

SUPPLEMENTARY TABLE S3. INGENUITY PATHWAY ANALYSIS NETWORKS DATA

ID	Molecules in network	Score	Focus molecules	Top diseases and functions
1	ABHD2, ABLIM1, ALDH, ALDH3A2, ALDH5A1, ANXA3, ASPM, ASS1, BCAT1, CLDN8, CLIC3, CLIC6, CXADR, DKK1, EPB41L5, ESRI, GPRASP1, GPM2, METTL7A, MME, Nuclear factor 1, PBK, PCP4, PLS1, PXDN, PYGL, SCAMP1, SEC63, SLC16A1, SORD, SYNE4, TCF/LEF, TWIST1, UBL3, YKT6	54	32	Cancer, cell death and survival, organismal injury and abnormalities
2	ANLN, BEX2, BMP, BUB1B, CASC5, CCNB2, CENPA, CENPE, CENPI, CENPN, DIAPH3, E2F7, ETS, Fascin, FOXD1, FOXM1, GFPT2, GTSE1, HJURP, INF2, KIF23, KIF20A, KIF4A, NFKB (complex), NUF2, PPAP2B, PRC1, RACGAP1, RIPK4, SHCBP1, SHOX2, SLC7A5, SPC24, TPMT, ZMYND11	51	31	Cell cycle, cellular movement, cellular assembly and organization
3	alcohol group acceptor phosphotransferase, ANPEP, AURKA, BIRC5, BUB1, CCBE1, CDK1, CDKN3, CEP55, CTPS1, ERO1L, FAM83D, GALNT12, HGF, HMMR, HOXB7, HOXD10, LY75, MELK, MKI67, MRTO4, Mucin, NEK2, PBX1, PPL, RCOR3, RRM2, SELENBP1, SHISA2, SRPX2, STIL, STMN1, TMEM158, TRIP13, Vegf	50	32	Cell cycle, cancer, organismal injury and abnormalities
4	AFAP1L2, ASAP1, c-Strc, CAV2, CDCA5, chymotrypsin, DOCK3, EPS8L1, ERK, EXOC6, Exocyst, FANCI, FARP1, Fgfr, FSCN1, Gap, GTPase, JAK, LAMTOR3, LTBPI, MAL, NCK, NEDD9, NEK6, OSMR, PEBP1, PKP4, PLAUR, RALA, RALGAP2, RALGPS1, RGL3, SDPR, SPINT2, UCK2	39	26	Cellular movement, reproductive system development and function, cancer
5	ABI2, ASAH1, ASF1A, CCNA2, CCNB1, CDC6, CDC45, CDK6, ELOVL7, H3F3A/H3F3B, Hat, HISTONE, histone deacetylase, Histone H1, Histone h3, HOPX, HOXB6, HPSE, ID2, Integrin alpha V beta 3, JADE1, LOXL2, MCM10, NAP1L2, ORC6, PAX8, PCMI, Pkc(s), PRR16, Rsk, SLC20A2, SOX6, SYNE2, UHRF1, WDHD1	39	27	Connective tissue disorders, developmental disorder, gastrointestinal disease
6	Adaptor protein 1, AP1M2, Ap2 alpha, atypical protein kinase C, CD200, CDCA8, DAB2, DAPK2, Dynamin, farnesyl transferase, FBLIM1, GAS2L3, GNA15, HOXC6, Intersectin, ITSN2, Jnk, JUN/JUNB/JUND, KIF2C, LMO3, MEGF10, MTHFD2, MYLIP, MYO5B, NPC1, NRAS, OIP5, PDCD4, Plc beta, SGOL2, Sos, SPC25, SRD5A1, TRIB3, TRIO	37	25	Cellular assembly and organization, dna replication, recombination, and repair, cellular development
7	Akt, ANGPTL1, ARHGAP44, BANK1, BMP7, CADM1, CDH13, COL12A1, COL5A1, COL5A3, COL6A1, COL6A2, COL7A1, collagen, Collagen type III, Collagen type IV, Collagen type V, Collagen type VI, CPE, DDR1, HNI, Hsp27, MAL2, N-Cadherin, NELL2, PARM1, Pdgf Ab, PDGF-AA, PTPRN2, Raf, SCD5, SERPINH1, SMOOTH MUSCLE ACTIN, TPD52, VGLL3	33	23	Connective tissue disorders, dermatological diseases and conditions, organismal injury and abnormalities
8	ADA, AK4, AMPK, CENPE, CLIC4, DIO2, DNMI1, Eph Receptor, EPHA4, FOXE1, FOXL1, GLCCII, Hedgehog, HHEX, MAP4K4, Mapk, MHC Class II (complex), MIR124, NCAPG, NDPK, NKX2-1, NME5, NME7, Pde, PDE1A, PDE8B, PLC gamma, Proinsulin, Rab5, SLIT3, SORL1, TG, TSH, TSPAN7, UNC5C	33	23	Developmental disorder, endocrine system disorders, hereditary disorder
9	ADAM12, ANK3, APC (complex), BTC, Cdc2, CDC20, Cdc25, CDC25C, Cdk, CDS1, CHEK1, Cyclin A, Cyclin B, DLGAP5, E2f, GINS1, GOLTI1B, growth factor receptor, IGF2BP3, KIF11, KIF15, MAD2L1, MAOA, MARCKS, Mpf, NUSAP1, PI3K (complex), PI3K p85, PRR11, RAB3B, RNF180, SH3PXD2B, TPX2, TTK, UBE2C	29	24	Cell cycle, cancer, organismal injury and abnormalities
10	AIFIL, ALDH1A3, AMD1, AUNIP, C18orf54, C2orf40, CASD1, CCND1, CENPH, CIRBP, DEPDC1, DIRAS3, ELAVL1, EPB41L4B, FECH, FGFR1OP2, FKBP14, FRMD8, GAS2L3, GPDIL, GRAMD3, HTATIP2, IGIP, KIF20B, KLHDC1, LDLRAD3, MYO5C, NFIC, PAPOLA, PCBPI, RRM2, SERINC3, TFPI, TMED4, ZEB2	27	20	Tissue development, cancer, organismal injury and abnormalities

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SUPPLEMENTARY TABLE S3. (CONTINUED)

<i>ID</i>	<i>Molecules in network</i>	<i>Score</i>	<i>Focus molecules</i>	<i>Top diseases and functions</i>
11	BEND7, BRIP1, C/ebp, caspase, Cbp/p300, CD24, CENPW, CIRBP, Cyclin D, CYP39A1, DEPDC1, DSP, ELOVL6, estrogen receptor, Focal adhesion kinase, FOSL1, Hdac, Histone h4, HSD17B6, Hsp70, Hsp90, IQGAP3, KPNA2, MUC15, N-cor, PAX6, Pro-inflammatory Cytokine, RAD51, Rb, RORA, RPA, Rxr, SMARCA2, thymidine kinase, TOP2A	24	19	DNA replication, recombination, and repair, cancer, organismal injury and abnormalities
12	ACADL, ACADVL, ATP11C, ATP1B1, ATP5EP2, ATP8A1, ATP8B1, ATP8B2, CDS2, CLN5, CPVL, CTNNA1, HID1, KIF14, KIF18A, KIF1BP, LONP1, P3H1, PAIP1, PAIP2, PAPOLA, PRC1, PRUNE2, RASSF8, RBMS1, RCN3, SCAPER, SHMT1, SLC25A22, SLC36A1, SVIP, TM7SF2, TMEM30A, TOR1A, UBC	23	18	Lipid metabolism, molecular transport, small molecule biochemistry
13	ANGPTL2, ARG2, Caveolin, CHN2, CLIP2, CLU, creatine kinase, CSPG4, ENAH, ERK1/2, Growth hormone, HDL, HDL-cholesterol, hemoglobin, Ldh (complex), LDL, LDL-cholesterol, LILRB2, LIPG, LRP, NFIA, Nos, Nr1h, PCYOX1, PI3K (family), PLTP, PRKAA, PSRC1, RGN, RGS5, Sphk, STAB1, TRIB1, TRIM2, VLDL-cholesterol	22	18	Embryonic development, nervous system development and function, organ development
14	ACTN1, Calcineurin protein(s), calpain, Cdc25B/C, CDH1, CFLAR, Cg, Ck2, Cyclin E, cytochrome C, DTL, EPCAM, EPHX2, EPM2AIP1, FSH, GALNT6, Gsk3, ID4, IFT57, ITCH, Lh, NFAT (complex), NMDA Receptor, OCLN, PARP, PARP8, phosphatase, PP1-C, PPFIBP2, PTPN13, PTPRM, SIRPA, Smad1/5/8, Sod, TCF	21	17	Cell morphology, cell-to-cell signaling and interaction, connective tissue development and function
15	ACOT7, ADAMI9, ADAMTS12, ADCY, ADCY9, ADRB, Alpha catenin, Cadherin, CaMKII, CD209, CDCA3, Creb, CSF1R, ESRP1, FAM214A, Fgf, FGFR2, Gm-csf, Ikk (family), IL1, IRAK1, ITGA5, MAGEA3/MAGEA6, Mek, Mic, NTRK2, PDGFRA, PPI protein complex group, PPP1R14C, Ras, Rock, SACS, Sapk, STAT5a/b, TGM2	20	18	Cancer, organismal injury and abnormalities, skeletal and muscular system development and function
16	APP, ATL3, ATP4A, C11orf52, C11orf71, CAAP1, CDH3, CDKL2, CSF1R, CTNNA1, CTNND1, DNAH1, DNAH14, DNALI1, DYNLT1, EPB41L4A, EYA4, FZD4, GDF15, KIF3B, LRP5, NANOS1, NDP, ODF1, ODF2, PPAP2B, RAPIB, RASGRF1, RSPH1, SIX2, SKA3, SPC24, TCP11L1, TSPAN12, ZSCAN18	19	17	Hereditary disorder, ophthalmic disease, organismal injury and abnormalities
17	BDH2, C19orf25, CD151, COG7, COLGALT1, ERP44, FAM72A, KIF18B, KLC4, KLHL7, KNTC1, LPCAT1, LPCAT2, LRRC16A, MIS18A, MRPL1, NBAS, NCDN, NNAT, PHF20L1, PNISR, PNN, RBM47, SCFD2, SH3BGR2, SLC16A9, SPDL1, STXBP6, TAZ, UBC, ZDHHC2, ZNF415, ZNF471, ZW10, ZWILCH	19	16	Cell cycle, cell morphology, cellular assembly and organization
18	ADRB2, BARX2, BEX4, CALM1 (includes others), CCDC8, CKAP2L, CLMP, CREB1, DEPDC7, DMXL1, EGFR, ELAVL1, ENOSF1, EPAS1, FAM169A, FHL2, GTF2B, ID3, IQCA1, ISG15, KMT2D, KRTPCAP3, LMNA, NT5DC1, NXF1, POT1, RASEF, SATB1, TCERGIL, TM9SF3, UBC, UNC93B1, ZBED2, ZNF540, ZNF626	19	16	Gene expression, cellular assembly and organization, RNA damage and repair
19	ADAM29, ADAMTS6, BEX5, C9orf3, CCDC176, CCL23, CD163L1, CREBRF, ECT2, ENO1, ENTPD2, FAM189A2, FANK1, GALNT18, GBPI, GGH, HS3ST3A1, IFNG, JUN, KANSL1L, LIG4, Metalloprotease, NFKBID, OPTN, OXRI, PDX1, RNA polymerase II, SAA1, SMARCA4, TMEM50B, TNFSF11, TSHR, TSPAN8, UPF2, VRK1	19	16	Cell morphology, connective tissue development and function, skeletal and muscular system development and function

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SUPPLEMENTARY TABLE S3. (CONTINUED)

<i>ID</i>	<i>Molecules in network</i>	<i>Score</i>	<i>Focus molecules</i>	<i>Top diseases and functions</i>
20	ACSS3, AT1L2, BRD8, CLCA2, DEF6, DUOXA1, EPCAM, HNF4A, KIAA0101, mir-140, mir-205, miR-1285-3p (and other miRNAs w/seed CUGGGCA), MOCOS, MSRB1, MTCL1, NPNT, PDIA5, PGM3, PODXL, REEP5, RNASE4, SH3BGR2, SH3YL1, SOGA1, SPATA6, TMC4, TMC04, TMEM245, TP53, TRIM28, UROD, VIM, ZNF10, ZNF302, ZSWIM5	18	16	Cancer, endocrine system disorders, organismal injury and abnormalities
21	ATXN1, CPQ, CREB1, ECM1, EPCAM, ESRP1, ETV3, FABP2, FOXE1, FUT7, GPR83, IL10RA, KIAA1549L, KRT7, LRG1, LRIG3, MGAT4C, NFIB, PDGFR, prostaglandin E1, RBMS3, RMST, SLC6A13, SOX2, STAC2, TG, TGFB1, TMEM30B, TNFRSF14, TSC22D1, USP34, USP54, VEPH1, WISP1, WNT3	18	15	Endocrine system development and function, small molecule biochemistry, embryonic development
22	Adaptor protein 2, ADGRD1, ADGRE2, ADGRF1, ADGRG1, ADORA3, ADORA2B, C5AR1, CCR1, CELSR2, chemokine, Clathrin, FZD5, G protein, G protein alpha, Gpr, GPR84, GPRC5A, IKK (complex), IL12 (family), LMBRD1, Metalloprotease, MTORC1, p85 (pik3r), PHF10, PLC, PTGER, Rac, Ras homolog, Relaxin, Sfk, She, SRC (family), STAT, TSHR	17	16	Carbohydrate metabolism, small molecule biochemistry, hematological system development and function
23	Alp, Alpha Actinin, CAT, Collagen Alpha1, Collagen type I, Collagen type II, Collagen(s), CREB3L1, CROT, DUOX2, Ecm, Fc gamma receptor, Fibrin, FRZB, Integrin, Laminin, LOX, Mmp, MMP1, NPNT, P38 MAPK, PARVB, Pdgf (complex), PDGF BB, Kar, SATB2, secreted MMP, SERPINE1, Smad, SMAD6, TFP2, Tgf beta, TGFB1, TIMP2, trypsin	17	15	Cellular movement, cardiovascular disease, organismal injury and abnormalities
24	ARVCF, CA8, CEMIP, CTNND1, CTNND2, CYB5D1, CYBRD1, DCUN1D1, DNAJB4, ENCL1, ENPP5, EPAS1, EPCAM, FAMI26A, FER, HIF1A, HILPDA, HSD17B8, HSP90AA1, Igfbp, IGFBP2, IQCK, KDM3A, KLHL14, LNX1, LOXL2, MARCKSL1, PKP4, PTPRU, RAD21, SCRIB, SLCO2A1, TMEM45A, tretinoin, WNT10B	15	15	Cellular function and maintenance, cellular development, cellular growth and proliferation
25	14-3-3, Alpha tubulin, Angiotensin II receptor type 1, BCR (complex), CLDN3, CYLD, DKK3, Dynein, F Actin, Fcer1, G protein alpha, Gamma tubulin, KCNJ16, MAATS1, MAP2K1/2, Nfat (family), NR3C2, Pka, PLD1, PP2A, PPP1R9A, PROCR, Ptk, PTPase, RAB32, Rap1, SNTB1, SNX1, SNX5, TCR, TUBB2A, tubulin (complex), tyrosine kinase, UBE2S, Wnt	15	15	Cell morphology, cellular assembly and organization, cell death and survival