Supplementary information Table S1: DEGs regulated by Chr-A were obtained from RNA-seq analysis of tumor tissues

Chr A-Related Target	fold changes	p-values
CTSD	46.1068	0.0019
ITGB1	28.9217	0.0000
RPS5	22.2056	0.0252
KPNB1	19.9508	0.0002
IMMT	13.0924	0.0303
AIMP1	12.6145	0.0001
SLC43A3	10.7698	0.0209
MLH1	10.0699	0.0004
PRPSAP1	8.8754	0.0008
IP6K1	8.1634	0.0000
AVL9	8.1329	0.0032
ARHGAP22	8.0901	0.0002
AES	8.0083	0.0000
PITPNB	7.6509	0.0324
TP53	7.2254	0.0004
GNPDA1	7.2235	0.0050
TNFAIP2	7.1712	0.0088
TOR1AIP1	6.9239	0.0039
SSBP3	6.8031	0.0015
INTS14	6.7593	0.0010
UBAC2	6.7454	0.0049
ACACA	6.1180	0.0000
ZYX	6.0630	0.0224
DIDO1	5.9091	0.0000
METTL7A	5.8520	0.0261
PMP22	5.8439	0.0010
DICER1	5.6950	0.0005
RNF41	5.4313	0.0012
CRLS1	5.3438	0.0001
VPS26A	5.2147	0.0174
ELP3	4.8439	0.0086
RPS15	4.8338	0.0307
CSNK1G3	4.7851	0.0002
CADPS	4.7562	0.0431
ANKRD28	4.7410	0.0201
DCAF5	4.6952	0.0002
GOLGA2	4.6052	0.0002

PARP1	4.5876	0.0006
SERP1	4.4603	0.0307
TMEM9	4.4258	0.0018
SAMD11	4.3750	0.0089
FRMD6	4.2764	0.0424
STK16	4.2471	0.0197
ADGRL2	4.2462	0.0033
PML	4.1717	0.0037
FZD6	4.1302	0.0023
BGLAP	4.0841	0.0123
TEN1	4.0764	0.0404
CDC25C	4.0565	0.0337
ZMYND8	3.9436	0.0404
DMAP1	3.9036	0.0073
RPL35A	3.8483	0.0452
ZBTB14	3.8380	0.0097
PCID2	3.8369	0.0412
TXNDC9	3.8243	0.0238
C12orf75	3.7689	0.0461
MRPL34	3.7539	0.0433
PELP1	3.7111	0.0109
COMMD7	3.6617	0.0142
CCDC14	3.5944	0.0021
CCT7	3.5550	0.0169
CCDC113	3.5416	0.0373
NIF3L1	3.5085	0.0204
TP53BP1	3.4916	0.0459
PON2	3.4493	0.0159
RIDA	3.4453	0.0440
PHC2	3.4316	0.0160
PRKCD	3.4097	0.0014
ZNF688	3.4011	0.0058
DCAKD	3.3876	0.0405
CCL24	3.3855	0.0392
CDC45	3.3531	0.0085
SHKBP1	3.3273	0.0376
ELOVL5	3.3134	0.0182
ANAPC11	3.2797	0.0145
RAB4B	3.2603	0.0114
CYFIP1	3.2185	0.0144
YY1AP1	3.2152	0.0205
ZC3HC1	3.1879	0.0133
GTF3C5	3.1688	0.0009

ZNF236	3.1671	0.0002
CBWD1	3.1414	0.0094
RND3	3.1138	0.0089
WDR61	3.0982	0.0340
FRYL	3.0953	0.0100
RNPEPL1	3.0913	0.0417
RAD51B	3.0631	0.0039
COL4A6	3.0367	0.0199
SGMS1	3.0361	0.0000
LANCL1	3.0349	0.0133
PXK	3.0212	0.0113
MGA	3.0090	0.0001
PLOD2	2.9942	0.0186
CLSPN	2.9478	0.0285
MED27	2.9313	0.0293
ATP11C	2.9175	0.0233
AC099811.2	2.8977	0.0095
ADGRE1	2.8977	0.0298
FLNC	2.8970	0.0400
TSEN15	2.8897	0.0199
AURKA	2.8857	0.0294
AGBL5	2.8767	0.0351
WDR74	2.8686	0.0454
DPM3	2.8525	0.0060
ZCCHC10	2.8458	0.0219
RNF8	2.8346	0.0006
EXOSC1	2.8339	0.0068
USP47	2.8227	0.0173
TLK1	2.8102	0.0030
C5orf24	2.8067	0.0308
BCL2L1	2.7959	0.0299
FERMT3	2.7785	0.0004
TAF9	2.7771	0.0007
HNRNPDL	2.7186	0.0182
APOBEC3B	2.7008	0.0011
MIF4GD	2.6855	0.0000
MRPL23	2.6667	0.0102
CDH18	2.6622	0.0000
GPR107	2.6479	0.0093
MXI1	2.6302	0.0123
BCKDK	2.6185	0.0279
BTBD10	2.6081	0.0446
ZSWIM7	2.5997	0.0079

CCNC	2.5989	0.0022
YPEL3	2.5953	0.0242
SYTL3	2.5858	0.0064
BDKRB1	2.5755	0.0119
TNFRSF19	2.5725	0.0184
GPATCH4	2.5418	0.0441
C11orf80	2.5303	0.0000
HIST1H3B	2.5279	0.0059
MTMR14	2.5270	0.0297
KCNMA1	2.5253	0.0011
SCML2	2.5173	0.0019
TROAP	2.5091	0.0050
ZNF749	2.5068	0.0026
LSM4	2.5065	0.0344
SLC4A2	2.5057	0.0446
HYI	2.4969	0.0011
N4BP2	2.4903	0.0296
BTBD11	2.4876	0.0312
ELP5	2.4671	0.0146
RPUSD3	2.4476	0.0498
ATP6V0E2	2.4454	0.0379
FDFT1	2.4299	0.0184
NUSAP1	2.4267	0.0295
MTMR12	2.4221	0.0083
RPS3A	2.4035	0.0438
FBXO8	2.3976	0.0333
EWSR1	2.3975	0.0337
PTK2	2.3971	0.0076
HIST1H1B	2.3907	0.0020
NSMCE2	2.3801	0.0350
HIST1H1E	2.3788	0.0118
SCG5	2.3755	0.0390
CCNA1	2.3668	0.0001
HIST2H2AC	2.3418	0.0134
DCLRE1C	2.3253	0.0173
NELFCD	2.3064	0.0001
MFGE8	2.3055	0.0067
DOCK10	2.2993	0.0426
KLC4	2.2961	0.0056
HAUS4	2.2901	0.0007
GOLGA7	2.2826	0.0230
CSNK2B	2.2789	0.0071
SHROOM2	2.2784	0.0479

CD58	2.2750	0.0072
RBMX	2.2738	0.0157
COQ10B	2.2692	0.0018
FANCI	2.2647	0.0011
C14orf2	2.2629	0.0274
ERCC8	2.2432	0.0103
RSBN1	2.2350	0.0036
RPP40	2.2312	0.0401
RPL6	2.2306	0.0173
SLC38A9	2.2236	0.0038
RERE	2.2190	0.0133
PERP	2.2179	0.0060
PREX1	2.2150	0.0057
PER3	2.2116	0.0019
SOX13	2.2109	0.0026
KCTD6	2.2048	0.0313
MYO6	2.2000	0.0013
TMEM267	2.1962	0.0037
ZNF586	2.1958	0.0155
STX10	2.1908	0.0185
SLITRK6	2.1888	0.0078
HADH	2.1866	0.0106
TMEM100	2.1859	0.0071
C11orf74	2.1849	0.0250
RBMS3	2.1816	0.0038
KLRC2	2.1788	0.0043
EHMT2	2.1787	0.0222
LPP	2.1780	0.0087
GNPAT	2.1755	0.0003
EXOSC2	2.1644	0.0081
CACTIN	2.1570	0.0299
PTTG1	2.1561	0.0148
LY6E	2.1507	0.0074
DEPDC1	2.1417	0.0499
ZFP90	2.1374	0.0406
CRTC2	2.1370	0.0137
AKR1C2	2.1324	0.0087
CAST	2.1320	0.0464
HTR7	2.1296	0.0214
RBCK1	2.1287	0.0009
TBL3	2.1265	0.0431
NLN	2.1178	0.0378
EEF1B2	2.1068	0.0057

CLYBL	2.1024	0.0040
CALD1	2.0982	0.0187
PDE4D	2.0819	0.0412
AKAP8L	2.0764	0.0487
SDF4	2.0688	0.0301
RANGRF	2.0687	0.0086
FDPS	2.0639	0.0199
PBX3	2.0592	0.0485
C1orf112	2.0529	0.0086
CINP	2.0526	0.0475
OGDH	2.0526	0.0408
DENND4C	2.0482	0.0162
HMCN2	2.0448	0.0383
MAIP1	2.0417	0.0395
ZFYVE19	2.0366	0.0074
SLC39A13	2.0263	0.0487
INVS	2.0193	0.0328
AEBP2	2.0178	0.0138
AADAT	2.0176	0.0016
SMG7	2.0175	0.0224
PHF19	2.0166	0.0139
ZDHHC8	2.0164	0.0122
RNF146	2.0136	0.0024
SNURF	2.0136	0.0279
WARS	2.0129	0.0169
MRE11	2.0126	0.0074
ZNF138	2.0017	0.0063
ANKRD35	2.0016	0.0076
FOXP2	1.9986	0.0376
PRPSAP2	1.9979	0.0488
MTHFD2L	1.9955	0.0394
HMBS	1.9916	0.0391
PHF6	1.9878	0.0327
PPP1R7	1.9874	0.0015
PTBP1	1.9870	0.0474
IFI27L1	1.9794	0.0326
RACK1	1.9782	0.0016
SLC6A15	1.9778	0.0127
ZNHIT3	1.9759	0.0055
LIN37	1.9747	0.0309
FOXC2	1.9743	0.0493
SHROOM1	1.9721	0.0157
FBXO28	1.9715	0.0150

CXXC1	1.9702	0.0176
ATP5G1	1.9626	0.0239
SNRNP35	1.9590	0.0007
PRPS2	1.9589	0.0007
GMNN	1.9588	0.0112
CDCA7L	1.9588	0.0257
ZFP1	1.9575	0.0022
NDUFV1	1.9572	0.0160
KNTC1	1.9569	0.0043
PHF23	1.9566	0.0197
ZMYM6	1.9550	0.0075
CUTA	1.9534	0.0248
ATP13A2	1.9502	0.0375
FANCB	1.9493	0.0222
HBS1L	1.9436	0.0041
RPL17	1.9425	0.0357
TTC13	1.9421	0.0185
IDH1	1.9417	0.0342
ADSL	1.9340	0.0091
DDX39A	1.9339	0.0459
MELK	1.9337	0.0420
LYPLA2	1.9308	0.0375
CREB3L2	1.9224	0.0498
CCNB1	1.9208	0.0295
OGFR	1.9185	0.0241
CSDE1	1.9070	0.0077
HOXA3	1.9022	0.0028
AKAP8	1.9002	0.0016
IRF3	1.8988	0.0132
MED17	1.8971	0.0262
RNASEH2B	1.8945	0.0484
PPA2	1.8913	0.0383
COQ8B	1.8900	0.0186
SSBP1	1.8885	0.0077
DCXR	1.8837	0.0093
BAIAP2	1.8798	0.0161
OSBPL10	1.8780	0.0103
MBD6	1.8767	0.0302
MCTP1	1.8751	0.0226
CCDC124	1.8698	0.0439
BROX	1.8648	0.0460
NELFE	1.8648	0.0011
TMEM106C	1.8648	0.0418

DUSP22	1.8642	0.0049
SLC39A14	1.8621	0.0314
USP21	1.8590	0.0380
MND1	1.8523	0.0331
PRKAR2B	1.8521	0.0444
KYAT1	1.8497	0.0397
NELFA	1.8487	0.0276
ANAPC7	1.8444	0.0004
ARMC10	1.8430	0.0048
RPL26	1.8402	0.0234
RELB	1.8381	0.0232
TRPT1	1.8367	0.0219
HIST1H3E	1.8304	0.0015
ACAT2	1.8295	0.0279
C3AR1	1.8273	0.0149
TM4SF1	1.8254	0.0155
ZNF644	1.8248	0.0095
RNPS1	1.8241	0.0407
DNER	1.8225	0.0022
NPC1	1.8202	0.0337
KIF2A	1.8181	0.0250
ANKRD16	1.8151	0.0044
FAM46A	1.8151	0.0246
PMPCB	1.8134	0.0007
RHBDD2	1.8089	0.0385
ZNF286A	1.8075	0.0032
CSF3	1.8060	0.0262
GNB1L	1.8043	0.0121
ZNF440	1.8037	0.0382
CPT1C	1.7967	0.0166
ANKRD7	1.7951	0.0146
CCDC74A	1.7932	0.0395
DCUN1D2	1.7931	0.0022
APOPT1	1.7927	0.0227
PLA2G4A	1.7915	0.0399
ZMYND11	1.7882	0.0157
MRPS24	1.7875	0.0367
C6orf89	1.7860	0.0410
ULBP3	1.7850	0.0266
ITPK1	1.7848	0.0176
NAGA	1.7812	0.0397
INSIG1	1.7802	0.0222
ATG5	1.7796	0.0143

YIPF3	1.7795	0.0214
ITGB1BP1	1.7789	0.0391
PSMB8	1.7788	0.0313
SMN2	1.7782	0.0394
LCORL	1.7772	0.0445
DDHD2	1.7745	0.0426
H3F3A	1.7723	0.0214
GRAMD4	1.7717	0.0189
ILVBL	1.7707	0.0488
UFSP2	1.7706	0.0011
NAMPT	1.7684	0.0286
DYNC1LI2	1.7661	0.0000
RMDN1	1.7643	0.0174
NUMB	1.7639	0.0248
RPL36	1.7636	0.0119
SLC20A2	1.7619	0.0478
VEZF1	1.7612	0.0206
SUPT5H	1.7576	0.0385
RPRD1A	1.7562	0.0058
DNAAF3	1.7549	0.0375
SPOCK3	1.7540	0.0344
KCNMB3	1.7496	0.0199
EZH2	1.7477	0.0012
FAM60A	1.7451	0.0020
FBL	1.7418	0.0009
TAF1A	1.7408	0.0154
UBE2D3	1.7404	0.0343
TIMM23B	1.7386	0.0022
RNASE4	1.7382	0.0283
STXBP6	1.7372	0.0065
TRIML2	1.7365	0.0029
ZNF404	1.7354	0.0006
MPV17	1.7340	0.0069
BACH1	1.7334	0.0293
CLN3	1.7318	0.0148
NAB2	1.7316	0.0339
ZBTB44	1.7313	0.0094
TECR	1.7308	0.0336
SLC12A2	1.7303	0.0008
SSBP4	1.7270	0.0179
SMURF2	1.7259	0.0482
CLN8	1.7222	0.0470
CCNH	1.7214	0.0186

LRBA	1.7211	0.0037
KIF2C	1.7208	0.0044
PRR16	1.7184	0.0169
TOPORS	1.7170	0.0192
NEK2	1.7143	0.0079
EPB41	1.7129	0.0316
KLHL7	1.7124	0.0427
RBM4	1.7120	0.0399
MRPS18C	1.7112	0.0278
GALNT11	1.7070	0.0158
IDH3B	1.7062	0.0420
HNRNPH1	1.7043	0.0056
RPL7A	1.7024	0.0168
MAML3	1.7023	0.0275
HIST1H2BE	1.6994	0.0200
NSD2	1.6987	0.0317
RIN1	1.6984	0.0057
SP2	1.6976	0.0472
NLE1	1.6946	0.0170
TTK	1.6939	0.0222
BUB1	1.6931	0.0029
HNRNPC	1.6912	0.0342
CKS2	1.6896	0.0107
METTL22	1.6890	0.0111
CARD8	1.6855	0.0078
NEK11	1.6848	0.0281
ING5	1.6841	0.0083
TMEM205	1.6836	0.0041
CKS1B	1.6821	0.0345
KLC1	1.6796	0.0304
PCDHGB2	1.6782	0.0258
PIH1D1	1.6755	0.0381
SMIM30	1.6754	0.0001
ZNF35	1.6749	0.0063
PEX19	1.6731	0.0259
AGFG1	1.6729	0.0257
ANKRD49	1.6710	0.0119
PRUNE1	1.6700	0.0012
SLCO4A1	1.6698	0.0354
SERPINB2	1.6666	0.0135
SLC12A9	1.6643	0.0001
C19orf54	1.6633	0.0236
TMEM101	1.6632	0.0453

NFU1	1.6628	0.0340
SH3D21	1.6614	0.0037
RMND5B	1.6610	0.0392
C5orf34	1.6608	0.0065
RNF4	1.6603	0.0219
TMEM71	1.6586	0.0013
DHRS3	1.6580	0.0463
PCBP4	1.6576	0.0341
TMEM243	1.6535	0.0340
SCYL1	1.6526	0.0483
HIST1H3C	1.6525	0.0262
ZNF185	1.6517	0.0188
RPLP2	1.6512	0.0217
ARL10	1.6502	0.0186
DTX3	1.6488	0.0472
CENPA	1.6464	0.0110
IL17RC	1.6443	0.0091
FOS	1.6424	0.0367
ANXA1	1.6396	0.0317
RAD51C	1.6389	0.0048
NFE2L1	1.6368	0.0484
PAK4	1.6353	0.0465
MRPL54	1.6352	0.0072
ANAPC10	1.6296	0.0209
FAM83D	1.6280	0.0201
LYPLA1	1.6257	0.0296
SF3B2	1.6251	0.0421
ISG20	1.6244	0.0390
LSM1	1.6230	0.0296
SAAL1	1.6213	0.0150
TRIM47	1.6206	0.0187
SIGLEC15	1.6206	0.0058
GLT8D1	1.6194	0.0318
PFKFB4	1.6185	0.0374
HMOX2	1.6179	0.0012
MAPK9	1.6177	0.0189
ECSIT	1.6172	0.0358
PPP4R4	1.6169	0.0069
MRGBP	1.6163	0.0096
MRPL22	1.6161	0.0305
OSCP1	1.6156	0.0371
MPP6	1.6152	0.0023
ALDH7A1	1.6133	0.0333

UBE2C	1.6130	0.0080
PPFIA2	1.6126	0.0367
FHOD3	1.6119	0.0207
KTN1	1.6109	0.0257
SETDB1	1.6104	0.0471
YBEY	1.6104	0.0284
LDHA	1.6096	0.0021
IER5L	1.6092	0.0363
PMCH	1.6090	0.0170
MIEF1	1.6087	0.0276
EXOC1	1.6086	0.0469
ERG28	1.6084	0.0194
FOXL1	1.6077	0.0492
PPP2R3A	1.6067	0.0396
RPS8	1.6065	0.0010
NIPAL3	1.6057	0.0312
NDUFA5	1.6057	0.0176
ANG	1.6053	0.0329
HIST1H4J	1.6031	0.0031
CHMP2A	1.6016	0.0221
NOL10	1.5982	0.0032
RALBP1	1.5965	0.0369
CCDC148	1.5937	0.0166
SYNE3	1.5926	0.0157
MAD2L1BP	1.5915	0.0041
PRELID2	1.5913	0.0198
CAPS2	1.5908	0.0309
GTF3C2	1.5904	0.0289
C3orf14	1.5901	0.0282
ING1	1.5875	0.0249
PLCD4	1.5866	0.0284
RGS10	1.5845	0.0415
LETM2	1.5842	0.0242
RPS27A	1.5828	0.0447
NDUFA10	1.5806	0.0243
LRRC57	1.5794	0.0051
SPRY2	1.5791	0.0038
H2AFZ	1.5765	0.0194
WASF1	1.5761	0.0330
RGS20	1.5743	0.0105
WTAP	1.5737	0.0093
KIAA0586	1.5733	0.0251
GPX4	1.5726	0.0052

JOSD2	1.5711	0.0169
TSEN34	1.5708	0.0386
ADAM22	1.5680	0.0077
LIPE	1.5671	0.0099
PLSCR4	1.5661	0.0134
ARL6IP1	1.5657	0.0130
UCHL5	1.5649	0.0336
ERC1	1.5639	0.0367
DUSP23	1.5619	0.0391
MARK1	1.5618	0.0464
KBTBD2	1.5601	0.0231
C15ORF31	1.5599	0.0287
EMP3	1.5587	0.0072
RPUSD4	1.5586	0.0257
CPNE1	1.5579	0.0447
SERPINE2	1.5577	0.0275
MKRN2	1.5569	0.0319
WWOX	1.5564	0.0380
FAM189B	1.5562	0.0000
ATAD2	1.5559	0.0483
STEAP3	1.5556	0.0064
PRKCE	1.5553	0.0188
AVPI1	1.5548	0.0079
SIRT4	1.5526	0.0031
SH3BGR	1.5516	0.0342
CEPT1	1.5511	0.0345
DNM1L	1.5504	0.0235
MARCH9	1.5503	0.0106
DYNLL1	1.5498	0.0174
MRPL39	1.5491	0.0192
CHST11	1.5487	0.0377
MAPKAP1	1.5476	0.0461
ASAH2	1.5475	0.0000
ST3GAL3	1.5459	0.0147
SPCS2	1.5458	0.0006
TEX30	1.5440	0.0306
COMMD10	1.5440	0.0006
KLHDC2	1.5437	0.0300
NSMCE4A	1.5429	0.0257
MICAL3	1.5427	0.0147
ENOSF1	1.5414	0.0011
LRRC8C	1.5408	0.0464
PCNX1	1.5397	0.0411

YEATS4	1.5393	0.0227
CRACR2B	1.5390	0.0343
REPS1	1.5385	0.0392
NDEL1	1.5380	0.0003
TMA16	1.5380	0.0283
SAP30	1.5372	0.0259
YWHAE	1.5370	0.0109
PLEC	1.5364	0.0177
ZNF287	1.5364	0.0499
MORN4	1.5363	0.0206
RBM4B	1.5361	0.0258
KARS	1.5360	0.0029
PTPN12	1.5352	0.0442
LTA4H	1.5339	0.0307
LDAH	1.5330	0.0302
SYNRG	1.5328	0.0249
FAM72B	1.5297	0.0205
RNASEH2C	1.5295	0.0173
ARHGAP11A	1.5285	0.0025
COQ3	1.5283	0.0378
UBTF	1.5279	0.0498
YBX1	1.5273	0.0479
FAM133B	1.5244	0.0297
PRPF31	1.5244	0.0432
TRIOBP	1.5239	0.0468
CSTF3	1.5209	0.0179
NGDN	1.5195	0.0443
BICRA	1.5189	0.0074
XPO1	1.5187	0.0156
SREK1IP1	1.5184	0.0039
HELLS	1.5168	0.0437
SEC63	1.5152	0.0030
ZNF655	1.5151	0.0023
MSANTD2	1.5147	0.0207
GCFC2	1.5131	0.0312
THAP10	1.5123	0.0253
ELAVL2	1.5105	0.0054
ZNF684	1.5102	0.0147
TKFC	1.5100	0.0089
CPSF1	1.5094	0.0009
STAMBP	1.5086	0.0279
PAPOLA	1.5076	0.0255
TIMP1	1.5067	0.0100

HERC4	1.5064	0.0161
SMPDL3A	1.5060	0.0322
ZMYND10	1.5059	0.0380
USP3	1.5057	0.0491
PLGRKT	1.5052	0.0130
ZSCAN20	1.5050	0.0022
PRR7	1.5040	0.0028
ELK4	1.5033	0.0149
ZNF587	1.5024	0.0416
SRD5A3	1.5013	0.0033
DEPDC1B	1.5006	0.0166
NDC80	1.5003	0.0217
CNN3	0.0556	0.0099
C6orf48	0.0793	0.0000
BGN	0.0910	0.0271
EDIL3	0.1084	0.0171
PTK7	0.1245	0.0002
RAB23	0.1622	0.0079
OS9	0.1652	0.0309
STOML1	0.1695	0.0319
SLN	0.1699	0.0458
MCM3	0.1827	0.0260
ACTG2	0.1923	0.0323
SFRP4	0.1948	0.0245
BCL2L13	0.1993	0.0032
PRPS1	0.2040	0.0002
FAM32A	0.2052	0.0001
ACTA2	0.2086	0.0069
RNF182	0.2098	0.0079
MYL9	0.2122	0.0240
CCAR1	0.2236	0.0007
CDK4	0.2297	0.0467
ZNF532	0.2316	0.0052
DDX47	0.2352	0.0206
STK40	0.2360	0.0345
SEPHS1	0.2386	0.0003
SUPT6H	0.2412	0.0286
NUP153	0.2414	0.0484
ABHD12	0.2460	0.0225
ATG16L1	0.2474	0.0207
FHL1	0.2479	0.0199
TPM1	0.2535	0.0176
CENPT	0.2650	0.0009

PLSCR3	0.2657	0.0343
LINC00094	0.2673	0.0003
CNN2	0.2713	0.0027
COL1A1	0.2788	0.0184
SLC12A4	0.2803	0.0472
MAGED1	0.2808	0.0169
PGRMC2	0.2878	0.0192
LRRC15	0.2880	0.0448
PARP10	0.2948	0.0045
BSCL2	0.2949	0.0158
ANAPC15	0.2949	0.0229
MME	0.2969	0.0325
CLIC3	0.2974	0.0111
ERP29	0.2989	0.0036
KDM6A	0.3017	0.0004
FIBIN	0.3024	0.0304
SEC31A	0.3087	0.0156
GPNMB	0.3124	0.0262
SELENOM	0.3171	0.0379
ITGA11	0.3189	0.0047
KCNS3	0.3212	0.0418
PLXDC1	0.3233	0.0493
SNRNP25	0.3272	0.0014
C1QTNF1	0.3273	0.0175
STRA6	0.3280	0.0051
TNC	0.3285	0.0239
PPP4R1	0.3293	0.0343
TMSB15B	0.3315	0.0094
SLC38A6	0.3325	0.0044
TFIP11	0.3345	0.0148
THBS3	0.3372	0.0176
ZFAND2A	0.3386	0.0250
CHRNA1	0.3411	0.0146
SPI1	0.3437	0.0334
CD164	0.3439	0.0005
LMOD1	0.3506	0.0051
MINK1	0.3510	0.0364
HSPG2	0.3524	0.0227
PMEPA1	0.3531	0.0098
NFATC3	0.3539	0.0004
DNASE1L1	0.3541	0.0002
UCP2	0.3547	0.0206
URGCP	0.3559	0.0471

HSPB3	0.3564	0.0084
RAB15	0.3575	0.0121
RHOC	0.3580	0.0011
DLG1	0.3589	0.0059
OSBPL9	0.3590	0.0342
DDX11	0.3592	0.0337
RNF38	0.3605	0.0318
ZNF17	0.3667	0.0023
ITGA7	0.3668	0.0186
OSBP2	0.3677	0.0028
FTH1	0.3707	0.0037
NEK6	0.3713	0.0106
NF1	0.3716	0.0094
SELENBP1	0.3741	0.0053
ANO10	0.3744	0.0028
S100A4	0.3770	0.0185
COL10A1	0.3800	0.0329
AMPH	0.3805	0.0366
TAGLN	0.3807	0.0245
KLC2	0.3831	0.0483
THBS2	0.3849	0.0314
SLC25A22	0.3858	0.0390
LEF1	0.3860	0.0440
EXTL2	0.3895	0.0007
FLAD1	0.3902	0.0364
CD248	0.3915	0.0021
ZNF438	0.3924	0.0025
CD81	0.3928	0.0488
BRD1	0.3943	0.0000
SUGCT	0.3950	0.0194
AP3D1	0.3959	0.0317
P3H2	0.3974	0.0135
SORBS1	0.3976	0.0168
STX5	0.4036	0.0001
RSPRY1	0.4044	0.0069
TMBIM6	0.4046	0.0323
PLPPR4	0.4059	0.0450
AKIP1	0.4109	0.0178
KIAA1671	0.4126	0.0078
PAPSS2	0.4135	0.0127
COA4	0.4138	0.0489
DTNA	0.4149	0.0401
RNF145	0.4166	0.0002

DACT1	0.4176	0.0255
GRSF1	0.4180	0.0469
TSPAN13	0.4198	0.0490
SELENOW	0.4243	0.0190
GALNT5	0.4282	0.0273
ADGRB2	0.4301	0.0361
SAMD4B	0.4345	0.0286
SEL1L3	0.4364	0.0376
FKBP10	0.4379	0.0008
INHBA	0.4402	0.0490
ALPK2	0.4405	0.0017
NPIPA1	0.4422	0.0076
TPM2	0.4443	0.0480
SLC39A11	0.4485	0.0006
ZNF207	0.4486	0.0433
GON4L	0.4499	0.0024
RUNX2	0.4505	0.0411
POU2F2	0.4530	0.0358
TBC1D10B	0.4552	0.0494
ALG13	0.4569	0.0169
TNFSF4	0.4612	0.0169
MGST2	0.4661	0.0366
SULT1A3	0.4661	0.0113
PUM2	0.4668	0.0210
IGDCC4	0.4673	0.0041
MEIS2	0.4676	0.0270
TMSB4X	0.4684	0.0086
DMXL1	0.4686	0.0173
CD4	0.4715	0.0214
PKIG	0.4720	0.0115
IL7R	0.4727	0.0290
CNTROB	0.4735	0.0059
RBM23	0.4750	0.0265
SKP1	0.4774	0.0147
MCTS1	0.4795	0.0070
KLHL5	0.4799	0.0396
FNBP1	0.4842	0.0001
TMEM44	0.4856	0.0344
TPM4	0.4880	0.0086
FBLN5	0.4897	0.0438
AC011448.1	0.4909	0.0282
BOC	0.4923	0.0470
TRIM39	0.4929	0.0041

TAF13	0.4929	0.0416
FAAP24	0.4953	0.0214
SERPINH1	0.4968	0.0209
GLT8D2	0.4974	0.0011
PSME2	0.4975	0.0008
ELMO2	0.4975	0.0060
FAM20B	0.4979	0.0049
PFKP	0.4990	0.0399
AIG1	0.5000	0.0089
SPARC	0.5000	0.0400
NAT10	0.5016	0.0497
HOPX	0.5022	0.0184
CYP26B1	0.5043	0.0486
TRAPPC6B	0.5055	0.0053
CHRDL1	0.5059	0.0178
MAP1A	0.5066	0.0192
OBSL1	0.5071	0.0191
DIABLO	0.5084	0.0238
MYO1B	0.5110	0.0070
LAMP5	0.5113	0.0084
C22orf23	0.5130	0.0466
PTRH1	0.5140	0.0412
ERLEC1	0.5174	0.0102
TUBA4A	0.5177	0.0405
ATXN2	0.5199	0.0305
FBN1	0.5205	0.0219
FAM19A3	0.5207	0.0038
NOG	0.5210	0.0287
DAZAP2	0.5215	0.0484
TINF2	0.5228	0.0000
FAM20A	0.5240	0.0169
SORT1	0.5241	0.0071
DCN	0.5247	0.0410
ZNF624	0.5270	0.0000
CTBP2	0.5270	0.0192
EED	0.5272	0.0069
C9orf3	0.5286	0.0058
MTFR1L	0.5309	0.0028
RAB40C	0.5319	0.0220
SPSB2	0.5320	0.0013
CYHR1	0.5321	0.0025
PEAK1	0.5321	0.0443
ATP6AP2	0.5354	0.0335

PPARD	0.5380	0.0057
MZF1	0.5382	0.0051
CEP112	0.5383	0.0200
EIF4G1	0.5388	0.0375
AC133555.3	0.5412	0.0451
CTNND1	0.5414	0.0338
BHMT2	0.5428	0.0028
C6orf52	0.5430	0.0013
ZNF410	0.5435	0.0128
ACSM5	0.5435	0.0475
FBLIM1	0.5437	0.0401
CALU	0.5454	0.0221
CHPF	0.5468	0.0455
PRRC2A	0.5468	0.0335
ARHGAP26	0.5495	0.0066
RETSAT	0.5499	0.0016
IDH2	0.5502	0.0310
RAD17	0.5505	0.0233
LAMB2	0.5512	0.0478
ATP2C1	0.5512	0.0021
C11orf57	0.5517	0.0403
FAM198B	0.5520	0.0005
DCLK1	0.5536	0.0135
TARS	0.5548	0.0171
GMPPA	0.5566	0.0033
ALOX5AP	0.5571	0.0435
RAB5A	0.5603	0.0003
POLR2H	0.5606	0.0394
P2RX6	0.5613	0.0363
CBWD3	0.5619	0.0139
SSH3	0.5623	0.0255
GPC1	0.5629	0.0411
SSB	0.5633	0.0072
CLSTN3	0.5658	0.0133
MYD88	0.5677	0.0255
GNB3	0.5684	0.0054
DST	0.5685	0.0268
NRG1	0.5717	0.0044
LRRC37B	0.5730	0.0138
NCDN	0.5744	0.0345
BIVM	0.5752	0.0051
NADSYN1	0.5760	0.0281
MKL1	0.5766	0.0023

DZIP1L	0.5775	0.0029
SIK3	0.5782	0.0330
NCBP2	0.5786	0.0291
DDR1	0.5792	0.0082
NKRF	0.5826	0.0265
CTSB	0.5844	0.0230
AHSA1	0.5850	0.0389
ETFRF1	0.5858	0.0139
THY1	0.5868	0.0003
SLC16A7	0.5870	0.0247
STAT6	0.5875	0.0272
UBE3C	0.5876	0.0479
RPL7L1	0.5879	0.0440
TBC1D8B	0.5893	0.0467
VPS51	0.5893	0.0000
IQSEC2	0.5895	0.0258
SLC9A1	0.5906	0.0159
TMEM169	0.5922	0.0334
C11orf63	0.5938	0.0398
MFAP5	0.5939	0.0199
MYL12B	0.5941	0.0256
RARA	0.5946	0.0013
SLC10A3	0.5949	0.0089
GPS2	0.5951	0.0249
DYNLRB2	0.5951	0.0163
HACD1	0.5965	0.0219
JAM2	0.5989	0.0401
APH1A	0.5991	0.0149
NSL1	0.6000	0.0326
TBC1D2	0.6006	0.0374
ZNF226	0.6008	0.0228
RAB34	0.6009	0.0027
EHD2	0.6011	0.0128
HDAC9	0.6018	0.0007
CCIN	0.6018	0.0169
ZNF619	0.6020	0.0119
VASH2	0.6025	0.0267
RSPO3	0.6035	0.0003
RUSC2	0.6045	0.0495
FAM156B	0.6053	0.0143
IL13RA1	0.6056	0.0459
MAN1B1	0.6059	0.0498
SLC39A7	0.6065	0.0052

TLCD1	0.6072	0.0007
FAM213B	0.6077	0.0009
CXorf40A	0.6077	0.0404
COL3A1	0.6077	0.0227
FAM171A1	0.6087	0.0174
VASH1	0.6091	0.0489
GUCY1A3	0.6093	0.0067
FGFR1	0.6095	0.0029
SETD4	0.6099	0.0262
VGLL3	0.6103	0.0016
GANC	0.6105	0.0203
CUX1	0.6109	0.0044
KIAA0391	0.6113	0.0328
GRAMD2B	0.6114	0.0379
MDK	0.6123	0.0030
SPATA18	0.6123	0.0474
TMEM209	0.6126	0.0483
ZNF117	0.6134	0.0060
GTPBP10	0.6146	0.0176
RASSF8	0.6146	0.0052
CCL2	0.6166	0.0143
ACOT8	0.6171	0.0290
PHLDA3	0.6176	0.0371
MIER1	0.6198	0.0168
FHL3	0.6198	0.0385
EFEMP2	0.6200	0.0328
RBM39	0.6226	0.0009
CGB5	0.6236	0.0363
PDGFRB	0.6258	0.0377
CSAD	0.6258	0.0030
SORD	0.6264	0.0304
PCYT1A	0.6268	0.0168
ING4	0.6274	0.0432
ADCY9	0.6279	0.0130
COMMD3	0.6280	0.0007
ING3	0.6282	0.0461
NABP1	0.6285	0.0043
RAB3IL1	0.6287	0.0263
RBM19	0.6291	0.0237
BCAP31	0.6303	0.0176
RPUSD1	0.6312	0.0064
VBP1	0.6319	0.0351
EHD1	0.6327	0.0004

ADPRH	0.6330	0.0002
PTGS1	0.6330	0.0125
PLTP	0.6334	0.0087
CDC25B	0.6339	0.0349
PPP2CB	0.6340	0.0192
NUDT18	0.6347	0.0054
MAP3K11	0.6361	0.0339
C9orf85	0.6363	0.0022
PEX3	0.6364	0.0482
PMS1	0.6368	0.0379
TRAPPC6A	0.6376	0.0005
LOXL4	0.6376	0.0243
BLVRB	0.6389	0.0395
PCMTD1	0.6397	0.0126
NLRC5	0.6425	0.0017
MPHOSPH8	0.6429	0.0057
SERPINA5	0.6430	0.0016
MYL4	0.6433	0.0006
IRF2	0.6434	0.0012
ITGA4	0.6450	0.0298
TMEM189	0.6450	0.0262
BAP1	0.6451	0.0401
NAA40	0.6464	0.0016
SMAD7	0.6474	0.0036
ITGA1	0.6485	0.0164
AMMECR1	0.6487	0.0079
VIPAS39	0.6491	0.0325
TSPAN1	0.6513	0.0488
ACSL1	0.6514	0.0333
NTF4	0.6519	0.0420
MCPH1	0.6521	0.0451
CPT1B	0.6538	0.0098
LRRC23	0.6554	0.0485
PHKB	0.6557	0.0317
PRICKLE2	0.6566	0.0314
DSN1	0.6570	0.0464
C14orf159	0.6577	0.0033
MFSD13A	0.6581	0.0126
PHOSPHO2	0.6583	0.0358
RNF170	0.6607	0.0310
PTGER4	0.6614	0.0335
SHISA5	0.6624	0.0150
ST3GAL4	0.6626	0.0062

APOBEC3F	0.6637	0.0346
TSPAN14	0.6645	0.0140
SRM	0.6652	0.0078
GIGYF2	0.6652	0.0043
GRINA	0.6653	0.0423
ACY3	0.6657	0.0354
USP15	0.6660	0.0309
CTIF	0.6663	0.0361
MRPL55	0.6663	0.0021

Supplementary information Table S2. Glioblastoma related genes were obtained from GeneCard, DrugBank Online and OMIM

TMEM132A	MAF1	ASPM
TP53TG5	MIR130A	ARHGEF7
TMEM14A	IQSEC1	DKK3
TAX1BP3	MIR125B2	CD274
MIR339	MIR125B1	TACC3
RASSF10	NBEAL1	TACC1
FOCAD	NDUFAF2	PXDN
EMC10	CARMIL1	NUDT21
MIR99A	CCP110	MMP24
KLHDC8A	IL31RA	LGI1
NDRG4	SYNJ2	DYRK1B
MIR326	PHLPP1	PROM1
WASHC1	LIN9	RAB3D
TMEM106B	MSH2	PLXNB2
LIN54	BRSK2	BACE1
MIR100	ENAH	OGA
NF1	SEMA6B	ADAM17
MIR181C	GJC2	CDK6
MIR181B2	MIIP	EPAS1
MIR181B1	ING4	MSI1
MIR181A2	MMP25	CDK13
MIR181A1	CHSY1	VTI1B
MIR25	UBAC1	DAXX
MIRLET7C	ANKFY1	HNRNPL
MIRLET7A2	PHF3	NIPSNAP2
SEPT14	APH1B	FABP7
RNF146	APH1A	RBBP9
IQSEC3	PAX6	HIST1H3B
RIOX2	PI15	ADAM9
TTC21B	COQ8A	GLIPR1
VOPP1	CERS1	MAD1L1
MIR128-1	GOPC	ADGRB3
MIR126	KMT2B	ADGRB1
MIR10B	DAAM2	PARK2
MIR9-2	ZNF320	RTKN
MIR21	WDR11	YEATS4
BCL2L12	OLIG2	DMBT1
CPEB4	TRIM8	OSMR
CNTNAP3	PES1	PTEN
LRRC4	KLHL2	VEGFC

HGF
CSF3
SHMT2
SLC2A1
FGFR1
FGFR3
EGFR
ENO2
CTLA4
MLH1
CHKA
CTSB
CTNNB1
CAPN2
BMP4
STAT3
KLK3
VEGFA
C1QA
C1QB
C1QC
FCGR3A
FCGR1A
FCGR2A
FCGR2B
FCGR2C
CDK4
HDAC1
HDAC2
HDAC3
HDAC6
HDAC8
acuC1
TOP2A
TOP2B
H3-3A
LZTR1
CDKN2A
MDM2
MTOR
RB1
H3C1
BRAF
SEPTIN14
MET
HRAS
NRAS
PRKCH
MYC
ATM
HIF1A
GFAP
CASP3
FBXW7
EGF
AKT3
CDKN1A
MAPK1
PRKCA
PDGFRB
CDK2
PRKCI
MYCN
GLI1
SRC
CDKN2B
MAPK8
PTK2
CDKN1B
E2F1
MMP2
IGF1R
MAPK3
POLE
NDRG2
CREBBP
CHI3L1
RAC1
CXCR4
TNFSF10
NES
PIK3CG
KDR
BIRC5
DNMT3A
PRKCB
AKT2
RAF1
LRRC56
CHTOP
CD44
ALK
RHOA
TNFRSF10B
PLAUR
PDGFA
IL13
APC
IGFBP2
KIT
TNC
PLAU
RPS6KB1
IL13RA2
LEF1
PDPK1
MTDH
SPHK1
CDKN3
TGFBR2
GPNMB
ERBB3
EPHA2
FASLG
C11orf65
MDM4
FGFR2
VEGFB
NOS2
FLT1
ANXA5
RPS20
MMP9
CHEK2
BMPR1A
TNFRSF12A
SLX4
FAN1
EPCAM
MLH3
PMS1
SEMA4A

CNTN2	PTGS2	CDK3
ANKH	SOX2	PTPN11
BCL2	THEM4	TUSC3
AGAP2	TNFSF13	SP1
H3-3B	PRKCD	SHH
CCND2	TET1	RAD51
IL2	IL6	CDH1
SYP	BRD2	RFX1
ANGPT2	PLCG1	CBL
GSK3B	GRB2	SLC6A16
TGFB1	GSTP1	ANXA2
AURKB	E2F2	ZEB1
CCND3	CYCS	SERPINE1
IGF1	TSC2	GAB1
STAT5B	ADGRD1	EGFL7
BRCA1	IL4R	ABCC3
IFNG	RHOB	EPHB6
CXCL8	IL1B	TIMP1
STAT5A	FAS	AIFM1
CD34	WRAP53	ZNF263
VAT1	KCNK12	WNT5A
SERPINA3	RND3	BMI1
FOXO3	RHBDD1	ABCG2
VIM	PARP1	BCL2L11
NFKB1	MAP2K1	PIK3CB
MMP7	BCL2L1	MAP2K4
MKI67	IFNB1	NFE2L2
FOXO1	TP73	TSPO
CXCL12	S100B	AQP4
EZH2	SMAD4	TWIST1
GJA1	LGALS1	MAP2K6
IGF2	PIK3CD	ATP23
NF2	PRKCZ	HSP90AA1
FGF2	CDC42	NUBP2
POT1	ERN1	TSPAN4
SSBP2	JUN	BUB1B
AURKA	MMP14	CCDC181
CAV1	FOXM1	CCDC196
NOTCH1	CCNE1	PDGFC
PTN	PINK1	CCL2
CASP8	MTHFR	PTPRZ1
CASP9	ABCC1	SOS1
ABCB1	STAT1	TNF
NKX2-1	EP300	DIABLO

ARAF	CA9	TFPI2
PECAM1	FN1	PRMT5
RTEL1	HIF1AN	GRP
PSMD3	PIK3R3	LRP1
SMAD7	TGFA	HMGA2
SPP1	AXIN1	CDK1
IFNA1	TRIM33	RHOD
E2F4	SPRY2	PIK3R2
BECN1	FZD7	ESR1
IL4	DIRAS3	F2R
ADM	ILK	PIK3C2G
FAP	ROCK1	GPR26
DNMT1	E2F3	EFNA1
PRKDC	BUB1	KLF6
HEY1	HSPB8	ERCC1
RHOC	DUSP26	FADD
MAPKAPK5	SLC6A17	EFEMP1
PLOD1	RPL23	XRCC3
CLEC1A	KCNK15	SNAI2
CARD6	MRPS2	SIRPA
LSM1	MRPS34	PKM
ST6GALNAC3	MRPL23	XRCC5
FILIP1	XRRA1	E2F5
PRR15	TMSB15A	MPG
PGBD5	XRCC6	HSPA5
ANKRD23	H3C4	ABL1
HSPA1A	ELK1	PCNA
SAPCD2	CCN1	HSPA8
YAP1	SIK1	SMARCB1
MAPK14	TRIB3	FZD2
NBN	NOTCH2	RND2
CDKN2C	ITPR3	SMAD2
NRP1	SOD2	PROX1
IFI27	GDF15	WT1
ALOX5	KDM4C	CHEK1
FPR1	TCF3	GDNF
TOP1	ERRFI1	FOXP3
FOXG1	TNFRSF6B	CAPZA2
IRS1	ITGB1	LIG4
RPS6KA3	MCL1	WWTR1
TNFAIP3	CSNK2A1	PGF
FZD6	TSC1	YBX1
CFLAR	MIF	CENPU
PDCD4	CSPG4	TGFBR1

CCN2	NDRG1	SOCS1
ITGAV	CSF2	RIPK1
DDIT3	TRRAP	HGFAC
POU5F1	DLL4	EPHA3
RICTOR	TNFRSF10A	IGFBP4
CYP1A1	TFRC	NQO1
SOX9	JAK2	FYN
TUBB3	EGR1	WWOX
RELA	PEA15	SRRT
HMGB1	ADAM10	HES1
FOXO4	FREM2	LGALS3
CTSL	APEX1	SREBF1
NTSR1	SMAD3	ING1
IGFBP3	HMGA1	XIAP
MAP2K3	ATF5	KCNMA1
RAD50	TLR4	GRPR
REST	HLA-B	TKT
HSPB1	PLK1	NT5E
TIMP2	NOP53	TGM2
S1PR1	CEBPB	ITGA9
PTPRM	BAG3	ALDH1A3
S1PR2	IL10	YWHAZ
FGF1	CCL5	KIF11
NTN1	LDLR	KLF4
AXL	MRE11	SETD2
STK11	PRKCQ	CCNA2
MAPK10	IL1A	ITGA6
ADAMTS5	MSN	HLA-A
CASP7	ANXA7	TUBG1
HOXA11	PTK2B	PDIA6
ID1	ITGA3	CYP27B1
HBEGF	KDM1A	BIRC3
CCR5	EIF2AK3	LRIG1
PRKCG	PTCH1	MMP13
SOX10	ABCC4	ARRB1
H3C2	ETS2	RRAS
EXO1	NANOG	DUSP19
CCNB1	TLR9	SLC7A11
ERBB4	GADD45A	H3C3
GLUL	MAP2K2	H3C10
MMP1	PLCG2	H3C12
BIRC7	MAP2K5	H3C7
JAG1	CXCR2	H3C11
SOCS3	TIMP3	H3C8

H3C6
PGR
CD9
EIF4EBP1
PLEKHG5
PDPN
HDAC9
TNFRSF19
SNAI1
CRYAB
PMAIP1
FGFR4
LRIG2
VHL
CDH2
PPARA
SHC1
HOXA9
EPHB4
CDH5
BAK1
HLA-E
SEC61G
AEBP1
ENPP2
BMP6
ANGPT1
PDCD1
S100A4
EDN1
TACR1
STMN3
PDK2
ITGA5
TCF4
HLA-C
STAT6
SEMA3A
EBF3
ITPR1
CDC20
ASCL1
RPS6
NPRL3
PTPN12
APRT
AGR2
RAN
EDNRB
NGF
RARB
H2AC18
SOD1
ACKR3
STYK1
BCL6
CDH11
IDO1
YWHAB
ALDH1A1
BCL2L2
IGFBP1
ID4
FOS
ADARB1
ATF3
CTSS
FSCN1
LGR5
CD70
ELAVL1
GAPDH
WIF1
NFATC1
ECHS1
ACACB
TUBB
PTPRB
ADAM12
PHLDB1
SLC9A3R1
CLDN5
GCH1
FBXO16
SQSTM1
SLC1A2
ENO1
PAK1
NAMPT
DAPK1
F2RL1
FZD4
PLCB1
PLCB4
S100A8
CREB1
ADAMTS4
SIRT1
BUB3
DRD2
VDR
SOX3
PRKCE
IKBKE
PFKFB3
HSPA4
ALDOA
SLC9A1
CD86
SLC1A3
DHX36
IRAK1
MAPKAPK3
PRKD3
SRPK2
NLK
MED12
DYRK2
BCOR
INSRR
CDC42BPG
GUCY2F
TAF1L
STKLD1
AQP1
NFIA
ASIC1
NCL
PPP1R9B
LYN
ADAMTSL1
NOX4

SLC37A4	PTPN1	PI3
CD47	CD151	ACTB
GRIA1	TEP1	IL24
MTAP	RECQL4	GLUD1
DNM1L	SOX4	PTPRD
PXN	SST	MCM7
MVP	XRCC1	CLIC1
RASSF1	MAOA	DPP3
FMNL1	TYMP	GATA3
CLEC5A	MAP2	RMDN3
CDK7	APP	GNRHR
HOXA10	DCT	NRIP1
MTR	IL15	FZD10
NFIB	PPIB	PLCD3
CXCR1	RB1CC1	TEK
PA2G4	PIN1	VIP
EPHB2	SOAT1	PTX3
TRPM8	ACTC1	HK2
IL12RB1	CYP19A1	LGALS2
RYK	RRM2	SERPINE2
H6PD	TRIM28	B4GALT3
NTRK2	FSTL1	AHSG
USP15	VEGFD	RARA
SLC34A2	LGALS3BP	NR1H2
INPPL1	EIF4E	FTL
TRAF2	CDKN1C	MAGED4B
PTPA	LPAR1	CHRM2
SKP2	IGF2BP2	KPNA2
STAT2	S1PR3	EFNB2
ZEB2	PTPRJ	GLS2
CSF1	DOCK1	QKI
WNT2	LDHA	IGF2BP3
IL2RA	CDC25C	NME1
TYR	SLC16A1	TJP2
MELK	KLRC3	EIF3E
DVL2	IL2RB	PDCD10
PRRT2	HNRNPA2B1	H4-16
AHR	BID	MRAS
RALBP1	BSG	RRAS2
ABCC5	NOS1	PDGFD
UHRF1	PTPRT	YY1
TNFSF12	FUS	PTP4A3
S100A9	TCN2	GPI
GSTT1	GOLPH3	RBPJ

ITGA2	TNFRSF1A	RUNX1
PSMA3	NCAM1	ACLY
DLX2	NTRK1	DDIT4
USP28	CALCRL	RAMP2
TH	CRK	CTSK
ITGA7	GBP1	MRPL28
TYMS	USP3	PLCB3
SUMO1	MMP12	PLCD1
CKB	LRG1	FZD5
HMOX1	CAT	PIK3R4
PLAT	HMGCR	PLCB2
CCL20	ITGB3	PIK3C2A
KLRK1	EGLN1	PIK3C2B
EPHA5	CSTB	ITPR2
ARF6	ADGRB2	MAP2K7
EIF2AK2	IL1RL1	PIK3R5
ADGRE5	MARCKS	SOS2
EDNRA	NR2E1	FZD9
PPP1R13L	PLK4	FZD1
NFATC2	TGFBI	MAPK6
LIN28A	PYCARD	FZD3
OGG1	PLK5	RHOH
RNASEL	MAPK11	FZD8
RNASE1	B4GALNT1	PLCD4
IGFBP7	TBX2	PLCE1
DFFB	HOXA1	CCNE2
SH3GL2	PON2	PLCZ1
G6PC1	TERF1	RHOG
S100A6	DYRK3	ROCK2
BNIP3	S100A2	TES
HSF1	CDK14	PPP2CA
THBS1	CBX7	CUL2
KCNH2	SLC35E3	PRKN
PIM1	SPRY3	HJURP
STK4	NPM1	ETS1
MAP3K12	MAPK9	LEP
EMP2	PARK7	ROBO1
NTF3	VCAM1	CDK20
BACH1	TRIM24	LLGL1
LRIG3	GSR	IL13RA1
SMO	PTBP1	IL1RAPL2
CREB3	SUZ12	PSEN1
PML	GSTM1	HLA-DRB1
CDK5	ECE1	MARK4

NTN4	L1CAM	UBC
PRKAA1	CD14	TNPO1
DFFA	AGO2	TET3
CX3CR1	GAST	SRSF3
CDH13	IL32	CHI3L2
RPS15A	EEF2K	SIAH1
RTN4R	LRP6	DDX6
SETDB1	GATA6	CFL1
NTS	NEFL	ATF4
SHC3	CBX5	SAT1
RPS27A	CHAF1A	IQGAP1
PURA	TNFRSF10C	DDB1
CTSD	G3BP1	RUNX3
GLI2	SLC2A3	CCDC88A
EPHA1	MALT1	CTNNBIP1
TNFRSF1B	TRAF6	SSRP1
MAP3K2	CNOT3	ZBTB18
OLIG1	PTPRA	SEMA3B
TIGAR	TRIO	AMOTL2
VWF	SPHK2	H3-4
TRPM7	VAV3	STOML3
CST3	MGP	LHFPL6
STC1	PHF8	MUTYH
NME4	POSTN	PALB2
DCC	N6AMT1	GLI3
TXN	SLC15A2	SMPD1
AIM2	RSU1	AGER
IL17A	GHRH	HMMR
NTRK3	NEU3	FLCN
IL6R	SLC15A4	LUC7L2
CBX3	SLC15A3	VCAN
CAV2	ALKBH1	FLT3LG
PODXL	CCN3	MBP
SPINT2	DICER1	CALR
FMOD	SLC7A5	PRKAA2
PHLPP2	DUSP6	HDAC7
STC2	YWHAG	WDR5
NGB	STIM1	ACP1
C3orf14	ABCA1	ADD3
CNR2	FOLH1	RBBP4
DKK1	PRKAB1	RBMX
F2	CASP4	NOVA1
APAF1	DPYSL2	NPTX2
CCR3	AGRN	SLC16A4

ST8SIA1	ATP6AP2	IGF2BP1
CPEB1	TRPV1	CD276
HSPB2	ERH	FNDC3B
SEMA3C	PAK2	MACC1
ARHGDIA	TLN1	PRDX1
VDAC1	EIF2A	SIRT2
CHD4	HSPD1	CTTN
EIF4A1	H2AX	HDAC4
RPTOR	ATP1A3	MAPT
LAMC1	ARF1	HPSE
RAI14	ST14	MAOB
CAVIN1	WNT3A	CCL18
CCN4	ADORA3	VCL
SPARC	FDPS	TENT4B
RDX	NPY	TRIP13
CTNNA1	HP	BIRC6
HSPA9	GAS6	AVEN
EZR	SIX3	ODC1
PVR	FRZB	FOSL1
RTN4	SAA1	KITLG
AJAP1	EME1	NOB1
RHOT2	PIBF1	SSTR2
SLC2A4RG	TRIM9	PTPN2
CHTF18	MTA2	ATF1
ZGPAT	RPS11	PFKP
WDR90	LANCL2	CD109
ATP1A1	NOS3	MAP4K4
LIMK1	DDX3X	TK1
RXRA	CNR1	ASIC2
USP7	AREG	CYLD
FGR	RWDD3	EPHA7
CEBPA	IL1RN	PLD2
DCX	RINT1	GNB3
LATS1	ABHD16A	PRLR
SATB1	PPP1CA	ITCH
LGALS8	ADORA2B	USP10
CLDN6	DUSP1	FHIT
SPINT1	PDIA3	FGF5
KLF9	TAPBP	HMGB3
NIPSNAP1	ORAI1	LGMN
DPP4	SRR	TKTL1
KAT2B	ITGB8	ANGPT4
ADAR	HHIP	NAIP
PPME1	TDGF1	COPS6

YTHDF2	PSMC4	TNN
ADAM33	ADGRG1	TMEM39A
DYNC1LI1	STAU1	INA
MXD1	DAZL	DDB2
PLXDC1	DDR1	XPC
RNF112	NUMB	YES1
ANKDD1A	PPARGC1A	LIMK2
CDR1	NRP2	MCM2
DHFR	INPP5K	CLDN1
IL1R1	F11R	FST
CCR6	AGK	GLO1
ARG2	IL7	CRKL
CRAT	OSM	NONO
PAM	PRRX1	UBE2D3
LIF	DYNC2H1	FADS2
GRM3	NUCB2	RAP1B
PLD1	SART3	PSMB4
IKBKB	NLRP12	CANX
CASP2	PRNP	CNP
CALM1	ALCAM	INHBA
FHL2	CDK9	MKNK2
ANG	JAK1	PPP1R1B
IL15RA	CHUK	UQCRB
FAT1	SLC12A2	ESPL1
EMP1	BAD	TRAF1
AGTR1	TLK2	CADM1
REN	MLXIPL	ARHGEF11
AGTR2	LTA	ALDH9A1
KHDRBS1	EPO	IAPP
CSF1R	THY1	JUND
MPO	NRG1	TRIM27
GATA4	PLOD2	APOC1
CASP6	CYB5R3	BAZ1B
GLS	ALOX12	ECT2
WASL	STIP1	HDGF
LPO	USF2	HEPACAM
PMEL	CSNK1E	MBD2
DAO	WNT2B	PHF6
AR	MACF1	SLC8A2
APOE	NEO1	MAML1
BTRC	FHOD1	HLTF
AQP9	NPRL2	LGALS9
PPP1R12A	CDC25B	RFC3
NMBR	ID3	SLAMF6

ERCC6	LAMP1	ATP1B2
POLD1	PLEK	PIAS3
RAD23B	EIF3B	ILF2
FBXO11	IFI30	PDCD6
REEP5	TRIM26	CXCL16
CPT1A	TRIM3	E2F7
VCP	SLITRK1	EMP3
ABCC2	SLITRK3	ILF3
RFC1	SLITRK2	HOPX
FEN1	SLITRK4	SLTM
IGF2R	KNG1	DMD
CRP	HNRNPU	GABRA1
EIF5A	SERPINB2	PGD
SMURF2	HPX	NDST1
DEK	MT-ATP6	CUX1
BBC3	C1QTNF8	FABP4
ADARB2	RXFP1	PREX1
CDC37	MYT1	CD1D
BCCIP	FOLR2	BNIP3L
SLC39A9	G6PD	RIOK2
DHX33	GRN	RIOK1
INF2	PKD2	ADGRE2
ITSN1	WEE1	SLC9A9
RBL1	NCOR1	SYNM
HNRNPC	DAAM1	ADCY7
CDC5L	NR3C1	POLR3B
CEBPZ	KCNN4	PIGQ
BARD1	CAMK2G	HBZ
RAD51C	ITGB4	SRMS
RAD51D	MUC1	DECR2
DDX58	ENPP1	ACOT12
CXCL14	SIRT3	LMF1
SPON1	RPL5	LUC7L
PLA2G4A	ITGB5	SLC16A8
PTPN6	ALOX5AP	RHBDF1
HSP90B1	TP53BP1	DMRTA1
ADCY10	KDM6B	RFX4
TACSTD2	HSPA1L	TCP11L2
PRKACA	NEDD9	GSDMC
FLNA	PABPC1	LIME1
PLG	RAD18	RAVER2
BCAR1	BHLHE40	SNRNP25
SMAD1	KDM2A	HBM
COL6A1	KPNA4	CNEP1R1

WDR24	PLAAT4	COL16A1
HEATR3	PRR13	HECTD1
FAM234A	ADA	TRIM44
PGAP6	SGK1	MYCL
FNDC11	MAX	MAGEA3
ENSG00000264545	MECOM	MX2
KDM5B	PPP2R1A	GK5
PHLDA2	CD46	NUPR1
PAX5	CCR1	MAGEC1
SLIT2	SFPQ	NREP
CYP2B6	GAS1	CREBRF
AXIN2	BRD3	DNMT3B
ARID1A	MAP1LC3B	SLC29A1
COL3A1	BAZ1A	CD55
LAMA5	RNF138	SCNN1A
FBLN7	WNK2	CD59
P4HB	NECTIN2	IRF3
CP	REEP4	NEK9
UBE2I	LMO2	SIRT6
MYO1C	SPRED3	PTGER4
SMARCA5	CA12	WNT1
ATXN2L	MYOD1	DCK
RBM14	ARHGEF26	TDO2
LARP4B	LEPR	EEA1
NUFIP2	CSF3R	ADAM8
GRIA2	GPX1	SELE
PSMB8	PPIA	ST3GAL1
TRPV4	EDN3	DOCK7
ROR2	IL7R	CD163
DAG1	MSX1	ANO1
ENG	PITX1	RPS12
ARNT2	LAMA1	NAB2
USF1	DGKA	HNRNPR
STMN1	NOTCH4	UPF1
THBS4	S1PR5	SLC27A3
BTG1	APLP2	ATP5F1A
HOXA5	IL9	SPARCL1
PCBP2	USP11	VTCN1
TP53I3	SPRY1	ADGRL4
PUM2	CD63	TFPT
IP6K2	DAP3	PRKAR1A
TRIM14	NUAK2	DEPDC5
UCN	PHIP	EPHX1
ZHX1	GPR65	RAD54B

MCC	ELOB	FLT4
MSH4	ATR	GRIA3
STUB1	MERTK	MME
ZC3HAV1	ESR2	CYP1B1
TDRD3	CD36	TP63
ANKHD1	CARM1	EPOR
LARP4	KAT5	ROR1
BCR	IFIH1	CYP1A2
GRIA4	NEDD4	MKNK1
CYP24A1	NR4A1	MECP2
BDNF	LIFR	RAP1A
CD81	TMPO	TRPV6
CHD7	MAP1B	COL4A2
IMPDH2	NR1I3	FOXP2
SIN3A	METAP2	LINGO1
PRKD2	DDX1	NPY2R
CXCR3	ACSS2	CD74
KMT2A	NDUFA13	PARP4
SOX6	TJP1	PCNT
SMURF1	RPS3	MTA1
GAB2	EFNA5	SLC13A5
DHPS	PBK	PRDX4
CPT1C	TRADD	CDC42BPB
KPNB1	RGS4	EFNB3
PARD6A	S100A11	MLC1
RELN	VANGL1	RNF135
TAC1	CCL11	CTHRC1
DNAJA1	CCT3	HLA-DMA
L2HGDH	LARP7	FABP5
PIM3	IL16	GINS1
EIF5A2	STK17A	NMB
IGSF8	PFKFB2	RNF213
HERC3	CD93	API5
IPO7	BLZF1	PCDH10
PARP3	COPB1	PIEZO1
ZFP57	DIP2A	PEG3
PDXP	CCL8	BTG2
HOXC9	S100A3	TUBGCP3
TSPAN32	RPP30	SOX1
DOHH	HOXC10	CCNG2
KIR2DS4	ZCCHC8	PBXIP1
NNAT	S100A5	C7orf31
USP26	ZKSCAN7	HMGN5
SRXN1	ATP2A2	BAALC

USP48	CYP4A22	YTHDF1
DLX4	TTC4	LSM14A
IFIT1	AP1AR	KANSL2
MOB1A	MYH9	LSM12
PJA2	PHGDH	UBAP2
LALBA	ASS1	ZNF598
SAP18	KEAP1	CNOT10
CCAR1	DCTN1	DRAM1
AVIL	STX1A	MCRIP1
FRAT1	TTK	PRPF19
SAFB2	CPS1	CFTR
PSPC1	ATF2	ADK
XAF1	FKBP5	F10
GLYR1	EIF4G1	GSK3A
FUT4	SERPINH1	SCD
MUC13	SNRPB	MAP3K11
ST7	TAP2	USP9X
RRP8	PPOX	CTCF
SRP68	XRCC4	BRD4
VSIG4	EIF4A3	KCNH1
CD24	KRT7	IRF1
CMTM3	TRAF4	PC
BATF2	SERPINB5	SIGMAR1
MT-ND4	CNOT2	PTGER3
CMTM1	CDC27	ABCB6
SLFN5	DHX9	BMX
HES3	CC2D1A	EPS8
MARCHF9	CNOT1	HSPG2
GATA2	DYNC1I2	PPP2R2B
TLR1	GIGYF2	SMC1A
C1S	LTBP4	ANGPTL3
MASP2	TOP3B	CTPS1
PKD1	CCL4	CSTA
ICAM2	GGT7	BLVRA
TNFRSF25	TNRC6A	HINT1
SOX17	CDCP1	EMX2
LY96	FXR2	GFER
TNFRSF18	NKIRAS2	NCOA1
LACTB	MIB2	MAK
MEN1	AGO1	POU2F1
CD8A	TNRC6B	DISC1
CYP2C18	ZWINT	FKBP4
CYP4A11	ALKBH2	EFNA3
CYP4F3	FAM107A	LCN2

GRK5
CRABP2
UGCG
SORT1
TRPM2
CUL7
CLK2
BCAN
CDH4
HMGB2
NTSR2
MAZ
PAPPA
MPC1
SLC17A7
RECQL
SUMO3
PTPN4
CKAP5
PSMC2
DPYSL5
WTAP
DNAJB9
CDH19
SUMO2
SUPT6H
DDX39A
ARHGAP21
CHST1
RAD51B
PYGO2
ZFHX4
CILK1
RACK1
AKIRIN2
ALKBH5
MT-CO2
RCOR2
TENM1
SOHLH1
MT-ND1
MT-CO3
CCL3L1
COMT
ACTG1
CYP17A1
ACTG2
PRSS1
EIF2B2
MSH3
ANXA6
PTPRG
AIMP2
GALNT12
XRCC2
PTPRH
ACER3
LRRFIP2
AFAP1
RNF43
ANXA10
SETD6
EPM2AIP1
FCGBP
ORMDL1
PRSS58
HNRNPCL2
DNM2
SLC25A4
ACACA
HCK
TRPC6
B2M
PAK4
DVL1
CUL3
NR4A2
SLC22A5
TXNRD1
PTS
ADAMTS1
CR1
SKI
TCF7L2
SCNN1G
ACD
CCR2
CD27
ADIPOR1
CTSG
MGLL
HRH2
LAMA3
PRSS8
HR
HPN
MYL9
PLP1
SERPINF2
CNDP1
BAMBI
GLUD2
NMT1
SLC22A18
USP5
RUVBL1
SRGAP1
VANGL2
D2HGDH
CAMTA1
CFHR1
GALNT14
KDELR2
MNX1
KIF3A
IL18R1
RCC1
UBE2S
PRMT2
RABGEF1
SEL1L
TRPV2
DPM3
CDK18
CDKN2D
EIF4E2
EFNA4
EREG
IL11
RAB25
RNF41
SV2B

SULF2	EIF1AD	MVD
ZMIZ1	KCNJ10	PRF1
DOCK4	AVPR2	TCF7
CD99	AHI1	USP2
CCRL2	FLT3	USP13
ATAD2	GRIN2A	TET2
ESM1	GNAS	TFDP1
LRP1B	ADRB2	TLE1
PRMT6	SNAP25	PTPN3
RNF40	CAPN1	PTPN14
GABPB1	FBP1	SPRY4
ING5	DIAPH1	CASP5
HM13	CALCR	IRF2
NMI	GGT1	CTSZ
MCM10	TEAD1	LNX1
PTGFRN	CAMKK2	NR1D2
RAB34	ADORA1	SLC1A5
SESN2	SLC25A13	TRIM25
RNF20	PFN1	TLK1
ZFP36	PROS1	TECR
EIF5B	TAP1	PSMD2
MMP28	ACOX1	CALCA
PMF1	ALDH18A1	BDKRB1
RPL38	IDH3A	CEACAM1
WARS1	PDE1C	B3GAT1
ZFX	MC4R	DLGAP1
ACKR1	SLC7A7	GART
ADGRA2	UCP2	FOXH1
NAA30	UGDH	LASP1
NEU4	TPM2	GHRL
PHYHIPL	PSAP	GJA3
UBAP2L	RPS6KA5	FERMT3
ULBP1	ZYX	HOXB13
EPRS1	VAV1	FNTA
SLC4A1AP	CCT5	LEFTY2
ACP3	CRYAA	PDCD6IP
ATP5F1B	CTBP2	NEUROD2
CHERP	ADIPOQ	NODAL
MRPL49	FLNC	MLF1
SVOPL	GLRX	NFAT5
CCDC9	HTRA1	NDP
ABCC8	PDE5A	PUM1
SUFU	PIP4K2A	SLC5A7
PURG	POMGNT1	TNFRSF14

UBE2T
STAM
PRPF31
NRF1
DGKI
ABCB5
CCT2
CX3CL1
ADCYAP1
DLG3
KRT20
GCLM
HDLBP
HPCAL1
IGFBP6
IL21
LEFTY1
PCBP1
LIMS1
TREH
TRH
ULK4
S100A1
TCF7L1
SETMAR
SRSF1
WNT6
VSNL1
ZBTB20
CACNA2D3
CNOT7
CNOT8
CLSPN
ATG4B
ADI1
CLDN3
DYNC1I1
ECH1
GNL3
GLYAT
IL22
GLE1
CYB5R2
POLR2L
POLD2
PDLIM5
SENP2
PHB2
UTRN
STK26
SMG1
AKT1S1
ATAD3A
FKBP14
IFT57
IBTK
ILKAP
MBNL1
LRRC32
PHF19
SFXN1
RRAD
SYT7
C1QTNF1
CAND1
CD58
BCL2L13
CSDE1
ELL2
EAF2
GOLM1
FRMD6
HBP1
KCNG3
MUC4
NRGN
NPY4R
MTSS1
MAML3
LRRFIP1
MPZL2
LAPTM4B
TNS3
TPD52L2
ST6GALNAC2
RARRES2
SEMA6A
WDR12
SMG7
SMOX
ZDHHC17
ARHGAP18
CHIC2
EIF4ENIF1
FUBP3
FBXO5
GBP2
HAUS6
ORAI2
NEIL3
TCTN1
ZC3H7B
ZFAND3
APLN
BTBD2
CLIP3
B3GAT2
ANKRD17
EGFLAM
E2F8
PAK5
MXD4
MOB4
SNAPC5
ZC3H7A
HELZ
LY6K
MDM1
RC3H1
PGGT1B
PTBP3
SCGB3A1
SOX7
XRN1
YTHDF3
BRMS1L
CEP85
BLOC1S2
ADGRE3
FKBP9
OIP5
SEPTIN9

SKA3	TARS2	CIC
TLE6	IGBP1	BAG1
RBM11	DCLK2	CHN2
ST8SIA3	EPS15L1	PATZ1
TIPRL	NT5C	XAGE1B
SPAG4	NME6	SDHB
SPDYA	TCP1	PAX3
SMG8	SNRPA	CORO1A
SMG9	BRWD1	RIPK3
ZNF131	BBS1	MYT1L
ARL4C	GTPBP2	CD248
C11orf49	PITPNM1	RBX1
NUSAP1	KLHL20	HAX1
MAP7D3	RBM3	ARHGAP35
PGAM5	SREK1	ARG1
TNFAIP8L3	IFRD2	SLC6A9
RNF214	RPP38	OTC
SMAGP	ALDH16A1	SMAD6
TSPAN17	FBXO21	NME2
TMEM168	MRTO4	UBE2L3
ATP5F1C	GSDME	P2RX1
ASPHD2	PAQR6	TMSB4X
HILPDA	F3	RCC2
HAUS5	ETV6	RRBP1
FBXL14	RNF216	CACYBP
SEPTIN2	GFPT1	AJUBA
PRRC2C	TARDBP	CERS6
CNOT9	ACVR1	PMEPA1
GML	CEBPD	CKAP2L
CNOT11	RASL10A	SAMSN1
TUSC1	NGFR	PLP2
TTC31	C4A	CITED4
CLEC18B	USP4	ACE2
GATD3	STRN	PLOD3
NBPF10	OSBPL3	MST1
TAFA5	STRN3	DGKZ
KIR2DS2	KIF15	TMPRSS2
SALL1	STRN4	APBB1
FOSL2	CTTNBP2	EFEMP2
IDE	CTTNBP2NL	MB
GCDH	STRIP1	ARHGAP5
MLX	PPM1D	FPGS
C4B	GSN	MED25
IL18	CBLB	HOXD9

RASSF5
PROP1
LTB
DPYSL4
LZTS2
PGK1
MMP15
SFRP1
SP100
ABCD3
SNCA
SLC7A1
KLLN
MMP3
IGFBP5
TUBB4A
SELL
NKAIN3
MYB
ARF4
ACTN4
RECK
MYBPC3
WRN
ADGRV1
ZNRF3
TCHP
DDX5
RBL2
RPL35A
EEF2
CLCN3
ERCC2
TFAP2A
NCF2
SFRP2
COL1A1
GNAO1
PADI4
POU3F2
PPIG
PADI2
PADI3
USP18
MMP21
ZNF217
MEX3A
MMP16
DNM1
GRIN2B
KCNK3
GRIN2D
PBX1
MYL2
MSX2
PI4KA
SCN9A
PRKAG1
BAP1
ASNS
MAT1A
SCN1A
PPP2R1B
CD3E
ATP2A3
AVPR1A
GDF5
LATS2
PDE2A
PDE6B
MAPK8IP1
PDE8B
IL5RA
RAD54L
SFN
SLC7A9
PON1
ACAD8
AICDA
CCNB2
COL7A1
B4GALT1
CYP51A1
CHRNA5
CLCN1
DUSP3
GALNS
GNE
HDC
IVD
HTR4
PAK6
PCSK7
PDE6G
MAP3K9
MTHFD1
MTM1
NDUFS6
RGS9
SLC34A1
SHMT1
SEC24C
SYT2
APOC3
KCNH7
GUCY2D
SCN4B
SLCO1B3
PSMA1
RAPGEF4
STK10
DBT
ARHGEF12
CACNB1
ANXA3
ERF
GPR35
KRT13
FABP1
FUT3
LIPH
IDI1
KCNQ5
KDM3B
PDE1B
LTB4R2
PPID
S1PR4
SGK2
SLC5A8
TPSAB1
TNFRSF13C

PGAM1
RSPO1
AKAP8
ARHGAP4
AMBP
CDK16
COL5A2
B3GALNT1
GJB5
LIPT1
LMOD1
HBA2
HAS3
PARS2
PAICS
MAPK8IP3
OTOF
SLC22A11
SH3KBP1
SLC7A8
UGT1A6
TSG101
TULP1
PEX10
RNMT
CALML3
ACOX3
AGPAT3
ARHGAP17
ARFGAP3
CCNC
CWC27
CLEC3B
B4GALNT2
BRD1
EHF
EPN1
ETNK1
KCND1
FFAR2
IL17B
GTSE1
ITPK1
NT5C3A
MARCO
MAP3K20
POU4F3
MCTP2
ME3
SLC26A9
SLC4A3
UBE2E2
TRAK1
PROZ
POLE3
SP110
SOX18
TAOK2
CCL28
ADAMTS12
ACOT7
DLX1
GAN
GEM
PCDH8
OLFM1
MRC1
MSC
MGAT4B
KCNS1
HPS5
KIR2DL4
RAB8A
SLC26A1
TRIM22
PSMD1
POLR3F
SLPI
ZNF143
CBX8
DDX3Y
ACY3
ACCS
ARL5B
ABHD11
CAB39
CLNS1A
CLSTN2
ATF6B
AFF1
ITGA10
GLCE
KCTD15
IL17RE
IL22RA2
GJA10
GTF2E1
NYX
MRGPRX2
PLCH1
PAPOLG
NEUROG2
MCOLN3
HIVEP2
KLK14
KRT83
SLC25A25
SLC25A37
RAB26
PNCK
TRAPPC2
USP21
UQCR10
RNF130
SYT3
RASAL1
SNX27
DHX34
AKAP4
BRMS1
BCL2L10
EVL
INHBE
ISL2
HINT2
EXOSC1
HSD17B14
HOXC8
CTSW
IRX3
PACSIN3
NUDT3

LHPP	CLNK	SLCO5A1
LY6H	FBXL2	UBTD1
PPP2R5B	FCRL1	PRRX2
POGK	IKZF5	ZNF773
MYBPH	NUDT11	ZNF792
NACA	HOXC11	TTLL4
NEK10	KRT80	WFDC3
RDH16	SH2D3A	ZNF282
SIRPG	SLC16A5	COX8C
SHPK	UFD1	GPR62
SLC37A1	PPIL4	LARGE1
RBP2	SNAPC3	OR3A1
RHOU	ZBTB22	MORN4
RAX	B3GNT8	MOGAT3
TCF20	ADPRHL1	TRIM34
SNRPC	ASCL4	RNF157
RTN4RL1	BRI3	SUPT7L
ZNF44	KLHL4	RGL3
DHDH	EPHX4	PRPF40B
CARHSP1	HEBP1	SNAPC2
BCL7A	OLAH	ZNF709
BCO2	PPP1R16A	ZFP62
ADPRH	PCDHB1	ZNF197
EMC1	SIGLEC11	ZNF586
GAL3ST1	SLC25A47	ZNF669
FRS3	SLC2A14	ZFAND4
KIR2DL1	ZNF563	C1orf56
GPR45	ZNF16	FRMD1
GADD45B	ZNF366	NAA38
HARS1	ZNF627	UBXN10
KLK12	ZNF230	RABL2B
OSR1	CFAP20	ZZEF1
NCR1	BARHL2	ZNF80
NKX2-6	AGBL4	WDR86
MCTP1	ADGRF4	ZNF721
KRT24	FXYD4	ATP5MC3
RAB21	HELT	FAM89B
PGP	EML2	OR3A2
RHBDD2	CASD1	OR51B6
TFAP2D	MYOZ3	OR7C2
ZNF655	NECAB2	SLC35E4
CALML5	MFSD9	ZNF766
APOO	KRT32	ZNF367
CAND2	NELFE	ATP5MC2

NUP58	RAC2	IRAK3
OR10A2	EHMT2	LAMB1
MSANTD2	PLXNB1	HMOX2
ZNF772	SFRP4	UBE2C
OR51D1	SFRP5	KCNA5
OR56A4	NKD2	HNRNPK
OR13C3	DPYD	PDK1
ABHD16B	FASN	OXTR
H2BC18	DKC1	CCR7
PCDH11Y	ABL2	EGLN2
OCM2	PSMD9	ENPEP
SERPINA2	ELAVL2	SELP
ADGRF2	WDR77	RPA2
PRAG1	SIM2	COX5A
PEDS1	RARS1	CLIP1
VN1R5	COL1A2	FLII
DNAJC25-GNG10	NCF4	HYAL2
CYP2D7	XDH	NUDT1
SERPINC1	EGLN3	LRPAP1
NECTIN1	SOD3	SRI
PRMT1	TCEA3	GPR55
CDCA7L	CASP10	MX1
USP1	GRM5	PDCD1LG2
HELLS	EEF1A2	MRC2
MMP11	CSNK2A2	OXT
STS	CCKBR	ARID3B
THBD	ARHGEF6	ICOSLG
ARNTL	FGF9	PLXNA4
TUBA1B	UTS2	NAP1L4
HOXB7	CAPG	MIA2
INPP5F	FGL2	ZNF207
CXADR	MBD1	MLF2
CD207	BIRC2	TRIM59
CCL26	HNRNPA1	MACROH2A1
PFKM	THRAP3	ELOC
TCF12	HSP90AB1	SLC2A2
CLOCK	NNMT	SMARCA4
PRND	FGF13	CYSLTR2
SCG5	MAGEC2	EHMT1
BMPR2	CTAG1B	SLC2A4
CDC25A	ITGB2	NUMA1
MYBL2	RPS6KA1	SLC2A5
TRAP1	ALB	ADAM19
KPNA1	TF	TRIM21

ELOVL2	UGP2	SENP3
CORO1C	CAPZA1	PRELP
MT3	RPL3	KLK7
BTF3	RPL4	SHPRH
MAGEA1	CAPZB	AIF1
DTL	ICAM5	CTRL
TSHZ3	HNRNPH1	IL33
LCMT1	CAPRIN1	TRIP6
CASP1	HNRNPA3	LEO1
HK1	FAM120A	BCAS3
DCN	PPFIA1	EFS
TNK2	G3BP2	PPP6R1
TYRP1	SAGE1	NSD2
THBS2	PRKG1	VASN
PTGS1	ACTN1	NCOA3
ALOX15	PSEN2	SIAH2
MAN2A1	CSNK1A1	ST3GAL4
KRIT1	ANXA1	ABI3
SOX11	PIK3C3	NEURL1
CAP2	DES	GLI4
CXCR6	MBL2	ZSCAN22
DSE	TNFSF11	ZNF875
EGR3	C1QBP	TLR3
ELAVL4	PPP2R5D	DDR2
NFYA	RAC3	TLR2
ZBTB48	TGFB3	IRAK4
TYK2	SRPK1	MYD88
MAPK7	EIF2S1	SLC6A2
GLB1	KCNA3	TBP
GNAI2	TUBB4B	SERPINA1
MMP10	SDHC	RAB7A
ASAH1	AHCYL1	CSK
DDX41	HYOU1	FANCD2
EWSR1	CXCL10	CCKAR
NDUFS2	DNAJB6	GZMB
SLC25A5	PLXNA1	P2RX7
GIT1	KLK6	TGIF1
NHP2	EPHA6	SET
NEU1	IFNA2	ANGPTL4
SCARB2	MCPH1	CCR4
DAB2	USP22	CDC73
DROSHA	TRPC5	EPHB3
MATR3	CHAF1B	STK38
TRAF5	PPP1R15A	WIPF1

C5AR1	LARP1	DBH
PICALM	RALY	BMPR1B
PTK7	SCFD1	DSP
FABP3	VTI1A	SYK
OLA1	TMOD3	PTH1R
IL12B	DHX15	APOA1
RNF168	ANAPC5	EXT1
SSB	C1RL	CSNK2B
PTTG1	CDK11A	CTBP1
SRP54	BRD8	IKBKG
DCTD	EBAG9	KCNJ1
CCK	LAS1L	NOD2
CYB561	NOM1	MASP1
FHL3	RNF113A	SLC12A1
MRPS22	DEFA4	RPL11
LYVE1	ATG14	RPS19
RANBP9	INTS7	C3
RPS13	IPO4	EXT2
CCNT1	TAF6L	KLKB1
EIF6	NKIRAS1	CYBA
PDLIM1	CSN1S1	IL2RG
RFX3	ACTBL2	SLC11A2
RAE1	BRIX1	SLC25A20
RFX2	NOL9	PTGDR
TIAL1	MRPL4	STAT4
TLR10	MRTFA	C2
CXCL2	PHF5A	DBI
COPS3	PWP1	ABCB4
ELP4	ADA2	C5
IQGAP3	MEPCE	CAST
MLANA	TRMT61A	CYP21A2
POP1	CGB5	CDK5R1
SUPT5H	DCAF1	DLL1
SRP72	CEP162	ERG
ZMYND8	MRPL58	EFNB1
CREB3L2	SEPTIN7	F5
CD200	MTREX	FURIN
CHD9	INTS11	LMAN1
FERMT2	PCLAF	HRH1
IL34	MIB1	HTRA2
GGCT	SDHA	LTA4H
NAPRT	ENC1	PNKP
OXER1	JAK3	SLC27A2
MSL3	NFKB2	PTHLH

SERPING1	ANLN	BPI
SERPINI1	DLG1	CKS1B
CPE	EEF1D	INSL3
CFL2	LBP	IRAK2
BCL10	KAT6A	FCER1A
CFB	FBP2	ICOS
LAMB2	FCER1G	CXCL1
IRF9	FXR1	ICAM3
FCER2	GABARAPL2	KDM2B
IL11RA	IL12A	GFI1
MINPP1	KHSRP	HAS2
NR2C2	NAA10	PAWR
NOD1	PDE1A	MLST8
KLK1	OPHN1	POLR1B
TICAM1	POLR2B	PLXND1
PTPRN	P2RX4	CYTH1
PTPRN2	KLK2	HS6ST1
RPL18	KLK4	KLK15
SOCS2	RCAN1	SELPLG
ALPI	SENP1	SEPHS1
APOA2	TOLLIP	PABPC4
C9	PRL	TNFRSF8
COL6A3	RBCK1	PTGDR2
GABARAP	SAMHD1	RFX5
HSPA6	RNASEH2A	RNF31
KIF23	PSMC5	SND1
MYO1E	RPS17	RPS3A
NFIX	RAB3A	RPL12
PER2	PTPRU	RPL26
ME2	RPL27	SERPINB3
MEFV	TAF15	RNF8
CYP4B1	TAGLN	SPAG9
RPS14	VDAC2	SRF
TLR6	CCL7	ZMYND11
CD209	DDX17	DIO2
C6	CNBP	DHX30
DNASE1	ADAM23	ARHGAP29
ACAA1	C8A	C8G
ALOXE3	CAPNS1	CD80
C7	CLK1	CCR9
C8B	CNTNAP1	C4BPA
CCR8	ALOX15B	C4BPB
COPA	ACTR3	ARPC1A
ALOX12B	ARPC2	ARPC5

BRF1
CLCA1
CLCA2
BCLAF1
FARSA
HS6ST2
HIF3A
FCGRT
LIMA1
LTBR
PDLIM4
METTL3
ULK2
RHPN2
SCGB1A1
STK19
RPL8
RPL27A
RPS16
SERPINB1
ZP1
TSN
DACH1
COPE
DEF6
BOK
CLEC1B
ITGAE
KLF11
HNRNPM
NAT10
PARG
KMT2E
TRIM11
RPL24
RPL30
DEFB1
C1D
DEFA5
ARF3
CD180
BACE2
ADAP1
CLEC12A
GRK3
HRK
KLF8
NUDT6
NUMBL
MUC6
MYL6B
NOP58
NIPAL4
NPLOC4
PDS5A
RBFOX1
NEIL1
SLC25A23
SLC7A4
TRAM1
TNFSF18
TWF1
TWF2
PSD
RGS3
SSBP1
SUPT16H
RPL18A
RPL34
RPS4X
SECTM1
ZNF76
ZNF436
CCL13
CCL1
DEFA3
DEFA6
ADAMDEC1
ACAD11
CCR10
ARPC4
DLG5
IPPK
GPR108
FHOD3
ICAM4
OLFML3
MYO1B
MUC7
MAL
SLC2A11
PLAGL2
SPECC1L
SOCS4
WDHD1
TSLP
ZFP36L2
DDX56
ARPC5L
ANOS1
EFHD2
FRMD4A
IL17C
PAM16
HES7
TNFSF8
TNFSF9
SCGB2A2
TTYH1
DDX28
CCL24
ATG9B
MZF1
DEFB119
FOXJ2
EVA1A
MOB2
LUZP1
SCAF4
RAVER1
RUBCN
TTYH3
ZAR1
H4C1
LY6G6D
STYXL1
TMCO6
FAM98A
DEFB118
MAGEA2
DEFB126
DEFB127

FAM120AOS	IQCD	SLITRK6
H4C14	H4C15	FOXD1
DUSP4	LOX	NECTIN4
EPN3	MMP19	SLITRK5
PLPP3	PAX8	DAOA
MELTF	GJB6	UCHL1
RIOX1	TSC22D1	CASR
ERCC3	CA2	ANPEP
UGT1A1	CTSH	CSNK1D
CDC6	SLC11A1	TPM1
CLCN2	PDE4A	TACR3
AASS	GREM1	ENO3
UBE2D1	MDK	CASK
ABCB7	VTN	IFNAR2
UBTF	FRS2	MVK
HAVCR2	PFKFB4	MARK3
LTBP1	ASAP1	POR
PFAS	MGAT5	PDXK
TRMT1	RAB3IP	TRPC3
PRKRA	FMNL2	ADAMTS13
ACTL6A	FMNL3	ADCY3
CDO1	LCK	FGF8
HCLS1	DRD5	GGCX
RPL7A	INS	NDUFS7
CYTH2	HLA-DRA	MEF2A
AP1M1	GSTM3	HSD17B4
FLAD1	HNF1A	UNG
BLVRB	TUBA4A	PISD
THAP1	CNTN1	PITX2
CPSF6	PDE7A	RASGRP1
CYTH3	NCK1	TLR5
CDK5RAP3	WNT7B	ARHGEF1
SRRM1	PDE3B	ACADVL
ZNF638	AMFR	ACHE
NOP2	CENPF	ASL
MAP7	PCYT2	ATP2C1
TOMM22	EDN2	AMACR
FYTTD1	SDCBP	ADORA2A
GPRASP1	TTF2	CSNK1G2
GPATCH4	BLOC1S6	FKBP1A
NIFK	IL20	GP1BA
TRIM65	MAGEA4	ITPA
TAC4	SLC38A3	MAG
METTL17	UNC5A	PKP2

PHKB
POLG
POLB
POMT1
MYO6
P2RY2
NDUFS1
LAMC2
PRDX5
PRDX6
SLC12A4
TPT1
ST3GAL3
TGM1
SMAD9
XBP1
TRPS1
APTX
AIP
CTSA
COL18A1
ATXN3
AGL
ACSL1
BMP7
EIF2B4
EMD
EIF4A2
GMPS
GP6
FMR1
DPAGT1
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NUP155
MYO9B
MYO5A
NAT1
NFE2L1
NFATC4
LTB4R
MARK2
PNPLA6
POLR2A
HEXA
LAMA4
TOR1A
UROD
PI4KB
PPP2R2A
RFC2
SORL1
SPTBN1
VAMP1
TAT
CALM3
DAPK3
DCXR
AP1B1
CLPB
ATXN1
ARNT
CHRNA3
GCLC
LMNB2
JAM3
NFATC3
NID1
PLSCR1
SLC4A2
SLC25A19
TRIM32
PLAGL1
PPAT
SUV39H1
TDG
PGM3
SMARCAL1
YARS2
DDAH1
ABI1
ARHGEF3
CDCA7
CLK3
ATG7
AZGP1
ATP13A2
ATXN2
BANF1
ARSG
CLCN5
EDC3
EIF2B5
GABARAPL1
FZR1
KAT7
FBL
GNB2
FOXA1
GTF2E2
ENTPD5
COQ7
CRBN
DOK1
GFPT2
PCM1
NOL3
MANBA
MAPRE2
POMT2
NOP56
MCF2L
SLC25A10
SLC39A4
MADD
SLC4A7
TGFB1I1
TACR2
TSFM
TPP1
UBA5
RIN2
PPM1G
RHOT1
SEC31A
TCOF1
PRPF3
TLE3
SREBF2
VAC14
TMPRSS3
UVRAG
VARS2

XRN2
CPD
DARS2
DGCR8
DNA2
ADAMTS10
ALMS1
ABR
CCT7
ATP6V0A1
AGPAT1
ADPGK
CTDP1
FLOT1
FLOT2
EXOC7
ERC1
EIF5
EIF4G3
FTSJ1
GORASP1
KLC2
FOSB
FANCI
ICMT
IDH3G
DPP9
KLC1
PAFAH1B3
PAPOLA
NKX3-1
MPV17
MSH5
LTBP3
LIN28B
MBOAT7
PHF1
PIGB
PER1
PASK
POLI
POLK
KIF13A
LAMC3
PDZK1
SLC35A3
SLC39A7
PUS7
SLC35A2
SLC30A9
RTN2
USP6
TREM2
PLEKHG4
PSME1
PSME3
PROCR
PRPF6
RNF14
SARS2
RABGGTA
RPGR
SMN2
SPTBN2
WWC1
SMUG1
SMARCD3
TARBP2
TMEM43
CPNE1
DBNL
DDX50
DHX16
DPH1
ADAM11
ABCB9
APEH
ANAPC10
AP1G1
AATF
ABCC10
ACTR1A
BZW2
CDH10
CTDSP2
CEP290
CLTCL1
CEP170
AMY2B
ATP13A1
CHFR
BPHL
ASAH2
ELOVL1
HOMER3
KTN1
EPB41L2
EPS8L2
IFRD1
GTPBP3
DPP7
DNAJB11
PAOX
PARP8
NUCB1
NUP85
NFIC
NOP10
MICU1
MSLN
MAFF
PINX1
PITPNB
POLD3
MED15
MOV10
HMGN1
HNRNPF
KLHL9
SEC14L2
PRG2
RAB6B
SGMS1
SH3BP2
SHARPIN
RNPEP
TPM4
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UBE2O
UPF3B
USP19
TRIM71

UBE2D4
UNC5C
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SRSF9
STARD13
PSMC6
SORBS3
TAX1BP1
ZC3H14
WDR1
WDR45
ABCE1
APBA3
CENPA
ATP8B3
AZU1
ELP3
ETV5
FASTKD2
GAPVD1
LMBR1
HBS1L
COPZ1
CRIPT
HACL1
MYSM1
NCBP2
ORC2
MGRN1
NIF3L1
MFAP4
LAMTOR3
RAP1GAP
SAFB
RIF1
SEMA6D
STX6
SUPT4H1
SFXN2
RPS18
RALGAPA1
SRSF5
TTC3
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BYSL
ARL4A
CDCA3
CLIP2
CNN2
ATG9A
BAG4
BAIAP3
ABTB1
BMP2K
CBFA2T2
CIZ1
CIRBP
DUSP23
ECSIT
EXOSC9
EDC4
EIF3K
ELMOD3
FUZ
GPRASP2
IQSEC2
KPNA6
KANK2
GOSR1
IKZF2
HIGD1A
HNRNPAB
GTPBP4
DPP8
DNASE2
DOCK9
KRR1
NAP1L1
NCBP1
NUDT12
NUP50
OBSL1
OSBP2
MYO9A
NAPB
MRPL42
NOXA1
PGS1
PKP3
POLDIP3
PPP4R1
PIGP
LZTFL1
POP4
NPTX1
KIFC3
KLHL12
PEX12
TRAPPC10
TBCE
TGS1
TUBGCP2
TRMT2A
TSEN34
TRA2B
PSRC1
RBM28
RNF10
SSH3
SSR2
SUMF2
TFDP2
STAP2
TCF25
TJP3
THOC2
SURF4
RPL14
SNX14
SLMAP
SNRNP70
SF3B2
SMTN
ZNF79
VPS28

TSR1
TMOD1
TMEM126B
ZBTB24
TSPAN9
DCP1B
DCP2
DHX8
AP2A2
ACAP2
ACSF2
CCDC8
BTBD10
ASB1
CXCL3
CENPK
CENPT
CNTROB
ADAT1
CLEC16A
CDK2AP1
CHCHD3
DUSP14
FTSJ3
EBNA1BP2
GOLGA7
HP1BP3
KREMEN2
L3MBTL3
EPB41L5
GATC
IFT74
HSPA12A
GTF3C2
FBXO3
CTDSPL2
DNAJC10
ORC3
OSR2
NARF
POU3F1
PPM1M
MPPE1
MTFR1
NEMF
RAPGEF6
RAPH1
SLC35F2
SLC39A11
SLC41A2
SH3GLB2
TPCN2
UACA
TRIM17
TUBD1
UBAC2
UBXN6
PTOV1
REXO4
RNF220
RNPS1
SENP5
SSR3
SSBP3
TASP1
THADA
STAU2
SNRPG
SNRPF
SNRPA1
SNF8
SRP14
TAF1A
ZFR
ZNF281
DCTPP1
DDX27
DIMT1
DHX29
DHX57
ARHGEF28
AP1G2
ARHGAP11A
ABLIM3
BUD13
CCDC28B
ARMC5
CEP78
CLSTN3
BAG6
BASP1
AHNAK
CTDNEP1
CLDND1
EPG5
FCHO1
DZIP3
ERGIC3
GNL2
LARS1
KLHDC2
IFT80
INO80
GARS1
HERC4
HNRNPLL
FAM3A
CREBZF
KLC4
JTB
OSBPL7
LIMCH1
MBIP
LPCAT1
LRWD1
PHPT1
PNMA2
MFSD1
HIVEP1
SENP7
PURB
RAD9B
SLC38A9
SIVA1
TNRC6C
TEX264
TMEM9
PHLDA3
RBMS3
RIC8A
THOC3
TIMM10

STRBP
SURF6
SNRPB2
ZC3H11A
ZNF346
YIPF1
ZNF12
ZNF189
CPNE8
CPSF7
DALRD3
DCAF7
AGO4
FOXJ3
GLB1L2
GADD45GIP1
DNAJB12
PATL1
OCIAD1
ODF2L
NKRF
LRRC41
PHAX
NOL6
MED26
MPHOSPH9
HIC2
RAET1E
SHKBP1
RRP1B
RUSC1
TBCEL
USE1
TRIM6
U2SURP
TARS1
PIH1D1
PROM2
SSBP4
TBC1D25
TJAP1
RPAIN
RAB43
SEZ6
WDR18
PRICKLE3
RRP12
RSF1
ZNHIT3
TMEM161A
TANGO2
ZNF185
WDR46
CCDC59
ANGEL2
ACTR8
CEP85L
CEP131
CERCAM
AGO3
ARMC10
ARRDC1
CHCHD7
DXO
CDKN2AIP
FBXL6
ENY2
DTX3
FIBCD1
GREB1L
FILIP1L
FAM184A
GCFC2
KCTD2
GSE1
IARS1
DNAJC21
MLLT11
IMP4
NAA60
NPEPL1
NMD3
MIF4GD
NOC3L
MOSPD3
LONRF3
PHACTR2
PNRC1
NOA1
MFSD11
KLHL21
RILPL1
SDR39U1
QPCTL
SIKE1
TRIM46
URGCP
TNKS1BP1
TAS2R14
UFL1
PTCD1
SEC61A2
RNF167
TBRG4
THUMPD3
VPS8
PRDM4
RRS1
ZWILCH
TBC1D10B
TBC1D17
TMCC1
ZBTB11
ZBTB2
ZBTB21
ZBTB44
ZMYM1
ZFP30
ZNF280C
WDR20
ZNF622
YIF1A
ZBTB14
C1orf43
DBF4B
AKAP17A
CCDC66
ANKRD46
ARMCX6
ELP1
CEP57L1
HNRNPUL2

HAUS8	MAP7D1	DNAH14
IFIT5	LTV1	C19orf25
MXD3	MTFR2	C1orf198
NSRP1	NECAB3	C19orf53
MIEF1	MEIS3	CGB3
LSM14B	KLHL29	EMILIN3
MAU2	NEURL4	FAAP24
LSG1	PYCR3	LINS1
PPAN	SLC10A3	FLYWCH2
POP7	TRMT44	ENKD1
P3H4	PRKRIP1	FAM193A
SDAD1	PRRC2A	H4C2
UBFD1	PTPDC1	MVB12A
S100PBP	RPUSD1	LRRC37A3
SCRN3	SNU13	GTF2IRD2B
ST7L	SPIDR	KYAT3
RBM34	TM2D2	NEPRO
RIMKLB	TAMM41	R3HDM4
SNX22	ZNF205	TVP23A
SPATA20	ZCCHC3	R3HCC1
RSBN1	ZNF506	ZSCAN32
RRP9	ZNF568	ZSWIM7
TMEM184A	ZNF573	SRPRA
ZCCHC10	YLPM1	ZNF48
ZFAND2A	ZKSCAN8	CBWD2
TRUB2	ZNF236	CCSAP
ZNF574	C7orf50	CDIN1
WDR91	BUD23	H4C8
C11orf24	CCDC124	FAM210A
EXD2	C1orf35	H4C3
CDKN2AIPNL	ARMCX5	NBPF6
DTWD2	ENDOV	PPP4R3A
EMC4	DNAJC4	SEPTIN8
KIAA1191	POTEE	THAP12
KRI1	LDLRAD4	CIAO3
KBTBD6	SPRYD7	H4C11
FBRS	PRR5L	H4C12
GPR89A	SERF1A	H4C6
EMSY	SUCO	H4C9
CASKIN2	SPOCD1	INTS13
H1-0	ZNF768	POLR2J2
OCEL1	ZSWIM8	QARS1
NOP16	ZNF628	TUT4
MTERF4	DCAF10	PRR14L

JPT1	FAAH	SKAP2
H4C13	MITF	TIMP4
H4C5	RUNX2	PRDM2
OBI1	CD40	GALNT9
ZNF841	IRF7	MT1E
C8orf82	HDAC5	MT1X
BMERB1	FER	MT1A
FBH1	TNFRSF11B	SLAMF1
GOLM2	PRPS1	RSL1D1
H4C4	PNP	MCTS1
RSRP1	CTNND1	SH3BGRL3
WDCP	BCAT1	CPQ
CBWD5	FPR2	SLFN11
KHDC4	FH	DMXL1
NTAQ1	ARHGAP1	CST9
SANBR	DLK1	SPANXA1
PABIR2	CRYM	BTK
SAPCD1	SDHD	RET
TEDC1	TNFRSF11A	MAP3K7
DENND10	DNM3	EPHA4
TEX22	ATP6V1E1	TUBA1A
ACP7	ABCG1	F7
GATD1	GAL	LMNA
MCRIP2	COL11A1	MAPK12
TEDC2	APOD	TPH2
ISY1-RAB43	ACSL5	IRF5
INSYN2A	ANP32A	KRT14
IQCN	DTNA	IL6ST
SRGAP2B	NAT2	KCNK9
ABHD14A-ACY1	RNGTT	GATA1
NPIPB5	SDC1	MAT2A
PEDS1-UBE2V1	TIE1	PLA2G2A
NUTM2D	WASF2	ABCB11
TRA	CEACAM3	KCNA1
GAGE13	MLLT10	FTO
SPDYE16	MEOX2	ISG15
NBPF26	SNCG	MATK
SMIM31	BCL3	RELB
FTH1	CLDN11	RALA
NOTCH3	ISG20	TUBB2A
PRKD1	GALNT13	TBX3
SMARCA2	NKX2-2	SMC3
CBS	NOX3	ZIC1
PTGER2	MSI2	COX6A1

HSD17B10	MTA3	PPIH
FGF14	MEIS2	MRPL12
GPC4	SEPSECS	TNPO3
OAS1	SLC38A1	RBM4
NCOR2	UBR5	VPS33A
LONP1	TANK	TAF2
PPP2R5C	PRPF4	ZMYM2
PIAS1	TAB1	WDR26
PEBP1	TRPC1	ZNF462
MAD2L1	ARID5B	DCBLD2
RALB	AKAP12	ARHGEF16
TNFRSF21	ASPH	CCT8
PRKAR2B	DUSP5	BAG2
SCO2	GJD2	CRMP1
SNTA1	CAP1	GLIS3
CCNK	IFITM3	DPYSL3
PARVA	PCMT1	MLLT1
NUP214	PCSK6	LSM2
MGAT1	NPC2	PHC2
MCM6	MAP4	PELP1
SIX1	MCM3AP	MRPL15
NET1	RANGAP1	HERPUD1
USP24	SLC3A2	RBBP6
SNCB	SH3GL3	PSCA
TIA1	TNR	RBP1
PTPN13	POLR2C	RGS16
SMARCC1	PSMB6	SP2
ZIC2	UTS2R	SMG6
CA5A	TSPYL1	SPEN
CBX2	XPO5	TMEM59
CBX4	ANAPC2	CCL3
CCNA1	ANAPC1	ARID3A
CNTFR	CNTF	CDC23
CHGA	BAG5	BAZ2B
CHD3	CHD8	BMF
COPS5	ELF3	FUBP1
EEF1A1	ELF4	FOXP4
ETF1	GADD45G	GATAD2A
FOXC1	FMN2	IL20RB
KLF10	DNAJA2	MYEF2
NME3	NCAPD2	NOX5
MAP1LC3A	IPO5	MRPS35
MBD3	NUP93	LSM3
PNPLA8	MAGED2	MAEA

PHC3	DIRAS1	ACTL8
PLVAP	EP400	ARMC8
PBX2	KIAA1549	GID8
NELL1	INTS3	MIER1
MRPS9	PCSK4	LSM8
SIN3B	PAF1	TRIM45
TRERF1	OSBPL11	TEX10
USP34	MRPL39	CDC26
UBR4	LSM6	BOD1L1
RBM15	MMS19	BEX2
SCYL2	MFAP1	EFL1
PFDN1	MED22	PCDHGA11
SMC2	SEC16A	TNRC18
SRSF4	RANBP10	SPANXC
ZMYND10	TUT1	TCEAL7
ZNF644	TMEM18	ZNF609
CORO1B	ZBTB7A	ZNF787
CCAR2	ZNF384	ZBTB5
AKAP11	ZNF536	ZDBF2
ANAPC7	YPEL5	PALD1
ASCC3	APPL2	NTN3
CUL9	IRF2BP1	RELL1
CHAC1	ETV3	SGO2
ANP32B	IFNL2	TENT2
CHD6	INTS9	SPANXD
FOXK2	MRPS26	QSER1
KCMF1	SAMD4B	BRINP3
GPN1	WDR3	GCN1
ENOX2	ANAPC4	INTS14
CTR9	ANP32E	ITPRID2
IER3	IL31	SPANXA2
MKLN1	INTS1	XAGE1A
NIP7	KCTD5	WASHC2A
MRPL1	INTS2	GAGE2C
MCRS1	MRPL41	GAGE7
MDN1	MAGI3	INSR
SAP130	MRPL9	NEK2
RNH1	MSL1	GRM1
TUBB8	KNL1	HNF4A
RMND5A	SHCBP1	CTH
S100A16	UTP14A	MAP3K1
RBM7	RMND5B	COL2A1
SOX21	SUGP2	ACVRL1
ZNF687	ZBTB10	ADRB1

FLI1
GNAQ
MST1R
THRA
HPRT1
GRM6
UBE3A
PLA2G6
ATF6
BMP1
ANTXR2
GJB2
ETV1
KDM6A
HPGD
ENTPD1
DLC1
PCCA
NPC1
NEDD4L
SLC19A1
TRAF3
UBA1
TXNRD2
SOX5
PRDX2
NR1I2
TLR7
YWHAQ
ZBTB16
COX4I1
ABCD1
ACVR2A
ALPP
AQP5
AKR1C3
CD79B
CLU
ALDH5A1
BIN1
CISH
CES1
ETFA
LDHB
GMNN
FLNB
FXN
GRM4
IDH3B
GHR
NOG
RAD21
RIPK2
PSMB9
RPA1
PRDM1
VIPR1
AOX1
C3AR1
CUL1
CSF2RA
ATN1
AFP
KLF5
PDE4C
LTF
PPP6C
KDM5C
SLC8A1
TFR2
ULK1
UBE2D2
PTGDS
PROK2
PSMA7
TDP1
TUBA8
CNTNAP2
BCL11A
CES2
HRG
GFRA1
GHRHR
NPC1L1
PPIF
HLA-DPB1
HSF2
SLC16A7
TFPI
TNXB
PRPS2
TFAM
SERPINF1
RNF2
VPS35
DIAPH2
AGRP
BRCC3
CTNND2
CELF2
EIF3F
GRIK4
GRIK5
IL1RAPL1
ITIH4
GAP43
HOXA13
GSTA4
HTT
NUP107
OPCML
MTRR
MBD4
PKMYT1
POU1F1
PLXNA2
PAPSS1
IL3
SLC22A1
SGK3
SKP1
PDGFRL
TG
PLEC
PSMC3
RASGRP3
ST6GAL1
SURF1
PSMD12
RPA3
RPS2
SP3

PRDX3	CSE1L	COX7A2
TSPAN7	BGLAP	DDX39B
DCTN2	CHST15	ARFGEF1
COL14A1	EBF1	CHCHD10
ARFGEF2	GMFB	CLIC3
C9orf72	GNG5	CDR2
DLL3	GDI2	DUSP13
EIF3A	HLA-F	EIF3I
CEACAM5	INSIG1	GNPDA2
EIF4B	PCDH15	ITSN2
GPR37L1	NUBP1	FNBP1
INHBB	MICB	HOXC6
GDF2	NFYB	GTF2H2
FIBP	POLR2J	CXXC5
FGF7	PPP2R5E	FMN1
IFITM1	POLA2	MICAL2
KLK8	MOCS1	NELL2
PBX3	RCOR1	MFF
NPEPPS	RAB18	PDXDC1
MIP	RAB31	RCVRN
POU3F3	SGCB	RAB27B
PMP22	TCERG1	PSPN
NOX1	UCK2	PSMD5
RAP1GDS1	STAB1	RNF139
RING1	RAB38	ST13
SIRT7	SNX1	STX8
TRIM5	SMOC1	STIM2
TUBB6	TMEFF2	PFDN5
PSME2	WBP2	SNX2
PSMB2	ARHGAP24	ZPBP
PSMC1	AGAP1	VPS26A
RBP3	CRHBP	TMEM165
SCAP	BICD1	WDR61
SDHAF2	HES6	WLS
SEMA3F	GPR18	CCL17
SLIT3	OSTF1	CLEC4A
SMOC2	NPAS3	ACBD3
DBN1	MGAT3	CLEC2D
ACTN3	UBA3	CBLC
ARHGAP15	POLR3K	CDH22
AKAP1	RNF144A	CGN
CA3	TLN2	DYNLT1
CXCL11	RRAGA	EIF3G
CEP55	TSPAN8	G6PC2

GMFG
HEATR1
GSPT2
HYDIN
IFITM2
INSM1
NOVA2
LSM5
PIN4
NID2
PREX2
TBL1X
TXNIP
SCGN
SEMA3G
PRPF40A
RPS25
RPL37A
SPA17
SRGAP2
AQP8
CST2
CST9L
ART1
BRF2
BDP1
GPR182
GPS2
GRIN3A
FNBP4
IBSP
PCGF1
PDCD2
POMGNT2
MORF4L2
RANBP6
SAMD9
SGTA
TCFL5
RNASEH2B
STRAP
PFDN2
RPRD1A
SNX6
ZPR1
TMSB10
HMG20B
KAZALD1
ETNPPL
NT5DC2
LRRC15
PPP2R2D
PLEKHA3
MCOLN2
SNRPD3
WBP4
DACT2
DCTN6
DCBLD1
ABT1
ARSH
ASAP3
DUSP11
ELOF1
ERBIN
ERO1A
HTRA4
IFNL1
LHFPL3
OSTC
MMP26
HSDL2
SLC7A13
TC2N
PID1
TSPAN13
ZDHHC18
CSRNP3
GET3
KLK9
NUDCD1
NAV3
SH3YL1
SYF2
ROMO1
TM2D3
ZDHHC23
ZNF554
DHFR2
CACUL1
BCL2L15
CLDN20
MFSD5
WIPF3
TMEM37
TMEM71
TMEM167A
ALPG
ATAD2B
PATJ
BEX1
H2AC4
CIAO2B
TMEM183A
ANKRD36B
ARRDC5
H2AZ2
IRAG1
MAP3K21
TSGA13
PAXX
MACIR
RUBCNL
NANOGP8
SMIM30
PTPRZ2
PHF20
H3F3A
DYRK1A
MSH6
GABPA
ID2
PMS2
BRCA2
BAX
MXI1
FAM46D
PRAF2
STAG2
MAGED4
SPANXB1
PDZD4

MIR222	TERT	LRRN2
MIR221	KDM5A	PPARG
SLC7A3	ARID4A	HLA-G
NLGN3	BCHE	IDH1
GPC3	PDGFRA	IDH2
ATRX	PIK3CA	NFKBIA
GLDC	PIK3R1	MGMT
TP53	CCND1	RPSA
TGFB2	ROS1	ICAM1
KRAS	ERBB2	
PDGFB	AKT1	

Supplementary information Table S3. The potential therapeutic targets of Chr-A against glioblastoma

CTSD	PLOD2	RBMS3
ITGB1	CLSPN	EHMT2
KPNB1	FLNC	PTTG1
MLH1	AURKA	CAST
PITPNB	DPM3	RBCK1
TP53	ZCCHC10	FDPS
SSBP3	RNF8	PBX3
INTS14	EXOSC1	SMG7
UBAC2	TLK1	PHF19
ACACA	BCL2L1	RNF146
ZYX	FERMT3	MRE11
DIDO1	MIF4GD	FOXP2
PMP22	MRPL23	PHF6
DICER1	MXI1	PTBP1
RNF41	BTBD10	RACK1
VPS26A	ZSWIM7	ZNHIT3
ELP3	CCNC	PRPS2
PARP1	BDKRB1	GMNN
TMEM9	TNFRSF19	CDCA7L
FRMD6	GPATCH4	ATP13A2
PML	HIST1H3B	HBS1L
FZD6	KCNMA1	IDH1
BGLAP	SLC4A2	DDX39A
CDC25C	NUSAP1	MELK
ZMYND8	RPS3A	CREB3L2
RPL35A	EWSR1	CCNB1
ZBTB14	PTK2	CSDE1
PELP1	SCG5	AKAP8
CCT7	CCNA1	IRF3
NIF3L1	KLC4	RNASEH2B
TP53BP1	GOLGA7	SSBP1
PON2	CSNK2B	DCXR
PHC2	CD58	MCTP1
PRKCD	RBMX	CCDC124
CCL24	FANCI	NELFE
SHKBP1	RSBN1	USP21
ZNF236	SLC38A9	PRKAR2B
RND3	PREX1	ANAPC7
WDR61	MYO6	ARMC10
RAD51B	ZNF586	RPL26

SGMS1
C3AR1
ZNF644
RNPS1
NPC1
RHBDD2
CSF3
CPT1C
PLA2G4A
ZMYND11
ITPK1
INSIG1
PSMB8
SMN2
H3F3A
NAMPT
NUMB
SUPT5H
RPRD1A
EZH2
FBL
TAF1A
UBE2D3
MPV17
BACH1
NAB2
ZBTB44
TECR
SLC12A2
SSBP4
SMURF2
NEK2
RBM4
IDH3B
HNRNPH1
RPL7A
MAML3
NSD2
SP2
TTK
BUB1
HNRNPC
ING5
CKS1B
SLITRK6
PIH1D1
SMIM30
SERPINB2
RMND5B
TMEM71
ZNF185
DTX3
CENPA
FOS
ANXA1
RAD51C
NFE2L1
PAK4
ANAPC10
SF3B2
ISG20
LSM1
PFKFB4
HMOX2
MAPK9
ECSIT
UBE2C
FHOD3
KTN1
SETDB1
LDHA
MIEF1
ANG
RALBP1
GTF3C2
C3orf14
ING1
PLCD4
RPS27A
SPRY2
WTAP
TSEN34
ERC1
DUSP23
EMP3
CPNE1
SERPINE2
WWOX
RELB
PRKCE
DNM1L
MRPL39
ASAH2
ST3GAL3
KLHDC2
YEATS4
PLEC
MORN4
PTPN12
LTA4H
ARHGAP11A
UBTF
YBX1
PRPF31
HELLS
ZNF655
MSANTD2
GCFC2
ELAVL2
PAPOLA
TIMP1
HERC4
ZMYND10
USP3
PTK7
ACTG2
SFRP4
BCL2L13
PRPS1
MYL9
CCAR1
CDK4
SEPHS1
SUPT6H
TPM1
CENPT
CNN2
COL1A1
SLC12A4
LRRC15
MME
CLIC3

KLC1
SEC31A
GPNMB
PLXDC1
SNRNP25
C1QTNF1
TNC
PPP4R1
ZFAND2A
LMOD1
HSPG2
PMEPA1
NFATC3
UCP2
URGCP
RHOC
DLG1
ITGA7
OSBP2
FTH1
NF1
S100A4
TAGLN
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THBS2
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FLAD1
CD248
CD81
BRD1
DTNA
TSPAN13
ADGRB2
SAMD4B
INHBA
TPM2
SLC39A11
ZNF207
RUNX2
TBC1D10B
ALG13
PUM2
MEIS2
TMSB4X
ATAD2
IL7R
CNTROB
SKP1
MCTS1
FNBP1
TPM4
FAAP24
SERPINH1
PSME2
PFKP
SPARC
NAT10
HOPX
OBSL1
DIABLO
MYO1B
TUBA4A
ATXN2
NOG
SORT1
DCN
CTBP2
ATP6AP2
MZF1
EIF4G1
CTNND1
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IDH2
LAMB2
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SSB
CLSTN3
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DDR1
NKRF
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RARA
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COL3A1
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CUX1
MDK
CCL2
PHLDA3
MIER1
FHL3
EFEMP2
CGB5
PDGFRB
ING4
RPUSD1
ADPRH
PTGS1
CDC25B
MAP3K11
PMS1
BLVRB
IRF2
BAP1
SMAD7
ACSL1
MCPH1
PHKB
PTGER4
ST3GAL4
GIGYF2
ACY3
USP15
DMXL1
STAT6