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| **Table S14. List of canonical pathways which is specifically identified in gene co-expression modules in B cells of primary Sjögren's syndrome.** |
| Ingenuity Canonical Pathways |  -log(p-value) | Ratio | module | Molecules |
| Renin-Angiotensin Signaling | 1.3 | 0.0233 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Endocannabinoid Developing Neuron Pathway | 1.31 | 0.0234 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Role of NANOG in Mammalian Embryonic Stem Cell Pluripotency | 1.32 | 0.0236 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| PTEN Signaling | 1.35 | 0.0244 | blue | PIK3CA,YWHAH,PIK3R5 |
| Sphingosine-1-phosphate Signaling | 1.35 | 0.0244 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Phosphatidylcholine Biosynthesis I | 1.36 | 0.143 | blue | PCYT1A |
| Adrenomedullin signaling pathway | 1.39 | 0.0198 | blue | PIK3C2B,PIK3CA,GUCY2C,PIK3R5 |
| Neuropathic Pain Signaling In Dorsal Horn Neurons | 1.41 | 0.0259 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Apelin Cardiomyocyte Signaling Pathway | 1.43 | 0.0263 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| 3-phosphoinositide Biosynthesis | 1.44 | 0.0206 | blue | PIK3C2B,PIK3CA,PTPRJ,PIK3R5 |
| Amyotrophic Lateral Sclerosis Signaling | 1.45 | 0.0268 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Mouse Embryonic Stem Cell Pluripotency | 1.46 | 0.027 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| UVA-Induced MAPK Signaling | 1.46 | 0.027 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Regulation of the Epithelial-Mesenchymal Transition Pathway | 1.47 | 0.0211 | blue | PIK3C2B,PIK3CA,SMAD3,PIK3R5 |
| RANK Signaling in Osteoclasts | 1.55 | 0.0294 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Ceramide Signaling | 1.58 | 0.03 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| TR/RXR Activation | 1.58 | 0.03 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| PDGF Signaling | 1.6 | 0.0306 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| PEDF Signaling | 1.63 | 0.0316 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Reelin Signaling in Neurons | 1.65 | 0.0319 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Glucocorticoid Receptor Signaling | 1.66 | 0.0178 | blue | PIK3C2B,PIK3CA,YWHAH,NFATC3,SMAD3,PIK3R5 |
| FGF Signaling | 1.67 | 0.0326 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Relaxin Signaling | 1.71 | 0.025 | blue | PIK3C2B,PIK3CA,GUCY2C,PIK3R5 |
| Angiopoietin Signaling | 1.76 | 0.0353 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Type II Diabetes Mellitus Signaling | 1.79 | 0.0265 | blue | PIK3C2B,PIK3CA,PIK3R5,SOCS5 |
| CD40 Signaling | 1.83 | 0.0375 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Role of PI3K/AKT Signaling in the Pathogenesis of Influenza | 1.88 | 0.039 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Gα12/13 Signaling | 1.89 | 0.0284 | blue | PIK3C2B,PIK3CA,TBXA2R,PIK3R5 |
| HMGB1 Signaling | 1.91 | 0.0288 | blue | PIK3C2B,PIK3CA,SP1,PIK3R5 |
| MSP-RON Signaling Pathway | 1.92 | 0.0405 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| EGF Signaling | 1.99 | 0.0429 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Role of IL-17A in Arthritis | 1.99 | 0.0429 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Lymphotoxin β Receptor Signaling | 2 | 0.0435 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Ephrin A Signaling | 2.13 | 0.0484 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| Apelin Pancreas Signaling Pathway | 2.21 | 0.0517 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| AMPK Signaling | 2.55 | 0.0275 | blue | PIK3C2B,PIK3CA,RAB1A,TBC1D1,PIK3R5,PFKFB2 |
| Role of p14/p19ARF in Tumor Suppression | 2.55 | 0.0682 | blue | PIK3C2B,PIK3CA,PIK3R5 |
| FcγRIIB Signaling in B Lymphocytes | 2.62 | 0.046 | blue | PIK3C2B,PIK3CA,CD79B,PIK3R5 |
| Antiproliferative Role of Somatostatin Receptor 2 | 2.68 | 0.0476 | blue | PIK3C2B,PIK3CA,GUCY2C,PIK3R5 |
| IL-17A Signaling in Airway Cells | 2.76 | 0.05 | blue | PIK3C2B,PIK3CA,TRAF3IP2,PIK3R5 |
| Calcium Transport I | 1.3 | 0.1 | brown | ATP2A3 |
| D-myo-inositol-5-phosphate Metabolism | 1.34 | 0.0195 | brown | PLD4,PTPRJ,PTEN |
| Ovarian Cancer Signaling | 1.38 | 0.0201 | brown | PRKACB,CD44,PTEN |
| Amyloid Processing | 1.56 | 0.04 | brown | PRKACB,BACE2 |
| Polyamine Regulation in Colon Cancer | 1.39 | 0.0476 | green | PSME4 |
| RAN Signaling | 1.5 | 0.0625 | green | KPNA1 |
| Superpathway of Geranylgeranyldiphosphate Biosynthesis I (via Mevalonate) | 1.5 | 0.0625 | green | IDI1 |
| Mevalonate Pathway I | 1.63 | 0.0833 | green | IDI1 |
| Trans, trans-farnesyl Diphosphate Biosynthesis | 2.1 | 0.25 | green | IDI1 |
| Diphthamide Biosynthesis | 2.23 | 0.333 | green | DPH5 |
| Cleavage and Polyadenylation of Pre-mRNA | 1.53 | 0.0833 | grey | PAPOLA |
| Agrin Interactions at Neuromuscular Junction | 1.3 | 0.192 | turquoise | ITGB1,RAP1B,RAP2B,RAP2A,GABPB1,PXN,MAPK1,ARHGEF7,ITGAL,LAMC1,PTK2,RRAS2,UTRN,ACTG1 |
| Pyrimidine Deoxyribonucleotides De Novo Biosynthesis I | 1.3 | 0.261 | turquoise | TYMS,DUT,RRM2B,RRM2,AK9,APOBEC3G |
| Phagosome Maturation | 1.31 | 0.172 | turquoise | TUBA1B,TUBB3,ATP6V1D,VPS41,PRDX5,TUBB4B,PRDX1,HLA-B,TUBG1,TUBA4A,CANX,TUBB,ATP6V1A,VTI1B,DYNLRB1,ATP6V0A1,CTSA,DYNLL1,PIK3C3,TUBA1C,CTSC,NAPA,ATP6V0E1 |
| GNRH Signaling | 1.37 | 0.168 | turquoise | RAP2B,RAP1B,RAP2A,CAMK4,MAPK1,SOS2,MAP3K5,PTK2,CAMK2D,PLCB1,PRKCE,GNG5,MAP3K14,MAP3K9,PXN,GNAS,CREB3,CREBBP,GNAQ,HBEGF,ITPR1,CREB5,CALM1 (includes others),GNAI3,RRAS2,PRKCI,PRKCD,PRKCB |
| IL-12 Signaling and Production in Macrophages | 1.37 | 0.171 | turquoise | PIK3CA,MAPK1,APOA2,PIK3R5,CEBPB,STAT4,TLR2,TLR4,LYZ,PRKCI,GAB1,PRKCD,PIK3C3,PIK3R6,TGFB2,PRKCE,SERPINA1,S100A8,IRS2,IRF8,REL,RXRA,TNF,FRS2,PRKCB |
| P2Y Purigenic Receptor Signaling Pathway | 1.37 | 0.173 | turquoise | RAP2B,RAP1B,RAP2A,PIK3CA,MAPK1,CREBBP,CREB3,GNAQ,PIK3R5,PLCL2,CREB5,GNAI3,RRAS2,PRKCI,GAB1,PRKCD,PIK3C3,PIK3R6,PRKCE,PLCB1,IRS2,GNG5,FRS2,PRKCB |
| Phosphatidylcholine Biosynthesis I | 1.38 | 0.429 | turquoise | CEPT1,CHPT1,PCYT1A |
| PPARα/RXRα Activation | 1.38 | 0.167 | turquoise | RAP1B,RAP2B,RAP2A,MAPK1,APOA2,CD36,TGFBR3,SMAD3,SOS2,NR2F1,TGFBR2,HSP90B1,HSP90AB1,TGFB2,PLCB1,STAT5B,GOT2,MAP3K14,GNAS,CREBBP,ACVR1,GNAQ,PLCL2,NCOA3,RRAS2,IL1B,MEF2C,RXRA,PRKCB |
| Glucocorticoid Receptor Signaling | 1.44 | 0.154 | turquoise | RAP2B,MAPK1,NFATC3,SMAD3,SOS2,TAF10,CD163,HSPA5,TGFBR2,SMARCB1,IRS2,FRS2,POLR2L,MAP3K14,CXCL8,HSPA9,CREBBP,NCOA3,SMARCD3,HSPA8,GAB1,SMARCA2,IL1RN,PIK3R6,ESR1,TNF,PHF10,RAP1B,RAP2A,PIK3CA,KRT76,PIK3R5,CCL5,CCL3,NR3C1,PTGES3,HSP90B1,HSP90AB1,PIK3C3,ANXA1,TGFB2,CEBPA,STAT5B,FKBP5,SRA1,CHP1,CEBPB,NFATC4,RRAS2,IL1B,PTGS2,NRIP1 |
| Neuropathic Pain Signaling In Dorsal Horn Neurons | 1.45 | 0.181 | turquoise | KCNN3,PIK3CA,KCNN4,CAMK4,MAPK1,CAMK1D,GRIA1,PIK3R5,PLCL2,ITPR1,PRKCI,CAMK2D,GAB1,PRKCD,PIK3C3,PIK3R6,PRKCE,PLCB1,IRS2,FRS2,PRKCB |
| Role of NFAT in Cardiac Hypertrophy | 1.45 | 0.163 | turquoise | RAP2B,RAP1B,RAP2A,PIK3CA,CAMK4,CAMK1D,MAPK1,SOS2,CSNK1A1,PIK3R5,TGFBR2,CAMK2D,PIK3C3,TGFB2,PLCB1,PRKCE,IRS2,GNG5,FRS2,HDAC9,GNAS,CHP1,GNAQ,ITPR1,NFATC4,PLCL2,CALM1 (includes others),GNAI3,PRKCI,RRAS2,GAB1,PRKCD,PIK3R6,MEF2C,SLC8A1,PRKCB |
| iNOS Signaling | 1.48 | 0.227 | turquoise | TLR4,CALM1 (includes others),LY96,CAMK4,MAPK1,CREBBP,CD14,HMGA1,IRAK1,IRAK2 |
| Th17 Activation Pathway | 1.5 | 0.2 | turquoise | IRF4,NFATC3,IL21R,TRGV9,IL6R,NFATC4,IRAK1,STAT4,HSP90B1,HSP90AB1,RORA,FCER1G,IL1B,AHR,IRAK2 |
| Estrogen-mediated S-phase Entry | 1.52 | 0.269 | turquoise | CCNA2,TFDP1,E2F7,CDK4,ESR2,ESR1,E2F2 |
| p38 MAPK Signaling | 1.56 | 0.186 | turquoise | MAPKAPK3,HIST1H3C,CREBBP,CREB3,MAP3K5,CREB5,FAS,IRAK1,TGFBR2,TRADD,PLA2G6,RPS6KA6,IL1RN,TGFB2,IL1B,MEF2C,RPS6KA4,EEF2K,TNFRSF1B,TNF,IRAK2 |
| Androgen Signaling | 1.32 | 0.0222 | yellow | SMAD3,GNG3,PRKD3 |
| Apelin Pancreas Signaling Pathway | 1.32 | 0.0345 | yellow | PIK3C2B,PIK3CA |
| Role of Pattern Recognition Receptors in Recognition of Bacteria and Viruses | 1.34 | 0.0227 | yellow | PIK3C2B,PIK3CA,PRKD3 |
| AMPK Signaling | 1.37 | 0.0183 | yellow | PIK3C2B,PIK3CA,MAP2K3,SMARCA4 |
| Endocannabinoid Developing Neuron Pathway | 1.38 | 0.0234 | yellow | PIK3C2B,PIK3CA,MAP2K3 |
| Role of NANOG in Mammalian Embryonic Stem Cell Pluripotency | 1.38 | 0.0236 | yellow | PIK3C2B,PIK3CA,BMPR2 |
| PTEN Signaling | 1.42 | 0.0244 | yellow | PIK3CA,YWHAH,BMPR2 |
| Sphingosine-1-phosphate Signaling | 1.42 | 0.0244 | yellow | PIK3C2B,PIK3CA,PLCG1 |
| G Beta Gamma Signaling | 1.45 | 0.0252 | yellow | PLCG1,GNG3,PRKD3 |
| Adrenomedullin signaling pathway | 1.47 | 0.0198 | yellow | PIK3C2B,PIK3CA,PLCG1,MAP2K3 |
| Osteoarthritis Pathway | 1.49 | 0.02 | yellow | SMAD3,CTNNA1,BMPR2,LEF1 |
| Amyotrophic Lateral Sclerosis Signaling | 1.52 | 0.0268 | yellow | PIK3C2B,PIK3CA,CAPN7 |
| UVA-Induced MAPK Signaling | 1.53 | 0.027 | yellow | PIK3C2B,PIK3CA,PLCG1 |
| Role of p14/p19ARF in Tumor Suppression | 1.54 | 0.0455 | yellow | PIK3C2B,PIK3CA |
| GPCR-Mediated Nutrient Sensing in Enteroendocrine Cells | 1.56 | 0.0278 | yellow | PLCG1,GNG3,PRKD3 |
| PDGF Signaling | 1.67 | 0.0306 | yellow | PIK3C2B,PIK3CA,PLCG1 |
| PPARα/RXRα Activation | 1.68 | 0.023 | yellow | SMAD3,PLCG1,BMPR2,MAP2K3 |
| Colorectal Cancer Metastasis Signaling | 1.76 | 0.0201 | yellow | PIK3C2B,PIK3CA,SMAD3,LEF1,GNG3 |
| Endocannabinoid Cancer Inhibition Pathway | 1.83 | 0.0256 | yellow | PIK3C2B,PIK3CA,MAP2K3,LEF1 |
| Opioid Signaling Pathway | 1.83 | 0.0209 | yellow | FYN,HCK,MAP2K3,AP1B1,PRKD3 |
| Antiproliferative Role of Somatostatin Receptor 2 | 1.85 | 0.0357 | yellow | PIK3C2B,PIK3CA,GNG3 |
| Type II Diabetes Mellitus Signaling | 1.88 | 0.0265 | yellow | PIK3C2B,PIK3CA,SOCS5,PRKD3 |
| CD40 Signaling | 1.9 | 0.0375 | yellow | PIK3C2B,PIK3CA,MAP2K3 |
| IL-17A Signaling in Airway Cells | 1.9 | 0.0375 | yellow | PIK3C2B,PIK3CA,TRAF3IP2 |
| Insulin Receptor Signaling | 1.96 | 0.028 | yellow | PIK3C2B,FYN,PIK3CA,PPP1R14A |
| CREB Signaling in Neurons | 2 | 0.023 | yellow | PIK3C2B,PIK3CA,PLCG1,GNG3,PRKD3 |
| EGF Signaling | 2.06 | 0.0429 | yellow | PIK3C2B,PIK3CA,PLCG1 |
| Role of IL-17A in Arthritis | 2.06 | 0.0429 | yellow | PIK3C2B,PIK3CA,MAP2K3 |
| Renin-Angiotensin Signaling | 2.11 | 0.031 | yellow | PIK3C2B,PIK3CA,PLCG1,PRKD3 |
| 3-phosphoinositide Biosynthesis | 2.2 | 0.0258 | yellow | PIK3C2B,FYN,DUSP5,PIK3CA,PPP1R14A |
| Ephrin A Signaling | 2.21 | 0.0484 | yellow | PIK3C2B,FYN,PIK3CA |
| Regulation of the Epithelial-Mesenchymal Transition Pathway | 2.23 | 0.0263 | yellow | PIK3C2B,PIK3CA,SMAD3,MAP2K3,LEF1 |
| Neuropathic Pain Signaling In Dorsal Horn Neurons | 2.28 | 0.0345 | yellow | PIK3C2B,PIK3CA,PLCG1,PRKD3 |
| Apelin Cardiomyocyte Signaling Pathway | 2.3 | 0.0351 | yellow | PIK3C2B,PIK3CA,PLCG1,PRKD3 |
| Mouse Embryonic Stem Cell Pluripotency | 2.34 | 0.036 | yellow | PIK3C2B,PIK3CA,BMPR2,LEF1 |
| Superpathway of Inositol Phosphate Compounds | 2.59 | 0.0263 | yellow | PIK3C2B,FYN,DUSP5,PIK3CA,PLCG1,PPP1R14A |
| Reelin Signaling in Neurons | 2.6 | 0.0426 | yellow | PIK3C2B,FYN,PIK3CA,HCK |
| FGF Signaling | 2.64 | 0.0435 | yellow | PIK3C2B,PIK3CA,PLCG1,MAP2K3 |
| Role of NFAT in Cardiac Hypertrophy | 2.66 | 0.0271 | yellow | PIK3C2B,PIK3CA,PLCG1,MAP2K3,GNG3,PRKD3 |
| P2Y Purigenic Receptor Signaling Pathway | 2.82 | 0.036 | yellow | PIK3C2B,PIK3CA,PLCG1,GNG3,PRKD3 |