

**Table S2: T2DM disease related genes:**

T2DM genes within DisGeNeT, OMIM,  
MALACARDS database (3041 genes)

A1BG  
NAT2  
ADA  
MIR675

CDKN2B-AS1  
HOTAIR  
ZGLP1  
HPN-AS1  
APBB1IP  
SOD2-OT1  
HDAC6  
KIF28P  
FOXO6  
KIR2DS2  
BCL2L11  
SH2B3  
IBD20  
INSL5  
H3C9P  
C4B\_2  
CDH5

TMED7-TICAM2  
AAA1  
CHAF1A  
PARP2  
MIR466  
MAMLD1  
LINC01672  
ARAP1-AS2  
OCLN  
VIM-AS1  
MICA  
GJC1

RBM14-RBM4

TMX2-CTNND1

KLRC4-KLRK1  
ABCC5  
ABCB6  
DNM1L  
ERVK-20  
NR1H3  
DNM3OS  
IL18BP  
PTPRU  
ERVK-18  
CERT1  
ARAP1-AS1  
CDH11  
PPIF  
PGR-AS1  
OPN1MW3  
HIPK3  
CDH13  
RASGRP1  
LRPPRC  
NAMPT  
CELA3A  
MBNL2  
ATP6AP2  
WASF2  
CDK2  
CDK4  
LINC01150  
EMSLR  
TRPM2-AS  
LIPC-AS1  
TSHZ1  
ADAM10  
CDK5  
NUTF2  
TRIM13  
DDX39A  
GDF11  
MRPS31  
RABEPK  
MIR6835  
RIDA  
ABCC4

CDK2AP2

CDKN1B

LOC102723407

LOC102724197

LOC102724334

CBSL

STUB1

CDKN1C

SIGMAR1

TP53COR1

CDKN2A

ADAR

CDKN2B

LANCL1

TNIP1

LAMC3

AKR1A1

CDKN3

TFG

KLF2

MICU1

CITED2

SEMA3A

TUBB4B

CORO2B

NOD1

RACK1

PEMT

CPQ

RAPGEF3

NSA2

CD52

RBM14

LYPLA1

C1D

VAV3

TOMM40

FST

TIMM44

CEACAM5

CAP1

CARM1  
CEBPA  
SEMA4D  
CEBPB  
FBLN5  
CIB2  
DEAF1  
HYOU1  
RNASEH2A  
UBD  
PERCC1  
THRA1/BTR  
CERNA3  
PRDX4  
CECR  
AGPAT2  
SLC35A1  
CEL  
SLC19A2  
CCT4  
CCT2  
GNLY  
CENPA  
SORBS1  
SCGN  
AHSA1  
SLCO1B1  
SH2B2  
IVNS1ABP  
TXNIP  
POSTN  
IGF2BP2  
CST12P  
RN7SL263P  
KHDRBS1  
CELF1  
CXCR6  
TNFSF13B  
CETN1  
MTCO2P12  
CETP  
OGA  
NFAT5  
TCFL5

MASP2  
CTSC  
GIPC1  
TRAF3IP2  
DHS  
NEK6  
CFTR  
SEPTIN9  
WASF3  
HPSE  
PGRMC1  
LILRB1  
SLC22A7  
USP19  
MRPS30  
PPARGC1A  
MALT1  
MMP24  
CPSF4  
ADCY3  
UTS2  
PAPOLA  
SUB1  
RALBP1  
PRSS21  
BTG3  
PDIA5  
ERP29  
EBNA1BP2  
KCNQ1OT1  
METAP2  
IMMT  
ERVK-32  
SLC27A2  
KIF2C  
LIAS  
CHAT  
RAPGEF4  
TRIM31  
  
LOC110806263  
ESM1  
ADAMTS13  
NUP42

ADCY5  
RPP14  
BTN2A1  
PTPRT  
FAF1  
CHGA  
CAPN10  
SLC7A9  
CHI3L1

LOC111674464  
PSIP1  
WDHD1  
CHIT1  
TREH  
SLC2A6  
MAP4K5  
IRAK3  
AKAP13  
POLG2  
PRRT2  
PTGDR2  
DUSP12  
IL17F  
TREX1  
KLF12  
LINC02605  
SLCO2B1  
CHRM3  
PARK7  
RBPJL  
SLC46A1  
STK38  
CTRC  
PHB2  
ACOT7  
PDAP1  
TUSC2  
AZIN2  
TMEM54

LOC113664106  
CHRNA4  
ADCY8

DBA2  
TXNRD3  
UCN3  
TNDM1  
NLRP3  
CYGB  
MYSM1  
SORCS1  
C1QTNF3  
C1QTNF5  
C1QTNF7  
FBXO32  
SLC26A9  
MARCHF3  
GPR146  
CISH  
H3P8  
H3P28  
H3P42  
H3P10  
H3P40  
SLC5A11  
CKM  
ADCYAP1  
RMI2  
SLC22A12  
ERCC8  
ABHD15  
APOA5  
SNAP47  
LRG1  
ARAP1  
TADA1  
THEM4  
DCD  
MRGPRX3  
MRGPRX4  
RLN3  
ADD1  
MSS51  
CLCN7  
CLU  
CLK2  
SERPINA3

CYP2R1  
CLPS  
PLIN2  
CCR1  
DEGS2  
CCR5  
ACKR2  
FOPNL  
CMKLR1  
NOXO1  
LTB4R  
CMM  
MSI2  
ADH1B  
ADH1C  
OSCAR  
NDUFA11  
CNP  
CNR1  
CNR2  
CNTF  
GJB4  
COL1A1  
TSACC  
COL6A3  
TMEM18  
RBM45  
COL9A3  
COL11A2  
PLEKHH2  
COMP  
COMT  
COPA  
KLF6  
CORT  
ADM  
SLCO6A1  
PPARGC1B  
ADORA1  
GPR151  
WDR36  
TAAR1  
ADORA2A  
COX8A



CP  
CPA1  
ADORA2B  
CPB1  
CPB2  
CPD  
KLF14  
CPE  
CLDN4  
CPOX  
CPS1  
CPT1A  
CPT2  
CR2  
CREB1  
ATF2  
CREBBP  
CREM  
CRH  
FUNDCl  
UPRT  
GPR119  
CRK  
CRMP1  
CRP  
BPIFA2  
CRY1  
TRPM6  
HT  
SIRPA  
PARP1  
CRYZ  
CS  
MAPK14  
CACUL1  
CSE1L  
CSF1  
CSF1R  
PIWIL4  
CSF2  
CSF2RA  
CSF3  
CSH1  
CSH2

CSK  
CSN2  
SERPINA12  
PWAR1  
C2CD4A  
NRG4  
CST3  
WIPF2  
CSTA  
LYPD4  
ADRA1A  
CILP2  
ZNF569  
CTAA1  
CTBS  
HJV  
CTF1  
CCN2  
CTLA4  
PDIK1L  
CTNS  
CTNNB1  
ADRA2A  
CTNND1  
SIK1  
CTRB1  
CTSB  
CTSD  
ADRA2B  
PLB1  
CTSG  
ERFE  
CTSK  
GPBAR1  
RMDN2  
CTSL  
UPP2  
CTSS  
CUX1  
CX3CR1  
CXADR  
KLB  
PPM1K  
ADRB1

CREBRF  
CYBA  
CYBB  
CYC1  
ADRB2  
SLC2A12  
CYP1A1  
CYP1A2  
AMOT  
ADRB3  
CYP2B6  
CYP2C19  
CYP2C9  
GRK2  
CYP2D7  
CYP2D6  
CYP2E1  
CYP2J2  
CYP3A4  
LINC00599  
CYP3A5  
CYP4A11  
CYP7A1  
CYP8B1  
CYP11B2  
CBLL2  
CYP19A1  
CYP21A2  
CYP24A1  
CYP27A1  
SLC35G1  
CYP27B1  
DAB1  
DAB2  
CD55  
DGKQ  
DAPK1  
DAPK3  
SPRED1  
DBH  
MARCHF10  
SLC16A11  
DBP  
DCN

ACE  
DCX  
TMPRSS6  
DDIT3  
DDOST  
OXER1  
DDT  
TLE5  
DECR1  
DEFA1  
DEFA3  
SGMS2  
DEFB1  
DES  
SLC30A8  
GLIS3  
NLRP6  
PTCRA  
DHPS  
NQO1  
DIAPH1  
AFM  
DIH1  
DIO2  
DIO3  
DKC1  
DLAT  
DLD  
AFP  
DLX3  
AGA  
DMD  
SARDH  
DMPK  
DMRT1  
DNAH8  
AGER  
DNASE1  
DNM2  
DNMT1  
DNMT3A  
DOCK3  
DPP4  
DPT

DPYD  
DPYS  
AGRP  
JAG1  
ATN1  
DSC3  
RCAN1  
AGT  
DSG3  
DSPP  
HBEGF  
DUSP1  
DUSP4  
AGTR1  
DUSP9  
DYRK1A  
AGTR2  
TOR1A  
E2F1  
APLNR  
EBF1  
ECE1  
EDA  
ABCA1  
S1PR1  
EDN1  
EDNRA  
EDNRB  
AIC  
EEF2  
EFNB2  
EGF  
CELSR2  
EGFR  
EGR1  
AHR  
EIF2S1  
ARID2  
PAOX  
EIF2S3  
AHSG  
UBR1  
EIF4E  
EIF4EBP1

EIF4EBP2  
EIF5A  
AIF1  
CELA1  
ELANE  
SERPINB1  
ELAVL2  
A2M  
CRTC2  
ELK3  
ELN  
ZBTB7C  
ENG  
ENO1  
ENO2  
ENPEP  
PRSS55  
EP300  
NRK  
PDILT  
EPHB1  
EPHB2  
EPO  
EPOR  
ERBB2  
ERBB3  
ERBB4  
ERCC1  
ERCC2  
EREG  
AKT1  
ERG  
AKT2  
ERN1  
FBL  
ESD  
ESR1  
ALAD  
ESRRA  
ALAS1  
ETS1  
ETV3  
ALB  
EXT2

ALCAM  
EZH2  
F2  
F2R  
F2RL1  
F3  
F5  
F7  
F8  
F9  
F10  
ALDH1A1  
F11  
FABP4  
FABP1  
FABP2  
ALDH2  
FABP3  
FABP5  
ACSL1  
PTK2B  
FAP  
FBLN1  
FASN  
FAT1  
LRRC55  
FOLH1B  
TPCN2  
FBN1  
FBN2  
EFEMP1  
FBP1  
RANP1  
PHACTR1  
FCGRT  
HOXA11-AS  
JAZF1  
FDPS  
GPRC6A  
RFX6  
GPC4  
FES  
FGB  
FGF1

FGF2  
ABCD2  
FGF13  
FGFR1  
FGFR4  
FGL1  
FHL1  
FHL2  
MRAS  
PUF60  
VASH1  
AAK1  
ANKRD26  
NLRP1  
INPP5F  
FKBP4  
FKBP5  
CARD8  
SACM1L  
KLRK1  
MMRN1  
MSRB2  
ATF6  
SIRT2  
DKK1  
TPX2  
PDCD11  
PALLD  
UNC13A  
MYO16  
FOXC2  
FOXO1  
FOXO1  
FOXO3  
AKR1B1  
NFASC  
FLG  
KDM6B  
FLII  
FLNA  
LPIN1  
PASK  
ATG4B  
FLT1



TBC1D1  
NBEAL2  
FBXO28  
PLCB1  
PHLPP1  
FLT4  
KAZN  
MCF2L  
CLEC16A  
FMO3  
CUX2  
FN1  
ZNF629  
SIK3  
SIRT4  
SIRT3  
SIRT1  
TARDBP  
CELA3B  
ANGPTL2  
ABCB10  
FOLH1  
NPTXR  
TRAM1  
BRD4  
FOLR1  
PES1  
FOLR2  
ZFYVE26  
CABIN1  
FOS  
NNT  
FOSB  
RBFOX2  
DDAH2  
LPAR3  
PADI4  
DDAH1  
SMUG1  
ELP5  
LEMD3  
DAPK2  
CD2AP  
SH3BP1

BACE1  
NUP62  
PLA2G15  
TMEFF2  
RAB38  
TMEM245  
DIANPH  
ALOX12  
FXN  
ALOX5  
ALOX5AP  
PANX1  
PRPF6  
ZNF318  
ALOX15  
IL27  
MTOR  
ALPI  
FSHMD1A  
NR5A2  
ALPP  
NR5A1  
GAST  
FUT2  
FNDC5  
KDSR  
G6PC  
G6PD  
ANGPTL5  
SLC37A4  
CNIH2  
GABPA  
PCSK9  
PTF1A  
TCERG1L  
WDR72  
FRMD3  
GAD1  
NEGR1  
GAD2  
GCA  
TAFA5  
ARIH1  
TPSG1

BACE2  
TXN2  
PART1  
GALNS  
POC1A  
PAMR1  
RNF19A  
AMBP  
GALNT3  
NDUFAF3  
MRGPRX1  
SAMHD1  
TPGS2  
KANK2  
GAP43  
GAPDH  
SH2B1  
TIPARP  
CHMP2B  
SNED1  
GORASP2  
TKFC  
ACOT11  
COPD  
APPL1  
POLDIP2  
LRIT1  
ZBTB20  
GAS1  
PTPN22  
AMD1  
GAS6  
PHGDH  
GATA3  
GATA4  
FBXO25  
FBXO8  
GATA6  
TINF2  
GATM  
ANKRD2  
FGF21  
AMD1P2  
GBE1

GAPDHS  
GC  
GCG  
GCGR  
GCH1  
GCK  
GCKR  
SLC17A5  
OPN1MW  
GDF2  
BSCL2  
GREM1  
MSTN  
GDF10  
HS6ST3  
GDNF  
GEM  
GFAP  
GFER  
GFPT1  
HAVCR1  
GGT1  
AMH  
GH1  
GHR  
GHRH  
GHSR  
CBLIF  
GIP  
GIPR  
GJA1  
FETUB  
ABL2  
AMPD1  
GJA3  
GJA4  
GJA5  
FOXD3  
ATP2C1  
NOX1  
SIGLEC7  
LAT  
SND1  
GJB3

FOXP1  
TAF5L  
GK  
CACYPB  
INTU  
NAAA  
GLS2  
GLA  
IL17B  
HCAR1  
GPR162  
PDCD4  
GCLC  
HPGDS  
ANGPTL3  
RPS6KA6  
DESI1  
SGSM3  
GLI2  
GLO1  
GLP1R  
MAT2B  
TOR2A  
GLRX  
GLUD2  
GLUL  
GNAO1  
GNAS  
GNAT1  
GNB3  
AMY2A  
ABO  
GOT2  
GP1BA  
SLCO1B3  
IFNL3  
ANG  
NEAT1  
OR10A4  
CXCR3  
HECTD4  
KSR2  
CHAMP1  
UTS2R

ANGPT1  
CAVIN1  
ZNF763  
RSPO1  
BTBD8  
MCHR1  
ANGPT2  
IGHD1-7  
DLL1  
GPER1  
GPR35  
TRBV7-8  
NSMCE2  
GPR39  
FFAR1  
GPR42  
FFAR2  
GPT  
GPX1  
GPX3  
GPX4  
GRIA2  
REM1  
DEXI  
LAMTOR2  
GRN  
OSTM1  
FLVCR1  
DBNL  
ANPEP  
GRIN1  
GRIN2A  
GRIN2B  
SETD2  
NDUFAF4  
NR3C1  
STXBP6  
CNIH4  
SLC25A4  
DROSHA  
TBK1  
GRM2  
CD274  
GRM5

CXCL1  
GSK3B  
GSN  
GSR  
GSTA4  
GSTM1  
GSTP1  
GSTT1  
GTF2H1  
GTF2H4  
GRHL1  
TRPM5  
ICOS  
NPC1L1  
GPSM2  
GUSB  
EEF2K  
NME7  
SEC61A1  
GYPA  
GPR132  
NENF  
GYPB  
DSE  
PADI1  
CERS2  
NRBP1  
GYPE  
PSAT1  
GYS1  
SH3KBP1  
GZMB  
H1-2  
ANXA1  
ANXA2  
HABP2  
HARS1  
HAS2  
HBA1  
HBB  
HBG2  
HCLS1  
HCRT  
HCRTR1

HDAC2  
CFH  
HFE  
ANXA5  
ERVW-1  
HGF  
NT5C  
NRG1  
PIK3R4  
HHEX  
ANXA6  
HIF1A  
UBE2K  
HK2  
ACACA  
HLA-A  
HLA-B  
HLA-C  
HLA-DMA  
HLA-DMB  
MNX1  
HLA-DPB1  
HLA-DQA1  
HLA-DQA2  
HLA-DQB1  
HLA-DQB2  
HLA-DRB1  
AOC2  
HMGB1  
HMGCR  
HMGCS2  
HMGA1  
HMOX1  
NR4A1  
FOXA2  
HNF4A  
HNF4G  
ONECUT1  
SLC29A2  
BPIFA4P  
HNRNPK  
ACACB  
HOXA3  
HOXC4



APC  
HP  
HPN  
APCS  
AIRE  
HPX  
MMAB  
AGFG1  
HRH1  
HRC  
PRMT1  
HES1  
HSD3B1  
HSD11B1  
HSD11B2  
HSF1  
HSPA1A  
HSPA1B  
HSPA2  
HSPA4  
HSPA5  
XIAP  
HSPA9  
HSPB1  
HSPB2  
HSP90AA1  
HSP90AB1  
HSPD1  
HSPG2  
NDST1  
HTC2  
APOA1  
HTR2A  
HTR2C  
APOA2  
APOA4  
TNC  
IAPP  
IARS1  
IBD2  
APOB  
IBSP  
ICA1  
ICAM1

GPIHBP1  
HCAR2  
FFAR4  
TMEM119  
BRINP3  
ARMH1  
ID1  
GADL1  
IDDM3  
IDDM4  
TSPAN33  
IDDM7  
VWA2  
IDDM11  
IDE  
GOLGA6A  
NANOS3  
CYCSP51  
IFNA1  
IFNA13  
APOC3  
IFNAR1  
IFNAR2  
IFNG  
ZFP57  
SOX2-OT  
PWAR4  
IGF1  
APOE  
IGF1R  
IGF2  
IGF2R  
IGFALS  
IGFBP1  
IGFBP2  
IGFBP3  
IGFBP5  
IGFBP7  
CCN1  
APOH  
GPR142  
APP  
APRT  
ZACN

SLCO4C1  
TICAM2  
KLK3  
FAS  
IL1A  
IL1B  
IL1R1  
IL1RN  
IL2  
IL2RA  
IL2RB  
IL3  
IL4  
IL4R  
IL6  
IL6R  
IL6ST  
IL7  
IL7R  
CXCL8  
CXCR1  
IL9  
AQP1  
IL10  
IL12B  
IL13  
ACADSB  
IL15  
IL15RA  
TNFRSF9  
IL17A  
IL18  
FO XK2  
ILF3  
AQP4  
ILK  
IMPDH1  
IMPDH2  
IDO1  
ING1  
ING2  
CXCL10  
INS  
INPPL1

AQP7  
INSL3  
INSM1  
INSR  
INSRR  
PDX1  
IRAK1  
IRF1  
AQP9  
IRF7  
IRS1  
ISG20  
AR  
ISL1  
ITGAM  
ITGAX  
ITGB2  
ITGB7  
ITIH1  
ITPK1  
ITPR1  
ITPR3  
IVD  
JAK1  
JAK2  
JUN  
JUNB  
JUND  
GSTK1  
AREG  
NDUFS7  
KCNC2  
KCNE1  
KCNH2  
ENHO  
KCNJ1  
KCNJ3  
KCNJ5  
KCNJ6  
KCNJ9  
KCNJ11  
KCNMA1  
KCNN4  
KCNQ1

LINC-PINT

MALAT1

KDR

KIF5B

KIR2DL2

KIR2DL3

KIR3DL1

KISS1

KLK1

KLKB1

KNG1

ARG1

KRAS

KRT5

KRT8

KRT16

SUMO4

TBPL2

KRT18

TMEM189

TMEM189-UBE2V1

SERPINA13P

LINC01550

C2CD4B

CCL4L1

C1QTNF12

LIN28B

KTN1

MAFA

LAD1

C1QL3

HES3

LAMP1

LAMC2

LAMP2

RPSA

LBP

LCK

LCN1

LCN2

LCP1

LDHB

LDLR

LEP  
LEPR  
LETM1  
LGALS1  
LGALS2  
LGALS3  
LGALS3BP  
LGALS4  
LHX1  
LIF  
LIG4  
LIPC  
LIPE  
FADS1  
SMIM10L2A  
LMNA  
LINC02694  
LNPEP  
LOX  
LOXL2  
LPA  
LPL  
LRP1  
LRP2  
LRP6  
LRP5  
LRPAP1  
LINC01194  
GTF2H5  
LTA  
ARNT  
LTBR  
ARNTL  
MIRLET7G  
LYZ  
MIR107  
MIR122  
MIR126  
MIR130A  
MIR132  
MIR134  
MIR140  
MIR142  
MIR143

MIR145  
MIR146A  
MIR148A  
MIR149  
MIR150  
MIR152  
MIR155  
MIR15A  
MIR15B  
MIR181C  
MIR182  
MIR184  
MIR185  
MIR190A  
MIR199A1  
MIR199A2  
MIR19A  
MIR200A  
MIR200B  
MIR200C  
MIR203A  
MIR204  
MIR205  
MIR21  
MIR210  
MIR211  
MIR214  
MIR216A  
MIR217  
ARR3  
MIR22  
MIR221  
MIR222  
MIR223  
MIR23A  
MIR23B  
MIR24-1  
MIR25  
MIR27A  
MIR27B  
MIR29A  
MIR296  
MIR29B1  
MIR29B2

MIR29C  
MIR302A  
MIR30A  
MIR30D  
MIR30E  
MIR31  
MIR320A  
MIR34A  
MIR93  
MIR96  
MIR98  
MIR99A  
MIR17HG  
MXD1  
SMAD1  
SMAD2  
SMAD3  
SMAD4  
ARRB2  
SMAD7  
MAFD2  
ASIC1  
ARSA  
STS  
MAOA  
MAP2  
MAP6  
MAPT  
MAS1  
MB  
MBL2  
MBNL1  
MBP  
MC2R  
MC3R  
MC4R  
MCL1  
SMCP  
ADAM11  
DNAJB9  
MDH2  
MDM2  
MDM4  
MECP2



MEF2A  
MEFV  
MAP3K5  
MEN1  
MEOX2  
MET  
MFAP1  
MFGE8  
MGAT2  
KITLG  
MGP  
MIF  
CXCL9  
MIP  
MITF  
MLH1  
MAP3K9  
MAP3K10  
MLN  
ACHE  
FOXO4  
NR3C2  
MME  
MMP1  
MMP2  
MMP3  
MMP8  
MMP9  
MMP10  
MMP14  
MNAT1  
ASIP  
MPG  
MPI  
MPO  
MPST  
MPZ  
MRE11  
ABCC1  
MS  
RNASEK  
MIAT  
CDNF  
VN1R17P

GPR166P  
MIR330  
MIR338  
MSH3  
MSMB  
MST1  
MSX2  
MT1A  
MT1E  
MT1JP  
PLF  
MT2A  
ATP6  
TRNC  
COX1  
COX2  
COX3  
CYTB  
MTHFR  
MTM1  
ND1  
ND2  
ND3  
ND5  
ND6  
MTNR1A  
MTNR1B  
MTTP  
TRNF  
TRNK  
TRNL1  
TRNQ  
TRNS1  
TRNS2  
TRNV  
TRNW  
MUC1  
MUSK  
MMUT  
MUTYH  
MVD  
MYC  
MYD88  
MYF6

SERPINC1  
MYH9  
ZFHX3  
MYL2  
PPP1R12A  
NAB2  
NAGLU  
ATF3  
ATF4  
NUBP1  
NBN  
NCAM1  
NCK1  
NCL  
NDN  
NDP  
NDUFA1  
NDUFA6  
NDUFB3  
ATIC  
NDUFB9  
NDUFB10  
NDUFS1  
ATM  
NDUFS2  
NDUFS3  
NDUFV1  
NDUFS4  
NDUFS6  
NDUFS8  
NDUFV2  
RERE  
NEFL  
NEUROD1  
NFATC1  
NFATC3  
NFATC4  
NFE2L2  
NFIL3  
ATP12A  
NFKB1  
NFKB2  
NFKBIA  
NGF

NGFR  
NHS  
NIDDM1  
NIDDM2  
NINJ1  
NNAT  
NM  
NME1  
NNMT  
NOS1  
NOS2  
NOS3  
NOTCH1  
NPY  
NOTCH2  
NOTCH3  
CCN3  
FXD2  
NPHS1  
ATP2A1  
NPPA  
NPPB  
ATP2A2  
NPPC  
SLC11A2  
NRF1  
ACR  
ATP2B1  
NRTN  
YBX1  
ATP2B2  
NTS  
NTSR1  
NUCB2  
NUMA1  
TRIM72  
CISD2  
OAS3  
OAT  
MIR375  
MIR377  
MIR424  
ATP4A  
ODC1

ODF1  
OGG1  
OGN  
OLR1  
OPA1  
TNFRSF11B  
ORM1  
CLDN11  
OXA1L  
OXTR  
P2RX3  
P2RX4  
P2RX5  
P2RX7  
P2RY1  
P4HB  
PA2G4  
FURIN  
PAEP  
RRM2B  
NOX4  
PRDX1  
SERPINE1  
IL20  
IL22  
MBL3P  
PAM  
NEUROG3  
REG3A  
PAPPA  
PRKN  
PARN  
PAWR  
PAX2  
PAX4  
PAX6  
ASAP1  
AK3  
F11R  
PBX1  
PC  
PCBD1  
PDE11A  
FOXP3

SOST  
PCDH8  
TPRKB  
ASCC1  
TMED7  
TVP23B  
SERPINA5  
PCK1  
PCK2  
GAL  
MLXIPL  
ADIPOR1  
PCMT1  
NDUFAF1  
TFB1M  
METTL9  
PCNA  
RMDN1  
IER3IP1  
ANGPTL4  
INSIG2  
SDF4  
PCNT  
DCTN4  
CYB5R4  
HSPA14  
GP6  
GLRX5  
PCSK1  
MZB1  
NT5C3A  
PCSK2  
CLEC1B  
TLR7  
PCYT1A  
TIMMDC1  
PDB1  
PDC  
PDCD1  
DACT1  
PRKAG2  
POLK  
PDE4D  
DCDC2

ISYNA1  
HSD17B7  
PDE7A  
DTL  
SIRT7  
SIRT6  
RAB14  
PDGFRA  
IL23A  
UFM1  
GDE1  
PIAS4  
TRIM33  
NBAS  
ATP6V1H  
SF3B6  
RASD1  
PDK4  
MPC1  
ZFR  
ENPP1  
EMCN  
PDR  
GHRL  
ARID4B  
PECAM1  
RTEL1  
SERPINF1  
MAP3K20  
ADA2  
PER1  
PEX1  
PEX6  
PF4  
PF4V1  
ACP1  
ATP5PF  
PGC  
PGF  
PGM1  
ABCB1  
PHB  
SLC25A3  
SERPINA1

SERPINB6  
PIK3CA  
PIK3CB  
PIM1  
PIK3CD  
PIK3CG  
PIK3R1  
PIN1  
PKD1  
PKLR  
PKM  
PKNOX1  
PLA2G1B  
PLA2G2A  
PLAG1  
PLAGL1  
PLAT  
PLAUR  
PLCB3  
IL17D  
UBASH3A  
PLCG1  
HDL3  
PLG  
PLEK  
SERPINF2  
PLIN1  
PLK1  
PLN  
PLTP  
PLXNA1  
PLXNA2  
PNOC  
PMM2  
PMP22  
IL20RA  
SLCO1C1  
ACP5  
FAM3B  
TLR9  
H2BS1  
PODXL  
ERRFI1  
TREM2



TREM1  
POLD1  
POLG  
SIAE  
POMC  
YIPF1  
SEMA5B  
PON1  
PON2  
MOV10L1  
PON3  
POR  
KRT20  
POU1F1  
SMOX  
ATR  
POU2F1  
C20orf181  
POU2F2  
CCHCR1  
ROBO4  
NDUFB11  
DDIT4  
EPB41L4B  
DLL4  
POU4F1  
ARL15  
PPARA  
PPARD  
PPARG  
KIF1A  
FEV  
FBLIM1  
PPIA  
TET2  
CNNM2  
DYM  
PPID  
TRPM7  
BCAS3  
VPS13C  
NCAPG2  
CASZ1  
CDKAL1

SARS2  
ACP3  
TUG1  
MARCHF1  
MOCOS  
PPP1R3A  
SLC52A1  
PPP1R3C  
AVP  
ANO1  
WRAP53  
MTPAP  
MSTO1  
RMDN3  
AVPR1A  
RCBTB1  
PTPA  
SLC47A1  
RHOT1  
FBXW7  
AVPR1B  
SLC29A3  
GIMAP5  
CHDH  
HEMGN  
IMPACT  
MEG3  
PPY  
AVPR2  
MIR429  
MIR449A  
PREP  
NOP10  
SLC30A10  
MAML3  
SOX6  
PLXNA3  
FOXRED1  
MIOX  
ZCCHC8  
RNPC3  
ITLN1  
CARMIL1  
FERMT1

PRKAA1  
STAP2  
PRKAA2  
SYBU  
PRKAB1  
NHP2  
PRKACA  
PRKAR1A  
ENAH  
PRKCA  
PRKCB  
PRKCD  
KDM3A  
PAG1  
SELENOS  
CISD1  
USE1  
ACOT13  
TMEM126B  
GSDMB  
GPRC5C  
ZNF395  
ACSS2  
ZC4H2  
ANGPTL8  
LANCL2  
APOM  
MAPK1  
MAPK3  
NSFL1C  
MAPK7  
MAPK8  
MYDGF  
MAP2K3  
MAP2K6  
DNAJC3  
PCDHGA4  
PRL  
PSPN  
PROC  
ZNF253  
PROS1  
PROX1  
TRPV5

PRSS1  
PRSS2  
MASP1  
PRSS8  
CYP26B1  
SLC2A9  
ASAH2  
PSEN1  
PSEN2  
CLDND1  
TWNK  
SUCNR1  
B2M  
RETN  
SPHK2  
PSMA6  
NMUR2  
ENY2  
PYY  
FAM20C  
CHPT1  
ADAMTS9  
BAAT  
ACKR3  
AKR1B10  
COQ9  
PCBP4  
PNPLA2  
KMT5AP1  
CAMK1D  
GOPC  
PSMD7  
PSMD9  
PSMD10  
PELI1  
ADAMTSL3  
BAD  
PSPH  
PTBP1  
PTCH1  
PTEN  
PTGDS  
JPH3  
GJD2

PTGIS  
MIR433  
HNP1  
PTH  
AS3MT  
PTGS1  
PTGS2  
PTHLH  
MIR409  
MIR146B  
MIR497  
PTH1R  
MIR499A  
MIR503  
AHRR  
SEMA6A  
CFAP97  
SHROOM3  
CIP2A  
RNF213  
PTPN1  
PTPN2  
TRIB3  
PTPN6  
MARK4  
SUGP1  
HAMP  
G6PC2  
ZNF410  
PTPRD  
PTPRF  
PTPRN  
PTPRN2  
PTX3  
BAX  
RAD1  
NEUROD4  
PVR  
NECTIN1  
BBS1  
PVT1  
BBS2  
PCTP  
OPRPN

ARHGAP22  
RAC1  
RAC2  
MOK  
RAF1  
RAG2  
BCHE  
RAN  
IL21  
RAPSN  
RARRES2  
ACE2  
UBL5  
GER  
TRPV4  
SCPEP1  
LGR6  
NPS  
RBP3  
CCND1  
RBP4  
RCN2  
OPN1LW  
BCL2  
REG1A  
REG1B  
BCL2A1  
RELA  
REN  
RENBP  
REST  
RFC2  
RGS1  
ACTB  
RHD  
RHEB  
RHO  
RIT2  
RNASE2  
RNASE3  
SLC25A19  
BRD2  
BACH2  
ELOVL5

NIF3L1  
IGAN1  
GAS5  
PROK2  
RNY1  
RNY3  
ROBO1  
ROCK1  
RORC  
ROS1  
HCN2  
RP9  
BCR  
RPL10  
RPL29  
RPL36A  
MBOAT4  
RPS6  
DELYQ11  
RPS6KA1  
HCC  
MIR483  
MIR486-1  
RPS6KB1  
RPS19  
RREB1  
RXRG  
RYS2  
RYS3  
BDNF  
S100A1  
SORT1  
S100A8  
S100A9  
S100A10  
S100A12  
S100B  
CFB  
ACSM3  
SALL1  
SATB1  
SCD  
BGLAP  
CLEC11A

SCN2A  
BGN  
SCN7A  
SCN10A  
SRL  
CCL2  
CCL4  
CCL5  
CCL11  
CCL16  
CCL20  
CCL21  
CCL22  
BID  
CXCL11  
CXCL5  
SRR  
SDC4  
CXCL12  
THADA  
UBE2O  
ELMO2  
CIDEA  
PCIF1  
DMRTA1  
PRDM16  
BLK  
SELE  
SELL  
SELP  
SELPLG  
SEMA3F  
TSPYL2  
CDH23  
LHPP  
TNMD  
SLC39A8  
FN3K  
NOD2  
IFIH1  
SELENOP  
ECSCR  
STRA6  
ABCG5



ABCG8  
SFRP5  
SRSF5  
SRSF6  
FBR5  
COP1  
IKZF5  
SFTPB  
HHIP  
SFTPC  
SFTPD  
SGCA  
SMIM10L2B  
SGK1  
SHBG  
SHC1  
EBF2  
GORASP1  
PDIA2  
WDR13  
MFSD1  
SI  
ST6GAL1  
P2RY12  
ST3GAL4  
GNPNAT1  
PMEL  
AGXT2  
SIX1  
BMP2  
PINK1  
SKP2  
SLC1A3  
RTN4R  
WNK1  
SLC2A1  
SLC2A2  
SLC2A3  
SLC2A4  
SLC3A1  
BMP4  
SLC5A1  
SLC5A2  
SLC5A3

UBE2Z  
SLC5A5  
SLC6A2  
SLC6A3  
CXADRP1  
SLC6A4  
NCF1  
SLC6A8  
SFTP1  
GGTLC5P  
BMP6  
SLC7A2  
SLC9A1  
BMP7  
SLC9A3  
SLC10A2  
SLC11A1  
SLC12A3  
SLC14A1  
SLC34A1  
SLC18A2  
SLC19A1  
SLC20A1  
SLC20A2  
SLC22A1  
SLC22A2  
BMPR2  
SMARCA4  
CYP4F12  
SMO  
SMPD1  
SMS  
SNAI1  
SNAP25  
SNCA  
SNRNP70  
SOAT1  
H3P37  
SOD1  
SOD2  
SOD3  
BNIP3L  
SORD  
SORL1

SOS1  
SOX2  
SOX4  
SOX9  
SP1  
DST  
SPARC  
SPG7  
SPINK1  
SPINT1  
SPP1  
SPR  
SPRR2A  
SRD5A2  
AKR1D1  
BRCA1  
SREBF1  
SREBF2  
SRY  
TRIM21  
ITPRID2  
BRCA2  
SST  
SSTR4  
SSTR5  
ST2  
ST13  
ST14  
STAT1  
STAT2  
STAT3  
STAT4  
STAT5A  
STAT5B  
STC1  
ELOVL4  
STIM1  
STK11  
BRS3  
STX1A  
STX4  
STXBP1  
STXBP3  
SULT1A1

BSG  
ABCC8  
SUV39H1  
VAMP2  
BTC  
SYN2  
SYP  
SYT1  
SYT5  
TAC1  
ADAM17  
TACR1  
KLF9  
TAGLN  
KLF5  
TALDO1  
TAP1  
TAP2  
TAPBP  
TAT  
TBX1  
BTF3P11  
TBP  
TBXA2R  
TCF4  
HNF1A  
HNF1B  
TCF3  
MIR579  
TCF7  
MIR615  
MIR618  
TCF7L2  
ZEB1  
TCF19  
TCF21

TRBV20OR9-2  
TRD  
BUB1  
TDGF1P3  
TDO2  
TEK  
TERC

TERF1  
TERT  
TFAM  
TFE3  
TFF3  
TFPI  
TFRC  
TG  
TGFA  
TGFB1  
TGFB2  
TGFB3  
TGFB1  
TGFB1  
TGFB2  
TGM2  
TH  
THBD  
THBS1  
THBS2  
TSPO  
THBS4  
THRA  
THRB  
KLF10  
TIE1  
TIMP1  
TIMP2  
TIMP3  
TIMP4  
C1QBP  
TJP1  
TKT  
TLE1  
TLE3  
TLR1  
TLR2  
TLR3  
TLR4  
TLR5  
TSPAN7  
TSPAN8  
TM7SF2  
TMSB4X

TNF  
TNFAIP3  
TNFRSF1A  
TNFRSF1B  
TNNI3  
TP53  
TPD52  
C2  
TPM4  
TPO  
C3  
CRISP2  
NR2C2  
TRAF6  
C4A  
C4B  
TRPC3  
TRPC6  
TRPM2  
INS-IGF2  
TSC1  
TSC2  
TSHR  
TST  
TTC4  
TTN  
TTPA  
TTR  
C5AR1  
GGTLC3  
POTEF  
GGT2  
OPN1MW2  
TWIST1  
TNFSF4  
CCR2  
TXN  
TYK2  
GGTLC4P  
UBE2I  
UBE2V1  
UCHL1  
UCN  
C9

UCP1  
UCP2  
UCP3  
UGCG  
UMOD  
UPP1  
UPK2  
VPS51  
USF1  
UTRN  
KDM6A  
VASP  
VCAM1  
VDAC1  
VDR  
VEGFA  
VEGFB  
VEGFC  
VGF  
VHL  
EZR  
VIM  
VIP  
BEST1  
VPREB1  
TRPV1  
VWF  
LAT2  
WFS1  
NSD2  
WNT1  
WNT2  
WNT5A  
WNT6  
WNT7A  
WRN  
XBP1  
XBP1P1  
XK  
XPC  
XRCC1  
XRCC4  
YES1  
YY1

YWHAZ  
SF1  
ZFP36  
PTTG1IP  
CNBP  
CA1  
CA2  
CACNA1A  
ZMYM2  
CACNA1E  
ZNF236  
SLC30A3  
DDR1  
AIR  
PSS  
NPHS2  
PXDN  
ALMS1  
TUBA1A  
PAX8  
CXCR4  
FZD5  
SCG2  
SLMAP  
MANF  
SLC25A20  
CAD  
ST8SIA4  
ASPSCR1  
FTO  
NDUFAF5  
CCDC28B  
MBOAT7  
FSD1  
DDX39B  
CALB1  
NOX5  
PLA2G7  
PAGR1  
TNDM  
NTT  
SLC52A2  
CORO7  
MUL1



CALCA  
ADIPOR2  
NAA16  
RNASEH2B  
AIMP2  
USB1  
PPP1R3B  
DHX40  
NLRX1  
VTCN1  
LIN28A  
PALB2  
FZD3  
ARMC5  
SHCBP1  
VASH2  
EHMT1  
HDAC11  
CALCR  
DCAF17  
CALM1  
BICC1  
NR4A3  
ZC3H12A  
ASRGL1  
MOGAT2  
CTC1  
ALPK1  
NUBPL  
STAM  
SCUBE1  
CDK5RAP3  
CUBN  
FLAD1  
PDGFD  
PNPLA3  
COASY  
CALM2  
PDHX  
ECB2  
THSD7B  
FGF23  
SPX  
COL18A1

CALM3  
ZNF436  
KMT2D  
SETD7  
AAAS  
HMGA2  
SLC2A10  
KCNH6  
CALR  
HBHR  
SLC7A5  
SLC38A1  
TXNDC5  
TSC22D4  
MAP1LC3B  
AKAP1  
OR2B2  
OR12D3  
MED25  
MKKS  
TAM  
CANX  
CAPN1  
CAPN2  
CAPN3  
UBL4A  
TKTL1  
CAPS  
CAST  
AXIN1  
BRAP  
FZD4  
CARS1  
CASP1  
ELOVL3  
GPR101  
MFRP  
CASP3  
SESN2  
CRISPLD2  
LOH19CR1  
KCNK16  
SETDB2  
ANGPTL6

FSD1L  
MIXL1  
PIP5K1B  
PLA2G6  
CCDC8  
PLA2G10  
MAGT1  
TAGLN2  
TKTL2  
CASP8  
ARL6  
SLC41A2  
EEA1  
RNASEH2C  
ASCC2  
NLRC5  
CASP9  
MEHMO  
RPAIN  
NR0B2  
CASQ1  
SYVN1  
HOPX  
CUL1  
CASR  
ZGPAT  
KLF11  
KISS1R  
SPZ1  
TRIM63  
ACCS  
INSM2  
CAT  
IRS4  
OGT  
CNDP1  
LMNB2  
ATP5MD  
HAVCR2  
ORAI1  
PLXDC2  
PPP1R15B  
UBASH3B  
ELP1

CST7  
ABCC11  
KRT90P  
APOL1  
LGR5  
MAPKAPK5  
GALP  
DEGS1  
DENR  
MADD  
CAV1  
KHSRP  
CAV3  
RUNX2  
TNFSF11  
STC2  
PDE8B  
TP63  
AOC3  
ABCB11  
NCOA1  
SOCS1  
PDE5A  
DYNLL1  
IRS2  
VAMP4  
BECN1  
CBLB  
PEA15  
IDDM17  
DGAT1  
RIPK1  
HRK  
TNFSF14  
TNFSF10  
CBS  
TNFRSF6B  
FADD  
SIGLEC5  
TNFRSF11A  
TNFRSF10B  
SUCLA2  
TRIM24  
DPM1

CES2  
NRP1  
CCN5  
CCN4  
HDAC3  
PROM1  
CCK  
KAT2B  
ASAP2  
ALDH1A2  
NR1I2  
CCKAR  
APLN  
PER3  
CCKBR  
CDC123  
ARHGEF7  
SPHK1  
SQSTM1  
FUBP1  
ZPR1  
EIF2S2  
WASF1  
MGAM  
WNT3A  
HSPB3  
TRPA1  
SELENBP1  
F2RL3  
SOCS3  
UCN2  
CH25H  
BAZ1B  
KNSTRN  
BMF  
RPL14  
ARTN  
AIP  
GPRC5A  
SLC7A7  
PYGO2  
IL33  
USP8  
MTA1

CD1D  
SLC16A4  
SLC16A3  
ARHGEF1  
PDCC5  
HGS  
UBXN11  
PCSK7  
CD3E  
LPAR2  
ARHGEF2  
RFT1  
TIMD4  
NDUFAF2  
ARRDC4  
SLC33A1  
HACD1  
CTBP1-DT  
GGTLC1  
MTG1  
CD5L  
PTTG1  
NAF1  
NOG  
MSC  
CD8A  
MFHAS1  
STK17B  
PIWIL1  
DNER  
SLC38A5  
CD14  
GPR55  
UBE2Q2  
S1PR2  
ACVR2B  
CD19  
MS4A1  
KLF4  
CD163  
B4GALT5  
GLP2R  
SLIT2  
TRMT10A

PPIG  
LONP1  
KL  
ADIPOQ  
COX5A  
CD27  
CIAO1  
HS6ST1  
CD101  
FOXP2  
CD28  
GRAP2  
MUC16  
CD80  
FADS2  
CD86  
CYP7B1  
NTN1  
TP53INP1  
ABCG2  
NCR1  
AIM2  
MAP4K4  
CD33  
EIF2AK3  
HOMER1  
FHL5  
PCYT1B  
CHST3  
CD34  
ROCK2  
NAPSA  
MAPK8IP1  
CD36  
SCARB1  
ADAMTS4  
ADAMTS1  
GAL3ST1  
GDF15  
TBPL1  
CD38  
NPEPPS  
ENTPD1  
BAG3

EI24  
CIR1  
CCL4L2  
H6PD  
BCAR1  
CLOCK  
CD40  
SOX13  
PRDX6  
CD40LG  
CD44  
CARTPT  
CD47  
ABCG1  
IKBKE  
SOCS5  
CD59  
LPIN2  
CD68  
CD69  
NOS1AP  
SEMA3E  
DCAF1  
SART3  
HDAC9  
HDAC4  
ADGRE5  
RASSF2  
RAPGEF5  
PIEZO1  
BMS1  
IP6K1  
GIT2  
KEAP1  
ELMO1  
TBC1D4  
NUAK1  
RNF10  
MFN2  
MVP  
FGF19  
TNFSF15  
NR1I3  
NR1H4



CCS  
CDC42  
CDH1  
DGCR2  
CASP8AP2

HNF4A::GH20J044350

HNF1A::GH12J120977  
GPD2

WFS1::GH04J006297

TCF7L2::GH10J113047

TCF7L2::GH10J112997

IGF2BP2::GH03J185795  
PRMT7  
MIR657  
LINC01370  
LINC00271

PDZRN3-AS1  
WFDC21P  
MIR206  
MIR125A  
NIDDM4  
RBPJ  
BAIAP2L1  
IL6-AS1

LOC110121472  
LEPQTL1  
NR1H2  
G6PC1  
LCAT  
COG2  
PIK3C2A  
LPXN  
RRAD  
APOC2  
MT-ND1  
PTS

TFAP2B  
PNLIP  
PDE3B  
GRB14  
DUSP2  
CYP17A1

FTO::GH16J053765  
MIR17  
MAPK10

KCNQ1::GH11J002824  
MIR144  
CD63  
DRD2  
SCT  
ICOSLG  
SAA1  
PDP1  
OPRM1  
IKBKB  
SDHB  
GNPDA2  
SLPI  
MSBP1  
SLC27A1  
NR1D1  
PRKAB2  
ELOVL6  
KCTD15  
RPS27A  
METRNL  
PLIN5  
MTCH2  
C1QTNF9  
UBE2E2  
DLK1  
OXT  
HMG20A

IGF2R::MIR657 47  
SLC47A2  
LIPG  
MT-CO1

AZGP1  
ITGB3  
GYS2  
ACTRT2  
AGMAT  
AGRN  
AGTRAP  
AJAP1  
AKR7A2  
AKR7A3  
ALDH4A1  
ANGPTL7  
ANIB3  
ANON1  
ARHGEF10L  
ARHGEF16  
ATAD3A  
ATAD3B  
ATP13A2  
B3GALT6  
BFIS4  
CA6  
CAMTA1  
CAPZB  
CCNL2  
CCV  
CDK11A  
CDK11B  
CELA2A  
CELA2B  
CENPS  
CEP104  
CHD5  
CLCN6  
CLCNKA  
CLCNKB  
CLSTN1  
CPTP  
CROCC  
CTNNBIP1  
DFFA  
DFFB  
DFNB96  
DHRS3

DISP3  
DNAJC11  
DVL1  
DYT13  
EA8  
EFHD2  
EMC1  
EPHA2  
ESPN  
EXOSC10  
FAAP20  
FBXO2  
FBXO42  
FBXO44  
FBXO6  
GABRD  
GBD2  
GLC3B  
GNB1  
GPR153  
HES2  
HES4  
HES5  
HSPB7  
HTR6  
ICMT  
INTS11  
ISG15  
KCNAB2  
KIF1B  
KLHL17  
KLHL21  
KONDS  
LRRC38  
LRRC47  
LZIC  
MAD2L2  
MEGF6  
MFAP2  
MIB2  
MICOS10  
MIIP  
MIR551A  
MMEL1

MMP23A  
MMP23B  
MRPL20  
MXRA8  
NADK  
NBL1  
NBPF1  
NECAP2  
NMNAT1  
NOC2L  
NPHP4  
OTUD3  
PADI2  
PADI3  
PADI6  
PANK4  
PAX7  
PDPN  
PERM1  
PEX10  
PEX14  
PGD  
PLA2G2E  
PLA2G5  
PLCH2  
PLEKHG5  
PLEKHM2  
PLOD1  
PRDM2  
PRKCZ  
PSORS7  
PTPRZ2  
RCC2  
RNF186  
RNF207  
RNU1-4  
RPL22  
RSC1A1  
SAI1  
SAMD11  
SCNN1D  
SCZD12  
SKI  
SLC25A33

SLC2A5  
SLC2A7  
SLC35E2B  
SLC45A1  
SLC66A1  
SMIM1  
SPEN  
SPSB1  
SRARP  
SRM  
SSU72  
TAS1R1  
TAS1R2  
TAS1R3  
THAP3  
TMEM240  
TNFRSF14  
TNFRSF18  
TNFRSF25  
TNFRSF4  
TNFRSF8  
TP73  
TPRG1L  
TRE-TTC3-1  
TRG-CCC1-1  
UBE4B  
UBIAD1  
UBR4  
VAMP3  
VPS13D  
VWA1  
WRAP73  
ZBTB17  
ZBTB48