Integrative analysis identifies PIGK as an oncogenic glycosylphosphatidylinositol transamidase subunit with prognostic, immunological, and therapeutic relevance in head and neck cancer

Type of article: Original Article

Author: Yi-Fang Yang, Jia-Bin Liao, Pei-Lun Yu, Chih-Yu Chou, Yu-Hsuan Lin

Running title: PIGK as an Oncogenic Driver and Therapeutic Target in Head and Neck Cancer

Numbers: Table-5; Figures-8; Supplementary Tables-5, Supplementary Figures-6

Supplementary information

Supplementary Table 1	Related to Figure 4
Supplementary Table 2	Related to Figure 4
Supplementary Table 3	Related to Figure 5
Supplementary Table 4	Related to Figure 5
Supplementary Table 5	Related to Figure 5

Supplementary Table 1

Co-expressed transcripts with *PIGK* in TCGA/HNC cohort

Supplementary Table 2

Cancer-related annotations of *PIGK* co-expressed genes identified by IPA

Supplementary Table 3

PIGK-interacting proteins from BioGRID

Supplementary Table 4

PIGK-interacting proteins significantly correlated with *PIGK* expression in TCGA/HNC

Supplementary Table 5

Refined physical interactors of PIGK used for PPI network construction

Figure S1.

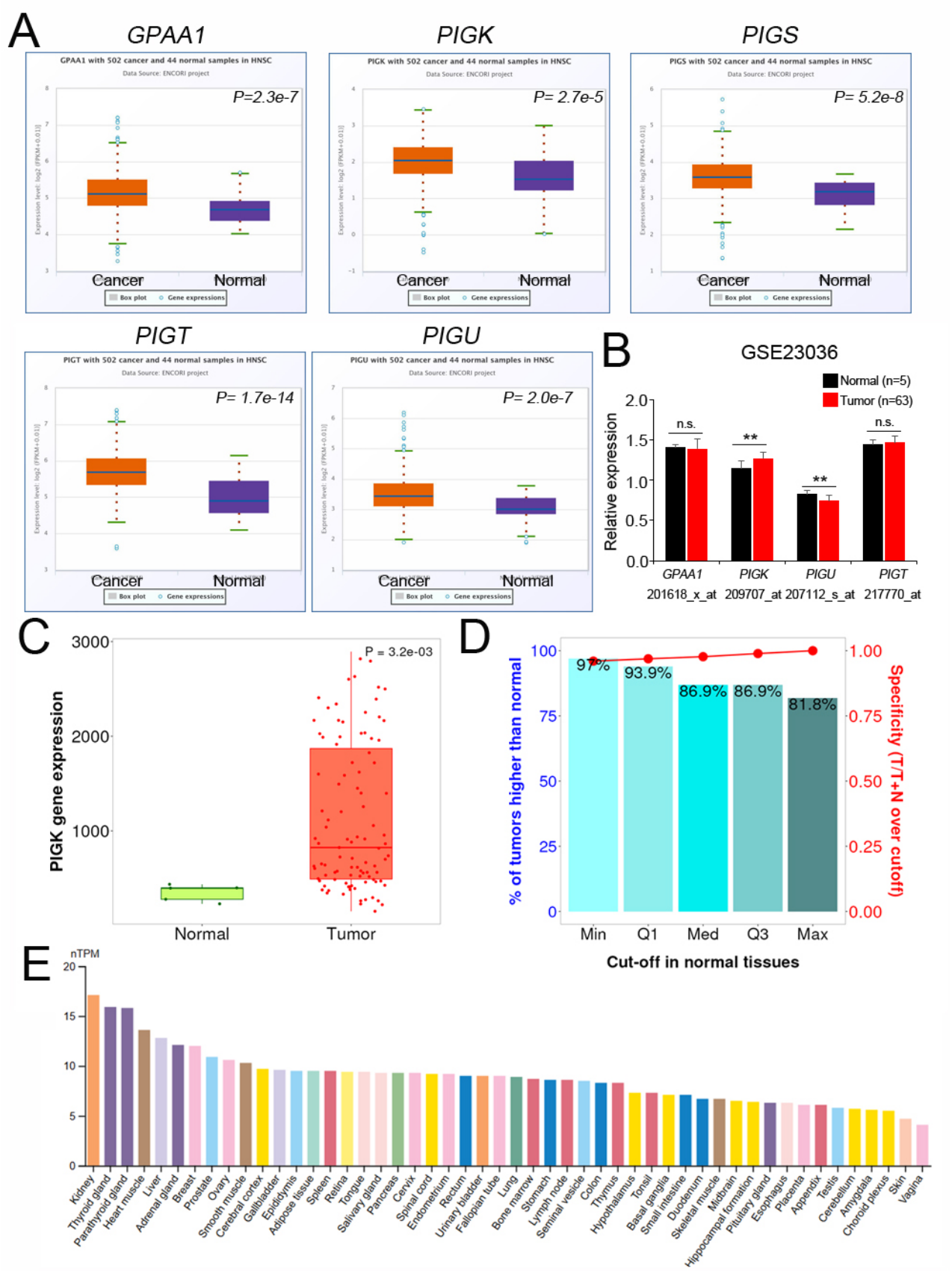
A
GPAA1
PIGK
PIGS
P=2.3e-7
P= 2.7e-5
P= 5.2e-8
Cancer
Normal
PIGT
PIGU
P= 1.7e-14
P= 2.0e-7
B
GSE23036
Normal (n=5)
Tumor (n=63)
Relative expression
n.s.
**
GPAA1
PIGK
PIGU
PIGT
201618_x_at
209707_at
207112_s_at
217770_at
C
PIGK gene expression
P = 3.2e-03
Normal
Tumor
D
% of tumors higher than normal
Specificity (T/T+N over cutoff)
97%
93.9%
86.9%
86.9%
81.8%
Min
Q1
Med
Q3
Max
Cut-off in normal tissues
E
nTPM
Kidney
Thyroid gland
Parathyroid gland
Heart muscle
Liver
Adrenal gland
Breast
Prostate
Ovary
Smooth muscle
Cerebral cortex
Gallbladder
Epididymis
Adipose tissue
Spleen
Retina
Tongue
Salivary gland
Pancreas
Cervix
Spinal cord
Endometrium
Rectum
Urinary bladder
Fallopian tube
Lung
Bone marrow
Stomach
Lymph node
Seminal vesicle
Colon
Thymus
Hypothalamus
Tonsil
Basal ganglia
Small intestine
Duodenum
Skeletal muscle
Midbrain
Hippocampal formation
Pituitary gland
Esophagus
Placenta
Appendix
Testis
Cerebellum
Amygdala
Choroid plexus
Skin
Vagina

Figure S1. Supplementary transcriptomic and protein-level expression of PIGK in HNC.
(A) mRNA levels of *GPAA1*, *PIGK*, *PIGS*, *PIGT*, and *PIGU* in patients ($n = 502$) and healthy samples ($n = 44$), based on data from TCGA database (ENCORI). (B) Comparison of *GPAA1*, *PIGK*, *PIGU*, and *PIGT* mRNA levels in normal ($n = 5$) and tumor tissues ($n = 63$) from GSE23036. $^{**}P < 0.01$. (C) The differential expression of *PIGK* in tumor and normal tissues based on a gene chip from the TNMplot database. (D) The bar plot shows the ratio of tumor-to-normal expression of *PIGK* across multiple cut-off thresholds. (E) *PIGK* mRNA expression in human tissues based on the Human Protein Atlas (HPA) database.

Figure S2.

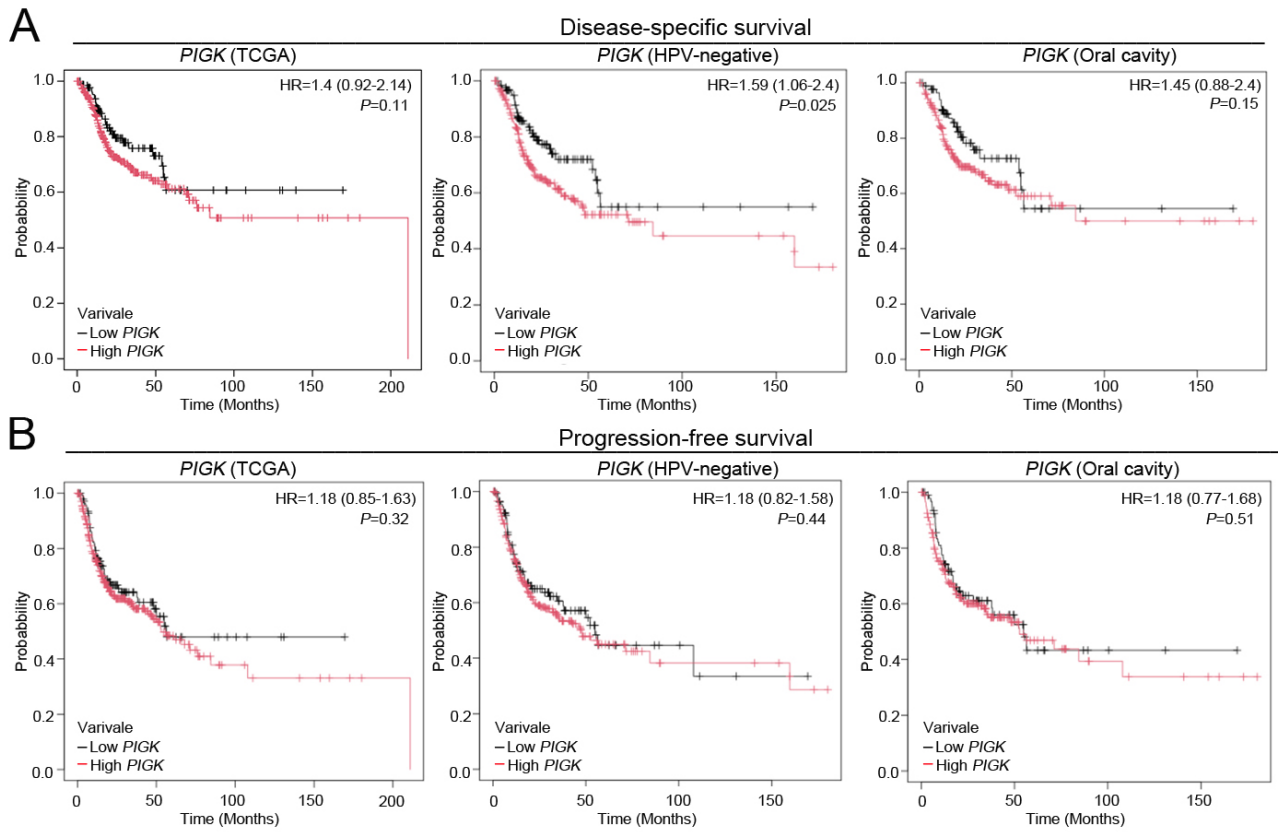

Figure S2. Kaplan–Meier survival analyses of *PIGK* in the TCGA/HNC cohort.

(A) Disease-specific survival (DSS) analysis stratified by *PIGK* expression. (B) Progression-free survival (PFS) analysis stratified by *PIGK* expression.

Figure S3.

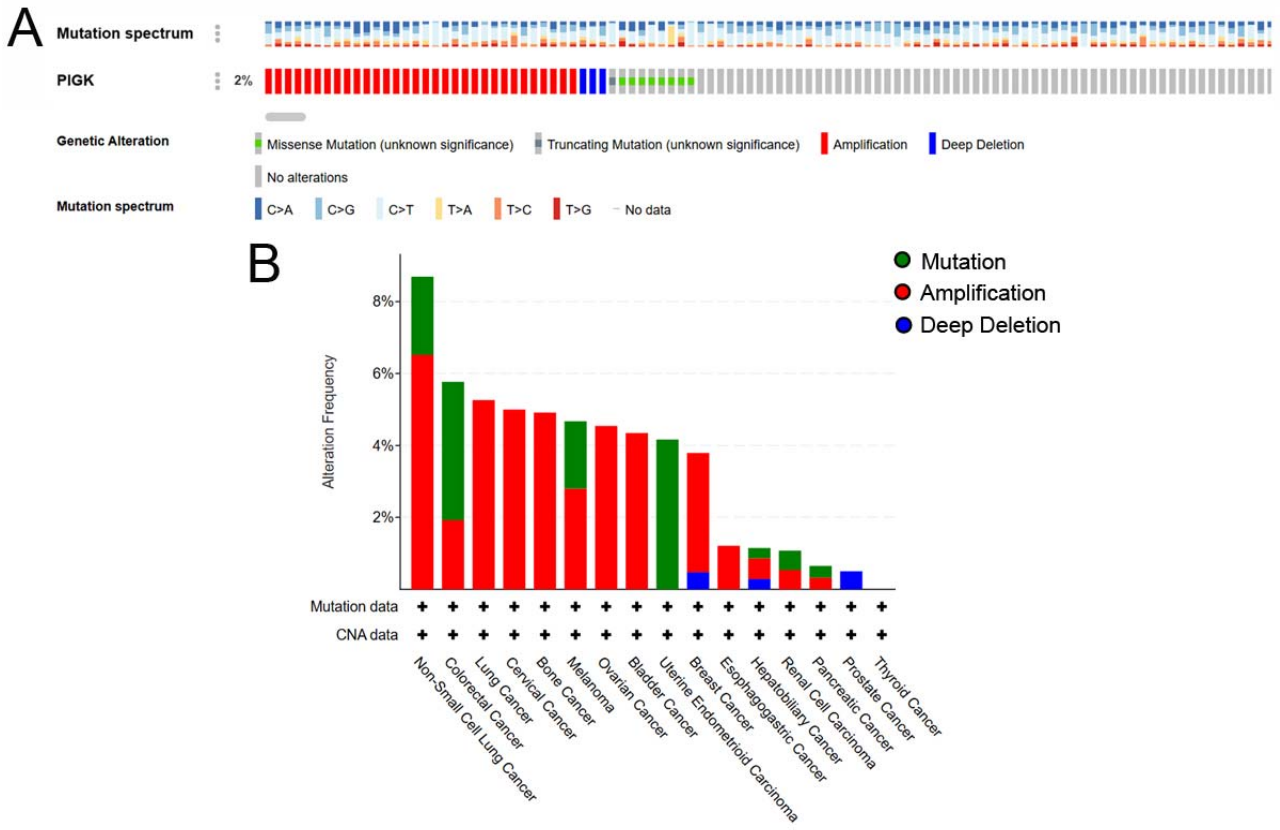

Figure S3. Genomic alterations of *PIGK* in PanCancer

(A) Overview of *PIGK* genetic alterations in pan-cancer shown by Oncoprint. (B) Frequency of *PIGK* copy number alterations across various cancer types.

Figure S4

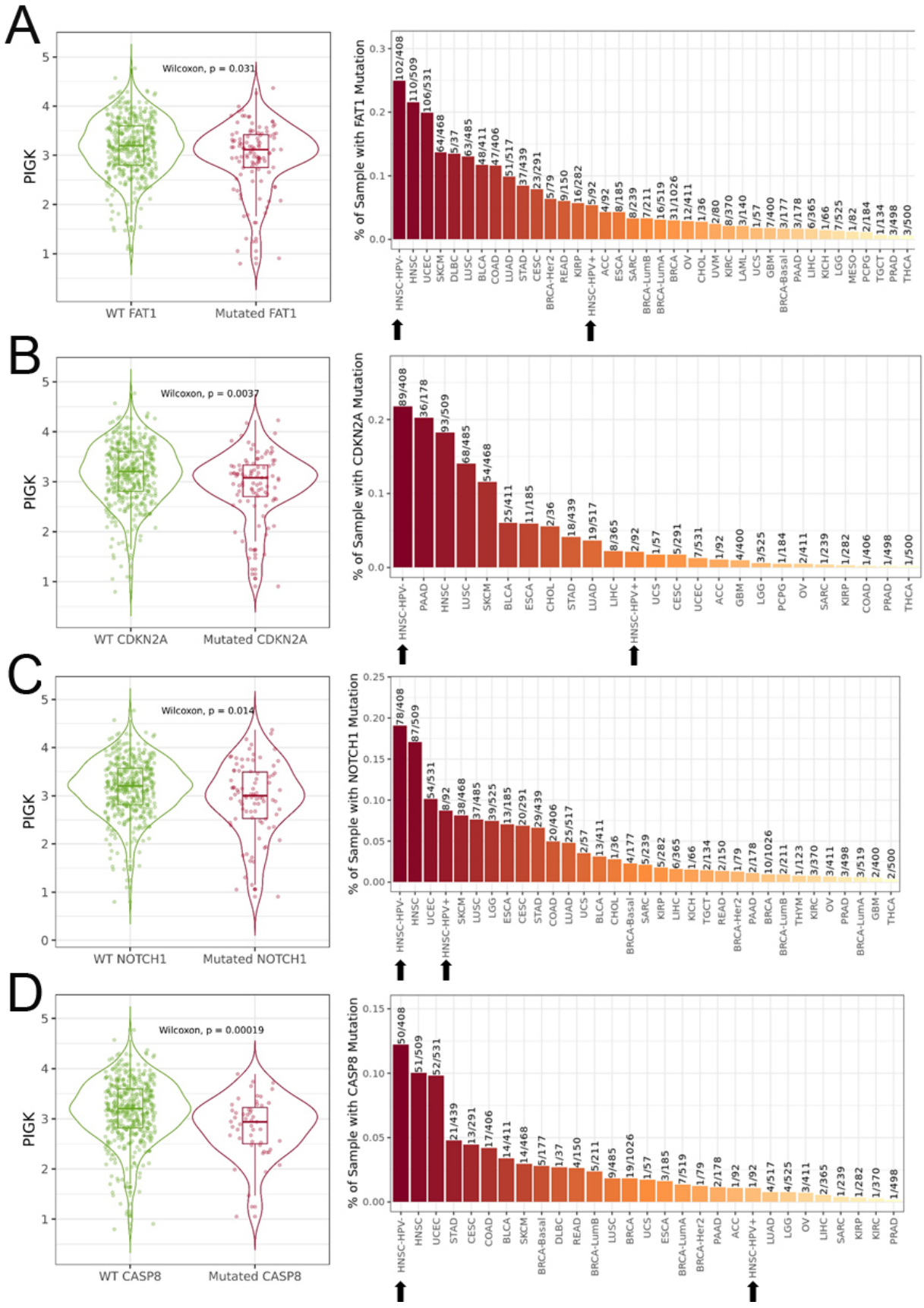

Figure S4. Comparison of *PIGK* level based on mutation status of top frequently altered genes

in the TCGA/HNC cohort.

Comparison of *PIGK* levels between wild-type and mutant tumors for *FAT1* (A), *CDKN2A* (B), *NOTCH1* (C), and *CASP8* (D). Statistical analysis was performed using the Wilcoxon rank-sum test.

Figure S5

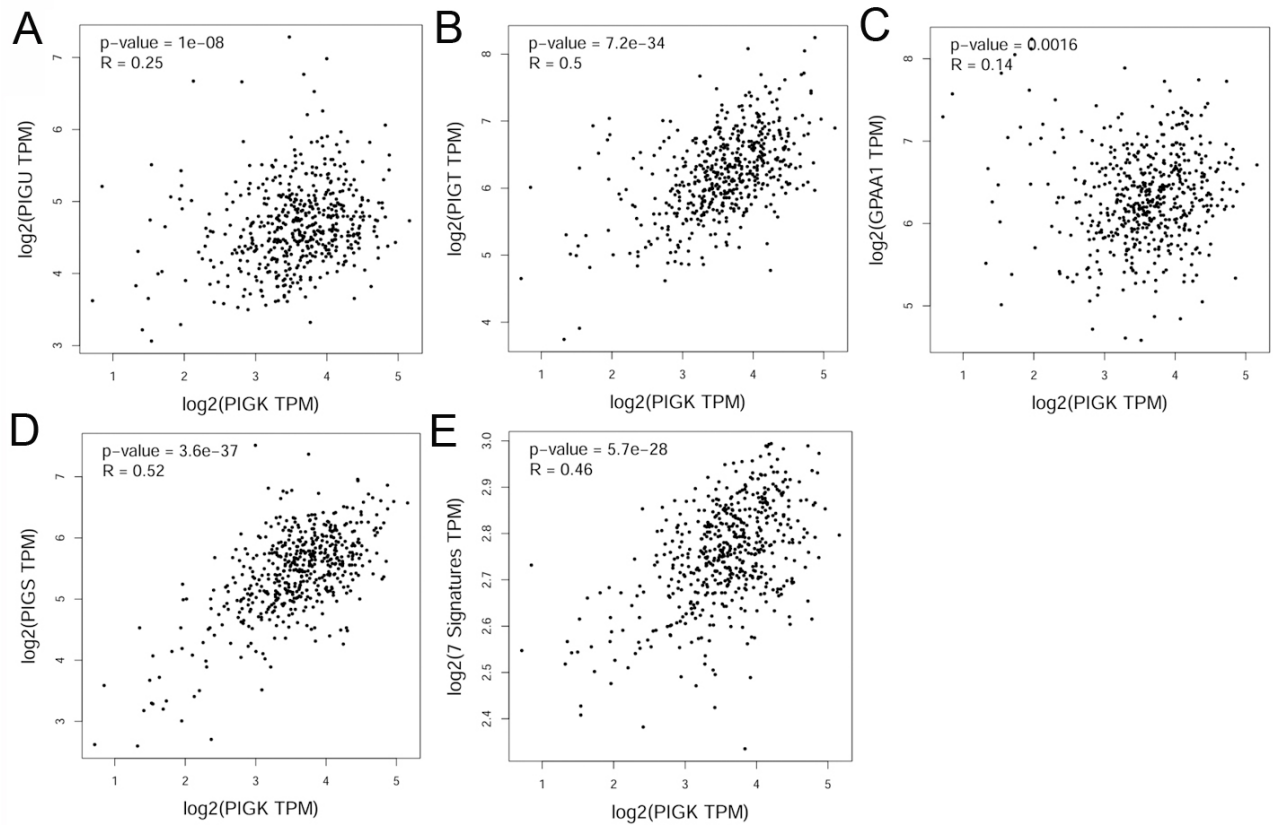

Figure S5. Correlation of *PIGK* with GPI-T subunits and lipid raft gene signature.

(A–D) Correlation of *PIGK* expression with other GPI-T subunits, including *PIGU* (A), *PIGT* (B), *GPAA1* (C), and *PIGS* (D). (E) Correlation between *PIGK* expression and a lipid raft–related gene signature (*STOM*, *PHB1*, *FLOT1*, *FLOT2*, *CAV1*, *CAV2*, *CAV3*).

Figure S6

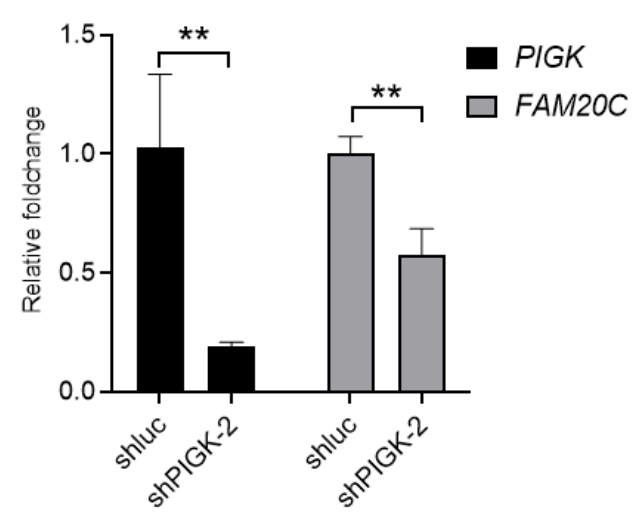

Figure S6. Knockdown of *PIGK* reduces *FAM20C* expression in TW1.5 cells. RT-qPCR analysis of *PIGK* and *FAM20C* expression in *PIGK* knockdown cells. Data were presented as the mean ± SD; $^{**}P < 0.01$

Supplementary Table 1. Co-expressed transcripts with *PIGK* in TCGA/HNC cohort

Query	Statistic	*P*-value	FDR (BH)
ABCC9	0.338015	4.53701E-15	8.20446E-14
ABCD3	0.4285631	3.73219E-24	3.78151E-22
ABI3BP	0.3519888	2.72082E-16	6.17088E-15
ABL1	0.3123103	5.60187E-13	6.80425E-12
ACAA1	-0.392882	3.10761E-20	1.4778E-18
ACADM	0.4703445	2.22303E-29	6.59162E-27
ACSL4	0.3497919	4.27469E-16	9.30784E-15
ACTL6A	0.3245793	5.95384E-14	8.71171E-13
ACTR2	0.3298858	2.18673E-14	3.49374E-13
ADAM10	0.3819668	3.98085E-19	1.49471E-17
ADAM17	0.3132723	4.71642E-13	5.80214E-12
ADAM19	0.3486241	5.42724E-16	1.16279E-14
ADAM9	0.3019282	3.44891E-12	3.63325E-11
ADAMTS6	0.3521072	2.65513E-16	6.04237E-15
ADAT1	0.3348185	8.46763E-15	1.44444E-13
ADAT3	-0.381539	4.39091E-19	1.64256E-17
ADCK2	-0.333654	1.06091E-14	1.78259E-13
ADNP	0.3970864	1.1341E-20	5.89354E-19
AFAP1	0.3807809	5.22189E-19	1.92133E-17
AGAP3	-0.439599	1.82528E-25	2.42125E-23
AGGF1	0.37418	2.31761E-18	7.67324E-17
AGL	0.3715862	4.12416E-18	1.28724E-16
AGPAT2	-0.369634	6.34193E-18	1.92289E-16
AHCYL1	0.3460929	9.0742E-16	1.86317E-14
AKAP10	0.4088854	6.19757E-22	4.04776E-20
AKAP11	0.3492654	4.76107E-16	1.02781E-14
AKAP2	0.4065845	1.10249E-21	6.9251E-20
AKAP8L	-0.38045	5.63156E-19	2.06078E-17
AKR1B10	-0.319334	1.57212E-13	2.12173E-12
AKR1C1	-0.306175	1.65421E-12	1.85402E-11
AKR1C2	-0.310275	8.04462E-13	9.57519E-12
AKT3	0.3123517	5.56061E-13	6.7582E-12
ALDH1B1	0.3203727	1.29904E-13	1.78302E-12
ALDH3A1	-0.301144	3.94516E-12	4.12103E-11
ALDOA	-0.337674	4.85119E-15	8.73344E-14
ALG10B	0.4040361	2.07581E-21	1.23465E-19
ALG10	0.325263	5.23876E-14	7.73427E-13
ALMS1	0.3617834	3.47601E-17	9.36283E-16
ALS2CR8	0.3101549	8.21833E-13	9.73597E-12
AMN	-0.31648	2.64518E-13	3.42989E-12
ANAPC11	-0.322338	9.0354E-14	1.27936E-12
ANGEL2	0.3213841	1.07806E-13	1.50013E-12
ANKIB1	0.3780586	9.69465E-19	3.39954E-17
ANKRD13C	0.4422773	8.62977E-26	1.24878E-23
ANKRD13D	-0.317164	2.33633E-13	3.06689E-12
ANKRD19	-0.325803	4.73404E-14	7.03408E-13
ANKRD26	0.3429027	1.72301E-15	3.34691E-14
ANKRD28	0.3163138	2.72621E-13	3.52589E-12

ANKRD32	0.3871015	1.21373E-19	5.02513E-18
ANKRD36BP1	0.3048232	2.09271E-12	2.30324E-11
ANKRD39	-0.323969	6.67194E-14	9.69909E-13
ANKRD40	0.324726	5.79279E-14	8.48837E-13
ANKRD44	0.312599	5.3203E-13	6.49354E-12
ANKRD9	-0.345881	9.47091E-16	1.9387E-14
ANLN	0.3827611	3.31722E-19	1.26676E-17
ANO6	0.3743271	2.24274E-18	7.4621E-17
ANO9	-0.329613	2.30327E-14	3.66395E-13
ANTXR2	0.3598205	5.28021E-17	1.36319E-15
ANXA5	0.3681077	8.86074E-18	2.60816E-16
ANXA9	-0.329626	2.29764E-14	3.66196E-13
AP1S2	0.3265099	4.14495E-14	6.22298E-13
AP2S1	-0.315787	2.99896E-13	3.83681E-12
AP3B1	0.3481744	5.94825E-16	1.26513E-14
APAF1	0.4695538	2.83574E-29	8.28652E-27
APOA1BP	-0.333528	1.08721E-14	1.8192E-13
APPBP2	0.3274816	3.45092E-14	5.27528E-13
APP	0.3531893	2.12242E-16	4.9189E-15
APRT	-0.459177	6.53075E-28	1.44703E-25
ARF5	-0.384769	2.0875E-19	8.33469E-18
ARFGAP3	0.3457312	9.7621E-16	1.98821E-14
ARFGEF2	0.3108033	7.3258E-13	8.75869E-12
ARFIP1	0.3295095	2.34921E-14	3.7209E-13
ARHGAP11A	0.3603812	4.68726E-17	1.2338E-15
ARHGAP11B	0.375705	1.64751E-18	5.58299E-17
ARHGAP18	0.347395	6.96989E-16	1.46848E-14
ARHGAP29	0.4302382	2.3775E-24	2.53638E-22
ARHGAP31	0.3262448	4.35699E-14	6.50741E-13
ARHGAP6	0.3182894	1.90315E-13	2.53289E-12
ARHGDIA	-0.31453	3.76268E-13	4.72397E-12
ARHGEF5	-0.32772	3.29871E-14	5.05794E-13
ARHGEF6	0.3479079	6.27984E-16	1.33005E-14
ARID1B	0.300584	4.34111E-12	4.48871E-11
ARL13B	0.4113465	3.33037E-22	2.33973E-20
ARL15	0.3802126	5.94472E-19	2.16751E-17
ARL1	0.3045981	2.17603E-12	2.38712E-11
ARL6IP1	0.3849262	2.01269E-19	8.06797E-18
ARL6IP5	0.3810652	4.89347E-19	1.81373E-17
ARL6IP6	0.4259674	7.46925E-24	7.2405E-22
ARL6	0.3349273	8.29068E-15	1.41545E-13
ARMC1	0.416739	8.38717E-23	6.73747E-21
ARMC5	-0.365725	1.48817E-17	4.20094E-16
ARNT	0.3098948	8.60552E-13	1.01481E-11
ARPC5L	-0.3212	1.1153E-13	1.54768E-12
ARRDC1	-0.404874	1.68698E-21	1.01536E-19
ARSB	0.401006	4.37383E-21	2.45653E-19
ARSK	0.5303049	2.94527E-38	3.49326E-35
ASAH2B	0.3173674	2.25144E-13	2.96705E-12
ASB3	0.3825331	3.49562E-19	1.32485E-17
ASPG	-0.356167	1.14104E-16	2.77859E-15
ASPM	0.3124814	5.43329E-13	6.61543E-12

ASXL2	0.3152488	3.30538E-13	4.19159E-12
ATAD2	0.389682	6.6286E-20	2.92456E-18
ATAD5	0.3517992	2.82939E-16	6.39564E-15
ATF1	0.4672326	5.77378E-29	1.59475E-26
ATF2	0.3834571	2.82611E-19	1.09372E-17
ATF7	0.3537592	1.88569E-16	4.38536E-15
ATG4C	0.6308793	7.48384E-58	5.02989E-54
ATG4D	-0.360337	4.73101E-17	1.24207E-15
ATG9B	-0.338807	3.8831E-15	7.13719E-14
ATM	0.3560724	1.16383E-16	2.82726E-15
ATP13A3	0.3372915	5.22853E-15	9.3212E-14
ATP2C1	0.3474982	6.82538E-16	1.43954E-14
ATP5D	-0.462789	2.21821E-28	5.27024E-26
ATP5G1	-0.325762	4.77076E-14	7.08342E-13
ATP5H	-0.319487	1.52849E-13	2.06839E-12
ATP6AP2	0.3402376	2.92738E-15	5.44007E-14
ATP6V0A1	-0.326138	4.44561E-14	6.63485E-13
ATP6V0C	-0.416195	9.64933E-23	7.65982E-21
ATP6V1C1	0.3117815	6.156E-13	7.444E-12
ATP6V1F	-0.354105	1.75492E-16	4.12887E-15
ATP8B2	0.3118648	6.06531E-13	7.34062E-12
ATRX	0.3137869	4.30057E-13	5.34601E-12
ATR	0.3209526	1.16744E-13	1.61669E-12
AURKAIP1	-0.360132	4.94203E-17	1.28576E-15
AXL	0.3291962	2.49349E-14	3.92477E-13
AZIN1	0.3306292	1.89745E-14	3.05822E-13
B3GNT1	0.3036497	2.56419E-12	2.7589E-11
B3GNT8	-0.32159	1.03773E-13	1.44901E-12
B3GNT9	0.3264202	4.21552E-14	6.31013E-13
B4GALT6	0.3004635	4.43137E-12	4.57266E-11
BACH2	0.3161138	2.82683E-13	3.642E-12
BAG1	-0.346887	7.72632E-16	1.59944E-14
BAIAP2	-0.414935	1.33414E-22	1.02283E-20
BARD1	0.4051806	1.56336E-21	9.49459E-20
BBS10	0.4833218	3.72999E-31	1.60016E-28
BBS12	0.5018324	8.02402E-34	5.77815E-31
BBS1	0.3694169	6.65184E-18	2.0048E-16
BBS4	0.3637506	2.27953E-17	6.26187E-16
BBS9	0.4919799	2.20984E-32	1.14249E-29
BBX	0.4633347	1.88245E-28	4.62875E-26
BCAP31	-0.314082	4.07829E-13	5.08224E-12
BCKDHB	0.3419057	2.10213E-15	4.02138E-14
BCOR	0.3041226	2.36287E-12	2.5711E-11
BCR	-0.314329	3.90151E-13	4.877E-12
BDH1	-0.32276	8.35557E-14	1.19062E-12
BDP1	0.3799421	6.32253E-19	2.27645E-17
BFAR	0.3038314	2.4849E-12	2.68505E-11
BICC1	0.3094337	9.33622E-13	1.09318E-11
BMI1	0.3548625	1.49871E-16	3.556E-15
BMPR2	0.3215706	1.04154E-13	1.45333E-12
BNIPL	-0.326487	4.16255E-14	6.23547E-13
BOD1L	0.3673284	1.05035E-17	3.04286E-16

BOK	-0.337712	4.81491E-15	8.68363E-14
BOLA2	-0.348619	5.43247E-16	1.16279E-14
BRCA2	0.3821207	3.84275E-19	1.44555E-17
BRI3	-0.304873	2.07452E-12	2.28572E-11
BRIP1	0.4348427	6.79391E-25	8.15391E-23
BRWD1	0.3013366	3.81696E-12	3.99799E-11
BVES	0.386644	1.35037E-19	5.53406E-18
C10orf116	-0.307865	1.23069E-12	1.41554E-11
C10orf25	0.3786418	8.49543E-19	2.99464E-17
C10orf88	0.3187204	1.759E-13	2.34878E-12
C10orf95	-0.391556	4.25796E-20	1.96911E-18
C11orf2	-0.308578	1.0856E-12	1.25871E-11
C11orf30	0.3430405	1.67619E-15	3.26542E-14
C11orf35	-0.338818	3.87457E-15	7.12801E-14
C11orf83	-0.391609	4.20509E-20	1.94913E-18
C12orf23	0.4357086	5.35659E-25	6.58566E-23
C12orf44	-0.361095	4.0266E-17	1.06827E-15
C14orf106	0.4097367	5.00242E-22	3.31789E-20
C14orf135	0.4800437	1.06496E-30	4.12938E-28
C14orf145	0.4735478	8.23725E-30	2.67884E-27
C14orf2	-0.322063	9.50836E-14	1.33881E-12
C14orf45	0.4288641	3.44233E-24	3.52324E-22
C15orf62	-0.311632	6.32267E-13	7.62008E-12
C15orf63	-0.300686	4.26619E-12	4.42031E-11
C16orf13	-0.334534	8.94891E-15	1.51755E-13
C16orf42	-0.38256	3.47413E-19	1.31919E-17
C16orf74	-0.304071	2.38388E-12	2.58838E-11
C17orf104	0.3702679	5.51679E-18	1.68794E-16
C17orf106	-0.393406	2.74278E-20	1.32303E-18
C17orf57	0.3613434	3.81846E-17	1.01959E-15
C17orf71	0.3077521	1.25528E-12	1.44032E-11
C17orf89	-0.304376	2.26134E-12	2.47532E-11
C17orf90	-0.320912	1.1761E-13	1.62757E-12
C18orf54	0.4204969	3.16099E-23	2.67795E-21
C19orf24	-0.361272	3.87693E-17	1.03127E-15
C19orf28	-0.307143	1.39667E-12	1.59372E-11
C19orf40	0.313065	4.89483E-13	6.00696E-12
C19orf43	-0.309965	8.49895E-13	1.00448E-11
C19orf53	-0.327017	3.76703E-14	5.71947E-13
C19orf55	0.3060294	1.69666E-12	1.89911E-11
C19orf60	-0.350991	3.34194E-16	7.43747E-15
C19orf73	-0.331363	1.64886E-14	2.68113E-13
C1orf109	0.4398224	1.71532E-25	2.30573E-23
C1orf170	-0.409784	4.94325E-22	3.28947E-20
C1orf174	0.3020979	3.34983E-12	3.54183E-11
C1orf177	-0.312692	5.23259E-13	6.39422E-12
C1orf25	0.3281373	3.0484E-14	4.70635E-13
C1orf26	0.3113594	6.63639E-13	7.97434E-12
C1orf35	-0.320423	1.2871E-13	1.76904E-12
C1orf58	0.3204292	1.2856E-13	1.76819E-12
C1orf83	0.45865	7.63672E-28	1.63808E-25
C1orf9	0.3034774	2.6416E-12	2.82895E-11

C20orf12	0.3087776	1.04817E-12	1.22022E-11
C20orf135	-0.317998	2.00708E-13	2.66417E-12
C20orf177	0.3039394	2.43894E-12	2.64389E-11
C21orf70	-0.405093	1.59767E-21	9.64488E-20
C3orf17	0.3055939	1.83039E-12	2.03676E-11
C3orf18	0.3170497	2.38534E-13	3.12309E-12
C3orf63	0.430569	2.17427E-24	2.35698E-22
C3orf64	0.3570092	9.56165E-17	2.36845E-15
C4orf29	0.334185	9.57406E-15	1.62084E-13
C4orf42	0.3159573	2.90808E-13	3.73713E-12
C4orf46	0.4668392	6.50975E-29	1.75008E-26
C4orf48	-0.363956	2.18076E-17	6.03163E-16
C5orf15	0.4657546	9.05433E-29	2.37094E-26
C5orf22	0.3898625	6.35273E-20	2.82137E-18
C5orf24	0.4283627	3.93834E-24	3.95068E-22
C5orf36	0.4372135	3.53804E-25	4.57292E-23
C5orf41	0.3413034	2.36967E-15	4.49902E-14
C5orf43	0.3311045	1.73254E-14	2.8104E-13
C5orf44	0.3239022	6.75605E-14	9.80016E-13
C5orf51	0.3734566	2.72314E-18	8.87021E-17
C5orf53	0.3090403	1.00075E-12	1.16906E-11
C6orf108	-0.32732	3.55814E-14	5.42273E-13
C6orf122	0.3296223	2.29928E-14	3.66196E-13
C6orf132	-0.348565	5.49337E-16	1.17458E-14
C6orf150	0.3148918	3.52531E-13	4.44811E-12
C6orf167	0.4330469	1.10989E-24	1.26434E-22
C6orf170	0.3191227	1.63414E-13	2.1925E-12
C6orf182	0.4110044	3.63179E-22	2.53384E-20
C6orf204	0.31451	3.77631E-13	4.73813E-12
C6orf211	0.456239	1.55689E-27	3.20321E-25
C6orf72	0.4328673	1.16554E-24	1.32026E-22
C7orf27	-0.356385	1.09004E-16	2.66084E-15
C7orf40	-0.303454	2.65223E-12	2.83848E-11
C7orf59	-0.307808	1.24301E-12	1.4289E-11
C8orf37	0.4245462	1.0893E-23	9.8952E-22
C8orf83	0.3835114	2.79095E-19	1.08219E-17
C9orf102	0.3230039	7.98574E-14	1.1444E-12
C9orf110	0.3385284	4.10156E-15	7.51133E-14
C9orf129	0.3305835	1.91412E-14	3.08016E-13
C9orf142	-0.355322	1.36168E-16	3.26853E-15
C9orf169	-0.393266	2.8358E-20	1.36463E-18
C9orf16	-0.41019	4.46158E-22	3.01875E-20
C9orf23	-0.326747	3.96375E-14	5.98211E-13
C9orf64	0.4127457	2.33421E-22	1.69298E-20
C9orf80	0.3428006	1.7585E-15	3.40929E-14
C9orf86	-0.365982	1.40749E-17	3.99146E-16
CACNA2D1	0.3087621	1.05103E-12	1.22285E-11
CALU	0.3994312	6.42351E-21	3.48164E-19
CANX	0.4340893	8.35024E-25	9.73214E-23
CAPN12	-0.306742	1.49814E-12	1.6969E-11
CAPZA1	0.3340468	9.83369E-15	1.65922E-13
CARD8	0.3639409	2.18805E-17	6.0435E-16

CASC2	0.3159199	2.92781E-13	3.7577E-12
CASC4	0.4411687	1.17767E-25	1.64898E-23
CASC5	0.374128	2.34469E-18	7.71379E-17
CASD1	0.4114663	3.23081E-22	2.27772E-20
CASP8AP2	0.4775426	2.35318E-30	8.9523E-28
CBLB	0.3011383	3.94874E-12	4.12103E-11
CBLC	-0.399682	6.0428E-21	3.293E-19
CBX5	0.3011812	3.91986E-12	4.09726E-11
CCDC110	0.3045147	2.20773E-12	2.41927E-11
CCDC111	0.3718426	3.89668E-18	1.22956E-16
CCDC124	-0.405541	1.42937E-21	8.75971E-20
CCDC12	-0.364847	1.79952E-17	5.0324E-16
CCDC132	0.3608945	4.20202E-17	1.11188E-15
CCDC137	-0.340027	3.05223E-15	5.66687E-14
CCDC14	0.3081507	1.17041E-12	1.34852E-11
CCDC15	0.3640329	2.14511E-17	5.94937E-16
CCDC163P	0.4670357	6.13136E-29	1.67063E-26
CCDC18	0.393214	2.87129E-20	1.37515E-18
CCDC21	0.3889174	7.93423E-20	3.41776E-18
CCDC42B	-0.337294	5.22604E-15	9.3212E-14
CCDC46	0.3148113	3.57683E-13	4.50466E-12
CCDC50	0.3878113	1.02824E-19	4.31924E-18
CCDC51	-0.307075	1.41335E-12	1.61094E-11
CCDC64B	-0.39346	2.70776E-20	1.30927E-18
CCDC75	0.3887883	8.17843E-20	3.49368E-18
CCDC76	0.4000351	5.54461E-21	3.0629E-19
CCDC82	0.3152659	3.29518E-13	4.1813E-12
CCDC85B	-0.337814	4.71992E-15	8.51994E-14
CCDC88A	0.4983214	2.648E-33	1.72231E-30
CCDC99	0.4252461	9.04782E-24	8.56485E-22
CCNE2	0.3966714	1.25355E-20	6.48086E-19
CCNI	0.3870635	1.22453E-19	5.04912E-18
CCNT1	0.3229132	8.12142E-14	1.16136E-12
CCPG1	0.4297354	2.72282E-24	2.82991E-22
CCR8	0.3065248	1.55616E-12	1.7529E-11
CCT7	-0.326978	3.79509E-14	5.75775E-13
CD164	0.4245859	1.07793E-23	9.87921E-22
CD2BP2	-0.351539	2.98524E-16	6.72529E-15
CD302	0.3009444	4.08187E-12	4.2446E-11
CD46	0.3345944	8.84379E-15	1.50431E-13
CDC23	0.4018663	3.54243E-21	2.03493E-19
CDC27	0.3988907	7.32585E-21	3.91807E-19
CDC34	-0.390364	5.64404E-20	2.53454E-18
CDC40	0.305176	1.96835E-12	2.18065E-11
CDC5L	0.3695956	6.39586E-18	1.93429E-16
CDC73	0.361338	3.82288E-17	1.01959E-15
CDC7	0.3759793	1.5491E-18	5.2672E-17
CDCA8	0.3872474	1.17308E-19	4.86685E-18
CDH2	0.3223843	8.95902E-14	1.27122E-12
CDK14	0.3807691	5.23598E-19	1.92301E-17
CDK17	0.4027885	2.82395E-21	1.65042E-19
CDK2	0.4333442	1.02347E-24	1.17251E-22

CDK8	0.3362011	6.47042E-15	1.13348E-13
CDR2	0.3437919	1.44207E-15	2.84227E-14
CEBPA	-0.351712	2.88047E-16	6.5038E-15
CENPE	0.3070117	1.42917E-12	1.62437E-11
CENPI	0.3945335	2.09513E-20	1.03034E-18
CENPK	0.374082	2.36884E-18	7.76633E-17
CENPL	0.4055293	1.43367E-21	8.75971E-20
CENPQ	0.4251216	9.35198E-24	8.68959E-22
CEP110	0.3223691	8.98432E-14	1.27392E-12
CEP120	0.3736177	2.62718E-18	8.5715E-17
CEP135	0.4737658	7.69622E-30	2.54391E-27
CEP152	0.3492097	4.8156E-16	1.03847E-14
CEP170	0.4500109	9.55159E-27	1.68937E-24
CEP192	0.3082205	1.15614E-12	1.33416E-11
CEP290	0.3323294	1.36964E-14	2.26175E-13
CEP97	0.3760519	1.52404E-18	5.19646E-17
CFD	-0.329022	2.57735E-14	4.04413E-13
CFL2	0.3120583	5.85955E-13	7.10013E-12
CGGBP1	0.3727487	3.18741E-18	1.025E-16
CHCHD5	-0.377282	1.15544E-18	3.99608E-17
CHIC1	0.3431696	1.63346E-15	3.19143E-14
CHMP2A	-0.363469	2.42197E-17	6.62609E-16
CHMP6	-0.350214	3.92028E-16	8.62932E-15
CHM	0.4328011	1.18674E-24	1.33678E-22
CHST15	0.3309966	1.76872E-14	2.86447E-13
CHSY1	0.3360553	6.65704E-15	1.15712E-13
CHSY3	0.3639038	2.20555E-17	6.07601E-16
CISD3	-0.391518	4.29628E-20	1.98228E-18
CIT	0.3130474	4.91026E-13	6.02223E-12
CKAP2L	0.4151944	1.24815E-22	9.60548E-21
CLASP2	0.3030518	2.84285E-12	3.03443E-11
CLCC1	0.4423276	8.50847E-26	1.24878E-23
CLDN4	-0.338584	4.05714E-15	7.4435E-14
CLGN	0.308237	1.1528E-12	1.33127E-11
CLIC3	-0.399483	6.3423E-21	3.4469E-19
CLIC4	0.4299091	2.59826E-24	2.72858E-22
CLK3	-0.356829	9.92998E-17	2.45667E-15
CLPP	-0.309527	9.18302E-13	1.07712E-11
CLSPN	0.4539959	3.00521E-27	5.94059E-25
CLTA	-0.347384	6.985E-16	1.47013E-14
CLTB	-0.33721	5.31239E-15	9.45399E-14
CMTM1	0.5733213	8.18299E-46	2.35705E-42
CMTM6	0.3614387	3.74157E-17	1.00188E-15
CNFN	-0.368577	7.99696E-18	2.38172E-16
CNN3	0.4530486	3.96148E-27	7.53541E-25
CNOT8	0.3011101	3.96787E-12	4.13672E-11
CNPY4	0.3117087	6.23638E-13	7.52508E-12
CNTLN	0.305193	1.96253E-12	2.1754E-11
COASY	-0.330098	2.1002E-14	3.36884E-13
COG6	0.4115142	3.1918E-22	2.26607E-20
COMMD10	0.3457822	9.66203E-16	1.97182E-14
COMMD2	0.3796863	6.70148E-19	2.40004E-17

COMTD1	-0.39259	3.33091E-20	1.56918E-18
COPA	0.3797402	6.6199E-19	2.37504E-17
COPB1	0.3194134	1.54938E-13	2.09384E-12
COPE	-0.336342	6.29534E-15	1.10665E-13
COX4I1	-0.395086	1.83526E-20	9.13914E-19
COX5A	-0.309618	9.03697E-13	1.06123E-11
COX5B	-0.382887	3.22225E-19	1.23283E-17
COX6A1	-0.304457	2.22994E-12	2.44228E-11
COX6B1	-0.345801	9.6246E-16	1.96816E-14
COX6C	-0.330811	1.83257E-14	2.96074E-13
COX7B	-0.301734	3.56551E-12	3.75021E-11
COX8A	-0.335018	8.14665E-15	1.3944E-13
CP110	0.4399604	1.65057E-25	2.26398E-23
CPD	0.3935088	2.67642E-20	1.29723E-18
CPEB1	0.3423844	1.91084E-15	3.66935E-14
CPE	0.3204557	1.27936E-13	1.7608E-12
CRB3	-0.408522	6.78959E-22	4.37375E-20
CREB1	0.3445847	1.22987E-15	2.4601E-14
CRY1	0.3371737	5.35055E-15	9.5135E-14
CRYBB3	-0.306771	1.49052E-12	1.69124E-11
CRYBG3	0.3050071	2.02697E-12	2.23821E-11
CSF1	0.3394001	3.45432E-15	6.37231E-14
CSGALNACT2	0.4036257	2.29731E-21	1.36237E-19
CSNK1G3	0.3926014	3.32214E-20	1.56872E-18
CSTA	-0.331785	1.52078E-14	2.495E-13
CSTB	-0.341147	2.44422E-15	4.63184E-14
CSTF2T	0.4302738	2.35472E-24	2.52544E-22
CTBS	0.5327744	1.15956E-38	1.55868E-35
CTDSPL2	0.448323	1.55171E-26	2.52315E-24
CTU1	-0.331549	1.59101E-14	2.59754E-13
CTXN1	-0.301504	3.70894E-12	3.89294E-11
CXorf23	0.3335624	1.07992E-14	1.80851E-13
CYB5R4	0.3123934	5.51943E-13	6.71221E-12
CYB5RL	0.3160588	2.85512E-13	3.67376E-12
CYHR1	-0.35519	1.3998E-16	3.34685E-15
CYP2U1	0.3826489	3.40382E-19	1.29493E-17
CYP4F22	-0.316355	2.70607E-13	3.50434E-12
CYSLTR1	0.3175934	2.16068E-13	2.85865E-12
DAAM2	0.3122936	5.61861E-13	6.82047E-12
DAB2	0.3266641	4.02631E-14	6.06292E-13
DAP	0.3168661	2.46625E-13	3.21857E-12
DAZAP1	-0.347546	6.75937E-16	1.42861E-14
DBR1	0.329254	2.46624E-14	3.88794E-13
DBT	0.4719429	1.35632E-29	4.14357E-27
DCBLD2	0.3752104	1.84071E-18	6.1857E-17
DCK	0.4304084	2.2707E-24	2.44835E-22
DCLRE1A	0.382388	3.61407E-19	1.36718E-17
DCLRE1B	0.4473644	2.04156E-26	3.24126E-24
DCP2	0.3005783	4.34539E-12	4.49083E-11
DCUN1D4	0.377503	1.09918E-18	3.80804E-17
DCXR	-0.34753	6.78165E-16	1.43182E-14
DDI2	0.3042468	2.31258E-12	2.52593E-11

DDOST	0.3409577	2.53806E-15	4.77824E-14
DDRGK1	-0.325124	5.37717E-14	7.90809E-13
DDT	-0.320299	1.31677E-13	1.80613E-12
DDX20	0.4345277	7.40628E-25	8.78428E-23
DDX54	-0.350765	3.50103E-16	7.74877E-15
DEFB1	-0.301468	3.73203E-12	3.9131E-11
DEK	0.3406417	2.7022E-15	5.05128E-14
DEM1	0.4099385	4.75419E-22	3.19469E-20
DENND5B	0.3566847	1.02359E-16	2.51079E-15
DEPDC1	0.4399022	1.67758E-25	2.27176E-23
DET1	0.3272601	3.59835E-14	5.47987E-13
DHFRL1	0.3394372	3.42913E-15	6.33164E-14
DHRS4L1	-0.323803	6.88212E-14	9.97121E-13
DHRS4L2	-0.410217	4.43154E-22	3.00852E-20
DHRS4	-0.399767	5.91922E-21	3.25202E-19
DHX33	0.3361359	6.55331E-15	1.14402E-13
DHX40	0.3889678	7.84084E-20	3.3926E-18
DHX57	0.3000226	4.77731E-12	4.90703E-11
DISP1	0.3695936	6.39869E-18	1.93429E-16
DKFZp761E198	-0.323316	7.53542E-14	1.08604E-12
DLEU2L	0.3065858	1.53966E-12	1.73671E-11
DMGDH	0.3020815	3.35928E-12	3.54996E-11
DMKN	-0.334048	9.83119E-15	1.65922E-13
DMXL1	0.3192596	1.59368E-13	2.14939E-12
DNA2	0.3243807	6.17892E-14	9.02794E-13
DNAJC10	0.4144579	1.50755E-22	1.15139E-20
DNAJC13	0.3904163	5.57506E-20	2.51476E-18
DNAJC14	0.3882505	9.27766E-20	3.9135E-18
DNAJC16	0.3510245	3.31905E-16	7.3947E-15
DNAJC18	0.3535421	1.97262E-16	4.57697E-15
DNAJC24	0.3298408	2.20554E-14	3.52101E-13
DNAJC30	-0.32611	4.46869E-14	6.66437E-13
DNAJC7	-0.316265	2.75031E-13	3.5525E-12
DNAL1	0.4649561	1.15353E-28	2.89264E-26
DNLZ	-0.312959	4.98895E-13	6.11503E-12
DNMT1	0.3117766	6.16131E-13	7.444E-12
DOCK10	0.3213006	1.09482E-13	1.5224E-12
DOCK1	0.3919207	3.90512E-20	1.82266E-18
DOCK7	0.4032265	2.53508E-21	1.49458E-19
DOHH	-0.302042	3.38228E-12	3.57052E-11
DOPEY1	0.3346671	8.72006E-15	1.48499E-13
DPH3B	0.3237623	6.93453E-14	1.00302E-12
DPM3	-0.323794	6.89387E-14	9.97855E-13
DPP8	0.3240019	6.6316E-14	9.6474E-13
DPY19L1	0.407313	9.1914E-22	5.84625E-20
DPY19L3	0.4448139	4.2184E-26	6.4928E-24
DPY19L4	0.5030293	5.32406E-34	4.0485E-31
DPYD	0.4057481	1.35781E-21	8.37231E-20
DR1	0.5167063	4.36224E-36	4.18837E-33
DSG2	0.3571391	9.30394E-17	2.31314E-15
DUS1L	-0.441385	1.10854E-25	1.57406E-23
DUS2L	-0.304221	2.32294E-12	2.53313E-11

DVL1	-0.307615	1.28577E-12	1.47301E-11
DYNC2H1	0.3099569	8.51153E-13	1.00538E-11
DYNLL1	-0.302101	3.34804E-12	3.54179E-11
DYRK1A	0.3864798	1.40303E-19	5.72659E-18
DZIP3	0.3560654	1.16554E-16	2.82802E-15
E2F7	0.3989942	7.14394E-21	3.83094E-19
E2F8	0.3079238	1.21801E-12	1.40176E-11
E4F1	-0.331977	1.46553E-14	2.41418E-13
EBPL	-0.400605	4.82411E-21	2.7019E-19
ECM2	0.3040883	2.37691E-12	2.5822E-11
ECT2	0.3709983	4.69631E-18	1.44949E-16
EDEM3	0.391281	4.54442E-20	2.08722E-18
EDF1	-0.365368	1.60777E-17	4.5087E-16
EEF1D	-0.32888	2.64777E-14	4.14174E-13
EEF1G	-0.361318	3.83927E-17	1.02261E-15
EFCAB7	0.506204	1.77953E-34	1.49503E-31
EFNA3	-0.336874	5.67389E-15	1.00618E-13
EFR3A	0.3684604	8.20304E-18	2.42519E-16
EGLN2	-0.303855	2.47469E-12	2.67689E-11
EHHADH	0.3232306	7.65608E-14	1.10107E-12
EID1	0.3358289	6.95726E-15	1.20722E-13
EIF2AK3	0.3376327	4.89038E-15	8.79614E-14
EIF2B4	-0.408984	6.04565E-22	3.97063E-20
EIF3B	-0.36924	6.91462E-18	2.07469E-16
EIF3CL	-0.36184	3.4344E-17	9.28256E-16
EIF3F	-0.301112	3.96656E-12	4.13672E-11
EIF3G	-0.328523	2.83334E-14	4.41489E-13
EIF6	-0.333227	1.15217E-14	1.92311E-13
ELF2	0.3884434	8.86755E-20	3.76413E-18
ELK3	0.3352604	7.77112E-15	1.33694E-13
ELMO2	0.3086317	1.07545E-12	1.24766E-11
ELMO3	-0.30018	4.6508E-12	4.78928E-11
ELOVL5	0.3972009	1.10316E-20	5.76244E-19
ENDOG	-0.44226	8.67079E-26	1.24878E-23
ENPP4	0.3174081	2.23484E-13	2.94903E-12
ENSA	-0.302754	2.99231E-12	3.18385E-11
EPB41L2	0.3497037	4.35267E-16	9.46741E-15
EPC1	0.3613713	3.79583E-17	1.01506E-15
EPC2	0.3731327	2.92666E-18	9.50244E-17
EPHA3	0.3527085	2.3447E-16	5.39066E-15
EPN1	-0.356712	1.01769E-16	2.50554E-15
EPR1	0.3048389	2.08699E-12	2.2982E-11
EPS15	0.3559387	1.1969E-16	2.89712E-15
EPS8L1	-0.384467	2.23819E-19	8.84876E-18
EPS8L2	-0.302169	3.30933E-12	3.50636E-11
ERAP1	0.3691643	7.03085E-18	2.10331E-16
ERBB2IP	0.428474	3.82247E-24	3.85362E-22
ERCC1	-0.300349	4.51876E-12	4.65807E-11
ERCC4	0.4077437	8.25255E-22	5.28242E-20
ERCC8	0.4164849	8.95539E-23	7.13706E-21
ERLEC1	0.3692595	6.88555E-18	2.06905E-16
ESRRA	-0.331878	1.49381E-14	2.45675E-13

ETS1	0.3767074	1.31515E-18	4.53287E-17
EVI5	0.3963946	1.34003E-20	6.84026E-19
EVPLL	-0.303384	2.68434E-12	2.86979E-11
EVPL	-0.399133	6.90621E-21	3.72005E-19
EXD3	-0.401539	3.83833E-21	2.18354E-19
EXOC5	0.3399009	3.129E-15	5.79872E-14
EXOSC4	-0.423206	1.55244E-23	1.36689E-21
EXOSC7	-0.316233	2.76661E-13	3.56898E-12
EXTL2	0.4767266	3.04358E-30	1.11578E-27
F12	-0.414159	1.62731E-22	1.2289E-20
F2R	0.3550351	1.44572E-16	3.44515E-15
F8	0.3699139	5.96365E-18	1.81092E-16
FAF2	0.336321	6.32085E-15	1.11017E-13
FAM100A	-0.326937	3.82422E-14	5.78888E-13
FAM100B	-0.384808	2.0687E-19	8.27603E-18
FAM102B	0.397114	1.12657E-20	5.86954E-19
FAM105A	0.3254765	5.03323E-14	7.45118E-13
FAM107B	0.3294517	2.3752E-14	3.75911E-13
FAM108A1	-0.371608	4.10464E-18	1.28313E-16
FAM110A	-0.335588	7.29186E-15	1.26202E-13
FAM111B	0.3434324	1.54976E-15	3.0456E-14
FAM114A1	0.3197025	1.46933E-13	1.99582E-12
FAM114A2	0.3708492	4.85339E-18	1.49175E-16
FAM125A	-0.323802	6.88386E-14	9.97121E-13
FAM128A	-0.342448	1.8869E-15	3.63377E-14
FAM128B	-0.389655	6.67151E-20	2.93707E-18
FAM129B	-0.338221	4.35717E-15	7.93618E-14
FAM136A	-0.317042	2.38875E-13	3.12552E-12
FAM13B	0.3590847	6.1716E-17	1.57716E-15
FAM13C	0.326739	3.9699E-14	5.98692E-13
FAM158A	-0.306027	1.69727E-12	1.89911E-11
FAM161A	0.4190847	4.56785E-23	3.75925E-21
FAM161B	0.4883922	7.19785E-32	3.37512E-29
FAM164A	0.3309615	1.78063E-14	2.87914E-13
FAM178A	0.4085255	6.78395E-22	4.37375E-20
FAM179B	0.3525504	2.42267E-16	5.55095E-15
FAM195A	-0.332128	1.42383E-14	2.3474E-13
FAM198B	0.3210278	1.15135E-13	1.59661E-12
FAM21A	0.3326122	1.29709E-14	2.15625E-13
FAM25A	-0.40321	2.54518E-21	1.49617E-19
FAM25B	-0.368056	8.96084E-18	2.63378E-16
FAM38B	0.3806815	5.34164E-19	1.95825E-17
FAM3A	-0.306731	1.50117E-12	1.69854E-11
FAM70A	0.3086676	1.06869E-12	1.24124E-11
FAM73A	0.5336781	8.22818E-39	1.18503E-35
FAM76A	0.3567904	1.00114E-16	2.47075E-15
FAM83F	-0.363534	2.38826E-17	6.54272E-16
FAM83H	-0.358783	6.57838E-17	1.66843E-15
FAM91A1	0.320128	1.35885E-13	1.86004E-12
FAM96B	-0.316968	2.42121E-13	3.16469E-12
FAM98B	0.3336798	1.0557E-14	1.77532E-13
FANCB	0.3268898	3.85872E-14	5.83672E-13

FANCM	0.4236106	1.3951E-23	1.23918E-21
FAR2	0.4070065	9.92306E-22	6.27206E-20
FASTKD3	0.3398361	3.16933E-15	5.86807E-14
FASTK	-0.402525	3.01296E-21	1.75073E-19
FAS	0.3852425	1.87042E-19	7.52762E-18
FAT4	0.3538754	1.84069E-16	4.30055E-15
FAU	-0.312473	5.44119E-13	6.62105E-12
FBRS	-0.315855	2.96256E-13	3.79746E-12
FBXL15	-0.388987	7.80524E-20	3.38445E-18
FBXL19	-0.365407	1.59431E-17	4.48341E-16
FBXL8	-0.314967	3.4777E-13	4.39354E-12
FBXO21	0.3169662	2.42182E-13	3.16469E-12
FBXO5	0.451121	6.93176E-27	1.28225E-24
FBXW4	-0.337357	5.16159E-15	9.22863E-14
FCF1	0.3255734	4.94256E-14	7.32771E-13
FDXR	-0.449801	1.01486E-26	1.76279E-24
FGD6	0.3407392	2.65051E-15	4.96674E-14
FICD	0.3083839	1.1234E-12	1.29954E-11
FIGNL1	0.3472725	7.14546E-16	1.49765E-14
FIGN	0.3009522	4.0765E-12	4.2412E-11
FILIP1L	0.3133746	4.63074E-13	5.71417E-12
FKBP14	0.3571025	9.37584E-17	2.32814E-15
FKBP2	-0.322122	9.40545E-14	1.32524E-12
FKBP7	0.3097389	8.84613E-13	1.04063E-11
FKBP8	-0.331405	1.63567E-14	2.66397E-13
FKTN	0.4015327	3.84444E-21	2.18354E-19
FLJ23867	-0.314896	3.52276E-13	4.44768E-12
FMNL3	0.3910931	4.75099E-20	2.1722E-18
FNBP1L	0.331027	1.75843E-14	2.8501E-13
FNDC3A	0.4458021	3.18675E-26	4.98097E-24
FNDC3B	0.4864295	1.3652E-31	6.11699E-29
FNIP1	0.343837	1.42908E-15	2.82128E-14
FOXH1	-0.331674	1.55352E-14	2.53838E-13
FOXJ3	0.399412	6.4536E-21	3.48857E-19
FPGT	0.4073308	9.15069E-22	5.83878E-20
FRRS1	0.3617807	3.47803E-17	9.36283E-16
FRS2	0.3546177	1.57721E-16	3.72381E-15
FRYL	0.389735	6.54633E-20	2.8946E-18
FSD1L	0.3051608	1.97356E-12	2.18457E-11
FSIP1	0.3229676	8.0397E-14	1.15131E-12
FTO	0.4117486	3.00754E-22	2.15039E-20
FUBP1	0.4308596	2.00998E-24	2.19066E-22
FUT4	0.3208596	1.18762E-13	1.64239E-12
FUT8	0.4961289	5.54221E-33	3.28669E-30
FXYD3	-0.30596	1.71743E-12	1.92036E-11
G2E3	0.3197802	1.44853E-13	1.9721E-12
G3BP1	0.31594	2.91718E-13	3.74644E-12
G3BP2	0.3839313	2.53333E-19	9.87999E-18
G6PD	-0.358265	7.3394E-17	1.8498E-15
GABPA	0.3326858	1.27884E-14	2.13102E-13
GADD45GIP1	-0.385211	1.88425E-19	7.56815E-18
GALC	0.4106861	3.93636E-22	2.70884E-20

GALK1	-0.324033	6.59307E-14	9.59827E-13
GALNT10	0.3723849	3.45541E-18	1.1024E-16
GALNT4	0.304931	2.05393E-12	2.26569E-11
GANAB	0.4017652	3.63143E-21	2.08013E-19
GAS2L3	0.4533461	3.63261E-27	6.97565E-25
GAST	-0.310254	8.07566E-13	9.60079E-12
GCA	0.3070318	1.42414E-12	1.62025E-11
GCC2	0.3500707	4.03731E-16	8.86757E-15
GDPD3	-0.338249	4.33326E-15	7.89977E-14
GET4	-0.404122	2.03224E-21	1.21231E-19
GFOD2	-0.317325	2.26908E-13	2.98834E-12
GGA1	-0.347125	7.36189E-16	1.53401E-14
GIN1	0.3229273	8.10008E-14	1.15913E-12
GIPC1	-0.491711	2.41586E-32	1.21778E-29
GIT2	0.4243903	1.13523E-23	1.02186E-21
GLB1	0.3723265	3.50047E-18	1.11501E-16
GLI4	-0.317088	2.36886E-13	3.10353E-12
GLTPD1	-0.359099	6.15318E-17	1.57445E-15
GLTP	-0.352428	2.48489E-16	5.68059E-15
GLTSCR2	-0.313322	4.67494E-13	5.76166E-12
GMCL1	0.3242864	6.28879E-14	9.16854E-13
GMFB	0.3274142	3.49512E-14	5.33476E-13
GNB2	-0.37931	7.3008E-19	2.59622E-17
GNB4	0.4225562	1.8421E-23	1.60789E-21
GNG12	0.3803264	5.79241E-19	2.1158E-17
GNG2	0.3292354	2.47497E-14	3.89866E-13
GNPDA2	0.3618266	3.44406E-17	9.29619E-16
GNPTAB	0.4437142	5.75754E-26	8.72852E-24
GNS	0.3808562	5.13276E-19	1.89199E-17
GOLIM4	0.3718657	3.87681E-18	1.2252E-16
GOLPH3	0.3684655	8.194E-18	2.42519E-16
GOPC	0.3376944	4.83157E-15	8.70589E-14
GORAB	0.3813979	4.53494E-19	1.68705E-17
GPAM	0.4059976	1.27607E-21	7.96579E-20
GPBP1L1	0.3274641	3.46235E-14	5.28875E-13
GPM6B	0.3219313	9.74319E-14	1.369E-12
GPN3	0.3639032	2.20584E-17	6.07601E-16
GPR137C	0.3610851	4.03477E-17	1.06903E-15
GPR141	0.3035365	2.61483E-12	2.8044E-11
GPR180	0.4131269	2.11818E-22	1.56443E-20
GPR34	0.3300613	2.11476E-14	3.3895E-13
GPR75	0.3564797	1.06861E-16	2.61484E-15
GPRIN3	0.3014801	3.72429E-12	3.90702E-11
GPX8	0.3446211	1.22089E-15	2.44458E-14
GRINL1A	0.4172188	7.4098E-23	5.97615E-21
GSTCD	0.4581662	8.81413E-28	1.87073E-25
GSTP1	-0.358942	6.36061E-17	1.62135E-15
GTF2A1	0.3302253	2.04961E-14	3.29293E-13
GTF2H3	0.3711772	4.51435E-18	1.39606E-16
GUCY1A3	0.3214034	1.07423E-13	1.49583E-12
GUCY1B3	0.3808975	5.08462E-19	1.87768E-17
GUK1	-0.361938	3.3631E-17	9.10203E-16

H2AFJ	-0.415712	1.09273E-22	8.50681E-21
HACE1	0.4296953	2.75235E-24	2.83141E-22
HCFC2	0.4818281	6.02458E-31	2.47905E-28
HDGFRP3	0.3065843	1.54007E-12	1.73671E-11
HDHD3	-0.435672	5.41065E-25	6.61182E-23
HEATR6	0.3077958	1.24569E-12	1.43116E-11
HEATR7A	-0.304798	2.10191E-12	2.3121E-11
HECTD2	0.4576758	1.01906E-27	2.14035E-25
HEG1	0.3160121	2.87933E-13	3.70255E-12
HELB	0.3417781	2.1562E-15	4.1131E-14
HELZ	0.3827374	3.33532E-19	1.27127E-17
HERC1	0.3040577	2.38955E-12	2.59314E-11
HFE	0.3540348	1.78067E-16	4.17485E-15
HGS	-0.344867	1.16187E-15	2.34738E-14
HIAT1	0.4152497	1.23055E-22	9.50638E-21
HIP1R	-0.314659	3.67616E-13	4.61822E-12
HIP1	0.3125839	5.33473E-13	6.5072E-12
HIPK1	0.3470399	7.4909E-16	1.5555E-14
HIPK3	0.3127985	5.13392E-13	6.27745E-12
HIVEP1	0.3156142	3.09424E-13	3.95119E-12
HIVEP3	0.3492839	4.74307E-16	1.02502E-14
HLCS	0.3252426	5.25885E-14	7.7567E-13
HLTF	0.4341436	8.22713E-25	9.64439E-23
HMBS	-0.328502	2.84468E-14	4.41573E-13
HMG20A	0.3450282	1.12487E-15	2.27947E-14
HMGA1	-0.338319	4.27367E-15	7.81232E-14
HMGN4	0.331719	1.54004E-14	2.52044E-13
HMGXB4	0.3874399	1.12152E-19	4.68184E-18
HMMR	0.3468789	7.73944E-16	1.60052E-14
HMOX2	-0.336404	6.21945E-15	1.09427E-13
HN1	-0.31751	2.19371E-13	2.90044E-12
HNRNPR	0.3765084	1.37541E-18	4.71638E-17
HNRNPUL1	0.3057931	1.76797E-12	1.97057E-11
HNRPLL	0.3355774	7.30651E-15	1.26347E-13
HOOK2	-0.346121	9.02337E-16	1.85462E-14
HP1BP3	0.3754203	1.75613E-18	5.93112E-17
HPCAL4	0.3156472	3.07585E-13	3.93019E-12
HPS3	0.4003661	5.11435E-21	2.84079E-19
HRAS	-0.364138	2.09708E-17	5.82416E-16
HRH2	0.3522109	2.59886E-16	5.92099E-15
HS2ST1	0.5459428	7.04931E-41	1.09335E-37
HSD17B1	-0.344456	1.2622E-15	2.51729E-14
HSP90B3P	0.4245456	1.08949E-23	9.8952E-22
HSPA13	0.4884402	7.08567E-32	3.37512E-29
HSPB1	-0.436109	4.79818E-25	6.00905E-23
HSPBP1	-0.310817	7.30858E-13	8.74558E-12
ID1	-0.302545	3.10221E-12	3.29905E-11
IER2	-0.317823	2.0722E-13	2.74519E-12
IFNAR2	0.3829795	3.15469E-19	1.21158E-17
IFT172	0.3260514	4.51829E-14	6.73336E-13
IFT52	0.329139	2.52075E-14	3.96457E-13
IFT80	0.4177476	6.46252E-23	5.23308E-21

IFT81	0.3440986	1.35603E-15	2.6911E-14
IGFBP7	0.3084027	1.11969E-12	1.29599E-11
IKBIP	0.4396588	1.79534E-25	2.39731E-23
IKZF4	0.3653772	1.60463E-17	4.50614E-16
IKZF5	0.3509618	3.36214E-16	7.47419E-15
IL17RE	-0.334744	8.59056E-15	1.46417E-13
IL1F10	-0.346212	8.85866E-16	1.82262E-14
IL1F5	-0.307063	1.41635E-12	1.61331E-11
IL1R1	0.3020065	3.40281E-12	3.58844E-11
IL1RAP	0.329566	2.32409E-14	3.68692E-13
IL6ST	0.406055	1.25798E-21	7.87719E-20
IL7R	0.4422854	8.6101E-26	1.24878E-23
ILVBL	-0.358101	7.59841E-17	1.91125E-15
IMP3	-0.348123	6.01091E-16	1.27711E-14
IMP4	-0.314823	3.56927E-13	4.49795E-12
IMPA1	0.3837793	2.62374E-19	1.01932E-17
IMPACT	0.3072409	1.37296E-12	1.56844E-11
IMPAD1	0.3388383	3.85885E-15	7.10556E-14
IMPDH2	-0.302051	3.37697E-12	3.56678E-11
ING3	0.3063159	1.61395E-12	1.81192E-11
INO80B	-0.372182	3.61461E-18	1.14593E-16
INTS12	0.3106718	7.49871E-13	8.95714E-12
INTS4L2	0.3189627	1.68274E-13	2.25293E-12
IPO11	0.3042995	2.29161E-12	2.50573E-11
IPP	0.328502	2.84483E-14	4.41573E-13
IQGAP2	0.3087407	1.055E-12	1.22676E-11
IQGAP3	0.3108513	7.26358E-13	8.69689E-12
IRAK3	0.3967373	1.23378E-20	6.39503E-19
IRF2	0.3387623	3.91704E-15	7.19302E-14
ITFG1	0.3250437	5.45847E-14	8.01012E-13
ITGA1	0.3513984	3.07316E-16	6.90024E-15
ITGA2	0.3137234	4.34983E-13	5.39727E-12
ITGA4	0.3235332	7.23689E-14	1.04451E-12
ITGA8	0.3223024	9.09598E-14	1.28613E-12
ITGAV	0.3874603	1.11619E-19	4.66926E-18
ITGB1	0.3647067	1.85493E-17	5.17303E-16
ITGB3	0.3892571	7.32552E-20	3.21097E-18
ITPKC	-0.304585	2.1811E-12	2.39138E-11
ITPR1	0.3016577	3.61266E-12	3.79782E-11
ITSN1	0.3231824	7.7251E-14	1.10941E-12
JAK1	0.430033	2.51287E-24	2.65272E-22
JAZF1	0.31717	2.33375E-13	3.06549E-12
JMJD1C	0.3105643	7.64314E-13	9.11346E-12
JMJD7-PLA2G4B	-0.421013	2.76211E-23	2.34989E-21
JMJD8	-0.322285	9.12511E-14	1.28908E-12
JOSD2	-0.333685	1.05464E-14	1.77502E-13
JUP	-0.354511	1.61258E-16	3.80287E-15
KANK2	0.4217419	2.28159E-23	1.94931E-21
KATNAL1	0.376047	1.52572E-18	5.19646E-17
KBTBD2	0.3063318	1.60949E-12	1.80792E-11
KBTBD4	0.415786	1.07213E-22	8.37885E-21
KBTBD7	0.3277063	3.30744E-14	5.06747E-13

KCNK7	-0.372206	3.59555E-18	1.14169E-16
KCNT2	0.3499764	4.11614E-16	9.02105E-15
KCTD12	0.3405347	2.76015E-15	5.14828E-14
KCTD20	0.3884187	8.919E-20	3.77802E-18
KDELC1	0.3563994	1.08676E-16	2.65603E-15
KDELR3	0.3512252	3.18473E-16	7.13487E-15
KDM3B	0.3196061	1.49555E-13	2.0279E-12
KDR	0.3181364	1.95707E-13	2.60293E-12
KIAA0090	0.442936	7.17004E-26	1.07089E-23
KIAA0196	0.3284151	2.89209E-14	4.48218E-13
KIAA0240	0.3537927	1.87258E-16	4.35992E-15
KIAA0247	0.3189966	1.67232E-13	2.24046E-12
KIAA0406	0.3508451	3.44382E-16	7.63053E-15
KIAA0494	0.399126	6.9187E-21	3.72005E-19
KIAA0586	0.4436228	5.90789E-26	8.88961E-24
KIAA0664	-0.372785	3.16184E-18	1.01841E-16
KIAA0754	0.300903	4.11092E-12	4.2704E-11
KIAA0776	0.3846956	2.12304E-19	8.44317E-18
KIAA0947	0.3602907	4.77835E-17	1.24962E-15
KIAA1009	0.3897462	6.52917E-20	2.89336E-18
KIAA1033	0.314857	3.54747E-13	4.47328E-12
KIAA1107	0.3557427	1.24701E-16	3.0112E-15
KIAA1109	0.3527171	2.34055E-16	5.38727E-15
KIAA1143	0.3842868	2.33359E-19	9.18989E-18
KIAA1257	-0.304745	2.12145E-12	2.33233E-11
KIAA1279	0.338153	4.4157E-15	8.01745E-14
KIAA1377	0.3418787	2.11345E-15	4.0392E-14
KIAA1524	0.4161693	9.71422E-23	7.68109E-21
KIAA1543	-0.394001	2.37984E-20	1.15905E-18
KIAA1586	0.3345357	8.94506E-15	1.51755E-13
KIAA1712	0.336473	6.13605E-15	1.08243E-13
KIDINS220	0.3341379	9.66167E-15	1.63293E-13
KIF14	0.3071856	1.38633E-12	1.58282E-11
KIF15	0.3059028	1.73453E-12	1.93651E-11
KIF18A	0.3336165	1.06869E-14	1.79268E-13
KIF20A	0.3876266	1.07362E-19	4.50051E-18
KIF20B	0.3823026	3.6857E-19	1.39166E-17
KIF23	0.3097063	8.89717E-13	1.04603E-11
KIF2A	0.3709386	4.7586E-18	1.46485E-16
KIF3A	0.3192159	1.60648E-13	2.1652E-12
KIF4B	0.352239	2.58381E-16	5.89336E-15
KIFC2	-0.395383	1.70921E-20	8.59271E-19
KITLG	0.3143519	3.88531E-13	4.86279E-12
KLC3	-0.320671	1.22967E-13	1.69473E-12
KLF16	-0.391789	4.02862E-20	1.87596E-18
KLHDC1	0.3499473	4.14072E-16	9.06508E-15
KLHDC4	-0.341316	2.36381E-15	4.49213E-14
KLHL20	0.3885734	8.6013E-20	3.66656E-18
KLHL28	0.3204663	1.27686E-13	1.75855E-12
KLHL5	0.4107402	3.8828E-22	2.68113E-20
KLHL8	0.3721706	3.62358E-18	1.14697E-16
KLK10	-0.350852	3.43864E-16	7.62742E-15

KLK11	-0.336118	6.57579E-15	1.14596E-13
KLK12	-0.371253	4.43906E-18	1.377E-16
KLK8	-0.306217	1.64201E-12	1.84195E-11
KLRG2	-0.341001	2.51641E-15	4.75078E-14
KNTC1	0.3637729	2.26863E-17	6.24045E-16
KRBA2	0.3599726	5.11247E-17	1.32497E-15
KRIT1	0.3041995	2.33161E-12	2.53983E-11
KRT17	-0.362133	3.22526E-17	8.75676E-16
KRT78	-0.304228	2.32014E-12	2.53281E-11
KRTDAP	-0.319192	1.61351E-13	2.17177E-12
KTELC1	0.3256604	4.86258E-14	7.21443E-13
LAD1	-0.406853	1.03108E-21	6.4968E-20
LAMC1	0.3665985	1.23119E-17	3.53626E-16
LASS4	-0.359566	5.57275E-17	1.43138E-15
LATS1	0.3011397	3.94782E-12	4.12103E-11
LCA5	0.465223	1.06389E-28	2.71535E-26
LDLRAD3	0.3600788	4.99843E-17	1.29876E-15
LDOC1L	0.3007485	4.22086E-12	4.37784E-11
LEMD3	0.3076767	1.272E-12	1.45806E-11
LEPROT	0.4537813	3.19954E-27	6.26334E-25
LGALS7	-0.301305	3.83758E-12	4.01542E-11
LHFP	0.3341583	9.62366E-15	1.62787E-13
LIFR	0.3961636	1.41667E-20	7.15898E-19
LIMS1	0.3664771	1.26411E-17	3.62563E-16
LIN52	0.4961639	5.4774E-33	3.28669E-30
LIN54	0.3115865	6.37351E-13	7.67677E-12
LIN9	0.3410394	2.49722E-15	4.71897E-14
LIPA	0.386252	1.47944E-19	6.01412E-18
LIX1L	0.3630119	2.6718E-17	7.29966E-16
LLGL2	-0.386163	1.51054E-19	6.12816E-18
LMAN1	0.4819793	5.73984E-31	2.41109E-28
LMBRD1	0.3195428	1.51302E-13	2.04883E-12
LMBRD2	0.3301674	2.0724E-14	3.32689E-13
LMLN	0.3488367	5.19686E-16	1.1171E-14
LMNA	-0.371508	4.19618E-18	1.30769E-16
LMNB1	0.3094436	9.31996E-13	1.09191E-11
LMTK3	-0.34985	4.22372E-16	9.21676E-15
LNPEP	0.3493177	4.71039E-16	1.01905E-14
LOC100132707	0.3623549	3.07596E-17	8.36985E-16
LOC100170939	0.3143406	3.89317E-13	4.8696E-12
LOC100216545	-0.31064	7.54065E-13	9.00191E-12
LOC100271831	-0.474955	5.30768E-30	1.87752E-27
LOC144486	0.3117762	6.1618E-13	7.444E-12
LOC146880	-0.316667	2.55684E-13	3.32819E-12
LOC283404	-0.303904	2.45371E-12	2.65753E-11
LOC284441	0.3194388	1.54218E-13	2.08551E-12
LOC402377	0.3179157	2.03744E-13	2.70091E-12
LOC440957	-0.320067	1.37422E-13	1.87727E-12
LOC642852	0.3198242	1.43687E-13	1.95754E-12
LOC646214	0.3129436	5.00229E-13	6.12765E-12
LOC646999	0.3382926	4.29623E-15	7.84647E-14
LOC650623	0.3132924	4.69946E-13	5.78481E-12

LOC653653	0.4160461	1.00273E-22	7.89767E-21
LOC728024	0.3066495	1.52261E-12	1.71991E-11
LOC729020	0.3191732	1.6191E-13	2.17784E-12
LOX	0.3589725	6.31984E-17	1.613E-15
LPAR4	0.3112414	6.77717E-13	8.13866E-12
LPCAT2	0.3278048	3.2464E-14	4.98531E-13
LPPR4	0.3297761	2.23291E-14	3.56187E-13
LRCH2	0.3058987	1.73577E-12	1.93682E-11
LRCH3	0.3432964	1.59254E-15	3.12357E-14
LRIG2	0.3716154	4.09763E-18	1.28293E-16
LRRC16B	-0.320167	1.34917E-13	1.84805E-12
LRRC40	0.6311575	6.45218E-58	5.02989E-54
LRRC8C	0.3526926	2.35245E-16	5.40232E-15
LRRCC1	0.3636457	2.33158E-17	6.39613E-16
LSM7	-0.346077	9.10365E-16	1.86731E-14
LY6G6C	-0.347251	7.1764E-16	1.50257E-14
LYNX1	-0.367385	1.03753E-17	3.01437E-16
LYRM7	0.3418307	2.13374E-15	4.07411E-14
LYSMD3	0.4618511	2.94002E-28	6.81374E-26
LYSMD4	-0.387424	1.12557E-19	4.68902E-18
LZTFL1	0.3945417	2.09102E-20	1.03034E-18
MAGI3	0.3515512	2.9779E-16	6.71626E-15
MAGT1	0.3493606	4.66926E-16	1.01124E-14
MAML1	0.3001581	4.66829E-12	4.80483E-11
MAN1A1	0.3494417	4.59245E-16	9.96745E-15
MAN1A2	0.3737709	2.539E-18	8.29724E-17
MAN2A1	0.4160026	1.01402E-22	7.95555E-21
MAN2B2	0.3251853	5.31562E-14	7.83471E-13
MANEA	0.4963823	5.09E-33	3.20718E-30
MAP2K2	-0.419206	4.42597E-23	3.65741E-21
MAP2K3	-0.306436	1.58046E-12	1.77764E-11
MAP3K2	0.3741289	2.34422E-18	7.71379E-17
MAP3K3	0.3411356	2.44997E-15	4.63403E-14
MAP3K7	0.3364487	6.16521E-15	1.08662E-13
MAP4K3	0.3382141	4.36299E-15	7.93962E-14
MAPK8	0.4748994	5.40116E-30	1.87765E-27
MAPK9	0.3266088	4.06853E-14	6.12192E-13
MAPRE2	0.3568189	9.95156E-17	2.45899E-15
45352	0.3180734	1.97968E-13	2.62953E-12
45359	0.3693557	6.74173E-18	2.02886E-16
MAT2B	0.4248887	9.94783E-24	9.20083E-22
MATR3	0.4317712	1.57009E-24	1.72993E-22
MBD5	0.3282041	3.01006E-14	4.65072E-13
MBLAC2	0.3022203	3.28015E-12	3.4791E-11
MBNL1	0.4360489	4.87787E-25	6.07114E-23
MBTPS1	0.3588567	6.47664E-17	1.64884E-15
MBTPS2	0.3552463	1.38336E-16	3.31268E-15
MCAT	-0.344671	1.20867E-15	2.42974E-14
MCFD2	0.3091024	9.89845E-13	1.157E-11
MCM4	0.3289614	2.60725E-14	4.0847E-13
MCM8	0.3900503	6.07777E-20	2.71721E-18
MDC1	0.3007053	4.25217E-12	4.40805E-11

MDH2	-0.393246	2.84971E-20	1.36806E-18
MDM1	0.4084165	6.97206E-22	4.47699E-20
MDN1	0.3276426	3.34749E-14	5.12493E-13
ME2	0.313296	4.69642E-13	5.7846E-12
MECOM	0.3152127	3.327E-13	4.21636E-12
MED13L	0.3223116	9.0806E-14	1.28486E-12
MED14	0.3473648	7.01286E-16	1.47446E-14
MED23	0.4099261	4.76915E-22	3.19469E-20
METRNL	-0.40964	5.12579E-22	3.38857E-20
METTL14	0.4199931	3.60539E-23	3.01641E-21
MEX3C	0.3055295	1.85102E-12	2.05744E-11
MFAP3	0.4679704	4.60863E-29	1.30879E-26
MFSD2B	-0.388929	7.91221E-20	3.41614E-18
MFSD3	-0.369218	6.94859E-18	2.08179E-16
MFSD5	-0.360518	4.55268E-17	1.20151E-15
MFSD8	0.3089849	1.01056E-12	1.17917E-11
MGAT2	0.447156	2.16679E-26	3.41321E-24
MGA	0.3324104	1.34847E-14	2.23275E-13
MGC16025	-0.338571	4.06774E-15	7.45616E-14
MGC70857	-0.301317	3.82966E-12	4.00922E-11
MGC72080	-0.31609	2.83898E-13	3.65532E-12
MIA3	0.3799498	6.31149E-19	2.27645E-17
MIB1	0.3433527	1.57469E-15	3.09157E-14
MIER1	0.5825028	1.41836E-47	4.7664E-44
MIER2	-0.314106	4.06111E-13	5.06709E-12
MIER3	0.3667117	1.20126E-17	3.45522E-16
MIF	-0.352757	2.32121E-16	5.34886E-15
MINPP1	0.3903642	5.64395E-20	2.53454E-18
MIS12	0.3694547	6.59685E-18	1.9912E-16
MITF	0.3438416	1.42777E-15	2.82128E-14
MKL2	0.3181163	1.96424E-13	2.61074E-12
MLF2	-0.321458	1.06339E-13	1.48176E-12
MLL5	0.3189238	1.69474E-13	2.26749E-12
MLST8	-0.316184	2.79105E-13	3.5982E-12
MMAB	-0.310191	8.16559E-13	9.68487E-12
MMACHC	0.3217431	1.00884E-13	1.41259E-12
MMD	0.3375206	4.99903E-15	8.98355E-14
MMP16	0.307788	1.24738E-12	1.43229E-11
MOB2	-0.405955	1.28952E-21	8.02489E-20
MOBKL1A	0.3409529	2.54046E-15	4.7783E-14
MOBKL1B	0.3675143	1.00862E-17	2.93884E-16
MOCS2	0.3083639	1.12735E-12	1.30337E-11
MON2	0.305482	1.86638E-12	2.07338E-11
MORC3	0.35242	2.48891E-16	5.68334E-15
MORF4	0.3414088	2.32057E-15	4.41829E-14
MOSPD2	0.3911564	4.68034E-20	2.14477E-18
MPG	-0.310114	8.27747E-13	9.80027E-12
MPHOSPH9	0.4594635	5.99744E-28	1.34363E-25
MPST	-0.438969	2.17507E-25	2.82942E-23
MRAS	0.3006086	4.32295E-12	4.47223E-11
MRPL12	-0.425182	9.20286E-24	8.64735E-22
MRPL14	-0.310871	7.23844E-13	8.67193E-12

MRPL23	-0.364664	1.87203E-17	5.21351E-16
MRPL24	-0.303543	2.61192E-12	2.80277E-11
MRPL27	-0.320052	1.37796E-13	1.8811E-12
MRPL28	-0.31547	3.17593E-13	4.0427E-12
MRPL38	-0.326554	4.11101E-14	6.17662E-13
MRPL41	-0.360343	4.72515E-17	1.24207E-15
MRPL4	-0.374127	2.34516E-18	7.71379E-17
MRPL53	-0.348068	6.07803E-16	1.29001E-14
MRPL55	-0.310212	8.13617E-13	9.66134E-12
MRPS12	-0.345285	1.06814E-15	2.16668E-14
MRPS18A	-0.326593	4.08098E-14	6.13608E-13
MRPS25	-0.344323	1.29622E-15	2.57748E-14
MRPS2	-0.334587	8.85589E-15	1.50431E-13
MRPS34	-0.379149	7.57261E-19	2.68342E-17
MRPS5	-0.343193	1.62568E-15	3.18238E-14
MSH2	0.359943	5.14475E-17	1.33162E-15
MSRB3	0.3098505	8.67325E-13	1.02209E-11
MTBP	0.3891076	7.58751E-20	3.31141E-18
MTF2	0.4989974	2.1064E-33	1.41571E-30
MTG1	-0.304104	2.37035E-12	2.57647E-11
MTHFD1	0.3039034	2.45416E-12	2.65753E-11
MTMR6	0.3227858	8.3159E-14	1.18665E-12
MTOR	0.3551801	1.40261E-16	3.34685E-15
MTRR	0.4124259	2.53213E-22	1.82994E-20
MTR	0.3318357	1.50593E-14	2.47467E-13
MTX1	-0.319144	1.62779E-13	2.18807E-12
MTX3	0.3685201	8.09671E-18	2.40079E-16
MUDENG	0.3600717	5.00592E-17	1.29903E-15
MUTED	0.3544664	1.6277E-16	3.83402E-15
MUT	0.3208044	1.19977E-13	1.65805E-12
MVD	-0.439228	2.02394E-25	2.66724E-23
MVK	-0.318434	1.85361E-13	2.47185E-12
MXRA5	0.3046835	2.14403E-12	2.35458E-11
MYBL1	0.4548653	2.33038E-27	4.69875E-25
MYEOV2	-0.321804	9.97563E-14	1.39777E-12
MYO1H	-0.310566	7.64109E-13	9.11346E-12
MYSM1	0.3324008	1.35097E-14	2.23275E-13
MYST2	0.3082072	1.15885E-12	1.33596E-11
N4BP2	0.3443331	1.29366E-15	2.57494E-14
NAA10	-0.327138	3.68224E-14	5.59496E-13
NACA2	-0.349502	4.53615E-16	9.85586E-15
NACA	-0.31649	2.64066E-13	3.42623E-12
NAGA	0.3801612	6.01465E-19	2.18905E-17
NAIP	0.3059256	1.72764E-12	1.92988E-11
NARFL	-0.328456	2.86966E-14	4.45084E-13
NARG2	0.3057179	1.79129E-12	1.99546E-11
NBN	0.4202627	3.36036E-23	2.83494E-21
NBPF10	0.3010687	3.99608E-12	4.16398E-11
NBPF15	0.3168305	2.48227E-13	3.23738E-12
NBPF16	0.3095495	9.14719E-13	1.07354E-11
NBPF1	0.340761	2.63905E-15	4.94988E-14
NBPF9	0.4108251	3.80035E-22	2.63321E-20

NBR1	0.3199974	1.39187E-13	1.89752E-12
NCEH1	0.3251676	5.33328E-14	7.85092E-13
NCOA2	0.3142457	3.96025E-13	4.94431E-12
NCSTN	0.3873288	1.15101E-19	4.7851E-18
NDNL2	0.3342998	9.36358E-15	1.58654E-13
NDOR1	-0.448798	1.3541E-26	2.23793E-24
NDUFA11	-0.306677	1.51537E-12	1.7127E-11
NDUFA13	-0.383364	2.88709E-19	1.11305E-17
NDUFAB1	-0.306627	1.5286E-12	1.72571E-11
NDUFB10	-0.355279	1.37405E-16	3.29429E-15
NDUFB2	-0.391427	4.38975E-20	2.02079E-18
NDUFB7	-0.362716	2.84671E-17	7.75651E-16
NDUFS7	-0.351092	3.27301E-16	7.31638E-15
NECAB1	0.3333147	1.13282E-14	1.89238E-13
NEDD1	0.4942835	1.02769E-32	5.75591E-30
NEDD4	0.3289739	2.6011E-14	4.07822E-13
NEK11	0.304896	2.06642E-12	2.27804E-11
NEK1	0.3548653	1.49785E-16	3.556E-15
NEK4	0.3924305	3.45984E-20	1.62612E-18
NEK9	0.3299096	2.17683E-14	3.48345E-13
NENF	-0.308124	1.17599E-12	1.35417E-11
NEU3	0.3159113	2.93234E-13	3.76112E-12
NF1	0.3296112	2.30417E-14	3.66395E-13
NFATC2	0.3067394	1.49887E-12	1.6969E-11
NFIC	0.3089853	1.01049E-12	1.17917E-11
NFKBIB	-0.303089	2.82474E-12	3.0167E-11
NFKBIL1	-0.316253	2.75628E-13	3.55793E-12
NHLRC2	0.3064377	1.58E-12	1.77764E-11
NHLRC3	0.3714605	4.24041E-18	1.3174E-16
NHSL2	0.3029497	2.89329E-12	3.08174E-11
NIPBL	0.3041098	2.3681E-12	2.5754E-11
NLRX1	-0.409491	5.32223E-22	3.50693E-20
NME2P1	-0.354706	1.54847E-16	3.66452E-15
NME2	-0.378144	9.50969E-19	3.34631E-17
NME3	-0.309462	9.28908E-13	1.08893E-11
NMRAL1	-0.372834	3.12767E-18	1.00901E-16
NNT	0.3285039	2.84377E-14	4.41573E-13
NOC4L	-0.308271	1.14591E-12	1.32407E-11
NOL12	-0.36047	4.59959E-17	1.21231E-15
NOL3	-0.359292	5.90685E-17	1.51334E-15
NOXA1	-0.325465	5.04454E-14	7.46244E-13
NPAT	0.338439	4.17434E-15	7.63768E-14
NPEPL1	-0.30378	2.50713E-12	2.70472E-11
NPTN	0.3801224	6.0681E-19	2.20452E-17
NR2C2	0.3977152	9.74183E-21	5.12858E-19
NR2F2	0.3124906	5.42439E-13	6.60857E-12
NR2F6	-0.414245	1.59207E-22	1.2068E-20
NR3C1	0.3219421	9.72377E-14	1.36723E-12
NRAS	0.411594	3.1278E-22	2.22848E-20
NRP1	0.3158352	2.97303E-13	3.80604E-12
NSDHL	-0.395373	1.71317E-20	8.59271E-19
NSL1	0.4310214	1.92384E-24	2.10817E-22

NT5C	-0.425392	8.70425E-24	8.35732E-22
NTHL1	-0.351867	2.7903E-16	6.31435E-15
NTN4	0.3908642	5.01528E-20	2.27755E-18
NUAK1	0.3020135	3.39877E-12	3.58605E-11
NUDT21	0.3088653	1.0321E-12	1.2029E-11
NUDT22	-0.384553	2.19451E-19	8.71021E-18
NUDT4	0.3962806	1.37732E-20	6.99997E-19
NUDT8	-0.304221	2.32291E-12	2.53313E-11
NUP107	0.3232826	7.5824E-14	1.09203E-12
NUP155	0.3706168	5.10856E-18	1.56541E-16
NUP160	0.401081	4.29426E-21	2.41858E-19
NUP54	0.3586269	6.79918E-17	1.72036E-15
ORC3L	0.3766499	1.33229E-18	4.58414E-17
OSBPL11	0.3212376	1.10762E-13	1.53914E-12
OSBPL8	0.4665659	7.07493E-29	1.877E-26
OSBPL9	0.3814978	4.43242E-19	1.65502E-17
OSGIN1	-0.331908	1.48525E-14	2.44466E-13
OSMR	0.3203984	1.29291E-13	1.77581E-12
OTUB1	-0.377506	1.09846E-18	3.80804E-17
OTUD4	0.3438337	1.43002E-15	2.82128E-14
OVOL1	-0.319122	1.63434E-13	2.1925E-12
OVOL2	-0.336957	5.58246E-15	9.90837E-14
OXR1	0.3279092	3.1829E-14	4.89526E-13
P2RY12	0.3228442	8.22611E-14	1.1755E-12
P2RY14	0.3005654	4.35494E-12	4.49839E-11
PABPC4L	0.3309771	1.77531E-14	2.87284E-13
PABPC5	0.3074415	1.32554E-12	1.51599E-11
PACSIN3	-0.379582	6.8627E-19	2.45342E-17
PALM2-AKAP2	0.3483772	5.70748E-16	1.21778E-14
PAPD4	0.374119	2.34936E-18	7.71499E-17
PAPL	-0.313647	4.41011E-13	5.45863E-12
PAPOLA	0.3091717	9.77813E-13	1.1436E-11
PAPOLG	0.3716411	4.07436E-18	1.27763E-16
PAPSS2	0.3753957	1.76584E-18	5.95394E-17
PAQR8	0.3443663	1.28506E-15	2.56034E-14
PARP8	0.3109904	7.08631E-13	8.49978E-12
PATL1	0.3093189	9.52747E-13	1.11493E-11
PCDH18	0.3168678	2.46551E-13	3.21857E-12
PCDHGA12	0.3136956	4.37163E-13	5.41766E-12
PCDHGA9	0.3040106	2.40911E-12	2.61296E-11
PCGF6	0.3524753	2.46059E-16	5.63143E-15
PCNP	0.3829054	3.2089E-19	1.23006E-17
PCYT2	-0.312604	5.31511E-13	6.49114E-12
PDDC1	-0.31365	4.40749E-13	5.45863E-12
PDE3A	0.3029642	2.88609E-12	3.0757E-11
PDE4DIP	0.335206	7.85382E-15	1.34937E-13
PDE6D	0.3294225	2.38843E-14	3.7771E-13
PDF	-0.314321	3.90715E-13	4.88103E-12
PDLIM2	-0.307079	1.41233E-12	1.61068E-11
PDPR	0.3295712	2.32178E-14	3.68615E-13
PDS5B	0.3870747	1.22135E-19	5.04632E-18
PES1	-0.349391	4.64073E-16	1.00614E-14

PGAP2	-0.345519	1.01901E-15	2.07121E-14
PGCP	0.3501205	3.99634E-16	8.78716E-15
PGLS	-0.422162	2.04323E-23	1.76814E-21
PGM2L1	0.3470299	7.50598E-16	1.55703E-14
PHC3	0.3446373	1.21694E-15	2.44016E-14
PHF12	0.3039003	2.45551E-12	2.65756E-11
PHF3	0.367915	9.24181E-18	2.70062E-16
PHF6	0.4442587	4.93644E-26	7.54042E-24
PHLDA2	-0.310162	8.20741E-13	9.72875E-12
PHLDB3	-0.493881	1.1753E-32	6.40477E-30
PHLPP2	0.3137545	4.32565E-13	5.37388E-12
PHTF1	0.3691305	7.08321E-18	2.11583E-16
PHTF2	0.3673697	1.04093E-17	3.01991E-16
PI3	-0.357401	8.80444E-17	2.19436E-15
PIBF1	0.3150371	3.43414E-13	4.34122E-12
PIGK	1	1E-58	1E-54
PIK3C2A	0.3054747	1.86875E-12	2.07484E-11
PIK3CA	0.3008718	4.13291E-12	4.29104E-11
PIK3CG	0.3051593	1.97406E-12	2.18457E-11
PIK3R1	0.3526463	2.3751E-16	5.44814E-15
PIK3R4	0.3306584	1.8869E-14	3.04365E-13
PIKFYVE	0.3839447	2.52547E-19	9.8684E-18
PJA2	0.3949555	1.89369E-20	9.38143E-19
PKD2	0.4220432	2.10807E-23	1.80872E-21
PKIA	0.3153018	3.27391E-13	4.15953E-12
PKN2	0.5049175	2.77829E-34	2.24074E-31
PKP1	-0.316651	2.56469E-13	3.33625E-12
PKP3	-0.368291	8.51233E-18	2.50927E-16
PLCD1	-0.317216	2.31433E-13	3.04198E-12
PLCL1	0.3700354	5.80646E-18	1.76585E-16
PLCL2	0.3155574	3.12619E-13	3.98441E-12
PLDN	0.3865855	1.3689E-19	5.5986E-18
PLEKHA3	0.3067578	1.49407E-12	1.69431E-11
PLEKHH3	-0.329052	2.56263E-14	4.02416E-13
PLEKHJ1	-0.355578	1.29062E-16	3.10534E-15
PLEKHM1	-0.304632	2.16327E-12	2.37441E-11
PLEKHM3	0.3324052	1.34983E-14	2.23275E-13
PLK4	0.3596889	5.42978E-17	1.39644E-15
PLOD2	0.4624986	2.42081E-28	5.67568E-26
PLSCR4	0.3111137	6.93282E-13	8.32063E-12
PLXNC1	0.3663229	1.30716E-17	3.73318E-16
PMPCA	-0.31742	2.23005E-13	2.94463E-12
PMVK	-0.413582	1.88612E-22	1.39816E-20
PNRC2	0.3519894	2.72049E-16	6.17088E-15
POC5	0.4043852	1.90404E-21	1.13921E-19
POFUT2	0.3426559	1.81007E-15	3.49919E-14
POLA1	0.3964713	1.31549E-20	6.73201E-19
POLD4	-0.32533	5.17315E-14	7.64708E-13
POLDIP2	-0.301789	3.53234E-12	3.71725E-11
POLK	0.5479734	3.14489E-41	5.2842E-38
POLR2B	0.3188725	1.71074E-13	2.28737E-12
POLR2E	-0.329537	2.33706E-14	3.70457E-13

POLR2L	-0.324587	5.94487E-14	8.70489E-13
POR	-0.392612	3.3141E-20	1.56859E-18
POT1	0.3866677	1.34294E-19	5.51479E-18
PPAN	-0.388796	8.16433E-20	3.49368E-18
PPAP2B	0.332998	1.20418E-14	2.00826E-13
PPDPF	-0.34203	2.05072E-15	3.93423E-14
PPFIA3	-0.340601	2.72395E-15	5.08547E-14
PPIF	-0.391993	3.83899E-20	1.79595E-18
PPIL4	0.4591314	6.61978E-28	1.45081E-25
PPIP5K2	0.4763063	3.47389E-30	1.25079E-27
PPM1K	0.3120226	5.89697E-13	7.14118E-12
PPP1R12A	0.4612071	3.56537E-28	8.16915E-26
PPP1R2P3	0.3225754	8.64696E-14	1.22867E-12
PPP1R8	0.4128191	2.29101E-22	1.67368E-20
PPP2R1A	-0.305836	1.75467E-12	1.95683E-11
PPP3CB	0.3029978	2.86941E-12	3.05954E-11
PPP4C	-0.383374	2.88073E-19	1.11272E-17
PPT1	0.343665	1.47921E-15	2.90978E-14
PPTC7	0.3800772	6.13097E-19	2.21539E-17
PPWD1	0.3571781	9.22794E-17	2.29707E-15
PRDM2	0.3519834	2.72384E-16	6.17088E-15
PRDM8	0.4088818	6.20323E-22	4.04776E-20
PRDX3	0.3473057	7.09748E-16	1.49069E-14
PRDX6	-0.31557	3.11919E-13	3.97801E-12
PRIM1	0.3197176	1.46527E-13	1.99354E-12
PRIM2	0.4649318	1.16205E-28	2.89264E-26
PRKAA1	0.4100861	4.58044E-22	3.08881E-20
PRKACB	0.4813518	7.01632E-31	2.8294E-28
PRKAR1A	0.3961779	1.4118E-20	7.15232E-19
PRKCZ	-0.361184	3.95084E-17	1.04955E-15
PRKD3	0.4690881	3.27196E-29	9.42466E-27
PRKDC	0.3155752	3.11616E-13	3.97665E-12
PRKG1	0.3000655	4.74251E-12	4.87377E-11
PRMT10	0.3299051	2.17868E-14	3.48365E-13
PRMT6	0.3365746	6.01547E-15	1.06395E-13
PRPS1	0.3680316	9.00943E-18	2.64421E-16
PRPS2	0.313336	4.66283E-13	5.75025E-12
PRR11	0.4251748	9.22076E-24	8.64735E-22
PRR24	-0.306215	1.64253E-12	1.84195E-11
PRR5	-0.414054	1.67163E-22	1.25298E-20
PRR7	-0.321527	1.04996E-13	1.46406E-12
PRRC1	0.412759	2.32633E-22	1.69298E-20
PRSS27	-0.341251	2.39447E-15	4.54183E-14
PSMC5	-0.319711	1.46695E-13	1.99448E-12
PSMD4	-0.300673	4.27594E-12	4.42814E-11
PTAR1	0.426073	7.26223E-24	7.10817E-22
PTBP2	0.3580982	7.60216E-17	1.91125E-15
PTCD2	0.3354147	7.54143E-15	1.29964E-13
PTDSS2	-0.313237	4.74652E-13	5.83561E-12
PTER	0.3158405	2.97015E-13	3.80478E-12
PTGER2	0.308486	1.1034E-12	1.27787E-11
PTGES2	-0.448957	1.29344E-26	2.17331E-24

PTOV1	-0.303477	2.64192E-12	2.82895E-11
PTPDC1	0.3218461	9.898E-14	1.38785E-12
PTPLB	0.3811909	4.75486E-19	1.7656E-17
PTPN11	0.3227559	8.36219E-14	1.19073E-12
PTPRB	0.3165401	2.61661E-13	3.40159E-12
PTPRM	0.3165038	2.63391E-13	3.42188E-12
PTRH1	-0.348261	5.84437E-16	1.24435E-14
PURA	0.3374352	5.08343E-15	9.11086E-14
PUS1	-0.328503	2.84401E-14	4.41573E-13
PUS7L	0.3722963	3.52404E-18	1.12074E-16
PUSL1	-0.321621	1.03181E-13	1.44275E-12
PVRL3	0.4654848	9.82708E-29	2.5403E-26
PVRL4	-0.300958	4.07259E-12	4.23932E-11
PVT1	-0.337228	5.29443E-15	9.43036E-14
PWWP2A	0.348945	5.08317E-16	1.09383E-14
PWWP2B	-0.422204	2.021E-23	1.75644E-21
PXK	0.3741838	2.31565E-18	7.67324E-17
PYCARD	-0.400014	5.57376E-21	3.0706E-19
QKI	0.454006	2.99636E-27	5.94059E-25
QTRTD1	0.3150756	3.41038E-13	4.31389E-12
RAB11FIP2	0.440384	1.46656E-25	2.02536E-23
RAB23	0.5687614	5.8496E-45	1.47432E-41
RAB24	-0.335797	7.00018E-15	1.21362E-13
RAB25	-0.404426	1.88514E-21	1.13125E-19
RAB28	0.3069409	1.44699E-12	1.6437E-11
RAB2B	0.3279423	3.16305E-14	4.86844E-13
RAB33B	0.3778411	1.01834E-18	3.55854E-17
RAB3D	-0.32078	1.20514E-13	1.66433E-12
RAB8B	0.3997196	5.98788E-21	3.2808E-19
RAB9B	0.302256	3.26009E-12	3.45965E-11
RABEP2	-0.360312	4.75706E-17	1.24567E-15
RABGGTA	-0.400394	5.08003E-21	2.82952E-19
RACGAP1	0.3132142	4.76574E-13	5.85568E-12
RAD17	0.3855643	1.73585E-19	7.014E-18
RAD18	0.3200477	1.37905E-13	1.88131E-12
RAD1	0.3299703	2.15179E-14	3.4461E-13
RAD21	0.3922227	3.63491E-20	1.70444E-18
RAD51AP1	0.3567063	1.01897E-16	2.50554E-15
RANGAP1	-0.379196	7.49149E-19	2.65935E-17
RAP1A	0.5312935	2.02983E-38	2.55797E-35
RAPGEF2	0.3225392	8.70532E-14	1.23609E-12
RAPGEF6	0.3658757	1.44037E-17	4.07323E-16
RAPGEFL1	-0.33497	8.22236E-15	1.40508E-13
RASA1	0.3038021	2.49753E-12	2.69581E-11
RASAL1	-0.32867	2.75544E-14	4.30348E-13
RASGRP3	0.3036714	2.5546E-12	2.75152E-11
RASSF3	0.3068074	1.48117E-12	1.68158E-11
RASSF7	-0.367161	1.08947E-17	3.14714E-16
RASSF8	0.4747474	5.66424E-30	1.90347E-27
RBBP4	0.5301455	3.1271E-38	3.50287E-35
RBBP5	0.3404371	2.81402E-15	5.23906E-14
RBBP9	0.3164453	2.66197E-13	3.44944E-12

RBL1	0.4297021	2.74735E-24	2.83141E-22
RBL2	0.3280996	3.07022E-14	4.73641E-13
RBM12B	0.3776317	1.06769E-18	3.71168E-17
RBM16	0.3231241	7.80923E-14	1.12069E-12
RBM27	0.426006	7.393E-24	7.20121E-22
RBM42	-0.302863	2.93665E-12	3.12628E-11
RBM43	0.4489186	1.30793E-26	2.17949E-24
RBM9	0.3362212	6.44513E-15	1.13003E-13
RCBTB1	0.3662341	1.33261E-17	3.80049E-16
RCHY1	0.3449634	1.13966E-15	2.30712E-14
RDH13	-0.436392	4.43857E-25	5.59343E-23
RECQL	0.4713543	1.62747E-29	4.89772E-27
REEP4	-0.319202	1.6105E-13	2.16918E-12
REPS2	0.3325305	1.31767E-14	2.18848E-13
REST	0.3373137	5.20585E-15	9.29722E-14
REV3L	0.3381507	4.41769E-15	8.01745E-14
RFC1	0.3267935	3.92937E-14	5.93467E-13
RFC3	0.3266654	4.02533E-14	6.06292E-13
RFWD3	0.3232096	7.68606E-14	1.10459E-12
RFXANK	-0.343213	1.61945E-15	3.17328E-14
RGMB	0.3235942	7.15515E-14	1.03345E-12
RGPD3	0.3271746	3.6569E-14	5.56064E-13
RGPD4	0.3498397	4.23303E-16	9.2271E-15
RGS12	-0.328	3.1289E-14	4.82325E-13
RGS18	0.3164946	2.6383E-13	3.42537E-12
RHOBTB1	0.3144574	3.81223E-13	4.77428E-12
RHOBTB3	0.3845163	2.21299E-19	8.7663E-18
RHOV	-0.349	5.02596E-16	1.08268E-14
RIC8B	0.4947201	8.88323E-33	5.1175E-30
RICTOR	0.3946268	2.04884E-20	1.01252E-18
RIF1	0.3413705	2.33828E-15	4.4478E-14
RLF	0.3446584	1.21179E-15	2.4336E-14
RMI1	0.366051	1.38664E-17	3.93785E-16
RNF115	0.3689086	7.43634E-18	2.21803E-16
RNF126	-0.367944	9.18377E-18	2.69146E-16
RNF138P1	0.3313836	1.64236E-14	2.67271E-13
RNF160	0.397843	9.44518E-21	4.98542E-19
RNF180	0.3222825	9.12961E-14	1.28908E-12
RNF187	-0.358374	7.17209E-17	1.8099E-15
RNF208	-0.439123	2.08416E-25	2.72876E-23
RNF219	0.3529848	2.2143E-16	5.11713E-15
RNF39	-0.302108	3.34404E-12	3.53941E-11
RNF41	0.3788507	8.10228E-19	2.86608E-17
RNFT1	0.4370993	3.65134E-25	4.65962E-23
RNGTT	0.3711846	4.50701E-18	1.39593E-16
RNH1	-0.332612	1.2972E-14	2.15625E-13
ROBLD3	-0.338864	3.83933E-15	7.07608E-14
ROCK1	0.3750236	1.91934E-18	6.42852E-17
ROCK2	0.3539567	1.80982E-16	4.23335E-15
ROMO1	-0.328338	2.93466E-14	4.54467E-13
ROR1	0.3890266	7.73321E-20	3.36045E-18
RP2	0.3602131	4.85779E-17	1.26687E-15

RPAP2	0.3510431	3.30636E-16	7.38273E-15
RPGRIP1L	0.4297653	2.70094E-24	2.82171E-22
RPL10A	-0.320969	1.164E-13	1.61304E-12
RPL10	-0.335564	7.32568E-15	1.26462E-13
RPL11	-0.323907	6.74979E-14	9.79813E-13
RPL12	-0.334588	8.85466E-15	1.50431E-13
RPL13AP20	-0.327809	3.24365E-14	4.98488E-13
RPL13AP3	-0.372917	3.07075E-18	9.92237E-17
RPL13A	-0.305647	1.81346E-12	2.01904E-11
RPL13	-0.416709	8.45186E-23	6.7625E-21
RPL14	-0.33497	8.22298E-15	1.40508E-13
RPL18A	-0.391002	4.8541E-20	2.21433E-18
RPL18	-0.401967	3.45579E-21	1.99541E-19
RPL19P12	-0.328729	2.72484E-14	4.25898E-13
RPL19	-0.405839	1.32743E-21	8.21014E-20
RPL22L1	-0.340934	2.54982E-15	4.79142E-14
RPL23A	-0.364194	2.07178E-17	5.76183E-16
RPL23P8	-0.316751	2.51818E-13	3.28209E-12
RPL23	-0.351489	3.01602E-16	6.77949E-15
RPL24	-0.308677	1.06696E-12	1.23995E-11
RPL27A	-0.376401	1.40896E-18	4.82323E-17
RPL28	-0.355558	1.29623E-16	3.11513E-15
RPL29	-0.396543	1.2931E-20	6.64581E-19
RPL31	-0.302216	3.28266E-12	3.47994E-11
RPL32	-0.319404	1.55192E-13	2.09587E-12
RPL34	-0.328528	2.83056E-14	4.41397E-13
RPL35	-0.371713	4.01032E-18	1.2595E-16
RPL36	-0.39166	4.15447E-20	1.93011E-18
RPL37A	-0.37944	7.08751E-19	2.52483E-17
RPL38	-0.398413	8.22622E-21	4.38797E-19
RPL39	-0.368536	8.06889E-18	2.39641E-16
RPL3	-0.304295	2.29353E-12	2.50647E-11
RPL41	-0.320277	1.32222E-13	1.81237E-12
RPL4	-0.375174	1.85576E-18	6.2259E-17
RPL7A	-0.346325	8.65845E-16	1.78325E-14
RPL8	-0.358626	6.80022E-17	1.72036E-15
RPLP0	-0.336088	6.61422E-15	1.15067E-13
RPLP1	-0.38882	8.11699E-20	3.48219E-18
RPLP2	-0.412981	2.19857E-22	1.61199E-20
RPS10	-0.333403	1.11376E-14	1.86209E-13
RPS12	-0.337914	4.62757E-15	8.36072E-14
RPS13	-0.3043	2.29122E-12	2.50573E-11
RPS15A	-0.343993	1.38505E-15	2.74599E-14
RPS15	-0.427192	5.38767E-24	5.35131E-22
RPS16	-0.348306	5.79124E-16	1.23434E-14
RPS17	-0.331737	1.53468E-14	2.51371E-13
RPS19BP1	-0.303663	2.55832E-12	2.75406E-11
RPS19	-0.364834	1.80478E-17	5.04014E-16
RPS21	-0.326969	3.80123E-14	5.76273E-13
RPS24	-0.361666	3.56431E-17	9.5568E-16
RPS25	-0.320683	1.22689E-13	1.69205E-12
RPS27A	-0.337411	5.1081E-15	9.14694E-14

RPS29	-0.344751	1.18936E-15	2.39571E-14
RPS2	-0.353609	1.94528E-16	4.51874E-15
RPS3	-0.330792	1.83947E-14	2.96951E-13
RPS4X	-0.319545	1.51235E-13	2.04883E-12
RPS5	-0.311436	6.54656E-13	7.87109E-12
RPS6KA3	0.309807	8.74024E-13	1.02938E-11
RPS9	-0.38408	2.4476E-19	9.62006E-18
RPUSD1	-0.347076	7.43644E-16	1.54578E-14
RQCD1	0.3965354	1.29534E-20	6.64581E-19
RRAGC	0.3264898	4.16069E-14	6.23547E-13
RRM2B	0.405117	1.58825E-21	9.61679E-20
RRP1	-0.410517	4.10846E-22	2.81765E-20
RRP9	-0.332431	1.34302E-14	2.22875E-13
RSBN1	0.4237367	1.34943E-23	1.20392E-21
RSPRY1	0.3900351	6.0995E-20	2.72089E-18
RSRC1	0.3965382	1.29447E-20	6.64581E-19
RYK	0.3070294	1.42474E-12	1.62025E-11
S100A11	-0.331778	1.52267E-14	2.49606E-13
S100A14	-0.367918	9.23474E-18	2.70062E-16
S100A16	-0.40713	9.62084E-22	6.10016E-20
S100A6	-0.313932	4.19024E-13	5.21529E-12
S100PBP	0.4801572	1.02715E-30	4.06087E-28
S100P	-0.374462	2.1761E-18	7.25234E-17
S1PR3	0.3540349	1.78064E-16	4.17485E-15
SACM1L	0.302343	3.21171E-12	3.41369E-11
SACS	0.3426782	1.80203E-15	3.48699E-14
SAPS2	-0.336724	5.84237E-15	1.03424E-13
SAR1B	0.3116796	6.26879E-13	7.55966E-12
SASS6	0.476784	2.98904E-30	1.11578E-27
SAV1	0.3101094	8.28482E-13	9.80322E-12
SBF2	0.3239131	6.74237E-14	9.79441E-13
SBNO1	0.3276159	3.36447E-14	5.14703E-13
SBSN	-0.340962	2.53589E-15	4.77824E-14
SCAND1	-0.41083	3.79564E-22	2.63321E-20
SCARB2	0.366393	1.28741E-17	3.68721E-16
SCLT1	0.4371734	3.57736E-25	4.59429E-23
SCMH1	0.3042074	2.32842E-12	2.53772E-11
SCNN1D	-0.355183	1.40182E-16	3.34685E-15
SCP2	0.4627841	2.22174E-28	5.27024E-26
SDCBP2	-0.313913	4.2044E-13	5.22969E-12
SEC22B	0.4427686	7.51604E-26	1.11431E-23
SEC23A	0.3243335	6.23368E-14	9.10136E-13
SEC23IP	0.3588016	6.55265E-17	1.66399E-15
SEC24D	0.3701062	5.71672E-18	1.74118E-16
SEC31A	0.3186689	1.77565E-13	2.36946E-12
SEC62	0.3512681	3.15675E-16	7.08004E-15
SECISBP2L	0.3207512	1.21159E-13	1.6721E-12
SEL1L	0.3863936	1.43146E-19	5.83082E-18
SELO	-0.449646	1.06091E-26	1.81281E-24
SEMA5A	0.34064	2.70314E-15	5.05128E-14
SENP1	0.4448182	4.21332E-26	6.4928E-24
SENP6	0.3273278	3.55264E-14	5.41844E-13

SENP7	0.3997027	6.01254E-21	3.28539E-19
45550	0.4570559	1.22385E-27	2.54397E-25
45537	0.3361482	6.53755E-15	1.14226E-13
45542	0.3605373	4.5341E-17	1.19818E-15
SERF2	-0.309894	8.60652E-13	1.01481E-11
SERINC1	0.460898	3.91052E-28	8.8593E-26
SERINC3	0.3233988	7.42031E-14	1.07021E-12
SF3B5	-0.317745	2.10201E-13	2.78285E-12
SFN	-0.344314	1.29866E-15	2.5798E-14
SFRS12	0.3050347	2.01727E-12	2.22873E-11
SFRS13A	0.4846333	2.44363E-31	1.07111E-28
SGCB	0.3928395	3.13917E-20	1.4893E-18
SGCE	0.3227722	8.33681E-14	1.18879E-12
SGK269	0.3459467	9.3463E-16	1.91514E-14
SGOL1	0.3019482	3.43705E-12	3.62265E-11
SGOL2	0.3709933	4.7015E-18	1.44949E-16
SGSM3	-0.328283	2.96557E-14	4.58549E-13
SGTB	0.3779291	9.98295E-19	3.49455E-17
SH2B3	0.3657204	1.4897E-17	4.20094E-16
SH2D3A	-0.306341	1.60679E-12	1.8059E-11
SH3D20	-0.355671	1.26596E-16	3.05329E-15
SH3GL1	-0.367801	9.47488E-18	2.76472E-16
SH3GLB1	0.4721736	1.26271E-29	3.91692E-27
SH3GLB2	-0.433747	9.16863E-25	1.06245E-22
SHB	-0.325112	5.38942E-14	7.92033E-13
SHE	0.3439081	1.40887E-15	2.79047E-14
SHFM1	-0.305472	1.86975E-12	2.07484E-11
SHPRH	0.3453319	1.05811E-15	2.14852E-14
SHQ1	0.3200735	1.37253E-13	1.87622E-12
SIKE1	0.4003191	5.17337E-21	2.86568E-19
SIRT1	0.3869258	1.26452E-19	5.20337E-18
SIRT7	-0.472868	1.01794E-29	3.25789E-27
SLC10A7	0.4122793	2.6283E-22	1.89266E-20
SLC15A4	0.3752163	1.83825E-18	6.1857E-17
SLC1A3	0.3122001	5.71323E-13	6.92699E-12
SLC25A10	-0.419466	4.13631E-23	3.4463E-21
SLC25A24	0.4870985	1.09809E-31	5.032E-29
SLC25A39	-0.357614	8.41913E-17	2.10093E-15
SLC25A40	0.4011217	4.25173E-21	2.40134E-19
SLC25A46	0.4178173	6.34695E-23	5.16022E-21
SLC26A2	0.4485859	1.439E-26	2.35891E-24
SLC27A4	-0.383863	2.57339E-19	1.00169E-17
SLC2A10	0.3296069	2.30607E-14	3.66409E-13
SLC2A13	0.3579329	7.87192E-17	1.97415E-15
SLC30A5	0.3447117	1.19886E-15	2.41245E-14
SLC30A6	0.4200522	3.55016E-23	2.98258E-21
SLC30A7	0.5679817	8.163E-45	1.82878E-41
SLC33A1	0.325262	5.2398E-14	7.73427E-13
SLC34A3	-0.426974	5.71202E-24	5.64566E-22
SLC35A3	0.302335	3.21615E-12	3.41661E-11
SLC35A5	0.4244099	1.12935E-23	1.02112E-21
SLC35B4	0.3419413	2.08726E-15	3.99672E-14

SLC35D1	0.3663346	1.30386E-17	3.72903E-16
SLC38A9	0.3429127	1.71956E-15	3.34345E-14
SLC39A10	0.3639817	2.1689E-17	6.00707E-16
SLC39A4	-0.336097	6.60254E-15	1.14963E-13
SLC41A2	0.3251664	5.33441E-14	7.85092E-13
SLC5A10	-0.338126	4.43925E-15	8.04934E-14
SLC6A17	0.3708134	4.89185E-18	1.50128E-16
SLC8A1	0.3546325	1.57235E-16	3.71668E-15
SLC9A3R1	-0.321593	1.03717E-13	1.44901E-12
SLFN11	0.4220644	2.09638E-23	1.80638E-21
SLPI	-0.32506	5.4417E-14	7.99133E-13
SLURP1	-0.329353	2.42009E-14	3.82416E-13
SMAD1	0.3809426	5.03245E-19	1.86182E-17
SMAD5	0.3100426	8.38331E-13	9.91394E-12
SMARCA5	0.3548614	1.49908E-16	3.556E-15
SMARCAD1	0.4024233	3.08946E-21	1.79002E-19
SMARCD2	-0.344834	1.16971E-15	2.35849E-14
SMC1A	0.3404701	2.7957E-15	5.20977E-14
SMC2	0.3931688	2.90237E-20	1.38346E-18
SMC3	0.3598229	5.27755E-17	1.36319E-15
SMC4	0.384717	2.11258E-19	8.41817E-18
SMOX	-0.324536	6.00261E-14	8.77669E-13
SMPD2	-0.447609	1.90344E-26	3.04595E-24
SMURF2	0.306528	1.55529E-12	1.7529E-11
SNAP23	0.4493104	1.16861E-26	1.98006E-24
SNHG7	-0.358391	7.14686E-17	1.80579E-15
SNHG8	-0.323614	7.12913E-14	1.03043E-12
SNIP1	0.3798779	6.41566E-19	2.30586E-17
SNRNP27	0.3212277	1.10965E-13	1.5409E-12
SNRNP35	-0.303565	2.60197E-12	2.79508E-11
SNRNP48	0.3263412	4.27868E-14	6.39519E-13
SNRNP70	-0.346577	8.22779E-16	1.69802E-14
SNX13	0.3367795	5.77944E-15	1.024E-13
SNX4	0.3486945	5.34986E-16	1.14877E-14
SOAT1	0.4319324	1.50288E-24	1.66498E-22
SOCS4	0.4251524	9.27577E-24	8.65868E-22
SOCS5	0.3777638	1.03629E-18	3.61499E-17
SOX30	0.3768748	1.26648E-18	4.37261E-17
SP3	0.3730402	2.98751E-18	9.66889E-17
SP4	0.474797	5.57707E-30	1.90347E-27
SPATA13	0.308892	1.02726E-12	1.19796E-11
SPATA1	0.3034383	2.65953E-12	2.84478E-11
SPATA2L	-0.488558	6.81725E-32	3.35259E-29
SPATA5	0.3282875	2.96284E-14	4.58479E-13
SPATA6	0.3001406	4.68222E-12	4.81672E-11
SPCS3	0.4300686	2.4888E-24	2.64115E-22
SPIN1	0.3800783	6.1294E-19	2.21539E-17
SPINK7	-0.30864	1.07387E-12	1.24654E-11
SPOP	0.3747513	2.03989E-18	6.80967E-17
SPRED1	0.315286	3.2833E-13	4.16884E-12
SPRED2	0.3096699	8.95472E-13	1.05218E-11
SPRR1A	-0.331302	1.6681E-14	2.71023E-13

SPRR1B	-0.319662	1.48026E-13	2.00851E-12
SRBD1	0.4932342	1.45759E-32	7.73405E-30
SRFBP1	0.4480736	1.66665E-26	2.68837E-24
SSH2	0.3171207	2.35479E-13	3.0891E-12
SSNA1	-0.345794	9.63984E-16	1.96928E-14
SSX2IP	0.5081608	9.0043E-35	7.89364E-32
ST14	-0.313731	4.34363E-13	5.3929E-12
ST3GAL2	0.3715	4.20353E-18	1.30796E-16
STAG1	0.3529821	2.21557E-16	5.11713E-15
STAM2	0.4632546	1.92839E-28	4.6846E-26
STAP2	-0.450233	8.95901E-27	1.62739E-24
STARD10	-0.353843	1.85309E-16	4.32451E-15
STARD13	0.3430584	1.67019E-15	3.25688E-14
STIL	0.458733	7.45088E-28	1.6154E-25
STK17B	0.3979074	9.299E-21	4.92115E-19
STK4	0.4140879	1.6573E-22	1.24687E-20
STT3B	0.3515099	3.00332E-16	6.75847E-15
STUB1	-0.394269	2.23187E-20	1.09226E-18
STX2	0.3800969	6.10354E-19	2.21341E-17
STX4	-0.335204	7.85677E-15	1.34937E-13
STXBP2	-0.326496	4.15615E-14	6.23516E-13
STXBP3	0.4497854	1.0193E-26	1.76279E-24
STXBP4	0.3602079	4.86314E-17	1.26687E-15
SUCNR1	0.3289498	2.61304E-14	4.09059E-13
SULT2B1	-0.401268	4.10251E-21	2.32356E-19
SURF2	-0.373077	2.96322E-18	9.60568E-17
SUSD5	0.3950852	1.83572E-20	9.13914E-19
SYNE1	0.3891952	7.43282E-20	3.25093E-18
SYNJ1	0.4407517	1.3234E-25	1.84025E-23
SYNJ2BP	0.3046915	2.14108E-12	2.35263E-11
SYTL1	-0.340975	2.52946E-15	4.77095E-14
TAF10	-0.331238	1.68874E-14	2.74156E-13
TAF1L	0.315538	3.13716E-13	3.99587E-12
TAF1	0.3021259	3.33378E-12	3.53041E-11
TAF2	0.4028812	2.7602E-21	1.61785E-19
TALDO1	-0.4399	1.67878E-25	2.27176E-23
TAOK3	0.3005148	4.39275E-12	4.53513E-11
TAZ	-0.314504	3.78014E-13	4.73999E-12
TBC1D15	0.3885494	8.64996E-20	3.67952E-18
TBC1D1	0.3221359	9.38098E-14	1.32272E-12
TBC1D8B	0.323028	7.95E-14	1.14008E-12
TBCCD1	0.3570561	9.46769E-17	2.34806E-15
TBCEL	0.3279785	3.14144E-14	4.83888E-13
TBL3	-0.381462	4.46878E-19	1.66551E-17
TBRG4	-0.303633	2.5715E-12	2.76529E-11
TBX15	0.3241768	6.41873E-14	9.35122E-13
TCEANC	0.3324032	1.35034E-14	2.23275E-13
TCEB2	-0.313715	4.35662E-13	5.40237E-12
TCF12	0.4104068	4.22422E-22	2.88722E-20
TCF19	0.3485305	5.5319E-16	1.18157E-14
TCF7	0.3340354	9.85527E-15	1.66147E-13
TCTN1	0.3741351	2.34094E-18	7.71379E-17

TCTN2	0.3444756	1.25715E-15	2.50969E-14
TDRKH	0.3050902	1.99789E-12	2.20974E-11
TEAD1	0.3223527	9.01157E-14	1.27688E-12
TECR	-0.316294	2.73601E-13	3.53629E-12
TEK	0.3014516	3.74257E-12	3.92211E-11
TEX264	-0.371722	4.00222E-18	1.25892E-16
TEX9	0.3619722	3.33851E-17	9.04763E-16
TFAM	0.3411367	2.44945E-15	4.63403E-14
TFPI	0.3115531	6.41157E-13	7.71801E-12
TGFBRAP1	0.3218694	9.85556E-14	1.38287E-12
TGOLN2	0.3510321	3.31384E-16	7.39125E-15
THAP10	0.3375043	5.01512E-15	9.00444E-14
THAP1	0.356546	1.05384E-16	2.58185E-15
THAP2	0.33242	1.34598E-14	2.23183E-13
THAP4	-0.356707	1.01883E-16	2.50554E-15
THAP6	0.3419666	2.07679E-15	3.98044E-14
THBS1	0.3061284	1.66761E-12	1.868E-11
THOP1	-0.303834	2.4836E-12	2.68505E-11
THRAP3	0.3374432	5.0755E-15	9.10474E-14
THUMPD1	0.350029	4.07203E-16	8.93409E-15
TIAF1	-0.381631	4.29926E-19	1.61126E-17
TIAM2	0.3102071	8.14272E-13	9.66343E-12
TICAM2	0.401709	3.68186E-21	2.10304E-19
TIMELESS	0.3041245	2.36207E-12	2.5711E-11
TIMM13	-0.408836	6.27529E-22	4.08157E-20
TIMM16	-0.32684	3.89521E-14	5.88748E-13
TIMM8B	-0.372414	3.4329E-18	1.09695E-16
TKT	-0.410236	4.41069E-22	3.00448E-20
TLR6	0.3122732	5.63913E-13	6.84127E-12
TM2D1	0.3900072	6.13981E-20	2.73282E-18
TM6SF1	0.3548526	1.50181E-16	3.55829E-15
TM7SF2	-0.408565	6.7169E-22	4.35475E-20
TM9SF2	0.3152019	3.33351E-13	4.2193E-12
TMCO3	0.3318291	1.50785E-14	2.47579E-13
TMED10P1	0.3743003	2.25622E-18	7.4946E-17
TMED10	0.3380686	4.48947E-15	8.12648E-14
TMED2	0.3429623	1.70259E-15	3.31364E-14
TMED5	0.5015784	8.75202E-34	6.08507E-31
TMED7	0.517945	2.79277E-36	2.81553E-33
TMEFF1	0.3660827	1.37712E-17	3.92188E-16
TMEM102	-0.317088	2.36868E-13	3.10353E-12
TMEM106B	0.3449507	1.14257E-15	2.31069E-14
TMEM115	-0.301022	4.02787E-12	4.19494E-11
TMEM120A	-0.303012	2.86249E-12	3.05378E-11
TMEM133	0.3190927	1.64314E-13	2.20283E-12
TMEM141	-0.347153	7.32067E-16	1.52802E-14
TMEM147	-0.302259	3.2582E-12	3.45946E-11
TMEM150C	0.317373	2.24914E-13	2.96596E-12
TMEM167A	0.3034989	2.63185E-12	2.82116E-11
TMEM167B	0.4418426	9.74984E-26	1.39423E-23
TMEM182	0.3018254	3.51023E-12	3.69591E-11
TMEM184A	-0.372621	3.27901E-18	1.05111E-16

TMEM184C	0.428782	3.51903E-24	3.58355E-22
TMEM191A	-0.388274	9.22655E-20	3.9001E-18
TMEM194A	0.4344263	7.61484E-25	8.97883E-23
TMEM200A	0.3577868	8.11811E-17	2.03084E-15
TMEM209	0.3362412	6.41997E-15	1.1266E-13
TMEM26	0.3499077	4.1745E-16	9.12912E-15
TMEM2	0.3527947	2.30323E-16	5.31351E-15
TMEM30A	0.4327042	1.21845E-24	1.36487E-22
TMEM38B	0.3380682	4.48986E-15	8.12648E-14
TMEM39A	0.3726038	3.29164E-18	1.05348E-16
TMEM40	-0.314488	3.7912E-13	4.7509E-12
TMEM43	0.3470875	7.41886E-16	1.54372E-14
TMEM47	0.3102687	8.05433E-13	9.58109E-12
TMEM48	0.3684396	8.24058E-18	2.43272E-16
TMEM54	-0.335068	8.06683E-15	1.38192E-13
TMEM55A	0.3226867	8.47031E-14	1.20527E-12
TMEM56	0.3012824	3.85257E-12	4.02902E-11
TMEM67	0.4140266	1.68347E-22	1.25718E-20
TMEM79	-0.310345	7.94602E-13	9.46341E-12
TMF1	0.3191373	1.62977E-13	2.18928E-12
TMOD2	0.3187608	1.74607E-13	2.33307E-12
TMPO	0.3597027	5.41394E-17	1.39414E-15
TMPRSS13	-0.311521	6.44839E-13	7.75769E-12
TMUB1	-0.36025	4.81977E-17	1.25882E-15
TMX1	0.3763108	1.43789E-18	4.91394E-17
TMX3	0.4193803	4.22963E-23	3.50955E-21
TMX4	0.3426386	1.81634E-15	3.50794E-14
TNFRSF9	0.3131197	4.84709E-13	5.952E-12
TNFSF8	0.3038273	2.48666E-12	2.68551E-11
TNIK	0.335738	7.08157E-15	1.22668E-13
TNPO1	0.3321441	1.41931E-14	2.34187E-13
TNS3	0.4266671	6.19885E-24	6.09695E-22
TOLLIP	-0.425287	8.94945E-24	8.51169E-22
TOM1	-0.344541	1.2407E-15	2.47932E-14
TOMM40	-0.300422	4.46268E-12	4.6026E-11
TOMM7	-0.317473	2.20843E-13	2.91799E-12
TOP1MT	-0.335104	8.01053E-15	1.37344E-13
TOP2A	0.3981261	8.81909E-21	4.67946E-19
TOPBP1	0.3361305	6.56015E-15	1.14422E-13
TOR1AIP1	0.3904868	5.48293E-20	2.47875E-18
TOR1B	0.3540964	1.75803E-16	4.13137E-15
TOX	0.3108014	7.32823E-13	8.75869E-12
TPI1	-0.336521	6.07862E-15	1.07323E-13
TPP1	0.309753	8.82407E-13	1.03864E-11
TPRA1	-0.389054	7.68442E-20	3.34646E-18
TPRN	-0.432046	1.45718E-24	1.62327E-22
TRABD	-0.435388	5.84986E-25	7.06292E-23
TRADD	-0.314013	4.12972E-13	5.14315E-12
TRAK2	0.4497731	1.0229E-26	1.76279E-24
TRAM1	0.3671774	1.08546E-17	3.14006E-16
TRAM2	0.3617185	3.52458E-17	9.46286E-16
TRAP1	-0.376572	1.3558E-18	4.65706E-17

TRAPPC2L	-0.342467	1.87978E-15	3.62352E-14
TRAPPC5	-0.365332	1.62029E-17	4.53749E-16
TREX2	-0.301567	3.66911E-12	3.85314E-11
TRIM11	-0.441194	1.16938E-25	1.64882E-23
TRIM23	0.433603	9.53693E-25	1.09882E-22
TRIM29	-0.336194	6.47927E-15	1.13404E-13
TRIM32	0.3146912	3.65503E-13	4.59453E-12
TRIM37	0.3839564	2.51865E-19	9.86087E-18
TRIM44	0.3102181	8.12679E-13	9.65589E-12
TRIM52	0.3326647	1.28405E-14	2.13792E-13
TRIM59	0.3477292	6.51228E-16	1.37783E-14
TRIO	0.375424	1.75467E-18	5.93112E-17
TRIP6	-0.353831	1.85792E-16	4.33078E-15
TRMT1	-0.311766	6.17251E-13	7.45247E-12
TRPM7	0.3232653	7.60685E-14	1.09477E-12
TRUB1	0.3949561	1.89342E-20	9.38143E-19
TSEN54	-0.393965	2.40025E-20	1.16617E-18
TSPAN2	0.4005136	4.93336E-21	2.75544E-19
TSPO	-0.435779	5.2543E-25	6.49954E-23
TSSC4	-0.414437	1.51572E-22	1.15327E-20
TSTD2	0.4356311	5.47189E-25	6.64637E-23
TST	-0.373883	2.47616E-18	8.105E-17
TTC17	0.395434	1.6883E-20	8.51032E-19
TTC21B	0.3109469	7.14132E-13	8.56067E-12
TTC26	0.3467036	8.01931E-16	1.65669E-14
TTC30B	0.3316742	1.55335E-14	2.53838E-13
TTC33	0.5182635	2.48942E-36	2.6418E-33
TTC37	0.4500589	9.42044E-27	1.68092E-24
TTC5	0.314717	3.6381E-13	4.57611E-12
TTF2	0.3557732	1.23908E-16	2.99562E-15
TTK	0.3561027	1.15647E-16	2.81277E-15
TTLL12	-0.300247	4.59825E-12	4.73758E-11
TTLL7	0.3832896	2.93733E-19	1.13026E-17
TUBB2C	-0.375741	1.63416E-18	5.54707E-17
TUBB4	-0.350913	3.39584E-16	7.54079E-15
TUFM	-0.331485	1.61064E-14	2.62533E-13
TWSG1	0.3671023	1.10338E-17	3.18275E-16
TXN2	-0.317922	2.03516E-13	2.69967E-12
TXNDC12	0.3216651	1.0235E-13	1.43211E-12
TXNDC15	0.3505409	3.66596E-16	8.08717E-15
TXNDC16	0.4242631	1.17411E-23	1.05216E-21
TXNDC5	0.331505	1.60457E-14	2.61756E-13
TXN	-0.335565	7.32423E-15	1.26462E-13
TYSND1	-0.4056	1.40875E-21	8.65995E-20
TYW3	0.343893	1.41314E-15	2.79619E-14
UBA52	-0.398162	8.74276E-21	4.6512E-19
UBE2J1	0.3085092	1.0989E-12	1.2734E-11
UBE2W	0.345767	9.69177E-16	1.97589E-14
UBIAD1	0.3007586	4.21359E-12	4.37255E-11
UBL5	-0.305205	1.95857E-12	2.1722E-11
UBQLN4	-0.336431	6.18684E-15	1.08948E-13
UBR1	0.3424097	1.90122E-15	3.65436E-14

UBR2	0.307602	1.28877E-12	1.47561E-11
UBR7	0.4058428	1.3262E-21	8.21014E-20
UBTD2	0.3580584	7.66635E-17	1.92499E-15
UBXN1	-0.306435	1.58077E-12	1.77764E-11
UBXN4	0.3055557	1.84258E-12	2.04919E-11
UFSP1	-0.365893	1.43507E-17	4.06396E-16
UGGT2	0.4346728	7.11768E-25	8.49194E-23
UHMK1	0.3128416	5.09451E-13	6.23304E-12
UHRF1BP1L	0.4112155	3.44274E-22	2.41028E-20
UNC45A	-0.315398	3.21727E-13	4.09015E-12
UPP1	-0.384065	2.45623E-19	9.6352E-18
UQCR10	-0.307506	1.31066E-12	1.49982E-11
UQCR11	-0.344859	1.16379E-15	2.34889E-14
USH1G	-0.300655	4.28873E-12	4.4391E-11
USMG5	-0.309895	8.60494E-13	1.01481E-11
USP12	0.3428741	1.73286E-15	3.36282E-14
USP16	0.3656417	1.51529E-17	4.26716E-16
USP1	0.5029766	5.42129E-34	4.0485E-31
USP24	0.3182978	1.90024E-13	2.53069E-12
USP33	0.5993864	5.79632E-51	2.92178E-47
USP37	0.3702448	5.54494E-18	1.69398E-16
USP45	0.3128794	5.06012E-13	6.19474E-12
USP49	0.328508	2.84158E-14	4.41573E-13
USP51	0.3895778	6.79329E-20	2.98416E-18
UTP20	0.3506657	3.57318E-16	7.89978E-15
VAMP7	0.324875	5.63359E-14	8.26109E-13
VAMP8	-0.34862	5.43139E-16	1.16279E-14
VANGL1	0.3088036	1.04339E-12	1.21536E-11
VASH2	0.3049305	2.0541E-12	2.26569E-11
VCPIP1	0.3140935	4.07008E-13	5.07514E-12
VDAC2	-0.327255	3.60212E-14	5.48147E-13
VEZF1	0.3732762	2.83471E-18	9.21876E-17
VGLL1	-0.306687	1.51265E-12	1.71058E-11
VPS13C	0.324326	6.2424E-14	9.10748E-13
VPS18	-0.322646	8.53498E-14	1.21362E-12
VPS28	-0.340009	3.06264E-15	5.68096E-14
VPS4A	-0.30706	1.41704E-12	1.61331E-11
WASH3P	-0.313435	4.58116E-13	5.6619E-12
WASH5P	-0.318308	1.89674E-13	2.5277E-12
WBP11P1	0.3373561	5.16287E-15	9.22863E-14
WDFY1	0.3358427	6.93859E-15	1.20502E-13
WDHD1	0.3974095	1.04895E-20	5.50778E-19
WDR11	0.3578892	7.94477E-17	1.98994E-15
WDR13	-0.303282	2.73199E-12	2.91919E-11
WDR18	-0.30165	3.61737E-12	3.80078E-11
WDR19	0.3382537	4.3292E-15	7.89952E-14
WDR31	0.3197003	1.46992E-13	1.99582E-12
WDR35	0.4258018	7.80568E-24	7.53043E-22
WDR36	0.3134326	4.58276E-13	5.6619E-12
WDR48	0.3228375	8.23639E-14	1.17614E-12
WDR74	-0.325986	4.57456E-14	6.81217E-13
WDR7	0.3550301	1.44723E-16	3.44515E-15

WIBG	-0.335435	7.5116E-15	1.29561E-13
WRB	0.3305905	1.91155E-14	3.07849E-13
XAB2	-0.303622	2.57657E-12	2.76927E-11
XRN1	0.3302437	2.04243E-14	3.28402E-13
XRN2	0.3674723	1.01792E-17	2.96165E-16
YIPF5	0.4508043	7.59648E-27	1.39243E-24
YTHDF3	0.3382039	4.37175E-15	7.94839E-14
YY2	0.3259277	4.62455E-14	6.88154E-13
ZBTB10	0.3463336	8.64308E-16	1.78191E-14
ZBTB11	0.3219901	9.63768E-14	1.35607E-12
ZBTB1	0.4025818	2.97129E-21	1.7315E-19
ZBTB2	0.3556547	1.27017E-16	3.0598E-15
ZBTB38	0.3166876	2.54751E-13	3.31818E-12
ZBTB41	0.3781034	9.59693E-19	3.37113E-17
ZBTB6	0.335178	7.89663E-15	1.35506E-13
ZBTB8A	0.4183796	5.48598E-23	4.47829E-21
ZC3H7A	0.4511956	6.78362E-27	1.26646E-24
ZCCHC11	0.4559086	1.71581E-27	3.49453E-25
ZCCHC4	0.3777187	1.04692E-18	3.64576E-17
ZCCHC8	0.3000739	4.73576E-12	4.8693E-11
ZCCHC9	0.3125486	5.36843E-13	6.54436E-12
ZDHHC17	0.5134192	1.41203E-35	1.29412E-32
ZDHHC20	0.329342	2.42529E-14	3.82937E-13
ZEB1	0.3201117	1.36293E-13	1.86437E-12
ZEB2	0.3437417	1.45666E-15	2.86823E-14
ZFP106	0.3050465	2.01312E-12	2.22536E-11
ZFP161	0.3726231	3.27754E-18	1.05111E-16
ZFP1	0.4519545	5.44458E-27	1.02597E-24
ZFP37	0.3277221	3.29755E-14	5.05794E-13
ZFP90	0.3472741	7.14313E-16	1.49765E-14
ZFP91	0.3105152	7.71E-13	9.18775E-12
ZFPM2	0.3701311	5.68548E-18	1.73429E-16
ZFR	0.4234459	1.45712E-23	1.2886E-21
ZFX	0.3593715	5.80787E-17	1.48987E-15
ZFYVE16	0.3822467	3.7333E-19	1.407E-17
ZGPAT	-0.351114	3.25863E-16	7.29231E-15
ZKSCAN4	0.340696	2.67331E-15	5.00482E-14
ZMPSTE24	0.4253709	8.75305E-24	8.36434E-22
ZMYM1	0.4019578	3.46374E-21	1.99541E-19
ZMYM4	0.4155086	1.1514E-22	8.9291E-21
ZMYM6	0.3900943	6.015E-20	2.69512E-18
ZMYND19	-0.34243	1.89373E-15	3.64343E-14
ZNF124	0.3154638	3.17953E-13	4.04473E-12
ZNF132	0.3152079	3.32989E-13	4.21738E-12
ZNF136	0.4246451	1.06115E-23	9.76982E-22
ZNF146	0.3530742	2.17368E-16	5.03191E-15
ZNF148	0.3073745	1.34121E-12	1.53304E-11
ZNF175	0.3795013	6.98942E-19	2.49429E-17
ZNF17	0.3952596	1.76048E-20	8.8081E-19
ZNF180	0.40979	4.93565E-22	3.28947E-20
ZNF181	0.3292843	2.45208E-14	3.86865E-13
ZNF184	0.3787481	8.29314E-19	2.92845E-17

ZNF187	0.3881212	9.56307E-20	4.02547E-18
ZNF192	0.4190285	4.6351E-23	3.79909E-21
ZNF205	-0.349856	4.21921E-16	9.21676E-15
ZNF214	0.3365654	6.0263E-15	1.06493E-13
ZNF221	0.3335788	1.0765E-14	1.80427E-13
ZNF222	0.3172381	2.30505E-13	3.03175E-12
ZNF225	0.4675833	5.18761E-29	1.45275E-26
ZNF227	0.3685352	8.07004E-18	2.39641E-16
ZNF22	0.3973789	1.05672E-20	5.53419E-19
ZNF230	0.3748486	1.99597E-18	6.6741E-17
ZNF23	0.3134235	4.5903E-13	5.66774E-12
ZNF25	0.3371412	5.38475E-15	9.56588E-14
ZNF260	0.3670646	1.11247E-17	3.2044E-16
ZNF268	0.3629113	2.73009E-17	7.44882E-16
ZNF280D	0.3566896	1.02256E-16	2.51079E-15
ZNF281	0.4534014	3.57449E-27	6.93005E-25
ZNF284	0.3843624	2.29319E-19	9.04844E-18
ZNF28	0.3258357	4.70515E-14	6.99631E-13
ZNF292	0.3336225	1.06745E-14	1.79209E-13
ZNF295	0.3426897	1.79789E-15	3.48231E-14
ZNF296	-0.396278	1.37826E-20	6.99997E-19
ZNF302	0.3456329	9.9577E-16	2.02601E-14
ZNF347	0.3338069	1.03007E-14	1.73511E-13
ZNF354C	0.3597573	5.35153E-17	1.37983E-15
ZNF367	0.3009304	4.09166E-12	4.25259E-11
ZNF37A	0.3059572	1.71816E-12	1.92036E-11
ZNF382	0.3576238	8.40171E-17	2.09918E-15
ZNF385A	-0.343182	1.62943E-15	3.18664E-14
ZNF397OS	0.3944262	2.14966E-20	1.05459E-18
ZNF408	-0.350533	3.67156E-16	8.09067E-15
ZNF417	0.347197	7.25587E-16	1.51764E-14
ZNF41	0.4130152	2.17939E-22	1.60376E-20
ZNF420	0.3480345	6.12007E-16	1.29757E-14
ZNF432	0.3082181	1.15663E-12	1.33416E-11
ZNF441	0.3416716	2.20239E-15	4.19724E-14
ZNF451	0.3588384	6.50184E-17	1.65317E-15
ZNF45	0.4727606	1.05236E-29	3.31543E-27
ZNF461	0.4054452	1.46394E-21	8.91762E-20
ZNF468	0.3255605	4.95459E-14	7.34014E-13
ZNF484	0.4229648	1.65418E-23	1.45014E-21
ZNF487	0.339721	3.24223E-15	5.99753E-14
ZNF507	0.3035434	2.61171E-12	2.80277E-11
ZNF510	0.4120748	2.76849E-22	1.98651E-20
ZNF524	-0.352093	2.66303E-16	6.05352E-15
ZNF527	0.3361605	6.52193E-15	1.14052E-13
ZNF529	0.3603277	4.74083E-17	1.24303E-15
ZNF532	0.3264112	4.22268E-14	6.31617E-13
ZNF546	0.3285668	2.81004E-14	4.38535E-13
ZNF548	0.3505649	3.64792E-16	8.05619E-15
ZNF551	0.3909883	4.87027E-20	2.21669E-18
ZNF559	0.342633	1.81835E-15	3.50846E-14
ZNF566	0.3621312	3.22684E-17	8.75676E-16

ZNF567	0.411475	3.22365E-22	2.27772E-20
ZNF581	-0.346947	7.63264E-16	1.58167E-14
ZNF585B	0.3718295	3.90799E-18	1.2312E-16
ZNF593	-0.366071	1.38074E-17	3.92664E-16
ZNF598	-0.361774	3.4828E-17	9.36317E-16
ZNF599	0.3560468	1.1701E-16	2.83566E-15
ZNF611	0.3157459	3.02142E-13	3.86309E-12
ZNF615	0.3218928	9.81287E-14	1.37783E-12
ZNF616	0.3036954	2.54403E-12	2.7416E-11
ZNF619	0.3471237	7.36461E-16	1.53401E-14
ZNF621	0.3172931	2.2821E-13	3.00352E-12
ZNF627	0.4276935	4.71186E-24	4.70323E-22
ZNF641	0.4036086	2.30701E-21	1.36411E-19
ZNF643	0.3403549	2.86022E-15	5.32016E-14
ZNF644	0.5611907	1.43313E-43	2.88962E-40
ZNF668	-0.34081	2.61363E-15	4.90676E-14
ZNF678	0.388909	7.94986E-20	3.41776E-18
ZNF680	0.3561796	1.13799E-16	2.77452E-15
ZNF684	0.5884235	9.6854E-49	3.90574E-45
ZNF689	0.4500812	9.36007E-27	1.68092E-24
ZNF699	0.3855955	1.72333E-19	6.9774E-18
ZNF701	0.3471783	7.2834E-16	1.52182E-14
ZNF709	0.3163171	2.72458E-13	3.52589E-12
ZNF718	0.3539623	1.80774E-16	4.23335E-15
ZNF765	0.3931715	2.90053E-20	1.38346E-18
ZNF776	0.3269576	3.80968E-14	5.7712E-13
ZNF780B	0.343096	1.65767E-15	3.23559E-14
ZNF791	0.3854548	1.78052E-19	7.18013E-18
ZNF804A	0.313568	4.47287E-13	5.53291E-12
ZNF813	0.3077497	1.25581E-12	1.44032E-11
ZNF81	0.3290964	2.54122E-14	3.99366E-13
ZNF826	0.3067434	1.49784E-12	1.6969E-11
ZNF827	0.4138971	1.74014E-22	1.29471E-20
ZNF828	0.3147901	3.59052E-13	4.51908E-12
ZNF845	0.3036964	2.54358E-12	2.7416E-11
ZNF92	0.3353689	7.60895E-15	1.31016E-13
ZNHIT6	0.3942128	2.26222E-20	1.10443E-18
ZRANB2	0.3446351	1.21748E-15	2.44016E-14
ZRANB3	0.3906176	5.31617E-20	2.40876E-18
ZSCAN20	0.3221948	9.27922E-14	1.30929E-12
ZWILCH	0.3396679	3.27645E-15	6.05527E-14
ZYG11B	0.4370234	3.72872E-25	4.72843E-23
ZZZ3	0.5538813	2.91078E-42	5.33545E-39

Supplementary Table 2. Cancer-related annotations of *PIGK* co-expressed genes identified by IPA

Diseases or Functions Annotation	*P*-value	Predicted Activation State	Activation z-score	Molecules
Cancer	6.79E-180	Increased	2.049	1882
Organization of cytoplasm	3.08E-17	Increased	3.661	329
Repair of DNA	1.01E-16	Increased	4.367	97
Cell death of osteosarcoma cells	1.56E-13	Increased	3.244	38
Cell viability	7.66E-13	Increased	3.916	310
Cell survival	2.18E-12	Increased	4.135	318
Microtubule dynamics	8.76E-12	Increased	3.522	253
Organization of cytoskeleton	1.01E-11	Increased	3.635	281
Cell proliferation of tumor cell lines	2.08E-11	Increased	4.182	435
DNA replication	6.33E-11	Increased	2.212	63
Cell viability of tumor cell lines	9.58E-11	Increased	3.974	218
Metabolism of DNA	1.22E-09	Increased	2.047	82
Formation of cellular protrusions	3.96E-09	Increased	2.965	203
Interphase	1.47E-08	Increased	2.244	151
Repair of cells	3.83E-08	Increased	3.636	45
Double-stranded DNA break repair	5.61E-08	Increased	2.813	48
Necrosis of tumor	9.29E-08	Increased	2.126	88
Cell death of tumor cells	1.19E-07	Increased	2.126	86
Invasive cancer	1.32E-07	Increased	3.576	288
Repair of tumor cell lines	1.47E-07	Increased	3.666	37
Double-stranded DNA break repair of tumor cell lines	1.6E-07	Increased	2.568	27
Double-stranded DNA break repair of cells	2.77E-07	Increased	2.781	32
Cell death of fibroblast cell lines	4.18E-07	Increased	2.518	78

Supplementary Table 3. PIGK-interacting proteins from BioGRID

#BioGRID Interaction ID	Official Symbol Interactor A	Official Symbol Interactor B	Experimental System	Organism Name Interactor B
3180044	B3GAT3	PIGK	Affinity Capture-MS	Homo sapiens
2638007	BST2	PIGK	Affinity Capture-MS	Homo sapiens
2981524	CALR3	PIGK	Proximity Label-MS	Homo sapiens
3349740	CANX	PIGK	Affinity Capture-MS	Homo sapiens
3376722	CCDC47	PIGK	Affinity Capture-MS	Homo sapiens
3581082	CLEC16A	PIGK	Affinity Capture-MS	Homo sapiens
3159099	CLEC2B	PIGK	Affinity Capture-MS	Homo sapiens
3352167	COPE	PIGK	Affinity Capture-MS	Homo sapiens
3181172	CST9L	PIGK	Affinity Capture-MS	Homo sapiens
2798069	E	PIGK	Proximity Label-MS	Homo sapiens
2887886	E5	PIGK	Affinity Capture-MS	Homo sapiens
2782375	EMC1	PIGK	Affinity Capture-MS	Homo sapiens
2804000	ESR1	PIGK	Affinity Capture-MS	Homo sapiens
2520291	ESR2	PIGK	Affinity Capture-MS	Homo sapiens
2935761	FAM20C	PIGK	Affinity Capture-MS	Homo sapiens
3171217	FBXO2	PIGK	Affinity Capture-MS	Homo sapiens
912908	FBXO6	PIGK	Affinity Capture-MS	Homo sapiens
3148831	GP9	PIGK	Affinity Capture-MS	Homo sapiens
286659	GPAA1	PIGK	Affinity Capture-Western	Homo sapiens
3624752	GRM2	PIGK	Affinity Capture-MS	Homo sapiens
3517642	HIST1H3C	PIGK	Proximity Label-MS	Homo sapiens
3148134	HS2ST1	PIGK	Affinity Capture-MS	Homo sapiens
3173155	IDS	PIGK	Affinity Capture-MS	Homo sapiens
2831861	KIF20A	PIGK	Affinity Capture-MS	Homo sapiens
3193231	KLK15	PIGK	Affinity Capture-MS	Homo sapiens
3162195	LPAR1	PIGK	Affinity Capture-MS	Homo sapiens
2995093	LRRC59	PIGK	Proximity Label-MS	Homo sapiens
1189086	LYPD3	PIGK	Affinity Capture-MS	Homo sapiens
2933123	NR3C1	PIGK	Proximity Label-MS	Homo sapiens
2800159	nsp4	PIGK	Proximity Label-MS	Homo sapiens
2876161	nsp4ab	PIGK	Affinity Capture-MS	Homo sapiens
2800561	nsp6	PIGK	Proximity Label-MS	Homo sapiens
3495571	ORF10	PIGK	Proximity Label-MS	Homo sapiens
2801287	ORF14	PIGK	Proximity Label-MS	Homo sapiens
2802155	ORF7a	PIGK	Proximity Label-MS	Homo sapiens
2802629	ORF7b	PIGK	Proximity Label-MS	Homo sapiens
3580506	ORF8	PIGK	Proximity Label-MS	Homo sapiens
3165396	P2RX2	PIGK	Affinity Capture-MS	Homo sapiens
3402867	PARK2	PIGK	Affinity Capture-MS	Homo sapiens
2999388	PDIA4	PIGK	Proximity Label-MS	Homo sapiens
3362777	PGRMC1	PIGK	Affinity Capture-MS	Homo sapiens
1450065	PIGS	PIGK	Affinity Capture-MS	Homo sapiens
3177773	PIGT	PIGK	Affinity Capture-MS	Homo sapiens
3396818	PLD3	PIGK	Affinity Capture-MS	Homo sapiens
3396925	PLD4	PIGK	Affinity Capture-MS	Homo sapiens
3396998	PLD6	PIGK	Affinity Capture-MS	Homo sapiens
2749571	PLEKHA4	PIGK	Affinity Capture-MS	Homo sapiens
3486678	POMK	PIGK	Affinity Capture-MS	Homo sapiens
3167930	PRG2	PIGK	Affinity Capture-MS	Homo sapiens

1190099	PRSS50	PIGK	Affinity Capture-MS	Homo sapiens
3181011	PSCA	PIGK	Affinity Capture-MS	Homo sapiens
3379303	RAB7A	PIGK	Proximity Label-MS	Homo sapiens
3517814	RAF1	PIGK	Affinity Capture-MS	Homo sapiens
3331714	RHOA	PIGK	Affinity Capture-MS	Homo sapiens
3335602	RHOF	PIGK	Affinity Capture-MS	Homo sapiens
2492930	RNF4	PIGK	Affinity Capture-MS	Homo sapiens
3630456	RPA1	PIGK	Proximity Label-MS	Homo sapiens
3633488	RPA2	PIGK	Proximity Label-MS	Homo sapiens
3635861	RPA3	PIGK	Proximity Label-MS	Homo sapiens
3004896	RPN1	PIGK	Proximity Label-MS	Homo sapiens
2637122	SLC15A3	PIGK	Affinity Capture-MS	Homo sapiens
3162906	ST8SIA5	PIGK	Affinity Capture-MS	Homo sapiens
3008711	SYNE3	PIGK	Proximity Label-MS	Homo sapiens
1430907	TCTN3	PIGK	Proximity Label-MS	Homo sapiens
3563984	TGOLN2	PIGK	Proximity Label-MS	Homo sapiens
3091860	THY1	PIGK	Affinity Capture-MS	Homo sapiens
3373319	TMED10	PIGK	Affinity Capture-MS	Homo sapiens
3186940	TMEM106A	PIGK	Affinity Capture-MS	Homo sapiens
3306216	TMEM106B	PIGK	Proximity Label-MS	Homo sapiens
2689982	TRIM28	PIGK	Affinity Capture-MS	Homo sapiens
3522049	TRIM67	PIGK	Affinity Capture-MS	Homo sapiens
3155209	TSPAN15	PIGK	Affinity Capture-MS	Homo sapiens
2637564	UNC93B1	PIGK	Affinity Capture-MS	Homo sapiens
3374737	VAPA	PIGK	Affinity Capture-MS	Homo sapiens
3148953	VAPB	PIGK	Affinity Capture-MS	Homo sapiens
3472271	ZRANB1	PIGK	Affinity Capture-MS	Homo sapiens

Supplementary Table 4. PIGK-interacting proteins significantly correlated with *PIGK* expression in TCGA/HNC

Official Symbol Interactor A	Correlation significance	Correlation coefficient
PIGS	***	0.508
IDS	***	0.327
EMC1	***	0.662
CCDC47	***	0.414
B3GAT3	*	0.108
NR3C1	***	0.59
CLEC16A	***	0.403
PGRMC1	***	0.462
CANX	***	0.615
CALR3	***	0.173
HS2ST1	***	0.71
LYPD3	***	-0.279
LRRC59	***	0.37
FAM20C	***	0.217
PDIA4	***	0.463
PARK2	***	0.31
HIST1H3C	*	0.101
GRM2	**	0.346
GPAA1	**	0.249
ESR1	***	0.333
LPAR1	***	0.454
KIF20A	***	0.54
ESR2	***	0.237
PIGT	***	0.464
PLD3	***	0.353
PLD4	***	0.252
PLD6	***	0.207
PLEKHA4	***	0.231
POMK	***	0.451
PRG2	**	0.146
PRSS50	*	0.109
PSCA	*	-0.115
RAB7A	***	0.243
RAF1	***	0.422
RHOA	***	0.446
RNF4	***	0.481
RPA1	***	0.494
RPA2	***	0.469
RPA3	***	0.302
RPN1	***	0.44
SLC15A3	***	0.164
ST8SIA5	***	0.198
SYNE3	***	0.433
TCTN3	***	0.528
TGOLN2	***	59
THY1	***	0.292
TMED10	***	0.6
TMEM106A	***	0.505
TMEM106B	***	0.5

TRIM28	***	0.179
TRIM67	***	0.28
TSPAN15	***	0.289
UNC93B1	***	0.296
VAPA	***	0.37
VAPB	***	0.475
ZRANB1	***	0.45

*$P < 0.05$, **$P < 0.01$, ***$P < 0.001$

Supplementary Table 5. Refined physical interactors of PIGK used for PPI network construction

Gene
B3GAT3
CALR3
CANX
CCDC47
EMC1
ESR1
ESR2
FAM20C
GPAA1
HS2ST1
KIF20A
LPAR1
LRRC59
LYPD3
NR3C1
PDIA4
PGRMC1
PIGS
PIGT
PLD3
PLD4
PLEKHA4
PRSS50
RAB7A
RAF1
RHOA
RNF4
RPA1
RPA2
RPA3
RPN1
TCTN3
TGOLN2
THY1
TMED10
TMEM106B
TRIM28
UNC93B1
VAPA
VAPB