## Ingenuity Pathway Analysis Enriched Gene Networks

| ID | Molecules in Network | Score | Focus Molecules | Top Diseases and Functions |
|----|----------------------|-------|----------------|--------------------------|
| 1  | ACER2,Akt,CHI3L1,Creb,CRH,CYP26B1,DUT, EGR1,EGR2,ERK,ERK1/2,F3,FGF2,Focal adhesion kinase,GNA12,GPER1,HGF,ITGB3,MeK,MT2A, MVP,NEUROD1,NRG1,OPCML,P38 MAPK,Pi3K (family),PLD2,PPP1CC,PRKCA,PRKCE,SRC (family),TAC1,TGFβ2,TGM2,TP53 | 31 | 26 | [Cell Cycle, Cell Death and Survival, Gene Expression] |
| 2  | AK5,CLU,COL4A1,CP,DTN,DTNA,DUSP2,ERSR1,FL1,FRS,FUS-DDIT3,GAP43,GATA6,INHBA,KAZN,KDM1A,KDM5A, LGALS1,MECP2,MXD1,MYH9,NR4A2,PALLD,PAX6,PRKG1,PTGES3,RAB5A,SNAP25,SRF,Taxin,TAFL5,TAGLN,TEAD2,TERT,THBS1,TMED10,TPM1 | 23 | 22 | [Cellular Development, Cellular Growth and Proliferation, Nervous System Development and Function] |
| 3  | APOE,CD99,CDH13,CHRM2,CSNK2A2,DCLK1,ERBB2,FLT1,HLA-A,IGF1,IL6,IL6J,ILF,MALT1,mir-148,mir-373,mir-7,MYC,NEFH,NLRCS,NPTX2,OSMR,PADI2,PPP1R1B,PPTPR,RA27A,REL,A,RP14,S1PR2,SLC6A11,SNC3,SYN3,TLR8 | 14 | 16 | [Cellular Movement, Hematological System Development and Function, Tissue Morphology] |
| 4  | AKR1C1/2,ATP5F1C,AUH,BAG1,BDNF,BMP4,CDKNA1,CDX2,CDIEN,DDX5,DLX3,FGFR3,FH,FST,HAPI,HEY1,HOPX,HTRC2,IGFBP4,NDUFA12,NDUFS6,NUPR1,PCP4,POKNOX1,PRDM16,PRL,PRF1,SYN2,SYN3,TLR8 | 14 | 13 | [Cell Death and Survival, Cellular Growth and Proliferation, Tissue Morphology] |
| 5  | ACTB,BAD,BST2,CCAT1,CNIH3,CTNNB1,DKK1,DUSP10,ENSA,EZR,GAPDH,HMG2,HRNPU,HTRA1, ID3,IGFBP7,ITGA1,KCNJ1,LEF1,LIMK,MYOD1,NEIL2,PLK1,PRP1,RPA1,S100A4,SLC9A3R1,SREB1,F1,THBD,TNFAP8,TP63,WNT3A,WNT5A,WNT7A,YWHA | 11 | 14 | [Cellular Movement, Hematological System Development and Function, Tissue Morphology] |
| 6  | ADAM17,Alpha 1 antitrypsin,BSG,CAPNS1,CRK,CTSB,CTTN,ELANE,EPAS1,EPHA2,ETV5,FERM2,FHL1,GRB2,HIC1,ITGAI,ITGAS,ITGB1,Nh,MMP2,MTOR,MYLK,NCF1,NEDD9,NR4A1,OLR1,PLSCR1,PRKCA,PTK2,SHC1,SLC2A1,SPINK7,SRC,STATA5,ZYX | 10 | 13 | [Cell-To-Cell Signaling and Interaction, Cellular Movement, Immune Cell Trafficking] |
| 7  | ADGRG1,AIM2,B2M,CAMP,CD81,COPA,Fcgr2,Fcgr3,FLT3LG,GLULS3,HIDIN,ICOSLG/LOC102723996,JITIM3,JL18,JL2,IL33,INS,Ldh (complex),MSN,NF,NKRF,OGG1,PAE,PCSK1,PLA2G3,PRTN3,PTK2B,SMARC4,SOX2-OT,TLR7,TLR7/8,TNF,TRAF3/IP2,TRAF4,VEGFA | 10 | 13 | [Cell Death and Survival, Hematological System Development and Function, Tissue Morphology] |
| 8 | AGER,BGN,CD14,CD40,CFTR,CSNK2B,FADS2,FIBRINOGEN (family),GH1,GPX1,Growth hormone,HMGB1,Hispg,ICAM1,IFN Beta,IgG,IL12 (complex),IL18BP,IL21,IL24,Jnk,LYN,MAP3K7,MAVS,NFKB (complex),NRG1,PLAT,PRKACA,PSMB9,PTGER1,SST,TAP1,TNFSF15,ZC3HAV1 | 10 | 13 | [Cell-To-Cell Signaling and Interaction, Hematological System Development and Function, Inflammatory Response] |
| 9 | ACTR1A,AGO2,ATP5MF,CARM1,CASP3,CSRPI1CY7,ERG,HSF1,HSPE1,HULC,JARID2,KIF5B,KPNA1,MAP1B,mir-122,mir-130a-3p (and other miRNAs w/seed AGUGCAA),miR-218-5p (and other miRNAs w/seed UGUGCUU),miR-2392 (miRNAs w/seed AGGAUGG),mir-34,MT-CO1,NFE2L2,PTPRZ1,PTPRZ2,RANBP1,SCL30A3,TGFBI,TIMP3,TMPRSS2-ERG,VIM,WNT7A,XAF1,ZEB1 | 10 | 13 | [Cell Death and Survival, Cellular Development, Cellular Movement] |
| 10 | ACVRL1,ADIPOQ,BMPR1B,BMPR2,CD40LG,COL1A2,CXCL8,DEFB4A/DEFB4B,EGR1,F2RL1,FA BP5,HDAC2,HMOX1,ID1,ID2,KDM5B,KLK6,KRT14 ,MMP9,MRTFA,MTPN,NEDD9,NOD1,Notch,OSC AR,PDGF BB,PPARG,PSD3,PTAFR,SMAD2,SMAD6,SSH1,TA GLN,TLR4 | 8 | 11 | [Cellular Development, Connective Tissue Development and Function, Tissue Development] |
| 11 | ALDH3A2,ARC,BAX,BMI1,CASP1,CCND1,CDK4,CDK6,CDKN1B,CDKN2A,CDKN2C,DNAJA2,EEF1A1, FABP6,GAD1,GLI1,HDAC2,LMNA,MDM4, NID1,NR1H4,PPIK (complex),PSMC3,RBL1,RBL2,RCN1,REF1,SMAD4,TCF,TCF7L2,TRIM28,USP11,VCAM1 | 8 | 11 | [Cellular Growth and Proliferation, Embryonic Development, Tissue Development] |
| 12 | CYRIA,Histone h3 | 1 | 1 | [Cancer, Gastrointestinal Disease, Organismal Injury and Abnormalities] |
| 13 | BACE1,RTN3 | 1 | 1 | [Cell Morphology, Cellular Assembly and Organization, Cellular Development] |
| 14 | AMFR,MFN2 | 1 | 1 | [Cellular Compromise, Hereditary Disorder, Neurological Disease] |
| 15 | RORA,SEMA3F | 1 | 1 | [Cardiovascular System Development and Function, Cell Morphology, Nervous System Development and Function] |
| 16 | CHGB,PROX1 | 1 | 1 | [Cardiovascular System Development and Function, Embryonic Development, Hematological System Development and Function] |
| 17 | SNRPB,SNRPN | 1 | 1 | [Connective Tissue Disorders, Developmental Disorder, Gastrointestinal Disease] |
| 18 | EMX2,SPAST | 1 | 1 | [Cell Cycle, Embryonic Development, Nervous System Development and Function] |
| 19 | LY6D,TSTA3 | 1 | 1 | [Cancer, Carbohydrate Metabolism, Cell-To-Cell Signaling and Interaction] |
| 20 | FSTL3,KDM3A | 1 | 1 | [Connective Tissue Disorders, Organismal Injury and Abnormalities, Tissue Morphology] |
| 21 | MSC,TCF3 | 1 | 1 | [Cancer, Organ Morphology, Skeletal and Muscular System Development and Function] |
| Ingenuity Canonical Pathways                                                                 | -log(p-value) |
|--------------------------------------------------------------------------------------------|--------------|
| Protein Kinase A Signaling                                                                   | 3.68         |
| ERK/MAPK Signaling                                                                          | 3.31         |
| Caveolar-mediated Endocytosis Signaling                                                     | 3.24         |
| Glutamate Dependent Acid Resistance                                                        | 3.1          |
| Cell Cycle: G2/M DNA Damage Checkpoint Regulation                                           | 2.96         |
| Chondroitin Sulfate Biosynthesis (Late Stages)                                              | 2.6          |
| Role of Tissue Factor in Cancer                                                             | 2.56         |
| Breast Cancer Regulation by Stathmin1                                                       | 2.53         |
| Histidine Degradation VI                                                                    | 2.5          |
| Pregnenolone Biosynthesis                                                                   | 2.5          |
| Huntington’s Disease Signaling                                                              | 2.46         |
| CREB Signaling in Neurons                                                                   | 2.44         |
| Calcium-induced T Lymphocyte Apoptosis                                                      | 2.39         |
| Chondroitin Sulfate Biosynthesis                                                            | 2.29         |
| Dermatan Sulfate Biosynthesis                                                               | 2.2          |
| Opioid Signaling Pathway                                                                    | 2.19         |
| IGF-1 Signaling                                                                             | 2.18         |
| Antigen Presentation Pathway                                                                | 2.18         |
| Phagosome Maturation                                                                        | 2.13         |
| Semaphorin Neuronal Repulsive Signaling                                                     | 2.13         |
| Glutamate Degradation III (via 4-aminobutyrate)                                             | 2.12         |
| Synaptogenesis Signaling Pathway                                                            | 2.12         |
| Ubiquinol-10 Biosynthesis (Eukaryotic)                                                      | 2.1          |
| nNOS Signaling in Neurons                                                                   | 2.07         |
| Hepatic Fibrosis / Hepatic Stellate Cell Activation                                          | 2.06         |
| RhoA Signaling                                                                             | 2.01         |
| GP6 Signaling Pathway                                                                       | 1.98         |
| Dermatan Sulfate Biosynthesis (Late Stages)                                                 | 1.97         |
| Amyloid Processing                                                                          | 1.92         |
| α-Adrenergic Signaling                                                                       | 1.91         |
| Cholecystokinin/Gastrin-mediated Signaling                                                  | 1.87         |
| Amyotrophic Lateral Sclerosis Signaling                                                     | 1.86         |
| Virus Entry via Endocytic Pathways                                                         | 1.86         |
| Neuroprotective Role of THOP1 in Alzheimer's Disease                                         | 1.84         |
| Coronavirus Replication Pathway                                                             | 1.82         |
| Allograft Rejection Signaling                                                               | 1.74         |
| HIPPO signaling                                                                             | 1.71         |
| Hepatic Cholestasis                                                                         | 1.64         |
| RhodGDI Signaling                                                                           | 1.64         |
| Prostanoid Biosynthesis                                                                     | 1.6          |
| Choline Biosynthesis III                                                                    | 1.6          |
| Remodeling of Epithelial Adherens Junctions                                                | 1.57         |
| Oncostatin M Signaling                                                                       | 1.55         |
| PFKFB4 Signaling Pathway                                                                    | 1.55         |
| No. | Pathway                                                                 | Score |
|-----|-------------------------------------------------------------------------|-------|
| 45  | Alanine Biosynthesis III                                               | 1.55  |
| 46  | Phototransduction Pathway                                               | 1.49  |
| 47  | CCR3 Signaling in Eosinophils                                          | 1.47  |
| 48  | Corticotropin Releasing Hormone Signaling                               | 1.47  |
| 49  | Heparan Sulfate Biosynthesis (Late Stages)                              | 1.45  |
| 50  | HIF1α Signaling                                                        | 1.45  |
| 51  | EIF2 Signaling                                                          | 1.44  |
| 52  | Coronavirus Pathogenesis Pathway                                        | 1.44  |
| 53  | Bile Acid Biosynthesis, Neutral Pathway                                 | 1.43  |
| 54  | Nitric Oxide Signaling in the Cardiovascular System                     | 1.42  |
| 55  | ERK5 Signaling                                                          | 1.41  |
| 56  | eNOS Signaling                                                         | 1.4   |
| 57  | Coagulation System                                                     | 1.4   |
| 58  | Sperm Motility                                                         | 1.38  |
| 59  | Synaptic Long Term Depression                                           | 1.37  |
| 60  | Macropinocytosis Signaling                                              | 1.37  |
| 61  | Extrinsic Prothrombin Activation Pathway                                | 1.36  |
| 62  | GPCR-Mediated Integration of Enteroendocrine                             | 1.34  |
| 63  | SAPK/JNK Signaling                                                     | 1.34  |
| 64  | Apoptosis Signaling                                                    | 1.34  |
| 65  | PAK Signaling                                                           | 1.32  |
| 66  | Insulin Secretion Signaling Pathway                                     | 1.31  |
| 67  | Regulation of eIF4 and p70S6K Signaling                                 | 1.31  |
| 68  | Gqq Signaling                                                           | 1.31  |
| 69  | Heparan Sulfate Biosynthesis                                            | 1.31  |