39
RGS1	regulator of G protein signaling 1	-1.39
RP11_250B26		-1.39
RP5_1086K131		-1.39
SH2D2A	SH2 domain containing 2A	-1.39
SLC9A9	solute carrier family 9 member A9	-1.39
SPIRE1	spire type actin nucleation factor 1	-1.39
TOR4A	torsin family 4 member A	-1.39
AOAH	acyloxyacyl hydrolase	-1.4
CH507_42P116		-1.4

CYBA	cytochrome b-245 alpha chain	-1.4
EMB	embigin	-1.4
EVI2A	ecotropic viral integration site 2A	-1.4
GATA3	GATA binding protein 3	-1.4
LINC01237	long intergenic non-protein coding RNA 1237	-1.4
ORM2	orosomuroid 2	-1.4
P2RY1	purinergic receptor P2Y1	-1.4
PIK3R5	phosphoinositide-3-kinase regulatory subunit 5	-1.4
PPP2R3A	protein phosphatase 2 regulatory subunit B"alpha	-1.4
RP11_1094M148		-1.4
SMIM6	small integral membrane protein 6	-1.4
CXCR2P1	C-X-C motif chemokine receptor 2 pseudogene 1	-1.41
FGD3	FYVE, RhoGEF and PH domain containing 3	-1.41
GPC1	glypican 1	-1.41
MAGEH1	MAGE family member H1	-1.41
MTHFD2	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 2, methenyltetrahydrofolate cyclohydrolase	-1.41
PLTP	phospholipid transfer protein	-1.41
RANBP17	RAN binding protein 17	-1.41
SLC28A1	solute carrier family 28 member 1	-1.41
TBXAS1	thromboxane A synthase 1	-1.41
AGAP6 (includes others)	ArfGAP with GTPase domain, ankyrin repeat and PH domain 4	-1.42
AKAP12	A-kinase anchoring protein 12	-1.42
AZGP1	alpha-2-glycoprotein 1, zinc-binding	-1.42
CASS4	Cas scaffold protein family member 4	-1.42
CLEC7A	C-type lectin domain containing 7A	-1.42
CNRIP1	cannabinoid receptor interacting protein 1	-1.42
FUT4	fucosyltransferase 4	-1.42
GALNT14	polypeptide N-acetylgalactosaminyltransferase 14	-1.42
INHBE	inhibin subunit beta E	-1.42
JUNB	JunB proto-oncogene, AP-1 transcription factor subunit	-1.42
LILRB1	leukocyte immunoglobulin like receptor B1	-1.42
LINC01934	long intergenic non-protein coding RNA 1934	-1.42
NCF1B	neutrophil cytosolic factor 1B pseudogene	-1.42
NIPAL1	NIPA like domain containing 1	-1.42
RERG	RAS like estrogen regulated growth inhibitor	-1.42
SCNN1A	sodium channel epithelial 1 subunit alpha	-1.42
TIGIT	T cell immunoreceptor with Ig and ITIM domains	-1.42
TNIK	TRAF2 and NCK interacting kinase	-1.42
UNC5C	unc-5 netrin receptor C	-1.42
ARHGEF26-AS1	ARHGEF26 antisense RNA 1	-1.43
CSF1R	colony stimulating factor 1 receptor	-1.43
CSF2RA	colony stimulating factor 2 receptor subunit alpha	-1.43
CSF2RA	colony stimulating factor 2 receptor subunit alpha	-1.43
DPYSL3	dihydropyrimidinase like 3	-1.43
KIF12	kinesin family member 12	-1.43
MMP23A	matrix metalloproteinase 23A (pseudogene)	-1.43
PLBD1	phospholipase B domain containing 1	-1.43
PRRG2	proline rich and Gla domain 2	-1.43
RP11_329N153		-1.43
SLC7A7	solute carrier family 7 member 7	-1.43
SMIM3	small integral membrane protein 3	-1.43
ANO9	anoctamin 9	-1.44
APOA1	apolipoprotein A1	-1.44
BCRP3	BCR pseudogene 3	-1.44
CLEC11A	C-type lectin domain containing 11A	-1.44



CLEC12A	C-type lectin domain family 12 member A	-1.44
FZD1	frizzled class receptor 1	-1.44
HP	haptoglobin	-1.44
LINC-PINT	long intergenic non-protein coding RNA, p53 induced transcript	-1.44
LINC00472	long intergenic non-protein coding RNA 472	-1.44
PNP	purine nucleoside phosphorylase	-1.44
RND1	Rho family GTPase 1	-1.44
RNF152	ring finger protein 152	-1.44
RP1_47M233		-1.44
SYNPO2	synaptopodin 2	-1.44
TMEM159	transmembrane protein 159	-1.44
C1orf162	chromosome 1 open reading frame 162	-1.45
CASC19	cancer susceptibility 19	-1.45
ERBB2	erb-b2 receptor tyrosine kinase 2	-1.45
GDF15	growth differentiation factor 15	-1.45
GLDC	glycine decarboxylase	-1.45
KIRREL1	kirre like nephrin family adhesion molecule 1	-1.45
LGALS3BP	galectin 3 binding protein	-1.45
LILRB2	leukocyte immunoglobulin like receptor B2	-1.45
SLFN12	schlafen family member 12	-1.45
SUSD2	sushi domain containing 2	-1.45
ZC3H12A	zinc finger CCCH-type containing 12A	-1.45
ZNF415	zinc finger protein 415	-1.45
ALB	albumin	-1.46
ATP1B2	ATPase Na <sup>+</sup> /K <sup>+</sup> transporting subunit beta 2	-1.46
CORO2B	coronin 2B	-1.46
FOXO1	forkhead box O1	-1.46
GALNT16	polypeptide N-acetylgalactosaminyltransferase 16	-1.46
HMOX1	heme oxygenase 1	-1.46
MRC2	mannose receptor C type 2	-1.46
ODF2L	outer dense fiber of sperm tails 2 like	-1.46
PRKCB	protein kinase C beta	-1.46
PROCR	protein C receptor	-1.46
UGT2B10	UDP glucuronosyltransferase family 2 member B10	-1.46
ZFP28	ZFP28 zinc finger protein	-1.46
ZNF90	zinc finger protein 90	-1.46
EPB41L3	erythrocyte membrane protein band 4.1 like 3	-1.47
GPR132	G protein-coupled receptor 132	-1.47
GUCY1A1	guanylate cyclase 1 soluble subunit alpha 1	-1.47
KLHDC7A	kelch domain containing 7A	-1.47
NFKBID	NFKB inhibitor delta	-1.47
PCDHGB6	protocadherin gamma subfamily B, 6	-1.47
RAP1GAP	RAP1 GTPase activating protein	-1.47
ETS2	ETS proto-oncogene 2, transcription factor	-1.48
MS4A6A	membrane spanning 4-domains A6A	-1.48
PCDH18	protocadherin 18	-1.48
PPP1R15A	protein phosphatase 1 regulatory subunit 15A	-1.48
SIDT1	SID1 transmembrane family member 1	-1.48
SMPD3	sphingomyelin phosphodiesterase 3	-1.48
STAT4	signal transducer and activator of transcription 4	-1.48
ARSJ	arylsulfatase family member J	-1.49
BASP1	brain abundant membrane attached signal protein 1	-1.49
BEX4	brain expressed X-linked 4	-1.49
CLEC4F	C-type lectin domain family 4 member F	-1.49
FMN1	formin 1	-1.49
LINC01197	long intergenic non-protein coding RNA 1197	-1.49
MST1R	macrophage stimulating 1 receptor	-1.49

PDGFD	platelet derived growth factor D	-1.49
PLAAT3	phospholipase A and acyltransferase 3	-1.49
PLG	plasminogen	-1.49
PRKX	protein kinase X-linked	-1.49
PROZ	protein Z, vitamin K dependent plasma glycoprotein	-1.49
SIGLEC7	sialic acid binding Ig like lectin 7	-1.49
TINAGL1	tubulointerstitial nephritis antigen like 1	-1.49
ADCY5	adenylate cyclase 5	-1.5
ANXA1	annexin A1	-1.5
CEP126	centrosomal protein 126	-1.5
COL4A4	collagen type IV alpha 4 chain	-1.5
GRAMD4	GRAM domain containing 4	-1.5
HLA-DOA	major histocompatibility complex, class II, DO alpha	-1.5
PAPPA	pappalysin 1	-1.5
PFKP	phosphofructokinase, platelet	-1.5
SMIM38	small integral membrane protein 38	-1.5
SPNS2	sphingolipid transporter 2	-1.5
STAC	SH3 and cysteine rich domain	-1.5
TMED3	transmembrane p24 trafficking protein 3	-1.5
C1orf210	chromosome 1 open reading frame 210	-1.51
CD300A	CD300a molecule	-1.51
CPAMD8	C3 and PZP like alpha-2-macroglobulin domain containing 8	-1.51
FCRL3	Fc receptor like 3	-1.51
ISG20	interferon stimulated exonuclease gene 20	-1.51
LINC02762	long intergenic non-protein coding RNA 2762	-1.51
MS4A7	membrane spanning 4-domains A7	-1.51
PRICKLE2	prickle planar cell polarity protein 2	-1.51
RAB34	RAB34, member RAS oncogene family	-1.51
SDSL	serine dehydratase like	-1.51
SOCS2-AS1	SOCS2 antisense RNA 1	-1.51
TAT	tyrosine aminotransferase	-1.51
TNFSF8	TNF superfamily member 8	-1.51
DUSP6	dual specificity phosphatase 6	-1.52
EYS	eyes shut homolog	-1.52
HENMT1	HEN methyltransferase 1	-1.52
NCOA7	nuclear receptor coactivator 7	-1.52
RASGEF1A	RasGEF domain family member 1A	-1.52
SH2D3A	SH2 domain containing 3A	-1.52
SLC8A1	solute carrier family 8 member A1	-1.52
ALDH8A1	aldehyde dehydrogenase 8 family member A1	-1.53
CDH1	cadherin 1	-1.53
DSE	dermatan sulfate epimerase	-1.53
FLT3	fms related receptor tyrosine kinase 3	-1.53
LINC01238	long intergenic non-protein coding RNA 1238	-1.53
MSR1	macrophage scavenger receptor 1	-1.53
PAIP2B	poly(A) binding protein interacting protein 2B	-1.53
RP11_168K113		-1.53
RP11_747H73		-1.53
TC2N	tandem C2 domains, nuclear	-1.53
TLR2	toll like receptor 2	-1.53
TRIB1	tribbles pseudokinase 1	-1.53
ADGRE4P	adhesion G protein-coupled receptor E4, pseudogene	-1.54
ARNTL2	aryl hydrocarbon receptor nuclear translocator like 2	-1.54
CSRNP3	cysteine and serine rich nuclear protein 3	-1.54
DLG2	discs large MAGUK scaffold protein 2	-1.54
PHLDA1	pleckstrin homology like domain family A member 1	-1.54
S100A6	S100 calcium binding protein A6	-1.54

SGCB	sarcoglycan beta	-1.54
SLC49A3	solute carrier family 49 member 3	-1.54
TMEM217	transmembrane protein 217	-1.54
UNC13D	unc-13 homolog D	-1.54
ZNF469	zinc finger protein 469	-1.54
ZSCAN18	zinc finger and SCAN domain containing 18	-1.54
ADIRF-AS1	ADIRF antisense RNA 1	-1.55
AF1312152		-1.55
ARRB1	arrestin beta 1	-1.55
CYGB	cytoglobin	-1.55
FAM99B	family with sequence similarity 99 member B	-1.55
FBLN5	fibulin 5	-1.55
IRF8	interferon regulatory factor 8	-1.55
LEPR	leptin receptor	-1.55
P2RY13	purinergic receptor P2Y13	-1.55
PNMA8B	PNMA family member 8B	-1.55
TMPRSS2	transmembrane serine protease 2	-1.55
TRAT1	T cell receptor associated transmembrane adaptor 1	-1.55
AC0076203		-1.56
ESR1	estrogen receptor 1	-1.56
FGG	fibrinogen gamma chain	-1.56
GSTZ1	glutathione S-transferase zeta 1	-1.56
NAMPTP1	nicotinamide phosphoribosyltransferase pseudogene 1	-1.56
NAP1L3	nucleosome assembly protein 1 like 3	-1.56
PLD1	phospholipase D1	-1.56
RGS9	regulator of G protein signaling 9	-1.56
SLA	Src like adaptor	-1.56
SPACA6	sperm acrosome associated 6	-1.56
TUBB6	tubulin beta 6 class V	-1.56
UBASH3B	ubiquitin associated and SH3 domain containing B	-1.56
WASF3	WASP family member 3	-1.56
ZNF518B	zinc finger protein 518B	-1.56
ADRA2B	adrenoceptor alpha 2B	-1.57
LCAT	lecithin-cholesterol acyltransferase	-1.57
MCC	MCC regulator of WNT signaling pathway	-1.57
PCDHGA10	protocadherin gamma subfamily A, 10	-1.57
PTGER2	prostaglandin E receptor 2	-1.57
ARL4C	ADP ribosylation factor like GTPase 4C	-1.58
ARMH4	armadillo like helical domain containing 4	-1.58
DUSP1	dual specificity phosphatase 1	-1.58
IFI16	interferon gamma inducible protein 16	-1.58
KCNE1	potassium voltage-gated channel subfamily E regulatory subunit 1	-1.58
KCNJ10	potassium inwardly rectifying channel subfamily J member 10	-1.58
MS4A4E	membrane spanning 4-domains A4E	-1.58
NDN	necdin, MAGE family member	-1.58
PDZD4	PDZ domain containing 4	-1.58
CBFA2T3	CBFA2/RUNX1 partner transcriptional co-repressor 3	-1.59
CLIP4	CAP-Gly domain containing linker protein family member 4	-1.59
KLF10	Kruppel like factor 10	-1.59
PLIN2	perilipin 2	-1.59
PRNP	prion protein	-1.59
RASL11A	RAS like family 11 member A	-1.59
RTL6	retrotransposon Gag like 6	-1.59
SLC4A4	solute carrier family 4 member 4	-1.59
STOM	stomatin	-1.59
ADGRE2	adhesion G protein-coupled receptor E2	-1.6
CHST3	carbohydrate sulfotransferase 3	-1.6

EHD3	EH domain containing 3	-1.6
FHL2	four and a half LIM domains 2	-1.6
IL2RA	interleukin 2 receptor subunit alpha	-1.6
IRAK3	interleukin 1 receptor associated kinase 3	-1.6
SIGLEC10	sialic acid binding Ig like lectin 10	-1.6
ACSM3	acyl-CoA synthetase medium chain family member 3	-1.61
CD86	CD86 molecule	-1.61
CYP2C8	cytochrome P450 family 2 subfamily C member 8	-1.61
GPR65	G protein-coupled receptor 65	-1.61
KCNK5	potassium two pore domain channel subfamily K member 5	-1.61
LRR4	leucine rich repeat containing 4	-1.61
ARMCX2	armadillo repeat containing X-linked 2	-1.62
DZIP1	DAZ interacting zinc finger protein 1	-1.62
ITM2C	integral membrane protein 2C	-1.62
LINC01702	long intergenic non-protein coding RNA 1702	-1.62
NAMPT	nicotinamide phosphoribosyltransferase	-1.62
UGT2B27P	UDP glucuronosyltransferase family 2 member B27, pseudogene	-1.62
CCL4	C-C motif chemokine ligand 4	-1.63
CCL4L1/CCL4L2	C-C motif chemokine ligand 4 like 1	-1.63
FAM107A	family with sequence similarity 107 member A	-1.63
GADD45B	growth arrest and DNA damage inducible beta	-1.63
GZMK	granzyme K	-1.63
IL18R1	interleukin 18 receptor 1	-1.63
MRO	maestro	-1.63
RNF122	ring finger protein 122	-1.63
RP11_588K222		-1.63
SH2D1A	SH2 domain containing 1A	-1.63
TCAF2	TRPM8 channel associated factor 2	-1.63
C16orf54	chromosome 16 open reading frame 54	-1.64
IL21R	interleukin 21 receptor	-1.64
LINC00313	long intergenic non-protein coding RNA 313	-1.64
MYZAP	myocardial zonula adherens protein	-1.64
PRKCQ	protein kinase C theta	-1.64
THEMIS2	thymocyte selection associated family member 2	-1.64
AMDHD1	amidohydrolase domain containing 1	-1.65
CA3	carbonic anhydrase 3	-1.65
CD38	CD38 molecule	-1.65
CD4	CD4 molecule	-1.65
CTD_2114J121		-1.65
FOXF1	forkhead box F1	-1.65
HOGA1	4-hydroxy-2-oxoglutarate aldolase 1	-1.65
ITK	IL2 inducible T cell kinase	-1.65
LILRA1	leukocyte immunoglobulin like receptor A1	-1.65
LILRB5	leukocyte immunoglobulin like receptor B5	-1.65
LOC100506388	uncharacterized LOC100506388	-1.65
P3H3	prolyl 3-hydroxylase 3	-1.65
RP11_253E33		-1.65
TNXB	tenascin XB	-1.65
ATF3	activating transcription factor 3	-1.66
C8A	complement C8 alpha chain	-1.66
FCGR1B	Fc fragment of IgG receptor 1b	-1.66
IGF1R	insulin like growth factor 1 receptor	-1.66
LTBP4	latent transforming growth factor beta binding protein 4	-1.66
RAB20	RAB20, member RAS oncogene family	-1.66
RUNX3	RUNX family transcription factor 3	-1.66
AGTR1	angiotensin II receptor type 1	-1.67
ARID3C	AT-rich interaction domain 3C	-1.67

CACNA2D1	calcium voltage-gated channel auxiliary subunit alpha2delta 1	-1.67
CYBRD1	cytochrome b reductase 1	-1.67
HDAC9	histone deacetylase 9	-1.67
LRAT	lecithin retinol acyltransferase	-1.67
NAV2	neuron navigator 2	-1.67
PLA2G5	phospholipase A2 group V	-1.67
PLSCR4	phospholipid scramblase 4	-1.67
SIGLEC8	sialic acid binding Ig like lectin 8	-1.67
SLC18A2	solute carrier family 18 member A2	-1.67
SV2B	synaptic vesicle glycoprotein 2B	-1.67
CREB5	cAMP responsive element binding protein 5	-1.68
LINC00924	long intergenic non-protein coding RNA 924	-1.68
MIAT	myocardial infarction associated transcript	-1.68
MIP	major intrinsic protein of lens fiber	-1.68
NAPSB	napsin B aspartic peptidase, pseudogene	-1.68
NFASC	neurofascin	-1.68
SLC7A5	solute carrier family 7 member 5	-1.68
TCHH	trichohyalin	-1.68
TRNP1	TMF1 regulated nuclear protein 1	-1.68
UGT1A10 (includes others)	UDP glucuronosyltransferase family 1 member A9	-1.68
ALDOB	aldolase, fructose-bisphosphate B	-1.69
F9	coagulation factor IX	-1.69
FUT6	fucosyltransferase 6	-1.69
GOT1	glutamic-oxaloacetic transaminase 1	-1.69
GRAMD1B	GRAM domain containing 1B	-1.69
LARP6	La ribonucleoprotein 6, translational regulator	-1.69
MYADM	myeloid associated differentiation marker	-1.69
SELL	selectin L	-1.69
SIGLEC11	sialic acid binding Ig like lectin 11	-1.69
SLC39A5	solute carrier family 39 member 5	-1.69
TKFC	triokinase and FMN cyclase	-1.69
TM4SF1	transmembrane 4 L six family member 1	-1.69
ZNF888	zinc finger protein 888	-1.69
CILP	cartilage intermediate layer protein	-1.7
EIF4E3	eukaryotic translation initiation factor 4E family member 3	-1.7
IER5L	immediate early response 5 like	-1.7
LAX1	lymphocyte transmembrane adaptor 1	-1.7
NCR3LG1	natural killer cell cytotoxicity receptor 3 ligand 1	-1.7
SERHL2	serine hydrolase like 2	-1.7
TRIM15	tripartite motif containing 15	-1.7
ALOX5	arachidonate 5-lipoxygenase	-1.71
ARHGAP15	Rho GTPase activating protein 15	-1.71
ARHGEF16	Rho guanine nucleotide exchange factor 16	-1.71
KCNA3	potassium voltage-gated channel subfamily A member 3	-1.71
LINC00598	long intergenic non-protein coding RNA 598	-1.71
MTCL1	microtubule crosslinking factor 1	-1.71
SEL1L3	SEL1L family member 3	-1.71
TNFRSF10D	TNF receptor superfamily member 10d	-1.71
ZNF160	zinc finger protein 160	-1.71
ZNF439	zinc finger protein 439	-1.71
ZNF827	zinc finger protein 827	-1.71
BST1	bone marrow stromal cell antigen 1	-1.72
CXCR4	C-X-C motif chemokine receptor 4	-1.72
DSG2	desmoglein 2	-1.72
FCN1	ficolin 1	-1.72
LOC101927751	uncharacterized LOC101927751	-1.72

LOC400867	uncharacterized LOC400867	-1.72
LY9	lymphocyte antigen 9	-1.72
PRR26	proline rich 26	-1.72
PTPRN2	protein tyrosine phosphatase receptor type N2	-1.72
RNF165	ring finger protein 165	-1.72
RP11_96D16		-1.72
TGFB3	transforming growth factor beta 3	-1.72
BHLHE41	basic helix-loop-helix family member e41	-1.73
DLG3	discs large MAGUK scaffold protein 3	-1.73
EMP1	epithelial membrane protein 1	-1.73
FGL2	fibrinogen like 2	-1.73
GSTP1	glutathione S-transferase pi 1	-1.73
MEIS3P1	Meis homeobox 3 pseudogene 1	-1.73
PLK3	polo like kinase 3	-1.73
SEMA4A	semaphorin 4A	-1.73
ZNF331	zinc finger protein 331	-1.73
ZNF470	zinc finger protein 470	-1.73
ALDH1A3	aldehyde dehydrogenase 1 family member A3	-1.74
CTH	cystathionine gamma-lyase	-1.74
DGCR5	DiGeorge syndrome critical region gene 5	-1.74
PCDHGB7	protocadherin gamma subfamily B, 7	-1.74
PLEKHH2	pleckstrin homology, MyTH4 and FERM domain containing H2	-1.74
SCRN1	secernin 1	-1.74
SIGLEC14	sialic acid binding Ig like lectin 14	-1.74
SLC11A1	solute carrier family 11 member 1	-1.74
SLC35F2	solute carrier family 35 member F2	-1.74
SLC4A3	solute carrier family 4 member 3	-1.74
TGM2	transglutaminase 2	-1.74
ZNF347	zinc finger protein 347	-1.74
ZNF816	zinc finger protein 816	-1.74
ZNF853	zinc finger protein 853	-1.74
CLCF1	cardiotrophin like cytokine factor 1	-1.75
CLRN3	clarin 3	-1.75
CP	ceruloplasmin	-1.75
JHY	junctional cadherin complex regulator	-1.75
PELATON	plaque enriched lncRNA in atherosclerotic and inflammatory bowel macrophage regulation	-1.75
PLA2G4A	phospholipase A2 group IVA	-1.75
RGPD4 (includes others)	RANBP2 like and GRIP domain containing 5	-1.75
SLC2A3	solute carrier family 2 member 3	-1.75
WDR17	WD repeat domain 17	-1.75
ZBP1	Z-DNA binding protein 1	-1.75
ZFPM2	zinc finger protein, FOG family member 2	-1.75
ZNF471	zinc finger protein 471	-1.75
GLIS3	GLIS family zinc finger 3	-1.76
IGLON5	IgLON family member 5	-1.76
SCIMP	SLP adaptor and CSK interacting membrane protein	-1.76
SGPP2	sphingosine-1-phosphate phosphatase 2	-1.76
SOCS2	suppressor of cytokine signaling 2	-1.76
SSC5D	scavenger receptor cysteine rich family member with 5 domains	-1.76
ZNF831	zinc finger protein 831	-1.76
ADAMTS2	ADAM metallopeptidase with thrombospondin type 1 motif 2	-1.77
ARMCX3	armadillo repeat containing X-linked 3	-1.77
COL9A2	collagen type IX alpha 2 chain	-1.77
DEFB1	defensin beta 1	-1.77
ENDOD1	endonuclease domain containing 1	-1.77

ERMN	ermin	-1.77
GPR162	G protein-coupled receptor 162	-1.77
IGLV6-57	immunoglobulin lambda variable 6-57	-1.77
RP11_295K31		-1.77
ZKSCAN7	zinc finger with KRAB and SCAN domains 7	-1.77
CAMK4	calcium/calmodulin dependent protein kinase IV	-1.78
CD69	CD69 molecule	-1.78
ELMO3	engulfment and cell motility 3	-1.78
GHR	growth hormone receptor	-1.78
LXN	latexin	-1.78
PPP1R1C	protein phosphatase 1 regulatory inhibitor subunit 1C	-1.78
RP11_93B149		-1.78
SERTAD1	SERTA domain containing 1	-1.78
FCMR	Fc fragment of IgM receptor	-1.79
GYS2	glycogen synthase 2	-1.79
HBEGF	heparin binding EGF like growth factor	-1.79
IL18RAP	interleukin 18 receptor accessory protein	-1.79
MIR22HG	MIR22 host gene	-1.79
AATK	apoptosis associated tyrosine kinase	-1.8
DPF3	double PHD fingers 3	-1.8
EGR2	early growth response 2	-1.8
ETNPPL	ethanolamine-phosphate phospho-lyase	-1.8
EZR	ezrin	-1.8
GPR182	G protein-coupled receptor 182	-1.8
MIR223HG	MIR223 host gene	-1.8
NELL2	neural EGFL like 2	-1.8
NKD2	NKD inhibitor of WNT signaling pathway 2	-1.8
PDE9A	phosphodiesterase 9A	-1.8
RP11-284N8.3		-1.8
SH3YL1	SH3 and SYLF domain containing 1	-1.8
SKAP1	src kinase associated phosphoprotein 1	-1.8
TNFRSF10C	TNF receptor superfamily member 10c	-1.8
HSPB6	heat shock protein family B (small) member 6	-1.81
AQP4	aquaporin 4	-1.82
B3GNT7	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 7	-1.82
HSH2D	hematopoietic SH2 domain containing	-1.82
SLIT2	slit guidance ligand 2	-1.82
SNRPN	small nuclear ribonucleoprotein polypeptide N	-1.82
TLR10	toll like receptor 10	-1.82
VMO1	vitelline membrane outer layer 1 homolog	-1.82
CCDC198	coiled-coil domain containing 198	-1.83
EPHB6	EPH receptor B6	-1.83
FXSD1	FXSD domain containing ion transport regulator 1	-1.83
GAPT	GRB2 binding adaptor protein, transmembrane	-1.83
GCH1	GTP cyclohydrolase 1	-1.83
SLC1A1	solute carrier family 1 member 1	-1.83
WFDC1	WAP four-disulfide core domain 1	-1.83
WNT4	Wnt family member 4	-1.83
ABLIM3	actin binding LIM protein family member 3	-1.84
C3orf14	chromosome 3 open reading frame 14	-1.84
CCDC68	coiled-coil domain containing 68	-1.84
MAFF	MAF bZIP transcription factor F	-1.84
MBL2	mannose binding lectin 2	-1.84
PLD4	phospholipase D family member 4	-1.84
RP1_239B225		-1.84
SLC7A1	solute carrier family 7 member 1	-1.84
ARNT2	aryl hydrocarbon receptor nuclear translocator 2	-1.85

SMIM10L2A	small integral membrane protein 10 like 2A	-1.85
TTYH1	tweety family member 1	-1.85
FCHO1	FCH and mu domain containing endocytic adaptor 1	-1.86
GBA3	glucosylceramidase beta 3 (gene/pseudogene)	-1.86
MPC1	mitochondrial pyruvate carrier 1	-1.86
PADI2	peptidyl arginine deiminase 2	-1.86
SLC13A2	solute carrier family 13 member 2	-1.86
TAGAP	T cell activation RhoGTPase activating protein	-1.86
ZNF204P	zinc finger protein 204, pseudogene	-1.86
CAMK2B	calcium/calmodulin dependent protein kinase II beta	-1.87
NCKAP5	NCK associated protein 5	-1.87
PRKCQ-AS1	PRKCQ antisense RNA 1	-1.87
DOK6	docking protein 6	-1.88
FABP1	fatty acid binding protein 1	-1.88
FAM99A	family with sequence similarity 99 member A	-1.88
MNDA	myeloid cell nuclear differentiation antigen	-1.88
PDE1A	phosphodiesterase 1A	-1.88
RP11_203J248		-1.88
RSPH1	radial spoke head component 1	-1.88
UGT2B7	UDP glucuronosyltransferase family 2 member B7	-1.88
AL1616685		-1.89
ELAPOR2	endosome-lysosome associated apoptosis and autophagy regulator family member 2	-1.89
AZGP1P1	AZGP1 pseudogene 1	-1.9
C5AR1	complement C5a receptor 1	-1.9
CYTIP	cytohesin 1 interacting protein	-1.9
IL18	interleukin 18	-1.9
LINC02593	long intergenic non-protein coding RNA 2593	-1.9
P2RX5	purinergic receptor P2X 5	-1.9
P2RY10	P2Y receptor family member 10	-1.9
PRAMEF10	PRAME family member 10	-1.9
SYTL5	synaptotagmin like 5	-1.9
TBXA2R	thromboxane A2 receptor	-1.9
TMEM156	transmembrane protein 156	-1.9
CSF3R	colony stimulating factor 3 receptor	-1.91
FGB	fibrinogen beta chain	-1.91
NPHP4	nephrocystin 4	-1.91
RGS11	regulator of G protein signaling 11	-1.91
SSTR2	somatostatin receptor 2	-1.91
CXCL3	C-X-C motif chemokine ligand 3	-1.92
DUSP2	dual specificity phosphatase 2	-1.92
FAM110C	family with sequence similarity 110 member C	-1.92
HSD17B2	hydroxysteroid 17-beta dehydrogenase 2	-1.92
RP5-117110.5		-1.92
TCAF2P1	TRPM8 channel associated factor 2 pseudogene 1	-1.92
TPPP2	tubulin polymerization promoting protein family member 2	-1.92
DOCK8	dedicator of cytokinesis 8	-1.93
EDNRB	endothelin receptor type B	-1.93
LOC105375153		-1.93
MXRA5	matrix remodeling associated 5	-1.93
PLA2R1	phospholipase A2 receptor 1	-1.93
SERPINA11	serpin family A member 11	-1.93
SPART	spartin	-1.93
AKR1D1	aldo-keto reductase family 1 member D1	-1.94
RP11_90L18		-1.94
TENT5C	terminal nucleotidyltransferase 5C	-1.94
USP43	ubiquitin specific peptidase 43	-1.94
DIRAS3	DIRAS family GTPase 3	-1.95



DTHD1	death domain containing 1	-1.95
GSPT2	G1 to S phase transition 2	-1.95
PTGIR	prostaglandin I2 receptor	-1.95
STX11	syntaxin 11	-1.95
ZNF711	zinc finger protein 711	-1.95
ALOX5AP	arachidonate 5-lipoxygenase activating protein	-1.96
BMP6	bone morphogenetic protein 6	-1.96
GREM2	gremlin 2, DAN family BMP antagonist	-1.96
OIT3	oncoprotein induced transcript 3	-1.96
RARB	retinoic acid receptor beta	-1.96
RNF150	ring finger protein 150	-1.96
CLDN4	claudin 4	-1.97
MRC1	mannose receptor C-type 1	-1.97
NLGN4X	neuroligin 4 X-linked	-1.97
SLC19A3	solute carrier family 19 member 3	-1.97
SPATA6	spermatogenesis associated 6	-1.97
TTLL2	tubulin tyrosine ligase like 2	-1.97
VANGL2	VANGL planar cell polarity protein 2	-1.97
ZNF239	zinc finger protein 239	-1.97
ASPN	asporin	-1.98
BGN	biglycan	-1.98
EMILIN1	elastin microfibril interfacer 1	-1.98
EPB41L4A	erythrocyte membrane protein band 4.1 like 4A	-1.98
LDOC1	LDOC1 regulator of NFkB signaling	-1.98
NFAM1	NFAT activating protein with ITAM motif 1	-1.98
RGS16	regulator of G protein signaling 16	-1.98
TTC36	tetratricopeptide repeat domain 36	-1.98
ADAP1	ArfGAP with dual PH domains 1	-1.99
CSRNP1	cysteine and serine rich nuclear protein 1	-1.99
FAM135B	family with sequence similarity 135 member B	-1.99
GPR171	G protein-coupled receptor 171	-1.99
LPAL2	lipoprotein(a) like 2, pseudogene	-1.99
MGLL	monoglyceride lipase	-1.99
POM121L9P	POM121 transmembrane nucleoporin like 9, pseudogene	-1.99
RANBP3L	RAN binding protein 3 like	-1.99
RBMS3	RNA binding motif single stranded interacting protein 3	-1.99
SAMSN1	SAM domain, SH3 domain and nuclear localization signals 1	-1.99
SNHG14		-1.99
TCTEX1D1	Tctex1 domain containing 1	-1.99
APOBEC3C	apolipoprotein B mRNA editing enzyme catalytic subunit 3C	-2
BHLHE22	basic helix-loop-helix family member e22	-2
CKMT2	creatine kinase, mitochondrial 2	-2
CLEC4E	C-type lectin domain family 4 member E	-2
CYP2A6 (includes others)	cytochrome P450 family 2 subfamily A member 6	-2
GPRIN3	GPRIN family member 3	-2
KAZN	kazrin, periplakin interacting protein	-2
METRNL	meteorin like, glial cell differentiation regulator	-2
PLA2G2D	phospholipase A2 group IID	-2
RUBCNL	rubicon like autophagy enhancer	-2
SCN11A	sodium voltage-gated channel alpha subunit 11	-2
SNURF	SNRPN upstream reading frame	-2
VSIG4	V-set and immunoglobulin domain containing 4	-2
OSMR	oncostatin M receptor	-2.01
S100A9	S100 calcium binding protein A9	-2.01
CD163	CD163 molecule	-2.02
CFP	complement factor properdin	-2.02

COL4A3	collagen type IV alpha 3 chain	-2.02
GPD1	glycerol-3-phosphate dehydrogenase 1	-2.02
LINC01767	long intergenic non-protein coding RNA 1767	-2.02
LOC284454	uncharacterized LOC284454	-2.02
NRSN2	neurensin 2	-2.02
SELENOM	selenoprotein M	-2.02
SERPINB9	serpin family B member 9	-2.02
SNAP25	synaptosome associated protein 25	-2.02
SULF2	sulfatase 2	-2.02
TIMP1	TIMP metalloproteinase inhibitor 1	-2.02
YBX3	Y-box binding protein 3	-2.02
LINC00659	long intergenic non-protein coding RNA 659	-2.03
LRRC6	leucine rich repeat containing 6	-2.03
MT1A	metallothionein 1A	-2.03
NTSR1	neurotensin receptor 1	-2.03
PLGLB1/PLGLB2	plasminogen like B2	-2.03
CLEC5A	C-type lectin domain containing 5A	-2.04
DUSP5	dual specificity phosphatase 5	-2.04
MYO10	myosin X	-2.04
NLRP3	NLR family pyrin domain containing 3	-2.04
PYGO1	pygopus family PHD finger 1	-2.04
SAMD12	sterile alpha motif domain containing 12	-2.04
SYTL3	synaptotagmin like 3	-2.04
CCN1	cellular communication network factor 1	-2.05
GIPR	gastric inhibitory polypeptide receptor	-2.05
OLFM1	olfactomedin 1	-2.05
SRGN	serglycin	-2.05
AQP1	aquaporin 1 (Colton blood group)	-2.06
ASPHD1	aspartate beta-hydroxylase domain containing 1	-2.06
BCL2L14	BCL2 like 14	-2.06
BDKRB2	bradykinin receptor B2	-2.06
CD1D	CD1d molecule	-2.06
NFATC1	nuclear factor of activated T cells 1	-2.06
QSOX1	quiescin sulfhydryl oxidase 1	-2.06
SLC7A2	solute carrier family 7 member 2	-2.06
SORCS2	sortilin related VPS10 domain containing receptor 2	-2.06
TESC	tescalcin	-2.06
ZNF215	zinc finger protein 215	-2.06
GPC4	glypican 4	-2.07
MAB21L2	mab-21 like 2	-2.07
MPPED1	metallophosphoesterase domain containing 1	-2.07
TTC25	tetratricopeptide repeat domain 25	-2.07
ADAMTS4	ADAM metalloproteinase with thrombospondin type 1 motif 4	-2.08
IER3	immediate early response 3	-2.08
THBD	thrombomodulin	-2.08
ZFP3	ZFP3 zinc finger protein	-2.08
AXL	AXL receptor tyrosine kinase	-2.09
GPAT3	glycerol-3-phosphate acyltransferase 3	-2.09
LAMA2	laminin subunit alpha 2	-2.09
SULT1C4	sulfotransferase family 1C member 4	-2.09
B4GALNT3	beta-1,4-N-acetyl-galactosaminyltransferase 3	-2.1
DTX1	deltex E3 ubiquitin ligase 1	-2.1
FGFR1	fibroblast growth factor receptor 1	-2.1
IFITM10	interferon induced transmembrane protein 10	-2.1
KBTD11	kelch repeat and BTB domain containing 11	-2.1
LINC01669	long intergenic non-protein coding RNA 1669	-2.1
P3H2	prolyl 3-hydroxylase 2	-2.1

PHGDH	phosphoglycerate dehydrogenase	-2.1
PMAIP1	phorbol-12-myristate-13-acetate-induced protein 1	-2.1
PRICKLE1	prickle planar cell polarity protein 1	-2.1
PRKAR2B	protein kinase cAMP-dependent type II regulatory subunit beta	-2.1
AC092053.3		-2.11
BACE2	beta-secretase 2	-2.11
CCL22	C-C motif chemokine ligand 22	-2.11
LRCOL1	leucine rich colipase like 1	-2.11
LRRN4	leucine rich repeat neuronal 4	-2.11
PMEPA1	prostate transmembrane protein, androgen induced 1	-2.11
TNFRSF21	TNF receptor superfamily member 21	-2.11
CCDC141	coiled-coil domain containing 141	-2.12
CR1	complement C3b/C4b receptor 1 (Knops blood group)	-2.12
ST8SIA6	ST8 alpha-N-acetyl-neuraminide alpha-2,8-sialyltransferase 6	-2.12
TMEM26	transmembrane protein 26	-2.12
AADAT	aminoadipate aminotransferase	-2.13
ADGRD1	adhesion G protein-coupled receptor D1	-2.13
ADGRE1	adhesion G protein-coupled receptor E1	-2.13
FCRL1	Fc receptor like 1	-2.13
MB21D2	Mab-21 domain containing 2	-2.13
SNAI1	snail family transcriptional repressor 1	-2.13
ZNF334	zinc finger protein 334	-2.13
ENO3	enolase 3	-2.14
HAO2	hydroxyacid oxidase 2	-2.14
LTK	leukocyte receptor tyrosine kinase	-2.14
MAPK15	mitogen-activated protein kinase 15	-2.14
SPHK1	sphingosine kinase 1	-2.14
ACHE	acetylcholinesterase (Cartwright blood group)	-2.15
GALNT12	polypeptide N-acetylgalactosaminyltransferase 12	-2.15
LILRA2	leukocyte immunoglobulin like receptor A2	-2.15
RP5_1052I52		-2.15
DACT1	dishevelled binding antagonist of beta catenin 1	-2.16
PLAC8	placenta associated 8	-2.16
RP11_23P136		-2.16
TMEM71	transmembrane protein 71	-2.16
ARHGAP8/PRR5-ARHGAP8	Rho GTPase activating protein 8	-2.17
C1QTNF7	C1q and TNF related 7	-2.17
CDC42BPG	CDC42 binding protein kinase gamma	-2.17
DNASE1L3	deoxyribonuclease 1 like 3	-2.17
IL1RAPL2	interleukin 1 receptor accessory protein like 2	-2.17
SCML4	Scm polycomb group protein like 4	-2.17
SDK1	sidekick cell adhesion molecule 1	-2.17
SLAIN1	SLAIN motif family member 1	-2.17
ADAMTS1	ADAM metalloproteinase with thrombospondin type 1 motif 1	-2.18
ADAMTS13	ADAM metalloproteinase with thrombospondin type 1 motif 13	-2.18
PDE7B	phosphodiesterase 7B	-2.18
PDP1	pyruvate dehydrogenase phosphatase catalytic subunit 1	-2.18
SYN1	synapsin I	-2.18
TDO2	tryptophan 2,3-dioxygenase	-2.18
TMIGD3	transmembrane and immunoglobulin domain containing 3	-2.18
VSIG2	V-set and immunoglobulin domain containing 2	-2.18
WIPF3	WAS/WASL interacting protein family member 3	-2.18
MAMDC2	MAM domain containing 2	-2.19
FCER1A	Fc fragment of IgE receptor Ia	-2.2
NTF3	neurotrophin 3	-2.2
TMPRSS13	transmembrane serine protease 13	-2.2

ZFP36	ZFP36 ring finger protein	-2.2
DUSP4	dual specificity phosphatase 4	-2.21
ITGA9	integrin subunit alpha 9	-2.21
PTPRS	protein tyrosine phosphatase receptor type S	-2.21
SDK2	sidekick cell adhesion molecule 2	-2.21
SEMA3C	semaphorin 3C	-2.21
CRYAB	crystallin alpha B	-2.22
TCIM	transcriptional and immune response regulator	-2.22
COL8A2	collagen type VIII alpha 2 chain	-2.23
MCTP2	multiple C2 and transmembrane domain containing 2	-2.23
SPATA18	spermatogenesis associated 18	-2.23
ZNF667	zinc finger protein 667	-2.23
CDH6	cadherin 6	-2.24
CRMP1	collapsin response mediator protein 1	-2.24
ESYT3	extended synaptotagmin 3	-2.24
KMO	kynurenine 3-monooxygenase	-2.24
PCDH9	protocadherin 9	-2.24
SOX6	SRY-box transcription factor 6	-2.24
CDCP1	CUB domain containing protein 1	-2.25
GLT1D1	glycosyltransferase 1 domain containing 1	-2.25
KLF4	Kruppel like factor 4	-2.25
LURAP1L	leucine rich adaptor protein 1 like	-2.25
SLC15A1	solute carrier family 15 member 1	-2.26
FILIP1L	filamin A interacting protein 1 like	-2.27
P2RY12	purinergic receptor P2Y12	-2.27
ZNF667-AS1	ZNF667 antisense RNA 1 (head to head)	-2.27
ANK3	ankyrin 3	-2.28
HBB	hemoglobin subunit beta	-2.28
KRTCAP3	keratinocyte associated protein 3	-2.28
PCDH19	protocadherin 19	-2.28
SEMA3D	semaphorin 3D	-2.28
ADAM28	ADAM metallopeptidase domain 28	-2.29
CYP2B6	cytochrome P450 family 2 subfamily B member 6	-2.29
FAHD2B	fumarylacetoacetate hydrolase domain containing 2B	-2.29
NBEA	neurobeachin	-2.29
PFKFB3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3	-2.29
SNHG18	small nucleolar RNA host gene 18	-2.29
TNN	tenascin N	-2.29
RASSF9	Ras association domain family member 9	-2.3
SLC24A3	solute carrier family 24 member 3	-2.3
WDR72	WD repeat domain 72	-2.3
ZNF141	zinc finger protein 141	-2.3
ENPP2	ectonucleotide pyrophosphatase/phosphodiesterase 2	-2.31
TSLP	thymic stromal lymphopietin	-2.31
CD300LG	CD300 molecule like family member g	-2.32
ELOVL7	ELOVL fatty acid elongase 7	-2.32
FBP1	fructose-bisphosphatase 1	-2.32
IGFALS	insulin like growth factor binding protein acid labile subunit	-2.32
LOC200772	uncharacterized LOC200772	-2.32
TSPYL5	TSPY like 5	-2.32
BCL2A1	BCL2 related protein A1	-2.33
CFAP251	cilia and flagella associated protein 251	-2.33
IL7R	interleukin 7 receptor	-2.33
ITGB6	integrin subunit beta 6	-2.33
MAPK10	mitogen-activated protein kinase 10	-2.33
NIBAN3	niban apoptosis regulator 3	-2.33
SERPINB8	serpin family B member 8	-2.33

ADRA1A	adrenoceptor alpha 1A	-2.34
FMOD	fibromodulin	-2.34
FAM9B	family with sequence similarity 9 member B	-2.35
S100A14	S100 calcium binding protein A14	-2.35
TNFSF11	TNF superfamily member 11	-2.35
TNFRSF13C	TNF receptor superfamily member 13C	-2.36
IGFBP6	insulin like growth factor binding protein 6	-2.37
PKNOX2	PBX/knotted 1 homeobox 2	-2.37
RP3_342P202		-2.37
FAM160A1	family with sequence similarity 160 member A1	-2.38
KIF19	kinesin family member 19	-2.38
PELI2	pellino E3 ubiquitin protein ligase family member 2	-2.38
ADIRF	adipogenesis regulatory factor	-2.39
AC0936421		-2.4
CD300LB	CD300 molecule like family member b	-2.4
IGHM	immunoglobulin heavy constant mu	-2.4
SAA4	serum amyloid A4, constitutive	-2.4
TUSC3	tumor suppressor candidate 3	-2.4
MYC	MYC proto-oncogene, bHLH transcription factor	-2.41
TRPV3	transient receptor potential cation channel subfamily V member 3	-2.41
ABI3BP	ABI family member 3 binding protein	-2.42
B3GNT3	UDP-GlcNAc:betaGal beta-1,3-N-acetylglucosaminyltransferase 3	-2.42
MAP9	microtubule associated protein 9	-2.42
PCDHGB4	protocadherin gamma subfamily B, 4	-2.42
PRG4	proteoglycan 4	-2.42
ADRA2A	adrenoceptor alpha 2A	-2.43
APCDD1	APC down-regulated 1	-2.43
CCR4	C-C motif chemokine receptor 4	-2.43
HUNK	hormonally up-regulated Neu-associated kinase	-2.43
LOC100506688	uncharacterized LOC100506688	-2.43
MMRN1	multimerin 1	-2.43
PLAUR	plasminogen activator, urokinase receptor	-2.43
BANK1	B cell scaffold protein with ankyrin repeats 1	-2.44
CD300E	CD300e molecule	-2.44
GDF6	growth differentiation factor 6	-2.44
KIF5C	kinesin family member 5C	-2.44
MZB1	marginal zone B and B1 cell specific protein	-2.44
SGCA	sarcoglycan alpha	-2.44
C13orf46	chromosome 13 open reading frame 46	-2.45
CPXM2	carboxypeptidase X, M14 family member 2	-2.45
IGHG2	immunoglobulin heavy constant gamma 2 (G2m marker)	-2.46
ITLN1	intelectin 1	-2.46
TNFRSF11B	TNF receptor superfamily member 11b	-2.46
TUB	TUB bipartite transcription factor	-2.46
COL6A6	collagen type VI alpha 6 chain	-2.47
LOXL4	lysyl oxidase like 4	-2.47
LRRN3	leucine rich repeat neuronal 3	-2.47
NTRK2	neurotrophic receptor tyrosine kinase 2	-2.47
RTL5	retrotransposon Gag like 5	-2.47
CHI3L1	chitinase 3 like 1	-2.48
IGHD	immunoglobulin heavy constant delta	-2.48
LILRA5	leukocyte immunoglobulin like receptor A5	-2.48
NOCT	nocturnin	-2.48
OMD	osteomodulin	-2.48
RP11_210M152		-2.48
BICC1	BicC family RNA binding protein 1	-2.49
C1orf116	chromosome 1 open reading frame 116	-2.49

CAND2	cullin associated and neddylation dissociated 2 (putative)	-2.49
IGKV2-30	immunoglobulin kappa variable 2-30	-2.49
LRRC4C	leucine rich repeat containing 4C	-2.49
SERPINE1	serpin family E member 1	-2.49
TPPP3	tubulin polymerization promoting protein family member 3	-2.49
SOD3	superoxide dismutase 3	-2.5
TUBBP5	tubulin beta pseudogene 5	-2.5
APOBEC3A	apolipoprotein B mRNA editing enzyme catalytic subunit 3A	-2.51
CRACD	capping protein inhibiting regulator of actin dynamics	-2.51
ECM1	extracellular matrix protein 1	-2.51
FMO2	flavin containing dimethylaniline monooxygenase 2	-2.51
GPR183	G protein-coupled receptor 183	-2.51
IGHA1	immunoglobulin heavy constant alpha 1	-2.51
IGHV4-34	immunoglobulin heavy variable 4-34	-2.51
LINC01348	long intergenic non-protein coding RNA 1348	-2.51
OLFML3	olfactomedin like 3	-2.51
MIRLET7A1HG		-2.52
RGS2	regulator of G protein signaling 2	-2.52
BCO2	beta-carotene oxygenase 2	-2.53
DSEL	dermatan sulfate epimerase like	-2.53
FAM30A	family with sequence similarity 30 member A	-2.53
CETP	cholesteryl ester transfer protein	-2.54
CILP2	cartilage intermediate layer protein 2	-2.54
GGT5	gamma-glutamyltransferase 5	-2.54
LINC01679	long intergenic non-protein coding RNA 1679	-2.54
MYOM2	myomesin 2	-2.54
SCD5	stearoyl-CoA desaturase 5	-2.54
TREH	trehalase	-2.54
EPHA3	EPH receptor A3	-2.55
UCA1	urothelial cancer associated 1	-2.55
ADAMTS9-AS2	ADAMTS9 antisense RNA 2	-2.56
CDA	cytidine deaminase	-2.56
CYFIP2	cytoplasmic FMR1 interacting protein 2	-2.56
NAV2-AS1	NAV2 antisense RNA 1	-2.56
PITPNM3	PITPNM family member 3	-2.56
RDH16	retinol dehydrogenase 16	-2.56
SLC22A1	solute carrier family 22 member 1	-2.56
SLC22A17	solute carrier family 22 member 17	-2.56
DNAH2	dynein axonemal heavy chain 2	-2.57
F3	coagulation factor III, tissue factor	-2.57
GAS1	growth arrest specific 1	-2.58
MS4A1	membrane spanning 4-domains A1	-2.58
S100A8	S100 calcium binding protein A8	-2.58
SLC2A9	solute carrier family 2 member 9	-2.58
SLFN13	schlafen family member 13	-2.58
VNN3	vanin 3	-2.58
ADGRG7	adhesion G protein-coupled receptor G7	-2.59
EGR3	early growth response 3	-2.59
KCND3	potassium voltage-gated channel subfamily D member 3	-2.59
PLXNA4	plexin A4	-2.59
SELP	selectin P	-2.59
SLCO4A1	solute carrier organic anion transporter family member 4A1	-2.59
CTTNBP2	cortactin binding protein 2	-2.6
POU2AF1	POU class 2 homeobox associating factor 1	-2.6
CA2	carbonic anhydrase 2	-2.61
STK33	serine/threonine kinase 33	-2.61
FCGR3A/FCGR3B	Fc fragment of IgG receptor IIIa	-2.62

HR	HR lysine demethylase and nuclear receptor corepressor	-2.62
IGF2-AS	IGF2 antisense RNA	-2.62
XXbac-BPG32J3.22		-2.62
ANK2	ankyrin 2	-2.63
IGHV3-48	immunoglobulin heavy variable 3-48	-2.63
LYVE1	lymphatic vessel endothelial hyaluronan receptor 1	-2.63
NPY1R	neuropeptide Y receptor Y1	-2.63
CNTN4	contactin 4	-2.64
MT1X	metallothionein 1X	-2.64
EGR1	early growth response 1	-2.65
A2M	alpha-2-macroglobulin	-2.66
PRELP	proline and arginine rich end leucine rich repeat protein	-2.66
RET	ret proto-oncogene	-2.66
MT2A	metallothionein 2A	-2.67
SAA2	serum amyloid A2	-2.68
COL25A1	collagen type XXV alpha 1 chain	-2.69
FAM180A	family with sequence similarity 180 member A	-2.69
IGFBP3	insulin like growth factor binding protein 3	-2.69
RP11-403F21.4		-2.69
AC1448311		-2.7
EPHB1	EPH receptor B1	-2.7
FENDRR	FOXF1 adjacent non-coding developmental regulatory RNA	-2.7
IGHV3-53	immunoglobulin heavy variable 3-53	-2.7
PTN	pleiotrophin	-2.7
RND3	Rho family GTPase 3	-2.7
SHBG	sex hormone binding globulin	-2.7
PROM2	prominin 2	-2.71
ANGPTL6	angiopoietin like 6	-2.72
SHISAL1	shisa like 1	-2.72
ANKRD36BP2	ankyrin repeat domain 36B pseudogene 2	-2.73
CFAP221	cilia and flagella associated protein 221	-2.73
GALNT3	polypeptide N-acetylgalactosaminyltransferase 3	-2.73
PTH1R	parathyroid hormone 1 receptor	-2.73
RIPOR3	RIPOR family member 3	-2.73
PDZRN3	PDZ domain containing ring finger 3	-2.74
AC139491.7		-2.75
ADH4	alcohol dehydrogenase 4 (class II), pi polypeptide	-2.75
ANGPTL1	angiopoietin like 1	-2.75
ANKRD1	ankyrin repeat domain 1	-2.75
ASS1	argininosuccinate synthase 1	-2.75
C6orf132	chromosome 6 open reading frame 132	-2.75
FLRT2	fibronectin leucine rich transmembrane protein 2	-2.75
IGKV3-15	immunoglobulin kappa variable 3-15	-2.75
IGLV1-51	immunoglobulin lambda variable 1-51	-2.75
SLC22A10	solute carrier family 22 member 10	-2.75
IGHG3	immunoglobulin heavy constant gamma 3 (G3m marker)	-2.76
IGHV3-11	immunoglobulin heavy variable 3-11 (gene/pseudogene)	-2.76
NNMT	nicotinamide N-methyltransferase	-2.76
HSPB8	heat shock protein family B (small) member 8	-2.77
LIF	LIF interleukin 6 family cytokine	-2.77
EFNB3	ephrin B3	-2.78
SDCBP2	syndecan binding protein 2	-2.78
GLB1L2	galactosidase beta 1 like 2	-2.79
NGFR	nerve growth factor receptor	-2.79
SIGLEC5	sialic acid binding Ig like lectin 5	-2.79
SVEP1	sushi, von Willebrand factor type A, EGF and pentraxin domain containing 1	-2.79
EVC2	EvC ciliary complex subunit 2	-2.8

FAM153A/FAM153B	family with sequence similarity 153 member B	-2.8
GGT1	gamma-glutamyltransferase 1	-2.8
IRF4	interferon regulatory factor 4	-2.8
MEDAG	mesenteric estrogen dependent adipogenesis	-2.8
PDGFRA	platelet derived growth factor receptor alpha	-2.8
PODN	podocan	-2.8
ACOT11	acyl-CoA thioesterase 11	-2.81
CLSTN2	calsyntenin 2	-2.81
CRISPLD2	cysteine rich secretory protein LCCL domain containing 2	-2.81
CXCL12	C-X-C motif chemokine ligand 12	-2.81
ID1	inhibitor of DNA binding 1, HLH protein	-2.81
IGLV1-47	immunoglobulin lambda variable 1-47	-2.81
IGLV2-8	immunoglobulin lambda variable 2-8	-2.81
TRMT9B	tRNA methyltransferase 9B (putative)	-2.81
IGHA2	immunoglobulin heavy constant alpha 2 (A2m marker)	-2.82
CD79A	CD79a molecule	-2.83
CTD_2033D152		-2.83
SCTR	secretin receptor	-2.83
VIPR1	vasoactive intestinal peptide receptor 1	-2.83
APOF	apolipoprotein F	-2.84
BSPRY	B-box and SPRY domain containing	-2.84
EPHA2	EPH receptor A2	-2.84
FCRL5	Fc receptor like 5	-2.84
GULP1	GULP PTB domain containing engulfment adaptor 1	-2.84
INMT	indolethylamine N-methyltransferase	-2.84
DACT2	dishevelled binding antagonist of beta catenin 2	-2.85
UPP2	uridine phosphorylase 2	-2.85
LIFR	LIF receptor subunit alpha	-2.86
FOXP2	forkhead box P2	-2.87
IGLC2	immunoglobulin lambda constant 2	-2.87
CCDC8	coiled-coil domain containing 8	-2.88
KIF1A	kinesin family member 1A	-2.88
IGHV3-43	immunoglobulin heavy variable 3-43	-2.89
C11orf96	chromosome 11 open reading frame 96	-2.9
RASEF	RAS and EF-hand domain containing	-2.9
SLCO4C1	solute carrier organic anion transporter family member 4C1	-2.9
TENM4	teneurin transmembrane protein 4	-2.9
TPBG	trophoblast glycoprotein	-2.9
CXCL5	C-X-C motif chemokine ligand 5	-2.91
HHIP-AS1	HHIP antisense RNA 1	-2.91
IGHV2-5	immunoglobulin heavy variable 2-5	-2.91
MMP19	matrix metalloproteinase 19	-2.91
SPP2	secreted phosphoprotein 2	-2.91
CLTRN	collectrin, amino acid transport regulator	-2.92
CPZ	carboxypeptidase Z	-2.92
DIO3OS	DIO3 opposite strand upstream RNA	-2.92
GEM	GTP binding protein overexpressed in skeletal muscle	-2.92
IGHV4-39	immunoglobulin heavy variable 4-39	-2.92
PLGLA	plasminogen like A (pseudogene)	-2.92
CXCL8	C-X-C motif chemokine ligand 8	-2.93
LOC100132813	uncharacterized LOC100132813	-2.93
ROBO2	roundabout guidance receptor 2	-2.93
SAMD5	sterile alpha motif domain containing 5	-2.93
IGHV3-23	immunoglobulin heavy variable 3-23	-2.95
PEG3	paternally expressed 3	-2.95
PAMR1	peptidase domain containing associated with muscle regeneration 1	-2.96
SCN7A	sodium voltage-gated channel alpha subunit 7	-2.96



FAM201A	family with sequence similarity 201 member A	-2.97
ISLR	immunoglobulin superfamily containing leucine rich repeat	-2.97
IGHV3-20	immunoglobulin heavy variable 3-20	-2.98
ALLC	allantoicase	-3
BLK	BLK proto-oncogene, Src family tyrosine kinase	-3
DLK1	delta like non-canonical Notch ligand 1	-3
IGLC3	immunoglobulin lambda constant 3 (Kern-Oz+ marker)	-3
ATOX1	atonal bHLH transcription factor 8	-3.01
DACH1	dachshund family transcription factor 1	-3.01
FPR1	formyl peptide receptor 1	-3.01
IGLL1/IGLL5	immunoglobulin lambda like polypeptide 1	-3.01
URO1	urocanate hydratase 1	-3.01
TCF21	transcription factor 21	-3.02
ADGRB3	adhesion G protein-coupled receptor B3	-3.03
CDH19	cadherin 19	-3.03
LPAR1	lysophosphatidic acid receptor 1	-3.03
RBP1	retinol binding protein 1	-3.03
ADAR2	adenosine deaminase RNA specific B2 (inactive)	-3.04
JCHAIN	joining chain of multimeric IgA and IgM	-3.04
CCN5	cellular communication network factor 5	-3.05
GALNT17	polypeptide N-acetylgalactosaminyltransferase 17	-3.05
IGLV3-25	immunoglobulin lambda variable 3-25	-3.05
MOGAT2	monoacylglycerol O-acyltransferase 2	-3.05
PLEKHA7	pleckstrin homology domain containing B1	-3.05
DSCAM1	DS cell adhesion molecule like 1	-3.06
NEBL	nebulin	-3.06
SLC3A1	solute carrier family 3 member 1	-3.06
DMKN	dermokine	-3.07
LINC01814	long intergenic non-protein coding RNA 1814	-3.07
TENM1	teneurin transmembrane protein 1	-3.07
BMP5	bone morphogenetic protein 5	-3.08
COLEC11	collectin subfamily member 11	-3.08
ST6GAL2	ST6 beta-galactoside alpha-2,6-sialyltransferase 2	-3.08
LINC01093	long intergenic non-protein coding RNA 1093	-3.09
RP11_256L63		-3.09
DLGAP2	DLG associated protein 2	-3.1
RASAL1	RAS protein activator like 1	-3.1
STEAP4	STEAP4 metalloproteinase	-3.1
C6orf141	chromosome 6 open reading frame 141	-3.11
CYP2B7P	cytochrome P450 family 2 subfamily B member 7, pseudogene	-3.11
ENPP5	ectonucleotide pyrophosphatase/phosphodiesterase family member 5	-3.11
IGHV3-73	immunoglobulin heavy variable 3-73	-3.11
NXF3	nuclear RNA export factor 3	-3.11
TGFA	transforming growth factor alpha	-3.11
ZDBF2	zinc finger DBF-type containing 2	-3.11
IGHV3-15	immunoglobulin heavy variable 3-15	-3.12
IGHV3-33	immunoglobulin heavy variable 3-33	-3.12
IGKC	immunoglobulin kappa constant	-3.12
NPC1L1	NPC1 like intracellular cholesterol transporter 1	-3.12
TNR	tenascin R	-3.12
GRM8	glutamate metabotropic receptor 8	-3.13
IGKV4-1	immunoglobulin kappa variable 4-1	-3.13
IGLC1	immunoglobulin lambda constant 1	-3.13
CDS1	CDP-diacylglycerol synthase 1	-3.14
IGKV1-5	immunoglobulin kappa variable 1-5	-3.14
KRT7-AS	KRT7 antisense RNA 1	-3.14
EVC	EvC ciliary complex subunit 1	-3.16

KCNJ15	potassium inwardly rectifying channel subfamily J member 15	-3.17
ANO3	anoctamin 3	-3.18
C1QTNF1	C1q and TNF related 1	-3.18
ID4	inhibitor of DNA binding 4, HLH protein	-3.18
IGLV1-40	immunoglobulin lambda variable 1-40	-3.18
IGLV3-1	immunoglobulin lambda variable 3-1	-3.18
RP11_34A143		-3.18
TMEM45A	transmembrane protein 45A	-3.18
IGHV4-61	immunoglobulin heavy variable 4-61	-3.19
PLGLB1/PLGLB2	plasminogen like B2	-3.19
RND2	Rho family GTPase 2	-3.19
IGHV3-74	immunoglobulin heavy variable 3-74	-3.2
BMPER	BMP binding endothelial regulator	-3.21
RETREG1	reticulophagy regulator 1	-3.21
TMEM200C	transmembrane protein 200C	-3.21
CCL2	C-C motif chemokine ligand 2	-3.22
IDO2	indoleamine 2,3-dioxygenase 2	-3.22
MFSD2A	major facilitator superfamily domain containing 2A	-3.22
CD5L	CD5 molecule like	-3.23
GPM6A	glycoprotein M6A	-3.24
IGHV3-7	immunoglobulin heavy variable 3-7	-3.25
IGHV3-21	immunoglobulin heavy variable 3-21	-3.26
ITIH5	inter-alpha-trypsin inhibitor heavy chain 5	-3.27
LRRC7	leucine rich repeat containing 7	-3.27
NR4A3	nuclear receptor subfamily 4 group A member 3	-3.27
CH17_360D52		-3.28
PTPN13	protein tyrosine phosphatase non-receptor type 13	-3.28
IGHV1-18	immunoglobulin heavy variable 1-18	-3.29
IQCA1	IQ motif containing with AAA domain 1	-3.29
IGHV3-30	immunoglobulin heavy variable 3-30	-3.3
IGLV2-14	immunoglobulin lambda variable 2-14	-3.3
UNC93A	unc-93 homolog A	-3.3
ABCA13	ATP binding cassette subfamily A member 13	-3.31
IGHV5-51	immunoglobulin heavy variable 5-51	-3.31
LGALS9C	galectin 9C	-3.31
SOCS3	suppressor of cytokine signaling 3	-3.31
MT1L	metallothionein 1L, pseudogene	-3.32
NALCN	sodium leak channel, non-selective	-3.32
DNM3OS	DNM3 opposite strand/antisense RNA	-3.33
MT1E	metallothionein 1E	-3.33
PLCXD3	phosphatidylinositol specific phospholipase C X domain containing 3	-3.33
LY6E	lymphocyte antigen 6 family member E	-3.34
STMN2	stathmin 2	-3.34
TMEM82	transmembrane protein 82	-3.34
IGLV4-69	immunoglobulin lambda variable 4-69	-3.35
PKHD1	PKHD1 ciliary IPT domain containing fibrocystin/polyductin	-3.35
C7	complement C7	-3.36
LOC105375304	uncharacterized LOC105375304	-3.36
NPTX2	neuronal pentraxin 2	-3.36
SEC14L6	SEC14 like lipid binding 6	-3.36
TMC4	transmembrane channel like 4	-3.36
GPRC5A	G protein-coupled receptor class C group 5 member A	-3.37
IGHG1	immunoglobulin heavy constant gamma 1 (G1m marker)	-3.37
SPINT2	serine peptidase inhibitor, Kunitz type 2	-3.37
IL1B	interleukin 1 beta	-3.38
LOC105375431		-3.38
PDZRN4	PDZ domain containing ring finger 4	-3.38

IGHV1-69D	immunoglobulin heavy variable 1-69D	-3.39
LINC00907	long intergenic non-protein coding RNA 907	-3.39
LINC01320		-3.39
IGKV1D-39	immunoglobulin kappa variable 1D-39	-3.4
KBTBD11-OT1	KBTBD11 overlapping transcript 1	-3.4
TMEM154	transmembrane protein 154	-3.4
RPS6KA6	ribosomal protein S6 kinase A6	-3.41
SRPX	sushi repeat containing protein X-linked	-3.41
CNTN3	contactin 3	-3.42
IGKV3-11	immunoglobulin kappa variable 3-11	-3.42
TMEM132E	transmembrane protein 132E	-3.42
CASR	calcium sensing receptor	-3.43
PTGIS	prostaglandin I2 synthase	-3.43
HGF	hepatocyte growth factor	-3.44
PLPP2	phospholipid phosphatase 2	-3.44
IGLV3-10	immunoglobulin lambda variable 3-10	-3.45
IGHV4-59	immunoglobulin heavy variable 4-59	-3.46
TRPV4	transient receptor potential cation channel subfamily V member 4	-3.46
IGHV1-2	immunoglobulin heavy variable 1-2	-3.47
IGHV1-46	immunoglobulin heavy variable 1-46	-3.47
IGKV1-12	immunoglobulin kappa variable 1-12	-3.47
ZBTB45P1	zinc finger and BTB domain containing 45 pseudogene 1	-3.47
FOS	Fos proto-oncogene, AP-1 transcription factor subunit	-3.48
FPR2	formyl peptide receptor 2	-3.48
IGKV3-20	immunoglobulin kappa variable 3-20	-3.48
LIPH	lipase H	-3.48
CA9	carbonic anhydrase 9	-3.49
FRAS1	Fraser extracellular matrix complex subunit 1	-3.49
IGKV1-33	immunoglobulin kappa variable 1-33	-3.49
SLC25A47	solute carrier family 25 member 47	-3.49
BEX2	brain expressed X-linked 2	-3.51
IGLV3-19	immunoglobulin lambda variable 3-19	-3.51
VEPH1	ventricular zone expressed PH domain containing 1	-3.51
FGFR2	fibroblast growth factor receptor 2	-3.52
IGHV3-13	immunoglobulin heavy variable 3-13	-3.52
CXCR2	C-X-C motif chemokine receptor 2	-3.53
CYP39A1	cytochrome P450 family 39 subfamily A member 1	-3.53
HAND2-AS1	HAND2 antisense RNA 1	-3.53
IGKV1-6	immunoglobulin kappa variable 1-6	-3.54
LINC01152	long intergenic non-protein coding RNA 1152	-3.54
PRSS3	serine protease 3	-3.54
FOSL1	FOS like 1, AP-1 transcription factor subunit	-3.55
FAM163B	family with sequence similarity 163 member B	-3.56
SFRP1	secreted frizzled related protein 1	-3.56
IGLV3-9	immunoglobulin lambda variable 3-9 (gene/pseudogene)	-3.57
IL6	interleukin 6	-3.57
NCAM1	neural cell adhesion molecule 1	-3.58
THRSP	thyroid hormone responsive	-3.58
CCL21	C-C motif chemokine ligand 21	-3.59
CTD_2033D153		-3.59
TREM1	triggering receptor expressed on myeloid cells 1	-3.59
FAM167A	family with sequence similarity 167 member A	-3.6
IGLV2-11	immunoglobulin lambda variable 2-11	-3.6
CXCL1	C-X-C motif chemokine ligand 1	-3.61
IGKV1-8	immunoglobulin kappa variable 1-8	-3.61
CNTFR	ciliary neurotrophic factor receptor	-3.62
IGLV2-23	immunoglobulin lambda variable 2-23	-3.62

IGLV3-21	immunoglobulin lambda variable 3-21	-3.62
KRT17P4	keratin 17 pseudogene 4	-3.62
TDRD15	tudor domain containing 15	-3.62
IGLV1-44	immunoglobulin lambda variable 1-44	-3.63
IL1RL1	interleukin 1 receptor like 1	-3.63
CHRM2	cholinergic receptor muscarinic 2	-3.64
DCN	decorin	-3.64
RAB36	RAB36, member RAS oncogene family	-3.64
TIMD4	T cell immunoglobulin and mucin domain containing 4	-3.65
FAM95C	family with sequence similarity 95 member C	-3.67
PKHD1L1	PKHD1 like 1	-3.69
B3GAT1	beta-1,3-glucuronyltransferase 1	-3.7
ADAMTSL2	ADAMTS like 2	-3.71
TBX15	T-box transcription factor 15	-3.71
MT1G	metallothionein 1G	-3.72
TFPI2	tissue factor pathway inhibitor 2	-3.72
THBS1	thrombospondin 1	-3.72
IGKV2-24	immunoglobulin kappa variable 2-24	-3.74
MFAP4	microfibril associated protein 4	-3.74
POF1B	POF1B actin binding protein	-3.74
CALN1	calneuron 1	-3.75
IGKV2-28	immunoglobulin kappa variable 2-28	-3.75
LAMA1	laminin subunit alpha 1	-3.75
CYP26A1	cytochrome P450 family 26 subfamily A member 1	-3.76
FREM1	FRAS1 related extracellular matrix 1	-3.76
LOC105371267	p53-regulated lncRNA 1	-3.78
ANKRD18A	ankyrin repeat domain 18A	-3.79
CHRD1	chordin like 1	-3.79
IGHV3-49	immunoglobulin heavy variable 3-49	-3.8
IGLV7-43	immunoglobulin lambda variable 7-43	-3.8
RGS4	regulator of G protein signaling 4	-3.8
GLP2R	glucagon like peptide 2 receptor	-3.82
GFPT2	glutamine-fructose-6-phosphate transaminase 2	-3.83
WNT9A	Wnt family member 9A	-3.83
EPO	erythropoietin	-3.85
HAS2	hyaluronan synthase 2	-3.85
HAND2	heart and neural crest derivatives expressed 2	-3.87
IGLV8-61	immunoglobulin lambda variable 8-61	-3.87
SCARA5	scavenger receptor class A member 5	-3.87
ANXA3	annexin A3	-3.88
PDX1	pancreatic and duodenal homeobox 1	-3.88
CRHBP	corticotropin releasing hormone binding protein	-3.89
IGKV1-9	immunoglobulin kappa variable 1-9	-3.89
KCNH8	potassium voltage-gated channel subfamily H member 8	-3.89
PTGS2	prostaglandin-endoperoxide synthase 2	-3.91
MUC5B	mucin 5B, oligomeric mucus/gel-forming	-3.93
IGHV1-24	immunoglobulin heavy variable 1-24	-3.95
CCL19	C-C motif chemokine ligand 19	-3.96
ESRRG	estrogen related receptor gamma	-3.96
FCN3	ficolin 3	-3.96
FXVD2	FXVD domain containing ion transport regulator 2	-3.96
MT1F	metallothionein 1F	-4.03
RSPO3	R-spondin 3	-4.03
IGHG4	immunoglobulin heavy constant gamma 4 (G4m marker)	-4.04
NDST3	N-deacetylase and N-sulfotransferase 3	-4.04
SPINT1	serine peptidase inhibitor, Kunitz type 1	-4.05
HHIP	hedgehog interacting protein	-4.07

IGKV1-17	immunoglobulin kappa variable 1-17	-4.08
EFNA5	ephrin A5	-4.1
MUC3A	mucin 3A, cell surface associated	-4.16
LINC01979	long intergenic non-protein coding RNA 1979	-4.17
RP4_568C114		-4.18
IGHV1-69	immunoglobulin heavy variable 1-69	-4.22
LINC02027	long intergenic non-protein coding RNA 2027	-4.23
CYP1A2	cytochrome P450 family 1 subfamily A member 2	-4.24
ILDR1	immunoglobulin like domain containing receptor 1	-4.24
IGKV1-27	immunoglobulin kappa variable 1-27	-4.25
MT1M	metallothionein 1M	-4.26
AJAP1	adherens junctions associated protein 1	-4.27
ARHGEF4	Rho guanine nucleotide exchange factor 4	-4.3
KRT80	keratin 80	-4.3
MT1H	metallothionein 1H	-4.3
CLEC1B	C-type lectin domain family 1 member B	-4.33
SDS	serine dehydratase	-4.34
BMPR1B	bone morphogenetic protein receptor type 1B	-4.35
IGHV6-1	immunoglobulin heavy variable 6-1	-4.39
IGKV1-16	immunoglobulin kappa variable 1-16	-4.39
GLRB	glycine receptor beta	-4.42
HAMP	hepcidin antimicrobial peptide	-4.42
CXCL14	C-X-C motif chemokine ligand 14	-4.43
COLEC10	collectin subfamily member 10	-4.44
GLS2	glutaminase 2	-4.44
SLC28A3	solute carrier family 28 member 3	-4.48
STAB2	stabilin 2	-4.5
MACC1	MET transcriptional regulator MACC1	-4.51
ANXA8/ANXA8L1	annexin A8 like 1	-4.53
TAFA5	TAFA chemokine like family member 5	-4.56
PCLO	piccolo presynaptic cytomatrix protein	-4.57
DPT	dermatopontin	-4.61
EREG	epiregulin	-4.61
HSD17B13	hydroxysteroid 17-beta dehydrogenase 13	-4.61
ASPG	asparaginase	-4.63
BMP10	bone morphogenetic protein 10	-4.64
IGF2	insulin like growth factor 2	-4.65
CCBE1	collagen and calcium binding EGF domains 1	-4.67
ITGB8	integrin subunit beta 8	-4.68
LAMC2	laminin subunit gamma 2	-4.69
RIC3	RIC3 acetylcholine receptor chaperone	-4.69
EPS8L1	EPS8 like 1	-4.7
MARCO	macrophage receptor with collagenous structure	-4.7
CNKSR1	connector enhancer of kinase suppressor of Ras 1	-4.75
AP1M2	adaptor related protein complex 1 subunit mu 2	-4.78
B3GALT5	beta-1,3-galactosyltransferase 5	-4.82
TRPV6	transient receptor potential cation channel subfamily V member 6	-4.82
CYP2A6	cytochrome P450 family 2 subfamily A member 6	-4.83
KRT7	keratin 7	-4.87
CYS1	cystin 1	-4.9
MMP7	matrix metalloproteinase 7	-4.9
C9	complement C9	-4.91
CAPN6	calpain 6	-4.97
FCN2	ficolin 2	-4.97
IGKV1-39	immunoglobulin kappa variable 1-39 (gene/pseudogene)	-4.97
ANXA8/ANXA8L1	annexin A8 like 1	-5.04
FGF23	fibroblast growth factor 23	-5.05

SEMA3E	semaphorin 3E	-5.05
SLC34A2	solute carrier family 34 member 2	-5.08
GGT6	gamma-glutamyltransferase 6	-5.1
IL20RA	interleukin 20 receptor subunit alpha	-5.13
NRG1	neuregulin 1	-5.19
ATP13A4	ATPase 13A4	-5.23
WNK2	WNK lysine deficient protein kinase 2	-5.24
PRSS8	serine protease 8	-5.28
SYT13	synaptotagmin 13	-5.29
GABRP	gamma-aminobutyric acid type A receptor subunit pi	-5.35
SMIM24	small integral membrane protein 24	-5.37
SYT9	synaptotagmin 9	-5.41
LINC01488	long intergenic non-protein coding RNA 1488	-5.46
FAM169B	family with sequence similarity 169 member B	-5.48
CLEC4G	C-type lectin domain family 4 member G	-5.58
CLEC4M	C-type lectin domain family 4 member M	-5.6
TACSTD2	tumor associated calcium signal transducer 2	-5.6
CXCL6	C-X-C motif chemokine ligand 6	-5.64
NPBWR1	neuropeptides B and W receptor 1	-5.71
BICDL2	BICD family like cargo adaptor 2	-5.76
ERVE-1	endogenous retrovirus group E member 1	-5.78
CLIC6	chloride intracellular channel 6	-5.89
FOSB	FosB proto-oncogene, AP-1 transcription factor subunit	-5.91
MUC6	mucin 6, oligomeric mucus/gel-forming	-5.94
GPRIN2	G protein regulated inducer of neurite outgrowth 2	-6
CDHR2	cadherin related family member 2	-6.06
PWWP3B	PWWP domain containing 3B	-6.12
CLDN10	claudin 10	-6.15
FAM83F	family with sequence similarity 83 member F	-6.16
SFRP5	secreted frizzled related protein 5	-6.26
ESRP1	epithelial splicing regulatory protein 1	-6.39
GDF2	growth differentiation factor 2	-6.39
VTCN1	V-set domain containing T cell activation inhibitor 1	-6.42
SLC5A1	solute carrier family 5 member 1	-6.62
GABRB3	gamma-aminobutyric acid type A receptor subunit beta3	-6.84
PROM1	prominin 1	-6.96
GRHL2	grainyhead like transcription factor 2	-7.05
MYH4	myosin heavy chain 4	-7.05
KCNJ16	potassium inwardly rectifying channel subfamily J member 16	-7.23
SLC6A11	solute carrier family 6 member 11	-7.24
CHST4	carbohydrate sulfotransferase 4	-7.25
SLC6A19	solute carrier family 6 member 19	-7.25
EPCAM	epithelial cell adhesion molecule	-7.34
KRT19	keratin 19	-7.46
CFTR	CF transmembrane conductance regulator	-7.61
FREM2	FRAS1 related extracellular matrix 2	-7.63

**Table S2.** Genes differentially expressed in HBV-HCC.

Gene Symbol	Entrez Gene Name	Fold change
AKR1B10	aldo-keto reductase family 1 member B10	7.38
AKR1B10P1	aldo-keto reductase family 1 member B10 pseudogene 1	7.12
NMRAL2P	NmrA like redox sensor 2, pseudogene	7.12
EPS8L3	EPS8 like 3	6.01
SPINK1	serine peptidase inhibitor Kazal type 1	5.95
ALDH3A1	aldehyde dehydrogenase 3 family member A1	5.39
LCN2	lipocalin 2	5.04
TGM3	transglutaminase 3	4.81
SULT1C2	sulfotransferase family 1C member 2	4.48
NRCAM	neuronal cell adhesion molecule	4.47
GCNT3	glucosaminyl (N-acetyl) transferase 3, mucin type	4.45
SPP1	secreted phosphoprotein 1	4.31
SLC7A11	solute carrier family 7 member 11	4.18
CDC20	cell division cycle 20	4.13
DEPDC1	DEP domain containing 1	4.03
CA12	carbonic anhydrase 12	4.01
NEK2	NIMA related kinase 2	3.89
RP11_770J15		3.88
CENPF	centromere protein F	3.85
SLC22A11	solute carrier family 22 member 11	3.79
COL24A1	collagen type XXIV alpha 1 chain	3.78
GABRD	gamma-aminobutyric acid type A receptor subunit delta	3.76
MUC13	mucin 13, cell surface associated	3.76
TTK	TTK protein kinase	3.71
KIF20A	kinesin family member 20A	3.7
TRIM16L	tripartite motif containing 16 like	3.68
B4GALNT1	beta-1,4-N-acetyl-galactosaminyltransferase 1	3.66
HJURP	Holliday junction recognition protein	3.63
FBXW10	F-box and WD repeat domain containing 10	3.61
MMP11	matrix metalloproteinase 11	3.6
CABYR	calcium binding tyrosine phosphorylation regulated	3.57
ANLN	anillin actin binding protein	3.56
TRIM16	tripartite motif containing 16	3.55
GPC3	glypican 3	3.52
THBS4	thrombospondin 4	3.52
DLGAP5	DLG associated protein 5	3.48
HMMR	hyaluronan mediated motility receptor	3.45
CEP55	centrosomal protein 55	3.44
LYPD1	LY6/PLAUR domain containing 1	3.43
BUB1B	BUB1 mitotic checkpoint serine/threonine kinase B	3.42
RP11_284F2110		3.42
RP11_284F217		3.42
KIF18B	kinesin family member 18B	3.39
KIF4A	kinesin family member 4A	3.37
TOP2A	DNA topoisomerase II alpha	3.34
KIF2C	kinesin family member 2C	3.33
RAB3B	RAB3B, member RAS oncogene family	3.28
CCNO	cyclin O	3.25
DUXAP9	double homeobox A pseudogene 9	3.23
MYBL2	MYB proto-oncogene like 2	3.23
BIRC5	baculoviral IAP repeat containing 5	3.22
NDC80	NDC80 kinetochore complex component	3.21
CDKN2A	cyclin dependent kinase inhibitor 2A	3.19
TTC39A	tetratricopeptide repeat domain 39A	3.17

RBM24	RNA binding motif protein 24	3.14
TROAP	trophinin associated protein	3.14
BUB1	BUB1 mitotic checkpoint serine/threonine kinase	3.13
PBK	PDZ binding kinase	3.13
VASH2	vasohibin 2	3.13
DUXAP10	double homeobox A pseudogene 10	3.12
NCAPG	non-SMC condensin I complex subunit G	3.11
RP11_284F219		3.11
CDCA5	cell division cycle associated 5	3.1
MELK	maternal embryonic leucine zipper kinase	3.1
KIFC1	kinesin family member C1	3.09
TREM2	triggering receptor expressed on myeloid cells 2	3.08
DUXAP8	double homeobox A pseudogene 8	3.06
EXO1	exonuclease 1	3.05
CDCA8	cell division cycle associated 8	3.04
PTTG1	PTTG1 regulator of sister chromatid separation, securin	3.02
SSUH2	ssu-2 homolog	3.02
ARFGEF3	ARFGEF family member 3	3
MKI67	marker of proliferation Ki-67	3
CCNB1	cyclin B1	2.98
APLN	apelin	2.94
E2F8	E2F transcription factor 8	2.93
UGT2B11	UDP glucuronosyltransferase family 2 member B11	2.93
ESM1	endothelial cell specific molecule 1	2.91
CKAP2L	cytoskeleton associated protein 2 like	2.9
ASPM	assembly factor for spindle microtubules	2.89
CDK1	cyclin dependent kinase 1	2.88
OLFML2B	olfactomedin like 2B	2.88
RAD54L	RAD54 like	2.87
GTSE1	G2 and S-phase expressed 1	2.86
ILDR2	immunoglobulin like domain containing receptor 2	2.86
MSL3P1	MSL complex subunit 3 pseudogene 1	2.85
RP11-73M18.2		2.85
ZIC4	Zic family member 4	2.82
DIAPH3	diaphanous related formin 3	2.81
KIF15	kinesin family member 15	2.79
FOXM1	forkhead box M1	2.78
KIF23	kinesin family member 23	2.78
CCL20	C-C motif chemokine ligand 20	2.77
E2F7	E2F transcription factor 7	2.77
CBX2	chromobox 2	2.75
MAPT	microtubule associated protein tau	2.75
CCNB2	cyclin B2	2.74
ROBO1	roundabout guidance receptor 1	2.74
TRIP13	thyroid hormone receptor interactor 13	2.74
MDK	midkine	2.73
HRCT1	histidine rich carboxyl terminus 1	2.72
LPL	lipoprotein lipase	2.72
CD109	CD109 molecule	2.69
KCNJ5	potassium inwardly rectifying channel subfamily J member 5	2.69
MSC	musculin	2.69
EPHB2	EPH receptor B2	2.68
POLQ	DNA polymerase theta	2.68
AURKB	aurora kinase B	2.67
CCNA2	cyclin A2	2.67
CRYBG2	crystallin beta-gamma domain containing 2	2.67
GPX2	glutathione peroxidase 2	2.66



STC2	stanniocalcin 2	2.66
UBD	ubiquitin D	2.65
IGSF3	immunoglobulin superfamily member 3	2.64
GNAZ	G protein subunit alpha z	2.63
DNAJC6	DnaJ heat shock protein family (Hsp40) member C6	2.62
PRC1	protein regulator of cytokinesis 1	2.62
TEDC2	tubulin epsilon and delta complex 2	2.59
CAP2	cyclase associated actin cytoskeleton regulatory protein 2	2.58
CENPE	centromere protein E	2.57
G6PD	glucose-6-phosphate dehydrogenase	2.57
MYO1A	myosin IA	2.57
IQGAP3	IQ motif containing GTPase activating protein 3	2.55
CCDC170	coiled-coil domain containing 170	2.52
KIF14	kinesin family member 14	2.52
UBE2T	ubiquitin conjugating enzyme E2 T	2.52
CDT1	chromatin licensing and DNA replication factor 1	2.5
MACIR	macrophage immunometabolism regulator	2.49
MPZ	myelin protein zero	2.49
SP5	Sp5 transcription factor	2.49
TRAIP	TRAF interacting protein	2.48
MAPK8IP2	mitogen-activated protein kinase 8 interacting protein 2	2.47
NEB	nebulin	2.47
XXbac-BPG32J3.22		2.47
AKR1C3	aldo-keto reductase family 1 member C3	2.46
C12orf75	chromosome 12 open reading frame 75	2.45
ECT2	epithelial cell transforming 2	2.45
FHAD1	forkhead associated phosphopeptide binding domain 1	2.44
EME1	essential meiotic structure-specific endonuclease 1	2.43
FAM72B	family with sequence similarity 72 member B	2.4
H2AC18/H2AC19	H2A clustered histone 18	2.4
NDUFA4L2	NDUFA4 mitochondrial complex associated like 2	2.4
SHCBP1	SHC binding and spindle associated 1	2.4
NCAPH	non-SMC condensin I complex subunit H	2.37
COL15A1	collagen type XV alpha 1 chain	2.36
TKT	transketolase	2.36
ASIC1	acid sensing ion channel subunit 1	2.35
CEMIP	cell migration inducing hyaluronidase 1	2.35
DEPDC1B	DEP domain containing 1B	2.35
GIMAP1-GIMAP5	GIMAP1-GIMAP5 readthrough	2.35
TMEM132A	transmembrane protein 132A	2.35
TP53I3	tumor protein p53 inducible protein 3	2.35
GPRIN1	G protein regulated inducer of neurite outgrowth 1	2.34
LEF1	lymphoid enhancer binding factor 1	2.32
SERTAD4	SERTA domain containing 4	2.32
CRIP3	cysteine rich protein 3	2.31
PKMYT1	protein kinase, membrane associated tyrosine/threonine 1	2.31
FAM83D	family with sequence similarity 83 member D	2.29
TICRR	TOPBP1 interacting checkpoint and replication regulator	2.29
TXNRD1	thioredoxin reductase 1	2.28
CENPI	centromere protein I	2.25
ZIC1	Zic family member 1	2.25
EDIL3	EGF like repeats and discoidin domains 3	2.24
GBAP1	glucosylceramidase beta pseudogene 1	2.24
SLC26A6	solute carrier family 26 member 6	2.23
ACSL4	acyl-CoA synthetase long chain family member 4	2.22
OR211P	olfactory receptor family 2 subfamily I member 1 pseudogene	2.22
PLK1	polo like kinase 1	2.22

UGT1A6	UDP glucuronosyltransferase family 1 member A6	2.19
CDC45	cell division cycle 45	2.18
DTL	denticleless E3 ubiquitin protein ligase homolog	2.18
E2F1	E2F transcription factor 1	2.18
RACGAP1	Rac GTPase activating protein 1	2.18
RECQL4	RecQ like helicase 4	2.18
HES6	hes family bHLH transcription factor 6	2.17
ORC1	origin recognition complex subunit 1	2.17
OSR1	odd-skipped related transcription factor 1	2.17
CELSR3	cadherin EGF LAG seven-pass G-type receptor 3	2.16
PARPBP	PARP1 binding protein	2.16
TRIM45	tripartite motif containing 45	2.16
MCM10	minichromosome maintenance 10 replication initiation factor	2.15
RRM2	ribonucleotide reductase regulatory subunit M2	2.15
ESCO2	establishment of sister chromatid cohesion N-acetyltransferase 2	2.14
RP1_140K85		2.14
TMEM150B	transmembrane protein 150B	2.14
CAPG	capping actin protein, gelsolin like	2.13
SRXN1	sulfiredoxin 1	2.13
CDCA3	cell division cycle associated 3	2.12
E2F2	E2F transcription factor 2	2.12
H2BC18	H2B clustered histone 18	2.12
PHLDA2	pleckstrin homology like domain family A member 2	2.11
SLC52A3	solute carrier family 52 member 3	2.11
ADAMTS14	ADAM metalloproteinase with thrombospondin type 1 motif 14	2.1
PRKAA2	protein kinase AMP-activated catalytic subunit alpha 2	2.1
ARHGAP11A	Rho GTPase activating protein 11A	2.09
GXYLT2	glucoside xylosyltransferase 2	2.09
ZSWIM5	zinc finger SWIM-type containing 5	2.08
KIF11	kinesin family member 11	2.07
TK1	thymidine kinase 1	2.07
MEX3A	mex-3 RNA binding family member A	2.06
NUSAP1	nucleolar and spindle associated protein 1	2.06
SNHG4	small nucleolar RNA host gene 4	2.06
THY1	Thy-1 cell surface antigen	2.06
TMEM265	transmembrane protein 265	2.06
BCAT1	branched chain amino acid transaminase 1	2.05
GINS1	GINS complex subunit 1	2.05
H4C14	H4 clustered histone 14	2.05
HSPB1	heat shock protein family B (small) member 1	2.05
MAP2	microtubule associated protein 2	2.05
RAD51	RAD51 recombinase	2.05
SLC45A2	solute carrier family 45 member 2	2.05
TONSL	tonsoku like, DNA repair protein	2.05
ARHGEF39	Rho guanine nucleotide exchange factor 39	2.04
CLSPN	claspin	2.03
COLCA2	colorectal cancer associated 2	2.03
PCLAF	PCNA clamp associated factor	2.03
STRIP2	striatin interacting protein 2	2.03
H4C15	H4 clustered histone 15	2.02
TPX2	TPX2 microtubule nucleation factor	2.02
DPYSL4	dihydropyrimidinase like 4	2.01
EFNA4	ephrin A4	2.01
FAM78B	family with sequence similarity 78 member B	1.99
CDC6	cell division cycle 6	1.98
FIGNL2	fidgetin like 2	1.98
TTC9	tetratricopeptide repeat domain 9	1.98

XRCC2	X-ray repair cross complementing 2	1.98
ASF1B	anti-silencing function 1B histone chaperone	1.97
CCNF	cyclin F	1.97
FERMT1	fermitin family member 1	1.97
SFRP4	secreted frizzled related protein 4	1.97
CCDC34	coiled-coil domain containing 34	1.96
CDKN2C	cyclin dependent kinase inhibitor 2C	1.96
FABP5	fatty acid binding protein 5	1.96
ITGA2	integrin subunit alpha 2	1.96
LINC01138	long intergenic non-protein coding RNA 1138	1.96
GAREM2	GRB2 associated regulator of MAPK1 subtype 2	1.94
H4C8	H4 clustered histone 8	1.94
C21orf58	chromosome 21 open reading frame 58	1.93
EML6	EMAP like 6	1.93
NT5DC2	5'-nucleotidase domain containing 2	1.93
TMCC1-AS1	TMCC1 antisense RNA 1 (head to head)	1.93
THY1-AS1		1.91
UHRF1	ubiquitin like with PHD and ring finger domains 1	1.91
OTUB2	OTU deubiquitinase, ubiquitin aldehyde binding 2	1.9
FAM72A	family with sequence similarity 72 member A	1.89
TUBB3	tubulin beta 3 class III	1.89
PIF1	PIF1 5'-to-3' DNA helicase	1.88
SGO2	shugoshin 2	1.88
ADM2	adrenomedullin 2	1.87
CTC_351M121		1.87
NOS2	nitric oxide synthase 2	1.87
AKR1C1/AKR1C2	aldo-keto reductase family 1 member C2	1.86
ASRGL1	asparaginase and isoaspartyl peptidase 1	1.86
GJC1	gap junction protein gamma 1	1.86
PRKAR2A-AS1	PRKAR2A antisense RNA 1	1.86
C1QTNF3	C1q and TNF related 3	1.85
PIR	pirin	1.85
SQSTM1	sequestosome 1	1.85
FAM111B	family with sequence similarity 111 member B	1.83
MAD2L1	mitotic arrest deficient 2 like 1	1.83
ZWINT	ZW10 interacting kinetochore protein	1.83
RP11_50171		1.81
SNCG	synuclein gamma	1.81
SNORD3A	small nucleolar RNA, C/D box 3A	1.81
ANKRD13B	ankyrin repeat domain 13B	1.8
LOC101927136	uncharacterized LOC101927136	1.8
RASD2	RASD family member 2	1.8
SLC6A9	solute carrier family 6 member 9	1.8
STEAP2	STEAP2 metalloreductase	1.8
GBA	glucosylceramidase beta	1.78
HMGA1	high mobility group AT-hook 1	1.78
PRR11	proline rich 11	1.78
CENPK	centromere protein K	1.77
FSD1L	fibronectin type III and SPRY domain containing 1 like	1.77
RGS17	regulator of G protein signaling 17	1.77
RP11_173P153		1.77
SPON2	spondin 2	1.76
STIL	STIL centriolar assembly protein	1.76
AC068831.7		1.75
CCNE1	cyclin E1	1.75
FGF13	fibroblast growth factor 13	1.75
LOC105370941	uncharacterized LOC105370941	1.75

MPP3	membrane palmitoylated protein 3	1.75
STMN1	stathmin 1	1.75
TMEM45B	transmembrane protein 45B	1.75
RAD51AP1	RAD51 associated protein 1	1.74
C2CD4D-AS1	C2CD4D and THEM5 antisense RNA 1	1.73
CDKN2B	cyclin dependent kinase inhibitor 2B	1.73
CIP2A	cellular inhibitor of PP2A	1.73
CSMD2	CUB and Sushi multiple domains 2	1.73
MSANTD3-TMEFF1	MSANTD3-TMEFF1 readthrough	1.73
DUOX1	dual oxidase 1	1.72
FOXD2-AS1	FOXD2 adjacent opposite strand RNA 1	1.72
SOWAHCP2	SOWAHC pseudogene 2	1.72
GOLGA2P7	GOLGA2 pseudogene 7	1.71
MTBP	MDM2 binding protein	1.71
MTHFD1L	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 1 like	1.71
S100A10	S100 calcium binding protein A10	1.71
CENPL	centromere protein L	1.7
CGREF1	cell growth regulator with EF-hand domain 1	1.7
FAM189B	family with sequence similarity 189 member B	1.7
H2BC20P	H2B clustered histone 20, pseudogene	1.7
DSCC1	DNA replication and sister chromatid cohesion 1	1.69
TMC7	transmembrane channel like 7	1.69
TMEM106C	transmembrane protein 106C	1.69
TMEM54	transmembrane protein 54	1.69
FLVCR1-DT	FLVCR1 divergent transcript	1.68
GOLM1	golgi membrane protein 1	1.68
ITGA6	integrin subunit alpha 6	1.68
NUDT1	nudix hydrolase 1	1.68
RP11-704M14.1		1.68
ARHGAP22	Rho GTPase activating protein 22	1.67
APOBEC3B	apolipoprotein B mRNA editing enzyme catalytic subunit 3B	1.66
ARHGAP39	Rho GTPase activating protein 39	1.66
RASL12	RAS like family 12	1.66
RRAGD	Ras related GTP binding D	1.66
BICDL1	BICD family like cargo adaptor 1	1.65
CD34	CD34 molecule	1.65
HDAC11	histone deacetylase 11	1.65
SPSB2	spiA/ryanodine receptor domain and SOCS box containing 2	1.65
C1orf112	chromosome 1 open reading frame 112	1.64
CEP131	centrosomal protein 131	1.64
LOC100288637	OTU deubiquitinase 7A pseudogene	1.64
WDR62	WD repeat domain 62	1.64
CES1P1	carboxylesterase 1 pseudogene 1	1.63
RTKN2	rhotekin 2	1.63
TMEM74B	transmembrane protein 74B	1.63
TNFRSF4	TNF receptor superfamily member 4	1.63
CTD_2649C142		1.62
FOXD2	forkhead box D2	1.62
LINC00653	long intergenic non-protein coding RNA 653	1.62
PVT1	Pvt1 oncogene	1.62
RHPN1	rhopilin Rho GTPase binding protein 1	1.62
EZH2	enhancer of zeste 2 polycomb repressive complex 2 subunit	1.61
PLVAP	plasmalemma vesicle associated protein	1.61
RAD54B	RAD54 homolog B	1.61
RP11_20I204		1.61
UBE2S	ubiquitin conjugating enzyme E2 S	1.61
ZBTB12	zinc finger and BTB domain containing 12	1.61

AURKA	aurora kinase A	1.6
FBXO32	F-box protein 32	1.6
PMFBP1	polyamine modulated factor 1 binding protein 1	1.6
KCNJ4	potassium inwardly rectifying channel subfamily J member 4	1.59
PFKFB4	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4	1.59
TLL7	tubulin tyrosine ligase like 7	1.59
CAVIN3	caveolae associated protein 3	1.58
RFC4	replication factor C subunit 4	1.58
ANXA2	annexin A2	1.57
ME1	malic enzyme 1	1.57
AC0921714		1.56
FANCI	FA complementation group I	1.56
OSBP2	oxysterol binding protein 2	1.56
PAFAH1B3	platelet activating factor acetylhydrolase 1b catalytic subunit 3	1.56
SPDL1	spindle apparatus coiled-coil protein 1	1.56
ASPH	aspartate beta-hydroxylase	1.55
RNF157	ring finger protein 157	1.55
TCF19	transcription factor 19	1.55
BOP1	BOP1 ribosomal biogenesis factor	1.54
CCDC112	coiled-coil domain containing 112	1.54
DDIAS	DNA damage induced apoptosis suppressor	1.54
NSMCE2	NSE2 (MMS21) homolog, SMC5-SMC6 complex SUMO ligase	1.54
RNF43	ring finger protein 43	1.54
C9orf16	chromosome 9 open reading frame 16	1.53
CTC_471F35		1.53
DCAF4L1	DDB1 and CUL4 associated factor 4 like 1	1.53
EHMT2	euchromatic histone lysine methyltransferase 2	1.53
PANX2	pannexin 2	1.53
PCSK5	proprotein convertase subtilisin/kexin type 5	1.53
AC068946.2		1.52
C11orf45	chromosome 11 open reading frame 45	1.52
DTNA	dystrobrevin alpha	1.52
LOC101926967	uncharacterized LOC101926967	1.52
OLFML2A	olfactomedin like 2A	1.52
STX1A	syntaxin 1A	1.52
VNN2	vanin 2	1.52
ZNF681	zinc finger protein 681	1.52
ANO10	anoctamin 10	1.51
RAC3	Rac family small GTPase 3	1.51
RP3_340N12		1.51
BRCA1	BRCA1 DNA repair associated	1.5
ANXA2P2	annexin A2 pseudogene 2	1.49
CHN1	chimerin 1	1.49
CHRD2	chordin like 2	1.49
CTSA	cathepsin A	1.49
GLMP	glycosylated lysosomal membrane protein	1.49
HTATIP2	HIV-1 Tat interactive protein 2	1.49
PYGB	glycogen phosphorylase B	1.49
RNASEH2A	ribonuclease H2 subunit A	1.49
RP5_1074L14		1.49
ASB16	ankyrin repeat and SOCS box containing 16	1.48
ENAH	ENAH actin regulator	1.48
H2BC15	H2B clustered histone 15	1.48
KRT8P12	keratin 8 pseudogene 12	1.48
MAPK12	mitogen-activated protein kinase 12	1.48
ORC6	origin recognition complex subunit 6	1.48
PACC1	proton activated chloride channel 1	1.48

SAC3D1	SAC3 domain containing 1	1.48
STXBP6	syntaxin binding protein 6	1.48
TMEM81	transmembrane protein 81	1.48
ABLIM2	actin binding LIM protein family member 2	1.47
HROB	homologous recombination factor with OB-fold	1.47
TRIM59	tripartite motif containing 59	1.47
CENPX	centromere protein X	1.46
PLK4	polo like kinase 4	1.46
PLXDC1	plexin domain containing 1	1.46
EID3	EP300 interacting inhibitor of differentiation 3	1.45
LIMK1	LIM domain kinase 1	1.45
KIF24	kinesin family member 24	1.44
TRIM6	tripartite motif containing 6	1.44
TXN	thioredoxin	1.44
ZBED8	zinc finger BED-type containing 8	1.44
ZNF775	zinc finger protein 775	1.44
CDH13	cadherin 13	1.43
FBF1	Fas binding factor 1	1.43
OXLD1	oxidoreductase like domain containing 1	1.43
PKM	pyruvate kinase M1/2	1.43
PSORS1C1	psoriasis susceptibility 1 candidate 1	1.43
TBC1D31	TBC1 domain family member 31	1.43
LOC105369760		1.42
MSC-AS1	MSC antisense RNA 1	1.42
PSRC1	proline and serine rich coiled-coil 1	1.42
S100A11	S100 calcium binding protein A11	1.42
SQLE	squalene epoxidase	1.42
WDR76	WD repeat domain 76	1.42
CCDC110	coiled-coil domain containing 110	1.41
MSTO2P	misato family member 2, pseudogene	1.41
RGS5	regulator of G protein signaling 5	1.41
EMC3-AS1	EMC3 antisense RNA 1	1.4
NOTCH3	notch receptor 3	1.4
PLAG1	PLAG1 zinc finger	1.4
RP1_267D116		1.4
STEAP1	STEAP family member 1	1.4
CCDC24	coiled-coil domain containing 24	1.39
DLG5	discs large MAGUK scaffold protein 5	1.38
DNMT3B	DNA methyltransferase 3 beta	1.38
EBF1	EBF transcription factor 1	1.38
LINC01011	long intergenic non-protein coding RNA 1011	1.38
N4BP3	NEDD4 binding protein 3	1.38
NME1	NME/NM23 nucleoside diphosphate kinase 1	1.38
RNASE1	ribonuclease A family member 1, pancreatic	1.38
SERPINI1	serpin family I member 1	1.38
SLC38A6	solute carrier family 38 member 6	1.38
SLC52A2	solute carrier family 52 member 2	1.38
TRIM36	tripartite motif containing 36	1.38
C1QTNF3-AMACR	C1QTNF3-AMACR readthrough (NMD candidate)	1.36
P4HA2	prolyl 4-hydroxylase subunit alpha 2	1.36
RP11_1109F113		1.36
SCNM1	sodium channel modifier 1	1.36
ZNF572	zinc finger protein 572	1.36
AC073111.5		1.35
CCNE2	cyclin E2	1.35
CDH24	cadherin 24	1.35
CENPU	centromere protein U	1.35

GLI4	GLI family zinc finger 4	1.35
INCENP	inner centromere protein	1.35
MCMDC2	minichromosome maintenance domain containing 2	1.35
MSTO1	misato mitochondrial distribution and morphology regulator 1	1.35
NECAB3	N-terminal EF-hand calcium binding protein 3	1.35
TDRKH	tudor and KH domain containing	1.35
VSIG10L	V-set and immunoglobulin domain containing 10 like	1.35
CENPH	centromere protein H	1.34
FANCD2	FA complementation group D2	1.34
HASPIN	histone H3 associated protein kinase	1.34
NR2C2AP	nuclear receptor 2C2 associated protein	1.34
PAQR4	progesterin and adipoQ receptor family member 4	1.34
ST20-MTHFS	ST20-MTHFS readthrough	1.34
TALDO1	transaldolase 1	1.34
TLCD1	TLC domain containing 1	1.34
UCK2	uridine-cytidine kinase 2	1.34
BOLA2/BOLA2B	bolA family member 2	1.33
COA6	cytochrome c oxidase assembly factor 6	1.33
EPDR1	ependymin related 1	1.33
HGH1	HGH1 homolog	1.33
MTMR11	myotubularin related protein 11	1.33
TLL1	tubulin tyrosine ligase like 1	1.33
ZBTB41	zinc finger and BTB domain containing 41	1.33
ALPK3	alpha kinase 3	1.32
CHEK1	checkpoint kinase 1	1.32
FEN1	flap structure-specific endonuclease 1	1.32
KIFC2	kinesin family member C2	1.32
PTP4A3	protein tyrosine phosphatase 4A3	1.32
RP1_80N23		1.32
CCN3	cellular communication network factor 3	1.31
CDC7	cell division cycle 7	1.31
LINC00528	long intergenic non-protein coding RNA 528	1.31
MCM8	minichromosome maintenance 8 homologous recombination repair factor	1.31
RP3_406P245		1.31
SMYD3	SET and MYND domain containing 3	1.31
ALDOA	aldolase, fructose-bisphosphate A	1.3
ASAP3	ArfGAP with SH3 domain, ankyrin repeat and PH domain 3	1.3
CSPG4	chondroitin sulfate proteoglycan 4	1.3
CTA_445C914		1.3
CTSC	cathepsin C	1.3
GGH	gamma-glutamyl hydrolase	1.3
HNF1A-AS1	HNF1A antisense RNA 1	1.3
PABPC4L	poly(A) binding protein cytoplasmic 4 like	1.3
RP11_600F247		1.3
ZNF436-AS1	ZNF436 antisense RNA 1	1.3
AC0093032		1.29
DPY19L1P1	DPY19L1 pseudogene 1	1.29
FLVCR1	FLVCR heme transporter 1	1.29
KPNA2	karyopherin subunit alpha 2	1.29
PP7080	uncharacterized LOC25845	1.29
ZC2HC1A	zinc finger C2HC-type containing 1A	1.29
CKAP2	cytoskeleton associated protein 2	1.28
COL5A3	collagen type V alpha 3 chain	1.28
CTD_2287O165		1.28
DNM3	dynamamin 3	1.28
DSTNP2	DSTN pseudogene 2	1.28
LINC02542	long intergenic non-protein coding RNA 2542	1.28

MCM2	minichromosome maintenance complex component 2	1.28
PSMG3	proteasome assembly chaperone 3	1.28
SCAMP3	secretory carrier membrane protein 3	1.28
TAF6	TATA-box binding protein associated factor 6	1.28
ZFP41	ZFP41 zinc finger protein	1.28
GRAMD1A	GRAM domain containing 1A	1.27
JPT1	Jupiter microtubule associated homolog 1	1.27
LIN9	lin-9 DREAM MuvB core complex component	1.27
TUBG1	tubulin gamma 1	1.27
ABHD4	abhydrolase domain containing 4, N-acyl phospholipase B	1.26
BAG2	BAG cochaperone 2	1.26
CCDC77	coiled-coil domain containing 77	1.26
CENPQ	centromere protein Q	1.26
CLCN7	chloride voltage-gated channel 7	1.26
GOLGA2P10	GOLGA2 pseudogene 10	1.26
LRP12	LDL receptor related protein 12	1.26
OSBPL3	oxysterol binding protein like 3	1.26
PLEKHA8P1	pleckstrin homology domain containing A8 pseudogene 1	1.26
PYCR3	pyrroline-5-carboxylate reductase 3	1.26
RELL2	RELT like 2	1.26
RFXANK	regulatory factor X associated ankyrin containing protein	1.26
RHNO1	RAD9-HUS1-RAD1 interacting nuclear orphan 1	1.26
RNF187	ring finger protein 187	1.26
SPATS2	spermatogenesis associated serine rich 2	1.26
AGTRAP	angiotensin II receptor associated protein	1.25
AP5Z1	adaptor related protein complex 5 subunit zeta 1	1.25
C7orf25	chromosome 7 open reading frame 25	1.25
H2BC12	H2B clustered histone 12	1.25
HOMER3	homer scaffold protein 3	1.25
LRRC45	leucine rich repeat containing 45	1.25
NT5M	5',3'-nucleotidase, mitochondrial	1.25
RP11_61J195		1.25
SCPEP1	serine carboxypeptidase 1	1.25
TPM2	tropomyosin 2	1.25
ABCB9	ATP binding cassette subfamily B member 9	1.24
ABCC5	ATP binding cassette subfamily C member 5	1.24
ADAM15	ADAM metallopeptidase domain 15	1.24
BCL9	BCL9 transcription coactivator	1.24
CDK5	cyclin dependent kinase 5	1.24
FAAP24	FA core complex associated protein 24	1.24
GPAA1	glycosylphosphatidylinositol anchor attachment 1	1.24
LAMB3	laminin subunit beta 3	1.24
SCRIB	scribble planar cell polarity protein	1.24
SLC7A6	solute carrier family 7 member 6	1.24
SPAG4	sperm associated antigen 4	1.24
BLVRA	biliverdin reductase A	1.23
FTH1P11	ferritin heavy chain 1 pseudogene 11	1.23
PDLIM7	PDZ and LIM domain 7	1.23
PRIM2	DNA primase subunit 2	1.23
SEPT5-GP1BB	SEPT5-GP1BB readthrough	1.23
TUBG2	tubulin gamma 2	1.23
ZKSCAN3	zinc finger with KRAB and SCAN domains 3	1.23
ZNF517	zinc finger protein 517	1.23
CBX8	chromobox 8	1.22
FTL	ferritin light chain	1.22
GSDME	gasdermin E	1.22
IQANK1	IQ motif and ankyrin repeat containing 1	1.22



MECOM	MDS1 and EVI1 complex locus	1.22
TARBP1	TAR (HIV-1) RNA binding protein 1	1.22
TRPS1	transcriptional repressor GATA binding 1	1.22
TUBA1B	tubulin alpha 1b	1.22
CHTF18	chromosome transmission fidelity factor 18	1.21
CNKSR2	connector enhancer of kinase suppressor of Ras 2	1.21
H2BC21	H2B clustered histone 21	1.21
LAGE3	L antigen family member 3	1.21
MKLN1-AS	MKLN1 antisense RNA	1.21
PLP2	proteolipid protein 2	1.21
SORT1	sortilin 1	1.21
TAGLN2	transgelin 2	1.21
TIGD1	tigger transposable element derived 1	1.21
ATP6V1E2	ATPase H+ transporting V1 subunit E2	1.2
C20orf27	chromosome 20 open reading frame 27	1.2
H2AX	H2A.X variant histone	1.2
KITLG	KIT ligand	1.2
MNS1	meiosis specific nuclear structural 1	1.2
NEU1	neuraminidase 1	1.2
ZNF213	zinc finger protein 213	1.2
ARL2	ADP ribosylation factor like GTPase 2	1.19
CUEDC1	CUE domain containing 1	1.19
EXTL3-AS1	EXTL3 antisense RNA 1	1.19
FTLP3	ferritin light chain pseudogene 3	1.19
HSF4	heat shock transcription factor 4	1.19
ITGA7	integrin subunit alpha 7	1.19
LOX	lysyl oxidase	1.19
RP11_346C203		1.19
TET1	tet methylcytosine dioxygenase 1	1.19
VPS72	vacuolar protein sorting 72 homolog	1.19
BOLA2-SMG1P6	BOLA2-SMG1P6 readthrough	1.18
C1orf35	chromosome 1 open reading frame 35	1.18
FANCG	FA complementation group G	1.18
HMGN3-AS1	HMGN3 antisense RNA 1	1.18
HSP90AB3P	heat shock protein 90 alpha family class B member 3, pseudogene	1.18
KDM4A-AS1	KDM4A antisense RNA 1	1.18
LAMA4	laminin subunit alpha 4	1.18
LOXL2	lysyl oxidase like 2	1.18
MIF	macrophage migration inhibitory factor	1.18
MSH2	mutS homolog 2	1.18
NAGPA	N-acetylglucosamine-1-phosphodiester alpha-N-acetylglucosaminidase	1.18
SLC35E4	solute carrier family 35 member E4	1.18
CCHCR1	coiled-coil alpha-helical rod protein 1	1.17
CPT1C	carnitine palmitoyltransferase 1C	1.17
FAM86JP	family with sequence similarity 86, member A pseudogene	1.17
H2AC6	H2A clustered histone 6	1.17
LLGL1	LLGL scribble cell polarity complex component 1	1.17
RPL13P5	ribosomal protein L13 pseudogene 5	1.17
SF3B4	splicing factor 3b subunit 4	1.17
AC1294921		1.16
CTC_251D131		1.16
FAM53A	family with sequence similarity 53 member A	1.16
LAMC1	laminin subunit gamma 1	1.16
LHX4	LIM homeobox 4	1.16
LINC00235	long intergenic non-protein coding RNA 235	1.16
LOC101927151	uncharacterized LOC101927151	1.16
NDRG3	NDRG family member 3	1.16

NSUN5P2	NSUN5 pseudogene 2	1.16
PKN3	protein kinase N3	1.16
SPACA9	sperm acrosome associated 9	1.16
ZEB1-AS1	ZEB1 antisense RNA 1	1.16
FADS2	fatty acid desaturase 2	1.15
KNTC1	kinetochore associated 1	1.15
MRPL20-DT		1.15
NABP2	nucleic acid binding protein 2	1.15
PSMD4	proteasome 26S subunit, non-ATPase 4	1.15
RPS6KL1	ribosomal protein S6 kinase like 1	1.15
SMIM29	small integral membrane protein 29	1.15
TACC3	transforming acidic coiled-coil containing protein 3	1.15
ZNF692	zinc finger protein 692	1.15
ZNF85	zinc finger protein 85	1.15
ACBD6	acyl-CoA binding domain containing 6	1.14
CCT3	chaperonin containing TCP1 subunit 3	1.14
EXOSC4	exosome component 4	1.14
FIGNL1	fidgetin like 1	1.14
LINC00240	long intergenic non-protein coding RNA 240	1.14
MICB	MHC class I polypeptide-related sequence B	1.14
NCAPD2	non-SMC condensin I complex subunit D2	1.14
PIGZ	phosphatidylinositol glycan anchor biosynthesis class Z	1.14
PSPH	phosphoserine phosphatase	1.14
RP11_480A161		1.14
RP11_96D18		1.14
RPUSD1	RNA pseudouridine synthase domain containing 1	1.14
TEAD2	TEA domain transcription factor 2	1.14
HTATSF1P2	HIV-1 Tat specific factor 1 pseudogene 2	1.13
NUDT17	nudix hydrolase 17	1.13
POLA2	DNA polymerase alpha 2, accessory subunit	1.13
RP11_197N182		1.13
RP1_228H135		1.13
SIRT7	sirtuin 7	1.13
SLC22A18AS	solute carrier family 22 member 18 antisense	1.13
TMEM164	transmembrane protein 164	1.13
UGDH	UDP-glucose 6-dehydrogenase	1.13
ZNF174	zinc finger protein 174	1.13
ZNNT1	ZNF706 neighboring transcript 1	1.13
B3GALNT1	beta-1,3-N-acetylgalactosaminyltransferase 1 (globoside blood group)	1.12
CEP41	centrosomal protein 41	1.12
CTC-338M12.4	uncharacterized LOC101928649	1.12
GMDS	GDP-mannose 4,6-dehydratase	1.12
MMS22L	MMS22 like, DNA repair protein	1.12
PPOX	protoporphyrinogen oxidase	1.12
RP11_496H11		1.12
RUSC1	RUN and SH3 domain containing 1	1.12
SASS6	SAS-6 centriolar assembly protein	1.12
SEMA4F	semaphorin 4F	1.12
TMEM64	transmembrane protein 64	1.12
CEP85	centrosomal protein 85	1.11
COL4A2	collagen type IV alpha 2 chain	1.11
DTYMK	deoxythymidylate kinase	1.11
LOC100287896	uncharacterized LOC100287896	1.11
NTAQ1	N-terminal glutamine amidase 1	1.11
NUP37	nucleoporin 37	1.11
PIGC	phosphatidylinositol glycan anchor biosynthesis class C	1.11
PLEKHN1	pleckstrin homology domain containing N1	1.11



PRSS36	serine protease 36	1.07
SNRPE	small nuclear ribonucleoprotein polypeptide E	1.07
SNX15	sorting nexin 15	1.07
CDK4	cyclin dependent kinase 4	1.06
CHAF1A	chromatin assembly factor 1 subunit A	1.06
COL4A1	collagen type IV alpha 1 chain	1.06
CTB_25B1312		1.06
CYHR1	cysteine and histidine rich 1	1.06
CYRIB	CYFIP related Rac1 interactor B	1.06
H2AZ1	H2A.Z variant histone 1	1.06
KCTD1	potassium channel tetramerization domain containing 1	1.06
KIF22	kinesin family member 22	1.06
KNL1	kinetochore scaffold 1	1.06
PFDN6	prefoldin subunit 6	1.06
RAB6B	RAB6B, member RAS oncogene family	1.06
SLC25A39	solute carrier family 25 member 39	1.06
TBX19	T-box transcription factor 19	1.06
TSSK6	testis specific serine kinase 6	1.06
AACS	acetoacetyl-CoA synthetase	1.05
ATP6V1H	ATPase H <sup>+</sup> transporting V1 subunit H	1.05
B9D1	B9 domain containing 1	1.05
KCNE3	potassium voltage-gated channel subfamily E regulatory subunit 3	1.05
NCAPG2	non-SMC condensin II complex subunit G2	1.05
PPIH	peptidylprolyl isomerase H	1.05
TMEM101	transmembrane protein 101	1.05
U91328.1		1.05
ZNF815P	zinc finger protein 815, pseudogene	1.05
AC009133.12		1.04
ASB16-AS1	ASB16 antisense RNA 1	1.04
C8orf33	chromosome 8 open reading frame 33	1.04
CH507-513H4.5		1.04
DDX12P	DEAD/H-box helicase 12, pseudogene	1.04
E2F5	E2F transcription factor 5	1.04
FAM50A	family with sequence similarity 50 member A	1.04
GINS3	GINS complex subunit 3	1.04
LA16C_390E64		1.04
LINC01126	long intergenic non-protein coding RNA 1126	1.04
MAD1L1	mitotic arrest deficient 1 like 1	1.04
NRM	nurim	1.04
SVBP	small vasohibin binding protein	1.04
ZNF605	zinc finger protein 605	1.04
ADAMTS7	ADAM metalloproteinase with thrombospondin type 1 motif 7	1.03
AMDHD2	amidohydrolase domain containing 2	1.03
AP0062222		1.03
ATP5MF-PTCD1	ATP5MF-PTCD1 readthrough	1.03
BICD1	BICD cargo adaptor 1	1.03
CAPN10-DT	CAPN10 divergent transcript	1.03
EEF1E1	eukaryotic translation elongation factor 1 epsilon 1	1.03
FHIT	fragile histidine triad diadenosine triphosphatase	1.03
GLA	galactosidase alpha	1.03
GNPDA1	glucosamine-6-phosphate deaminase 1	1.03
KLC2	kinesin light chain 2	1.03
LOC102724238	uncharacterized LOC102724238	1.03
LSM2	LSM2 homolog, U6 small nuclear RNA and mRNA degradation associated	1.03
MSH5	mutS homolog 5	1.03
NME2	NME/NM23 nucleoside diphosphate kinase 2	1.03
PFDN4	prefoldin subunit 4	1.03

RNF139-AS1	RNF139 antisense RNA 1 (head to head)	1.03
RRP9	ribosomal RNA processing 9, U3 small nucleolar RNA binding protein	1.03
TSTA3	tissue specific transplantation antigen P35B	1.03
ZNF691	zinc finger protein 691	1.03
ZNF696	zinc finger protein 696	1.03
APIP	APAF1 interacting protein	1.02
BBS12	Bardet-Biedl syndrome 12	1.02
DAPK2	death associated protein kinase 2	1.02
FAM110A	family with sequence similarity 110 member A	1.02
GALNT10	polypeptide N-acetylgalactosaminyltransferase 10	1.02
IFT80	intraflagellar transport 80	1.02
KIAA1614	KIAA1614	1.02
KMT5C	lysine methyltransferase 5C	1.02
LINC01772	long intergenic non-protein coding RNA 1772	1.02
MCM3	minichromosome maintenance complex component 3	1.02
ROBO3	roundabout guidance receptor 3	1.02
RP11_106M33		1.02
SLC1A3	solute carrier family 1 member 3	1.02
SMC4	structural maintenance of chromosomes 4	1.02
SMYD2	SET and MYND domain containing 2	1.02
SNRPC	small nuclear ribonucleoprotein polypeptide C	1.02
SPINDOC	spindlin interactor and repressor of chromatin binding	1.02
TTF2	transcription termination factor 2	1.02
TUBA1C	tubulin alpha 1c	1.02
ATRIP	ATR interacting protein	1.01
BORA	BORA aurora kinase A activator	1.01
CCDC137	coiled-coil domain containing 137	1.01
DLGAP1-AS1	DLGAP1 antisense RNA 1	1.01
LOC105369779	uncharacterized LOC105369779	1.01
MVP	major vault protein	1.01
NOL3	nucleolar protein 3	1.01
PARS2	prolyl-tRNA synthetase 2, mitochondrial	1.01
PIK3R2	phosphoinositide-3-kinase regulatory subunit 2	1.01
PPP1R16A	protein phosphatase 1 regulatory subunit 16A	1.01
SLC16A1-AS1	SLC16A1 antisense RNA 1	1.01
STIP1	stress induced phosphoprotein 1	1.01
TLCD5	TLC domain containing 5	1.01
ZNF219	zinc finger protein 219	1.01
C7orf50	chromosome 7 open reading frame 50	1
CH17-340M24.3	uncharacterized protein BC009467	1
CIART	circadian associated repressor of transcription	1
FTH1	ferritin heavy chain 1	1
GRIN2D	glutamate ionotropic receptor NMDA type subunit 2D	1
IQCC	IQ motif containing C	1
LPCAT2	lysophosphatidylcholine acyltransferase 2	1
MAPKAPK5-AS1	MAPKAPK5 antisense RNA 1	1
MYL6B	myosin light chain 6B	1
PCDH17	protocadherin 17	1
PPIAP22	peptidylprolyl isomerase A pseudogene 22	1
S100A6	S100 calcium binding protein A6	1
SAMD1	sterile alpha motif domain containing 1	1
VPS45	vacuolar protein sorting 45 homolog	1
WASF1	WASP family member 1	1
FTCDNL1	formiminotransferase cyclodeaminase N-terminal like	-1
LOC100288798	uncharacterized LOC100288798	-1
ABCD3	ATP binding cassette subfamily D member 3	-1.01
FAH	fumarylacetoacetate hydrolase	-1.01

FAHD2A	fumarylacetoacetate hydrolase domain containing 2A	-1.01
FBXO21	F-box protein 21	-1.01
HPN-AS1	HPN antisense RNA 1	-1.01
IQGAP2	IQ motif containing GTPase activating protein 2	-1.01
MAP1LC3A	microtubule associated protein 1 light chain 3 alpha	-1.01
PDXDC2P-NPIPB14P	nuclear pore complex-interacting protein	-1.01
RAB37	RAB37, member RAS oncogene family	-1.01
SEC24B	SEC24 homolog B, COPII coat complex component	-1.01
WFIKKN1	WAP, follistatin/kazal, immunoglobulin, kunitz and netrin domain containing 1	-1.01
ZDHHC11	zinc finger DHHC-type containing 11	-1.01
ASS1P12	argininosuccinate synthetase 1 pseudogene 12	-1.02
CCDC198	coiled-coil domain containing 198	-1.02
CNOT6L	CCR4-NOT transcription complex subunit 6 like	-1.02
COL18A1	collagen type XVIII alpha 1 chain	-1.02
CPEB4	cytoplasmic polyadenylation element binding protein 4	-1.02
CROCCP2	CROCC pseudogene 2	-1.02
DNMBP	dynamamin binding protein	-1.02
FES	FES proto-oncogene, tyrosine kinase	-1.02
FYN	FYN proto-oncogene, Src family tyrosine kinase	-1.02
HPS5	HPS5 biogenesis of lysosomal organelles complex 2 subunit 2	-1.02
KDF1	keratinocyte differentiation factor 1	-1.02
KIAA1671	KIAA1671	-1.02
MCL1	MCL1 apoptosis regulator, BCL2 family member	-1.02
NPR1	natriuretic peptide receptor 1	-1.02
P2RX5-TAX1BP3	P2RX5-TAX1BP3 readthrough (NMD candidate)	-1.02
PCAT7	prostate cancer associated transcript 7	-1.02
PEAR1	platelet endothelial aggregation receptor 1	-1.02
PER2	period circadian regulator 2	-1.02
RAPGEF5	Rap guanine nucleotide exchange factor 5	-1.02
RMDN2	regulator of microtubule dynamics 2	-1.02
RP11-470M1.2		-1.02
TTC39B	tetratricopeptide repeat domain 39B	-1.02
ZNF154	zinc finger protein 154	-1.02
C4orf19	chromosome 4 open reading frame 19	-1.03
CCNB1IP1	cyclin B1 interacting protein 1	-1.03
CFH	complement factor H	-1.03
ETS1	ETS proto-oncogene 1, transcription factor	-1.03
GCHFR	GTP cyclohydrolase I feedback regulator	-1.03
GNG7	G protein subunit gamma 7	-1.03
KLF8	Kruppel like factor 8	-1.03
LONRF1	LON peptidase N-terminal domain and ring finger 1	-1.03
MYO1B	myosin IB	-1.03
PUS10	pseudouridine synthase 10	-1.03
SEMA5A	semaphorin 5A	-1.03
SUCLG2P2	SUCLG2 pseudogene 2	-1.03
TRAM2	translocation associated membrane protein 2	-1.03
TTC39C	tetratricopeptide repeat domain 39C	-1.03
ARMH1	armadillo like helical domain containing 1	-1.04
CFI	complement factor I	-1.04
CTD_2555O164		-1.04
GLIPR1L2	GLIPR1 like 2	-1.04
GLYCK	glycerate kinase	-1.04
KCNAB3	potassium voltage-gated channel subfamily A regulatory beta subunit 3	-1.04
MTRNR2L12	MT-RNR2 like 12	-1.04
OXER1	oxoeicosanoid receptor 1	-1.04
PNMA8B	PNMA family member 8B	-1.04
RECK	reversion inducing cysteine rich protein with kazal motifs	-1.04

RP11_799B121		-1.04
RPL17-C18orf32	RPL17-C18orf32 readthrough	-1.04
SIK2	salt inducible kinase 2	-1.04
SULT1A1	sulfotransferase family 1A member 1	-1.04
USP6NL	USP6 N-terminal like	-1.04
ZFP1	ZFP1 zinc finger protein	-1.04
ZNF141	zinc finger protein 141	-1.04
A1BG-AS1	A1BG antisense RNA 1	-1.05
FAM167B	family with sequence similarity 167 member B	-1.05
HDAC6	histone deacetylase 6	-1.05
LINC02532	long intergenic non-protein coding RNA 2532	-1.05
MGMT	O-6-methylguanine-DNA methyltransferase	-1.05
MYD88	MYD88 innate immune signal transduction adaptor	-1.05
PTPN21	protein tyrosine phosphatase non-receptor type 21	-1.05
RAB17	RAB17, member RAS oncogene family	-1.05
RP11_23N24		-1.05
SLC19A2	solute carrier family 19 member 2	-1.05
SLC8A1	solute carrier family 8 member A1	-1.05
SUCLG2	succinate-CoA ligase GDP-forming subunit beta	-1.05
SULT1A2	sulfotransferase family 1A member 2	-1.05
ZNF462	zinc finger protein 462	-1.05
ANTXR2	ANTXR cell adhesion molecule 2	-1.06
DIP2C	disco interacting protein 2 homolog C	-1.06
FLNB-AS1		-1.06
HIVEP1	HIVEP zinc finger 1	-1.06
HNF1B	HNF1 homeobox B	-1.06
PROX1	prospero homeobox 1	-1.06
PRR22	proline rich 22	-1.06
RAB20	RAB20, member RAS oncogene family	-1.06
RASGRP1	RAS guanyl releasing protein 1	-1.06
REL	REL proto-oncogene, NF-kB subunit	-1.06
REPS2	RALBP1 associated Eps domain containing 2	-1.06
TJP2	tight junction protein 2	-1.06
ZNF471	zinc finger protein 471	-1.06
ZRANB1	zinc finger RANBP2-type containing 1	-1.06
ZSWIM6	zinc finger SWIM-type containing 6	-1.06
ACO1	aconitase 1	-1.07
AGPAT2	1-acylglycerol-3-phosphate O-acyltransferase 2	-1.07
ALDH1B1	aldehyde dehydrogenase 1 family member B1	-1.07
B4GALT1-AS1	B4GALT1 antisense RNA 1	-1.07
CTD_2240E144		-1.07
IFNAR1	interferon alpha and beta receptor subunit 1	-1.07
IL6ST	interleukin 6 signal transducer	-1.07
IPO5P1	importin 5 pseudogene 1	-1.07
MTHFS	methenyltetrahydrofolate synthetase	-1.07
PLD1	phospholipase D1	-1.07
QSOX1	quiescin sulfhydryl oxidase 1	-1.07
RP11_182J117		-1.07
ST3GAL6	ST3 beta-galactoside alpha-2,3-sialyltransferase 6	-1.07
TIPARP	TCDD inducible poly(ADP-ribose) polymerase	-1.07
TSPAN9	tetraspanin 9	-1.07
APOL6	apolipoprotein L6	-1.08
C17orf100	chromosome 17 open reading frame 100	-1.08
CCND1	cyclin D1	-1.08
CCT6B	chaperonin containing TCP1 subunit 6B	-1.08
CSAD	cysteine sulfinic acid decarboxylase	-1.08
HGD	homogentisate 1,2-dioxygenase	-1.08

KLHL2	kelch like family member 2	-1.08
MEG3	maternally expressed 3	-1.08
PGM1	phosphoglucomutase 1	-1.08
RP11_338I211		-1.08
SH3BGRL2	SH3 domain binding glutamate rich protein like 2	-1.08
SHH	sonic hedgehog signaling molecule	-1.08
SUCNR1	succinate receptor 1	-1.08
TINAGL1	tubulointerstitial nephritis antigen like 1	-1.08
UNC13D	unc-13 homolog D	-1.08
WWC2	WW and C2 domain containing 2	-1.08
CLDN1	claudin 1	-1.09
CTSW	cathepsin W	-1.09
DCUN1D3	defective in cullin neddylation 1 domain containing 3	-1.09
DNAJC25	DnaJ heat shock protein family (Hsp40) member C25	-1.09
FAS	Fas cell surface death receptor	-1.09
GIMAP5	GTPase, IMAP family member 5	-1.09
IER2	immediate early response 2	-1.09
KLF10	Kruppel like factor 10	-1.09
NCALD	neurocalcin delta	-1.09
PRCD	photoreceptor disc component	-1.09
RP11_373L241		-1.09
SLC43A3	solute carrier family 43 member 3	-1.09
A1CF	APOBEC1 complementation factor	-1.1
B4GALT1	beta-1,4-galactosyltransferase 1	-1.1
BTG2	BTG anti-proliferation factor 2	-1.1
ISG20	interferon stimulated exonuclease gene 20	-1.1
NAP1L5	nucleosome assembly protein 1 like 5	-1.1
OXCT2	3-oxoacid CoA-transferase 2	-1.1
PDE4B	phosphodiesterase 4B	-1.1
PSD4	pleckstrin and Sec7 domain containing 4	-1.1
RAPGEF4	Rap guanine nucleotide exchange factor 4	-1.1
RP11-903H12.5		-1.1
RP11_544M2213		-1.1
TSPAN7	tetraspanin 7	-1.1
TSPYL2	TSPY like 2	-1.1
TTPAL	alpha tocopherol transfer protein like	-1.1
AGBL2	ATP/GTP binding protein like 2	-1.11
ARRB1	arrestin beta 1	-1.11
CBLN3	cerebellin 3 precursor	-1.11
DBT	dihydrolipoamide branched chain transacylase E2	-1.11
ESR2	estrogen receptor 2	-1.11
FGFR1	fibroblast growth factor receptor 1	-1.11
JDP2	Jun dimerization protein 2	-1.11
MLYCD	malonyl-CoA decarboxylase	-1.11
POR	cytochrome p450 oxidoreductase	-1.11
RHOA	ras homolog family member U	-1.11
RPH3AL	rabphilin 3A like (without C2 domains)	-1.11
ZNF395	zinc finger protein 395	-1.11
CCL5	C-C motif chemokine ligand 5	-1.12
CYB5D2	cytochrome b5 domain containing 2	-1.12
FXSD6	FXSD domain containing ion transport regulator 6	-1.12
IFITM1	interferon induced transmembrane protein 1	-1.12
INHBB	inhibin subunit beta B	-1.12
PARP15	poly(ADP-ribose) polymerase family member 15	-1.12
RAD54L2	RAD54 like 2	-1.12
ARSD	arylsulfatase D	-1.13
C9orf72	C9orf72-SMCR8 complex subunit	-1.13



DAAM2	dishevelled associated activator of morphogenesis 2	-1.13
EIF5	eukaryotic translation initiation factor 5	-1.13
LDB2	LIM domain binding 2	-1.13
NADK2	NAD kinase 2, mitochondrial	-1.13
NAT1	N-acetyltransferase 1	-1.13
P3H2	prolyl 3-hydroxylase 2	-1.13
RP11_417L195		-1.13
RP11_96D111		-1.13
SCML4	Scm polycomb group protein like 4	-1.13
UAP1	UDP-N-acetylglucosamine pyrophosphorylase 1	-1.13
ARAP2	ArfGAP with RhoGAP domain, ankyrin repeat and PH domain 2	-1.14
ATXN1-AS1	ATXN1 antisense RNA 1	-1.14
GRHPR	glyoxylate and hydroxypyruvate reductase	-1.14
IKZF1	IKAROS family zinc finger 1	-1.14
LTBP1	latent transforming growth factor beta binding protein 1	-1.14
MT-ND6	NADH dehydrogenase, subunit 6 (complex I)	-1.14
NKG7	natural killer cell granule protein 7	-1.14
PHLDB2	pleckstrin homology like domain family B member 2	-1.14
PNRC1	proline rich nuclear receptor coactivator 1	-1.14
PPFIBP2	PPFIA binding protein 2	-1.14
SLA2	Src like adaptor 2	-1.14
TBX21	T-box transcription factor 21	-1.14
TIGIT	T cell immunoreceptor with Ig and ITIM domains	-1.14
ZNF160	zinc finger protein 160	-1.14
ABHD18	abhydrolase domain containing 18	-1.15
ACBD4	acyl-CoA binding domain containing 4	-1.15
ENPP1	ectonucleotide pyrophosphatase/phosphodiesterase 1	-1.15
FANCC	FA complementation group C	-1.15
MT-RNR2	l-rRNA	-1.15
TMC8	transmembrane channel like 8	-1.15
TMEM178A	transmembrane protein 178A	-1.15
ZC3H13	zinc finger CCCH-type containing 13	-1.15
EDEM1	ER degradation enhancing alpha-mannosidase like protein 1	-1.16
LILRB2	leukocyte immunoglobulin like receptor B2	-1.16
LURAP1L	leucine rich adaptor protein 1 like	-1.16
NONOP2	non-POU domain containing, octamer-binding pseudogene 2	-1.16
RORA	RAR related orphan receptor A	-1.16
RPL5P30	ribosomal protein L5 pseudogene 30	-1.16
STARD5	StAR related lipid transfer domain containing 5	-1.16
ACER2	alkaline ceramidase 2	-1.17
ADGRE4P	adhesion G protein-coupled receptor E4, pseudogene	-1.17
AGL	amylase-like 1, 6-glucosidase, 4-alpha-glucanotransferase	-1.17
BST1	bone marrow stromal cell antigen 1	-1.17
C21orf91	chromosome 21 open reading frame 91	-1.17
CLNK	cytokine dependent hematopoietic cell linker	-1.17
GNG12-AS1	GNG12, DIRAS3 and WLS antisense RNA 1	-1.17
LOC101929343	uncharacterized LOC101929343	-1.17
MIRLET7BHG	MIRLET7B host gene	-1.17
PLA2G12B	phospholipase A2 group XIIIB	-1.17
PRODH2	proline dehydrogenase 2	-1.17
RPSAP70	ribosomal protein SA pseudogene 70	-1.17
SLC9A9	solute carrier family 9 member A9	-1.17
ATP11C	ATPase phospholipid transporting 11C	-1.18
CBFA2T3	CBFA2/RUNX1 partner transcriptional co-repressor 3	-1.18
CDA	cytidine deaminase	-1.18
CHP1	calcineurin like EF-hand protein 1	-1.18
CTS0	cathepsin O	-1.18

ERVK9-11		-1.18
KCNAB1	potassium voltage-gated channel subfamily A member regulatory beta subunit 1	-1.18
LINC01197	long intergenic non-protein coding RNA 1197	-1.18
LINC02762	long intergenic non-protein coding RNA 2762	-1.18
MAGI2-AS3	MAGI2 antisense RNA 3	-1.18
PROX1-AS1	PROX1 antisense RNA 1	-1.18
PRRG2	proline rich and Gla domain 2	-1.18
RP11_196G113		-1.18
RP11_298J204		-1.18
STARD4-AS1	STARD4 antisense RNA 1	-1.18
ACADM	acyl-CoA dehydrogenase medium chain	-1.19
ADK	adenosine kinase	-1.19
AKAP5	A-kinase anchoring protein 5	-1.19
CTC_425O232		-1.19
DCAF11	DDB1 and CUL4 associated factor 11	-1.19
LN2	ligand of numb-protein X 2	-1.19
LOC105370854		-1.19
NPHP4	nephrocystin 4	-1.19
SALL1	spalt like transcription factor 1	-1.19
SLC17A9	solute carrier family 17 member 9	-1.19
TLE2	TLE family member 2, transcriptional corepressor	-1.19
ZFP3	ZFP3 zinc finger protein	-1.19
BMS1P2-AGAP9		-1.2
C1RL	complement C1r subcomponent like	-1.2
CDKN1C	cyclin dependent kinase inhibitor 1C	-1.2
ENTPD5	ectonucleoside triphosphate diphosphohydrolase 5 (inactive)	-1.2
FOXA3	forkhead box A3	-1.2
FRMD6	FERM domain containing 6	-1.2
FURIN	furin, paired basic amino acid cleaving enzyme	-1.2
HOOK1	hook microtubule tethering protein 1	-1.2
ITIH4-AS1	ITIH4 antisense RNA 1	-1.2
NDEL1	nudE neurodevelopment protein 1 like 1	-1.2
PROS1	protein S	-1.2
QDPR	quinoid dihydropteridine reductase	-1.2
SERPINB9	serpin family B member 9	-1.2
SPRY2	sprouty RTK signaling antagonist 2	-1.2
TP53INP2	tumor protein p53 inducible nuclear protein 2	-1.2
USP12	ubiquitin specific peptidase 12	-1.2
FMO4	flavin containing dimethylaniline monooxygenase 4	-1.21
IRF2BP1	interferon regulatory factor 2 binding protein like	-1.21
LOC101927752	uncharacterized LOC101927752	-1.21
ONECUT1	one cut homeobox 1	-1.21
PAPSS2	3'-phosphoadenosine 5'-phosphosulfate synthase 2	-1.21
RP11_295K31		-1.21
SAMD4A	sterile alpha motif domain containing 4A	-1.21
SLC22A9	solute carrier family 22 member 9	-1.21
SORD2P	sorbitol dehydrogenase 2, pseudogene	-1.21
WDFY3-AS2	WDFY3 antisense RNA 2	-1.21
WEE1	WEE1 G2 checkpoint kinase	-1.21
BDH2	3-hydroxybutyrate dehydrogenase 2	-1.22
C19orf71	chromosome 19 open reading frame 71	-1.22
CLN8	CLN8 transmembrane ER and ERGIC protein	-1.22
KLF9	Kruppel like factor 9	-1.22
MTARC2	mitochondrial amidoxime reducing component 2	-1.22
PECR	peroxisomal trans-2-enoyl-CoA reductase	-1.22
RP11_158M23		-1.22
SIGLEC7	sialic acid binding Ig like lectin 7	-1.22

STEAP3	STEAP3 metalloredutase	-1.22
TMPRSS13	transmembrane serine protease 13	-1.22
VAT1L	vesicle amine transport 1 like	-1.22
ASGR1	asialoglycoprotein receptor 1	-1.23
BCAR3-AS1	BCAR3 antisense RNA 1	-1.23
DGAT2	diacylglycerol O-acyltransferase 2	-1.23
KIAA0040	KIAA0040	-1.23
NR3C2	nuclear receptor subfamily 3 group C member 2	-1.23
SYTL5	synaptotagmin like 5	-1.23
TMEM25	transmembrane protein 25	-1.23
AMOTL1	angiotonin like 1	-1.24
BASP1	brain abundant membrane attached signal protein 1	-1.24
CYP4F3	cytochrome P450 family 4 subfamily F member 3	-1.24
FAM229B	family with sequence similarity 229 member B	-1.24
HIC1	HIC ZBTB transcriptional repressor 1	-1.24
PLA2R1	phospholipase A2 receptor 1	-1.24
TRIM10	tripartite motif containing 10	-1.24
TUBBP10	tubulin beta class I pseudogene 10	-1.24
ZCCHC24	zinc finger CCHC-type containing 24	-1.24
CD27	CD27 molecule	-1.25
IL4R	interleukin 4 receptor	-1.25
MIR99AHG	mir-99a-let-7c cluster host gene	-1.25
NFKBIZ	NFKB inhibitor zeta	-1.25
RAPH1	Ras association (RalGDS/AF-6) and pleckstrin homology domains 1	-1.25
SYNE1	spectrin repeat containing nuclear envelope protein 1	-1.25
TSPYL5	TSPY like 5	-1.25
UNC5C	unc-5 netrin receptor C	-1.25
AC0996685		-1.26
ANKRD33B	ankyrin repeat domain 33B	-1.26
CDH4	cadherin 4	-1.26
GPR174	G protein-coupled receptor 174	-1.26
PPIEL	peptidylprolyl isomerase E like pseudogene	-1.26
PSAT1	phosphoserine aminotransferase 1	-1.26
RAB27A	RAB27A, member RAS oncogene family	-1.26
RIPOR2	RHO family interacting cell polarization regulator 2	-1.26
SPINT2	serine peptidase inhibitor, Kunitz type 2	-1.26
TLR4	toll like receptor 4	-1.26
ABHD15	abhydrolase domain containing 15	-1.27
AP0066219		-1.27
BLNK	B cell linker	-1.27
CLYBL	citramalyl-CoA lyase	-1.27
CRPPA	CDP-L-ribitol pyrophosphorylase A	-1.27
EGFR	epidermal growth factor receptor	-1.27
FAAH2	fatty acid amide hydrolase 2	-1.27
MT-ND5	NADH dehydrogenase, subunit 5 (complex I)	-1.27
RP11_329N153		-1.27
SYNPO2	synaptopodin 2	-1.27
IKZF3	IKAROS family zinc finger 3	-1.28
MYO1E	myosin IE	-1.28
NTN4	netrin 4	-1.28
SGK2	serum/glucocorticoid regulated kinase 2	-1.28
SHPK	sedoheptulokinase	-1.28
SLC25A20	solute carrier family 25 member 20	-1.28
C16orf54	chromosome 16 open reading frame 54	-1.29
CHRM5	cholinergic receptor muscarinic 5	-1.29
DUSP16	dual specificity phosphatase 16	-1.29
ERN1	endoplasmic reticulum to nucleus signaling 1	-1.29

LINC00574	long intergenic non-protein coding RNA 574	-1.29
PLIN5	perilipin 5	-1.29
SYDE2	synapse defective Rho GTPase homolog 2	-1.29
ARL5B	ADP ribosylation factor like GTPase 5B	-1.3
ASGR2	asialoglycoprotein receptor 2	-1.3
KCNMA1	potassium calcium-activated channel subfamily M alpha 1	-1.3
LATS2	large tumor suppressor kinase 2	-1.3
NBEA	neurobeachin	-1.3
RP11_109D202		-1.3
SELENOP	selenoprotein P	-1.3
SLC17A1	solute carrier family 17 member 1	-1.3
ACOT1	acyl-CoA thioesterase 1	-1.31
ACOT2	acyl-CoA thioesterase 2	-1.31
BCRP3	BCR pseudogene 3	-1.31
DNAJC12	DnaJ heat shock protein family (Hsp40) member C12	-1.31
PAH	phenylalanine hydroxylase	-1.31
PDE3B	phosphodiesterase 3B	-1.31
PER1	period circadian regulator 1	-1.31
PNPLA7	patatin like phospholipase domain containing 7	-1.31
RNF180	ring finger protein 180	-1.31
RP1_47M233		-1.31
SLC24A4	solute carrier family 24 member 4	-1.31
SLC35D1	solute carrier family 35 member D1	-1.31
TRIM22	tripartite motif containing 22	-1.31
CAMK4	calcium/calmodulin dependent protein kinase IV	-1.32
CRYL1	crystallin lambda 1	-1.32
GIPC2	GIPC PDZ domain containing family member 2	-1.32
KCNK5	potassium two pore domain channel subfamily K member 5	-1.32
LILRB1	leukocyte immunoglobulin like receptor B1	-1.32
MTHFD1P1	methylenetetrahydrofolate dehydrogenase (NADP+ dependent) 1 pseudogene 1	-1.32
PLSCR4	phospholipid scramblase 4	-1.32
PXMP2	peroxisomal membrane protein 2	-1.32
S1PR3	sphingosine-1-phosphate receptor 3	-1.32
SORBS2	sorbin and SH3 domain containing 2	-1.32
STOM	stomatin	-1.32
TGFBR3	transforming growth factor beta receptor 3	-1.32
EDA	ectodysplasin A	-1.33
FILIP1L	filamin A interacting protein 1 like	-1.33
IVD	isovaleryl-CoA dehydrogenase	-1.33
LOC105371267	p53-regulated lncRNA 1	-1.33
PINX1	PIN2 (TERF1) interacting telomerase inhibitor 1	-1.33
THSD4	thrombospondin type 1 domain containing 4	-1.33
AKR7L	aldo-keto reductase family 7 like (gene/pseudogene)	-1.34
ARL4D	ADP ribosylation factor like GTPase 4D	-1.34
CCL4	C-C motif chemokine ligand 4	-1.34
GADD45A	growth arrest and DNA damage inducible alpha	-1.34
GLUD1	glutamate dehydrogenase 1	-1.34
LONP2	lon peptidase 2, peroxisomal	-1.34
MTARC1	mitochondrial amidoxime reducing component 1	-1.34
RAMP3	receptor activity modifying protein 3	-1.34
SEC14L4	SEC14 like lipid binding 4	-1.34
SPRYD4	SPRY domain containing 4	-1.34
UGP2	UDP-glucose pyrophosphorylase 2	-1.34
AMBP	alpha-1-microglobulin/bikunin precursor	-1.35
CD4	CD4 molecule	-1.35
CYB5A	cytochrome b5 type A	-1.35
DAPK1	death associated protein kinase 1	-1.35

DOCK8	dedicator of cytokinesis 8	-1.35
EPAS1	endothelial PAS domain protein 1	-1.35
FAM107A	family with sequence similarity 107 member A	-1.35
PGM5	phosphoglucomutase 5	-1.35
SCP2	sterol carrier protein 2	-1.35
SNED1	sushi, nidogen and EGF like domains 1	-1.35
DHRS1	dehydrogenase/reductase 1	-1.36
F3	coagulation factor III, tissue factor	-1.36
MGLL	monoglyceride lipase	-1.36
PDCD1LG2	programmed cell death 1 ligand 2	-1.36
STX11	syntaxin 11	-1.36
CCL3	C-C motif chemokine ligand 3	-1.37
CYGB	cytoglobin	-1.37
GABARAPL1	GABA type A receptor associated protein like 1	-1.37
GJB2	gap junction protein beta 2	-1.37
GLIS3	GLIS family zinc finger 3	-1.37
NR112	nuclear receptor subfamily 1 group I member 2	-1.37
PLIN4	perilipin 4	-1.37
PTGER2	prostaglandin E receptor 2	-1.37
PTP4A1	protein tyrosine phosphatase 4A1	-1.37
SERTAD1	SERTA domain containing 1	-1.37
TDRP	testis development related protein	-1.37
USH2A	usherin	-1.37
AC1156172		-1.38
ACADS	acyl-CoA dehydrogenase short chain	-1.38
CPB2	carboxypeptidase B2	-1.38
EHHADH	enoyl-CoA hydratase and 3-hydroxyacyl CoA dehydrogenase	-1.38
EVA1A	eva-1 homolog A, regulator of programmed cell death	-1.38
HSH2D	hematopoietic SH2 domain containing	-1.38
LARP1B	La ribonucleoprotein 1B	-1.38
LY9	lymphocyte antigen 9	-1.38
NCKAP5	NCK associated protein 5	-1.38
PDLIM5	PDZ and LIM domain 5	-1.38
PROC	protein C, inactivator of coagulation factors Va and VIIIa	-1.38
RNASE4	ribonuclease A family member 4	-1.38
RP11_437L71		-1.38
RP11_463O125		-1.38
SORD	sorbitol dehydrogenase	-1.38
TMEM86B	transmembrane protein 86B	-1.38
TPBG	trophoblast glycoprotein	-1.38
ANKRD24	ankyrin repeat domain 24	-1.39
CLDN14	claudin 14	-1.39
CTD_2373N43		-1.39
DHTKD1	dehydrogenase E1 and transketolase domain containing 1	-1.39
FAM160A1	family with sequence similarity 160 member A1	-1.39
FERMT2	fermitin family member 2	-1.39
JUN	Jun proto-oncogene, AP-1 transcription factor subunit	-1.39
JUNB	JunB proto-oncogene, AP-1 transcription factor subunit	-1.39
MBNL2	muscleblind like splicing regulator 2	-1.39
MST1L	macrophage stimulating 1 like	-1.39
MYCT1	MYC target 1	-1.39
PNPLA3	patatin like phospholipase domain containing 3	-1.39
RASSF9	Ras association domain family member 9	-1.39
SMAD6	SMAD family member 6	-1.39
AL358113.1		-1.4
DLL1	delta like canonical Notch ligand 1	-1.4
ENTPD8	ectonucleoside triphosphate diphosphohydrolase 8	-1.4

F8	coagulation factor VIII	-1.4
GFOD1	glucose-fructose oxidoreductase domain containing 1	-1.4
GOT2	glutamic-oxaloacetic transaminase 2	-1.4
HDC	histidine decarboxylase	-1.4
KLRB1	killer cell lectin like receptor B1	-1.4
RP11_250B26		-1.4
SLAMF6	SLAM family member 6	-1.4
TNK2-AS1	TNK2 antisense RNA 1	-1.4
ZNF638-IT1		-1.4
ARMCX3	armadillo repeat containing X-linked 3	-1.41
ASL	argininosuccinate lyase	-1.41
AVPI1	arginine vasopressin induced 1	-1.41
CDHR1	cadherin related family member 1	-1.41
EPOR	erythropoietin receptor	-1.41
IRF8	interferon regulatory factor 8	-1.41
MMAA	metabolism of cobalamin associated A	-1.41
PCAT19	prostate cancer associated transcript 19	-1.41
PCDHGB7	protocadherin gamma subfamily B, 7	-1.41
SERPINA6	serpin family A member 6	-1.41
SLC34A1	solute carrier family 34 member 1	-1.41
SLC41A2	solute carrier family 41 member 2	-1.41
ABCA6	ATP binding cassette subfamily A member 6	-1.42
ABCG5	ATP binding cassette subfamily G member 5	-1.42
CTD_3203P23		-1.42
ERLIN1	ER lipid raft associated 1	-1.42
LHX2	LIM homeobox 2	-1.42
MAMDC4	MAM domain containing 4	-1.42
NSUN6	NOP2/Sun RNA methyltransferase 6	-1.42
PTPRD	protein tyrosine phosphatase receptor type D	-1.42
RP3_414A1512		-1.42
TKFC	triokinase and FMN cyclase	-1.42
ZC2HC1C	zinc finger C2HC-type containing 1C	-1.42
C17orf107	chromosome 17 open reading frame 107	-1.43
CAT	catalase	-1.43
CCN1	cellular communication network factor 1	-1.43
CDC37L1	cell division cycle 37 like 1	-1.43
CTD_2114J121		-1.43
HK3	hexokinase 3	-1.43
IPCEF1	interaction protein for cytohesin exchange factors 1	-1.43
TCHH	trichohyalin	-1.43
ABLIM3	actin binding LIM protein family member 3	-1.44
ACAD11	acyl-CoA dehydrogenase family member 11	-1.44
C5	complement C5	-1.44
CDC42BPG	CDC42 binding protein kinase gamma	-1.44
CDH23	cadherin related 23	-1.44
CYTIP	cytohesin 1 interacting protein	-1.44
DMD	dystrophin	-1.44
FXN	frataxin	-1.44
NDUFA6-DT	NDUFA6 divergent transcript	-1.44
P2RY10	P2Y receptor family member 10	-1.44
PCOLCE	procollagen C-endopeptidase enhancer	-1.44
PRKAG2	protein kinase AMP-activated non-catalytic subunit gamma 2	-1.44
RP5_849H193		-1.44
THBD	thrombomodulin	-1.44
TNFRSF10C	TNF receptor superfamily member 10c	-1.44
ZDHHC11B	zinc finger DHHC-type containing 11B	-1.44
ALDH5A1	aldehyde dehydrogenase 5 family member A1	-1.45

ATP7B	ATPase copper transporting beta	-1.45
BCKDHB	branched chain keto acid dehydrogenase E1 subunit beta	-1.45
C11orf54	chromosome 11 open reading frame 54	-1.45
CD14	CD14 molecule	-1.45
DUSP10	dual specificity phosphatase 10	-1.45
IFNLR1	interferon lambda receptor 1	-1.45
KCNJ8	potassium inwardly rectifying channel subfamily J member 8	-1.45
KLHL3	kelch like family member 3	-1.45
PPP1R16B	protein phosphatase 1 regulatory subunit 16B	-1.45
SDC4	syndecan 4	-1.45
SERPINA10	serpin family A member 10	-1.45
SLC4A4	solute carrier family 4 member 4	-1.45
TMEM220-AS1	TMEM220 antisense RNA 1	-1.45
TMEM45A	transmembrane protein 45A	-1.45
TSPOAP1	TSPO associated protein 1	-1.45
USP2	ubiquitin specific peptidase 2	-1.45
AUTS2	activator of transcription and developmental regulator AUTS2	-1.46
ITIH1	inter-alpha-trypsin inhibitor heavy chain 1	-1.46
LONRF3	LON peptidase N-terminal domain and ring finger 3	-1.46
TNIK	TRAF2 and NCK interacting kinase	-1.46
YPEL2	yippee like 2	-1.46
ADAP1	ArfGAP with dual PH domains 1	-1.47
C16orf96	chromosome 16 open reading frame 96	-1.47
C5AR1	complement C5a receptor 1	-1.47
CP	ceruloplasmin	-1.47
FAM13A	family with sequence similarity 13 member A	-1.47
FNIP2	folliculin interacting protein 2	-1.47
GP1BA	glycoprotein Ib platelet subunit alpha	-1.47
LGI4	leucine rich repeat LGI family member 4	-1.47
PPP2R1B	protein phosphatase 2 scaffold subunit Abeta	-1.47
SERPINB8	serpin family B member 8	-1.47
SLC18A2	solute carrier family 18 member A2	-1.47
DAB1	DAB adaptor protein 1	-1.48
GATM	glycine amidinotransferase	-1.48
MST1P2	macrophage stimulating 1 pseudogene 2	-1.48
PEX11G	peroxisomal biogenesis factor 11 gamma	-1.48
PIK3R1	phosphoinositide-3-kinase regulatory subunit 1	-1.48
PRRG4	proline rich and Gla domain 4	-1.48
SC5D	sterol-C5-desaturase	-1.48
SGMS2	sphingomyelin synthase 2	-1.48
AC00401913		-1.49
AC007262.2		-1.49
AXL	AXL receptor tyrosine kinase	-1.49
BANK1	B cell scaffold protein with ankyrin repeats 1	-1.49
BTBD16	BTB domain containing 16	-1.49
C2orf88	chromosome 2 open reading frame 88	-1.49
DLEC1	DLEC1 cilia and flagella associated protein	-1.49
GBP1	guanylate binding protein 1	-1.49
HMOX1	heme oxygenase 1	-1.49
MIR29B2CHG	MIR29B2 and MIR29C host gene	-1.49
MROH8	maestro heat like repeat family member 8	-1.49
PXDC1	PX domain containing 1	-1.49
SLC14A1	solute carrier family 14 member 1 (Kidd blood group)	-1.49
SORL1	sortilin related receptor 1	-1.49
VMO1	vitelline membrane outer layer 1 homolog	-1.49
APOM	apolipoprotein M	-1.5
ARHGEF26	Rho guanine nucleotide exchange factor 26	-1.5

CAVIN2	caveolae associated protein 2	-1.5
DCXR	dicarbonyl and L-xylulose reductase	-1.5
DNALI1	dynein axonemal light intermediate chain 1	-1.5
GPRASP1	G protein-coupled receptor associated sorting protein 1	-1.5
KDM6B	lysine demethylase 6B	-1.5
MEFV	MEFV innate immunity regulator, pyrin	-1.5
PELI2	pellino E3 ubiquitin protein ligase family member 2	-1.5
PTPRB	protein tyrosine phosphatase receptor type B	-1.5
SLC9B2	solute carrier family 9 member B2	-1.5
SMAD9	SMAD family member 9	-1.5
ZNF667	zinc finger protein 667	-1.5
ARSD-AS1	ARSD antisense RNA 1	-1.51
CBR4	carbonyl reductase 4	-1.51
CHST7	carbohydrate sulfotransferase 7	-1.51
DHODH	dihydroorotate dehydrogenase (quinone)	-1.51
GATA6	GATA binding protein 6	-1.51
GRAMD4	GRAM domain containing 4	-1.51
LTBP4	latent transforming growth factor beta binding protein 4	-1.51
MIDEAS	mitotic deacetylase associated SANT domain protein	-1.51
MYO7A	myosin VIIA	-1.51
PRF1	perforin 1	-1.51
PROSER2-AS1	PROSER2 antisense RNA 1	-1.51
S100A14	S100 calcium binding protein A14	-1.51
SCD5	stearoyl-CoA desaturase 5	-1.51
SLC16A4	solute carrier family 16 member 4	-1.51
WFDC1	WAP four-disulfide core domain 1	-1.51
ABHD2	abhydrolase domain containing 2, acylglycerol lipase	-1.52
ACAT1	acetyl-CoA acetyltransferase 1	-1.52
CREB3L3	cAMP responsive element binding protein 3 like 3	-1.52
GPHN	gephyrin	-1.52
GRHL1	grainyhead like transcription factor 1	-1.52
ITIH2	inter-alpha-trypsin inhibitor heavy chain 2	-1.52
PCP4L1	Purkinje cell protein 4 like 1	-1.52
SKAP1	src kinase associated phosphoprotein 1	-1.52
SLC16A5	solute carrier family 16 member 5	-1.52
THEMIS	thymocyte selection associated	-1.52
ZNF334	zinc finger protein 334	-1.52
CA3	carbonic anhydrase 3	-1.53
GC	GC vitamin D binding protein	-1.53
ORM1	orosomucoid 1	-1.53
RIPK4	receptor interacting serine/threonine kinase 4	-1.53
SSTR2	somatostatin receptor 2	-1.53
TRGC2	T cell receptor gamma constant 2	-1.53
ABCC9	ATP binding cassette subfamily C member 9	-1.54
ADAMTS9-AS2	ADAMTS9 antisense RNA 2	-1.54
LAX1	lymphocyte transmembrane adaptor 1	-1.54
PTK6	protein tyrosine kinase 6	-1.54
RGS4	regulator of G protein signaling 4	-1.54
SLC39A14	solute carrier family 39 member 14	-1.54
SORBS1	sorbin and SH3 domain containing 1	-1.54
MCTP2	multiple C2 and transmembrane domain containing 2	-1.55
MST1	macrophage stimulating 1	-1.55
PBX1	PBX homeobox 1	-1.55
PHYH	phytanoyl-CoA 2-hydroxylase	-1.55
RP11_449P151		-1.55
SMOC1	SPARC related modular calcium binding 1	-1.55
TIAM1	TIAM Rac1 associated GEF 1	-1.55



ADGRA3	adhesion G protein-coupled receptor A3	-1.56
ALAS1	5'-aminolevulinate synthase 1	-1.56
GLTPD2	glycolipid transfer protein domain containing 2	-1.56
GNPNAT1	glucosamine-phosphate N-acetyltransferase 1	-1.56
MRPL23-AS1	MRPL23 antisense RNA 1	-1.56
MYO15A	myosin XVA	-1.56
RP11-986E7.7		-1.56
SRD5A1	steroid 5 alpha-reductase 1	-1.56
TRIB1	tribbles pseudokinase 1	-1.56
ADGRG6	adhesion G protein-coupled receptor G6	-1.57
CCL15-CCL14	CCL15-CCL14 readthrough (NMD candidate)	-1.57
CPAMD8	C3 and PZP like alpha-2-macroglobulin domain containing 8	-1.57
CTB_50L1714		-1.57
CYP2J2	cytochrome P450 family 2 subfamily J member 2	-1.57
SLC38A2	solute carrier family 38 member 2	-1.57
SOWAHB	sosondawah ankyrin repeat domain family member B	-1.57
SPIRE1	spire type actin nucleation factor 1	-1.57
CCDC71L	coiled-coil domain containing 71 like	-1.58
CD160	CD160 molecule	-1.58
DUSP2	dual specificity phosphatase 2	-1.58
EVC2	EvC ciliary complex subunit 2	-1.58
HAO1	hydroxyacid oxidase 1	-1.58
LPIN2	lipin 2	-1.58
MEIS3P1	Meis homeobox 3 pseudogene 1	-1.58
SLC17A2	solute carrier family 17 member 2	-1.58
SLC19A3	solute carrier family 19 member 3	-1.58
STAT4	signal transducer and activator of transcription 4	-1.58
APLNR	apelin receptor	-1.59
AR	androgen receptor	-1.59
C3	complement C3	-1.59
GALNT16	polypeptide N-acetylgalactosaminyltransferase 16	-1.59
GENE	glucosamine (UDP-N-acetyl)-2-epimerase/N-acetylmannosamine kinase	-1.59
MMUT	methylmalonyl-CoA mutase	-1.59
ZFPM2	zinc finger protein, FOG family member 2	-1.59
ACMSD	aminocarboxymuconate semialdehyde decarboxylase	-1.6
ACOX1	acyl-CoA oxidase 1	-1.6
ATRNL1	attractin like 1	-1.6
BACH2	BTB domain and CNC homolog 2	-1.6
CD226	CD226 molecule	-1.6
CDNF	cerebral dopamine neurotrophic factor	-1.6
KLF11	Kruppel like factor 11	-1.6
KLF6	Kruppel like factor 6	-1.6
FGL2	fibrinogen like 2	-1.61
IDNK	IDNK gluconokinase	-1.61
PSD3	pleckstrin and Sec7 domain containing 3	-1.61
ZDBF2	zinc finger DBF-type containing 2	-1.61
CTC_250I146		-1.62
EPS8L1	EPS8 like 1	-1.62
FMO5	flavin containing dimethylaniline monooxygenase 5	-1.62
GSTZ1	glutathione S-transferase zeta 1	-1.62
IL2RB	interleukin 2 receptor subunit beta	-1.62
MPC1	mitochondrial pyruvate carrier 1	-1.62
MTHFD1	methylenetetrahydrofolate dehydrogenase, cyclohydrolase and formyltetrahydrofolate synthetase 1	-1.62
ORM2	orosomucoid 2	-1.62
RCL1	RNA terminal phosphate cyclase like 1	-1.62
SLC24A3	solute carrier family 24 member 3	-1.62

STEAP3-AS1	STEAP3 antisense RNA 1	-1.62
TMEM154	transmembrane protein 154	-1.62
CD69	CD69 molecule	-1.63
CTD_2619J138		-1.63
ESRP2	epithelial splicing regulatory protein 2	-1.63
F13B	coagulation factor XIII B chain	-1.63
GPR180	G protein-coupled receptor 180	-1.63
LAG3	lymphocyte activating 3	-1.63
LINC02637	long intergenic non-protein coding RNA 2637	-1.63
NAV2	neuron navigator 2	-1.63
NR4A1	nuclear receptor subfamily 4 group A member 1	-1.63
RP5_875O137		-1.63
SPTBN2	spectrin beta, non-erythrocytic 2	-1.63
ZBTB21	zinc finger and BTB domain containing 21	-1.63
BX8425682		-1.64
C1R	complement C1r	-1.64
GPAT3	glycerol-3-phosphate acyltransferase 3	-1.64
RASL11B	RAS like family 11 member B	-1.64
SLAIN1	SLAIN motif family member 1	-1.64
SPNS2	sphingolipid transporter 2	-1.64
ACOX2	acyl-CoA oxidase 2	-1.65
NAALADL2	N-acetylated alpha-linked acidic dipeptidase like 2	-1.65
NFIL3	nuclear factor, interleukin 3 regulated	-1.65
PALM3	paralemmin 3	-1.65
SH3YL1	SH3 and SYLF domain containing 1	-1.65
TLL1	tolloid like 1	-1.65
DACT1	dishevelled binding antagonist of beta catenin 1	-1.66
PHGDH	phosphoglycerate dehydrogenase	-1.66
RP11-606E8.2		-1.66
SLAMF7	SLAM family member 7	-1.66
SLC23A2	solute carrier family 23 member 2	-1.66
SLC25A25	solute carrier family 25 member 25	-1.66
TTYH1	tweety family member 1	-1.66
ABCA10	ATP binding cassette subfamily A member 10	-1.67
ATP1B2	ATPase Na <sup>+</sup> /K <sup>+</sup> transporting subunit beta 2	-1.67
HSPB6	heat shock protein family B (small) member 6	-1.67
PIK3C2G	phosphatidylinositol-4-phosphate 3-kinase catalytic subunit type 2 gamma	-1.67
PRSS53	serine protease 53	-1.67
SCNN1A	sodium channel epithelial 1 subunit alpha	-1.67
TUBE1	tubulin epsilon 1	-1.67
ZNF667-AS1	ZNF667 antisense RNA 1 (head to head)	-1.67
FAM149A	family with sequence similarity 149 member A	-1.68
ID4	inhibitor of DNA binding 4, HLH protein	-1.68
TNXB	tenascin XB	-1.68
ACAA1	acetyl-CoA acyltransferase 1	-1.69
CYP3A5	cytochrome P450 family 3 subfamily A member 5	-1.69
EPHA2	EPH receptor A2	-1.69
IL18RAP	interleukin 18 receptor accessory protein	-1.69
KCNE1	potassium voltage-gated channel subfamily E regulatory subunit 1	-1.69
NAV2-AS1	NAV2 antisense RNA 1	-1.69
PFKFB3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3	-1.69
AGTR1	angiotensin II receptor type 1	-1.7
BGN	biglycan	-1.7
CCDC3	coiled-coil domain containing 3	-1.7
IGSF9	immunoglobulin superfamily member 9	-1.7
PCSK6	proprotein convertase subtilisin/kexin type 6	-1.7
TGFA	transforming growth factor alpha	-1.7

ZNF385B	zinc finger protein 385B	-1.7
KCNJ15	potassium inwardly rectifying channel subfamily J member 15	-1.71
NAAA	N-acylethanolamine acid amidase	-1.71
PBLD	phenazine biosynthesis like protein domain containing	-1.71
PRUNE2	prune homolog 2 with BCH domain	-1.71
CFAP251	cilia and flagella associated protein 251	-1.72
RDH5	retinol dehydrogenase 5	-1.72
RP11_872D178		-1.72
SLC1A1	solute carrier family 1 member 1	-1.72
VTN	vitronectin	-1.72
ATF3	activating transcription factor 3	-1.73
CFD	complement factor D	-1.73
CISH	cytokine inducible SH2 containing protein	-1.73
DUSP5	dual specificity phosphatase 5	-1.73
EDNRB	endothelin receptor type B	-1.73
EGR3	early growth response 3	-1.73
EXOC3L4	exocyst complex component 3 like 4	-1.73
FCMR	Fc fragment of IgM receptor	-1.73
GPT	glutamic--pyruvic transaminase	-1.73
HS3ST3A1	heparan sulfate-glucosamine 3-sulfotransferase 3A1	-1.73
PRKAR2B	protein kinase cAMP-dependent type II regulatory subunit beta	-1.73
SH2D1B	SH2 domain containing 1B	-1.73
SOCS3	suppressor of cytokine signaling 3	-1.73
ACAA2	acetyl-CoA acyltransferase 2	-1.74
CST7	cystatin F	-1.74
GK	glycerol kinase	-1.74
ITK	IL2 inducible T cell kinase	-1.74
LILRA2	leukocyte immunoglobulin like receptor A2	-1.74
NAPSB	napsin B aspartic peptidase, pseudogene	-1.74
SYTL3	synaptotagmin like 3	-1.74
ABCA9	ATP binding cassette subfamily A member 9	-1.75
GBP7	guanylate binding protein 7	-1.75
GOT1	glutamic-oxaloacetic transaminase 1	-1.75
KLHL15	kelch like family member 15	-1.75
NDRG2	NDRG family member 2	-1.75
PEMT	phosphatidylethanolamine N-methyltransferase	-1.75
PLEKHB1	pleckstrin homology domain containing B1	-1.75
RGS7BP	regulator of G protein signaling 7 binding protein	-1.75
SEMA6D	semaphorin 6D	-1.75
TMPRSS2	transmembrane serine protease 2	-1.75
VNN3	vanin 3	-1.75
ACACB	acetyl-CoA carboxylase beta	-1.76
FITM1	fat storage inducing transmembrane protein 1	-1.76
GZMK	granzyme K	-1.76
PTPRS	protein tyrosine phosphatase receptor type S	-1.76
RP11-284N8.3		-1.76
RP11_93B149		-1.76
SCIMP	SLP adaptor and CSK interacting membrane protein	-1.76
SDCBP2	syndecan binding protein 2	-1.76
TMIGD3	transmembrane and immunoglobulin domain containing 3	-1.76
ZFP36	ZFP36 ring finger protein	-1.76
CYP4F12	cytochrome P450 family 4 subfamily F member 12	-1.77
FLRT3	fibronectin leucine rich transmembrane protein 3	-1.77
TEK	TEK receptor tyrosine kinase	-1.77
TGFB3	transforming growth factor beta 3	-1.77
VWCE	von Willebrand factor C and EGF domains	-1.77
ABAT	4-aminobutyrate aminotransferase	-1.78

BMP6	bone morphogenetic protein 6	-1.78
BMX	BMX non-receptor tyrosine kinase	-1.78
CBS/CBSL	cystathionine beta-synthase	-1.78
CD1D	CD1d molecule	-1.78
MACC1	MET transcriptional regulator MACC1	-1.78
FCRLA	Fc receptor like A	-1.79
GCDH	glutaryl-CoA dehydrogenase	-1.79
GPR171	G protein-coupled receptor 171	-1.79
RP11-235E17.2		-1.79
ADH6	alcohol dehydrogenase 6 (class V)	-1.8
ART4	ADP-ribosyltransferase 4 (Dombrock blood group)	-1.8
CA14	carbonic anhydrase 14	-1.8
CLEC12A	C-type lectin domain family 12 member A	-1.8
CTD_2033D152		-1.8
DEPDC7	DEP domain containing 7	-1.8
FGG	fibrinogen gamma chain	-1.8
MAN1C1	mannosidase alpha class 1C member 1	-1.8
NALCN	sodium leak channel, non-selective	-1.8
RASGEF1B	RasGEF domain family member 1B	-1.8
TENT5C	terminal nucleotidyltransferase 5C	-1.8
EOMES	eomesodermin	-1.81
GAREM1	GRB2 associated regulator of MAPK1 subtype 1	-1.81
GK-AS1	GK antisense RNA 1	-1.81
PCDH9	protocadherin 9	-1.81
PEG3	paternally expressed 3	-1.81
PTPN13	protein tyrosine phosphatase non-receptor type 13	-1.81
RIDA	reactive intermediate imine deaminase A homolog	-1.81
SLC25A18	solute carrier family 25 member 18	-1.81
AC00507714		-1.82
ADAMTSL3	ADAMTS like 3	-1.82
GNAO1	G protein subunit alpha o1	-1.82
ITIH4	inter-alpha-trypsin inhibitor heavy chain 4	-1.82
MIR122HG		-1.82
RP11_242C192		-1.82
SCN11A	sodium voltage-gated channel alpha subunit 11	-1.82
SHROOM2	shroom family member 2	-1.82
FAXDC2	fatty acid hydroxylase domain containing 2	-1.83
FCGR2B	Fc fragment of IgG receptor IIb	-1.83
IL33	interleukin 33	-1.83
NPY5R	neuropeptide Y receptor Y5	-1.83
OLFM1	olfactomedin 1	-1.83
PCK2	phosphoenolpyruvate carboxykinase 2, mitochondrial	-1.83
ANG	angiogenin	-1.84
AQP7	aquaporin 7	-1.84
CTC_490E2111		-1.84
DSEL	dermatan sulfate epimerase like	-1.84
ESPNP	espin pseudogene	-1.84
GPD1	glycerol-3-phosphate dehydrogenase 1	-1.84
HAAO	3-hydroxyanthranilate 3,4-dioxygenase	-1.84
INMT-MINDY4	INMT-MINDY4 readthrough (NMD candidate)	-1.84
MASP2	mannan binding lectin serine peptidase 2	-1.84
MCC	MCC regulator of WNT signaling pathway	-1.84
ADRA1B	adrenoceptor alpha 1B	-1.85
CD163	CD163 molecule	-1.85
CTD_2619J135		-1.85
MMP23A	matrix metalloproteinase 23A (pseudogene)	-1.85
SPIB	Spi-B transcription factor	-1.85

TLCD4	TLC domain containing 4	-1.85
ALDH1A3	aldehyde dehydrogenase 1 family member A3	-1.86
ANGPTL3	angiotensinogen like 3	-1.86
DLG2	discs large MAGUK scaffold protein 2	-1.86
IL1RN	interleukin 1 receptor antagonist	-1.86
LEAP2	liver enriched antimicrobial peptide 2	-1.86
RHOB	ras homolog family member B	-1.86
SORCS2	sortilin related VPS10 domain containing receptor 2	-1.86
ACSM3	acyl-CoA synthetase medium chain family member 3	-1.87
CHRNE	cholinergic receptor nicotinic epsilon subunit	-1.87
CPT1A	carnitine palmitoyltransferase 1A	-1.87
CYP2D7	cytochrome P450 family 2 subfamily D member 7 (gene/pseudogene)	-1.87
LINC02037	long intergenic non-protein coding RNA 2037	-1.87
PRICKLE1	prickle planar cell polarity protein 1	-1.87
PROM2	prominin 2	-1.87
RBMS3	RNA binding motif single stranded interacting protein 3	-1.87
RP1_232L22_B1		-1.87
SH2D1A	SH2 domain containing 1A	-1.87
ADAMTS1	ADAM metalloproteinase with thrombospondin type 1 motif 1	-1.88
AKAP12	A-kinase anchoring protein 12	-1.88
ALDH2	aldehyde dehydrogenase 2 family member	-1.88
ALPL	alkaline phosphatase, biomineralization associated	-1.88
CYFIP2	cytoplasmic FMR1 interacting protein 2	-1.88
GTF2IP7	general transcription factor Iii pseudogene 7	-1.88
LILRA1	leukocyte immunoglobulin like receptor A1	-1.88
MIR22HG	MIR22 host gene	-1.88
RP11_524F111		-1.88
ABCB4	ATP binding cassette subfamily B member 4	-1.89
CILP	cartilage intermediate layer protein	-1.89
CYP2D8P	cytochrome P450 family 2 subfamily D member 8, pseudogene	-1.89
LIPC	lipase C, hepatic type	-1.89
PDE2A	phosphodiesterase 2A	-1.89
PLPP3	phospholipid phosphatase 3	-1.89
TNN	tenascin N	-1.89
CD302	CD302 molecule	-1.9
CYP2C19	cytochrome P450 family 2 subfamily C member 19	-1.9
DLC1	DLC1 Rho GTPase activating protein	-1.9
GADD45G	growth arrest and DNA damage inducible gamma	-1.9
PCDH19	protocadherin 19	-1.9
RND1	Rho family GTPase 1	-1.9
TRMT9B	tRNA methyltransferase 9B (putative)	-1.9
FAM167A	family with sequence similarity 167 member A	-1.91
LINC00261	long intergenic non-protein coding RNA 261	-1.91
SLC28A1	solute carrier family 28 member 1	-1.91
SLC6A12	solute carrier family 6 member 12	-1.91
ETNPPL	ethanolamine-phosphate phospho-lyase	-1.92
FEZ1	fasciculation and elongation protein zeta 1	-1.92
FYB2	FYN binding protein 2	-1.92
LOC653513	phosphodiesterase 4D interacting protein-like	-1.92
AOC4P	amine oxidase copper containing 4, pseudogene	-1.93
ID2-AS1	ID2 antisense RNA 1	-1.93
IGFBP1	insulin like growth factor binding protein 1	-1.93
KLRC4-KLRK1/KLRK1	killer cell lectin like receptor K1	-1.93
RP11_116D21		-1.93
BCHE	butyrylcholinesterase	-1.94
CPED1	cadherin like and PC-esterase domain containing 1	-1.94
DUSP1	dual specificity phosphatase 1	-1.94

GASK1A	golgi associated kinase 1A	-1.94
HS3ST3B1	heparan sulfate-glucosamine 3-sulfotransferase 3B1	-1.94
LOC105375304	uncharacterized LOC105375304	-1.94
PPP1R3B	protein phosphatase 1 regulatory subunit 3B	-1.94
RGN	regucalcin	-1.94
SPATA6L	spermatogenesis associated 6 like	-1.94
SULT1E1	sulfotransferase family 1E member 1	-1.94
TECTA	tectorin alpha	-1.94
TMEM220	transmembrane protein 220	-1.94
ADAMTS9-AS1	ADAMTS9 antisense RNA 1	-1.95
CCDC38	coiled-coil domain containing 38	-1.96
FAT4	FAT atypical cadherin 4	-1.96
TNFRSF13C	TNF receptor superfamily member 13C	-1.96
TRAT1	T cell receptor associated transmembrane adaptor 1	-1.96
CD38	CD38 molecule	-1.97
EPB41L4A	erythrocyte membrane protein band 4.1 like 4A	-1.97
PHLDA1	pleckstrin homology like domain family A member 1	-1.97
RNF150	ring finger protein 150	-1.97
ZBTB16	zinc finger and BTB domain containing 16	-1.97
ASPN	asporin	-1.98
ID2	inhibitor of DNA binding 2	-1.98
KRT17P4	keratin 17 pseudogene 4	-1.98
KRT80	keratin 80	-1.98
SLCO4A1	solute carrier organic anion transporter family member 4A1	-1.98
CAND2	cullin associated and neddylation dissociated 2 (putative)	-1.99
ENO3	enolase 3	-1.99
RBP1	retinol binding protein 1	-1.99
SAMD5	sterile alpha motif domain containing 5	-1.99
CLTRN	collectrin, amino acid transport regulator	-2
LDLR	low density lipoprotein receptor	-2
LOC101927793	uncharacterized LOC101927793	-2
P2RY12	purinergic receptor P2Y12	-2
S100A8	S100 calcium binding protein A8	-2
TNFSF11	TNF superfamily member 11	-2
AASS	aminoadipate-semialdehyde synthase	-2.01
AGXT2	alanine--glyoxylate aminotransferase 2	-2.01
C1orf210	chromosome 1 open reading frame 210	-2.01
DIRAS3	DIRAS family GTPase 3	-2.01
EXPH5	exophilin 5	-2.01
IL18R1	interleukin 18 receptor 1	-2.01
TNFRSF10D	TNF receptor superfamily member 10d	-2.01
IGFBP3	insulin like growth factor binding protein 3	-2.02
MAMDC2	MAM domain containing 2	-2.02
SLCO1B1	solute carrier organic anion transporter family member 1B1	-2.02
TMEM200C	transmembrane protein 200C	-2.02
CD244	CD244 molecule	-2.03
PRR26	proline rich 26	-2.03
SIGLEC5	sialic acid binding Ig like lectin 5	-2.03
TBXA2R	thromboxane A2 receptor	-2.03
AC0053297		-2.04
CD300E	CD300e molecule	-2.04
COL26A1	collagen type XXVI alpha 1 chain	-2.04
EPB41L4B	erythrocyte membrane protein band 4.1 like 4B	-2.04
EPHX2	epoxide hydrolase 2	-2.04
FBLN5	fibulin 5	-2.04
FPR1	formyl peptide receptor 1	-2.04
NR4A2	nuclear receptor subfamily 4 group A member 2	-2.04

SLC16A2	solute carrier family 16 member 2	-2.04
ADIRF	adipogenesis regulatory factor	-2.05
FLT3	fms related receptor tyrosine kinase 3	-2.05
HBB	hemoglobin subunit beta	-2.05
LINC01146	long intergenic non-protein coding RNA 1146	-2.05
LINC01702	long intergenic non-protein coding RNA 1702	-2.05
RP11_420153		-2.05
RP3_453C1214		-2.05
RP4_669P1019		-2.05
AL034417.4		-2.06
ANXA3	annexin A3	-2.06
C8A	complement C8 alpha chain	-2.06
CA5A	carbonic anhydrase 5A	-2.06
ETFDH	electron transfer flavoprotein dehydrogenase	-2.06
CLEC3B	C-type lectin domain family 3 member B	-2.07
ETS2	ETS proto-oncogene 2, transcription factor	-2.07
KCNA3	potassium voltage-gated channel subfamily A member 3	-2.07
RNF125	ring finger protein 125	-2.07
CCR7	C-C motif chemokine receptor 7	-2.08
GPR17	G protein-coupled receptor 17	-2.08
MFAP3L	microfibril associated protein 3 like	-2.08
MIR17HG	miR-17-92a-1 cluster host gene	-2.08
RP11_400G35		-2.08
SERPINA5	serpin family A member 5	-2.08
EPHB1	EPH receptor B1	-2.09
GALNT14	polypeptide N-acetylgalactosaminyltransferase 14	-2.09
NAT8	N-acetyltransferase 8 (putative)	-2.09
USP43	ubiquitin specific peptidase 43	-2.09
FGB	fibrinogen beta chain	-2.1
RXFP1	relaxin family peptide receptor 1	-2.1
SERPINF2	serpin family F member 2	-2.1
CNTN4	contactin 4	-2.11
GLDC	glycine decarboxylase	-2.11
MASP1	mannan binding lectin serine peptidase 1	-2.11
PALM2AKAP2	PALM2 and AKAP2 fusion	-2.11
RP4-669P10.20		-2.11
ZNF831	zinc finger protein 831	-2.11
GPT2	glutamic--pyruvic transaminase 2	-2.12
KLRD1	killer cell lectin like receptor D1	-2.12
LINC01554	long intergenic non-protein coding RNA 1554	-2.12
LINC02453	long intergenic non-protein coding RNA 2453	-2.12
PRG4	proteoglycan 4	-2.12
SAA4	serum amyloid A4, constitutive	-2.12
TSLP	thymic stromal lymphopietin	-2.12
ALDH8A1	aldehyde dehydrogenase 8 family member A1	-2.13
C1QTNF7	C1q and TNF related 7	-2.13
GGT5	gamma-glutamyltransferase 5	-2.13
IFITM10	interferon induced transmembrane protein 10	-2.13
LRRC4	leucine rich repeat containing 4	-2.13
LRRC7	leucine rich repeat containing 7	-2.13
PLIN2	perilipin 2	-2.13
RP11_162P232		-2.13
SMPD3	sphingomyelin phosphodiesterase 3	-2.13
TF	transferrin	-2.13
TRPM8	transient receptor potential cation channel subfamily M member 8	-2.13
C11orf96	chromosome 11 open reading frame 96	-2.14
FOLH1	folate hydrolase 1	-2.14

FUT3	fucosyltransferase 3 (Lewis blood group)	-2.14
RTL5	retrotransposon Gag like 5	-2.14
CYP4V2	cytochrome P450 family 4 subfamily V member 2	-2.15
PDE7B	phosphodiesterase 7B	-2.15
WDR72	WD repeat domain 72	-2.15
CTC_526N191		-2.16
RND3	Rho family GTPase 3	-2.16
DOCK8-AS1	DOCK8 antisense RNA 1	-2.17
ID1	inhibitor of DNA binding 1, HLH protein	-2.17
ITGA9	integrin subunit alpha 9	-2.17
MYO10	myosin X	-2.17
NLRP14	NLR family pyrin domain containing 14	-2.17
PAIP2B	poly(A) binding protein interacting protein 2B	-2.17
PTGS2	prostaglandin-endoperoxide synthase 2	-2.17
RCAN1	regulator of calcineurin 1	-2.17
ANO1	anoctamin 1	-2.18
EFNB3	ephrin B3	-2.18
GDF6	growth differentiation factor 6	-2.18
HSD17B6	hydroxysteroid 17-beta dehydrogenase 6	-2.18
LGR6	leucine rich repeat containing G protein-coupled receptor 6	-2.18
MAB21L2	mab-21 like 2	-2.18
RP4_564F226		-2.18
ACADL	acyl-CoA dehydrogenase long chain	-2.19
CPEB3	cytoplasmic polyadenylation element binding protein 3	-2.19
HOGA1	4-hydroxy-2-oxoglutarate aldolase 1	-2.19
KCND3	potassium voltage-gated channel subfamily D member 3	-2.19
SLC2A9	solute carrier family 2 member 9	-2.19
FAM110C	family with sequence similarity 110 member C	-2.2
MT1L	metallothionein 1L, pseudogene	-2.2
CMYA5	cardiomyopathy associated 5	-2.21
LINC01679	long intergenic non-protein coding RNA 1679	-2.21
RET	ret proto-oncogene	-2.21
TMEM26	transmembrane protein 26	-2.21
CDH1	cadherin 1	-2.22
CR1	complement C3b/C4b receptor 1 (Knops blood group)	-2.22
CSRNP1	cysteine and serine rich nuclear protein 1	-2.22
ELFN1	extracellular leucine rich repeat and fibronectin type III domain containing 1	-2.22
FMO2	flavin containing dimethylaniline monooxygenase 2	-2.22
HNF4A-AS1	HNF4A antisense RNA 1	-2.22
KRTCAP3	keratinocyte associated protein 3	-2.22
MXRA5	matrix remodeling associated 5	-2.22
OLFML3	olfactomedin like 3	-2.22
RETREG1	reticulophagy regulator 1	-2.22
SYT7	synaptotagmin 7	-2.22
LINC01831	long intergenic non-protein coding RNA 1831	-2.23
LOC105375153		-2.23
GLDCP1	glycine decarboxylase pseudogene 1	-2.24
KCNJ10	potassium inwardly rectifying channel subfamily J member 10	-2.24
LOC100506388	uncharacterized LOC100506388	-2.24
NR1I3	nuclear receptor subfamily 1 group I member 3	-2.24
PRR18	proline rich 18	-2.24
RNF152	ring finger protein 152	-2.24
MRC1	mannose receptor C-type 1	-2.25
PAX5	paired box 5	-2.25
AZGP1	alpha-2-glycoprotein 1, zinc-binding	-2.26
LINC02754	long intergenic non-protein coding RNA 2754	-2.26
RORB	RAR related orphan receptor B	-2.26



SARDH	sarcosine dehydrogenase	-2.26
TMEM30B	transmembrane protein 30B	-2.26
ARHGAP8/PRR5-ARHGAP8	Rho GTPase activating protein 8	-2.27
FRMPD1	FERM and PDZ domain containing 1	-2.27
SLCO1B7	solute carrier organic anion transporter family member 1B7 (putative)	-2.27
ASS1P1	argininosuccinate synthetase 1 pseudogene 1	-2.28
DBH-AS1	DBH antisense RNA 1	-2.28
FOXO1	forkhead box O1	-2.28
FOXP2	forkhead box P2	-2.28
IL1RAP	interleukin 1 receptor accessory protein	-2.28
LRAT	lecithin retinol acyltransferase	-2.28
MAT1A	methionine adenosyltransferase 1A	-2.28
RAB36	RAB36, member RAS oncogene family	-2.28
ADRA2B	adrenoceptor alpha 2B	-2.29
ITGAD	integrin subunit alpha D	-2.29
LIPG	lipase G, endothelial type	-2.29
PTGIS	prostaglandin I2 synthase	-2.29
RP11_108O102		-2.29
DACH1	dachshund family transcription factor 1	-2.3
IGHD	immunoglobulin heavy constant delta	-2.3
LINC00671	long intergenic non-protein coding RNA 671	-2.3
XCR1	X-C motif chemokine receptor 1	-2.3
ANK3	ankyrin 3	-2.31
FCRL3	Fc receptor like 3	-2.31
GPLD1	glycosylphosphatidylinositol specific phospholipase D1	-2.31
KLKB1	kallikrein B1	-2.31
F11	coagulation factor XI	-2.32
GDF7	growth differentiation factor 7	-2.32
PANK1	pantothenate kinase 1	-2.32
RP11_325P151		-2.32
SLC27A2	solute carrier family 27 member 2	-2.32
BLK	BLK proto-oncogene, Src family tyrosine kinase	-2.33
ERRF11	ERBB receptor feedback inhibitor 1	-2.33
HPD	4-hydroxyphenylpyruvate dioxygenase	-2.33
NSUN7	NOP2/Sun RNA methyltransferase family member 7	-2.33
PPP1R3G	protein phosphatase 1 regulatory subunit 3G	-2.33
PALM2	paralemmin 2	-2.33
GCH1	GTP cyclohydrolase 1	-2.34
KAZN	kazrin, periplakin interacting protein	-2.34
LINC00365	long intergenic non-protein coding RNA 365	-2.34
PTN	pleiotrophin	-2.34
SERPINA4	serpin family A member 4	-2.34
TFPI2	tissue factor pathway inhibitor 2	-2.34
C1QTNF1	C1q and TNF related 1	-2.35
CIDEB	cell death inducing DFFA like effector b	-2.35
EVC	EvC ciliary complex subunit 1	-2.35
GLP2R	glucagon like peptide 2 receptor	-2.35
LILRB5	leukocyte immunoglobulin like receptor B5	-2.35
MIRLET7A1HG		-2.35
NBPF13P		-2.35
RGPD4 (includes others)	RANBP2 like and GRIP domain containing 5	-2.35
CRISPLD2	cysteine rich secretory protein LCCL domain containing 2	-2.36
GNA14	G protein subunit alpha 14	-2.36
N4BP2L1	NEDD4 binding protein 2 like 1	-2.36
TRPV3	transient receptor potential cation channel subfamily V member 3	-2.36
NNMT	nicotinamide N-methyltransferase	-2.37

CD8A	CD8a molecule	-2.38
CYP2C18	cytochrome P450 family 2 subfamily C member 18	-2.38
LRRC55	leucine rich repeat containing 55	-2.38
PDK4	pyruvate dehydrogenase kinase 4	-2.38
ACADSB	acyl-CoA dehydrogenase short/branched chain	-2.39
CTH	cystathionine gamma-lyase	-2.39
LILRA5	leukocyte immunoglobulin like receptor A5	-2.39
LRRC31	leucine rich repeat containing 31	-2.39
SIGLEC11	sialic acid binding Ig like lectin 11	-2.39
BBOX1	gamma-butyrobetaine hydroxylase 1	-2.4
LTK	leukocyte receptor tyrosine kinase	-2.4
EGR1	early growth response 1	-2.41
HS1BP3-IT1	HS1BP3 intronic transcript 1	-2.41
TTR	transthyretin	-2.41
A2M	alpha-2-macroglobulin	-2.42
EPHA3	EPH receptor A3	-2.42
LGSN	lengsin, lens protein with glutamine synthetase domain	-2.42
LINC00598	long intergenic non-protein coding RNA 598	-2.42
RP11_404G162		-2.42
APOH	apolipoprotein H	-2.43
LCN10	lipocalin 10	-2.43
LOC102723701	uncharacterized LOC102723701	-2.43
MTUS2	microtubule associated scaffold protein 2	-2.43
PRELP	proline and arginine rich end leucine rich repeat protein	-2.43
ASPDH	aspartate dehydrogenase domain containing	-2.44
EDAR	ectodysplasin A receptor	-2.44
EGILA		-2.44
LPAL2	lipoprotein(a) like 2, pseudogene	-2.44
LY6E	lymphocyte antigen 6 family member E	-2.44
CPN1	carboxypeptidase N subunit 1	-2.45
DMKN	dermokine	-2.45
PODN	podocan	-2.45
C3P1	complement component 3 precursor pseudogene	-2.46
FETUB	fetuin B	-2.46
AMDHD1	amidohydrolase domain containing 1	-2.47
DMGDH	dimethylglycine dehydrogenase	-2.47
F11-AS1	F11 antisense RNA 1	-2.47
FOS	Fos proto-oncogene, AP-1 transcription factor subunit	-2.47
PON3	paraoxonase 3	-2.47
RND2	Rho family GTPase 2	-2.47
TCP10L	t-complex 10 like	-2.47
NPY1R	neuropeptide Y receptor Y1	-2.48
OAT	ornithine aminotransferase	-2.48
TCIM	transcriptional and immune response regulator	-2.48
CCL14	C-C motif chemokine ligand 14	-2.49
CYS1	cystin 1	-2.49
GRAMD1C	GRAM domain containing 1C	-2.49
IRF4	interferon regulatory factor 4	-2.49
NTS	neurotensin	-2.49
PKHD1	PKHD1 ciliary IPT domain containing fibrocystin/polyductin	-2.49
PPARGC1A	PPARG coactivator 1 alpha	-2.49
LINC00844	long intergenic non-protein coding RNA 844	-2.5
SGCA	sarcoglycan alpha	-2.5
SIK1/SIK1B	salt inducible kinase 1	-2.5
ANGPTL1	angiopoietin like 1	-2.51
ANO3	anoctamin 3	-2.51
MT1A	metallothionein 1A	-2.51

AQP3	aquaporin 3 (Gill blood group)	-2.52
CH17_360D52		-2.52
ACSL1	acyl-CoA synthetase long chain family member 1	-2.53
APBA1	amyloid beta precursor protein binding family A member 1	-2.53
CXCR2P1	C-X-C motif chemokine receptor 2 pseudogene 1	-2.53
SNX29P2	sorting nexin 29 pseudogene 2	-2.53
INMT	indolethylamine N-methyltransferase	-2.54
NTRK3	neurotrophic receptor tyrosine kinase 3	-2.54
TPPP2	tubulin polymerization promoting protein family member 2	-2.54
CYP4F2	cytochrome P450 family 4 subfamily F member 2	-2.55
HGF	hepatocyte growth factor	-2.55
LINC00319	long intergenic non-protein coding RNA 319	-2.55
TCF21	transcription factor 21	-2.55
SLC25A15	solute carrier family 25 member 15	-2.56
TAT-AS1	TAT antisense RNA 1	-2.56
MMRN1	multimerin 1	-2.57
CA2	carbonic anhydrase 2	-2.58
LRRC3	leucine rich repeat containing 3	-2.58
IL1RAPL2	interleukin 1 receptor accessory protein like 2	-2.59
MPPED1	metallophosphoesterase domain containing 1	-2.59
NAT2	N-acetyltransferase 2	-2.59
TREH	trehalase	-2.59
HSD17B2	hydroxysteroid 17-beta dehydrogenase 2	-2.6
LEPR	leptin receptor	-2.6
NIPAL1	NIPA like domain containing 1	-2.6
PROM1	prominin 1	-2.6
RP11_90L18		-2.6
DNM3OS	DNM3 opposite strand/antisense RNA	-2.61
FPR2	formyl peptide receptor 2	-2.61
POU2AF1	POU class 2 homeobox associating factor 1	-2.61
TMC4	transmembrane channel like 4	-2.61
C8B	complement C8 beta chain	-2.62
DTHD1	death domain containing 1	-2.62
SRPX	sushi repeat containing protein X-linked	-2.62
STEAP4	STEAP4 metalloreductase	-2.62
IYD	iodotyrosine deiodinase	-2.63
XDH	xanthine dehydrogenase	-2.63
ABI3BP	ABI family member 3 binding protein	-2.64
AC092053.3		-2.64
ARID3C	AT-rich interaction domain 3C	-2.64
NOCT	nocturnin	-2.64
CNTN3	contactin 3	-2.65
DNAH6	dynein axonemal heavy chain 6	-2.65
SLCO4C1	solute carrier organic anion transporter family member 4C1	-2.65
CFHR3	complement factor H related 3	-2.66
RP11_258F12		-2.66
ALKAL2	ALK and LTK ligand 2	-2.67
CXCL2	C-X-C motif chemokine ligand 2	-2.67
MRGPRF	MAS related GPR family member F	-2.67
SPATA18	spermatogenesis associated 18	-2.67
TRPV4	transient receptor potential cation channel subfamily V member 4	-2.67
ABCA8	ATP binding cassette subfamily A member 8	-2.68
AQP4	aquaporin 4	-2.68
CASR	calcium sensing receptor	-2.68
FAM9B	family with sequence similarity 9 member B	-2.68
FNDC5	fibronectin type III domain containing 5	-2.68
MUC3A	mucin 3A, cell surface associated	-2.68

THBS1	thrombospondin 1	-2.68
ALDH6A1	aldehyde dehydrogenase 6 family member A1	-2.69
SLC16A9	solute carrier family 16 member 9	-2.69
ALB	albumin	-2.7
SLC51A	solute carrier family 51 subunit alpha	-2.7
TBX15	T-box transcription factor 15	-2.7
KB_68A71		-2.71
MT2A	metallothionein 2A	-2.71
NEU4	neuraminidase 4	-2.71
PLIN1	perilipin 1	-2.71
SLC28A3	solute carrier family 28 member 3	-2.71
KBTBD11	kelch repeat and BTB domain containing 11	-2.72
PRRT1B	proline rich transmembrane protein 1B	-2.72
SLC39A5	solute carrier family 39 member 5	-2.72
TDRD15	tudor domain containing 15	-2.72
FCRL1	Fc receptor like 1	-2.74
LCAT	lecithin-cholesterol acyltransferase	-2.74
TMEM132E	transmembrane protein 132E	-2.74
EHD3	EH domain containing 3	-2.75
SLC7A2	solute carrier family 7 member 2	-2.75
CLRN3	clarin 3	-2.76
GOLGA6A (includes others)	golgin A6 family member A	-2.76
ATF5	activating transcription factor 5	-2.77
HBA1/HBA2	hemoglobin subunit alpha 2	-2.77
NTF3	neurotrophin 3	-2.77
SLC27A5	solute carrier family 27 member 5	-2.77
ANXA10	annexin A10	-2.78
GFRA1	GDNF family receptor alpha 1	-2.78
LINC02428	long intergenic non-protein coding RNA 2428	-2.78
PROZ	protein Z, vitamin K dependent plasma glycoprotein	-2.78
VNN1	vanin 1	-2.78
ANGPTL6	angiopoietin like 6	-2.79
LINC01595	long intergenic non-protein coding RNA 1595	-2.79
WNT9A	Wnt family member 9A	-2.79
CHST9	carbohydrate sulfotransferase 9	-2.8
PDGFRA	platelet derived growth factor receptor alpha	-2.8
ST8SIA6	ST8 alpha-N-acetyl-neuraminidase alpha-2,8-sialyltransferase 6	-2.8
CTD-3080P12.3	uncharacterized LOC101928857	-2.81
HAS2	hyaluronan synthase 2	-2.81
KMO	kynurenine 3-monooxygenase	-2.81
LINC02027	long intergenic non-protein coding RNA 2027	-2.81
RNF165	ring finger protein 165	-2.81
PI4K2B	phosphatidylinositol 4-kinase type 2 beta	-2.81
CTD_2033D153		-2.82
GLT1D1	glycosyltransferase 1 domain containing 1	-2.82
HMGCS2	3-hydroxy-3-methylglutaryl-CoA synthase 2	-2.82
MT1X	metallothionein 1X	-2.82
SAMD11	sterile alpha motif domain containing 11	-2.82
FAM95C	family with sequence similarity 95 member C	-2.83
HPGD	15-hydroxyprostaglandin dehydrogenase	-2.84
NPTX2	neuronal pentraxin 2	-2.84
SELP	selectin P	-2.84
ANKRD36BP2	ankyrin repeat domain 36B pseudogene 2	-2.85
COLEC11	collectin subfamily member 11	-2.85
FTCD	formimidoyltransferase cyclodeaminase	-2.85
NRG3	neuregulin 3	-2.85

PAMR1	peptidase domain containing associated with muscle regeneration 1	-2.85
WNT11	Wnt family member 11	-2.85
AGXT	alanine--glyoxylate and serine--pyruvate aminotransferase	-2.86
TACSTD2	tumor associated calcium signal transducer 2	-2.86
TCTEX1D1	Tctex1 domain containing 1	-2.86
NR4A3	nuclear receptor subfamily 4 group A member 3	-2.87
RP4_669P1016		-2.87
ABCA13	ATP binding cassette subfamily A member 13	-2.88
MBL2	mannose binding lectin 2	-2.89
MZB1	marginal zone B and B1 cell specific protein	-2.89
ARHGEF4	Rho guanine nucleotide exchange factor 4	-2.9
MRO	maestro	-2.91
MTND4P20	MT-ND4 pseudogene 20	-2.91
SOCS2-AS1	SOCS2 antisense RNA 1	-2.91
LIFR	LIF receptor subunit alpha	-2.92
OMD	osteomodulin	-2.92
RIC3	RIC3 acetylcholine receptor chaperone	-2.92
IGKV2D-28	immunoglobulin kappa variable 2D-28	-2.93
WNK2	WNK lysine deficient protein kinase 2	-2.93
AADAT	aminoadipate aminotransferase	-2.94
C6	complement C6	-2.94
CD79A	CD79a molecule	-2.94
DTX1	deltex E3 ubiquitin ligase 1	-2.94
KDM8	lysine demethylase 8	-2.94
LRRN3	leucine rich repeat neuronal 3	-2.94
RP11_548K2311		-2.94
SEC14L3	SEC14 like lipid binding 3	-2.94
ECM1	extracellular matrix protein 1	-2.95
KIF19	kinesin family member 19	-2.95
MS4A1	membrane spanning 4-domains A1	-2.95
PITPNM3	PITPNM family member 3	-2.95
PWWP3B	PWWP domain containing 3B	-2.95
AJAP1	adherens junctions associated protein 1	-2.97
PLGLB1/PLGLB2	plasminogen like B2	-2.97
TRPC5	transient receptor potential cation channel subfamily C member 5	-2.97
AZGP1P1	AZGP1 pseudogene 1	-2.98
CNGA1	cyclic nucleotide gated channel subunit alpha 1	-2.98
DPF3	double PHD fingers 3	-2.98
LINC02197	long intergenic non-protein coding RNA 2197	-2.98
LOC101928858	uncharacterized LOC101928858	-2.98
MYOM2	myomesin 2	-2.98
CH507_42P116		-2.99
HAND2	heart and neural crest derivatives expressed 2	-3
C3orf85	chromosome 3 open reading frame 85	-3.02
ADGRE1	adhesion G protein-coupled receptor E1	-3.03
GBA3	glucosylceramidase beta 3 (gene/pseudogene)	-3.03
GLYAT	glycine-N-acyltransferase	-3.03
LINC01767	long intergenic non-protein coding RNA 1767	-3.03
LINC02593	long intergenic non-protein coding RNA 2593	-3.03
ALLC	allantoicase	-3.04
ANGPTL4	angiopoietin like 4	-3.04
ASS1	argininosuccinate synthase 1	-3.04
GLYATL1	glycine-N-acyltransferase like 1	-3.04
IGHV4-28	immunoglobulin heavy variable 4-28	-3.04
LINC02362	long intergenic non-protein coding RNA 2362	-3.04
LRCOL1	leucine rich colipase like 1	-3.04
CYP39A1	cytochrome P450 family 39 subfamily A member 1	-3.05

NGFR	nerve growth factor receptor	-3.05
FAM163B	family with sequence similarity 163 member B	-3.06
KCNJ3	potassium inwardly rectifying channel subfamily J member 3	-3.06
KRT7	keratin 7	-3.06
TDO2	tryptophan 2,3-dioxygenase	-3.06
CTD_25271215		-3.07
FAM83A-AS1	FAM83A antisense RNA 1	-3.07
HPX	hemopexin	-3.07
ITGB8	integrin subunit beta 8	-3.07
LINC02499	long intergenic non-protein coding RNA 2499	-3.07
AC1048092		-3.08
BCO2	beta-carotene oxygenase 2	-3.08
TMEM125	transmembrane protein 125	-3.08
KANK4	KN motif and ankyrin repeat domains 4	-3.09
LINC01018	long intergenic non-protein coding RNA 1018	-3.09
LOC100132813	uncharacterized LOC100132813	-3.09
CLIC6	chloride intracellular channel 6	-3.1
CTC_505032		-3.1
FABP1	fatty acid binding protein 1	-3.1
GRM8	glutamate metabotropic receptor 8	-3.11
RP11_256L63		-3.11
ANKRD55	ankyrin repeat domain 55	-3.12
ALDOB	aldolase, fructose-bisphosphate B	-3.13
BHMT	betaine--homocysteine S-methyltransferase	-3.13
GADD45B	growth arrest and DNA damage inducible beta	-3.13
ATP13A4	ATPase 13A4	-3.14
FCRL2	Fc receptor like 2	-3.14
FENDRR	FOXF1 adjacent non-coding developmental regulatory RNA	-3.14
SHBG	sex hormone binding globulin	-3.14
AL1616685		-3.15
ATOX8	atonal bHLH transcription factor 8	-3.15
DSCAML1	DS cell adhesion molecule like 1	-3.15
PZP	PZP alpha-2-macroglobulin like	-3.15
TENM1	teneurin transmembrane protein 1	-3.15
CALN1	calneuron 1	-3.16
ESR1	estrogen receptor 1	-3.16
MTND5P1	MT-ND5 pseudogene 1	-3.16
COL25A1	collagen type XXV alpha 1 chain	-3.17
CCL19	C-C motif chemokine ligand 19	-3.18
IL13RA2	interleukin 13 receptor subunit alpha 2	-3.18
NPAP1	nuclear pore associated protein 1	-3.18
THRSP	thyroid hormone responsive	-3.18
TMEM82	transmembrane protein 82	-3.18
ADAMTSL2	ADAMTS like 2	-3.19
IGHV3-43	immunoglobulin heavy variable 3-43	-3.19
KRT7-AS	KRT7 antisense RNA 1	-3.19
PLAC8	placenta associated 8	-3.19
RP11_96D16		-3.2
NIBAN3	niban apoptosis regulator 3	-3.21
NRG1	neuregulin 1	-3.21
PKHD1L1	PKHD1 like 1	-3.21
RP11_1035H133		-3.21
IGLV6-57	immunoglobulin lambda variable 6-57	-3.23
PLXNA4	plexin A4	-3.24
CLSTN2	calsyntenin 2	-3.25
FREM1	FRAS1 related extracellular matrix 1	-3.25
SFRP1	secreted frizzled related protein 1	-3.25

LINC01348	long intergenic non-protein coding RNA 1348	-3.26
PLGLA	plasminogen like A (pseudogene)	-3.26
DIO3OS	DIO3 opposite strand upstream RNA	-3.27
LINC00313	long intergenic non-protein coding RNA 313	-3.27
RDH16	retinol dehydrogenase 16	-3.27
TRPV6	transient receptor potential cation channel subfamily V member 6	-3.27
SLCO1B3-SLCO1B7	SLCO1B3-SLCO1B7 readthrough	-3.28
B3GALT5	beta-1,3-galactosyltransferase 5	-3.29
F9	coagulation factor IX	-3.29
DBH	dopamine beta-hydroxylase	-3.3
ADCY1	adenylate cyclase 1	-3.31
RP11_286N2216		-3.31
IGHV4-4	immunoglobulin heavy variable 4-4	-3.32
RP4_568C114		-3.32
ASPA	aspartoacylase	-3.33
CPS1	carbamoyl-phosphate synthase 1	-3.35
CXCR5	C-X-C motif chemokine receptor 5	-3.35
SPSB4	splA/ryanodine receptor domain and SOCS box containing 4	-3.36
RP11_39H32		-3.37
FGFR2	fibroblast growth factor receptor 2	-3.39
FAM99B	family with sequence similarity 99 member B	-3.4
AFM	afamin	-3.41
CAMK2B	calcium/calmodulin dependent protein kinase II beta	-3.41
ALOX15P1	arachidonate 15-lipoxygenase pseudogene 1	-3.42
AMD1P4	adenosylmethionine decarboxylase 1 pseudogene 4	-3.42
GPRIN2	G protein regulated inducer of neurite outgrowth 2	-3.42
PPP1R1A	protein phosphatase 1 regulatory inhibitor subunit 1A	-3.42
IGLV1-51	immunoglobulin lambda variable 1-51	-3.44
KCNK17	potassium two pore domain channel subfamily K member 17	-3.44
RP11_96O204		-3.44
SLC13A2	solute carrier family 13 member 2	-3.45
SRD5A2	steroid 5 alpha-reductase 2	-3.45
IGHV3-30	immunoglobulin heavy variable 3-30	-3.46
FXYD2	FXYD domain containing ion transport regulator 2	-3.47
PLCXD3	phosphatidylinositol specific phospholipase C X domain containing 3	-3.47
RANBP3L	RAN binding protein 3 like	-3.47
HAND2-AS1	HAND2 antisense RNA 1	-3.48
SLC13A5	solute carrier family 13 member 5	-3.49
ADAMTS13	ADAM metalloproteinase with thrombospondin type 1 motif 13	-3.5
ACOT12	acyl-CoA thioesterase 12	-3.51
CNTN1	contactin 1	-3.51
IGHA2	immunoglobulin heavy constant alpha 2 (A2m marker)	-3.51
CTD_2527I214		-3.52
CTNNA3	catenin alpha 3	-3.52
EPCAM	epithelial cell adhesion molecule	-3.52
GREM2	gremlin 2, DAN family BMP antagonist	-3.52
NXF3	nuclear RNA export factor 3	-3.52
SLCO1B3	solute carrier organic anion transporter family member 1B3	-3.52
CXCL12	C-X-C motif chemokine ligand 12	-3.53
FRMD1	FERM domain containing 1	-3.53
IGHV3-20	immunoglobulin heavy variable 3-20	-3.53
MT1E	metallothionein 1E	-3.53
CRYAA/CRYAA2	crystallin alpha A	-3.54
IGLV7-46	immunoglobulin lambda variable 7-46 (gene/pseudogene)	-3.54
DLGAP2	DLG associated protein 2	-3.55
ZG16	zymogen granule protein 16	-3.55
SERPINA11	serpin family A member 11	-3.56

G6PC	glucose-6-phosphatase catalytic subunit	-3.57
SLC10A1	solute carrier family 10 member 1	-3.57
FAM30A	family with sequence similarity 30 member A	-3.58
GYS2	glycogen synthase 2	-3.58
IGF1	insulin like growth factor 1	-3.58
IGHG2	immunoglobulin heavy constant gamma 2 (G2m marker)	-3.58
IGHV3-66	immunoglobulin heavy variable 3-66	-3.58
APOA4	apolipoprotein A4	-3.59
CYP2C9	cytochrome P450 family 2 subfamily C member 9	-3.59
FCRL5	Fc receptor like 5	-3.6
IGHV3-33	immunoglobulin heavy variable 3-33	-3.6
ARHGEF18	Rho/Rac guanine nucleotide exchange factor 18	-3.61
UNC93A	unc-93 homolog A	-3.61
ADGRB3	adhesion G protein-coupled receptor B3	-3.62
CFP	complement factor properdin	-3.62
IDO2	indoleamine 2,3-dioxygenase 2	-3.62
IGKV1-39	immunoglobulin kappa variable 1-39 (gene/pseudogene)	-3.62
IGHV3-53	immunoglobulin heavy variable 3-53	-3.63
IGKV1-27	immunoglobulin kappa variable 1-27	-3.65
AVPR1A	arginine vasopressin receptor 1A	-3.66
GNMT	glycine N-methyltransferase	-3.66
IGHV3-73	immunoglobulin heavy variable 3-73	-3.66
RP11_108K1412		-3.66
SLC34A2	solute carrier family 34 member 2	-3.66
IGHV3-74	immunoglobulin heavy variable 3-74	-3.68
IGLV3-1	immunoglobulin lambda variable 3-1	-3.68
CDH19	cadherin 19	-3.69
LYVE1	lymphatic vessel endothelial hyaluronan receptor 1	-3.69
APOA5	apolipoprotein A5	-3.7
CCL21	C-C motif chemokine ligand 21	-3.7
FAM151A	family with sequence similarity 151 member A	-3.7
FBP1	fructose-bisphosphatase 1	-3.7
IGHV3-72	immunoglobulin heavy variable 3-72	-3.7
IGLV3-9	immunoglobulin lambda variable 3-9 (gene/pseudogene)	-3.7
ITLN1	intelectin 1	-3.7
SOCS2	suppressor of cytokine signaling 2	-3.7
TTC36	tetratricopeptide repeat domain 36	-3.7
IGHV2-70	immunoglobulin heavy variable 2-70	-3.71
PTH1R	parathyroid hormone 1 receptor	-3.72
TTL2	tubulin tyrosine ligase like 2	-3.72
CYP3A7	cytochrome P450 family 3 subfamily A member 7	-3.73
IGLC1	immunoglobulin lambda constant 1	-3.73
SDS	serine dehydratase	-3.74
RIPOR3	RIPOR family member 3	-3.75
GPR182	G protein-coupled receptor 182	-3.76
GPM6A	glycoprotein M6A	-3.77
IL1RL1	interleukin 1 receptor like 1	-3.77
KCNJ16	potassium inwardly rectifying channel subfamily J member 16	-3.77
FOLH1B	folate hydrolase 1B	-3.78
CYP3A43	cytochrome P450 family 3 subfamily A member 43	-3.79
MOGAT2	monoacylglycerol O-acyltransferase 2	-3.8
APOF	apolipoprotein F	-3.81
IGLV3-25	immunoglobulin lambda variable 3-25	-3.81
CETP	cholesteryl ester transfer protein	-3.82
IGLV3-10	immunoglobulin lambda variable 3-10	-3.83
ADGRG7	adhesion G protein-coupled receptor G7	-3.84
IGHV1-69	immunoglobulin heavy variable 1-69	-3.84



IGKV1-5	immunoglobulin kappa variable 1-5	-3.84
IGLV1-47	immunoglobulin lambda variable 1-47	-3.84
IGLV2-8	immunoglobulin lambda variable 2-8	-3.84
ST6GAL2	ST6 beta-galactoside alpha-2,6-sialyltransferase 2	-3.84
CFTR	CF transmembrane conductance regulator	-3.85
SMIM24	small integral membrane protein 24	-3.85
IGHA1	immunoglobulin heavy constant alpha 1	-3.86
IGHV4-34	immunoglobulin heavy variable 4-34	-3.87
IGLV8-61	immunoglobulin lambda variable 8-61	-3.87
IGLC2	immunoglobulin lambda constant 2	-3.88
IGKV1D-39	immunoglobulin kappa variable 1D-39	-3.9
IGHV1-69D	immunoglobulin heavy variable 1-69D	-3.92
TAT	tyrosine aminotransferase	-3.92
CHRD1	chordin like 1	-3.93
GHR	growth hormone receptor	-3.93
LECT2	leukocyte cell derived chemotaxin 2	-3.94
IGLV3-19	immunoglobulin lambda variable 3-19	-3.95
SCN7A	sodium voltage-gated channel alpha subunit 7	-3.95
SLITRK6	SLIT and NTRK like family member 6	-3.95
MFAP4	microfibril associated protein 4	-3.98
ADH1A	alcohol dehydrogenase 1A (class I), alpha polypeptide	-3.99
CYP2C8	cytochrome P450 family 2 subfamily C member 8	-4
PGLYRP2	peptidoglycan recognition protein 2	-4
IGHV3-13	immunoglobulin heavy variable 3-13	-4.01
IGKC	immunoglobulin kappa constant	-4.01
MT1F	metallothionein 1F	-4.01
IGKV1-17	immunoglobulin kappa variable 1-17	-4.02
CLDN10	claudin 10	-4.03
IGHV1-2	immunoglobulin heavy variable 1-2	-4.03
DCN	decorin	-4.04
IGHV4-39	immunoglobulin heavy variable 4-39	-4.04
KRT19	keratin 19	-4.04
LOC200772	uncharacterized LOC200772	-4.04
MT1G	metallothionein 1G	-4.04
IGHV4-31	immunoglobulin heavy variable 4-31	-4.05
IGKV4-1	immunoglobulin kappa variable 4-1	-4.05
WNT2	Wnt family member 2	-4.06
IGHV2-5	immunoglobulin heavy variable 2-5	-4.07
IGHV5-51	immunoglobulin heavy variable 5-51	-4.07
IGLC3	immunoglobulin lambda constant 3 (Kern-Oz+ marker)	-4.07
IGLV1-44	immunoglobulin lambda variable 1-44	-4.07
IGHV6-1	immunoglobulin heavy variable 6-1	-4.08
IGHV3-15	immunoglobulin heavy variable 3-15	-4.09
B3GAT1	beta-1,3-glucuronyltransferase 1	-4.1
CNTFR	ciliary neurotrophic factor receptor	-4.1
HAL	histidine ammonia-lyase	-4.1
IGKV3-11	immunoglobulin kappa variable 3-11	-4.1
MT1H	metallothionein 1H	-4.1
IGHV3-11	immunoglobulin heavy variable 3-11 (gene/pseudogene)	-4.11
IGHV3-48	immunoglobulin heavy variable 3-48	-4.11
SCARA5	scavenger receptor class A member 5	-4.11
IGHV1-46	immunoglobulin heavy variable 1-46	-4.13
IGLL1/IGLL5	immunoglobulin lambda like polypeptide 1	-4.13
PDZRN4	PDZ domain containing ring finger 4	-4.13
IGHM	immunoglobulin heavy constant mu	-4.14
KCNN2	potassium calcium-activated channel subfamily N member 2	-4.14
RP3_342P202		-4.14

IGHV3-49	immunoglobulin heavy variable 3-49	-4.15
IGKV2-24	immunoglobulin kappa variable 2-24	-4.15
OIT3	oncogene induced transcript 3	-4.16
IGHV1-18	immunoglobulin heavy variable 1-18	-4.17
IGHG4	immunoglobulin heavy constant gamma 4 (G4m marker)	-4.18
IGKV3-20	immunoglobulin kappa variable 3-20	-4.18
IGLV2-23	immunoglobulin lambda variable 2-23	-4.18
IGHV1-24	immunoglobulin heavy variable 1-24	-4.19
BMP5	bone morphogenetic protein 5	-4.2
IGKV1-16	immunoglobulin kappa variable 1-16	-4.2
IGKV1-33	immunoglobulin kappa variable 1-33	-4.21
IGLV4-69	immunoglobulin lambda variable 4-69	-4.21
ADH4	alcohol dehydrogenase 4 (class II), pi polypeptide	-4.24
FAM99A	family with sequence similarity 99 member A	-4.24
IGLV3-21	immunoglobulin lambda variable 3-21	-4.26
IGHG1	immunoglobulin heavy constant gamma 1 (G1m marker)	-4.27
IGHV4-61	immunoglobulin heavy variable 4-61	-4.28
GABRB3	gamma-aminobutyric acid type A receptor subunit beta3	-4.29
IGKV1-9	immunoglobulin kappa variable 1-9	-4.31
MUC6	mucin 6, oligomeric mucus/gel-forming	-4.31
NPBWR1	neuropeptides B and W receptor 1	-4.31
TIMD4	T cell immunoglobulin and mucin domain containing 4	-4.31
DNASE1L3	deoxyribonuclease 1 like 3	-4.35
CDHR2	cadherin related family member 2	-4.36
GABRP	gamma-aminobutyric acid type A receptor subunit pi	-4.36
MFSD2A	major facilitator superfamily domain containing 2A	-4.36
BICDL2	BICD family like cargo adaptor 2	-4.37
VIPR1	vasoactive intestinal peptide receptor 1	-4.37
AKR1D1	aldo-keto reductase family 1 member D1	-4.38
IGHG3	immunoglobulin heavy constant gamma 3 (G3m marker)	-4.39
RSPO3	R-spondin 3	-4.4
SLC22A10	solute carrier family 22 member 10	-4.4
CHRM2	cholinergic receptor muscarinic 2	-4.41
IGLV1-40	immunoglobulin lambda variable 1-40	-4.42
FXYP1	FXYP domain containing ion transport regulator 1	-4.43
JCHAIN	joining chain of multimeric IgA and IgM	-4.44
CHRNA4	cholinergic receptor nicotinic alpha 4 subunit	-4.47
IGKV3-15	immunoglobulin kappa variable 3-15	-4.47
IGKV2-30	immunoglobulin kappa variable 2-30	-4.48
IGHV4-59	immunoglobulin heavy variable 4-59	-4.49
IGKV2-28	immunoglobulin kappa variable 2-28	-4.5
FOSB	FosB proto-oncogene, AP-1 transcription factor subunit	-4.51
IGHV3-21	immunoglobulin heavy variable 3-21	-4.52
IGHV3-23	immunoglobulin heavy variable 3-23	-4.52
CYP4A22	cytochrome P450 family 4 subfamily A member 22	-4.53
GCGR	glucagon receptor	-4.53
CYP2B6	cytochrome P450 family 2 subfamily B member 6	-4.54
ADRA1A	adrenoceptor alpha 1A	-4.55
IGLV2-11	immunoglobulin lambda variable 2-11	-4.56
IGLV2-14	immunoglobulin lambda variable 2-14	-4.56
HGFAC	HGF activator	-4.58
C9	complement C9	-4.6
CYP4A11	cytochrome P450 family 4 subfamily A member 11	-4.62
LINC01979	long intergenic non-protein coding RNA 1979	-4.62
PRSS8	serine protease 8	-4.62
FAM180A	family with sequence similarity 180 member A	-4.63
HAO2	hydroxyacid oxidase 2	-4.63

IGHV3-7	immunoglobulin heavy variable 3-7	-4.63
CYP3A4	cytochrome P450 family 3 subfamily A member 4	-4.65
MT1M	metallothionein 1M	-4.67
IGKV1-12	immunoglobulin kappa variable 1-12	-4.68
HSD17B13	hydroxysteroid 17-beta dehydrogenase 13	-4.69
FREM2	FRAS1 related extracellular matrix 2	-4.7
CCBE1	collagen and calcium binding EGF domains 1	-4.71
GGT6	gamma-glutamyltransferase 6	-4.71
PCK1	phosphoenolpyruvate carboxykinase 1	-4.72
CYP2A6 (includes others)	cytochrome P450 family 2 subfamily A member 6	-4.73
CHST4	carbohydrate sulfotransferase 4	-4.74
C7	complement C7	-4.8
SLC22A1	solute carrier family 22 member 1	-4.82
CYP26A1	cytochrome P450 family 26 subfamily A member 1	-4.89
CNDP1	carnosine dipeptidase 1	-4.9
ANXA8/ANXA8L1	annexin A8 like 1	-4.92
BMPER	BMP binding endothelial regulator	-4.97
RPS6KA6	ribosomal protein S6 kinase A6	-5
ASPG	asparaginase	-5.08
HHIP	hedgehog interacting protein	-5.08
IGKV1-6	immunoglobulin kappa variable 1-6	-5.12
DPT	dermatopontin	-5.14
LPA	lipoprotein(a)	-5.14
SLC6A11	solute carrier family 6 member 11	-5.14
IGF2	insulin like growth factor 2	-5.17
IGFALS	insulin like growth factor binding protein acid labile subunit	-5.21
COLEC10	collectin subfamily member 10	-5.31
UROC1	urocanate hydratase 1	-5.35
CYP3A7-CYP3A51P	CYP3A7-CYP3A51P readthrough	-5.4
CXCL14	C-X-C motif chemokine ligand 14	-5.42
IGF2-AS	IGF2 antisense RNA	-5.42
FAM83F	family with sequence similarity 83 member F	-5.48
GRHL2	grainyhead like transcription factor 2	-5.5
SLC25A47	solute carrier family 25 member 47	-5.65
GLS2	glutaminase 2	-5.69
FCN3	ficolin 3	-5.78
LINC01093	long intergenic non-protein coding RNA 1093	-5.82
SPP2	secreted phosphoprotein 2	-5.85
SLC6A19	solute carrier family 6 member 19	-5.87
ESRP1	epithelial splicing regulatory protein 1	-5.91
CYP1A2	cytochrome P450 family 1 subfamily A member 2	-5.98
CD5L	CD5 molecule like	-6.04
SYT9	synaptotagmin 9	-6.1
NDST3	N-deacetylase and N-sulfotransferase 3	-6.15
CRHBP	corticotropin releasing hormone binding protein	-6.17
HAMP	hepcidin antimicrobial peptide	-6.17
BMP10	bone morphogenetic protein 10	-6.24
MARCO	macrophage receptor with collagenous structure	-6.25
CLEC1B	C-type lectin domain family 1 member B	-6.28
STAB2	stabilin 2	-6.36
SLC5A1	solute carrier family 5 member 1	-6.39
SFRP5	secreted frizzled related protein 5	-6.4
CLEC4G	C-type lectin domain family 4 member G	-6.68
LINC01488	long intergenic non-protein coding RNA 1488	-6.69
FCN2	ficolin 2	-7.32
GDF2	growth differentiation factor 2	-7.6

CLEC4M	C-type lectin domain family 4 member M	-8.06
IGF2	insulin like growth factor 2	-8.29

**Table S3.** Immune genes differentially expressed in HCV-HCC.

Gene symbol	Gene title	Fold change
CFHR5	complement factor H-related 5	2.06
IL27	interleukin 27	1.67
PSMD4	proteasome (prosome, macropain) 26S subunit, non-ATPase, 4	1.34
KLHL13	kelch-like family member 13	1.23
IRF6	interferon regulatory factor 6	1.03
S100A10	S100 calcium binding protein A10	1.03
TNFSF4	tumor necrosis factor (ligand) superfamily, member 4	1.02
MICB	MHC class I polypeptide-related sequence B	1.01
CD3E	CD3e molecule, epsilon (CD3-TCR complex)	-1.00
NFATC2	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 2	-1.01
IL17RE	interleukin 17 receptor E	-1.01
GBP1	guanylate binding protein 1, interferon-inducible	-1.02
ABR	active BCR-related	-1.02
NCF4	neutrophil cytosolic factor 4, 40kDa	-1.02
POU2F2	POU class 2 homeobox 2	-1.03
LILRB4	leukocyte immunoglobulin-like receptor, subfamily B, member 4	-1.04
TNFSF13	tumor necrosis factor (ligand) superfamily, member 13	-1.04
HAVCR2	hepatitis A virus cellular receptor 2 (TIM3)	-1.07
C3AR1	complement component 3a receptor 1	-1.07
TLR4	toll-like receptor 4	-1.07
SIGLEC1	sialic acid binding Ig-like lectin 1, sialoadhesin	-1.07
LILRB3	leukocyte immunoglobulin-like receptor, subfamily B, member 3	-1.08
FCER1G	Fc fragment of IgE, high affinity I, receptor for; gamma polypeptide	-1.09
FOLR2	folate receptor 2 (fetal)	-1.09
TNFRSF10A	tumor necrosis factor receptor superfamily, member 10a	-1.09
LILRA6	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 6	-1.10
CD55	CD55 molecule, decay accelerating factor for complement (Cromer blood group)	-1.10
IL2RB	interleukin 2 receptor, beta	-1.11
CD72	CD72 molecule	-1.11
KLRK1	killer cell lectin-like receptor subfamily K, member 1	-1.12
BCL11B	B-cell CLL/lymphoma 11B (zinc finger protein)	-1.13
HLA-DRB1	major histocompatibility complex, class II, DR beta 1	-1.14
S100A4	S100 calcium binding protein A4	-1.14
CCL14	chemokine (C-C motif) ligand 14	-1.15
HLA-DPA1	major histocompatibility complex, class II, DP alpha 1	-1.15
CD7	CD7 molecule	-1.16
FCGR3A	Fc fragment of IgG, low affinity IIIa, receptor (CD16a)	-1.16
HRH2	histamine receptor H2	-1.16
IL4R	interleukin 4 receptor	-1.17
MS4A4A	membrane-spanning 4-domains, subfamily A, member 4A	-1.17
HLA-DRA	major histocompatibility complex, class II, DR alpha	-1.17
CCL5	chemokine (C-C motif) ligand 5	-1.18
CYBB	cytochrome b-245, beta polypeptide	-1.19
C1QA	complement component 1, q subcomponent, A chain	-1.19
CD274	CD274 molecule (PD-L1)	-1.19
CD53	CD53 molecule	-1.19
HLA-DQA1	major histocompatibility complex, class II, DQ alpha 1	-1.19
HLA-DPB1	major histocompatibility complex, class II, DP beta 1	-1.20
PDCD1LG2	programmed cell death 1 ligand 2 (PD-L2)	-1.20
GCA	grancalcin, EF-hand calcium binding protein	-1.20
SELPLG	selectin P ligand	-1.20
CD27	Tumor Necrosis Factor Receptor Superfamily, Member 7	-1.20
LY86	lymphocyte antigen 86	-1.21
LCP2	lymphocyte cytosolic protein 2 (SH2 domain containing leukocyte protein of 76kDa)	-1.21

NCF1C	neutrophil cytosolic factor 1C pseudogene	-1.21
ITGA4	integrin, alpha 4 (antigen CD49D, alpha 4 subunit of VLA-4 receptor)	-1.22
TNFRSF1B	tumor necrosis factor receptor superfamily, member 1B	-1.23
C1QC	complement component 1, q subcomponent, C chain	-1.23
CCL3	chemokine (C-C motif) ligand 3	-1.24
LY75	lymphocyte antigen 75	-1.24
CD244	CD244 molecule, natural killer cell receptor 2B4	-1.24
LAT2	linker for activation of T cells family, member 2	-1.24
C8B	complement component 8, beta polypeptide	-1.26
CD14	Monocyte Differentiation Antigen CD14	-1.27
CD8A	T-Cell Surface Glycoprotein CD8 Alpha Chain	-1.27
C1R	complement component 1, r subcomponent	-1.27
C1QB	complement component 1, q subcomponent, B chain	-1.27
SEMA4D	sema domain, immunoglobulin domain (Ig), (semaphorin) 4D	-1.28
TNFSF13B	tumor necrosis factor (ligand) superfamily, member 13b	-1.30
HPSE	heparanase	-1.32
NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta	-1.32
CD8B	T-Cell Surface Glycoprotein CD8 Beta Chain	-1.32
CD96	CD96 molecule	-1.33
CD79B	CD79b molecule, immunoglobulin-associated beta	-1.33
NCF1	neutrophil cytosolic factor 1	-1.33
IL15RA	interleukin 15 receptor, alpha	-1.34
CD5	CD5 molecule	-1.35
EBI3	Epstein-Barr virus induced 3 (Interleukin-27 Subunit Beta)	-1.35
KLHL6	kelch-like family member 6	-1.36
DAPP1	dual adaptor of phosphotyrosine and 3-phosphoinositides	-1.36
CCR1	chemokine (C-C motif) receptor 1	-1.38
IL1RAP	interleukin 1 receptor accessory protein	-1.38
CCR7	chemokine (C-C motif) receptor 7	-1.38
PTPRC	protein tyrosine phosphatase, receptor type, C	-1.39
CFD	complement factor D (adipsin)	-1.39
KLRB1	killer cell lectin-like receptor subfamily B, member 1	-1.39
CYBA	cytochrome b-245, alpha polypeptide	-1.40
GATA3	GATA binding protein 3	-1.40
AOAH	acyloxyacyl hydrolase (neutrophil)	-1.40
LILRB1	leukocyte immunoglobulin-like receptor, subfamily B, member 1	-1.42
TIGIT	T cell immunoreceptor with Ig and ITIM domains	-1.42
NCF1B	neutrophil cytosolic factor 1B pseudogene	-1.42
CSF1R	colony stimulating factor 1 receptor	-1.43
LILRB2	leukocyte immunoglobulin-like receptor, subfamily B, member 2	-1.45
PROCR	protein C receptor, endothelial	-1.46
MRC2	mannose receptor, C type 2 (CD280)	-1.46
NFKBID	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, delta	-1.47
STAT4	signal transducer and activator of transcription 4	-1.48
SIGLEC7	sialic acid binding Ig-like lectin 7	-1.49
HLA-DOA	major histocompatibility complex, class II, DO alpha	-1.50
ISG20	interferon stimulated exonuclease gene 20kDa	-1.51
TNFSF8	tumor necrosis factor (ligand) superfamily, member 8	-1.51
FCRL3	Fc receptor-like 3	-1.51
TLR2	toll-like receptor 2	-1.53
S100A6	S100 calcium binding protein A6	-1.54
TRAT1	T cell receptor associated transmembrane adaptor 1	-1.55
IRF8	interferon regulatory factor 8	-1.55
IFI16	interferon, gamma-inducible protein 16	-1.58
SIGLEC10	sialic acid binding Ig-like lectin 10	-1.60
IL2RA	interleukin 2 receptor, alpha	-1.60
IRAK3	interleukin-1 receptor-associated kinase 3	-1.60

CD86	T-Lymphocyte Activation Antigen CD86	-1.61
NAMPT	nicotinamide phosphoribosyltransferase	-1.62
IL18R1	interleukin 18 receptor 1	-1.63
GZMK	granzyme K (granzyme 3; tryptase II)	-1.63
CCL4	chemokine (C-C motif) ligand 4	-1.63
IL21R	interleukin 21 receptor	-1.64
ITK	IL2-inducible T-cell kinase	-1.65
LILRB5	leukocyte immunoglobulin-like receptor, subfamily B, member 5	-1.65
CD4	CD4 molecule	-1.65
LILRA1	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 1	-1.65
C8A	complement component 8, alpha polypeptide	-1.66
FCGR1B	Fc fragment of IgG, high affinity Ib, receptor (CD64)	-1.66
SIGLEC11	sialic acid binding Ig-like lectin 11	-1.69
NCR3LG1	natural killer cell cytotoxicity receptor 3 ligand 1	-1.70
TNFRSF10D	tumor necrosis factor receptor superfamily, member 10d	-1.71
CXCR4	chemokine (C-X-C motif) receptor 4	-1.72
LY9	lymphocyte antigen 9	-1.72
TGFB3	transforming growth factor, beta 3	-1.72
DEFB1	defensin, beta 1	-1.77
IGLV6-57	immunoglobulin lambda variable 6-57	-1.77
CD69	CD69 molecule	-1.78
IL18RAP	interleukin 18 receptor accessory protein	-1.79
TNFRSF10C	tumor necrosis factor receptor superfamily, member 10c	-1.80
TLR10	toll-like receptor 10	-1.82
TAGAP	T-cell activation RhoGTPase activating protein	-1.86
MNDA	myeloid cell nuclear differentiation antigen	-1.88
C5AR1	complement component 5a receptor 1	-1.90
IL18	interleukin 18	-1.90
CXCL3	chemokine (C-X-C motif) ligand 3	-1.92
MRC1	mannose receptor, C type 1 (CD206)	-1.97
NFAM1	NFAT activating protein with ITAM motif 1	-1.98
VSIG4	V-set and immunoglobulin domain containing 4	-2.00
APOBEC3C	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3C	-2.00
S100A9	S100 calcium binding protein A9	-2.01
CFP	complement factor properdin	-2.02
CD163	Macrophage-Associated Antigen	-2.02
NFATC1	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1	-2.06
CD1D	CD1d molecule	-2.06
CCL22	chemokine (C-C motif) ligand 22	-2.11
TNFRSF21	tumor necrosis factor receptor superfamily, member 21	-2.11
CR1	complement component (3b/4b) receptor 1 (Knops blood group)	-2.12
FCRL1	Fc receptor-like 1	-2.13
LILRA2	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 2	-2.15
FCER1A	Fc fragment of IgE, high affinity I, receptor for; alpha polypeptide	-2.20
SEMA3C	sema domain, immunoglobulin domain (Ig), (semaphorin) 3C	-2.21
ITGB6	integrin, beta 6	-2.33
IL7R	interleukin 7 receptor	-2.33
TNFSF11	tumor necrosis factor (ligand) superfamily, member 11	-2.35
TNFRSF13C	tumor necrosis factor receptor superfamily, member 13C	-2.36
IGHM	immunoglobulin heavy constant mu	-2.40
CCR4	chemokine (C-C motif) receptor 4	-2.43
MZB1	marginal zone B and B1 cell-specific protein	-2.44
IGHG2	immunoglobulin heavy constant gamma 2 (G2m marker)	-2.46
TNFRSF11B	tumor necrosis factor receptor superfamily, member 11b	-2.46
LILRA5	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 5	-2.48
IGHD	immunoglobulin heavy constant delta	-2.48
IGHA1	immunoglobulin heavy constant alpha 1	-2.51

APOBEC3A	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3A	-2.51
RGS2	regulator of G-protein signaling 2	-2.52
KIAA0125	KIAA0125 (Family With Sequence Similarity 30 Member A)	-2.53
S100A8	S100 calcium binding protein A8	-2.58
MS4A1	membrane-spanning 4-domains, subfamily A, member 1 (CD20)	-2.58
SELP	selectin P (granule membrane protein 140kDa, antigen CD62)	-2.59
POU2AF1	POU class 2 associating factor 1	-2.60
FCGR3B	Fc fragment of IgG, low affinity IIIb, receptor (CD16b)	-2.62
IGHG3	immunoglobulin heavy constant gamma 3 (G3m marker)	-2.76
IRF4	interferon regulatory factor 4	-2.80
CXCL12	chemokine (C-X-C motif) ligand 12 (Stromal cell-derived factor 1, SDF1)	-2.81
IGHA2	immunoglobulin heavy constant alpha 2 (A2m marker)	-2.82
CD79A	CD79a molecule, immunoglobulin-associated alpha	-2.83
FCRL5	Fc receptor-like 5	-2.84
CXCL5	chemokine (C-X-C motif) ligand 5	-2.91
CXCL8	chemokine (C-X-C motif) ligand 8	-2.93
IGHV3-23	immunoglobulin heavy variable 3-23	-2.95
IGLL5	immunoglobulin lambda-like polypeptide 5	-3.01
FPR1	formyl peptide receptor 1	-3.01
TGFA	transforming growth factor, alpha	-3.11
IGKC	immunoglobulin kappa constant	-3.12
IGLC1	immunoglobulin lambda constant 1 (Mcg marker)	-3.13
IGKV1-5	Immunoglobulin Kappa Variable 1-5	-3.14
CCL2	chemokine (C-C motif) ligand 2	-3.22
CD5L	CD5 molecule-like	-3.23
LY6E	lymphocyte antigen 6 complex, locus E	-3.34
C7	complement component 7	-3.36
IGHG1	immunoglobulin heavy constant gamma 1 (G1m marker)	-3.37
IL1B	interleukin 1, beta	-3.38
CXCR2	chemokine (C-X-C motif) receptor 2	-3.53
IL6	interleukin 6	-3.57
NCAM1	neural cell adhesion molecule 1 (CD56)	-3.58
CCL21	chemokine (C-C motif) ligand 21	-3.59
CXCL1	chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	-3.61
IGLV3-21	Immunoglobulin Lambda Variable 3-21	-3.62
IL1RL1	interleukin 1 receptor-like 1	-3.63
IGLV1-44	immunoglobulin lambda variable 1-44	-3.63
TIMD4	T-cell immunoglobulin and mucin domain containing 4	-3.65
CCL19	chemokine (C-C motif) ligand 19	-3.96
IGHG4	immunoglobulin heavy constant gamma 4 (G4m marker)	-4.04
CXCL14	chemokine (C-X-C motif) ligand 14	-4.43
C9	complement component 9	-4.91
SEMA3E	sema domain, immunoglobulin domain (Ig), (semaphorin) 3E	-5.05
IL20RA	interleukin 20 receptor, alpha	-5.13
CLEC4G	C-type lectin domain family 4, member G	-5.58
CLEC4M	C-type lectin domain family 4, member M	-5.60
CXCL6	chemokine (C-X-C motif) ligand 6	-5.64
VTCN1	V-set domain containing T cell activation inhibitor 1	-6.42



**Table S4.** Immune genes differentially expressed in HBV-HCC.

Gene symbol	Gene title	Fold change
TREM2	triggering receptor expressed on myeloid cells 2	3.08
CCL20	chemokine (C-C motif) ligand 20	2.77
CD109	CD109 molecule	2.69
GIMAP1-GIMAP5	GIMAP1-GIMAP5 readthrough	2.35
TRIM45	tripartite motif containing 45	2.16
ITGA2	integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)	1.96
NOS2	nitric oxide synthase 2, inducible	1.87
C1QTNF3	C1q and tumor necrosis factor related protein 3	1.85
SQSTM1	sequestosome 1	1.85
HMGA1	high mobility group AT-hook 1	1.78
S100A10	S100 calcium binding protein A10	1.71
APOBEC3B	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3B	1.66
CD34	CD34 molecule	1.65
TNFRSF4	tumor necrosis factor receptor superfamily, member 4	1.63
VNN2	vanin 2	1.52
CTSA	cathepsin A	1.49
S100A11	S100 calcium binding protein A11	1.42
TALDO1	transaldolase 1	1.34
CTSC	cathepsin C	1.30
LOXL2	lysyl oxidase-like 2	1.18
MIF	macrophage migration inhibitory factor (glycosylation-inhibiting factor)	1.18
PSMD4	proteasome (prosome, macropain) 26S subunit, non-ATPase, 4	1.15
MICB	MHC class I polypeptide-related sequence B	1.14
SEMA4F	semaphorin 4F	1.12
IKBKE	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon	1.10
TNFSF4	tumor necrosis factor (ligand) superfamily, member 4	1.10
S100A6	S100 calcium binding protein A6	1.00
CFH	complement factor H	-1.03
CFI	complement factor I	-1.04
IFNAR1	interferon (alpha, beta and omega) receptor 1	-1.07
IL6ST	interleukin 6 signal transducer	-1.07
CTSW	cathepsin W	-1.09
FAS	Fas Cell Surface Death Receptor (CD95, TNFRSF6)	-1.09
GIMAP5	GTPase, IMAP family member 5	-1.09
ISG20	interferon stimulated exonuclease gene 20kDa	-1.10
CCL5	chemokine (C-C motif) ligand 5	-1.12
IFITM1	interferon induced transmembrane protein 1	-1.12
NKG7	natural killer cell granule protein 7	-1.14
TBX21	T-Cell-Specific T-Box Transcription Factor T-Bet (T-Box21)	-1.14
TIGIT	T cell immunoreceptor with Ig and ITIM domains	-1.14
LILRB2	leukocyte immunoglobulin-like receptor, subfamily B, member 2	-1.16
CTSO	cathepsin O	-1.18
C1RL	complement component 1, r subcomponent-like	-1.20
SIGLEC7	sialic acid binding Ig-like lectin 7	-1.22
CD27	Tumor Necrosis Factor Receptor Superfamily, Member 7	-1.25
IL4R	interleukin 4 receptor	-1.25
NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta	-1.25
TLR4	toll-like receptor 4	-1.26
BLNK	B-cell linker	-1.27
LILRB1	leukocyte immunoglobulin-like receptor, subfamily B, member 1	-1.32
TGFBR3	transforming growth factor, beta receptor III	-1.32
CCL4	chemokine (C-C motif) ligand 4	-1.34
CD4	CD4 molecule	-1.35
PDCD1LG2	programmed cell death 1 ligand 2 (PD-L2)	-1.36

CCL3	chemokine (C-C motif) ligand 3	-1.37
LY9	lymphocyte antigen 9	-1.38
KLRB1	killer cell lectin-like receptor subfamily B, member 1	-1.40
IRF8	interferon regulatory factor 8	-1.41
C5	complement component 5	-1.44
TNFRSF10C	tumor necrosis factor receptor superfamily, member 10c, decoy	-1.44
CD14	Monocyte Differentiation Antigen CD14	-1.45
IFNLR1	interferon, lambda receptor 1	-1.45
KLHL3	kelch-like family member 3	-1.45
C5AR1	complement component 5a receptor 1	-1.47
GBP1	guanylate binding protein 1, interferon-inducible	-1.49
PRF1	perforin 1 (pore forming protein)	-1.51
TRGC2	T cell receptor gamma constant 2	-1.53
TIAM1	T-cell lymphoma invasion and metastasis 1	-1.55
CCL15-CCL14	CCL15-CCL14 readthrough (NMD candidate)	-1.57
CD160	CD160 molecule	-1.58
STAT4	signal transducer and activator of transcription 4	-1.58
C3	complement component 3	-1.59
IL2RB	interleukin 2 receptor, beta	-1.62
CD69	CD69 molecule	-1.63
LAG3	lymphocyte-activation gene 3	-1.63
C1R	complement component 1, r subcomponent	-1.64
IL18RAP	interleukin 18 receptor accessory protein	-1.69
TGFA	transforming growth factor, alpha	-1.70
CFD	complement factor D (adipsin)	-1.73
CISH	cytokine inducible SH2-containing protein	-1.73
SOCS3	suppressor of cytokine signaling 3	-1.73
ITK	IL2-inducible T-cell kinase	-1.74
LILRA2	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 2	-1.74
GZMK	granzyme K (granzyme 3; tryptase II)	-1.76
TEK	TEK receptor tyrosine kinase	-1.77
TGFB3	transforming growth factor, beta 3	-1.77
CD1D	CD1d molecule	-1.78
FCRLA	Fc receptor-like A	-1.79
EOMES	eomesodermin	-1.81
FCGR2B	Fc fragment of IgG, low affinity IIb, receptor (CD32)	-1.83
IL33	interleukin 33	-1.83
CD163	Scavenger Receptor Cysteine-Rich Type 1 Protein M130	-1.85
IL1RN	interleukin 1 receptor antagonist	-1.86
LILRA1	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 1	-1.88
TNFRSF13C	tumor necrosis factor receptor superfamily, member 13C	-1.96
TRAT1	T cell receptor associated transmembrane adaptor 1	-1.96
S100A8	S100 calcium binding protein A8	-2.00
TNFSF11	tumor necrosis factor (ligand) superfamily, member 11	-2.00
IL18R1	interleukin 18 receptor 1	-2.01
TNFRSF10D	tumor necrosis factor receptor superfamily, member 10d, decoy	-2.01
CD244	CD244 molecule, natural killer cell receptor 2B4	-2.03
FPR1	formyl peptide receptor 1	-2.04
C8A	complement component 8, alpha polypeptide	-2.06
CCR7	chemokine (C-C motif) receptor 7	-2.08
KLRD1	killer cell lectin-like receptor subfamily D, member 1	-2.12
CR1	complement component (3b/4b) receptor 1 (Knops blood group)	-2.22
MRC1	mannose receptor, C type 1 (CD206)	-2.25
PAX5	paired box 5	-2.25
IL1RAP	interleukin 1 receptor accessory protein	-2.28
ITGAD	integrin, alpha D	-2.29
IGHD	immunoglobulin heavy constant delta	-2.30

FCRL3	Fc receptor-like 3	-2.31
LILRB5	leukocyte immunoglobulin-like receptor, subfamily B, member 5	-2.35
CD8A	T-Cell Surface Glycoprotein CD8 Alpha Chain	-2.38
LILRA5	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 5	-2.39
SIGLEC11	sialic acid binding Ig-like lectin 11	-2.39
LY6E	lymphocyte antigen 6 complex, locus E	-2.44
CCL14	chemokine (C-C motif) ligand 14	-2.49
IRF4	interferon regulatory factor 4	-2.49
POU2AF1	POU class 2 associating factor 1	-2.61
C8B	complement component 8, beta polypeptide	-2.62
CFHR3	complement factor H-related 3	-2.66
CXCL2	chemokine (C-X-C motif) ligand 2	-2.67
FCRL1	Fc receptor-like 1	-2.74
VNN1	vanin 1	-2.78
SELP	selectin P (granule membrane protein 140kDa, antigen CD62)	-2.84
MZB1	marginal zone B and B1 cell-specific protein	-2.89
C6	complement component 6	-2.94
CD79A	CD79a molecule, immunoglobulin-associated alpha	-2.94
MS4A1	membrane-spanning 4-domains, subfamily A, member 1 (CD20)	-2.95
HPX	hemopexin	-3.07
FCRL2	Fc receptor-like 2	-3.14
CCL19	chemokine (C-C motif) ligand 19	-3.18
IL13RA2	interleukin 13 receptor, alpha 2	-3.18
IGLV6-57	immunoglobulin lambda variable 6-57	-3.23
CXCR5	chemokine (C-X-C motif) receptor 5	-3.35
IGHA2	immunoglobulin heavy constant alpha 2 (A2m marker)	-3.51
CXCL12	chemokine (C-X-C motif) ligand 12 (Stromal cell-derived factor 1, SDF1)	-3.53
IGHG2	immunoglobulin heavy constant gamma 2 (G2m marker)	-3.58
FCRL5	Fc receptor-like 5	-3.60
CFP	complement factor properdin	-3.62
IDO2	Indoleamine 2,3-Dioxygenase 2	-3.62
CCL21	chemokine (C-C motif) ligand 21	-3.70
SOCS2	suppressor of cytokine signaling 2	-3.70
IGLC1	immunoglobulin lambda constant 1 (Mcg marker)	-3.73
IL1RL1	interleukin 1 receptor-like 1	-3.77
IGKV1-5	Immunoglobulin Kappa Variable 1-5	-3.84
IGHA1	immunoglobulin heavy constant alpha 1	-3.86
IGKC	immunoglobulin kappa constant	-4.01
IGHV4-31	immunoglobulin heavy variable 4-31	-4.05
IGLV1-44	immunoglobulin lambda variable 1-44	-4.07
IGHM	immunoglobulin heavy constant mu	-4.14
IGHG4	immunoglobulin heavy constant gamma 4 (G4m marker)	-4.18
IGLV3-21	Immunoglobulin Lambda Variable 3-21	-4.26
IGHG1	immunoglobulin heavy constant gamma 1 (G1m marker)	-4.27
TIMD4	T-cell immunoglobulin and mucin domain containing 4	-4.31
IGHG3	immunoglobulin heavy constant gamma 3 (G3m marker)	-4.39
IGHV3-23	immunoglobulin heavy variable 3-23	-4.52
C9	complement component 9	-4.60
C7	complement component 7	-4.80
CXCL14	chemokine (C-X-C motif) ligand 14	-5.42
CD5L	CD5 molecule-like	-6.04
CLEC4G	C-type lectin domain family 4, member G	-6.68
CLEC4M	C-type lectin domain family 4, member M	-8.06

**Table S5.** Immune genes uniquely expressed in HCV-HCC.

Gene symbol	Gene title	Fold change
CFHR5	complement factor H-related 5	2.06
IL27	interleukin 27	1.67
KLHL13	kelch-like family member 13	1.23
IRF6	interferon regulatory factor 6	1.03
CD3E	CD3e molecule, epsilon (CD3-TCR complex)	-1.00
IL17RE	interleukin 17 receptor E	-1.01
NFATC2	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 2	-1.01
ABR	active BCR-related	-1.02
NCF4	neutrophil cytosolic factor 4, 40kDa	-1.02
POU2F2	POU class 2 homeobox 2	-1.03
LILRB4	leukocyte immunoglobulin-like receptor, subfamily B, member 4	-1.04
TNFSF13	tumor necrosis factor (ligand) superfamily, member 13	-1.04
C3AR1	complement component 3a receptor 1	-1.07
HAVCR2	hepatitis A virus cellular receptor 2 (TIM3)	-1.07
SIGLEC1	sialic acid binding Ig-like lectin 1, sialoadhesin	-1.07
LILRB3	leukocyte immunoglobulin-like receptor, subfamily B, member 3	-1.08
FCER1G	Fc fragment of IgE, high affinity I, receptor for; gamma polypeptide	-1.09
FOLR2	folate receptor 2 (fetal)	-1.09
TNFRSF10A	tumor necrosis factor receptor superfamily, member 10a	-1.09
CD55	CD55 molecule, decay accelerating factor for complement (Cromer blood group)	-1.10
LILRA6	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 6	-1.10
CD72	CD72 molecule	-1.11
BCL11B	B-cell CLL/lymphoma 11B (zinc finger protein)	-1.13
HLA-DRB1	major histocompatibility complex, class II, DR beta 1	-1.14
S100A4	S100 calcium binding protein A4	-1.14
HLA-DPA1	major histocompatibility complex, class II, DP alpha 1	-1.15
CD7	CD7 molecule	-1.16
HRH2	histamine receptor H2	-1.16
HLA-DRA	major histocompatibility complex, class II, DR alpha	-1.17
MS4A4A	membrane-spanning 4-domains, subfamily A, member 4A	-1.17
C1QA	complement component 1, q subcomponent, A chain	-1.19
CD274	CD274 molecule (PD-L1)	-1.19
CD53	CD53 molecule	-1.19
CYBB	cytochrome b-245, beta polypeptide	-1.19
HLA-DQA1	major histocompatibility complex, class II, DQ alpha 1	-1.19
GCA	grancalcin, EF-hand calcium binding protein	-1.20
HLA-DPB1	major histocompatibility complex, class II, DP beta 1	-1.20
IL10RA	Interleukin 10 Receptor Subunit Alpha (IL-10R1)	-1.20
SELPLG	selectin P ligand	-1.20
LCP2	lymphocyte cytosolic protein 2 (SH2 domain containing leukocyte protein of 76kDa)	-1.21
LY86	lymphocyte antigen 86	-1.21
NCF1C	neutrophil cytosolic factor 1C pseudogene	-1.21
ITGA4	integrin, alpha 4 (antigen CD49D, alpha 4 subunit of VLA-4 receptor)	-1.22
C1QC	complement component 1, q subcomponent, C chain	-1.23
TNFRSF1B	tumor necrosis factor receptor superfamily, member 1B	-1.23
LAT2	linker for activation of T cells family, member 2	-1.24
LY75	lymphocyte antigen 75	-1.24
C1QB	complement component 1, q subcomponent, B chain	-1.27
SEMA4D	semaphorin 4D	-1.28
TNFSF13B	tumor necrosis factor (ligand) superfamily, member 13b	-1.30
CD8B	T-Cell Surface Glycoprotein CD8 Beta Chain	-1.32
HPSE	heparanase	-1.32
CD79B	CD79b molecule, immunoglobulin-associated beta	-1.33
CD96	CD96 molecule	-1.33

NCF1	neutrophil cytosolic factor 1	-1.33
IL15RA	interleukin 15 receptor, alpha	-1.34
CD5	CD5 molecule	-1.35
EBI3	Epstein-Barr virus induced 3 (Interleukin-27 Subunit Beta)	-1.35
DAPP1	dual adaptor of phosphotyrosine and 3-phosphoinositides	-1.36
KLHL6	kelch-like family member 6	-1.36
CCR1	chemokine (C-C motif) receptor 1	-1.38
PTPRC	protein tyrosine phosphatase, receptor type, C	-1.39
AOAH	acyloxyacyl hydrolase (neutrophil)	-1.40
CYBA	cytochrome b-245, alpha polypeptide	-1.40
GATA3	GATA binding protein 3	-1.40
NCF1B	neutrophil cytosolic factor 1B pseudogene	-1.42
CSF1R	colony stimulating factor 1 receptor	-1.43
CSF2RA	Colony Stimulating Factor 2 Receptor Alpha Subunit	-1.43
MRC2	mannose receptor, C type 2 (CD280)	-1.46
PROCR	protein C receptor, endothelial	-1.46
NFKBID	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, delta	-1.47
HLA-DOA	major histocompatibility complex, class II, DO alpha	-1.50
TNFSF8	tumor necrosis factor (ligand) superfamily, member 8	-1.51
TLR2	toll-like receptor 2	-1.53
IFI16	interferon, gamma-inducible protein 16	-1.58
IL2RA	interleukin 2 receptor, alpha	-1.60
IRAK3	interleukin-1 receptor-associated kinase 3	-1.60
SIGLEC10	sialic acid binding Ig-like lectin 10	-1.60
CD86	T-Lymphocyte Activation Antigen CD86	-1.61
NAMPT	nicotinamide phosphoribosyltransferase	-1.62
IL21R	interleukin 21 receptor	-1.64
FCGR1B	Fc fragment of IgG, high affinity Ib, receptor (CD64)	-1.66
NCR3LG1	natural killer cell cytotoxicity receptor 3 ligand 1	-1.70
CXCR4	chemokine (C-X-C motif) receptor 4	-1.72
DEFB1	defensin, beta 1	-1.77
TLR10	toll-like receptor 10	-1.82
TAGAP	T-cell activation RhoGTPase activating protein	-1.86
MNDA	myeloid cell nuclear differentiation antigen	-1.88
IL18	interleukin 18	-1.90
CXCL3	chemokine (C-X-C motif) ligand 3	-1.92
NFAM1	NFAT activating protein with ITAM motif 1	-1.98
APOBEC3C	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3C	-2.00
VSIG4	V-set and immunoglobulin domain containing 4	-2.00
S100A9	S100 calcium binding protein A9	-2.01
NFATC1	nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1	-2.06
CCL22	chemokine (C-C motif) ligand 22	-2.11
TNFRSF21	tumor necrosis factor receptor superfamily, member 21	-2.11
FCER1A	Fc fragment of IgE, high affinity I, receptor for; alpha polypeptide	-2.20
SEMA3C	semaphorin 3C	-2.21
IL7R	interleukin 7 receptor	-2.33
ITGB6	integrin, beta 6	-2.33
CCR4	chemokine (C-C motif) receptor 4	-2.43
TNFRSF11B	tumor necrosis factor receptor superfamily, member 11b	-2.46
APOBEC3A	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3A	-2.51
RGS2	regulator of G-protein signaling 2	-2.52
CXCL5	chemokine (C-X-C motif) ligand 5	-2.91
CXCL8	chemokine (C-X-C motif) ligand 8 (IL-8)	-2.93
CCL2	chemokine (C-C motif) ligand 2	-3.22
IL1B	interleukin 1, beta	-3.38
CXCR2	chemokine (C-X-C motif) receptor 2	-3.53
IL6	interleukin 6	-3.57

NCAM1	neural cell adhesion molecule 1 (CD56)	-3.58
CXCL1	chemokine (C-X-C motif) ligand 1 (melanoma growth stimulating activity, alpha)	-3.61
SEMA3E	semaphorin 3E	-5.05
IL20RA	interleukin 20 receptor, alpha	-5.13
CXCL6	chemokine (C-X-C motif) ligand 6	-5.64
VTCN1	V-set domain containing T cell activation inhibitor 1	-6.42

**Table S6.** Immune genes uniquely expressed in HBV-HCC.

Gene symbol	Gene title	Fold change
TREM2	triggering receptor expressed on myeloid cells 2	3.08
CCL20	chemokine (C-C motif) ligand 20	2.77
CD109	CD109 molecule	2.69
GIMAP1-GIMAP5	GIMAP1-GIMAP5 readthrough	2.35
TRIM45	tripartite motif containing 45	2.16
ITGA2	integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)	1.96
NOS2	nitric oxide synthase 2, inducible	1.87
C1QTNF3	C1q and tumor necrosis factor related protein 3	1.85
SQSTM1	sequestosome 1	1.85
HMGA1	high mobility group AT-hook 1	1.78
APOBEC3B	apolipoprotein B mRNA editing enzyme, catalytic polypeptide-like 3B	1.66
CD34	CD34 molecule	1.65
TNFRSF4	tumor necrosis factor receptor superfamily, member 4	1.63
VNN2	vanin 2	1.52
CTSA	cathepsin A	1.49
S100A11	S100 calcium binding protein A11	1.42
TALDO1	transaldolase 1	1.34
CTSC	cathepsin C	1.30
LOXL2	lysyl oxidase-like 2	1.18
MIF	macrophage migration inhibitory factor (glycosylation-inhibiting factor)	1.18
SEMA4F	semaphorin 4F	1.12
IKBKE	inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase epsilon	1.10
CFH	complement factor H	-1.03
CFI	complement factor I	-1.04
IFNAR1	interferon (alpha, beta and omega) receptor 1	-1.07
IL6ST	interleukin 6 signal transducer	-1.07
CTSW	cathepsin W	-1.09
FAS	Fas Cell Surface Death Receptor (CD95, TNFRSF6)	-1.09
GIMAP5	GTPase, IMAP family member 5	-1.09
IFITM1	interferon induced transmembrane protein 1	-1.12
NKG7	natural killer cell granule protein 7	-1.14
TBX21	T-Cell-Specific T-Box Transcription Factor T-Bet (T-Box21)	-1.14
CTSO	cathepsin O	-1.18
C1RL	complement component 1, r subcomponent-like	-1.20
BLNK	B-cell linker	-1.27
TGFBR3	transforming growth factor, beta receptor III	-1.32
C5	complement component 5	-1.44
IFNLR1	interferon, lambda receptor 1	-1.45
KLHL3	kelch-like family member 3	-1.45
PRF1	perforin 1 (pore forming protein)	-1.51
TRGC2	T cell receptor gamma constant 2	-1.53
TIAM1	T-cell lymphoma invasion and metastasis 1	-1.55
CCL15-CCL14	CCL15-CCL14 readthrough (NMD candidate)	-1.57
CD160	CD160 molecule	-1.58
C3	complement component 3	-1.59
LAG3	lymphocyte-activation gene 3	-1.63
CISH	cytokine inducible SH2-containing protein	-1.73
TEK	TEK receptor tyrosine kinase	-1.77
FCRLA	Fc receptor-like A	-1.79
EOMES	eomesodermin	-1.81
FCGR2B	Fc fragment of IgG, low affinity IIb, receptor (CD32)	-1.83
IL33	interleukin 33	-1.83
IL1RN	interleukin 1 receptor antagonist	-1.86
KLRD1	killer cell lectin-like receptor subfamily D, member 1	-2.12

PAX5	paired box 5	-2.25
ITGAD	integrin, alpha D	-2.29
CFHR3	complement factor H-related 3	-2.66
CXCL2	chemokine (C-X-C motif) ligand 2	-2.67
VNN1	vanin 1	-2.78
C6	complement component 6	-2.94
HPX	hemopexin	-3.07
FCRL2	Fc receptor-like 2	-3.14
IL13RA2	interleukin 13 receptor, alpha 2	-3.18
CXCR5	chemokine (C-X-C motif) receptor 5	-3.35
IGHV4-31	immunoglobulin heavy variable 4-31	-4.05

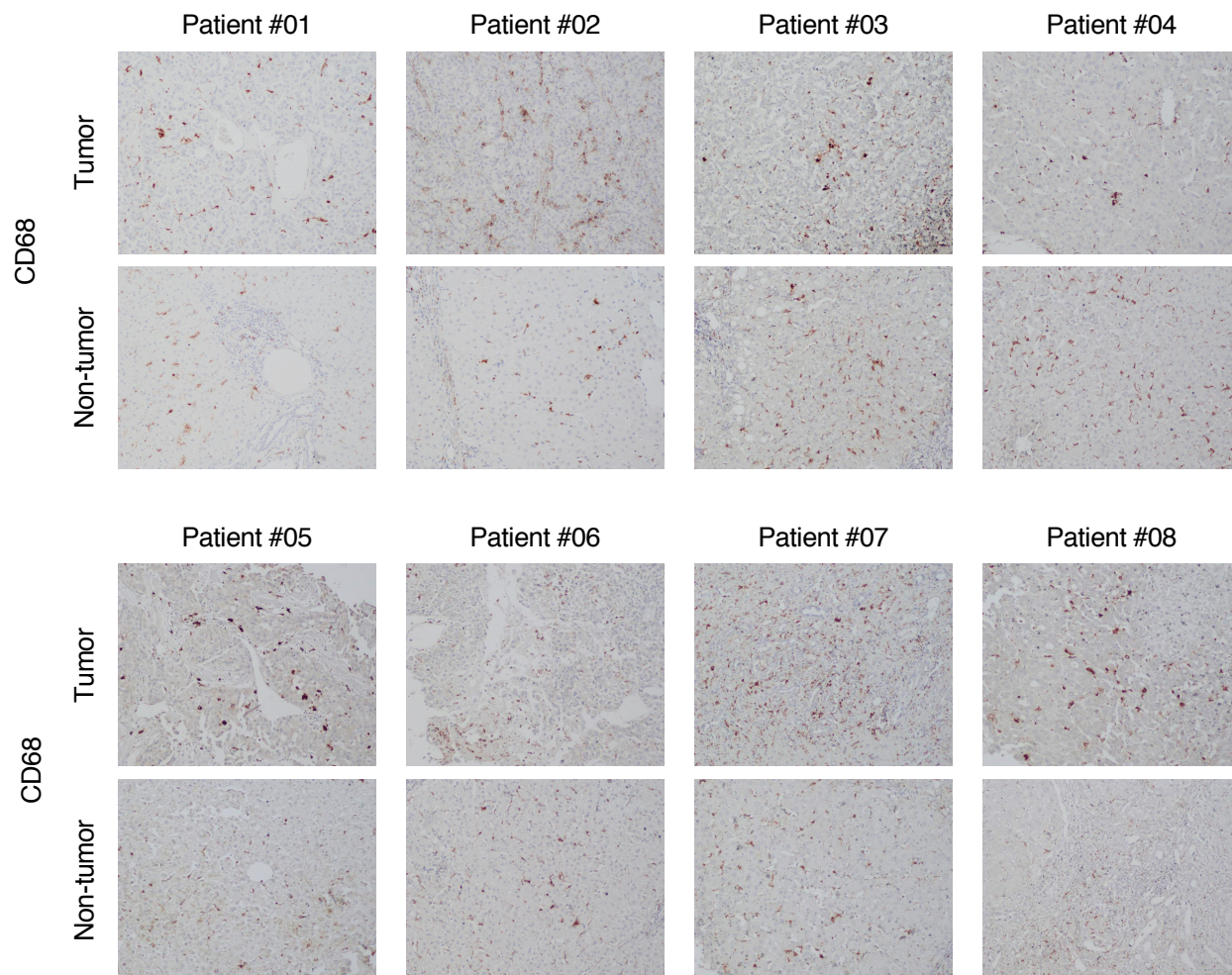


**Table S7.** Immune genes commonly expressed in viral-associated HCC.

Gene Symbol	Entrez Gene Name	HCV-HCC	HBV-HCC
PSMD4	proteasome (prosome, macropain) 26S subunit, non-ATPase, 4	1.34	1.15
S100A10	S100 calcium binding protein A10	1.03	1.71
TNFSF4	tumor necrosis factor (ligand) superfamily, member 4	1.02	1.10
MICB	MHC class I polypeptide-related sequence B	1.01	1.14
GBP1	guanylate binding protein 1, interferon-inducible	-1.02	-1.49
TLR4	toll-like receptor 4	-1.07	-1.26
IL2RB	interleukin 2 receptor, beta	-1.11	-1.62
CCL14	chemokine (C-C motif) ligand 14	-1.15	-2.49
IL4R	interleukin 4 receptor	-1.17	-1.25
CCL5	chemokine (C-C motif) ligand 5	-1.18	-1.12
CD27	Tumor Necrosis Factor Receptor Superfamily, Member 7	-1.20	-1.25
PDCD1LG2	programmed cell death 1 ligand 2 (PD-L2)	-1.20	-1.36
CCL3	chemokine (C-C motif) ligand 3	-1.24	-1.37
CD244	CD244 molecule, natural killer cell receptor 2B4	-1.24	-2.03
C8B	complement component 8, beta polypeptide	-1.26	-2.62
C1R	complement component 1, r subcomponent	-1.27	-1.64
CD14	Monocyte Differentiation Antigen CD14	-1.27	-1.45
CD8A	T-Cell Surface Glycoprotein CD8 Alpha Chain	-1.27	-2.38
NFKBIZ	nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, zeta	-1.32	-1.25
CCR7	chemokine (C-C motif) receptor 7	-1.38	-2.08
IL1RAP	interleukin 1 receptor accessory protein	-1.38	-2.28
CFD	complement factor D (adipsin)	-1.39	-1.73
KLRB1	killer cell lectin-like receptor subfamily B, member 1	-1.39	-1.40
LILRB1	leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 1	-1.42	-1.32
TIGIT	T cell immunoreceptor with Ig and ITIM domains	-1.42	-1.14
LILRB2	leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 2	-1.45	-1.16
STAT4	signal transducer and activator of transcription 4	-1.48	-1.58
SIGLEC7	sialic acid binding Ig-like lectin 7	-1.49	-1.22
FCRL3	Fc receptor-like 3	-1.51	-2.31
ISG20	interferon stimulated exonuclease gene 20kDa	-1.51	-1.10
S100A6	S100 calcium binding protein A6	-1.54	1.00
IRF8	interferon regulatory factor 8	-1.55	-1.41
TRAT1	T cell receptor associated transmembrane adaptor 1	-1.55	-1.96
CCL4	chemokine (C-C motif) ligand 4	-1.63	-1.34
GZMK	granzyme K (granzyme 3; tryptase II)	-1.63	-1.76
IL18R1	interleukin 18 receptor 1	-1.63	-2.01
CD4	CD4 molecule	-1.65	-1.35
ITK	IL2-inducible T-cell kinase	-1.65	-1.74
LILRA1	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 1	-1.65	-1.88
LILRB5	leukocyte immunoglobulin-like receptor, subfamily B (with TM and ITIM domains), member 5	-1.65	-2.35
C8A	complement component 8, alpha polypeptide	-1.66	-2.06
SIGLEC11	sialic acid binding Ig-like lectin 11	-1.69	-2.39
TNFRSF10D	tumor necrosis factor receptor superfamily, member 10d, decoy with truncated death domain	-1.71	-2.01
LY9	lymphocyte antigen 9	-1.72	-1.38
TGFB3	transforming growth factor, beta 3	-1.72	-1.77
SOCS2	suppressor of cytokine signaling 2	-1.76	-3.70
IGLV6-57	immunoglobulin lambda variable 6-57	-1.77	-3.23
CD69	CD69 molecule	-1.78	-1.63
IL18RAP	interleukin 18 receptor accessory protein	-1.79	-1.69
TNFRSF10C	tumor necrosis factor receptor superfamily, member 10c, decoy without an intracellular domain	-1.80	-1.44

C5AR1	complement component 5a receptor 1	-1.90	-1.47
MRC1	mannose receptor, C type 1 (CD206)	-1.97	-2.25
CD163	Scavenger Receptor Cysteine-Rich Type 1 Protein M130	-2.02	-1.85
CFP	complement factor properdin	-2.02	-3.62
CD1D	CD1d molecule	-2.06	-1.78
CR1	complement component (3b/4b) receptor 1 (Knops blood group)	-2.12	-2.22
FCRL1	Fc receptor-like 1	-2.13	-2.74
LILRA2	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 2	-2.15	-1.74
TNFSF11	tumor necrosis factor (ligand) superfamily, member 11	-2.35	-2.00
TNFRSF13C	tumor necrosis factor receptor superfamily, member 13C	-2.36	-1.96
IGHM	immunoglobulin heavy constant mu	-2.40	-4.14
MZB1	marginal zone B and B1 cell-specific protein	-2.44	-2.89
IGHG2	immunoglobulin heavy constant gamma 2 (G2m marker)	-2.46	-3.58
IGHD	immunoglobulin heavy constant delta	-2.48	-2.30
LILRA5	leukocyte immunoglobulin-like receptor, subfamily A (with TM domain), member 5	-2.48	-2.39
IGHA1	immunoglobulin heavy constant alpha 1	-2.51	-3.86
MS4A1	membrane-spanning 4-domains, subfamily A, member 1 (CD20)	-2.58	-2.95
S100A8	S100 calcium binding protein A8	-2.58	-2.00
SELP	selectin P (granule membrane protein 140kDa, antigen CD62)	-2.59	-2.84
POU2AF1	POU class 2 associating factor 1	-2.60	-2.61
IGHG3	immunoglobulin heavy constant gamma 3 (G3m marker)	-2.76	-4.39
IRF4	interferon regulatory factor 4	-2.80	-2.49
CXCL12	chemokine (C-X-C motif) ligand 12 (Stromal cell-derived factor 1, SDF1)	-2.81	-3.53
IGHA2	immunoglobulin heavy constant alpha 2 (A2m marker)	-2.82	-3.51
CD79A	CD79a molecule, immunoglobulin-associated alpha	-2.83	-2.94
FCRL5	Fc receptor-like 5	-2.84	-3.60
IGHV3-23	immunoglobulin heavy variable 3-23	-2.95	-4.52
FPR1	formyl peptide receptor 1	-3.01	-2.04
TGFA	transforming growth factor, alpha	-3.11	-1.70
IGKC	immunoglobulin kappa constant	-3.12	-4.01
IGLC1	immunoglobulin lambda constant 1 (Mcg marker)	-3.13	-3.73
IGKV1-5	Immunoglobulin Kappa Variable 1-5	-3.14	-3.84
IDO2	Indoleamine 2,3-Dioxygenase 2	-3.22	-3.62
CD5L	CD5 molecule-like	-3.23	-6.04
SOCS3	suppressor of cytokine signaling 3	-3.31	-1.73
LY6E	lymphocyte antigen 6 complex, locus E	-3.34	-2.44
C7	complement component 7	-3.36	-4.80
IGHG1	immunoglobulin heavy constant gamma 1 (G1m marker)	-3.37	-4.27
CCL21	chemokine (C-C motif) ligand 21	-3.59	-3.70
IGLV3-21	Immunoglobulin Lambda Variable 3-21	-3.62	-4.26
IGLV1-44	immunoglobulin lambda variable 1-44	-3.63	-4.07
IL1RL1	interleukin 1 receptor-like 1	-3.63	-3.77
TIMD4	T-cell immunoglobulin and mucin domain containing 4	-3.65	-4.31
CCL19	chemokine (C-C motif) ligand 19	-3.96	-3.18
IGHG4	immunoglobulin heavy constant gamma 4 (G4m marker)	-4.04	-4.18
CXCL14	chemokine (C-X-C motif) ligand 14	-4.43	-5.42
C9	complement component 9	-4.91	-4.60
CLEC4G	C-type lectin domain family 4, member G	-5.58	-6.68
CLEC4M	C-type lectin domain family 4, member M	-5.60	-8.06

## SUPPLEMENTARY FIGURES



**Figure S1** Immunohistochemical staining of a monocyte/macrophage marker CD68 in liver tissue from 8 patients with HCV-associated HCC. Liver specimens obtained at the time of liver transplantation were stained with monoclonal antibodies against CD68 with the use of immunoperoxidase both within the tumor and in the surrounding nontumorous tissue from 8 patients with HCV-HCC. (Magnification: x10)