

SUPPLEMENTAL MATERIAL

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Supplemental Methods

Weighted gene co-expression network analysis (WGCNA) is a technique developed by Horvath et. al. to identify sets (or modules) of genes that share similar correlation patterns ¹. In the first step of module identification, Pearson correlations between all gene pairs were computed. At this point, either a “hard thresholding” (correlations above a certain magnitude are kept while all others are shrunk to zero) or a “soft thresholding” approach may be used to quantify the connection between two genes. We chose the soft thresholding approach because it allows for the emphasis of stronger correlations over weaker and less meaningful ones while preserving the continuous nature of gene-gene relationships. The following weighted adjacency matrix was then constructed:

$$a_{ij} = |c_{ij}|^{\beta} \tag{1}$$

where c_{ij} = Pearson correlation between gene i and gene j , a_{ij} = adjacency between gene i and gene j , and β = soft-thresholding parameter.

In addition to its role as a stringency parameter, β also serves as a tuning parameter for approximating scale-free topology. A scale-free network is one in which the connectivity of its nodes follow a power law distribution:

$$p(k) \sim k^{-\gamma} \tag{2}$$

where $p(k)$ = fraction of nodes with k connections. A scale-free network is populated by a relatively small number of highly connected nodes (known as hubs) ². Many metabolic and biological networks have been reported to exhibit scale-free behavior ¹⁻³. Thus, it is appropriate to select β such that an approximate scale-free topology of the network is

achieved. We computed the signed scale-free topology model fit index (R^2) for different values of β . There is an inverse relationship between the R^2 index and the mean connectivity of the network. To fulfill the scale-free approximation criterion while maintaining a relatively high number of connections, we chose the first β value that gave an R^2 index of 0.9 or above (as advocated by Horvath et. al.)¹; this value corresponded to 3 in our data (Figure S1).

Supplemental Figures

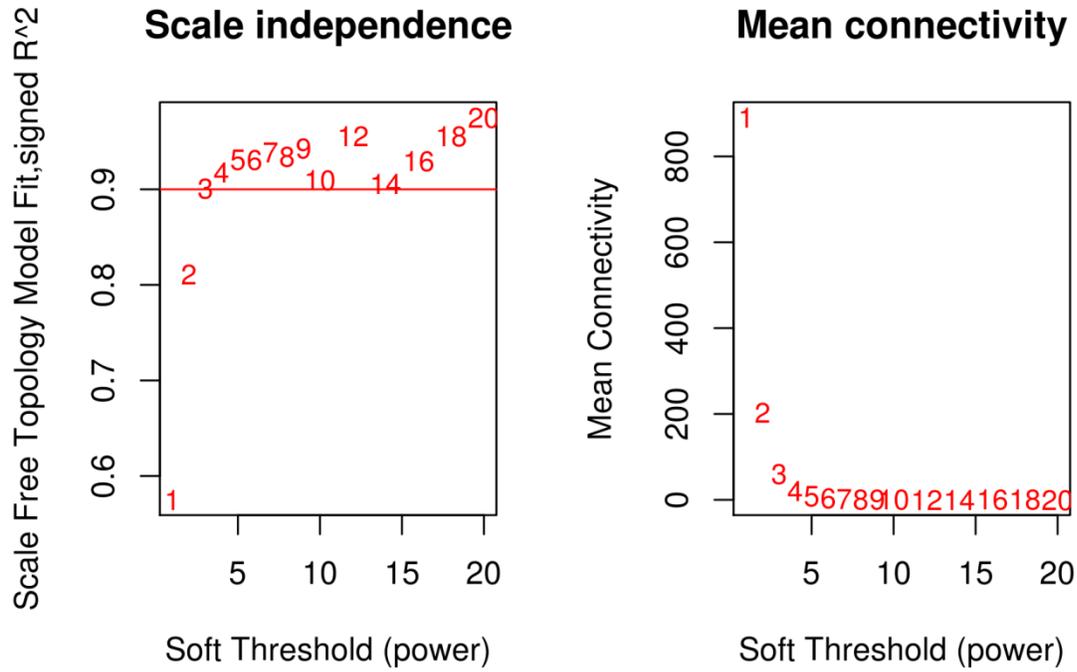


Figure S1: Plots of scale-free topology R^2 fit index (left) and mean connectivity (right) with different values of β .

Supplemental Figure Legends

Figure S1: Plots of scale-free topology R^2 fit index (left) and mean connectivity (right) with different values of β . The value 3 is the first to reach the R^2 index cutoff of 0.9; thus, $\beta=3$ was chosen for the construction of the weighted adjacency matrix.

Supplemental Tables

Table S1: Clinical definitions of cardiovascular phenotype groups.

Criterion Type	Mitral Valve (MV) Disease	Coronary Artery Disease (CAD)	Lone Atrial Fibrillation (LAF)
Inclusion Criteria	Surgical indication – mitral valve repair or replacement	Surgical indication – coronary artery bypass graft	History of atrial fibrillation Surgical indication – MAZE procedure Preserved ejection fraction ($\geq 50\%$)
Exclusion Criteria	Significant coronary artery disease: - Significant ($\geq 50\%$) stenosis in at least one coronary artery via cardiac catheterization - History of revascularization (percutaneous coronary intervention or coronary artery bypass graft surgery)	Significant mitral valve disease: - Documented echocardiography finding of mitral regurgitation (≥ 3) or mitral stenosis - History of mitral valve repair or replacement	Significant coronary artery disease: - Significant ($\geq 50\%$) stenosis in at least one coronary artery via cardiac catheterization - History of revascularization (percutaneous coronary intervention or coronary artery bypass graft surgery) Significant valvular heart disease: - Documented echocardiography finding of valvular regurgitation (≥ 3) or stenosis - History of valve repair or replacement

Table S2: Network preservation analysis between the MV and CAD groups – size and Z_{summary} scores of gene modules detected.

Module	Module Size	Z_{summary}
Black	275	15.52
Blue	964	44.79
Brown	817	12.80
Cyan	119	13.42
Green	349	14.27
Green-Yellow	215	19.31
Magenta	239	15.38
Midnight-Blue	83	15.92
Pink	252	23.31
Purple	224	16.96
Red	278	17.30
Salmon	124	13.84
Tan	679	28.48
Turquoise	1512	44.03

Table S3: Network preservation analysis between the MV and LAF groups – size and Z_{summary} scores of gene modules detected.

Module	Module Size	Z_{summary}
Black	275	13.14
Blue	964	39.26
Brown	817	14.98
Cyan	119	11.46
Green	349	14.91
Green-Yellow	215	20.99
Magenta	239	18.58
Midnight-Blue	83	13.87
Pink	252	19.10
Purple	224	8.80
Red	278	16.62
Salmon	124	11.57
Tan	679	28.61
Turquoise	1512	42.07

Table S4: Proportion of variance explained by the principal components for each module.

Dataset Group	Principal Component	Black	Blue	Brown	Cyan	Green	Green-Yellow	Magenta
Mitral	1	20.5%	22.2%	20.1%	21.8%	21.4%	22.8%	19.6%
	2	4.1%	3.6%	4.8%	5.7%	4.5%	5.9%	3.9%
	3	3.4%	3.1%	3.8%	4.4%	3.9%	3.7%	3.7%
CAD	1	12.5%	18.6%	7.1%	16.8%	12.2%	20.3%	12.8%
	2	6.0%	5.5%	5.0%	7.0%	5.5%	6.1%	6.4%
	3	4.9%	4.1%	4.4%	6.5%	4.8%	4.4%	4.8%
LAF	1	14.0%	16.6%	11.7%	14.3%	14.7%	20.8%	20.2%
	2	8.9%	8.5%	7.6%	9.3%	7.3%	11.1%	6.9%
	3	6.5%	6.3%	5.5%	8.2%	6.1%	5.3%	6.2%

Dataset Group	Principal Component	Midnight-Blue	Pink	Purple	Red	Salmon	Tan	Turquoise
Mitral	1	28.5%	22.6%	18.7%	20.5%	22.3%	19.0%	25.8%
	2	4.6%	6.0%	4.7%	4.1%	6.9%	4.0%	3.5%
	3	4.2%	4.2%	4.2%	3.5%	4.0%	3.6%	3.3%
CAD	1	23.4%	17.1%	15.5%	15.0%	18.0%	14.6%	18.2%
	2	7.4%	8.6%	6.0%	6.4%	7.2%	5.8%	6.6%
	3	5.1%	5.4%	5.3%	5.4%	6.2%	5.1%	4.5%
LAF	1	23.5%	18.4%	12.0%	15.9%	16.9%	13.7%	16.5%
	2	7.9%	8.5%	9.8%	9.4%	9.5%	9.1%	9.6%
	3	6.7%	7.0%	6.6%	6.0%	6.9%	6.8%	6.3%

Table S5: Salmon module gene members and selected characteristics.

ILMN_ID*	HGNC [†]	Chr. No. [‡]	kWithin [§]	MM
ILMN_2367239	RCAN1	21	8.19	0.81
ILMN_1776998	DNAJA4	15	7.73	0.81
ILMN_2301722	PDE8B	5	7.65	0.80
ILMN_1738632	PRKAR1A	17	6.86	0.76
ILMN_1793549	PTPN4	2	6.74	0.75
ILMN_1716407	SORBS2	4	5.97	0.68
ILMN_1685156	ADCY6	12	5.73	0.69
ILMN_2355831	FHL2	2	5.71	0.69
ILMN_1689237	BVES	6	5.44	0.65
ILMN_2145116	TMEM173	5	5.28	0.63
ILMN_1792356	DPYSL4	10	5.14	0.64
ILMN_1733998	DHRS9	2	4.84	0.67
ILMN_1757877	HCFC1R1	16	4.56	-0.65
ILMN_1815346	TMEM136	11	4.51	0.63
ILMN_1680196	LAPTM4B	8	4.50	0.65
ILMN_1765966	CHGB	20	4.48	0.65
ILMN_1657087	ZNF385B	2	4.42	0.64
ILMN_1796339	PLEKHA2	8	4.32	0.59
ILMN_1767422	POLR1D	13	4.32	-0.62
ILMN_1802380	RERE	1	4.20	0.54
ILMN_1723874	MRPS6	21	4.13	0.58
ILMN_2152581	STK38	6	4.04	0.62
ILMN_1770206	GEMIN4	17	4.00	-0.59
ILMN_1763568	ZDHHC16	10	3.93	0.60
ILMN_2186137	RRAD	16	3.85	0.54
ILMN_1843198	AK4	1	3.71	0.56
ILMN_2305544	DBI	2	3.59	0.57
ILMN_1669714	MYH7	14	3.17	0.39
ILMN_1813530	AGT	1	3.17	-0.52
ILMN_1708204	COPG1	3	3.13	0.56
ILMN_1814022	NR1H3	11	3.01	-0.53
ILMN_2397880	CSTF3	11	2.96	0.52
ILMN_1744949	RHOBTB3	5	2.88	0.51
ILMN_1780898	PRKCH	14	2.88	0.54
ILMN_1788095	SPRYD3	12	2.87	0.48
ILMN_1674402	TMEM71	8	2.82	0.34
ILMN_2119224	KIFAP3	1	2.80	0.51
ILMN_1735584	ST8SIA5	18	2.79	0.41
ILMN_1727194	CALU	7	2.70	0.48
ILMN_1719199	TULP3	12	2.66	-0.47
ILMN_1771987	SLC44A2	19	2.65	-0.53
ILMN_1661194	CLDN14	21	2.64	-0.52

ILMN_1810725	FAM129A	1	2.62	-0.46
ILMN_1780667	POC1A	3	2.54	0.49
ILMN_1807455	DHRS7	14	2.53	-0.48
ILMN_1708743	NT5DC2	3	2.50	-0.45
ILMN_1674236	HSPB1	7	2.49	-0.45
ILMN_1671106	GJA4	1	2.46	0.49
ILMN_2351466	NTM	11	2.42	-0.50
ILMN_1682799	STAMBPL1	10	2.42	0.41
ILMN_1699489	TUBB6	18	2.41	0.47
ILMN_1814333	SERPINI1	3	2.39	0.49
ILMN_1752755	VWF	12	2.38	0.45
ILMN_1738147	NES	1	2.35	0.36
ILMN_1794213	ABHD14A	3	2.34	-0.50
ILMN_1680314	TXN	9	2.29	-0.43
ILMN_2320250	NOL6	9	2.25	0.48
ILMN_1690880	CTAGE5	14	2.25	0.42
ILMN_1773865	HSPA5	9	2.24	-0.47
ILMN_2054607	CYP4V2	4	2.22	-0.46
ILMN_1708081	LCLAT1	2	2.16	0.44
ILMN_1739586	FEZ2	2	2.13	0.40
ILMN_1734353	GPX4	19	2.11	-0.43
ILMN_1694111	PNKP	19	2.10	0.45
ILMN_1691090	MPV17	2	2.08	0.47
ILMN_1715684	LAMB3	1	2.08	0.37
ILMN_1669851	STAG3L4	7	2.04	0.46
ILMN_2185845	BRSK1	19	2.04	0.44
ILMN_1714159	LUZP1	1	2.01	0.45
ILMN_1758939	RIPK2	8	1.95	0.42
ILMN_1740742	UROD	1	1.90	-0.37
ILMN_1683462	GSS	20	1.89	0.44
ILMN_2230025	PDLIM3	4	1.87	0.38
ILMN_1774432	DTD1	20	1.87	0.44
ILMN_1665212	EDC4	16	1.85	0.37
ILMN_1653861	SCMH1	1	1.84	-0.43
ILMN_1704206	NPSR1	7	1.83	0.43
ILMN_1778347	NUDT2	9	1.82	-0.45
ILMN_1695797	NCOA6	20	1.79	-0.41
ILMN_1662880	C5orf27	5	1.79	-0.40
ILMN_1661376	GRIK2	6	1.75	0.41
ILMN_1800733	MANBA	4	1.66	-0.42
ILMN_1766925	CDH13	16	1.65	-0.42
ILMN_1682273	SHISA3	4	1.65	-0.40
ILMN_1660232	PEX5	12	1.61	-0.40
ILMN_1774207	ANGPT2	8	1.58	0.38
ILMN_1803788	LGALS3	14	1.55	-0.37

ILMN_1664608	INPP5A	10	1.53	0.39
ILMN_2143250	FAR1	11	1.51	-0.37
ILMN_1690342	LTA4H	12	1.51	-0.38
ILMN_1689989	CDC42BPB	14	1.49	0.37
ILMN_1785857	ISY1	3	1.46	0.32
ILMN_1748438	POLR2G	11	1.45	-0.39
ILMN_1706957	BMP1A	10	1.41	-0.34
ILMN_1716089	KANK2	19	1.40	-0.32
ILMN_1687743	BTBD7	14	1.38	-0.33
ILMN_2153332	ATXN1	6	1.36	-0.38
ILMN_1756006	ATG2A	11	1.34	-0.35
ILMN_1679460	PPFIBP1	12	1.32	0.35
ILMN_2406552	PIDD	11	1.31	-0.37
ILMN_2049727	C20orf111	20	1.30	-0.37
ILMN_1654893	SCAMP2	15	1.30	-0.36
ILMN_1723843	CSNK2A2	16	1.27	-0.27
ILMN_1724897	C14orf93	14	1.25	-0.33
ILMN_1685170	ANXA11	10	1.18	0.26
ILMN_1730940	KLHDC3	6	1.16	-0.32
ILMN_1659874	SCAF4	21	1.13	0.25
ILMN_1729767	TARBP2	12	1.12	-0.32
ILMN_1705261	CAPN1	11	1.11	-0.35
ILMN_1672496	DNAJA1	9	1.11	0.34
ILMN_2370772	EIF4G1	3	1.07	0.34
ILMN_1728528	ZNF655	7	1.06	-0.34
ILMN_1804735	CBS	21	1.04	-0.31
ILMN_1808821	COMMD9	11	1.04	-0.31
ILMN_1715416	NUP188	9	1.03	0.28
ILMN_1658182	MEX3C	18	0.98	-0.30
ILMN_1798177	CHURC1	14	0.96	-0.27
ILMN_1760778	ENG	9	0.94	0.22
ILMN_2389582	HNRNPL	19	0.83	0.26
ILMN_1810225	UVSSA	4	0.81	-0.26
ILMN_1710962	TMEM97	17	0.78	-0.29
ILMN_2192385	TTC19	17	0.72	0.29
ILMN_1750664	PPT2	6	0.61	0.20
ILMN_1684647	ILKAP	2	0.58	-0.24

*ILMN_ID – Probe Illumina ID

†HGNC – HGNC symbol

‡Chr. No. – Chromosome number

§kWithin – Intramodular connectivity

||MM – Module membership

Table S6: Tan module gene members and selected characteristics.

ILMN_ID*	HGNC [†]	Chr. No. [‡]	kWithin [§]	MM
ILMN_1755954	CPEB3	10	43.35	0.85
ILMN_1689515	CPLX3	15	42.47	0.84
ILMN_1733627	NEDD4L	18	40.80	0.83
ILMN_1762207	SGSM1	22	40.68	0.82
ILMN_2050255	UCKL1	20	39.03	0.81
ILMN_1715463	SOSTDC1	7	37.16	0.79
ILMN_2366388	PRDX1	1	35.50	0.76
ILMN_1791366	RCOR2	11	35.43	0.78
ILMN_1763382	NPPB	1	35.25	-0.78
ILMN_1773650	LRRN3	7	34.63	0.75
ILMN_1789171	EEF2K	16	33.64	0.77
ILMN_1655915	MMP11	22	32.44	0.76
ILMN_1696537	DDIT4L	4	32.23	0.73
ILMN_1712998	CORIN	4	32.18	0.75
ILMN_2352131	ERBB2	17	32.01	0.75
ILMN_1709634	CMBL	5	31.83	0.75
ILMN_1806692	HEXB	5	30.94	-0.71
ILMN_1668072	PGAM2	7	30.90	0.73
ILMN_2227968	NTHL1	16	30.74	0.75
ILMN_2046611	MCOLN3	1	29.79	0.72
ILMN_1674817	C1orf115	1	29.72	0.73
ILMN_1791847	DAPK2	15	28.62	0.71
ILMN_2227790	GRIN2C	17	28.58	0.69
ILMN_2104295	TMEM178	2	28.54	0.72
ILMN_1696767	SERP2	13	27.84	0.70
ILMN_2406106	CACNB2	10	27.66	0.70
ILMN_1655614	DSP	6	27.37	0.70
ILMN_1807767	KIAA0182	16	27.28	0.70
ILMN_1733811	JUP	17	27.14	0.70
ILMN_1701875	ZYX	7	27.09	-0.69
ILMN_2104106	XPR1	1	26.61	-0.69
ILMN_2321416	DIAPH1	5	26.54	-0.70
ILMN_1661264	SHMT2	12	26.49	-0.68
ILMN_1779071	FEZ1	11	26.25	0.64
ILMN_2329114	COLQ	3	26.18	-0.64
ILMN_1684865	GPR22	7	26.11	0.67
ILMN_1793630	SLC4A3	2	26.10	0.67
ILMN_1743373	DLL1	6	25.84	0.69
ILMN_1752932	MPZL2	11	25.75	-0.69
ILMN_2056606	PPP1R1A	12	25.72	0.67
ILMN_1653220	PITPNM1	11	25.30	-0.66
ILMN_1718621	TSPAN32	11	25.15	0.69

ILMN_1714737	ASF1A	6	25.04	0.68
ILMN_1667716	TMEM101	17	24.84	0.69
ILMN_1716019	RHBDL3	17	24.81	0.67
ILMN_1757807	AGXT2L1	4	24.61	0.65
ILMN_1750181	TESC	12	24.52	0.65
ILMN_1811102	LRSAM1	9	24.50	0.67
ILMN_1787691	CITED4	1	24.10	0.65
ILMN_1804150	HIBADH	7	23.96	0.66
ILMN_1780036	WDR1	4	23.85	-0.65
ILMN_1723971	SLC29A1	6	23.85	0.67
ILMN_1786197	NR2F1	5	23.77	0.66
ILMN_1741727	QPCT	2	23.74	-0.65
ILMN_1767960	NSUN7	4	23.59	0.66
ILMN_1750912	STXBP6	14	23.48	0.64
ILMN_1673682	GATAD2A	19	23.41	-0.66
ILMN_1713901	KDELR3	22	23.23	-0.63
ILMN_1692785	KLHL21	1	23.12	0.65
ILMN_1711030	OPLAH	8	22.49	0.64
ILMN_1753639	MTAP	9	22.47	0.64
ILMN_1767848	PCMTD2	20	22.46	0.64
ILMN_1699644	MARCH3	5	22.40	-0.65
ILMN_2063925	CTNNB1	20	22.23	0.64
ILMN_1682139	RAI14	5	22.17	-0.65
ILMN_1729455	EML1	14	21.99	0.65
ILMN_1785175	SWAP70	11	21.97	-0.62
ILMN_1808487	PLA2G12B	10	21.88	0.61
ILMN_1810274	HOXB2	17	21.79	-0.60
ILMN_1753010	PET112	4	21.64	0.61
ILMN_1793859	ALDH2	12	21.62	0.62
ILMN_1713162	GSTM2	1	21.33	0.63
ILMN_1687301	VCAN	5	21.22	-0.61
ILMN_1696675	CES2	16	21.00	-0.60
ILMN_1797475	FAM216B	13	20.93	0.62
ILMN_1807710	HINT1	5	20.74	0.60
ILMN_1729980	RNF216	7	20.65	-0.56
ILMN_2191313	FAM21A	10	20.51	0.61
ILMN_1656682	AZIN1	8	20.50	-0.58
ILMN_1694432	CRIP2	14	20.44	0.58
ILMN_1657515	RPS6KA5	14	20.31	0.64
ILMN_1766499	HSPA2	14	20.26	-0.61
ILMN_1789058	RNF207	1	20.11	0.60
ILMN_1772605	FRS3	6	20.10	0.62
ILMN_1715927	VSTM2L	20	20.02	0.59
ILMN_1718769	ITSN1	21	19.81	0.60
ILMN_1801205	GPNMB	7	19.73	-0.62

ILMN_2214098	BIVM	13	19.71	0.61
ILMN_2383611	PTPRE	10	19.69	-0.59
ILMN_1691572	TST	22	19.52	0.61
ILMN_1790173	COL28A1	7	19.51	0.61
ILMN_1705231	SLCO2A1	3	19.20	-0.60
ILMN_1719518	ARF4	3	19.11	-0.58
ILMN_1707695	IFIT1	10	18.99	0.60
ILMN_1678730	NOMO1	16	18.93	0.59
ILMN_1796216	VASH1	14	18.90	-0.57
ILMN_1689001	CDK4	12	18.79	-0.60
ILMN_2402640	DSC1	18	18.72	0.58
ILMN_2371379	ACLY	17	18.62	-0.60
ILMN_2148819	TUBA1A	12	18.52	-0.58
ILMN_1671568	ECHDC2	1	18.49	0.59
ILMN_1658499	SYT13	11	18.20	0.56
ILMN_1730670	FSTL3	19	18.12	-0.57
ILMN_1735996	NOX4	11	18.10	-0.58
ILMN_2115125	CTGF	6	18.09	-0.58
ILMN_2326713	CD151	11	18.05	-0.58
ILMN_1653028	COL4A1	13	18.04	-0.57
ILMN_2343048	ABCB9	12	17.93	0.58
ILMN_1695276	MAPRE2	18	17.91	-0.58
ILMN_1702501	RPS6KA2	6	17.88	-0.53
ILMN_1800447	PHKB	16	17.88	0.59
ILMN_1705049	TMEM67	8	17.83	0.56
ILMN_1656940	ABLIM3	5	17.71	0.56
ILMN_1684352	TRIM45	1	17.68	0.59
ILMN_1776519	RAP1GAP	1	17.67	0.57
ILMN_1810100	PBX3	9	17.44	0.57
ILMN_1657744	FAM219B	15	17.41	0.57
ILMN_1678037	HIRIP3	16	17.38	0.55
ILMN_1657373	LEPREL1	3	17.31	-0.53
ILMN_1801616	EMP1	12	17.28	-0.57
ILMN_1690040	TM7SF2	11	16.84	0.53
ILMN_2197128	OSR1	2	16.54	0.55
ILMN_1658333	ECM1	1	16.52	-0.56
ILMN_1681591	PTPN1	20	16.52	-0.56
ILMN_1751028	SERPINH1	11	16.47	-0.56
ILMN_1693338	CYP1B1	2	16.42	-0.55
ILMN_2387090	CGGBP1	3	16.41	-0.56
ILMN_1738652	BAD	11	16.35	0.56
ILMN_1770548	CLASP2	3	16.34	0.57
ILMN_1784217	SOX15	17	16.31	0.51
ILMN_1808202	R3HDM4	19	16.27	-0.57
ILMN_1778240	GFOD1	6	16.26	0.54

ILMN_1681515	CRLF1	19	16.11	-0.57
ILMN_1711089	DNAJC21	5	16.06	0.52
ILMN_1759513	RND3	2	16.04	-0.54
ILMN_1768662	UCK2	1	15.97	-0.55
ILMN_1726928	TCEA3	1	15.97	0.54
ILMN_1659688	LGALS3BP	17	15.76	0.55
ILMN_1666894	CSPG4	15	15.73	-0.53
ILMN_2064725	METTTL7B	12	15.69	0.54
ILMN_2343278	PPAP2A	5	15.59	-0.54
ILMN_1703955	FBXO32	8	15.44	0.51
ILMN_1686116	THBS1	15	15.39	-0.54
ILMN_1675797	EPDR1	7	15.30	0.55
ILMN_1737988	PRNP	20	15.29	0.54
ILMN_2404049	RBM38	20	15.24	0.54
ILMN_1793002	C20orf196	20	15.22	0.54
ILMN_1787648	GPR125	4	15.16	0.54
ILMN_1762466	BBS4	15	15.14	0.54
ILMN_1717599	CNTN3	3	15.08	0.53
ILMN_1655884	ATP2A2	12	15.01	0.50
ILMN_1656186	SLC41A1	1	15.00	0.50
ILMN_1772612	ANGPTL2	9	14.99	-0.45
ILMN_1761566	CYSTEM1	5	14.93	-0.53
ILMN_1688242	C6	5	14.91	0.52
ILMN_1785732	TNFAIP6	2	14.88	-0.50
ILMN_1813175	LPHN1	19	14.87	0.52
ILMN_1720344	NIPA2	15	14.84	-0.52
ILMN_1665331	AMT	3	14.76	0.55
ILMN_1715384	B3GNT1	11	14.74	0.53
ILMN_1742330	PLXNB1	3	14.72	0.55
ILMN_1705390	KLHL22	22	14.72	0.52
ILMN_1791967	C20orf166-AS1	20	14.64	0.51
ILMN_1732060	ARHGAP1	11	14.62	-0.53
ILMN_1809101	STEAP2	7	14.58	0.53
ILMN_2110252	NPM3	10	14.57	-0.52
ILMN_1741133	NME1	17	14.40	-0.51
ILMN_1792389	RNF165	18	14.27	0.52
ILMN_1803256	STOX2	4	14.16	0.52
ILMN_1692072	CENPBD1	16	14.12	0.51
ILMN_1719143	APOBEC2	6	14.11	0.49
ILMN_1793732	FARS2	6	14.06	0.50
ILMN_2376958	TBX5	12	13.87	0.53
ILMN_1718193	MYLK3	16	13.78	0.48
ILMN_1654118	BCL2L1	20	13.77	-0.50
ILMN_2116127	NPEPPS	17	13.74	0.50
ILMN_1660063	POLE4	2	13.72	-0.50

ILMN_1665871	ANGEL1	14	13.65	0.52
ILMN_2210934	NR3C2	4	13.58	0.50
ILMN_1704353	IGSF3	1	13.56	0.50
ILMN_1716488	PACS1	11	13.55	-0.50
ILMN_1662470	C10orf35	10	13.46	0.51
ILMN_1733690	AKAP7	6	13.35	0.52
ILMN_1660793	PAQR4	16	13.32	-0.50
ILMN_1804007	NANOS3	19	13.26	0.53
ILMN_1736078	THBS4	5	13.17	-0.50
ILMN_1694426	ROR2	9	13.17	0.50
ILMN_1730487	CALD1	7	13.13	-0.45
ILMN_2153373	LRBA	4	13.11	0.48
ILMN_1654639	HERC6	4	13.09	0.51
ILMN_1686968	ZNF362	1	13.06	0.49
ILMN_1733515	LOXL3	2	13.04	-0.51
ILMN_1665945	ACBD3	1	12.98	-0.49
ILMN_1743655	TMED9	5	12.91	-0.49
ILMN_2395043	HSPA4	5	12.81	-0.50
ILMN_1680781	C14orf135	14	12.80	-0.48
ILMN_2289924	TRAK1	3	12.72	0.46
ILMN_1653133	SH3D19	4	12.70	-0.48
ILMN_2302118	CCDC50	3	12.47	-0.48
ILMN_1652065	KCNMB1	5	12.46	-0.46
ILMN_1738173	METTL4	18	12.45	0.51
ILMN_1804737	RAVER2	1	12.34	0.48
ILMN_1789463	FXD1	19	12.32	0.49
ILMN_1687315	RXRA	9	12.22	0.49
ILMN_1679919	ASCC2	22	12.18	-0.49
ILMN_1796210	PPRC1	10	12.18	-0.48
ILMN_2336094	ODZ3	4	12.15	0.49
ILMN_1676984	DDIT3	12	12.12	0.45
ILMN_1680353	NSF	17	12.10	-0.47
ILMN_1751072	SRPRB	3	12.08	-0.48
ILMN_1679428	CHIC2	4	12.04	-0.48
ILMN_2386818	URGCP	7	12.04	0.47
ILMN_1687978	PHLDA1	12	12.02	-0.47
ILMN_1781560	ST3GAL6	3	12.00	-0.45
ILMN_1767446	RNF150	4	11.90	0.44
ILMN_1666503	DENND2A	7	11.89	0.47
ILMN_1718070	CASP9	1	11.87	0.50
ILMN_2283325	WLS	1	11.86	0.46
ILMN_1731064	ADCK3	1	11.82	0.43
ILMN_2232177	ACTN1	14	11.78	-0.47
ILMN_2041577	SLC52A2	8	11.77	-0.49
ILMN_1723021	ICMT	1	11.70	-0.48

ILMN_1753582	RPA2	1	11.66	0.48
ILMN_1725746	CARNS1	11	11.64	0.45
ILMN_2220187	GFPT1	2	11.63	-0.48
ILMN_1747303	DDX39A	19	11.63	-0.48
ILMN_2357730	CDK20	9	11.63	0.47
ILMN_1747227	ADORA1	1	11.60	0.44
ILMN_1807031	C14orf28	14	11.60	0.46
ILMN_1680652	SELENBP1	1	11.59	0.49
ILMN_1770412	AHCYL1	1	11.57	-0.47
ILMN_1751559	TMEM204	16	11.56	-0.47
ILMN_1702691	TNFAIP3	6	11.50	-0.47
ILMN_1782688	THNSL1	10	11.48	0.43
ILMN_1765146	IFNAR2	21	11.45	-0.47
ILMN_2410772	KEAP1	19	11.45	0.46
ILMN_1712944	AES	19	11.44	0.47
ILMN_1775170	MT1X	16	11.42	0.44
ILMN_2364022	SLC16A3	17	11.41	-0.46
ILMN_2144088	FDFT1	8	11.38	0.49
ILMN_1800261	TUBA1B	12	11.36	-0.47
ILMN_1755589	DIP2B	12	11.34	-0.47
ILMN_1769409	C9orf123	9	11.34	0.46
ILMN_1682326	PCP4	21	11.26	0.46
ILMN_1693951	C14orf180	14	11.19	0.45
ILMN_1720771	STX11	6	11.18	-0.45
ILMN_1671693	TPGS2	18	11.16	0.39
ILMN_2047599	TMEM50B	21	11.15	0.46
ILMN_1736828	CHST10	2	11.11	0.45
ILMN_1712975	YIF1A	11	11.11	-0.45
ILMN_1806533	PDE7B	6	11.08	0.44
ILMN_1790026	SFRP5	10	11.06	0.42
ILMN_1873621	NTN1	17	11.06	0.45
ILMN_2334042	THYN1	11	11.03	0.47
ILMN_2378376	CYB561	17	11.02	0.47
ILMN_1812856	ZSWIM1	20	11.01	0.46
ILMN_1808590	GUCY1A3	4	10.97	0.47
ILMN_1805543	ADAMTS9	3	10.97	-0.46
ILMN_2215119	SYNJ2	6	10.95	-0.45
ILMN_2308849	MYADM	19	10.94	-0.43
ILMN_1690487	PCM1	8	10.91	0.42
ILMN_1682147	HOOK2	19	10.88	-0.47
ILMN_1734742	ARHGDI A	17	10.87	-0.46
ILMN_2378100	FBXL5	4	10.83	0.44
ILMN_2120210	RCAN2	6	10.82	0.44
ILMN_1726368	ZNF135	19	10.77	0.48
ILMN_2224486	C3orf14	3	10.77	-0.44

ILMN_1667748	ANKRD33	12	10.70	-0.44
ILMN_1733176	LIMS1	2	10.67	-0.43
ILMN_1792679	ITGA5	12	10.66	-0.46
ILMN_2201678	FSTL1	3	10.61	-0.45
ILMN_1745041	TCF15	20	10.58	0.44
ILMN_1695719	EIF2C2	8	10.57	-0.46
ILMN_2047112	DPCD	10	10.54	0.45
ILMN_1803180	PRDX6	1	10.53	0.43
ILMN_1662658	PUS1	12	10.49	-0.44
ILMN_1727001	DDX46	5	10.47	0.43
ILMN_1721457	RANBP1	22	10.46	-0.44
ILMN_1795300	ARHGEF37	5	10.45	0.45
ILMN_1733221	SEMA4D	9	10.44	0.43
ILMN_1783546	CARKD	13	10.40	0.46
ILMN_2149164	SFRP1	8	10.38	0.41
ILMN_1787251	DAAM1	14	10.36	0.44
ILMN_1766408	CBFB	16	10.36	-0.43
ILMN_1671911	MTA1	14	10.36	0.39
ILMN_1723706	GRAMD4	22	10.35	0.36
ILMN_2047676	OSGEPL1	2	10.30	0.44
ILMN_1811178	SCAPER	15	10.29	0.44
ILMN_1682781	TEAD2	19	10.28	0.36
ILMN_1673820	HLTF	3	10.26	0.43
ILMN_1694514	ZDHHC11	5	10.25	0.44
ILMN_1672589	SEMA4B	15	10.25	0.43
ILMN_1734445	PKDCC	2	10.22	0.45
ILMN_1721901	CTNNAL1	9	10.21	0.37
ILMN_1738494	AQP7	9	10.19	0.44
ILMN_1783304	ATP1B3	3	10.15	-0.44
ILMN_2052208	GADD45A	1	10.15	-0.45
ILMN_1718177	CYP20A1	2	10.11	-0.45
ILMN_1693740	DNAJC3-AS1	13	10.06	0.43
ILMN_2388155	CASP3	4	10.06	-0.42
ILMN_2399896	SEC31A	4	10.04	-0.45
ILMN_1747577	ALAD	9	10.00	0.42
ILMN_2049303	ECI1	16	9.98	0.43
ILMN_1723684	DARC	1	9.96	-0.41
ILMN_2335718	HNRNPAB	5	9.83	-0.44
ILMN_2399310	MLLT10	10	9.81	0.42
ILMN_1735461	DDX21	10	9.80	-0.42
ILMN_1771957	MAN1B1	9	9.77	0.40
ILMN_1656501	DUSP5	10	9.74	-0.38
ILMN_2050813	CLGN	4	9.70	0.41
ILMN_1674135	RALGPS1	9	9.67	0.43
ILMN_2139761	LIMCH1	4	9.66	0.43

ILMN_1787718	SLC27A1	19	9.61	0.42
ILMN_1784785	COPS7B	2	9.61	0.42
ILMN_1726288	TMEM106B	7	9.58	0.45
ILMN_2118472	FAM213A	10	9.53	0.43
ILMN_1741032	HERC3	4	9.51	0.43
ILMN_1811921	CSRP1	1	9.49	-0.44
ILMN_1724333	TOR1B	9	9.47	-0.43
ILMN_1780698	ZFYVE19	15	9.47	0.44
ILMN_1770356	POLRMT	19	9.44	0.43
ILMN_1813400	CBR4	4	9.38	0.38
ILMN_1767263	FUBP3	9	9.31	0.41
ILMN_1764431	COPS6	7	9.28	0.40
ILMN_1796900	NUDCD3	7	9.16	0.40
ILMN_1706539	KDM3B	5	9.15	0.45
ILMN_1662795	CA2	8	9.12	-0.41
ILMN_1685703	ACOX2	3	9.04	0.42
ILMN_1704154	TNFRSF19	13	9.03	0.38
ILMN_1707326	TASP1	20	9.02	-0.43
ILMN_1704795	MARK3	14	9.00	0.40
ILMN_2224143	MCM3	6	8.92	0.41
ILMN_1707372	RNF187	1	8.88	0.40
ILMN_2180682	MTPN	7	8.87	-0.39
ILMN_1786278	FAM149A	4	8.87	0.40
ILMN_1785756	H2AFX	11	8.81	-0.45
ILMN_1715189	LHX6	9	8.79	-0.39
ILMN_1679725	PCYOX1	2	8.79	0.40
ILMN_1668514	PIP5K1C	19	8.77	-0.39
ILMN_2120555	ADCY1	7	8.76	0.39
ILMN_1674661	CIRBP	19	8.76	0.40
ILMN_2306955	ACPL2	3	8.70	-0.36
ILMN_1773741	GOLGA5	14	8.68	-0.42
ILMN_2175447	ZNF767	7	8.64	0.40
ILMN_1754045	FANCL	2	8.62	0.41
ILMN_2325347	B3GALNT1	3	8.58	0.40
ILMN_1803279	TMED5	1	8.56	-0.42
ILMN_1784678	PBX1	1	8.56	0.37
ILMN_1662174	ORMDL3	17	8.54	-0.38
ILMN_1678165	LSM7	19	8.53	-0.41
ILMN_1694223	DGCR8	22	8.51	0.39
ILMN_1763228	MEF2D	1	8.44	0.37
ILMN_1691946	FAM173B	5	8.37	0.40
ILMN_1766916	RPAP3	12	8.36	0.36
ILMN_1720708	CSNK1D	17	8.36	-0.42
ILMN_1707062	REV1	2	8.33	0.43
ILMN_2174081	ZNF133	20	8.29	0.42

ILMN_1730611	RTN4	2	8.27	-0.36
ILMN_1699723	RARB	3	8.26	0.37
ILMN_1811823	MED25	19	8.19	0.39
ILMN_2392189	CTDSPL	3	8.18	0.39
ILMN_1656560	PARM1	4	8.18	0.37
ILMN_1731745	NINJ2	12	8.16	-0.39
ILMN_1673073	WDR62	19	8.14	0.34
ILMN_2049693	C11orf71	11	8.12	0.33
ILMN_1715647	VANGL2	1	8.10	0.38
ILMN_1803611	SNAPC3	9	8.08	0.38
ILMN_1769883	IDE	10	8.07	0.41
ILMN_1785644	AP5S1	20	7.95	0.40
ILMN_1666122	HEG1	3	7.93	0.38
ILMN_1750722	RPS7	2	7.92	-0.36
ILMN_2156982	IMP4	2	7.88	-0.38
ILMN_2324056	GNL3	3	7.81	-0.38
ILMN_1801302	SCN1B	19	7.79	0.36
ILMN_1724666	INADL	1	7.74	0.36
ILMN_1804476	GMPPA	2	7.72	-0.38
ILMN_1667239	INPP1	2	7.71	0.38
ILMN_1734254	ZNF770	15	7.67	0.40
ILMN_1716973	POLM	7	7.65	0.38
ILMN_1743402	SIX4	14	7.64	0.39
ILMN_2235283	MAPK1	22	7.61	-0.40
ILMN_2215545	C3orf26	3	7.58	-0.37
ILMN_2209748	DERL1	8	7.58	-0.37
ILMN_1747775	STX2	12	7.53	-0.36
ILMN_2199313	NPDC1	9	7.52	-0.37
ILMN_2358560	TIAM2	6	7.52	-0.40
ILMN_1795428	WDR59	16	7.52	0.37
ILMN_1766814	TK2	16	7.50	-0.36
ILMN_1780825	RRAS	19	7.48	-0.34
ILMN_1741881	C9orf72	9	7.47	0.39
ILMN_1710697	BUD31	7	7.47	-0.36
ILMN_1682165	NT5C2	10	7.43	-0.34
ILMN_1730698	ODF2	9	7.42	-0.37
ILMN_1745623	EFCAB4A	11	7.40	0.39
ILMN_1775573	DPY19L4	8	7.28	-0.33
ILMN_1706523	FCGR2A	1	7.18	0.35
ILMN_2128770	CDR2L	17	7.17	-0.34
ILMN_1764096	CCBL1	9	7.16	0.36
ILMN_1745778	SLC45A4	8	7.15	0.35
ILMN_1663538	CLYBL	13	7.15	0.40
ILMN_1784766	MCM3AP	21	7.10	0.36
ILMN_1807372	ADORA2A	22	7.09	0.35

ILMN_1651719	MBTPS1	16	7.08	0.35
ILMN_1753502	IGSF11	3	7.08	0.36
ILMN_1713964	BTBD3	20	7.05	0.34
ILMN_2403664	POMC	2	7.03	0.39
ILMN_1708934	ADM	11	6.97	-0.30
ILMN_1800590	BBS1	11	6.95	0.35
ILMN_1682449	ZNF518B	4	6.93	0.34
ILMN_1664424	ZBED5	11	6.87	0.34
ILMN_1708009	LANCL2	7	6.87	0.36
ILMN_1792415	GTDC2	3	6.86	0.35
ILMN_1707649	MPDZ	9	6.83	0.37
ILMN_1705144	ULK1	12	6.79	0.27
ILMN_1731287	ARFGAP3	22	6.77	-0.31
ILMN_2178587	ANKRD6	6	6.76	0.35
ILMN_1680987	HAND1	5	6.76	0.37
ILMN_1657495	MLEC	12	6.74	0.34
ILMN_2129161	LRRC32	11	6.73	-0.34
ILMN_2375484	CPEB2	4	6.73	0.35
ILMN_1791226	NXN	17	6.64	0.32
ILMN_1755643	MGAT4A	2	6.62	-0.36
ILMN_2180239	DOPEY2	21	6.61	-0.35
ILMN_1718907	TSHZ1	18	6.56	0.29
ILMN_1747058	TRAPPC2L	16	6.55	0.30
ILMN_1767253	RRP12	10	6.54	-0.34
ILMN_1759411	C16orf79	16	6.52	0.32
ILMN_1878019	DOK6	18	6.48	0.30
ILMN_1797341	ARID1A	1	6.43	-0.32
ILMN_1753584	KRT8	12	6.42	0.27
ILMN_1695491	WDYHV1	8	6.40	0.37
ILMN_1710427	VPS37B	12	6.39	0.32
ILMN_1655563	CTIF	18	6.39	-0.35
ILMN_1799104	SPAG9	17	6.37	-0.35
ILMN_1814315	PBXIP1	1	6.36	0.34
ILMN_1687857	ST6GALNAC4	9	6.36	-0.35
ILMN_1717490	RPL6	12	6.35	-0.34
ILMN_1787539	ZNF177	19	6.34	0.34
ILMN_1755741	DACH1	13	6.31	0.32
ILMN_2395285	SNRNP35	12	6.29	0.34
ILMN_1799589	NOXA1	9	6.29	0.30
ILMN_1697962	NSMCE1	16	6.23	-0.32
ILMN_1692267	B4GALT3	1	6.23	-0.34
ILMN_1803855	FAIM2	12	6.22	0.30
ILMN_2415189	ATP1A1	1	6.20	-0.33
ILMN_1704305	NIP7	16	6.18	-0.33
ILMN_1754051	RMI1	9	6.16	0.30

ILMN_1691567	GNPDA2	4	6.16	0.35
ILMN_1680874	TUBB2B	6	6.14	0.32
ILMN_1672022	EPHA4	2	6.14	0.29
ILMN_2358541	RBMS1	2	6.13	-0.37
ILMN_1728228	ZNF548	19	6.05	0.28
ILMN_1665964	GAB2	11	6.04	-0.34
ILMN_1688152	IL27RA	19	5.96	-0.31
ILMN_2159859	LYSMD4	15	5.96	0.27
ILMN_1713993	UBAC2	13	5.96	-0.32
ILMN_1692168	UBE2Z	17	5.96	-0.34
ILMN_1770020	PPIL3	2	5.91	0.34
ILMN_1726108	CERS2	1	5.91	-0.32
ILMN_1666385	CALM3	19	5.90	-0.13
ILMN_1736077	LIAS	4	5.87	0.32
ILMN_1751887	PREP	6	5.82	-0.29
ILMN_1710209	MFSD6	2	5.81	0.25
ILMN_1671686	EPB49	8	5.80	0.33
ILMN_1678268	VPS8	3	5.79	-0.27
ILMN_1667043	EIF4A3	17	5.77	-0.28
ILMN_2230683	CDCA7L	7	5.75	0.31
ILMN_1743714	CARD10	22	5.71	0.29
ILMN_1749866	GATA4	8	5.65	0.31
ILMN_1688480	CCND1	11	5.63	-0.26
ILMN_1709114	TAB1	22	5.62	0.34
ILMN_1666482	SP2	17	5.60	0.29
ILMN_2179717	FAM189A2	9	5.59	0.27
ILMN_2411963	RBM39	20	5.58	-0.32
ILMN_1674380	TRPC1	3	5.56	0.25
ILMN_2107933	ZNF285	19	5.56	0.29
ILMN_2070044	PPM1K	4	5.54	0.31
ILMN_1749821	MED28	4	5.54	0.27
ILMN_1737965	ELOVL4	6	5.52	-0.28
ILMN_1782551	E2F5	8	5.52	0.32
ILMN_1767111	ANO10	3	5.50	-0.32
ILMN_1763144	NEU1	6	5.49	-0.30
ILMN_1765532	RDBP	6	5.48	-0.32
ILMN_1654541	ATP6V1G2	6	5.47	0.30
ILMN_1813010	VTA1	6	5.44	0.30
ILMN_1699545	PCSK7	11	5.44	-0.29
ILMN_1691559	ELF2	4	5.44	0.31
ILMN_1678504	RHOT1	17	5.44	0.31
ILMN_2123119	MFSD8	4	5.43	-0.30
ILMN_1815032	SOX7	8	5.43	0.30
ILMN_1789436	DENND1B	1	5.41	0.30
ILMN_1661337	SRM	1	5.41	-0.33

ILMN_1713529	SEMA6A	5	5.39	0.28
ILMN_1724293	KDELR2	7	5.38	-0.31
ILMN_1734830	MTHFR	1	5.37	0.27
ILMN_1761531	SGPL1	10	5.37	-0.33
ILMN_1780861	METRNL	17	5.37	-0.29
ILMN_1784238	SEC22B	1	5.35	-0.29
ILMN_1796377	C14orf37	14	5.31	-0.28
ILMN_2186858	ZNF839	14	5.29	0.31
ILMN_1690252	ALKBH2	12	5.28	0.31
ILMN_2388539	C17orf101	17	5.27	-0.29
ILMN_1723768	NLRX1	11	5.26	0.25
ILMN_1711919	SCYL2	12	5.25	-0.30
ILMN_1795338	YPEL1	22	5.25	0.27
ILMN_1750689	MPP5	14	5.22	0.31
ILMN_1736533	RND2	17	5.19	0.29
ILMN_1747556	CDK9	9	5.19	0.27
ILMN_1727740	SYNCRIP	6	5.18	-0.28
ILMN_1741869	WDR47	1	5.14	0.29
ILMN_1760121	RRAGC	1	5.14	-0.31
ILMN_1755504	CALCOCO2	17	5.14	0.30
ILMN_1693401	KLHL28	14	5.13	0.29
ILMN_1716507	EPB41L1	20	5.12	0.28
ILMN_1674034	H2AFY	5	5.12	0.21
ILMN_1742935	ZNF33B	10	5.11	0.30
ILMN_1700834	SLK	10	5.09	-0.24
ILMN_1689431	APCDD1L	20	5.09	0.29
ILMN_1718629	NRIP1	21	5.09	0.28
ILMN_1703246	SBF1	22	5.07	-0.30
ILMN_1785926	ZNF621	3	5.06	-0.30
ILMN_1735495	TBC1D8	2	5.00	-0.27
ILMN_2285802	SEC14L1	17	4.99	-0.29
ILMN_2227757	PCDHB2	5	4.99	-0.30
ILMN_2141482	SERPINF1	17	4.99	-0.27
ILMN_1763461	ALDH7A1	5	4.98	0.29
ILMN_1722059	SAFB	19	4.95	0.25
ILMN_1804629	TPK1	7	4.94	-0.26
ILMN_2363591	SDCBP	8	4.94	0.20
ILMN_1679358	ZDHHC5	11	4.93	-0.25
ILMN_2173835	FTH1P3	2	4.93	-0.28
ILMN_1703314	KLHL36	16	4.92	-0.28
ILMN_1786347	TNPO1	5	4.92	-0.28
ILMN_1703754	CEP192	18	4.90	0.30
ILMN_1713037	PFKL	21	4.90	-0.27
ILMN_1755588	KANK3	19	4.90	0.26
ILMN_1777344	RPS13	11	4.89	0.30

ILMN_1814971	TCF25	16	4.89	-0.26
ILMN_1781198	PPP1R3D	20	4.85	0.29
ILMN_1769575	JAM3	11	4.84	-0.28
ILMN_1671427	FBXW4	10	4.84	0.26
ILMN_1754655	TTLL5	14	4.84	0.25
ILMN_2306540	PDE9A	21	4.81	0.27
ILMN_1752111	SMARCA1	2	4.80	0.28
ILMN_1773307	NAP1L5	4	4.79	-0.26
ILMN_2210729	STYXL1	7	4.75	0.30
ILMN_1812968	SOX18	20	4.71	0.25
ILMN_1778010	IL32	16	4.68	-0.27
ILMN_1734229	SPPL2A	15	4.67	-0.27
ILMN_2221673	ASNSD1	2	4.65	0.27
ILMN_1658399	KLRG1	12	4.64	0.24
ILMN_1708101	LMNB2	19	4.62	-0.27
ILMN_1815673	DKK3	11	4.62	-0.23
ILMN_1708328	RAB11FIP3	16	4.61	-0.21
ILMN_1754839	DHX15	4	4.60	-0.29
ILMN_1797566	SNAP47	1	4.57	-0.18
ILMN_1802843	PRCC	1	4.56	0.27
ILMN_1812841	C8orf34	8	4.56	0.27
ILMN_1665049	SPG11	15	4.55	0.29
ILMN_1906187	CAMK1D	10	4.54	0.19
ILMN_2225709	PTCD1	7	4.53	0.26
ILMN_1748970	PRR15L	17	4.51	0.27
ILMN_1715669	TP53I11	11	4.50	0.19
ILMN_1696065	SDF4	1	4.48	-0.28
ILMN_1792176	TADA3	3	4.47	-0.29
ILMN_2059211	KIAA0195	17	4.44	0.19
ILMN_1733667	DHX35	20	4.42	0.24
ILMN_1722753	GJA5	1	4.42	0.19
ILMN_2398926	C17orf58	17	4.39	0.18
ILMN_1691112	PIGN	18	4.39	0.28
ILMN_1815141	MTR	1	4.33	0.23
ILMN_2305721	POMT1	9	4.33	0.27
ILMN_1682332	GYPC	2	4.30	-0.27
ILMN_1652753	PAAF1	11	4.30	0.21
ILMN_1731546	RPL26	17	4.29	0.28
ILMN_2410909	AKT1	14	4.27	-0.27
ILMN_1781231	SLC25A38	3	4.27	0.25
ILMN_1656136	STAU1	20	4.24	-0.27
ILMN_1704753	EPAS1	2	4.23	0.21
ILMN_2111187	ELOVL6	4	4.22	-0.26
ILMN_1700461	AARSD1	17	4.21	0.24
ILMN_2072973	TOP3A	17	4.20	-0.22

ILMN_1801833	ARHGAP24	4	4.20	-0.12
ILMN_1768101	HOXB6	17	4.17	-0.17
ILMN_1669032	PPIC	5	4.15	-0.27
ILMN_1805807	SLC30A3	2	4.14	0.18
ILMN_2075051	PGS1	17	4.13	-0.23
ILMN_1655557	INTS6	13	4.12	-0.24
ILMN_2237746	ING3	7	4.11	-0.23
ILMN_2093389	SNAPC1	14	4.07	0.26
ILMN_1791511	TMEM176A	7	4.07	0.25
ILMN_1766542	RNPC3	1	4.06	0.22
ILMN_1653466	HES4	1	4.02	-0.19
ILMN_1659054	CHKB	22	4.01	0.24
ILMN_1664641	MED4	13	4.01	0.27
ILMN_1685679	RNF146	6	4.00	-0.20
ILMN_1772224	KCNJ5	11	4.00	0.22
ILMN_1766264	PI16	6	3.99	-0.25
ILMN_1662667	ANKRD20A8P	2	3.98	0.25
ILMN_1786189	MKI67IP	2	3.95	-0.20
ILMN_1782829	GLTSCR1	19	3.91	0.26
ILMN_2077886	C1orf109	1	3.89	0.23
ILMN_1755235	XPO6	16	3.88	-0.18
ILMN_1710906	RNF145	5	3.81	-0.24
ILMN_1777411	ATP1A2	1	3.80	-0.19
ILMN_1678290	HMG20A	15	3.76	0.24
ILMN_2160929	FEN1	11	3.74	0.23
ILMN_1658176	ABCG1	21	3.70	0.15
ILMN_1655225	C19orf25	19	3.70	0.22
ILMN_1775498	FAM100B	17	3.69	-0.18
ILMN_1758337	ZNF213	16	3.68	-0.21
ILMN_1779486	FAM126B	2	3.66	0.25
ILMN_1665066	NOA1	4	3.63	0.22
ILMN_1797367	TSC1	9	3.61	0.20
ILMN_1663379	FBXL15	10	3.60	0.23
ILMN_1768181	TOR3A	1	3.59	-0.21
ILMN_2365881	ATG16L1	2	3.56	0.22
ILMN_2167616	NACA	12	3.54	-0.21
ILMN_1772113	U2AF1	21	3.53	-0.24
ILMN_2405018	PPP1CB	2	3.52	-0.24
ILMN_2175465	RSL24D1	15	3.50	0.24
ILMN_1771026	GARS	7	3.50	-0.24
ILMN_1750511	NT5C3L	17	3.48	-0.23
ILMN_2406892	URI1	19	3.46	-0.23
ILMN_1803652	C9orf91	9	3.45	-0.21
ILMN_1658884	ATP11B	3	3.45	0.24
ILMN_1692219	RAB11FIP1	8	3.44	0.15

ILMN_1778226	EXTL3	8	3.40	0.17
ILMN_1732537	HEATR2	7	3.40	0.17
ILMN_2222065	FZD1	7	3.40	0.17
ILMN_1766346	ZNF512B	20	3.39	0.18
ILMN_2386016	C2orf28	2	3.39	0.20
ILMN_1762436	UBB	17	3.37	0.22
ILMN_2088172	POLR2B	4	3.34	0.23
ILMN_1691476	MYLK	3	3.33	0.16
ILMN_1699665	CLIC6	21	3.33	0.16
ILMN_1690099	ITGB1BP1	2	3.32	-0.20
ILMN_1693630	C16orf7	16	3.32	0.20
ILMN_1694589	PAQR8	6	3.31	-0.23
ILMN_1731157	MYOZ1	10	3.30	-0.22
ILMN_1768773	EGLN2	19	3.30	0.22
ILMN_2245305	ABHD12	20	3.29	-0.23
ILMN_2072091	HNRNPUL2	11	3.27	0.23
ILMN_1685140	PRRC1	5	3.26	-0.21
ILMN_1791067	TESK1	9	3.26	-0.23
ILMN_2360705	ACSL3	2	3.26	-0.23
ILMN_1761113	GNL2	1	3.25	-0.17
ILMN_1749218	TOPORS	9	3.25	0.18
ILMN_1739558	CRELD1	3	3.25	0.09
ILMN_1677200	CYFIP2	5	3.25	0.22
ILMN_2069593	SCAF11	12	3.24	-0.23
ILMN_1815719	PLCG2	16	3.23	0.25
ILMN_1729430	FBXO18	10	3.23	0.22
ILMN_1807304	MBNL1	3	3.21	-0.20
ILMN_2157240	MNS1	15	3.21	-0.21
ILMN_2217935	RFC1	4	3.20	0.22
ILMN_1705213	TMBIM1	2	3.14	-0.19
ILMN_2148507	ANKRD13C	1	3.12	-0.21
ILMN_1737157	GRAMD1A	19	3.05	-0.14
ILMN_1696330	GUF1	4	3.03	-0.20
ILMN_2309228	GPS1	17	3.03	0.21
ILMN_2290998	CCS	11	3.00	0.19
ILMN_1763640	NCKAP5L	12	2.98	0.14
ILMN_1708841	GOLPH3	5	2.98	-0.18
ILMN_1661424	THAP6	4	2.92	0.18
ILMN_1673185	CPSF2	14	2.90	0.21
ILMN_1668027	NDUFB4	3	2.88	0.19
ILMN_1801383	SMG1	16	2.88	-0.21
ILMN_1776515	MPPE1	18	2.78	-0.15
ILMN_1794643	ZGPAT	20	2.75	-0.11
ILMN_2087989	ZFAND1	8	2.74	-0.13
ILMN_2136177	CNOT6	5	2.52	-0.15

ILMN_1783843	MIIP	1	2.52	-0.14
ILMN_1700044	SAP130	2	2.51	0.14
ILMN_1744665	EP300	22	2.25	-0.14
ILMN_1685824	B4GALT5	20	2.18	0.15
ILMN_1745130	RBFOX2	22	2.17	-0.12
ILMN_2341815	TFG	3	2.14	-0.11
ILMN_1695959	FAM176C	21	1.81	-0.12

*ILMN_ID – Probe Illumina ID

†HGNC – HGNC symbol

‡Chr. No. – Chromosome number

§kWithin – Intramodular connectivity

||MM – Module membership

Table S7: Ingenuity IPA[®] analysis of salmon module gene contents.

Category	Functions	Functions Annotation	p-Value	Molecules	# Molecules
Cellular Compromise	oxidative stress response	oxidative stress response of myocardium	4.44E-04	AGT, TXN	2
Organ Morphology	oxidative stress response	oxidative stress response of myocardium	4.44E-04	AGT, TXN	2
Tissue Morphology	oxidative stress response	oxidative stress response of myocardium	4.44E-04	AGT, TXN	2
Endocrine System Disorders	primary pigmented nodular adrenocortical disease	primary pigmented nodular adrenocortical disease	4.44E-04	PDE8B, PRKAR1A	2
Organismal Injury and Abnormalities	restenosis	restenosis of femoral artery	4.44E-04	AGT, RCAN1	2
Cardiovascular System Development and Function	stroke volume index	stroke volume index	4.44E-04	ANGPT2, ENG	2
Cardiovascular System Development and Function	vasoconstriction	vasoconstriction of mesenteric artery	4.44E-04	AGT, ANGPT2	2
Post-Translational Modification	folding	folding of protein	7.56E-04	DNAJA1, DNAJA4, HSPA5, HSPB1, TXN	5
Protein Folding	folding	folding of protein	7.56E-04	DNAJA1, DNAJA4, HSPA5, HSPB1, TXN	5
Endocrine System Disorders	differentiated thyroid cancer	differentiated thyroid cancer	1.25E-03	ANGPT2, ENG, LGA, LS3, PRKAR1A, PTPN4	5
Cancer	differentiated thyroid cancer	differentiated thyroid cancer	1.25E-03	ANGPT2, ENG, LGA, LS3, PRKAR1A, PTPN4	5
Cell Death and Survival	apoptosis	apoptosis of lymphoid cells	1.31E-03	HSPA5, TXN	2
Tissue Morphology	dilation	dilation of epithelial tissue	1.31E-03	AGT, LGALS3	2
Free Radical Scavenging	metabolism	metabolism of hydrogen peroxide	1.76E-03	AGT, ANGPT2, GPX4, LCLAT1, TXN	5
Small Molecule Biochemistry	metabolism	metabolism of hydrogen peroxide	1.76E-03	AGT, ANGPT2, GPX4, LCLAT1, TXN	5
Organ Morphology	abnormal morphology	abnormal morphology of sebaceous glands	2.59E-03	CBS, NCOA6	2
Developmental	developmental	developmental	2.59E-03	NCOA6, PEX5	2

Disorder	delay	delay of brain			
Neurological Disease	developmental delay	developmental delay of brain	2.59E-03	NCOA6,PEX5	2
Organismal Injury and Abnormalities	formation	formation of abdominal aortic aneurysm	2.59E-03	AGT,ANGPT2	2
Cardiovascular Disease	formation	formation of abdominal aortic aneurysm	2.59E-03	AGT,ANGPT2	2
Cellular Development	proliferation	proliferation of adrenal gland cells	2.59E-03	AGT,ANGPT2	2
Cellular Growth and Proliferation	proliferation	proliferation of adrenal gland cells	2.59E-03	AGT,ANGPT2	2
Endocrine System Development and Function	proliferation	proliferation of adrenal gland cells	2.59E-03	AGT,ANGPT2	2
Small Molecule Biochemistry	uptake	uptake of dopamine	2.59E-03	AGT,SCAMP2	2
Cell-To-Cell Signaling and Interaction	uptake	uptake of dopamine	2.59E-03	AGT,SCAMP2	2
Drug Metabolism	uptake	uptake of dopamine	2.59E-03	AGT,SCAMP2	2
Molecular Transport	uptake	uptake of dopamine	2.59E-03	AGT,SCAMP2	2
Cardiovascular Disease	hypertrophy	hypertrophy of left ventricle	2.63E-03	AGT,ANGPT2,MYH7,RCAN1	4
Developmental Disorder	hypertrophy	hypertrophy of left ventricle	2.63E-03	AGT,ANGPT2,MYH7,RCAN1	4
Organismal Injury and Abnormalities	degeneration	Organ Degeneration	2.73E-03	AGT,ATXN1,CAPN1,NR1H3,PPT2,TXN	6
Endocrine System Disorders	thyroid carcinoma	thyroid carcinoma	3.21E-03	ANGPT2,ENG,LGALS3,PRKAR1A,PTPN4	5
Cancer	thyroid carcinoma	thyroid carcinoma	3.21E-03	ANGPT2,ENG,LGALS3,PRKAR1A,PTPN4	5
Endocrine System Disorders	papillary thyroid cancer	papillary thyroid cancer	3.40E-03	ENG,LGALS3,PRKAR1A,PTPN4	4
Cancer	papillary thyroid cancer	papillary thyroid cancer	3.40E-03	ENG,LGALS3,PRKAR1A,PTPN4	4
Cell Signaling	signaling	signaling of Ca ²⁺	4.23E-03	CDH13,HSPA5,INPP5A	3
Vitamin and Mineral Metabolism	signaling	signaling of Ca ²⁺	4.23E-03	CDH13,HSPA5,INPP5A	3
Cellular Growth and Proliferation	cytostasis	cytostasis of leukemia cell lines	4.26E-03	CBS,PRKAR1A	2
Developmental	developmental	developmental	4.26E-03	CBS,PEX5	2

Disorder	delay	delay of kidney			
Renal and Urological Disease	developmental delay	developmental delay of kidney	4.26E-03	CBS,PEX5	2
Organismal Injury and Abnormalities	neurodegeneration	neurodegeneration of cerebellum	4.26E-03	ATXN1,PPT2	2
Neurological Disease	neurodegeneration	neurodegeneration of cerebellum	4.26E-03	ATXN1,PPT2	2
Cardiovascular System Development and Function	relaxation	relaxation of aortic ring tissue	4.26E-03	AGT,FHL2	2
Tissue Morphology	relaxation	relaxation of aortic ring tissue	4.26E-03	AGT,FHL2	2
Cell-To-Cell Signaling and Interaction	synaptic transmission	synaptic transmission of hippocampal neurons	4.26E-03	ATXN1,GRIK2	2
Nervous System Development and Function	synaptic transmission	synaptic transmission of hippocampal neurons	4.26E-03	ATXN1,GRIK2	2
Small Molecule Biochemistry	synthesis	synthesis of corticosterone	4.26E-03	AGT,PDE8B	2
Endocrine System Development and Function	synthesis	synthesis of corticosterone	4.26E-03	AGT,PDE8B	2
Vitamin and Mineral Metabolism	synthesis	synthesis of corticosterone	4.26E-03	AGT,PDE8B	2
Lipid Metabolism	synthesis	synthesis of corticosterone	4.26E-03	AGT,PDE8B	2
Small Molecule Biochemistry	synthesis	synthesis of pregnenolone	4.26E-03	AGT,DBI	2
Endocrine System Development and Function	synthesis	synthesis of pregnenolone	4.26E-03	AGT,DBI	2
Vitamin and Mineral Metabolism	synthesis	synthesis of pregnenolone	4.26E-03	AGT,DBI	2
Lipid Metabolism	synthesis	synthesis of pregnenolone	4.26E-03	AGT,DBI	2
Small Molecule Biochemistry	secretion	secretion of steroid	4.32E-03	AGT,ANGPT2,NCOA6,NR1H3	4
Molecular Transport	secretion	secretion of steroid	4.32E-03	AGT,ANGPT2,NCOA6,NR1H3	4
Lipid Metabolism	secretion	secretion of steroid	4.32E-03	AGT,ANGPT2,NCOA6,NR1H3	4
Organ Morphology	abnormal morphology	abnormal morphology of enlarged liver	5.97E-03	CBS,NR1H3,PPT2	3
Digestive	abnormal	abnormal	5.97E-03	CBS,NR1H3,PPT2	3

System Development and Function	morphology	morphology of enlarged liver			
Hepatic System Development and Function	abnormal morphology	abnormal morphology of enlarged liver	5.97E-03	CBS,NR1H3,PPT2	3
Tissue Morphology	quantity	quantity of smooth muscle cells	5.97E-03	AGT,ANGPT2,ENG	3
Cellular Assembly and Organization	quantity	quantity of smooth muscle cells	5.97E-03	AGT,ANGPT2,ENG	3
Cellular Function and Maintenance	quantity	quantity of smooth muscle cells	5.97E-03	AGT,ANGPT2,ENG	3
Skeletal and Muscular System Development and Function	quantity	quantity of smooth muscle cells	5.97E-03	AGT,ANGPT2,ENG	3
Small Molecule Biochemistry	accumulation	accumulation of cyclic AMP	6.00E-03	ADCY6,AGT,ANGPT2,PRKAR1A	4
Molecular Transport	accumulation	accumulation of cyclic AMP	6.00E-03	ADCY6,AGT,ANGPT2,PRKAR1A	4
Cell Signaling	accumulation	accumulation of cyclic AMP	6.00E-03	ADCY6,AGT,ANGPT2,PRKAR1A	4
Nucleic Acid Metabolism	accumulation	accumulation of cyclic AMP	6.00E-03	ADCY6,AGT,ANGPT2,PRKAR1A	4
Small Molecule Biochemistry	accumulation	accumulation of cyclic GMP	6.30E-03	AGT,CBS	2
Molecular Transport	accumulation	accumulation of cyclic GMP	6.30E-03	AGT,CBS	2
Nucleic Acid Metabolism	accumulation	accumulation of cyclic GMP	6.30E-03	AGT,CBS	2
Cardiovascular System Development and Function	contraction	contraction of aortic ring tissue	6.30E-03	AGT,ANGPT2	2
Tissue Morphology	contraction	contraction of aortic ring tissue	6.30E-03	AGT,ANGPT2	2
Cardiovascular System Development and Function	diastolic function	diastolic function	6.30E-03	AGT,MYH7	2
Molecular Transport	excretion	excretion of K ⁺	6.30E-03	ADCY6,AGT	2
Cardiovascular System Development and Function	sprouting	sprouting of capillary vessel	6.30E-03	AGT,ANGPT2	2
Cellular Development	sprouting	sprouting of capillary vessel	6.30E-03	AGT,ANGPT2	2
Cell Morphology	sprouting	sprouting of capillary vessel	6.30E-03	AGT,ANGPT2	2
Organismal	sprouting	sprouting of	6.30E-03	AGT,ANGPT2	2

Development		capillary vessel			
Cardiovascular Disease	hypertension	Hypertension	6.81E-03	AGT,ANGPT2,BMP R1A,CDH13,CSNK2 A2,ENG,VWF	7
Neurological Disease	chronic fatigue syndrome	chronic fatigue syndrome	6.98E-03	CHGB,EIF4G1,POL R2G	3
Small Molecule Biochemistry	synthesis	synthesis of steroid hormone	6.98E-03	AGT,DBI,PDE8B	3
Vitamin and Mineral Metabolism	synthesis	synthesis of steroid hormone	6.98E-03	AGT,DBI,PDE8B	3
Lipid Metabolism	synthesis	synthesis of steroid hormone	6.98E-03	AGT,DBI,PDE8B	3
Cardiovascular Disease	hypertrophy	hypertrophy of cardiomyocytes	8.38E-03	ADCY6,AGT,ANGP T2,FHL2,RRAD	5
Developmental Disorder	hypertrophy	hypertrophy of cardiomyocytes	8.38E-03	ADCY6,AGT,ANGP T2,FHL2,RRAD	5
Skeletal and Muscular Disorders	hypertrophy	hypertrophy of cardiomyocytes	8.38E-03	ADCY6,AGT,ANGP T2,FHL2,RRAD	5
Cell Cycle	G1 phase	G1 phase of cervical cancer cell lines	8.70E-03	DTD1,STK38	2
Cell Cycle	cell cycle progression	arrest in cell cycle progression of prostate cancer cell lines	8.70E-03	LGALS3,RRAD	2
Organismal Injury and Abnormalities	bleeding	bleeding of blood vessel	8.70E-03	AGT,ENG	2
Cardiovascular Disease	bleeding	bleeding of blood vessel	8.70E-03	AGT,ENG	2
Molecular Transport	excretion	excretion of protein	8.70E-03	AGT,ANGPT2	2
Protein Trafficking	excretion	excretion of protein	8.70E-03	AGT,ANGPT2	2
Organismal Injury and Abnormalities	fibrosis	fibrosis of left ventricle	8.70E-03	AGT,ANGPT2	2
Cardiovascular Disease	fibrosis	fibrosis of left ventricle	8.70E-03	AGT,ANGPT2	2
Organ Development	function	function of uterus	8.70E-03	CBS,NR1H3	2
Reproductive System Development and Function	function	function of uterus	8.70E-03	CBS,NR1H3	2
Cellular Movement	infiltration	infiltration by monocytes	8.70E-03	AGT,ANGPT2	2
Hematological System Development and Function	infiltration	infiltration by monocytes	8.70E-03	AGT,ANGPT2	2
Immune Cell	infiltration	infiltration by	8.70E-03	AGT,ANGPT2	2

Trafficking		monocytes			
Inflammatory Response	infiltration	infiltration by monocytes	8.70E-03	AGT,ANGPT2	2
Tissue Development	mineralization	mineralization of extracellular matrix	8.70E-03	FHL2,VWF	2
Small Molecule Biochemistry	secretion	secretion of corticosterone	8.70E-03	AGT,NR1H3	2
Endocrine System Development and Function	secretion	secretion of corticosterone	8.70E-03	AGT,NR1H3	2
Molecular Transport	secretion	secretion of corticosterone	8.70E-03	AGT,NR1H3	2
Lipid Metabolism	secretion	secretion of corticosterone	8.70E-03	AGT,NR1H3	2
Cell Morphology	shape change	shape change of epithelial cells	8.70E-03	LGALS3,PRKCH	2
Cellular Compromise	vacuolation	vacuolation of cells	8.70E-03	AGT,ATXN1	2
Cell Morphology	vacuolation	vacuolation of cells	8.70E-03	AGT,ATXN1	2
Cardiovascular Disease	vascular disease	vascular disease	8.78E-03	AGT,ANGPT2,BMP R1A,CAPN1,CBS,CDH13,ENG,GRIK2,LGALS3,NR1H3,PRKCH,RCAN1,VWF	13
Developmental Disorder	developmental delay	developmental delay	9.30E-03	CBS,NCOA6,PEX5	3
Small Molecule Biochemistry	metabolism	metabolism of progesterone	9.30E-03	AGT,DBI,DHRS9	3
Drug Metabolism	metabolism	metabolism of progesterone	9.30E-03	AGT,DBI,DHRS9	3
Endocrine System Development and Function	metabolism	metabolism of progesterone	9.30E-03	AGT,DBI,DHRS9	3
Vitamin and Mineral Metabolism	metabolism	metabolism of progesterone	9.30E-03	AGT,DBI,DHRS9	3
Lipid Metabolism	metabolism	metabolism of progesterone	9.30E-03	AGT,DBI,DHRS9	3
Cell Death and Survival	cell death	cell death of eye cells	1.06E-02	GPX4,HSPB1,NCOA6	3
Small Molecule Biochemistry	synthesis	synthesis of terpenoid	1.09E-02	AGT,ANGPT2,DBI,DHRS9,NR1H3,PD E8B	6
Vitamin and Mineral Metabolism	synthesis	synthesis of terpenoid	1.09E-02	AGT,ANGPT2,DBI,DHRS9,NR1H3,PD E8B	6
Lipid Metabolism	synthesis	synthesis of terpenoid	1.09E-02	AGT,ANGPT2,DBI,DHRS9,NR1H3,PD E8B	6
Cellular Development	differentiation	differentiation of vascular smooth	1.14E-02	ADCY6,ENG	2

		muscle cells			
Skeletal and Muscular System Development and Function	differentiation	differentiation of vascular smooth muscle cells	1.14E-02	ADCY6,ENG	2
Organismal Injury and Abnormalities	edema	edema of brain	1.14E-02	ENG,SERPINI1	2
Neurological Disease	edema	edema of brain	1.14E-02	ENG,SERPINI1	2
Cardiovascular System Development and Function	ejection fraction	ejection fraction of heart	1.14E-02	ANGPT2,ENG	2
Developmental Disorder	hypertrophy	hypertrophy of smooth muscle cells	1.14E-02	AGT,ANGPT2	2
Skeletal and Muscular Disorders	hypertrophy	hypertrophy of smooth muscle cells	1.14E-02	AGT,ANGPT2	2
Organismal Injury and Abnormalities	injury	injury of muscle	1.14E-02	AGT,TXN	2
Skeletal and Muscular Disorders	injury	injury of muscle	1.14E-02	AGT,TXN	2
Tissue Morphology	quantity	quantity of hepatocytes	1.14E-02	CBS,NCOA6	2
Hepatic System Development and Function	quantity	quantity of hepatocytes	1.14E-02	CBS,NCOA6	2
Tissue Morphology	quantity	quantity of neural precursor cells	1.14E-02	BMPR1A,NES	2
Nervous System Development and Function	quantity	quantity of neural precursor cells	1.14E-02	BMPR1A,NES	2
Organismal Injury and Abnormalities	neurodegeneration	neurodegeneration of brain	1.20E-02	ATXN1,CAPN1,PPT2	3
Neurological Disease	neurodegeneration	neurodegeneration of brain	1.20E-02	ATXN1,CAPN1,PPT2	3
Skeletal and Muscular System Development and Function	migration	migration of vascular smooth muscle cells	1.24E-02	AGT,ANGPT2,RCAN1,TXN	4
Cellular Movement	migration	migration of vascular smooth muscle cells	1.24E-02	AGT,ANGPT2,RCAN1,TXN	4
Cell-To-Cell Signaling and Interaction	recruitment	recruitment of cells	1.25E-02	AGT,ANGPT2,ENG, LGALS3,RIPK2,TXN, VWF	7

Cellular Movement	recruitment	recruitment of cells	1.25E-02	AGT,ANGPT2,ENG, LGALS3,RIPK2,TXN ,VWF	7
Cardiovascular System Development and Function	cell viability	cell viability of endothelial cells	1.35E-02	ANGPT2,CDH13,HS PA5	3
Cell Death and Survival	cell viability	cell viability of endothelial cells	1.35E-02	ANGPT2,CDH13,HS PA5	3
Neurological Disease	Huntington's disease	Huntington's Disease	1.40E-02	CHGB,DNAJA1,GRI K2,HSPA5,LAPTM4 B,MYH7,RCAN1,RE RE,RHOBTB3,RIPK 2,SERPINI1,TXN,Z NF385B	13
Skeletal and Muscular Disorders	Huntington's disease	Huntington's Disease	1.40E-02	CHGB,DNAJA1,GRI K2,HSPA5,LAPTM4 B,MYH7,RCAN1,RE RE,RHOBTB3,RIPK 2,SERPINI1,TXN,Z NF385B	13
Hereditary Disorder	Huntington's disease	Huntington's Disease	1.40E-02	CHGB,DNAJA1,GRI K2,HSPA5,LAPTM4 B,MYH7,RCAN1,RE RE,RHOBTB3,RIPK 2,SERPINI1,TXN,Z NF385B	13
Cell Morphology	abnormal morphology	abnormal morphology of cytotoxic T cells	1.45E-02	LGALS3,RCAN1	2
Hematological System Development and Function	abnormal morphology	abnormal morphology of cytotoxic T cells	1.45E-02	LGALS3,RCAN1	2
Cardiovascular Disease	aortic aneurysm	aortic aneurysm	1.45E-02	AGT,RCAN1	2
Skeletal and Muscular System Development and Function	area	area of muscle cells	1.45E-02	AGT,ANGPT2	2
Cell Morphology	area	area of muscle cells	1.45E-02	AGT,ANGPT2	2
Organismal Development	development	development of paraxial mesoderm	1.45E-02	BMPR1A,PRKAR1A	2
Tissue Development	development	development of paraxial mesoderm	1.45E-02	BMPR1A,PRKAR1A	2
Embryonic Development	development	development of paraxial mesoderm	1.45E-02	BMPR1A,PRKAR1A	2
Cardiovascular System Development	diameter	diameter of blood vessel	1.45E-02	AGT,ANGPT2	2

and Function					
Tissue Morphology	diameter	diameter of blood vessel	1.45E-02	AGT,ANGPT2	2
Cellular Compromise	formation	formation of nuclear inclusions	1.45E-02	ATXN1,DNAJA1	2
Cellular Assembly and Organization	formation	formation of nuclear inclusions	1.45E-02	ATXN1,DNAJA1	2
DNA Replication, Recombination, and Repair	formation	formation of nuclear inclusions	1.45E-02	ATXN1,DNAJA1	2
Cardiovascular System Development and Function	function	function of blood-brain barrier	1.45E-02	AGT,VWF	2
Nervous System Development and Function	function	function of blood-brain barrier	1.45E-02	AGT,VWF	2
Organ Development	function	function of blood-brain barrier	1.45E-02	AGT,VWF	2
Cardiovascular System Development and Function	systole	systole	1.45E-02	AGT,MYH7	2
Organ Morphology	systole	systole	1.45E-02	AGT,MYH7	2
Cell Morphology	abnormal morphology	abnormal morphology of T lymphocytes	1.51E-02	LGALS3,PRKCH,R CAN1	3
Hematological System Development and Function	abnormal morphology	abnormal morphology of T lymphocytes	1.51E-02	LGALS3,PRKCH,R CAN1	3
Cardiovascular Disease	aneurysm	aneurysm	1.51E-02	AGT,ANGPT2,RCA N1	3
Cellular Development	differentiation	differentiation of smooth muscle cells	1.51E-02	ADCY6,AGT,ENG	3
Skeletal and Muscular System Development and Function	differentiation	differentiation of smooth muscle cells	1.51E-02	ADCY6,AGT,ENG	3
Free Radical Scavenging	production	production of hydrogen peroxide	1.51E-02	AGT,ANGPT2,LCLA T1	3
Small Molecule Biochemistry	production	production of hydrogen peroxide	1.51E-02	AGT,ANGPT2,LCLA T1	3
Organ Morphology	abnormal morphology	abnormal morphology of	1.57E-02	BRSK1,MANBA,NC OA6,NR1H3	4

		cerebral ventricles			
Nervous System Development and Function	abnormal morphology	abnormal morphology of cerebral ventricles	1.57E-02	BRSK1,MANBA,NC OA6,NR1H3	4
Small Molecule Biochemistry	homeostasis	homeostasis of cholesterol	1.68E-02	DBI,NR1H3,TMEM97	3
Vitamin and Mineral Metabolism	homeostasis	homeostasis of cholesterol	1.68E-02	DBI,NR1H3,TMEM97	3
Lipid Metabolism	homeostasis	homeostasis of cholesterol	1.68E-02	DBI,NR1H3,TMEM97	3
Cellular Development	proliferation	proliferation of endocrine cells	1.68E-02	AGT,ANGPT2,NCOA6	3
Cellular Growth and Proliferation	proliferation	proliferation of endocrine cells	1.68E-02	AGT,ANGPT2,NCOA6	3
Post-Translational Modification	phosphorylation	phosphorylation of protein	1.70E-02	AGT,ATXN1,BMPR1A,BRSK1,CDC42BPB,CSNK2A2,ENG,FAM129A,POLR2G,PRKAR1A,PRKCH,STK38,VWF	13
Organ Morphology	abnormal morphology	abnormal morphology of choroid plexus	1.79E-02	MANBA,NR1H3	2
Nervous System Development and Function	abnormal morphology	abnormal morphology of choroid plexus	1.79E-02	MANBA,NR1H3	2
Cell Death and Survival	apoptosis	apoptosis of spermatocytes	1.79E-02	CSNK2A2,GPX4	2
Cancer	esophageal adenocarcinoma	esophageal adenocarcinoma	1.79E-02	ENG,GSS	2
Gastrointestinal Disease	esophageal adenocarcinoma	esophageal adenocarcinoma	1.79E-02	ENG,GSS	2
Renal and Urological System Development and Function	osmolality	osmolality of urine	1.79E-02	ADCY6,AGT	2
Cell-To-Cell Signaling and Interaction	paired-pulse facilitation	paired-pulse facilitation of synapse	1.79E-02	ATXN1,GRIK2	2
Nervous System Development and Function	paired-pulse facilitation	paired-pulse facilitation of synapse	1.79E-02	ATXN1,GRIK2	2
Cellular Function and Maintenance	paired-pulse facilitation	paired-pulse facilitation of synapse	1.79E-02	ATXN1,GRIK2	2
Renal and Urological Disease	polydipsia	polydipsia	1.79E-02	AGT,LCLAT1	2

Organ Morphology	quantity	quantity of hair follicle	1.79E-02	BMPR1A,NCOA6	2
Hair and Skin Development and Function	quantity	quantity of hair follicle	1.79E-02	BMPR1A,NCOA6	2
Cellular Development	proliferation	proliferation of neuroglia	1.81E-02	AGT,DBI,NR1H3,PRKCH	4
Cellular Growth and Proliferation	proliferation	proliferation of neuroglia	1.81E-02	AGT,DBI,NR1H3,PRKCH	4
Nervous System Development and Function	proliferation	proliferation of neuroglia	1.81E-02	AGT,DBI,NR1H3,PRKCH	4
Organismal Injury and Abnormalities	wound	Wound	1.86E-02	CAPN1,ENG,LGALS3,NCOA6,PRKCH	5
Developmental Disorder	hypertrophy	Hypertrophy	1.88E-02	ADCY6,AGT,ANGPT2,BMPR1A,FHL2,MYH7,NR1H3,RCAN1,RRAD,TXN	10
Neurological Disease	neuromuscular disease	neuromuscular disease	1.91E-02	AGT,CHGB,DNAJA1,EIF4G1,GRIK2,HSPA5,HSPB1,LAPTM4B,MYH7,RCAN1,RERE,RHOBTB3,RIPK2,SERPINI1,TXN,ZNF385B	16
Skeletal and Muscular Disorders	neuromuscular disease	neuromuscular disease	1.91E-02	AGT,CHGB,DNAJA1,EIF4G1,GRIK2,HSPA5,HSPB1,LAPTM4B,MYH7,RCAN1,RERE,RHOBTB3,RIPK2,SERPINI1,TXN,ZNF385B	16
Neurological Disease	disorder of basal ganglia	disorder of basal ganglia	1.93E-02	CHGB,DNAJA1,EIF4G1,GRIK2,HSPA5,HSPB1,LAPTM4B,MYH7,RCAN1,RERE,RHOBTB3,RIPK2,SERPINI1,TXN,ZNF385B	15
Endocrine System Disorders	experimentally-induced diabetes	experimentally-induced diabetes	1.94E-02	AGT,HSPB1,LGALS3,PPT2	4
Gastrointestinal Disease	experimentally-induced diabetes	experimentally-induced diabetes	1.94E-02	AGT,HSPB1,LGALS3,PPT2	4
Metabolic Disease	experimentally-induced diabetes	experimentally-induced diabetes	1.94E-02	AGT,HSPB1,LGALS3,PPT2	4
Reproductive System Disease	infertility	infertility	1.96E-02	CBS,CSNK2A2,GJA4,NCOA6,NR1H3,SCMH1,TARBP2	7
Organismal	damage	damage of heart	2.06E-02	AGT,MYH7,TXN	3

Injury and Abnormalities					
Cardiovascular Disease	damage	damage of heart	2.06E-02	AGT,MYH7,TXN	3
Neurological Disease	movement disorder	Movement Disorders	2.10E-02	ATXN1,BRSK1,CHGB,DNAJA1,EIF4G1,GRIK2,HSPA5,HS PB1,LAPTM4B,MYH7,PPT2,RCAN1,RE RE,RHOBTB3,RIPK2,SERPINI1,TXN,Z NF385B	18
Ophthalmic Disease	Bietti's crystalline retinopathy	Bietti's crystalline retinopathy	2.12E-02	CYP4V2	1
Cancer	Carney complex type 2	Carney complex type 2	2.12E-02	PRKAR1A	1
Cardiovascular Disease	Carney complex type 2	Carney complex type 2	2.12E-02	PRKAR1A	1
Hereditary Disorder	Carney complex type 2	Carney complex type 2	2.12E-02	PRKAR1A	1
Dermatological Diseases and Conditions	Carney complex type 2	Carney complex type 2	2.12E-02	PRKAR1A	1
Neurological Disease	Charcot-Marie-Tooth disease axonal type 2f	Charcot-Marie-Tooth disease axonal type 2f	2.12E-02	HSPB1	1
Skeletal and Muscular Disorders	Charcot-Marie-Tooth disease axonal type 2f	Charcot-Marie-Tooth disease axonal type 2f	2.12E-02	HSPB1	1
Hereditary Disorder	Charcot-Marie-Tooth disease axonal type 2f	Charcot-Marie-Tooth disease axonal type 2f	2.12E-02	HSPB1	1
Developmental Disorder	Laing-type distal myopathy	Laing-type distal myopathy	2.12E-02	MYH7	1
Skeletal and Muscular Disorders	Laing-type distal myopathy	Laing-type distal myopathy	2.12E-02	MYH7	1
Hereditary Disorder	Laing-type distal myopathy	Laing-type distal myopathy	2.12E-02	MYH7	1
Skeletal and Muscular Disorders	Myosin storage myopathy	Myosin storage myopathy	2.12E-02	MYH7	1
Hereditary Disorder	Myosin storage myopathy	Myosin storage myopathy	2.12E-02	MYH7	1
Neurological Disease	Navajo neurohepatopathy	Navajo neurohepatopathy	2.12E-02	MPV17	1
Hereditary Disorder	Navajo neurohepatopathy	Navajo neurohepatopathy	2.12E-02	MPV17	1
Gastrointestinal Disease	Navajo neurohepatopathy	Navajo neurohepatopathy	2.12E-02	MPV17	1
Hepatic System	Navajo	Navajo	2.12E-02	MPV17	1

Disease	neurohepatopathy	neurohepatopathy			
Neurological Disease	Parkinson disease type 18	Parkinson disease type 18	2.12E-02	EIF4G1	1
Skeletal and Muscular Disorders	Parkinson disease type 18	Parkinson disease type 18	2.12E-02	EIF4G1	1
Hereditary Disorder	Parkinson disease type 18	Parkinson disease type 18	2.12E-02	EIF4G1	1
Organ Morphology	abnormal morphology	abnormal morphology of Ammon's horn	2.12E-02	MANBA	1
Nervous System Development and Function	abnormal morphology	abnormal morphology of Ammon's horn	2.12E-02	MANBA	1
Organ Morphology	abnormal morphology	abnormal morphology of deep cerebellar nucleus	2.12E-02	MANBA	1
Nervous System Development and Function	abnormal morphology	abnormal morphology of deep cerebellar nucleus	2.12E-02	MANBA	1
Tissue Morphology	abnormal morphology	abnormal morphology of disorganized cortical plate	2.12E-02	BRSK1	1
Organ Morphology	abnormal morphology	abnormal morphology of enlarged pancreas	2.12E-02	PPT2	1
Endocrine System Development and Function	abnormal morphology	abnormal morphology of enlarged pancreas	2.12E-02	PPT2	1
Digestive System Development and Function	abnormal morphology	abnormal morphology of enlarged pancreas	2.12E-02	PPT2	1
Cell Morphology	abnormal morphology	abnormal morphology of monocytes	2.12E-02	LGALS3	1
Hematological System Development and Function	abnormal morphology	abnormal morphology of monocytes	2.12E-02	LGALS3	1
Inflammatory Response	abnormal morphology	abnormal morphology of monocytes	2.12E-02	LGALS3	1
Tissue Morphology	abnormal morphology	abnormal morphology of prickle cells	2.12E-02	CBS	1
Cell Morphology	abnormal morphology	abnormal morphology of	2.12E-02	CBS	1

		prickle cells			
Small Molecule Biochemistry	accumulation	accumulation of porphyrin	2.12E-02	UROD	1
Molecular Transport	accumulation	accumulation of porphyrin	2.12E-02	UROD	1
Developmental Disorder	acro dysostosis type 1	acro dysostosis type 1	2.12E-02	PRKAR1A	1
Skeletal and Muscular Disorders	acro dysostosis type 1	acro dysostosis type 1	2.12E-02	PRKAR1A	1
Hereditary Disorder	acro dysostosis type 1	acro dysostosis type 1	2.12E-02	PRKAR1A	1
Connective Tissue Disorders	acro dysostosis type 1	acro dysostosis type 1	2.12E-02	PRKAR1A	1
Cell-To-Cell Signaling and Interaction	activation	activation of kidney cancer cell lines	2.12E-02	AGT	1
Cardiovascular Disease	aneurysm	aneurysm of abdominal aorta	2.12E-02	AGT	1
Cell Death and Survival	apoptosis	apoptosis of medial smooth muscle cells	2.12E-02	AGT	1
Cell Death and Survival	apoptosis	apoptosis of primary spermatocytes	2.12E-02	GPX4	1
Cellular Development	arborization	arborization of vascular smooth muscle cells	2.12E-02	ADCY6	1
Skeletal and Muscular System Development and Function	arborization	arborization of vascular smooth muscle cells	2.12E-02	ADCY6	1
Cardiovascular System Development and Function	area	area of ventricular myocytes	2.12E-02	AGT	1
Skeletal and Muscular System Development and Function	area	area of ventricular myocytes	2.12E-02	AGT	1
Cell Morphology	area	area of ventricular myocytes	2.12E-02	AGT	1
Cell Cycle	G1 phase	arrest in G1 phase of cervical cancer cell lines	2.12E-02	STK38	1
Cell Cycle	G2/M phase	arrest in G2/M phase of skin cancer cell lines	2.12E-02	CDH13	1
Cell Cycle	G2/M phase	arrest in G2/M phase of	2.12E-02	CDH13	1

		squamous cell carcinoma cell lines			
Cellular Development	growth	arrest in growth of skin cell lines	2.12E-02	ENG	1
Cellular Growth and Proliferation	growth	arrest in growth of skin cell lines	2.12E-02	ENG	1
Hair and Skin Development and Function	growth	arrest in growth of skin cell lines	2.12E-02	ENG	1
Cancer	atrial myxoma	atrial myxoma	2.12E-02	PRKAR1A	1
Cell-To-Cell Signaling and Interaction	attachment	attachment of RPE cells	2.12E-02	LGALS3	1
Tissue Development	attachment	attachment of RPE cells	2.12E-02	LGALS3	1
Cell-To-Cell Signaling and Interaction	attachment	attachment of prostate cells	2.12E-02	ENG	1
Reproductive System Development and Function	attachment	attachment of prostate cells	2.12E-02	ENG	1
Tissue Development	attachment	attachment of prostate cells	2.12E-02	ENG	1
Post-Translational Modification	autoprocessing	autoprocessing of protein	2.12E-02	CAPN1	1
Renal and Urological System Development and Function	autoregulation	autoregulation of kidney	2.12E-02	AGT	1
Organismal Functions	autoregulation	autoregulation of kidney	2.12E-02	AGT	1
Neurological Disease	familial encephalopathy with neuroserpin inclusion bodies	autosomal dominant familial encephalopathy with neuroserpin inclusion bodies	2.12E-02	SERPINI1	1
Neurological Disease	autosomal recessive deafness DFNB29	autosomal recessive deafness DFNB29	2.12E-02	CLDN14	1
Hereditary Disorder	autosomal recessive deafness DFNB29	autosomal recessive deafness DFNB29	2.12E-02	CLDN14	1
Auditory Disease	autosomal recessive deafness DFNB29	autosomal recessive deafness DFNB29	2.12E-02	CLDN14	1
Neurological	autosomal	autosomal	2.12E-02	CLDN14	1

Disease	recessive deafness type 29	recessive deafness type 29			
Hereditary Disorder	autosomal recessive deafness type 29	autosomal recessive deafness type 29	2.12E-02	CLDN14	1
Auditory Disease	autosomal recessive deafness type 29	autosomal recessive deafness type 29	2.12E-02	CLDN14	1
Developmental Disorder	autosomal recessive nonsyndromic mental retardation	autosomal recessive nonsyndromic mental retardation	2.12E-02	GRIK2	1
Neurological Disease	autosomal recessive nonsyndromic mental retardation	autosomal recessive nonsyndromic mental retardation	2.12E-02	GRIK2	1
Nervous System Development and Function	baroreceptor reflex	baroreceptor reflex of artery	2.12E-02	AGT	1
Developmental Disorder	beta-mannosidosis	beta-mannosidosis	2.12E-02	MANBA	1
Hereditary Disorder	beta-mannosidosis	beta-mannosidosis	2.12E-02	MANBA	1
Metabolic Disease	beta-mannosidosis	beta-mannosidosis	2.12E-02	MANBA	1
Connective Tissue Disorders	beta-mannosidosis	beta-mannosidosis	2.12E-02	MANBA	1
Gene Expression	binding	binding of CRE-like element	2.12E-02	ADCY6	1
Gene Expression	binding	binding of TCF binding site	2.12E-02	BMPR1A	1
Gene Expression	binding	binding of dioxin responsive element	2.12E-02	TXN	1
Organismal Injury and Abnormalities	bleeding	bleeding of tumor	2.12E-02	VWF	1
Cancer	bleeding	bleeding of tumor	2.12E-02	VWF	1
Cardiovascular System Development and Function	blood pressure	blood pressure of pulmonary alveolus	2.12E-02	AGT	1
Respiratory System Development and Function	blood pressure	blood pressure of pulmonary alveolus	2.12E-02	AGT	1
Cardiovascular	capillary leak	capillary leak	2.12E-02	ANGPT2	1

Disease	syndrome	syndrome			
Cardiovascular System Development and Function	cardiac index	cardiac index	2.12E-02	ENG	1
Small Molecule Biochemistry	catabolism	catabolism of L-serine	2.12E-02	CBS	1
Amino Acid Metabolism	catabolism	catabolism of L-serine	2.12E-02	CBS	1
Cell Cycle	cell cycle progression	cell cycle progression of adipoblasts	2.12E-02	AGT	1
Connective Tissue Development and Function	cell cycle progression	cell cycle progression of adipoblasts	2.12E-02	AGT	1
Cell Death and Survival	cell death	cell death of fibrosarcoma cells	2.12E-02	TXN	1
Tumor Morphology	cell death	cell death of fibrosarcoma cells	2.12E-02	TXN	1
Cell Morphology	cell flattening	cell flattening of keratinocytes	2.12E-02	PRKCH	1
Hair and Skin Development and Function	cell flattening	cell flattening of keratinocytes	2.12E-02	PRKCH	1
Skeletal and Muscular System Development and Function	cell movement	cell movement of osteoclast-like cells	2.12E-02	CAPN1	1
Cellular Movement	cell movement	cell movement of osteoclast-like cells	2.12E-02	CAPN1	1
Connective Tissue Development and Function	cell movement	cell movement of osteoclast-like cells	2.12E-02	CAPN1	1
Cellular Movement	cell movement	cell movement of single positive thymocytes	2.12E-02	HNRNPL	1
Hematological System Development and Function	cell movement	cell movement of single positive thymocytes	2.12E-02	HNRNPL	1
Immune Cell Trafficking	cell movement	cell movement of single positive thymocytes	2.12E-02	HNRNPL	1
Cell-mediated Immune Response	cell movement	cell movement of single positive thymocytes	2.12E-02	HNRNPL	1
Cell Morphology	cell spreading	cell spreading of RPE cells	2.12E-02	LGALS3	1
Developmental	central core	central core	2.12E-02	MYH7	1

Disorder	disease	disease			
Skeletal and Muscular Disorders	central core disease	central core disease	2.12E-02	MYH7	1
Hereditary Disorder	central core disease	central core disease	2.12E-02	MYH7	1
Cellular Assembly and Organization	clustering	clustering of lipid droplets	2.12E-02	ATG2A	1
Cellular Compromise	collapse	collapse of actin cytoskeleton	2.12E-02	SORBS2	1
Cell Morphology	collapse	collapse of actin cytoskeleton	2.12E-02	SORBS2	1
Small Molecule Biochemistry	composition	composition of phosphatidylinositol	2.12E-02	LCLAT1	1
Lipid Metabolism	composition	composition of phosphatidylinositol	2.12E-02	LCLAT1	1
Small Molecule Biochemistry	concentration	concentration of 6-keto-prostaglandin F1 alpha	2.12E-02	AGT	1
Molecular Transport	concentration	concentration of 6-keto-prostaglandin F1 alpha	2.12E-02	AGT	1
Lipid Metabolism	concentration	concentration of 6-keto-prostaglandin F1 alpha	2.12E-02	AGT	1
Cell-To-Cell Signaling and Interaction	conductance	conductance of gap junctions	2.12E-02	AGT	1
Cardiovascular System Development and Function	contraction	contraction of afferent arterioles	2.12E-02	AGT	1
Tissue Morphology	contraction	contraction of afferent arterioles	2.12E-02	AGT	1
Organ Morphology	contraction	contraction of anococcygeus smooth muscle	2.12E-02	AGT	1
Skeletal and Muscular System Development and Function	contraction	contraction of anococcygeus smooth muscle	2.12E-02	AGT	1
Cardiovascular System Development and Function	contraction	contraction of carotid artery	2.12E-02	AGT	1
Tissue Morphology	contraction	contraction of carotid artery	2.12E-02	AGT	1

Cell Morphology	contraction	contraction of mesangial cells	2.12E-02	AGT	1
Renal and Urological System Development and Function	contraction	contraction of mesangial cells	2.12E-02	AGT	1
Cardiovascular System Development and Function	contraction	contraction of renal artery	2.12E-02	AGT	1
Organ Morphology	contraction	contraction of renal artery	2.12E-02	AGT	1
Tissue Morphology	contraction	contraction of renal artery	2.12E-02	AGT	1
Renal and Urological System Development and Function	contraction	contraction of renal artery	2.12E-02	AGT	1
Organismal Injury and Abnormalities	contusion	contusion	2.12E-02	CAPN1	1
Post-Translational Modification	conversion	conversion of L-serine	2.12E-02	CBS	1
Small Molecule Biochemistry	conversion	conversion of L-serine	2.12E-02	CBS	1
Amino Acid Metabolism	conversion	conversion of L-serine	2.12E-02	CBS	1
Small Molecule Biochemistry	conversion	conversion of leukotriene B4	2.12E-02	LTA4H	1
Lipid Metabolism	conversion	conversion of leukotriene B4	2.12E-02	LTA4H	1
Cancer	conversion	conversion of spindle cell-type squamous cell carcinoma	2.12E-02	ENG	1
Tumor Morphology	conversion	conversion of spindle cell-type squamous cell carcinoma	2.12E-02	ENG	1
Cell Death and Survival	cytotoxicity	cytotoxicity of eosinophils	2.12E-02	TXN	1
Cell-To-Cell Signaling and Interaction	deadhesion	deadhesion of endothelial cell lines	2.12E-02	CDH13	1
Tissue Development	deadhesion	deadhesion of endothelial cell lines	2.12E-02	CDH13	1
Cardiovascular System Development and Function	density	density of vasculature	2.12E-02	ANGPT2	1
Cell-To-Cell	detachment	detachment of	2.12E-02	ENG	1

Signaling and Interaction		prostate cell lines			
Tissue Development	detachment	detachment of prostate cell lines	2.12E-02	ENG	1
Organismal Development	development	development of apical ectodermal ridge	2.12E-02	BMPR1A	1
Tissue Development	development	development of apical ectodermal ridge	2.12E-02	BMPR1A	1
Embryonic Development	development	development of apical ectodermal ridge	2.12E-02	BMPR1A	1
Organismal Development	development	development of body trunk	2.12E-02	PRKAR1A	1
Embryonic Development	development	development of body trunk	2.12E-02	PRKAR1A	1
Cellular Development	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Organismal Development	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Organ Development	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Reproductive System Development and Function	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Tissue Development	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Embryonic Development	development	development of syncytiotrophoblast cells	2.12E-02	ENG	1
Cardiovascular System Development and Function	diameter	diameter of afferent arterioles	2.12E-02	AGT	1
Tissue Morphology	diameter	diameter of afferent arterioles	2.12E-02	AGT	1
Cardiovascular System Development and Function	diameter	diameter of aorta	2.12E-02	AGT	1
Tissue Morphology	diameter	diameter of aorta	2.12E-02	AGT	1
Cardiovascular System Development and Function	diameter	diameter of blood vessel lumen	2.12E-02	ANGPT2	1
Cardiovascular	diameter	diameter of	2.12E-02	ANGPT2	1

System Development and Function		capillary vessel			
Tissue Morphology	diameter	diameter of capillary vessel	2.12E-02	ANGPT2	1
Cardiovascular System Development and Function	diameter	diameter of efferent glomerular arteriole	2.12E-02	AGT	1
Tissue Morphology	diameter	diameter of efferent glomerular arteriole	2.12E-02	AGT	1
Renal and Urological System Development and Function	diameter	diameter of efferent glomerular arteriole	2.12E-02	AGT	1
Cellular Development	differentiation	differentiation of inner root sheath	2.12E-02	BMPR1A	1
Organ Development	differentiation	differentiation of inner root sheath	2.12E-02	BMPR1A	1
Hair and Skin Development and Function	differentiation	differentiation of inner root sheath	2.12E-02	BMPR1A	1
Cardiovascular System Development and Function	dilation	dilation of sinus venosus	2.12E-02	NCOA6	1
Tissue Morphology	dilation	dilation of sinus venosus	2.12E-02	NCOA6	1
Embryonic Development	dilation	dilation of sinus venosus	2.12E-02	NCOA6	1
Tissue Morphology	disorganization	disorganization of seminiferous epithelium	2.12E-02	GPX4	1
Small Molecule Biochemistry	distribution	distribution of triacylglycerol	2.12E-02	CBS	1
Molecular Transport	distribution	distribution of triacylglycerol	2.12E-02	CBS	1
Lipid Metabolism	distribution	distribution of triacylglycerol	2.12E-02	CBS	1
Neurological Disease	early infantile epileptic encephalopathy 10	early infantile epileptic encephalopathy 10	2.12E-02	PNKP	1
Organismal Injury and Abnormalities	edema	edema of lateral cerebral ventricle	2.12E-02	ENG	1
Neurological Disease	edema	edema of lateral cerebral ventricle	2.12E-02	ENG	1
Ophthalmic	enophthalmos	enophthalmos	2.12E-02	BMPR1A	1

Disease					
Organismal Injury and Abnormalities	epidermolysis bullosa letalis	epidermolysis bullosa letalis	2.12E-02	LAMB3	1
Developmental Disorder	epidermolysis bullosa letalis	epidermolysis bullosa letalis	2.12E-02	LAMB3	1
Hereditary Disorder	epidermolysis bullosa letalis	epidermolysis bullosa letalis	2.12E-02	LAMB3	1
Connective Tissue Disorders	epidermolysis bullosa letalis	epidermolysis bullosa letalis	2.12E-02	LAMB3	1
Dermatological Diseases and Conditions	epidermolysis bullosa letalis	epidermolysis bullosa letalis	2.12E-02	LAMB3	1
Cellular Development	erythropoiesis	erythropoiesis of embryonic stem cells	2.12E-02	ENG	1
Organismal Development	erythropoiesis	erythropoiesis of embryonic stem cells	2.12E-02	ENG	1
Hematological System Development and Function	erythropoiesis	erythropoiesis of embryonic stem cells	2.12E-02	ENG	1
Embryonic Development	erythropoiesis	erythropoiesis of embryonic stem cells	2.12E-02	ENG	1
Hematopoiesis	erythropoiesis	erythropoiesis of embryonic stem cells	2.12E-02	ENG	1
Molecular Transport	excretion	excretion of nitrate	2.12E-02	AGT	1
Small Molecule Biochemistry	excretion	excretion of nitrite	2.12E-02	AGT	1
Molecular Transport	excretion	excretion of nitrite	2.12E-02	AGT	1
Molecular Transport	excretion	excretion of water	2.12E-02	ADCY6	1
Cardiovascular System Development and Function	expansion	expansion of suprarenal aorta	2.12E-02	AGT	1
Tissue Morphology	expansion	expansion of suprarenal aorta	2.12E-02	AGT	1
Organismal Development	expansion	expansion of suprarenal aorta	2.12E-02	AGT	1
Neurological Disease	experimental spinocerebellar ataxia type 1	experimental spinocerebellar ataxia type 1	2.12E-02	ATXN1	1
Hereditary Disorder	experimental spinocerebellar ataxia type 1	experimental spinocerebellar ataxia type 1	2.12E-02	ATXN1	1
Skeletal and Muscular Disorders	experimentally-induced arthritis	experimentally-induced arthritis of knee joint	2.12E-02	RIPK2	1

Connective Tissue Disorders	experimentally-induced arthritis	experimentally-induced arthritis of knee joint	2.12E-02	RIPK2	1
Inflammatory Disease	experimentally-induced arthritis	experimentally-induced arthritis of knee joint	2.12E-02	RIPK2	1
Nervous System Development and Function	extension	extension of climbing fiber	2.12E-02	ATXN1	1
Cellular Assembly and Organization	extension	extension of climbing fiber	2.12E-02	ATXN1	1
Cellular Function and Maintenance	extension	extension of climbing fiber	2.12E-02	ATXN1	1
Cell Morphology	extension	extension of climbing fiber	2.12E-02	ATXN1	1
Organismal Injury and Abnormalities	fatigue	fatigue of soleus muscle	2.12E-02	RCAN1	1
Skeletal and Muscular Disorders	fatigue	fatigue of soleus muscle	2.12E-02	RCAN1	1
Organismal Injury and Abnormalities	fibrosis	fibrosis of atrioventricular node	2.12E-02	BMPR1A	1
Cardiovascular Disease	fibrosis	fibrosis of atrioventricular node	2.12E-02	BMPR1A	1
Organismal Injury and Abnormalities	fibrosis	fibrosis of perivascular cuff	2.12E-02	AGT	1
Cardiovascular Disease	fibrosis	fibrosis of perivascular cuff	2.12E-02	AGT	1
Cellular Assembly and Organization	formation	formation of Weibel-Palade bodies	2.12E-02	VWF	1
Organismal Development	formation	formation of cardiac crescent	2.12E-02	BMPR1A	1
Tissue Development	formation	formation of cardiac crescent	2.12E-02	BMPR1A	1
Embryonic Development	formation	formation of cardiac crescent	2.12E-02	BMPR1A	1
Small Molecule Biochemistry	formation	formation of cytarabine	2.12E-02	CBS	1
Drug Metabolism	formation	formation of cytarabine	2.12E-02	CBS	1
Nucleic Acid Metabolism	formation	formation of cytarabine	2.12E-02	CBS	1
Renal and Urological System Development and Function	formation	formation of mesangial matrix	2.12E-02	AGT	1

Cellular Assembly and Organization	formation	formation of neurofilaments	2.12E-02	HSPB1	1
Cellular Function and Maintenance	formation	formation of neurofilaments	2.12E-02	HSPB1	1
Tissue Development	formation	formation of neurofilaments	2.12E-02	HSPB1	1
Cellular Assembly and Organization	formation	formation of rosettes	2.12E-02	TXN	1
Embryonic Development	frequency	frequency of hemangioblasts	2.12E-02	ENG	1
Cellular Function and Maintenance	function	function of fibroblast-like synoviocytes	2.12E-02	TXN	1
Small Molecule Biochemistry	generation	generation of hydrogen sulfide	2.12E-02	CBS	1
Hereditary Disorder	gluthathione synthetase deficiency	gluthathione synthetase deficiency	2.12E-02	GSS	1
Metabolic Disease	gluthathione synthetase deficiency	gluthathione synthetase deficiency	2.12E-02	GSS	1
Immunological Disease	gluthathione synthetase deficiency	gluthathione synthetase deficiency	2.12E-02	GSS	1
Organismal Injury and Abnormalities	hereditary mixed polyposis syndrome	hereditary mixed polyposis syndrome	2.12E-02	BMPR1A	1
Cancer	hereditary mixed polyposis syndrome	hereditary mixed polyposis syndrome	2.12E-02	BMPR1A	1
Gastrointestinal Disease	hereditary mixed polyposis syndrome	hereditary mixed polyposis syndrome	2.12E-02	BMPR1A	1
Small Molecule Biochemistry	homeostasis	homeostasis of bile salt	2.12E-02	NR1H3	1
Vitamin and Mineral Metabolism	homeostasis	homeostasis of bile salt	2.12E-02	NR1H3	1
Lipid Metabolism	homeostasis	homeostasis of bile salt	2.12E-02	NR1H3	1
Small Molecule Biochemistry	hydrolysis	hydrolysis of inositol phospholipid	2.12E-02	AGT	1
Lipid Metabolism	hydrolysis	hydrolysis of inositol phospholipid	2.12E-02	AGT	1
Cardiovascular Disease	hypertension	hypertension of heart	2.12E-02	AGT	1
Cardiovascular Disease	hypertension	hypertension of renal glomerulus	2.12E-02	AGT	1
Renal and Urological	hypertension	hypertension of renal glomerulus	2.12E-02	AGT	1

Disease					
Cardiovascular Disease	hypertrophy	hypertrophy of carotid artery	2.12E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of carotid artery	2.12E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of podocytes	2.12E-02	AGT	1
Renal and Urological Disease	hypertrophy	hypertrophy of podocytes	2.12E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of proximal tubule cells	2.12E-02	AGT	1
Renal and Urological Disease	hypertrophy	hypertrophy of proximal tubule cells	2.12E-02	AGT	1
Cardiovascular Disease	hypertrophy	hypertrophy of thoracic aorta	2.12E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of thoracic aorta	2.12E-02	AGT	1
Cardiovascular Disease	hypertrophy	hypertrophy of tunica media	2.12E-02	ANGPT2	1
Developmental Disorder	hypertrophy	hypertrophy of tunica media	2.12E-02	ANGPT2	1
Developmental Disorder	hypertrophy	hypertrophy of vascular tissue	2.12E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of ventral prostatic lobe	2.12E-02	NR1H3	1
Reproductive System Disease	hypertrophy	hypertrophy of ventral prostatic lobe	2.12E-02	NR1H3	1
Developmental Disorder	hypotrophy	hypotrophy of adipocytes	2.12E-02	AGT	1
Connective Tissue Disorders	hypotrophy	hypotrophy of adipocytes	2.12E-02	AGT	1
Cancer	induction	induction of papilloma	2.12E-02	ENG	1
Tumor Morphology	induction	induction of papilloma	2.12E-02	ENG	1
Cellular Movement	infiltration	infiltration by multinucleated giant cells	2.12E-02	PPT2	1
Hematological System Development and Function	infiltration	infiltration by multinucleated giant cells	2.12E-02	PPT2	1
Immune Cell Trafficking	infiltration	infiltration by multinucleated giant cells	2.12E-02	PPT2	1
Inflammatory Response	infiltration	infiltration by multinucleated giant cells	2.12E-02	PPT2	1
Inflammatory	inflammation	inflammation of	2.12E-02	AGT	1

Response		myocardium			
Tissue Development	inflammation	inflammation of myocardium	2.12E-02	AGT	1
Inflammatory Response	inflammation	inflammation of perivascular matrix	2.12E-02	ANGPT2	1
Cell-To-Cell Signaling and Interaction	inflammation	inflammation of vascular smooth muscle cells	2.12E-02	AGT	1
Inflammatory Response	inflammation	inflammation of vascular smooth muscle cells	2.12E-02	AGT	1
Skeletal and Muscular System Development and Function	S phase	initiation of S phase of smooth muscle cells	2.12E-02	AGT	1
Cell Cycle	S phase	initiation of S phase of smooth muscle cells	2.12E-02	AGT	1
Cellular Compromise	injury	injury of dopaminergic neurons	2.12E-02	ANGPT2	1
Cell-To-Cell Signaling and Interaction	injury	injury of dopaminergic neurons	2.12E-02	ANGPT2	1
Organismal Injury and Abnormalities	injury	injury of retina	2.12E-02	TXN	1
Ophthalmic Disease	injury	injury of retina	2.12E-02	TXN	1
Cellular Compromise	injury	injury of tubules	2.12E-02	AGT	1
Cardiovascular Disease	instability	instability of vasculature	2.12E-02	ANGPT2	1
Molecular Transport	internalization	internalization of water	2.12E-02	AGT	1
Cellular Movement	invasion	invasion of prostate cells	2.12E-02	ENG	1
Cardiovascular Disease	left ventricular noncompaction type 5	left ventricular noncompaction type 5	2.12E-02	MYH7	1
Cell-To-Cell Signaling and Interaction	long term depression	long term depression of dentate gyrus	2.12E-02	PRKAR1A	1
Nervous System Development and Function	long term depression	long term depression of dentate gyrus	2.12E-02	PRKAR1A	1
Cell Death and Survival	loss	loss of hilar interneurons	2.12E-02	GRIK2	1
Nervous System Development and Function	loss	loss of hilar interneurons	2.12E-02	GRIK2	1

Cell Death and Survival	loss	loss of pericytes	2.12E-02	ANGPT2	1
Cellular Assembly and Organization	maintenance	maintenance of mitochondria	2.12E-02	TXN	1
Cellular Function and Maintenance	maintenance	maintenance of mitochondria	2.12E-02	TXN	1
Cellular Assembly and Organization	maintenance	maintenance of mitochondrial cristae	2.12E-02	TXN	1
Cellular Function and Maintenance	maintenance	maintenance of mitochondrial cristae	2.12E-02	TXN	1
Cellular Assembly and Organization	maintenance	maintenance of myofibrils	2.12E-02	TXN	1
Cellular Function and Maintenance	maintenance	maintenance of myofibrils	2.12E-02	TXN	1
Skeletal and Muscular System Development and Function	maintenance	maintenance of myofibrils	2.12E-02	TXN	1
Cellular Assembly and Organization	maintenance	maintenance of sarcoplasmic reticulum	2.12E-02	TXN	1
Cellular Function and Maintenance	maintenance	maintenance of sarcoplasmic reticulum	2.12E-02	TXN	1
Skeletal and Muscular System Development and Function	maintenance	maintenance of sarcoplasmic reticulum	2.12E-02	TXN	1
Small Molecule Biochemistry	metabolism	metabolism of 12(S)-hydroxyeicosate traenoic acid	2.12E-02	GPX4	1
Lipid Metabolism	metabolism	metabolism of 12(S)-hydroxyeicosate traenoic acid	2.12E-02	GPX4	1
Nervous System Development and Function	migration	migration of projection neurons	2.12E-02	ANGPT2	1
Cellular Movement	migration	migration of projection neurons	2.12E-02	ANGPT2	1
Cellular Movement	migration	migration of prostate cells	2.12E-02	ENG	1
Reproductive System	migration	migration of prostate cells	2.12E-02	ENG	1

Development and Function					
Cancer	mitogenesis	mitogenesis of liver cancer cells	2.12E-02	AGT	1
Cell Cycle	mitogenesis	mitogenesis of liver cancer cells	2.12E-02	AGT	1
Tumor Morphology	mitogenesis	mitogenesis of liver cancer cells	2.12E-02	AGT	1
Cell Cycle	mitogenesis	mitogenesis of testicular cancer cell lines	2.12E-02	DBI	1
Endocrine System Development and Function	mitosis	mitosis of adrenocortical cells	2.12E-02	AGT	1
Cell Cycle	mitosis	mitosis of adrenocortical cells	2.12E-02	AGT	1
Cell Cycle	mitosis	mitosis of hepatic stellate cells	2.12E-02	AGT	1
Small Molecule Biochemistry	modulation	modulation of Ca2+	2.12E-02	AGT	1
Cell Signaling	modulation	modulation of Ca2+	2.12E-02	AGT	1
Vitamin and Mineral Metabolism	modulation	modulation of Ca2+	2.12E-02	AGT	1
Organ Morphology	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Skeletal and Muscular System Development and Function	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Organismal Development	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Organ Development	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Tissue Development	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Embryonic Development	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Connective Tissue Development and Function	morphogenesis	morphogenesis of embryonic skull vault	2.12E-02	TULP3	1
Tissue Morphology	morphology	morphology of apical processes	2.12E-02	DPYSL4	1
Nervous	morphology	morphology of	2.12E-02	DPYSL4	1

System Development and Function		apical processes			
Cell Morphology	morphology	morphology of apical processes	2.12E-02	DPYSL4	1
Cell Death and Survival	necrosis	necrosis of left ventricle	2.12E-02	AGT	1
Organismal Injury and Abnormalities	neurodegeneration	neurodegeneration of brainstem	2.12E-02	ATXN1	1
Neurological Disease	neurodegeneration	neurodegeneration of brainstem	2.12E-02	ATXN1	1
Organismal Injury and Abnormalities	non-Herlitz type junctional epidermolysis bullosa	non-Herlitz type junctional epidermolysis bullosa	2.12E-02	LAMB3	1
Developmental Disorder	non-Herlitz type junctional epidermolysis bullosa	non-Herlitz type junctional epidermolysis bullosa	2.12E-02	LAMB3	1
Hereditary Disorder	non-Herlitz type junctional epidermolysis bullosa	non-Herlitz type junctional epidermolysis bullosa	2.12E-02	LAMB3	1
Connective Tissue Disorders	non-Herlitz type junctional epidermolysis bullosa	non-Herlitz type junctional epidermolysis bullosa	2.12E-02	LAMB3	1
Dermatological Diseases and Conditions	non-Herlitz type junctional epidermolysis bullosa	non-Herlitz type junctional epidermolysis bullosa	2.12E-02	LAMB3	1
Organ Morphology	organization	organization of cerebellum	2.12E-02	HSPA5	1
Nervous System Development and Function	organization	organization of cerebellum	2.12E-02	HSPA5	1
Cellular Compromise	oxidative stress response	oxidative stress response of kidney	2.12E-02	AGT	1
Cell-To-Cell Signaling and Interaction	paired-pulse facilitation	paired-pulse facilitation of mossy fiber cells	2.12E-02	GRIK2	1
Nervous System Development and Function	paired-pulse facilitation	paired-pulse facilitation of mossy fiber cells	2.12E-02	GRIK2	1
Cellular Function and Maintenance	paired-pulse facilitation	paired-pulse facilitation of mossy fiber cells	2.12E-02	GRIK2	1
Endocrine System Disorders	parathyroid hyperplasia	parathyroid hyperplasia	2.12E-02	PRKAR1A	1
Cancer	parathyroid	parathyroid	2.12E-02	PRKAR1A	1

	hyperplasia	hyperplasia			
Digestive System Development and Function	peristalsis	peristalsis of intestine	2.12E-02	AGT	1
Cellular Function and Maintenance	permeability	permeability of podocytes	2.12E-02	ANGPT2	1
Cell Morphology	permeability	permeability of podocytes	2.12E-02	ANGPT2	1
Cell Cycle	premature senescence	premature senescence of prostate cancer cell lines	2.12E-02	RRAD	1
Cell Cycle	premature senescence	premature senescence of stomach cancer cell lines	2.12E-02	RRAD	1
Cardiovascular System Development and Function	pressure	pressure of vasculature	2.12E-02	AGT	1
Endocrine System Disorders	primary pigmented nodular adrenocortical disease type 3	primary pigmented nodular adrenocortical disease type 3	2.12E-02	PDE8B	1
Cellular Development	proliferation	proliferation of adrenal glomerulosa cells	2.12E-02	ANGPT2	1
Cellular Growth and Proliferation	proliferation	proliferation of adrenal glomerulosa cells	2.12E-02	ANGPT2	1
Endocrine System Development and Function	proliferation	proliferation of adrenal glomerulosa cells	2.12E-02	ANGPT2	1
Cellular Development	proliferation	proliferation of cytotrophoblastic cells	2.12E-02	AGT	1
Cellular Growth and Proliferation	proliferation	proliferation of cytotrophoblastic cells	2.12E-02	AGT	1
Embryonic Development	proliferation	proliferation of cytotrophoblastic cells	2.12E-02	AGT	1
Cellular Development	proliferation	proliferation of myeloblasts	2.12E-02	LGALS3	1
Cellular Growth and Proliferation	proliferation	proliferation of myeloblasts	2.12E-02	LGALS3	1
Hematological System	proliferation	proliferation of myeloblasts	2.12E-02	LGALS3	1

Development and Function					
Hematopoiesis	proliferation	proliferation of myeloblasts	2.12E-02	LGALS3	1
Lymphoid Tissue Structure and Development	proliferation	proliferation of myeloblasts	2.12E-02	LGALS3	1
Cardiovascular System Development and Function	proliferation	proliferation of myocardium	2.12E-02	BMPR1A	1
Skeletal and Muscular System Development and Function	proliferation	proliferation of myocardium	2.12E-02	BMPR1A	1
Organ Development	proliferation	proliferation of myocardium	2.12E-02	BMPR1A	1
Tissue Development	proliferation	proliferation of myocardium	2.12E-02	BMPR1A	1
Cellular Development	proliferation	proliferation of myoid cells	2.12E-02	AGT	1
Cellular Growth and Proliferation	proliferation	proliferation of myoid cells	2.12E-02	AGT	1
Skeletal and Muscular System Development and Function	proliferation	proliferation of myoid cells	2.12E-02	AGT	1
Reproductive System Development and Function	proliferation	proliferation of myoid cells	2.12E-02	AGT	1
Cellular Development	proliferation	proliferation of neural tube cells	2.12E-02	BMPR1A	1
Cellular Growth and Proliferation	proliferation	proliferation of neural tube cells	2.12E-02	BMPR1A	1
Nervous System Development and Function	proliferation	proliferation of neural tube cells	2.12E-02	BMPR1A	1
Embryonic Development	proliferation	proliferation of neural tube cells	2.12E-02	BMPR1A	1
Cardiovascular Disease	pseudoaneurysm	pseudoaneurysm	2.12E-02	AGT	1
Developmental Disorder	pyridoxine non-responsive cystathionine beta-synthase deficiency	pyridoxine non-responsive cystathionine beta-synthase deficiency	2.12E-02	CBS	1
Hereditary Disorder	pyridoxine non-responsive	pyridoxine non-responsive	2.12E-02	CBS	1

	cystathionine beta-synthase deficiency	cystathionine beta-synthase deficiency			
Metabolic Disease	pyridoxine non-responsive cystathionine beta-synthase deficiency	pyridoxine non-responsive cystathionine beta-synthase deficiency	2.12E-02	CBS	1
Tissue Morphology	quantity	quantity of adrenocortical cells	2.12E-02	ANGPT2	1
Endocrine System Development and Function	quantity	quantity of adrenocortical cells	2.12E-02	ANGPT2	1
Cardiovascular System Development and Function	quantity	quantity of adventitial fibroblasts	2.12E-02	ANGPT2	1
Tissue Morphology	quantity	quantity of adventitial fibroblasts	2.12E-02	ANGPT2	1
Connective Tissue Development and Function	quantity	quantity of adventitial fibroblasts	2.12E-02	ANGPT2	1
Cardiovascular System Development and Function	quantity	quantity of atrioventricular node	2.12E-02	BMPR1A	1
Tissue Morphology	quantity	quantity of fenestra	2.12E-02	ANGPT2	1
Small Molecule Biochemistry	quantity	quantity of inositol phosphate	2.12E-02	AGT	1
Molecular Transport	quantity	quantity of inositol phosphate	2.12E-02	AGT	1
Carbohydrate Metabolism	quantity	quantity of inositol phosphate	2.12E-02	AGT	1
Organ Morphology	quantity	quantity of mammary duct	2.12E-02	NCOA6	1
Reproductive System Development and Function	quantity	quantity of mammary duct	2.12E-02	NCOA6	1
Cellular Assembly and Organization	quantity	quantity of nuclear inclusions	2.12E-02	ATXN1	1
Small Molecule Biochemistry	quantity	quantity of taurine	2.12E-02	ATXN1	1
Molecular Transport	quantity	quantity of taurine	2.12E-02	ATXN1	1
Amino Acid	quantity	quantity of	2.12E-02	ATXN1	1

Metabolism		taurine			
Small Molecule Biochemistry	quantity	quantity of very long chain fatty acid	2.12E-02	DBI	1
Molecular Transport	quantity	quantity of very long chain fatty acid	2.12E-02	DBI	1
Lipid Metabolism	quantity	quantity of very long chain fatty acid	2.12E-02	DBI	1
Cell-To-Cell Signaling and Interaction	recognition	recognition of neurons	2.12E-02	NTM	1
Nervous System Development and Function	recognition	recognition of neurons	2.12E-02	NTM	1
Small Molecule Biochemistry	reduction	reduction of palmitoyl-coenzyme A	2.12E-02	FAR1	1
Lipid Metabolism	reduction	reduction of palmitoyl-coenzyme A	2.12E-02	FAR1	1
Nucleic Acid Metabolism	reduction	reduction of palmitoyl-coenzyme A	2.12E-02	FAR1	1
Tissue Morphology	regeneration	regeneration of sciatic nerve	2.12E-02	AGT	1
Nervous System Development and Function	regeneration	regeneration of sciatic nerve	2.12E-02	AGT	1
Tissue Development	regeneration	regeneration of sciatic nerve	2.12E-02	AGT	1
Organ Morphology	regeneration	regeneration of skeletal muscle satellite cells	2.12E-02	BVES	1
Cell Death and Survival	regeneration	regeneration of skeletal muscle satellite cells	2.12E-02	BVES	1
Cellular Development	regeneration	regeneration of skeletal muscle satellite cells	2.12E-02	BVES	1
Skeletal and Muscular System Development and Function	regeneration	regeneration of skeletal muscle satellite cells	2.12E-02	BVES	1
Tissue Development	regeneration	regeneration of skeletal muscle satellite cells	2.12E-02	BVES	1
Organ Morphology	relaxation	relaxation of anococcygeus smooth muscle	2.12E-02	AGT	1
Skeletal and	relaxation	relaxation of	2.12E-02	AGT	1

Muscular System Development and Function		anococcygeus smooth muscle			
Cardiovascular System Development and Function	relaxation	relaxation of renal artery	2.12E-02	AGT	1
Organ Morphology	relaxation	relaxation of renal artery	2.12E-02	AGT	1
Tissue Morphology	relaxation	relaxation of renal artery	2.12E-02	AGT	1
Renal and Urological System Development and Function	relaxation	relaxation of renal artery	2.12E-02	AGT	1
Small Molecule Biochemistry	release	release of 20-hydroxyeicosate traenoic acid	2.12E-02	AGT	1
Molecular Transport	release	release of 20-hydroxyeicosate traenoic acid	2.12E-02	AGT	1
Lipid Metabolism	release	release of 20-hydroxyeicosate traenoic acid	2.12E-02	AGT	1
Small Molecule Biochemistry	release	release of inositol phosphate	2.12E-02	AGT	1
Molecular Transport	release	release of inositol phosphate	2.12E-02	AGT	1
Carbohydrate Metabolism	release	release of inositol phosphate	2.12E-02	AGT	1
Small Molecule Biochemistry	release	release of phosphatidylinositol polyphosphate	2.12E-02	AGT	1
Molecular Transport	release	release of phosphatidylinositol polyphosphate	2.12E-02	AGT	1
Lipid Metabolism	release	release of phosphatidylinositol polyphosphate	2.12E-02	AGT	1
Carbohydrate Metabolism	release	release of phosphatidylinositol polyphosphate	2.12E-02	AGT	1
Tissue Morphology	remodeling	remodeling of aorta	2.12E-02	AGT	1
Tissue Morphology	remodeling	remodeling of basal lamina	2.12E-02	ANGPT2	1

Cardiovascular System Development and Function	remodeling	remodeling of vascular endothelial tissue	2.12E-02	ENG	1
Tissue Morphology	remodeling	remodeling of vascular endothelial tissue	2.12E-02	ENG	1
Free Radical Scavenging	removal	removal of hydrogen peroxide	2.12E-02	TXN	1
Cardiovascular System Development and Function	response	response of aortic ring tissue	2.12E-02	AGT	1
Tissue Development	response	response of aortic ring tissue	2.12E-02	AGT	1
Cell-To-Cell Signaling and Interaction	responsiveness	responsiveness of Purkinje cells	2.12E-02	ATXN1	1
Cellular Compromise	retraction	retraction of mesangial cells	2.12E-02	AGT	1
Renal and Urological System Development and Function	retraction	retraction of mesangial cells	2.12E-02	AGT	1
Cardiovascular Disease	rupture	rupture of abdominal aorta	2.12E-02	AGT	1
Organ Morphology	scaling	scaling of skin	2.12E-02	DBI	1
Hair and Skin Development and Function	scaling	scaling of skin	2.12E-02	DBI	1
Skeletal and Muscular Disorders	scapuloperoneal muscular dystrophy	scapuloperoneal muscular dystrophy	2.12E-02	MYH7	1
Hereditary Disorder	scapuloperoneal muscular dystrophy	scapuloperoneal muscular dystrophy	2.12E-02	MYH7	1
Cell Cycle	senescence	senescence of vascular smooth muscle cells	2.12E-02	AGT	1
Cardiovascular System Development and Function	shape	shape of endothelial cells	2.12E-02	CAPN1	1
Cell Morphology	shape	shape of endothelial cells	2.12E-02	CAPN1	1
Organismal Injury and Abnormalities	size	size of thrombus	2.12E-02	VWF	1
Cardiovascular Disease	size	size of thrombus	2.12E-02	VWF	1
Hair and Skin	skin turgor	skin turgor	2.12E-02	KIFAP3	1

Development and Function					
Cancer	spindle cell-type squamous cell carcinoma	spindle cell-type squamous cell carcinoma	2.12E-02	ENG	1
Cell-To-Cell Signaling and Interaction	stimulation	stimulation of adrenal glomerulosa cells	2.12E-02	ANGPT2	1
Cellular Growth and Proliferation	stimulation	stimulation of adrenal glomerulosa cells	2.12E-02	ANGPT2	1
Cell-To-Cell Signaling and Interaction	stimulation	stimulation of myofibroblasts	2.12E-02	LGALS3	1
Cellular Growth and Proliferation	stimulation	stimulation of myofibroblasts	2.12E-02	LGALS3	1
Skeletal and Muscular System Development and Function	stimulation	stimulation of myofibroblasts	2.12E-02	LGALS3	1
Cell-To-Cell Signaling and Interaction	stimulation	stimulation of pericytes	2.12E-02	LGALS3	1
Cellular Growth and Proliferation	stimulation	stimulation of pericytes	2.12E-02	LGALS3	1
Connective Tissue Development and Function	stimulation	stimulation of pericytes	2.12E-02	LGALS3	1
Cardiovascular System Development and Function	structural integrity	structural integrity of blood vessel	2.12E-02	ANGPT2	1
Tissue Morphology	structural integrity	structural integrity of blood vessel	2.12E-02	ANGPT2	1
Cellular Assembly and Organization	structural integrity	structural integrity of mitochondria	2.12E-02	LGALS3	1
Cell Morphology	structural integrity	structural integrity of mitochondria	2.12E-02	LGALS3	1
Cell Morphology	surface area	surface area of mesangial cells	2.12E-02	AGT	1
Renal and Urological System Development and Function	surface area	surface area of mesangial cells	2.12E-02	AGT	1
Cell Death and	survival	survival of	2.12E-02	RCAN1	1

Survival		neuronal progenitor cells			
Nervous System Development and Function	survival	survival of neuronal progenitor cells	2.12E-02	RCAN1	1
Small Molecule Biochemistry	synthesis	synthesis of L-cysteine	2.12E-02	CBS	1
Amino Acid Metabolism	synthesis	synthesis of L-cysteine	2.12E-02	CBS	1
Small Molecule Biochemistry	synthesis	synthesis of wax ester	2.12E-02	FAR1	1
Lipid Metabolism	synthesis	synthesis of wax ester	2.12E-02	FAR1	1
Tissue Morphology	thickening	thickening of adventitia	2.12E-02	AGT	1
Tissue Morphology	thickening	thickening of endothelial tissue	2.12E-02	ENG	1
Tissue Morphology	thickening	thickening of interstitial tissue	2.12E-02	TXN	1
Cardiovascular Disease	thickening	thickening of neointima	2.12E-02	AGT	1
Post-Translational Modification	thiolation	thiolation of protein	2.12E-02	GPX4	1
Cardiovascular Disease	thrombosis	thrombosis of vascular tissue	2.12E-02	VWF	1
Hematological Disease	thrombosis	thrombosis of vascular tissue	2.12E-02	VWF	1
Developmental Disorder	treacher collins syndrome type 2	treacher collins syndrome type 2	2.12E-02	POLR1D	1
Skeletal and Muscular Disorders	treacher collins syndrome type 2	treacher collins syndrome type 2	2.12E-02	POLR1D	1
Hereditary Disorder	treacher collins syndrome type 2	treacher collins syndrome type 2	2.12E-02	POLR1D	1
Connective Tissue Disorders	treacher collins syndrome type 2	treacher collins syndrome type 2	2.12E-02	POLR1D	1
Small Molecule Biochemistry	uptake	uptake of ADP	2.12E-02	ATXN1	1
Molecular Transport	uptake	uptake of ADP	2.12E-02	ATXN1	1
Nucleic Acid Metabolism	uptake	uptake of ADP	2.12E-02	ATXN1	1
Cellular Compromise	vacuolation	vacuolation of brain cells	2.12E-02	ATXN1	1
Cell Morphology	vacuolation	vacuolation of brain cells	2.12E-02	ATXN1	1
Cardiovascular System Development and Function	vasoconstriction	vasoconstriction of efferent glomerular arteriole	2.12E-02	AGT	1
Cardiovascular	vasoconstriction	vasoconstriction	2.12E-02	AGT	1

System Development and Function		of mesenteric arteriolar ring			
Cardiovascular System Development and Function	vasodilation	vasodilation of cerebellum	2.12E-02	CBS	1
Tissue Morphology	vasodilation	vasodilation of cerebellum	2.12E-02	CBS	1
Organismal Development	vasodilation	vasodilation of cerebellum	2.12E-02	CBS	1
Tissue Morphology	volume	volume of vascular smooth muscle cells	2.12E-02	ANGPT2	1
Skeletal and Muscular System Development and Function	volume	volume of vascular smooth muscle cells	2.12E-02	ANGPT2	1
Cell Morphology	volume	volume of vascular smooth muscle cells	2.12E-02	ANGPT2	1
Hereditary Disorder	von Willebrand disease type 2A/IIE	von Willebrand disease type 2A/IIE	2.12E-02	VWF	1
Hematological Disease	von Willebrand disease type 2A/IIE	von Willebrand disease type 2A/IIE	2.12E-02	VWF	1
Hereditary Disorder	von Willebrand disease type 3	von Willebrand disease type 3	2.12E-02	VWF	1
Hematological Disease	von Willebrand disease type 3	von Willebrand disease type 3	2.12E-02	VWF	1
Hereditary Disorder	von Willebrand's disease type 2B	von Willebrand's disease type 2B	2.12E-02	VWF	1
Hematological Disease	von Willebrand's disease type 2B	von Willebrand's disease type 2B	2.12E-02	VWF	1
Hereditary Disorder	von Willebrand's disease type 2N	von Willebrand's disease type 2N	2.12E-02	VWF	1
Hematological Disease	von Willebrand's disease type 2N	von Willebrand's disease type 2N	2.12E-02	VWF	1
Hereditary Disorder	von Willebrand's disease type I	von Willebrand's disease type I	2.12E-02	VWF	1
Hematological Disease	von Willebrand's disease type I	von Willebrand's disease type I	2.12E-02	VWF	1
Hereditary Disorder	von Willebrand's disease, Vicenza type	von Willebrand's disease, Vicenza type	2.12E-02	VWF	1
Hematological Disease	von Willebrand's disease, Vicenza type	von Willebrand's disease, Vicenza type	2.12E-02	VWF	1
Organ Morphology	abnormal morphology	abnormal morphology of Sertoli cells	2.16E-02	DNAJA1,NR1H3	2
Tissue Morphology	abnormal morphology	abnormal morphology of	2.16E-02	DNAJA1,NR1H3	2

		Sertoli cells			
Cell Morphology	abnormal morphology	abnormal morphology of Sertoli cells	2.16E-02	DNAJA1,NR1H3	2
Reproductive System Development and Function	abnormal morphology	abnormal morphology of Sertoli cells	2.16E-02	DNAJA1,NR1H3	2
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of Sertoli cells	2.16E-02	DNAJA1,NR1H3	2
Cancer	autosomal dominant polycystic kidney disease	autosomal dominant polycystic kidney disease	2.16E-02	AGT,ANGPT2	2
Developmental Disorder	autosomal dominant polycystic kidney disease	autosomal dominant polycystic kidney disease	2.16E-02	AGT,ANGPT2	2
Renal and Urological Disease	autosomal dominant polycystic kidney disease	autosomal dominant polycystic kidney disease	2.16E-02	AGT,ANGPT2	2
Hereditary Disorder	autosomal dominant polycystic kidney disease	autosomal dominant polycystic kidney disease	2.16E-02	AGT,ANGPT2	2
Cell Cycle	mitogenesis	mitogenesis of connective tissue cells	2.16E-02	AGT,TXN	2
Post-Translational Modification	refolding	refolding of protein	2.16E-02	DNAJA1,DNAJA4	2
Protein Folding	refolding	refolding of protein	2.16E-02	DNAJA1,DNAJA4	2
Small Molecule Biochemistry	secretion	secretion of aldosterone	2.16E-02	AGT,ANGPT2	2
Endocrine System Development and Function	secretion	secretion of aldosterone	2.16E-02	AGT,ANGPT2	2
Molecular Transport	secretion	secretion of aldosterone	2.16E-02	AGT,ANGPT2	2
Lipid Metabolism	secretion	secretion of aldosterone	2.16E-02	AGT,ANGPT2	2
Small Molecule Biochemistry	synthesis	synthesis of aldosterone	2.16E-02	AGT,ANGPT2	2
Endocrine System Development and Function	synthesis	synthesis of aldosterone	2.16E-02	AGT,ANGPT2	2
Vitamin and Mineral Metabolism	synthesis	synthesis of aldosterone	2.16E-02	AGT,ANGPT2	2

Lipid Metabolism	synthesis	synthesis of aldosterone	2.16E-02	AGT,ANGPT2	2
Organ Morphology	volume	volume of trabecular bone	2.16E-02	BMPR1A,CAPN1	2
Skeletal and Muscular System Development and Function	volume	volume of trabecular bone	2.16E-02	BMPR1A,CAPN1	2
Tissue Morphology	quantity	quantity of muscle cells	2.21E-02	AGT,ANGPT2,ENG,RCAN1	4
Skeletal and Muscular System Development and Function	quantity	quantity of muscle cells	2.21E-02	AGT,ANGPT2,ENG,RCAN1	4
Small Molecule Biochemistry	synthesis	synthesis of steroid	2.29E-02	AGT,ANGPT2,DBI, NR1H3,PDE8B	5
Vitamin and Mineral Metabolism	synthesis	synthesis of steroid	2.29E-02	AGT,ANGPT2,DBI, NR1H3,PDE8B	5
Lipid Metabolism	synthesis	synthesis of steroid	2.29E-02	AGT,ANGPT2,DBI, NR1H3,PDE8B	5
Cell-To-Cell Signaling and Interaction	recruitment	recruitment of leukocytes	2.32E-02	AGT,ANGPT2,LGALS3,RIPK2,TXN,VWF	6
Cellular Movement	recruitment	recruitment of leukocytes	2.32E-02	AGT,ANGPT2,LGALS3,RIPK2,TXN,VWF	6
Hematological System Development and Function	recruitment	recruitment of leukocytes	2.32E-02	AGT,ANGPT2,LGALS3,RIPK2,TXN,VWF	6
Immune Cell Trafficking	recruitment	recruitment of leukocytes	2.32E-02	AGT,ANGPT2,LGALS3,RIPK2,TXN,VWF	6
Cellular Function and Maintenance	autophagy	autophagy of cells	2.41E-02	AGT,ATG2A,CAPN1 ,GJA4,HSPA5,TME M173	6
Cell Morphology	autophagy	autophagy of cells	2.41E-02	AGT,ATG2A,CAPN1 ,GJA4,HSPA5,TME M173	6
Cell Morphology	morphology	morphology of macrophages	2.47E-02	LGALS3,MANBA,N R1H3	3
Hematological System Development and Function	morphology	morphology of macrophages	2.47E-02	LGALS3,MANBA,N R1H3	3
Inflammatory Response	morphology	morphology of macrophages	2.47E-02	LGALS3,MANBA,N R1H3	3
Nervous System Development and Function	spatial memory	spatial memory	2.47E-02	ATXN1,PRKAR1A,RCAN1	3
Behavior	spatial memory	spatial memory	2.47E-02	ATXN1,PRKAR1A,RCAN1	3
Cardiovascular	adhesion	adhesion of	2.55E-02	ANGPT2,CDH13	2

System Development and Function		endothelial cell lines			
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of endothelial cell lines	2.55E-02	ANGPT2,CDH13	2
Tissue Development	adhesion	adhesion of endothelial cell lines	2.55E-02	ANGPT2,CDH13	2
Molecular Transport	excretion	excretion of Na+	2.55E-02	AGT,ANGPT2	2
Cellular Function and Maintenance	function	function of blood platelets	2.55E-02	CAPN1,VWF	2
Hematological System Development and Function	function	function of blood platelets	2.55E-02	CAPN1,VWF	2
Organismal Injury and Abnormalities	interstitial fibrosis	interstitial fibrosis of heart	2.55E-02	AGT,ANGPT2	2
Cardiovascular Disease	interstitial fibrosis	interstitial fibrosis of heart	2.55E-02	AGT,ANGPT2	2
Metabolic Disease	iron overload	iron overload	2.55E-02	BMPR1A,CBS	2
Hematological Disease	iron overload	iron overload	2.55E-02	BMPR1A,CBS	2
Nutritional Disease	iron overload	iron overload	2.55E-02	BMPR1A,CBS	2
Cardiovascular System Development and Function	permeability	permeability of blood vessel	2.55E-02	ANGPT2,VWF	2
Tissue Morphology	permeability	permeability of blood vessel	2.55E-02	ANGPT2,VWF	2
Cardiovascular System Development and Function	survival	survival of vascular endothelial cells	2.55E-02	ANGPT2,CDH13	2
Cell Death and Survival	survival	survival of vascular endothelial cells	2.55E-02	ANGPT2,CDH13	2
Small Molecule Biochemistry	concentration	concentration of glutathione	2.70E-02	AGT,CBS,TXN	3
Drug Metabolism	concentration	concentration of glutathione	2.70E-02	AGT,CBS,TXN	3
Molecular Transport	concentration	concentration of glutathione	2.70E-02	AGT,CBS,TXN	3
Cellular Movement	migration	migration of prostate cancer cell lines	2.70E-02	LAMB3,LGALS3,NE S	3
Organ Morphology	abnormal morphology	abnormal morphology of liver	2.78E-02	CBS,NCOA6,NR1H3,PEX5,PPT2	5
Digestive	abnormal	abnormal	2.78E-02	CBS,NCOA6,NR1H	5

System Development and Function	morphology	morphology of liver		3,PEX5,PPT2	
Hepatic System Development and Function	abnormal morphology	abnormal morphology of liver	2.78E-02	CBS,NCOA6,NR1H3,PEX5,PPT2	5
Organ Morphology	morphology	morphology of liver	2.83E-02	CBS,MANBA,NCOA6,NR1H3,PEX5,PPT2	6
Digestive System Development and Function	morphology	morphology of liver	2.83E-02	CBS,MANBA,NCOA6,NR1H3,PEX5,PPT2	6
Hepatic System Development and Function	morphology	morphology of liver	2.83E-02	CBS,MANBA,NCOA6,NR1H3,PEX5,PPT2	6
Reproductive System Development and Function	fertility	fertility	2.91E-02	AGT,DNAJA1,GPX4,NCOA6,NR1H3,PRKAR1A,RCAN1	7
Cardiovascular System Development and Function	adhesion	adhesion of vascular endothelial cells	2.93E-02	ANGPT2,LGALS3,RCAN1	3
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of vascular endothelial cells	2.93E-02	ANGPT2,LGALS3,RCAN1	3
Tissue Development	adhesion	adhesion of vascular endothelial cells	2.93E-02	ANGPT2,LGALS3,RCAN1	3
Nucleic Acid Metabolism	metabolism	metabolism of nucleic acid component or derivative	2.96E-02	ADCY6,AGT,AK4,ANGPT2,ATXN1,CBS,DBI,MYH7,NUDT2,RHOBTB3	10
Gastrointestinal Disease	Barrett's syndrome	Barrett's syndrome	2.98E-02	ENG,GSS	2
Inflammatory Disease	Barrett's syndrome	Barrett's syndrome	2.98E-02	ENG,GSS	2
Organismal Injury and Abnormalities	area	area of atherosclerotic lesion	2.98E-02	AGT,CBS	2
Tissue Morphology	area	area of atherosclerotic lesion	2.98E-02	AGT,CBS	2
Cardiovascular Disease	area	area of atherosclerotic lesion	2.98E-02	AGT,CBS	2
Free Radical Scavenging	catabolism	catabolism of hydrogen peroxide	2.98E-02	GPX4,TXN	2
Small Molecule Biochemistry	catabolism	catabolism of hydrogen peroxide	2.98E-02	GPX4,TXN	2
Cell Cycle	cell cycle progression	cell cycle progression of	2.98E-02	PRKCH,ZNF655	2

		leukemia cell lines			
Cellular Movement	chemotaxis	chemotaxis of leukocyte cell lines	2.98E-02	AGT, TXN	2
Hematological System Development and Function	chemotaxis	chemotaxis of leukocyte cell lines	2.98E-02	AGT, TXN	2
Immune Cell Trafficking	chemotaxis	chemotaxis of leukocyte cell lines	2.98E-02	AGT, TXN	2
Endocrine System Disorders	polycystic ovary syndrome	polycystic ovary syndrome	2.98E-02	BMPR1A, PRKAR1A	2
Cancer	polycystic ovary syndrome	polycystic ovary syndrome	2.98E-02	BMPR1A, PRKAR1A	2
Reproductive System Disease	polycystic ovary syndrome	polycystic ovary syndrome	2.98E-02	BMPR1A, PRKAR1A	2
Cardiovascular System Development and Function	relaxation	relaxation of artery	2.98E-02	AGT, CBS	2
Tissue Morphology	relaxation	relaxation of artery	2.98E-02	AGT, CBS	2
Cardiovascular System Development and Function	size	size of blood vessel	2.98E-02	AGT, CBS	2
Tissue Morphology	size	size of blood vessel	2.98E-02	AGT, CBS	2
Organismal Development	size	size of blood vessel	2.98E-02	AGT, CBS	2
Cardiovascular System Development and Function	adhesion	adhesion of endothelial cells	3.00E-02	ANGPT2, LGALS3, R CAN1, TXN	4
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of endothelial cells	3.00E-02	ANGPT2, LGALS3, R CAN1, TXN	4
Tissue Development	adhesion	adhesion of endothelial cells	3.00E-02	ANGPT2, LGALS3, R CAN1, TXN	4
Cellular Assembly and Organization	formation	formation of filaments	3.02E-02	AGT, CAPN1, CDC42 BPB, HSPA5, HSPB1, INPP5A, KANK2, MYH7, PRKCH	9
Tissue Development	formation	formation of filaments	3.02E-02	AGT, CAPN1, CDC42 BPB, HSPA5, HSPB1, INPP5A, KANK2, MYH7, PRKCH	9
Cell-To-Cell Signaling and Interaction	recruitment	recruitment of phagocytes	3.05E-02	AGT, ANGPT2, LGALS3, RIPK2, VWF	5
Cellular	recruitment	recruitment of	3.05E-02	AGT, ANGPT2, LGALS3, RIPK2, VWF	5

Movement		phagocytes		S3,RIPK2,VWF	
Hematological System Development and Function	recruitment	recruitment of phagocytes	3.05E-02	AGT,ANGPT2,LGALS3,RIPK2,VWF	5
Immune Cell Trafficking	recruitment	recruitment of phagocytes	3.05E-02	AGT,ANGPT2,LGALS3,RIPK2,VWF	5
Inflammatory Response	recruitment	recruitment of phagocytes	3.05E-02	AGT,ANGPT2,LGALS3,RIPK2,VWF	5
Organismal Injury and Abnormalities	formation	formation of vascular lesion	3.18E-02	AGT,ANGPT2,CBS	3
Cardiovascular Disease	formation	formation of vascular lesion	3.18E-02	AGT,ANGPT2,CBS	3
Cell-To-Cell Signaling and Interaction	recruitment	recruitment of neutrophils	3.18E-02	AGT,LGALS3,RIPK2,VWF	4
Cellular Movement	recruitment	recruitment of neutrophils	3.18E-02	AGT,LGALS3,RIPK2,VWF	4
Hematological System Development and Function	recruitment	recruitment of neutrophils	3.18E-02	AGT,LGALS3,RIPK2,VWF	4
Immune Cell Trafficking	recruitment	recruitment of neutrophils	3.18E-02	AGT,LGALS3,RIPK2,VWF	4
Inflammatory Response	recruitment	recruitment of neutrophils	3.18E-02	AGT,LGALS3,RIPK2,VWF	4
Cardiovascular System Development and Function	cell movement	cell movement of endothelial cells	3.21E-02	AGT,ANGPT2,CDH13,ENG,HSPA5,HSBP1,LGALS3	7
Cellular Movement	cell movement	cell movement of endothelial cells	3.21E-02	AGT,ANGPT2,CDH13,ENG,HSPA5,HSBP1,LGALS3	7
Cancer	prostate cancer	prostate cancer	3.26E-02	ATXN1,BMP1A,CDH13,CHGB,ENG,FHL2,GJA4,NES,PRKCH,TUBB6	10
Reproductive System Disease	prostate cancer	prostate cancer	3.26E-02	ATXN1,BMP1A,CDH13,CHGB,ENG,FHL2,GJA4,NES,PRKCH,TUBB6	10
Organ Morphology	abnormal morphology	abnormal morphology of cerebrum	3.43E-02	MANBA,NR1H3	2
Nervous System Development and Function	abnormal morphology	abnormal morphology of cerebrum	3.43E-02	MANBA,NR1H3	2
Tissue Morphology	abnormal morphology	abnormal morphology of spinal cord	3.43E-02	KIFAP3,MANBA	2
Nervous System Development	abnormal morphology	abnormal morphology of spinal cord	3.43E-02	KIFAP3,MANBA	2

and Function					
Cell Morphology	cell flattening	cell flattening	3.43E-02	PRKCH,RRAD	2
Cellular Movement	cell movement	cell movement of sperm	3.43E-02	CSNK2A2,DNAJA1	2
Reproductive System Development and Function	cell movement	cell movement of sperm	3.43E-02	CSNK2A2,DNAJA1	2
Cellular Development	proliferation	proliferation of mesangial cells	3.43E-02	AGT,ANGPT2	2
Cellular Growth and Proliferation	proliferation	proliferation of mesangial cells	3.43E-02	AGT,ANGPT2	2
Renal and Urological System Development and Function	proliferation	proliferation of mesangial cells	3.43E-02	AGT,ANGPT2	2
Molecular Transport	quantity	quantity of Na+	3.43E-02	ADCY6,AGT	2
Reproductive System Disease	oligozoospermia	oligozoospermia	3.43E-02	CSNK2A2,DNAJA1, TARBP2	3
Cardiovascular Disease	thrombosis	Thrombosis	3.55E-02	ANGPT2,CAPN1,GRIK2,VWF	4
Hematological Disease	thrombosis	Thrombosis	3.55E-02	ANGPT2,CAPN1,GRIK2,VWF	4
Organ Morphology	abnormal morphology	abnormal morphology of gland	3.55E-02	CBS,DNAJA1,NCOA6,PPT2	4
Cell Death and Survival	apoptosis	apoptosis of male germ cells	3.70E-02	CSNK2A2,GPX4,NR1H3	3
Cell-To-Cell Signaling and Interaction	activation	activation of hepatic stellate cells	3.90E-02	AGT,LGALS3	2
Hepatic System Development and Function	activation	activation of hepatic stellate cells	3.90E-02	AGT,LGALS3	2
Connective Tissue Development and Function	activation	activation of hepatic stellate cells	3.90E-02	AGT,LGALS3	2
Cellular Movement	chemotaxis	chemotaxis of fibroblasts	3.90E-02	AGT,ANGPT2	2
Connective Tissue Development and Function	chemotaxis	chemotaxis of fibroblasts	3.90E-02	AGT,ANGPT2	2
Small Molecule Biochemistry	concentration	concentration of aldosterone	3.90E-02	AGT,ANGPT2	2
Endocrine System Development and Function	concentration	concentration of aldosterone	3.90E-02	AGT,ANGPT2	2

Molecular Transport	concentration	concentration of aldosterone	3.90E-02	AGT,ANGPT2	2
Lipid Metabolism	concentration	concentration of aldosterone	3.90E-02	AGT,ANGPT2	2
Cellular Assembly and Organization	duplication	duplication of centrosome	3.90E-02	BRSK1,STK38	2
Cellular Function and Maintenance	duplication	duplication of centrosome	3.90E-02	BRSK1,STK38	2
Cell Cycle	duplication	duplication of centrosome	3.90E-02	BRSK1,STK38	2
DNA Replication, Recombination, and Repair	duplication	duplication of centrosome	3.90E-02	BRSK1,STK38	2
Cellular Function and Maintenance	function	function of Th1 cells	3.90E-02	RCAN1,RIPK2	2
Hematological System Development and Function	function	function of Th1 cells	3.90E-02	RCAN1,RIPK2	2
Cancer	endocrine gland tumor	endocrine gland tumor	3.91E-02	ANGPT2,BMP1A, DPYSL4,ENG,LAM B3,LGALS3,PRKAR 1A,PTPN4	8
Cell-To-Cell Signaling and Interaction	attachment	attachment of cells	3.94E-02	CDH13,ENG,LGALS 3,VWF	4
Tissue Development	attachment	attachment of cells	3.94E-02	CDH13,ENG,LGALS 3,VWF	4
Cell Death and Survival	cell death	cell death of pheochromocytoma cell lines	3.94E-02	AGT,ANGPT2,HSP B1,SERPINI1	4
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of granulocytes	3.97E-02	ANGPT2,LGALS3,T XN	3
Hematological System Development and Function	adhesion	adhesion of granulocytes	3.97E-02	ANGPT2,LGALS3,T XN	3
Immune Cell Trafficking	adhesion	adhesion of granulocytes	3.97E-02	ANGPT2,LGALS3,T XN	3
Tissue Development	adhesion	adhesion of granulocytes	3.97E-02	ANGPT2,LGALS3,T XN	3
Organismal Development	development	development of placenta	3.97E-02	ENG,NCOA6,VWF	3
Organ Development	development	development of placenta	3.97E-02	ENG,NCOA6,VWF	3
Reproductive System Development and Function	development	development of placenta	3.97E-02	ENG,NCOA6,VWF	3
Tissue	development	development of	3.97E-02	ENG,NCOA6,VWF	3

Development		placenta			
Embryonic Development	development	development of placenta	3.97E-02	ENG,NCOA6,VWF	3
Neurological Disease	hyperactive behavior	hyperactive behavior	3.97E-02	AGT,LCLAT1,RCAN1	3
Psychological Disorders	hyperactive behavior	hyperactive behavior	3.97E-02	AGT,LCLAT1,RCAN1	3
Tissue Morphology	quantity	quantity of brain cells	3.97E-02	ATXN1,BMPR1A,NES	3
Nervous System Development and Function	quantity	quantity of brain cells	3.97E-02	ATXN1,BMPR1A,NES	3
Small Molecule Biochemistry	synthesis	synthesis of lipid	3.99E-02	AGT,ANGPT2,DBI,DHRS9,FAR1,GPX4,LTA4H,NR1H3,PDE8B,ST8SIA5,TXN	11
Lipid Metabolism	synthesis	synthesis of lipid	3.99E-02	AGT,ANGPT2,DBI,DHRS9,FAR1,GPX4,LTA4H,NR1H3,PDE8B,ST8SIA5,TXN	11
Cardiovascular Disease	hypertrophy	hypertrophy of heart	4.12E-02	AGT,ANGPT2,FHL2,RCAN1,TXN	5
Developmental Disorder	hypertrophy	hypertrophy of heart	4.12E-02	AGT,ANGPT2,FHL2,RCAN1,TXN	5
Cell Death and Survival	apoptosis	apoptosis of parenchymal cells	4.15E-02	CBS,HSPA5,NCOA6,TXN	4
Cellular Function and Maintenance	autophagy	autophagy of tumor cell lines	4.15E-02	ATG2A,CAPN1,GJA4,HSPA5	4
Cell Morphology	autophagy	autophagy of tumor cell lines	4.15E-02	ATG2A,CAPN1,GJA4,HSPA5	4
Cancer	Carney complex type 1	Carney complex type 1	4.19E-02	PRKAR1A	1
Cardiovascular Disease	Carney complex type 1	Carney complex type 1	4.19E-02	PRKAR1A	1
Hereditary Disorder	Carney complex type 1	Carney complex type 1	4.19E-02	PRKAR1A	1
Dermatological Diseases and Conditions	Carney complex type 1	Carney complex type 1	4.19E-02	PRKAR1A	1
Cell Signaling	G-protein signaling, coupled to cGMP nucleotide second messenger	G-protein signaling, coupled to cGMP nucleotide second messenger	4.19E-02	AGT	1
Cancer	PTEN hamartoma tumor syndrome	PTEN hamartoma tumor syndrome	4.19E-02	BMPR1A	1
Hereditary Disorder	PTEN hamartoma tumor syndrome	PTEN hamartoma tumor syndrome	4.19E-02	BMPR1A	1

Organ Morphology	abnormal morphology	abnormal morphology of axillary lymph node	4.19E-02	PRKCH	1
Tissue Morphology	abnormal morphology	abnormal morphology of axillary lymph node	4.19E-02	PRKCH	1
Lymphoid Tissue Structure and Development	abnormal morphology	abnormal morphology of axillary lymph node	4.19E-02	PRKCH	1
Tissue Morphology	abnormal morphology	abnormal morphology of cortical subplate	4.19E-02	BRSK1	1
Organ Morphology	abnormal morphology	abnormal morphology of enlarged cervical lymph node	4.19E-02	PRKCH	1
Tissue Morphology	abnormal morphology	abnormal morphology of enlarged cervical lymph node	4.19E-02	PRKCH	1
Lymphoid Tissue Structure and Development	abnormal morphology	abnormal morphology of enlarged cervical lymph node	4.19E-02	PRKCH	1
Organ Morphology	abnormal morphology	abnormal morphology of enlarged inguinal lymph node	4.19E-02	PRKCH	1
Tissue Morphology	abnormal morphology	abnormal morphology of enlarged inguinal lymph node	4.19E-02	PRKCH	1
Lymphoid Tissue Structure and Development	abnormal morphology	abnormal morphology of enlarged inguinal lymph node	4.19E-02	PRKCH	1
Organ Morphology	abnormal morphology	abnormal morphology of enlarged sebaceous glands	4.19E-02	CBS	1
Tissue Morphology	abnormal morphology	abnormal morphology of epididymal epithelium	4.19E-02	MANBA	1
Organ	abnormal	abnormal	4.19E-02	AGT	1

Morphology	morphology	morphology of juxtaglomerular apparatus			
Renal and Urological System Development and Function	abnormal morphology	abnormal morphology of juxtaglomerular apparatus	4.19E-02	AGT	1
Tissue Morphology	abnormal morphology	abnormal morphology of medulla oblongata	4.19E-02	KIFAP3	1
Nervous System Development and Function	abnormal morphology	abnormal morphology of medulla oblongata	4.19E-02	KIFAP3	1
Organ Morphology	abnormal morphology	abnormal morphology of myometrium	4.19E-02	NR1H3	1
Reproductive System Development and Function	abnormal morphology	abnormal morphology of myometrium	4.19E-02	NR1H3	1
Organ Morphology	abnormal morphology	abnormal morphology of wrinkled skin	4.19E-02	CBS	1
Cellular Assembly and Organization	accumulation	accumulation of autophagosomes	4.19E-02	ATG2A	1
Cellular Function and Maintenance	accumulation	accumulation of autophagosomes	4.19E-02	ATG2A	1
Cell Morphology	accumulation	accumulation of autophagosomes	4.19E-02	ATG2A	1
Inflammatory Response	accumulation	accumulation of autophagosomes	4.19E-02	ATG2A	1
Hematological System Development and Function	accumulation	accumulation of monocyte-derived macrophages	4.19E-02	CBS	1
Immune Cell Trafficking	accumulation	accumulation of monocyte-derived macrophages	4.19E-02	CBS	1
Inflammatory Response	accumulation	accumulation of monocyte-derived macrophages	4.19E-02	CBS	1
Tissue Development	accumulation	accumulation of monocyte-derived macrophages	4.19E-02	CBS	1
Cardiovascular	activation	activation of	4.19E-02	ANGPT2	1

System Development and Function		lymphatic endothelial cells			
Cell-To-Cell Signaling and Interaction	activation	activation of lymphatic endothelial cells	4.19E-02	ANGPT2	1
Cell-To-Cell Signaling and Interaction	activation	activation of neural precursor cells	4.19E-02	ANGPT2	1
Small Molecule Biochemistry	activation	activation of sterol	4.19E-02	NR1H3	1
Lipid Metabolism	activation	activation of sterol	4.19E-02	NR1H3	1
Cell-To-Cell Signaling and Interaction	activation	activation of sympathetic nerve	4.19E-02	AGT	1
Nervous System Development and Function	activation	activation of sympathetic nerve	4.19E-02	AGT	1
Tissue Development	activation	activation of sympathetic nerve	4.19E-02	AGT	1
Cell-To-Cell Signaling and Interaction	agglutination	agglutination of blood platelets	4.19E-02	VWF	1
Hematological System Development and Function	agglutination	agglutination of blood platelets	4.19E-02	VWF	1
Inflammatory Response	agglutination	agglutination of blood platelets	4.19E-02	VWF	1
Tissue Development	agglutination	agglutination of blood platelets	4.19E-02	VWF	1
Cardiovascular System Development and Function	angiogenesis	angiogenesis of carcinoma	4.19E-02	AGT	1
Cancer	angiogenesis	angiogenesis of carcinoma	4.19E-02	AGT	1
Cardiovascular System Development and Function	angiogenesis	angiogenesis of granuloma	4.19E-02	AGT	1
Organismal Development	angiogenesis	angiogenesis of granuloma	4.19E-02	AGT	1
Cell Death and Survival	apoptosis	apoptosis of chronic lymphocytic leukemia B cells	4.19E-02	TXN	1
Tumor Morphology	apoptosis	apoptosis of chronic lymphocytic leukemia B cells	4.19E-02	TXN	1
Cell Death and	apoptosis	apoptosis of	4.19E-02	AGT	1

Survival		endothelial progenitor cells			
Cell Death and Survival	apoptosis	apoptosis of interdigital cells	4.19E-02	BMPR1A	1
Embryonic Development	apoptosis	apoptosis of interdigital cells	4.19E-02	BMPR1A	1
Cell Death and Survival	apoptosis	apoptosis of lens fiber cells	4.19E-02	NCOA6	1
Cell Death and Survival	apoptosis	apoptosis of skeletal muscle cells	4.19E-02	AGT	1
Cardiovascular System Development and Function	area	area of abdominal aorta	4.19E-02	AGT	1
Tissue Morphology	area	area of abdominal aorta	4.19E-02	AGT	1
Organismal Development	area	area of abdominal aorta	4.19E-02	AGT	1
Cardiovascular System Development and Function	area	area of tunica media	4.19E-02	AGT	1
Organismal Development	area	area of tunica media	4.19E-02	AGT	1
Lymphoid Tissue Structure and Development	area	area of tunica media	4.19E-02	AGT	1
Cell Cycle	G1 phase	arrest in G1 phase of keratinocytes	4.19E-02	PRKCH	1
Hair and Skin Development and Function	G1 phase	arrest in G1 phase of keratinocytes	4.19E-02	PRKCH	1
Cellular Development	growth	arrest in growth of cervical cancer cell lines	4.19E-02	TXN	1
Cellular Growth and Proliferation	growth	arrest in growth of cervical cancer cell lines	4.19E-02	TXN	1
Cardiovascular System Development and Function	growth	arrest in growth of endothelial cells	4.19E-02	ENG	1
Cellular Development	growth	arrest in growth of endothelial cells	4.19E-02	ENG	1
Cellular Growth and Proliferation	growth	arrest in growth of endothelial cells	4.19E-02	ENG	1
Organismal Development	growth	arrest in growth of endothelial cells	4.19E-02	ENG	1
Tissue	growth	arrest in growth	4.19E-02	ENG	1

Development		of endothelial cells			
Cardiovascular Disease	atherosclerosis	atherosclerosis of thoracic aorta	4.19E-02	NR1H3	1
Cell-To-Cell Signaling and Interaction	attachment	attachment of brain cancer cell lines	4.19E-02	CDH13	1
Tissue Development	attachment	attachment of brain cancer cell lines	4.19E-02	CDH13	1
Cell-To-Cell Signaling and Interaction	binding	binding of adrenocortical cells	4.19E-02	AGT	1
Cell-To-Cell Signaling and Interaction	binding	binding of brain cancer cell lines	4.19E-02	HSPA5	1
Cell-To-Cell Signaling and Interaction	binding	binding of focal adhesions	4.19E-02	ANGPT2	1
Cellular Assembly and Organization	binding	binding of focal adhesions	4.19E-02	ANGPT2	1
Tissue Development	binding	binding of focal adhesions	4.19E-02	ANGPT2	1
Gene Expression	binding	binding of hypoxia response element	4.19E-02	AGT	1
Small Molecule Biochemistry	biosynthesis	biosynthesis of L-serine	4.19E-02	CBS	1
Amino Acid Metabolism	biosynthesis	biosynthesis of L-serine	4.19E-02	CBS	1
Organismal Injury and Abnormalities	bleeding	bleeding of abdominal aorta	4.19E-02	AGT	1
Cardiovascular Disease	bleeding	bleeding of abdominal aorta	4.19E-02	AGT	1
Endocrine System Disorders	bleeding	bleeding of ovary	4.19E-02	NR1H3	1
Organismal Injury and Abnormalities	bleeding	bleeding of ovary	4.19E-02	NR1H3	1
Reproductive System Disease	bleeding	bleeding of ovary	4.19E-02	NR1H3	1
Cell Morphology	cell flattening	cell flattening of neuroblastoma cell lines	4.19E-02	RRAD	1
Cardiovascular System Development and Function	cell-cell adhesion	cell-cell adhesion of endothelial cell lines	4.19E-02	CDH13	1
Cell-To-Cell Signaling and	cell-cell adhesion	cell-cell adhesion of	4.19E-02	CDH13	1

Interaction		endothelial cell lines			
Tissue Development	cell-cell adhesion	cell-cell adhesion of endothelial cell lines	4.19E-02	CDH13	1
Cellular Growth and Proliferation	colony formation	colony formation of pheochromocytoma cell lines	4.19E-02	RCAN1	1
Small Molecule Biochemistry	concentration	concentration of androstenedione	4.19E-02	NR1H3	1
Endocrine System Development and Function	concentration	concentration of androstenedione	4.19E-02	NR1H3	1
Molecular Transport	concentration	concentration of androstenedione	4.19E-02	NR1H3	1
Lipid Metabolism	concentration	concentration of androstenedione	4.19E-02	NR1H3	1
Small Molecule Biochemistry	concentration	concentration of dinoprost	4.19E-02	AGT	1
Molecular Transport	concentration	concentration of dinoprost	4.19E-02	AGT	1
Lipid Metabolism	concentration	concentration of dinoprost	4.19E-02	AGT	1
Organismal Injury and Abnormalities	congestion	congestion of liver	4.19E-02	ENG	1
Gastrointestinal Disease	congestion	congestion of liver	4.19E-02	ENG	1
Hepatic System Disease	congestion	congestion of liver	4.19E-02	ENG	1
Cell-To-Cell Signaling and Interaction	contact growth inhibition	contact growth inhibition of myeloma cell lines	4.19E-02	BMPR1A	1
Cellular Growth and Proliferation	contact growth inhibition	contact growth inhibition of myeloma cell lines	4.19E-02	BMPR1A	1
Cell Cycle	contact growth inhibition	contact growth inhibition of myeloma cell lines	4.19E-02	BMPR1A	1
Cell Morphology	contractility	contractility of vascular smooth muscle cells	4.19E-02	AGT	1
Cardiovascular System Development and Function	contraction	contraction of aorta	4.19E-02	AGT	1
Tissue Morphology	contraction	contraction of aorta	4.19E-02	AGT	1
Cardiovascular	contraction	contraction of	4.19E-02	AGT	1

System Development and Function		mesenteric artery			
Tissue Morphology	contraction	contraction of mesenteric artery	4.19E-02	AGT	1
Skeletal and Muscular System Development and Function	contraction	contraction of myoid cells	4.19E-02	AGT	1
Cell Morphology	contraction	contraction of myoid cells	4.19E-02	AGT	1
Reproductive System Development and Function	contraction	contraction of myoid cells	4.19E-02	AGT	1
Cellular Development	conversion	conversion of epithelial cell lines	4.19E-02	ENG	1
Cell Morphology	conversion	conversion of epithelial cell lines	4.19E-02	ENG	1
Hair and Skin Development and Function	conversion	conversion of epithelial cell lines	4.19E-02	ENG	1
Post-Translational Modification	conversion	conversion of homocysteine	4.19E-02	CBS	1
Small Molecule Biochemistry	conversion	conversion of homocysteine	4.19E-02	CBS	1
Amino Acid Metabolism	conversion	conversion of homocysteine	4.19E-02	CBS	1
Small Molecule Biochemistry	conversion	conversion of leukotriene A4	4.19E-02	LTA4H	1
Lipid Metabolism	conversion	conversion of leukotriene A4	4.19E-02	LTA4H	1
Cellular Development	conversion	conversion of skin cell lines	4.19E-02	ENG	1
Cell Morphology	conversion	conversion of skin cell lines	4.19E-02	ENG	1
Hair and Skin Development and Function	conversion	conversion of skin cell lines	4.19E-02	ENG	1
Developmental Disorder	dedifferentiation	dedifferentiation of smooth muscle cells	4.19E-02	AGT	1
Skeletal and Muscular Disorders	dedifferentiation	dedifferentiation of smooth muscle cells	4.19E-02	AGT	1
Cancer	tumorigenesis	delay in tumorigenesis of kidney cancer cell lines	4.19E-02	PRKAR1A	1
Renal and	tumorigenesis	delay in	4.19E-02	PRKAR1A	1

Urological Disease		tumorigenesis of kidney cancer cell lines			
Cardiovascular System Development and Function	density	density of artery	4.19E-02	AGT	1
Tissue Morphology	density	density of artery	4.19E-02	AGT	1
Organismal Development	density	density of artery	4.19E-02	AGT	1
Cellular Assembly and Organization	density	density of axons	4.19E-02	BMPR1A	1
Cardiovascular System Development and Function	density	density of vascular tissue	4.19E-02	RCAN1	1
Tissue Morphology	density	density of vascular tissue	4.19E-02	RCAN1	1
Molecular Transport	depletion	depletion of mitochondrial DNA	4.19E-02	LCLAT1	1
DNA Replication, Recombination, and Repair	depletion	depletion of mitochondrial DNA	4.19E-02	LCLAT1	1
Cell-To-Cell Signaling and Interaction	detachment	detachment of vascular endothelial cells	4.19E-02	ENG	1
Tissue Development	detachment	detachment of vascular endothelial cells	4.19E-02	ENG	1
Organismal Development	development	development of fur	4.19E-02	DBI	1
Organ Development	development	development of fur	4.19E-02	DBI	1
Tissue Development	development	development of fur	4.19E-02	DBI	1
Embryonic Development	development	development of fur	4.19E-02	DBI	1
Hair and Skin Development and Function	development	development of fur	4.19E-02	DBI	1
Organismal Development	development	development of glomerular basement membrane	4.19E-02	MPV17	1
Organ Development	development	development of glomerular basement membrane	4.19E-02	MPV17	1
Tissue Development	development	development of glomerular basement	4.19E-02	MPV17	1

		membrane			
Embryonic Development	development	development of glomerular basement membrane	4.19E-02	MPV17	1
Renal and Urological System Development and Function	development	development of glomerular basement membrane	4.19E-02	MPV17	1
Organismal Development	development	development of labyrinthine zone of placenta	4.19E-02	NCOA6	1
Organ Development	development	development of labyrinthine zone of placenta	4.19E-02	NCOA6	1
Reproductive System Development and Function	development	development of labyrinthine zone of placenta	4.19E-02	NCOA6	1
Tissue Development	development	development of labyrinthine zone of placenta	4.19E-02	NCOA6	1
Embryonic Development	development	development of labyrinthine zone of placenta	4.19E-02	NCOA6	1
Organismal Development	development	development of lateral plate mesoderm	4.19E-02	PRKAR1A	1
Tissue Development	development	development of lateral plate mesoderm	4.19E-02	PRKAR1A	1
Embryonic Development	development	development of lateral plate mesoderm	4.19E-02	PRKAR1A	1
Cardiovascular Disease	development	development of thrombus	4.19E-02	VWF	1
Cardiovascular System Development and Function	diameter	diameter of abdominal aorta	4.19E-02	AGT	1
Tissue Morphology	diameter	diameter of abdominal aorta	4.19E-02	AGT	1
Cell Morphology	diameter	diameter of myofiber	4.19E-02	AGT	1
Cellular Development	differentiation	differentiation of bone marrow-derived mononuclear cells	4.19E-02	AGT	1
Hematological System Development and Function	differentiation	differentiation of bone marrow-derived mononuclear cells	4.19E-02	AGT	1

Hematopoiesis	differentiation	differentiation of bone marrow-derived mononuclear cells	4.19E-02	AGT	1
Developmental Disorder	dysplasia	dysplasia of mammary gland	4.19E-02	CSNK2A2	1
Reproductive System Disease	dysplasia	dysplasia of mammary gland	4.19E-02	CSNK2A2	1
Cellular Compromise	endoplasmic reticulum stress response	endoplasmic reticulum stress response of leukemia cell lines	4.19E-02	HSPA5	1
Cellular Function and Maintenance	endoplasmic reticulum stress response	endoplasmic reticulum stress response of leukemia cell lines	4.19E-02	HSPA5	1
Immunological Disease	enlargement	enlargement of lymph vessel	4.19E-02	AGT	1
Nervous System Development and Function	establishment	establishment of blood-brain barrier	4.19E-02	AGT	1
Organ Morphology	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Organismal Development	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Organ Development	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Tissue Development	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Embryonic Development	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Renal and Urological System Development and Function	expansion	expansion of mesangium	4.19E-02	LGALS3	1
Organismal Injury and Abnormalities	experimentally-induced hepatic fibrosis	experimentally-induced hepatic fibrosis	4.19E-02	LGALS3	1
Gastrointestinal Disease	experimentally-induced hepatic fibrosis	experimentally-induced hepatic fibrosis	4.19E-02	LGALS3	1
Hepatic System Disease	experimentally-induced hepatic fibrosis	experimentally-induced hepatic fibrosis	4.19E-02	LGALS3	1
Behavior	eyeblink conditioning	eyeblink conditioning	4.19E-02	PTPN4	1
Organismal Injury and Abnormalities	fibrosis	fibrosis of coronary artery	4.19E-02	AGT	1

Cardiovascular Disease	fibrosis	fibrosis of coronary artery	4.19E-02	AGT	1
Organismal Injury and Abnormalities	fibrosis	fibrosis of pericytes	4.19E-02	AGT	1
Connective Tissue Disorders	fibrosis	fibrosis of pericytes	4.19E-02	AGT	1
Organismal Injury and Abnormalities	fibrosis	fibrosis of perivascular matrix	4.19E-02	ANGPT2	1
Organ Development	formation	formation of lens	4.19E-02	BMPR1A	1
Visual System Development and Function	formation	formation of lens	4.19E-02	BMPR1A	1
Cardiovascular System Development and Function	formation	formation of vascular tissue	4.19E-02	ANGPT2	1
Tissue Development	formation	formation of vascular tissue	4.19E-02	ANGPT2	1
Cardiovascular Disease	fragmentation	fragmentation of elastic lamina	4.19E-02	AGT	1
Organ Development	function	function of lung	4.19E-02	TXN	1
Visual System Development and Function	growth	growth of lens	4.19E-02	NCOA6	1
Renal and Urological System Development and Function	growth	growth of renal glomerulus	4.19E-02	ANGPT2	1
Hereditary Disorder	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Gastrointestinal Disease	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Metabolic Disease	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Dermatological Diseases and Conditions	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Hematological Disease	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Hepatic System Disease	hepatoerythropoietic porphyria	hepatoerythropoietic porphyria	4.19E-02	UROD	1
Endocrine System Disorders	hypercorticosteronemia	hypercorticosteronemia	4.19E-02	NR1H3	1
Cardiovascular Disease	hypertrophy	hypertrophy of aorta	4.19E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of aorta	4.19E-02	AGT	1
Cardiovascular	hypertrophy	hypertrophy of	4.19E-02	AGT	1

Disease		coronary artery			
Developmental Disorder	hypertrophy	hypertrophy of coronary artery	4.19E-02	AGT	1
Developmental Disorder	hypertrophy	hypertrophy of muscle cell lines	4.19E-02	AGT	1
Skeletal and Muscular Disorders	hypertrophy	hypertrophy of muscle cell lines	4.19E-02	AGT	1
Free Radical Scavenging	induction	induction of superoxide	4.19E-02	AGT	1
Small Molecule Biochemistry	inhibition	inhibition of cyclic GMP	4.19E-02	AGT	1
Nucleic Acid Metabolism	inhibition	inhibition of cyclic GMP	4.19E-02	AGT	1
Molecular Transport	exocytosis	initiation of exocytosis of vesicles	4.19E-02	INPP5A	1
Cellular Assembly and Organization	exocytosis	initiation of exocytosis of vesicles	4.19E-02	INPP5A	1
Cellular Function and Maintenance	exocytosis	initiation of exocytosis of vesicles	4.19E-02	INPP5A	1
Cardiovascular Disease	intracranial arteriovenous malformation	intracranial arteriovenous malformation	4.19E-02	ANGPT2	1
Developmental Disorder	intracranial arteriovenous malformation	intracranial arteriovenous malformation	4.19E-02	ANGPT2	1
Cancer	invasion	invasion of trophoblast	4.19E-02	AGT	1
Embryonic Development	invasion	invasion of trophoblast	4.19E-02	AGT	1
Neurological Disease	juvenile onset Huntington disease	juvenile onset Huntington disease	4.19E-02	GRIK2	1
Skeletal and Muscular Disorders	juvenile onset Huntington disease	juvenile onset Huntington disease	4.19E-02	GRIK2	1
Hereditary Disorder	juvenile onset Huntington disease	juvenile onset Huntington disease	4.19E-02	GRIK2	1
Cell Death and Survival	killing	killing of brain cancer cell lines	4.19E-02	HSPA5	1
Cell Death and Survival	killing	killing of thymocytes	4.19E-02	LGALS3	1
Organ Morphology	lack	lack of choroid plexus	4.19E-02	NR1H3	1
Nervous System Development and Function	lack	lack of choroid plexus	4.19E-02	NR1H3	1

Table S8: Ingenuity IPA[®] analysis of tan module gene contents.

Category	Functions	Functions Annotation	p-Value	Molecules	# Molecules
Tissue Morphology	abnormal morphology	abnormal morphology of sternebrae	4.73E-05	CTGF,HOXB2,HOXB6,TASP1,TCF15,TSHZ1	6
Cancer	tumorigenesis	tumorigenesis of breast carcinoma	2.15E-04	AKT1,ERBB2,MTA1,PRDX1,PTPRE,STX2,THBS1	7
Reproductive System Disease	tumorigenesis	tumorigenesis of breast carcinoma	2.15E-04	AKT1,ERBB2,MTA1,PRDX1,PTPRE,STX2,THBS1	7
Cancer	tumorigenesis	tumorigenesis of mammary tumor	2.59E-04	AKT1,CCND1,CDK4,ERBB2,GADD45A,MTA1,PRDX1,PTPN1,PTPRE,STX2,THBS1	11
Reproductive System Disease	tumorigenesis	tumorigenesis of mammary tumor	2.59E-04	AKT1,CCND1,CDK4,ERBB2,GADD45A,MTA1,PRDX1,PTPN1,PTPRE,STX2,THBS1	11
Cardiovascular Disease	heart failure	heart failure	4.45E-04	ADM,ATP1A1,ATP1A2,ATP2A2,BCL2L1,CA2,CACNB2,CDK4,CTGF,DGCR8,EP300,GAB2,GATA4,GUCY1A3,HAND1,LIMS1,MAPK1,MTPN,NPPB,NR3C2,PDE7B,RXRA	22
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Embryonic Development	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Organ Development	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Organ Morphology	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Organismal Development	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of neural arch	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4
Tissue Development	abnormal morphology	abnormal morphology of	7.43E-04	HOXB2,ITGB1BP1,RARB,TSHZ1	4

		neural arch			
Connective Tissue Development and Function	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Embryonic Development	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Organ Development	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Organ Morphology	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Organismal Development	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Skeletal and Muscular System Development and Function	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Tissue Development	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Nervous System Development and Function	morphology	morphology of vertebral column	8.19E-04	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,SMARCAL1,TASP1,TCF15,TEAD2,THBS1	13
Nervous System Development and Function	excitatory postsynaptic potential	excitatory postsynaptic potential	8.88E-04	ADCY1,ADORA1,ADORA2A,CHST10,CPLX3,EPHA4,ERBB2,GRIN2C,PIP5K1C,RARB,SLC29A1	11
Cell-To-Cell	excitatory	excitatory	8.88E-04	ADCY1,ADORA1,A	11

Signaling and Interaction	postsynaptic potential	postsynaptic potential		DORA2A,CHST10,CPLX3,EPHA4,ERBB2,GRIN2C,PIP5K1C,RARB,SLC29A1	
Cardiovascular Disease	dysfunction	dysfunction of heart	1.11E-03	CACNB2,DSP,EP300,FSTL3,GATA4,ITGA5,NOX4,RXRA,TBX5	9
Organismal Injury and Abnormalities	dysfunction	dysfunction of heart	1.11E-03	CACNB2,DSP,EP300,FSTL3,GATA4,ITGA5,NOX4,RXRA,TBX5	9
Connective Tissue Development and Function	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Embryonic Development	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Organ Development	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Organ Morphology	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Organismal Development	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Skeletal and Muscular System Development and Function	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Tissue Development	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Nervous System Development and Function	morphology	morphology of vertebrae	1.42E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PKDCC,RARB,ROR2,TASP1,TCF15,TEAD2,THBS1	12
Skeletal and Muscular System	migration	migration of myoblasts	1.45E-03	SIX4,THBS4,TRPC1	3

Development and Function					
Cellular Movement	migration	migration of myoblasts	1.45E-03	SIX4,THBS4,TRPC1	3
Cell Death and Survival	apoptosis	apoptosis of granule cells	1.52E-03	ADORA1,AKT1,BAD,BCL2L1,CASP3,EP300,MEF2D,PRNP,SERPINF1	9
Cancer	tumorigenesis	tumorigenesis of mammary adenocarcinoma	1.57E-03	ERBB2,PRDX1,PTPRE,STX2,THBS1	5
Reproductive System Disease	tumorigenesis	tumorigenesis of mammary adenocarcinoma	1.57E-03	ERBB2,PRDX1,PTPRE,STX2,THBS1	5
Skeletal and Muscular System Development and Function	morphology	morphology of axial skeleton	1.59E-03	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PBX1,PKDCC,RARB,ROR2,RXRA,SMA,RCAL1,TASP1,TCF15,TEAD2,THBS1,TSZH1	16
Nucleic Acid Metabolism	synthesis	synthesis of cyclic GMP	1.75E-03	ADM,AKT1,ALDH2,GUCY1A3,NPPB,POMC	6
Small Molecule Biochemistry	synthesis	synthesis of cyclic GMP	1.75E-03	ADM,AKT1,ALDH2,GUCY1A3,NPPB,POMC	6
Tissue Development	adhesion	adhesion of squamous cell carcinoma cell lines	2.03E-03	AKT1,ITGA5,THBS1,ZYX	4
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of squamous cell carcinoma cell lines	2.03E-03	AKT1,ITGA5,THBS1,ZYX	4
Molecular Transport	transport	transport of monovalent inorganic cation	2.65E-03	ADORA1,AHCYL1,AKT1,ATP1A1,ATP1A2,ATP1B3,ATP6V1G2,C16orf7,CA2,KCNJ5,KCNMB1,NEDD4L,NR3C2,NSF,SCN1B,TSC1	16
Cancer	carcinoma	carcinoma in breast	2.76E-03	ADAMTS9,AKT1,CALD1,CALM1 (includes others),CASP3,CCND1,CDK4,CTDSPL,DACH1,ECM1,ERBB2,FSTL3,FZD1,HAND1,IFIT1,MT1X,MTA1,MYLK,PRDX1,PTPRE,RAB11FIP1,RBM39,SERPINF1,SLC27A1,SMG1,STX2,SYT13,THBS1,T	30

				UBA1A,WDR1	
Molecular Transport	flux	flux of monovalent inorganic cation	2.84E-03	BCL2L1,FXVD1,KC NJ5,MAPK1,NR3C2	5
Cellular Function and Maintenance	flux	flux of monovalent inorganic cation	2.84E-03	BCL2L1,FXVD1,KC NJ5,MAPK1,NR3C2	5
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Embryonic Development	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Organ Development	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Organ Morphology	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Organismal Development	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Tissue Development	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Nervous System Development and Function	abnormal morphology	abnormal morphology of vertebrae	3.07E-03	CTGF,FSTL1,HEXB ,HOXB6,ITGB1BP1, PKDCC,RARB,ROR 2,TASP1,TCF15,TE AD2	11
Nervous System Development and Function	action potential	action potential of cells	3.36E-03	ADCY1,ADORA1,A DORA2A,ATP1A2,C ALM1 (includes others),CHST10,ER BB2,PRNP,RARB,S CN1B	10
Cell-To-Cell Signaling and	action potential	action potential of cells	3.36E-03	ADCY1,ADORA1,A DORA2A,ATP1A2,C	10

Interaction				ALM1 (includes others),CHST10,ERBB2,PRNP,RARB,SCN1B	
Organismal Development	development	development of multicellular organism	3.38E-03	ADAMTS9,AES,ANGPTL2,EMP1,GATA4,HOXB2,KRT8,MM P11,POMT1,ROR2,SERPINF1,VCAN	12
Developmental Disorder	meiotic nondisjunction	meiotic nondisjunction	3.43E-03	ABCG1,CCND1,CRELD1,DLL1,GRIN2C,U2AF1,UBB	7
Hereditary Disorder	meiotic nondisjunction	meiotic nondisjunction	3.43E-03	ABCG1,CCND1,CRELD1,DLL1,GRIN2C,U2AF1,UBB	7
Nervous System Development and Function	action potential	action potential of neurons	3.58E-03	ADCY1,ADORA1,ADORA2A,ATP1A2,CHST10,ERBB2,PRNP,RARB,SCN1B	9
Cell-To-Cell Signaling and Interaction	action potential	action potential of neurons	3.58E-03	ADCY1,ADORA1,ADORA2A,ATP1A2,CHST10,ERBB2,PRNP,RARB,SCN1B	9
Cardiovascular Disease	congenital heart disease	congenital heart disease	4.11E-03	CRELD1,DGCR8,DCPD,DSP,GATA4,GJA5,JUP,PBX1,RARB,ROR2,RXRA,TEAD2	12
Developmental Disorder	congenital heart disease	congenital heart disease	4.11E-03	CRELD1,DGCR8,DCPD,DSP,GATA4,GJA5,JUP,PBX1,RARB,ROR2,RXRA,TEAD2	12
Nervous System Development and Function	excitatory postsynaptic potential	excitatory postsynaptic potential of neurons	4.20E-03	ADCY1,ADORA1,ADORA2A,CHST10,ERBB2,RARB	6
Cell-To-Cell Signaling and Interaction	excitatory postsynaptic potential	excitatory postsynaptic potential of neurons	4.20E-03	ADCY1,ADORA1,ADORA2A,CHST10,ERBB2,RARB	6
Cell Death and Survival	cell death	cell death of granule cells	4.24E-03	ADORA1,AKT1,BAD,BCL2L1,CASP3,EP300,FAIM2,MEF2D,PRNP,SERPINF1	10
Dermatological Diseases and Conditions	eczema	eczema	4.31E-03	ARHGDI1A,RARB,RPS6KA5,RXRA	4
Inflammatory Disease	eczema	eczema	4.31E-03	ARHGDI1A,RARB,RPS6KA5,RXRA	4
Cardiovascular Disease	arrhythmia	arrhythmia	4.34E-03	ADORA1,ADORA2A,ATP1A1,ATP1A2,ATP2A2,CACNB2,GJA5,JUP,KCNJ5,KCNMB1,NPPB,NR3C2,	14

				SCN1B,TBX5	
Digestive System Development and Function	morphogenesis	morphogenesis of gastrointestinal tract	4.73E-03	GATA4,SFRP1,SFRP5,STX2,VANGL2	5
Cardiovascular Disease	congenital anomaly of cardiovascular system	congenital anomaly of cardiovascular system	5.10E-03	CRELD1,DGCR8,DPCD,DSP,GATA4,GJA5,JUP,PBX1,RARB,ROR2,RXRA,TBX5,TEAD2	13
Developmental Disorder	congenital anomaly of cardiovascular system	congenital anomaly of cardiovascular system	5.10E-03	CRELD1,DGCR8,DPCD,DSP,GATA4,GJA5,JUP,PBX1,RARB,ROR2,RXRA,TBX5,TEAD2	13
Cardiovascular Disease	supraventricular arrhythmia	supraventricular arrhythmia	5.29E-03	ADORA1,ADORA2A,ATP1A1,ATP1A2,ATP2A2,GJA5,KCNJ5,KCNMB1,NPPB,NR3C2	10
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Embryonic Development	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Organ Development	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Organ Morphology	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Organismal Development	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Tissue Development	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Nervous System Development and Function	abnormal morphology	abnormal morphology of axis	5.30E-03	FSTL1,PKDCC,TASP1	3
Organ Morphology	abnormal morphology	abnormal morphology of barrel cortex	5.30E-03	ADCY1,EPHA4,NR2F1	3
Nervous System Development and Function	abnormal morphology	abnormal morphology of barrel cortex	5.30E-03	ADCY1,EPHA4,NR2F1	3

Organ Morphology	abnormal morphology	abnormal morphology of stratum spinosum	5.30E-03	AKT1,DSC1,JUP	3
Cellular Function and Maintenance	assembly	assembly of olfactory cilia	5.30E-03	BBS1,BBS4,VANGL2	3
Cell Morphology	assembly	assembly of olfactory cilia	5.30E-03	BBS1,BBS4,VANGL2	3
Cellular Assembly and Organization	assembly	assembly of olfactory cilia	5.30E-03	BBS1,BBS4,VANGL2	3
Cancer	pulmonary metastases	pulmonary metastases	5.30E-03	AKT1,ERBB2,ITGA5	3
Small Molecule Biochemistry	regulation	regulation of L-amino acid	5.30E-03	ADORA2A,MTHFR,SLC29A1	3
Amino Acid Metabolism	regulation	regulation of L-amino acid	5.30E-03	ADORA2A,MTHFR,SLC29A1	3
Cellular Movement	cell movement	cell movement of myeloid cells	5.72E-03	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1D,CBFB,CCND1,CD151,COL4A1,CTGF,DARC,EPAS1,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NR3C2,NTN1,PIP5K1C,POMC,PRNP,QPCT,RTN4,SEMA4D,SFRP1,SWAP70,THBS1,THBS4,TNF AIP3,TSC1	34
Hematological System Development and Function	cell movement	cell movement of myeloid cells	5.72E-03	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1D,CBFB,CCND1,CD151,COL4A1,CTGF,DARC,EPAS1,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NR3C2,NTN1,PIP5K1C,POMC,PRNP,QPCT,RTN4,SEMA4D,SFRP1,SWAP70,THBS1,THBS4,TNF AIP3,TSC1	34
Immune Cell Trafficking	cell movement	cell movement of myeloid cells	5.72E-03	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1D,CBFB,CCND1,CD151,COL4A1,CTGF,DARC,EPAS1,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NR3C2,NTN1,PIP	34

				5K1C,POMC,PRNP,QPCT,RTN4,SEMA4D,SFRP1,SWAP70,THBS1,THBS4,TNF AIP3,TSC1	
Molecular Transport	transport	transport of K+	5.86E-03	ADORA1,ATP1A1,ATP1A2,ATP1B3,KCNJ5,KCNMB1,NR3C2,NSF,TSC1	9
Cancer	breast cancer	breast cancer	5.96E-03	ADAMTS9,AKT1,ARHGDI1,ATRAID,BAD,CALD1,CALM1 (includes others),CASP3,CASP9,CCND1,CDK4,CLGN,CPEB2,CTDSP,CTGF,DACH1,ECM1,EGLN2,ELOVL6,EP300,ERBB2,FFIT1,FSTL3,FZD1,GRIN2C,GSTM2,H2AFY,HAND1,HIBADH,HOXB6,IFIT1,IL32,KRT8,MMP11,MT1XM,MTA1,MYLK,NEU1,NME1,NPEPPS,NRIP1,POLE4,PRDX1,PRR15L,PRRC1,PTPRE,RAB11FIP1,RANBP1,RARB,RBM39,RND3,RPL6,RRP12,SERPINF1,SFRP1,SFRP5,SLC27A1,SMG1,SOSTDC1,SOX7,STX2,STYXL1,SYT13,THBS1,TUBA1A,TUBA1B,VCAN,WDR1,ZYX	69
Cellular Movement	cell movement	cell movement of granulocytes	6.12E-03	ADM,ADORA1,ADORA2A,ARHGAP1,CAMK1D,CBFB,CD151,CTGF,DARC,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NTN1,PIP5K1C,POMC,RTN4,SFRP1,SWAP70,THBS4,TNFAIP3,TSC1	24
Hematological System Development and Function	cell movement	cell movement of granulocytes	6.12E-03	ADM,ADORA1,ADORA2A,ARHGAP1,CAMK1D,CBFB,CD151,CTGF,DARC,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NTN1,PIP5K1C,POMC,RTN4,SFRP1,	24

				SWAP70,THBS4,TNFAIP3,TSC1	
Immune Cell Trafficking	cell movement	cell movement of granulocytes	6.12E-03	ADM,ADORA1,ADORA2A,ARHGAP1,CAMK1D,CBFB,CD151,CTGF,DARC,ERBB2,FCGR2A,IL27RA,JAM3,MYLK,MYLK3,NTN1,PIP5K1C,POMC,RTN4,SFRP1,SWAP70,THBS4,TNFAIP3,TSC1	24
Cell Death and Survival	apoptosis	apoptosis of granulosa cells	7.36E-03	AKT1,BAD,CASP3,CTGF,THBS1	5
Developmental Disorder	atresia	atresia	7.36E-03	ATP1A1,ATP1A2,GATA4,RXRA,TSHZ1	5
Tissue Development	formation	formation of extracellular matrix	7.36E-03	ADM,AKT1,ROR2,TNFAIP6,VCAN	5
Tissue Morphology	vasodilation	vasodilation of aorta	7.36E-03	ADM,ADORA2A,AKT1,ALDH2,THBS1	5
Organismal Development	vasodilation	vasodilation of aorta	7.36E-03	ADM,ADORA2A,AKT1,ALDH2,THBS1	5
Cardiovascular System Development and Function	vasodilation	vasodilation of aorta	7.36E-03	ADM,ADORA2A,AKT1,ALDH2,THBS1	5
Cancer	mammary tumor	mammary tumor	7.61E-03	ADAMTS9,AKT1,ARHGDI1,ATRAID,BAD,CALD1,CALM1 (includes others),CASP3,CASP9,CCND1,CDK4,CLGN,CPEB2,CTD SPL,CTGF,DACH1,ECM1,EGLN2,ELOVL6,EP300,ERBB2,FDFT1,FEN1,FSTL3,FZD1,GADD45A,GRIIN2C,GSTM2,H2AFY,HAND1,HIBADH,H OXB6,IFIT1,IL32,KRT8,MMP11,MT1X,MTA1,MYLK,NEU1,NME1,NPEPPS,NRIP1,PCSK7,POLE4,PRDX1,PRR15L,PRRC1,PTPN1,PTPRE,RAB11FIP1,RANBP1,RARB,RBM39,RND3,RPL6,RRP12,SRPINF1,SFRP1,SFRP5,SLC27A1,SMG1,SOSTDC1,SOX7,STX2,STYXL1,SYT	73

				13,THBS1,TUBA1A, TUBA1B,VCAN,WD R1,ZYX	
Cell-To-Cell Signaling and Interaction	fusion	fusion of plasma membrane	7.85E-03	NSF,RND2,SEC22B ,STX2	4
Cellular Assembly and Organization	fusion	fusion of plasma membrane	7.85E-03	NSF,RND2,SEC22B ,STX2	4
Nervous System Development and Function	projection	projection of axons	7.85E-03	NR2F1,NR3C2,NTN 1,RTN4	4
Cell Morphology	projection	projection of axons	7.85E-03	NR2F1,NR3C2,NTN 1,RTN4	4
Cellular Assembly and Organization	projection	projection of axons	7.85E-03	NR2F1,NR3C2,NTN 1,RTN4	4
Cell Morphology	shape change	shape change of gonadal cell lines	7.85E-03	AKT1,ARHGAP24,D IAPH1,NSF	4
Gastrointestinal Disease	vomiting	vomiting	7.85E-03	ATP1A1,ATP1A2,C A2,GRIN2C	4
Cellular Movement	cell movement	cell movement of neutrophils	8.38E-03	ADM,ADORA1,ADO RA2A,ARHGAP1,C AMK1D,CD151,CTG F,DARC,ERBB2,FC GR2A,JAM3,MYLK, MYLK3,NTN1,PIP5 K1C,RTN4,SFRP1,T HBS4,TNFAIP3,TS C1	20
Hematological System Development and Function	cell movement	cell movement of neutrophils	8.38E-03	ADM,ADORA1,ADO RA2A,ARHGAP1,C AMK1D,CD151,CTG F,DARC,ERBB2,FC GR2A,JAM3,MYLK, MYLK3,NTN1,PIP5 K1C,RTN4,SFRP1,T HBS4,TNFAIP3,TS C1	20
Immune Cell Trafficking	cell movement	cell movement of neutrophils	8.38E-03	ADM,ADORA1,ADO RA2A,ARHGAP1,C AMK1D,CD151,CTG F,DARC,ERBB2,FC GR2A,JAM3,MYLK, MYLK3,NTN1,PIP5 K1C,RTN4,SFRP1,T HBS4,TNFAIP3,TS C1	20
Inflammatory Response	cell movement	cell movement of neutrophils	8.38E-03	ADM,ADORA1,ADO RA2A,ARHGAP1,C AMK1D,CD151,CTG F,DARC,ERBB2,FC GR2A,JAM3,MYLK,	20

				MYLK3,NTN1,PIP5 K1C,RTN4,SFRP1,T HBS4,TNFAIP3,TS C1	
Molecular Transport	transport	transport of ion	8.40E-03	ADORA1,AHCYL1,A KAP7,AKT1,AQP7,A TP1A1,ATP1A2,AT P1B3,ATP2A2,ATP6 V1G2,C16orf7,CA2, CACNB2,FXDY1,G RIN2C,KCNJ5,KCN MB1,NEDD4L,NIPA 2,NR3C2,NSF,PCY OX1,PPP1R1A,SCN 1B,SLC30A3,SLC4A 3,TRPC1,TSC1	28
Tissue Morphology	quantity	quantity of neuroendocrine cells	8.51E-03	AKT1,CDK4,DACH1 ,FSTL3,NTN1,POM C	6
Endocrine System Development and Function	quantity	quantity of neuroendocrine cells	8.51E-03	AKT1,CDK4,DACH1 ,FSTL3,NTN1,POM C	6
Developmental Disorder	trisomy	trisomy	8.51E-03	ABCG1,CCND1,CR ELD1,DLL1,GRIN2C ,UBB	6
Hereditary Disorder	trisomy	trisomy	8.51E-03	ABCG1,CCND1,CR ELD1,DLL1,GRIN2C ,UBB	6
Cell Death and Survival	apoptosis	apoptosis of endothelial cells	8.57E-03	ADM,AKT1,ALDH2, BCL2L1,CASP3,CA SP9,DDIT3,ICMT,IT SN1,MAPK1,NTN1, PRDX6,SERPINF1, TBX5,THBS1,TNFAI P3	16
Tissue Development	adhesion	adhesion of extracellular matrix	9.12E-03	CD151,CTGF,ITGA 5,ITGB1BP1,JAM3, LIMS1,THBS1,TSC1 ,VCAN	9
Cell Death and Survival	apoptosis	apoptosis of vascular endothelial cells	9.69E-03	ADM,AKT1,ALDH2, BCL2L1,CASP3,CA SP9,DDIT3,ITSN1, MAPK1,THBS1	10
Embryonic Development	development	development of ear	9.92E-03	AKT1,DLL1,MCOLN 3,NR2F1,NTN1,OS R1,ROR2,SIX4,TCF 15,TSHZ1,VANGL2	11
Organ Development	development	development of ear	9.92E-03	AKT1,DLL1,MCOLN 3,NR2F1,NTN1,OS R1,ROR2,SIX4,TCF 15,TSHZ1,VANGL2	11
Organismal Development	development	development of ear	9.92E-03	AKT1,DLL1,MCOLN 3,NR2F1,NTN1,OS R1,ROR2,SIX4,TCF	11

				15,TSHZ1,VANGL2	
Tissue Development	development	development of ear	9.92E-03	AKT1,DLL1,MCOLN3,NR2F1,NTN1,OSR1,ROR2,SIX4,TCF15,TSHZ1,VANGL2	11
Auditory and Vestibular System Development and Function	development	development of ear	9.92E-03	AKT1,DLL1,MCOLN3,NR2F1,NTN1,OSR1,ROR2,SIX4,TCF15,TSHZ1,VANGL2	11
Organismal Injury and Abnormalities	injury	injury of kidney	1.02E-02	ADM,ADORA1,ADORA2A,ARHGDI A,FCGR2A,NR3C2,NTN1,THBS1	8
Renal and Urological Disease	injury	injury of kidney	1.02E-02	ADM,ADORA1,ADORA2A,ARHGDI A,FCGR2A,NR3C2,NTN1,THBS1	8
Cell Death and Survival	cell death	cell death of endothelial cells	1.04E-02	ADM,AKT1,ALDH2,BCL2L1,CASP3,CASP9,DDIT3,ICMT,IL32,ITSN1,MAPK1,NTN1,PRDX6,SERPINF1,TBX5,THBS1,TNFAIP3	17
Cardiovascular Disease	hypertrophy	hypertrophy of right ventricle	1.09E-02	EPAS1,GUCY1A3,MYLK3,PBX1,PBX3	5
Developmental Disorder	hypertrophy	hypertrophy of right ventricle	1.09E-02	EPAS1,GUCY1A3,MYLK3,PBX1,PBX3	5
Tissue Morphology	vasodilation	vasodilation of artery	1.12E-02	ADM,ADORA2A,AKT1,ALDH2,GUCY1A3,PTPN1,THBS1	7
Organismal Development	vasodilation	vasodilation of artery	1.12E-02	ADM,ADORA2A,AKT1,ALDH2,GUCY1A3,PTPN1,THBS1	7
Cardiovascular System Development and Function	vasodilation	vasodilation of artery	1.12E-02	ADM,ADORA2A,AKT1,ALDH2,GUCY1A3,PTPN1,THBS1	7
Cell Death and Survival	cell death	cell death of vascular endothelial cells	1.18E-02	ADM,AKT1,ALDH2,BCL2L1,CASP3,CASP9,DDIT3,IL32,ITSN1,MAPK1,THBS1	11
Cancer	ductal carcinoma	ductal carcinoma	1.18E-02	AKT1,CCND1,ECM1,ERBB2,HAND1,MT1X,MTA1,RAB11FIP1,RBM39,SERPINF1,SMG1	11
Embryonic Development	abnormal morphology	abnormal morphology of sclera	1.21E-02	ADORA2A,RARB,RXRA	3
Organ Development	abnormal morphology	abnormal morphology of sclera	1.21E-02	ADORA2A,RARB,RXRA	3
Organ	abnormal	abnormal	1.21E-02	ADORA2A,RARB,RXRA	3

Morphology	morphology	morphology of sclera		XRA	
Organismal Development	abnormal morphology	abnormal morphology of sclera	1.21E-02	ADORA2A,RARB,RXRA	3
Tissue Development	abnormal morphology	abnormal morphology of sclera	1.21E-02	ADORA2A,RARB,RXRA	3
Visual System Development and Function	abnormal morphology	abnormal morphology of sclera	1.21E-02	ADORA2A,RARB,RXRA	3
Reproductive System Development and Function	acrosome reaction	acrosome reaction of sperm	1.21E-02	NSF,PRNP,PTPN1	3
Connective Tissue Development and Function	activation	activation of fibroblasts	1.21E-02	CCND1,CDK4,IFNAR2	3
Cell-To-Cell Signaling and Interaction	activation	activation of fibroblasts	1.21E-02	CCND1,CDK4,IFNAR2	3
Cell Death and Survival	cell death	cell death of medium spiny neurons	1.21E-02	ADORA2A,CASP3,CASP9	3
Cell Death and Survival	condensation	condensation of cells	1.21E-02	BCL2L1,CASP3,EMP1	3
Embryonic Development	development	development of striatum	1.21E-02	BBS1,BBS4,RARB	3
Organ Development	development	development of striatum	1.21E-02	BBS1,BBS4,RARB	3
Organismal Development	development	development of striatum	1.21E-02	BBS1,BBS4,RARB	3
Tissue Development	development	development of striatum	1.21E-02	BBS1,BBS4,RARB	3
Nervous System Development and Function	development	development of striatum	1.21E-02	BBS1,BBS4,RARB	3
Cancer	ductal carcinoma in situ	ductal carcinoma in situ	1.21E-02	AKT1,ERBB2,RBM39	3
Molecular Transport	efflux	efflux of monovalent inorganic cation	1.21E-02	BCL2L1,FXVD1,MAPK1	3
Cellular Function and Maintenance	efflux	efflux of monovalent inorganic cation	1.21E-02	BCL2L1,FXVD1,MAPK1	3
Molecular Transport	flux	flux of Na+	1.21E-02	FXVD1,KCNJ5,NR3C2	3
Cellular Function and Maintenance	flux	flux of Na+	1.21E-02	FXVD1,KCNJ5,NR3C2	3
Cancer	islet-cell adenoma	islet-cell adenoma	1.21E-02	ATP1A1,ATP1A2,PRDX1	3

Gastrointestinal Disease	islet-cell adenoma	islet-cell adenoma	1.21E-02	ATP1A1,ATP1A2,P RDX1	3
Endocrine System Disorders	islet-cell adenoma	islet-cell adenoma	1.21E-02	ATP1A1,ATP1A2,P RDX1	3
Tissue Morphology	quantity	quantity of microvessel	1.21E-02	ADAMTS9,ERBB2,T HBS4	3
Organismal Development	quantity	quantity of microvessel	1.21E-02	ADAMTS9,ERBB2,T HBS4	3
Cardiovascular System Development and Function	quantity	quantity of microvessel	1.21E-02	ADAMTS9,ERBB2,T HBS4	3
Small Molecule Biochemistry	synthesis	synthesis of sulfur amino acid	1.21E-02	MTHFR,MTR,SHMT 2	3
Amino Acid Metabolism	synthesis	synthesis of sulfur amino acid	1.21E-02	MTHFR,MTR,SHMT 2	3
Cancer	Zollinger-Ellison syndrome	Zollinger-Ellison syndrome	1.28E-02	ATP1A1,ATP1A2	2
Gastrointestinal Disease	Zollinger-Ellison syndrome	Zollinger-Ellison syndrome	1.28E-02	ATP1A1,ATP1A2	2
Endocrine System Disorders	Zollinger-Ellison syndrome	Zollinger-Ellison syndrome	1.28E-02	ATP1A1,ATP1A2	2
Tissue Morphology	abnormal morphology	abnormal morphology of hypoglossal nerve	1.28E-02	ERBB2,RARB	2
Nervous System Development and Function	abnormal morphology	abnormal morphology of hypoglossal nerve	1.28E-02	ERBB2,RARB	2
Tissue Morphology	abnormal morphology	abnormal morphology of sagittal suture	1.28E-02	CASP3,ITGB1BP1	2
Organ Morphology	abnormal morphology	abnormal morphology of small adrenal gland	1.28E-02	PBX1,POMC	2
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Embryonic Development	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Organ Development	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Organ Morphology	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Organismal	abnormal	abnormal	1.28E-02	FSTL1,ROR2	2

Development	morphology	morphology of stylopod			
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Tissue Development	abnormal morphology	abnormal morphology of stylopod	1.28E-02	FSTL1,ROR2	2
Dermatological Diseases and Conditions	acantholysis	acantholysis	1.28E-02	DSC1,JUP	2
Cell Death and Survival	apoptosis	apoptosis of blood platelets	1.28E-02	BCL2L1,CASP9	2
Cell Death and Survival	apoptosis	apoptosis of medium spiny neurons	1.28E-02	CASP3,CASP9	2
Cell Cycle	G1 phase	arrest in G1 phase of neuroblastoma cell lines	1.28E-02	CCND1,CDK4	2
Cardiovascular Disease	atrioventricular septal defect and common atrioventricular junction	atrioventricular septal defect and common atrioventricular junction	1.28E-02	CRELD1,GATA4	2
Developmental Disorder	atrioventricular septal defect and common atrioventricular junction	atrioventricular septal defect and common atrioventricular junction	1.28E-02	CRELD1,GATA4	2
Cell-To-Cell Signaling and Interaction	binding	binding of dopamine	1.28E-02	ADORA1,ADORA2A	2
Small Molecule Biochemistry	binding	binding of dopamine	1.28E-02	ADORA1,ADORA2A	2
Drug Metabolism	binding	binding of dopamine	1.28E-02	ADORA1,ADORA2A	2
Skeletal and Muscular System Development and Function	cell cycle progression	cell cycle progression of skeletal muscle satellite cells	1.28E-02	CCND1,CDK4	2
Cell Cycle	cell cycle progression	cell cycle progression of skeletal muscle satellite cells	1.28E-02	CCND1,CDK4	2
Cell Death and Survival	cell death	cell death of naive helper T cells	1.28E-02	CASP3,CASP9	2
Organismal Injury and Abnormalities	chronic lower back pain	chronic lower back pain	1.28E-02	GRIN2C,SCN1B	2
Tumor	clearance	clearance of	1.28E-02	CD151,NME1	2

Morphology		tumor			
Cell Death and Survival	colony survival	colony survival of lymphoma cell lines	1.28E-02	BCL2L1,CCND1	2
Cellular Function and Maintenance	colony survival	colony survival of lymphoma cell lines	1.28E-02	BCL2L1,CCND1	2
Connective Tissue Development and Function	cytotoxicity	cytotoxicity of fibroblast cell lines	1.28E-02	ERBB2,TNFAIP3	2
Cell Death and Survival	cytotoxicity	cytotoxicity of fibroblast cell lines	1.28E-02	ERBB2,TNFAIP3	2
Cancer	tumorigenesis	delay in tumorigenesis of mammary tumor	1.28E-02	ERBB2,PTPN1	2
Reproductive System Disease	tumorigenesis	delay in tumorigenesis of mammary tumor	1.28E-02	ERBB2,PTPN1	2
Cardiovascular Disease	diastolic heart failure	diastolic heart failure	1.28E-02	CTGF,NR3C2	2
Cellular Assembly and Organization	dilation	dilation of endoplasmic reticulum	1.28E-02	CASP3,CASP9	2
Cancer	endocrine adenoma	endocrine adenoma	1.28E-02	ATP1A1,ATP1A2	2
Inflammatory Disease	erosive esophagitis	erosive esophagitis	1.28E-02	ATP1A1,ATP1A2	2
Gastrointestinal Disease	erosive esophagitis	erosive esophagitis	1.28E-02	ATP1A1,ATP1A2	2
Behavior	escape behavior	escape behavior	1.28E-02	ADORA1,ADORA2A	2
Developmental Disorder	esophageal atresia	esophageal atresia	1.28E-02	ATP1A1,ATP1A2	2
Gastrointestinal Disease	esophageal atresia	esophageal atresia	1.28E-02	ATP1A1,ATP1A2	2
Developmental Disorder	exophthalmos	exophthalmos	1.28E-02	ITGB1BP1,MTHFR	2
Ophthalmic Disease	exophthalmos	exophthalmos	1.28E-02	ITGB1BP1,MTHFR	2
Tissue Development	formation	formation of desmosomes	1.28E-02	DSP,JUP	2
Cell-To-Cell Signaling and Interaction	formation	formation of desmosomes	1.28E-02	DSP,JUP	2
Cellular Function and Maintenance	formation	formation of desmosomes	1.28E-02	DSP,JUP	2
Cellular Assembly and Organization	formation	formation of desmosomes	1.28E-02	DSP,JUP	2
Nervous System Development and Function	function	function of GABAergic neurons	1.28E-02	ADORA1,ADORA2A	2

Cellular Function and Maintenance	function	function of GABAergic neurons	1.28E-02	ADORA1,ADORA2A	2
Skeletal and Muscular System Development and Function	fusion	fusion of neural arch	1.28E-02	RARB,TSHZ1	2
Dermatological Diseases and Conditions	hand dermatosis	hand dermatosis	1.28E-02	RARB,RXRA	2
Endocrine System Disorders	hyperaldosteronism	hyperaldosteronism	1.28E-02	KCNJ5,NR3C2	2
Metabolic Disease	hyperaldosteronism	hyperaldosteronism	1.28E-02	KCNJ5,NR3C2	2
Cancer	hyperplasia	hyperplasia of gastric epithelium	1.28E-02	ATP2A2,THBS1	2
Gastrointestinal Disease	hyperplasia	hyperplasia of gastric epithelium	1.28E-02	ATP2A2,THBS1	2
Hematological System Development and Function	inactivation	inactivation of lymphocytes	1.28E-02	ADORA2A,POMC	2
Cellular Development	inactivation	inactivation of lymphocytes	1.28E-02	ADORA2A,POMC	2
Cell Morphology	integrity	integrity of adherens junctions	1.28E-02	PIP5K1C,ZYX	2
Cellular Assembly and Organization	integrity	integrity of adherens junctions	1.28E-02	PIP5K1C,ZYX	2
Cellular Movement	invasion	invasion of central nervous system cells	1.28E-02	B4GALT5,ERBB2	2
Cell Death and Survival	killing	killing of cervical cancer cell lines	1.28E-02	AKT1,BCL2L1	2
Organ Morphology	lack	lack of barrel cortex	1.28E-02	ADCY1,NR2F1	2
Nervous System Development and Function	lack	lack of barrel cortex	1.28E-02	ADCY1,NR2F1	2
Cellular Development	lifespan	lifespan of chronic lymphocytic leukemia B cells	1.28E-02	PLXNB1,SEMA4D	2
Organismal Injury and Abnormalities	malformation	malformation of aortic valve	1.28E-02	PBX1,PBX3	2
Developmental Disorder	malformation	malformation of aortic valve	1.28E-02	PBX1,PBX3	2
Organismal	malformation	malformation of	1.28E-02	PBX1,PBX3	2

Injury and Abnormalities		pulmonary valve			
Developmental Disorder	malformation	malformation of pulmonary valve	1.28E-02	PBX1,PBX3	2
Cancer	metastasis	metastasis of medulloblastoma	1.28E-02	CDCA7L,ERBB2	2
Neurological Disease	metastasis	metastasis of medulloblastoma	1.28E-02	CDCA7L,ERBB2	2
Cardiovascular Disease	mitochondrial myopathy	mitochondrial myopathy	1.28E-02	GOLPH3,PUS1	2
Metabolic Disease	mitochondrial myopathy	mitochondrial myopathy	1.28E-02	GOLPH3,PUS1	2
Neurological Disease	mitochondrial myopathy	mitochondrial myopathy	1.28E-02	GOLPH3,PUS1	2
Skeletal and Muscular Disorders	mitochondrial myopathy	mitochondrial myopathy	1.28E-02	GOLPH3,PUS1	2
Inflammatory Disease	mucositis	mucositis	1.28E-02	GRIN2C,MTHFR	2
Gastrointestinal Disease	mucositis	mucositis	1.28E-02	GRIN2C,MTHFR	2
Nervous System Development and Function	neurological function	neurological function of central nervous system	1.28E-02	ADORA1,ADORA2A	2
Gastrointestinal Disease	non-erosive reflux disease	non-erosive reflux disease	1.28E-02	ATP1A1,ATP1A2	2
Gastrointestinal Disease	peptic disorder	peptic disorder	1.28E-02	ATP1A1,ATP1A2	2
Small Molecule Biochemistry	peroxidation	peroxidation of phospholipid	1.28E-02	NOX4,PRDX6	2
Cellular Compromise	peroxidation	peroxidation of phospholipid	1.28E-02	NOX4,PRDX6	2
Lipid Metabolism	peroxidation	peroxidation of phospholipid	1.28E-02	NOX4,PRDX6	2
Nervous System Development and Function	projection	projection of thalamocortical axons	1.28E-02	NR2F1,NTN1	2
Cell Morphology	projection	projection of thalamocortical axons	1.28E-02	NR2F1,NTN1	2
Cellular Assembly and Organization	projection	projection of thalamocortical axons	1.28E-02	NR2F1,NTN1	2
Cellular Development	proliferation	proliferation of mammary tumor	1.28E-02	AKT1,ERBB2	2
Cellular Growth and Proliferation	proliferation	proliferation of mammary tumor	1.28E-02	AKT1,ERBB2	2
Tumor Morphology	proliferation	proliferation of mammary tumor	1.28E-02	AKT1,ERBB2	2
Cell-To-Cell	quantity	quantity of	1.28E-02	DSP,ERBB2	2

Signaling and Interaction		adherens junctions			
Cellular Assembly and Organization	quantity	quantity of adherens junctions	1.28E-02	DSP,ERBB2	2
Cancer	quantity	quantity of mammary tumor	1.28E-02	CDK4,ERBB2	2
Reproductive System Disease	quantity	quantity of mammary tumor	1.28E-02	CDK4,ERBB2	2
Tissue Morphology	quantity	quantity of mural cells	1.28E-02	EPAS1,VASH1	2
Cancer	quantity	quantity of pulmonary metastases	1.28E-02	AKT1,ERBB2	2
Connective Tissue Development and Function	reactivation	reactivation of fibroblasts	1.28E-02	CCND1,CDK4	2
Cell-To-Cell Signaling and Interaction	reactivation	reactivation of fibroblasts	1.28E-02	CCND1,CDK4	2
Cell Signaling	removal	removal of Ca ²⁺	1.28E-02	ATP2A2,SLC27A1	2
Vitamin and Mineral Metabolism	removal	removal of Ca ²⁺	1.28E-02	ATP2A2,SLC27A1	2
Cardiovascular Disease	salt-sensitive essential hypertension	salt-sensitive essential hypertension	1.28E-02	CORIN,NEDD4L	2
Cell Morphology	size	size of megakaryocytes	1.28E-02	CCND1,CDK4	2
Inflammatory Response	size	size of megakaryocytes	1.28E-02	CCND1,CDK4	2
Hematopoiesis	size	size of megakaryocytes	1.28E-02	CCND1,CDK4	2
Lymphoid Tissue Structure and Development	size	size of megakaryocytes	1.28E-02	CCND1,CDK4	2
Cancer	sporadic mastocytosis	sporadic mastocytosis	1.28E-02	ATP1A1,ATP1A2	2
Organismal Injury and Abnormalities	sporadic mastocytosis	sporadic mastocytosis	1.28E-02	ATP1A1,ATP1A2	2
Hematological Disease	sporadic mastocytosis	sporadic mastocytosis	1.28E-02	ATP1A1,ATP1A2	2
Immunological Disease	sporadic mastocytosis	sporadic mastocytosis	1.28E-02	ATP1A1,ATP1A2	2
Cardiovascular Disease	stenosis	stenosis of mitral valve	1.28E-02	GJA5,RXRA	2
Organismal Injury and Abnormalities	stenosis	stenosis of mitral valve	1.28E-02	GJA5,RXRA	2
Small Molecule Biochemistry	synthesis	synthesis of L-methionine	1.28E-02	MTHFR,MTR	2

Amino Acid Metabolism	synthesis	synthesis of L-methionine	1.28E-02	MTHFR,MTR	2
Small Molecule Biochemistry	synthesis	synthesis of cardiolipin	1.28E-02	PGS1,SLC27A1	2
Lipid Metabolism	synthesis	synthesis of cardiolipin	1.28E-02	PGS1,SLC27A1	2
Tissue Morphology	vasodilation	vasodilation of abdominal aorta	1.28E-02	ADM,AKT1	2
Organismal Development	vasodilation	vasodilation of abdominal aorta	1.28E-02	ADM,AKT1	2
Cardiovascular System Development and Function	vasodilation	vasodilation of abdominal aorta	1.28E-02	ADM,AKT1	2
Nervous System Development and Function	waking	waking	1.28E-02	ADORA1,ADORA2A	2
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Embryonic Development	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Organ Development	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Organ Morphology	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Organismal Development	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Tissue Development	abnormal morphology	abnormal morphology of middle ear ossicle	1.29E-02	PBX1,RARB,ROR2,TSHZ1	4
Cellular Growth and Proliferation	colony formation	colony formation of epithelial cell lines	1.29E-02	CCND1,ERBB2,MAPK1,PRCC	4
Hair and Skin Development and Function	colony formation	colony formation of epithelial cell lines	1.29E-02	CCND1,ERBB2,MAPK1,PRCC	4
Cell Morphology	size	size of mitochondria	1.29E-02	BCL2L1,CCND1,EP300,KRT8	4

Cellular Assembly and Organization	size	size of mitochondria	1.29E-02	BCL2L1,CCND1,EP300,KRT8	4
Small Molecule Biochemistry	synthesis	synthesis of glucocorticoid	1.29E-02	ATP1A1,DIAPH1,DKK3,POMC	4
Endocrine System Development and Function	synthesis	synthesis of glucocorticoid	1.29E-02	ATP1A1,DIAPH1,DKK3,POMC	4
Lipid Metabolism	synthesis	synthesis of glucocorticoid	1.29E-02	ATP1A1,DIAPH1,DKK3,POMC	4
Vitamin and Mineral Metabolism	synthesis	synthesis of glucocorticoid	1.29E-02	ATP1A1,DIAPH1,DKK3,POMC	4
Cell Death and Survival	cell viability	cell viability of breast cancer cell lines	1.30E-02	AKT1,BCL2L1,CA2,CARD10,CASP3,CCND1,CTGF,EP300,ERBB2,MTHFR,NTN1,PBX1,PTPRE	13
Molecular Transport	transport	transport of inorganic cation	1.32E-02	ADORA1,AHCYL1,AKT1,ATP1A1,ATP1A2,ATP1B3,ATP2A2,ATP6V1G2,C16orf7,CA2,CACNB2,KCNJ5,KCNMB1,NEDD4L,NIPA2,NR3C2,NSF,PPP1R1A,SCN1B,SLC30A3,TRPC1,TRSC1	22
Embryonic Development	patterning	patterning of rostrocaudal axis	1.42E-02	HOXB2,HOXB6,PBX1,SFRP1,TCF15,TRSHZ1,VANGL2	7
Organismal Development	patterning	patterning of rostrocaudal axis	1.42E-02	HOXB2,HOXB6,PBX1,SFRP1,TCF15,TRSHZ1,VANGL2	7
Cardiovascular Disease	essential hypertension	essential hypertension	1.53E-02	CA2,CORIN,GUCY1A3,KCNJ5,NEDD4L,NR3C2	6
Organismal Injury and Abnormalities	hydrops fetalis	hydrops fetalis	1.53E-02	ADM,CCND1,ROR2,TAB1,TBX5,TSC1	6
Cell Cycle	interphase	initiation of interphase	1.53E-02	BAD,BCL2L1,CCND1,CDK4,EP300,NRIP1	6
Inflammatory Disease	allergic pulmonary eosinophilia	allergic pulmonary eosinophilia	1.54E-02	ALDH2,HNRNPAB,PRDX1,PRDX6,SELENBP1	5
Inflammatory Response	allergic pulmonary eosinophilia	allergic pulmonary eosinophilia	1.54E-02	ALDH2,HNRNPAB,PRDX1,PRDX6,SELENBP1	5
Hematological Disease	allergic pulmonary eosinophilia	allergic pulmonary eosinophilia	1.54E-02	ALDH2,HNRNPAB,PRDX1,PRDX6,SELENBP1	5
Immunological Disease	allergic pulmonary	allergic pulmonary	1.54E-02	ALDH2,HNRNPAB,PRDX1,PRDX6,SELENBP1	5

	eosinophilia	eosinophilia		ENBP1	
Respiratory Disease	allergic pulmonary eosinophilia	allergic pulmonary eosinophilia	1.54E-02	ALDH2,HNRNPAB, PRDX1,PRDX6,SEL ENBP1	5
Cancer	metastasis	metastasis of breast cancer cell lines	1.54E-02	AKT1,CD151,ERBB2,NME1,SEMA4D	5
Reproductive System Disease	metastasis	metastasis of breast cancer cell lines	1.54E-02	AKT1,CD151,ERBB2,NME1,SEMA4D	5
Cancer	morphology	morphology of tumor	1.54E-02	ERBB2,PRDX1,PTPRE,THBS1,TSC1	5
Tumor Morphology	morphology	morphology of tumor	1.54E-02	ERBB2,PRDX1,PTPRE,THBS1,TSC1	5
Cardiovascular Disease	atrial fibrillation	atrial fibrillation	1.57E-02	ATP1A1,ATP1A2,ATP2A2,GJA5,KCNJ5,KCNMB1,NPPB,NR3C2	8
Hereditary Disorder	Huntington's disease	Huntington's Disease	1.58E-02	ADORA2A,AGXT2L1,AHCYL1,AKT1,ALDH2,ATP2A2,B3GNT1,B4GALT5,BCL2L1,CA2,CASP3,CASP9,CIRBP,CTGF,CYFIP2,DDIT3,DKK3,DISP5,EML1,EPHA4,FDFT1,GADD45A,GRIN2C,GYPC,HINT1,INPP1,MBTPS1,MPDZ,MT1X,NAP1L5,NME1,PGAM2,PPP1CB,PPP1R1A,PPRC1,PRDX6,RANBP1,RAP1GAP,RARB,REV1,RPS6KA5,SCN1B,SLC27A1,SRM,TESC,TUBA1A,UCK2,VCAN	48
Neurological Disease	Huntington's disease	Huntington's Disease	1.58E-02	ADORA2A,AGXT2L1,AHCYL1,AKT1,ALDH2,ATP2A2,B3GNT1,B4GALT5,BCL2L1,CA2,CASP3,CASP9,CIRBP,CTGF,CYFIP2,DDIT3,DKK3,DISP5,EML1,EPHA4,FDFT1,GADD45A,GRIN2C,GYPC,HINT1,INPP1,MBTPS1,MPDZ,MT1X,NAP1L5,NME1,PGAM2,PPP1CB,PPP1R1A,PPRC1,PRDX6,RANBP1,RAP1GAP,RARB,REV1,RPS6KA5,	48

				SCN1B,SLC27A1,SRM,TESC,TUBA1A,UCK2,VCAN	
Skeletal and Muscular Disorders	Huntington's disease	Huntington's Disease	1.58E-02	ADORA2A,AGXT2L1,AHCYL1,AKT1,ALDH2,ATP2A2,B3GNT1,B4GALT5,BCL2L1,CA2,CASP3,CASP9,CIRBP,CTGF,CYFIP2,DDIT3,DKK3,USP5,EML1,EPHA4,FDFT1,GADD45A,GRIN2C,GYPC,HINT1,INPP1,MBTPS1,MPDZ,MT1X,NAP1L5,NME1,PGAM2,PPP1CB,PPP1R1A,PPRC1,PRDX6,RANBP1,RAP1GAP,RARB,REV1,RPS6KA5,SCN1B,SLC27A1,SRM,TESC,TUBA1A,UCK2,VCAN	48
Molecular Transport	localization	localization of protein	1.61E-02	ADM,AKAP7,AKT1,ARHGDI1A,CASP3,COLQ,FCGR2A,GRIN2C,ICMT,LRBA,MT HFR,THBS1,TIAM2,ULK1	14
Protein Synthesis	localization	localization of protein	1.61E-02	ADM,AKAP7,AKT1,ARHGDI1A,CASP3,COLQ,FCGR2A,GRIN2C,ICMT,LRBA,MT HFR,THBS1,TIAM2,ULK1	14
Protein Trafficking	localization	localization of protein	1.61E-02	ADM,AKAP7,AKT1,ARHGDI1A,CASP3,COLQ,FCGR2A,GRIN2C,ICMT,LRBA,MT HFR,THBS1,TIAM2,ULK1	14
Cardiovascular Disease	ventricular septal defect	ventricular septal defect	1.65E-02	ATP2A2,CDK4,GATA4,GJA5,HEG1,PBX1,RARB,RXRA,TBX5,TEAD2	10
Molecular Transport	transport	transport of cation	1.73E-02	ADORA1,AHCYL1,AKT1,ATP1A1,ATP1A2,ATP1B3,ATP2A2,ATP6V1G2,C16orf7,CA2,CACNB2,GRIN2C,KCNJ5,KCNMB1,NEDD4L,NIPA2,NR3C2,NSF,PPP1R1A,SCN1B,SLC30A3,TRPC1,TSC1	23

Cellular Function and Maintenance	formation	formation of cilia	1.79E-02	BBS1,BBS4,ODF2,PCM1,RANBP1,TM EM67,VANGL2	7
Cell Morphology	formation	formation of cilia	1.79E-02	BBS1,BBS4,ODF2,PCM1,RANBP1,TM EM67,VANGL2	7
Cellular Assembly and Organization	formation	formation of cilia	1.79E-02	BBS1,BBS4,ODF2,PCM1,RANBP1,TM EM67,VANGL2	7
Tissue Morphology	quantity	quantity of endocrine cells	1.79E-02	AKT1,BAD,CDK4,D ACH1,FSTL3,NTN1, POMC	7
Endocrine System Development and Function	quantity	quantity of endocrine cells	1.79E-02	AKT1,BAD,CDK4,D ACH1,FSTL3,NTN1, POMC	7
Neurological Disease	neurological signs	neurological signs	1.89E-02	ADCY1,ADORA2A, AGXT2L1,AHCYL1, AKT1,ALDH2,ATP2 A2,B3GNT1,B4GAL T5,BCL2L1,CA2,CA SP3,CASP9,CIRBP, CTGF,CYFIP2,DDIT 3,DKK3,DUSP5,EM L1,EPHA4,FDFT1,G ADD45A,GRIN2C,G YPC,HINT1,INPP1, MBTPS1,MPDZ,MT 1X,NAP1L5,NME1,P GAM2,PPP1CB,PP P1R1A,PPRC1,PRD X6,RANBP1,RAP1G AP,RARB,REV1,RP S6KA5,SCN1B,SLC 27A1,SRM,TESC,T UBA1A,UCK2,VCA N	49
Cell Death and Survival	apoptosis	apoptosis of kidney cells	1.92E-02	ADORA1,ATP1A1,C ASP3,CTGF,DDIT3, GFPT1,NTN1,SLK	8
Molecular Transport	transport	transport of Na+	1.92E-02	AHCYL1,AKT1,ATP 1A1,ATP1A2,ATP1B 3,NEDD4L,NR3C2, SCN1B	8
Tissue Development	adhesion	adhesion of melanoma cell lines	1.96E-02	CD151,NME1,THBS 1,VCAN	4
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of melanoma cell lines	1.96E-02	CD151,NME1,THBS 1,VCAN	4
Cancer	gallbladder cancer	gallbladder cancer	1.96E-02	CCND1,ERBB2,KE AP1,POLE4	4
Gastrointestinal Disease	gallbladder cancer	gallbladder cancer	1.96E-02	CCND1,ERBB2,KE AP1,POLE4	4
Hepatic System	gallbladder	gallbladder	1.96E-02	CCND1,ERBB2,KE	4

Disease	cancer	cancer		AP1,POLE4	
Cancer	mastocytosis	mastocytosis	1.96E-02	ATP1A1,ATP1A2,IL27RA,U2AF1	4
Organismal Injury and Abnormalities	mastocytosis	mastocytosis	1.96E-02	ATP1A1,ATP1A2,IL27RA,U2AF1	4
Hematological Disease	mastocytosis	mastocytosis	1.96E-02	ATP1A1,ATP1A2,IL27RA,U2AF1	4
Immunological Disease	mastocytosis	mastocytosis	1.96E-02	ATP1A1,ATP1A2,IL27RA,U2AF1	4
Organ Morphology	morphology	morphology of stratum corneum	1.96E-02	DSC1,ELOVL4,JUP,RXRA	4
Hair and Skin Development and Function	morphology	morphology of stratum corneum	1.96E-02	DSC1,ELOVL4,JUP,RXRA	4
Reproductive System Disease	sterility	sterility	1.96E-02	CDK4,H2AFX,SBF1,STX2	4
Molecular Transport	uptake	uptake of Na+	1.96E-02	ADM,KRT8,NEDD4L,NR3C2	4
Cellular Function and Maintenance	uptake	uptake of Na+	1.96E-02	ADM,KRT8,NEDD4L,NR3C2	4
Embryonic Development	development	skin development	1.98E-02	AKT1,ATP2A2,CCND1,CTGF,DSP,EIF2C2,ELOVL4,EMP1,EPB49,JUP,KRT8,ARB,SOX18,TCF15,TNFRSF19,VANGL2	16
Organ Development	development	skin development	1.98E-02	AKT1,ATP2A2,CCND1,CTGF,DSP,EIF2C2,ELOVL4,EMP1,EPB49,JUP,KRT8,ARB,SOX18,TCF15,TNFRSF19,VANGL2	16
Organismal Development	development	skin development	1.98E-02	AKT1,ATP2A2,CCND1,CTGF,DSP,EIF2C2,ELOVL4,EMP1,EPB49,JUP,KRT8,ARB,SOX18,TCF15,TNFRSF19,VANGL2	16
Tissue Development	development	skin development	1.98E-02	AKT1,ATP2A2,CCND1,CTGF,DSP,EIF2C2,ELOVL4,EMP1,EPB49,JUP,KRT8,ARB,SOX18,TCF15,TNFRSF19,VANGL2	16
Hair and Skin Development and Function	development	skin development	1.98E-02	AKT1,ATP2A2,CCND1,CTGF,DSP,EIF2C2,ELOVL4,EMP1,	16

				EPB49,JUP,KRT8,RARB,SOX18,TCF15,TNFRSF19,VANGL2	
Cancer	thyroid cancer	thyroid cancer	2.06E-02	AKT1,BAD,CCND1,CDK4,ECM1,ERBB2,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,RARB,SERPINF1,THBS1	14
Endocrine System Disorders	thyroid cancer	thyroid cancer	2.06E-02	AKT1,BAD,CCND1,CDK4,ECM1,ERBB2,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,RARB,SERPINF1,THBS1	14
Cancer	neoplasia	neoplasia of tumor cell lines	2.06E-02	ADAMTS9,AKT1,CASP3,CCND1,CD151,COL4A1,COPS6,DACH1,EPAS1,ERBB2,IL27RA,JUP,NME1,NOX4,PPAP2A,PRNP,SEMA4D,THBS1	18
Developmental Disorder	Down's syndrome	Down's syndrome	2.09E-02	ABCG1,CRELD1,DL1,GRIN2C,UBB	5
Hereditary Disorder	Down's syndrome	Down's syndrome	2.09E-02	ABCG1,CRELD1,DL1,GRIN2C,UBB	5
Cardiovascular Disease	heart disease	Heart Disease	2.11E-02	ADM,ADORA1,ADORA2A,AKT1,ATP1A1,ATP1A2,ATP2A2,BCL2L1,C6,C8orf34,CA2,CACNB2,CDK4,CDR2L,CORIN,CPEB3,CRELD1,CTGF,CTNNB1,DDIT3,DGCR8,DPCD,DSP,EP300,EPAS1,ERBB2,FBXO32,FSTL1,FSTL3,FXDY1,GAB2,GATA4,GFOD1,GJA5,GUCY1A3,HAND1,HEG1,ITGA5,JUP,KCNJ5,KCNMB1,LIMS1,MAPK1,MEF2D,MTPN,NOX4,NPBP,NR3C2,PBX1,PBX3,PDE7B,PPP1R1A,RARB,ROR2,RXRA,SCN1B,TBX5,TEAD2,THBS1,TRPC1,TUBA1A	61
Cellular Movement	migration	migration of myeloid cells	2.17E-02	ADORA1,ADORA2A,ARHGAP1,DARC,JAM3,MYLK3,POMC,	11

				PRNP,RTN4,SEMA4D,SWAP70	
Hematological System Development and Function	migration	migration of myeloid cells	2.17E-02	ADORA1,ADORA2A,ARHGAP1,DARC,JAM3,MYLK3,POMC,PRNP,RTN4,SEMA4D,SWAP70	11
Immune Cell Trafficking	migration	migration of myeloid cells	2.17E-02	ADORA1,ADORA2A,ARHGAP1,DARC,JAM3,MYLK3,POMC,PRNP,RTN4,SEMA4D,SWAP70	11
Cell Morphology	collapse	collapse of growth cone	2.22E-02	EPHA4,ERBB2,NTN1,PLXNB1,RRAS,RTN4,SEMA4D	7
Cellular Compromise	collapse	collapse of growth cone	2.22E-02	EPHA4,ERBB2,NTN1,PLXNB1,RRAS,RTN4,SEMA4D	7
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Embryonic Development	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Organ Development	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Organ Morphology	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Organismal Development	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Tissue Development	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Auditory and Vestibular System Development and Function	abnormal morphology	abnormal morphology of malleus	2.23E-02	PBX1,ROR2,TSHZ1	3
Tissue Morphology	abnormal morphology	abnormal morphology of paraxial mesoderm	2.23E-02	ITGA5,TCF15,TEAD2	3
Embryonic Development	abnormal morphology	abnormal morphology of paraxial mesoderm	2.23E-02	ITGA5,TCF15,TEAD2	3

Behavior	addiction behavior	addiction behavior	2.23E-02	ADORA2A,ATP1A1, POMC	3
Cell-To-Cell Signaling and Interaction	binding	binding of mast cells	2.23E-02	AKT1,DLL1,ITGA5	3
Hematological System Development and Function	binding	binding of mast cells	2.23E-02	AKT1,DLL1,ITGA5	3
Inflammatory Response	binding	binding of mast cells	2.23E-02	AKT1,DLL1,ITGA5	3
Hypersensitivity Response	binding	binding of mast cells	2.23E-02	AKT1,DLL1,ITGA5	3
Molecular Transport	flux	flux of K+	2.23E-02	BCL2L1,MAPK1,NR3C2	3
Cellular Function and Maintenance	flux	flux of K+	2.23E-02	BCL2L1,MAPK1,NR3C2	3
Cell Cycle	interphase	interphase of hepatoma cell lines	2.23E-02	DDIT3,E2F5,PBX1	3
Hematological Disease	microcytosis	microcytosis	2.23E-02	EPB49,FBXL5,PRDX1	3
Gastrointestinal Disease	nausea	nausea	2.23E-02	ATP1A1,ATP1A2,GRIN2C	3
Cell Morphology	permeabilization	permeabilization of mitochondrial outer membrane	2.23E-02	BAD,BCL2L1,ITSN1	3
Organ Development	recovery	recovery of heart	2.23E-02	ADORA1,AKT1,PPP1R1A	3
Cardiovascular System Development and Function	recovery	recovery of heart	2.23E-02	ADORA1,AKT1,PPP1R1A	3
Cell Morphology	size	size of hematopoietic progenitor cells	2.23E-02	AKT1,CCND1,CDK4	3
Hematopoiesis	size	size of hematopoietic progenitor cells	2.23E-02	AKT1,CCND1,CDK4	3
Cancer	transformation	transformation of tumor cells	2.23E-02	ERBB2,PTPRE,SFRP1	3
Tumor Morphology	transformation	transformation of tumor cells	2.23E-02	ERBB2,PTPRE,SFRP1	3
Connective Tissue Development and Function	patterning	patterning of axis	2.31E-02	GATA4,ITGA5,MAPK1,PBX1,SFRP1,SFRP5,TCF15,WLS	8
Embryonic Development	patterning	patterning of axis	2.31E-02	GATA4,ITGA5,MAPK1,PBX1,SFRP1,SFRP5,TCF15,WLS	8
Skeletal and Muscular System Development	patterning	patterning of axis	2.31E-02	GATA4,ITGA5,MAPK1,PBX1,SFRP1,SFRP5,TCF15,WLS	8

and Function					
Tissue Development	patterning	patterning of axis	2.31E-02	GATA4,ITGA5,MAPK1,PBX1,SFRP1,SFRP5,TCF15,WLS	8
Free Radical Scavenging	generation	generation of reactive oxygen species	2.50E-02	ALDH2,BCL2L1,CASP3,CYP1B1,EPAS1,ITSN1,MAPK1,NOX4,NOXA1,NR3C2,POMC,PTPN1,SERPINF1	13
Skeletal and Muscular System Development and Function	morphology	morphology of skeleton	2.51E-02	CTGF,FSTL1,HEXB,HOXB6,ITGB1BP1,PBX1,PKDCC,PTPRE,RARB,ROR2,RXRA,SAFB,SMARCAL1,TASP1,TCF15,TEAD2,THBS1,TSHZ1	18
Organismal Injury and Abnormalities	cerebral hemorrhage	cerebral hemorrhage	2.52E-02	ADORA1,ADORA2A,CASP9,CBFB,E2F5,JAM3	6
Neurological Disease	cerebral hemorrhage	cerebral hemorrhage	2.52E-02	ADORA1,ADORA2A,CASP9,CBFB,E2F5,JAM3	6
Cellular Growth and Proliferation	proliferation	proliferation of cells	2.64E-02	ABCG1,ACLY,ACTN1,ADCY1,ADM,ADORA1,ADORA2A,AES,AKT1,ANKRD6,AQP7,ARFGAP3,ARHGAP1,ARHGAP24,ARHGDIA,ARID1A,ATP2A2,BAD,BCL2L1,CALCOCO2,CALM1 (includes others),CARD10,CASP3,CASP9,CBFB,CCND1,CD151,CDCA7L,CDK20,CDK4,CDK9,CES2,CIRBP,COL4A1,COPS6,CRIP2,CRLF1,CSNK1D,CSPG4,CTDSPL,CTGF,CYP1B1,CYP20A1,DACH1,DAPK2,DDIT3,DDX21,DGCR8,DIAPH1,DKK3,DLL1,DSP,DUSP5,E2F5,ECM1,EEF2K,EGLN2,EIF2C2,EMP1,EP300,EPAS1,ERBB2,EXTL3,FANCL,FBXW4,FDFT1,FEN1,FSTL3,FXYD1,GAB2,GADD45A,GATA4,GJA5,GNL3,GOLPH3,GPNMB,GRIN	197

				2C,H2AFX,H2AFY, HAND1,HEXB,HINT1,HNRNPAB,ICMT,IFNAR2,IL27RA,IL32,ITGA5,ITSN1,JUP,KCNJ5,KDM3B,KRT8,LEPREL1,LIMS1,L MNB2,LRRC32,MAPK1,MAPRE2,MCM3,MED25,MED28,MP11,MTA1,MTAP,MTPN,MYLK,NACA,NEU1,NME1,NOA1,NOX4,NPDC1,NPPB,NR2F1,NR3C2,NRIP1,NTN1,NUDCD3,OSR1,PBX1,PBX3,PCYOX1,PGAM2,PHLDA1,PIP5K1C,PLCG2,PLXNB1,POLM,POMC,PPRC1,PRCC,PRDX1,PRNP,PTPN1,PTPRE,QPCT,RAP1GAP,RARB,RBFOX2,RBM38,RDBP,RFC1,RMI1,RNF187,ROR2,RPL26,RPS6KA2,RPS6KA5,RRAS,RXRA,SAFB,SBF1,SCAF11,SELENBP1,SEMA4D,SEMA6A,SERPINF1,SERPINH1,SFRP1,SFRP5,SGPL1,SHMT2,SLC29A1,SLK,SMARCAL1,SOX18,SOX7,SP2,STAU1,STEAP2,STX2,SWAP70,TADA3,TASP1,TBC1D8,TBX5,TEAD2,TESC,TFG,THBS1,THBS4,TIAM2,TNFAIP3,TNFAIP6,TNFRSF19,TOPORS,TP53I11,TRPC1,TSC1,TSPAN32,URGCP,URI1,VASH1,VCAN,ZNF512B,ZYX	
Embryonic Development	development	development of inner ear	2.71E-02	DLL1,MCOLN3,NR2F1,NTN1,ROR2,SIX4,VANGL2	7
Organ Development	development	development of inner ear	2.71E-02	DLL1,MCOLN3,NR2F1,NTN1,ROR2,SIX4,VANGL2	7
Organismal	development	development of	2.71E-02	DLL1,MCOLN3,NR2	7

Development		inner ear		F1,NTN1,ROR2,SIX4,VANGL2	
Tissue Development	development	development of inner ear	2.71E-02	DLL1,MCOLN3,NR2F1,NTN1,ROR2,SIX4,VANGL2	7
Auditory and Vestibular System Development and Function	development	development of inner ear	2.71E-02	DLL1,MCOLN3,NR2F1,NTN1,ROR2,SIX4,VANGL2	7
Cancer	hyperplasia	hyperplasia of cells	2.74E-02	AKT1,CASP3,CASP9,CDK4,DSC1,ERBB2,FSTL3,GADD45A,IL27RA,KRT8,LIMS1,MTA1,PTPN1,RNF187,RXRA,SAFB,THBS1	17
Cell Cycle	S phase	initiation of S phase	2.77E-02	BCL2L1,CCND1,CDK4,EP300,NRIP1	5
Nervous System Development and Function	miniature excitatory postsynaptic currents	miniature excitatory postsynaptic currents	2.77E-02	CPLX3,EPHA4,GRI N2C,PIP5K1C,SLC29A1	5
Cell-To-Cell Signaling and Interaction	miniature excitatory postsynaptic currents	miniature excitatory postsynaptic currents	2.77E-02	CPLX3,EPHA4,GRI N2C,PIP5K1C,SLC29A1	5
Cell Death and Survival	apoptosis	apoptosis of endocrine cell lines	2.81E-02	AKT1,CASP3,CCND1,PRDX1	4
Tissue Development	formation	formation of basement membrane	2.81E-02	ADM,COL4A1,CTGF,SERPINH1	4
Small Molecule Biochemistry	synthesis	synthesis of aldosterone	2.81E-02	DKK3,KCNJ5,NR2F1,POMC	4
Endocrine System Development and Function	synthesis	synthesis of aldosterone	2.81E-02	DKK3,KCNJ5,NR2F1,POMC	4
Lipid Metabolism	synthesis	synthesis of aldosterone	2.81E-02	DKK3,KCNJ5,NR2F1,POMC	4
Vitamin and Mineral Metabolism	synthesis	synthesis of aldosterone	2.81E-02	DKK3,KCNJ5,NR2F1,POMC	4
Tissue Morphology	transformation	transformation of thoracic vertebra	2.81E-02	HOXB6,RARB,TASP1,TSHZ1	4
Cancer	transformation	transformation of thoracic vertebra	2.81E-02	HOXB6,RARB,TASP1,TSHZ1	4
Skeletal and Muscular Disorders	transformation	transformation of thoracic vertebra	2.81E-02	HOXB6,RARB,TASP1,TSHZ1	4
Cellular Movement	cell movement	cell movement of phagocytes	2.94E-02	ADM,ADORA1,ADORA2A,ANGPTL2,AR	32

				HGAP1,C6,CAMK1 D,CCND1,CD151,C OL4A1,CTGF,DARC ,EPAS1,ERBB2,FC GR2A,ITGA5,JAM3, MYLK,MYLK3,NR3 C2,NTN1,PIP5K1C, PRNP,QPCT,RTN4, SEMA4D,SFRP1,S WAP70,THBS1,THB S4,TNFAIP3,TSC1	
Hematological System Development and Function	cell movement	cell movement of phagocytes	2.94E-02	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1 D,CCND1,CD151,C OL4A1,CTGF,DARC ,EPAS1,ERBB2,FC GR2A,ITGA5,JAM3, MYLK,MYLK3,NR3 C2,NTN1,PIP5K1C, PRNP,QPCT,RTN4, SEMA4D,SFRP1,S WAP70,THBS1,THB S4,TNFAIP3,TSC1	32
Immune Cell Trafficking	cell movement	cell movement of phagocytes	2.94E-02	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1 D,CCND1,CD151,C OL4A1,CTGF,DARC ,EPAS1,ERBB2,FC GR2A,ITGA5,JAM3, MYLK,MYLK3,NR3 C2,NTN1,PIP5K1C, PRNP,QPCT,RTN4, SEMA4D,SFRP1,S WAP70,THBS1,THB S4,TNFAIP3,TSC1	32
Inflammatory Response	cell movement	cell movement of phagocytes	2.94E-02	ADM,ADORA1,ADORA2A,ANGPTL2,ARHGAP1,C6,CAMK1 D,CCND1,CD151,C OL4A1,CTGF,DARC ,EPAS1,ERBB2,FC GR2A,ITGA5,JAM3, MYLK,MYLK3,NR3 C2,NTN1,PIP5K1C, PRNP,QPCT,RTN4, SEMA4D,SFRP1,S WAP70,THBS1,THB S4,TNFAIP3,TSC1	32
Cell Morphology	contraction	contraction of cells	3.16E-02	ADM,ATP2A2,CASP3,CASP9,ITGA5,MYLK,PLXNB1,RND2, SEMA4D	9
Hematological System	circulation	circulation of blood	3.26E-02	ADM,ADORA2A,ERBB2,GUCY1A3,HO	8

Development and Function				XB2,JUP,MTHFR,TBC1D8	
Cellular Development	immortalization	immortalization	3.26E-02	CCND1,CDK4,ERBB2,HINT1,HOXB6,PBX1,PGAM2,SAFB	8
Organ Morphology	morphology	morphology of ventricular septum	3.26E-02	ADM,ATP2A2,CCND1,GATA4,RXRA,TAB1,TBX5,THBS1	8
Cardiovascular System Development and Function	morphology	morphology of ventricular septum	3.26E-02	ADM,ATP2A2,CCND1,GATA4,RXRA,TAB1,TBX5,THBS1	8
Molecular Transport	transport	transport of metal ion	3.27E-02	ADORA1,AHCYL1,AKT1,ATP1A1,ATP1A2,ATP1B3,ATP2A2,CACNB2,KCNJ5,KCNMB1,NEDD4L,NIPPA2,NR3C2,NSF,PP1R1A,SCN1B,SLC30A3,TRPC1,TSC1	19
Embryonic Development	fertilization	fertilization	3.27E-02	ARHGDI1A,BBS1,BCL2L1,CLGN,HEXB,PRNP,TNFAIP6	7
Organismal Development	fertilization	fertilization	3.27E-02	ARHGDI1A,BBS1,BCL2L1,CLGN,HEXB,PRNP,TNFAIP6	7
Reproductive System Development and Function	fertilization	fertilization	3.27E-02	ARHGDI1A,BBS1,BCL2L1,CLGN,HEXB,PRNP,TNFAIP6	7
Organismal Injury and Abnormalities	intracranial hemorrhage	intracranial hemorrhage	3.27E-02	ADORA1,ADORA2A,CASP9,CBFB,E2F5,JAM3,NPPB	7
Cancer	papillary carcinoma	papillary carcinoma	3.46E-02	AKT1,BAD,GOLGA5,ITGA5,LSM7,PCM1,PRCC,RAP1GAP,SFRP1,THBS1	10
Reproductive System Development and Function	G1 phase	G1 phase of breast cell lines	3.56E-02	EP300,ERBB2	2
Cell Cycle	G1 phase	G1 phase of breast cell lines	3.56E-02	EP300,ERBB2	2
Hereditary Disorder	Netherton syndrome	Netherton syndrome	3.56E-02	DSC1,DSP	2
Dermatological Diseases and Conditions	Netherton syndrome	Netherton syndrome	3.56E-02	DSC1,DSP	2
Cell Cycle	S phase	S phase of hepatoma cell lines	3.56E-02	E2F5,PBX1	2
Connective Tissue Development	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2

and Function					
Embryonic Development	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Organ Development	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Organ Morphology	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Organismal Development	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Tissue Development	abnormal morphology	abnormal morphology of bent fibula	3.56E-02	CTGF,FSTL1	2
Organ Morphology	abnormal morphology	abnormal morphology of geniculate ganglion	3.56E-02	ERBB2,HOXB2	2
Nervous System Development and Function	abnormal morphology	abnormal morphology of geniculate ganglion	3.56E-02	ERBB2,HOXB2	2
Tissue Morphology	abnormal morphology	abnormal morphology of nasal capsule	3.56E-02	CTGF,ROR2	2
Gastrointestinal Disease	achlorhydria	achlorhydria	3.56E-02	ATP1A1,ATP1A2	2
Dermatological Diseases and Conditions	acne vulgaris	acne vulgaris	3.56E-02	RARB,RXRA	2
Inflammatory Disease	acne vulgaris	acne vulgaris	3.56E-02	RARB,RXRA	2
Cancer	activation	activation of chronic lymphocytic leukemia B cells	3.56E-02	PLXNB1,SEMA4D	2
Cell-To-Cell Signaling and Interaction	activation	activation of chronic lymphocytic leukemia B cells	3.56E-02	PLXNB1,SEMA4D	2
Tissue Development	adhesion	adhesion of fibrosarcoma cell lines	3.56E-02	ITGA5,JAM3	2
Cell-To-Cell Signaling and Interaction	adhesion	adhesion of fibrosarcoma cell lines	3.56E-02	ITGA5,JAM3	2
Cell Death and Survival	anoikis	anoikis of RPE cells	3.56E-02	BCL2L1,MAPK1	2

Cell Death and Survival	antibody-dependent cell-mediated cytotoxic reaction	antibody-dependent cell-mediated cytotoxic reaction of cells	3.56E-02	ERBB2,FCGR2A	2
Inflammatory Response	antibody-dependent cell-mediated cytotoxic reaction	antibody-dependent cell-mediated cytotoxic reaction of cells	3.56E-02	ERBB2,FCGR2A	2
Cell Death and Survival	apoptosis	apoptosis of embryonal carcinoma cell	3.56E-02	AKT1,GAB2	2
Tumor Morphology	apoptosis	apoptosis of embryonal carcinoma cell	3.56E-02	AKT1,GAB2	2
Cell Death and Survival	apoptosis	apoptosis of eye cell lines	3.56E-02	MAPK1,SERPINF1	2
Cell Death and Survival	apoptosis	apoptosis of osteocytes	3.56E-02	MAPK1,RPS6KA2	2
Cell Cycle	G2 phase	arrest in G2 phase of blood cells	3.56E-02	E2F5,GADD45A	2
Organismal Injury and Abnormalities	atrophy	atrophy of myotube	3.56E-02	EP300,FBXO32	2
Cellular Compromise	atrophy	atrophy of myotube	3.56E-02	EP300,FBXO32	2
Cell-To-Cell Signaling and Interaction	binding	binding of lung cancer cell lines	3.56E-02	FCGR2A,JAM3	2
Cellular Assembly and Organization	binding	binding of mitochondrial membrane	3.56E-02	BAD,BCL2L1	2
Cell Morphology	cell spreading	cell spreading of melanoma cell lines	3.56E-02	PRNP,THBS1	2
Hereditary Disorder	childhood absence epilepsy	childhood absence epilepsy	3.56E-02	ATP1A2,SCN1B	2
Neurological Disease	childhood absence epilepsy	childhood absence epilepsy	3.56E-02	ATP1A2,SCN1B	2
Cellular Growth and Proliferation	cloning	cloning of cells	3.56E-02	CCND1,PHLDA1	2
Nucleic Acid Metabolism	concentration	concentration of acetyl-coenzyme A	3.56E-02	ACLY,BCL2L1	2
Small Molecule Biochemistry	concentration	concentration of acetyl-coenzyme A	3.56E-02	ACLY,BCL2L1	2
Molecular Transport	concentration	concentration of acetyl-coenzyme A	3.56E-02	ACLY,BCL2L1	2

Lipid Metabolism	concentration	concentration of acetyl-coenzyme A	3.56E-02	ACLY,BCL2L1	2
Nervous System Development and Function	degeneration	degeneration of myelin sheath	3.56E-02	C6,CERS2	2
Cellular Compromise	degeneration	degeneration of myelin sheath	3.56E-02	C6,CERS2	2
Cancer	cancer	delay in cancer	3.56E-02	ERBB2,PBX3	2
Cell Cycle	S phase	delay in initiation of S phase	3.56E-02	FEN1,GADD45A	2
Cancer	tumorigenesis	delay in tumorigenesis of mammary gland	3.56E-02	AKT1,ERBB2	2
Reproductive System Disease	tumorigenesis	delay in tumorigenesis of mammary gland	3.56E-02	AKT1,ERBB2	2
Embryonic Development	development	development of anterior commissure	3.56E-02	EPHA4,NTN1	2
Organ Development	development	development of anterior commissure	3.56E-02	EPHA4,NTN1	2
Organismal Development	development	development of anterior commissure	3.56E-02	EPHA4,NTN1	2
Tissue Development	development	development of anterior commissure	3.56E-02	EPHA4,NTN1	2
Nervous System Development and Function	development	development of anterior commissure	3.56E-02	EPHA4,NTN1	2
Embryonic Development	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Organ Development	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Organismal Development	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Tissue Development	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Nervous System Development and Function	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Auditory and Vestibular System Development and Function	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Cellular Development	development	development of hair cells	3.56E-02	MCOLN3,NR2F1	2
Embryonic Development	development	development of stomach	3.56E-02	CASP9,GATA4	2

Organ Development	development	development of stomach	3.56E-02	CASP9,GATA4	2
Organismal Development	development	development of stomach	3.56E-02	CASP9,GATA4	2
Tissue Development	development	development of stomach	3.56E-02	CASP9,GATA4	2
Digestive System Development and Function	development	development of stomach	3.56E-02	CASP9,GATA4	2
Cancer	differentiation	differentiation of mammary tumor	3.56E-02	AKT1,ERBB2	2
Cellular Development	differentiation	differentiation of mammary tumor	3.56E-02	AKT1,ERBB2	2
Tumor Morphology	differentiation	differentiation of mammary tumor	3.56E-02	AKT1,ERBB2	2
Reproductive System Disease	diminished ovarian reserve	diminished ovarian reserve	3.56E-02	CASP3,GATA4	2
Endocrine System Disorders	diminished ovarian reserve	diminished ovarian reserve	3.56E-02	CASP3,GATA4	2
Tissue Development	disruption	disruption of tight junctions	3.56E-02	CASP3,MYLK	2
Cell-To-Cell Signaling and Interaction	disruption	disruption of tight junctions	3.56E-02	CASP3,MYLK	2
Cellular Assembly and Organization	disruption	disruption of tight junctions	3.56E-02	CASP3,MYLK	2
Cellular Compromise	disruption	disruption of tight junctions	3.56E-02	CASP3,MYLK	2
Molecular Transport	efflux	efflux of K+	3.56E-02	BCL2L1,MAPK1	2
Cellular Function and Maintenance	efflux	efflux of K+	3.56E-02	BCL2L1,MAPK1	2
Hereditary Disorder	experimental Huntington's disease	experimental Huntington's disease	3.56E-02	DDIT3,RPS6KA5	2
Neurological Disease	experimental Huntington's disease	experimental Huntington's disease	3.56E-02	DDIT3,RPS6KA5	2
Skeletal and Muscular Disorders	experimental Huntington's disease	experimental Huntington's disease	3.56E-02	DDIT3,RPS6KA5	2
Connective Tissue Development and Function	formation	formation of granulation tissue	3.56E-02	ADORA2A,THBS1	2
Tissue Development	formation	formation of granulation tissue	3.56E-02	ADORA2A,THBS1	2
Connective Tissue	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2

Development and Function					
Embryonic Development	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2
Organ Development	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2
Organismal Development	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2
Skeletal and Muscular System Development and Function	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2
Tissue Development	formation	formation of trabecula	3.56E-02	ERBB2,SFRP1	2
Tissue Development	function	function of extraembryonic tissue	3.56E-02	FBXL5,KRT8	2
Cancer	hyperplasia	hyperplasia of neurons	3.56E-02	CASP3,CASP9	2
Neurological Disease	hyperplasia	hyperplasia of neurons	3.56E-02	CASP3,CASP9	2
Developmental Disorder	hypoplasia	hypoplasia of exocrine region of pancreas	3.56E-02	PBX1,THBS1	2
Developmental Disorder	hypoplasia	hypoplasia of tongue	3.56E-02	PBX1,PBX3	2
Cancer	immortalization	immortalization of keratinocytes	3.56E-02	CCND1,CDK4	2
Cellular Development	immortalization	immortalization of keratinocytes	3.56E-02	CCND1,CDK4	2
Cell-To-Cell Signaling and Interaction	immune response	immune response of natural killer cells	3.56E-02	FCGR2A,FSTL1	2
Hematological System Development and Function	immune response	immune response of natural killer cells	3.56E-02	FCGR2A,FSTL1	2
Inflammatory Response	immune response	immune response of natural killer cells	3.56E-02	FCGR2A,FSTL1	2
Hematological System Development and Function	inactivation	inactivation of myeloid cells	3.56E-02	ADORA2A,POMC	2
Cellular Development	inactivation	inactivation of myeloid cells	3.56E-02	ADORA2A,POMC	2
Cancer	invasion	invasion of extracellular matrix	3.56E-02	ITGA5,NME1	2
Cancer	invasion	invasion of mammary tumor	3.56E-02	AKT1,ERBB2	2
Tumor	invasion	invasion of	3.56E-02	AKT1,ERBB2	2

Morphology		mammary tumor			
Organ Morphology	lack	lack of Harderian gland	3.56E-02	RARB,RXRA	2
Cell Death and Survival	lifespan	lifespan of keratinocytes	3.56E-02	CCND1,CDK4	2
Cellular Development	lifespan	lifespan of keratinocytes	3.56E-02	CCND1,CDK4	2
Hair and Skin Development and Function	lifespan	lifespan of keratinocytes	3.56E-02	CCND1,CDK4	2
Molecular Transport	localization	localization of actin	3.56E-02	FCGR2A,TIAM2	2
Cellular Function and Maintenance	localization	localization of actin	3.56E-02	FCGR2A,TIAM2	2
Cellular Assembly and Organization	localization	localization of actin	3.56E-02	FCGR2A,TIAM2	2
Protein Synthesis	localization	localization of actin	3.56E-02	FCGR2A,TIAM2	2
Protein Trafficking	localization	localization of actin	3.56E-02	FCGR2A,TIAM2	2
Inflammatory Response	memory immune response	memory immune response	3.56E-02	EP300,FCGR2A	2
Small Molecule Biochemistry	metabolism	metabolism of homocysteine	3.56E-02	MTHFR,MTR	2
Amino Acid Metabolism	metabolism	metabolism of homocysteine	3.56E-02	MTHFR,MTR	2
Cancer	metastasis	metastasis of mammary gland	3.56E-02	ERBB2,MMP11	2
Reproductive System Disease	metastasis	metastasis of mammary gland	3.56E-02	ERBB2,MMP11	2
Organ Development	metastasis	metastasis of mammary gland	3.56E-02	ERBB2,MMP11	2
Tissue Development	metastasis	metastasis of mammary gland	3.56E-02	ERBB2,MMP11	2
Reproductive System Development and Function	metastasis	metastasis of mammary gland	3.56E-02	ERBB2,MMP11	2
Embryonic Development	morphogenesis	morphogenesis of tail	3.56E-02	SFRP5,TCF15	2
Organismal Development	morphogenesis	morphogenesis of tail	3.56E-02	SFRP5,TCF15	2
Cellular Function and Maintenance	organization	organization of chromatin	3.56E-02	ARID1A,SAFB	2
Cellular Assembly and Organization	organization	organization of chromatin	3.56E-02	ARID1A,SAFB	2
Cell Cycle	organization	organization of chromatin	3.56E-02	ARID1A,SAFB	2
DNA Replication,	organization	organization of chromatin	3.56E-02	ARID1A,SAFB	2

Recombination, and Repair					
Organismal Injury and Abnormalities	palmoplantar keratoderma	palmoplantar keratoderma	3.56E-02	DSP,JUP	2
Dermatological Diseases and Conditions	palmoplantar keratoderma	palmoplantar keratoderma	3.56E-02	DSP,JUP	2
Immunological Disease	passive cutaneous anaphylaxis	passive cutaneous anaphylaxis	3.56E-02	FCGR2A,GAB2	2
Cell-To-Cell Signaling and Interaction	permeability	permeability of tight junctions	3.56E-02	KRT8,MYLK3	2
Cell Morphology	permeability	permeability of tight junctions	3.56E-02	KRT8,MYLK3	2
Cellular Assembly and Organization	permeability	permeability of tight junctions	3.56E-02	KRT8,MYLK3	2
Cell Death and Survival	pyknosis	pyknosis of cells	3.56E-02	BCL2L1,CASP3	2
Tissue Development	quantity	quantity of desmosomes	3.56E-02	DSP,JUP	2
Cell-To-Cell Signaling and Interaction	quantity	quantity of desmosomes	3.56E-02	DSP,JUP	2
Cellular Assembly and Organization	quantity	quantity of desmosomes	3.56E-02	DSP,JUP	2
Small Molecule Biochemistry	redistribution	redistribution of cholesterol	3.56E-02	ABCG1,ATP1A1	2
Molecular Transport	redistribution	redistribution of cholesterol	3.56E-02	ABCG1,ATP1A1	2
Lipid Metabolism	redistribution	redistribution of cholesterol	3.56E-02	ABCG1,ATP1A1	2
Small Molecule Biochemistry	regulation	regulation of L-glutamic acid	3.56E-02	ADORA2A,SLC29A1	2
Amino Acid Metabolism	regulation	regulation of L-glutamic acid	3.56E-02	ADORA2A,SLC29A1	2
Organismal Development	relaxation	relaxation of mice	3.56E-02	ATP1A1,ATP1A2	2
Cellular Function and Maintenance	release	release of dense core granules	3.56E-02	NSF,STX2	2
Cellular Assembly and Organization	release	release of dense core granules	3.56E-02	NSF,STX2	2
Small Molecule Biochemistry	release	release of hydrocortisone	3.56E-02	NPPB,POMC	2
Molecular Transport	release	release of hydrocortisone	3.56E-02	NPPB,POMC	2
Endocrine System Development and Function	release	release of hydrocortisone	3.56E-02	NPPB,POMC	2

Drug Metabolism	release	release of hydrocortisone	3.56E-02	NPPB,POMC	2
Lipid Metabolism	release	release of hydrocortisone	3.56E-02	NPPB,POMC	2
Cell Morphology	size	size of T lymphocytes	3.56E-02	AKT1,BCL2L1	2
Small Molecule Biochemistry	synthesis	synthesis of sphingomyelin	3.56E-02	SGPL1,SLC27A1	2
Lipid Metabolism	synthesis	synthesis of sphingomyelin	3.56E-02	SGPL1,SLC27A1	2
Small Molecule Biochemistry	transport	transport of lactic acid	3.56E-02	ATP1A2,PRNP	2
Molecular Transport	transport	transport of lactic acid	3.56E-02	ATP1A2,PRNP	2
Nucleic Acid Metabolism	transport	transport of nucleoside	3.56E-02	ADORA1,SLC29A1	2
Small Molecule Biochemistry	transport	transport of nucleoside	3.56E-02	ADORA1,SLC29A1	2
Molecular Transport	transport	transport of nucleoside	3.56E-02	ADORA1,SLC29A1	2
Cancer	tumorigenesis	tumorigenesis of ovarian cancer cell lines	3.56E-02	IL27RA,PPAP2A	2
Reproductive System Disease	tumorigenesis	tumorigenesis of ovarian cancer cell lines	3.56E-02	IL27RA,PPAP2A	2
Cancer	type M3 acute myeloid leukemia	type M3 acute myeloid leukemia	3.56E-02	RARB,RXRA	2
Hematological Disease	type M3 acute myeloid leukemia	type M3 acute myeloid leukemia	3.56E-02	RARB,RXRA	2
Tissue Morphology	volume	volume of neurons	3.56E-02	BCL2L1,MAPK1	2
Nervous System Development and Function	volume	volume of neurons	3.56E-02	BCL2L1,MAPK1	2
Cell Morphology	volume	volume of neurons	3.56E-02	BCL2L1,MAPK1	2
Cardiovascular Disease	infarction	Infarction	3.56E-02	ADORA1,ADORA2A,AKT1,BCL2L1,C6,F AIM2,FSTL1,FSTL3,GATA4,GUCY1A3,MAPK1,MTHFR,NO X4,NPPB,NR3C2,PP1R1A,PRNP,TBX 5,TNFAIP3	19
Nervous System Development and Function	analgesia	analgesia	3.57E-02	ADCY1,ADORA1,HINT1,NPEPPS,POMC	5
Cell Death and Survival	apoptosis	apoptosis of dendritic cells	3.57E-02	AKT1,BCL2L1,CASP3,CASP9,TNFAIP3	5
Cell Death and	cell death	cell death of	3.57E-02	AKT1,BAD,BCL2L1,	5

Survival		liver cell lines		CASP3,CASP9	
Tissue Morphology	quantity	quantity of islet cells	3.57E-02	AKT1,BAD,CDK4,DACH1,FSTL3	5
Endocrine System Development and Function	quantity	quantity of islet cells	3.57E-02	AKT1,BAD,CDK4,DACH1,FSTL3	5
Cellular Movement	transmigration	transmigration of granulocytes	3.57E-02	ADORA1,ADORA2A,JAM3,MYLK3,RTN4	5
Hematological System Development and Function	transmigration	transmigration of granulocytes	3.57E-02	ADORA1,ADORA2A,JAM3,MYLK3,RTN4	5
Immune Cell Trafficking	transmigration	transmigration of granulocytes	3.57E-02	ADORA1,ADORA2A,JAM3,MYLK3,RTN4	5
Cancer	Ewing's sarcoma	Ewing's sarcoma	3.57E-02	FDFT1,HINT1,LGALS3BP	3
Skeletal and Muscular Disorders	Ewing's sarcoma	Ewing's sarcoma	3.57E-02	FDFT1,HINT1,LGALS3BP	3
Connective Tissue Disorders	Ewing's sarcoma	Ewing's sarcoma	3.57E-02	FDFT1,HINT1,LGALS3BP	3
Cell Cycle	S phase	S phase of epithelial cell lines	3.57E-02	CCND1,ERBB2,NRIP1	3
Hair and Skin Development and Function	S phase	S phase of epithelial cell lines	3.57E-02	CCND1,ERBB2,NRIP1	3
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Embryonic Development	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Organ Development	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Organ Morphology	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Organismal Development	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Tissue Development	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3

Nervous System Development and Function	abnormal morphology	abnormal morphology of atlas	3.57E-02	CTGF,FSTL1,PKDC C	3
Cardiovascular Disease	bleeding	bleeding of blood vessel	3.57E-02	CASP9,EPAS1,POMC	3
Organismal Injury and Abnormalities	bleeding	bleeding of blood vessel	3.57E-02	CASP9,EPAS1,POMC	3
Cell Morphology	cell spreading	cell spreading of gonadal cell lines	3.57E-02	AKT1,ARHGAP24,NSF	3
Reproductive System Development and Function	cell spreading	cell spreading of gonadal cell lines	3.57E-02	AKT1,ARHGAP24,NSF	3
Cardiovascular Disease	chronic heart failure	chronic heart failure	3.57E-02	CA2,GATA4,NPPB	3
Cellular Growth and Proliferation	cytostasis	cytostasis of lung cancer cell lines	3.57E-02	NR2F1,RARB,RXR A	3
Tissue Development	development	development of sensory neurons	3.57E-02	MCOLN3,NR2F1,THBS1	3
Nervous System Development and Function	development	development of sensory neurons	3.57E-02	MCOLN3,NR2F1,THBS1	3
Cellular Development	development	development of sensory neurons	3.57E-02	MCOLN3,NR2F1,THBS1	3
Cell Cycle	interphase	interphase of hematopoietic progenitor cells	3.57E-02	AKT1,BCL2L1,E2F5	3
Cell Morphology	orientation	orientation of stereocilia bundles	3.57E-02	NR2F1,SFRP1,VANG L2	3
Cellular Assembly and Organization	orientation	orientation of stereocilia bundles	3.57E-02	NR2F1,SFRP1,VANG L2	3
Auditory and Vestibular System Development and Function	orientation	orientation of stereocilia bundles	3.57E-02	NR2F1,SFRP1,VANG L2	3
Small Molecule Biochemistry	release	release of hormone	3.57E-02	NPPB,POMC,RBMS 1	3
Nervous System Development and Function	sleep	sleep	3.57E-02	ADORA1,ADORA2A,SLC29A1	3
Nervous System Development and Function	synaptic transmission	synaptic transmission of pyramidal neurons	3.57E-02	ADORA2A,NSF,PRNP	3
Cell-To-Cell Signaling and	synaptic transmission	synaptic transmission of	3.57E-02	ADORA2A,NSF,PRNP	3

Interaction		pyramidal neurons			
Cancer	endocrine gland tumor	endocrine gland tumor	3.68E-02	AKT1,ALDH2,ATP1A1,ATP1A2,BAD,CASP3,CCND1,CDK4,DLL1,ECM1,EP300,ERBB2,GADD45A,GOLGA5,HAND1,H OXB2,HOXB6,ITGA5,LSM7,MMP11,NRIP1,PCM1,POLE4,POMC,RAP1GAP,RARB,SEMA4D,SERPINF1,THBS1	29
Cell Death and Survival	quantity	quantity of apoptotic cells	3.82E-02	BCL2L1,CASP3,CASP9,DDIT3,EPHA4,HEXB,THBS1,VASH1	8
Cancer	Kaposi's sarcoma	Kaposi's sarcoma	3.84E-02	IFNAR2,RARB,RXRA,TUBA1A	4
Dermatological Diseases and Conditions	Kaposi's sarcoma	Kaposi's sarcoma	3.84E-02	IFNAR2,RARB,RXRA,TUBA1A	4
Cellular Assembly and Organization	amplification	amplification of centrosome	3.84E-02	CCND1,CDK4,GADD45A,MTA1	4
DNA Replication, Recombination, and Repair	amplification	amplification of centrosome	3.84E-02	CCND1,CDK4,GADD45A,MTA1	4
Cell Death and Survival	cell viability	cell viability of thymocytes	3.84E-02	AKT1,BCL2L1,CASP9,CBFB	4
Hematological System Development and Function	cell viability	cell viability of thymocytes	3.84E-02	AKT1,BCL2L1,CASP9,CBFB	4
Connective Tissue Development and Function	cytostasis	cytostasis of fibroblasts	3.84E-02	ADORA1,ADORA2A,PCYOX1,SAFB	4
Cellular Growth and Proliferation	cytostasis	cytostasis of fibroblasts	3.84E-02	ADORA1,ADORA2A,PCYOX1,SAFB	4
Cellular Function and Maintenance	function	function of endothelial cells	3.84E-02	CD151,H2AFX,ITGA5,NR3C2	4
Small Molecule Biochemistry	metabolism	metabolism of sulfur amino acid	3.84E-02	MTHFR,MTR,PCYOX1,SHMT2	4
Amino Acid Metabolism	metabolism	metabolism of sulfur amino acid	3.84E-02	MTHFR,MTR,PCYOX1,SHMT2	4
Tissue Morphology	morphology	morphology of mesoderm	3.84E-02	ITGA5,PBX1,TCF15,TEAD2	4
Embryonic	morphology	morphology of	3.84E-02	ITGA5,PBX1,TCF15	4

Development		mesoderm		,TEAD2	
Organismal Injury and Abnormalities	neurocutaneous syndrome	neurocutaneous syndrome	3.84E-02	ADM,CCND1,DDIT3,TSC1	4
Developmental Disorder	neurocutaneous syndrome	neurocutaneous syndrome	3.84E-02	ADM,CCND1,DDIT3,TSC1	4
Dermatological Diseases and Conditions	neurocutaneous syndrome	neurocutaneous syndrome	3.84E-02	ADM,CCND1,DDIT3,TSC1	4
Neurological Disease	neurocutaneous syndrome	neurocutaneous syndrome	3.84E-02	ADM,CCND1,DDIT3,TSC1	4
Cardiovascular Disease	persistent truncus arteriosus	persistent truncus arteriosus	3.84E-02	GATA4,PBX1,RARB,RXRA	4
Developmental Disorder	persistent truncus arteriosus	persistent truncus arteriosus	3.84E-02	GATA4,PBX1,RARB,RXRA	4
Respiratory Disease	persistent truncus arteriosus	persistent truncus arteriosus	3.84E-02	GATA4,PBX1,RARB,RXRA	4
Small Molecule Biochemistry	phosphorylation	phosphorylation of lipid	3.84E-02	NME1,PIP5K1C,SMG1,SYNJ2	4
Lipid Metabolism	phosphorylation	phosphorylation of lipid	3.84E-02	NME1,PIP5K1C,SMG1,SYNJ2	4
Small Molecule Biochemistry	redistribution	redistribution of lipid	3.84E-02	ABCG1,ATP1A1,SLC27A1,TRPC1	4
Lipid Metabolism	redistribution	redistribution of lipid	3.84E-02	ABCG1,ATP1A1,SLC27A1,TRPC1	4
Cellular Movement	transmigration	transmigration of neutrophils	3.84E-02	ADORA2A,JAM3,MYLK3,RTN4	4
Hematological System Development and Function	transmigration	transmigration of neutrophils	3.84E-02	ADORA2A,JAM3,MYLK3,RTN4	4
Immune Cell Trafficking	transmigration	transmigration of neutrophils	3.84E-02	ADORA2A,JAM3,MYLK3,RTN4	4
Inflammatory Response	transmigration	transmigration of neutrophils	3.84E-02	ADORA2A,JAM3,MYLK3,RTN4	4
Neurological Disease	neuromuscular disease	neuromuscular disease	3.88E-02	ADORA1,ADORA2A,AGXT2L1,AHCYL1,AKT1,ALDH2,ATP2A2,B3GNT1,B4GALT5,BCL2L1,CA2,CASP3,CASP9,CIRBP,COLQ,CTGF,CTIF,CYFIP2,DDIT3,DKK3,DUSP5,EML1,EPHA4,FDFT1,GADD45A,GFPT1,GRIN2C,GYPC,HINT1,IFIT1,IFNAR2,INPP1,MBTPS1,MEF2D,MPDZ,MT1X,NAP1L5,NME1,PGAM2,PPP1CB,PPP1R1A,PPRC1,P	61

				RDX6,PRNP,RANBP1,RAP1GAP,RARB,RDBP,REV1,RPS6KA5,RTN4,SCN1B,SLC27A1,SRM,TESC,TUBA1A,TUBA1B,TUBB2B,UBB,UCK2,VCAN	
Skeletal and Muscular Disorders	neuromuscular disease	neuromuscular disease	3.88E-02	ADORA1,ADORA2A,AGXT2L1,AHCYL1,AKT1,ALDH2,ATP2A2,B3GNT1,B4GALT5,BCL2L1,CA2,CASP3,CASP9,CIRBP,COLQ,CTGF,CTIF,CYFIP2,DDIT3,DKK3,DUSP5,EML1,EPHA4,FDFT1,GADD45A,GFPT1,GRIN2C,GYPC,HINT1,IFIT1,IFNAR2,INPP1,MBTPS1,MEF2D,MPDZ,MT1X,NAP1L5,NME1,PGAM2,PPP1CB,PPP1R1A,PPRC1,PRDX6,PRNP,RANBP1,RAP1GAP,RARB,RDBP,REV1,RPS6KA5,RTN4,SCN1B,SLC27A1,SRM,TESC,TUBA1A,TUBA1B,TUBB2B,UBB,UCK2,VCAN	61
Cancer	thyroid carcinoma	thyroid carcinoma	3.95E-02	AKT1,BAD,CDK4,ERBB2,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,THBS1	10
Endocrine System Disorders	thyroid carcinoma	thyroid carcinoma	3.95E-02	AKT1,BAD,CDK4,ERBB2,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,THBS1	10
Tissue Development	cell-cell adhesion	cell-cell adhesion	3.98E-02	CD151,CNTN3,CYFIP2,DSP,ITGA5,JUP,LIMS1,MPZL2,NINJ2,NME1,NTN1,PIP5K1C,RAP1GAP,ZYX	14
Cell-To-Cell Signaling and Interaction	cell-cell adhesion	cell-cell adhesion	3.98E-02	CD151,CNTN3,CYFIP2,DSP,ITGA5,JUP,LIMS1,MPZL2,NINJ2,NME1,NTN1,PIP5K1C,RAP1GAP,ZYX	14
Tissue Morphology	closure	closure of neural tube	4.15E-02	ADM,BBS4,CASP9,EP300,FDFT1,LIAS,SERPINH1,SFRP1,TEAD2,TSC1,VANG L2	11

Embryonic Development	closure	closure of neural tube	4.15E-02	ADM,BBS4,CASP9,EP300,FDFT1,LIAS,SERPINH1,SFRP1,TEAD2,TSC1,VANG L2	11
Organismal Development	closure	closure of neural tube	4.15E-02	ADM,BBS4,CASP9,EP300,FDFT1,LIAS,SERPINH1,SFRP1,TEAD2,TSC1,VANG L2	11
Tissue Development	closure	closure of neural tube	4.15E-02	ADM,BBS4,CASP9,EP300,FDFT1,LIAS,SERPINH1,SFRP1,TEAD2,TSC1,VANG L2	11
Developmental Disorder	congenital anomalies of kidney and urinary tract	congenital anomalies of kidney and urinary tract	4.15E-02	ACTN1,ARHGAP1,BAD,BCL2L1,CALD1,CCND1,EPAS1,FSTL1,PBX1,PDE7B,RARB	11
Renal and Urological Disease	congenital anomalies of kidney and urinary tract	congenital anomalies of kidney and urinary tract	4.15E-02	ACTN1,ARHGAP1,BAD,BCL2L1,CALD1,CCND1,EPAS1,FSTL1,PBX1,PDE7B,RARB	11
Cancer	neoplasia	Ovarian Cancer and Tumors	4.19E-02	AKT1,ARID1A,BCL2L1,CALCOCO2,CDK4,COL4A1,CTDSP L,CTNNAL1,CYP1B1,DACH1,EP300,ERBB2,GAB2,GADD45A,H2AFX,H2AFY,HOXB2,HOXB6,POL E4,POMC,PPAP2A,PTPN1,RRAS,SLC16A3,TUBA1A,URI1,VCAN	27
Reproductive System Disease	neoplasia	Ovarian Cancer and Tumors	4.19E-02	AKT1,ARID1A,BCL2L1,CALCOCO2,CDK4,COL4A1,CTDSP L,CTNNAL1,CYP1B1,DACH1,EP300,ERBB2,GAB2,GADD45A,H2AFX,H2AFY,HOXB2,HOXB6,POL E4,POMC,PPAP2A,PTPN1,RRAS,SLC16A3,TUBA1A,URI1,VCAN	27
Endocrine System Disorders	neoplasia	Ovarian Cancer and Tumors	4.19E-02	AKT1,ARID1A,BCL2L1,CALCOCO2,CDK4,COL4A1,CTDSP L,CTNNAL1,CYP1B1,DACH1,EP300,ERBB2,GAB2,GADD45	27

				A,H2AFX,H2AFY,H OXB2,HOXB6,POL E4,POMC,PPAP2A, PTPN1,RRAS,SLC1 6A3,TUBA1A,URI1, VCAN	
Embryonic Development	closure	closure of embryonic tissue	4.28E-02	ADM,BBS4,BCL2L1, CASP9,EP300,FDF T1,LIAS,SERPINH1, SFRP1,TEAD2,TSC 1,VANGL2	12
Organismal Development	closure	closure of embryonic tissue	4.28E-02	ADM,BBS4,BCL2L1, CASP9,EP300,FDF T1,LIAS,SERPINH1, SFRP1,TEAD2,TSC 1,VANGL2	12
Tissue Development	closure	closure of embryonic tissue	4.28E-02	ADM,BBS4,BCL2L1, CASP9,EP300,FDF T1,LIAS,SERPINH1, SFRP1,TEAD2,TSC 1,VANGL2	12
Connective Tissue Development and Function	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Embryonic Development	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Organ Development	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Organ Morphology	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT	23

				GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	
Organismal Development	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Skeletal and Muscular System Development and Function	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Tissue Development	abnormal morphology	abnormal morphology of bone	4.43E-02	ARHGAP1,CCND1, CTGF,DPCD,E2F5, EGLN2,FSTL1,HEX B,HOXB2,HOXB6,IT GB1BP1,PBX1,PKD CC,PTPRE,RARB,R OR2,SMARCAL1,T AB1,TASP1,TBX5,T CF15,TEAD2,TSHZ 1	23
Organ Morphology	abnormal morphology	abnormal morphology of islets of Langerhans	4.49E-02	AKT1,CDK4,DACH1 ,FSTL3,PBX1	5
Digestive System Development and Function	abnormal morphology	abnormal morphology of islets of Langerhans	4.49E-02	AKT1,CDK4,DACH1 ,FSTL3,PBX1	5
Endocrine System Development and Function	abnormal morphology	abnormal morphology of islets of Langerhans	4.49E-02	AKT1,CDK4,DACH1 ,FSTL3,PBX1	5
Organ Morphology	abnormal morphology	abnormal morphology of ventricular septum	4.62E-02	ADM,ATP2A2,CCN D1,GATA4,RXRA,T AB1,THBS1	7
Cardiovascular System Development	abnormal morphology	abnormal morphology of ventricular	4.62E-02	ADM,ATP2A2,CCN D1,GATA4,RXRA,T AB1,THBS1	7

and Function		septum			
Digestive System Development and Function	development	development of gastrointestinal tract	4.62E-02	CASP9,EP300,GATA4,SFRP1,SFRP5,STX2,VANGL2	7
Embryonic Development	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Organ Development	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Organismal Development	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Skeletal and Muscular System Development and Function	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Tissue Development	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Cellular Assembly and Organization	formation	formation of myofibrils	4.62E-02	EP300,GATA4,KRT8,MYLK,MYLK3,MYOZ1,TBX5	7
Cancer	papillary thyroid cancer	papillary thyroid cancer	4.62E-02	BAD,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,THBS1	7
Endocrine System Disorders	papillary thyroid cancer	papillary thyroid cancer	4.62E-02	BAD,GOLGA5,ITGA5,LSM7,PCM1,RAP1GAP,THBS1	7
Tissue Morphology	size	size of infarct	4.66E-02	ADORA2A,AKT1,FAIM2,FSTL3,GATA4,NOX4,NR3C2,PPP1R1A,PRNP,TBX5,TNFAIP3	11
Cardiovascular Disease	size	size of infarct	4.66E-02	ADORA2A,AKT1,FAIM2,FSTL3,GATA4,NOX4,NR3C2,PPP1R1A,PRNP,TBX5,TNFAIP3	11
Organismal Injury and Abnormalities	size	size of infarct	4.66E-02	ADORA2A,AKT1,FAIM2,FSTL3,GATA4,NOX4,NR3C2,PPP1R1A,PRNP,TBX5,TNFAIP3	11
Nervous System Development and Function	function	function of neurons	4.68E-02	ADORA1,ADORA2A,CPLX3,EPAS1,POMC,TNFRSF19	6
Cellular Function and Maintenance	function	function of neurons	4.68E-02	ADORA1,ADORA2A,CPLX3,EPAS1,POMC,TNFRSF19	6
Cellular Movement	invasion	invasion of fibroblast cell	4.68E-02	ERBB2,FSTL1,JUP,NTN1,RND3,SEMA	6

		lines		4D	
Cancer	neoplasia	neoplasia of breast cancer cell lines	4.68E-02	AKT1,CD151,EPAS1,ERBB2,NME1,SEMA4D	6
Reproductive System Disease	neoplasia	neoplasia of breast cancer cell lines	4.68E-02	AKT1,CD151,EPAS1,ERBB2,NME1,SEMA4D	6
Cancer	sarcoma	sarcoma	4.80E-02	ADM,CDK4,CYP1B1,DDIT3,ERBB2,FDFT1,H2AFX,HINT1,HSPA4,IFNAR2,LGALS3BP,PFKL,PRDX1,RARB,RXRA,SFRP1,TFG,THBS1,TSC1,TUBA1A	20
Cancer	urinary tract tumor	urinary tract tumor	4.82E-02	AKT1,ARID1A,CDK4,ERBB2,MAPK1,POLE4,SFRP1,TSC1,TUBB2B	9
Renal and Urological Disease	urinary tract tumor	urinary tract tumor	4.82E-02	AKT1,ARID1A,CDK4,ERBB2,MAPK1,POLE4,SFRP1,TSC1,TUBB2B	9
Small Molecule Biochemistry	synthesis	synthesis of steroid	4.83E-02	ABCG1,ACBD3,ACOX2,ADM,ATP1A1,CYP1B1,DIAPH1,DKK3,FDFT1,KCNJ5,MAPK1,MBTPS1,NR2F1,POMC	14
Lipid Metabolism	synthesis	synthesis of steroid	4.83E-02	ABCG1,ACBD3,ACOX2,ADM,ATP1A1,CYP1B1,DIAPH1,DKK3,FDFT1,KCNJ5,MAPK1,MBTPS1,NR2F1,POMC	14
Vitamin and Mineral Metabolism	synthesis	synthesis of steroid	4.83E-02	ABCG1,ACBD3,ACOX2,ADM,ATP1A1,CYP1B1,DIAPH1,DKK3,FDFT1,KCNJ5,MAPK1,MBTPS1,NR2F1,POMC	14
Connective Tissue Development and Function	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	28
Embryonic Development	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1	28

				,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	
Organ Development	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	28
Organ Morphology	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	28
Organismal Development	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	28
Skeletal and Muscular System Development and Function	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	28
Tissue Development	morphology	morphology of bone	4.87E-02	ARHGAP1,CCND1,CTGF,DARC,DPCD,E2F5,EGLN2,FSTL1,GAB2,HEXB,HOXB	28

				2,HOXB6,ITGB1BP1,PBX1,PKDCC,PLCG2,PTPRE,RARB,ROR2,SMARCAL1,TAB1,TASP1,TBX5,TCF15,TEAD2,THBS1,TM7SF2,TSHZ1	
Cancer	epithelial neoplasia	epithelial neoplasia	4.88E-02	ABCG1,ACLY,ACOX2,ADAMTS9,ADM,AKT1,ALAD,ALDH2,ALDH7A1,ANGPTL2,ARF4,ARHGDIARID1A,ATG16L1,ATP1A1,ATP1A2,ATP1B3,ATP2A2,B4GALT5,BAD,BCL2L1,CA2,CACNB2,CALCO2,CALD1,CALM1 (includes others),CASP3,CCND1,CDK4,CES2,CIRBP,CLGN,COL4A1,CRELD1,CSPG4,CTDSPL,CTGF,CTNNAL1,CYP1B1,DACH1,DAPK2,DDX39A,DENND2A,DGCR8,DIAPH1,DLL1,DUSP5,E2F5,ECM1,EIF2C2,EMP1,EP300,EPAS1,EPB49,EPA4,ERBB2,EXTL3,FDFT1,FEN1,FSTL3,FXD1,FZD1,GAB2,GADD45A,GATA4,GOLGA5,GUCY1A3,GYPC,H2AFX,H2AFY,HAND1,HINT1,HOLF,HOOK2,HOXB2,HOXB6,IFIT1,IFNAR2,IGSF3,IL32,ITGA5,JAM3,JUP,KCNMB1,KDM3B,KEAP1,LRSAM1,LSM7,MAPK1,MBNL1,MCM3,MMP11,MT1X,MTA1,MTAP,MTHFR,MYLK,NDUFB4,NME1,NR2F1,NR3C2,NRIP1,NT5C3L,NTHL1,PAQR4,PCM1,PCP4,POLE4,POMC,PPAP2A,PRCC,PRDX1,PRDX6,PRNP,PTPN1,PTPRE,QPCT,RAB11FIP1,RAP1G	157

				AP,RARB,RBM39,R CAN2,RNF150,RRA S,RXRA,SBF1,SEC 31A,SELENBP1,SE MA4D,SERPINF1,S FRP1,SFRP5,SLC1 6A3,SLC27A1,SLC2 9A1,SMG1,SPPL2A, SRM,STX2,STXBP6 ,SYT13,TASP1,THB S1,THBS4,TNFRSF 19,TRAK1,TRAPPC 2L,TSC1,TUBA1A,T UBB2B,URI1,VASH 1,VCAN,VSTM2L,W DR1,WLS,ZDHHC1 1	
Free Radical Scavenging	metabolism	metabolism of reactive oxygen species	4.99E-02	AKT1,ALDH2,ARHG DIA,BCL2L1,CASP3 ,CCS,CYP1B1,DDIT 3,EPAS1,FCGR2A, GAB2,IL32,ITGA5,IT SN1,MAPK1,MYLK, NLRX1,NOA1,NOX4 ,NOXA1,NR3C2,PL CG2,POMC,PRDX1, PRDX6,PRNP,PTP N1,RND3,RRAS,SE RPINF1,SPAG9,TS C1	32

Table S9: Module locations of AF-associated candidate genes and top five correlated partners.

Gene	Module	Gene Partners (Correlation)
PITX2	Green	TTC37 (0.56) PEX1 (0.55) WDR26 (0.54) CTBP1 (0.50) FAM98A (0.49)
ZFHX3	Turquoise	MRPL41 (-0.61) TGFB111 (0.60) PCBD1 (-0.60) EFNA4 (-0.59) CS (-0.58)
PRRX1	Turquoise	MFAP4 (0.45) PLAGL1 (0.45) COL6A3 (0.42) FAM117B (0.42) COL5A1 (0.40)
SYNPO2L	Cyan	CYP2J2 (0.69) MURC (0.65) C2orf29 (0.57) WEE1 (0.56) STAT4 (0.55)
SYNE2	Turquoise	ATP5O (0.49) RHBDF1 (-0.49) PSMD1 (0.48) BOLA3 (0.47) DLAT (0.46)
CAV1	Red	WDR12 (0.53) DIRC2 (0.53) HMG20B (-0.51) MRPS33 (0.51) RPS3 (-0.50)
C9orf3	Turquoise	CYC1 (0.66) ENDOG (0.65) MRPS15 (0.65) UQCRC1 (0.65) RPL8 (0.63)
KCNN3	Not in network	N/A
HCN4	Not in network	N/A
WNT8A	Not in network	N/A

Table S10: Module assignments for genes in network.

Illumina_ID	HGNC_Symbol	Module
ILMN_1803398	SRF	black
ILMN_1695945	MEIS2	black
ILMN_1693014	CEBPB	black
ILMN_1728360	MED29	black
ILMN_1751886	REC8	black
ILMN_2065022	ARHGAP44	black
ILMN_1754757	SCNN1D	black
ILMN_1750321	TRANK1	black
ILMN_1802753	TSSC4	black
ILMN_1704537	PHGDH	black
ILMN_1766269	HM13	black
ILMN_1785646	PMP22	black
ILMN_1772910	GAS1	black
ILMN_1735014	KLF6	black
ILMN_2339266	LAMA2	black
ILMN_2207393	CNOT3	black
ILMN_1798602	PCF11	black
ILMN_1798360	CXCR7	black
ILMN_1681103	AQP1	black
ILMN_1750518	ALYREF	black
ILMN_1748538	ALDH1A2	black
ILMN_1732985	PHF20L1	black
ILMN_1672536	FBLN1	black
ILMN_2128428	DAB2	black
ILMN_1664440	TP53BP1	black
ILMN_1765091	ANKHD1	black
ILMN_1733256	PSMD8	black
ILMN_1813840	KDM1A	black
ILMN_1690125	PDLIM7	black
ILMN_1716368	CCDC111	black
ILMN_1722981	TLR5	black
ILMN_1796925	CXADR	black
ILMN_1749838	MZF1	black
ILMN_1684497	PYROXD2	black
ILMN_1751062	SCARA5	black
ILMN_1761450	DHRS4L2	black
ILMN_2183409	SCARB1	black
ILMN_2410783	GAA	black
ILMN_1681016	SPNS1	black
ILMN_2121816	GPR137B	black
ILMN_2258268	GLRX2	black
ILMN_1811592	ARHGAP21	black

ILMN_1737170	FLII	black
ILMN_1787843	HSDL2	black
ILMN_1722726	ARHGAP32	black
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ILMN_1688011	UPF1	black
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ILMN_1741159	MAP3K8	black
ILMN_2098325	C8orf33	black
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ILMN_1898518	GFRA1	black
ILMN_2097790	C1orf86	black
ILMN_1678235	KANSL1	black
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ILMN_1799614	PNPLA6	black
ILMN_1794825	ALDH3A2	black
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ILMN_1678961	FRMD4A	black
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ILMN_1849186	ZNF704	black
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ILMN_1752668	DAAM2	black
ILMN_1775677	TYSND1	black
ILMN_1772876	ZNF395	black
ILMN_1789558	ZC2HC1A	black
ILMN_1798659	CCDC28A	black
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Supplemental References

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