Table S18: GO process analysis of ranked signals from CEU population using the T_2 test statistic.

Description	p-value	Enrichment	Genes
Biological adhesion	8.8×10^{-16}	2.3	*ADAM12*, *AJAP1*, *AMTN*, *ANGPT1*, *BMPR1B*, *CADM2*, *CDH10*, *CDH13*, *CDH4*, *CDHR2*, *CDON*, *CDSN*, *CLDN1*, *CLDN10*, *CLDN14*, *CLSTN2*, *CNTN1*, *CNTN4*, *CNTN5*, *CNTNAP2*, *CNTNAP4*, *CNTNAP5*, *COL13A1*, *COL4A3*, *COL5A1*, *CTNNA2*, *CTNNA3*, *CTNND2*, *CXADR*, *CXCL12*, *DCHS2*, *DDR1*, *DSC1*, *DSCAM*, *DSG1*, *DSG3*, *EMR1*, *EPHB1*, *F5*, *FAT2*, *FAT3*, *FAT4*, *FER*, *HABP2*, *HPSE*, *IGFBP7*, *IGSF5*, *ITGA1*, *ITGA2*, *ITGB5*, *ITGBL1*, *KITLG*, *LAMA1*, *LAMA2*, *LAMC1*, *LAMC2*, *LOXL2*, *LPP*, *LSAMP*, *MEGF10*, *MEGF11*, *MTSS1*, *MUC16*, *MYH9*, *NCAM2*, *NELL2*, *NFASC*, *NID2*, *NRCAM*, *NRP1*, *NRXN1*, *NTM*, *NTN1*, *ODZ3*, *OPCML*, *PCDH15*, *PCDH17*, *PCDHA1*, *PCDHA10*, *PCDHA11*, *PCDHA12*, *PCDHA13*, *PCDHA2*, *PCDHA3*, *PCDHA4*, *PCDHA5*, *PCDHA6*, *PCDHA7*, *PCDHA8*, *PCDHA9*, *PCDHAC1*, *PKD1L1*, *PKHD1*, *PKP1*, *PKP2*, *PLEK*, *PLEKHA7*, *PRKCE*, *PRPH2*, *PTPRD*, *PTPRF*, *PTPRM*, *PTPRT*, *PTPRU*, *RELN*, *ROBO2*, *RPSA*, *SCARB1*, *SDK1*, *SELE*, *SEMA5A*, *SIRPA*, *SPON1*, *SSPO*, *SYK*, *TECTA*, *TEK*, *THBS2*, *TNN*, *TNR*, *VNN1*, *VWF*
Cell adhesion	8.8×10^{-16}	2.3	*ADAM12*, *AJAP1*, *AMTN*, *ANGPT1*, *BMPR1B*, *CADM2*, *CDH10*, *CDH13*, *CDH4*, *CDHR2*, *CDON*, *CDSN*, *CLDN1*, *CLDN10*, *CLDN14*, *CLSTN2*, *CNTN1*, *CNTN4*, *CNTN5*, *CNTNAP2*, *CNTNAP4*, *CNTNAP5*, *COL13A1*, *COL4A3*, *COL5A1*, *CTNNA2*, *CTNNA3*, *CTNND2*, *CXADR*, *CXCL12*, *DCHS2*, *DDR1*, *DSC1*, *DSCAM*, *DSG1*, *DSG3*, *EMR1*, *EPHB1*, *F5*, *FAT2*, *FAT3*, *FAT4*, *FER*, *HABP2*, *HPSE*, *IGFBP7*, *IGSF5*, *ITGA1*, *ITGA2*, *ITGB5*, *ITGBL1*, *KITLG*, *LAMA1*, *LAMA2*, *LAMC1*, *LAMC2*, *LOXL2*, *LPP*, *LSAMP*, *MEGF10*, *MEGF11*, *MTSS1*, *MUC16*, *MYH9*, *NCAM2*, *NELL2*, *NFASC*, *NID2*, *NRCAM*, *NRP1*, *NRXN1*, *NTM*, *NTN1*, *ODZ3*, *OPCML*, *PCDH15*, *PCDH17*, *PCDHA1*, *PCDHA10*, *PCDHA11*, *PCDHA12*, *PCDHA13*, *PCDHA2*, *PCDHA3*, *PCDHA4*, *PCDHA5*, *PCDHA6*, *PCDHA7*, *PCDHA8*, *PCDHA9*, *PCDHAC1*, *PKD1L1*, *PKHD1*, *PKP1*, *PKP2*, *PLEK*, *PLEKHA7*, *PRKCE*, *PRPH2*, *PTPRD*, *PTPRF*, *PTPRM*, *PTPRT*, *PTPRU*, *RELN*, *ROBO2*, *RPSA*, *SCARB1*, *SDK1*, *SELE*, *SEMA5A*, *SIRPA*, *SPON1*, *SSPO*, *SYK*, *TECTA*, *TEK*, *THBS2*, *TNN*, *TNR*, *VNN1*, *VWF*
Cell-cell adhesion	8.4×10^{-13}	2.7	*BMPR1B*, *CDH10*, *CDH13*, *CDH4*, *CDHR2*, *CDSN*, *CLDN1*, *CLDN10*, *CLDN14*, *CLSTN2*, *CNTN4*, *COL13A1*, *CTNNA2*, *CTNNA3*, *CTNND2*, *CXADR*, *DCHS2*, *DSC1*, *DSG1*, *DSG3*, *FAT2*, *FAT3*, *FAT4*, *FER*, *IGSF5*, *MEGF10*, *MEGF11*, *MYH9*, *NCAM2*, *NRCAM*, *NRXN1*, *NTN1*, *ODZ3*, *PCDH15*, *PCDH17*, *PCDHA1*, *PCDHA10*, *PCDHA11*, *PCDHA12*, *PCDHA13*, *PCDHA2*, *PCDHA3*, *PCDHA4*, *PCDHA5*, *PCDHA6*, *PCDHA7*, *PCDHA8*, *PCDHA9*, *PCDHAC1*, *PKD1L1*, *PKHD1*, *PKP2*, *PLEK*, *PLEKHA7*, *PTPRD*, *PTPRF*, *PTPRM*, *PTPRT*, *PTPRU*, *ROBO2*, *SELE*, *SYK*, *TEK*, *TNR*, *VNN1*
Interferon-gamma-mediated signaling pathway	1.8×10^{-10}	42.9	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Cellular response to interferon-gamma	1.1×10^{-9}	34.7	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Homophilic cell adhesion	1.5×10^{-9}	4.1	*CDH10*, *CDH13*, *CDH4*, *CDHR2*, *CLSTN2*, *DSC1*, *DSG1*, *DSG3*, *FAT2*, *PCDH15*, *PCDH17*, *PCDHA1*, *PCDHA10*, *PCDHA11*, *PCDHA12*, *PCDHA13*, *PCDHA2*, *PCDHA3*, *PCDHA4*, *PCDHA5*, *PCDHA6*, *PCDHA7*, *PCDHA8*, *PCDHA9*, *PCDHAC1*, *PTPRM*, *ROBO2*
Response to interferon-gamma	5.6×10^{-9}	28.5	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Antigen processing and presentation of peptide antigen	8.3×10^{-9}	18.1	*ERAP1*, *HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Antigen processing and presentation	2.8×10^{-8}	15.9	*ERAP1*, *HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Axon guidance	5.9×10^{-8}	2.0	*ABLIM1*, *ABLIM2*, *ANK2*, *ANK3*, *BMPR1B*, *CACNA1C*, *CACNB2*, *CAP1*, *CDH4*, *CHL1*, *CNTN1*, *CNTN4*, *COL4A1*, *COL4A2*, *COL4A3*, *COL5A1*, *COL5A2*, *COL9A1*, *CXCL12*, *DCC*, *DOCK1*, *DPYSL2*, *EGFR*, *EPHA7*, *EPHB1*, *ETV1*, *EXT1*, *EZR*, *ITGA1*, *ITGA2*, *ITGA9*, *KCNQ3*, *KIF5C*, *LAMA1*, *LAMA2*, *LAMC1*, *MATN2*, *MYH11*, *MYH9*, *MYO10*, *NFASC*, *NRCAM*, *NRP1*, *NRXN1*, *NRXN3*, *NTN1*, *NTN4*, *PAK2*, *PLXNA4*, *PTPRM*, *RAC2*, *RELN*, *ROBO1*, *ROBO2*, *RPS6KA2*, *SCN3B*, *SEMA3A*, *SEMA3E*, *SEMA5A*, *SEMA6D*, *SH3GL2*, *SLIT3*, *SPTB*, *TNR*, *TRPC4*, *TRPC6*, *UNC5C*, *VAV2*
Antigen processing and presentation of exogenous peptide antigen	9.9×10^{-8}	17.2	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Antigen processing and presentation of exogenous antigen	1.1×10^{-7}	17.0	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Protein localization to membrane	3.1×10^{-7}	9.1	*ANK2*, *ANK3*, *CACNA1A*, *CPE*, *DLG2*, *GRIK2*, *MAGI2*, *NRXN1*, *RAMP3*, *RELN*, *SCP2*
Antigen processing and presentation of exogenous peptide antigen via MHC class I TAP-independent	5.2×10^{-7}	300.5	*HLA-A*, *HLA-B*, *HLA-C*

GO categories in which false discovery rate is less than 0.01.

Table S18 continued.

Description	p-value	Enrichment	Genes
Chemotaxis	1.3×10^{-6}	1.7	*ABLIM1*, *ABLIM2*, *ANGPT1*, *ANK2*, *ANK3*, *BMPR1B*, *CACNA1C*, *CACNB2*, *CAP1*, *CCL15*, *CCL23*, *CCL24*, *CDH4*, *CHL1*, *CMTM7*, *CMTM8*, *CNTN1*, *CNTN4*, *COL4A1*, *COL4A2*, *COL4A3*, *COL5A1*, *COL5A2*, *COL9A1*, *CXADR*, *CXCL11*, *CXCL12*, *DCC*, *DEFB1*, *DOCK1*, *DOCK2*, *DOCK4*, *EGFR*, *EMR2*, *EPHA7*, *EPHB1*, *ETV1*, *EZR*, *FER*, *FGF2*, *ITGA1*, *ITGA2*, *ITGA9*, *KCNQ3*, *KIF5C*, *LAMA1*, *LAMA2*, *LAMC1*, *MATN2*, *MYH11*, *MYH9*, *MYO10*, *NFASC*, *NRCAM*, *NRP1*, *NRXN1*, *NRXN3*, *NTN1*, *NTN4*, *PAK2*, *PDGFA*, *PIK3C2G*, *PLA2G6*, *PLAUR*, *PLD1*, *PLXNA4*, *PRKCA*, *PTPRM*, *RAC2*, *RELN*, *ROBO1*, *ROBO2*, *RPS6KA2*, *SCN3B*, *SEMA3A*, *SEMA3E*, *SEMA5A*, *SEMA6D*, *SH3GL2*, *SLIT3*, *SPTB*, *SYK*, *TNFRSF11A*, *TNR*, *TRPC4*, *TRPC6*, *UNC5C*, *VAV2*
Taxis	1.3×10^{-6}	1.7	*ABLIM1*, *ABLIM2*, *ANGPT1*, *ANK2*, *ANK3*, *BMPR1B*, *CACNA1C*, *CACNB2*, *CAP1*, *CCL15*, *CCL23*, *CCL24*, *CDH4*, *CHL1*, *CMTM7*, *CMTM8*, *CNTN1*, *CNTN4*, *COL4A1*, *COL4A2*, *COL4A3*, *COL5A1*, *COL5A2*, *COL9A1*, *CXADR*, *CXCL11*, *CXCL12*, *DCC*, *DEFB1*, *DOCK1*, *DOCK2*, *DOCK4*, *EGFR*, *EMR2*, *EPHA7*, *EPHB1*, *ETV1*, *EZR*, *FER*, *FGF2*, *ITGA1*, *ITGA2*, *ITGA9*, *KCNQ3*, *KIF5C*, *LAMA1*, *LAMA2*, *LAMC1*, *MATN2*, *MYH11*, *MYH9*, *MYO10*, *NFASC*, *NRCAM*, *NRP1*, *NRXN1*, *NRXN3*, *NTN1*, *NTN4*, *PAK2*, *PDGFA*, *PIK3C2G*, *PLA2G6*, *PLAUR*, *PLD1*, *PLXNA4*, *PRKCA*, *PTPRM*, *RAC2*, *RELN*, *ROBO1*, *ROBO2*, *RPS6KA2*, *SCN3B*, *SEMA3A*, *SEMA3E*, *SEMA5A*, *SEMA6D*, *SH3GL2*, *SLIT3*, *SPTB*, *SYK*, *TNFRSF11A*, *TNR*, *TRPC4*, *TRPC6*, *UNC5C*, *VAV2*
Locomotion	2.3×10^{-6}	1.5	*ABLIM1*, *ABLIM2*, *ANGPT1*, *ANGPT2*, *ANGPT4*, *ANK2*, *ANK3*, *ANKS1A*, *AVL9*, *B4GALT1*, *BMPR1B*, *CACNA1C*, *CACNB2*, *CAP1*, *CCDC40*, *CCL15*, *CCL23*, *CCL24*, *CD244*, *CDC42BPA*, *CDH13*, *CDH4*, *CHL1*, *CMTM7*, *CMTM8*, *CNTN1*, *CNTN4*, *COL4A1*, *COL4A2*, *COL4A3*, *COL5A1*, *COL5A2*, *COL9A1*, *CTNNA2*, *CXADR*, *CXCL11*, *CXCL12*, *DCC*, *DDR1*, *DEFB1*, *DISC1*, *DNAH5*, *DNAH8*, *DNER*, *DOCK1*, *DOCK2*, *DOCK4*, *DPYSL2*, *DYNC2H1*, *EGFR*, *EMR2*, *EPHA7*, *EPHB1*, *ERBB4*, *ETV1*, *EXT1*, *EZR*, *FAT2*, *FER*, *FGF2*, *GPC6*, *GPLD1*, *GRIN2A*, *INPP5D*, *INSL6*, *ITGA1*, *ITGA2*, *ITGA9*, *KCNQ3*, *KIAA0319*, *KIF5C*, *KIRREL3*, *KITLG*, *LAMA1*, *LAMA2*, *LAMC1*, *LDHC*, *LOXL2*, *LRRC16A*, *LRRK2*, *LYN*, *MAPT*, *MATN2*, *MYH11*, *MYH9*, *MYO10*, *MYO5A*, *NEDD4*, *NFASC*, *NKX2-3*, *NRCAM*, *NRG1*, *NRP1*, *NRXN1*, *NRXN3*, *NTN1*, *NTN4*, *OVOL2*, *PAK2*, *PAK7*, *PARD3*, *PDGFA*, *PIK3C2G*, *PLA2G6*, *PLAUR*, *PLD1*, *PLXNA4*, *PPAP2A*, *PRKCA*, *PRKG1*, *PTPRM*, *RAC2*, *RELN*, *ROBO1*, *ROBO2*, *RPS6KA2*, *SCARB1*, *SCN3B*, *SCNN1G*, *SELE*, *SEMA3A*, *SEMA3E*, *SEMA5A*, *SEMA6D*, *SH3GL2*, *SIRPA*, *SLC22A16*, *SLC7A7*, *SLC9C1*, *SLIT3*, *SPATA13*, *SPTB*, *SYK*, *TBX20*, *TEK*, *TNFRSF11A*, *TNN*, *TNR*, *TNS1*, *TRPC4*, *TRPC6*, *UNC5C*, *VAV2*, *VAV3*, *WWC1*
Cytokine-mediated signaling pathway	3.7×10^{-6}	9.2	*HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*, *NUP88*
Detection of bacterium	4.4×10^{-6}	27.3	*HLA-A*, *HLA-B*, *HLA-DRB1*, *HLA-DRB5*, *PGLYRP4*
T cell costimulation	6.4×10^{-6}	20.0	*HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRA*, *HLA-DRB1*
Lymphocyte costimulation	7.1×10^{-6}	19.6	*HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRA*, *HLA-DRB1*
Regulation of immune response	9.8×10^{-6}	7.1	*DMBT1*, *ERAP1*, *HLA-A*, *HLA-B*, *HLA-C*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRB1*
Immune response-activating signal transduction	2.0×10^{-5}	8.7	*DMBT1*, *HLA-DPA1*, *HLA-DPB1*, *HLA-DQA1*, *HLA-DQB1*, *HLA-DRA*, *HLA-DRB1*, *MAP2K3*

GO categories in which false discovery rate is less than 0.01.