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Supplemental information

Human iPSC-derived fallopian tube organoids

with BRCA1 mutation recapitulate

early-stage carcinogenesis

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Figure S1 (Related to Figure 1). BRCA1^{mut}-iPSC lines exhibit normal karyotypes, even after extensive

culturing. G-band analysis of karyotype for (A) BRCA1mut-iPSC lines and (B) control iPSC lines at passage 9. (C)

Karyotype analysis for 87i-CTR-n3 control and BRCA1 mutant 70i-BRCA-n1 and 79i-BRCA-n2 at passage 32.



Figure S2 (Related to Figure 1). *BRCA1^{mut}*-iPSC lines have the capacity to differentiate into three germ layers and (Related to Figure 2) to differentiate of *BRCA1^{mut}*-iPSC into Intermediate Mesoderm-Like Cells. (A) The factors and markers involved in the differentiation of three different germ layers (Chambers et al., 2009; Mae et al., 2013; Teo et al., 2014; Yucer et al., 2017). Expression of ectoderm marker *PAX6*, mesoderm marker *BRACHYURY*, and endoderm marker *SOX17* during course of differentiations. Relative gene expression to iPSC stage (day 0) was calculated using the $\Delta\Delta$ Ct method and normalized to endogenous *GAPDH* level. Error bars are Standard Error of the Mean (SEM) (n = 3 independent biological experiments and each dot represents the average of 3 independent

biological experiments per line). (B) Expression kinetics of mesoderm markers *BRACHYURY* and *MIXL1* during the 6-day differentiation course using established protocol (Yucer et al., 2017). (C) Expression of intermediate mesoderm markers, *PAX2*, *OSR1*, and *GATA3* during the 6-day differentiation course. (D) Immunocytochemistry for FTE marker PAX8 in *BRCA1^{mut}*-FTE organoid (70i-BRCA line) at day 30 in culture. Scale bars, 50 µm. Relative gene expression at iPSC stage (day 0) was calculated using the $\Delta\Delta$ Ct method and normalized to endogenous *GAPDH* level. Error bars are Standard Error of the Mean (SEM) (n = 3 independent biological experiments and each dot represents the average of 3 independent biological experiments per line).



Figure S3 (Related to Figure3). Histological characterization of controls and *BRCA1^{mut}* **FTE organoids.** (A) H&E staining of normal FTE organoids at 4-months and quantification tissue thickness distribution. (B) FTE organoids thickness distribution by genotype. (C) H&E staining image, which was stitched using Stereo

Investigator to indicate the cellular outgrowth (D) Cellular outgrowth measured as arithmetic average roughness by

genotype.

$$R_{\mathbf{a}} = rac{1}{n}\sum_{i=1}^n |y_i|$$

Significance calculated using student t-test, ***p<0.00



Figure S4 (Related to Figure4). *BRCA1^{mut}*-**iPSC-derived fallopian tube organoids present cellular signature of STIC pathology** *in vitro*. (A) Immunocytochemistry for TP53 and Ki67 for 3 different *BRCA1^{mut}*-FTE-organoids. Scale bars, 50 μm. Cilia formation at 6-months shown by (B) immunocytochemistry for FTE secretory cell marker OVGP1 and ciliated cell marker TUBB4A and FOXJ1 and (C) H&E staining in 80iCTR line organoids. Scale bars, 25 μm and 50 μm. (D) Immunocytochemistry for FTE secretory cell marker TUBB4A in for 3 different *BRCA1^{mut}*-FTE organoids at 4 months. Scale bars, 50 μm.





Figure S5 (Related to Figure4). *BRCA1^{mut}*-**iPSC-derived fallopian tube organoids exhibit the molecular basis for STIC pathology** *in vitro*. Differential gene expression and GSEA for control and *BRCA1^{mut}*-FTE organoids at 4month in culture. FDR value is < 0.05. Z-scores of the leading-edge genes were calculated and used to construct a heatmap.



Figure S6 (Related to Figure 5). The decrease in *BRCA1* expression in *BRCA1^{mut}*-iPSC-derived fallopian tube organoid is not due to loss of heterozygosity (LOH). (A) qRT-PCR quantification of full-length *BRCA1* gene expression at 1 month and 1 year. (B) qRT-PCR quantification of Delta exon 11 *BRCA1* gene expression. (C) Fragment mapping for the *BRCA1* gene on RNA sequencing data at 1-year culture. Relative gene expression to 87i-CTR was calculated using $\Delta\Delta$ Ct method and normalized to endogenous *GAPDH* level. Error bars are Standard Error of the Mean (SEM) (n = 3 independent biological experiments and each dot represents the average of 3 independent biological experiments per line). Significance calculated using One-way ANOVA, Dunnett Multiple comparisons,*p<0.05. (D) Differential gene expression and GSEA for control and *BRCA1^{mut}*-FTE organoids at 1 year in culture. FDR value is < 0.05. Z-scores of the leading-edge genes were calculated and used to construct a heatmap.



Figure S7 (Related to Figure6). *BRCA1^{mut}*-**iPSC-derived fallopian tube organoids demonstrate cancerous characteristics** *in vivo.* (A) H&E images for normal control and *BRCA1^{mut}*-FTE organoids within the mammary gland. (B) Brightfield images at 3 months post-transplantation of 87i-CTR FTE organoids and 79i-BRCA FTE organoids (after 4 months in culture), and total number of nodules per experiment. (C) H&E and TP53 immunohistochemistry images at 3 months post-transplantation. Scale bars, 50 μm.(D) Immunocytochemistry for TP53, Ki67, gH2AX and Cleaved Caspase3 in response to 100 mM DMSO, Rucaparib, Niraparib and Olaparib at 24, 48 and 72 hours treatment of primary cells from *BRCA1^{mut}* tumor lesions. (E) Time course of cellular

cytotoxicity assay (LDH assay) in response to 100, 10, 5 and 1 mM DMSO, Rucaparib, Niraparib and Olaparib at 24, 48 and 72 hours treatment of primary cells from *BRCA1^{mut}* tumor lesions.

 Table S1 (Related to Figure3). Gene enrichment sets for control vs BRCA1^{mut}-FTE organoids at 4-month

 culture

NAME	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
CAR_HPX	58	0.6686738	2.296964	0	0	0	1512	tags=36%, list=8%, signal=39%
GNF2_CCNA2	67	0.65380585	2.2726195	0	0	0	3785	tags=61%, list=19%, signal=76%
GNF2_CCNB2	56	0.6678471	2.2662804	0	0	0	3653	tags=61%, list=19%, signal=75%
GNF2_CDC20	55	0.66336524	2.2533634	0	0	0	3785	tags=62%, list=19%, signal=77%
GNF2_HMMR	47	0.6797286	2.2286162	0	0	0	3785	tags=68%, list=19%, signal=84%
GNF2_CDC2	61	0.6328634	2.2126033	0	0	0	3653	tags=54%, list=19%, signal=66%
GNF2_CENPF	61	0.636856	2.1734078	0	1.60E-04	0.001	3653	tags=56%, list=19%, signal=68%
GNF2_CENPE	40	0.6784023	2.1681633	0	1.40E-04	0.001	3653	tags=60%, list=19%, signal=74%
GNF2_HPX	111	0.562162	2.148408	0	1.25E-04	0.001	1688	tags=32%, list=9%, signal=34%
MODULE_24	404	0.48340335	2.1414783	0	1.12E-04	0.001	2470	tags=31%, list=13%, signal=35%
GNF2_HPN	111	0.5525837	2.114176	0	2.00E-04	0.002	1688	tags=32%, list=9%, signal=34%
GNF2_TST	92	0.5701473	2.1135342	0	1.84E-04	0.002	1688	tags=33%, list=9%, signal=36%
MODULE_342	202	0.5081765	2.1120644	0	2.52E-04	0.003	1930	tags=34%, list=10%, signal=38%
GNF2_MKI67	28	0.71962315	2.095437	0	3.16E-04	0.004	3652	tags=71%, list=19%, signal=88%
GNF2_PCNA	67	0.5948131	2.0905054	0	3.72E-04	0.005	4503	tags=60%, list=23%, signal=77%
GNF2_LCAT	105	0.5475117	2.084383	0	3.49E-04	0.005	2034	tags=33%, list=10%, signal=37%
GNF2_BUB1	26	0.70440525	2.075836	0	3.95E-04	0.006	4113	tags=65%, list=21%, signal=83%
GNF2_RRM2	39	0.6553588	2.0745828	0	3.73E-04	0.006	3785	tags=64%, list=19%, signal=79%
GNF2_ESPL1	35	0.6514922	2.0113218	0	0.001224449	0.02	3785	tags=63%, list=19%, signal=78%
GNF2_GSTM1	93	0.5400912	2.004573	0	0.001499126	0.026	1688	tags=30%, list=9%, signal=33%
MODULE_180	115	0.5121064	1.989555	0	0.001798731	0.033	2229	tags=39%, list=11%, signal=44%
GNF2 MCM4	53	0.58221394	1.9832239	0.001941748	0.001918978	0.037	3886	tags=55%, list=20%, signal=68%

 Table S2 (Related to Figure3). Functional annotation for control vs BRCA1^{mut} -FTE organoids at 4 months by

 IPA software

	Categories	Diseases or Functions Annotation	p-value	z-score	Gene List	# Molecules
2	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Solid tumor	2.5E-48 7.95E-48	0.139	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1591
3	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Cancer Malignant solid tumor	1.5E-47 1.92E-47	0.821	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1597
5	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Non-hematological solid tumor Nonhematologic malignant neoplasm	5.85E-44 1.15E-43	0.351	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1562
7	Cancer, Organismal Injury and Abnormalities	Tumorigenesis of tissue	1.52E-42	0.698	A1CF,ABCB11,ABCC3	1544
9	Cancer,Organismal Injury and Abnormalities	Non-melanoma solid tumor	1.53E-40	-0.481	A1CF,ABCB11,ABCC3	1544
10	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Epithelial neoplasm	7.53E-40	0.511	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1531
12	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Abdominal cancer Adenocarcinoma	2.81E-39 3.78E-34	2.458	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1460 1363
14	Cancer, Organismal Injury and Abnormalities Cancer Gastrointestinal Disease Organismal Injury and Abnormalities	Abdominal carcinoma Digestive organ tumor	1.36E-32 2.73E-32	2.431	A1CF,ABCB11,ABCC3 A1CF ABCB11 ABCC3	1402
16	Cancer, Organismal Injury and Abnormalities	Abdominal adenocarcinoma	2.97E-31	1.673	A1CF,ABCB11,ABCC3	1329
17	Cancer,Gastrointestinai Disease,Organismai injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Genitourinary tumor	5.49E-28	0.512	A1CF,ABCC3,ABCF2,F	1078
19 20	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Gastrointestinal tumor Malignant genitourinary solid tumor	8.6E-28 3.74E-27	0.255 0.304	ABCB11,ABCC3,ABCF A1CF,ABCC3,ABCF2,A	1266 1058
21	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Gastrointestinal tract cancer Intestinal tumor	1.21E-25 2.97E-25	1.388	ABCB11,ABCC3,ABCF ABCB11,ABCC3,ABCF	1253
23	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Large intestine neoplasm	5.19E-25 7.29E-25	1.497	ABCB11,ABCC3,ABCF	1209
25	Cancer, Organismal Injury and Abnormalities	Incidence of tumor	3.8E-24	0.537	A1CF,ABCB11,ABCC3	1084
26	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Intestinal cancer Malignant neoplasm of large intestine	1.9E-23 2.38E-23	1.585	ABCB11,ABCC3,ABCF ABCB11,ABCC3,ABCF	1199
28 29	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Anogenital cancer Head and neck cancer	3.48E-23 4.48E-23	-0.248 0.026	A1CF,ABCC3,ABCF2,A A1CF,ABCB11,ABCC3	978 1229
30	Cancer, Organismal Injury and Abnormalities	Head and neck carcinoma	2.34E-22 2.81E-22	0 28	A1CF ABCB11 ABCC3	1220
32	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Endocrine gland tumor	6.67E-22	0.072	A1CF,ABCB11,ABCC3	1183
34	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Breast or gynecological cancer	9.69E-22	-0.363	A1CF,ABCC3,ABCF2,A	790
35	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Frequency of tumor	1.37E-21 1.85E-21	0.114 1.137	A1CF,ABCC3,ABCF2,A A1CF,ABCB11,ABCC3	933
37	Cancer, Organismal Injury and Abnormalities Cancer, Endocrine System Disorders, Organismal Injury and Abnormalities	Tumorigenesis of epithelial neoplasm Nonpituitary endocrine tumor	2.36E-21 2.78E-21	1.112 0.179	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1031 1175
39 40	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Development of carcinoma Genitourinary carcinoma	4.96E-21 6.26E-21	1.388	A1CF,ABCB11,ABCC3 A1CF,ABCC3 ABCF2 4	1018
41	Cancer, Organismal Injury and Abnormalities	Development of malignant tumor	7.19E-21	1.189	A1CF,ABCB11,ABCC3	1028
43	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Female genital neoplasm	8.89E-21	0.239	A1CF,ABCC3,ABCF2,A	665
44 45	Cancer, Organismai Injury and Abnormalities, Reproductive System Disease Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Gastrointestinal carcinoma	1.87E-20	0.426	ABCB11,ABCC3,ABCF2,A	1187
46 47	Cancer,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Neck neoplasm Thyroid gland tumor	2.01E-20 8.8E-20		A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1172 1159
48	Inflammatory Response, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Inflammation of organ Genital tumor	1.06E-19 1.83E-19	-1.399	ABCB11,ACE2,ACKR4 A1CF,ABCC3,ABCF2,4	275
50	Organismal Development	Morphology of body cavity	2.8E-19 3.69E-10	0.555	ABCB11,ACE2,ACSL1	319
52	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Genital tract cancer	3.92E-19	-0.655	A1CF,ABCC3,ABCF2,A	871
53 54	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Endocrine cancer Endocrine carcinoma	7.82E-19		A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1156
55 56	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Thyroid cancer Thyroid carcinoma	1.31E-18 1.69E-18		A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	1151 1149
57 58	Cancer, Organismal Injury and Abnormalities Organismal Development Organismal Injury and Abnormalities	Genitourinary adenocarcinoma Abnormal morphology of abdomen	5.73E-18 8.38E-18	1.709	A1CF,ABCC3,ABCF2,A ABCB11,ACF2,ACTG2	824
59	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Intestinal carcinoma	1.87E-17	0.816	ABCB11,ABCC3,ABCF	1122
61	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Breast or pancreatic cancer	2.48E-17 2.9E-17	0.265	ABCB11,ABCC3,ABCF	695
62	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease Cancer, Organismal Injury and Abnormalities	Neoplasia of cells	3.55E-17 9.27E-17	0.13	A1CF,ABCC3,ABCF2,F A1CF,ABCB11,ABCC3	768
64 65	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Female genital tract serous carcinoma Psoriasis	1.08E-16 1.85E-16	2.449	ACTG2,ALDH1A1,ANX AGER,ALDH1A3,ANX4	99 127
66 67	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Intestinal adenocarcinoma Chronic inflammatory disorder	1.95E-16 2.59E-16	0	ABCB11,ABCC3,ABCF ACSL1,ACTA1,ADCY8	1109
68	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Large intestine adenovation a	2.72E-16	0.063	ABCB11,ABCC3,ABCF	1108
70	Cancer, Organismal injury and Abnormalities, Reproductive System Disease Cancer, Organismal Injury and Abnormalities	Breast or colorectal cancer	5.5E-16	1.148	ABCC3,ABCF2,ABLIM ABCC3,ABCF2,ABLIM	840
71	Digestive System Development and Function Organismal Development	Morphology of digestive system Abnormal morphology of body cavity	1.02E-15 1.13E-15		ABCB11,AGR2,AGTR2 ABCB11,ACE2,ACSL1	155 277
73	Cellular Movement Cancer,Organismal Injury and Abnormalities	Cell movement Development of adenocarcinoma	3.22E-15 3.33E-15	-0.801 1.522	ACE2,ACKR4,ADAMTS ABCB11,ABCC3,ABCF	407 684
75	Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer Organismal Injury and Abnormalities	Colorectal disorder Advanced malignant tumor	3.73E-15 8.5E-15	-0.935	ABCC3,ABCF2,ABLIM: ABCC3,ABLIM1,AFAP1	752
77	Digestive System Development and Function, Gastrointestinal Disease	Abnormal morphology of digestive system	2.07E-14	0.051	ABCB11,AGR2,AGTR2	126
79	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Uterine tumor	6.56E-14	-0.651	A1CF,ACSL1,ACSM3,4	505
80 81	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cellular Movement	Female genital tract adenocarcinoma Migration of cells	6.6E-14 1.03E-13	-0.95	ABCC3,ABCF2,ABLIM: ACE2,ADARB1,ADCY/	525 364
82 83	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Colorectal tumor Pelvic adenocarcinoma	1.06E-13 2.19E-13	1.497	ABCC3,ABCF2,ABLIM: A1CF,ABCC3,ABCF2,A	725
84 85	Inflammatory Response Cancer Organismal Injury and Abnormalities	Inflammation of absolute anatomical region Serous adenocarcinoma	2.44E-13 3.39E-13	-1.028	ABCB11,ACE2,ACKR4 ABLIM2,ACTG2,ADCY;	223
86	Cancer, Organismal Injury and Abnormalities	Advanced malignant solid tumor	4.13E-13	0.998	ABCC3,AFAP1L1,AGR	153
88	Cancer, organisma injury and Abnormalities, (Ceptoductate system Disease Cancer, Organismal Injury and Abnormalities	Extraadrenal retroperitoneal tumor	1.03E-12	0.17	ABCB11,ABCC3,ABO,	507
90	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Inflammatory Response	Inflammation of body cavity	1.08E-12 1.81E-12	-1.166	ABCB11,ACE2,AGER,/	189
91 92	Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Gonadal tumor Respiratory system tumor	2.19E-12 3.66E-12	0.647	ABCC3,ABCF2,ABLIM: ABCB11,ABCC3,ABO,/	301 460
93 94	crine System Disorders, Organismal Injury and Abnormalities, Reproductive System Dis Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Ovarian lesion Ovarian tumor	5.58E-12 8E-12	0.816 0.447	ABCC3,ABCF2,ABLIM: ABCC3,ABCF2,ABLIM:	290 289
95 96	Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Skin lesion	8.77E-12 8.8E-12	0.113	A1CF,ABCB11,ABCC3 ABCC3 ABCE2 ABLIM	877
97	Cancer, Organismal Injury and Abnormalities	Advanced extracranial solid tumor	1.02E-11	1.12	ABCC3,ANK3,ANXA8/	125
99	Organismal injury and Abriomalities,Reproductive System Disease	Abnormal growth in endometrium	1.44E-11	0.13	A1CF,ACSL1,ACSM3,AD	449
100	Cell-To-Cell Signaling and Interaction Organismal Injury and Abnormalities,Reproductive System Disease	Interaction of tumor cell lines Abnormality of endometrium	1.63E-11 1.89E-11	0.85	ADAM28,APOH,BCAN, A1CF,ACSL1,ACSM3,A	92 449
102	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cancer,Organismal Injury and Abnormalities	Male genital neoplasm Cancer of cells	2.35E-11 2.82E-11	-0.359 0.579	A1CF,ABO,ACSM3,AD ABCB11,ABCC3,ABLIN	532 630
104	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Prostate cancer Breast or ovarian carcinoma	3E-11 3.13E-11	0.762	A1CF,ABO,ACSM3,AD ABCC3,ABCF2 ABL IM	522 420
106	indocrine System Disorders,Organismal Injury and Abnormalities,Reproductive System Organismal Survival	Primary ovarian cancer Organismal death	4.14E-11 5.24E-11	-0.83	AGR2,ANXA10,AOC1,E ABCB11,ACE2,ACT41	26 393
108	Cancer,Organismal Injury and Abnormalities	Malignant solid organ tumor	5.27E-11	-1.13	A1CF,ABCB11,ABCC3	875
110	Organismal Survival	Morbidity or mortality	6.21E-11	-0.726	ABCB11,ACE2,ACTA1	397
111	Cell-To-Cell Signaling and Interaction e Disorders,Inflammatory Disease,Organismal Injury and Abnormalities,Skeletal and M	Binding of tumor cell lines Rheumatic Disease	7E-11 7.99E-11	0.731 -1.805	ADAM28,APOH,BCAN, ACSL1,ACSL5,ACTA1,	88 225
113 114	Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Skin tumor Liver lesion	8.45E-11 9.37E-11	-1.322 0.931	A1CF,ABCB11,ABCC3 A1CF,ABCB11,ABCC3	864 728
115 116	Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Skin cancer Malignant neoplasm of retroperitoneum	1.07E-10 1.11E-10	-0.6	A1CF,ABCB11,ABCC3 ABCB11,ABO,AC0040	859 455
117	Tissue Development Cancer Organismal Injury and Abnormalities Reproductive System Discours	Growth of epithelial tissue	1.15E-10 1.3E-10	-1.11	AGER, AGR2, AGTR2, A	138
119	indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Advanced ovarian carcinoma Metaboliam of c livia carcinoma	1.3E-10		ANXA8/ANXA8L1,ARL	37
120	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Endometrial cancer	1.33E-10 1.43E-10	_	A1CF,ACSL1,ACSM3,	47
122	Tissue Morphology Cellular Growth and Proliferation,Tissue Development	Quantity of cells Proliferation of epithelial cells	1.76E-10 1.86E-10	0.37 -1.518	AGR2,AGTR2,AREG,A	309
124 125	Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System Immunological Disease	Advanced ovarian cancer Systemic autoimmune syndrome	1.9E-10 1.96E-10	0.164	ANXA8/ANXA8L1,ARL ACSL1,ACSL5,ACTA1.	39 231
126 127	Cancer,Organismal Injury and Abnormalities	Squamous cell tumor Advanced ovarian adenocarcinome	2.4E-10 2.55E-10	0.96	ABCB11,ABCC3,ABO, ANXA8/ANXA8L1 API	474
128	gestive System Development and Function, Organ Morphology, Organismal Developme	Morphology of intestine	2.74E-10		AGR2,AP1M2,AREG,B	59
129	Cancer,Organismal injury and Abnormalities,Reproductive System Cancer,Organismal Injury and Abnormalities	Squamous-cell carcinoma	3.09E-10 3.37E-10	1.119	ABCB11,ABCC3,ABO,	473
131 132	Lipid Metabolism,Small Molecule Biochemistry Cancer,Organismal Injury and Abnormalities	Metabolism of acylglycerol Primary tumor	3.79E-10 4.11E-10	0.599	ACSL1,ACSL5,ALDH1 AFAP1L1,AGR2,ANXA	40 86
133 134	Organismal Injury and Abnormalities Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Benign lesion Cutaneous melanoma	4.16E-10 5.08E-10	-0.192	ADARB1,AGER,AJUBA A1CF,ABCB11,ABCC3	173 816
135	nd Function,Gastrointestinal Disease,Organ Morphology,Organismal Development,Org	Abnormal morphology of intestine	5.44E-10	-0.336	AGR2,AP1M2,AREG,C	53
137	Cancer, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Uterine serous papillary cancer	7.3E-10	-0.336	ACTG2,ALDH1A1,B3G	51
138 139	Cellular Movement Gastrointestinal Disease,Inflammatory Disease	Invasion of cells Inflammatory Bowel Disease	7.82E-10 7.82E-10	0.027 1.628	ABLIM1, AFAP1L1, AGE ACSL1, AGER, B3GAT1	189 85
140 141	Cancer, Organismal Injury and Abnormalities Cellular Development, Tissue Development	Thoracic neoplasm Differentiation of epithelial tissue	7.94E-10 9.56E-10	1.705 1.571	ABCB11,ABCC3,ABO, AGER,AQP3,BMP4,BM	391 84
142	Cancer,Organismal Injury and Abnormalities,Respiratory Disease	Lung tumor	1.11E-09 1.17E-09	1.467	ABCB11,ABCC3,ABO, A1CE,ABCB11,ABCC3	387
144	Cancer, Organismal Injury and Abnormalities	Advanced adenocarcinoma	1.19E-09	2.024	ABCC3,ANXA8/ANXA8	53
145	Cancer, Organismal Tury and Abnormalities	Secondary tumor	1.23E-09	0.703	ABCC3,ABLIM1,AFAP1	182
147	Cer, Gastroimestinal Disease, Hepatic System Disease, Organismal Injury and Abnormal Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Liver tumor Mammary tumor	1.49E-09 1.78E-09	2.016 0.439	ATCF,ABCB11,ABCC3 ABLIM1,ABO,ADAM28,	696 365
149	Cardiovascular Disease, Organismal Injury and Abnormalities	Vaso-occlusion	1.85E-09	-0.652	ABO,AGER,ANGPTL3,	105

151	Cancer Organismal Injury and Abnormalities	Intrathoracic malignant tumor	2.06E-09	1 507	ABCB11 ABCC3 ABO	380
152	Organismal Injury and Abnormalities, Reproductive System Disease	Benign pelvic disease	2.23E-09	1.507	ADARB1,ALDH1A1,AL	110
153	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Hepatobiliary carcinoma	2.29E-09	2.282	A1CF,ABCB11,ABCC3	619
154	Cancer, Hematological Disease, Organismal Injury and Abnormalities	Hematopoietic neoplasm	2.32E-09	-0.162	A1CF,ABCB11,ABCC3	464
155	Callular Development Callular Growth and Proliferation	Hematologic cancer	2.59E-09	-0.338	A1CF,ABCB11,ABCC3	458
157	Lipid Metabolism.Molecular Transport.Small Molecule Biochemistry	Concentration of triacylg/ycerol	2.64E-09	0.848	ACSL1 ADCYAP1 AGT	71
158	Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Lung carcinoma	2.69E-09	0.51	ABCB11,ABCC3,ABO,	353
159	Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Lung cancer	2.71E-09	1.37	ABCB11,ABCC3,ABO,	377
160	Cancer, Organismal Injury and Abnormalities	Primary solid tumor	2.77E-09		AFAP1L1,AGR2,ANXA	83
161	cer,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnormal	Hepatobiliary system cancer	2.99E-09	1.774	A1CF,ABCB11,ABCC3	637
162	Cell-To-Cell Signaling and Interaction	Adhesion of tumor cell lines	3.21E-09 3.25E-09	1.266	ADAM28, APOH, BCAN,	459
164	Lipid Metabolism.Molecular Transport.Small Molecule Biochemistry	Concentration of lipid	3.29E-09	0.856	ABCB11_ABCC3_ACSE	151
165	Lipid Metabolism,Molecular Transport,Small Molecule Biochemistry	Concentration of acylglycerol	4.03E-09	0.418	ACSL1, ADCYAP1, AGT	75
166	Gastrointestinal Disease,Inflammatory Response	Inflammation of gastrointestinal tract	4.09E-09	-1.518	AGR2, APOA4, APOBEC	96
167	Cancer, Organismal Injury and Abnormalities	Benign Tumors	4.67E-09	0.208	ADARB1,AGER,AJUB/	152
168	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Uterine carcinoma	5.04E-09	0.404	A1CF,ACSL1,ACSM3,	430
169	r,Endocrine System Disorders,Gastrointestinal Disease,Organismal Injury and Abnorm Gastrointestinal Disease Organismal Injury and Abnormalities	Abnormality of large intestine	5.4E-09	-0.181	AGR2 APOA4 AREG B	388
171	Cancer Organismal Injury and Abnormalities Reproductive System Disease	Breast cancer	6.74E-09	-0.048	ABLIM1 ABO ADAM28	344
172	Lipid Metabolism,Small Molecule Biochemistry	Metabolism of triacylglycerol	6.81E-09	1.269	ACSL1,ACSL5,ALDH1.	31
173	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Colon tumor	7.48E-09	0.792	ABCC3,ABCF2,ABLIM	608
174	Cancer, Organismal Injury and Abnormalities	Benign solid tumor	8.02E-09	0.208	ADARB1,AGER,AJUBA	150
175	Cardiovascular Disease	Occlusion of blood vessel	8.48E-09	-0.562	ABO,AGER,ANGPTL3,	102
177	Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Urinary tract cancer	1.07E-08	1.378	AC0040692 ADAM28 4	314
178	Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tu	Proliferation of tumor cells	1.16E-08	1.092	ADAM28,APCDD1,ARE	89
179	Cancer, Organismal Injury and Abnormalities	Primary neoplasm	1.37E-08	0.11	AFAP1L1,AGR2,ANXA	94
180	Cell-To-Cell Signaling and Interaction	Activation of cells	1.57E-08	-0.798	ACSL5,ADCYAP1,AFP	174
181	Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Exanthem of skin	0.00000016	0.000	C3,C4A/C4B,CCL20,C	37
182	Cancer Gastrointestinal Disease Organismal Injury and Abnormalities	Epilepsy Colon cancer	1.69E-08	1 109	ABCC3 ABCE2 ABLIM	599
184	Neurological Disease	Epilepsy or neurodevelopmental disorder	2.17E-08	-0.262	ADCYAP1.ALG13.ANC	91
185	cer,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnormal	Liver cancer	2.22E-08	1.626	A1CF,ABCB11,ABCC3	600
186	atological Diseases and Conditions, Organ Morphology, Organismal Injury and Abnorma	Abnormal morphology of skin	2.24E-08		APOA1, AREG, BCL2L1	52
187	Cancer,Organismal Injury and Abnormalities,Respiratory Disease	Non-small cell lung carcinoma	0.00000023	1.938	ABCB11,ABCC3,ACE2	307
188	Cerdiovascular Disease Organismal Injury and Abnormalities	Occlusion of artery	2.45E-08	-0.562	AGER ANGETI 3 APO4	182
190	cer,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnormal	Liver carcinoma	2.75E-08	2.123	A1CF,ABCB11,ABCC3	580
191	Cell Death and Survival	Necrosis	2.87E-08	-0.273	ABCC3,ACE2,ACSL1,#	410
192	Cancer, Organismal Injury and Abnormalities, Renal and Urological Disease	Urinary tract tumor	2.89E-08		AC0040692,ADAM28,#	318
193	Cancer, Organismal Injury and Abnormalities	Lymphoreticular neoplasm	2.98E-08	-0.061	A1CF,ABCB11,ABCC3	405
194	Digestive System Development and Function	Development of digestive system	3.24E-08	2.2	AGR2,ALDH1A1,AQP3	82
195	Cancer.Organismal Injury and Abnormalities	Extrapulmonary squamous cell carcinoma	4.01E-08	-0.577	ABCB11,ABCC3,ABC	427
197	eases and Conditions,Inflammatory Disease,Inflammatory Response,Organismal Injun	Dermatitis	4.07E-08	0.02	ACKR4,AGER,AREG,B	82
198	Cancer, Organismal Injury and Abnormalities	Advanced stage carcinoma	4.39E-08		ABCC3,ANXA8/ANXA8	61
199	Organismal Injury and Abnormalities, Tissue Morphology	Abnormal morphology of epithelial tissue	4.39E-08		ABCB11,ADCYAP1,AG	82
200	Dermatorogical Diseases and Conditions,Organismal Injury and Abnormalities	Plaque psoriasis	4.40E-08	0 207	ACSI 1 ACTA1 ADAM7	33
202	Indocrine System Disorders, Organismal Injury and Abnormalities, Skeletal and Muscular Dis	Ovarian serous tumor	5.01E-08	0.207	ABLIM2, ADCY2, AHNA	125
203	Hematological System Development and Function, Tissue Morphology	Quantity of leukocytes	5.16E-08	-0.938	ACKR4, ADCYAP1, AGE	162
204	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Upper gastrointestinal tract cancer	6.12E-08	0	ADAM28,ADARB1,AD0	416
205	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Upper gastrointestinal tract tumor	6.59E-08	-0.571	ADAM28,ADARB1,AD0	418
206	Neurological Disease,Organismal Injury and Abnormalities	Epileptic seizure	6.76E-08	0.152	ADCYAP1,ANOS1,BAL	45
208	Digestive System Development and Function	Development of gastrointestinal tract	7.08E-08	1.664	AGR2 AOP3 BCL 2L 11	60
209	Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Advanced serous ovarian adenocarcinoma	7.19E-08		ANXA8/ANXA8L1,ARL	28
210	Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Development of lung tumor	8.19E-08	1.856	ABCB11,ABCC3,ACE2	254
211	Organ Morphology	Abnormal morphology of gland	9.56E-08		AGR2,AGTR2,ALDH1A	64
212	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Upper gastrointestinal carcinoma	0.00000103		ADAM28,ADARB1,ADC	397
213	Embryonic Development Organismal Development	Development of body trunk	0.000000107	1 29	ACE2 ADAP2 ADCYAE	205
215	Immunological Disease	Hypersensitive reaction	0.000000114	0.318	ACKR4,AGER,BCL2L1	82
216	Cancer, Organismal Injury and Abnormalities	Metastatic solid turnor	0.000000116	0.851	ABCC3,AFAP1L1,AGR	120
217	Gastrointestinal Disease,Inflammatory Disease	Crohn disease	0.00000126		ACSL1,AGER,B3GAT1	58
218	cal Disease,Inflammatory Disease,Inflammatory Response,Organismal Injury and Abno	Rheumatoid arthritis	0.0000013	0.077	ACSL1,ACTA1,ADCY8	131
219	Cellular Movement	Invasion of tumor cell lines	0.000000131	-0.004	ABLIM1, AFAP1L1, AGE	149
221	Gastrointestinal Disease.Organismal Injury and Abnormalities	Gastric lesion	0.000000133	-0.708	ADAM28.ADARB1.AD(236
222	Cancer, Organismal Injury and Abnormalities	Ductal carcinoma	0.00000015	1.709	ABCB11,ABO,ACAP1,4	377
223	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	HER2-negative breast cancer	0.00000153		AREG, BRCA1, CAV1, C	43
224	Molecular Transport	Quantity of metal	0.0000016	-0.396	ADCYAP1,APOC3,ASI	92
225	Cancer, Organismal Injury and Abnormalities	HER2 negative cancer	0.00000163		AREG,BRCA1,CAV1,C	44
226	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Gastroenteritie	0.00000164	-1647	AGR2 AROA4 AROH A	397
228	Cancer.Gastrointestinal Disease.Organismal Injury and Abnormalities	Gastroesophageal cancer	0.000000176	0	ADAM28.ADARB1.ADC	286
229	Hematological System Development and Function, Tissue Morphology	Quantity of blood cells	0.00000182	-0.977	ACKR4, ADCYAP1, AGE	176
230	Cancer, Organismal Injury and Abnormalities	HER2 negative solid tumor	0.00000183		AREG, BRCA1, CAV1, C	44
231	Cardiovascular System Development and Function, Organismal Development	Angiogenesis	0.00000261	0.486	ACE2,AGER,AGTR2,AI	165
232	Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Disorder of hair	0.00000287	-2.431	APCDD1,AREG,BCL2/	47
233	Cellular Movement	Homing of cells	0.000000292	-0.804	ACKR4 AFP AGER AN	106
235	crine System Development and Function, Molecular Transport, Small Molecule Biochen	Concentration of hormone	0.000000301	1,437	ACSBG1,ADCYAP1,AF	75
236	Cancer, Organismal Injury and Abnormalities, Respiratory Disease	Development of lung carcinoma	0.00000304	1	ABCB11,ABCC3,ACE2	248
237	Cardiovascular System Development and Function, Organismal Development	Vasculogenesis	0.00000305	0.454	ACE2,AGER,AGTR2,AI	138
238	Development, Cellular Growth and Proliferation, Organismal Injury and Abnormalities, Tu	Proliferation of cancer cells	0.00000314	1.405	ADAM28,APCDD1,ARE	64
239	Neurological Disease,Organismal Injury and Abnormalities	Seizure disorder	0.00000325	-0.549	ADARB1, ADCYAP1, AL	97
240	Lipid Metabolism Molecular Transport Small Molecule Biochemistry	Quantity of steroid	0.000000328	0.891	ABCB11 ABCC3 ACSE	88
242	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Stomach tumor	0.00000339	-0.685	ADAM28,ADARB1,ADC	233
243	Organismal Injury and Abnormalities, Reproductive System Disease	Endometriosis	0.00000388		ALDH1A3,ANK3,BRCA	73
244	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Gastric cancer	0.00000424		ADAM28,ADARB1,AD0	230
245	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Development of intestinal tumor	0.000000435	0.200	ABCC3,ABCF2,ABLIM2	590
240	stinal Disease.Inflammatory Disease.Inflammatory Response.Organismal Injury and Ab	Enteritis	0.000000437	-1,558	AGR2, APOA4 APOH A	79
248	Cancer, Organismal Injury and Abnormalities. Respiratory Disease	Lung adenocarcinoma	0.000000487	1.414	ABCB11,ABCC3,ACE2	246
249	Organismal Injury and Abnormalities	Ulcer	0.00000049	-1.109	AGER, APOA1, AREG, C	31
250	stinal Disease,Inflammatory Disease,Inflammatory Response,Organismal Injury and Ab	Inflammation of large intestine	0.000000492	-1.182	AGR2, APOA4, AREG, B	74
251	sunal Disease, Initiammatory Disease, Initiammatory Response, Organismal Injury and Ab Cancer Gastrointestinal Disease Organismal Injury and Abnormetities	Colitis Development of colorectal tymor	0.00000052	-1.054	AGK2, APOA4, AREG, B ABCC3 ABCE2 ABL MA	73
253	r,Endocrine System Disorders,Gastrointestinal Disease.Organismal Injury and Abnorm	Pancreatic cancer	0.000000558	0.518	ABCB11,ABO,ACAP1 4	331
254	Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Hyperplasia of epidermis	0.000000582	-1.432	AGER, AREG, CAV1, CD	28
255	Neurological Disease,Organismal Injury and Abnormalities	Seizures	0.00000589	-0.686	ADARB1, ADCYAP1, AL	87
256	Cancer, Organismal Injury and Abnormalities	Papillary adenocarcinoma Papillary cominama	0.000000593		ABCC3,ANXA8/ANXA8	65
258	Cardiovascular System Development and Function	Development of vasculature	0.000000642	0.519	ACE2, AGER. AGTR2, AI	181
259	Cellular Movement	Chemotaxis	0.00000664	-0.485	ACKR4, AFP, AGER, AN	100
260	Organ Morphology	Morphology of gland	0.0000068		AGR2,AGTR2,ALDH1A	79
261	Cardiovascular Disease, Organismal Injury and Abnormalities	Arteriosclerosis	0.00000072	-0.906	AGER, ANGPTL3, APOA	85
262	Respiratory Disease	Lower respiratory tract disorder	0.00000766	-0.516	ABCC3 ABCE2 APL M4	76
264	ncer.Hematological Disease.Immunological Disease.Organismal Injury and Abnormalities	Leukemia	0.00000821	0,464	A1CF,ABCB11,ABCC3	310
265	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Hormone receptor negative breast cancer	0.000000827	0.104	AREG,BRCA1,CAV1,C	38
266	Cancer, Dermatological Diseases and Conditions, Organismal Injury and Abnormalities	Hyperplasia of skin	0.00000877	-1.368	AGER, AREG, CAV1, CD	32
267	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Progesterone receptor negative breast tumor	0.00000878		AREG, BRCA1, CAV1, C	39
268	Cancer, Organismal Injury and Abnormalities	Growth of malignant tumor	0.000000887	0.627	ADAM28,APCDD1,APC	81
269	Digestive System Development and Function Henatic System Development and Function	Apoptosis Differentiation of henatoxytee	0.000000941	-0.119	ABO,AGE2,AGSL1,AD/ BMP4,E2E7 EGE1 EGS	399
271	Skeletal and Muscular Disorders	Abnormality of limb	0.000000956	-0.893	ATL1,BMP4.BMPER.C	64
272	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Prostatic adenocarcinoma	0.00000973		A1CF,ABO,ACSM3,AD	415
273	Cell-To-Cell Signaling and Interaction, Cellular Assembly and Organization	Cell-cell contact	0.00000098	1.037	AJUBA, AMPH, ANK3, AI	114
274	Cardiovascular System Development and Function, Cellular Movement	Cell movement of endothelial cells	0.00000985	0.093	ANGPTL3, APOH, ARH(73
275	Molecular Transport	Quantity of metal ion	0.00000108	-0.333	ADCYAP1, APOC3, ASI	80
276	Cell-To-Cell Signaling and Interaction	Intercellular communication	0.00000114		ADCYAP1 ASIP CCL 2/	222
278	ncer,Hematological Disease,Immunological Disease.Organismal Injury and Abnormalif	Acute myeloid leukemia	0.00000123	0.059	A1CF,ABCB11,ABCC3	242
279	orders,Organismal Injury and Abnormalities,Skeletal and Muscular Disorders,Skeletal a	Abnormal morphology of bone	0.00000123		AGTR2,AREG,BMP4,B	80
280	nd Function,Gastrointestinal Disease,Organ Morphology,Organismal Development,Org	Abnormal morphology of small intestine	0.00000123		AGR2, AP1M2, AREG, C	25
281	ncer,Hematological Disease,Immunological Disease,Organismal Injury and Abnormalit	Myeloid leukemia	0.00000126	0.864	A1CF,ABCB11,ABCC3	247
282	Cellular Movement	Migration of tumor cell lines	0.00000129	-0.067	AGER, AREG, ARHGAP	150
284	Jular Movement, Hematological System Development and Function, Gastrointestinal Disease	Cell movement of granulocytes	0.00000134	-0.771	AGR2, AF 1M2, AREG, C	73
285	Cancer,Organismal Injury and Abnormalities,Renal and Urological Disease	Bladder cancer	0.00000142	-9.771	ADCY8,AHNAK2,AJUE	185
286	cer,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnormal	Hepatocellular carcinoma	0.00000147	2.123	ABCB11,ACSM3,ADAM	144
287	System Disorders, Gastrointestinal Disease, Metabolic Disease, Organismal Injury and At	Diabetes mellitus	0.0000153	0.339	ACE2, ACSL1, ACSM3,	198
288	Cardiovascular Disease, Organismal Injury and Abnormalities	Atherosclerosis	0.00000155	-0.747	AGER, ANGPTL3, APOA	83
289	Cellular Movement, immune Cell Trafficking	Leukocyte migration	0.00000156	-1.555	AGER AGTR2 ABOA4	163
290 291	Organismal Injury and Abnormalities Tissue Morphology	Size of Jesion	0.00000167	0.03	ADCYAP1.AGER APO	70
292	Cellular Assembly and Organization.Cellular Function and Maintenance	Organization of cytoskeleton	0.00000179	0.331	ABLIM1,ACAP1.ADAP	228
293	Lipid Metabolism,Molecular Transport,Small Molecule Biochemistry	Secretion of triacylglycerol	0.00000179	0.024	APOA1, APOA2, APOA4	12
294	Lipid Metabolism, Small Molecule Biochemistry, Vitamin and Mineral Metabolism	Metabolism of terpenoid	0.00000179	1.43	ADCYAP1, ADH1C, AFF	62
295		Cell movement of blood cells	0.00000189	-1.601	ACE2, ADCYAP1, ADGF	164
	Cellular Movement	December and the first the	0.000001100	0.555	AOTHO AD	404
296	Cellular Movement Neurological Disease Cancer Organismal Injury and Abnormalitize Reproductive System Disease	Progressive neurological disorder	0.00000196	0.508	ACTN3,ADH1C,AGER, AREG BRCA1 CAV1 C	164
296 297 298	Collular Movement Neurological Disease Cancer,Organismal Injury and Abnormalities,Reproductive System Disease & Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Progressive neurological disorder t2 negative hormone receptor negative breast ca Endometrial adenocarcinoma	0.00000196 0.00000198 0.000002	0.508	ACTN3,ADH1C,AGER, AREG,BRCA1,CAV1,C ACSL1,ACSM3,ADCY2	164 37 347
296 297 298 299	Cellular Movement Neurological Disease Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cellular Function and Maintenance	Progressive neurological disorder t2 negative hormone receptor negative breast ca Endometrial adenocarcinoma Ion homeostasis of cells	0.00000196 0.00000198 0.000002 0.00000206	0.508	ACTN3,ADH1C,AGER, AREG,BRCA1,CAV1,C ACSL1,ACSM3,ADCY2 ABCC3,ADCY8,ADCY2	164 37 347 103

301	t,Hair and Skin Development and Function,Organ Development,Organismal Developm	Formation of epidermis	0.00000231	-1.054	APCDD1,BNC1,CDH1,	38
302	Carbohydrate Metabolism	Metabolism of carbohydrate	0.00000232	1.254	ADCY2, ADCYAP1, AG1	119
304	System Development and Function,Lymphoid Tissue Structure and Development,Tisse	Morphology of lymphoid tissue	0.00000245		AGR2,ARHGDIB,ARHC	94
305	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry Behavior, Digestive System Development and Function	Clearance of lipid Feeding	0.00000246	0.156	ABCB11,ADH1C,ALDF AGTR2,APOA4,ASIP,A	14
307	nd Function,Gastrointestinal Disease,Organ Morphology,Organismal Development,Org	Abnormal morphology of stomach	0.00000318	0.200	AGR2, BRCA1, CA9, CA	19
308	System Development and Function,Hepatic System Disease,Inflammatory Disease,Infl	Inflammation of liver	0.00000321	0.638	ABCB11,APOA1,APOA	64
310	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Concentration of sterol Proliferation of dermal cells	0.00000361	0.932	ABCB11,ADCYAP1,AN	60
312	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Concentration of cholesterol	0.0000037	1.009	ABCB11,ADCYAP1,AN	58
313	Hair and Skin Development and Function, Organ Development Cell Signaling, Molecular Transport, Vitamin and Mineral Metabolism	Growth of skin Quantity of Ca2+	0.00000373	-1.148	AGTR2, AREG, BRCA1, ADCYAP1, APOC3, ASII	45
315	Cellular Assembly and Organization	Formation of plasma membrane	0.00000393	0.238	BCAN, BHLHB9, CASR,	53
317	t,Hair and Skin Development and Function,Organ Development,Organismal Developm	Formation of skin	0.00000405	0.433	AGTR2,APCDD1,AQPS	79
318	Metabolic Disease,Organismal Injury and Abnormalities Indocrine System Disorders,Organismal Injury and Abnormalities,Reproductive System	Glucose metabolism disorder Early stage serous ovarian cancer	0.00000408	0.3	ACE2,ACSL1,ACSM3, CLEC3B,MSLN,MUC1	231
320	Organismal Injury and Abnormalities, Tissue Morphology	Morphology of lesion	0.00000424	0.070	ADCYAP1, AGER, APO/	74
322	Indocrine System Disorders,Organismal Injury and Abnormalities,Reproductive System	Grade 3 primary serous ovarian carcinoma	0.00000447	0.378	CLEC3B,MSLN,MUC1	6
323	Respiratory Disease, Respiratory System Development and Function Conditions Immunological Disease Inflammatory Disease Inflammatory Response Organ	Abnormal morphology of respiratory system Atopic dermatitis	0.00000459		ALDH1A1,ALDH1A3,A	55
325	Jular Growth and Proliferation, Hair and Skin Development and Function, Organ Develop	Proliferation of epidermal cells	0.00000479	-1.577	AGTR2,AREG,CASR,C	37
326	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Hematological Disease,Organismal Injury and Abnormalities	Gastro-esophageal carcinoma Malignant myeloid neoplasm	0.00000482	0.059	ADAM28,ADARB1,ADC A1CF,ABCB11,ABCC3	258
328	Organismal Development	Morphology of head	0.00000502		ADCYAP1,AGTR2,ALD	165
330	Organismal Injury and Abnormalities, Kenal and Orological Disease Organismal Injury and Abnormalities	Visceromegaly	0.00000529		ABCB11,ACE2,ACSL1	130
331	Cellular Movement ular Development.Embryonic Development.Organismal Development.Tissue Developm	Migration of hepatoma cell lines Differentiation of embryonic tissue	0.00000534	-1.045	AJUBA.BEX2.BMP4.BF	26
333	evelopment and Function,Lymphoid Tissue Structure and Development,Organ Morpho	Morphology of lymphoid organ	0.0000054	4.954	ARHGDIB, ARHGEF6, A	86
335	Cardiovascular System Development and Function,Cellular Movement	Migration of endothelial cells	0.00000556	0.703	ANGPTL3,APOH,ARH(66
336	tion,Organ Morphology,Organismal Development,Skeletal and Muscular System Devel Cell-To-Cell Signaling and Interaction Cellular Assembly and Organization	Morphology of rib Stabilization of intercellular junctions	0.00000584	-0.518	BMP4,CDX1,CDX2,CR	19
338	ellular Development,Connective Tissue Development and Function,Tissue Developme	Differentiation of connective tissue cells	0.00000625	1.408	AGER, AREG, ASXL2, A	110
340	Cell-To-Cell Signaling and Interaction,Cellular Assembly and Organization	Formation of intercellular junctions	0.00000642	0.46	AJUBA,BCAN,BHLHBS	54
341	Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Ovarian carcinoma Bone marrow cancer	0.00000686	0.864	ABCC3,ABCF2,ABLIM2 A1CF ABCB11 ABCC3	228
343	Hematological System Development and Function, Tissue Morphology	Quantity of granulocytes	0.00000704	-0.958	AGER, AMBP, ARHGDIE	61
344	Renal and Urological System Development and Function	Morphology of urinary system	0.00000711		ACE2,ACTG2,AGER,A	62
346	Netabolism, Molecular Transport, Small Molecule Biochemistry, Vitamin and Mineral Meta Cancer Organismal Injury and Abnormalities	Quantity of retinoid	0.00000749	-0.618	ADH1C,ALDH1A1,APC	12
348	Metabolic Disease, Organismal Injury and Abnormalities	Amyloidosis	0.00000763		AGER, AMPH, APOA1, A	103
349	Digestive System Development and Function	Function of gastrointestinal tract Assembly of intercellular junctions	0.00000793	0.444	AGR2,AP1M2,CFTR,CI BCAN,BHLHB9,CASR,	13
351	Immunological Disease, Inflammatory Disease	Atopic disease	0.00000808	-0.152	ACKR4, BRF2, C3, CARI	51
353	Gastrointestinal Disease,Hepatic System Disease	Cholestasis	0.00000841		ABCB11,ABCC3,ACSL	22
354	Cancer, Neurological Disease, Organismal Injury and Abnormalities Neurological Disease, Organismal Injury and Abnormalities, Psychological Disorders	Nervous system neoplasm Degenerative dementia	0.0000087	0.538	AGER, AMPH, APOA1, A	209
356	Developmental Disorder, Organismal Injury and Abnormalities	Ectodermal dysplasia Breast carcinoma	0.0000092	0.423	CDH1,COL11A1,DSP,I	15
358	natological System Development and Function,Inflammatory Response,Tissue Morphol	Quantity of phagocytes	0.0000094	-0.913	AGER, AGR2, AMBP, AP	78
359	Cancer, Organismat Injury and Abnormalities Gastrointestinal Disease, Organismal Injury and Abnormalities	Neoplasia of tumor cell lines Abnormality of small intestine	0.00000942	0.522	AGR2, AP1M2, AREG.C	74 29
361	atological Diseases and Conditions, Organ Morphology, Organismal Injury and Abnorma	Redness of skin Myeloid neonlasm	0.0000101	0.128	CTSE, DGAT1, GBA, IL3 A1CE, ABCB11, ABCC2	10
363	atological Diseases and Conditions, Organ Morphology, Organismal Injury and Abnorma	Abnormal morphology of epidermis	0.0000103	0.1.0	AREG,CBS/CBSL,CTS	28
364	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Growth of tumor	0.0000105	0.084	ADAM28,ADARB1,ADC ADAM28,AFAP1L1,AG	233
366	Molecular Transport	Transport of ion	0.0000107	1.654	ABCC3,ANK3,ANO10	89
368	Cancer	Hyperplasia of tissue	0.000011	-1.739	AGR2,C3,CA9,CAV1,C	39
369 370	Respiratory System Development and Function Organismal Injury and Abnormalities, Renal and Urological Disease	Morphology of respiratory system Renal lesion	0.0000112 0.0000112	0.116	ACE2,ALDH1A1,ALDH AC0040692,ADAM28 4	59 199
371	Neurological Disease, Organismal Injury and Abnormalities, Psychological Disorders	Alzheimer disease or frontotemporal dementia	0.0000117	.0.116	AGER, AMPH, APOA1, A	99
373	Cancer, Organismal Injury and Abnormalities	Malignant neoplasm of aerodigestive tract	0.0000119	-0.115	ADAM28,ADARB1,AHM	305
374 375	Carbohydrate Metabolism ctive Tissue Disorders,Organismal Injury and Abnormalities,Skeletal and Muscular Dis	Synthesis of carbohydrate Abnormality of rib cage	0.0000121 0.0000124	0.961	ADCY2,ADCYAP1,AG1 BMP4,CDX1,CDX2,CR	90 25
376	Cancer, Organismal Injury and Abnormalities	Connective or soft tissue tumor	0.0000128	0.39	A1CF, ADAMTS5, ADAF	217
378	Indocrine System Disorders,Organismal Injury and Abnormalities,Reproductive System	Grade 3 ovarian cancer	0.0000136	1.002	CLEC3B,FOXG1,MSLN	8
379	nd Function,Gastrointestinal Disease,Organ Morphology,Organismal Development,Org Neurological Disease,Organismal Injury and Abnormalities,Psychological Disorders	Abnormal morphology of duodenum Dementia	0.0000136		AP1M2,CFTR,FGA,IHH AGER, AMPH, APOA1, A	8
381	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Uptake of lipid	0.0000142	0.528	ABCC3,ACSL1,ACSL5	34
382	Organismal Injury and Abnormalities, Respiratory Disease	Lung injury	0.0000144	-0.841	AGER, AMBP, APOH, C3	40
384	Cell-To-Cell Signaling and Interaction Dermatological Diseases and Conditions Organismal Injury and Abnormalities	Activation of connective tissue cells Chronic psoriasis	0.0000149	1.454	AGER, APOB, BCL2L11 AGER, CASP4, CDC25F	32
386	Developmental Disorder, Organismal Injury and Abnormalities	Congenital malformation of genitourinary system	0.0000153	-0.069	ACSL1,AGTR2,ALDH1	73
387	Tetabolism,Molecular Transport,Small Molecule Biochemistry,Vitamin and Mineral Meta	Concentration of retinol	0.0000156	-0.983	APOA1,APOC3,DGAT1	18
389	Tissue Development Cancer Hematological Disease Organismal Injury and Abnormalities	Formation of gland Bone marrow peoplasm	0.0000159	0.374	APOA1, AREG, BCL2L1 A1CE ABCB11 ABCC3	46
391	ncer,Hematological Disease,Immunological Disease,Organismal Injury and Abnormalit	Acute leukemia	0.0000161	-0.44	A1CF.ABCB11.ABCC3	253
392	Vitamin and Mineral Metabolism	Quantity of vitamin	0.0000165	-0.692	ABCC3,ADH1C,ALDH1	25
394	r,Endocrine System Disorders,Gastrointestinal Disease,Organismal Injury and Abnorm	Pancreatic adenocarcinoma	0.0000167	0.849	ABCB11,ABO,ACAP1,	290
396	Cancer, Organismal Injury and Abnormalities, Tumor Morphology	Invasion of tumor	0.0000171	0.087	AREG, BCAN, CA9, CAV	44
398	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Secondary neoplasm of digestive system	0.0000174	0.816	ANK3,APOA1,CAV1,CI	58
399	egy, Organismal Development, Organismal Injury and Abnormalities, Skeletal and Muscu	Abnormal morphology of rib Differentiation of liver cells	0.0000188	-0.964	BMP4,CDX1,CDX2,CR BMP4 E2E7 EGE1 EOS	18
401	Cellular Assembly and Organization	Sliding of myofilaments	0.0000189	0.316	ACTA1,ACTN3,DES,M	12
402	Neurological Disease,Organismal Injury and Abnormalities Neurological Disease,Organismal Injury and Abnormalities,Psychological Disorders	Tauopathy	0.0000191	0.216	AGER, AMPH, APOA1, A	100
404	isease,Lymphoid Tissue Structure and Development,Organ Morphology,Organismal De Cancer,Organismal Injury and Abnormalities	Abnormal morphology of spleen Lymphatic system tumor	0.0000205	-0.721	BANK1,BCL2L11,BLNF AFAP1L1,AGR2,ALDH	57 281
406	Gastrointestinal Disease,Organismal Injury and Abnormalities	Obstruction of intestine	0.0000212	-1.144	ACTG2,AGR2,CFTR,CI	19
407	Cell-To-Cell Signaling and Interaction	Adhesion of carcinoma cell lines	0.0000214	0.039	CAV1,CDH1,CHP2,DS	14
409	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Colorectal adenocarcinoma Abnormal morphology of bair	0.0000214		ABCC3,ABCF2,ABLIM2	560
411	Tissue Development	Organization of extracellular matrix	0.0000234	0	ADAMTS5,BCAN,CAPI	42
412 413	Molecular Transport Cellular Development,Cellular Growth and Proliferation	I ransport of chloride Proliferation of pancreatic cancer cell lines	0.0000235	0.223	CDH17,CEACAM6,CEI	17 36
414	pment,Organismal Injury and Abnormalities,Skeletal and Muscular Disorders,Skeletal Cell-To-Cell Signaling and Interaction Cellular Growth and Proliferation	Abnormal morphology of rib cage Stimulation of cells	0.0000242	-1.009	BMP4,CDX1,CDX2,CR ADCYAP1 APOA1 AS"	21
416	Molecular Transport	Transport of molecule	0.000025	1.687	A1CF,ABCB11,ABCC3	246
417	Organismal Injury and Abnormalities, Renal and Urological Disease	Renal impairment	0.0000252	-0.659	AGTR2,APOB,C3,C4A/	48
419 420	Cardiovascular System Development and Function Neurological Disease	Neovascularization Neurological signs	0.0000263	-0.571 -1.176	C3,CAV1,CBS/CBSL,C ACTN3,ADCY2 ADCY1	34 114
421	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Concentration of fatty acid	0.0000264	0.771	ACSBG1,ACSL1,ADCY	54
422	Cancer, organismai injury and Abnormalities Digestive System Development and Function, Organismal Development	Morphology of mouth	0.0000269		AREG,BMP4,CFTR,CR	30
424	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities eases and Conditions, Immunological Disease, Inflammatory Disease. Organismal Injury	Gastric carcinoma Lichen planus	0.0000274 0.0000282		ADAM28,ADARB1,ADC CALML3,CCL20.DEFR	199 21
426	Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Intrahepatic cholestasis	0.0000284	0.990	ABCB11,ACSL1,ADH1	17
428	Carbohydrate Metabolism	Synthesis of polysaccharide	0.0000286	-0.024	ADCY2,B3GAT1,B3GN	41
429 430	Organismal Development velopment,Skeletal and Muscular Disorders,Skeletal and Muscular System Developme	Abnormal morphology of body wall Abnormal morphology of limb	0.0000289 0.0000291		BMP4,CDX1,CDX2,CR ATL1,BMP4,BMPER,CI	23 43
431	Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System Cellular Assembly and Organization Cellular Function and Mainteeance	Stage I serous ovarian adenocarcinoma Organization of cytoplasm	0.0000296	0.331	CLEC3B,MSLN,MUC1, ABLIM1,ACAP1,ADAP	7 240
433	Cancer,Organismal Injury and Abnormalities,Renal and Urological Disease	Bladder carcinoma	0.00003	5.001	ADCY8,AHNAK2,AJUE	165
434	Cancer,Organismal Injury and Abnormalities	Invasion of tissue	0.0000315	-0.586	AFAP1L1,ALDH1A1,AL	36
436 437	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities Cellular Assembly and Organization. Cellular Function and Maintenance	Advanced colorectal cancer Microtubule dynamics	0.0000322 0.0000322	0.169	ANK3,CAV1,CD36,CD ABLIM1,ACAP1,ADAP	53 191
438	Organismal Survival	Survival of organism Recruitment of linid	0.0000324	-0.666	ACSL1,ACTG2,ADCYA	125
440	Cell Morphology,Embryonic Development	Conversion of embryonic cells	0.0000324	1.000	BMP4,DMBT1,FOS,MM	4
441	Cancer, Neurological Diseases and Conditions, Organismal Injury and Abnormalities Cancer, Neurological Disease, Organismal Injury and Abnormalities	Central nervous system solid tumor	0.0000329	-2.431 0.339	ABCC3,ADAMTS5,ADA	<i>∠7</i> 196
443	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities Cardiovascular Disease, Organismal Injury and Abnormalities	Metastatic colorectal cancer Atherosclerotic lesion	0.0000341 0.0000353	-1.537	ANK3,CAV1,CD36,CD APOA1,APOA2,APOA4	52 34
445	ve Tissue Development and Function, Skeletal and Muscular System Development and	Remodeling of bone	0.0000359	-0.354	BCL2L11,CAV1,CD68,	39
447	Cancer, Organismal Injury and Abnormalities	Neoplasia of carcinoma cell lines	0.0000371	0.257	ALDH1A3,CAV1,CEAC	24
448 449	Lipid Metabolism,Small Molecule Biochemistry Gastrointestinal Disease,Organismal Injury and Abnormalities	Synthesis of acylglycerol Non-inflammatory intestinal disease	0.0000379 0.0000379	0.685	ACSL1,ACSL5,ALDH1. ACTG2,AGR2,CFTR.CI	23 21
450	Cancer,Organismal Injury and Abnormalities	Stage I-II cancer Repair cancer	0.0000382		BPIFA1,CLDN2,CLECS	36
452	Organismal Development,Organismal Injury and Abnormalities	Abnormal morphology of thoracic cavity	0.0000391		ACE2,ACSL1,ACTG2,A	144
453 454	Organismal Injury and Abnormalities, Renal and Urological Disease velopmental Disorder, Organismal Injury and Abnormalities, Renal and Urological Disea	Formation of renal lesion Congenital anomalies of kidney and urinary tract	0.0000397	-0.736	ACSL1,AGTR2,ALDH1	164 56
455	Embryonic Development,Organismal Development ent,Hematological System Development and Function Immuno Cell Trafficking Info	Development of body axis Cell movement of phagocates	0.00004	1.682	ADCYAP1,AGTR2,AK7 ACE2,ADCYAP1 ACE7	173
457	Cancer	Hyperplasia of epithelial cells	0.0000411	-1.061	C3,CAV1,CD40,ERBB	19
459	docrine System Disorders, Gastrointestinal Disease, Organization, Cellular Function and N	Abnormal morphology of pancreas	0.0000422	-0.193	AGTR2,CES1,CFTR,DI	24
460	ng Function,Gastrointestinal Disease,Organ Morphology,Organismal Development,Org Cancer,Organismal Injury and Abnormalities,Renal and Urological Disease	Abnormal morphology of large intestine Renal cell carcinoma	0.0000429 0.0000431		AGR2,CEACAM1,CFTF AC0040692,ADAM28.4	16 163
462	Lipid Metabolism,Small Molecule Biochemistry feration.Connective Tissue Development and Function Scientific and Museum	Catabolism of acylglycerol Formation of estephiests	0.0000434	0.199	APOA2, APOB, APOC3,	10
464	idocrine System Disorders,Gastrointestinal Disease,Organismal Injury and Abnormaliti	Pancreatic duct disorder	0.0000442	0.849	ABCB11,ABO,ACAP1,	282
465	opment and Function, Hepatic System Development and Function, Organ Morphology, O Indocrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Morphology of liver Stage 3c primary serous ovarian carcinoma	0.0000448		ABCB11,ANGPTL3,AP MSLN,MUC1,MUC16.5	59 5
467	Indocrine System Disorders,Organismal Injury and Abnormalities,Reproductive System	Stage 1A primary serous ovarian carcinoma Mitogenesis of sarcoma call lines	0.0000451	0.391	CLEC3B,MUC1,MUC1	5
469	Cellular Movement	Cellular infiltration	0.0000462	-0.403	ACE2,AGER,APOA1,BI	81
470 471	ropment and Function,Gastrointestinal Disease,Organismal Development,Organismal I Immunological Disease	Abnormal morphology of mouth Allergy	0.0000463	-0.518	AKEG, BMP4, CFTR, CR ACKR4, AGER, AQP3, B	27
472	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities	Familial encephalopathy Visceral metastasis	0.0000475	1 685	ABLIM1, ACSL1, ACTNS ANK3, APOA1, CAV1, C	182
474	Cellular Development,Embryonic Development,Organismal Development	Differentiation of embryonic cells	0.0000494	2.47	AGER,AJUBA,BAIAP2,	48
475	Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities,Renal and Urological Disease	Edema Renal tumor	0.0000499	1.05	AGER,ATP1A3,C3,CA5 AC0040692,ADAM28./	65 183
477	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Metastatic gastrointestinal tract cancer	0.0000517		ANK3,CAV1,CD36,CD	56
479	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Peroxisomal acyl CoA oxidase deficiency	0.0000518		CCL26,CCL7,CXCL14	7
480 481	Organ Morphology Organismal Development	Abnormal morphology of exocrine gland Size of body	0.0000519	1.125	AGR2, AREG, BRCA1, C ABCB11, ACTA1, ADCY	27
482	Jular Movement, Hematological System Development and Function, Immune Cell Traffick	Cellular infiltration by leukocytes Angiogenesis of eve	0.0000523	-0.494	ACE2, AGER, APOA1, BI ANGPTL3, CXCI 14 CY	73
484	Gastrointestinal Disease, Hepatic System Disease, Organismal Injury and Abnormalities	Cirrhosis of liver	0.0000535	0.002	ABCB11,ABCC3,APOA	37
485 486	connective Tissue Disorders, Organismal Injury and Abnormalities, Tissue Morphology)r, Endocrine System Disorders, Gastrointestinal Disease, Organismal Injury and Abnorm	Deterioration of connective tissue Pancreatic ductal carcinoma	0.0000535	0.744 0.849	ADAMTS5, AREG, CTSF ABCB11, ABO, ACAP1	37 281
487	ismal Injury and Abnormalities, Skeletal and Muscular Disorders, Skeletal and Muscular	Abnormal morphology of skeleton	0.0000539	0.440	BMP4,BMPER,CDK10,	49
488	Molecular Transport	Transport of anion	0.0000539	0.967	ABCC3,ANO10,ANO4,	28
490 491	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cell Signaling	Advanced malignant gastrointestinal neoplasm Cell surface receptor linked signal transduction	0.0000548	0.628	ANK3,CAV1,CD36,CD AKAP7,APOA1,BATF,B	57 66
492	Neurological Disease, Organismal Injury and Abnormalities Organismal Injury and Abnormalities Reproductive System Disease	Progressive encephalopathy Benjan uterine disease	0.0000559		ACTN3,ADH1C,AGER,	135
494	Organismal Injury and Abnormalities,Renal and Urological Disease	Proximal tubular toxicity	0.0000563		BMP4,CRYM,CYP2C9,	19
495 496	Endocrine System Development and Function, Small Molecule Biochemistry	Axonogenesis Metabolism of hormone	0.0000566	-0.116 0.785	ADGRG6,AGTR2,ANK ADCYAP1,AFP,AREG,I	44 38
497	Organismal Injury and Abnormalities Digestive System Development and Function Organismal Development	Pathological Cyst Morphogenesis of embryonic gastrointestical trac	0.0000572	-0.558	ADAP1, AGER, ANO9, B	31 8
499	Digestive System Development and Function, Organ Development Organismal Development Organismal Injunct and Abnormality	Function of intestine Abnormal morphology of head	0.0000597		AGR2, AP1M2, CFTR, EF	10
	Liganianiai Cerelophiani, Organismai Injury and Abnormandes	Achorman morphology of head	0.000003			

 Table S3 (Related to Figure 4). Gene enrichment sets for control vs BRCA1^{mut} -FTE organoids at 1 year

 culture

NAME	SIZE	ES	NES	NOM p-val	FDR q-val	FWER p-val	RANK AT MAX	LEADING EDGE
GNF2_EIF3S6	120	0.6727409	2.8466096	0	0	0	5273	tags=82%, list=27%, signal=111%
MORF ACTG1	138	0.6190265	2.7050114	0	0	0	6618	tags=83%, list=34%, signal=125%
MORF_TPT1	102	0.6477453	2.6736124	0	0	0	5716	tags=81%, list=29%, signal=115%
MORF_NPM1	162	0.6042291	2.647897	0	0	0	6649	tags=83%, list=34%, signal=125%
GCM_TPT1	69	0.6866267	2.6212063	0	0	0	4785	tags=86%, list=25%, signal=113%
GCM_NPM1	115	0.61789876	2.5851052	0	0	0	6596	tags=86%, list=34%, signal=129%
GNF2_ST13	64	0.6888458	2.5632267	0	0	0	5273	tags=84%, list=27%, signal=115%
GNF2_TPT1	38	0.73548156	2.5450826	0	0	0	4761	tags=95%, list=24%, signal=125%
MORF_NME2	154	0.5721919	2.5130274	0	0	0	6659	tags=77%, list=34%, signal=115%
GNF2_MMP1	32	0.7303712	2.4124823	0	0	0	1928	tags=59%, list=10%, signal=66%
MODULE_312	45	0.68017954	2.389409	0	0	0	2563	tags=40%, list=13%, signal=46%
MODULE_83	316	0.49353978	2.3648179	0	0	0	6709	tags=68%, list=34%, signal=102%
GCM_PSME1	84	0.5871864	2.352315	0	0	0	6830	tags=75%, list=35%, signal=115%
MODULE_254	54	0.629287	2.3378637	0	0	0	2563	tags=39%, list=13%, signal=45%
MORF_RAN	266	0.49931005	2.332909	0	0	0	8072	tags=77%, list=41%, signal=129%
MORF_FBL	138	0.5317876	2.3047824	0	0	0	8072	tags=82%, list=41%, signal=139%
GCM_CSNK2B	98	0.56095266	2.303643	0	0	0	7609	tags=81%, list=39%, signal=132%
MODULE_357	76	0.5848927	2.2981043	0	0	0	1789	tags=37%, list=9%, signal=40%
GNF2_FBL	145	0.52505535	2.2934113	0	0	0	5833	tags=61%, list=30%, signal=87%
MODULE_29	27	0.7299376	2.2928236	0	0	0	4785	tags=93%, list=25%, signal=123%
MORF_UBE2I	238	0.49950063	2.2902822	0	0	0	7819	tags=71%, list=40%, signal=117%
MODULE_154	71	0.5919356	2.2594893	0	8.69E-05	0.001	1789	tags=37%, list=9%, signal=40%
GNF2_DAP3	118	0.5474657	2.259309	0	8.32E-05	0.001	6928	tags=72%, list=36%, signal=111%
MODULE_297	76	0.58601916	2.2580717	0	7.97E-05	0.001	1789	tags=37%, list=9%, signal=40%
MORF_ANP32B	197	0.49914193	2.2527962	0	7.65E-05	0.001	7939	tags=75%, list=41%, signal=125%
GCM_APEX1	113	0.5416784	2.2478492	0	7.36E-05	0.001	6935	tags=73%, list=36%, signal=113%
GNF2_GLTSCR2	31	0.6947166	2.234576	0	1.40E-04	0.002	4785	tags=94%, list=25%, signal=124%
GNF2_SPRR1B	21	0.75724036	2.2250254	0	1.35E-04	0.002	1541	tags=57%, list=8%, signal=62%
GCM_ACTG1	123	0.5223154	2.2139533	0	1.87E-04	0.003	7113	tags=72%, list=37%, signal=112%
MORF_ERH	114	0.52058136	2.2041113	0	1.81E-04	0.003	7947	tags=81%, list=41%, signal=135%
MORF_EIF3S6	122	0.5279552	2.200043	0	1.75E-04	0.003	7947	tags=80%, list=41%, signal=135%
MODULE_298	19	0.7568386	2.1905832	0	1.69E-04	0.003	596	tags=42%, list=3%, signal=43%
MORF_JUND	64	0.5846139	2.18988	0	1.64E-04	0.003	5647	tags=72%, list=29%, signal=101%
MODULE_68	19	0.75790423	2.1639967	0	1.60E-04	0.003	596	tags=42%, list=3%, signal=43%
MORF_G22P1	171	0.48629752	2.160848	0	1.55E-04	0.003	7947	tags=72%, list=41%, signal=120%
MODULE_73	19	0.7453506	2.1528246	0	1.51E-04	0.003	560	tags=53%, list=3%, signal=54%
GNF2_CKS2	50	0.59455144	2.1213331	0	1.47E-04	0.003	4890	tags=58%, list=25%, signal=77%
MORF_EIF4A2	138	0.49196252	2.100293	0	2.38E-04	0.005	6830	tags=64%, list=35%, signal=99%
MODULE_114	332	0.4412614	2.099389	0	2.32E-04	0.005	6614	tags=64%, list=34%, signal=96%
GNF2_CDC20	56	0.569282	2.09359	0	2.26E-04	0.005	5387	tags=63%, list=28%, signal=86%
MODULE_151	311	0.43870503	2.0863914	0	3.06E-04	0.007	6614	tags=65%, list=34%, signal=96%
MODULE_32	237	0.45042282	2.0774214	0	5.56E-04	0.013	7049	tags=65%, list=36%, signal=100%
MODULE_153	32	0.6424479	2.0701852	0	5.84E-04	0.014	727	tags=34%, list=4%, signal=36%
MORF_EIF3S2	243	0.44350612	2.0691514	0	5.71E-04	0.014	7819	tags=64%, list=40%, signal=105%
GNF2_CCNA2	68	0.5379757	2.0674078	0	5.58E-04	0.014	5387	tags=57%, list=28%, signal=79%
GNF2_RAN	85	0.51783055	2.0476763	0	6.27E-04	0.016	7423	tags=71%, list=38%, signal=114%
MODULE_552	16	0.7388666	2.041278	0	6.91E-04	0.017	2623	tags=69%, list=13%, signal=79%
GCM_PFN1	51	0.5614346	2.027505	0	7.47E-04	0.019	6657	tags=69%, list=34%, signal=104%
MODULE_537	17	0.72189254	2.0227401	0.002304148	7.32E-04	0.019	1687	tags=41%, list=9%, signal=45%
MORF_CSNK2B	285	0.4247475	1.9933726	0	0.001108753	0.03	8124	tags=65%, list=42%, signal=110%
GNF2_PTX3	36	0.60176075	1.990988	0.002604167	0.001154729	0.032	3290	tags=50%, list=17%, signal=60%
GNF2_HMMR	47	0.5508787	1.9842057	0	0.001268832	0.036	5387	tags=62%, list=28%, signal=85%
GCM_PPP1CC	56	0.5361963	1.9795676	0	0.001517148	0.044	7609	tags=70%, list=39%, signal=114%
GNF2_CCNB2	57	0.5345916	1.9762547	0	0.001523605	0.045	5387	tags=58%, list=28%, signal=80%

 Table S4 (Related to Figure 4). Functional annotation for control vs BRCA1^{mut} -FTE organoids at 1 year by

 IPA software

	Categories	Diseases or Functions Annotation	p-value	z-score	Gene List	# Molecules
1	Cancer, Organismal Injury and Abnormalities	Non-hematological solid tumor	4.47E-44	1.922	AAAS,AATK,ABCA8,ABC	1023
3	Cancer, Organismal Injury and Abnormalities	Tumorigenesis of tissue	1.2E-43	2.413	AAAS,AATK,ABCA8,ABC	1014
4 5	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Non-melanoma solid tumor Cancer of secretory structure	1.1E-42 1.25E-42	2.787	AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	1015
6	Cancer, Organismal Injury and Abnormalities	Epithelial neoplasm	3.1E-42	2.692	AAAS,AATK,ABCA8,ABC	1009
7 8	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Thyroid cancer Thyroid carcinoma	3.32E-42 3.8E-42		AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	833
9	Cancer,Organismal Injury and Abnormalities	Carcinoma	8.37E-42	1.914	AAAS,AATK,ABCA8,ABC	1007
10	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Endocrine carcinoma Endocrine cancer	9.28E-42 9.87E-42		AAAS,AATK,ABCA8,ABC	833
12	Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Nonpituitary endocrine tumor	9.23E-41		AAAS,AATK,ABCA8,ABC	836
13	Cancer,Organismal Injury and Abnormalities Cancer,Endocrine System Disorders,Organismal Injury and Abnormalities	Endocrine gland tumor	1.59E-40 2.44E-40	1.897	AAAS,AATK,ABCAB,ABC AAAS,AATK,ABCA8,ABC	836
15	Cancer,Organismal Injury and Abnormalities	Head and neck carcinoma	4.49E-40		AAAS,AATK,ABCA8,ABC	858
17	Cancer,Organismal Injury and Abnormalities	Extracranial solid tumor	6.39E-39	2.026	AAAS,AATK,ABCA8,ABC	1026
18	Cancer,Organismal Injury and Abnormalities	Malignant solid tumor	1.17E-38	1.182	AAAS,AATK,ABCA8,ABC	1026
20	Cancer,Organismal Injury and Abnormalities	Solid tumor	6.83E-38	1.868	AAAS,AATK,ABCAS,ABC	1029
21	Cancer,Organismal Injury and Abnormalities	Head and neck tumor	1.35E-37 3.07E-36	3.063	AAAS,AATK,ABCA8,ABC	862
23	Cancer,Organismal Injury and Abnormalities	Abdominal adenocarcinoma	2.32E-33	2.200	AAAS,AATK,ABCA8,ABC	885
24	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Adenocarcinoma Abdominal cancer	2.44E-32 4.6E-32	0.622	AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	897 946
26	Cancer,Organismal Injury and Abnormalities	Abdominal neoplasm	7.24E-32	1.959	AAAS,AATK,ABCA8,ABC	955
27	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Gastrointestinal Disease.Organismal Injury and Abnormalities	Large intestine adenocarcinoma Digestive system cancer	4.37E-29 7.54E-28	1.006	AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	778
29	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Digestive organ tumor	2.68E-27	1.984	AAAS,AATK,ABCA8,ABC	906
30	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Gastrointestinal Disease.Organismal Injury and Abnormalities	Gastrointestinal adenocarcinoma Gastrointestinal carcinoma	5.95E-27 3.34E-25	1,119	AAAS,AATK,ABCA8,ABC	786
32	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Large intestine neoplasm	4.27E-23	0.493	AAAS,AATK,ABCA8,ABC	795
34	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Gastrointestinal tumor	3.32E-21	0.806	AAAS,AATK,ABCA8,ABC	817
35	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Gastrointestinal tract cancer	7E-21 7.44E-21	-0.169	AAAS,AATK,ABCA8,ABC	813
37	Cancer, Organismal Injury and Abnormalities	Tumorigenesis of epithelial neoplasm	1E-20	3.082	AAAS,AATK,ABCA8,ABC	685
38	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Development of carcinoma Development of malignant tumor	5.07E-20 8.04E-20	2.706	AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	675
40	Cancer,Organismal Injury and Abnormalities	Incidence of tumor	3.92E-19	4.033	AAAS,AATK,ABCA8,ABC	704
41 42	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities	Genitourinary tumor Endometrioid carcinoma	1.12E-15 3.3E-15	1.258	AAAS,AATK,ABCA8,ABC AAAS,ABCA8,ABCB1.AB	675 318
43	Cancer, Organismal Injury and Abnormalities	Pelvic adenocarcinoma	3.61E-15		AAAS,ABCA8,ABCB1,AB	499
45	Cancer,Organismal Injury and Abnormalities	Genitourinary adenocarcinoma	5.15E-15		AAAS,ABCA8,ABCB1,AB	540
46	Cancer, Organismal Injury and Abnormalities	Malignant genitourinary solid tumor Genital tumor	6.32E-15	-0.107	AAAS,AATK,ABCA8,ABC	661 573
48	Cancer,Organismal Injury and Abnormalities	Pelvic tumor	1.33E-14	1.616	AAAS,AATK,ABCA8,ABC	604
49	Cancer,Organismal Injury and Abnormalities Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Genitourinary carcinoma Colon adenocarcinoma	2.01E-14 3.18E-14	0.896	AAAS,ABCA8,ABCB1,AB AAAS,AATK ABCA8,ABC	590 408
51	Cancer,Organismal Injury and Abnormalities	Pelvic cancer	3.19E-14		AAAS,AATK,ABCA8,ABC	594
52 53	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Colorectal carcinoma Genital tract cancer	5.28E-14 5.9E-14		AAAS,AATK,ABCA8,ABC AAAS,AATK,ABCA8,ABC	429 561
54	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Colon carcinoma	8.61E-14	0	AAAS,AATK,ABCA8,ABC	411
56	Cancer,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Uterine endometrioid carcinoma	1.56E-13 3.58E-13	0.948	AAAS,ABCA8,ABCB1,AB AAAS,ABCA8,ABCB1,AB	453
57	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Colon tumor	3.97E-13	0.366	AAAS,AATK,ABCA8,ABC	428
59	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Female genital tract adenocarcinoma	7.7E-13	0.133	AAAS,ABCA8,ABCB1,AB	352
60	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cancer Gastrointestinal Disease Organismal Injury and Abnormalities	Endometrioid endometrial adenocarcinoma Colon cancer	9.85E-13 1.02E-12	-1.067	AAAS,ABCA8,ABCB1,AB	255
62	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Endometrial adenocarcinoma	1.28E-12		AAAS,ABCA8,ABCB1,AB	264
63 64	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Development of digestive organ tumor Endometrial carcinoma	1.77E-12 2.86E-12	3.047	AAAS,AATK,ABCA8,ABC AAAS,ABCA8,ABCB1,AB	470 291
65	Organismal Injury and Abnormalities, Reproductive System Disease	Abnormality of endometrium	7.38E-12	2 1 2 8	AAAS,ABCA8,ABCB1,AB	307
67	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Female genital neoplasm	9.74E-12	1.96	AAAS,ABCA8,ABCB1,AB	426
68	Organismal Injury and Abnormalities, Reproductive System Disease	Abnormal growth in endometrium	9.75E-12	1.06	AAAS, ABCA8, ABCB1, AB	306
70	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Development of genital tumor	1.52E-11	1.446	AAAS,ABCA8,ABCB1,AB	400
71	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Female genital tract cancer Gancer of head	4.62E-11 4.67E-11	2 6 1 3	AAAS, ABCA8, ABCB1, AB ABCB1 ACVR1 AMER1 A	399
73	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Endometrium tumor	5.13E-11	21010	AAAS,ABCA8,ABCB1,AB	301
74	r,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnorm Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Liver carcinoma Endometrial cancer	7.35E-11 1.05E-10	2.138	AAAS,AATK,ABCA8,ABC AAAS,ABCA8,ABCB1,AB	401 299
76	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Breast or gynecological cancer	1.31E-10	0.555	AAAS,ABCA8,ABCB1,AB	484
78	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Colorectal disorder Colorectal tumor	1.67E-10	0.343	AAAS,AATK,ABCA8,ABC	469
79	r,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnorn	Hepatobiliary system cancer	1.92E-10	2.261	AAAS,AATK,ABCA8,ABC	431
81	Cancer,Organismal Injury and Abnormalities	Breast or colorectal cancer	7.27E-10	-0.588	AAAS,AATK,ABCA8,ABC	530
82	Cellular Assembly and Organization, Cellular Function and Maintenance	Organization of cytoplasm	1.05E-09	-4.002	AATK, ABCD3, ABI1, ACTR	184
84	Lipid Metabolism,Small Molecule Biochemistry	Metabolism of glycosphingolipid	1.48E-09	-2.572	ABCA8,ABCB1,ARSA,AS	21
85	Lipid Metabolism,Small Molecule Biochemistry r.Gastrointestinal Disease.Hepatic System Disease.Organismal Injury and Abnorr	Metabolism of membrane lipid derivative Liver cancer	1.55E-09 1.65E-09	-3.397	ABCA8,ABCB1,ABHD6,A AAAS,AATK,ABCA8,ABC	69 406
87	r,Gastrointestinal Disease,Hepatic System Disease,Organismal Injury and Abnorn	Liver tumor	2.55E-09	2.797	AAAS,AATK,ABCA8,ABC	461
88	Lipid Metabolism,Small Molecule Biochemistry	Autosomal recessive neurological disorder Metabolism of glycolipid	3.44E-09 4.08E-09	-2.581	ABCA8,ABCB1,ALG14,AL	25
90	Cancer, Organismal Injury and Abnormalities, Reproductive System Disease	Uterine tumor	4.81E-09		AAAS,ABCA8,ABCB1,AB	320
92	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Uterine cancer	6.09E-09		AAAS,ABCA8,ABCB1,AB	308
93	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Oral tumor	6.27E-09 7.66E-09		ABCB1,AMER1,ANKRD1	133
95	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Oral squamous cell carcinoma	8.69E-09		ABCB1,AMER1,ANKRD1	126
96 97	Cell Morphology,Cellular Function and Maintenance Cell Morphology,Cellular Function and Maintenance	Autophagy of cells Autophagy	9.75E-09 1.38E-08	-2.784 -2.544	ARSA,ATG3,BAX,BCL2L' ACBD5,ARSA,ATG3,BAX	62 68
98	Cellular Assembly and Organization, Cellular Function and Maintenance	Organization of cytoskeleton	1.75E-08	-3.991	AATK,ABI1,ACTR2,ADAP	165
99 100	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormaliti Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Oral cavity carcinoma	2.34E-08 2.42E-08	3.448	ABCB1,AMER1,ANKRD1	470
101	Developmental Disorder, Neurological Disease	Mental retardation	5.02E-08		ALDH18A1,ARHGEF6,AF	62
103	Lipid Metabolism,Small Molecule Biochemistry	Metabolism of sphingolipid	6.02E-08	-2.647	ABCA8,ABCB1,ARSA,AS	29
104	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Developmental Disorder	Upper gastrointestinal tract tumor Autism or intellectual disability	6.86E-08 0.00000077	1.124	AATK, ABCA8, ABCB1, ABC ABCB1, ALDH18A1, ADH/	281 65
106	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Upper gastrointestinal tract cancer	8.57E-08		AATK,ABCA8,ABCB1,AB	279
107	Gene Expression	Microtubule dynamics Transcription of RNA	9.77E-08 0.000000233	-3.883	AATK,ABI1,ACTR2,ADAP ACTR2,ACVR1,AKIRIN2	142
109	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Malignant neoplasm of male genital organ	0.000000237		AATK,ABCB1,ABCB9,AB	334
111	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Prostatic carcinoma	0.000000268		ABCB1,ABCB9,ABCF3,AI	292
112	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Prostate cancer	0.000000275	-1 276	AATK, ABCB1, ABCB9, ABC	330
114	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Prostatic tumor	0.000000342	-1.270	AATK,ABCB1,ABCB9,AB	331
115	Cancer,Organismal Injury and Abnormalities Post-Translational Modification	Neoplasia of cells Ubiquitination of protein	0.000000557	0.711	ABCB1,ABCF1,ABHD15, AMER1,ATG3.BAG5.BRA	463 58
117	Organismal Survival	Organismal death	0.000000918	14.072	ABCB1, ABI1, ACVR1, AKII	246
119	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Prostatic adenocarcinoma	0.00000125	14.065	ABCB1,ABCB9,ABCF3,AI	277
120	Lipid Metabolism,Small Molecule Biochemistry Hepatic System Development and Function Hepatic System Disease Organ More	Hydrolysis of glycosylceramide Abnormal morphology of liver	0.00000145	-2.2	ARSA,GBA2,HEXA,HEXE ABCD3,AOAH APC APID	5
122	Cancer,Organismal Injury and Abnormalities	Breast or pancreatic cancer	0.00000171	-0.2	AATK,ABCA8,ABCB1,AB	412
123 124	ment and Function, Hepatic System Development and Function, Organ Morphology Intal Disorder, Hereditary Disorder, Neurological Disease. Organismal Injury and Ab	Morphology of liver Familial mental retardation	0.00000225 0.00000253		ABCD3,AOAH,APC,ARID ALDH18A1,ARHGEF6 AF	46 46
125	Gene Expression	Expression of RNA	0.00000326	-2.657	ABCF1,ACO1,ACTR2,AC	231
127	Lipid Metabolism,Molecular Transport,Small Molecule Biochemistry	Accumulation of glycosphingolipid	0.00000479	1.468	ARSA,GALC,GBA2,GULF	8
128	Cancer, Organismal Injury and Abnormalities	Upper aero-digestive squamous cell carcinoma Accumulation of galacteeviceramide	0.00000483		ABCB1,AMER1,ANKRD1	163
130	Neurological Disease	Cognitive impairment	0.00000529	0.965	ALDH18A1,ARHGEF6,AF	80
131 132	Gene Expression Infectious Diseases	Transcription of DNA Infection by HIV-1	0.00000569 0.0000058	-3.398	ACTR2,ACVR1,AKIRIN2, ALG14,ATMIN.ATXN2 BIC	161 70
133	Morphology,Cellular Assembly and Organization,Cellular Function and Maintena	Formation of cellular protrusions	0.00000662	-3.12	ABI1 ACTR2 ADAP1 APC	107
134	Cell Death and Survival Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Familial encephalopathy	0.00000662	-0.358	APC, ATMIN, BAX, BCL2L1 ALDH18A1, AMER1, ANO:	37
136	Cancer, Cardiovascular Disease, Organismal Injury and Abnormalities	Capillary hemangioma	0.00000744	1 5 4	ABCB1,AMER1,BCL2L1,I	13
138	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Hereditary neuropathy	0.00000857	1.54	ALDH18A1,ASAH1,ATL1	37
139	Cell Death and Survival	Apoptosis of tumor cell lines Synthesis of rebingelinid	0.00000915	2.707	AAAS,AATK,ABCB1,AKIP	138
141	DNA Replication, Recombination, and Repair	Repair of DNA	0.0000107	-3.697	ASCC3,ATF2,ATMIN,BCL	46
142	Cancer,Organismal Injury and Abnormalities	Melanoma Infection of cells	0.0000123	-0.393	AATK, ABCA8, ABCB1, AB ACTR2, ADAL AL G14 ATA	589 85
144	Cell Death and Survival	Cell viability of tumor cell lines	0.0000135	-6.073	ABCB1,AGPS,AK3,ASAH	106
145 146	Gene Expression Cancer,Organismal Injury and Abnormalities.Reproductive System Disease	Transcription Breast or ovarian carcinoma	0.0000231 0.0000232	-3.676	ACO1,ACTR2,ACVR1,AK ABCA8,ABCB9,ABHD10	214 253
147	ellular Growth and Proliferation, Nervous System Development and Function, Organ	Morphogenesis of neurons	0.0000255	-1.997	ABI1, ADAP1, APC, ARHG	74
		Mellanest sections of section that	0.0000262	0.102	ADCAR ADCD4 ACC4 AC	202

151	Carbohydrate Metabolism,Lipid Metabolism,Small Molecule Biochemistry	Synthesis of phosphatidylinositol	0.0000308	-0.728	CDS1,HSPA5,INPP4A,IN	20
152	Cell Morphology, Cellular Assembly and Organization	Morphology of lysosome	0.0000347		BAX,CLN3,CTSA,DNM2,E	10
153	Lipid Metabolism,Small Molecule Biochemistry	Synthesis of phospholipid	0.0000362	-1.293	ABCA8,AGPS,ATF6,CDS	32
154	Digestive System Development and Function,Gastrointestinal Disease	Abnormal morphology of digestive system	0.0000384	0.070	ABCB1,ABCD3,AOAH,AF	66
155	Cell Death and Suprival	Cell death of neuronal progenitor cells	0.0000405	-2.279	DICER1 ERBB3 HTT PAX	57
157	Intal Disorder Hereditary Disorder Neurological Disease Organismal Injury and Ab	Autosomal dominant mental retardation	0.000045	0.040	ARID2 ATP6V1B2.CDK1	18
158	Cell Death and Survival	Cell viability	0.0000483	-6.186	ABCB1,AGPS,AK3,AMIG0	147
159	Jocrine System Disorders, Organismal Injury and Abnormalities, Reproductive Syste	Ovarian tumor	0.0000514		ABCA8,ABCB1,ABCB9,A	168
160	Cell Death and Survival	Cell death of connective tissue cells	0.0000519	-0.894	ABCB1,ASAH1,ATF2,ATF	68
161	ellular Function and Maintenance, Cellular Growth and Proliferation, Nervous Syste	Neuritogenesis	0.0000524	-1.997	ABI1,ADAP1,APC,ARHG/	72
162	Cancer, Organismal Injury and Abnormalities	Synthesis of phosphatidic acid	0.0000527	-1672	ABCA8, ABCB1, ACO1, AC	196
164	Intal Disorder Hereditary Disorder Neurological Disease Organismal Injury and Ab	Dominant mental retardation	0.0000555	-1.075	ARID2 ATP6V1B2 CDK1	19
165	Cell Morphology	Morphology of cellular protrusions	0.0000582		AATK AP1M2 APC ARSA	39
166	Jocrine System Disorders, Organismal Injury and Abnormalities, Reproductive Syste	Ovarian cancer	0.0000609		ABCA8,ABCB1,ABCB9,A	164
167	d Function, Neurological Disease, Organ Morphology, Organismal Development, Organismal Development, Organisma (Development, Organisma)	Abnormal morphology of Purkinje's layer of cerebellum	0.0000645		ARSA,ATXN2,BICD2,CLN	14
168	focrine System Disorders, Organismal Injury and Abnormalities, Reproductive Syste	Gonadal tumor	0.0000664	1.387	ABCA8,ABCB1,ABCB9,A	173
169	Cellular Assembly and Organization, Cellular Compromise	Formation of cellular inclusion bodies	0.0000824	-1.721	ATF6,BAG5,BCL2L1,CRY	15
170	Cell Death and Survival	Apoptosis	0.0000833	2.677	AAAS,AATK,ABCB1,ABR.	254
171	Carbohydrate Metabolism,Lipid Metabolism,Small Molecule Biochemistry	Metabolism of phosphatidic acid	0.000087	-2.496	ATF6,CDS1,CTBP2,DGK	30
172	Cell Death and Survival	Apoptosis of fibroblast cell lines	0.0000876	-1.495	ABCB1,ASAH1,ATF2,ATF	40
174	Linid Metabolism Molecular Transport Small Molecule Biochemistry	Accumulation of cerebroeide	0.0000895	-2.969	ADRAAA32,AMERT,ANK	5
175	Cell Morphology Cellular Function and Maintenance	Autophagy of tumor cell lines	0.0000922	-2.973	ATG3 BAX BCL 2L1 CRY	25
176	Cell Morphology	Morphology of microvilli	0.0000944		AP1M2,PLS1,PLS3,RAB8	6
177	order, Neurological Disease, Organismal Injury and Abnormalities, Skeletal and Mus	Autosomal dominant hereditary spastic paraplegia	0.0000944		ALDH18A1,ATL1,CPT1C	6
178	Cell Death and Survival	Cell death of colorectal cancer cell lines	0.000107	1.335	APC, ATMIN, BAX, BCL2L1	39
179	Cellular Assembly and Organization	Opening of cellular membrane	0.00011		BAX,BCL2L1,BID	3
180	Cellular Growth and Proliferation,Organismal Development	Growth of yeast	0.000116	0.522	ABCB1,ALG14,ATXN2,B/	15
101	Concer Organismel Inium and Abnormelities	Metabolism of DNA	0.000116	0.016	ABCBLANKRD17, APC, A	40
183	Cellular Function and Maintenance	Clathrin mediated endocytosis	0.00012	-2.791	ATP6AP1 ATP6V1B2 CD	13
184	nt,Cellular Growth and Proliferation,Nervous System Development and Function,1	Development of neurons	0.000122	-3.665	ABI1,ADAP1,AMIGO2,AP	89
185	Cell Death and Survival	Cellular degradation	0.000133	2.181	ARSA,ATF2,ATP8B1,BAC	34
186	Lipid Metabolism,Small Molecule Biochemistry	Synthesis of glycolipid	0.000135	-2.156	ABCA8,ABCB1,ALG14,AL	14
187	Jocrine System Disorders, Organismal Injury and Abnormalities, Reproductive Syste	Development of gonadal tumor	0.000148	0.705	ABCA8,ABCB9,ABHD6,A	141
189	Incrine System Disorders Organismal Injuny and Abnormalities Reproductive System	Ovarian carcinoma	0.000154	-3.705	ABCA8,ABCB1,ABCD3,A	147
190	Infectious Diseases	HIV infection	0.000164	-7.705	ABCB1 ALG14 ATMIN AT	75
191	Cell Death and Survival, Embryonic Development	Apoptosis of ectoderm	0.000164	2	CUL1,HNF4A,HTT,VPS41	4
192	Carbohydrate Metabolism	Synthesis of carbohydrate	0.000185	-1.404	AKR1A1,ALG14,ALG3,AT	59
193	Cancer, Hematological Disease, Organismal Injury and Abnormalities	Neoplasia of blood cells	0.00019	2.617	ABCB1,ABI1,ABRAXAS2,	278
194	opment and Function, Neurological Disease, Organ Morphology, Organismal Devel	Loss of Purkinje cells	0.00019		ATXN2,EI24,HTT,OSTM1	6
195	Cell Death and Survival	Viral lefection	0.000197	-1.685	ABUBI ASAHI ATF2 ATF	49
196	Cell Death and Supplyal	Cell supival	0.0002	-7.507	ABCB1 AGPS AK3 AMIC	155
198	Cell Morphology,Cellular Assembly and Organization	Morphology of mitochondria	0.000214	0.100	ACOT13,ATG3.BAX.BCI	20
199	er,Hematological Disease,Immunological Disease,Organismal Injury and Abnorma	Acute myeloid leukemia	0.000217	0.272	ABCB1,ACBD5,AFTPH,A	152
200	Morphology, Cellular Assembly and Organization, Cellular Function and Maintena	Formation of microvilli	0.000219		ATP8B1,DAG1,HNF4A,PL	7
201	Cancer, Organismal Injury and Abnormalities	Extraadrenal retroperitoneal tumor	0.000221	1.444	AATK,ABCB1,ABCD3,AB	294
202	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Autosomal dominant neuropathy	0.000223		ALDH18A1,ATL1,CHMP2	13
203	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Gastric carcinoma	0.000224		AATK, ABCF1, ACO1, ACV	130
204	Cell Morphology Cellular Exection and Maintenance	Macroautophagy	0.000226	-1 092	AGCD1, ABCD3, AOAH, AP	18
206	er.Hematological Disease.Immunological Disease Organismal Injury and Abnorm	Myeloid leukemia	0.000233	-0.073	ABCB1.ACBD5.AFTPH A	155
207	Jocrine System Disorders, Organismal Injury and Abnormalities. Reproductive Syste	Ovarian adenocarcinoma	0.000238		ABCA8, ABCB9, ABHD6, A	139
208	logy,Nervous System Development and Function,Organ Morphology,Organismal [Morphology of cerebellar cortex cells	0.000254		ARSA,ATXN2,BICD2,EI24	12
209	intal Disorder, Hereditary Disorder, Neurological Disease, Organismal Injury and Ab	Recessive mental retardation	0.00027		ALDH18A1,ARHGEF6,AS	25
210	II Death and Survival, Cellular Compromise, Neurological Disease, Tissue Morphole	Degeneration of neurons	0.000282	2.136	ARSA,ATF2,ATP8B1,BAC	31
211	Cancer, Hematological Disease, Organismal Injury and Abnormalities	Hematopoietic neoplasm	0.000288	2.726	ABCB1,ABI1,ABRAXAS2,	279
212	Cell Death and Survival,Embryonic Development	Apoptosis of embryonic cell lines	0.000288	-1.618	ATF2,ATG3,BAX,BCL2L1	34
213	Linid Metabolism Small Molecule Biochemistry	Catabolism of lipid	0.000289	-3.093	ABHD6 ACBD5 ABSA AS	19
215	Cancer.Cardiovascular Disease.Organismal Injury and Abnormalities	Hemangioblastoma	0.000295	-0.000	ABCB1.AMER1.DDX6.DK	10
216	Organismal Development	Arrest in growth of organism	0.000296		ACVR1,ATF2,CTCF,CUL	22
217	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Rectal adenocarcinoma	0.000302		ACBD5,AMER1,AMIGO2,	56
218	vous System Development and Function, Organ Morphology, Organismal Developm	Morphology of cerebral cortex	0.000309		ARHGAP5,ARL6,BACE1,	30
219	d Function, Neurological Disease, Organ Morphology, Organismal Development, Org	Abnormal morphology of cerebellar cortex	0.00033	4 050	ARSA,ATXN2,BICD2,CLN	15
220	Cancer, Organismai Injury and Abnormalities	Cancer of cells	0.000337	1.953	ABCB1, ABCF1, ABHD15,	3/4
222	Cancer.Hematological Disease.Organismal Injury and Abnormalities	Bone marrow neoplasm	0.000354	0.439	ABCB1,ABI1,ACBD5,ADA	168
223	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Cecum adenocarcinoma	0.000369		AMER1, APC, ARHGAP5,	54
224	vous System Development and Function, Organ Morphology, Organismal Developm	Morphology of hippocampus	0.000371		ARL6, BACE1, BICD2, BID,	19
225	Carbohydrate Metabolism	Metabolism of carbohydrate	0.00039	-1.517	ABCB1,AKR1A1,ALG14,	74
226	Morphology, Cellular Assembly and Organization, Cellular Function and Maintena	Extension of cellular protrusions	0.000401	-2.693	AATK,ARHGAP20,ARHG	27
227	Infectious Diseases	Infection of tumor cell lines	0.000401	-6.15	ACTR2,ADAL,ALG14,BIC	53
220	Cencer Hemetological Disease Organismal Injury and Abnormalities	Hematologic cancer	0.000422	-1.546	ABCB1 ABRAXAS2 ACBI	274
230	Cell Morphology	Size of microvilli	0.000425	2.40	PLS1.RAB8A,USH1C	3
231	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities	Right colon tumor	0.000425		APC,KRAS,MSH2	3
232	Cancer,Organismal Injury and Abnormalities,Reproductive System Disease	Breast carcinoma	0.000428		ABCA8,ABHD10,ACOT9,	153
233	Gene Expression	Activation of DNA endogenous promoter	0.000429	-3.654	ACTR2, ACVR1, AKIRIN2,	122
234	Behavior	Habituation	0.000463	-1.342	BACE1,CERS6,CKAP5,F	6
235	cancer, Organismal Injury and Abnormalities	Double-stranded DNA break repair of tumor cell lines	0.000473	2.559	BMI1 DEK PBRM1 RB1 R	245
237	Cancer,Organismal Injury and Abnormalities	Clear-cell adenocarcinoma	0.000501	0.000	ABCB1,ACADS,ADAL,AP	91
238	Cell Morphology, Cellular Assembly and Organization	Size of lysosome	0.000506		BAX, DNM2, EPS8, HEXA, F	5
239	Cancer, Hematological Disease, Organismal Injury and Abnormalities	Malignant myeloid neoplasm	0.000512	1.034	ABCB1,ACBD5,ADAL,AF	162
240	Cell Morphology,Cellular Function and Maintenance	Macroautophagy of cells	0.000512	-1.715	ATG3,CHMP2A,CHMP2B	17
241	Disorder, Neurological Disease, Organismal Injury and Abnormalities, Psychologica	Familial amyotrophic lateral sclerosis	0.000534		BCL2L1,CHMP2B,GRN,N	8
242	er, rematological Disease, immunological Disease, Organismal Injury and Abnorma	Acute leukemia Abnormal morphology of Purkinie celle	0.000536	-0.161	ABGBT, AGBD5, AFTPH, A	101
244	Cancer.Hematological Disease.Organismal Injury and Abnormalities	Bone marrow cancer	0.00057	0,428	ABCB1.ACBD5.ADAL.AF	163
245	Embryonic Development, Organismal Development	Arrest in growth of embryo	0.000572		ACVR1,ATF2,CTCF.CUL	21
246	Cell Death and Survival	Neuronal cell death	0.00058	1.418	AATK,AMIGO2,APC,ASA	72
247	Cancer,Organismal Injury and Abnormalities	Head and neck squamous cell carcinoma	0.000585		ABCB1,ABCF1,AMER1,A	205
248	Intal Disorder, Hereditary Disorder, Neurological Disease, Organismal Injury and Ab	Autosomal recessive mental retardation	0.0006		ALDH18A1,ASCC3,CASF	20
249	Lipid Metabolism Small Molecule Biochemistry	Gastric agenocarcinoma Synthesis of glycoephingolinid	0.000628	4 000	ABCHT,ACOT,ACVR1,AD	122
251	Protein Svnthesis	Homo-oligomerization of protein	0.000655	-1 4 2 2		9
252	Lipid Metabolism, Molecular Transport, Small Molecule Biochemistry	Concentration of lipid		-1.922	AK3,APC.ATL1.ATL2.BA	9 22
253	Protein Synthesis		0.000667	-0.808	AK3,APC,ATL1,ATL2,BA) ABCB1,ABHD6,ACOT13,	9 22 85
254		Metabolism of protein	0.000667 0.000669	-0.808	AK3,APC,ATL1,ATL2,BA) ABCB1,ABHD6,ACOT13, ABCF1,ACO1,ACR,AKIP1	9 22 85 117
255	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities	Metabolism of protein Rectum cancer	0.000667 0.000669 0.000672	-1.922 -0.808 -1.871	AK3,APC,ATL1,ATL2,BA) ABCB1,ABHD6,ACOT13, ABCF1,ACO1,ACR,AKIP1 ACBD5,AMER1,AMIGO2,	9 22 85 117 57
257	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cancer,Hematological Disease,Organismal Injury and Abnormalities	Metabolism of protein Rectum cancer Myeloid neoplasm	0.000667 0.000669 0.000672 0.000672 0.000672	-0.808 -1.871 0.729	ABCAD, ABCAD, ABCAD, ABCAD, ABCAD, ABCAD, ABCB1, ABHD6, ACOT13, ABCF1, ACO1, ACR, AKIP1 ACBD5, AMER1, AMIGO2, ABCB1, ABI1, ACBD5, ADA ABCB1, ACV/21, APC, ATE	9 22 85 117 57 167 79
	Cancer,Gastrointestinal Disease,Organismal injury and Abnormalities Cancer,Hematological Disease,Organismal Injury and Abnormalities Cell Cycle Infectious Diseases,Organismal Injury and Abnormalities	Metabolism of protein Rectum cancer Myeloid neoplasm Interphase Infection of empryonic cell lines	0.000667 0.000669 0.000672 0.000672 0.000688 0.000699	-1.922 -0.808 -1.871 0.729 -1.837 -5.559	ABCAD, ABCAD, ABCAD, ARCAD, ABCAD, ARCAD, ARCAD, ARCAD, ABCBT, ABHOB, ACCOT13, ABCF1, ACCO1, ACR, AKIP1 ACBD5, AMER1, AMIGO2, ABCB1, ACBD5, ADA ABCB1, ABI1, ACBD5, ADA ABCB1, ACR1, APC, ATF, ATMIN, ATXN2, CD164, CF	9 22 85 117 57 167 79 31
258	Cancer, dastrointestinal Disease, Organismal Injury and Abnormalities Cancer, Hematological Disease, Organismal Injury and Abnormalities Cell Cycle Infectious Diseases, Organismal Injury and Abnormalities Audiory Disease, Neurological Disease	Metabolism of protein Rectum cancer Mysloid neoplasm Interphase Infection of embryonic cell lines Hearing loss	0.000667 0.000669 0.000672 0.000672 0.000688 0.000699 0.000704	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07	ABCARABAGES AK3,APC AT L1 ATL2,BA ABCB1,ABHD6,ACOT13, ABCF1,ACOT,ACR AKIP1 ACBD5,AMER1,AMIGO2, ABCB1,ACVR1,APC,ATF ATMIN,ATXN2,CD164,CE ABCB1,ARSA,ATP6V1B2	9 22 85 117 57 167 79 31 29
258 259	Cancer, destrointestinal Disease, Urganismal Injury and Abnormalities Cancer, Hematological Disease, Organisma Injury and Abnormalities Cell Cycle Infectious Diseases, Organisma Injury and Abnormalities Auditory Disease, Neurological Disease 2ellular Function and Maintenance, Cellular Growth and Proliferation, Nervous Syst	Metabolism of protein Rectum cancer Mysloid neoplasm Interphase Infection of embryonic cell lines Hearing loss Polarization of neurons	0.000667 0.000669 0.000672 0.000672 0.000688 0.000699 0.000704 0.000706	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07	ABCARABED ANGA, DA AK3, APC, ATL 1, ATL2, BA ABCB1, ABHD6, ACOT13, ABCF1, ACOT1, ACR, AKIP1 ACBD5, AMER1, AMIGO2, ABCB1, ACVR1, APC, ATF ATMIN, ATXN2, CD164, CE ABCB1, ARSA, ATP6V1B2 APC, GSK3B, HTT, KIF3A, F	9 22 85 117 57 167 79 31 29 5
258 259 260	Cancer Astrointestina Disease, Urganisma Injury and Abnormalities Cancer Hematological Disease, Organisma Injury and Abnormalities Infectious Diseases, Organisma Injury and Abnormalities Auditory Disease, Neurological Disease Sellular Function and Maintenance, Cellular Growth and Proliferation, Nervous Syst Cellular Survival	Matabolism of protein Rectum cancer Myeioid neoplasm Interplasm Infection of embryonic cell lines Hearing location of neurons Cell death of lung cancer cell lines	0.000667 0.000669 0.000672 0.000672 0.000688 0.000699 0.000704 0.000706 0.000717	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296	AGLAGAGGG ATL 1 ATL2 BA AK3 APC ATL 1 ATL2 BA ABCF1 ACOT13, ABCF1 ACOT14, ACG1 ACRARP1 ACG1 ACC1 ACRARP1 ACG1 AGLAGAGAGAGA ABCG1 AL1 ACGD5 ADA ABCG1 AL1 ACGD5 ADA ABCG1 ARXA ATP6V182 APC, GSK3B, HTT, KIF3A, F AMER1 BAX, BCL2L 1, BID	9 22 85 117 57 167 79 31 29 5 35
258 259 260 261	Cancer, Gastrointestinal Disease, Urganismal tinjury and Abnormalities Cancer, Hematological Disease, Organismal linjury and Abnormalities Calcer, Hematological Disease, Neurological Disease Infectious Diseases, Surganismal Injury and Abnormalities Auditory Disease, Neurological Disease Auditory Disease, Neurological Disease Cellular Function and Native and Polifersion, Nervous Syste Call Death and Survival Cellular Auditory Disease Disease Development Control and Maintenance	Metabolism of protein Rectum cancer MetroPhase Infection of embryonic cell lines Hearing loss Polarization of neurons Cell death of lung cancer cell lines Maintenance of fatter cells	0.000667 0.000672 0.000672 0.000672 0.000688 0.000699 0.000704 0.000706 0.000717 0.000715 0.000725	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296	AK3 APC, ATL 1 ATL 2, BAX ABCB1, AND 1, BAXCOT 1, ACC 1,	9 22 85 117 57 167 79 31 29 5 35 35 12 87
258 259 260 261 262 263	Cancer Astrointestina Disease. Vrganisma Injury and Abnormalities Cancer Hematological Disease. Jorganisma Injury and Abnormalities Infectious Diseases. Organisma Injury and Abnormalities Auditory Disease. Neurological Disease Sellular Function and Maintenance. Cellular Growth and Proliferation.Nervous Syst Cellular Function and Maintenance Cellular And SuryVal DA Beglicitation Bergentian Cell Death and SuryVal DA Beglicitation and Parenti	Metabolism of protein Rectum cancer Myeloid neoplasm Infection of embryonic cell lines Hearing to the same Cell diffit zation of neurosal lines Cell diffit zation of neurosal lines Maintenance of tear cells Catabolism of protein Eramentation of INA	0.000667 0.000672 0.000672 0.000672 0.000688 0.000699 0.000704 0.000706 0.000717 0.000725 0.000742	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -0.296 -2.074 -0.642	AK3 APC, ATL 1 ATL2 BAX ARGB1, ABHOB, ACOT13, ABGC1, ARHOB, ACOT13, ARGB1, ARHOB, ACOT13, ARGB1, ACHER1, AMIGO2, ARGB1, ACVR1, APC, ATF ATMIN, ATXN2, CD164, CE ARGB1, ARS, AATR6V1182 APC, GSK3B, HTT, KIF3A, F AMER1, BAX, ABCL21, 1810 ACR, ANIAPC102PC, ATF ARGB1, ASA415, BAX PC1	9 22 85 117 57 167 79 31 29 5 35 12 67 21
258 259 260 261 262 263 263 264	Cancer,Gastrointestinal Disease, Organismal Injury and Abnormalities Cancer,Hematological Disease, Organismal Injury and Abnormalities Call Orde Infectious Diseases, Call Orde Infectious Diseases, Call Orde Matting Diseases, Call Order, Call Call Infectious Diseases, Call Order, Call Call Infectious Diseases, Call Order, Call Infectious Diseases, Call Infectious Diseases, Call Infectious Diseases, Call Infectious Diseases, Call Call Call Call Call Call Call Call	Metabolism of protein Rectum cancer Muterphase Infection of embryonic cell lines Hearing loss Polarization of neurons Cell death of lung cancer cell lines Maintenance of sterm cells Cell factor of DNA Breast cancer	0.000667 0.000672 0.000672 0.000672 0.000688 0.000704 0.000706 0.000706 0.000706 0.000772 0.000742 0.000744	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152	AK3 APC ATL 1 ATL2 BA3 ABC 14 AIHO BA COT13, ABC 15 AIHO BA COT13, ABC 15 AIHO BA COT13, ABC 15 ACH 1 ACE ABC AKIF 1 ACBD5 AMERT AMIGO2 ABC 15 ABH ACE AD5 AD7 ABC 15 ACH 1 APC ATF ATMN ATXN2 CD 164, CE ABC 15 AGE AATBV 118 APC GSK3B, HTT JKF3A,F AMERT 18AX,ATBV 118 APC GSK3B, HTT JKF3A,F AMERT 18AX,ATBV 118 APC ABMPR 1 AD DX8 DIC ACR ANAPCT 10, APC ATF ABC 81, ASAH1, BAX, BCL ABCA8, BACE 1, ABHD 10.	9 22 85 117 57 167 79 31 29 5 35 12 67 21 203
258 259 260 261 262 263 263 264 265	Cancer Asstointestina Disease. Urganisma Injury and Abnormalities Cancer Hematological Disease. Organisma Injury and Abnormalities Infectious Diseases. Organisma Injury and Abnormalities Auditory Disease. Neurological Disease Sellular Function and Maintenance. Cellular Growth and Proliferation. Nervous Syst Cell Death and Survival Cell Death and Survival Cell Death and Survival Cell Death and Survival DAR Reginication. Recombination, and Repair Cancer, Organisma Injury and Abnormalities, Reproductive System Disease Cell Lar Compromise	Metabolism of protein Rectum cancer Myeloid neoplasm Infercient of embryonic cell lines Polarization of neurons Cell death of lung cancer cell lines Maintenance of atem cells Catabolism of protein Fragmentation of DNA Breast cancer Degeneration of cells	0.000667 0.000669 0.000672 0.000672 0.000688 0.000688 0.000764 0.000706 0.000777 0.000775 0.000744 0.000744	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 3.312	AK3.AFC.ATL.1ATL2BA3 ABC61.ABH06.ACOT13. ABC61.ABH06.ACOT13. ABC61.ABH06.ACOT13. ABC61.ACH1.ACB05.ADC ABC61.ACH1.ACB05.ADC ABC61.ACH1.ACCB05.ADC ABC61.ACH1.ACCB16.ACT ATMIN.ATXN2.CD164.CE ABC61.ASAATBV1B2. ACCGNSB.HTT.IKTSAF ABC61.ASAATBV1B2. ACCGNSB.HTT.IKTSAF ABC61.ASAATBV1B2. ACCA.ADC610.AFCATF ABC61.ASAATBV1.BAX.BCC ABC64.ABC61.ABH010, ARSAAT22.ATP861.BAC	9 22 85 117 57 167 79 31 29 5 35 12 67 21 203 40
258 259 260 261 262 263 264 265 266	Cancer, Gastrointestina i Disease, Organisma I injury and Abnormalities Cancer Hematological Disease, Organisma I livya nad Abnormalities Infectious Diseases, Orcal Organisma Auditory Diseases, Mercal Organisma Disease Meurological Disease Fellular Function and Maintenance Cell Death and Survival Cellular Function and Maintenance Protein Degradation, Protein Synthesis Call Death and Survival, DNA Replication, Recombination, and Repair Cancer, Organisma I livyi and Abnormalities, Reproductive System Disease Cellular Compromise iogical Disease, Herefultary Disease (Cancer, Organisma I hijury and	Metabolism of protein Rectum cancer Interphase Infection of embryonic cell lines Hearing loss Polarization of neurons Cell death of lung cancer cell lines Maintenance of sterm cells Cell death of lung cancer cell lines Fagmentation of DNA Breast cancer Degeneration of cells Familia acute myeloid teukemia	0.000667 0.000669 0.000672 0.000672 0.000688 0.000704 0.000706 0.000704 0.000725 0.000742 0.000742 0.000742 0.000746 0.000769	-1.922 -0.808 -1.871 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 -1.5312	AK3,APC,ATL1,ATL2,BA3 ABCB1,ABH06,AC0T13, ABCB1,ABH06,AC0T13, ABCB1,ABH1,ACB05,AMF1 ACB05,AMF1,AME02,ADF ABCB1,ABH1,ACB05,ADF ABCB1,ABH3,CD194,CE ABCB1,ARSA,ATFB41K2,CD194,CE ABCB1,ARSA,ATFB41K2,CD194,CE ABCB1,ARSA,ATFB41K2,CD194,CE ABCB1,ARSA,ATFB41,BAC APC,SHX3B,ABC12,L1,BIC ABCB1,ASAH1,BAX,BCL ABCA9,ABCB1,ABH010, ARSA,ATF2,ATF881,BBAC APC,CHIC2,RAB3,SM512	9 22 85 117 57 79 31 29 5 35 12 67 21 203 40 6 6
258 259 260 261 262 263 264 265 266 266 266 266	Cancer Asstorintestinal Disease. Urganismal Injury and Abnormalities Cancer Hematological Disease. Droganismal Injury and Abnormalities Cancer Hematological Disease. Concording and Cancer Cancer Infectious Diseases. Revological Disease Sellular Function and Maintenance. Cellular Growth and Proliferation. Nervous Syst Cell Death and Survival Cell Death and Survival Cell Death and Survival Cell Death and Survival DNA Replication. Recombination, and Repair Cancer, Organismal Injury and Abnormalities, Reproductive System Disease Cell Disease. Heredilary Disorder. Immunological Disease. Organismal Injury an Infectious Disease.	Metabolism of protein Rectum cancer Myeloid neoplasm Interplase cell lines Hearing loss Polarization of neurons Cell death of lung cancer cell lines Maintenance of stem cells Catabolism of protein Fragmentation of DNA Breast cancer Degeneration of cells Hearing Leeming	0.000667 0.000669 0.000672 0.000672 0.000688 0.000704 0.000704 0.000704 0.000774 0.000774 0.000742 0.000742 0.000746 0.000775 0.000775 0.000775	-1.922 -0.808 -1.871 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 3.312 -5.468	AK3.AFC.ATL1.ATL2BA3 ABC61.ABH06.AC0T13. ABC61.ABH06.AC0T13. ABC61.ABH06.AC0T13. ABC61.AC0T.ACR.AKIP1 AC055.AME1.AMC03C.AD ABC61.AC81.ACBA5.AD ABC61.AC81.ACBA5.AD ABC61.AC81.ACBA5.ATC9.Y182 AABC61.AC81.ACBA5.ATC9.Y182 AABC61.AC81.ADDX8.DIG ACC.ANAPC10.AFC.ATF ABC61.ASA1.BOX.BD ACC.ANAPC10.AFC.ATF ABC61.ASA1.BOX.BD ACC.ATF61.BAX.BC1.A BC63.ASBC61.ABH010, ARSA.ATE2.ATF81.BAX. APC.CHIC2.XRAS.MSH2 ATMMA.ATAN.2.O164.CE	9 22 85 117 57 167 79 31 29 5 35 12 29 5 12 29 5 12 7 21 20 340 6 30
258 259 260 261 262 263 264 265 266 266 266 266 268 269	Cancer, Gastrointestina i Disease, Organisma Injury and Abnormalities Cancer Hematological Disease, Organisma Injury and Abnormalities Infectious Diseases, Organisma Injury and Abnormalities Auditory Disease, Neurological Disease Isellular Function and Maintenance Protein Death and Survival Cellular Function and Maintenance Protein Degradation, Protein Synthesis Cancer, Organisma Injury and Abnormalities, Reproductive System Disease Cellular Compromise Iogical Disease, Herefultary Disease Cellular Compromise Iogical Disease, Herefultary Disease Cellular Compromise Iogical Disease, Herefultary Disease Cellular Compromise Cancer, Gastrointesting Phashoment Infectious Disease	Metabolism of protein Rectum cancer Interphase Infection of embryonic cell lines Polarization of neurons Cell death of lung cancer cell lines Maintenance of sterm cells Cell death of lung cancer cell lines Maintenance of sterm cells Fragmentation of DNA Breast cancer Degeneration of cells Familia cuter myeloid teukemia Infection of cellsla cell lines Infection of cellsla cell lines	0.000667 0.000669 0.000672 0.000672 0.000688 0.000699 0.000704 0.000706 0.000776 0.000742 0.000742 0.000744 0.000746 0.000757 0.000775 0.000775	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 3.312 -5.468	AK3,APC,ATL1,ATL2,BA3 ABCB1,ABH06,AC0T13, ABCB1,ABH06,AC0T13, ABCB1,ABH1,ACB05,AMF1 ACB05,AMET,AMIGO2, ABCB1,ABH1,ACB05,ADF ABCB1,ABH1,ACB05,ADF ABCB1,ARSA,ATFB41,CD14B,ACF ABCB1,ARSA,ATFB41,CD14B,ACF APC,SK13B,ACTFB41,BA2 APC,SK13B,ACTFB41,BA2 APC,SK13B,ACF ABCB1,ASA1TB,AX,BC1, ABCA8,ABCB1,ABH010, ARSA,ATF2,ATP881,BA2 ATMM,ATNA2,CD184,CE ATMM,ATNA2,CD184,CE ATMM,ATNA2,CD184,CE	9 22 85 117 57 167 79 31 29 5 35 12 67 21 203 40 6 30 30 30 30 30 30 30
258 259 260 261 262 263 264 265 266 266 266 268 269 270	Cancer, dastrointestinar Disease. Urganismai Injury and Abnormalities Cancer Hematological Disease. Drganisma Injury and Abnormalities Cancer Hematological Disease. Neurological Disease Infectious Diseases. Neurological Disease Multiar Function and Maintenance. Cellular Growth and Proliferation, Nervous Syst Cell Death and Survival Cellular Function and Maintenancein Cell Death and Survival DNA Replication, Recombination, and Repair Cancer, Organisma Injury and Abnormalities, Reconductive System Disease Cellular Componies Cancer, destrointesting Theodox Survival Cancer, Astrointesting Theodox Survival Cancer, Astrointesting Theodox Survival Cancer, Astrointesting Theodox Survival Cancer, Astrointesting Theodox Survival Abnormalities Cancer,	Metabolism of protein Rectum cancer Myeiold neoplasm Infection of employation coll lines Polarization of neurons Cell death of lung cancer cell lines Maintenance of atem cells Catabolism of protein Fragmentation of DNA Breast cancer Degeneration of cells Infellal acute myeiold leukensa Infellal gastric adencearcinoma Loss of brain cells Senescence of Broblast cell lines	0.000667 0.000669 0.000672 0.000672 0.000688 0.000704 0.000706 0.000706 0.000717 0.000725 0.000742 0.000742 0.000742 0.000742 0.000742 0.000757 0.000757 0.000759 0.000775 0.000775	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 3.312 -5.468	AK3 APC ATL 1 ATL 2 BAY ABC51 ABHOR ACOT13, ABC51 ABHOR ACOT13, ABC51 ABHOR ACOT13, ABC51 ACOT ACR AKIP1 ACB05 AMERT AMIGO2 ABC51 ASIT ACB05 ADA ABC51 AC81 ACB05 ADA ABC51 AC81 ACB05 ADA ABC51 AC81 ACB05 ADA AMERT BAX BC124 1 BIC APC BMPR1 ADX BC124 AD ABC51 ASAH ADX AD ABC51 ASAH APC ACF5 ABC51 ADA APC ACF5 ATXA2 CHM22B DICERT ARHCA75 BMIT BROT.D	9 22 85 117 57 167 31 29 5 35 25 21 203 40 6 30 30 30 30 30 10 19
258 259 260 261 262 263 264 265 266 267 268 269 269 270 271	Cancer, Gastointestina T Disease, Organisma Injury and Abnormalities Cancer Hematological Disease, Organisma Injury and Abnormalities Infectious Diseases, Organisma Injury and Abnormalities Auditory Disease, Neurological Disease Sellular Function and Maintenance Cell Death and Survival Cellular Function and Maintenance Protein Degradation, Protein Synthesis Cancer, Grasmisma Injury and Abnormalities, Reproductive System Disease Cellular Compromise Cancer, Gastrointestinal Disease, Organisma Injury an Cellular Compromise Cancer, Gastrointestinal Disease, Organisma Injury and Cancer, Gastrointestinal Disease, Organisma Injury and Abnormalities Cell Morphology, Nervous System Development and Function, Organ Morphology, Cell Cycle, Cellular Development and Function, Cancer, Gastrointestinal Disease, Organisma Injury and Abnormalities	Metabolism of protein Rectum cancer Metrophase Infection of embryonic cell lines Polarization of neurons Cell death of lung cancer cell lines Methanance of term cells Methanance of term cells Fragmentation of DNA Breast cancer Degeneration of cells Familia acute myeloid teukemia Infection of epithelial cell lines between the cells Senescence of Biroblast cell lines Apoptolas of conset	0.000667 0.000669 0.000672 0.000672 0.000688 0.000704 0.000706 0.000706 0.000706 0.000717 0.000742 0.000742 0.000740 0.000757 0.000757 0.000757 0.000752	-1.922 -0.808 -1.871 0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 0.152 3.312 -5.468 -0.682 -0.38	AK3, APC, ATL 1, ATL 2, BA3 ABCB1, ABHOB, ACOT13, ABCCF1, ADHOB, ACOT13, ABCCF1, ADHOB, ACOT13, ABCCF1, ADHOB, ACOT13, ABCCF1, ADHI, AC2, BD5, ADF, ABCCF1, ABH, AC2, BD5, ADF, ABCCF1, ABK3, ACTF94V182 APC, SSK38M, ZC, D149, AC5 ABCCF1, ARSA, ATF94V182 APC, SSK38M, ADDXA, DLC ABCCF1, ABK3, ACTF94V182 APC, SSK38M, ADDXA, DLC ABCCF1, ABK3, ADF, ABCCF1, ABCH1, ADDXA, DLC ABCAF, ABCGF1, ABHO10, AFS, AATF2, ATF98, BASC, ATMX, ATXN2, CD 164, CE AFK2, ATK92, BD7, DLC ATK72, ATF98, BM1, BK07, D, ATK72, ATF98, BX4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK2, BM1, BK07, D, ATK72, ATF98, BX4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK2, BM1, BK07, D, ATK72, ATF98, BX4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK2, BX4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK2, BX4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK3, BK3, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK3, BK4, SEC, L1, L1, ADF4, BCCF2, AFK2, AFK3, BK4, SEC, L1, L1, ADF4, BCCF2, AFK4, AFK4, AFK	9 22 85 117 57 79 31 29 5 35 5 35 5 32 67 21 203 40 6 30 30 30 30 30 34
258 259 260 261 263 264 265 266 267 266 267 268 269 270 271 272	Cancer Astroinessinal Disease. Arganismal Injury and Abnormalities Cancer Hematological Disease. Arganismal Injury and Abnormalities Cancer Hematological Disease. Cancer and the command of the command of the commentation of th	Metabolism of protein Rectum cancer Myeiolid neoplasm Infection of embyonic cell lines Polarization of neurons Cell death of lung cancer cell lines Catabolism of protein Fragmentation of DNA Breast cancer Loss of brain cells Infection of epithelial cell lines Infection of epithelial cell lines Loss of brain cells Senescence of Broblast cell lines Apoptosis of connective tissue cells Transport of protein	0.000667 0.000672 0.000672 0.000672 0.000672 0.000689 0.000704 0.000707 0.000707 0.000725 0.000742 0.000742 0.000746 0.000752 0.000755 0.000755 0.000552 0.000552 0.000552 0.000552 0.000552 0.000552 0.000552 0.000552 0.000552 0.0005555 00	-1.922 -0.808 -1.871 -0.729 -1.837 -5.559 3.07 -0.296 -2.074 -0.642 -0.642 -0.152 3.312 -5.468 -0.682 -0.38 -1.965	AKS APC ATL 1 ATL 2 BAY ABC51 ABHOR ACOT13, ABC51 ABHOR ACOT13, ABC51 ABHOR ACOT13, ABC51 ACH APC ATFL ACB5 AMER1 AMEGO2 ABC51 AC91 APC ATFL ATMIN ATXN2 CD 164, 45 ABC51 AC91 APC ATFL ABC51 AC91 APC ATFL	9 9 22 85 117 79 79 31 29 5 35 12 67 21 203 40 6 30 30 10 19 34 35
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258 259 260 261 262 263 264 265 266 267 266 269 270 271 271 272 273 274 275	Cancer, Gastointestina Disease, Organisma Injury and Abnormalities Cancer Hematological Disease, Organisma Injury and Abnormalities Infectious Diseases, Organisma Injury and Abnormalities Auditory Disease, Neurological Disease cellular Function and Maintenance Protein Death and Survival Cellular Function and Maintenance Protein Death and Survival Cancer, Grasmisma Injury and Abnormalities, Reproductive System Disease (Call Death and Survival, DNA Replication, Reproductive System Disease Cell Death and Survival, DNA Replication, Reproductive System Disease (Call Death and Survival, DNA Replication, Reproductive System Disease Cancer, Gastointestinal Disease, Organisma Injury and Abnormalities Cell Morphology, Nervous System Development and Function, Organ Morphology, C Cell Cycle, Cellular Development and Function, Cangan Morphology, C Cancer, Gastointestinal Disease, Organisma Injury and Abnormalities Cell Cycle, Cellular Development and Function, Cangan Morphology, C Cancer, Gastointestinal Disease, Organisma Injury and Abnormalities Cancer, Gastointestinal Disease, Organisma Injury and Abnormalities Cell Cycle, Cellular Development, Crister Development and Function Cellular Abnormalities Cancer, Gastointestinal Disease, Organisma Injury and Abnormalities Cancer, Gastointestinal Disease, Organisma Tallfording Cancer, Gastointes	Metabolism of protein Rectum cancer Rectum cancer Interphase Infection of embryonic cell lines Polarization of neurons Cell death of lung cancer cell lines Polarization of tembryonic sell lines Polarization of tembryonic sell lines Polarization of DNA Breast cancer Degeneration of Cells Familia such myeloid teukemia Infection of epithelial cell lines Infection of epithelial cell lines Senescence of Biroblast cell lines Senescence of Biroblast cell lines Transport of protein Gastroscyhageal adencearcinoma Transport of virblastine Expansion of endite	0.000667 0.000669 0.000672 0.000672 0.000672 0.000672 0.000724 0.000704 0.000704 0.000704 0.000742 0.000742 0.000742 0.000742 0.000742 0.000742 0.000775 0.000775 0.000775 0.000775 0.000775	-1.922 -0.803 -1.871 0.729 -1.837 -5.569 3.07 -0.296 -2.074 -0.642 0.152 -5.468 -0.682 -0.38 -1.965	AK3.APC,ATL1ATL2BA3 ABC61,ABH06,AC0113, ABC61,ABH06,AC0113, ABC61,ABH06,AC0113, ABC61,ABH1ACB05,ADF ARCB5,AMET,AMIGO2, ABC61,AB1A,ACB05,ADF ABC61,AB1AC,ACB05,ADF ABC61,ARSA,ATF84V182 APC,GSK38A,ATF84V182 APC,GSK38A,ATF84V182 APC,GSK38A,ATF84V182 APC,GSK38A,ATF84V182 APC,GSK38A,ATF84V182 APC,GSK38A,ATF84V182 ABC6A,BAC61,ABH010, ARSA,ATF2,ATF881,BAC APC,CHIC2KRAS,MSH2 ATMM,ATXN2,C0184,CE ABC6A,BAC61,ABH010, ARSA,ATF2,ATF881,BAC APC,CHIC2KRAS,MSH2 ATMM,ATXN2,C0184,CE ABC74,BAC61,ABH010, ABC74,BAC61,ABH010, AFSA,ATF2,ATF881,BAC APC,CHIC2KRAS,MSH2 ATMM,ATXN2,C0184,CE ABC74,BAC61,ABH010,D ABC74,BAC61,ABH010,D ABC74,BAC61,ABH010,D ABC74,BAC61,BAC71,ABC72,ABC7	9 9 22 85 17 157 57 57 31 29 5 35 12 79 5 35 12 20 3 40 6 6 30 30 30 30 10 19 34 35 148 4 4 4
258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277	Cancer, destrointestinal Disease, Organismal Injury and Abnormalities Cancer Hematological Disease, Neurological Disease, Calillar Compromise, Neurological Disease, Heredilary Disorder, Immunological Disease, Organismal Injury an Mecilous Disease Dury and Abnormalities, Calil Cycle, Cellular Development and Survival Molecular Transport, Proteina Idvecture Bochemisty, Molecular Transport, Proteina Idvecture Bochemistes, Drog Metaboliam, Molecular Transport, Protein Tafficking, Cancer, Gastrointestinal Transport, Proteinal Metecula Bochemisty, Calil Disease, Neurolar Janase, Neurolar Janase, Drog Metaboliam, Molecular Transport, Proteinal Metecular Bochemisty, Calibaryota, Databoliam, Molecular Transport, Proteinal Metecular Bochemisty, Calibaryota, Status, Cancer, Casarismal Injury and Abnormalities, Drog Metaboliam, Molecular Transport, Proteinal Metecular Bochemisty, Calibaryota, Status, Disease, Neurologo, Disease, Casarismal Injury and Abnormalities, Drog Metaboliam, Molecular Transport, Proteinal Metecular Bochemisty, Calibaryota, Databoliam, Molecular Transport, Proteinal Metecular Bochemisty, Calibaryota, Databoliam, Molecular Transport, Proteinal Metecular Bo	Metabolism of protein Rectum cancer Myeiolid neoplasm Infection of embyonic cell lines Polarization of neurons Cell death of lung cancer cell lines Catabolism of protein Fragmentation of DNA Breast cancer Catabolism of protein Fragmentation of DNA Breast cancer Infection of epithelial cell lines Infection of epithelial cell lines Infection of epithelial cell lines Senescence of Broblast cell lines Gasto of brain cells Catabolisat cell senest Apoptosis of connective tissue cells Transport of protein Gasto of protein Gasto approve the sene cells Catabolisat cell senest Apoptosis of connective tissue cells Transport of protein Development of epithelia Expansion of endoplasmic reticulum Primary sclerosing cholandits	0.000667 0.000669 0.000699 0.000699 0.000699 0.000699 0.000704 0.000704 0.000704 0.000704 0.000742 0.000742 0.000742 0.000742 0.000743 0.000745 0.000745 0.000757 0.000757 0.000757 0.000757 0.000755 0.000755 0.000755 0.000755 0.000755 0.000755 0.000552 0.000552 0.000852	-1.922 -0.802 -1.871 -1.871 -7.29 -1.837 -5.559 -0.296 -2.074 -0.642 0.152 -0.152 -0.468 -0.682 -0.388 -1.965 -0.254	AKS APC ATL 1 ATL 28A ARC 1 ABHOR ACOT13, ABC 61 ABHOR ACOT13, ABC 61 ABHOR ACOT13, ABC 61 ABHOR ACOT13, ABC 61 ACH ARC ATK ABC 61 ACH APC ATC ABC 61 ACH APC ATC ATL APC ATC ATL APC ATC ATL APC ATC APC 364 ABHOR ACC APC 364 ABHOR ACC APC 364 ABHOR ACC APC 364 ABHOR APC ATC ABC 61 ASH 1 BAX BOL ARC ANAPC 10 APC ATC ABC 61 ASH 1 BAX BOL ABC 61 ASH 1 BAX BOL ABC 71 ADA APC CEP6 ATKA APC CEN APC ATC ABC 61 ASH APC ACC ATL APC APC APC APC ATL APC APC APC APC ATC APC APC APC APC ATC APC	9 9 22 85 17 157 167 79 31 20 5 5 12 67 21 20 3 12 67 21 20 3 0 6 6 6 9 0 10 10 19 34 35 14 6 4 4 4 4 4 4 8
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258 259 260 261 262 263 264 265 266 266 266 267 270 270 277 278 277 277 277 277 277 277 277 277	Cancer, destointestina Disease, Organismal injury and Abnormalities Cancer, Hermatological Disease, Neurological Disease Participant Control of the Control	Metabolism of protein Recture cancer Metabolism of protein Recture cancer Metarphase Infection of embryonic cell lines Polarization of neurons Cell death of lung cancer cell lines Polarization of arbityonic cell lines Polarization of the cell lines Polarization of DNA Breast cancer Degeneration of DNA Breast cancer Degeneration of cells Familial such rejective lines Infection of epithelial cell lines Infection of epithelial cell lines Senescence of Biroblast cell lines Familian of the democration Senescence of Biroblast cell lines Familian of cells Transport of yroblast cell lines Familian of and cells Familiant of cells Fam	0 000667 0 000667 0 000679 0 000679 0 000699 0 000699 0 000699 0 000699 0 000699 0 000704 0 000704 0 000716 0 000716 0 000742 0 000745 0 000746 0 000746 0 000746 0 000746 0 000747 0 000747 0 000747 0 000746 0 000747 0 000746 0 000747 0 000782 0 000782 0 000887 0 000887 0 000887 0 000887 0 000877 0 000890 0 000890 0 000890 0 000959 0 0000000000	-1.922 -0.808 -1.871 -0.287 -1.871 -0.287 -0.296 -0.296 -0.296 -0.296 -0.296 -0.382 -0.682 -0.382 -0.682 -0.38 -1.965 -0.388 -1.965 -0.254 -0.254 -1.225 -1.546 2.425 -1.546 2.425 -1.283	AK3APCATL1ATL2BAY AK3APCATL1ATL2BAY ABC61 ABH06 AC0T13. ABC61 ABH06 AC0T13. ABC61 ABH06 AC0T13. ABC61 ABH1ACB05 AD0 ABC61 ABH1ACB05 AD0 ABC61 ABH1ACB05 AD0 ABC61 ABH1ACB05 AD0 ABC61 ABH1ACB05 AD0 ABC61 ABH1ACB05 AD0 ABC61 ABA1AB1AB1 ABC61 ABA1AB1AB1AB1 ABC61 ABA1AB1AB1AB1AB1 ABC61 ABA1AB1CA ABC61 ABA1AB1CA ABC61 ABA1AB1CA ABC61 ABA1AB1CA ABC61 ABA1AB1CA ABC61 ABA1AB1CA ABC71 AD1AB1CA ABC71 AD1CA ABC71 AD1CA ABC71 AD1CA ABC71 AD1CCA ABC71	9 9 22 85 117 57 167 79 31 29 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5

301 302	Neurological Disease Cellular Development,Cellular Growth and Proliferation	Neurodegeneration Colony formation of sarcoma cell lines	0.0012 0.00121	2.584	ARSA,ATF2,ATP8B1,BAC BMI1,CNOT7,DICER1,MT	37 6
303 304 305	Cellular Compromise,DNA Replication, Recombination, and Repair Cancer,Organismal Injury and Abnormalities,Reproductive System Disease Neurological Disease	Chromosomal instability Mammary tumor Degeneration of nervous system	0.00121 0.00121 0.00123	2.488 0.36 2.375	ABRAXAS2,APC,CDR12, ABCA8,ABCB1,ABHD10, ARSA,ATF2,ATP8B1,BAC	12 212 34
306	Organismal Development Cell Death and Survival	Morphology of head Cell viability of gastrointestinal stromal tumor cell lines	0.00127	-2.224	AATK,AMER1,ARHGAP5 IGF2R,ZNF254,ZNF429,Z	101
309	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cellular Function and Maintenance	Stomach tumor Cellular homeostasis	0.00128	-1.446	AATK,ABCB1,ABCF1,AC ABCD3,ACBD5,ACO1,AC	139 155
311 312	Cell Death and Survival Cell Death and Survival	Apoptosis of lung cancer cell lines Apoptosis of neuronal progenitor cells	0.0013 0.00133	-0.369 1.067	AMER1,BAX,BCL2L1,BID DICER1,ERBB3,HTT,RB1	30 4
313 314 315	Cell Death and Survival,Embryonic Development Cell Morphology Organismal Development	Anoikis of embryonic cell lines Permeabilization of liposome Growth of organism	0.00133	-1.067	RRAS, RB1, RBL2, TSC1 BAX, BID, FGF1, RB1 ABCB1, ACVR1, ALG14, AI	4 4 83
316 317	DNA Replication, Recombination, and Repair,Gene Expression Cell Morphology,Cellular Function and Maintenance	Methylation of DNA Repair of tumor cell lines	0.00134 0.00134	0.52	APC,ARID4A,ATF7IP,CTC BMI1,DEK,PARG,PBRM1	11
318 319	Infectious Diseases Cell Death and Survival	Infection of kidney cell lines Cell death of fibroblasts	0.00136	-5.468 -0.522	ATMIN,ATXN2,CD164,CE ATF2,BAX,BCL2L1,BID,C	30 30
321 322	Cancer,Organismal Injury and Abnormalities Sycle,Cellular Assembly and Organization,DNA Replication, Recombination, and F	Liquid tumor Segregation of chromosomes	0.00137 0.00137	0.342	ABCB1,ABI1,ACBD5,ACC ABRAXAS2,APC,CHMP2	198
323 324	ve Tissue Disorders, Organismal Injury and Abnormalities, Skeletal and Muscular E er, Hematological Disease, Immunological Disease, Organismal Injury and Abnorm	Bone deformity Leukemia	0.00138	1.982	AMER1,CHPF,CSK,CTSk ABCB1,ACBD5,ACOT9,A	21 188
325 326 327	Cellular Assembly and Organization, Cellular Function and Maintenance Neurological Disease,Organismal Injury and Abnormalities Cell Cycle	Gliosis Quiescence	0.0014 0.0014	2.305	AGPS,ARSA,BACE1,BID, BID.DEK.DIGER1.DYRK1	18
328 329	vous System Development and Function,Organ Morphology,Organismal Developm Cancer,Organismal Injury and Abnormalities	Size of brain Malignant neoplasm of retroperitoneum	0.00142 0.00144	-0.447	AATK,ARHGAP5,ATF2,B/ AATK,ABCB1,ABCD3,AB	22 262
330	Carbohydrate Metabolism Infectious Diseases Neurological Disease Skalatal and Muscular Disorders	Quantity of carbohydrate Infection by RNA virus	0.00146	-2.178 -7.878 2.608	ABCB1,AP1M2,ATF6,ATX ABCB1,ACTR2,ADAL,AL(57 87 25
333 334	Cell Death and Survival Lipid Metabolism,Small Molecule Biochemistry	Apoptosis of rhombencephalon Catabolism of sphingolipid	0.0015	-1.067 -2.2	ATF2,BAX,EP300,GSK3B ARSA,ASAH1,GBA2,HEX	6
335	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Cell Cycle	Gastric cancer G2 phase	0.00151 0.00152	0.174	AATK,ABCB1,ABCF1,AC ABCB1,ATF2,BAX,BCL2L ABCD3 ABC ATL1 ATL2	137 37 65
338 339	Developmental Disorder,Neurological Disease Hepatic System Development and Function,Hepatic System Disease,Organ Morph	Global developmental delay with intellectual disability Abnormal morphology of hepatocytes	0.00161 0.00162	-1.004	CYFIP1,LOC102724788/I CLN3,CTHRC1,ENTPD5,	10
340	Cell Morphology,Cellular Function and Maintenance vous System Development and Function,Organ Morphology,Organismal Developm	Autophagy of cervical cancer cell lines Morphology of brain	0.00162	-0.059	BAX,BCL2L1,CRYAB,MA AATK,ARHGAP5,ARL6,A	8 57
342 343 344	Embryonic Development, Organismai Development RNA Damage and Repair Lipid Metabolism, Small Molecule Biochemistry	Destabilization of mRNA Catabolism of glycosphingolipid	0.00167	-1.964	APC,BMPR1A,GRSF1,HF FTO,GIGYF2,METTL3,PU ARSA,GBA2,HEXA,HEXE	5
345 346	Cancer, Neurological Disease, Organismal Injury and Abnormalities Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Brain cancer Familial motor neuron disease	0.00168 0.00171	2.429	ACVR1,APC,BAX,BCL2L ASAH1,BCL2L1,BICD2,C	28 14
347 348 349	Lipid Metabolism,Molecular Transport,Small Molecule Biochemistry Developmental Disorder	Concentration of phospholipid Global developmental delay	0.00173	-0.563	ABHD6,BAX,BID,CDS1,C CYFIP1.DICER1.KAT6A.L	24 24 15
350 351	Carbohydrate Metabolism, Lipid Metabolism, Small Molecule Biochemistry focrine System Disorders, Organismal Injury and Abnormalities, Reproductive System	Dephosphorylation of phosphatidylinositol Mixed ovarian carcinoma	0.00183 0.00183		INPP5D,INPP5E,INPP5F, ABCB9,ACADS,ACTR2,A	6 84
352 353 354	vous System Development and Function, Organ Morphology,Organismal Developn Neurological Disease Auditory Disease Neurological Disease	Size of cerebral ventricles Incoordination Sepsorineural bearing loss	0.00191 0.00191 0.00196	1	ATF2,DICER1,HSF2,VAM ATXN2,FMR1,HTT,PRNP ABCB1 ATP5V1B2 BAX (4 4 15
355	Embryonic Development,Organismal Development,Tissue Morphology Cancer,Organismal Injury and Abnormalities,Tissue Morphology,Tumor Morpholog	Size of embryo Volume of benign tumor	0.00197 0.00198		ACVR1,BMPR1A,BRAP,C APC,KRAS,NR3C1	37
357	Cellular Assembly and Organization,Cellular Compromise Carbohydrate Metabolism,Lipid Metabolism,Small Molecule Biochemistry Cell Death and Survival Embreoic Development	Disruption of chromosome components Cleavage of phosphatidylinositol-3,4,5-triphosphate Cell death of emboracia tiesue	0.00198	2.646	HSF1,NR3C1,RB1 INPP5D,INPP5E,INPP5F AMER1,CUL1 HNE4A HC	3 3 10
360	Embryonic Development.Organismal Development Cellular Assembly and Organization	Patterning of rostrocaudal axis Transport of endosomes	0.002	2.040	APC,BMPR1A,GRSF1,HN AP5M1,CHMP2A,CHMP2	14
362	pmental Disorder,Embryonic Development,Organismal Development,Tissue Morp Cell Death and Survival	Abnormal morphology of embryo Cell death of forebrain	0.00209	0.414	ABI1 ACVR1 AMER1 ANI BAX,BCL2L1,CASP2,CAS	58 9
364 365 366	Cancer,Organismal injury and Abnormalities,Reproductive Syste Cancer,Organismal Injury and Abnormalities Nervous System Development and Function	Morphology of nervous system	0.00214 0.00214 0.00218		APC,BCL2L1,KRAS,SPIN AATK,APC,ARHGAP5.AF	5 96
367	Lipid Metabolism Small Molecule Biochemistry Cellular Assembly and Organization Cellular Function and Maintenance	Cleavage of glycosphingolipid Organization of Golgi apparatus	0.00221	-2.415	ARSA,GALC,GBA2,HEXA ATL2,BAG5,CLASP1,COC	6 10
369 370 371	amzason, cerlular Function and Maintenance, Cellular Movement, Nervous System Skeletal and Muscular Disorders Cell Morphology, Cellular Function and Maintenance	Axonal transport Abnormality of limb Transmembrane potential of tumor cell lines	0.00223 0.0023 0.0023	-0.57	AATK,FMR1,GSK3B,HTT, ABCB1,AMER1,ATL1,ATF BCL2L1,HNF4A	36 2
372 373	rder, Hereditary Disorder, Metabolic Disease, Neurological Disease, Organismal Inju sembly and Organization, Cellular Compromise, DNA Replication, Recombination,	Infantile Sandhoff disease Disruption of chromatin	0.0023		HEXB,PSAP HSF1,RB1	2
374 375 376	Cellular Compromise Cancer,Cardiovascular Disease,Organismal Injury and Abnormalities ilogical Disease,Hereditary Disorder,Immunological Disease Organismal Injury and	Destabilization of lipid bilayer Pyogenic granuloma Hereditary type M7 aqute mysloid leukemia	0.0023 0.0023 0.0023		BCL2L1,BID BCL2L1,GNA11 APC.MSH2	2 2 2
377	isorder,Gastrointestinal Disease,Organismal Development,Organismal Injury and I Disorder,Endocrine System Disorders,Organ Morphology,Organismal Injury and	Frontal bossing Hypertrophy of adrenal cortex	0.0023		HEXA,HEXB HTT,NR3C1	2
379 380 381	r, Organismal Development, Organismal Injury and Abnormalities, Skeletal and Mus Disorder, Hereditary Disorder, Organismal Injury and Abnormalities, Skeletal and Mu solication. Recombination, and Repair, Embryonic Development Organ Development	Abnormal morphology of broad rib Severe X-linked myotubular myopathy Formation of raial hordies	0.0023 0.0023 0.0023		HEXA,HEXB DNM2,MTM1 COIL.TOE1	2 2 2
382	Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities ieurological Disease, Organismal Injury and Abnormalities, Psychological Disorder	Adenoma of ampulla of Vater Abnormal putamen	0.0023		APC,KRAS HSF1,HTT	2 2
384 385	lar Assembly and Organization,Cellular Function and Maintenance,Molecular Trar nflammatory Disease,Inflammatory Response,Ophthalmic Disease,Organismal Inju	Transcytosis of Golgi vesicles Hereditary keratitis	0.0023		OSBPL1A,OSBPL2 COL17A1,PAX6	2
386 387 388	Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Lipid Metabolism,Small Molecule Biochemistry Carbohydrate Metabolism	Sigmoid colon cancer Hydrolysis of gangliotriaosylceramide II3-sulfate Transduction of carbohydrate	0.0023		HEXA,HEXB INPP5D,TRAF6	2 2 2
389 390	Lipid Metabolism,Small Molecule Biochemistry Cell Death and Survival	Transduction of lipid emucleosomal DNA fragmentation of lymphoma cell lin	0.0023 0.0023		INPP5D,TRAF6 BAX,BCL2L1	2
391 392 393	Organ Morphology, Tissue Morphology Organismal Functions Cell Cycle	Permeability of skin tissue Healing of enterocytes Cleavage of colorectal cancer cell lines	0.0023		NR3C1,PRSS8 TFF3,VANGL1 DEK LOC102724788/PR(2
394 395	Lipid Metabolism,Small Molecule Biochemistry Repair,Endocrine System Disorders,Organ Morphology,Organismal Injury and At	Hydrolysis of lactosylceramide II3-sulfate Abnormal morphology of cajal bodies	0.0023		HEXA,HEXB COIL,ZPR1	2
396 397	rder,Hereditary Disorder,Metabolic Disease,Neurological Disease,Organismal Inju Cellular Assembly and Organization,DNA Replication, Recombination, and Repair and Replanment and Evideo Corea, Development Organismal Development	Juvenile GM2 gangliosidosis Rearrangement of chromatin	0.0023		HEXA,HEXB NR3C1,TP53BP1 CNTNAP2 C8K2P	2
399	rder,Hereditary Disorder,Metabolic Disease,Neurological Disease,Organismal Inju Behavior	Adult GM2 gangliosidosis Limb clasping of forelimb	0.0023		HEXA,HEXB DICER1,HTT	2
401	r,Hereditary Disorder,Neurological Disease,Organismal Injury and Abnormalities,f Cell Morphology Neurological Disease Optical Disease	Familial primary progressive aphasia Permeabilization of phospholipid vesicles	0.0023		GRN,PRNP BAX,BID	2
404	Cellular Assembly and Organization, DNA Replication, Recombination, and Repair Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Quantity of melotic spindles Amish infantile epilepsy syndrome	0.0023		DICER1,SACM1L ATXN2,ST3GAL5	2
406	Compromise,Ophthalmic Disease,Organismal Injury and Abnormalities,Tissue Mo Cancer,Gastrointestinal Disease,Organismal Injury and Abnormalities Handline, Disease,Organismal Injury and Abnormalities	Degeneration of retinal cells Gastro-esophageal carcinoma	0.00233 0.00234	2.229	BACE1,CHM,DICER1,ER AATK,ABCA8,ABCB1,AB	12 157
408 409 410	lopment,Skeletal and Muscular Disease,Organismal Injury and Abnormalities Cancer,Neurological Disease,Organismal Injury and Abnormalities	Abnormal morphology of limb Primitive neuroectodermal tumor	0.00235 0.0024 0.00252	1.964	AMER1,ATL1,CCP110,CI APC,BAX,BCL2L1,BMI1,C	26
411 412	RNA Post-Transcriptional Modification Cell Morphology,Cellular Function and Maintenance	Processing of mRNA Length of cells	0.00258	0.115	BCAS2,CDC5L,CDK13,C BAX,BMPR1A,FMR1,GR	30 15
413 414 415	Cellular Assembly and Organization	Morphology of cervical cancer cell lines Transport of mitochondria	0.00265	0	BCL2L1,CAP1,CRYAB,C APC,GSK3B,HTT,RANBP	6
416	gy,Cellular Function and Maintenance,Renal and Urological System Developmen yous System Development and Function,Organ Morphology,Organismal Developm	Autophagy of kidney cell lines Size of striatum	0.00265	0.277	GSK3B,HTT,RASD2,TBC CPEB4,DICER1,HSF2,H1	6
418 419 420	DNA Replication, Recombination, and Repair Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities DNA Replication, Recombination, and Repair	Hereditary sensory neuropathy DNA damage response of cells	0.00266 0.00267		ALDH18A1,ATL1,BICD2, APC,ATF2,BAX,BAZ1B,BI	4 16 29
421 422	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities Lipid Metabolism, Small Molecule Biochemistry	Hereditary polyneuropathy Catabolism of phospholipid	0.00267 0.00267	-1.949	ALDH18A1,ATL1,BICD2, ABHD6,GDE1,INPP5D,L1	17
423 424 425	Cell Death and Survival, Neurological Disease, Organismal Injury and Abnormalities, Skeletal an Cell Death and Survival	Apoptosis of progenitor cells Apoptosis of cerebellar granule cell	0.00269	0.314	DICER1,ERBB3,HTT,PAX ATF2,BAX,EP300,GSK3B	5
426 427	cellular Assembly and Organization, DNA Replication, Recombination, and F Cell Morphology, Cellular Assembly and Organization	Duplication of centriole Morphology of nucleus	0.00269 0.00272	-1.231	CCP110,CEP57,CUL1,M APC,CHMP2A,COIL,DEK	5 22
428 429 430	Developmenal Disorcer,Neurological Disease ology,Nervous System Development and Function,Neurological Disease,Tissue N Cellular Response to Therapeutics	Abnormal morphology of neurons Radiosensitivity	0.00278	1.297	AATK,ARSA,ATXN2,BAC ATG3,BAX,EP300,ERBB	52 8
431 432	Neurological Disease Nutritional Disease, Organismal Injury and Abnormalities	Demyelination of nerves Wasting	0.00278	2.804	ARSA, BACE1, DAG1, HSF ABCB1, ATF6, BACE1, EDI	8 15
433 434 435	Ophthalmic Disease, Organismal Injury and Abnormalities Cancer, Cardiovascular Disease, Organismal Injury and Abnormalities Cell Cycle, DNA Replication, Recombination, and Repair	Hetnal degeneration Hemangloma Checkpoint control	0.00282 0.00284 0.003	-1.937	ACBD5,ARL6,BACE1,CH ABCB1,AMER1,BCL2L1,I BCL2L1,BID,ERCC3.ESC	32 17 13
436 437	Organismal Development Embryonic Development,Organismal Development	Size of body Gastrulation of embryo	0.003	-7.785	AAAS,ACOT13,AP1M2,AI ACVR1,CLASP1,DAG1,D	81 7
438 439 440	Cell Cycle sorders,Developmental Disorder,Organismal Injury and Abnormalities,Skeletal an Cell Death and Survival	Guiescence of cells Microcephaly Cell death of carcinoma cell lines	0.00316 0.00322 0.00324	2.778	BMPR1A,DCPS,DICER1, ATF6,BAX,BCL2L1,BID B	6 15 39
441 442	Organismal Development y and Organization,Cellular Function and Maintenance,Nervous System Developm	Size of animal Release of synaptic vesicles	0.0033	-4.197	BACE1,CAPRIN1,CCP11 PPP3R1,SYT1,VAMP7	20 3
443	Cenular Compromise, Cenular Function and Maintenance Cancer,Organismal Injury and Abnormalities forphology,Organismal Development,Skeletal and Muscular System Development	Latency of malignant tumor Diameter of tibia	0.00333 0.00333 0.00333		EED,KRAS,PMS2 CTSK,HOXA11,LRP5	3
446	Organismal Functions Molecular Transport,RNA Trafficking	Jumping Accumulation of RNA	0.00333	0.447	HTT,MMP9,PRNP ATXN2,DDX6,DIS3L,SBD	3 5
448 449 450	Intectious Diseases Cellular Function and Maintenance,Molecular Transport,Protein Trafficking Cancer,Organismal Injury and Abnormalities	Viral entry by Influenza virus Endocytosis of protein Mixed cell carcinoma	0.00335 0.00335 0.00337	-2.236	ALP6AP1,ATP6V1B2,FAN CAP1,DNM2,HTT,KRAS, ABCB9,ACADS,ACTR2,A	5 5 86
451 452	Organismal Functions DNA Replication, Recombination, and Repair	Hypoactivity of mice Chromosomal aberration	0.00343 0.0035	2.824	AAAS,ACOT13,ARID4A,C ABRAXAS2,APC,BACE1,	19 22
453 454 455	Central Assembly and Organization,DNA Replication, Recombination, and Repair opment,Digestive System Development and Function,Hepatic System Developmen Cell Death and Survival	rormation of chromatin Differentiation of liver Cell death of striatal neurons	0.00356 0.00356	-1.951 0.131	FGF1,HNF1B,HNF4A,KR BAX,BCL2L1,CASP2,CAS	11 8 8
456 457	Protein Synthesis Cellular Assembly and Organization	Oligomerization of protein Formation of nuclear speckles	0.00356	-2	AK3,APC,ATL1,ATL2,BA) HECTD3,TFCP2,XIAP,ZN	31
458 459 460	Cell Cycle,Connective Tissue Development and Function er,Hematological Disease,Immunological Disease,Organismal Injury and Abnorm Hair and Skin Development and Function	G2/M phase transition of fibroblasts Follicular B-cell lymphoma in lymph node Pallor	0.00358 0.00358 0.00363		ATF2,JUNB,KRAS,MBD4 EP300,ERBB3,TET2,XIAF ARID3A,COL5A2,FST.KA	4 4 14
461 462	Cellular Assembly and Organization, Cellular Function and Maintenance Gastrointestinal Disease, Organ Morphology, Organismal Development, Organisma	Secretion of vesicles Abnormal morphology of intestinal epithelium	0.00373 0.00373	-1.432	CRYAB,GSK3B,HTT,PLD ABCB1,AP1M2,MAPK8,P	6
463 464 465	a Function, Neurological Disease, Organ Morphology, Organismal Development, Or prinective Tissue Disorders, Hereditary Disorder, Organismal Injury and Abnormaliti Cell Morphology	Abnormal morphology of rhombencephalon Hereditary connective tissue disorder Morphology of cilia	0.00383 0.00383 0.004	2.748	ARSA, ATXN2, BICD2, CLN ACVR1, AGPS, ALDH18A APC, EPS8, FTO. INPPSF	19 63 8
466	Endocrine System Development and Function Nutritional Disease, Organismal Injury and Abnormalities	Glucose tolerance Cachexia	0.004	0.847 2.362	ACOT13,ATF2,BAX,CERS ABCB1,ATF6,BACE1,ED	30 13
468 469 470	Cell Cycle Jocrine System Disorders,Organismal Injury and Abnormalities,Reproductive Syste Cellular Assembly and Organization Cellular Function and Maintenance	M phase Adenosquamous ovarian carcinoma Assembly of multivesionar bodias	0.00408 0.0041 0.00411	-2.043	APC,BCL2L1,CAP1,CCP ABCB9,ACADS,ACTR2,A CHMP2A,CHMP2B,STAN	26 80 5
471	Cell Morphology Cell Death and Survival	Abnormal morphology of cilia Cell viability of epithelial cells	0.00411 0.00412	-0.555	EPS8,KIAA0586,KIF3A,KI BCL2L1,COL17A1,KEAP	5
473 474 47F	Cellular Function and Maintenance Embryonic Development, Organismal Development Nervous System Development and Europeine Tieves Membrates	Endocytosis by cervical cancer cell lines Growth of embryo	0.00412 0.00425 0.00432	-2.96 -1.456 -0.582	ABI1,ATP6AP1,ATP6V1B ABCB1,ACVR1,ARHGAP ADAP1,BACE1,BAY, PMC	9 49 17
476	Post-Translational Modification Post-Translational Modification Sycle,Cellular Assembly and Organization,DNA Replication, Recombination, and F	Acetylation of protein Replication of centriole	0.00438	-1.231	CLOCK,EP300,HTT,KATE CCP110,CEP57,CUL1,M	6
478	Lipid Metabolism Small Molecule Biochemistry Organismal Development	Hydrolysis of sphingolipid Size of head	0.00438	-2.403	ARSA,ASAH1,GBA2,HEX AATK,AMER1,ARHGAP5	6 25
480 481 482	Cell Learn and Survival Cellular Assembly and Organization,Cellular Function and Maintenance Cell Death and Survival	Apoptosis of tissue Formation of vesicles Apoptosis of male germ cells	0.00443 0.00444 0.00446	-1.112 0.342	ABI1,ATG3,CALY,CHMP2 BAX,GPX4,HOXA11,HSF	18
483	Cellular Assembly and Organization, DNA Replication, Recombination, and Repair Cell Death and Survival, Neurological Disease, Organismal Injury and Abnormalitier Vahelle Disease, Organismal Injury and Abnormalitier	Formation of chromosome components Apoptosis of granule cells	0.00448	-2 -0.314	BAZ1B,BMI1,CTCF,GPX4 AATK,ATF2,BAX,BCL2L1	15 8
485 486 487		Colorectal adenoma Cell death of granule cells	0.00449 0.0045 0.00453	0.16	ABCB1,APC,BCL2L1,BID AATK,ATF2,BAX,BCL2L1	8 21 11
488 489	Cellular Growth and Proliferation, Tissue Development RNA Post-Transcriptional Modification	Proliferation of epithelial cells Splicing of RNA	0.00455 0.00468	-0.1 0.651	APC,ATF2,BAX,BID,BMPI BCAS2,CDC5L,CDK12,C	51 28
490 491 492	and Maintenance, Cellular Growth and Proliferation, Reproductive System Develop Post-Translational Modification velopment and Function, Skeletal and Muscular System Development and Function	Production of germ cells Sialylation Formation of growth clate	0.0047 0.0047 0.0047	-1.982	ARSA,HSF2,PUM1,UBE3 BACE1,CMAS,ST3GAL5, GRN,HOXA11,MMP9,TN1	4 4 4
493 494	Cell Death and Survival Cell Death and Survival rental Disorder,Hereditary Disorder,Metabolic Disease,Organismal Injury and Abn	Apoptosis of neurons Lysosomal storage disease	0.00483 0.00485	1.302 2.216	AATK, AMIGO2, ASAH1, AT ARSA, ASAH1, CLN3, CTS	45 12
495 496 497	Developmental Disorder / Disease, Hereditary Disorder, Neurological Disease, Organismal Injury and Abnor ase, Neurological Disease, Organismal Injury and Abnormalilias Statistication of the second statistication of th	Syndromic developmental delay Hereditary hearing loss Mitochondrial leukoscenshalonathy	0.005		DICER1,KAT6A,KDM5B,S ATP6V1B2,CCDC50,CD1 COX15,DLD,ERCC8,GC1	5 19 8
498	Cellular Function and Maintenance, Nervous System Development and Function, T Cellular Compromise, DNA Replication, Recombination, and Repair	Length of neurons Damage of chromosomes	0.00503	2.961	BMPR1A,FMR1,GRN,HT BMI1,CCP110,LIG4,MCM	13 9
500	Hereditary Disorder, Neurological Disease, Organismal Injury and Abnormalities	Autosomal recessive progressive encephalopathy	0.00504		ASAH1,BCL2L1,FBX07,C	9

Table S5 (Related to STAR Method) Primer sequences

Primer Name	Gene Targeted	Application	Sequence (5'-3')
hBRACHYURY-F	BRACHYURY	qRT-PCR	5'-GCTGTGACAGGTACCCAACC-3'
hBRACHYURY-R	BRACHYURY	qRT-PCR	5'-CATGCAGGTGAGTTGTCAGAA-3'
hBRCA1-Full-F	BRCA1	qRT-PCR	5'-TAGCAAGGAGCCAACATAACAGAT-3'
hBRCA1-Full-R	BRCA1	qRT-PCR	5'-CTGTGTGAGAGAAAAGAATGGAATAAG-3'
hBRCA1-DeltaEXON1-F	BRCA1	qRT-PCR	5'-GATTCTGCAAAAAGGCTGCT-3'
hBRCA1-DeltaEXON1-R	BRCA1	qRT-PCR	5'-CAGATGCTGCTTCACCCTGA-3'
hGAPDH-F	GAPDH	qRT-PCR	5'-GTGGACCTGACCTGCCGTCT-3'
hGAPDH-R	GAPDH	qRT-PCR	5'-GGAGGAGTGGGTGTCGCTGT-3'
hGATA3-F	GATA3	qRT-PCR	5'-CTCATTAAGCCCAAGCGAAG-3'
hGATA3-R	GATA3	qRT-PCR	5'-GTCTGACAGTTCGCACAGGA-3'
hMIXL1-F	MIXL1	qRT-PCR	5'-GGTACCCCGACATCCACTT-3'
hMIXL1-R	MIXL1	qRT-PCR	5'-GCCTGTTCTGGAACCATACCT-3'
hOCT4-F	POU5F1	qRT-PCR	5'-ACCCACACTGCAGCAGATCA-3'
hOCT4-R	POU5F1	qRT-PCR	5'-CCACACTCGGACCACATCC-3'
hOSR1-F	OSR1	qRT-PCR	5'-GGACCTCTGCGGAACAAG-3'
hOSR1-R	OSR1	qRT-PCR	5'-TGCAGGGAAGGGTGGATA-3'
hOVGP1-F	OVGP1	qRT-PCR	5'-AATTCTCTACCCAGAGTTCAACAAA-3'
hOVGP1-R	OVGP1	qRT-PCR	5'-CCGATGGACAGTAGTGTTTTCA-3'
hPAX2-F	PAX2	qRT-PCR	5'-GAAGTGCCCCCTTGTGTG-3'

hPAX2-R	PAX2	qRT-PCR	5'-TCGTTGTAGGCCGTGTACTG-3'
hSALL1-F	SALL1	qRT-PCR	5'-ATTGCAGCCTAGCCAAAAAG-3'
hSALL1-R	SALL1	qRT-PCR	5'-ACCAGCTGAGCAGAAAGGTC-3'
hSOX17-F	SOX17	qRT-PCR	5'-ACGCCGAGTTGAGCAAGA-3'
hSOX17-R	SOX17	qRT-PCR	5'-TCTGCCTCCTCCACGAAG-3'
hSOX2-F	SOX2	qRT-PCR	5'-GGGGGAATGGACCTTGTATAG-3'
hSOX2-R	SOX2	qRT-PCR	5'-GCAAAGCTCCTACCGTACCA-3'
hWT1-F	WT1	qRT-PCR	5'-GAATGCATGACCTGGAATCA-3'
hWT1-R	WT1	qRT-PCR	5'-TCTGCCCTTCTGTCCATTTC-3'