Supplemental Table S5. Pathways analysis of 30 top ranked eigenvector centrality and 30 top ranked betweenness proteins using IPA.

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| **Ingenuity Canonical Pathways** | **B-H p-value** | **Genes** |
| FXR/RXR Activation | 4.67735E-10 | PPARG,PPARA,APOE,APOB,APOA1,SCARB1,APOC1,APOC2,HNF4A |
| Clathrin-mediated Endocytosis Signaling | 7.76247E-09 | HSPA8,APOE,APOB,APOA1,F2R,GRB2,APOC1,APOC2,UBC |
| Telomerase Signaling | 5.01187E-08 | TP53,MYC,RB1,GRB2,TERT,CDKN1A,EGFR |
| IL-12 Signaling and Production in Macrophages | 3.38844E-07 | PPARG,APOE,APOB,APOA1,APOC1,APOC2,REL |
| Prostate Cancer Signaling | 4.67735E-07 | TP53,RB1,AR,GRB2,CREB1,CDKN1A |
| ERK/MAPK Signaling | 2.51189E-06 | PPARG,YWHAQ,MYC,GRB2,CREB1,YWHAZ,ESR1 |
| Myc Mediated Apoptosis Signaling | 2.88403E-06 | YWHAQ,TP53,MYC,GRB2,YWHAZ |
| LXR/RXR Activation | 2.88403E-06 | APOE,APOB,APOA1,APOC1,APOA5,APOC2 |
| Atherosclerosis Signaling | 2.88403E-06 | APOE,APOB,APOA1,CXCL12,APOC1,APOC2 |
| Estrogen-mediated S-phase Entry | 2.88403E-06 | MYC,RB1,CDKN1A,ESR1 |
| ERK5 Signaling | 2.95121E-06 | YWHAQ,MYC,CREB1,YWHAZ,EGFR |
| Aryl Hydrocarbon Receptor Signaling | 4.36516E-06 | TP53,MYC,RB1,CDKN1A,ESR1,SMARCA4 |
| Huntington's Disease Signaling | 4.36516E-06 | HSPA8,TP53,GRB2,CREB1,DLG4,UBC,EGFR |
| Glioblastoma Multiforme Signaling | 5.88844E-06 | TP53,MYC,RB1,GRB2,CDKN1A,EGFR |
| Bladder Cancer Signaling | 1.02329E-05 | TP53,MYC,RB1,CDKN1A,EGFR |
| Glucocorticoid Receptor Signaling | 1.25893E-05 | HSPA8,AR,GRB2,CREB1,CDKN1A,ESR1,SMARCA4 |
| Chronic Myeloid Leukemia Signaling | 1.28825E-05 | TP53,MYC,RB1,GRB2,CDKN1A |
| Glioma Signaling | 1.34896E-05 | TP53,RB1,GRB2,CDKN1A,EGFR |
| Production of Nitric Oxide and Reactive Oxygen Species in Macrophages | 1.47911E-05 | PPARA,APOE,APOB,APOA1,APOC1,APOC2 |
| Pancreatic Adenocarcinoma Signaling | 2.18776E-05 | TP53,RB1,GRB2,CDKN1A,EGFR |
| Cell Cycle: G2/M DNA Damage Checkpoint Regulation | 2.69153E-05 | YWHAQ,TP53,CDKN1A,YWHAZ |
| p70S6K Signaling | 3.38844E-05 | YWHAQ,F2R,GRB2,YWHAZ,EGFR |
| PI3K/AKT Signaling | 3.63078E-05 | YWHAQ,TP53,GRB2,CDKN1A,YWHAZ |
| Hereditary Breast Cancer Signaling | 4.2658E-05 | TP53,RB1,CDKN1A,UBC,SMARCA4 |
| Estrogen-Dependent Breast Cancer Signaling | 5.88844E-05 | TERT,CREB1,ESR1,EGFR |
| Cell Cycle: G1/S Checkpoint Regulation | 5.88844E-05 | TP53,MYC,RB1,CDKN1A |
| Non-Small Cell Lung Cancer Signaling | 6.45654E-05 | TP53,RB1,GRB2,EGFR |
| HER-2 Signaling in Breast Cancer | 0.00011749 | TP53,GRB2,CDKN1A,EGFR |
| Role of BRCA1 in DNA Damage Response | 0.000125893 | TP53,RB1,CDKN1A,SMARCA4 |
| HIPPO signaling | 0.000165959 | YWHAQ,YWHAZ,DLG4,LATS2 |
| Neuregulin Signaling | 0.000165959 | MYC,GRB2,DLG4,EGFR |
| AMPK Signaling | 0.000165959 | CREB1,CDKN1A,HNF4A,ELAVL1,SMARCA4 |
| LPS/IL-1 Mediated Inhibition of RXR Function | 0.000346737 | PPARA,APOE,SCARB1,APOC1,APOC2 |
| Thyroid Cancer Signaling | 0.000398107 | PPARG,TP53,MYC |
| Melanoma Signaling | 0.00047863 | TP53,RB1,CDKN1A |
| Endometrial Cancer Signaling | 0.000891251 | TP53,MYC,GRB2 |
| Unfolded protein response | 0.000912011 | PPARG,HSPA8,VCP |
| Regulation of Cellular Mechanics by Calpain Protease | 0.001 | RB1,GRB2,EGFR |
| ATM Signaling | 0.001202264 | TP53,CREB1,CDKN1A |
| Hypoxia Signaling in the Cardiovascular System | 0.001412538 | TP53,CREB1,VHL |
| Renal Cell Carcinoma Signaling | 0.001819701 | GRB2,UBC,VHL |
| Small Cell Lung Cancer Signaling | 0.001905461 | TP53,MYC,RB1 |
| STAT3 Pathway | 0.002041738 | MYC,CDKN1A,EGFR |
| Cyclins and Cell Cycle Regulation | 0.002290868 | TP53,RB1,CDKN1A |
| Thrombin Signaling | 0.002398833 | F2R,GRB2,CREB1,EGFR |
| GADD45 Signaling | 0.002951209 | TP53,CDKN1A |
| Molecular Mechanisms of Cancer | 0.003090295 | TP53,MYC,RB1,GRB2,CDKN1A |
| PPAR Signaling | 0.003388442 | PPARG,PPARA,GRB2 |
| Mouse Embryonic Stem Cell Pluripotency | 0.003715352 | TP53,MYC,GRB2 |
| Polyamine Regulation in Colon Cancer | 0.003715352 | PPARG,MYC |
| IGF-1 Signaling | 0.003890451 | YWHAQ,GRB2,YWHAZ |
| p53 Signaling | 0.003981072 | TP53,RB1,CDKN1A |
| Colorectal Cancer Metastasis Signaling | 0.004466836 | TP53,MYC,GRB2,EGFR |
| NGF Signaling | 0.004786301 | TP53,GRB2,CREB1 |
| Role of p14/p19ARF in Tumor Suppression | 0.005888437 | TP53,RB1 |
| 14-3-3-mediated Signaling | 0.006025596 | YWHAQ,GRB2,YWHAZ |
| p38 MAPK Signaling | 0.006025596 | TP53,MYC,CREB1 |
| PTEN Signaling | 0.006025596 | GRB2,CDKN1A,EGFR |
| GNRH Signaling | 0.00724436 | GRB2,CREB1,EGFR |
| Estrogen Receptor Signaling | 0.00724436 | GRB2,ESR1,SMARCA4 |
| Ovarian Cancer Signaling | 0.007585776 | TP53,RB1,EGFR |
| Neuroprotective Role of THOP1 in Alzheimer's Disease | 0.009772372 | CREB1,APP |
| UVC-Induced MAPK Signaling | 0.010715193 | TP53,EGFR |
| Role of Oct4 in Mammalian Embryonic Stem Cell Pluripotency | 0.012022644 | TP53,RB1 |
| Hepatic Cholestasis | 0.012302688 | PPARA,HNF4A,ESR1 |
| PPARα/RXRα Activation | 0.013803843 | PPARA,APOA1,GRB2 |
| Wnt/β-catenin Signaling | 0.013803843 | TP53,MYC,UBC |
| Ephrin Receptor Signaling | 0.015135612 | GRB2,CREB1,CXCL12 |
| UVB-Induced MAPK Signaling | 0.015488166 | TP53,EGFR |
| Thrombopoietin Signaling | 0.016218101 | MYC,GRB2 |
| Role of CHK Proteins in Cell Cycle Checkpoint Control | 0.016218101 | TP53,CDKN1A |
| ErbB2-ErbB3 Signaling | 0.016218101 | MYC,GRB2 |
| EGF Signaling | 0.016218101 | GRB2,EGFR |
| Breast Cancer Regulation by Stathmin1 | 0.018197009 | TP53,GRB2,CDKN1A |
| PXR/RXR Activation | 0.019952623 | PPARA,HNF4A |
| Neurotrophin/TRK Signaling | 0.021877616 | GRB2,CREB1 |
| GDNF Family Ligand-Receptor Interactions | 0.022387211 | GRB2,CREB1 |
| FLT3 Signaling in Hematopoietic Progenitor Cells | 0.023442288 | GRB2,CREB1 |
| PEDF Signaling | 0.023442288 | PPARG,TP53 |
| JAK/Stat Signaling | 0.023988329 | GRB2,CDKN1A |
| Prolactin Signaling | 0.023988329 | MYC,GRB2 |
| Toll-like Receptor Signaling | 0.023988329 | PPARA,UBC |
| BMP signaling pathway | 0.024547089 | GRB2,CREB1 |
| PDGF Signaling | 0.025703958 | MYC,GRB2 |
| Acute Myeloid Leukemia Signaling | 0.02630268 | MYC,GRB2 |
| Reelin Signaling in Neurons | 0.026915348 | APOE,APP |
| Melanocyte Development and Pigmentation Signaling | 0.029512092 | GRB2,CREB1 |
| TR/RXR Activation | 0.029512092 | SCARB1,APOA5 |
| ErbB Signaling | 0.029512092 | GRB2,EGFR |
| FGF Signaling | 0.029512092 | GRB2,CREB1 |
| FAK Signaling | 0.029512092 | GRB2,EGFR |
| UVA-Induced MAPK Signaling | 0.029512092 | TP53,EGFR |
| TGF-β Signaling | 0.029512092 | GRB2,HNF4A |
| G Beta Gamma Signaling | 0.030199517 | GRB2,EGFR |
| VEGF Signaling | 0.030199517 | GRB2,ELAVL1 |
| Protein Ubiquitination Pathway | 0.030902954 | HSPA8,UBC,VHL |
| SAPK/JNK Signaling | 0.032359366 | TP53,GRB2 |
| HIF1α Signaling | 0.036307805 | TP53,VHL |
| Cholecystokinin/Gastrin-mediated Signaling | 0.037153523 | GRB2,EGFR |
| HGF Signaling | 0.038904514 | GRB2,CDKN1A |
| Role of Tissue Factor in Cancer | 0.039810717 | TP53,EGFR |
| Role of Macrophages, Fibroblasts and Endothelial Cells in Rheumatoid Arthritis | 0.039810717 | MYC,CREB1,CXCL12 |
| Role of NANOG in Mammalian Embryonic Stem Cell Pluripotency | 0.040738028 | TP53,GRB2 |
| Acyl-CoA Hydrolysis | 0.044668359 | HNF4A |
| P2Y Purigenic Receptor Signaling Pathway | 0.046773514 | MYC,CREB1 |