

# Supplementary Table 1.






A

## Differential H3K4me2 binding sites MSigDB Perturbation

Rank	Term Name	Binom Raw P-Value
1	Genes with promoters occupied by PML-RAR $\alpha$ fusion [GeneID=5371,5914] protein in acute promyelocytic leukemia(APL) cells NB4 and two APL primary blasts, based on ChIP-seq data.	2.10E-46
2	The 'MLL signature 1': genes up-regulated in pediatric AML (acute myeloid leukemia) with rearranged MLL [GeneID=4297] compared to all AML cases with the intact gene.	7.37E-24
3	The 'MLL signature 2': genes up-regulated in pediatric AML (acute myeloid leukemia) with rearranged MLL [GeneID=4297] compared to the AML cases with intact MLL and NPM1 [GeneID=4869].	4.03E-23
4	Up-regulated genes in colon carcinoma tumors compared to the matched normal mucosa samples.	1.02E-16
5	Genes up-regulated in NHEK cells (normal epidermal keratinocytes) after UVB irradiation.	4.00E-16

B

## Known tranCrtliption factor motifs for differential H3K4me2 binding sites

Rank	Motif	Name	P-value	# Target Sequences with Motif	% of Targets Sequences with Motif
1		ETS1	1.00E-48	949	20.62%
2		PU.1	1.00E-35	1452	31.55%
3		EWS:ERG-fusion	1.00E-27	1612	35.03%
4		SpiB	1.00E-25	724	15.73%
5		C/EBP	1.00E-23	1036	22.51%

C

## KDM5A binding sites MSigDB Pathways

Rank	Term Name	P-Value
1	Genes involved in Gene Expression	2.88E-28
2	Genes involved in HIV Infection	2.12E-21
3	Genes involved in Processing of Capped Intron-Containing Pre-mRNA	1.83E-18
4	Spliceosome	7.05E-18
5	Genes involved in Formation and Maturation of mRNA TranCrtlipt	1.55E-16
6	Genes involved in Host Interactions of HIV factors	2.54E-16
7	Genes involved in Mitotic M-M/G1 phases	9.85E-16
8	Genes involved in Cell Cycle, Mitotic	2.21E-15
9	Genes involved in Elongation and Processing of Capped TranCrtlipts	1.48E-14
10	Genes involved in Cell Cycle Checkpoints	9.13E-14

## Supplementary Table 2

### PML-RAR $\alpha$ Target Genes

[https://www.gsea-msigdb.org/gsea/msigdb/geneset\\_page.jsp?geneSetName=MARTENS\\_BOUND\\_BY\\_PML\\_RARA\\_FUSION&keywords=MARTENS\\_BOUND\\_BY\\_PML\\_RARA\\_FUSION](https://www.gsea-msigdb.org/gsea/msigdb/geneset_page.jsp?geneSetName=MARTENS_BOUND_BY_PML_RARA_FUSION&keywords=MARTENS_BOUND_BY_PML_RARA_FUSION)

<b>Original Member</b>	<b>NCBI (Entrez) Gene Id</b>	<b>Gene Symbol</b>	<b>Gene Description</b>
ABHD2	<a href="#">11057</a>	<a href="#">ABHD2</a>	abhydrolase domain containing 2 [...
ABI3	<a href="#">51225</a>	<a href="#">ABI3</a>	ABI family member 3 [Source:HGNC ...
ACP5	<a href="#">54</a>	<a href="#">ACP5</a>	"acid phosphatase 5, tartrate res...
ACSF3	<a href="#">197322</a>	<a href="#">ACSF3</a>	acyl-CoA synthetase family member...
ACSL1	<a href="#">2180</a>	<a href="#">ACSL1</a>	acyl-CoA synthetase long chain fa...
ADAM8	<a href="#">101</a>	<a href="#">ADAM8</a>	ADAM metallopeptidase domain 8 [S...
ADAMTS10	<a href="#">81794</a>	<a href="#">ADAMTS10</a>	ADAM metallopeptidase with thromb...
ADC	<a href="#">113451</a>	<a href="#">AZIN2</a>	antizyme inhibitor 2 [Source:HGNC...
ADCY10	<a href="#">55811</a>	<a href="#">ADCY10</a>	adenylate cyclase 10 [Source:HGNC...
ADORA3	<a href="#">140</a>	<a href="#">ADORA3</a>	adenosine A3 receptor [Source:HGN...
ADRBK1	<a href="#">156</a>	<a href="#">GRK2</a>	G protein-coupled receptor kinase...
AJAP1	<a href="#">55966</a>	<a href="#">AJAP1</a>	adherens junctions associated pro...
AK1	<a href="#">203</a>	<a href="#">AK1</a>	adenylate kinase 1 [Source:HGNC S...
AKNA	<a href="#">80709</a>	<a href="#">AKNA</a>	AT-hook transcription factor [Sou...
ALDH2	<a href="#">217</a>	<a href="#">ALDH2</a>	aldehyde dehydrogenase 2 family m...
ALOX5AP	<a href="#">241</a>	<a href="#">ALOX5AP</a>	arachidonate 5-lipoxygenase activ...
ANKDD1A	<a href="#">348094</a>	<a href="#">ANKDD1A</a>	ankyrin repeat and death domain c...
ANKRD11	<a href="#">29123</a>	<a href="#">ANKRD11</a>	ankyrin repeat domain 11 [Source:...
ANKRD33B	<a href="#">651746</a>	<a href="#">ANKRD33B</a>	ankyrin repeat domain 33B [Source...
ANP32E	<a href="#">81611</a>	<a href="#">ANP32E</a>	acidic nuclear phosphoprotein 32 ...
ANXA11	<a href="#">311</a>	<a href="#">ANXA11</a>	annexin A11 [Source:HGNC Symbol;A...
APBB1IP	<a href="#">54518</a>	<a href="#">APBB1IP</a>	amyloid beta precursor protein bi...
APLP2	<a href="#">334</a>	<a href="#">APLP2</a>	amyloid beta precursor like prote...
ARAP1	<a href="#">116985</a>	<a href="#">ARAP1</a>	"ArfGAP with RhoGAP domain, ankyr...
ARHGAP30	<a href="#">257106</a>	<a href="#">ARHGAP30</a>	Rho GTPase activating protein 30 ...
ARHGEF2	<a href="#">9181</a>	<a href="#">ARHGEF2</a>	Rho/Rac guanine nucleotide exchan...
ARID2	<a href="#">196528</a>	<a href="#">ARID2</a>	AT-rich interaction domain 2 [Sou...
ARID3B	<a href="#">10620</a>	<a href="#">ARID3B</a>	AT-rich interaction domain 3B [So...
ARRB1	<a href="#">408</a>	<a href="#">ARRB1</a>	arrestin beta 1 [Source:HGNC Symb...
ASB2	<a href="#">51676</a>	<a href="#">ASB2</a>	ankyrin repeat and SOCS box conta...
ATG16L2	<a href="#">89849</a>	<a href="#">ATG16L2</a>	autophagy related 16 like 2 [Sour...
ATP2B4	<a href="#">493</a>	<a href="#">ATP2B4</a>	ATPase plasma membrane Ca <sup>2+</sup> trans...
ATP6V0C	<a href="#">527</a>	<a href="#">ATP6V0C</a>	ATPase H <sup>+</sup> transporting V0 subunit...
ATP8B4	<a href="#">79895</a>	<a href="#">ATP8B4</a>	ATPase phospholipid transporting ...
AUH	<a href="#">549</a>	<a href="#">AUH</a>	AU RNA binding methylglutaconyl-C...

B3GNT7	<a href="#">93010</a>	<a href="#">B3GNT7</a>	"UDP-GlcNAc:betaGal beta-1,3-N-ac...
B4GALT1	<a href="#">2683</a>	<a href="#">B4GALT1</a>	"beta-1,4-galactosyltransferase 1...
BAGE2	<a href="#">85319</a>	<a href="#">BAGE2</a>	BAGE family member 2 [Source:HGNC...
BANF1	<a href="#">8815</a>	<a href="#">BANF1</a>	barrier to autointegration factor...
BANP	<a href="#">54971</a>	<a href="#">BANP</a>	BTG3 associated nuclear protein [...
BCL3	<a href="#">602</a>	<a href="#">BCL3</a>	BCL3 transcription coactivator [S...
BHLHE40	<a href="#">8553</a>	<a href="#">BHLHE40</a>	basic helix-loop-helix family mem...
BLM	<a href="#">641</a>	<a href="#">BLM</a>	BLM RecQ like helicase [Source:HG...
BRE	<a href="#">9577</a>	<a href="#">BABAM2</a>	BRISC and BRCA1 A complex member ...
BRF1	<a href="#">2972</a>	<a href="#">BRF1</a>	BRF1 RNA polymerase III transcrip...
BZRAP1	<a href="#">9256</a>	<a href="#">TSPOAP1</a>	TSPO associated protein 1 [Source...
C10orf137	<a href="#">26098</a>	<a href="#">EDRF1</a>	erythroid differentiation regulat...
C11orf21	<a href="#">29125</a>	<a href="#">C11orf21</a>	chromosome 11 open reading frame ...
C12orf24	<a href="#">29902</a>	<a href="#">FAM216A</a>	family with sequence similarity 2...
C15orf39	<a href="#">56905</a>	<a href="#">C15orf39</a>	chromosome 15 open reading frame ...
C19orf36	<a href="#">113177</a>	<a href="#">IZUMO4</a>	IZUMO family member 4 [Source:HGNC...
C1orf106	<a href="#">55765</a>	<a href="#">INAVA</a>	innate immunity activator [Source...
C1orf132	<a href="#">100128537</a>	<a href="#">MIR29B2CHG</a>	MIR29B2 and MIR29C host gene [Sou...
C1orf183	<a href="#">55924</a>	<a href="#">INKA2</a>	inka box actin regulator 2 [Sourc...
C1orf55	<a href="#">163859</a>	<a href="#">SDE2</a>	SDE2 telomere maintenance homolog...
C1orf85	<a href="#">112770</a>	<a href="#">GLMP</a>	glycosylated lysosomal membrane p...
C1orf86	<a href="#">199990</a>	<a href="#">FAAP20</a>	FA core complex associated protei...
C20orf197	<a href="#">284756</a>	<a href="#">C20orf197</a>	chromosome 20 open reading frame ...
C20orf43	<a href="#">51507</a>	<a href="#">RTF2</a>	replication termination factor 2 ...
C3orf19	<a href="#">51244</a>	<a href="#">CCDC174</a>	coiled-coil domain containing 174...
C3orf27	<a href="#">23434</a>	<a href="#">LINC01565</a>	long intergenic non-protein codin...
C5AR1	<a href="#">728</a>	<a href="#">C5AR1</a>	complement C5a receptor 1 [Source...
C5orf62	<a href="#">85027</a>	<a href="#">SMIM3</a>	small integral membrane protein 3...
C9orf139	<a href="#">401563</a>	<a href="#">C9orf139</a>	chromosome 9 open reading frame 1...
C9orf47			
CACNA1C	<a href="#">775</a>	<a href="#">CACNA1C</a>	calcium voltage-gated channel sub...
CAMK2G	<a href="#">818</a>	<a href="#">CAMK2G</a>	calcium/calmodulin dependent prot...
CAPG	<a href="#">822</a>	<a href="#">CAPG</a>	"capping actin protein, gelsolin ...
CCDC114	<a href="#">93233</a>	<a href="#">CCDC114</a>	coiled-coil domain containing 114...
CCDC88B	<a href="#">283234</a>	<a href="#">CCDC88B</a>	coiled-coil domain containing 88B...
CCDC94	<a href="#">55702</a>	<a href="#">YJU2</a>	YJU2 splicing factor homolog [Sou...
CCND3	<a href="#">896</a>	<a href="#">CCND3</a>	cyclin D3 [Source:HGNC Symbol;Acc...
CD164	<a href="#">8763</a>	<a href="#">CD164</a>	CD164 molecule [Source:HGNC Symbo...
CD58	<a href="#">965</a>	<a href="#">CD58</a>	CD58 molecule [Source:HGNC Symbol...
CD82	<a href="#">3732</a>	<a href="#">CD82</a>	CD82 molecule [Source:HGNC Symbol...
CDH23	<a href="#">64072</a>	<a href="#">CDH23</a>	cadherin related 23 [Source:HGNC ...
CDK5	<a href="#">1020</a>	<a href="#">CDK5</a>	cyclin dependent kinase 5 [Source...
CDK9	<a href="#">1025</a>	<a href="#">CDK9</a>	cyclin dependent kinase 9 [Source...
CDS2	<a href="#">8760</a>	<a href="#">CDS2</a>	CDP-diacylglycerol synthase 2 [So...

CETP	<a href="#">1071</a>	<a href="#">CETP</a>	cholesteryl ester transfer protei...
CHD7	<a href="#">55636</a>	<a href="#">CHD7</a>	chromodomain helicase DNA binding...
CHST15	<a href="#">51363</a>	<a href="#">CHST15</a>	carbohydrate sulfotransferase 15 ...
CISH	<a href="#">1154</a>	<a href="#">CISH</a>	cytokine inducible SH2 containing...
CORO2A	<a href="#">7464</a>	<a href="#">CORO2A</a>	coronin 2A [Source:HGNC Symbol;Ac...
COTL1	<a href="#">23406</a>	<a href="#">COTL1</a>	coactosin like F-actin binding pr...
CPNE9	<a href="#">151835</a>	<a href="#">CPNE9</a>	copine family member 9 [Source:HG...
CRAMP1L	<a href="#">57585</a>	<a href="#">CRAMP1</a>	cramped chromatin regulator homol...
CRTC1	<a href="#">23373</a>	<a href="#">CRTC1</a>	CREB regulated transcription coac...
CSK	<a href="#">1445</a>	<a href="#">CSK</a>	C-terminal Src kinase [Source:HGN...
CSTF1	<a href="#">1477</a>	<a href="#">CSTF1</a>	cleavage stimulation factor subun...
CTCF	<a href="#">10664</a>	<a href="#">CTCF</a>	CCCTC-binding factor [Source:HGNC...
CTSD	<a href="#">1509</a>	<a href="#">CTSD</a>	cathepsin D [Source:HGNC Symbol;A...
CUEDC1	<a href="#">404093</a>	<a href="#">CUEDC1</a>	CUE domain containing 1 [Source:H...
CUGBP2	<a href="#">10659</a>	<a href="#">CELF2</a>	CUGBP Elav-like family member 2 [...
CUTA	<a href="#">51596</a>	<a href="#">CUTA</a>	cutA divalent cation tolerance ho...
CUX1	<a href="#">1523</a>	<a href="#">CUX1</a>	cut like homeobox 1 [Source:HGNC ...
CXCR5	<a href="#">643</a>	<a href="#">CXCR5</a>	C-X-C motif chemokine receptor 5 ...
CXXC5	<a href="#">51523</a>	<a href="#">CXXC5</a>	CXXC finger protein 5 [Source:HGN...
CYTH4	<a href="#">27128</a>	<a href="#">CYTH4</a>	cytohesin 4 [Source:HGNC Symbol;A...
DAPK2	<a href="#">23604</a>	<a href="#">DAPK2</a>	death associated protein kinase 2...
DCAF11	<a href="#">80344</a>	<a href="#">DCAF11</a>	DDB1 and CUL4 associated factor 1...
DCTN1	<a href="#">1639</a>	<a href="#">DCTN1</a>	dynactin subunit 1 [Source:HGNC S...
DCTN4	<a href="#">51164</a>	<a href="#">DCTN4</a>	dynactin subunit 4 [Source:HGNC S...
DDIT4	<a href="#">54541</a>	<a href="#">DDIT4</a>	DNA damage inducible transcript 4...
DDX5	<a href="#">1655</a>	<a href="#">DDX5</a>	DEAD-box helicase 5 [Source:HGNC ...
DEF6	<a href="#">50619</a>	<a href="#">DEF6</a>	DEF6 guanine nucleotide exchange ...
DENND3	<a href="#">22898</a>	<a href="#">DENND3</a>	DENN domain containing 3 [Source:...
DNAJB12	<a href="#">54788</a>	<a href="#">DNAJB12</a>	DnaJ heat shock protein family (H...
DNM2	<a href="#">1785</a>	<a href="#">DNM2</a>	dynamamin 2 [Source:HGNC Symbol;Acc...
DOK3	<a href="#">79930</a>	<a href="#">DOK3</a>	docking protein 3 [Source:HGNC Sy...
DOT1L	<a href="#">84444</a>	<a href="#">DOT1L</a>	DOT1 like histone lysine methyltr...
DRG2	<a href="#">1819</a>	<a href="#">DRG2</a>	developmentally regulated GTP bin...
DUSP28	<a href="#">285193</a>	<a href="#">DUSP28</a>	dual specificity phosphatase 28 [...
DUSP5	<a href="#">1847</a>	<a href="#">DUSP5</a>	dual specificity phosphatase 5 [S...
ECE1	<a href="#">1889</a>	<a href="#">ECE1</a>	endothelin converting enzyme 1 [S...
EFHD2	<a href="#">79180</a>	<a href="#">EFHD2</a>	EF-hand domain family member D2 [...
ELAVL1	<a href="#">1994</a>	<a href="#">ELAVL1</a>	ELAV like RNA binding protein 1 [...
ELF4	<a href="#">2000</a>	<a href="#">ELF4</a>	E74 like ETS transcription factor...
ELL	<a href="#">8178</a>	<a href="#">ELL</a>	elongation factor for RNA polymer...
EMR2	<a href="#">30817</a>	<a href="#">ADGRE2</a>	adhesion G protein-coupled recept...
ENSA	<a href="#">2029</a>	<a href="#">ENSA</a>	endosulfine alpha [Source:HGNC Sy...
EXOSC4	<a href="#">54512</a>	<a href="#">EXOSC4</a>	exosome component 4 [Source:HGNC ...
F11R	<a href="#">50848</a>	<a href="#">F11R</a>	F11 receptor [Source:HGNC Symbol;...

FAM129C	<a href="#">199786</a>	<a href="#">NIBAN3</a>	niban apoptosis regulator 3 [Sour...
FAM159A	<a href="#">348378</a>	<a href="#">SHISAL2A</a>	shisa like 2A [Source:HGNC Symbol...
FAM53B	<a href="#">9679</a>	<a href="#">FAM53B</a>	family with sequence similarity 5...
FAM78A	<a href="#">286336</a>	<a href="#">FAM78A</a>	family with sequence similarity 7...
FAM89B	<a href="#">23625</a>	<a href="#">FAM89B</a>	family with sequence similarity 8...
FAM96A	<a href="#">84191</a>	<a href="#">CIAO2A</a>	cytosolic iron-sulfur assembly co...
FBXO46	<a href="#">23403</a>	<a href="#">FBXO46</a>	F-box protein 46 [Source:HGNC Sym...
FCGRT	<a href="#">2217</a>	<a href="#">FCGRT</a>	Fc fragment of IgG receptor and t...
FCN1	<a href="#">2219</a>	<a href="#">FCN1</a>	ficolin 1 [Source:HGNC Symbol;Acc...
FERMT3	<a href="#">83706</a>	<a href="#">FERMT3</a>	fermitin family member 3 [Source:...
FGFR1OP2	<a href="#">26127</a>	<a href="#">FGFR1OP2</a>	FGFR1 oncogene partner 2 [Source:...
FGR	<a href="#">2268</a>	<a href="#">FGR</a>	"FGR proto-oncogene, Src family t...
FHOD1	<a href="#">29109</a>	<a href="#">FHOD1</a>	formin homology 2 domain containi...
FLNB	<a href="#">2317</a>	<a href="#">FLNB</a>	filamin B [Source:HGNC Symbol;Acc...
FLT3	<a href="#">2322</a>	<a href="#">FLT3</a>	fms related tyrosine kinase 3 [So...
FMNL1	<a href="#">752</a>	<a href="#">FMNL1</a>	formin like 1 [Source:HGNC Symbol...
FNBP1	<a href="#">23048</a>	<a href="#">FNBP1</a>	formin binding protein 1 [Source:...
FOSB	<a href="#">2354</a>	<a href="#">FOSB</a>	"FosB proto-oncogene, AP-1 transc...
FOSL2	<a href="#">2355</a>	<a href="#">FOSL2</a>	"FOS like 2, AP-1 transcription f...
FRAT1	<a href="#">10023</a>	<a href="#">FRAT1</a>	FRAT regulator of WNT signaling p...
FXYD6	<a href="#">53826</a>	<a href="#">FXYD6</a>	FXYD domain containing ion transp...
GALC	<a href="#">2581</a>	<a href="#">GALC</a>	galactosylceramidase [Source:HGNC...
GALK2	<a href="#">2585</a>	<a href="#">GALK2</a>	galactokinase 2 [Source:HGNC Symb...
GALNT6	<a href="#">11226</a>	<a href="#">GALNT6</a>	polypeptide N-acetylgalactosaminy...
GAS7	<a href="#">8522</a>	<a href="#">AC005747.1</a>	growth arrest specific 7 [Source:...
GBA	<a href="#">2629</a>	<a href="#">GBA</a>	glucosylceramidase beta [Source:H...
GBE1	<a href="#">2632</a>	<a href="#">GBE1</a>	"1,4-alpha-glucan branching enzym...
GFOD1	<a href="#">54438</a>	<a href="#">GFOD1</a>	glucose-fructose oxidoreductase d...
GGA1	<a href="#">26088</a>	<a href="#">GGA1</a>	"golgi associated, gamma adaptin ...
GNB2	<a href="#">2783</a>	<a href="#">GNB2</a>	G protein subunit beta 2 [Source:...
GNB5	<a href="#">10681</a>	<a href="#">GNB5</a>	G protein subunit beta 5 [Source:...
GPATCH8	<a href="#">23131</a>	<a href="#">GPATCH8</a>	G-patch domain containing 8 [Sour...
GPR114	<a href="#">221188</a>	<a href="#">ADGRG5</a>	adhesion G protein-coupled recept...
GPR132	<a href="#">29933</a>	<a href="#">GPR132</a>	G protein-coupled receptor 132 [S...
GPR97	<a href="#">222487</a>	<a href="#">ADGRG3</a>	adhesion G protein-coupled recept...
GRIP2	<a href="#">80852</a>	<a href="#">GRIP2</a>	glutamate receptor interacting pr...
GRK5	<a href="#">2869</a>	<a href="#">GRK5</a>	G protein-coupled receptor kinase...
GRK6	<a href="#">2870</a>	<a href="#">GRK6</a>	G protein-coupled receptor kinase...
GTF3A	<a href="#">2971</a>	<a href="#">GTF3A</a>	general transcription factor IIIA...
GUSB	<a href="#">2990</a>	<a href="#">GUSB</a>	glucuronidase beta [Source:HGNC S...
H6PD	<a href="#">9563</a>	<a href="#">H6PD</a>	hexose-6-phosphate dehydrogenase/...
HCK	<a href="#">3055</a>	<a href="#">HCK</a>	"HCK proto-oncogene, Src family t...
HDAC4	<a href="#">9759</a>	<a href="#">HDAC4</a>	histone deacetylase 4 [Source:HGN...
HECW1	<a href="#">23072</a>	<a href="#">HECW1</a>	"HECT, C2 and WW domain containin...

HIP1	<a href="#">3092</a>	<a href="#">HIP1</a>	huntingtin interacting protein 1 ...
HIVEP2	<a href="#">3097</a>	<a href="#">HIVEP2</a>	HIVEP zinc finger 2 [Source:HGNC ...
HIVEP3	<a href="#">59269</a>	<a href="#">HIVEP3</a>	HIVEP zinc finger 3 [Source:HGNC ...
HMGA1	<a href="#">3159</a>	<a href="#">HMGA1</a>	high mobility group AT-hook 1 [So...
HMHA1	<a href="#">23526</a>	<a href="#">AC004151.1</a>	Rho GTPase activating protein 45 ...
HMOX1	<a href="#">3162</a>	<a href="#">HMOX1</a>	heme oxygenase 1 [Source:HGNC Sym...
HNRNPM	<a href="#">4670</a>	<a href="#">HNRNPM</a>	heterogeneous nuclear ribonucleop...
HPCAL1	<a href="#">3241</a>	<a href="#">HPCAL1</a>	hippocalcin like 1 [Source:HGNC S...
ICAM1	<a href="#">3383</a>	<a href="#">ICAM1</a>	intercellular adhesion molecule 1...
ICAM4	<a href="#">3386</a>	<a href="#">ICAM4</a>	intercellular adhesion molecule 4...
ID1	<a href="#">3397</a>	<a href="#">ID1</a>	"inhibitor of DNA binding 1, HLH ...
ID2	<a href="#">3398</a>	<a href="#">ID2</a>	inhibitor of DNA binding 2 [Sourc...
IDH1	<a href="#">3417</a>	<a href="#">IDH1</a>	isocitrate dehydrogenase (NADP(+))...
IFITM3	<a href="#">10410</a>	<a href="#">IFITM3</a>	interferon induced transmembrane ...
IFNAR2	<a href="#">3455</a>	<a href="#">IFNAR2</a>	interferon alpha and beta recepto...
INHBA	<a href="#">3624</a>	<a href="#">INHBA</a>	inhibin subunit beta A [Source:HG...
IQCD	<a href="#">115811</a>	<a href="#">IQCD</a>	IQ motif containing D [Source:HGN...
IQSEC1	<a href="#">9922</a>	<a href="#">IQSEC1</a>	IQ motif and Sec7 domain ArfGEF 1...
IRF1	<a href="#">3659</a>	<a href="#">IRF1</a>	interferon regulatory factor 1 [S...
IRF2BP2	<a href="#">359948</a>	<a href="#">IRF2BP2</a>	interferon regulatory factor 2 bi...
IRF8	<a href="#">3394</a>	<a href="#">IRF8</a>	interferon regulatory factor 8 [S...
ITGA4	<a href="#">3676</a>	<a href="#">ITGA4</a>	integrin subunit alpha 4 [Source:...
ITGB2	<a href="#">3689</a>	<a href="#">ITGB2</a>	integrin subunit beta 2 [Source:H...
ITPR1	<a href="#">3708</a>	<a href="#">ITPR1</a>	"inositol 1,4,5-trisphosphate rec...
ITPR2	<a href="#">3709</a>	<a href="#">ITPR2</a>	"inositol 1,4,5-trisphosphate rec...
JUND	<a href="#">3727</a>	<a href="#">JUND</a>	"JunD proto-oncogene, AP-1 transc...
KCNAB2	<a href="#">8514</a>	<a href="#">KCNAB2</a>	potassium voltage-gated channel s...
KIAA0020	<a href="#">9933</a>	<a href="#">PUM3</a>	pumilio RNA binding family member...
KIAA0182	<a href="#">23199</a>	<a href="#">GSE1</a>	Gse1 coiled-coil protein [Source:...
KIAA1539	<a href="#">80256</a>	<a href="#">FAM214B</a>	family with sequence similarity 2...
KLF13	<a href="#">51621</a>	<a href="#">KLF13</a>	Kruppel like factor 13 [Source:HG...
KLF2	<a href="#">10365</a>	<a href="#">KLF2</a>	Kruppel like factor 2 [Source:HGN...
KLHDC4	<a href="#">54758</a>	<a href="#">KLHDC4</a>	kelch domain containing 4 [Source...
KLHL24	<a href="#">54800</a>	<a href="#">KLHL24</a>	kelch like family member 24 [Sour...
KPTN	<a href="#">11133</a>	<a href="#">KPTN</a>	"kaptin, actin binding protein [S...
KREMEN1	<a href="#">83999</a>	<a href="#">KREMEN1</a>	kringle containing transmembrane ...
KRI1	<a href="#">65095</a>	<a href="#">KRI1</a>	KRI1 homolog [Source:HGNC Symbol;...
KSR1	<a href="#">8844</a>	<a href="#">KSR1</a>	kinase suppressor of ras 1 [Sourc...
LAPTM5	<a href="#">7805</a>	<a href="#">LAPTM5</a>	lysosomal protein transmembrane 5...
LASP1	<a href="#">3927</a>	<a href="#">LASP1</a>	LIM and SH3 protein 1 [Source:HGN...
LATS2	<a href="#">26524</a>	<a href="#">LATS2</a>	large tumor suppressor kinase 2 [...
LBR	<a href="#">3930</a>	<a href="#">LBR</a>	lamin B receptor [Source:HGNC Sym...
LCP2	<a href="#">3937</a>	<a href="#">LCP2</a>	lymphocyte cytosolic protein 2 [S...
LETMD1	<a href="#">25875</a>	<a href="#">LETMD1</a>	LETM1 domain containing 1 [Source...



LFNG	<a href="#">3955</a>	<a href="#">LFNG</a>	LFNG O-fucosylpeptide 3-beta-N-ac...
LMBR1	<a href="#">64327</a>	<a href="#">LMBR1</a>	limb development membrane protein...
LMO2	<a href="#">4005</a>	<a href="#">LMO2</a>	LIM domain only 2 [Source:HGNC Sy...
LRRC20	<a href="#">55222</a>	<a href="#">LRRC20</a>	leucine rich repeat containing 20...
LRRC29	<a href="#">26231</a>	<a href="#">LRRC29</a>	leucine rich repeat containing 29...
LTB4R	<a href="#">1241</a>	<a href="#">LTB4R</a>	leukotriene B4 receptor [Source:H...
LTBP3	<a href="#">4054</a>	<a href="#">LTBP3</a>	latent transforming growth factor...
LYL1	<a href="#">4066</a>	<a href="#">LYL1</a>	LYL1 basic helix-loop-helix famil...
LYN	<a href="#">4067</a>	<a href="#">LYN</a>	"LYN proto-oncogene, Src family t...
MAFB	<a href="#">9935</a>	<a href="#">MAFB</a>	MAF bZIP transcription factor B [...
MAML2	<a href="#">84441</a>	<a href="#">MAML2</a>	mastermind like transcriptional c...
MAP2K3	<a href="#">5606</a>	<a href="#">MAP2K3</a>	mitogen-activated protein kinase ...
MBD6	<a href="#">114785</a>	<a href="#">MBD6</a>	methyl-CpG binding domain protein...
MBP	<a href="#">4155</a>	<a href="#">MBP</a>	myelin basic protein [Source:HGNC...
MCAM	<a href="#">4162</a>	<a href="#">MCAM</a>	melanoma cell adhesion molecule [...
MCM5	<a href="#">4174</a>	<a href="#">MCM5</a>	minichromosome maintenance comple...
MDM1	<a href="#">56890</a>	<a href="#">MDM1</a>	Mdm1 nuclear protein [Source:HGNC...
MEF2D	<a href="#">4209</a>	<a href="#">MEF2D</a>	myocyte enhancer factor 2D [Sourc...
MFN1	<a href="#">55669</a>	<a href="#">MFN1</a>	mitofusin 1 [Source:HGNC Symbol;A...
MFSD8	<a href="#">256471</a>	<a href="#">MFSD8</a>	major facilitator superfamily dom...
MGLL	<a href="#">11343</a>	<a href="#">MGLL</a>	monoglyceride lipase [Source:HGNC...
MIDN	<a href="#">90007</a>	<a href="#">MIDN</a>	midnolin [Source:HGNC Symbol;Acc...
MIR223	<a href="#">407008</a>	<a href="#">MIR223</a>	microRNA 223 [Source:HGNC Symbol;...
MIR23A	<a href="#">407010</a>	<a href="#">MIR23A</a>	microRNA 23a [Source:HGNC Symbol;...
MIR24-2	<a href="#">407013</a>	<a href="#">MIR24-2</a>	microRNA 24-2 [Source:HGNC Symbol...
MIR29B1	<a href="#">407024</a>	<a href="#">MIR29B1</a>	microRNA 29b-1 [Source:HGNC Symbo...
MIR663	<a href="#">724033</a>	<a href="#">MIR663A</a>	microRNA 663a [Source:HGNC Symbol...
MLXIPL	<a href="#">51085</a>	<a href="#">MLXIPL</a>	MLX interacting protein like [Sou...
MMP9	<a href="#">4318</a>	<a href="#">MMP9</a>	matrix metalloproteinase 9 [Source...
MN1	<a href="#">4330</a>	<a href="#">MN1</a>	"MN1 proto-oncogene, transcriptio...
MORN3	<a href="#">283385</a>	<a href="#">MORN3</a>	MORN repeat containing 3 [Source:...
MPG	<a href="#">4350</a>	<a href="#">MPG</a>	N-methylpurine DNA glycosylase [S...
MRPL1	<a href="#">65008</a>	<a href="#">MRPL1</a>	mitochondrial ribosomal protein L...
MRPL24	<a href="#">79590</a>	<a href="#">MRPL24</a>	mitochondrial ribosomal protein L...
MRPL34	<a href="#">64981</a>	<a href="#">MRPL34</a>	mitochondrial ribosomal protein L...
MRVI1	<a href="#">10335</a>	<a href="#">MRVI1</a>	murine retrovirus integration sit...
MTRF1L	<a href="#">54516</a>	<a href="#">MTRF1L</a>	mitochondrial translational relea...
MX2	<a href="#">4600</a>	<a href="#">MX2</a>	MX dynamin like GTPase 2 [Source:...
MYH9	<a href="#">4627</a>	<a href="#">MYH9</a>	myosin heavy chain 9 [Source:HGNC...
MYO1F	<a href="#">4542</a>	<a href="#">MYO1F</a>	myosin IF [Source:HGNC Symbol;Acc...
MYO9B	<a href="#">4650</a>	<a href="#">MYO9B</a>	myosin IXB [Source:HGNC Symbol;Ac...
NADK	<a href="#">65220</a>	<a href="#">NADK</a>	NAD kinase [Source:HGNC Symbol;Ac...
NBR1	<a href="#">4077</a>	<a href="#">NBR1</a>	NBR1 autophagy cargo receptor [So...
NCOR2	<a href="#">9612</a>	<a href="#">NCOR2</a>	nuclear receptor corepressor 2 [S...

NCRNA00173	<a href="#">100287569</a>	<a href="#">LINC00173</a>	long intergenic non-protein codin...
NDRG1	<a href="#">10397</a>	<a href="#">NDRG1</a>	N-myc downstream regulated 1 [Sou...
NDUFA4	<a href="#">4697</a>	<a href="#">NDUFA4</a>	NDUFA4 mitochondrial complex asso...
NEK6	<a href="#">10783</a>	<a href="#">NEK6</a>	NIMA related kinase 6 [Source:HGNC...
NFE2	<a href="#">4778</a>	<a href="#">NFE2</a>	"nuclear factor, erythroid 2 [Sou...
NINJ1	<a href="#">4814</a>	<a href="#">NINJ1</a>	ninjurin 1 [Source:HGNC Symbol;Ac...
NLRP3	<a href="#">114548</a>	<a href="#">NLRP3</a>	NLR family pyrin domain containin...
NME1-NME2	<a href="#">654364</a>	<a href="#">NME1-NME2</a>	NME1-NME2 readthrough [Source:HGN...
NMUR1	<a href="#">10316</a>	<a href="#">NMUR1</a>	neuromedin U receptor 1 [Source:H...
NOLC1	<a href="#">9221</a>	<a href="#">NOLC1</a>	nucleolar and coiled-body phospho...
NOSIP	<a href="#">51070</a>	<a href="#">NOSIP</a>	nitric oxide synthase interacting...
NPAS4	<a href="#">266743</a>	<a href="#">NPAS4</a>	neuronal PAS domain protein 4 [So...
NRXN2	<a href="#">9379</a>	<a href="#">NRXN2</a>	neurexin 2 [Source:HGNC Symbol;Ac...
NUAK2	<a href="#">81788</a>	<a href="#">NUAK2</a>	NUAK family kinase 2 [Source:HGNC...
NUDT15	<a href="#">55270</a>	<a href="#">NUDT15</a>	nudix hydrolase 15 [Source:HGNC S...
NUDT3	<a href="#">11165</a>	<a href="#">NUDT3</a>	nudix hydrolase 3 [Source:HGNC Sy...
NUDT9	<a href="#">53343</a>	<a href="#">NUDT9</a>	nudix hydrolase 9 [Source:HGNC Sy...
NUP210	<a href="#">23225</a>	<a href="#">NUP210</a>	nucleoporin 210 [Source:HGNC Symb...
NUP85	<a href="#">79902</a>	<a href="#">NUP85</a>	nucleoporin 85 [Source:HGNC Symbo...
NUTF2	<a href="#">10204</a>	<a href="#">NUTF2</a>	nuclear transport factor 2 [Sourc...
OAZ1	<a href="#">4946</a>	<a href="#">OAZ1</a>	ornithine decarboxylase antizyme ...
OLIG1	<a href="#">116448</a>	<a href="#">OLIG1</a>	oligodendrocyte transcription fac...
OLIG2	<a href="#">10215</a>	<a href="#">OLIG2</a>	oligodendrocyte transcription fac...
P2RY2	<a href="#">5029</a>	<a href="#">P2RY2</a>	purinergic receptor P2Y2 [Source:...
PAFAH2	<a href="#">5051</a>	<a href="#">PAFAH2</a>	platelet activating factor acetyl...
PDE4DIP	<a href="#">9659</a>	<a href="#">PDE4DIP</a>	phosphodiesterase 4D interacting ...
PDP2	<a href="#">57546</a>	<a href="#">PDP2</a>	pyruvate dehydrogenase phosphatase...
PEBP4	<a href="#">157310</a>	<a href="#">PEBP4</a>	phosphatidylethanolamine binding ...
PEX12	<a href="#">5193</a>	<a href="#">PEX12</a>	peroxisomal biogenesis factor 12 ...
PGC	<a href="#">5225</a>	<a href="#">PGC</a>	progastricsin [Source:HGNC Symbol...
PGD	<a href="#">5226</a>	<a href="#">PGD</a>	phosphogluconate dehydrogenase [S...
PGLS	<a href="#">25796</a>	<a href="#">PGLS</a>	6-phosphogluconolactonase [Source...
PGPEP1	<a href="#">54858</a>	<a href="#">PGPEP1</a>	pyroglutamyl-peptidase I [Source:...
PHF12	<a href="#">57649</a>	<a href="#">PHF12</a>	PHD finger protein 12 [Source:HGN...
PIGL	<a href="#">9487</a>	<a href="#">PIGL</a>	phosphatidylinositol glycan ancho...
PIK3AP1	<a href="#">118788</a>	<a href="#">PIK3AP1</a>	phosphoinositide-3-kinase adaptor...
PITPNM2	<a href="#">57605</a>	<a href="#">PITPNM2</a>	phosphatidylinositol transfer pro...
PIWIL4	<a href="#">143689</a>	<a href="#">PIWIL4</a>	piwi like RNA-mediated gene silen...
PKIG	<a href="#">11142</a>	<a href="#">PKIG</a>	cAMP-dependent protein kinase inh...
PKM2	<a href="#">5315</a>	<a href="#">PKM2</a>	pyruvate kinase M1/2 [Source:HGNC...
PLAC8	<a href="#">51316</a>	<a href="#">PLAC8</a>	placenta associated 8 [Source:HGN...
PLCB2	<a href="#">5330</a>	<a href="#">PLCB2</a>	phospholipase C beta 2 [Source:HG...
PLCG2	<a href="#">5336</a>	<a href="#">PLCG2</a>	phospholipase C gamma 2 [Source:H...
PLEK	<a href="#">5341</a>	<a href="#">PLEK</a>	pleckstrin [Source:HGNC Symbol;Ac...



PLEKHA2	<a href="#">59339</a>	<a href="#">PLEKHA2</a>	pleckstrin homology domain contai...
PLEKHO1	<a href="#">51177</a>	<a href="#">PLEKHO1</a>	pleckstrin homology domain contai...
PLXND1	<a href="#">23129</a>	<a href="#">PLXND1</a>	plexin D1 [Source:HGNC Symbol;Acc...
PMF1	<a href="#">11243</a>	<a href="#">PMF1</a>	polyamine modulated factor 1 [Sou...
PPCDC	<a href="#">60490</a>	<a href="#">PPCDC</a>	phosphopantothenoylcysteine decar...
PREX1	<a href="#">57580</a>	<a href="#">PREX1</a>	"phosphatidylinositol-3,4,5-trisp...
PRKCD	<a href="#">5580</a>	<a href="#">PRKCD</a>	protein kinase C delta [Source:HG...
PSAP	<a href="#">5660</a>	<a href="#">PSAP</a>	prosaposin [Source:HGNC Symbol;Ac...
PSMD3	<a href="#">5709</a>	<a href="#">PSMD3</a>	"proteasome 26S subunit, non-ATPa...
PSMD9	<a href="#">5715</a>	<a href="#">PSMD9</a>	"proteasome 26S subunit, non-ATPa...
PTEN	<a href="#">5728</a>	<a href="#">PTEN</a>	phosphatase and tensin homolog [S...
PTGES	<a href="#">9536</a>	<a href="#">PTGES</a>	prostaglandin E synthase [Source:...
PTPN6	<a href="#">5777</a>	<a href="#">PTPN6</a>	protein tyrosine phosphatase non-...
PTPRJ	<a href="#">5795</a>	<a href="#">PTPRJ</a>	protein tyrosine phosphatase rece...
PVRL1	<a href="#">5818</a>	<a href="#">NECTIN1</a>	nectin cell adhesion molecule 1 [...
PVRL4	<a href="#">81607</a>	<a href="#">NECTIN4</a>	nectin cell adhesion molecule 4 [...
PXN	<a href="#">5829</a>	<a href="#">PXN</a>	paxillin [Source:HGNC Symbol;Acc:...
RAB11FIP1	<a href="#">80223</a>	<a href="#">RAB11FIP1</a>	RAB11 family interacting protein ...
RAB11FIP3	<a href="#">9727</a>	<a href="#">RAB11FIP3</a>	RAB11 family interacting protein ...
RAB20	<a href="#">55647</a>	<a href="#">RAB20</a>	"RAB20, member RAS oncogene famil...
RAB31	<a href="#">11031</a>	<a href="#">RAB31</a>	"RAB31, member RAS oncogene famil...
RAB37	<a href="#">326624</a>	<a href="#">RAB37</a>	"RAB37, member RAS oncogene famil...
RAB3D	<a href="#">9545</a>	<a href="#">RAB3D</a>	"RAB3D, member RAS oncogene famil...
RAB43	<a href="#">339122</a>	<a href="#">RAB43</a>	"RAB43, member RAS oncogene famil...
RAC2	<a href="#">5880</a>	<a href="#">RAC2</a>	Rac family small GTPase 2 [Source:...
RAP1GAP2	<a href="#">23108</a>	<a href="#">AC002316.1</a>	RAP1 GTPase activating protein 2 ...
RAPGEF1	<a href="#">2889</a>	<a href="#">RAPGEF1</a>	Rap guanine nucleotide exchange f...
RARA	<a href="#">5914</a>	<a href="#">RARA</a>	retinoic acid receptor alpha [Sou...
RASA3	<a href="#">22821</a>	<a href="#">RASA3</a>	RAS p21 protein activator 3 [Sour...
RASGRP2	<a href="#">10235</a>	<a href="#">RASGRP2</a>	RAS guanyl releasing protein 2 [S...
RAVER1	<a href="#">125950</a>	<a href="#">RAVER1</a>	"ribonucleoprotein, PTB binding 1...
RBBP8	<a href="#">5932</a>	<a href="#">RBBP8</a>	"RB binding protein 8, endonuclea...
RCSD1	<a href="#">92241</a>	<a href="#">RCSD1</a>	RCSD domain containing 1 [Source:...
RFX2	<a href="#">5990</a>	<a href="#">RFX2</a>	regulatory factor X2 [Source:HGNC...
RHBDF2	<a href="#">79651</a>	<a href="#">RHBDF2</a>	rhomoid 5 homolog 2 [Source:HGNC...
RNF122	<a href="#">79845</a>	<a href="#">RNF122</a>	ring finger protein 122 [Source:H...
RNF149	<a href="#">284996</a>	<a href="#">RNF149</a>	ring finger protein 149 [Source:H...
RNF34	<a href="#">80196</a>	<a href="#">RNF34</a>	ring finger protein 34 [Source:HG...
RPL24	<a href="#">6152</a>	<a href="#">RPL24</a>	ribosomal protein L24 [Source:HGN...
RPL9	<a href="#">6133</a>	<a href="#">RPL9</a>	ribosomal protein L9 [Source:HGNC...
RPS19	<a href="#">6223</a>	<a href="#">RPS19</a>	ribosomal protein S19 [Source:HGN...
RPS6	<a href="#">6194</a>	<a href="#">RPS6</a>	ribosomal protein S6 [Source:HGNC...
RPS6KA1	<a href="#">6195</a>	<a href="#">RPS6KA1</a>	ribosomal protein S6 kinase A1 [S...
RPS6KA2	<a href="#">6196</a>	<a href="#">RPS6KA2</a>	ribosomal protein S6 kinase A2 [S...

RPS9	<a href="#">6203</a>	<a href="#">RPS9</a>	ribosomal protein S9 [Source:HGNC...
RSL24D1	<a href="#">51187</a>	<a href="#">RSL24D1</a>	ribosomal L24 domain containing 1...
RSRC2	<a href="#">65117</a>	<a href="#">RSRC2</a>	arginine and serine rich coiled-c...
RUNX1	<a href="#">861</a>	<a href="#">RUNX1</a>	RUNX family transcription factor ...
RUNX3	<a href="#">864</a>	<a href="#">RUNX3</a>	RUNX family transcription factor ...
RUVBL1	<a href="#">8607</a>	<a href="#">RUVBL1</a>	RuvB like AAA ATPase 1 [Source:HG...
RWDD1	<a href="#">51389</a>	<a href="#">RWDD1</a>	RWD domain containing 1 [Source:H...
SCARB1	<a href="#">949</a>	<a href="#">SCARB1</a>	scavenger receptor class B member...
SCUBE1	<a href="#">80274</a>	<a href="#">SCUBE1</a>	"signal peptide, CUB domain and E...
SEC11A	<a href="#">23478</a>	<a href="#">SEC11A</a>	"SEC11 homolog A, signal peptidas...
SEC11B	<a href="#">157708</a>	<a href="#">SEC11B</a>	"SEC11 homolog B, signal peptidas...
SERPINB1	<a href="#">1992</a>	<a href="#">SERPINB1</a>	serpin family B member 1 [Source:...
SETD8	<a href="#">387893</a>	<a href="#">KMT5A</a>	lysine methyltransferase 5A [Sour...
SF3A3	<a href="#">10946</a>	<a href="#">SF3A3</a>	splicing factor 3a subunit 3 [Sou...
SH2B1	<a href="#">25970</a>	<a href="#">SH2B1</a>	SH2B adaptor protein 1 [Source:HG...
SH3BGRL3	<a href="#">83442</a>	<a href="#">SH3BGRL3</a>	SH3 domain binding glutamate rich...
SH3BP2	<a href="#">6452</a>	<a href="#">SH3BP2</a>	SH3 domain binding protein 2 [Sou...
SH3PXD2A	<a href="#">9644</a>	<a href="#">SH3PXD2A</a>	SH3 and PX domains 2A [Source:HGN...
SIK1	<a href="#">150094</a>	<a href="#">SIK1</a>	salt inducible kinase 1 [Source:H...
SIRPA	<a href="#">140885</a>	<a href="#">SIRPA</a>	signal regulatory protein alpha [...
SKI	<a href="#">6497</a>	<a href="#">SKI</a>	SKI proto-oncogene [Source:HGNC S...
SLC22A11	<a href="#">55867</a>	<a href="#">SLC22A11</a>	solute carrier family 22 member 1...
SLC24A3	<a href="#">57419</a>	<a href="#">SLC24A3</a>	solute carrier family 24 member 3...
SLC25A19	<a href="#">60386</a>	<a href="#">SLC25A19</a>	solute carrier family 25 member 1...
SLC35B1	<a href="#">10237</a>	<a href="#">SLC35B1</a>	solute carrier family 35 member B...
SLC6A6	<a href="#">6533</a>	<a href="#">SLC6A6</a>	solute carrier family 6 member 6 ...
SLC7A10	<a href="#">56301</a>	<a href="#">SLC7A10</a>	solute carrier family 7 member 10...
SLC7A5	<a href="#">8140</a>	<a href="#">SLC7A5</a>	solute carrier family 7 member 5 ...
SLC7A5P1	<a href="#">81893</a>	<a href="#">SLC7A5P1</a>	solute carrier family 7 member 5 ...
SLC9A1	<a href="#">6548</a>	<a href="#">SLC9A1</a>	solute carrier family 9 member A1...
SLC9A3	<a href="#">6550</a>	<a href="#">SLC9A3</a>	solute carrier family 9 member A3...
SMAD3	<a href="#">4088</a>	<a href="#">SMAD3</a>	SMAD family member 3 [Source:HGNC...
SMG6	<a href="#">23293</a>	<a href="#">SMG6</a>	SMG6 nonsense mediated mRNA decay...
SNX20	<a href="#">124460</a>	<a href="#">SNX20</a>	sorting nexin 20 [Source:HGNC Sym...
SPG7	<a href="#">6687</a>	<a href="#">SPG7</a>	"SPG7 matrix AAA peptidase subuni...
SPHK2	<a href="#">56848</a>	<a href="#">SPHK2</a>	sphingosine kinase 2 [Source:HGNC...
SPI1	<a href="#">6688</a>	<a href="#">SPI1</a>	Spi-1 proto-oncogene [Source:HGNC...
SPN	<a href="#">6693</a>	<a href="#">SPN</a>	sialophorin [Source:HGNC Symbol;A...
SPTBN1	<a href="#">6711</a>	<a href="#">SPTBN1</a>	"spectrin beta, non-erythrocytic ...
SQSTM1	<a href="#">8878</a>	<a href="#">SQSTM1</a>	sequestosome 1 [Source:HGNC Symbo...
SREBF1	<a href="#">6720</a>	<a href="#">SREBF1</a>	sterol regulatory element binding...
ST3GAL2	<a href="#">6483</a>	<a href="#">ST3GAL2</a>	"ST3 beta-galactoside alpha-2,3-s...
STK24	<a href="#">8428</a>	<a href="#">STK24</a>	serine/threonine kinase 24 [Sourc...
STRADA	<a href="#">92335</a>	<a href="#">STRADA</a>	STE20 related adaptor alpha [Sour...

STXBP2	<a href="#">6813</a>	<a href="#">STXBP2</a>	syntaxin binding protein 2 [Sour...
SULF2	<a href="#">55959</a>	<a href="#">SULF2</a>	sulfatase 2 [Source:HGNC Symbol;A...
SUSD3	<a href="#">203328</a>	<a href="#">SUSD3</a>	sushi domain containing 3 [Source...
SYT2	<a href="#">127833</a>	<a href="#">SYT2</a>	synaptotagmin 2 [Source:HGNC Symb...
TAGLN2	<a href="#">8407</a>	<a href="#">TAGLN2</a>	transgelin 2 [Source:HGNC Symbol;...
TARBP1	<a href="#">6894</a>	<a href="#">TARBP1</a>	TAR (HIV-1) RNA binding protein 1...
TARS2	<a href="#">80222</a>	<a href="#">TARS2</a>	"threonyl-tRNA synthetase 2, mito...
TBP	<a href="#">6908</a>	<a href="#">TBP</a>	TATA-box binding protein [Source:...
TBX6	<a href="#">6911</a>	<a href="#">TBX6</a>	T-box transcription factor 6 [Sou...
TBXAS1	<a href="#">6916</a>	<a href="#">TBXAS1</a>	thromboxane A synthase 1 [Source:...
TESC	<a href="#">54997</a>	<a href="#">TESC</a>	tescalcin [Source:HGNC Symbol;Acc...
TFDP1	<a href="#">7027</a>	<a href="#">TFDP1</a>	transcription factor Dp-1 [Source...
TIMP2	<a href="#">7077</a>	<a href="#">TIMP2</a>	TIMP metalloproteinase inhibitor 2...
TK2	<a href="#">7084</a>	<a href="#">TK2</a>	thymidine kinase 2 [Source:HGNC S...
TM9SF4	<a href="#">9777</a>	<a href="#">TM9SF4</a>	transmembrane 9 superfamily membe...
TMC8	<a href="#">147138</a>	<a href="#">TMC8</a>	transmembrane channel like 8 [Sou...
TMCC2	<a href="#">9911</a>	<a href="#">TMCC2</a>	transmembrane and coiled-coil dom...
TMEM104	<a href="#">54868</a>	<a href="#">TMEM104</a>	transmembrane protein 104 [Source...
TMEM115	<a href="#">11070</a>	<a href="#">TMEM115</a>	transmembrane protein 115 [Source...
TMEM143	<a href="#">55260</a>	<a href="#">TMEM143</a>	transmembrane protein 143 [Source...
TMEM148	<a href="#">197196</a>	<a href="#">LINC00311</a>	long intergenic non-protein codin...
TMEM173	<a href="#">340061</a>	<a href="#">STING1</a>	stimulator of interferon response...
TMEM41B	<a href="#">440026</a>	<a href="#">TMEM41B</a>	transmembrane protein 41B [Source...
TNFAIP2	<a href="#">7127</a>	<a href="#">TNFAIP2</a>	TNF alpha induced protein 2 [Sour...
TNFAIP3	<a href="#">7128</a>	<a href="#">TNFAIP3</a>	TNF alpha induced protein 3 [Sour...
TNFRSF10B	<a href="#">8795</a>	<a href="#">TNFRSF10B</a>	TNF receptor superfamily member 1...
TNFRSF4	<a href="#">7293</a>	<a href="#">TNFRSF4</a>	TNF receptor superfamily member 4...
TOMM20	<a href="#">9804</a>	<a href="#">TOMM20</a>	translocase of outer mitochondria...
TOMM40	<a href="#">10452</a>	<a href="#">TOMM40</a>	translocase of outer mitochondria...
TOX2	<a href="#">84969</a>	<a href="#">TOX2</a>	TOX high mobility group box famil...
TPD52L2	<a href="#">7165</a>	<a href="#">TPD52L2</a>	TPD52 like 2 [Source:HGNC Symbol;...
TPPP3	<a href="#">51673</a>	<a href="#">TPPP3</a>	tubulin polymerization promoting ...
TPR	<a href="#">7175</a>	<a href="#">TPR</a>	"translocated promoter region, nu...
TPRA1	<a href="#">131601</a>	<a href="#">TPRA1</a>	transmembrane protein adipocyte a...
TRIM72	<a href="#">493829</a>	<a href="#">TRIM72</a>	tripartite motif containing 72 [S...
TRIP4	<a href="#">9325</a>	<a href="#">TRIP4</a>	thyroid hormone receptor interact...
TRNP1	<a href="#">388610</a>	<a href="#">TRNP1</a>	TMF1 regulated nuclear protein 1 ...
TSSK3	<a href="#">81629</a>	<a href="#">TSSK3</a>	testis specific serine kinase 3 [...
TUBA1C	<a href="#">84790</a>	<a href="#">TUBA1C</a>	tubulin alpha 1c [Source:HGNC Sym...
TUBGCP2	<a href="#">10844</a>	<a href="#">TUBGCP2</a>	tubulin gamma complex associated ...
TYK2	<a href="#">7297</a>	<a href="#">TYK2</a>	tyrosine kinase 2 [Source:HGNC Sy...
TYROBP	<a href="#">7305</a>	<a href="#">TYROBP</a>	TYRO protein tyrosine kinase bind...
UACA	<a href="#">55075</a>	<a href="#">UACA</a>	uveal autoantigen with coiled-coi...
UBASH3B	<a href="#">84959</a>	<a href="#">UBASH3B</a>	ubiquitin associated and SH3 doma...

UBE2O	<a href="#">63893</a>	<a href="#">UBE2O</a>	ubiquitin conjugating enzyme E2 O...
UBE2R2	<a href="#">54926</a>	<a href="#">UBE2R2</a>	ubiquitin conjugating enzyme E2 R...
UBL3	<a href="#">5412</a>	<a href="#">UBL3</a>	ubiquitin like 3 [Source:HGNC Sym...
UBN2	<a href="#">254048</a>	<a href="#">UBN2</a>	ubinnuclein 2 [Source:HGNC Symbol;...
UCK2	<a href="#">7371</a>	<a href="#">UCK2</a>	uridine-cytidine kinase 2 [Source...
UPB1	<a href="#">51733</a>	<a href="#">UPB1</a>	beta-ureidopropionase 1 [Source:H...
UPP1	<a href="#">7378</a>	<a href="#">UPP1</a>	uridine phosphorylase 1 [Source:H...
VASP	<a href="#">7408</a>	<a href="#">VASP</a>	vasodilator stimulated phosphopro...
WDR26	<a href="#">80232</a>	<a href="#">WDR26</a>	WD repeat domain 26 [Source:HGNC ...
WDR51A	<a href="#">25886</a>	<a href="#">POC1A</a>	POC1 centriolar protein A [Source...
WDR81	<a href="#">124997</a>	<a href="#">WDR81</a>	WD repeat domain 81 [Source:HGNC ...
WNT5B	<a href="#">81029</a>	<a href="#">WNT5B</a>	Wnt family member 5B [Source:HGNC...
WNT9A	<a href="#">7483</a>	<a href="#">WNT9A</a>	Wnt family member 9A [Source:HGNC...
YTHDF2	<a href="#">51441</a>	<a href="#">YTHDF2</a>	YTH N6-methyladenosine RNA bindin...
ZBTB16	<a href="#">7704</a>	<a href="#">ZBTB16</a>	zinc finger and BTB domain contai...
ZBTB3	<a href="#">79842</a>	<a href="#">ZBTB3</a>	zinc finger and BTB domain contai...
ZC3H12A	<a href="#">80149</a>	<a href="#">ZC3H12A</a>	zinc finger CCCH-type containing ...
ZC3H4	<a href="#">23211</a>	<a href="#">ZC3H4</a>	zinc finger CCCH-type containing ...
ZDHHC19	<a href="#">131540</a>	<a href="#">ZDHHC19</a>	zinc finger DHHC-type containing ...
ZFYVE28	<a href="#">57732</a>	<a href="#">ZFYVE28</a>	zinc finger FYVE-type containing ...
ZMIZ1	<a href="#">57178</a>	<a href="#">ZMIZ1</a>	zinc finger MIZ-type containing 1...
ZNF595	<a href="#">152687</a>	<a href="#">ZNF595</a>	zinc finger protein 595 [Source:H...
ZNF683	<a href="#">257101</a>	<a href="#">ZNF683</a>	zinc finger protein 683 [Source:H...
ZNF710	<a href="#">374655</a>	<a href="#">ZNF710</a>	zinc finger protein 710 [Source:H...
ZZEF1	<a href="#">23140</a>	<a href="#">ZZEF1</a>	zinc finger ZZ-type and EF-hand d...

### Supplementary Fig. 1 Related to Figure 2 and 3

- (A) Western blot analysis of the levels of indicated proteins and histone marks in two control (Ctrl) and two KDM5A-KO NB4 cells.
- (B) ChIP-seq snapshots of *FBRSL1* for KDM5A, H3K4me1 and input in NB4; H3K4me2, H3K4me3 and RNA-seq in the control and KDM5A-KO NB4 cells.
- (C) Heatmap analysis of the ChIP-seq profiles of KDM5A in NB4 and H3K4me2 in the control and KDM5A-KO NB4 cells. The genebodies with up-regulated H3K4me2 but not able to call KDM5A peaks were shown ( $\pm 3$  kb), sorted by KDM5A binding intensity.
- (D) Proliferation assay of control cells, KDM5A-KO cells, or KDM5B-KO cells for the indicated days. Viable cells were detected by trypan blue exclusion assay. Statistical significance was determined by 2way ANOVA between Ctrl1 and KDM5B-KO, n.s.,  $p > 0.05$ .
- (E) Western blot analysis of the levels of indicated proteins in two control (Ctrl), two KDM5A-KO and KDM5B-KO NB4 cells. The specific band for KDM5B is marked by red arrow.

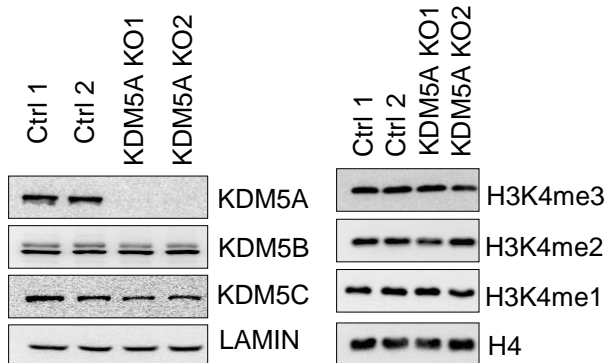
### Supplementary Fig. 2 Related to Figure 4

- (A) GSEA plots showing the differential expressed genes enriched for (a) Acute myeloid leukemia signature (NES=-2.0, FDR=0.0056), (b) MYC Target (NES=-2.0, FDR=0.0000), (c) B cell receptor signaling pathway (NES=-2.0, FDR=0.0015) and (d) PI3K-AKT-mTOR pathway (NES=-2.0, FDR=0.005) in KDM5A KO compared to control NB4 cells.

# Supplementary Figure 1

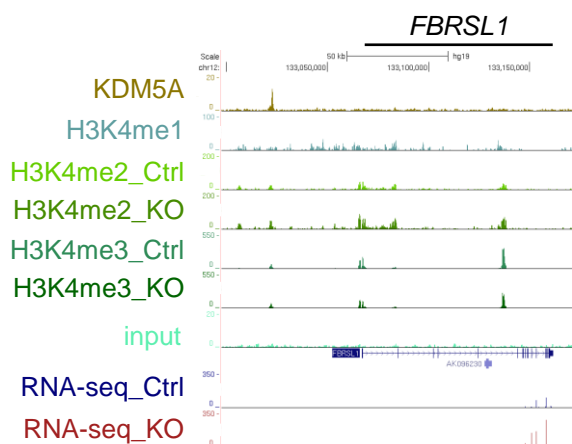
**A**

## Western blot



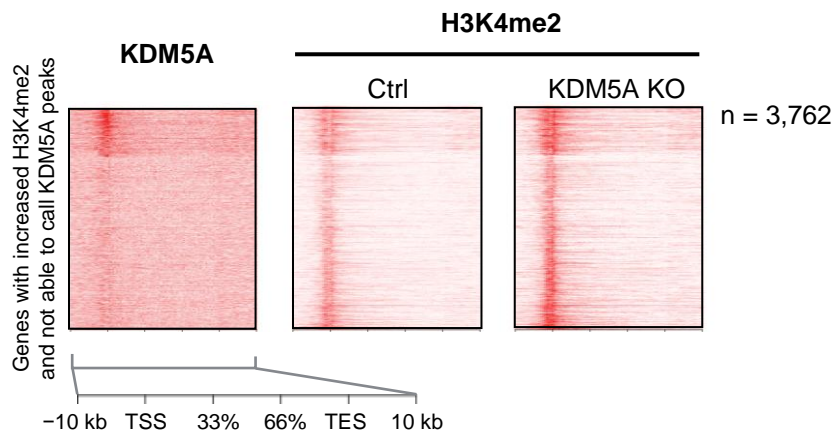
**B**

## ChIP-seq



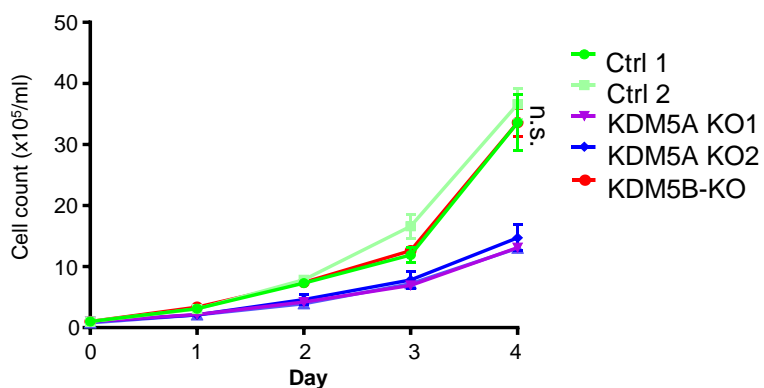
**C**

## ChIP-seq heatmap



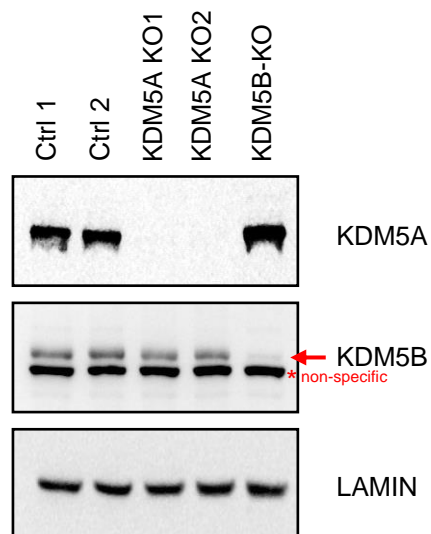
**D**

## Proliferation Assay



**E**

## Western blot



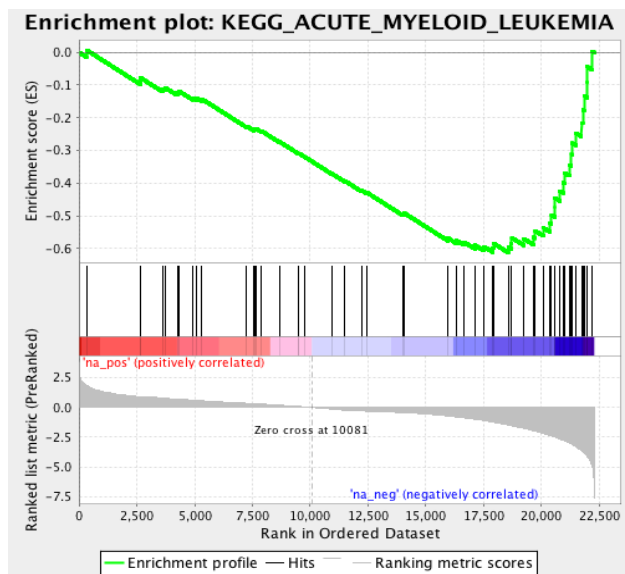


# Supplementary Figure 2

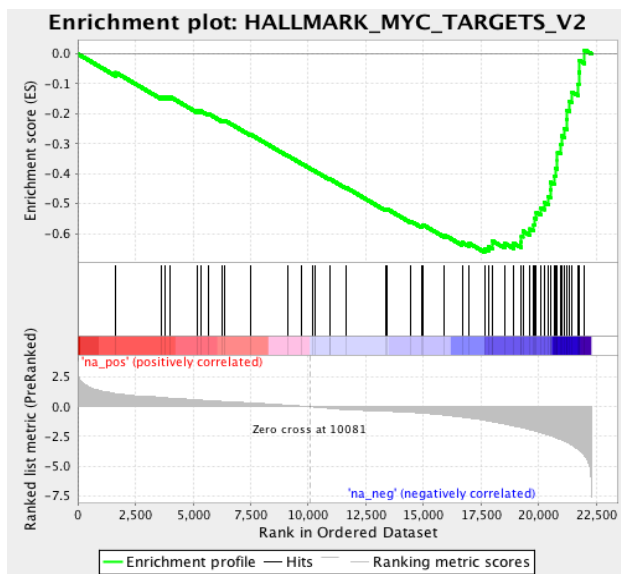
A

## RNA-seq GSEA plots

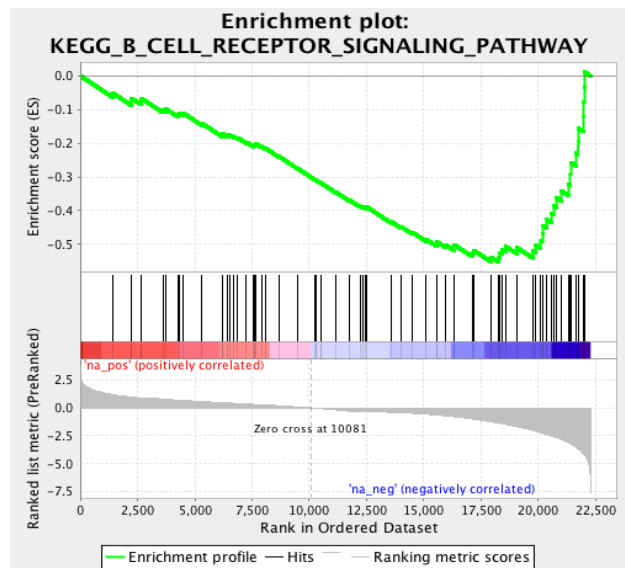
a) FDR=0.0056



b) FDR=0.0000



c) FDR=0.015



d) FDR=0.005

