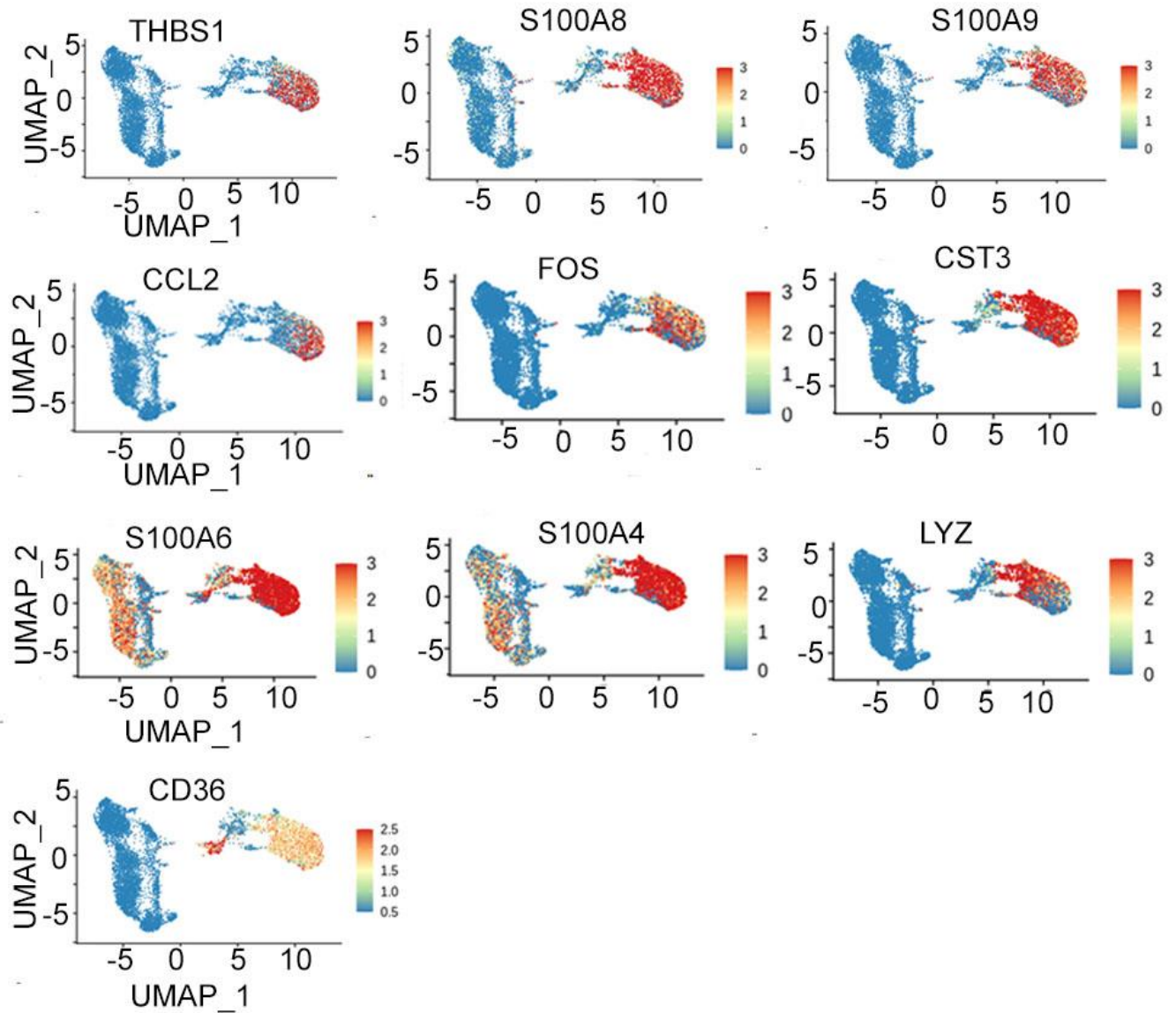
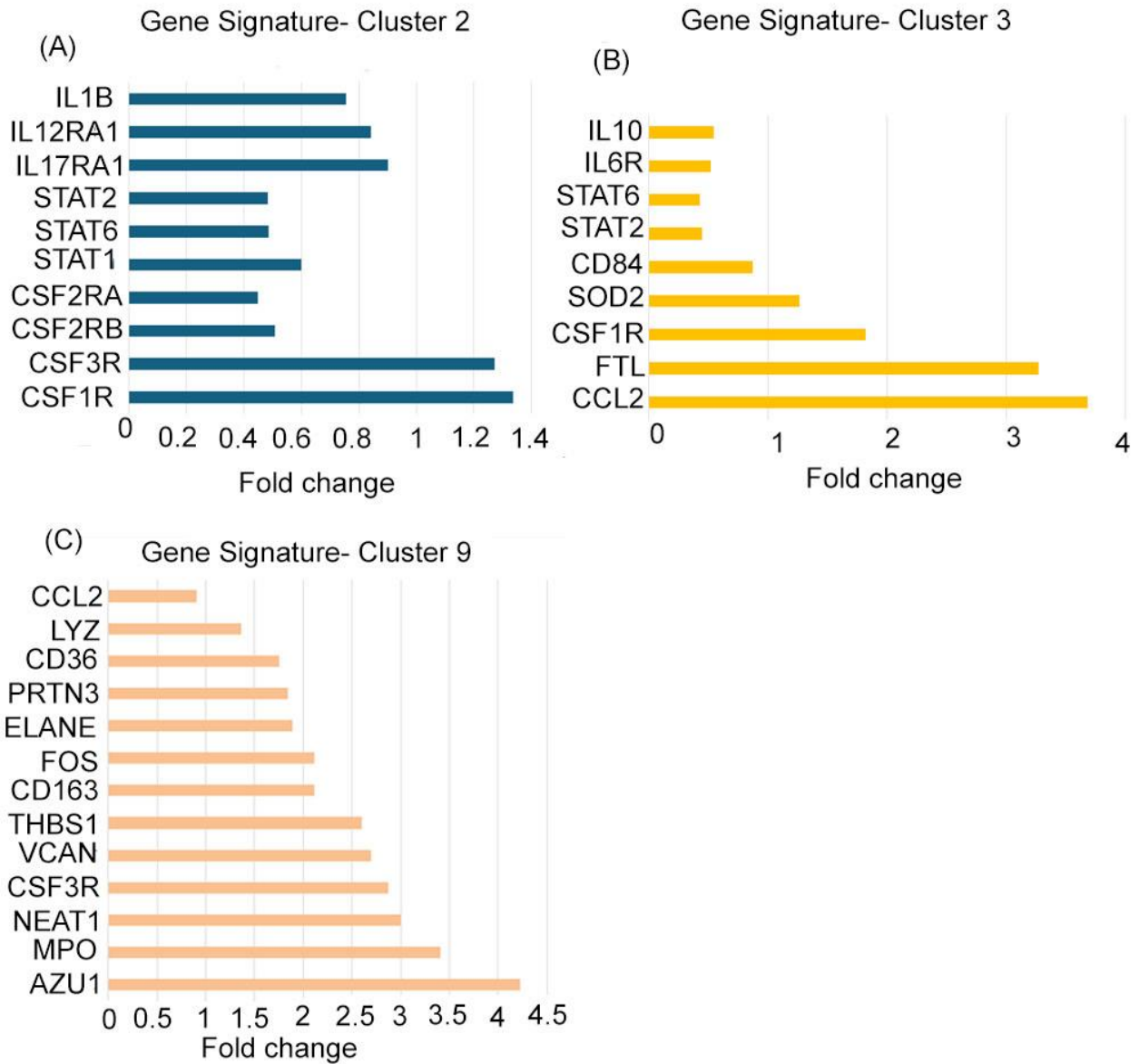


## Supplementary Figure 1



**Supplementary Figure 1:** Gene expression on WM MDSCs: UMAP plots for selected genes expressed on MDSCs : THBS1, S100A8, S100A9, CCL2, FOS, CST3, S100A6, S100A4, LYZ, and CD36. In each featured plot, we color each cell according to the intensity of the relative expression on genes.

## Supplementary Figure 2



**Supplementary Figure 2:** The distinct transcriptome gene expression of MDSCs clusters: (A) Bar chart depicting signature gene expression of cluster 2. (B) Bar chart illustrating the expression of signature genes in Cluster 3. (C) Bar chart showing the expression of hallmark genes in Cluster 9.

**Supplementary Table 1:** Patient characteristics

Clinical parameters	N =24
Median age (range) (years)	53-79
Median BM involvement (range) %	10-90
Median serum IgM (range) mg/dl	402-6060
HGB<11.5g/dL	
Yes	12
No	12
Platelet<100*10 <sup>9</sup> /L	
Yes	3
No	21
Beta-2-Microglobulin>3mcg/ml	
Yes	11
No	4
No data	9
Disease status	
SWM	7
Symptomatic	17
ISSWM	
1	2
2	15
3	7
First line treatment	
Observation	13
Chemoimmunotherapy	11

Note: BM: Bone marrow, HGB: Hemoglobin, ISSWM: International Prognostic Scoring System for WM.

**Supplementary Table 2: CyTOF and CITEseq antibodies**

CyTOF antibodies

CITEseq antibodies

**Table 2.1:** List of Cytof antibodies

Channel	Target	Clone	Location	Source
89Y	CD45	HI30	Surface	Fluidigm
140Ce	EQ beads	n/a	n/a	Fluidigm
142Nd	CD19	HIB19	Surface	Fluidigm
143Nd	CD127 (IL-7Ra)	A019D5	Surface	Fluidigm
144Nd	CD15 (SSEA-1)	W6D3	surface	Fluidigm
145Nd	CD163	GHI/61	surface	Fluidigm
147Sm	CD11c	Bu15	Surface	Fluidigm
148Nd	CD16	3G8	Surface	Fluidigm
150Nd	CD138	DL-101	surface	Fluidigm
151Eu	CD123/IL-3R	6H6	Surface	Fluidigm
152Sm	CD36		Surface	
154Sm	CD3	UCHT1	Surface	Fluidigm
155Gd	CD45RA	HI100	Surface	Fluidigm
156Gd	PD-L1	29E.2A3	Surface	Fluidigm
158Gd	CD33	WM53	surface	Fluidigm
162Dy	CD66b	80H3	Surface	Fluidigm
165Ho	CD45RO	UCHL1	Surface	Fluidigm
167Er	CD197 (CCR7)	G043H7	Surface	Fluidigm
168Er	CD8a	SK1	Surface	Fluidigm
169Tm	CD25/IL-2R	2A3	Surface	Fluidigm
173Yb	HLA-DR	L243	Surface	Fluidigm
174Yb	CD4	SK3	Surface	Fluidigm
175Lu	CD14	M5E2	Surface	Fluidigm
176Yb	CD56/NCAM	NCAM16.2	Surface	Fluidigm
191Ir	DNA	n/a	Nuclear	Fluidigm
193Ir	DNA	n/a	Nuclear	Fluidigm
195Pt	Viability	n/a	n/a	Fluidigm
209Bi	CD11b (Mac-1)	ICRF44	surface	Fluidigm

**Table 2.2:** List of CITE Seq antibodies

Category	Barcode	Specificity	Clone	Reactivity	Barcode Sequence
TotalSeq™-C	0007	CD274 (B7-H1, PD-L1)	29E.2A3	Human	GTTGTCCGACAATAC
TotalSeq™-C	0034	CD3	UCHT1	Human	CTCATTGTAACCTCT
TotalSeq™-C	0045	CD4	SK3	Human	GAGGTTAGTGATGGA
TotalSeq™-C	0047	CD56 (NCAM)	5.1H11	Human	TCCTTTCCTGATAGG
TotalSeq™-C	0048	CD45	2D1	Human	TCCCTTGCGATTTAC
TotalSeq™-C	0050	CD19	HIB19	Human	CTGGGCAATTACTCG
TotalSeq™-C	0051	CD14	63D3	Human	CAATCAGACCTATGA
TotalSeq™-C	0052	CD33	P67.6	Human	TAACTCAGGGCCTAT
TotalSeq™-C	0053	CD11c	S-HCL-3	Human	TACGCCTATAACTTG
TotalSeq™-C	0055	CD138 (Syndecan-1)	MI15	Human	ACTCTTTCGTTTACG
TotalSeq™-C	0063	CD45RA	HI100	Human	TCAATCCTTCCGCTT
TotalSeq™-C	0064	CD123	6H6	Human	CTTCACTCTGTCAGG
TotalSeq™-C	0080	CD8a	RPA-T8	Human	GCTGCGCTTTCCATT
TotalSeq™-C	0083	CD16	3G8	Human	AAGTTCACCTTTTGC
TotalSeq™-C	0085	CD25	BC96	Human	TTTGTCTGTACGCC
TotalSeq™-C	0087	CD45RO	UCHL1	Human	CTCCGAATCATGTTG
TotalSeq™-C	0148	CD197 (CCR7)	G043H7	Human	AGTTCAGTCAACCGA
TotalSeq™-C	0159	HLA-DR	L243	Human	AATAGCGAGCAAGTA
TotalSeq™-C	0161	CD11b	ICRF44	Human	GACAAGTGATCTGCA

TotalSeq™-C	0166	CD66b	6/40c	Human	AGCTGTAAGTTTCGG
TotalSeq™-C	0390	CD127 (IL-7R $\alpha$ )	A019D5	Human	GTGTGTTGTCCTATG
TotalSeq™-C	0392	CD15 (SSEA-1)	W6D3	Human	TCACCAGTACCTAGT
TotalSeq™-C	0407	CD36	5-271	Human	TTCTTGCCTTGCCA
TotalSeq™-C	358	CD163	GHI/61	Human	GCTTCTCCTTCCTTA

**Supplementary Table 3:** Up and downregulated genes

Table 3.1: Up regulated genes in MDSCs WM vs NBM

Table 3.2: Down regulated genes in MDSCs WM vs NBM

Table 3.3: Up regulated genes in CD66b<sup>+</sup> PMN-MDSCs (PMN vs M-MDSCs)

Table 3.4: Down regulated genes in CD66b<sup>+</sup> MDSCs (PMN vs M-MDSCs)



**Table 3.1:** Up regulated genes in MDSCs WM vs NBM

Gene	Ensembl ID	p_val_adj	avg_log2FC
THBS1	ENSG00000137801	2.44E-41	2.070413
MTRNR2L2	ENSG00000269028	6.63E-62	1.758034
HLA-DRB5	ENSG00000198502	2.51E-11	1.518066
EGR1	ENSG00000120738	2.7E-15	1.429899
ZFP36L1	ENSG00000185650	5.66E-38	1.422987
MTRNR2L1	ENSG00000256618	7.52E-06	1.371534
MS4A7	ENSG00000166927	1.82E-23	1.290619
FOS	ENSG00000170345	3.45E-29	1.264835
NRG1	ENSG00000157168	7.78E-14	1.203748
ARL4C	ENSG00000188042	1.45E-08	1.192812
TIMP1	ENSG00000102265	2.19E-15	1.179749
RNASE1	ENSG00000129538	3.15E-13	1.149242
RNASE6	ENSG00000169413	3.28E-15	1.116015
PAX8-AS1	ENSG00000189223	9.97E-11	1.100039
FCGR3A	ENSG00000203747	1.43E-14	1.095064
STAB1	ENSG00000010327	1.16E-17	1.08326
HIF1A	ENSG00000100644	4.39E-16	1.080104
FCGR2A	ENSG00000143226	3.8E-11	1.021257
NCF4	ENSG00000100365	1.57E-15	1.020558
HLA-DPA1	ENSG00000231389	0.000615	0.994244
HSPA6	ENSG00000173110	5.46E-10	0.963766
RCBTB2	ENSG00000136161	4.92E-09	0.947087
FCGR2B	ENSG00000072694	2.44E-09	0.946809
IER2	ENSG00000160888	1.28E-09	0.937936
MEF2C	ENSG00000081189	6.37E-11	0.927845
JUNB	ENSG00000171223	6.9E-13	0.916054
JAML	ENSG00000160593	0.017845	0.911375
PLEKHO1	ENSG00000023902	2.01E-10	0.90804
DUSP6	ENSG00000139318	1.44E-10	0.906785
HLA-DQB1	ENSG00000179344	0.022915	0.872323
SLC43A2	ENSG00000167703	3.53E-09	0.871021
CD4	ENSG00000010610	3.35E-06	0.837785
IER3	ENSG00000137331	4.79E-11	0.813778
NISCH	ENSG00000010322	2.01E-05	0.812007
TXNIP	ENSG00000265972	2.38E-07	0.80962
LPAR6	ENSG00000139679	1.51E-08	0.805351
HLA-DRA	ENSG00000204287	0.001648	0.803509
ZFP36L2	ENSG00000152518	3.42E-07	0.794975
GAS7	ENSG00000007237	6.31E-07	0.775393
BTG2	ENSG00000159388	0.001097	0.761815
IL10RA	ENSG00000110324	1.54E-07	0.760139

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PILRA	ENSG00000085514	1.73E-05	0.756964
PNRC1	ENSG00000146278	0.002192	0.750591
QKI	ENSG00000112531	9.58E-05	0.746959
BTG1	ENSG00000133639	0.023014	0.732978
FXYD5	ENSG00000089327	4.73E-08	0.732215
RESF1	ENSG00000174718	1E-05	0.716051
AHR	ENSG00000106546	0.004559	0.715739
CD86	ENSG00000114013	3.87E-05	0.711663
CARD16	ENSG00000204397	0.000296	0.705678
FGL2	ENSG00000127951	0.000286	0.704753
NFXL1	ENSG00000170448	0.006788	0.704209
TGFBR2	ENSG00000163513	0.000524	0.696543
IL13RA1	ENSG00000131724	0.004992	0.695449
HLA-DQA1	ENSG00000237541	0.031366	0.691958
DMXL2	ENSG00000104093	1.24E-05	0.684481
MAF	ENSG00000178573	0.000736	0.681371
FUCA1	ENSG00000179163	0.003533	0.675943
LILRB1	ENSG00000104972	3.25E-06	0.671413
TNFRSF1B	ENSG00000028137	5.65E-07	0.651764
ANPEP	ENSG00000166825	7.05E-06	0.650821
TGFBI	ENSG00000120708	8.26E-06	0.650457
HLA-E	ENSG00000204592	3.13E-08	0.649757
HCLS1	ENSG00000180353	4.46E-06	0.649282
TYROBP	ENSG00000011600	1.12E-23	0.649095
PNISR	ENSG00000132424	0.010916	0.647236
HLA-A	ENSG00000206503	2.42E-10	0.643003
ARHGAP4	ENSG00000089820	0.008207	0.642683
HBEGF	ENSG00000113070	0.000162	0.63757
MPEG1	ENSG00000197629	3.92E-05	0.633598
SRRM2	ENSG00000167978	0.028674	0.61709
ABTB1	ENSG00000114626	0.023279	0.617083
NCKAP1L	ENSG00000123338	0.035938	0.612711
MS4A14	ENSG00000166928	1.49E-06	0.612674
LILRB2	ENSG00000131042	0.000636	0.608169
SPI1	ENSG00000066336	6.2E-05	0.602771
GPR82	ENSG00000171657	0.000698	0.599254
HLA-F	ENSG00000204642	0.004372	0.599184
CD74	ENSG00000019582	0.000195	0.596783
CTTNBP2	ENSG00000077063	0.00052	0.590533
VSIR	ENSG00000107738	0.00113	0.587654
ITM2B	ENSG00000136156	2.66E-06	0.586135
MAP3K3	ENSG00000198909	0.023565	0.575057
FPR3	ENSG00000187474	0.003609	0.570843
OLFML2B	ENSG00000162745	0.000844	0.561462

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CSF1R	ENSG00000182578	0.000881	0.560716
HS3ST1	ENSG00000002587	0.001622	0.55624
FCN1	ENSG00000085265	6.01E-10	0.545899
TNNT1	ENSG00000105048	0.01022	0.54067
CYBA	ENSG00000051523	0.011155	0.535785
GPRIN3	ENSG00000185477	0.003135	0.515497
TCIRG1	ENSG00000110719	0.000204	0.515483
C1orf162	ENSG00000143110	0.032404	0.508093
GAPT	ENSG00000175857	0.003239	0.506559
COTL1	ENSG00000103187	0.000463	0.481456
MALAT1	ENSG00000251562	6.92E-11	0.471916
SLC7A8	ENSG00000092068	0.009185	0.470715
SAMHD1	ENSG00000101347	0.000415	0.460829
MARCKS	ENSG00000277443	0.011491	0.457077
TPT1	ENSG00000133112	1.85E-09	0.457007
GNAI2	ENSG00000114353	0.001012	0.456569
DDX5	ENSG00000108654	0.009117	0.455627
B2M	ENSG00000166710	9.41E-13	0.452174
HLA-B	ENSG00000234745	2.99E-08	0.436569
CALM2	ENSG00000143933	0.044094	0.432342
AIF1	ENSG00000204472	3.03E-07	0.431836
FYB1	ENSG00000082074	0.016116	0.42568
SAT1	ENSG00000130066	0.000305	0.41429
H3-3A	ENSG00000163041	1.84E-05	0.413701
HLA-C	ENSG00000204525	0.005053	0.383766
TYMP	ENSG00000025708	0.040287	0.344572
CST3	ENSG00000101439	0.017595	0.284987

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**Table 3.2:** Down regulated genes in MDSCs WM vs NBM

Gene	Ensembl ID	p_val_adj	avg_log2FC
MTRNR2L8	ENSG00000255823	1.23E-39	-3.44267
APOC1	ENSG00000130208	1.3E-24	-1.95796
MPO	ENSG00000005381	1.1E-13	-1.80464
GPNMB	ENSG00000136235	6.46E-17	-1.56256
RETN	ENSG00000104918	8.37E-29	-1.49135
LGALS3	ENSG00000131981	8.92E-09	-1.46942
PLAC8	ENSG00000145287	7.66E-25	-1.3988
CSTB	ENSG00000160213	4.97E-08	-1.39285
ACP5	ENSG00000102575	9.82E-11	-1.35105
CTSD	ENSG00000117984	1.22E-24	-1.30875
FABP5	ENSG00000164687	2.19E-11	-1.19354
SNHG29	ENSG00000175061	0.006379	-1.18337
RPS26	ENSG00000197728	5.04E-20	-1.06164
CD52	ENSG00000169442	1.32E-15	-1.01213
S100A8	ENSG00000143546	0.000576	-1.01105
DEFA3	ENSG00000239839	7.56E-18	-0.98401
CRIP1	ENSG00000213145	4.24E-06	-0.97074
VAT1	ENSG00000108828	3.15E-12	-0.90705
ALOX5AP	ENSG00000132965	7.13E-11	-0.89833
MGLL	ENSG00000074416	1.32E-06	-0.88633
MCEMP1	ENSG00000183019	1.44E-30	-0.87966
RPLP1	ENSG00000137818	4.44E-24	-0.86868
FBP1	ENSG00000165140	4.48E-09	-0.86796
CAPG	ENSG00000042493	2.62E-13	-0.83008
AZU1	ENSG00000172232	1.16E-07	-0.82813
S100A10	ENSG00000197747	2.81E-14	-0.81387
CES1	ENSG00000198848	9.39E-23	-0.81031
MGST3	ENSG00000143198	5.27E-09	-0.80854
OTOA	ENSG00000155719	2.01E-07	-0.79875
HSPB1	ENSG00000106211	3.71E-07	-0.79869
TXN	ENSG00000136810	4.59E-10	-0.78988
CD9	ENSG00000010278	0.004388	-0.73096
ND6	ENSG00000198695	2.05E-05	-0.717
STMN1	ENSG00000117632	0.028976	-0.71401
NFE2	ENSG00000123405	7.37E-15	-0.69045
NDUFB9	ENSG00000147684	1.01E-05	-0.68969
MGST1	ENSG00000008394	1.72E-08	-0.6885
RPLP0	ENSG00000089157	1.32E-07	-0.68697
CLEC11A	ENSG00000105472	2.37E-06	-0.68554
VIM	ENSG00000026025	3.5E-16	-0.67883
NME2	ENSG00000243678	3.11E-06	-0.64993

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RPL37A	ENSG00000197756	5.22E-08	-0.62957
RPSA	ENSG00000168028	0.008162	-0.62693
FLNA	ENSG00000196924	0.000705	-0.62115
RNASE2	ENSG00000169385	0.000187	-0.61684
TSPO	ENSG00000100300	1.32E-06	-0.61163
RPS29	ENSG00000213741	9.48E-08	-0.60694
ANXA6	ENSG00000197043	0.001707	-0.57181
RIPOR2	ENSG00000111913	9.16E-07	-0.56751
ID2	ENSG00000115738	0.002095	-0.56036
NLRP12	ENSG00000142405	0.02546	-0.55588
PPT1	ENSG00000131238	6.2E-06	-0.55246
RUNX1	ENSG00000159216	0.014902	-0.54294
DBI	ENSG00000155368	0.000205	-0.53944
OLR1	ENSG00000173391	1.01E-12	-0.53487
SPN	ENSG00000197471	1.91E-11	-0.53352
ND5	ENSG00000198786	0.004563	-0.53282
RPS12	ENSG00000112306	9.19E-08	-0.53277
RPS8	ENSG00000142937	0.00599	-0.52792
NDUFB7	ENSG00000099795	0.003309	-0.52774
CTSA	ENSG00000064601	0.03935	-0.52236
RPL36A	ENSG00000241343	0.031665	-0.5137
SMDT1	ENSG00000183172	0.017234	-0.51181
PPDPF	ENSG00000125534	0.014595	-0.49092
ATP5ME	ENSG00000169020	0.000859	-0.48315
ENO1	ENSG00000074800	5.65E-05	-0.48313
EIF5A	ENSG00000132507	0.006027	-0.47763
GLO1	ENSG00000124767	4.72E-05	-0.47103
EMP1	ENSG00000134531	7.57E-09	-0.47027
RPL39	ENSG00000198918	3.47E-06	-0.46084
ATP5MC2	ENSG00000135390	0.007415	-0.4555
FAH	ENSG00000103876	0.040208	-0.45483
UBE2J1	ENSG00000198833	4.05E-05	-0.44805
MIF	ENSG00000240972	7.05E-05	-0.43981
RPL35	ENSG00000136942	0.000222	-0.427
ATP5MF	ENSG00000241468	0.008334	-0.42094
S100A4	ENSG00000196154	0.034083	-0.42004
RPL21	ENSG00000122026	0.008844	-0.40061
ESYT1	ENSG00000139641	0.004809	-0.39989
PRDX2	ENSG00000167815	0.032324	-0.39848
CDK6	ENSG00000105810	3.44E-05	-0.39211
RPS15	ENSG00000115268	0.036944	-0.38861
NME1	ENSG00000239672	0.018121	-0.3846
COX8A	ENSG00000176340	0.013925	-0.38446
MYADM	ENSG00000179820	0.008642	-0.37113

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RPS28	ENSG00000233927	4.59E-05	-0.34378
ND4L	ENSG00000212907	0.001426	-0.31732
G6PC3	ENSG00000141349	0.005344	-0.31626
PDLIM7	ENSG00000196923	0.010798	-0.30581
RPL41	ENSG00000229117	0.002354	-0.27351
TMSB10	ENSG00000034510	0.001404	-0.27337
GGCT	ENSG00000006625	0.038001	-0.2709
MGST2	ENSG00000085871	0.018239	-0.26841

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**Table 3.3:** Up regulated genes in CD66b<sup>+</sup> PMN-MDSCs (PMN vs M-MDSCs)

Gene	Ensembl ID	p_val_adj	avg_log2FC
CLC	ENSG00000105205	4.19E-36	5.756697
HDC	ENSG00000140287	9.52E-43	3.326741
MPO	ENSG00000005381	3.79E-16	3.250901
H4C3	ENSG00000197061	0.000275	2.765475
GATA2	ENSG00000179348	2.38E-74	2.577398
TPSAB1	ENSG00000172236	1.5E-23	2.542903
SNHG29	ENSG00000175061	3.71E-10	2.267067
MS4A2	ENSG00000149534	3.39E-34	2.227676
CENPF	ENSG00000117724	4.22E-74	2.101197
STMN1	ENSG00000117632	3.59E-34	2.036355
MKI67	ENSG00000148773	1.5E-72	2.019794
PRG2	ENSG00000186652	9.18E-12	1.996044
PRTN3	ENSG00000196415	2.28E-12	1.985173
CPA3	ENSG00000163751	1.32E-45	1.862147
HMGB2	ENSG00000164104	5.65E-16	1.73148
CXCR4	ENSG00000121966	9.69E-06	1.692182
UBE2C	ENSG00000175063	1.99E-68	1.677887
CRIP1	ENSG00000213145	1.08E-07	1.660485
H1-5	ENSG00000184357	4.88E-27	1.545581
MS4A3	ENSG00000149516	1.19E-28	1.542827
AKAP12	ENSG00000131016	2.37E-31	1.538941
AZU1	ENSG00000172232	6.58E-09	1.523372
TPX2	ENSG00000088325	8.39E-72	1.519861
LTC4S	ENSG00000213316	2.24E-05	1.512848
IFITM2	ENSG00000185201	6.95E-06	1.508186
LDHB	ENSG00000111716	3.28E-11	1.474235
ASPM	ENSG00000066279	5.28E-51	1.45825
ALOX5AP	ENSG00000132965	0.012616	1.384832
TOP2A	ENSG00000131747	2.8E-47	1.37243
SLC40A1	ENSG00000138449	1.35E-32	1.369034
SERPINB1	ENSG00000021355	5.11E-06	1.362723
RPSA	ENSG00000168028	9.29E-07	1.325197
GIHCG	ENSG00000257698	4.39E-34	1.316974
TUBB	ENSG00000196230	5.44E-05	1.291691
SPN	ENSG00000197471	1.55E-29	1.27796
NUSAP1	ENSG00000137804	7.07E-40	1.266724
NFE2	ENSG00000123405	6.67E-29	1.259665
PRSS57	ENSG00000185198	1.28E-46	1.258901
RPS3	ENSG00000149273	3.13E-07	1.25151

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SELL	ENSG00000188404	2.99E-25	1.227638
RFLNB	ENSG00000183688	0.000276	1.207233
RPS4X	ENSG00000198034	0.000356	1.204779
RPS8	ENSG00000142937	4.32E-08	1.203107
CKAP2	ENSG00000136108	3.4E-13	1.199451
GAS5	ENSG00000234741	0.001427	1.195993
EEF1B2	ENSG00000114942	0.005109	1.183574
RPS3A	ENSG00000145425	0.002069	1.182941
RPS6	ENSG00000137154	3.67E-06	1.172018
RPLP0	ENSG00000089157	0.000577	1.159798
RNASE2	ENSG00000169385	0.004754	1.159035
ELANE	ENSG00000197561	9.17E-09	1.158835
RPL37A	ENSG00000197756	5.47E-10	1.150954
RUNX1	ENSG00000159216	2.89E-06	1.145739
CLEC11A	ENSG00000105472	2.29E-10	1.12436
FCER1A	ENSG00000179639	4.22E-06	1.124212
ANP32B	ENSG00000136938	6.8E-11	1.122616
SOX4	ENSG00000124766	2.54E-23	1.121986
RPS18	ENSG00000231500	0.00956	1.113762
RPLP1	ENSG00000137818	6.51E-12	1.107038
PTTG1	ENSG00000164611	3.56E-32	1.091325
CENPE	ENSG00000138778	4.65E-29	1.086167
RPS21	ENSG00000171858	3.26E-10	1.075463
LMNB1	ENSG00000113368	2.12E-21	1.075261
HMGN1	ENSG00000205581	6.44E-09	1.074972
HMGB1	ENSG00000189403	3.62E-05	1.074509
SMC4	ENSG00000113810	1.96E-13	1.074066
RPL7A	ENSG00000148303	0.000105	1.069674
TRIM58	ENSG00000162722	1.6E-06	1.069102
NUCB2	ENSG00000070081	3.12E-16	1.067425
NKG7	ENSG00000105374	2.21E-10	1.067268
RPL11	ENSG00000142676	9.76E-09	1.060704
CLU	ENSG00000120885	3.76E-10	1.059901
EEF1G	ENSG00000254772	1.43E-06	1.055702
EXD3	ENSG00000187609	2.2E-06	1.048157
RRM2	ENSG00000171848	9.52E-43	1.040142
ATP2A3	ENSG00000074370	6.9E-06	1.035064
RPL36A	ENSG00000241343	0.004709	1.028556
PCLAF	ENSG00000166803	4.47E-49	1.02729
PLAC8	ENSG00000145287	1.59E-11	1.025141
HSH2D	ENSG00000196684	5.2E-28	1.018508
RIPOR2	ENSG00000111913	8.35E-15	1.016339
ZFAS1	ENSG00000177410	0.000422	1.011066
RPS12	ENSG00000112306	7.54E-07	1.004999

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CENPU	ENSG00000151725	3.85E-28	0.997454
IL2RG	ENSG00000147168	4.2E-07	0.995029
TMPO	ENSG00000120802	1.94E-05	0.991066
CDK6	ENSG00000105810	4.41E-19	0.990045
TAGLN2	ENSG00000158710	0.000221	0.986615
HMMR	ENSG00000072571	1.93E-32	0.985105
PRDX2	ENSG00000167815	1.28E-09	0.980119
PDCD4	ENSG00000150593	1.57E-08	0.978999
SNHG6	ENSG00000245910	9.03E-07	0.977412
RPL34	ENSG00000109475	1.33E-07	0.968888
CTSG	ENSG00000100448	1.64E-19	0.957833
RPS23	ENSG00000186468	0.002024	0.957315
RPL39	ENSG00000198918	1.89E-08	0.95377
FAM111A	ENSG00000166801	1.51E-12	0.952204
ATAD2	ENSG00000156802	1.38E-22	0.951895
HNRNPA1	ENSG00000135486	0.03073	0.94969
RPL7	ENSG00000147604	0.000525	0.938803
KNL1	ENSG00000137812	9.66E-37	0.935684
RPL32	ENSG00000144713	5.14E-06	0.934567
RPS7	ENSG00000171863	0.00185	0.928646
GMCL1	ENSG00000087338	0.0001	0.926037
RPL37	ENSG00000145592	1.4E-05	0.922913
RPS24	ENSG00000138326	1.05E-08	0.919488
RCSD1	ENSG00000198771	0.00143	0.919077
RBBP7	ENSG00000102054	1.14E-05	0.918369
ITM2C	ENSG00000135916	2.12E-37	0.916147
MIS18BP1	ENSG00000129534	9.94E-10	0.905717
BIRC5	ENSG00000089685	1.14E-45	0.903938
GYPC	ENSG00000136732	1.98E-15	0.894927
RPS14	ENSG00000164587	3.79E-07	0.894475
PLP2	ENSG00000102007	0.000144	0.893397
DUT	ENSG00000128951	1.14E-12	0.892134
FRY	ENSG00000073910	6.1E-09	0.89084
RPL9	ENSG00000163682	0.012265	0.885919
SMC2	ENSG00000136824	2.12E-18	0.882759
RAB37	ENSG00000172794	4.52E-23	0.878286
ANKRD36	ENSG00000135976	9.32E-29	0.875948
C21orf58	ENSG00000160298	2.96E-25	0.874837
CKS1B	ENSG00000173207	9.11E-22	0.868548
GTSE1	ENSG00000075218	2.49E-37	0.868004
AURKB	ENSG00000178999	1.03E-29	0.867592
P2RY8	ENSG00000182162	0.000421	0.866191
TROAP	ENSG00000135451	2.25E-18	0.858434
CLSPN	ENSG00000092853	3.57E-28	0.85122

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H3C2	ENSG00000286522	3.96E-34	0.850851
CST7	ENSG00000077984	6.31E-11	0.844655
EIF3E	ENSG00000104408	0.000477	0.837683
HELLS	ENSG00000119969	1.48E-19	0.832313
RPL35A	ENSG00000182899	0.003942	0.821691
RPS29	ENSG00000213741	0.000984	0.816206
RPL18	ENSG00000063177	0.001696	0.811357
ATP6V0A2	ENSG00000185344	1.76E-11	0.809117
SGO1	ENSG00000129810	6.31E-37	0.807425
NCAPD2	ENSG00000010292	3.2E-12	0.80421
C12orf57	ENSG00000111678	5.14E-07	0.803628
NASP	ENSG00000132780	0.040245	0.797862
RPS15	ENSG00000115268	2.78E-05	0.796079
TYMS	ENSG00000176890	3.2E-48	0.784137
PRC1	ENSG00000198901	8.58E-23	0.781677
SPTBN1	ENSG00000115306	2.67E-26	0.780825
MED13L	ENSG00000123066	0.032125	0.778536
GPSM2	ENSG00000121957	3.36E-15	0.774331
RAD21	ENSG00000164754	0.00324	0.772898
CHST12	ENSG00000136213	9.43E-23	0.768095
RPL21	ENSG00000122026	0.010429	0.766095
RPL19	ENSG00000108298	0.005349	0.764426
DCK	ENSG00000156136	0.001647	0.763699
HJURP	ENSG00000123485	8.29E-26	0.752284
MIR4435- 2HG	ENSG00000172965	0.018826	0.747043
CAMLG	ENSG00000164615	1.32E-06	0.742797
ITM2A	ENSG00000078596	4.82E-28	0.742386
MCM7	ENSG00000166508	2.68E-07	0.736668
ARHGAP11A	ENSG00000198826	1.49E-20	0.733165
MYB	ENSG00000118513	2.2E-43	0.729372
CDK1	ENSG00000170312	1.26E-29	0.727351
RPS13	ENSG00000110700	0.016494	0.721787
RPL24	ENSG00000114391	0.011459	0.717553
MAN1A1	ENSG00000111885	1.66E-05	0.708313
SHCBP1	ENSG00000171241	1.56E-23	0.705621
SH2D3C	ENSG00000095370	0.001338	0.705182
FANCI	ENSG00000140525	1.74E-19	0.699176
STX17	ENSG00000136874	7.72E-06	0.694126
SMIM24	ENSG00000095932	7E-37	0.693943
NCAPG	ENSG00000109805	5.41E-34	0.690883
CCND2	ENSG00000118971	1.39E-28	0.686785
PRKACB	ENSG00000142875	3.22E-10	0.686408
MZT2B	ENSG00000152082	3.35E-09	0.681131

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RPL22	ENSG00000116251	0.007578	0.680371
KIT	ENSG00000157404	1.06E-34	0.679595
ASF1B	ENSG00000105011	1.33E-16	0.67663
THUMP3- AS1	ENSG00000206573	0.035468	0.668871
ANKRD28	ENSG00000206560	5.82E-21	0.668227
DTYMK	ENSG00000168393	0.000121	0.666463
PLAAT4	ENSG00000133321	0.005118	0.662976
PLK1	ENSG00000166851	5.72E-15	0.658337
TFDP2	ENSG00000114126	8.87E-18	0.658074
SNHG8	ENSG00000269893	0.000329	0.657945
SPAG5	ENSG00000076382	2.09E-14	0.654944
DHFR	ENSG00000228716	7.02E-07	0.653891
CDKN3	ENSG00000100526	3.82E-33	0.652731
MT2A	ENSG00000125148	0.000243	0.649368
TSTD1	ENSG00000215845	4.49E-07	0.649195
ACAP1	ENSG00000072818	7.41E-05	0.648597
SEPTIN1	ENSG00000180096	0.001204	0.647772
DLGAP5	ENSG00000126787	1.43E-28	0.638548
SLC39A3	ENSG00000141873	8.39E-07	0.637574
CD59	ENSG00000085063	7.91E-07	0.637421
RPL36	ENSG00000130255	0.037523	0.637154
CCNG1	ENSG00000113328	5.83E-09	0.636174
HSD17B11	ENSG00000198189	0.000278	0.633212
FOXM1	ENSG00000111206	2.12E-22	0.629363
GSE1	ENSG00000131149	0.000621	0.627331
TK1	ENSG00000167900	5.65E-27	0.62104
CTSW	ENSG00000172543	3E-24	0.617351
VRK1	ENSG00000100749	1.89E-13	0.608877
SGO2	ENSG00000163535	1.68E-08	0.608796
CKS2	ENSG00000123975	1.33E-15	0.608781
ANLN	ENSG00000011426	9.89E-26	0.607724
CENPM	ENSG00000100162	1.48E-29	0.601955
HOXA9	ENSG00000078399	1.24E-21	0.598224
BRCA1	ENSG00000012048	1.03E-08	0.596961
FEN1	ENSG00000168496	2.05E-12	0.596137
H2AC6	ENSG00000180573	1.76E-07	0.595779
H2AX	ENSG00000188486	3.79E-11	0.586112
VPS13A	ENSG00000197969	1.35E-06	0.584654
UBE2S	ENSG00000108106	0.038159	0.584524
UBAP2	ENSG00000137073	8.19E-07	0.579605
TMED3	ENSG00000166557	1.6E-06	0.577136
CEP43	ENSG00000213066	1.28E-05	0.575753
ZNF521	ENSG00000198795	2.37E-31	0.574482

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TACC3	ENSG00000013810	0.000356	0.572821
PTMA	ENSG000000187514	0.00349	0.567363
EZH2	ENSG000000106462	4.37E-13	0.564042
RAB44	ENSG000000255587	5.51E-23	0.563885
H1-2	ENSG000000187837	0.000979	0.555258
RFC3	ENSG000000133119	2.47E-06	0.553525
SEPTIN6	ENSG000000125354	0.023877	0.55333
INCENP	ENSG000000149503	3.35E-05	0.548239
SF3A2	ENSG000000104897	0.006724	0.546151
ST8SIA6	ENSG000000148488	2.23E-28	0.54447
BZW2	ENSG000000136261	7.34E-09	0.543215
SMARCAD1	ENSG000000163104	0.00185	0.541527
NSD2	ENSG000000109685	0.00283	0.541024
CKAP5	ENSG000000175216	3.24E-05	0.53826
HAUS4	ENSG000000092036	3.13E-06	0.537146
SVIP	ENSG000000198168	3.27E-07	0.5354
IGFBP7	ENSG000000163453	1.18E-13	0.535156
KDM5B	ENSG000000117139	6.38E-08	0.533693
ANP32E	ENSG000000143401	9.81E-05	0.529266
BRCA2	ENSG000000139618	1.37E-06	0.528292
MPHOSPH9	ENSG000000051825	2.33E-09	0.528044
IMPDH2	ENSG000000178035	2.46E-05	0.526636
SMIM3	ENSG000000256235	1.52E-07	0.523294
ELOVL5	ENSG000000012660	8.09E-05	0.523166
TESPA1	ENSG000000135426	7.82E-32	0.521738
CCNA2	ENSG000000145386	1.17E-21	0.51973
DYNC2I2	ENSG000000119333	4.33E-17	0.517127
CDC20	ENSG000000117399	9.13E-26	0.515282
LMAN1	ENSG000000074695	2.97E-11	0.515272
NOB1	ENSG000000141101	0.000192	0.515168
PXMP2	ENSG000000176894	6.98E-21	0.513947
DANCR	ENSG000000226950	4.43E-05	0.512483
CENPJ	ENSG000000151849	5.33E-10	0.5061
HMGB3	ENSG00000029993	0.000654	0.503048
C18orf21	ENSG000000141428	0.000482	0.501534
UHRF1	ENSG000000276043	9.8E-16	0.501521

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**Table 3.4:** Down regulated genes in CD66b<sup>+</sup> MDSCs (PMN vs M-MDSCs)

<b>A</b>	<b>Ensemble ID</b>	<b>p value</b>	<b>Avg log2FC</b>
CCL2	ENSG00000108691	1.36E-09	-2.62118
FUCA1	ENSG00000179163	2.82E-14	-2.3794
THBS1	ENSG00000137801	2.27E-14	-2.33764
TGFBI	ENSG00000120708	9.37E-17	-2.21271
RNASE1	ENSG00000129538	8.13E-12	-2.12461
MAFB	ENSG00000204103	3.62E-13	-2.01481
STAB1	ENSG00000010327	1.32E-17	-1.98376
FOS	ENSG00000170345	8.76E-13	-1.9661
ZFP36L1	ENSG00000185650	5.48E-21	-1.9505
MS4A7	ENSG00000166927	5.59E-11	-1.87395
FTL	ENSG00000087086	1.37E-29	-1.81939
DAB2	ENSG00000153071	6.14E-08	-1.79421
CTSB	ENSG00000164733	9.5E-14	-1.7772
CD163	ENSG00000177575	3.59E-09	-1.74188
ADAP2	ENSG00000184060	3E-08	-1.56232
TYROBP	ENSG00000011600	9.88E-28	-1.56012
FPR3	ENSG00000187474	9.14E-06	-1.54023
MARCKS	ENSG00000277443	1.6E-09	-1.53764
AIF1	ENSG00000204472	1.98E-20	-1.53677
FTH1	ENSG00000167996	2.23E-20	-1.53566
SLC43A2	ENSG00000167703	1.52E-05	-1.50193
IER3	ENSG00000137331	2.26E-05	-1.50159
CYBB	ENSG00000165168	8.07E-14	-1.48151
FCGR3A	ENSG00000203747	4.92E-06	-1.4484
FCGRT	ENSG00000104870	1.06E-07	-1.43981
LPAR6	ENSG00000139679	2.08E-06	-1.42549
ENG	ENSG00000106991	0.000127	-1.4219
IFI30	ENSG00000216490	1.31E-27	-1.40668
TIMP1	ENSG00000102265	2.73E-08	-1.34886
RGL1	ENSG00000143344	0.000939	-1.33619
CD68	ENSG00000129226	6.55E-08	-1.29953
CSF1R	ENSG00000182578	7.24E-06	-1.29454
HIF1A	ENSG00000100644	6.81E-05	-1.28243
CAPZB	ENSG00000077549	1.35E-05	-1.27234
SEMA6B	ENSG00000167680	0.004961	-1.27174
SAMHD1	ENSG00000101347	3.77E-11	-1.27114
FCER1G	ENSG00000158869	1.74E-14	-1.27048
CD14	ENSG00000170458	6.19E-11	-1.26419
NCF4	ENSG00000100365	0.000185	-1.26166

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NPC2	ENSG00000119655	1.31E-09	-1.25226
PSAP	ENSG00000197746	9.79E-15	-1.25053
LILRB2	ENSG00000131042	1.6E-06	-1.24528
TNFRSF1B	ENSG00000028137	0.000252	-1.23106
MPEG1	ENSG00000197629	1.22E-05	-1.20637
HMOX1	ENSG00000100292	0.003776	-1.19877
CYP1B1	ENSG00000138061	0.000492	-1.18747
HCK	ENSG00000101336	0.001831	-1.17443
FCGR2A	ENSG00000143226	0.000685	-1.16347
COTL1	ENSG00000103187	1.76E-08	-1.16176
DUSP6	ENSG00000139318	1.34E-05	-1.14718
MAF	ENSG00000178573	0.004863	-1.14707
RCBTB2	ENSG00000136161	0.008594	-1.11183
EPB41L3	ENSG00000082397	0.009476	-1.10973
HCLS1	ENSG00000180353	0.00014	-1.1097
ANXA5	ENSG00000164111	1.37E-09	-1.10963
SNX6	ENSG00000129515	0.020675	-1.1002
SAT1	ENSG00000130066	1.23E-06	-1.0967
LRP1	ENSG00000123384	2.18E-06	-1.09641
S100A11	ENSG00000163191	2.67E-13	-1.07652
SH3BGRL3	ENSG00000142669	1.64E-16	-1.06405
GAS7	ENSG00000007237	0.000356	-1.04555
LILRB3	ENSG00000204577	0.023717	-1.00813
PLEC	ENSG00000178209	0.000279	-1.00635
GRB2	ENSG00000177885	0.000119	-1.00574
C5AR1	ENSG00000197405	0.003505	-1.00418
POLR2L	ENSG00000177700	0.000414	-0.99999
CAMK1	ENSG00000134072	0.005328	-0.99805
TYMP	ENSG00000025708	4.57E-07	-0.98869
CTSD	ENSG00000117984	0.023894	-0.98465
LILRB1	ENSG00000104972	0.012184	-0.98254
NPL	ENSG00000135838	0.036256	-0.96893
DOK2	ENSG00000147443	0.003335	-0.96587
ANPEP	ENSG00000166825	0.01782	-0.96533
IL10RA	ENSG00000110324	0.004965	-0.95826
ZEB2	ENSG00000169554	0.024935	-0.94658
KCTD12	ENSG00000178695	0.000712	-0.9456
RAB31	ENSG00000168461	0.012298	-0.92868
TCIRG1	ENSG00000110719	0.017689	-0.92112
CTSS	ENSG00000163131	4.83E-06	-0.89963
C1orf162	ENSG00000143110	0.004638	-0.87958
AP2S1	ENSG00000042753	0.03625	-0.86919
CTSZ	ENSG00000101160	0.013842	-0.86219
PELATON	ENSG00000224397	0.042894	-0.85707

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CST3	ENSG00000101439	1.5E-08	-0.85604
ARRB2	ENSG00000141480	0.032251	-0.83533
PTPRE	ENSG00000132334	0.002659	-0.81979
PKM	ENSG00000067225	0.000481	-0.78819
ARPC3	ENSG00000111229	0.00094	-0.7651
CALM1	ENSG00000198668	0.032292	-0.74665
LST1	ENSG00000204482	0.000312	-0.74503
ATP5F1E	ENSG00000124172	1.69E-08	-0.73191
SERF2	ENSG00000140264	1.11E-08	-0.68716
S100A4	ENSG00000196154	2.01E-05	-0.66725
FCN1	ENSG00000085265	0.004913	-0.65635
PFN1	ENSG00000108518	0.000238	-0.6291
PFDN5	ENSG00000123349	0.012659	-0.57916
CFL1	ENSG00000172757	0.026594	-0.57184
S100A6	ENSG00000197956	0.000249	-0.5583
ANXA2	ENSG00000182718	0.030668	-0.55689
LAPTM5	ENSG00000162511	0.017644	-0.51119

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