Supplementary Table 4. Enrichment analysis of disease classes using 1218 gene list differentially expressed between assumed somatic MMR deficient and MMR proficient tumors

Category	Term	Fold enrichment	p-value	Benjamini	Genes
GAD_DISEASE_CLASS	*METABOLIC*	*1.28*	*1.66E-11*	*2.98E-10*	*PTGS2, SCN3B, FSTL4, CDH22, BSX, CDH20, GRIN2B, FSTL5, HTR1E, TMEFF2, WNT10A, CRTAC1, GRIN2A, TMEM132B, COLEC10, PTPRT, CYP1A2, PROX1, TMEM132C, RETN, SSTR1, IFNB1, C1ORF87, RYR1, HGC6.3, FAM163B, SCN1A, IGFBPL1, SERPINA12, SORCS1, SORCS2, SORCS3, FAM19A5, IQSEC3, NTF3, RMST, PCDH10, NXF2, PCDH15, KCNK2, CCDC158, NPY5R, GH2, GH1, KCNJ4, PENK, APCDD1L, RAPSN, ZNF385B, AGXT2, RGS9, CSH1, OPRM1, ZNF536, FGF8, ZNF676, RNF182, ZNF679, SPAG17, INSRR, KISS1R, MMP20, TMEM108, FOXB1, CFHR5, FGF3, FBXL21, NPBWR1, TNMD, PKDCC, OR2W3, ZNF135, DOK5, FOXC2, CER1, C9, TFR2, FFAR1, PCSK2, LRRTM4, FMO2, FMO3, LRRTM1, GBX1, PCSK9, SLCO3A1, HTR3B, SIM1, SLC8A1, IGF2, TMPRSS6, DSCR10, CDH18, CDH19, FOXE1, GFRA1, LRP2, HTR2C, WNT7A, ZNF257, GFRA2, SLC8A3, QRFPR, SLC13A5, STK31, LMO3, GRIK3, SLC7A8, TSPAN7, DLK1, LRRC4C, PDX1, ZIC3, IL10, CDKN2A, DAB1, CDKN2B, SLC2A2, ELOVL2, IL1A, SPON1, IRS2, CHODL, AJAP1, NTSR1, ASCL1, FBXO17, RASGRF1, GPR50, RELN, ASCL4, TMEM212, DRD1, ADAMTSL2, DRD2, ASTN1, NKAIN2, CNTFR, PAH, KCNA5, RNF165, OR2T33, KIAA1210, SLC6A11, KCNB2, SLC6A12, GRIN1, SLC6A13, INSC, CACNA2D3, CACNA1S, THSD7B, HULC, CXCL14, EBF3, CXCL13, THSD4, MYO16, ADRA1B, SYT14, CACNA1E, VCX, SLC5A12, NXPH2, NRG3, PNMT, GABBR2, AKR1C3, GPC5, AKR1C4, KC6, IAPP, PCP4, WISP3, PRMT8, TCERG1L, ANO2, NRG2, KNG1, EDAR, HOXC13, CYP2A6, CYP2A7, NCAN, TSHR, ADAMTS14, ANKRD34B, TCAP, ADAMTS16, CLCNKA, PRSS1, SYCP2L, ADH7, CDH6, COL9A1, COL9A3, SLCO1A2, FBN3, SCN5A, GSTA1, SLC12A1, ADARB2, KLK3, SLC12A3, SLC12A5, DBH, GDPD4, ACTL8, GCK, TAS2R38, SLC14A1, SLC14A2, LYPD2, CYP24A1, EDN3, SYT1, SLC36A2, CDX2, CYP3A7, ADCY8, FAM110B, SYT9, SYT6, LEMD1, CCBE1, GRID2, CHRNA6, CHRNA3, TWIST2, PMCH, MDGA2, HTR4, PDYN, PPARGC1A, SCEL, CRHR2, CRCT1, PRDM9, CD36, CCR3, BHMT, HHLA2, ADD2, CALY, IGF2BP2, PEX5L, EPHB2, TMEM229A, C10ORF90, LGSN, NKX2-2, NR1H4, BMP4, BMP3, BHMT2, BMP2, CIDEA, EN1, ABCG8, NTRK3, TULP1, NPY, SEMA6D, SFRP2, PON1, CHRNB4, FAM43B, BMP7, ABO, JPH3, ZMAT4, GPX5, SLC24A2, HHIP, COL11A2, CCKBR, COL25A1, AMBP, BSND, PGPEP1L, GRM3, GRM8, KRTAP3-2, RASSF10, SUSD4, TPH1, AVPR2, OXT, TH, SLC19A3, GCGR, CPN1, FAM46D, ANKRD33, FAT3, GPM6A, AGT, NPFFR2, DTNA, DLGAP3, PTPRZ1, LRRN2, TBX4, MACROD2, SPSB4, ATP1A4, DKK4, COL19A1, DKK1, PYGM, KREMEN1, LRRN1, FGF19, SLCO6A1, MYOD1, CASR, PLXNA4, THRB, SLC22A12, GABRB2, LRTM1, FGF12, C20ORF197, ANKRD7, CNGB3, H19, KLHL1, REG3A, LPA, PHOSPHO1, LGI2, MX2, TMPRSS15, COL22A1, PROKR2, NR0B2, KCNT1, CELF4, CARTPT, PAEP, PPY, SLC38A3, ONECUT1, ITLN2, HMP19, DSCAML1, TCL1B, TRH, LIN28B, CNR1, RUNX2, NOVA1, TMEM196, GABRA2, FAM178B, WIF1, MAFA, SST, PRKAG3, TACR3, POU6F2, BCAM, KCNQ5, FAM133A, TPO, SV2B, ALX4, C11ORF87, ABHD12B, GABRG2, C9ORF84, CNTNAP4, WBSCR17, NRXN3, CNTNAP5, OTC, SOX11, PEBP4, BTNL2, IGFALS, SEZ6L, ALK, EYA4, XIRP2, ZNF717, ZNF716, WNT11, CUX2, NGFR, ZNF98, CTSG, SYNPR, C3ORF67, SYN3, TGM1, SYN2, TUBA3C, SCG3, SCG5, DPT, CR2, FRMPD1, FRMPD4, CPVL, SLC17A8, KRT76, TMEM163, C5ORF38, CRH, ATP8A2, SP7, IGFBP1*
GAD_DISEASE_CLASS	*PSYCH*	*1.53*	*5.15E-10*	*4.63E-09*	*SLCO6A1, SYT1, PTGS2, THRB, GABRB2, GRIK3, IL19, GRIK5, FSTL4, L1CAM, SYT6, PDX1, LRRC4C, MOG, IL10, REG3A, ATP2B3, CDKN2A, GRIN2B, CHRNA6, IL1A, CHRNA3, HTR1E, MAGEL2, RNLS, MYO3A, PMCH, PLD5, MDGA2, GRIN2A, HTR4, PTPRT, ACTN2, AJAP1, CYP1A2, NTSR1, PDYN, PKIA, NTSR2, PPARGC1A, TMEM132C, SLITRK2, RETN, ASCL1, CRHR2, GABRR1, SSTR1, CCR3, LSAMP, VSNL1, C1ORF87, CARTPT, GPR50, RELN, DRD1, CALY, SNAP91, DRD2, ASTN1, HMP19, NKAIN2, MME, CNTFR, PAH, ST8SIA2, TRH, SORCS2, CAMKV, CNR1, RUNX2, NOVA1, GABRQ, GABRE, GABRA2, MOBP, RFX4, NTF3, SLC6A11, SLC6A12, OSBPL6, GRIN1, SLC6A13, EN1, KCNK2, NPY5R, DOCK3, NTRK3, GH1, HULC, NPY, PENK, ADRA1B, CHRNB4, PON1, ZNF385B, WIF1, RGS9, SCN8A, BMP7, SST, ABO, ADRA1D, CACNA1A, MTNR1A, GJA8, OPRM1, NRG3, CLSTN2, TACR3, PNMT, ZMAT4, POU6F2, NUDT9P1, GLRA2, GABBR2, PCBP3, TCERG1L, AP3B2, ANO2, SV2B, FIGNL2, BHLHE41, NRG2, GABRG1, KNG1, GABRG2, RAX, FBXL21, CNTNAP4, CCKBR, CNTNAP5, NRXN3, NPBWR1, SDK1, ALK, MYT1L, GRM3, XIRP2, GRM8, DOK5, CYP2A6, NGFR, CUX2, NCAN, TPH1, CHL1, CPLX3, AVPR2, ADAMTS14, OXT, ADAMTS16, TH, GPM6A, NPTX2, AGT, SYN3, FMO3, SYN2, NEFH, PCSK9, SCG5, POU3F2, SLCO3A1, DCX, HTR3B, SIM1, HTR3C, HTR3D, MAG, PTPRZ1, MACROD2, NLGN1, NPR1, IGF2, DBH, WNT2B, DKK4, CYP26C1, PNOC, FBLN2, CRH, LRP2, WNT7A, HTR2C, GFRA2*

GAD_DISEASE_CLASS	ARDIOVASCULA	1.27	7.61E-08	4.57E-07	SYT1, CYP24A1, EDN3, PTGS2, SCN3B, ADCY8, FSTL4, SYT9, SYT6, GRIN2B, FSTL5, CCBE1, GRID2, CHRNA6, CHRNA3, HTR1E, WNT10A, TMEFF2, SCN2B, CRTAC1, PMCH, ADAMTS20, MDGA2, GRIN2A, TMEM132B, HTR4, PTPRT, MYH7, CYP1A2, PDYN, TMEM26, PPARGC1A, SCEL, CLEC4M, RETN, CD36, C14ORF39, PRDM9, SPAG6, LAMC3, CCR3, C1ORF87, BHMT, ADD2, SCN1A, SERPINA10, IGFBPL1, MME, SORCS1, IGF2BP2, SORCS2, FAM19A5, TMEM229A, SORCS3, IL17A, VWA5B1, C10ORF90, LGSN, SPERT, OLFM3, IQSEC3, NR1H4, C16ORF82, BHMT2, GPR158, BMP2, RMST, PCDH10, PCDH15, KRT35, KCNK2, NPY5R, NTRK3, ABCG8, GH1, NPY, APCDD1L, SFRP2, PON1, CHRNB4, MCCD1, PAPPA2, ZNF385B, RGS9, ABO, OPRM1, ZNF536, JPH3, PXDN, MYO7B, ZMAT4, GLRA2, APCDD1, RNF182, SLC24A2, HHIP, FOXB1, DPEP1, IL13RA2, ZP1, SDK1, CACNG4, PKDCC, COL25A1, ZNF334, BSND, LYZL2, HIST1H1T, SGCG, GRM8, DOK5, LGALS14, FOXC2, RASSF10, SUSD4, SCN11A, TPH1, CHL1, TFR2, TH, ITM2C, GCGR, PCSK2, BEST3, CYP2A13, FAT3, GPM6A, LRRTM4, AGT, FMO3, PCSK9, SLCO3A1, HTR3B, GALNT13, SLC8A1, RBM20, MACROD2, NLGN1, NPR1, SPSB4, IGF2, TMPRSS6, ZNF662, KCNV1, DSCR10, CDH18, CDH19, LRRN1, HTR2C, WNT7A, SLC8A3, QRFPR, SLCO6A1, MYOD1, CASR, STK31, PLXNA4, LMO3, GABRB2, LRTM1, SLC7A8, FGF12, LRRC4C, PDX1, ANKRD7, CNGB3, ZIC3, IL10, KLHL1, LPA, CDKN2A, DAB1, CDKN2B, ASPG, LGI2, IL1A, TMPRSS15, SPON1, RNLS, IRS2, COL22A1, CST2, ACTN2, AJAP1, NTSR1, PKIA, ASCL1, GABRR1, KCNT2, RASGRF1, LSAMP, CELF4, CARTPT, GPR50, RELN, NGB, DRD1, DRD2, SLC38A8, MYL3, ASTN1, NKAIN2, HMP19, ST8SIA3, CNTFR, KCNA5, ST8SIA2, TRH, ATP6V1B1, TRIM71, CNR1, ADAM33, TFF1, NOVA1, TMEM196, LMAN1L, GABRA2, PHACTR3, KCNB2, MYLPF, INSC, CACNA2D3, FAM178B, SLC6A19, THSD7B, HULC, SALL4, THSD4, TRIM58, SYT14, ADRA1B, MYO16, WIF1, CACNA1E, SCN8A, VCX, ADRA1D, SLC5A12, PRKAG3, NXPH2, NRG3, PNMT, CLSTN2, POU6F2, BCAM, GABBR2, TMEM233, GPC5, KRTAP11-1, TCERG1L, PRMT8, FLJ16779, TPO, SV2B, LOXL4, LBP, ALX4, C11ORF87, KNG1, GABRG1, ABHD12B, C9ORF84, NLRP4, TRPM5, CNTNAP4, WBSCR17, NRXN3, CNTNAP5, SOX11, OTC, PEBP4, BTNL2, PCDH8, EDAR, SEZ6L, ALK, TRPM1, EYA4, XIRP2, ZNF717, ZNF716, WNT11, TSHR, ZNF98, GPR12, CTSG, GAP43, CPLX3, ANKRD34B, TCAP, VPREB1, CLCNKA, CLCNKB, ADH7, CDH6, COL9A1, SYNPR, SLCO1A2, C3ORF67, SYN3, DNER, FBN3, SCG5, NEFL, SCN5A, DPT, GSTA1, CR2, SLC12A1, ADARB2, KLK2, SLC12A3, KLK4, SOX30, FRMPD1, FRMPD4, KLK1, DBH, CPVL, TNFSF8, ACTL8, KRT74, GCK, TMEM163, C5ORF38, TSG1, IGFBP1, SLC14A1, NBPF22P, SLC14A2
GAD_DISEASE_CLASS	IEMDEPENDEN	1.29	1.89E-07	8.52E-07	SYT1, ADCY8, PGC, FAM110B, FSTL4, SYT9, RPL22L1, MOG, CDH20, KCNK9, GRIN2B, FSTL5, CCBE1, GRID2, CHRNA6, CHRNA3, TMEFF2, SCN2B, CRTAC1, PLD5, MDGA2, GRIN2A, TMEM132B, PTPRT, MYH7, ABCC12, CYP1A2, PDYN, PPARGC1A, TMEM132C, CRHR2, MGAM, RYR1, FAM163B, ADD2, SERPINA11, SERPINA12, SORCS1, C3ORF14, PEX5L, SORCS2, FAM19A5, SORCS3, IL17A, VWA5B1, LGSN, OLFM3, GPR155, GPR158, NTF3, AGBL4, PCDH10, PCDH15, KCNK2, NPY5R, NTRK3, ABCG8, NPY, PENK, APCDD1L, PON1, CHRNB4, MCCD1, PAPPA2, ZNF385B, RGS9, OPRM1, KCNJ16, JPH3, PXDN, GLRA2, APCDD1, ZNF679, MMP20, TMEM108, HHIP, RFPL4A, CCKBR, SDK1, CPXM2, COL25A1, GRM3, IGFN1, SGCG, GRM8, FOXC2, BRDT, GLB1L3, TPH1, CHL1, OXT, TH, PCSK2, FAT3, GPM6A, HPSE2, LRRTM4, AGT, LRRTM1, C10ORF53, SLCO3A1, NPFFR1, HTR3B, GALNT13, DTNA, SLC8A1, PTPRZ1, RBM20, LRRN2, MACROD2, NLGN1, SPSB4, COL19A1, NRAP, FBLN2, CDH18, KREMEN1, CDH19, GFRA1, MPPED1, LRP2, HTR2C, WNT7A, SLC8A3, SLCO6A1, STK31, SLC13A5, PLXNA4, THRB, CCIN, GABRB2, GRIK3, IL19, SLC7A8, LRRC4C, FGF12, CNGB3, IL10, KLHL1, REG3A, CIB4, LPA, DAB1, PGLYRP4, SRRM4, ELOVL2, IL1A, TMPRSS15, SPON1, COL22A1, CECR2, PROKR2, ACTN2, FGF20, NTSR1, NTSR2, UGT1A10, GABRR1, LSAMP, CST5, CELF4, CARTPT, RELN, DRD1, SNAP91, DRD2, KBTBD12, SLC38A8, ASTN1, NKAIN2, DSCAML1, KCNA6, CNTFR, WT1, TMEM63C, DBX2, REG1A, RNF165, GPR26, CNR1, SDR16C5, RUNX2, GABRQ, LMAN1L, GABRE, GABRA2, PHACTR3, KCNB2, SLC6A11, PTPN5, GRIN1, SLC6A13, MUC7, INSC, CACNA2D3, CACNA1S, DOCK3, THSD7B, SALL4, CXCL14, THSD4, SYT14, ADRA1B, MYO16, CACNA1E, SCN8A, ADRA1D, CACNA1A, NXPH2, IGDCC3, NDST3, NDST4, NRG3, TACR3, PNMT, CLSTN2, RGS7BP, POU6F2, GABBR2, TMEM233, AKR1C3, GPC5, KCNQ5, AKR1C4, PCP4, TCERG1L, PRMT8, TPO, ANO2, SV2B, LBP, KNG1, GABRG1, GABRG2, HMGCLL1, CNTNAP4, FAM24B, WBSCR17, NRXN3, CNTNAP5, PEBP4, HEPHL1, PADI4, SEZ6L, ALK, EYA4, MYT1L, XIRP2, CYP2A6, WNT11, TSHR, GAP43, CPLX3, ADAMTS14, ADAMTS16, PRSS1, ADH7, TDRD10, COL9A1, SYNPR, SLCO1A2, POU2F3, SYN3, SYN2, TGM3, NEFL, SCN5A, GSTA1, ADARB2, SLC12A3, SLC12A5, FRMPD1, SUN3, PAPLN, DBH, CPVL, CNNM1, RGS22, KRT74, PNOC, KRT76, TAS2R38, ATP8A2, CRH, ANXA13, SLC14A1, SLC14A2

GAD_DISEASE_CLASS	UNKNOWN	1.50	1.93E-07	6.93E-07	SLCO6A1, EDN3, CYP24A1, CASR, PTGS2, THRB, SLC22A12, GABRB2, GRIK3, PGC, IL19, PDX1, IL10, RNF212, H19, CDH22, CDKN2A, LPA, GRIN2B, CDKN2B, SLC2A2, MX2, CHRNA3, IL1A, HTR1E, IRS2, MDGA2, HTR4, CST2, PROKR2, MYH7, ACTN2, NR0B2, CYP1A2, PPARGC1A, CLEC4M, UGT1A10, ASCL1, CRHR2, TNNT3, CD36, CCR3, BHMT, RYR1, GPR50, RELN, ADD2, RTP3, SCN1A, DRD1, DRD2, MME, PAH, IGF2BP2, KCNA5, LIN28B, PDE6B, KCNS1, FOLR3, REG1A, CNR1, OR51B5, ADAM33, RUNX2, NR1H4, BMP4, BMP2, GABRA2, SLC6A11, GRIN1, MYOZ1, EN1, CACNA1S, NPY5R, ABCG8, NTRK3, GH1, SALL4, NPY, PON1, CHRNB4, BMP7, ABO, CACNA1A, RHO, OPRM1, CLSTN2, PNMT, MLH1, BCAM, KISS1R, TPO, HHIP, LBP, CFHR5, ALX4, KNG1, GABRG2, CCKBR, CNTNAP5, BTNL2, IGFALS, EDAR, ALK, CYP2A6, FOXC2, TPH1, TSHR, OXT, TH, PRSS1, NHLRC1, RAG2, GJC3, COL9A3, AGT, FMO2, FMO3, TGM1, PCSK9, DCX, HTR3B, SCN5A, HTR3C, GSTA1, KLK8, DLGAP3, KLK3, SLC12A5, TBX4, MACROD2, NPR1, PAPLN, IGF2, KLK1, DBH, TMPRSS6, AFP, DKK1, GCK, NRAP, TAS2R38, FOXE1, GFRA1, IGFBP1, SLC14A1, HTR2C, SCN4A
GAD_DISEASE_CLASS	OTHER	1.37	1.17E-04	3.51E-04	EDN3, CYP24A1, CASR, CYP3A7, THRB, PTGS2, GABRB2, PGC, IL19, L1CAM, IL10, RNF212, CDKN2A, LPA, CHRNA3, IL1A, PHOX2A, IRS2, PLD5, GRIN2A, MYH7, PTPRT, CYP1A2, PPARGC1A, RETN, UGT1A10, ASCL1, CD36, CCR3, BHMT, RYR1, GPR50, RELN, SCN1A, DRD1, DRD2, MME, PAH, WT1, IL17A, UPK1A, CNR1, C10ORF90, TFF3, ADAM33, TFF1, NR1H4, BMP4, GABRA2, EPHX3, PCDH15, GH1, NPY, PON1, ADRA1B, RGS9, ABO, CACNA1A, ADRA1D, RHO, MTNR1A, OPRM1, ZNF536, NRG3, TACR3, CLSTN2, POU6F2, UCHL1, MLH1, AKR1C3, AKR1C4, HHIP, COL11A2, BHLHE41, FGF3, C9ORF84, RAX, CCKBR, CNTNAP4, WBSCR17, CNTNAP5, SDK1, GIF, IGFALS, PADI4, EYA4, OR2H2, KLRG2, CYP2A6, TPH1, TSHR, CHL1, AVPR2, TYRP1, TFR2, TH, PRSS1, CLCNKB, ADH7, GCGR, PCSK2, COL9A1, CYP2A13, COL9A3, FAT3, AGT, FMO2, TGM1, LRRTM1, FMO3, SCN5A, HTR3B, HTR3C, HTR3D, DTNA, GSTA1, PLP1, SLC12A1, ADARB2, IGF2, FLJ34503, GCK, NRAP, TAS2R38, CRH, GFRA1, IGFBP1, GFRA4, HTR2C, GFRA2, SCN4A, GFRA3, SLC14A2
GAD_DISEASE_CLASS	NEUROLOGICAL	1.24	1.86E-04	4.77E-04	SNCG, SYT1, S100A5, PTGS2, ADCY8, L1CAM, GRIN2B, CHRNA3, HTR1E, CRTAC1, GRIN2A, TMEM132B, HTR4, CYP1A2, TMEM26, PDYN, PROX1, PPARGC1A, PRDM9, SPAG6, CCR3, C1ORF87, BHMT, HHLA2, FAM163B, CALHM3, SCN1A, CALY, MME, SORCS1, EPHB2, FAM19A5, SORCS3, C10ORF90, NR1H4, BMP4, BMP3, BHMT2, BMP2, GPR158, MOBP, NTF3, PCDH15, EN1, KCNK2, NTRK3, GH1, NPY, SEMA6D, APCDD1L, CHRNB4, PON1, ZNF385B, RGS9, BMP7, OPRM1, CSTL1, JPH3, ZMAT4, GLRA2, APCDD1, TMEM108, SLC24A2, DNAJC12, COL11A2, CCKBR, NPBWR1, TNMD, CPXM2, PKDCC, COL25A1, SLIT1, GRM3, VCX3B, SGCG, HAO2, TPH1, C9, TH, CPN1, PCSK2, HPSE2, AGT, LRRTM1, PCSK9, NPFFR1, NLGN1, MACROD2, IGF2, TMPRSS6, DKK1, NRAP, FBLN2, CDH19, GFRA1, GAMT, LRP2, HTR2C, GFRA2, CASR, THRB, GABRB2, FGF12, TCEAL2, ANKRD7, IL10, REG3A, DAB1, CDKN2A, LPA, CDKN2B, ELOVL4, KRT85, RGR, KRT83, IL1A, RNLS, IRS2, MYO3A, COL22A1, FGF20, VCX2, ASCL1, RASGRF1, VSNL1, RELN, NGB, DRD1, ARPP21, DRD2, NKAIN2, DSCAML1, CNTFR, PAH, WT1, FOLR3, CNR1, RUNX2, NOVA1, GABRQ, SSX1, GABRE, RFX4, KCNB2, SLC6A12, GRIN1, CACNA1I, ACMSD, INSC, CACNA1S, THSD7B, SALL4, EBF3, MYO16, CACNA1E, SCN8A, SST, CACNA1A, SLC5A12, PRKAG3, PRPH, CLSTN2, PNMT, POU6F2, UCHL1, GABBR2, GPC5, AKR1C4, TCERG1L, SV2B, LOXL4, NRG2, C11ORF87, GABRG2, PTGER1, WBSCR17, CNTNAP5, OTC, SOX11, BTNL2, EDAR, ZNF717, CYP2A6, WNT11, NGFR, CTSG, ADAMTS14, ADAMTS16, SYNPR, SLCO1A2, COL9A3, C3ORF67, CALML3, SYN3, SYN2, NEFH, POU3F2, TGM6, SCN5A, NEFL, GSTA1, GSTA2, PLP1, CR2, ADARB2, SUN3, FRMPD1, FRMPD4, KLK1, DBH, CPVL, CNNM1, GCK, CYP26C1, TMEM163, C5ORF38, ANXA13, IGFBP1, DMBT1
GAD_DISEASE_CLASS	REPRODUCTION	1.43	6.61E-04	1.49E-03	OPRM1, PRKAG3, NXPH2, CYP3A7, PTGS2, THRB, GABBR2, SOHLH1, IL10, ZIC3, H19, AKR1C3, BSX, KISS1R, LPA, GRIN2B, PVALB, DDX25, PIWIL1, CHRNA6, LBP, SPATA22, IL1A, IL13RA2, FGF4, PTGER1, IRS2, ZP1, MDGA2, BTNL2, PROKR2, CYP1A2, H2BFWT, PPARGC1A, CRHR2, HIST1H1T, PRDM9, DEFA5, CCR3, BHMT, RASSF10, BRDT, TPH1, TSHR, EIF5A2, LY6G6F, IGFBPL1, DRD2, TFR2, OXT, TH, SYCP2L, SYCP2, LIN28B, SORCS2, AGT, LRRTM1, FMO3, FBN3, LHX8, PTX3, HTR3B, HTR3C, GALNT13, HTR3D, BMP2, LRRN4, MSH4, NPR1, IGF2, TMPRSS6, THSD7B, MUC4, ACTL8, GH1, SALL4, NPY, THSD4, LRRN1, CRH, PON1, WNT7A, SLC14A2, SMC1B

GAD_DISEASE_CLASS	EVELOPMENTA	1.30	1.97E-03	3.93E-03	EDN3, CASR, CYP3A7, THRB, SCN3B, LMO3, TSPAN7, FGF12, LRRC4C, CNGB3, ZIC3, KLHL1, CDH22, FSTL5, WNT6, WNT10A, PMCH, MYH2, TMEM132B, FOXN1, CYP1A2, AJAP1, TNNT3, CRCT1, PRDM9, C14ORF39, BHMT, ARHGDIG, SNAP91, SOX1, MME, PAH, LIN28B, SORCS2, WT1, FAM19A5, EPHB2, FOLR3, CRB2, VWA5B1, SDR16C5, LHX8, RUNX2, BMP4, PLAG1, BMP3, BHMT2, GABRA2, BMP2, ACMSD, MUC7, CACNA1S, NPY5R, DOCK3, SFRP5, GH2, SALL3, GH1, SALL4, PENK, PON1, ZNF385B, BMP7, MTNR1A, CSH1, NXPH2, FGF8, GABBR2, KCNJ12, TTLL2, SPAG17, AKR1C3, GPC5, BARX2, HHIP, ALX4, COL11A2, FGF4, GABRG1, GABRG2, NRXN3, IGFALS, ALK, CYP2A6, FOXC2, WNT11, CUX2, TPH1, TSHR, CHL1, TYRP1, HS3ST5, TH, LIX1, CRNN, TSPYL5, PIPOX, FAM46D, COL9A1, SYN3, TGM1, LRRTM1, TGM3, FBN3, SIM1, TBX4, SLC12A5, NLGN1, MACROD2, IGF2, SLC17A8, DKK1, CYP26C1, MEOX1, TMEM163, KREMEN1, FOXE1, WNT7A, HTR2C
GAD_DISEASE_CLASS	EMATOLOGICA	1.24	8.87E-03	1.59E-02	SLC22A16, SYT1, SLCO6A1, PTGS2, GRIK3, FSTL4, SYT9, LEMD1, LRRC4C, RPL22L1, ANKRD7, IL10, ZIC3, KLHL1, GAB4, CDKN2A, DAB1, FSTL5, MDGA2, BARHL2, COL22A1, GRIN2A, CYP1A2, AJAP1, NTSR1, PPARGC1A, PROX1, CD36, IFNB1, LAMC3, C1ORF87, CARTPT, MYH7B, ADD2, GSDMA, DRD2, NKAIN2, SORCS1, FLG2, KCNA5, ST8SIA2, SORCS2, FAM19A5, SORCS3, IL17A, RUNX2, NOVA1, BMP4, BMP2, NFE2, PCDH10, CACNA1I, PCDH15, CACNA2D3, GPR151, KRT35, SALL3, SFRP5, FOXI2, HULC, THSD4, TRIM58, ABO, ADRA1D, SMC1B, NRG3, CLSTN2, RGS7BP, GLRA2, KCNIP1, GPC5, GPX5, PCP4, ALX4, HPD, KNG1, ZP1, CNTNAP4, NRXN3, CNTNAP5, WBSCR17, SOX11, SDK1, SEZ6L, ALK, HIST1H1T, SGCG, ZNF717, RASSF10, CUX2, ZNF98, CHL1, TFR2, ADAMTS16, CRNN, PCSK2, SLCO1A2, SYN3, AGT, LRRTM1, CD22, FBN3, SLCO3A1, GALNT13, MACROD2, TMPRSS6, CPVL, KCNV1, CNNM1, GCK, FBLN2, TAS2R38, C5ORF38, TSG1, GFRA1, MPPED1
GAD_DISEASE_CLASS	AGING	1.31	0.01	0.02	PRKAG3, SYT1, PXDN, STK31, S100A7, IL19, GLRA2, MLH1, SYT9, LRRC4C, ANKRD7, IL10, BNIPL, GPC5, MMP20, CDKN2A, GRIN2B, C8ORF46, CDKN2B, SLC24A2, HIST1H2BI, SLC2A2, TPO, LBP, COL11A2, IL1A, CHRNA3, GABRG1, GABRG2, IRS2, WBSCR17, PPARGC1A, TMEM132C, RETN, UGT1A10, GRM3, ZNF717, CELF4, GALNT8, TSHR, CTSG, DRD2, TH, TKTL2, IGF2BP2, LIX1, ST8SIA3, TCL1B, ADH7, COL9A3, GPM6A, AGT, OLFM3, RUNX2, GALNT13, TMEM196, DPT, GSTA1, GSTA2, ADARB2, KLK3, PCDH15, IGF2, DBH, THSD7B, OPN5, HULC, CXCL14, FBLN2, PON1, PAPPA2, WIF1, SCN8A, LRP2, SST, GFRA2
GAD_DISEASE_CLASS	IMMUNE	1.12	0.03	0.05	CYP24A1, HRNR, SLC36A2, S100A5, PTGS2, S100A7, FAM110B, FSTL4, SYT6, L1CAM, MOG, GAB4, GRIN2B, CCBE1, S100A1, TMEFF2, PLD5, BARHL2, MDGA2, PTPRT, CYP1A2, PDYN, PPARGC1A, RETN, CRHR2, VSIG2, CRCT1, IFNB1, CCR3, C1ORF87, ADD2, LY6G6E, LY6G6F, GSDMA, LY6G6C, SORCS1, FLG2, MYT1, IL17A, IL23A, ZBTB46, AGBL4, PCDH15, EN1, SFRP5, NPY, SEMA6D, SFRP2, MCCD1, PON1, ZNF385B, ABO, OPRM1, KCNJ16, SPINK2, MLH1, KCNIP1, RNF182, SPAG17, SLC24A2, HHIP, COL11A2, FGF4, IL13RA2, FBXL21, CACNG6, GIF, CACNG4, PKDCC, CLC, OR2H2, GRM8, C1QL2, SCGB3A2, OPN1LW, OXT, TFR2, TH, LECT1, GPM6A, AGT, LRRTM1, MEG3, CD22, FOXD3, MACROD2, IGF2, DKK1, COL19A1, NHLH2, SLCO6A1, PLXNA4, STK31, THRB, GABRB2, LMO3, IL19, PDX1, LRRC4C, DLK1, ANKRD7, IL10, CDKN2A, LPA, JSRP1, CDKN2B, ZNF300, RGR, IL1A, TMPRSS15, RNLS, IRS2, MYO3A, CHP2, CST2, NR0B2, AJAP1, CBLN2, DEFA6, RASGRF1, DEFA5, CELF4, RELN, DRD2, KCNA5, LIN28B, REG1A, CNR1, ADAM33, SDR16C5, PHACTR3, KCNB2, SLC6A11, SLC6A12, CACNA1I, MUC7, CACNA2D3, DOCK3, MUC4, SALL3, ZNF311, THSD4, MYO16, ADRA1B, SYT14, WIF1, MTNR1A, SLC5A12, NDST3, NRG3, CLSTN2, PNMT, GABBR2, TMEM233, GPC5, TCERG1L, TPO, SV2B, LBP, PTGER1, NLRP4, NRXN3, WBSCR17, PEBP4, BTNL2, SLC7A10, SEZ6L, PADI4, ALK, CPAMD8, XIRP2, HCG4, CUX2, NGFR, TSHR, GPR12, TYRP1, ADAMTS14, ENDOU, PRSS1, RAG2, SYNPR, C3ORF67, SYN3, SCG3, TUBA3C, NEFH, SCN5A, NEFL, VSTM2B, GSTA1, MAG, KLK7, PLP1, CR2, MAL, KLK1, DBH, CPVL, WNT2B, TNFSF8, GCK, CRH, SLC14A1, DMBT1
GAD_DISEASE_CLASS	RMALVARIATI	1.36	0.04	0.05	CASR, CYP3A7, PTGS2, DRD2, SYCP2L, CNTFR, PAH, DLK1, LIN28B, IL10, SPAG17, PCSK2, CYP2A13, LPA, IAPP, AGT, ELOVL2, FMO3, HHIP, IL1A, PLAG1, GSTA1, GSTA2, BMP2, PMCH, IGF2, CYP1A2, DBH, PPARGC1A, CLEC4M, RETN, CD36, NPY, TAS2R38, PON1, CARTPT, CYP2A6, NGFR, LRP2, SLC14A1, HTR2C, ABO, SLC14A2

GAD_DISEASE_CLASS	RENAL	1.17	0.06	0.08	*CYP24A1, CASR, SLC36A2, STK31, CYP3A7, PTGS2, SLC22A12, FGF12, PDX1, IL10, CDH20, CDKN2A, CDKN2B, C8ORF46, SLC2A2, IL1A, IRS2, MYO3A, PLD5, SLC34A1, HTR4, PTPRT, CYP1A2, PPARGC1A, RETN, UGT1A10, CD36, AKR1B10, BHMT, CARTPT, TMEM63C, WT1, TFF1, BMP4, BMP3, BMP2, PTPN5, SLC6A13, CACNA1I, ABCG8, GH1, NPY, CXCL13, SYT14, PON1, MYO16, ADRA1D, PXDN, JPH3, NRG3, PNMT, MYO7B, MLH1, APCDD1, GPC5, IAPP, CHST13, CFHR5, C11ORF87, KNG1, NRXN3, SOX11, BTNL2, ALK, AMBP, MAP3K15, CYP2A6, CYP2A7, SCGB3A2, NGFR, GAP43, CTSG, AVPR2, TYRP1, WNT16, ADH7, GCGR, PCSK2, CYP2A13, SLCO1A2, SYN3, FMO2, AGT, FMO3, PCSK9, NEFL, SIM1, GSTA1, GSTA2, SLC12A3, MSH4, MACROD2, IGF2, DBH, TNFSF8, DKK1, GCK, IGFBP1, LRP2, ALKBH3, SLC14A2*

Significantly enriched classes are in bold italics (adjusted p-value <0.05 used as significance cut-off).