



Research article

Risk stratification of acute myeloid leukemia: Assessment using a novel prediction model based on ferroptosis-immune related genes

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Supplementary

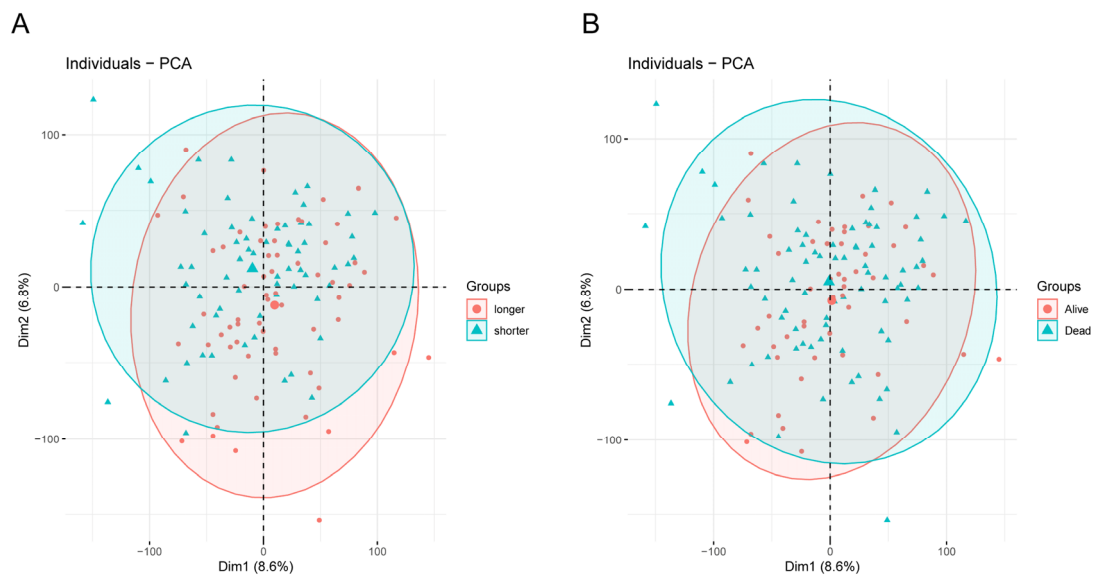


Figure S1. Principle component analysis (PCA)-based exploratory data analysis. (A and B) PCA of patients' survival time (A) and survival status (B).

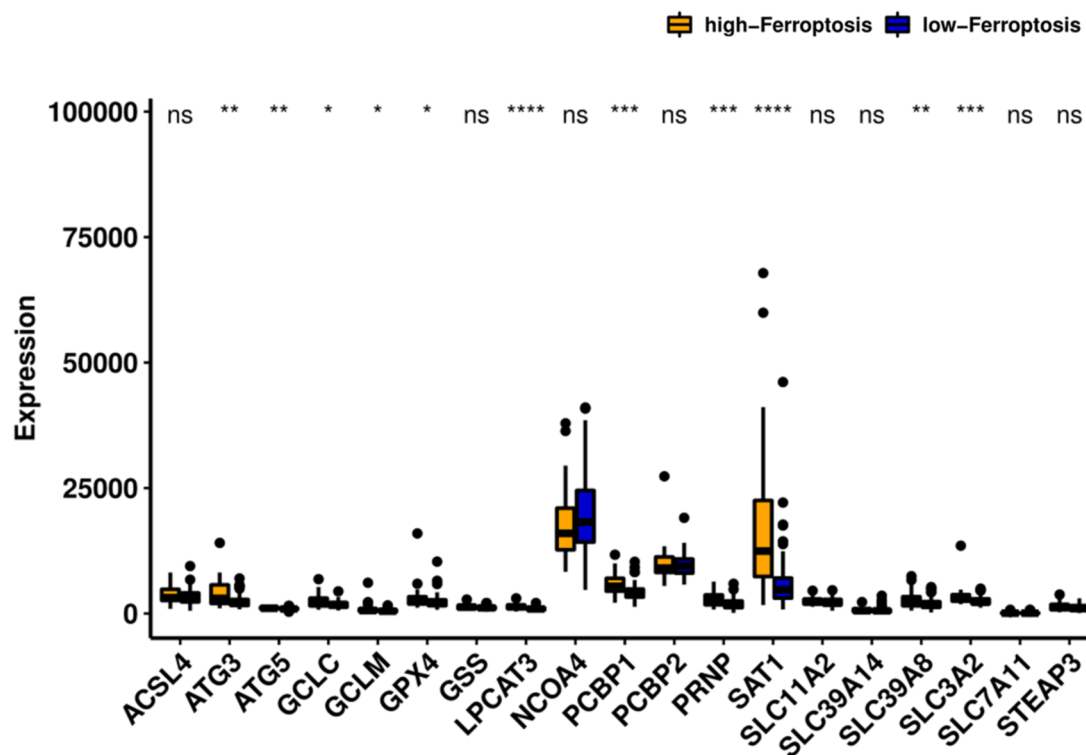


Figure S2. Expression of ferroptosis signal pathway-related marker genes in high- and low-ferroptosis score groups.

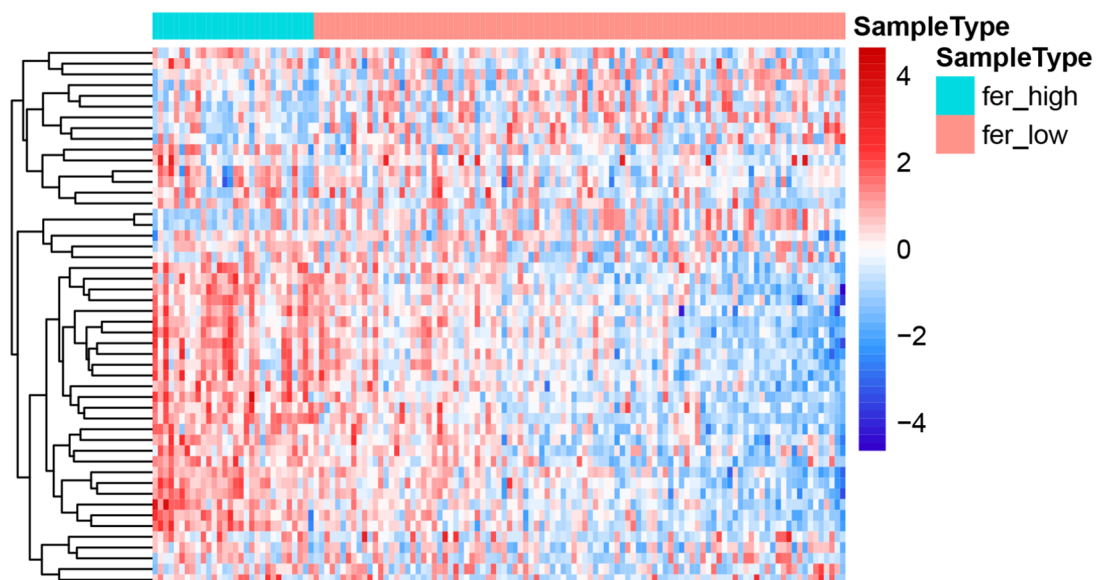


Figure S3. Expression of the top 50 differentially expressed genes between high- and low-ferroptosis score groups in The Cancer Genome Atlas dataset.

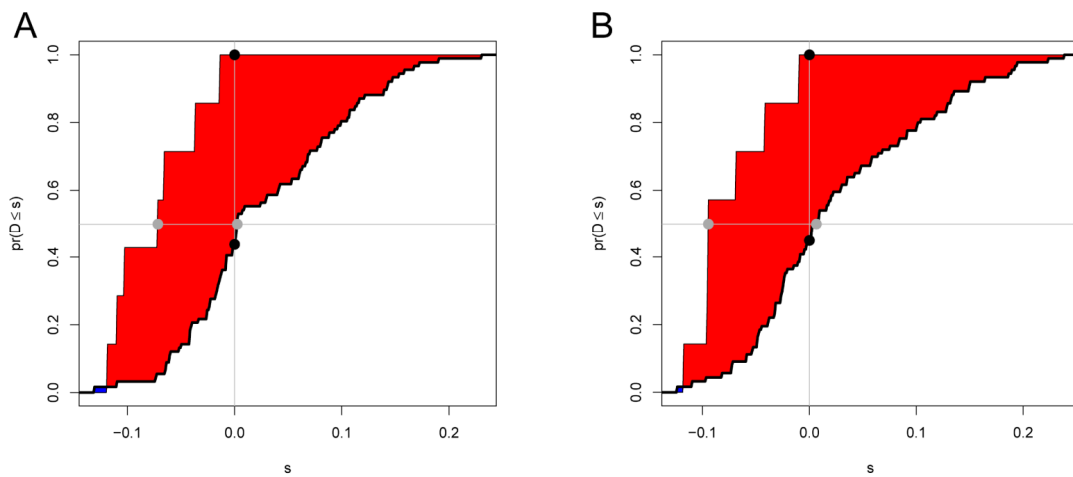


Figure S4. Measure of risk model performance with integrated discrimination improvement (IDI) analysis (A and B). Comparison with the model in PMID 3511195 (A) and PMID 35359394 (B).

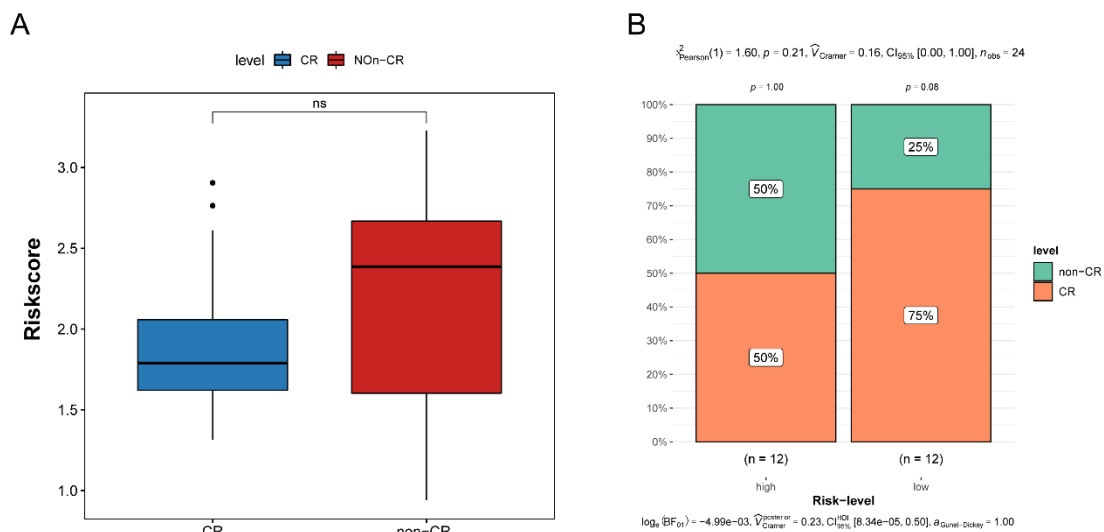


Figure S5. (A) Risk scores in AML patients achieved or did not achieve complete remission (CR). (B) The proportion of CR in AML patients in high- and low-risk groups.

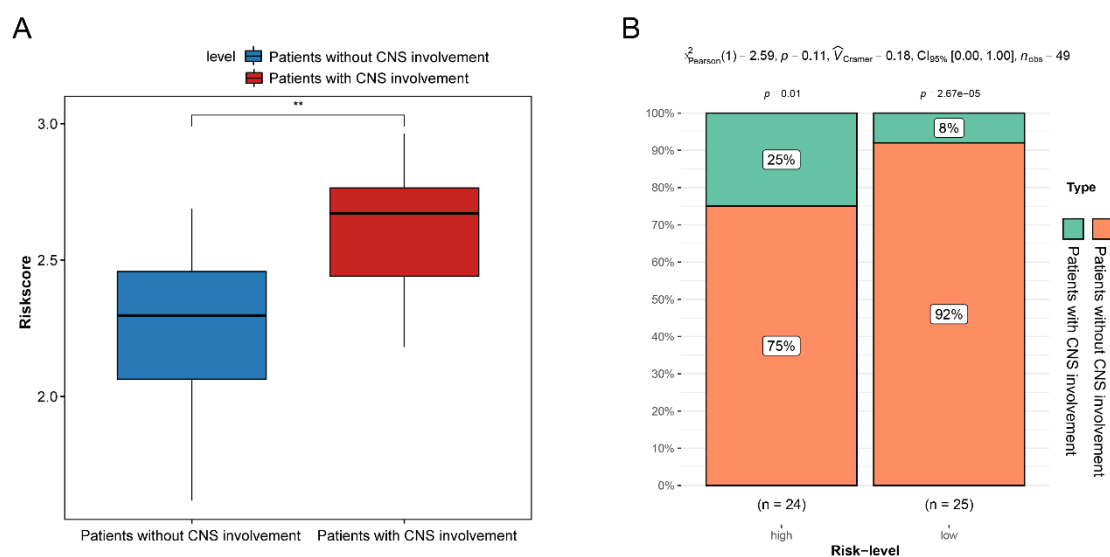


Figure S6. (A) Patients with CNS leukemia have higher risk score. (B) Patients in high-risk group have higher proportion of CNS leukemia.

Table S1. Function and references for R packages.

R package	References	Function
GSVA (v1.36.3)	[1]	Performing single sample GSEA (ssGSEA) analysis
survminer (v0.4.9)	[2]	Exploring the optimal cutpoint the optimal cutpoint
survival (v3.2-3)	[3]	Performing K-M survival analysis and log-rank test
survival ROC (v1.0.3)	[4,5]	Plotting ROC curves and measure AUC values to predictive efficiency of the risk model, the better efficiency associated to the bigger AUC value
limma (v3.44.3)	[6]	Performing differential expression analysis
clusterProfiler (v3.18.0)	[7]	Performing enrichment analyses
glmnet (v4.1-1)	[8]	Performing the LASSO regression analyses
pheatmap (v0.7.7)	[9,10]	Performing clustering analysis
Rtsne (v0.15)	[11,12]	Performing t-SNE analysis
rms (v6.2-0)	[13]	Developing the nomograms
nomogramEx (v3)	[13]	Developing the nomograms
regplot (v1.1)	[14]	Enhanced Regression Nomogram Plot
stdca (v1.4)	[15]	Plotting the decision curve analysis (DCA) which can assess the clinical net benefit of different probability thresholds to assess the clinical usefulness of the nomogram
pRRophetic (v0.5)	[16]	Studying the chemotherapy response
SubMap	[17]	Predicting the immunotherapy response of the AML patients in different riskscore subgroups
FactoMine	[18]	An R package dedicated to multivariate data analysis, which used for PCA analysis
survIDINRI	[19]	Performing integrated discrimination improvement (IDI) analysis, and assess risk model performance

Table S2. Clinical characteristics of patients in TCGA-LAML cohort, GSE37642, and GSE12417.

	TCGA-LAML	GSE37642	GSE12417
age(year)			
Mean (SD)	53.5 (\pm 16.3)	54.7 (\pm 14.9)	55.6 (\pm 14.9)
> 60	55 (42.6%)	179 (42.9%)	71 (43.8%)
\leq 60	74 (57.4%)	238 (50.1%)	91 (56.2%)
gender			
Female	60 (46.5%)	--	--
Male	69 (53.5%)	--	--
Race			
ASIAN	1 (0.8%)	--	--
BLACK OR AFRICAN AMERICAN	10 (7.9%)	--	--
WHITE	116 (91.3%)	--	--
WBC (10⁹/L)			
Mean (SD)	31.6 (\pm 37.5)	--	--
\leq 100	118 (91.5%)	--	--
> 100	8 (6.2%)	--	--
HB(g/dl)			
Mean (SD)	9.6 (\pm 1.4)	--	--
Platelet(10⁹/L)			
Mean (SD)	66.1 (\pm 55.3)	--	--
PB_blast (%)			
Mean (SD)	37.8 (\pm 30.9)	--	--
BM_blast (%)			
Mean (SD)	68.3 (\pm 19.6)	--	--
FAB			
M0	12 (9.3%)	14 (3.5%)	--
M1	31 (24.0%)	84 (20.9%)	--
M2	31 (24.0%)	117 (29.1%)	--
M3	14 (10.9%)	19 (4.7%)	--
M4	26 (20.2%)	104 (25.9%)	--
M5	12 (9.3%)	47 (11.7%)	--
M6	2 (1.6%)	15 (3.7%)	--
M7	1 (0.8%)	2 (0.5%)	--
OS (months)			
Mean (SD)	52.1 (\pm 50.4)	33.6 (\pm 45.0)	15.2 (\pm 14.1)
Vital			
Alive	51 (39.5%)	109 (26.1%)	59 (36.4%)
Dead	78 (60.5%)	308 (73.9%)	103 (63.6%)
runx1-runx1t1_fusion			
No	--	394 (94.5%)	--
Yes	--	23 (5.5%)	--
runx1_mutation			

No	--	311 (84.1%)	--
Yes	--	59 (15.9%)	--

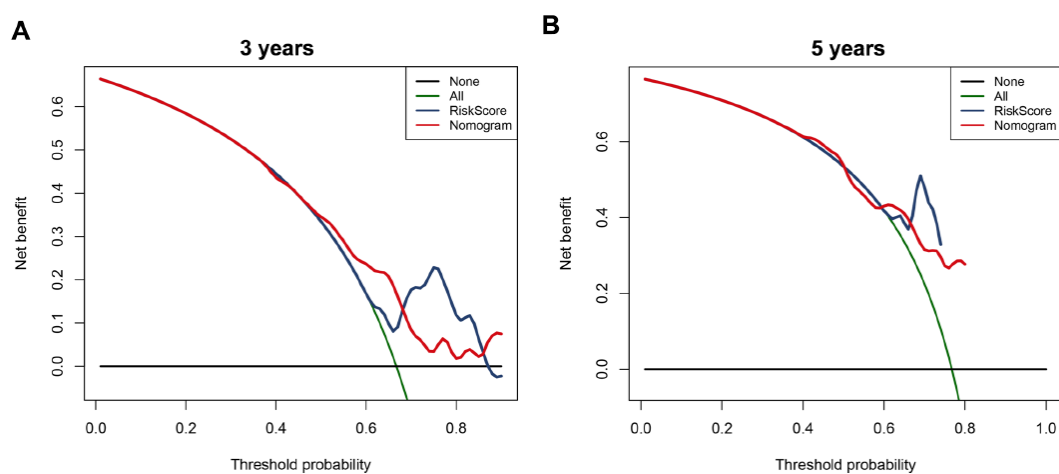


Figure S7. Comparison of the prognostic efficiency of the simple risk model with that of the model incorporating clinical factors using decision curve analysis.

Table S3. Differentially expressed genes (DEGs) between high- and low-ferroptosis score groups.

	logFC	AveExpr	t	P.Value	adj.P.Val	B
PPARG	3.365348	5.502661	9.102211	8.42E-16	2.93E-11	25.15703
NPL	1.998661	8.449997	8.295335	8.39E-14	1.46E-09	20.78477
LGALS3	1.998512	9.004655	7.99565	4.49E-13	5.21E-09	19.19151
SAT1	1.370582	12.52423	7.736487	1.88E-12	1.31E-08	17.83003
CTSL	2.193301	7.457796	7.670724	2.70E-12	1.35E-08	17.48718
BLVRB	1.409563	9.854779	7.669326	2.72E-12	1.35E-08	17.4799
TMEM63B	1.001385	9.14389	7.567664	4.74E-12	1.77E-08	16.95214
OLFML2B	1.980766	6.980193	7.547949	5.27E-12	1.77E-08	16.85011
ACSL1	1.42775	11.59004	7.46912	8.09E-12	2.35E-08	16.44321
SDC2	2.521409	3.660791	7.380575	1.31E-11	3.50E-08	15.98823
ARL4A	1.222767	9.646983	7.216557	3.15E-11	6.19E-08	15.15145
PCOLCE	1.185431	6.621129	7.21366	3.20E-11	6.19E-08	15.13674
KIF1C	1.141016	9.42029	7.118977	5.30E-11	9.71E-08	14.65748
IRS2	1.37493	11.64003	7.078534	6.57E-11	1.04E-07	14.45363
CA2	1.83167	9.994002	7.019464	8.99E-11	1.25E-07	14.15683
CTSB	1.099153	13.11003	6.967262	1.18E-10	1.45E-07	13.89548
CXCR4	1.138417	12.76056	6.963588	1.21E-10	1.45E-07	13.87711
SATB2	1.850286	5.832654	6.935431	1.40E-10	1.62E-07	13.73656
TGM2	1.900281	7.445444	6.927572	1.46E-10	1.64E-07	13.69737
RGL3	1.561413	3.564759	6.846851	2.23E-10	2.12E-07	13.29611
PLAAT3	1.933035	6.210115	6.844556	2.25E-10	2.12E-07	13.28473
NIBAN2	1.833837	9.315942	6.83414	2.38E-10	2.14E-07	13.23312

SGCB	1.424963	5.899432	6.832546	2.40E-10	2.14E-07	13.22523
UPP1	1.569061	8.890758	6.780248	3.15E-10	2.60E-07	12.96671
SMARCD3	1.361011	8.88354	6.649426	6.20E-10	4.08E-07	12.3243
WIPI1	1.021984	8.178223	6.626219	6.99E-10	4.37E-07	12.21098
JDP2	1.001511	9.521293	6.621311	7.17E-10	4.37E-07	12.18704
SEPTIN10	1.67005	4.170488	6.618067	7.29E-10	4.37E-07	12.17123
PER1	1.247131	12.51222	6.599841	8.00E-10	4.72E-07	12.08243
GPNMB	1.782665	4.926561	6.595522	8.18E-10	4.74E-07	12.06141
BCL2L11	1.095785	9.423425	6.556881	9.97E-10	5.60E-07	11.87362
RTL8C	2.168237	7.607559	6.549055	1.04E-09	5.73E-07	11.83565
NT5DC2	1.269614	9.795467	6.534682	1.12E-09	6.07E-07	11.76599
CD276	2.195406	6.125985	6.482255	1.46E-09	7.58E-07	11.51255
SLED1	1.716731	5.791627	6.465907	1.59E-09	7.98E-07	11.43374
HMOX1	1.998296	8.287104	6.458085	1.65E-09	7.98E-07	11.39606
GADD45G	1.370297	3.772174	6.444401	1.77E-09	8.32E-07	11.33022
PCSK5	1.327989	6.404686	6.433731	1.87E-09	8.55E-07	11.27892
PLAUR	1.305281	10.30864	6.421463	1.99E-09	8.87E-07	11.22001
APOBEC3A	2.340986	7.251235	6.411925	2.09E-09	9.19E-07	11.17423
JAZF1	1.174641	8.822899	6.368867	2.59E-09	1.10E-06	10.96807
OSR2	1.501725	2.607279	6.349404	2.86E-09	1.18E-06	10.87512
RTL8B	2.260083	3.798038	6.301376	3.64E-09	1.39E-06	10.6464
LINC01127	2.31418	4.742875	6.294443	3.77E-09	1.41E-06	10.61346
ADAMTS2	2.993092	7.114318	6.288103	3.89E-09	1.43E-06	10.58336
DUSP1	1.121739	13.44458	6.275215	4.15E-09	1.49E-06	10.52222
BCL6	1.548909	10.39654	6.263407	4.40E-09	1.56E-06	10.46625
LMNA	1.806512	10.92614	6.260293	4.47E-09	1.57E-06	10.4515
HTRA1	1.754059	3.016894	6.230146	5.20E-09	1.75E-06	10.30893
NR4A2	1.537861	10.47905	6.229562	5.22E-09	1.75E-06	10.30617
PSAP	1.07964	14.55769	6.221553	5.43E-09	1.78E-06	10.26836
NINJ1	1.310291	9.241689	6.213422	5.65E-09	1.82E-06	10.23
C1QC	2.467078	5.89605	6.212167	5.69E-09	1.82E-06	10.22408
S100A6	1.3511	10.75076	6.209926	5.75E-09	1.82E-06	10.21351
TLE1	1.371167	8.188284	6.203684	5.93E-09	1.86E-06	10.18409
MYO7A	2.178052	6.704453	6.197494	6.12E-09	1.88E-06	10.15493
WLS	2.189541	4.219216	6.18147	6.63E-09	1.98E-06	10.07952
C1QA	2.489108	6.447611	6.176136	6.81E-09	2.01E-06	10.05444
SLC1A3	1.482443	8.541997	6.17291	6.92E-09	2.02E-06	10.03928
ADAMTS5	2.272385	3.530806	6.166288	7.15E-09	2.04E-06	10.00817
PI4K2A	1.247534	7.924402	6.155264	7.55E-09	2.14E-06	9.95642
PTGFR	2.392113	3.565842	6.138056	8.22E-09	2.31E-06	9.875749
KCNJ2	2.187098	4.223052	6.129147	8.59E-09	2.39E-06	9.834032
LINC02777	1.111375	2.854733	6.110658	9.41E-09	2.58E-06	9.747566
TSC22D3	1.011407	13.27275	6.097555	1.00E-08	2.66E-06	9.686373
KLF9	1.333883	8.855043	6.089965	1.04E-08	2.69E-06	9.650962

TUBB2A	1.529298	5.405866	6.087786	1.05E-08	2.70E-06	9.640802
BTNL9	1.704944	4.643512	6.066726	1.17E-08	2.93E-06	9.542699
SDC3	1.971449	6.563527	6.059454	1.21E-08	2.99E-06	9.508867
CDKN1A	1.431419	9.987405	6.057291	1.22E-08	3.00E-06	9.498808
ADGRL2	2.23687	4.177199	6.02253	1.45E-08	3.46E-06	9.337446
SMPDL3A	2.23962	4.758665	6.021126	1.46E-08	3.46E-06	9.330941
ID2	1.315159	10.01714	6.002983	1.60E-08	3.73E-06	9.246942
PID1	1.95297	4.659764	5.978543	1.80E-08	4.02E-06	9.134019
CD36	1.9622	11.67063	5.970519	1.87E-08	4.05E-06	9.097003
THBD	1.369102	7.243798	5.952849	2.04E-08	4.28E-06	9.015586
SMCO4	1.203904	7.731822	5.941186	2.16E-08	4.47E-06	8.961926
PDK4	2.249179	7.025798	5.940247	2.17E-08	4.47E-06	8.957608
MAFB	2.476412	8.573604	5.932411	2.25E-08	4.56E-06	8.921594
CTSH	1.123077	10.35386	5.929644	2.28E-08	4.60E-06	8.90888
PPIC	1.528445	3.222596	5.917559	2.42E-08	4.84E-06	8.853407
THBS1	2.208011	9.52719	5.903983	2.59E-08	5.03E-06	8.791165
RXRA	1.175722	10.86793	5.897707	2.67E-08	5.13E-06	8.762421
SLC22A15	2.293346	9.012739	5.877491	2.94E-08	5.50E-06	8.669952
CAVIN3	2.06278	3.338323	5.876355	2.96E-08	5.50E-06	8.664761
CPE	1.655005	2.376184	5.869798	3.05E-08	5.65E-06	8.634814
TUBA4A	1.348416	9.654142	5.864413	3.13E-08	5.76E-06	8.610233
HSPA6	1.630119	5.72423	5.842507	3.48E-08	6.09E-06	8.510373
NFIL3	1.119206	9.875031	5.820475	3.87E-08	6.67E-06	8.410168
TRPV4	1.679399	3.226238	5.809205	4.09E-08	6.94E-06	8.358994
S100A11	1.280861	11.00761	5.761606	5.14E-08	8.24E-06	8.143519
CCL3	1.33463	6.269856	5.751631	5.39E-08	8.49E-06	8.098495
TMTC1	1.938734	4.2402	5.751527	5.39E-08	8.49E-06	8.098027
EPB41L3	2.345984	6.499606	5.748335	5.47E-08	8.58E-06	8.083633
COPZ2	1.52136	4.658859	5.744769	5.57E-08	8.69E-06	8.067554
CR1	1.999548	9.111852	5.727558	6.04E-08	9.23E-06	7.990043
CKAP4	1.576225	8.911516	5.72692	6.06E-08	9.23E-06	7.98717
RNASE1	1.875896	5.747712	5.722235	6.20E-08	9.30E-06	7.966095
CDH10	1.456293	1.792558	5.721188	6.23E-08	9.30E-06	7.961386
HECW2	1.045113	4.971658	5.718875	6.30E-08	9.33E-06	7.950991
GRN	1.252835	13.56071	5.717004	6.35E-08	9.37E-06	7.942577
IL10	1.843882	3.932043	5.715962	6.39E-08	9.38E-06	7.937896
HES6	1.362379	6.645194	5.711896	6.51E-08	9.46E-06	7.919627
FCGR2A	1.539036	10.2392	5.693577	7.10E-08	1.01E-05	7.837412
CYP1B1	2.237299	7.603635	5.681552	7.52E-08	1.05E-05	7.783535
WDFY3	1.585601	10.0764	5.679446	7.60E-08	1.05E-05	7.774106
CST3	1.63715	12.12776	5.673162	7.83E-08	1.06E-05	7.745985
CDA	2.215251	7.584346	5.667031	8.06E-08	1.07E-05	7.718567
ZFP36	1.024232	12.9834	5.65803	8.41E-08	1.10E-05	7.678346
NCS1	1.637823	5.777641	5.657732	8.42E-08	1.10E-05	7.677014

TREM1	1.786792	9.3288	5.655555	8.51E-08	1.11E-05	7.667295
PSAT1	1.418306	5.874641	5.642333	9.06E-08	1.15E-05	7.608296
NOD2	1.650734	9.025831	5.641084	9.11E-08	1.16E-05	7.602732
MAP3K6	1.027874	8.940632	5.639587	9.17E-08	1.16E-05	7.596057
IGSF3	1.404059	4.205833	5.6262	9.77E-08	1.22E-05	7.536428
JUNB	1.001206	12.68682	5.620075	1.01E-07	1.25E-05	7.509175
RTL8A	1.681145	7.525234	5.611418	1.05E-07	1.28E-05	7.47069
SERINC2	1.909047	6.518673	5.611019	1.05E-07	1.28E-05	7.468919
LILRB5	1.56642	4.562079	5.602671	1.09E-07	1.30E-05	7.431841
RIN1	1.308487	7.777914	5.591103	1.15E-07	1.36E-05	7.380519
C4A	1.037461	4.96798	5.58694	1.18E-07	1.37E-05	7.362066
FCER1G	1.529175	10.90455	5.576439	1.24E-07	1.42E-05	7.315555
UBTD1	1.030518	7.268396	5.555364	1.36E-07	1.54E-05	7.222379
ITGA1	1.471066	5.831374	5.552384	1.38E-07	1.55E-05	7.20922
PHLDA1	1.371444	7.123777	5.546232	1.42E-07	1.58E-05	7.182072
CLEC4G	1.689416	4.482857	5.538334	1.48E-07	1.62E-05	7.147243
IL17RA	1.205495	12.79562	5.536622	1.49E-07	1.63E-05	7.139698
RAB11FIP5	1.672104	6.174197	5.524648	1.57E-07	1.69E-05	7.08697
TIMP4	1.799686	3.683453	5.524281	1.58E-07	1.69E-05	7.085353
CACNA2D1	1.570097	2.254449	5.50685	1.71E-07	1.78E-05	7.008725
TPRG1	1.312679	4.531498	5.505873	1.72E-07	1.78E-05	7.004431
HK3	2.378493	9.272542	5.501765	1.75E-07	1.81E-05	6.986397
SERPINA1	2.428549	10.92811	5.50093	1.76E-07	1.81E-05	6.982733
MRAS	1.859818	6.155884	5.500429	1.76E-07	1.81E-05	6.980534
SPR	1.301761	5.130844	5.485084	1.89E-07	1.91E-05	6.913249
FPR1	2.278529	8.193822	5.483083	1.91E-07	1.92E-05	6.904486
FCN1	2.218841	11.22111	5.480461	1.93E-07	1.93E-05	6.893004
RN7SL368P	1.421645	5.879281	5.479725	1.94E-07	1.93E-05	6.889779
PPFIBP2	1.267708	7.65402	5.477511	1.96E-07	1.93E-05	6.880089
C4B	1.221165	4.191643	5.472134	2.01E-07	1.96E-05	6.85656
SCPEP1	1.539082	10.64435	5.468506	2.04E-07	1.98E-05	6.840691
WDFY3.AS2	1.283693	2.717095	5.46826	2.05E-07	1.98E-05	6.839619
SIGLEC7	1.809856	6.373029	5.465305	2.07E-07	1.98E-05	6.826698
CLEC4E	2.487314	5.901519	5.456948	2.16E-07	2.04E-05	6.790191
SPATS2L	1.42649	7.525179	5.450447	2.22E-07	2.08E-05	6.761811
C1QB	2.241969	6.210733	5.44219	2.31E-07	2.14E-05	6.7258
JUN	1.38977	11.56333	5.4387	2.35E-07	2.17E-05	6.710592
TLR4	1.495173	10.59031	5.436892	2.37E-07	2.17E-05	6.702713
SPATA18	1.911136	3.817187	5.436463	2.37E-07	2.17E-05	6.700844
SLC2A3	1.068558	11.84258	5.42952	2.45E-07	2.22E-05	6.670613
SGSH	1.437538	8.854076	5.427056	2.48E-07	2.23E-05	6.659888
FCN2	1.301084	2.219775	5.409449	2.69E-07	2.38E-05	6.583352
EPOR	1.099826	8.180501	5.407791	2.71E-07	2.39E-05	6.576154
KCNE1	1.71001	6.937264	5.405181	2.74E-07	2.41E-05	6.564825

RASSF4	1.446328	10.64968	5.39481	2.87E-07	2.50E-05	6.51984
HNMT	2.183323	7.220035	5.390356	2.93E-07	2.53E-05	6.500538
BASP1	1.866528	8.927091	5.388695	2.96E-07	2.55E-05	6.493342
SPTBN4	1.025238	3.65106	5.386815	2.98E-07	2.56E-05	6.485201
NFAM1	1.930465	10.62588	5.379255	3.09E-07	2.62E-05	6.452476
SLAMF1	1.024715	6.935798	5.37688	3.12E-07	2.64E-05	6.4422
CD151	1.005787	10.31441	5.374611	3.15E-07	2.66E-05	6.432388
PTPRU	1.558549	4.650782	5.369575	3.23E-07	2.72E-05	6.410615
CAMK1	1.276726	6.737882	5.367618	3.26E-07	2.73E-05	6.40216
RRAS	1.011577	8.005286	5.36576	3.28E-07	2.73E-05	6.394132
RGS2	1.588231	10.03329	5.362403	3.34E-07	2.77E-05	6.379634
RPL36AP41	1.341673	2.115211	5.36132	3.35E-07	2.78E-05	6.374955
RN7SL552P	1.001211	1.450448	5.335072	3.78E-07	3.07E-05	6.261809
PTPRJ	1.251746	11.00406	5.326027	3.94E-07	3.17E-05	6.222904
SHISA4	1.176793	4.214356	5.324081	3.97E-07	3.19E-05	6.214539
TSHZ3	1.850473	6.946245	5.323453	3.99E-07	3.19E-05	6.21184
ITGAM	1.418562	11.46099	5.321143	4.03E-07	3.20E-05	6.201913
CRISPLD2	1.745836	7.945642	5.320996	4.03E-07	3.20E-05	6.201283
MYO1C	1.121881	8.570803	5.320521	4.04E-07	3.20E-05	6.199242
LONRF3	1.379455	7.678153	5.318771	4.07E-07	3.22E-05	6.191725
AIM2	1.219388	5.975794	5.310496	4.23E-07	3.31E-05	6.156197
DCBLD1	1.416389	6.865416	5.290673	4.63E-07	3.56E-05	6.071244
PNPLA1	1.522665	4.843073	5.28565	4.74E-07	3.63E-05	6.049749
PELI1	1.04159	9.970379	5.274378	4.98E-07	3.75E-05	6.001562
SH3BP5	1.176162	6.956822	5.262434	5.26E-07	3.86E-05	5.950577
SIK1B	1.460505	6.863084	5.261272	5.29E-07	3.87E-05	5.945623
CT75	1.32979	2.486234	5.259896	5.32E-07	3.88E-05	5.939752
CLTCL1	1.981671	9.097229	5.254176	5.46E-07	3.97E-05	5.915372
RASL11A	1.050114	5.306004	5.252394	5.51E-07	3.99E-05	5.907779
CD163	2.616801	8.704029	5.249083	5.59E-07	4.03E-05	5.893675
TNFAIP6	1.489897	4.895072	5.24836	5.61E-07	4.03E-05	5.890596
CEBPB	1.118817	9.800593	5.243207	5.74E-07	4.09E-05	5.868661
LINC00656	1.207163	1.934873	5.241399	5.79E-07	4.11E-05	5.860968
CD4	1.339127	11.40466	5.228247	6.14E-07	4.30E-05	5.805063
TYMP	1.341347	10.41231	5.227289	6.17E-07	4.31E-05	5.800996
UCHL1	1.744167	3.394849	5.226611	6.19E-07	4.31E-05	5.798116
SERPINB2	2.275693	6.946194	5.219475	6.39E-07	4.43E-05	5.767828
STX11	1.287566	9.408356	5.203461	6.87E-07	4.72E-05	5.699957
PTAFR	1.536742	10.52137	5.202516	6.90E-07	4.73E-05	5.695956
CD163L1	1.522886	4.487869	5.190184	7.29E-07	4.94E-05	5.643791
KLF4	1.827278	10.09731	5.187924	7.37E-07	4.96E-05	5.634239
SNX24	1.140194	6.563576	5.187045	7.40E-07	4.96E-05	5.630525
CEBPD	1.324855	10.2146	5.179923	7.64E-07	5.07E-05	5.600446
FAM110B	1.973827	4.900289	5.169989	7.98E-07	5.26E-05	5.558542

HBEGF	1.418254	8.891222	5.143229	9.00E-07	5.83E-05	5.445921
DAAM2	1.952245	4.286473	5.139708	9.14E-07	5.89E-05	5.43113
SRGAP1	1.280732	7.970964	5.139603	9.15E-07	5.89E-05	5.430692
STS	1.023911	8.879654	5.135603	9.31E-07	5.97E-05	5.4139
CYP19A1	1.234558	2.2436	5.13481	9.35E-07	5.97E-05	5.41057
S1PR3	1.848223	7.141069	5.133124	9.42E-07	6.00E-05	5.403494
BAG3	1.417788	6.201089	5.131422	9.49E-07	6.04E-05	5.396355
FBP1	1.77617	7.835841	5.122029	9.90E-07	6.24E-05	5.35698
RHOU	1.337835	8.759221	5.117412	1.01E-06	6.33E-05	5.33764
RCN3	1.378212	7.166241	5.114353	1.02E-06	6.40E-05	5.324837
TBC1D12	1.678056	5.708709	5.113266	1.03E-06	6.40E-05	5.320284
CHPF	1.119098	6.997634	5.105805	1.06E-06	6.57E-05	5.28908
CD200R1	1.317406	6.849987	5.100331	1.09E-06	6.70E-05	5.266203
BMP2	1.786325	3.077659	5.083695	1.17E-06	7.06E-05	5.196779
C3	1.266048	5.659852	5.078421	1.20E-06	7.18E-05	5.174801
PLEKHH3	1.149454	6.94252	5.069874	1.25E-06	7.37E-05	5.13922
FCGRT	1.198135	10.94788	5.068702	1.25E-06	7.37E-05	5.134343
ITGA7	1.416255	8.095593	5.066896	1.26E-06	7.37E-05	5.126832
KRT23	2.036936	2.845336	5.059028	1.31E-06	7.53E-05	5.094126
PTGER3	2.12841	4.75103	5.048131	1.37E-06	7.80E-05	5.048883
NHS	1.380885	5.431225	5.045387	1.39E-06	7.83E-05	5.037499
CDC42EP1	1.777343	5.635341	5.042016	1.41E-06	7.89E-05	5.023523
KCNJ2.AS1	1.357394	2.358031	5.041881	1.41E-06	7.89E-05	5.022963
TP53INP2	1.420732	9.613263	5.03525	1.45E-06	8.07E-05	4.995489
NECAB2	1.020539	1.418353	5.030622	1.48E-06	8.22E-05	4.97633
MARCKS	1.529106	8.958023	5.029884	1.49E-06	8.24E-05	4.973277
SIRPB1	1.881869	9.692293	5.028586	1.50E-06	8.27E-05	4.967904
CYBB	1.775408	12.26599	5.027991	1.50E-06	8.28E-05	4.965444
TESC	1.174764	8.945015	5.024795	1.52E-06	8.36E-05	4.952221
SLC26A11	1.14149	6.967413	5.01678	1.58E-06	8.57E-05	4.919092
TP73.AS3	1.354081	2.284862	5.011933	1.61E-06	8.71E-05	4.899078
SGK1	1.423583	9.118684	5.000317	1.70E-06	9.05E-05	4.851158
HCAR3	1.293439	4.888106	4.999725	1.70E-06	9.06E-05	4.848718
PLEKHN1	1.196638	4.341329	4.998213	1.71E-06	9.09E-05	4.842488
TMEM176A	1.954035	6.6025	4.996112	1.73E-06	9.14E-05	4.833831
RGS16	1.236002	4.295512	4.985268	1.81E-06	9.50E-05	4.789193
DGAT2	1.284275	7.095966	4.983951	1.82E-06	9.52E-05	4.783778
LYZ	2.011559	15.22259	4.982491	1.83E-06	9.53E-05	4.777773
GASK1B	1.859999	9.19635	4.98122	1.84E-06	9.56E-05	4.772548
MNDA	1.517552	11.624	4.969664	1.94E-06	9.90E-05	4.725079
MOCS1	1.605881	3.873017	4.968584	1.95E-06	9.93E-05	4.720648
CHSY3	1.382598	2.736557	4.963629	1.99E-06	0.000101	4.700319
PILRA	1.067101	9.403714	4.963565	1.99E-06	0.000101	4.700054
SLC12A8	1.002366	4.167579	4.959772	2.03E-06	0.000102	4.684504

LINC00968	1.575733	4.813747	4.953979	2.08E-06	0.000104	4.66077
TRIB1	1.067693	11.14727	4.945609	2.16E-06	0.000107	4.626508
ADAM9	1.025687	9.643212	4.931866	2.29E-06	0.000112	4.570345
APOA2	1.338427	5.017522	4.929227	2.31E-06	0.000113	4.559573
RNU6ATAC35P	1.251066	2.488966	4.920683	2.40E-06	0.000117	4.524723
VCAN	2.475594	12.39153	4.920451	2.41E-06	0.000117	4.523774
SCML1	1.128349	6.761975	4.917484	2.44E-06	0.000118	4.511682
ARHGAP29	1.511819	4.246193	4.915195	2.46E-06	0.000118	4.502359
CNR1	1.26823	3.164618	4.914375	2.47E-06	0.000119	4.49902
SMIM10	1.483427	6.56771	4.912444	2.49E-06	0.000119	4.491156
VEGFC	1.434225	3.589103	4.903765	2.59E-06	0.000123	4.455838
LRRC66	1.047287	2.061018	4.903608	2.59E-06	0.000123	4.455198
ELOVL3	1.497404	3.62909	4.893963	2.70E-06	0.000127	4.416002
PPP1R14C	1.580764	2.758198	4.893371	2.71E-06	0.000127	4.413598
EDNRB	1.519402	3.479755	4.884361	2.81E-06	0.000132	4.377034
SLCO2B1	1.597548	4.607931	4.871711	2.97E-06	0.000137	4.32578
MAB21L3	1.37433	2.531611	4.871334	2.98E-06	0.000137	4.324251
MMP19	1.554263	7.345474	4.867335	3.03E-06	0.000139	4.30807
C1orf226	1.786126	4.787846	4.866994	3.03E-06	0.000139	4.306691
CCL20	1.037444	1.205785	4.866836	3.03E-06	0.000139	4.30605
GLDN	1.712435	4.827114	4.861569	3.10E-06	0.000141	4.284751
COPDA1	1.089089	2.708184	4.854783	3.20E-06	0.000144	4.257333
SERPINB10	1.840862	7.853668	4.840412	3.40E-06	0.000151	4.199358
FAM20C	1.484149	7.813352	4.836306	3.46E-06	0.000153	4.182818
STRIP2	1.000604	6.783673	4.829845	3.56E-06	0.000155	4.156807
ZFP36L1	1.095263	10.75054	4.828135	3.58E-06	0.000156	4.149925
PCOLCE2	1.920603	3.041486	4.827123	3.60E-06	0.000156	4.145855
FAM114A1	1.016336	7.015307	4.801372	4.02E-06	0.000171	4.042473
C2	1.628331	6.428145	4.800962	4.03E-06	0.000171	4.040833
CD14	2.329247	8.79509	4.798561	4.07E-06	0.000172	4.031213
LINC02518	1.097958	1.356818	4.790417	4.21E-06	0.000177	3.998613
IL4I1	1.157225	5.133805	4.770051	4.60E-06	0.000187	3.917257
EFEMP1	1.712781	2.905088	4.768626	4.63E-06	0.000188	3.911577
PDLIM4	1.094252	3.539591	4.761401	4.77E-06	0.000192	3.882779
PLD2	1.183543	7.818858	4.756883	4.86E-06	0.000195	3.864787
IGHA1	1.435941	13.38118	4.755616	4.89E-06	0.000195	3.859745
IGLV10.54	1.658698	4.76231	4.749812	5.01E-06	0.000199	3.836656
LPL	1.921231	6.167015	4.741754	5.19E-06	0.000205	3.804631
CD1D	1.895328	7.889543	4.735454	5.33E-06	0.000208	3.77962
EIF5A2	1.019719	6.512496	4.734549	5.35E-06	0.000209	3.77603
CDHR1	1.182496	4.765083	4.722892	5.62E-06	0.000216	3.729821
CLU	1.788434	10.23744	4.722102	5.64E-06	0.000217	3.726693
ASGR2	1.961925	6.256638	4.714268	5.83E-06	0.000221	3.695691
FOLR2	1.428809	4.437048	4.711116	5.90E-06	0.000223	3.683228

CPM	1.558548	7.941044	4.705365	6.05E-06	0.000227	3.660499
PKDCC	1.3872	2.989364	4.690859	6.43E-06	0.000237	3.603266
CES1	2.652231	5.373103	4.688829	6.49E-06	0.000238	3.595267
ADM	1.466677	5.464059	4.685641	6.58E-06	0.00024	3.58271
SIGLEC9	1.765361	7.857846	4.682516	6.66E-06	0.000242	3.570405
SLC2A10	1.608069	4.956402	4.676969	6.82E-06	0.000246	3.548579
PRUNE2	1.032638	7.983068	4.670128	7.02E-06	0.000252	3.52169
MMRN2	1.258412	4.12532	4.66741	7.10E-06	0.000254	3.511016
TNFSF10	1.027081	9.898859	4.661307	7.28E-06	0.000259	3.487059
ODF3B	1.128541	8.493043	4.655922	7.45E-06	0.000263	3.465941
GAS2L3	1.265419	7.035707	4.655441	7.47E-06	0.000263	3.464056
CYP1B1.AS1	1.247402	4.262666	4.640185	7.96E-06	0.000276	3.404324
GPR88	1.316047	5.032304	4.639237	7.99E-06	0.000276	3.400618
FZD4	1.174283	4.486565	4.638009	8.03E-06	0.000277	3.395819
SOBP	1.104336	3.958158	4.637456	8.05E-06	0.000277	3.393656
KLF11	1.184427	9.582037	4.628247	8.37E-06	0.000287	3.357686
SLC11A1	1.763349	9.923246	4.627066	8.41E-06	0.000287	3.353075
ISL2	1.001824	1.989699	4.62347	8.54E-06	0.000291	3.339045
TMEM150B	1.332696	7.112557	4.619102	8.69E-06	0.000294	3.322015
CAMSAP2	1.119378	6.209301	4.618528	8.71E-06	0.000295	3.319778
LRP1	1.882054	11.45204	4.615579	8.82E-06	0.000298	3.308287
CCDC170	1.552225	4.96592	4.603323	9.28E-06	0.00031	3.260589
RND3	1.416484	2.143207	4.602646	9.31E-06	0.000311	3.25796
PDE4A	1.27236	7.827206	4.599417	9.44E-06	0.000313	3.24541
C5AR1	1.847764	9.24243	4.596915	9.53E-06	0.000315	3.23569
CLEC4D	2.043828	5.36176	4.595892	9.58E-06	0.000316	3.231717
CDKN2A	1.393816	6.781265	4.593302	9.68E-06	0.000317	3.221659
JAZF1.AS1	1.184337	2.834833	4.589975	9.81E-06	0.00032	3.208749
ARHGEF11	1.454686	9.879452	4.587467	9.92E-06	0.000323	3.19902
DDIT4	1.302368	8.8145	4.587326	9.92E-06	0.000323	3.198475
FCAR	1.804147	8.016186	4.582365	1.01E-05	0.000329	3.179244
MAP3K21	1.215202	7.266841	4.582002	1.01E-05	0.000329	3.177835
IGHA2	1.43525	10.12282	4.576518	1.04E-05	0.000336	3.156594
KITLG	1.46053	5.137849	4.571629	1.06E-05	0.00034	3.137675
TMEM176B	1.862093	7.191768	4.570317	1.06E-05	0.000341	3.132599
FAM157C	1.317775	6.778717	4.565891	1.08E-05	0.000347	3.115488
SYN2	1.179841	3.879272	4.562437	1.10E-05	0.00035	3.102142
ZC2HC1A	1.376156	5.501268	4.562211	1.10E-05	0.00035	3.101268
IGHV1.12	1.005085	1.709688	4.558605	1.12E-05	0.000354	3.087342
AFDN	1.337732	7.667037	4.556818	1.13E-05	0.000355	3.080445
ASRGL1	1.189246	8.457944	4.55457	1.14E-05	0.000357	3.071772
METRNL	1.016283	8.585858	4.552103	1.15E-05	0.00036	3.062256
C1orf115	1.164418	4.255057	4.547363	1.17E-05	0.000366	3.043984
APOE	1.28468	6.759694	4.54277	1.19E-05	0.00037	3.026293

TOX2	1.160002	4.203134	4.541681	1.20E-05	0.000372	3.022101
ABLIM3	1.429936	4.744009	4.531123	1.25E-05	0.000387	2.981488
RBM47	1.702855	9.601432	4.530311	1.26E-05	0.000387	2.978367
SPOCK1	1.625388	4.746892	4.523854	1.29E-05	0.000394	2.953566
IGHV3OR16.9	1.183686	2.27923	4.5196	1.31E-05	0.000398	2.93724
NGFR	1.212434	5.278297	4.519532	1.31E-05	0.000398	2.936982
SRGN	1.174591	15.1035	4.51651	1.33E-05	0.000402	2.925391
MARCO	2.100887	5.056139	4.511422	1.36E-05	0.000408	2.905892
MEFV	1.88349	8.1633	4.503898	1.40E-05	0.000417	2.877083
S100A8	2.207778	11.21536	4.503593	1.40E-05	0.000417	2.875916
IGF2R	1.14932	11.10145	4.502703	1.41E-05	0.000418	2.87251
MYO10	1.23416	5.527548	4.496261	1.45E-05	0.000427	2.847878
IGF1	1.025939	2.089345	4.495448	1.45E-05	0.000428	2.844774
FABP4	1.740493	3.652711	4.49371	1.46E-05	0.000429	2.838133
GAS2L1	1.157579	7.895474	4.490006	1.48E-05	0.000434	2.823989
PADI2	1.490394	8.551597	4.483174	1.52E-05	0.000445	2.797919
HSD3B7	1.015055	6.121502	4.467079	1.63E-05	0.00047	2.736625
ADA2	1.044349	12.62828	4.466691	1.63E-05	0.00047	2.735152
IGHV1OR21.1	1.002021	1.514235	4.464908	1.64E-05	0.000473	2.72837
IL1R1	1.453697	7.413616	4.462867	1.66E-05	0.000476	2.720612
NOS1AP	1.545891	4.746983	4.456902	1.70E-05	0.000485	2.697953
VEGFA	1.147053	9.339884	4.456241	1.70E-05	0.000486	2.695444
LGALS12	1.621905	7.695748	4.453121	1.72E-05	0.00049	2.683604
EMP2	1.221159	5.055114	4.451812	1.73E-05	0.000491	2.678635
LDLRAD3	1.865762	7.452955	4.438712	1.83E-05	0.000511	2.628995
FHDC1	1.153263	7.117449	4.437471	1.84E-05	0.000513	2.6243
IGHV1.67	1.214351	2.96694	4.43256	1.87E-05	0.00052	2.605721
TRPM4	1.715152	5.73285	4.432435	1.88E-05	0.00052	2.605246
EXT1	1.134178	6.869739	4.430435	1.89E-05	0.000523	2.597686
PRDX2	1.062671	10.07768	4.425379	1.93E-05	0.000532	2.578583
COL11A1	1.481602	2.242628	4.425214	1.93E-05	0.000532	2.577958
DPF3	1.072069	4.690123	4.414459	2.02E-05	0.000547	2.537379
P3H2	1.321211	4.005347	4.407346	2.08E-05	0.000556	2.510581
MORC4	1.078006	5.4446	4.406735	2.08E-05	0.000557	2.508277
SNX7	1.200934	2.135295	4.405641	2.09E-05	0.000558	2.504162
NID1	1.71795	9.290104	4.403538	2.11E-05	0.000562	2.496244
PLA2G7	1.538646	3.894764	4.403274	2.11E-05	0.000562	2.495251
NAV3	2.00151	5.32792	4.395227	2.18E-05	0.000577	2.464994
SHROOM2	1.225243	2.357985	4.394748	2.18E-05	0.000578	2.463194
OSBPL6	1.363795	3.949606	4.393497	2.20E-05	0.00058	2.458494
APBB2	1.307241	5.807673	4.390194	2.23E-05	0.000585	2.44609
IL1R2	2.034529	4.894149	4.38773	2.25E-05	0.000589	2.436843
FNDC10	1.022726	8.338628	4.385906	2.26E-05	0.000593	2.429999
NR4A1	1.253323	9.475737	4.377404	2.34E-05	0.000609	2.398126

CHST15	1.585056	8.897001	4.3728	2.39E-05	0.000618	2.380885
RNU6.917P	1.210422	1.993808	4.363759	2.48E-05	0.000636	2.347067
TSPAN12	1.247771	1.988581	4.359683	2.52E-05	0.000642	2.33184
TWIST2	1.02322	1.731629	4.35964	2.52E-05	0.000642	2.33168
PHLDA2	1.103934	3.526776	4.354955	2.56E-05	0.000651	2.314187
DTNA	2.151668	5.534194	4.350258	2.61E-05	0.000659	2.296669
SLC6A9	1.124006	6.783753	4.348167	2.64E-05	0.000662	2.288872
ARHGAP24	1.158553	7.004581	4.344897	2.67E-05	0.000668	2.276686
MB21D2	1.026634	3.612271	4.339655	2.73E-05	0.000679	2.257168
SPIRE1	1.223086	7.191113	4.332759	2.80E-05	0.000695	2.231519
TNFSF12	1.078538	7.241571	4.33243	2.81E-05	0.000696	2.230296
SMARCA1	1.692368	4.518505	4.329158	2.84E-05	0.000701	2.218137
IL13RA1	1.180503	10.3313	4.328213	2.85E-05	0.000702	2.214625
IL1RN	1.637674	7.795145	4.32404	2.90E-05	0.000711	2.199131
NRN1	1.084243	2.71192	4.322413	2.92E-05	0.000713	2.193094
IGKV1D.8	1.193659	4.175345	4.31526	3.01E-05	0.000727	2.166566
KCNQ1	1.204358	8.317036	4.314641	3.01E-05	0.000728	2.164273
IGHV4.34	1.213912	7.474583	4.306488	3.11E-05	0.000745	2.134081
TMEM38A	1.061539	5.346011	4.305161	3.13E-05	0.000747	2.129173
NR2F2	1.500559	3.240477	4.3014	3.18E-05	0.000756	2.115262
LINC01655	1.072175	1.231422	4.300054	3.19E-05	0.000759	2.110287
IGHV5.51	1.265308	8.49623	4.298921	3.21E-05	0.000762	2.1061
SOWAHC	1.10926	3.110512	4.294154	3.27E-05	0.000773	2.088494
CTTNBP2	1.113981	1.850655	4.278531	3.48E-05	0.00081	2.030886
VDR	1.177185	8.532134	4.275664	3.52E-05	0.000816	2.020333
NRGN	1.3338	9.497282	4.275252	3.52E-05	0.000817	2.018817
BLVRA	1.132293	8.387121	4.2704	3.59E-05	0.000829	2.00097
HID1	1.04055	5.599719	4.267921	3.63E-05	0.000834	1.991855
CCR1	1.390819	9.105356	4.262221	3.71E-05	0.000848	1.970917
IGKV1D.39	1.120275	1.52612	4.259403	3.75E-05	0.000854	1.960576
DAAM2.AS1	1.368591	2.804124	4.254573	3.83E-05	0.000867	1.942859
IGLL5	1.320531	8.480203	4.254181	3.83E-05	0.000867	1.941423
LINC01637	1.120527	6.292134	4.253978	3.83E-05	0.000867	1.940678
S100A9	2.096453	11.94646	4.253769	3.84E-05	0.000867	1.939909
IGHV1OR15.9	1.199275	2.415673	4.249873	3.90E-05	0.000877	1.925632
ADAMDEC1	1.423288	4.29876	4.247678	3.93E-05	0.000884	1.917595
STAB1	1.919186	13.08024	4.245997	3.96E-05	0.00089	1.91144
LILRA6	1.661833	7.462657	4.239696	4.06E-05	0.000907	1.888384
TENM4	1.246576	4.763895	4.239673	4.06E-05	0.000907	1.888303
MYOSLID	1.024838	3.706926	4.236661	4.11E-05	0.000914	1.877292
SFTPD	1.074679	2.274056	4.235841	4.12E-05	0.000916	1.874294
LIMCH1	1.430315	3.941601	4.22857	4.24E-05	0.000935	1.847743
HCK	1.11713	11.02189	4.228141	4.25E-05	0.000935	1.846176
ACSS3	1.443113	3.558617	4.226651	4.27E-05	0.000938	1.840743

MS4A7	1.191735	10.1556	4.224153	4.31E-05	0.000946	1.831631
HAL	1.125525	9.98633	4.223001	4.33E-05	0.000949	1.82743
RNASE2	1.360896	12.23483	4.220685	4.37E-05	0.000954	1.81899
LRRC32	1.296617	4.564852	4.218768	4.41E-05	0.00096	1.812003
CDKL5	1.080731	7.586002	4.217877	4.42E-05	0.000962	1.808759
SHROOM1	1.142428	5.30468	4.212277	4.52E-05	0.00098	1.788371
DHCR24	1.068866	9.839849	4.20905	4.58E-05	0.000987	1.776633
TLR5	1.598848	7.315843	4.206528	4.62E-05	0.000995	1.767465
IGHV1.3	1.263553	2.739957	4.205517	4.64E-05	0.000998	1.76379
IGHV3.62	1.046757	2.279762	4.204926	4.65E-05	0.000999	1.761642
IGHV3.15	1.27132	8.004372	4.201326	4.72E-05	0.001009	1.748564
IGHV1.58	1.191511	4.924	4.193524	4.86E-05	0.001034	1.720256
PTPRG	1.717942	5.121434	4.187857	4.97E-05	0.001053	1.699716
SEMA6B	1.080612	6.196885	4.186234	5.00E-05	0.001057	1.693838
TMOD1	1.041422	6.893	4.182633	5.08E-05	0.001068	1.680802
IGKV1OR2.108	1.257822	3.6024	4.180167	5.12E-05	0.001073	1.671882
IGHV3.60	1.030651	2.002843	4.178242	5.16E-05	0.001079	1.664918
SIGLEC11	1.427498	4.152685	4.176499	5.20E-05	0.001086	1.658617
TP73	1.155832	6.244244	4.166439	5.41E-05	0.00112	1.622286
MOCOS	1.224051	3.412453	4.166001	5.42E-05	0.001121	1.620707
PRKAR2B	1.092811	9.884214	4.16208	5.50E-05	0.001132	1.606565
TMEM37	1.197396	3.946225	4.162003	5.50E-05	0.001132	1.606289
XK	1.359272	7.692653	4.16175	5.51E-05	0.001132	1.605375
OSCAR	1.307456	9.722655	4.161106	5.52E-05	0.001134	1.603053
OPLAH	1.128625	6.020367	4.14815	5.80E-05	0.001178	1.55641
CCL14	1.253151	2.620539	4.147162	5.83E-05	0.001181	1.552858
NCAM1	1.527786	6.978211	4.144489	5.89E-05	0.001188	1.54325
IGKV2.28	1.162609	1.689319	4.142874	5.92E-05	0.001191	1.537446
FRMD3	1.11748	7.740247	4.142117	5.94E-05	0.001193	1.534729
RAB31	1.374307	10.15715	4.141281	5.96E-05	0.001196	1.531727
HRH2	1.0644	9.618051	4.140489	5.98E-05	0.001199	1.528882
RIN2	1.175412	7.768894	4.136772	6.07E-05	0.001213	1.515541
LINC01736	1.253201	2.22837	4.135632	6.09E-05	0.001214	1.511451
SIRPB2	1.079286	11.00201	4.131843	6.18E-05	0.001226	1.497861
RAMP3	1.132071	2.431057	4.131751	6.19E-05	0.001226	1.49753
RAP1GAP	1.159113	5.761706	4.129419	6.24E-05	0.001233	1.489175
CDO1	1.105669	2.079896	4.127979	6.28E-05	0.001239	1.484013
CSTA	1.504438	9.092093	4.125218	6.34E-05	0.001249	1.474127
SIRPD	1.514233	5.086788	4.121807	6.43E-05	0.001261	1.461919
LINC01503	1.13892	5.181084	4.116084	6.57E-05	0.00128	1.441449
SPOCK3	1.724875	2.459153	4.107423	6.80E-05	0.001312	1.410518
ARAP3	1.250521	8.65879	4.107103	6.80E-05	0.001312	1.409377
PLPP3	1.219116	6.114342	4.105045	6.86E-05	0.001319	1.402034
ADD2	1.492936	8.583912	4.104773	6.87E-05	0.001319	1.401064

IGKC	1.264499	13.18664	4.102258	6.93E-05	0.001329	1.392098
IGKV1.6	1.25767	6.192713	4.098234	7.04E-05	0.001345	1.377757
RHOJ	1.152047	2.06727	4.097546	7.06E-05	0.001347	1.375305
UBXN10	1.173676	5.032238	4.093427	7.17E-05	0.001362	1.360639
SDC4	1.104419	7.216337	4.087089	7.35E-05	0.001393	1.338098
ABCC3	1.331983	6.668491	4.083593	7.45E-05	0.001407	1.325673
NCAM2	1.354752	4.126993	4.079464	7.57E-05	0.00142	1.311011
PTGS2	1.346802	9.370148	4.078808	7.59E-05	0.001422	1.308685
STXBP1	1.132528	7.064879	4.07863	7.59E-05	0.001422	1.308051
CXCL9	1.40054	3.010937	4.07728	7.63E-05	0.001426	1.303261
CD101	1.312288	7.449445	4.076415	7.66E-05	0.001429	1.300194
FAM225A	1.11465	3.599188	4.07256	7.77E-05	0.001444	1.286521
SPTB	1.384406	8.527311	4.07214	7.78E-05	0.001444	1.285032
IGHV3OR16.17	1.07969	2.226573	4.06577	7.98E-05	0.001473	1.262469
FPR2	1.611744	6.875608	4.06575	7.98E-05	0.001473	1.262399
TMEM47	1.154668	1.923265	4.060704	8.13E-05	0.001495	1.244543
ERFE	1.299093	5.84973	4.060564	8.14E-05	0.001495	1.244047
TMEM30BP1	1.09156	4.533939	4.055671	8.29E-05	0.001517	1.226751
NLRP12	1.567402	8.320896	4.054916	8.31E-05	0.001519	1.224082
IFI30	1.349702	6.239186	4.052424	8.39E-05	0.00153	1.215281
IGKV6.21	1.05956	4.697627	4.051711	8.42E-05	0.001533	1.212764
FST	1.433523	3.155316	4.048274	8.53E-05	0.001549	1.200633
ULBP2	1.011448	1.658087	4.047495	8.55E-05	0.001549	1.197883
PROS1	1.329442	5.088132	4.047367	8.56E-05	0.001549	1.19743
LIN7A	2.185231	6.656273	4.045745	8.61E-05	0.001555	1.191712
SLC8A1	1.549367	7.866393	4.042251	8.73E-05	0.001566	1.179393
ADGRL4	1.519802	3.010336	4.033193	9.03E-05	0.001604	1.147498
RNF182	1.517803	2.531994	4.031912	9.08E-05	0.001609	1.142994
IGLV9.49	1.182919	4.274772	4.031849	9.08E-05	0.001609	1.14277
EBI3	1.10927	3.183137	4.029103	9.17E-05	0.001623	1.133116
CA3.AS1	1.081934	4.224629	4.028386	9.20E-05	0.001625	1.130596
IGKV1.27	1.265459	6.43545	4.025106	9.32E-05	0.00164	1.119068
FAM198B.AS1	1.666856	6.485955	4.018099	9.57E-05	0.001677	1.094475
BCAR1	1.012846	3.663396	4.017517	9.59E-05	0.001678	1.092432
KDR	1.447609	3.937695	4.017403	9.59E-05	0.001678	1.092033
NUP62CL	1.232722	2.997028	4.014675	9.69E-05	0.001694	1.082467
OLFM1	1.197762	2.596316	4.003985	0.000101	0.001749	1.045036
LINC00482	1.842516	4.902096	4.003944	0.000101	0.001749	1.044891
CLEC1A	1.155023	3.225147	4.003894	0.000101	0.001749	1.044718
ADGRF5	1.412233	2.978689	4.003607	0.000101	0.001749	1.043712
IGLV4.69	1.250804	6.336961	3.995313	0.000104	0.001792	1.014724
CFI	1.390999	3.63244	3.995304	0.000104	0.001792	1.014695
NR2F1	1.043233	3.03477	3.994108	0.000105	0.001796	1.010517
TDRD9	1.803013	7.000524	3.993122	0.000105	0.0018	1.007078

IGHV3.33	1.267651	6.903298	3.989141	0.000107	0.001818	0.993185
SLPI	1.835468	4.941905	3.988509	0.000107	0.00182	0.99098
EMCN	1.35776	3.153725	3.986844	0.000108	0.001829	0.985175
GPR153	1.245103	7.20653	3.984084	0.000109	0.001841	0.975558
SFRP1	1.345522	2.530651	3.980557	0.00011	0.001861	0.963272
NR4A3	1.004024	6.110974	3.977868	0.000111	0.001876	0.953911
IER3	1.295971	6.257535	3.971598	0.000114	0.001907	0.932105
RBP4	1.037282	2.025467	3.967965	0.000116	0.00193	0.919484
FCGR2B	1.092727	7.109954	3.964705	0.000117	0.001949	0.908162
IL33	1.40737	2.682084	3.964224	0.000117	0.00195	0.906495
SEMA3C	1.702854	4.374792	3.962444	0.000118	0.00196	0.900317
RGL1	1.089428	6.08682	3.959811	0.000119	0.001973	0.891185
LHFPL6	1.210524	6.534071	3.956489	0.000121	0.001993	0.879669
LINC02207	1.096478	5.606478	3.956081	0.000121	0.001995	0.878254
TAMALIN	1.14303	8.330542	3.952345	0.000123	0.002019	0.865316
IGKV1.39	1.275958	2.363515	3.947781	0.000125	0.002047	0.84952
TJP1	1.18148	3.898251	3.943308	0.000127	0.002073	0.834055
SLC37A2	1.141876	8.329136	3.942651	0.000127	0.002076	0.831782
IGHV3.47	1.03726	2.474633	3.942185	0.000127	0.002077	0.830174
S100A12	2.08265	7.630614	3.940741	0.000128	0.002084	0.825184
TMEM158	1.03445	3.718388	3.937389	0.00013	0.002103	0.81361
PLBD1.AS1	1.132622	1.699205	3.933663	0.000132	0.002128	0.800752
PLAG1	1.20509	6.578593	3.929796	0.000133	0.002147	0.78742
LAMP5	2.125366	4.274537	3.928986	0.000134	0.002148	0.784626
IGKV2.30	1.116915	3.947706	3.927844	0.000134	0.002155	0.780693
MPDZ	1.451482	3.009158	3.927756	0.000134	0.002155	0.780387
ARHGAP6	1.344037	5.322982	3.92774	0.000134	0.002155	0.780332
H2AW	1.380416	3.484337	3.927291	0.000135	0.002157	0.778786
CDKN2B	1.157464	5.368952	3.92667	0.000135	0.00216	0.776648
SDC1	1.192777	6.449485	3.923695	0.000137	0.002175	0.766404
IGHV3.74	1.108054	7.762239	3.922623	0.000137	0.002179	0.762711
ACHE	1.345542	5.154023	3.921572	0.000138	0.002184	0.759094
FXVD6	1.465724	6.610395	3.915144	0.000141	0.002233	0.736992
NCF2	1.149874	11.10733	3.915067	0.000141	0.002233	0.736725
NKX3.1	1.186131	4.366475	3.913192	0.000142	0.002246	0.730286
ARHGEF10L	1.873703	7.209198	3.912705	0.000142	0.002249	0.728611
LRIG3	1.041694	1.801388	3.912022	0.000143	0.002253	0.726267
FEZ1	1.121018	4.405164	3.908488	0.000145	0.002275	0.714133
TNFAIP8L3	1.329838	2.607476	3.907049	0.000145	0.002281	0.709194
FSTL1	1.436479	7.169677	3.905809	0.000146	0.002287	0.704942
HES1	1.137547	3.703013	3.901271	0.000148	0.002311	0.689383
IGLV3.9	1.257453	5.349891	3.896955	0.000151	0.002338	0.674598
IGHV3.30	1.262389	7.697577	3.896063	0.000151	0.002344	0.671547
IGKV3.11	1.142207	9.529637	3.895836	0.000151	0.002345	0.670768

SLC2A14	1.151686	5.834964	3.894552	0.000152	0.002352	0.666374
TCN2	1.125266	8.820371	3.889882	0.000155	0.002378	0.6504
DKK2	1.764308	3.437542	3.889637	0.000155	0.002379	0.649564
IGLC2	1.137418	10.44794	3.889414	0.000155	0.00238	0.6488
COL4A2	1.368332	5.103105	3.887839	0.000156	0.00239	0.643419
IGLV3.16	1.027664	2.961676	3.884991	0.000158	0.002409	0.633687
CADPS2	1.175496	2.7919	3.884803	0.000158	0.002409	0.633044
HP	1.028563	6.693683	3.883783	0.000158	0.002411	0.629563
CYP27A1	1.590235	6.071599	3.882771	0.000159	0.002414	0.626108
LINC01270	1.12314	2.55038	3.882761	0.000159	0.002414	0.626072
ADAMTS9	1.532433	3.765759	3.882063	0.000159	0.002417	0.623689
UNC5A	1.514444	5.514929	3.878921	0.000161	0.002435	0.612969
IGHV3.21	1.194735	7.832747	3.877484	0.000162	0.002443	0.608068
ADGRA2	1.169284	9.765202	3.874759	0.000164	0.002464	0.598777
CXCL16	1.197944	7.354007	3.865994	0.000169	0.002525	0.568933
IGLV5.45	1.145645	5.191448	3.865562	0.000169	0.002528	0.567461
IGKV1.8	1.038239	4.727439	3.864538	0.00017	0.002536	0.56398
GNG12	1.296321	3.544306	3.863758	0.000171	0.002541	0.561326
IGKV3.15	1.127187	7.447303	3.863241	0.000171	0.002543	0.559569
IGLV6.57	1.17231	7.193753	3.862876	0.000171	0.002545	0.558328
SORCS2	1.467326	5.603212	3.86103	0.000172	0.002556	0.552052
CALHM5	1.031582	2.34135	3.860361	0.000173	0.00256	0.549778
FFAR2	1.370848	5.335736	3.859076	0.000174	0.002569	0.545414
IGHGP	1.295737	8.051112	3.857939	0.000174	0.002577	0.541552
LILRA5	1.907875	7.080124	3.856806	0.000175	0.002584	0.537703
NCF1C	1.294517	7.378806	3.85581	0.000176	0.002591	0.534323
IGKV3.20	1.113181	9.349819	3.851617	0.000178	0.002623	0.520094
PRICKLE2	1.306913	3.319195	3.851022	0.000179	0.002625	0.518074
KCNE1B	1.187557	2.514346	3.84899	0.00018	0.002637	0.511186
SLC15A3	1.371091	7.999476	3.847361	0.000181	0.002649	0.505664
TM4SF18	1.169369	2.308991	3.843225	0.000184	0.002677	0.491651
PTGDS	1.639011	6.991413	3.840786	0.000186	0.002694	0.483394
GPC4	1.613053	3.756645	3.840625	0.000186	0.002695	0.48285
LYPD6B	1.249737	2.905879	3.837399	0.000188	0.00272	0.471937
LAMB3	1.089051	4.255591	3.836995	0.000188	0.002721	0.47057
NAALADL1	1.113534	7.692366	3.833946	0.00019	0.002746	0.460266
IGKV4.1	1.159873	9.410047	3.833052	0.000191	0.002752	0.457245
KCNJ8	1.117765	2.092046	3.825109	0.000197	0.002821	0.430427
MS4A14	1.207778	8.350372	3.814891	0.000204	0.002896	0.395998
SLC9A7P1	1.356084	6.63116	3.811085	0.000207	0.002923	0.383193
TRPC6	1.215451	2.42621	3.810028	0.000208	0.002931	0.379638
CLCN4	1.15834	5.928031	3.807183	0.00021	0.002952	0.370073
MYOF	1.54252	8.761848	3.806053	0.000211	0.002962	0.366275
IGHV3.49	1.189178	6.947069	3.803962	0.000213	0.002977	0.359254

ACKR1	1.395939	3.680257	3.802227	0.000214	0.00299	0.353426
C5AR2	1.08281	7.181332	3.801462	0.000215	0.002993	0.350859
ITGB2.AS1	1.103219	8.566676	3.800619	0.000215	0.003	0.348029
CTSG	1.971167	10.7333	3.798854	0.000217	0.003013	0.342107
LIPM	1.003566	2.552147	3.796781	0.000218	0.003031	0.335154
LILRB4	1.939193	8.077744	3.796487	0.000218	0.003033	0.33417
DES	1.389283	3.512145	3.789846	0.000224	0.003093	0.311918
SLIT2	1.037286	2.884752	3.78979	0.000224	0.003093	0.311733
IGHV1OR15.2	1.112565	2.997745	3.788397	0.000225	0.003106	0.307069
SEMA3A	1.212748	4.383947	3.787968	0.000225	0.003108	0.305631
SMOC2	1.150691	2.246599	3.787254	0.000226	0.003113	0.303242
PLA2G2F	1.422391	3.262261	3.786625	0.000226	0.003115	0.301138
VNN3	1.594949	5.516836	3.784776	0.000228	0.003132	0.294954
VNN2	1.305072	8.378248	3.779853	0.000232	0.003168	0.278496
CNN3	1.19915	4.528591	3.774533	0.000237	0.003218	0.260734
ADAMTS1	1.591345	5.341621	3.772936	0.000238	0.003235	0.255403
RNF180	1.013161	1.692704	3.772852	0.000238	0.003235	0.255123
AQP9	1.800126	7.02453	3.770501	0.00024	0.003257	0.247284
APOC1	1.349023	4.048232	3.765769	0.000244	0.003304	0.231513
LILRP1	1.32116	3.155722	3.762791	0.000247	0.00333	0.221597
SIGLEC16	1.007482	6.029403	3.762403	0.000247	0.003334	0.220305
NYAP2	1.023563	1.345912	3.755016	0.000254	0.003411	0.195737
IGLV2.23	1.139581	7.818354	3.753579	0.000255	0.003422	0.19096
STEAP4	1.229816	5.967283	3.753522	0.000255	0.003422	0.190772
LINC00570	1.063254	2.313761	3.750296	0.000258	0.003449	0.180058
KLHDC8A	1.274428	3.120891	3.749829	0.000259	0.00345	0.178509
ROR2	1.056969	3.363804	3.748604	0.00026	0.003463	0.174443
IGKV3D.15	1.135057	3.191991	3.747928	0.000261	0.003466	0.172199
IGKV3D.11	1.075869	3.89128	3.747623	0.000261	0.003469	0.171186
ABCA8	1.099421	4.066628	3.745975	0.000262	0.003484	0.165719
IGKV6D.21	1.073036	3.179713	3.74382	0.000264	0.003507	0.158573
MAOA	1.299351	4.902734	3.740551	0.000268	0.003533	0.147739
FGD2	1.199659	10.14476	3.739302	0.000269	0.003545	0.143604
ST14	1.309356	7.753662	3.738598	0.00027	0.00355	0.141272
IGHV6.1	1.135675	4.207409	3.733966	0.000274	0.003595	0.125941
NCF1	1.311011	8.446101	3.732905	0.000275	0.003603	0.122432
MCEMP1	1.110792	8.075285	3.729747	0.000278	0.003635	0.111989
IGKV1.5	1.083609	9.082111	3.728716	0.000279	0.003641	0.108583
IGLV3.25	1.217374	7.753282	3.721787	0.000286	0.003714	0.085705
IGKV1.12	1.117876	5.312472	3.719874	0.000288	0.003736	0.079395
CPVL	1.326653	9.431498	3.718739	0.00029	0.003744	0.075651
SLC22A31	1.304781	3.502166	3.716696	0.000292	0.003761	0.068917
MS4A4A	1.468245	7.403698	3.716672	0.000292	0.003761	0.068838
NHSL2	1.137362	8.888473	3.714292	0.000294	0.003785	0.060996

KCNC3	1.295876	6.394683	3.710515	0.000298	0.003818	0.04856
RNASE3	1.412325	9.552799	3.710096	0.000299	0.003822	0.04718
IGHG2	1.289459	11.86489	3.707445	0.000302	0.003848	0.038458
SNAI2	1.32982	2.840617	3.704392	0.000305	0.003886	0.028422
IGLV3.19	1.170434	7.953365	3.704187	0.000305	0.003887	0.027747
IGLV2.18	1.0714	4.322252	3.690007	0.000321	0.004047	-0.01878
RAB39A	1.142186	4.512232	3.685881	0.000326	0.004089	-0.0323
ID4	1.082013	2.079476	3.68579	0.000326	0.004089	-0.0326
MYL4	1.397558	5.414534	3.68104	0.000331	0.004141	-0.04813
LRG1	1.053384	8.156707	3.680341	0.000332	0.004147	-0.05042
HSPA7	1.452621	6.263806	3.678092	0.000335	0.00417	-0.05777
MYO7B	1.124874	7.435743	3.67398	0.00034	0.004222	-0.0712
ONECUT2	1.436156	3.104176	3.670627	0.000344	0.004258	-0.08215
AIG1	1.013005	8.44782	3.668896	0.000346	0.004281	-0.08779
FBN2	1.493824	8.414711	3.660619	0.000356	0.004372	-0.11476
SPATA6	1.175254	7.158912	3.658978	0.000359	0.004394	-0.1201
IGHV1.46	1.165006	7.616104	3.652601	0.000367	0.00447	-0.14083
FCGR1B	1.017538	6.220724	3.651446	0.000368	0.004485	-0.14459
NOX5	1.04264	2.679558	3.650182	0.00037	0.004496	-0.14869
CAV2	1.378739	5.396972	3.649771	0.00037	0.004501	-0.15003
IGLV7.46	1.148202	5.679071	3.647312	0.000374	0.004526	-0.15801
RNVU1.15	1.390552	3.868123	3.646722	0.000375	0.004528	-0.15992
IGHV3.53	1.093	6.270784	3.646415	0.000375	0.004528	-0.16092
PLAAT5	1.357925	3.390914	3.641985	0.000381	0.004576	-0.17529
CR1L	1.141311	4.485127	3.641237	0.000382	0.004582	-0.17771
APCDD1	1.265308	5.029953	3.639843	0.000384	0.004595	-0.18223
MARVELD2	1.054003	5.081662	3.638155	0.000386	0.004619	-0.1877
KEL	1.21268	7.606266	3.637006	0.000388	0.004635	-0.19142
IGKV1.9	1.11321	6.885874	3.636953	0.000388	0.004635	-0.19159
FMOD	1.184959	3.586701	3.634098	0.000392	0.004665	-0.20083
WASF3	1.150954	4.245284	3.633625	0.000392	0.004672	-0.20236
CECR2	1.00244	3.995507	3.630889	0.000396	0.004709	-0.21121
NEO1	1.115418	6.965741	3.630305	0.000397	0.004717	-0.2131
IGHV3.48	1.183869	5.821993	3.627269	0.000401	0.004758	-0.22291
LYVE1	1.124455	4.423216	3.626019	0.000403	0.004776	-0.22695
TACC2	1.058129	3.505663	3.625864	0.000403	0.004777	-0.22745
ESPN	1.183856	4.702249	3.622879	0.000407	0.004816	-0.23709
IGHV3.7	1.076985	5.616492	3.618273	0.000414	0.004872	-0.25195
S100A10	1.144226	10.40294	3.614589	0.00042	0.004919	-0.26382
TNFSF9	1.011896	5.916387	3.611545	0.000424	0.004944	-0.27362
FBN1	1.010721	8.112179	3.597505	0.000446	0.005127	-0.31874
LUCAT1	1.265678	5.218138	3.596097	0.000448	0.005147	-0.32326
IGKV1D.17	1.050079	2.154442	3.591069	0.000456	0.00522	-0.33938
IGLV7.43	1.046073	5.394674	3.589898	0.000458	0.005235	-0.34313

TPRG1.AS1	1.275682	1.955231	3.584519	0.000466	0.00532	-0.36035
SHTN1	1.541732	7.100076	3.582365	0.00047	0.005354	-0.36724
GLB1L2	1.194772	5.415514	3.578626	0.000476	0.005408	-0.37919
IGHV3.13	1.170005	5.251512	3.576465	0.00048	0.005439	-0.3861
LILRB3	1.124621	8.765863	3.575346	0.000482	0.005449	-0.38967
IL15	1.085671	6.442074	3.573462	0.000485	0.005475	-0.39568
FRZB	1.306867	2.998608	3.573021	0.000486	0.00548	-0.39709
COL1A1	1.40102	6.212099	3.572723	0.000486	0.00548	-0.39804
SECTM1	1.506976	7.185709	3.570026	0.000491	0.005514	-0.40664
MAGI1	1.211943	3.079099	3.565612	0.000498	0.005578	-0.42071
ZMYND15	1.042108	4.259383	3.56405	0.000501	0.005605	-0.42569
PKP2	1.434706	4.207618	3.562344	0.000504	0.005629	-0.43112
RHAG	1.437124	7.681035	3.561163	0.000506	0.005645	-0.43488
WWC2	1.31892	6.872858	3.558593	0.000511	0.005683	-0.44305
PAPPA	1.090526	4.254988	3.555359	0.000516	0.005731	-0.45333
CTSV	1.156325	2.411875	3.554896	0.000517	0.005739	-0.4548
FCGR2C	1.378441	7.499549	3.551952	0.000523	0.005783	-0.46416
PGBD5	1.277171	3.593198	3.549136	0.000528	0.005829	-0.47309
HES4	1.059787	3.43166	3.545564	0.000534	0.005885	-0.48442
IGHV1.18	1.090961	8.002205	3.544251	0.000537	0.005906	-0.48859
PTPRB	1.246055	5.340486	3.544104	0.000537	0.005908	-0.48905
IGLV3.10	1.22183	6.148049	3.542704	0.00054	0.005931	-0.49349
CD300C	1.135605	8.09904	3.53814	0.000548	0.006005	-0.50794
LYNX1	1.02394	4.562736	3.536549	0.000551	0.006026	-0.51298
COL4A1	1.250072	4.80147	3.535544	0.000553	0.006039	-0.51615
IGHV4.28	1.016586	5.137125	3.534734	0.000555	0.006053	-0.51872
IGHV3.23	1.041455	9.129082	3.530324	0.000563	0.006129	-0.53266
COL15A1	1.054294	3.545336	3.529557	0.000565	0.006141	-0.53508
ASS1	1.470767	4.669045	3.528988	0.000566	0.006141	-0.53688
CFD	1.285623	11.58963	3.526137	0.000572	0.006188	-0.54588
CD70	1.232616	4.551508	3.525754	0.000572	0.006194	-0.54708
IGHG3	1.035602	10.45705	3.525234	0.000573	0.0062	-0.54873
TMEM132C	1.155103	2.648783	3.521927	0.00058	0.006255	-0.55916
SLC6A12	1.344467	4.451435	3.520705	0.000582	0.00628	-0.56301
COLGALT2	1.056644	5.896418	3.517579	0.000589	0.006331	-0.57286
OLFML2A	1.410398	7.449083	3.515779	0.000592	0.006362	-0.57853
GABRE	2.158418	5.16695	3.51031	0.000604	0.006444	-0.59574
IGHV4.31	1.02396	6.133628	3.508308	0.000608	0.006478	-0.60203
DCLK1	1.057224	2.773153	3.506037	0.000613	0.006519	-0.60916
CDC42BPA	1.527924	6.793335	3.503476	0.000618	0.006564	-0.61721
IGHV3.11	1.11349	7.502807	3.499755	0.000626	0.00662	-0.62888
CXCL10	1.148631	3.642688	3.494595	0.000637	0.006708	-0.64506
SAMHD1	1.029268	12.81149	3.494439	0.000638	0.006709	-0.64555
SLC35G1	1.198248	5.272573	3.494017	0.000639	0.006717	-0.64687

IGHV4.59	1.00806	8.412903	3.493274	0.00064	0.006722	-0.64919
PF4	1.547499	5.697518	3.491139	0.000645	0.006749	-0.65588
IGHV4.55	1.004648	3.957923	3.485931	0.000657	0.006843	-0.67217
PHACTR3	1.643203	4.102498	3.481922	0.000666	0.006898	-0.6847
WDR45P1	1.11821	5.038845	3.481034	0.000668	0.006913	-0.68747
IGLV2.11	1.05534	7.671268	3.474265	0.000683	0.007044	-0.70859
LDB2	1.005844	3.404914	3.473493	0.000685	0.007057	-0.711
CDH6	1.050982	2.697648	3.473452	0.000685	0.007057	-0.71112
LRRC25	1.222851	9.146518	3.46339	0.000709	0.007253	-0.74245
CES4A	1.041487	6.104251	3.459413	0.000719	0.00732	-0.75481
DCLK2	1.078701	5.452914	3.45607	0.000727	0.007384	-0.76518
C7	1.441928	4.711561	3.453133	0.000735	0.007437	-0.7743
LBP	1.359413	3.607893	3.451866	0.000738	0.007461	-0.77823
ACVRL1	1.203313	5.057226	3.450989	0.00074	0.007475	-0.78095
RAB17	1.107294	2.952838	3.450219	0.000742	0.007483	-0.78333
CD300E	2.096302	7.920743	3.449966	0.000743	0.007487	-0.78412
PDGFRA	1.039528	4.109466	3.445187	0.000755	0.007566	-0.79892
IGHV2.70	1.105151	5.182588	3.442033	0.000763	0.007617	-0.80868
CDH1	1.169122	5.781465	3.440257	0.000768	0.007648	-0.81417
IGLV1.47	1.024343	7.665693	3.434211	0.000783	0.007756	-0.83285
IGHG1	1.113495	13.23087	3.428652	0.000798	0.007877	-0.85
ST6GAL2	1.225168	3.324725	3.421657	0.000818	0.007987	-0.87155
IGKV1.16	1.045297	6.568366	3.419813	0.000823	0.008021	-0.87722
LILRB1	1.047086	9.113967	3.41876	0.000826	0.008041	-0.88046
ADAP2	1.078577	8.323601	3.411091	0.000847	0.00819	-0.90403
CAMP	1.209429	3.752485	3.408786	0.000854	0.00825	-0.9111
PRLR	1.863492	5.988754	3.406693	0.00086	0.008293	-0.91752
LRP3	1.020607	9.389775	3.406298	0.000861	0.008301	-0.91873
G0S2	1.346133	4.968593	3.402798	0.000871	0.008377	-0.92946
IGHV1.24	1.158285	6.856032	3.401385	0.000876	0.008405	-0.93379
GABBR1	1.141401	9.740311	3.399889	0.00088	0.00843	-0.93837
CXCL1	1.142981	4.609065	3.391546	0.000905	0.008613	-0.96388
LCNL1	1.147315	3.823345	3.389582	0.000911	0.008648	-0.96988
IGHV3.66	1.102903	4.703359	3.385315	0.000924	0.008745	-0.9829
IGLV8.61	1.252112	6.316931	3.378955	0.000944	0.008884	-1.00229
AREG	1.646901	7.449323	3.371849	0.000967	0.009063	-1.02391
IGLC7	1.221254	4.541993	3.363984	0.000993	0.009258	-1.0478
CA1	1.338283	9.859017	3.363979	0.000993	0.009258	-1.04781
IGHV1.69D	1.110231	7.287818	3.361493	0.001001	0.009322	-1.05535
IGFBP4	1.056316	7.067024	3.358589	0.001011	0.009389	-1.06416
TMEM105	1.530914	4.643209	3.357524	0.001015	0.00941	-1.06738
SPATA46	1.002265	2.150997	3.342633	0.001066	0.009759	-1.1124
PRR16	1.585472	3.831383	3.336183	0.001089	0.009917	-1.13185
KCTD12	1.300423	10.57495	3.330668	0.00111	0.010045	-1.14846

IGLV1.40	1.060519	8.627343	3.32456	0.001132	0.01017	-1.16682
RNASE6	1.164515	9.432093	3.324085	0.001134	0.010182	-1.16825
UGGT2	1.528245	6.570153	3.321193	0.001145	0.010264	-1.17693
KIF5A	1.078082	3.543576	3.318799	0.001154	0.010325	-1.18411
LILRB2	1.356673	9.687396	3.318386	0.001156	0.010334	-1.18535
VCAN.AS1	1.576964	4.408696	3.314347	0.001171	0.010419	-1.19746
LY6G6E	1.061449	2.589693	3.312962	0.001177	0.010443	-1.20161
SRPX	1.050627	2.988593	3.31047	0.001187	0.010513	-1.20907
RPL7AP64	1.359992	3.392434	3.307187	0.0012	0.010597	-1.21889
COL3A1	1.587924	5.129076	3.304903	0.001209	0.01066	-1.22572
HBBP1	1.188768	2.529715	3.302825	0.001217	0.010722	-1.23193
EBF3	1.265255	5.160925	3.301906	0.001221	0.010745	-1.23467
FAM201A	1.394716	4.477674	3.301528	0.001222	0.010752	-1.2358
CBLN2	1.028397	2.167204	3.296091	0.001244	0.010873	-1.25203
S100P	1.108582	6.257983	3.295538	0.001247	0.010882	-1.25368
FOLR3	1.325169	3.900945	3.29498	0.001249	0.010894	-1.25534
PLBD1	1.507027	8.479259	3.28875	0.001275	0.011063	-1.2739
IGKV1.17	1.063642	5.941646	3.284376	0.001293	0.011194	-1.28691
PTPRF	1.001152	6.612863	3.283845	0.001296	0.011205	-1.28849
ISLR	1.123786	3.091097	3.282984	0.001299	0.011225	-1.29105
TMEM108	1.041845	3.546106	3.278822	0.001317	0.011347	-1.30341
AZU1	1.5553	12.41152	3.274391	0.001336	0.011474	-1.31656
PELATON	1.519823	7.029086	3.272433	0.001345	0.011527	-1.32236
NCF1B	1.10311	7.117585	3.272171	0.001346	0.011532	-1.32314
GULP1	1.023325	1.930622	3.269952	0.001356	0.011591	-1.32971
C8orf88	1.163215	4.076138	3.269044	0.00136	0.011619	-1.3324
UNC13B	1.287744	7.170186	3.265915	0.001374	0.011713	-1.34167
FGR	1.142875	11.43727	3.265731	0.001375	0.011715	-1.34221
TMEM63C	1.127716	5.107347	3.264787	0.001379	0.011737	-1.345
PON2	1.072529	8.736178	3.262765	0.001388	0.011797	-1.35098
FMO3	1.185928	3.617168	3.262524	0.001389	0.011803	-1.35169
CADM1	1.03621	5.117864	3.252204	0.001437	0.012123	-1.38216
IGLV1.44	1.043418	8.105428	3.247282	0.00146	0.012274	-1.39666
HBD	1.195166	9.334509	3.242635	0.001483	0.012411	-1.41034
GUCY2C	1.153358	3.132205	3.239634	0.001497	0.012492	-1.41916
EPB42	1.021938	7.927907	3.238668	0.001502	0.012521	-1.422
SLITRK4	1.660838	7.876249	3.230284	0.001544	0.012779	-1.4466
LAMA4	1.197122	4.237936	3.229742	0.001546	0.012792	-1.44819
IGHV1.69	1.199585	5.56403	3.219541	0.001598	0.013114	-1.47804
PLA2G2C	1.213346	3.257942	3.214258	0.001626	0.013296	-1.49347
TDRD6	1.040729	3.254524	3.213931	0.001628	0.013304	-1.49443
EGR2	1.109653	7.072195	3.207442	0.001662	0.013495	-1.51335
NECAB1	1.17074	5.540368	3.206559	0.001667	0.013524	-1.51592
C3orf14	1.028058	2.399005	3.204179	0.00168	0.013604	-1.52285

PAQR9	1.213914	3.100055	3.200535	0.0017	0.013732	-1.53346
LUM	1.414168	4.694779	3.193059	0.001741	0.014002	-1.55517
SCUBE1	1.348493	8.058268	3.187684	0.001772	0.014185	-1.57076
MEG3	2.019935	6.918732	3.181821	0.001805	0.014382	-1.58774
CCL23	1.389296	5.197007	3.179339	0.00182	0.014474	-1.59492
FAM124A	1.177341	5.446165	3.179162	0.001821	0.014479	-1.59543
TTLL7	1.061132	5.936004	3.17681	0.001835	0.014556	-1.60223
SLC7A7	1.000741	9.491566	3.165	0.001906	0.014991	-1.6363
CPED1	1.130333	6.091307	3.154396	0.001971	0.015352	-1.6668
SEC14L4	1.178954	4.242036	3.149394	0.002003	0.015554	-1.68115
DSC2	1.665623	6.995937	3.147794	0.002013	0.015616	-1.68574
F3	1.235699	5.801981	3.145346	0.002029	0.015714	-1.69276
IGHG4	1.264592	9.21337	3.144736	0.002033	0.015731	-1.6945
NXF3	1.317398	7.163365	3.141315	0.002055	0.01585	-1.7043
MMP14	1.223386	7.676347	3.138774	0.002072	0.015951	-1.71157
SASH1	1.206494	4.725575	3.132953	0.002111	0.01616	-1.7282
PRKG1	1.086343	2.038009	3.131945	0.002118	0.016197	-1.73108
FGL2	1.092683	10.79851	3.129198	0.002136	0.0163	-1.73892
PPP1R27	1.173179	6.022754	3.115532	0.002231	0.016835	-1.77782
LAMC1	1.391431	7.980683	3.106743	0.002294	0.017167	-1.80276
PRRG1	1.450746	4.1066	3.104504	0.00231	0.017259	-1.80911
IGLV1.36	1.010356	5.014474	3.103648	0.002316	0.017298	-1.81153
EPHB3	1.033381	6.063051	3.103136	0.00232	0.017314	-1.81298
FFAR4	1.016032	3.428445	3.09659	0.002368	0.017582	-1.8315
IGKV1D.13	1.175722	3.116125	3.096489	0.002369	0.017584	-1.83178
NLGN1	1.101003	2.01224	3.091179	0.002409	0.017812	-1.84678
MYCT1	1.507599	4.489177	3.090986	0.002411	0.017819	-1.84732
MSR1	1.404032	5.603899	3.084268	0.002462	0.018141	-1.86626
IGHV3.43	1.029586	5.033643	3.081231	0.002486	0.018263	-1.87482
SLC22A3	1.116753	3.604175	3.078693	0.002506	0.018371	-1.88196
SLC6A19	1.287198	3.446003	3.077853	0.002512	0.018398	-1.88432
IL7	1.045303	4.674036	3.076538	0.002523	0.01844	-1.88801
DLGAP1.AS3	1.0966	3.067042	3.074919	0.002535	0.018503	-1.89256
CDH11	1.351078	4.492855	3.072375	0.002556	0.018609	-1.89971
PPARGC1A	1.646498	4.897656	3.065185	0.002614	0.018932	-1.91987
IGKV2D.29	1.026306	4.545285	3.061314	0.002646	0.01908	-1.93071
MGAM	1.059601	8.047939	3.058569	0.002669	0.019185	-1.93839
EPS8	1.05552	7.473866	3.055637	0.002693	0.019317	-1.94658
LY86	1.156231	8.685148	3.047461	0.002763	0.019711	-1.9694
TLR8	1.544017	8.269961	3.045972	0.002775	0.019786	-1.97355
BPI	1.328384	7.290523	3.039395	0.002833	0.020071	-1.99186
CACNA2D3	1.322046	6.255331	3.036897	0.002855	0.020191	-1.9988
FCGR3A	1.017317	8.875433	3.035504	0.002867	0.020258	-2.00267
NSUN7	1.164795	3.938178	3.034541	0.002876	0.020301	-2.00535

DNASE1L3	1.183542	4.356391	3.031641	0.002902	0.020426	-2.01339
AK4	1.008637	7.8248	3.028956	0.002926	0.020516	-2.02084
IGLC3	1.000911	9.293148	3.024347	0.002968	0.020749	-2.03361
IGLV3.21	1.039093	8.611507	3.018507	0.003023	0.021013	-2.04977
IGHV1.2	1.020683	7.16322	3.010952	0.003094	0.021407	-2.07063
TLCD4	1.184778	6.378092	3.006109	0.003141	0.021622	-2.08398
COL1A2	1.466487	5.687164	3.002826	0.003173	0.021734	-2.09302
NUDT19P5	1.003601	2.72903	3.002681	0.003174	0.021736	-2.09342
CD300LB	1.144968	7.792659	2.991895	0.003281	0.022294	-2.12305
IL31RA	1.317834	4.057003	2.990818	0.003292	0.022364	-2.126
TMEM121B	1.108342	7.252942	2.990547	0.003295	0.022371	-2.12675
TEX15	1.358858	2.76633	2.98922	0.003308	0.022448	-2.13039
RUFY4	1.045289	4.785907	2.988713	0.003313	0.022478	-2.13177
HTRA3	1.221467	7.999661	2.971112	0.003497	0.023378	-2.17988
HAUS1P1	1.000194	3.107394	2.962212	0.003593	0.023876	-2.20411
METTL7B	1.216837	6.719044	2.953446	0.003691	0.024351	-2.22792
TBC1D8B	1.178035	5.120177	2.95245	0.003702	0.024402	-2.23062
HOXB7	1.168338	3.639854	2.951424	0.003714	0.024459	-2.2334
KCNH2	1.090884	8.1309	2.940556	0.003838	0.025068	-2.26281
RBMS3	1.021326	4.287402	2.937356	0.003876	0.025228	-2.27145
MMP8	1.578898	6.186102	2.934433	0.00391	0.025382	-2.27934
CAV1	1.113195	5.819211	2.931864	0.003941	0.025536	-2.28626
OLIG1	1.073525	7.377785	2.925259	0.004021	0.025965	-2.30404
TPBG	1.189481	6.363755	2.922572	0.004053	0.026123	-2.31127
NMU	1.118278	2.867254	2.916982	0.004122	0.02645	-2.32627
FREM1	1.168059	3.577469	2.915092	0.004146	0.026573	-2.33134
NFIB	1.039201	3.926079	2.909711	0.004214	0.026883	-2.34576
APLNR	1.146524	3.444633	2.90193	0.004314	0.027405	-2.36656
FAM178B	1.099516	5.137896	2.89616	0.004389	0.027775	-2.38195
SORT1	1.237952	9.80527	2.894994	0.004404	0.027824	-2.38506
DDIT4L	1.38007	3.332685	2.887569	0.004504	0.028317	-2.40483
NUDT16L2P	1.013608	6.062024	2.886901	0.004513	0.028353	-2.4066
THAP10	1.094099	3.179115	2.883451	0.004559	0.028565	-2.41577
EREG	1.636162	8.11106	2.879852	0.004609	0.028791	-2.42532
MS4A6A	1.271684	10.586	2.870914	0.004734	0.029349	-2.44899
SELENBP1	1.163822	7.096294	2.869695	0.004751	0.029413	-2.45222
ABCC9	1.030027	3.564847	2.865063	0.004817	0.029723	-2.46445
LRRK2	1.106178	9.014759	2.86253	0.004853	0.0299	-2.47114
SHROOM4	1.295706	6.271565	2.843751	0.005132	0.03114	-2.52054
SLC26A9	1.014716	2.863701	2.840917	0.005175	0.031316	-2.52797
PGAP4	1.090785	2.980437	2.833848	0.005284	0.031845	-2.54647
SEMA6D	1.058188	3.402878	2.831624	0.005319	0.032027	-2.55229
FBLN1	1.297712	4.673465	2.829978	0.005345	0.032111	-2.55659
BGN	1.244104	4.762887	2.824346	0.005435	0.032525	-2.57129

MPEG1	1.305916	11.58589	2.809583	0.005676	0.033623	-2.60968
RBPMS2	1.064604	5.864174	2.80732	0.005714	0.033772	-2.61555
MYCL	1.204748	5.72746	2.780852	0.006174	0.035767	-2.6839
COL6A5	1.148651	3.045197	2.779963	0.00619	0.035819	-2.68618
SLC24A4	1.006848	9.364663	2.773303	0.006311	0.036309	-2.70329
CMTM5	1.061841	3.907443	2.770612	0.006361	0.036534	-2.71018
SIGLEC1	1.260853	6.988208	2.748133	0.006789	0.038263	-2.76759
TNNT1	1.126512	4.755975	2.743451	0.006881	0.03865	-2.77949
CFH	1.027537	7.511849	2.741201	0.006926	0.038842	-2.7852
HTR7	1.303466	4.947624	2.73855	0.006979	0.039074	-2.79193
IGHV2.70D	1.024719	4.044102	2.734427	0.007063	0.039353	-2.80238
CPNE8	1.402399	8.572871	2.731586	0.007121	0.039586	-2.80957
SVEP1	1.012685	4.039166	2.674751	0.008375	0.04478	-2.95205
LINC00900	1.198268	4.312394	2.661924	0.008685	0.045969	-2.98384
SNX18P3	1.189514	4.662703	2.661081	0.008706	0.046057	-2.98592
INAVA	1.016286	4.745694	2.649464	0.008995	0.047174	-3.01458
APOL4	1.100967	6.465558	2.644398	0.009124	0.047707	-3.02705
STAC	1.047566	2.940332	2.640151	0.009234	0.048062	-3.03748
LIFR	1.077819	5.113753	2.609757	0.010053	0.051282	-3.11169
VSIG4	1.000346	7.508608	2.605526	0.010172	0.051715	-3.12195
FMO2	1.124941	3.976296	2.594718	0.010482	0.052804	-3.14812
EVC	1.15401	4.938846	2.592683	0.010541	0.053041	-3.15303
MEG8	1.087209	1.975366	2.582418	0.010844	0.054138	-3.17777
NETO1	1.082363	3.71432	2.580881	0.010891	0.054291	-3.18147
BICC1	1.012077	3.933962	2.56585	0.011351	0.055787	-3.21751
ELANE	1.433013	10.86026	2.56493	0.01138	0.055905	-3.21972
AHSP	1.15869	7.56072	2.55842	0.011585	0.056626	-3.23526
HBM	1.079937	5.64081	2.545973	0.011987	0.057963	-3.26489
CCN2	1.160796	4.587985	2.545907	0.011989	0.057965	-3.26505
GJA3	1.043099	3.474853	2.54394	0.012054	0.058205	-3.26972
DSG2	1.339886	4.634551	2.509746	0.013228	0.062261	-3.35037
HBA2	1.184604	10.30501	2.495604	0.013743	0.064061	-3.38344
CHL1	1.045502	4.889215	2.494135	0.013798	0.064263	-3.38686
DCN	1.132813	4.9405	2.490824	0.013921	0.064683	-3.39458
BEX1	1.229399	5.137091	2.486638	0.014079	0.06525	-3.40431
UNC5C	1.038527	4.115961	2.484	0.014179	0.065626	-3.41044
IGFBP5	1.14826	6.218789	2.444659	0.01575	0.070623	-3.50115
VCAM1	1.1514	5.533337	2.438649	0.016003	0.071482	-3.51488
SLITRK5	1.366315	5.19677	2.425049	0.016589	0.07345	-3.54586
PRTN3	1.172038	11.10982	2.412304	0.017156	0.075212	-3.57475
PPBP	1.123236	7.135282	2.411856	0.017176	0.075263	-3.57576
HOXB9	1.202878	2.883063	2.38031	0.018654	0.079899	-3.64664
GYPA	1.045421	6.98359	2.36088	0.01962	0.082932	-3.68987
ROBO1	1.101289	3.923809	2.331208	0.02118	0.087682	-3.75526

GPC6	1.202016	3.071841	2.326472	0.021438	0.088542	-3.76563
TUSC1	1.048519	4.176751	2.291198	0.023455	0.09434	-3.84222
HBB	1.074487	13.28972	2.289976	0.023528	0.094611	-3.84485
LGALS2	1.187967	5.471794	2.278696	0.024209	0.09646	-3.86911
CXCL12	1.278894	8.529521	2.249643	0.026043	0.101829	-3.93107
IRX3	1.277421	5.68611	2.220176	0.028025	0.107397	-3.99315
COL4A5	1.603579	7.029904	2.197516	0.029639	0.111698	-4.04038
CLDN10	1.135394	4.164422	2.161826	0.032343	0.11899	-4.11385
NUDT10	1.012904	3.305658	2.105864	0.037013	0.130936	-4.22678
HOXA10	1.214445	7.659996	2.066421	0.040644	0.140081	-4.30472
PRDM16.DT	1.217964	4.403567	2.007985	0.046582	0.154089	-4.41763
RNA5SP379	-1.0552	2.417286	-6.4984	1.34E-09	7.09E-07	11.5905
SMYD3.AS1	-1.0188	6.296996	-6.00132	1.61E-08	3.74E-06	9.239248
TCEAL3.AS1	-1.03628	2.150344	-5.91345	2.47E-08	4.91E-06	8.834572
ZBTB8A	-1.27559	8.302913	-5.83614	3.59E-08	6.22E-06	8.48137
PPP1R11P2	-1.03124	3.188499	-5.77449	4.83E-08	7.85E-06	8.201755
GNRHR	-1.00245	5.246545	-5.66998	7.95E-08	1.06E-05	7.731744
RNU1.11P	-1.00747	2.424067	-5.38645	2.99E-07	2.56E-05	6.483634
PSD2.AS1	-1.23601	3.52362	-5.33389	3.80E-07	3.08E-05	6.256707
PNKDP1	-1.03658	2.858805	-5.18691	7.40E-07	4.96E-05	5.629972
RNA5SP277	-1.18601	3.20299	-5.13525	9.33E-07	5.97E-05	5.412418
RPS27P16	-1.12616	3.726085	-4.97498	1.90E-06	9.71E-05	4.746918
BNIP3P17	-1.0201	5.1016	-4.89536	2.68E-06	0.000126	4.421667
MYOZ3	-1.01578	7.609699	-4.87253	2.96E-06	0.000137	4.329103
PCDHGB8P	-1.24673	4.635376	-4.8477	3.30E-06	0.000148	4.228728
B4GALT6	-1.17279	10.31075	-4.79971	4.05E-06	0.000172	4.035835
LINC02400	-1.43665	2.298622	-4.7921	4.18E-06	0.000176	4.005329
YBX1P8	-1.06934	4.176883	-4.75613	4.88E-06	0.000195	3.861797
PRB1	-1.00597	2.64987	-4.71513	5.81E-06	0.000221	3.699105
LINC02316	-1.07217	3.02855	-4.62236	8.58E-06	0.000291	3.334706
SLC38A4	-1.14322	5.574909	-4.61568	8.82E-06	0.000298	3.308682
TAS2R3	-1.08496	4.788668	-4.60241	9.32E-06	0.000311	3.257024
SMIM24	-1.18473	9.982001	-4.53709	1.22E-05	0.000378	3.004443
MTND1P24	-1.1547	2.295111	-4.50396	1.40E-05	0.000417	2.877336
TOX	-1.00328	9.149925	-4.44964	1.75E-05	0.000494	2.670413
PCDHGB3	-1.15124	6.051234	-4.32977	2.84E-05	0.0007	2.220402
CORO1CP1	-1.27248	4.031127	-4.27293	3.56E-05	0.000823	2.010292
PCDHGA8	-1.02765	4.820188	-4.25074	3.88E-05	0.000876	1.928814
FAM230I	-1.05725	2.386772	-4.12409	6.37E-05	0.001254	1.470075
HPGDS	-2.11441	6.914083	-4.11452	6.61E-05	0.001285	1.435853
RHEX	-1.27315	11.08334	-4.11058	6.71E-05	0.001301	1.421772
CD34	-2.53159	10.84523	-4.08306	7.46E-05	0.001408	1.323775
TTLL6	-1.42186	3.975461	-4.07556	7.68E-05	0.001432	1.297173
SVOPL	-1.06472	5.430101	-4.07071	7.83E-05	0.001451	1.279953

C3orf56	-1.49496	2.513976	-4.05962	8.17E-05	0.001499	1.240707
FAM180B	-1.00735	5.956761	-4.03638	8.92E-05	0.001589	1.158727
NBAT1	-1.47201	3.65357	-3.99435	0.000105	0.001796	1.01138
BAALC.AS1	-1.53078	6.204019	-3.98271	0.000109	0.001848	0.970765
RD3	-1.15594	2.103988	-3.93119	0.000133	0.002141	0.792235
TRBVB	-1.7604	6.867916	-3.92419	0.000136	0.002174	0.76811
FSIP2	-1.01203	7.069004	-3.89741	0.000151	0.002335	0.67615
TEX101	-1.28893	4.222769	-3.89618	0.000151	0.002344	0.671951
TRAV8.5	-1.00467	3.591228	-3.89288	0.000153	0.002361	0.660642
GLYATL1P1	-1.33335	5.008397	-3.87876	0.000161	0.002435	0.612411
TFPI	-1.1496	9.963931	-3.87342	0.000165	0.002474	0.594219
STYXL2	-1.96232	5.273252	-3.84834	0.000181	0.002643	0.508974
GUCY1A1	-1.40886	10.52566	-3.81873	0.000201	0.002866	0.408928
LINC01659	-1.3744	2.937675	-3.81418	0.000205	0.002898	0.393607
SLC35G3	-1.18202	3.022443	-3.79962	0.000216	0.003009	0.344665
DYNAP	-1.03523	1.009109	-3.77127	0.000239	0.003251	0.249848
BAALC.AS2	-1.41234	2.87429	-3.68559	0.000326	0.00409	-0.03323
MMP28	-1.25856	5.405554	-3.61437	0.00042	0.004919	-0.26452
ADGRF1	-1.24372	2.201409	-3.54915	0.000528	0.005829	-0.47304
ITGA9	-1.29773	9.95301	-3.53901	0.000547	0.005994	-0.50519
MEGF10	-1.25608	5.287323	-3.53848	0.000548	0.006001	-0.50685
PCAT14	-1.15121	3.211801	-3.47673	0.000678	0.006993	-0.7009
ABCA12	-1.04231	4.408558	-3.46872	0.000696	0.007149	-0.72585
RN7SKP240	-1.1985	2.551661	-3.43973	0.000769	0.007658	-0.81579
LINC02573	-1.6679	4.603549	-3.42272	0.000815	0.00798	-0.86826
CASC15	-1.36699	7.176933	-3.384	0.000928	0.008779	-0.98691
IKZF2	-1.22106	9.267946	-3.37535	0.000956	0.008981	-1.01326
MEST	-1.03794	10.62829	-3.36367	0.000994	0.009265	-1.04874
BAALC	-1.77372	8.615216	-3.35688	0.001017	0.009427	-1.06934
LINC01792	-1.23804	4.225087	-3.33878	0.00108	0.009869	-1.12401
LINC00958	-1.55245	2.822594	-3.33687	0.001087	0.009907	-1.12978
ST18	-1.72238	6.081365	-3.25006	0.001447	0.012202	-1.38849
MN1	-1.3814	8.928353	-3.24249	0.001483	0.012411	-1.41077
VPREB1	-1.3962	3.746589	-3.23924	0.001499	0.012504	-1.42031
NPR3	-1.77205	9.95581	-3.12609	0.002157	0.016404	-1.74779
MYCN	-1.36537	7.897814	-3.03276	0.002892	0.020382	-2.0103
IGHD4.11	-1.07664	3.695862	-3.02225	0.002988	0.020845	-2.03941
RXFP1	-1.60328	6.343372	-2.98583	0.003343	0.022635	-2.13967
TUSC8	-1.15871	6.110797	-2.97429	0.003463	0.023212	-2.17121
RBPMS.AS1	-1.08542	2.507599	-2.97189	0.003489	0.023341	-2.17776
GPR12	-1.36655	4.02613	-2.97009	0.003508	0.023429	-2.18266
SERP2	-1.05155	5.154251	-2.96045	0.003613	0.023965	-2.2089
LINC02174	-1.38943	2.311147	-2.8858	0.004528	0.028417	-2.40954
ROBO4	-1.12679	7.184669	-2.85023	0.005034	0.030733	-2.50352

MMRN1	-1.12665	9.670507	-2.84952	0.005045	0.030774	-2.5054
SORCS1	-1.16495	4.840775	-2.82067	0.005494	0.032803	-2.58087
UGT2B28	-1.15179	4.271884	-2.81353	0.00561	0.033325	-2.59942
OPALIN	-1.50417	3.355957	-2.80393	0.005771	0.034018	-2.62435
SHANK1	-1.18231	8.530607	-2.78452	0.006108	0.035464	-2.67447
MYCNOS	-1.00631	4.092486	-2.77747	0.006235	0.036003	-2.6926
TRBV27	-1.08252	5.618672	-2.77293	0.006318	0.036332	-2.70424
LINC01257	-1.09897	2.865254	-2.76764	0.006416	0.036717	-2.71779
TPO	-1.27313	3.189243	-2.72028	0.007356	0.040607	-2.83812
LINC01375	-1.04001	2.422339	-2.65555	0.008842	0.046618	-2.99958
NOG	-1.01113	6.997515	-2.65377	0.008887	0.046777	-3.00398
RNU1.133P	-1.06829	2.548296	-2.63999	0.009238	0.048066	-3.03788
UMODL1	-1.1438	7.485963	-2.60493	0.010189	0.051733	-3.12341
PLCH1	-1.00886	6.216996	-2.57399	0.0111	0.054949	-3.19803
PGBD4P1	-1.17818	4.396921	-2.53491	0.012354	0.05927	-3.29111
ADAMTS18	-1.14382	2.790517	-2.4994	0.013604	0.063571	-3.37459
TPSD1	-1.33986	6.288838	-2.48999	0.013953	0.064794	-3.39653
PSMD14P1	-1.15684	3.2103	-2.46322	0.01499	0.068264	-3.45851
DNTT	-1.79787	6.444446	-2.34512	0.020435	0.085463	-3.72469
UGT2B11	-1.36268	5.383684	-2.32882	0.02131	0.088115	-3.76049
PROM1	-1.49917	9.464217	-2.2773	0.024294	0.096699	-3.87211
IGKV1.22	-1.13339	3.91804	-2.21363	0.028483	0.108578	-4.00683
SHD	-1.03352	5.225944	-2.17497	0.031323	0.115948	-4.08692
SLCO5A1	-1.06423	6.163051	-2.16074	0.032428	0.119241	-4.11606
AADAT	-1.00463	4.787791	-2.11993	0.035788	0.127798	-4.19865
RNU6ATAC6P	-1.0569	4.154372	-2.06917	0.040381	0.139534	-4.29932
IGKV2.23	-1.05776	4.19819	-2.00137	0.047298	0.155718	-4.43021

Table S4. Ferroptosis-immune related genes for AML.

X	logFC	AveExpr	t	P.Value	adj.P.Val	B
PPARG	3.365348	5.502661	9.102211	8.42E-16	2.93E-11	25.15703
CTSL	2.193301	7.457796	7.670724	2.70E-12	1.35E-08	17.48718
SDC2	2.521409	3.660791	7.380575	1.31E-11	3.50E-08	15.98823
CTSB	1.099153	13.11003	6.967262	1.18E-10	1.45E-07	13.89548
CXCR4	1.138417	12.76056	6.963588	1.21E-10	1.45E-07	13.87711
HMOX1	1.998296	8.287104	6.458085	1.65E-09	7.98E-07	11.39606
PLAUR	1.305281	10.30864	6.421463	1.99E-09	8.87E-07	11.22001
APOBEC3A	2.340986	7.251235	6.411925	2.09E-09	9.19E-07	11.17423
NR4A2	1.537861	10.47905	6.229562	5.22E-09	1.75E-06	10.30617
S100A6	1.3511	10.75076	6.209926	5.75E-09	1.82E-06	10.21351
PTGFR	2.392113	3.565842	6.138056	8.22E-09	2.31E-06	9.875749
SDC3	1.971449	6.563527	6.059454	1.21E-08	2.99E-06	9.508867
THBS1	2.208011	9.52719	5.903983	2.59E-08	5.03E-06	8.791165
RXRA	1.175722	10.86793	5.897707	2.67E-08	5.13E-06	8.762421

HSPA6	1.630119	5.72423	5.842507	3.48E-08	6.09E-06	8.510373
S100A11	1.280861	11.00761	5.761606	5.14E-08	8.24E-06	8.143519
CCL3	1.33463	6.269856	5.751631	5.39E-08	8.49E-06	8.098495
GRN	1.252835	13.56071	5.717004	6.35E-08	9.37E-06	7.942577
IL10	1.843882	3.932043	5.715962	6.39E-08	9.38E-06	7.937896
GNRHR	-1.00245	5.246545	-5.66998	7.95E-08	1.06E-05	7.731744
NOD2	1.650734	9.025831	5.641084	9.11E-08	1.16E-05	7.602732
FCER1G	1.529175	10.90455	5.576439	1.24E-07	1.42E-05	7.315555
IL17RA	1.205495	12.79562	5.536622	1.49E-07	1.63E-05	7.139698
FPR1	2.278529	8.193822	5.483083	1.91E-07	1.92E-05	6.904486
JUN	1.38977	11.56333	5.4387	2.35E-07	2.17E-05	6.710592
TLR4	1.495173	10.59031	5.436892	2.37E-07	2.17E-05	6.702713
FCN2	1.301084	2.219775	5.409449	2.69E-07	2.38E-05	6.583352
EPOR	1.099826	8.180501	5.407791	2.71E-07	2.39E-05	6.576154
CD4	1.339127	11.40466	5.228247	6.14E-07	4.30E-05	5.805063
TYMP	1.341347	10.41231	5.227289	6.17E-07	4.31E-05	5.800996
PTAFR	1.536742	10.52137	5.202516	6.90E-07	4.73E-05	5.695956
HBEGF	1.418254	8.891222	5.143229	9.00E-07	5.83E-05	5.445921
BMP2	1.786325	3.077659	5.083695	1.17E-06	7.06E-05	5.196779
C3	1.266048	5.659852	5.078421	1.20E-06	7.18E-05	5.174801
FCGRT	1.198135	10.94788	5.068702	1.25E-06	7.37E-05	5.134343
PTGER3	2.12841	4.75103	5.048131	1.37E-06	7.80E-05	5.048883
CYBB	1.775408	12.26599	5.027991	1.50E-06	8.28E-05	4.965444
LYZ	2.011559	15.22259	4.982491	1.83E-06	9.53E-05	4.777773
VEGFC	1.434225	3.589103	4.903765	2.59E-06	0.000123	4.455838
EDNRB	1.519402	3.479755	4.884361	2.81E-06	0.000132	4.377034
CCL20	1.037444	1.205785	4.866836	3.03E-06	0.000139	4.30605
CD14	2.329247	8.79509	4.798561	4.07E-06	0.000172	4.031213
IGHA1	1.435941	13.38118	4.755616	4.89E-06	0.000195	3.859745
CD1D	1.895328	7.889543	4.735454	5.33E-06	0.000208	3.77962
ADM	1.466677	5.464059	4.685641	6.58E-06	0.00024	3.58271
TNFSF10	1.027081	9.898859	4.661307	7.28E-06	0.000259	3.487059
SLC11A1	1.763349	9.923246	4.627066	8.41E-06	0.000287	3.353075
LRP1	1.882054	11.45204	4.615579	8.82E-06	0.000298	3.308287
C5AR1	1.847764	9.24243	4.596915	9.53E-06	0.000315	3.23569
IGHA2	1.43525	10.12282	4.576518	1.04E-05	0.000336	3.156594
KITLG	1.46053	5.137849	4.571629	1.06E-05	0.00034	3.137675
NGFR	1.212434	5.278297	4.519532	1.31E-05	0.000398	2.936982
MARCO	2.100887	5.056139	4.511422	1.36E-05	0.000408	2.905892
S100A8	2.207778	11.21536	4.503593	1.40E-05	0.000417	2.875916
IGF2R	1.14932	11.10145	4.502703	1.41E-05	0.000418	2.87251
IGF1	1.025939	2.089345	4.495448	1.45E-05	0.000428	2.844774
FABP4	1.740493	3.652711	4.49371	1.46E-05	0.000429	2.838133
ADA2	1.044349	12.62828	4.466691	1.63E-05	0.00047	2.735152

IL1R1	1.453697	7.413616	4.462867	1.66E-05	0.000476	2.720612
VEGFA	1.147053	9.339884	4.456241	1.70E-05	0.000486	2.695444
PRDX2	1.062671	10.07768	4.425379	1.93E-05	0.000532	2.578583
IL1R2	2.034529	4.894149	4.38773	2.25E-05	0.000589	2.436843
NR4A1	1.253323	9.475737	4.377404	2.34E-05	0.000609	2.398126
TNFSF12	1.078538	7.241571	4.33243	2.81E-05	0.000696	2.230296
IL13RA1	1.180503	10.3313	4.328213	2.85E-05	0.000702	2.214625
IL1RN	1.637674	7.795145	4.32404	2.90E-05	0.000711	2.199131
NR2F2	1.500559	3.240477	4.3014	3.18E-05	0.000756	2.115262
VDR	1.177185	8.532134	4.275664	3.52E-05	0.000816	2.020333
CCR1	1.390819	9.105356	4.262221	3.71E-05	0.000848	1.970917
S100A9	2.096453	11.94646	4.253769	3.84E-05	0.000867	1.939909
SFTPD	1.074679	2.274056	4.235841	4.12E-05	0.000916	1.874294
HCK	1.11713	11.02189	4.228141	4.25E-05	0.000935	1.846176
RNASE2	1.360896	12.23483	4.220685	4.37E-05	0.000954	1.81899
SEMA6B	1.080612	6.196885	4.186234	5.00E-05	0.001057	1.693838
CCL14	1.253151	2.620539	4.147162	5.83E-05	0.001181	1.552858
IGKC	1.264499	13.18664	4.102258	6.93E-05	0.001329	1.392098
SDC4	1.104419	7.216337	4.087089	7.35E-05	0.001393	1.338098
PTGS2	1.346802	9.370148	4.078808	7.59E-05	0.001422	1.308685
CXCL9	1.40054	3.010937	4.07728	7.63E-05	0.001426	1.303261
FPR2	1.611744	6.875608	4.06575	7.98E-05	0.001473	1.262399
IFI30	1.349702	6.239186	4.052424	8.39E-05	0.00153	1.215281
ULBP2	1.011448	1.658087	4.047495	8.55E-05	0.001549	1.197883
EBI3	1.10927	3.183137	4.029103	9.17E-05	0.001623	1.133116
KDR	1.447609	3.937695	4.017403	9.59E-05	0.001678	1.092033
NR2F1	1.043233	3.03477	3.994108	0.000105	0.001796	1.010517
SLPI	1.835468	4.941905	3.988509	0.000107	0.00182	0.99098
NR4A3	1.004024	6.110974	3.977868	0.000111	0.001876	0.953911
RBP4	1.037282	2.025467	3.967965	0.000116	0.00193	0.919484
FCGR2B	1.092727	7.109954	3.964705	0.000117	0.001949	0.908162
IL33	1.40737	2.682084	3.964224	0.000117	0.00195	0.906495
SEMA3C	1.702854	4.374792	3.962444	0.000118	0.00196	0.900317
S100A12	2.08265	7.630614	3.940741	0.000128	0.002084	0.825184
SDC1	1.192777	6.449485	3.923695	0.000137	0.002175	0.766404
IGLC2	1.137418	10.44794	3.889414	0.000155	0.00238	0.6488
CXCL16	1.197944	7.354007	3.865994	0.000169	0.002525	0.568933
PTGDS	1.639011	6.991413	3.840786	0.000186	0.002694	0.483394
ACKR1	1.395939	3.680257	3.802227	0.000214	0.00299	0.353426
C5AR2	1.08281	7.181332	3.801462	0.000215	0.002993	0.350859
CTSG	1.971167	10.7333	3.798854	0.000217	0.003013	0.342107
DES	1.389283	3.512145	3.789846	0.000224	0.003093	0.311918
SLIT2	1.037286	2.884752	3.78979	0.000224	0.003093	0.311733
SEMA3A	1.212748	4.383947	3.787968	0.000225	0.003108	0.305631

AQP9	1.800126	7.02453	3.770501	0.00024	0.003257	0.247284
RNASE3	1.412325	9.552799	3.710096	0.000299	0.003822	0.04718
IGHG2	1.289459	11.86489	3.707445	0.000302	0.003848	0.038458
NOX5	1.04264	2.679558	3.650182	0.00037	0.004496	-0.14869
NEO1	1.115418	6.965741	3.630305	0.000397	0.004717	-0.2131
S100A10	1.144226	10.40294	3.614589	0.00042	0.004919	-0.26382
TNFSF9	1.011896	5.916387	3.611545	0.000424	0.004944	-0.27362
LILRB3	1.124621	8.765863	3.575346	0.000482	0.005449	-0.38967
IL15	1.085671	6.442074	3.573462	0.000485	0.005475	-0.39568
SECTM1	1.506976	7.185709	3.570026	0.000491	0.005514	-0.40664
CD70	1.232616	4.551508	3.525754	0.000572	0.006194	-0.54708
IGHG3	1.035602	10.45705	3.525234	0.000573	0.0062	-0.54873
CXCL10	1.148631	3.642688	3.494595	0.000637	0.006708	-0.64506
PF4	1.547499	5.697518	3.491139	0.000645	0.006749	-0.65588
LBP	1.359413	3.607893	3.451866	0.000738	0.007461	-0.77823
ACVRL1	1.203313	5.057226	3.450989	0.00074	0.007475	-0.78095
PDGFRA	1.039528	4.109466	3.445187	0.000755	0.007566	-0.79892
CDH1	1.169122	5.781465	3.440257	0.000768	0.007648	-0.81417
IGHG1	1.113495	13.23087	3.428652	0.000798	0.007877	-0.85
CAMP	1.209429	3.752485	3.408786	0.000854	0.00825	-0.9111
PRLR	1.863492	5.988754	3.406693	0.00086	0.008293	-0.91752
CXCL1	1.142981	4.609065	3.391546	0.000905	0.008613	-0.96388
LCNL1	1.147315	3.823345	3.389582	0.000911	0.008648	-0.96988
AREG	1.646901	7.449323	3.371849	0.000967	0.009063	-1.02391
IGLC7	1.221254	4.541993	3.363984	0.000993	0.009258	-1.0478
S100P	1.108582	6.257983	3.295538	0.001247	0.010882	-1.25368
AZU1	1.5553	12.41152	3.274391	0.001336	0.011474	-1.31656
FGR	1.142875	11.43727	3.265731	0.001375	0.011715	-1.34221
CCL23	1.389296	5.197007	3.179339	0.00182	0.014474	-1.59492
IGHG4	1.264592	9.21337	3.144736	0.002033	0.015731	-1.6945
NPR3	-1.77205	9.95581	-3.12609	0.002157	0.016404	-1.74779
MSR1	1.404032	5.603899	3.084268	0.002462	0.018141	-1.86626
IL7	1.045303	4.674036	3.076538	0.002523	0.01844	-1.88801
TLR8	1.544017	8.269961	3.045972	0.002775	0.019786	-1.97355
BPI	1.328384	7.290523	3.039395	0.002833	0.020071	-1.99186
FCGR3A	1.017317	8.875433	3.035504	0.002867	0.020258	-2.00267
IGLC3	1.000911	9.293148	3.024347	0.002968	0.020749	-2.03361
IL31RA	1.317834	4.057003	2.990818	0.003292	0.022364	-2.126
RXFP1	-1.60328	6.343372	-2.98583	0.003343	0.022635	-2.13967
KCNH2	1.090884	8.1309	2.940556	0.003838	0.025068	-2.26281
APLNR	1.146524	3.444633	2.90193	0.004314	0.027405	-2.36656
SORT1	1.237952	9.80527	2.894994	0.004404	0.027824	-2.38506
EREG	1.636162	8.11106	2.879852	0.004609	0.028791	-2.42532
SEMA6D	1.058188	3.402878	2.831624	0.005319	0.032027	-2.55229

TRBV27	-1.08252	5.618672	-2.77293	0.006318	0.036332	-2.70424
CMTM5	1.061841	3.907443	2.770612	0.006361	0.036534	-2.71018
LIFR	1.077819	5.113753	2.609757	0.010053	0.051282	-3.11169
UMODL1	-1.1438	7.485963	-2.60493	0.010189	0.051733	-3.12341
ELANE	1.433013	10.86026	2.56493	0.01138	0.055905	-3.21972
CCN2	1.160796	4.587985	2.545907	0.011989	0.057965	-3.26505
VCAM1	1.1514	5.533337	2.438649	0.016003	0.071482	-3.51488
PRTN3	1.172038	11.10982	2.412304	0.017156	0.075212	-3.57475
PPBP	1.123236	7.135282	2.411856	0.017176	0.075263	-3.57576
ROBO1	1.101289	3.923809	2.331208	0.02118	0.087682	-3.75526
CXCL12	1.278894	8.529521	2.249643	0.026043	0.101829	-3.93107

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