

Supplementary Materials for
Tumor immune microenvironment in cancer patients with leukocytosis

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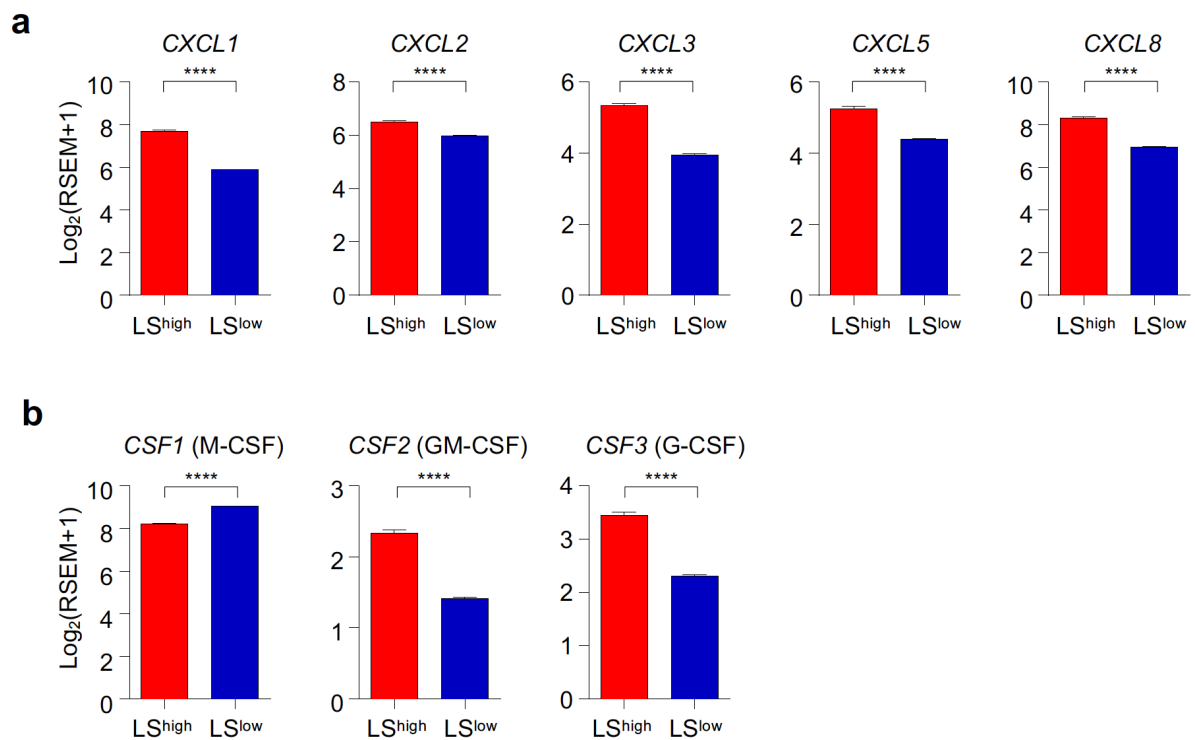
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This file includes:

Supplementary Fig. 1

Supplementary Table 1

Supplementary Methods



Supplementary Figure 1. Expression of selected genes in LS^{high} and LS^{low} tumors of the pan-cancer cohort. a Expression of selected CXCR2-related chemokines in LS^{high} (n = 2496) and LS^{low} (n = 7488) tumors. **b** Expression of *CSF1*, *CSF2*, and *CSF3* in LS^{high} (n = 2496) and LS^{low} (n = 7488) tumors. Bar graphs represent mean and s.e.m. Student's t-test (A, B). ****, p<0.0001.

Supplementary Table 1. Differentially expressed genes (log₂fold change > 1, adjusted *P* <0.05) between TRL^{pos} and TRL^{neg} tumors.

Genes	log ₂ fold change	p-value	adjusted <i>P</i>
SOX2	-6.79477709	6.21E-23	1.07E-18
GALNT5	-4.275293287	1.05E-18	9.02E-15
KAL1	-2.644190163	2.37E-18	1.36E-14
SLITRK3	-23.55465378	8.52E-16	3.66E-12
RTEL1-TNFRSF6B	-26.98047132	1.53E-15	5.27E-12
MAGEA6	26.78859858	2.42E-15	6.94E-12
SLC15A2	-3.275534792	5.53E-15	1.36E-11
CA11	-3.696152668	8.74E-15	1.88E-11
MPP6	2.072290777	1.06E-14	2.03E-11
C7	-25.6557989	3.39E-14	5.83E-11
ACTL8	25.49943771	4.83E-14	7.56E-11
ZNF611	-3.188252636	5.89E-14	8.45E-11
KIAA0513	-1.940448695	7.76E-14	1.03E-10
CHRD1	-25.16982208	1.02E-13	1.25E-10
PAX3	24.95802065	1.63E-13	1.87E-10
DAW1	24.62515224	3.39E-13	3.65E-10
TMEM110-MUSTN1	24.36683395	5.96E-13	6.03E-10
GRB14	8.239134538	7.11E-13	6.79E-10
APOBEC3F	-2.142497688	1.54E-12	1.40E-09
CACNA1B	23.73569131	2.30E-12	1.98E-09
NYNRIN	-3.386123118	9.93E-12	8.14E-09
PKP2	3.154691817	3.21E-11	2.51E-08
CD1C	-10.52678689	6.81E-11	5.10E-08
MID1	-3.175969631	8.92E-11	6.40E-08
SPINK6	10.16666551	9.78E-11	6.73E-08
SESN3	-2.43963219	1.06E-10	7.03E-08
APOL1	-2.781444478	2.26E-10	1.44E-07
SEC1P	-9.046776965	3.33E-10	2.05E-07
ID2	-2.190312856	4.98E-10	2.96E-07
CD1E	-9.7485652	6.42E-10	3.68E-07
SUSD4	-3.854633137	9.90E-10	5.49E-07
PAQR5	4.099098428	1.11E-09	5.97E-07
KBTBD12	-7.290014505	1.29E-09	6.74E-07
ABCA13	-4.107358981	2.10E-09	1.06E-06
TRHR	8.528991882	2.21E-09	1.08E-06
DDX26B	-1.558507933	2.98E-09	1.42E-06
SLC1A3	-2.664536766	3.72E-09	1.73E-06
MAML3	-1.512298897	3.96E-09	1.79E-06
DMP1	-4.425717665	4.53E-09	2.00E-06
ADAMTSL4	1.428238592	4.77E-09	2.05E-06
WFDC2	-5.706709672	4.95E-09	2.08E-06
EPB41L1	-2.5805146	5.58E-09	2.28E-06
TXNIP	-2.080089768	5.71E-09	2.28E-06
AQPEP	9.135324368	7.17E-09	2.80E-06
METTL7A	-3.579507581	8.47E-09	3.24E-06
MYLIP	-2.007162629	9.01E-09	3.37E-06
GSTM2	-2.152888686	9.39E-09	3.44E-06
SNAI2	1.310952637	9.87E-09	3.54E-06
ZNF177	-6.748123335	1.04E-08	3.67E-06
NME2	1.85833086	1.31E-08	4.46E-06
DAPL1	-5.68546884	1.34E-08	4.46E-06
SYNPO2	-3.430408178	1.35E-08	4.46E-06

ATP1B1	-1.681022985	1.85E-08	6.01E-06
KRT17	3.016501546	2.15E-08	6.81E-06
SLFN5	-1.945985321	2.22E-08	6.81E-06
AASS	-1.646056058	2.20E-08	6.81E-06
CYP4X1	-3.448005286	3.06E-08	9.23E-06
RTP4	-2.11409825	4.26E-08	1.26E-05
APOBEC3D	-2.556007124	4.61E-08	1.34E-05
NEFH	5.955453806	4.92E-08	1.41E-05
MAPK10	-3.946051622	5.25E-08	1.48E-05
SSBP2	-2.302883927	6.54E-08	1.82E-05
TRIM2	-2.612972623	7.07E-08	1.91E-05
ZNF81	-1.652900324	7.10E-08	1.91E-05
CCDC60	-6.78912381	8.03E-08	2.12E-05
FAM102A	-1.75458244	9.76E-08	2.54E-05
CCT7	1.068300165	1.22E-07	3.09E-05
ZNF470	-3.089938083	1.22E-07	3.09E-05
KIAA1683	-2.012566068	1.29E-07	3.22E-05
BCL2L12	1.550399895	1.35E-07	3.28E-05
CHST9	-8.566320919	1.35E-07	3.28E-05
TET2	-1.659122756	1.42E-07	3.39E-05
SMOC1	6.415290126	1.46E-07	3.45E-05
APOBEC3C	-1.200827663	1.95E-07	4.53E-05
MAGEA3	10.7322197	2.10E-07	4.81E-05
PADI3	-8.147480023	2.29E-07	5.18E-05
ZNF586	-2.154405899	2.38E-07	5.27E-05
OPHN1	-1.86080735	2.39E-07	5.27E-05
FJX1	2.721702348	2.60E-07	5.60E-05
MEIS1	-2.179200596	2.59E-07	5.60E-05
NGFR	-5.261798457	2.85E-07	6.05E-05
SNORD93	2.699760903	2.98E-07	6.25E-05
KRBOX4	-1.384370148	3.48E-07	7.21E-05
CERS2	1.620464609	3.81E-07	7.81E-05
GPR153	2.62914813	5.27E-07	0.000106778
L1CAM	4.389714504	5.36E-07	0.000107264
CYP4Z2P	-6.6834593	7.69E-07	0.000149265
MCF2L	-1.923510235	7.72E-07	0.000149265
ZNF614	-2.070461404	9.01E-07	0.000172186
SNORD116-9	-5.039110509	1.03E-06	0.000194966
HMCN2	-5.119775582	1.06E-06	0.000197998
CD207	-9.95904778	1.25E-06	0.00022925
LGALS3	-1.021365346	1.25E-06	0.00022925
ADH4	-4.296790384	1.27E-06	0.000229487
RNF138P1	-2.459303288	1.41E-06	0.000253043
ANAPC15	1.79954193	1.71E-06	0.000302547
GUSBP3	-1.56519272	1.74E-06	0.000305534
HES4	2.357776016	1.79E-06	0.000310684
GUSBP2	-1.522639582	1.97E-06	0.000338325
NDUFA4	1.103278434	2.02E-06	0.000343549
GAL	7.004482589	2.12E-06	0.000353398
CALML5	-7.434639316	2.11E-06	0.000353398
GAL3ST2	-5.823920536	2.15E-06	0.000355943
OSBP2	4.182546042	2.35E-06	0.000381319
C21orf91	-1.679347206	2.34E-06	0.000381319
CGNL1	-3.703265855	3.01E-06	0.000483911
COLCA1	-6.784719193	3.32E-06	0.000528978
ZNF836	-1.64014723	3.40E-06	0.000533866
ARHGAP26	-1.260394844	3.41E-06	0.000533866
DSG2	1.735690918	3.47E-06	0.000535183
EDARADD	-2.270030592	3.51E-06	0.000535183

CACHD1	-1.637657127	3.51E-06	0.000535183
PYGL	1.747956117	3.57E-06	0.000538914
MMP13	-3.794252555	3.84E-06	0.00057404
NAGK	-1.266445119	3.92E-06	0.000581625
ARHGEF3	-1.601591663	4.02E-06	0.000586571
CYLD	-1.403128004	4.01E-06	0.000586571
CCL19	-6.103543255	4.20E-06	0.000602234
ATXN1	-1.26136561	4.18E-06	0.000602234
NENF	1.447747081	4.26E-06	0.000605598
MAML2	-1.678948833	4.30E-06	0.000606743
CHD6	-1.001677368	4.60E-06	0.000642933
TMTC2	-1.562677787	4.84E-06	0.000672371
PPAP2A	-1.365094622	5.04E-06	0.00069336
CNTNAP3P2	-14.65063849	5.43E-06	0.000738653
ZNF827	-2.219381212	5.45E-06	0.000738653
MAD2L2	2.130001461	5.68E-06	0.000763379
CISD1	1.88745205	5.79E-06	0.000763814
RPE65	12.56920864	5.84E-06	0.000763814
TSHZ2	-3.266863554	5.81E-06	0.000763814
MMP24	-1.521299762	5.86E-06	0.000763814
CASK	-1.382647513	6.32E-06	0.00081775
FOXQ1	-2.998025406	6.51E-06	0.000836094
NDUFB9	1.119953467	6.61E-06	0.000841968
GADD45GIP1	1.911023061	6.98E-06	0.000876793
FFAR4	-4.059100598	6.96E-06	0.000876793
TNFRSF6B	2.981680853	7.14E-06	0.000888478
NHLH2	-7.733209855	7.19E-06	0.000888478
AMOT	-3.761701618	7.23E-06	0.000888478
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PIK3R1	-2.271179368	7.91E-06	0.000958348
SLC39A6	2.128318611	8.35E-06	0.000998081
COL9A2	-3.456176103	8.33E-06	0.000998081
SRMS	7.944297512	8.46E-06	0.00100382
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EML6	-1.906543979	8.92E-06	0.00103741
CEP97	-1.073634725	8.89E-06	0.00103741
DAPP1	-1.955048997	9.07E-06	0.001047508
SPTSSB	-6.107965147	1.02E-05	0.00117168
CFL1	1.255051862	1.04E-05	0.001184202
MOCOS	2.857411125	1.09E-05	0.00122288
MALL	-2.499269085	1.10E-05	0.001225845
TTC9	-2.894253423	1.14E-05	0.001261446
UPK1B	-10.87294926	1.16E-05	0.001274873
MYBPC2	-7.808697968	1.25E-05	0.001368152
DSPP	-3.737827444	1.32E-05	0.001433502
CXCL14	-5.403113224	1.35E-05	0.001457958
F3	3.293586861	1.39E-05	0.001490124
PFN1	1.049035825	1.40E-05	0.00149779
ZNF708	-2.022744343	1.45E-05	0.001538324
LTBR	1.480495125	1.65E-05	0.001741687
DTX3	-1.703406741	1.66E-05	0.001742099
TMOD2	-1.143022986	1.67E-05	0.001742099
SAPCD1	-9.198438251	1.69E-05	0.001756782
POF1B	-2.171906847	1.75E-05	0.001800015
ZNF347	-2.714700829	1.82E-05	0.00186618
NDUFAF4	1.598903629	1.86E-05	0.001893693
ZG16B	-4.074146136	1.88E-05	0.001898505
SCN7A	-9.662915866	1.92E-05	0.00193329
IL1B	3.069230459	2.03E-05	0.002026186

NDUFC2	1.436210776	2.07E-05	0.002030662
CAPN6	-9.684763137	2.05E-05	0.002030662
PIK3C2B	-1.701054095	2.05E-05	0.002030662
LRRC37A3	-1.115085523	2.08E-05	0.002030662
GAGE2A	7.956087563	2.18E-05	0.002119711
SCNN1G	-4.925524941	2.28E-05	0.002203485
TRIM22	-1.739234861	2.32E-05	0.002232581
EYA2	-2.412903177	2.38E-05	0.002260577
WISP3	-5.968248476	2.45E-05	0.002302942
ELN	-3.863555079	2.44E-05	0.002302942
NPNT	-2.044270367	2.48E-05	0.002322116
CPS1	5.90750055	2.67E-05	0.002471486
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CDH26	-3.559320185	2.69E-05	0.002471486
CX3CL1	-3.865420445	2.75E-05	0.002513856
GPR152	-7.544419607	2.77E-05	0.002523966
NPIPA3	4.394518977	2.85E-05	0.002580289
IMPAD1	1.049305818	2.88E-05	0.00258682
CXCL3	3.187767747	2.90E-05	0.00258682
CDC14A	-2.064366158	2.89E-05	0.00258682
GRAMD1B	2.982352764	2.96E-05	0.002622779
TMEM63C	-4.440173178	2.99E-05	0.002634993
UBA7	-1.545872344	3.04E-05	0.002673466
NPM3	2.18360317	3.14E-05	0.002731937
LGALS9C	-5.319178606	3.13E-05	0.002731937
TRAFD1	-1.037064815	3.17E-05	0.002744479
FAM156A	4.325756125	3.29E-05	0.002835122
GATS	-1.914368043	3.47E-05	0.002971908
EHF	-2.168537544	3.56E-05	0.003015932
PTPRS	-1.759966225	3.54E-05	0.003015932
FGFR4	5.130591325	3.91E-05	0.003262254
SCPEP1	-1.943657907	3.90E-05	0.003262254
PARD6B	-1.305989817	3.89E-05	0.003262254
EFHD2	1.718228443	3.96E-05	0.003263811
KIAA1549L	3.033686383	3.94E-05	0.003263811
CCDC146	-2.004995426	3.95E-05	0.003263811
ECHS1	1.004808006	4.00E-05	0.003275231
IL13RA2	8.964654602	4.07E-05	0.003301833
DNM1P46	-2.500277614	4.06E-05	0.003301833
TDRD5	11.8967354	4.12E-05	0.00333116
SLC35B2	1.69772259	4.30E-05	0.003449284
TLX3	8.871743178	4.52E-05	0.003599014
C11orf24	1.813443269	4.56E-05	0.003616287
VAV3	-2.049904508	4.59E-05	0.003625938
SURF4	1.248462468	4.72E-05	0.003706952
IKZF2	-1.811322935	4.89E-05	0.003828705
ATXN7L1	-1.043038706	4.98E-05	0.003879266
STXBP6	7.493195644	5.04E-05	0.003908049
OR2A20P	-1.820270121	5.41E-05	0.004136136
GATA3	-2.167499246	5.45E-05	0.004149095
SEC11A	1.287120431	5.54E-05	0.004200273
C1orf110	-6.152688458	5.70E-05	0.004303916
MTHFD1L	1.99357165	5.90E-05	0.004435954
CXCL8	2.958818953	5.96E-05	0.004445527
GPR34	-1.410385738	5.97E-05	0.004445527
SLX1A-SULT1A3	-1.17852368	6.18E-05	0.004586049
SIDT1	-2.883639949	6.25E-05	0.004613196
CP	-4.073066332	6.40E-05	0.004707783
NLRP7	-3.924800615	6.47E-05	0.004735297

POLR2F	1.272025542	6.51E-05	0.004747285
LOC399815	2.774329796	6.60E-05	0.004794034
SLC25A39	1.604719033	6.82E-05	0.004910367
FOSB	-4.215542727	6.81E-05	0.004910367
MCMBP	1.06492321	7.51E-05	0.005341434
APOL3	-1.746872517	7.50E-05	0.005341434
KLHL13	-2.057064263	7.75E-05	0.005485132
ZNF137P	-2.673697625	7.79E-05	0.005496164
SYTL5	-5.127407443	8.01E-05	0.005603149
LRP8	1.817336736	8.10E-05	0.005645148
PRSS12	-2.079501976	8.23E-05	0.005714244
RASSF6	-1.555717614	8.42E-05	0.005818997
BDH2	-1.411296507	9.15E-05	0.006296235
BTN3A2	-1.726974147	9.22E-05	0.006318156
STC1	4.129140378	9.43E-05	0.006439368
CRYBG3	-1.299933301	9.55E-05	0.006493249
IGFBP5	-4.053992889	9.81E-05	0.006646701
BNIP3	2.127034347	9.86E-05	0.006655203
IGFBP2	-3.320514701	9.90E-05	0.006658268
CCDC88B	-1.656804398	0.000100941	0.006759114
CBX6	-2.04991545	0.000103905	0.006930605
KCNJ12	4.586527424	0.000105455	0.006959584
CADM3	-9.535252084	0.000105552	0.006959584
AGL	-2.266110723	0.000105405	0.006959584
NAIP	-1.114519942	0.000106825	0.007016582
AVPI1	2.658635439	0.000107468	0.007031988
PXN	1.56458588	0.00010943	0.007133268
APOBEC3G	-1.965703857	0.000117263	0.007586404
ARHGAP24	-2.255098804	0.000118688	0.007649842
EMR4P	-1.281574069	0.000119667	0.007684134
SHROOM2	-1.893480493	0.000120429	0.007704333
MAGEA1	12.33378694	0.00012455	0.007880071
ZNF549	-2.251602606	0.0001238	0.007880071
SLC9A7	-1.62156394	0.000124226	0.007880071
KRT24	-12.62680071	0.000128148	0.008078044
MRPL52	1.275334485	0.000129367	0.00812509
TMPRSS2	-3.315632432	0.000129847	0.008125583
THAP4	1.176616761	0.000133105	0.00827292
GAPDH	1.28970388	0.000133644	0.00827292
PCCA	-1.135158076	0.000133345	0.00827292
CKS1B	1.566057254	0.000145644	0.008929769
HLF	-3.849356388	0.000145811	0.008929769
RFPL1	6.047488961	0.00014679	0.008957838
LDLRAD4	-2.344302279	0.000148615	0.009037141
C21orf140	-1.741574159	0.00014957	0.00906323
CSNK1E	1.676131875	0.000151719	0.009146199
KRT7	-4.842338141	0.000153758	0.009155809
IDO1	-2.727618586	0.000153237	0.009155809
IRX5	-2.092247881	0.000152739	0.009155809
LRRC59	1.62167397	0.000154835	0.009156542
NBEA	-2.890355025	0.000154798	0.009156542
PTP4A1	2.184022727	0.000156659	0.009221959
CLDN11	-3.172218936	0.000157013	0.009221959
SOX9	1.334025657	0.000160005	0.009271108
VSTM5	6.898610962	0.000159517	0.009271108
MLYCD	-1.416255252	0.000158689	0.009271108
GUSBP4	-1.016009859	0.000159921	0.009271108
MAD2L1BP	1.050429194	0.000163008	0.009413449
MPPED2	-6.159725001	0.000166362	0.009574982

ACSS1	-1.620666794	0.000170868	0.009801544
SFXN4	1.306211852	0.000171641	0.009813165
RPF2	1.184004883	0.000173627	0.009866289
ATP9A	-1.67842356	0.000173716	0.009866289
MAP3K1	-1.280608443	0.000175416	0.009930038
GSTO2	1.502023198	0.000176792	0.009975114
ARID5B	-1.537911203	0.000177958	0.010008128
ROBO2	-5.576649583	0.000180949	0.010110255
SEMA6D	-2.75012608	0.000180945	0.010110255
PSMB7	1.134911085	0.000192616	0.010686117
PITPNM2	1.374004711	0.000193119	0.010686117
KAT2B	-1.910186647	0.000192109	0.010686117
PTGES	2.903863388	0.000197855	0.010740975
GAGE8	11.26034115	0.00019543	0.010740975
CCDC162P	-5.657767877	0.000196626	0.010740975
ZNF878	-3.966057312	0.000195778	0.010740975
PARM1	-1.734198254	0.000197545	0.010740975
LGR4	-1.810828234	0.000198739	0.010755023
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CHCHD2	1.14876531	0.000203385	0.010937672
PM20D2	1.977773262	0.000204906	0.010985117
MRPS24	2.685451897	0.000210782	0.011247577
ACACB	-1.630034894	0.000211109	0.011247577
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POLR3G	1.981100484	0.000222099	0.011688375
FAM72B	1.494743903	0.000233474	0.012228745
ERGIC1	1.755458372	0.000233788	0.012228745
ABI3BP	-3.35888721	0.000235377	0.012274563
MARK1	-1.923875659	0.000239988	0.012439617
RAB36	-1.802242195	0.000240878	0.012448269
NT5C3B	1.022393764	0.000244736	0.012609747
ZNF702P	-4.024402954	0.000246405	0.012657884
ZBTB22	-2.367096121	0.000248208	0.012712519
SRM	1.797027979	0.000251332	0.012827193
ADAM22	-2.886848727	0.000251937	0.012827193
ZNF100	-1.514810329	0.0002601	0.013164887
SYT17	-2.205719374	0.000260908	0.013167052
PRSS45	-7.415598538	0.000261704	0.013168606
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NAALADL2	-3.127178049	0.000266031	0.013269934
PKD1L2	-4.788358795	0.000267665	0.013312831
GGCT	1.114131593	0.00027618	0.013696759
ATP13A4	-4.619545911	0.000279913	0.013842003
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ATP5G1	1.538792249	0.000287349	0.014008481
ESR1	-2.904223979	0.000290531	0.014107259
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CDC37	1.245841372	0.000302189	0.014566852
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ZNF440	-2.000883113	0.000313212	0.014999812
KCNRG	-1.074718659	0.000319217	0.015217184
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KLF4	-2.641614035	0.00034243	0.016144894
MAGI3	-1.665393826	0.00034844	0.016383342

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EEF1A2	8.715232338	0.000351894	0.016455803
FRMPD3	-2.644008462	0.000355117	0.01651676
BPGM	-1.546454126	0.000355053	0.01651676
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LGALS2	-2.184231848	0.000357866	0.016540595
HLA-E	-1.000568402	0.000357202	0.016540595
ZNF501	-2.711762688	0.000360906	0.016606483
GAGE2C	7.04070478	0.000362411	0.016613838
GMPR	-1.790787913	0.000362996	0.016613838
PRMT5	1.116559764	0.000364245	0.016626757
FOXP2	-3.896682454	0.000370287	0.016813379
GPI	1.012563906	0.000372315	0.016816723
NUS1	1.215139248	0.000371781	0.016816723
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SOCS7	1.03109021	0.000376607	0.016933222
C1QB	1.543414432	0.000381672	0.017097054
KLHL3	-1.41712141	0.000382496	0.017097054
SERPINB13	-2.221074637	0.000384948	0.017162083
MAP7	2.326589009	0.000387914	0.017249649
BCAP31	1.171776469	0.000392441	0.017405993
CYP3A5	-2.375177927	0.000400138	0.017701742
OSR2	-2.06338223	0.000402224	0.017748384
ITGA5	1.893106939	0.000404777	0.01781538
FAM177A1	1.252445924	0.000410521	0.017930582
CDKL4	8.456981937	0.000409873	0.017930582
LGALS9	-1.566233838	0.000409447	0.017930582
ALOX15	-4.799071152	0.000413646	0.01802135
FBXL6	1.667087565	0.000414731	0.018022997
MAFK	1.770652304	0.000425509	0.018379166
TCHHL1	11.28722585	0.000427199	0.018379166
VIPR1	-4.484470231	0.000426166	0.018379166
RBPM5	-1.822976861	0.000424094	0.018379166
CD8B	-2.627388585	0.000431228	0.018506229
SLC26A7	7.037551291	0.000442037	0.018922934
FAM72D	1.320568981	0.00045219	0.019268372
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SCNN1B	-4.143224743	0.00045646	0.019268372
MFSB6	-1.164911498	0.000456505	0.019268372
SERPINF2	-2.086131101	0.000462924	0.019477903
VWA5A	-1.773482148	0.000465718	0.019547647
NRXN1	-7.229356077	0.000474354	0.019861715
SMPD1	-1.382930641	0.000478349	0.01998036
STRIP2	1.36417281	0.000485673	0.020237168
GSN-AS1	-2.595172939	0.000489959	0.020366428
ITPK1	1.352843255	0.000500121	0.020721036
MMP3	4.225423965	0.000502102	0.020721036
SMAD6	-1.734134576	0.000501812	0.020721036
RABL2A	-1.096709624	0.000510342	0.021010705
IL34	-2.583505903	0.000528553	0.021656832
CPEB3	-1.275482967	0.000551239	0.022532705
TRIM65	1.293607496	0.000561692	0.022905596
SLC39A4	2.443665989	0.000567848	0.023047413
GTF2IRD2	-1.231263925	0.000566983	0.023047413
PTX3	8.096794287	0.000574044	0.023244056
RFX2	-1.585899819	0.000595039	0.023981335
TMEM33	1.108539652	0.000603536	0.024210371

DMD	-2.487908119	0.000602205	0.024210371
ANKRD20A9P	-2.937261146	0.000611764	0.024483383
MRPL57	1.486329489	0.000617222	0.024587439
GAGE12B	8.009485925	0.0006163	0.024587439
CFHR4	8.391215757	0.000622304	0.02473263
ZNF221	-2.045253939	0.00063421	0.025147732
SPR	1.207509782	0.000637666	0.02522667
ZNF439	-2.327062032	0.000640594	0.025284362
ZNF528	-2.018661837	0.000645	0.025400019
NR1D2	-1.654279823	0.000652028	0.025618165
ZNF812	-3.394528916	0.00066068	0.025840103
SHMT2	1.111931451	0.000667734	0.026001697
KRT15	-3.912332533	0.000667834	0.026001697
BARX1	9.498391613	0.000674036	0.026183946
TOP1MT	1.393666811	0.000683063	0.026356136
TOMM5	1.502549302	0.000682798	0.026356136
C20orf197	8.400468229	0.000681032	0.026356136
TMEM178B	-8.216475788	0.00068996	0.026562683
C1orf74	3.229541672	0.000693403	0.02663566
GATSL2	-1.721192018	0.000697691	0.026740681
PIGR	-5.231976378	0.000705911	0.026935766
ZNF281	-2.434849194	0.000708302	0.0269672
TOP1P1	-1.978207666	0.000709961	0.026970697
C4orf19	-2.580909895	0.000713993	0.027064113
ADAM8	1.967073785	0.00072352	0.027322028
IKZF4	-1.47171249	0.00072556	0.027322028
FAM156B	-1.415082903	0.000725284	0.027322028
NOP2	1.515304822	0.000727438	0.027332916
CALB1	5.528257592	0.000736283	0.027604992
TIFA	-1.555537509	0.000755275	0.02819421
HERC6	-1.753742547	0.000762121	0.028326858
PIK3IP1	-1.11936543	0.000774253	0.028715764
S100A6	1.509095672	0.000781588	0.028925497
IFITM10	-2.488566669	0.000787091	0.0290044
APOL4	-2.171836521	0.000796731	0.029296897
COX6A1	1.047957218	0.000808792	0.02954227
SLC39A8	1.097782176	0.000810271	0.02954227
AURKAIP1	1.369760277	0.000809624	0.02954227
GBP4	-1.521227941	0.000808263	0.02954227
SALL4	-2.051747671	0.000812953	0.029577408
CBFA2T2	-1.210678746	0.0008185	0.029716392
KIAA1217	-1.463895544	0.000820355	0.029721042
USP53	-1.136661848	0.000824422	0.029805615
BOC	-2.504139602	0.000826317	0.029811498
RPL8	1.079644352	0.000831395	0.029931953
RPS3	1.103332281	0.000835986	0.029971851
GPRC5B	-2.025058519	0.000835784	0.029971851
EBNA1BP2	1.084811449	0.000839392	0.030031398
PHB	1.18175869	0.000856274	0.03048486
CYP4Z1	-4.035673109	0.000866238	0.03048486
SLC9A9	-2.523654592	0.000863376	0.03048486
LTB	-2.446385982	0.000861303	0.03048486
ZNF701	-2.109052487	0.000858052	0.03048486
PRSS3	-4.015483715	0.000869364	0.030489774
IST1	-1.020229875	0.000869921	0.030489774
GAGE7	7.840261493	0.000876889	0.030671502
WWC1	1.705356432	0.00088079	0.030683223
PARP14	-1.327839424	0.000880531	0.030683223
DNAH1	-1.289191861	0.000886719	0.030827373

EAF2	-1.873786658	0.000897524	0.031140096
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MRPL11	1.148588704	0.000917509	0.031705637
CAMK2D	-1.247613558	0.00092098	0.031761798
RFPL1S	6.812752737	0.000928107	0.03194358
INTS12	-1.068377216	0.000939551	0.032272908
ELF5	-9.341780164	0.000943499	0.03234396
C8orf4	-3.048691206	0.000945817	0.032358992
HSPD1	1.178953005	0.000952472	0.03245759
TOMM7	1.332459073	0.000950639	0.03245759
NDRG2	-1.95141957	0.000956176	0.032519422
PTTG2	-2.110696259	0.000965195	0.032696935
NEDD9	-1.705410922	0.000965154	0.032696935
TGFBI	2.786068417	0.000971689	0.032801565
GABRP	-3.415396297	0.000972096	0.032801565
LOC441242	-6.667430433	0.000978438	0.032942765
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GPR98	-3.930968506	0.000996207	0.033224272
AIM2	-2.217773672	0.001004003	0.033354997
LOC441081	-1.357587323	0.001003079	0.033354997
SEC16B	-1.686227126	0.00101472	0.033646084
CUTA	1.158597867	0.001022652	0.033783096
TRIB2	-1.698268934	0.001022778	0.033783096
MAGEC2	9.291860044	0.001034309	0.03396835
ARMCX4	-2.085094153	0.001033423	0.03396835
GBP2	-1.790218372	0.001033868	0.03396835
TEF	-2.028647594	0.001040319	0.034100659
GNPNAT1	1.219499369	0.001058204	0.034489836
PFN2	1.926983782	0.001061399	0.034512125
ZNF471	-3.692812633	0.001062899	0.034512125
GAGE13	7.798483098	0.001079997	0.034823522
ZNF736	-1.977768955	0.001074808	0.034823522
PER3	-1.965564956	0.00107938	0.034823522
ZNF680	-1.203974424	0.001080583	0.034823522
NCF2	1.399649985	0.001090065	0.034933145
HAGHL	1.820249644	0.001087791	0.034933145
TSTA3	1.201669448	0.001094469	0.035008754
HDAC2	1.274063916	0.001101093	0.035155301
FURIN	1.030258969	0.001115678	0.035555001
DBP	-1.417703647	0.001118065	0.035565217
MOV10L1	4.681855684	0.001128593	0.035833883
PDZD8	1.073143975	0.001146694	0.036274748
NOP10	1.250937116	0.001145428	0.036274748
GAGE12J	7.921457407	0.00115055	0.036329951
SLC4A4	-3.993702673	0.001156649	0.036455623
CDKN2C	-2.057265128	0.001158974	0.036462143
SH3TC2	3.182293122	0.001161203	0.03646559
PSMD4	1.034757102	0.001171935	0.03660224
CD55	3.314701705	0.001171391	0.03660224
MLC1	7.754445063	0.001175884	0.036659047
PSMB5	1.17977385	0.001179948	0.036719219
GUSBP1	-1.366543093	0.001192916	0.037048594
MRGPRX3	8.155594385	0.001213033	0.037276943
GRHL3	-2.818475357	0.001210561	0.037276943
STX19	-2.028071383	0.001212543	0.037276943
C11orf63	-2.021080425	0.001207606	0.037276943
ZNF532	-1.313607616	0.001210891	0.037276943
MRPL18	1.146708206	0.00122815	0.037607186

EHD3	-2.209404494	0.001228064	0.037607186
BEND3	1.923009912	0.001231089	0.037630227
CD8A	-2.786536551	0.001252451	0.038215289
VIPR2	-5.254577433	0.001259657	0.038299362
FAM46B	-2.934024804	0.001271917	0.038535962
MYH11	-2.954573356	0.001289471	0.038999127
EIF2AK1	1.051152487	0.001293302	0.039046387
EIF3B	1.257687459	0.001299403	0.039061837
C1QTNF6	1.846751389	0.00129746	0.039061837
PANX2	2.103810869	0.00130267	0.039061837
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AIMP2	1.664192411	0.001336902	0.040011722
MARCO	3.667599732	0.001342183	0.04002879
RARRES3	-2.245372244	0.001340232	0.04002879
EXPH5	-2.048974462	0.00134445	0.04002879
CYP2W1	-6.647232788	0.001355355	0.040214312
CDKN3	1.562073836	0.001374862	0.040710567
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ALGIL	-2.173826756	0.00137993	0.040732792
ADAT2	1.376776438	0.001385912	0.040839306
SEMA5A	-1.794209392	0.001402329	0.041252455
SPRYD7	1.462664788	0.001409752	0.041375807
SELENBP1	-2.131862676	0.001411331	0.041375807
TMC8	-1.629255297	0.001418778	0.041523393
PTGIS	-3.315757027	0.001445828	0.042100255
PON2	1.104258189	0.001449218	0.042127682
TRPV6	-4.418266759	0.001474035	0.042704837
BUB1	1.248911386	0.001490923	0.043063556
KCNJ2	-1.826001683	0.001491422	0.043063556
PSG2	-9.06667117	0.001507564	0.043456744
CYP2E1	-3.153934553	0.001510788	0.043476852
BACE2	1.433664149	0.00151629	0.043562321
SLC7A5	2.915672738	0.001557056	0.044584644
PSD3	-1.199030495	0.001563868	0.044705326
GPC5	7.901735921	0.00157405	0.044921779
PIF1	1.431730386	0.001581415	0.045057234
PSMB3	1.145840191	0.001591097	0.045183474
ABR	-1.275494345	0.00159072	0.045183474
TNFAIP2	-1.721286213	0.001598159	0.045309245
CCT4	1.020336419	0.001606018	0.045457166
LOC100507156	9.044521115	0.001611715	0.045510672
BCO2	-1.800196947	0.001613197	0.045510672
DTX2P1-UPK3BP1-			
PMS2P11	-1.737185092	0.001623541	0.045727532
ARHGEF28	-1.882334154	0.001637904	0.045997232
RHD	-1.202986034	0.001643064	0.046051279
TRIM62	-1.445968422	0.001679344	0.046991599
DHFRL1	-2.926688137	0.001700514	0.047506741
RPL36A	1.263418561	0.001716433	0.047796261
GAGE2B	7.552566388	0.001714048	0.047796261
ENTPD3	2.652302064	0.001727719	0.047967437
SENP7	-1.092236819	0.001728155	0.047967437
CEP55	1.142574908	0.001747636	0.048430066
LOC101926943	-1.596292497	0.001755895	0.048561371
APOL6	-1.215576119	0.001758018	0.048561371
MFI2	1.981729684	0.001765378	0.048686514
MRPL24	1.403614531	0.001773555	0.048755765
CAND2	-3.245966166	0.001771338	0.048755765
EGR2	-2.199119231	0.001777516	0.048760673

KRTCAP2	1.271591254	0.001784701	0.048828163
MTUS1	-1.522261035	0.001789418	0.048879515
EPCAM	2.304309915	0.001800745	0.048955799
ETNK2	-1.809996813	0.0017996	0.048955799
PTPN13	-1.645394344	0.001797097	0.048955799
FGFR2	-2.361839827	0.001812837	0.04920679
LOXL2	1.913328218	0.001821846	0.049373468
ITGB4	1.923209501	0.001829126	0.049492805
ZNF354C	-1.702728866	0.001837798	0.049649395

Methods

RNA sequencing and analysis

An oligo-dT primer containing an Illumina-compatible sequence at its 5' end was hybridized to the RNA for reverse transcription. After degradation of the RNA template, second strand synthesis was initiated with a random primer containing an Illumina-compatible linker sequence at its 5' end. The double-stranded library was, then, purified using magnetic beads. The library was amplified to add the adapter sequences required for cluster generation. Purified libraries were sequenced with HiSeq 2500 (Illumina) at an average of 58 million paired-end 100-bp reads. Reads were aligned to the human genome (hg19) using TopHat v2.1.1 (<https://ccb.jhu.edu/software/tophat/index.shtml>). The number of mapped reads for each gene was quantified using StringTie.