

Supplementary Table 3. KEGG analysis of mRNAs in GM-related CEN

Term	Count	PValue	Genes
hsa04360:Axon guidance	19	5.20E-07	EPHB6, ITGB1, ROBO2, EPHA4, UNC5A, UNC5D, L1CAM, EFNA5, RGS3, CDK5, DPYSL5, CFL2, RAC2, SLIT1, PAK6, PAK3, SRGAP2, LRRC4C, EPHB1
hsa05033:Nicotine addiction	10	8.84E-06	GABRB3, GRIA1, GABRB2, GABRA1, GRIN2A, SLC32A1, CACNA1B, GABRD, GRIN2B, GABRG2
hsa04727:GABAergic synapse	14	8.86E-06	GABRB3, GABBR2, GABRB2, GABRA1, KCNJ6, SLC32A1, GAD1, PLCL1, CACNA1B, GABRG2, TRAK2, GNG3, GNB5, GABRD
hsa04723:Retrograde endocannabinoid signaling	15	1.29E-05	GABRB3, GRIA1, GABRB2, GABRA1, KCNJ6, SLC32A1, CACNA1B, ITPR1, GABRG2, MAPK10, GNG3, CNR1, GNB5, GABRD, KCNJ3
hsa04725:Cholinergic synapse	15	3.84E-05	CAMK2B, KCNJ4, CHRM3, KCNJ6, CHRM1, CAMK2A, CACNA1B, ITPR1, GNG3, CAMK4, KCNQ2, KCNQ5, GNB5, KCNJ3, ATF4
hsa04728:Dopaminergic synapse	16	4.87E-05	GRIA1, CAMK2B, KCNJ6, CAMK2A, CACNA1B, ITPR1, GRIN2B, MAPK10, GNG3, GRIN2A, CALY, KIF5A, GNB5, KCNJ3, SCN1A, ATF4
hsa05032:Morphine addiction	12	3.81E-04	GABRB3, GABBR2, GABRB2, GABRA1, GNG3, KCNJ6, SLC32A1, CACNA1B, GNB5, GABRD, GABRG2, KCNJ3
hsa04724:Glutamatergic synapse	13	7.51E-04	GRIA1, SLC1A1, SLC1A2, ITPR1, SLC1A6, GRIN2B, GNG3, GRIN2A, DLGAP1, HOMER3, GNB5, SHANK2, KCNJ3
hsa04080:Neuroactive ligand-receptor interaction	21	0.002170521	GABRB3, PTGER4, GRIA1, GABBR2, GABRB2, CHRM3, GABRA1, CHRM1, C5AR1, NPY1R, GPR83, PTH2R, HTR2A, SSTR1, GRIN2B, GABRG2, GRIN2A, GLRB, ADORA2B, CNR1, GABRD
hsa04921:Oxytocin signaling pathway	14	0.002762355	CAMK2B, KCNJ4, MEF2C, KCNJ6, CAMK2A, ITPR1, CACNA2D2, CACNB2, CACNB3, CACNB4, CAMK4, CACNG2, CAMK1G, KCNJ3
hsa05132:Salmonella infection	10	0.002771134	MAPK10, IL6, CXCL8, IFNGR1, RHOG, FLNA, CXCL1, FLNC, WASF1, CXCL3
hsa04512:ECM-receptor interaction	10	0.003819647	ITGB1, RELN, SV2B, COL4A1, SV2A, COL5A2, SPP1, COL6A3, ITGA5, THBS1

hsa04010:MAPK signaling pathway	19	0.004175989	NTRK2, PTPRR, MEF2C, CACNA1B, CACNA2D2, FGF1, CACNA1E, RASGRP3, MAPK10, CACNB2, CACNB3, CACNB4, FGF14, RAC2, FLNA, FLNC, CACNG2, PTPN5, ATF4
hsa04024:cAMP signaling pathway	16	0.00490993	GRIA1, CAMK2B, GABBR2, CHRM1, CAMK2A, NPY1R, ATP2B2, ATP2B1, SSTR1, GRIN2B, MAPK10, NFKBIA, HCAR3, GRIN2A, CAMK4, RAC2
hsa04726:Serotonergic synapse	11	0.006340691	GABRB3, GABRB2, GNG3, KCNJ6, CYP4X1, CACNA1B, ITPR1, GNB5, HTR2A, KCNJ3, PTGS1
hsa05410:Hypertrophic cardiomyopathy (HCM)	9	0.006600629	ITGB1, CACNB2, CACNB3, IL6, CACNB4, TPM4, CACNA2D2, ITGA5, CACNG2
hsa04713:Circadian entrainment	10	0.0068309	CAMK2B, GRIA1, GNG3, KCNJ6, GRIN2A, CAMK2A, ITPR1, GNB5, GRIN2B, KCNJ3
hsa04721:Synaptic vesicle cycle	8	0.007038633	UNC13C, SNAP25, UNC13A, SLC32A1, SYT1, STXBP1, CACNA1B, TCIRG1
hsa04510:Focal adhesion	16	0.007066308	ITGB1, SHC3, CAV1, THBS1, MAPK10, RELN, COL4A1, COL5A2, SPP1, RAC2, FLNA, COL6A3, PAK6, FLNC, ITGA5, PAK3
hsa04720:Long-term potentiation	8	0.009049524	CAMK2B, GRIA1, GRIN2A, CAMK4, CAMK2A, ITPR1, GRIN2B, ATF4
hsa05412:Arrhythmogenic right ventricular cardiomyopathy (ARVC)	8	0.009805055	ITGB1, CACNB2, CACNB3, CACNB4, CACNA2D2, CTNNA2, ITGA5, CACNG2
hsa04668:TNF signaling pathway	10	0.014399248	MAPK10, NFKBIA, IL6, VCAM1, CCL20, TNFAIP3, CXCL1, CXCL3, ATF4, ICAM1
hsa03010:Ribosome	11	0.024084386	RPS19, RPS5, RPL12, RPL11, RPL36, RPL35, RPL8, RPL29, RPS21, UBA52, RPL19
hsa04261:Adrenergic signaling in cardiomyocytes	11	0.026334464	CAMK2B, CACNB2, CACNB3, CACNB4, TPM4, CAMK2A, CACNA2D2, ATP2B2, ATP2B1, CACNG2, ATF4
hsa05131:Shigellosis	7	0.026608434	MAPK10, ITGB1, NFKBIA, CXCL8, RHOG, ITGA5, WASF1
hsa04020:Calcium signaling pathway	13	0.02719134	CAMK2B, CHRM3, CHRM1, CAMK2A, CACNA1B, ITPR1, ATP2B2, ATP2B1, HTR2A, CACNA1E, GRIN2A, ADORA2B, CAMK4
hsa05205:Proteoglycans in cancer	14	0.027490747	ITGB1, CAMK2B, CD63, FZD3, CAV1, CAMK2A, STAT3, PLAUR, ITPR1, THBS1, CTSL, FLNA, FLNC, ITGA5
hsa04722:Neurotrophin signaling	10	0.028191156	CAMK2B, MAPK10, NFKBIA, NTRK2, SHC3, IRS1, MAGED1, CAMK4, CAMK2A,

pathway			ATF4
hsa05031:Amphetamine addiction	7	0.030408181	CAMK2B, GRIA1, GRIN2A, CAMK4, CAMK2A, GRIN2B, ATF4
hsa05414:Dilated cardiomyopathy	8	0.030670864	ITGB1, CACNB2, CACNB3, CACNB4, TPM4, CACNA2D2, ITGA5, CACNG2
hsa04014:Ras signaling pathway	15	0.032674345	SHC3, KSR2, FGF1, EFNA5, GRIN2B, RASGRP3, MAPK10, PLA2G16, GNG3, GRIN2A, FGF14, RAC2, PAK6, GNB5, PAK3
hsa05134:Legionellosis	6	0.043456442	NFKBIA, IL6, ITGAM, CXCL8, CXCL1, CXCL3
hsa04621:NOD-like receptor signaling pathway	6	0.049585765	MAPK10, NFKBIA, IL6, CXCL8, TNFAIP3, CXCL1