

## **Supplementary materials**

Supplementary Table 1: A total of 1793 immune-related genes.

Supplementary Table 2: Differentially expressed genes (DEGs) between DN patients and controls in GSE30528.

Supplementary Table 3: The sequences of primers used in real-time PCR.

Supplementary Table 4: Hyperparameter selection table for machine learning models.

Supplementary Table 5: Evaluation metrics for the validation set GSE47183.

Supplementary Table 6: Evaluation metrics for the validation set GSE30529.

Supplementary Table 1: A total of 1793 immune-related genes

Symbol

AZGP1	NR1I3	FGF4	IGHD4-17	PML
B2M	NR2C1	FGF5	IGHD4-23	AEN
CALR	NR2C2	FGF6	IGHD4-4	CYBB
CANX	NR2E1	FGF7	IGHD5-12	BPIFA2
CD1A	NR2E3	FGF8	IGHD5-18	ISG20
CD1B	NR2F1	FGF9	IGHD5-24	BCL3
CD1C	NR2F2	VEGFD	IGHD5-5	ISG20L2
CD1D	NR2F6	FIGNL2	IGHD6-13	NOX5
CD1E	NR3C1	FLT3LG	IGHD6-19	NOX3
CD4	NR3C2	FSHB	IGHD6-25	DUOX2
CD8A	NR4A1	GAL	IGHD6-6	TLR3
CD8B	NR4A2	GALP	IGHD7-27	TFRC
CD74	NR4A3	GAST	IGHE	IFIH1
CREB1	NR5A1	GCG	IGHG1	LRP1
CTSB	NR5A2	GDF1	IGHG2	TRIM5
CTSE	NR6A1	GDF10	IGHG3	IDO1
CTSL	NRP1	GDF11	IGHG4	GDF15
CTSS	NRP2	GDF2	IGHJ1	NEDD4
FCER1G	OGFR	GDF3	IGHJ2	ADIPOQ
FCGRT	OPRD1	GDF5	IGHJ3	STAT3
PDIA3	OPRK1	GDF6	IGHJ4	STAT1
HFE	OPRL1	GDF7	IGHJ5	IFNL2
HLA-A	OPRM1	GDF9	IGHJ6	SOCS3
HLA-B	OSMR	GDNF	IGHM	SEMG1
HLA-C	OXTR	GH1	IGHV1-18	TNFSF10
HLA-DMA	PGR	GH2	IGHV1-2	CCL20
HLA-DMB	PGRMC2	GHRH	IGHV1-24	SOCS1
HLA-DOA	PPARA	GHRL	IGHV1-3	RNASEL
HLA-DOB	PPARD	GIP	IGHV1-45	IRF1
HLA-DPA1	PRLHR	GKN1	IGHV1-46	IL15
HLA-DPB1	PRLR	GMFB	IGHV1-58	APOBEC3F
HLA-DQA1	PTGER1	GMFG	IGHV1-69	PLAAT4
HLA-DQA2	PTGER2	GNRH1	IGHV1-8	CHIT1
HLA-DQB1	PTGER3	GNRH2	IGHV1-38-4	CD40
HLA-DRA	PTGER4	GPHA2	IGHV1-69-2	TLR7
HLA-DRB1	PTGFR	GPHB5	IGHV2-26	PPIA
HLA-DRB3	PTH1R	GPI	IGHV2-5	ZYX
HLA-DRB4	PTH2R	GREM1	IGHV2-70	NLRX1
HLA-DRB5	RARA	GREM2	IGHV3-11	PGC
HLA-E	RARB	GRP	IGHV3-13	VEGFA
HLA-F	RARG	GUCA2A	IGHV3-15	IKBKE
HLA-G	RORA	HBEGF	IGHV3-16	ISG15
HLA-H	RORB	HDGF	IGHV3-20	DHX58
MR1	RORC	HDGFL3	IGHV3-21	TNFAIP3

HSPA1A	RXFP1	IAPP	IGHV3-23	TFR2
HSPA1B	RXFP2	IFNE	IGHV3-30	FCN2
HSPA1L	RXRA	IFNK	IGHV3-30-3	MUC4
HSPA2	RXRB	IFNW1	IGHV3-30-5	F2R
HSPA4	RXRG	IGF1	IGHV3-33	ELN
HSPA5	S1PR1	IGF2	IGHV3-35	IL27
HSPA6	S1PR2	IL11	IGHV3-38	MAPT
HSPA8	SCTR	IL12A	IGHV3-43	LYZ
HSP90AA1	SDC1	IL16	IGHV3-48	CCL5
HSP90AB1	SDC2	IL17B	IGHV3-49	LEP
ICAM1	SDC3	IL17C	IGHV3-53	CYLD
IFNA1	SDC4	IL17D	IGHV3-64	KLKB1
IFNA2	SORT1	IL17F	IGHV3-66	CST4
IFNA4	SSTR1	IL19	IGHV3-7	CSRP1
IFNA5	SSTR2	IL1F10	IGHV3-72	MAPK14
IFNA6	SSTR5	IL36RN	IGHV3-73	JUN
IFNA7	ST2	IL36A	IGHV3-74	ITGAV
IFNA8	TACR1	IL37	IGHV3-9	IRF5
IFNA10	TEK	IL36B	IGHV3-38-3	CCR6
IFNA13	TGFBR1	IL36G	IGHV3-69-1	IL12B
IFNA14	TGFBR2	IL1RN	IGHV4-28	TLR8
IFNA16	TGFBR3	IL20	IGHV4-30-1	GPLY
IFNA17	THRA	IL21	IGHV4-30-2	CD81
IFNA21	THRB	IL23A	IGHV4-30-4	EIF2AK2
IFNG	TIE1	IL24	IGHV4-31	APOM
KIR2DL1	TNFRSF10C	IL25	IGHV4-34	CACYBP
KIR2DL2	TNFRSF10D	IL26	IGHV4-39	NOD1
KIR2DL3	TNFRSF11A	IFNL3	IGHV4-4	MAPK8
KIR2DL4	TNFRSF12A	IL3	IGHV4-59	MAPK3
KIR2DS1	TNFRSF13B	IL31	IGHV4-61	BST2
KIR2DS3	TNFRSF13C	IL32	IGHV4-38-2	BPHL
KIR2DS4	TNFRSF14	IL33	IGHV5-51	PLA2G2A
KIR2DS5	TNFRSF17	IL34	IGHV5-10-1	GRN
KIR3DL1	TNFRSF18	IL5	IGHV6-1	NEWENTRY
KIR3DL2	TNFRSF19	IL6ST	IGHV7-4-1	PDGFRA
KLRC1	TNFRSF1A	IL7	IGHV7-81	GNAI1
KLRC2	TNFRSF1B	IL9	IGK	WNT5A
KLRC3	TNFRSF21	INHA	IGKC	FURIN
KLRD1	TNFRSF25	INHBA	IGKDEL	ADAR
LTA	TNFRSF4	INHBB	IGKJ	TYK2
CIITA	TNFRSF6B	INHBC	IGKJ1	NOS2
MICA	TNFRSF8	INHBE	IGKJ2	TRAF3
MICB	TNFRSF9	INS	IGKJ3	TPT1
NFYA	TRHR	INS-IGF2	IGKJ4	TPM2
NFYB	TSHR	INSL3	IGKJ5	NEO1
NFYC	TUBB3	INSL4	IGKV@	AHNAK

LGMN	VIPR1	INSL5	IGKV1-12	TLR1
PSMB8	VIPR2	INSL6	IGKV1-13	TK2
PSMC1	PTPN11	JAG1	IGKV1-16	PRDX2
PSMC2	ICAM2	JAG2	IGKV1-17	MX2
PSMC3	ITGAL	FGF7P6	IGKV1-27	FGF2
PSMC4	ITGB2	FGF7P3	IGKV1-33	FGA
PSMC5	PAK1	KITLG	IGKV1-37	TCF7L2
PSMC6	NCR2	KL	IGKV1-39	F2RL1
PSMD1	TYROBP	LACRT	IGKV1-5	TKFC
PSMD2	LCK	LEFTY1	IGKV1-6	MSR1
PSMD3	FCGR3A	LEFTY2	IGKV1-8	NFKBIZ
PSMD4	FCGR3B	LHB	IGKV1-9	LMBR1
PSMD5	NCR1	LIF	IGKV1D-12	EPPIN
PSMD7	NCR3	LRSAM1	IGKV1D-13	SRC
PSMD8	CD247	LTB	IGKV1D-16	MPO
PSMD10	ZAP70	LTBP2	IGKV1D-17	ELAVL1
PSMD11	LCP2	LTBP3	IGKV1D-33	ROBO3
PSMD13	LAT	LTBP4	IGKV1D-37	SP1
PSME1	PLCG1	MDK	IGKV1D-39	SOD1
PSME2	SH3BP2	MIA	IGKV1D-42	PDF
RELB	FYN	MLN	IGKV1D-43	DLL4
RFX5	SHC2	MSTN	IGKV1D-8	ECD
RFXAP	SHC4	NAMPT	IGKV2-24	SLC11A1
SLC10A2	SHC3	NDP	IGKV2-28	DMBT1
TAP1	SHC1	NENF	IGKV2-30	STING1
TAP2	GRB2	NGF	IGKV2-40	SKIV2L
TAPBP	SOS1	NMB	IGKV2D-24	SEMG2
THBS1	SOS2	NODAL	IGKV2D-28	DES
SEM1	ARAF	CCN3	IGKV2D-29	DCK
KLRC4	BRAF	NPFF	IGKV2D-30	DAXX
AP3B1	RAF1	NPPA	IGKV2D-40	TNFRSF10A
RFXANK	HCST	NPPB	IGKV3-11	TNFRSF10B
PSMD6	CD48	NPPC	IGKV3-15	EED
PSME3	CD244	NPY	IGKV3-20	CCL4
PSMD14	PRKCA	NRG1	IGKV3-7	LIMS1
CLEC4M	PRKCG	NRG2	IGKV3D-11	LALBA
IFI30	SH2D1B	NRG3	IGKV3D-15	APOBEC3H
PROCR	SH2D1A	NRG4	IGKV3D-20	TMPRSS6
ADRM1	FAS	NRTN	IGKV3D-7	SPINK5
ECPAS	GZMB	NTF3	IGKV4-1	MARCO
TRPC4AP	PRF1	NTF4	IGKV5-2	BECN1
CD209	CASP3	NTS	IGKV6-21	TNFSF11
UBXN1	BID	NUDT6	IGKV6D-21	KNG1
ERAP1	CD3D	OGN	IGKV6D-41	CSK
TAPBPL	CD3E	OSGIN1	IGL	KLRK1
KIR2DL5A	CD3G	OSM	IGLC1	KCNH2

ERAP2	PTPRC	OSTN	IGLC2	JUND
ULBP3	ITK	OXT	IGLC3	JAK1
ULBP2	TEC	ENDOU	IGLC6	CLDN4
ULBP1	NCK1	PDGFA	IGLC7	CCL28
KIR3DL3	NCK2	PDGFB	IGLJ	RNASE3
RAET1E	GRAP2	PDGFC	IGLJ1	RN7SL1
RAET1L	PAK2	PDGFD	IGLJ2	IRF7
UBR1	PAK3	PDGFRL	IGLJ3	IREB2
RAET1G	PAK4	PGF	IGLJ4	ILK
PDIA2	PAK6	PMCH	IGLJ5	IL18
HAMP	PAK5	PNOC	IGLJ6	IL17A
PI3	RHOA	POMC	IGLJ7	LTB4R
CAMP	CDC42	PPBPP2	IGLV@	APOBEC3A
DEFB4A	CD28	PPY	IGLV1-36	MASP2
PPBP	ICOS	PRL	IGLV1-40	TRIM27
REG3G	MAP3K8	PRLH	IGLV1-44	RELA
CXCL14	MAP3K14	PROK1	IGLV1-47	IL7R
CXCL16	CTLA4	PSPN	IGLV1-50	IL1A
SLPI	CBLC	PTH	IGLV1-51	PTX3
CXCL8	CBL	PTH2	IGLV10-54	IFNAR2
CXCL10	CBLB	PTHLH	IGLV11-55	IFN1@
CXCL9	CDK4	PTN	IGLV2-11	SYTL1
CXCL5	RASGRP1	PYY	IGLV2-14	APOBEC3C
CXCL11	PDK1	QRFP	IGLV2-18	DDX17
CXCL6	PRKCQ	RABEP1	IGLV2-23	PTGS2
CXCL1	TRAC	RABEP2	IGLV2-33	HTR1A
CXCL12	TRAJ1	REG1A	IGLV2-8	SEPTIN7
CXCL13	TRAJ2	RETN	IGLV3-1	CD40LG
CXCL2	TRAJ3	RETNLB	IGLV3-10	CD14
PF4	TRAJ4	RLN1	IGLV3-12	MASP1
XCL1	TRAJ5	RLN2	IGLV3-16	PROC
CXCL3	TRAJ6	RLN3	IGLV3-19	MAP2K2
DEFB103B	TRAJ7	SCG2	IGLV3-21	MAP2K1
CCL13	TRAJ8	SCGB3A1	IGLV3-22	HRG
CCL1	TRAJ9	SCT	IGLV3-25	NDRG1
DEFB1	TRAJ10	AIMP1	IGLV3-27	IRF9
CCL8	TRAJ11	SECTM1	IGLV3-32	TRIM22
ELANE	TRAJ12	SLURP1	IGLV3-9	LANCL1
DEFB103A	TRAJ13	SPP1	IGLV4-3	PPP4C
DEFA3	TRAJ14	SST	IGLV4-60	HMOX1
DEFA1	TRAJ15	STC1	IGLV4-69	HMGB1
TMSB10	TRAJ16	STC2	IGLV5-37	RNASE7
DEFA6	TRAJ17	TAC1	IGLV5-39	ABCC4
DEFA5	TRAJ18	TDGF1	IGLV5-45	HGF
DEFA4	TRAJ19	TDGF1P3	IGLV5-48	HDAC1
LCN2	TRAJ20	TG	IGLV5-52	IFNLR1

LCN1	TRAJ21	TGFA	IGLV6-57	PLSCR1
COLEC10	TRAJ22	TGFB2	IGLV7-43	BACH2
BPI	TRAJ23	TGFB3	IGLV7-46	TANK
S100A9	TRAJ24	THPO	IGLV8-61	PIK3CG
S100A8	TRAJ25	TNFRSF11B	IGLV9-49	ARRB1
DCD	TRAJ26	TNFSF12	C3	RSAD2
LCN6	TRAJ27	TNFSF13	C5	STAB2
S100A12	TRAJ28	TNFSF13B	CCL3P1	TBK1
HTN3	TRAJ29	TNFSF14	CKLF	PDYN
LCN8	TRAJ30	TNFSF15	CMA1	PDGFRB
DEFA1B	TRAJ31	TNFSF18	CX3CL1	PDCD1
CCR10	TRAJ32	TNFSF8	CXCL17	PCSK2
CELA1	TRAJ33	TNFSF9	CCN1	PCSK1
DEFB106A	TRAJ34	TOR2A	EDN1	ARG2
PENK	TRAJ35	TRH	EDN2	AQP9
BPIFC	TRAJ36	TSHB	EDN3	FASLG
MMP12	TRAJ37	TSLP	FGF10	APOH
BPIFB6	TRAJ38	TXLNA	LECT2	BIRC5
LEAP2	TRAJ39	UCN	PPBPP1	ANXA6
SFTPD	TRAJ40	UCN2	PROK2	IL22
LCN9	TRAJ41	UCN3	SAA1	VTN
BPIFB2	TRAJ42	UTS2	SAA2	VIM
PTGDS	TRAJ43	UTS2B	SBDS	VCAM1
TMSB4X	TRAJ44	VEGFB	SEMA3A	PRDX1
PGLYRP1	TRAJ45	VEGFC	SEMA3B	GFAP
ZC3HAV1	TRAJ46	VEGF	SEMA3C	GBP2
TMSB15A	TRAJ47	VIP	SEMA3D	ALB
S100B	TRAJ48	ACVR1B	SEMA3E	SLC29A3
S100A13	TRAJ49	ACVR1C	SEMA3F	OAS1
S100A6	TRAJ50	ACVR2A	SEMA3G	AGER
DEFB119	TRAJ52	ACVR2B	SEMA4A	UNC93B1
DEFB107A	TRAJ53	ACVRL1	SEMA4B	TNFSF4
DEFB105A	TRAJ54	ADCYAP1R1	SEMA4C	NOS1
SERPIND1	TRAJ56	ADIPOR1	SEMA4D	ACTG1
DEFB129	TRAJ57	ADIPOR2	SEMA4F	ACTA1
DEFB127	TRAJ58	ADRB1	SEMA4G	ACO1
S100P	TRAJ59	ADRB2	SEMA5A	SERPINA3
S100A7	TRAJ61	AGTR1	SEMA5B	CXCR1
DEFB104A	TRAV1-1	AGTR2	SEMA6A	CCL15
DEFB126	TRAV1-2	AMHR2	SEMA6B	CCL14
DEFB106B	TRAV2	ANGPT1	SEMA6C	CCL16
DEFB104B	TRAV3	ANGPT4	SEMA6D	CCL19
DEFB107B	TRAV4	ANGPTL1	SEMA7A	CCL18
PGLYRP3	TRAV5	ANGPTL2	SLIT1	CCL17
PGLYRP2	TRAV7	ANGPTL3	SLIT2	CCL26
S100A10	TRAV8-1	ANGPTL4	TNC	CCL22

S100A2	TRAV8-2	ANGPTL6	TYMP	CCR3
DEFB125	TRAV8-3	APLNR	C5AR1	CCL4L1
DEFB123	TRAV8-4	AR	CCR9	ACKR2
DEFB105B	TRAV8-6	AVPR1A	CCRL2	CCR7
DEFB132	TRAV8-7	AVPR1B	CMKLR1	CCL27
BPIFB3	TRAV9-1	AVPR2	CX3CR1	CCR8
LCN12	TRAV9-2	BMPR1A	CXCR3	ACKR4
PGLYRP4	TRAV10	BMPR1B	CXCR5	CCL2
S100A11	TRAV12-1	BMPR2	ACKR3	CCL21
S100A5	TRAV12-2	BRD8	CYSLTR1	CCL7
S100A3	TRAV12-3	C3AR1	CYSLTR2	CCL3
S100A1	TRAV13-1	CALCR	ACKR1	CCL11
DEFB128	TRAV13-2	CALCRL	EDNRA	CCR5
DEFB108B	TRAV14DV4	CNTFR	EDNRB	CCL23
HTN1	TRAV16	CRHR1	FPR1	CCL25
LMBR1L	TRAV17	CRHR2	FPR2	CCL3L3
S100A7A	TRAV18	CRIM1	GPR17	CCL4L2
DEFB118	TRAV19	CRLF1	GPR32	CCL3L1
COLEC12	TRAV20	CRLF2	GPR33	CCR1
TMSB4Y	TRAV21	CRLF3	PTGDR2	CCL24
DEFB131A	TRAV22	CSF1R	C5AR2	XCL2
DEFB134	TRAV23DV6	CSF2RA	CXCR2	CXCR4
DEFB130A	TRAV24	CSF2RB	LTB4R2	CXCR6
DEFB124	TRAV25	CSF3R	PLAUR	CCR4
DEFB121	TRAV26-1	EGFR	PLXNA1	TAFA5
DEFB116	TRAV26-2	ENG	PLXNA2	TAFA3
DEFB115	TRAV27	EPOR	PLXNA3	TAFA4
DEFB114	TRAV29DV5	ESR1	PLXNA4	TAFA1
DEFB113	TRAV30	ESR2	PLXNB1	TAFA2
DEFB112	TRAV34	ESRRA	PLXNB2	CCL15-CCL14
DEFB110	TRAV35	ESRRB	PLXNB3	PTK2B
TMSB15B	TRAV36DV7	ESRRG	PLXNC1	IL4
DEFB133	TRAV38-1	FGFR1	PLXND1	CDH1
S100Z	TRAV38-2DV8	FGFR2	PTAFR	LTBP1
MAVS	TRAV39	FGFR3	ROBO1	IL13
TMSB4XP8	TRAV40	FGFR4	ROBO2	IL10
S100A14	TRAV41	FGFRL1	RXFP3	IL2
LCN10	TRBC1	FLT1	XCR1	PPARG
S100A16	TRBC2	FLT3	ADM	FGR
DEFB136	TRBD1	FLT4	ADM2	MIF
DEFB135	TRBD2	FSHR	AGRP	CRP
DEFB117	TRBJ1-1	GALR2	AGT	JAK2
ZC3HAV1L	TRBJ1-2	GALR3	AMBN	PTK2
S100A7L2	TRBJ1-3	GCGR	AMELX	PTGDR
MBL3P	TRBJ1-4	GHR	AMH	CD86
DEFB4B	TRBJ1-5	GHRHR	ANGPTL5	HCK

BPIFB4	TRBJ1-6	GHSR	ANGPTL7	VDR
IFNAR1	TRBJ2-1	GIPR	APLN	OLR1
AZU1	TRBJ2-2	GLP1R	AREG	GRK2
DEFB131B	TRBJ2-3	GLP2R	MANF	TXK
DEFA1A3	TRBJ2-4	GNRHR	CDNF	RNASE2
LCN1P1	TRBJ2-5	GPER1	ARTN	CD79A
S100G	TRBJ2-6	HNF4A	AVP	CD79B
DEFA7P	TRBJ2-7	HNF4G	BDNF	LYN
DEFB130B	TRBV2	HTR3A	BMP1	SYK
DEFB108F	TRBV3-1	HTR3B	BMP10	BTK
DEFB131C	TRBV4-1	HTR3C	BMP15	BLNK
TCHHL1	TRBV4-2	HTR3D	BMP2	VAV3
TINAGL1	TRBV4-3	HTR3E	BMP3	VAV1
IFNGR1	TRBV5-1	IFNGR2	BMP4	VAV2
SLC22A17	TRBV5-4	IGF1R	BMP5	RAC1
WFIKKN1	TRBV5-5	IGF2R	BMP6	RAC2
WFDC2	TRBV5-6	IL10RA	BMP7	RAC3
IL6	TRBV5-7	IL10RB	BMP8A	PPP3CA
UMODL1	TRBV5-8	IL11RA	BMP8B	PPP3CB
TGFB1	TRBV6-1	IL12RB1	BTC	PPP3CC
PF4V1	TRBV6-2	IL12RB2	MYDGF	CHP1
MMP9	TRBV6-3	IL13RA1	CALCA	PPP3R1
ANOS1	TRBV6-4	IL13RA2	CALCB	PPP3R2
TLR4	TRBV6-5	IL15RA	CAT	CHP2
SPAG11B	TRBV6-6	IL2RB	CCK	NFAT5
A2M	TRBV6-7	IL17RA	CD320	NFATC1
NFKB1	TRBV6-8	IL17RB	CD70	NFATC2
APOBEC3G	TRBV6-9	IL17RC	ADA2	NFATC3
FABP6	TRBV7-2	IL17RD	CER1	NFATC4
NOD2	TRBV7-3	IL17RE	CGA	HRAS
MBL2	TRBV7-4	IL18R1	CGB3	KRAS
SFTPA1	TRBV7-6	IL18RAP	CGB1	NRAS
RBP1	TRBV7-7	IL1R1	CGB2	FOS
TLR2	TRBV7-8	IL1R2	CGB5	CARD11
SLC40A1	TRBV7-9	IL1RAP	CGB7	BCL10
PLAU	TRBV9	IL1RL1	CGB8	MALT1
IL1B	TRBV10-1	IL1RL2	CHGA	CHUK
PAEP	TRBV10-2	IL20RA	CHGB	IKBKB
HJV	TRBV10-3	IL20RB	CLCF1	IKBKG
MUC5AC	TRBV11-1	IL21R	CLEC11A	NFKBIA
OBP2A	TRBV11-2	IL22RA1	CMTM1	NFKBIB
PLTP	TRBV11-3	IL22RA2	CMTM2	NFKBIE
MX1	TRBV12-3	IL23R	CMTM3	CD19
DDX58	TRBV12-4	IL27RA	CMTM4	CR2
IFNL1	TRBV12-5	IL2RA	CMTM5	PIK3R5
IRF3	TRBV13	IL2RG	CMTM6	PIK3R1



SFTPA2	TRBV14	IL31RA	CMTM7	PIK3R2
LPA	TRBV15	IL3RA	CMTM8	PIK3R3
LBP	TRBV16	IL4R	CNTF	PIK3CA
RBP4	TRBV17	IL5RA	CORT	PIK3CB
NOX4	TRBV18	IL6R	CRH	PIK3CD
LTF	TRBV19	IL9R	CSF1	AKT3
IFNB1	TRBV20-1	INSR	CSF2	AKT1
RBP5	TRBV24-1	KDR	CSF3	AKT2
FABP7	TRBV25-1	LEPR	CSH1	GSK3B
FABP5	TRBV27	LGR4	CSH2	INPP5D
FABP3	TRBV28	LGR5	CSHL1	CD22
FABP2	TRBV29-1	LGR6	CSPG5	CD72
FABP4	TRBV30	LHCGR	CTF1	PTPN6
R3HDML	TRDC	LIFR	CCN2	LILRB3
BPIFA3	TRDD1	LTBR	DKK1	FCGR2B
BPIFB1	TRDD2	MC1R	EBI3	RASGRP3
OASL	TRDD3	MC2R	EGF	PLCG2
CRABP2	TRDJ1	MC3R	EPGN	PRKCB
CRABP1	TRDJ2	MC4R	EPO	IFITM1
RBP7	TRDJ3	MCHR1	EREG	IGH
DUOX1	TRDJ4	MCHR2	ESM1	IGHA1
OBP2B	TRDV1	MET	FAM3B	IGHA2
RBP2	TRDV2	MLNR	FAM3C	IGHD
LCN15	TRDV3	MPL	FAM3D	IGHD1-1
CETP	TRGV9	MTNR1A	FGF1	IGHD1-14
FABP12	TRGV8	MTNR1B	FGF11	IGHD1-20
FABP9	TRGV5	NGFR	FGF12	IGHD1-26
BPIFA1	TRGV4	NMBR	FGF13	IGHD1-7
LCNL1	TRGV3	NPR1	FGF14	IGHD2-15
C8G	TRGV2	NPR3	FGF16	IGHD2-2
SPAG11A	TRGJP2	NR0B1	FGF17	IGHD2-21
PII5	TRGJP1	NR0B2	FGF18	IGHD2-8
NOX1	TRGJP	NR1D1	FGF19	IGHD3-10
PMP2	TRGJ2	NR1D2	FGF20	IGHD3-16
APOD	TRGJ1	NR1H2	FGF21	IGHD3-22
ORM2	TRGC2	NR1H3	FGF22	IGHD3-3
ORM1	TRGC1	NR1H4	FGF23	IGHD3-9
TNF	TRAV6	NR1I2	FGF3	IGHD4-11
CTSG	PRTN3	MAPK1		

Supplementary Table 2: Differentially expressed genes (DEGs) between DN patients and controls in GSE30528

Tag	logFC	AveExpr	t	P.Value	adj.P.Val	B
ZNF415	-1.5986726	-0.3290002	-11.280424	7.46E-11	8.57E-07	14.839326
LOX	-2.0651729	-0.4592303	-10.774832	1.82E-10	8.57E-07	14.0007061
CA10	-2.546763	-0.6837071	-10.639418	2.33E-10	8.57E-07	13.7705575
TRAM2	-1.774324	-0.1749566	-10.414123	3.51E-10	8.57E-07	13.3823512
ARHGAP19	-2.3046172	-0.6114305	-10.231156	4.93E-10	8.57E-07	13.0621448
FYN	-1.6632815	-0.3436198	-10.228263	4.95E-10	8.57E-07	13.0570453
MPP5	-1.658312	-0.3788755	-10.194382	5.28E-10	8.57E-07	12.9972477
PARVA	-1.1805984	-0.2178328	-10.093118	6.38E-10	8.57E-07	12.8176038
TCF7L1	-2.1805335	-0.4445923	-10.043323	7.00E-10	8.57E-07	12.72876
C1orf21	-2.1294061	-0.2490786	-9.9675928	8.08E-10	8.57E-07	12.5929961
NPHS1	-2.9627307	-0.7915856	-9.963485	8.14E-10	8.57E-07	12.5856096
ZNF185	-2.3357588	-0.5599117	-9.9453711	8.43E-10	8.57E-07	12.5530106
FERMT2	-1.0892783	-0.1739411	-9.9012227	9.16E-10	8.65E-07	12.4733706
LGALS8	-1.5637274	-0.2701227	-9.7939781	1.12E-09	9.91E-07	12.2787985
SLC31A2	-1.444234	-0.1990275	-9.7020037	1.34E-09	1.10E-06	12.1106701
CCDC91	-1.867353	-0.4253402	-9.6733113	1.42E-09	1.10E-06	12.0579815
B3GALT2	-2.6796018	-0.4038344	-9.4937903	2.01E-09	1.47E-06	11.725724
PRKAR2B	-3.0161065	-0.9710511	-9.4669475	2.12E-09	1.47E-06	11.6756568
WBP5	-1.051291	-0.1451292	-9.4351888	2.25E-09	1.49E-06	11.6162899
PLCE1	-2.2869932	-0.6422848	-9.3019514	2.92E-09	1.82E-06	11.3656826
TGFBR3	-2.2503654	-0.3984462	-9.2843623	3.03E-09	1.82E-06	11.3324122
KLF7	-2.093725	-0.2960212	-9.2361997	3.33E-09	1.90E-06	11.2410866
C2orf68	-1.058473	-0.1808399	-9.1947421	3.62E-09	1.90E-06	11.1622119
RABL3	-1.1194637	-0.2761924	-9.1900235	3.65E-09	1.90E-06	11.153219
FBXL7	-1.7178403	-0.1083982	-9.1784561	3.74E-09	1.90E-06	11.1311603
CERS6	-1.6159434	-0.2195375	-9.0840266	4.51E-09	2.21E-06	10.9503743
MAGI2	-2.8778895	-0.4174257	-9.0426381	4.90E-09	2.31E-06	10.8707352
F5	-2.0162157	-0.385724	-9.0226453	5.10E-09	2.32E-06	10.8321777
CORO2B	-2.0449628	-0.3323154	-9.0067275	5.27E-09	2.32E-06	10.8014383
DACH1	-2.2269363	-0.2627997	-8.9837843	5.52E-09	2.35E-06	10.7570683
SEMA5A	-1.9923736	-0.3790724	-8.8746148	6.88E-09	2.84E-06	10.5449111
TNS3	-1.0393233	-0.130007	-8.8195227	7.70E-09	3.08E-06	10.4371971
DPYSL3	-1.4088547	-0.2462567	-8.7701406	8.51E-09	3.31E-06	10.340276
DPP6	-2.8181472	-0.76005	-8.6840513	1.02E-08	3.84E-06	10.17047
LEPREL1	-1.3774174	-0.2284875	-8.6358859	1.12E-08	4.12E-06	10.075
TJP1	-1.3678624	-0.325802	-8.4607363	1.61E-08	5.61E-06	9.7250023
SGCE	-1.3272186	-0.2346023	-8.3860366	1.88E-08	6.23E-06	9.57437935
USP46	-1.2620467	-0.2486659	-8.3655032	1.97E-08	6.34E-06	9.53283462
CXADR	-1.6864874	-0.2417628	-8.291786	2.30E-08	7.23E-06	9.3831797
FANCL	-1.3769465	-0.3709001	-8.2500867	2.51E-08	7.53E-06	9.29817597
ZNF211	-1.1402794	-0.11871	-8.2318217	2.61E-08	7.66E-06	9.26086331
C1QA	1.92227621	0.0965512	8.21967328	2.67E-08	7.69E-06	9.23601921
SULF1	-1.9634948	-0.375712	-8.190406	2.85E-08	7.89E-06	9.17607802
GJA1	-1.9385544	-0.275716	-8.1675904	2.99E-08	8.06E-06	9.12926422
ARMCX1	-1.0660469	-0.1271784	-8.1454256	3.13E-08	8.08E-06	9.08371336

LOC728392	-1.9527209	-0.4861754	-8.1443447	3.14E-08	8.08E-06	9.08149016
TACC2	-1.38809	-0.2614089	-8.138318	3.18E-08	8.08E-06	9.0690913
KLK6	-2.5896216	-0.4812422	-8.1084673	3.39E-08	8.45E-06	9.00760167
ANKRD28	-1.2224306	-0.2093061	-8.0622606	3.74E-08	8.70E-06	8.91216551
TSPYL4	-1.0865148	-0.1000418	-8.0530335	3.81E-08	8.70E-06	8.89307049
GTF2A2	-1.2940725	-0.1284476	-8.0526338	3.82E-08	8.70E-06	8.89224314
BTG3	-1.094967	-0.2387443	-8.040718	3.91E-08	8.77E-06	8.86756508
CITED2	-1.1636136	-0.0704749	-7.9663747	4.59E-08	9.95E-06	8.71313348
TNNT2	-3.2378439	-0.7332161	-7.9305078	4.96E-08	1.06E-05	8.63834175
PDPN	-1.1076364	-0.2891511	-7.9206349	5.07E-08	1.06E-05	8.61772149
B3GNT1	-1.1907673	-0.2996584	-7.9148853	5.13E-08	1.06E-05	8.60570662
PVRL2	-1.2945581	-0.1790137	-7.9059098	5.23E-08	1.06E-05	8.58694113
POGLUT1	-1.095571	-0.1485516	-7.8948165	5.36E-08	1.07E-05	8.56373149
ARRB1	-1.2229468	-0.2218707	-7.8059896	6.49E-08	1.27E-05	8.37724615
NRIP2	-1.7420059	-0.4445742	-7.8029064	6.54E-08	1.27E-05	8.37075269
EFEMP1	-1.0773434	-0.1394476	-7.7728839	6.98E-08	1.34E-05	8.30745204
LRRC2	-3.1681071	-1.1157013	-7.760591	7.17E-08	1.35E-05	8.28149568
KBTBD11	-1.5450984	-0.2504599	-7.7103189	8.00E-08	1.48E-05	8.17512052
H2AFJ	-2.109432	-0.3022961	-7.707857	8.04E-08	1.48E-05	8.16990201
CHI3L1	-2.6956437	-0.5540163	-7.6847997	8.46E-08	1.53E-05	8.12098343
SYBU	-1.078144	-0.1754207	-7.6541098	9.04E-08	1.61E-05	8.05575296
THSD7A	-2.3792741	-0.4066957	-7.5868625	1.05E-07	1.77E-05	7.91234958
SYNPO	-2.5101104	-0.6635832	-7.5821227	1.06E-07	1.77E-05	7.90221754
F2R	-1.9204716	-0.2826073	-7.5668086	1.10E-07	1.81E-05	7.86945994
ZNF274	-1.0315548	-0.1247327	-7.5437728	1.15E-07	1.88E-05	7.82012204
CRYZL1	-1.0044512	-0.1422515	-7.5008825	1.27E-07	2.04E-05	7.72805851
FRY	-1.7491735	-0.3663552	-7.4836625	1.32E-07	2.07E-05	7.69102245
VEGFA	-1.6025525	-0.1649998	-7.462826	1.38E-07	2.13E-05	7.64615164
ZFPM2	-1.5083578	-0.1910163	-7.4264253	1.49E-07	2.27E-05	7.56761644
NFE2L3	-1.2770626	-0.0656422	-7.3803735	1.66E-07	2.43E-05	7.46799054
STXBP1	-1.4223106	-0.0254016	-7.3540638	1.76E-07	2.55E-05	7.41093912
ZDHHC6	-2.2559674	-0.6004896	-7.3216155	1.89E-07	2.64E-05	7.34044255
TCF21	-2.5397624	-0.6237804	-7.3198218	1.90E-07	2.64E-05	7.3365412
FOXD1	-1.4473853	-0.1947619	-7.3119111	1.93E-07	2.65E-05	7.3193301
NEK7	-1.203051	-0.3109282	-7.3076764	1.95E-07	2.65E-05	7.31011332
ST3GAL6	-1.2347834	-0.3296892	-7.2840141	2.05E-07	2.77E-05	7.25856551
ARHGEF3	-1.7952895	-0.4074154	-7.2388635	2.27E-07	3.01E-05	7.15998914
FAM65A	-1.9252052	-0.4626463	-7.237566	2.28E-07	3.01E-05	7.15715202
CTNNBIP1	-1.5055058	-0.2682782	-7.2032669	2.46E-07	3.16E-05	7.08207139
CD200	-1.3071363	-0.3043782	-7.1951064	2.51E-07	3.19E-05	7.06418405
MCM6	-1.6441966	-0.4715529	-7.1734727	2.63E-07	3.31E-05	7.01671941
KLHL3	-1.1155445	-0.0970715	-7.1418201	2.83E-07	3.49E-05	6.94715667
MXRA8	-1.6808233	-0.3805652	-7.1278335	2.92E-07	3.55E-05	6.9163741
ANXA2P2	-1.2567208	-0.3421383	-7.1269579	2.92E-07	3.55E-05	6.91444613
SERPINE2	1.76349739	0.27504734	7.0997575	3.11E-07	3.74E-05	6.85450187
SRGAP2	-2.4757559	-0.5260944	-7.0803826	3.25E-07	3.84E-05	6.81174153
STON1	-1.5353735	-0.2350216	-7.0780812	3.27E-07	3.84E-05	6.80665878

BCAR3	-1.3601555	-0.2849656	-7.0762098	3.28E-07	3.84E-05	6.80252523
GPRC5A	-1.9484283	-0.2524982	-7.0507822	3.48E-07	4.00E-05	6.746314
NEBL	-1.6844617	-0.4529073	-7.0409518	3.55E-07	4.05E-05	6.7245589
TSPYL5	-1.2231824	-0.1481022	-7.0337281	3.61E-07	4.08E-05	6.70856416
C1QB	2.20468584	0.35690211	7.01237914	3.79E-07	4.21E-05	6.66125141
FAM134B	-1.1578196	-0.106185	-7.003907	3.87E-07	4.26E-05	6.64245867
KAT2B	-1.1071478	-0.2181679	-6.994904	3.95E-07	4.31E-05	6.62247773
ZNF423	-1.2947601	-0.2429007	-6.9775954	4.11E-07	4.38E-05	6.58403267
ADRA2A	1.00658882	0.19767046	6.95359919	4.34E-07	4.58E-05	6.53066639
SPOCK2	-1.6263889	-0.2565233	-6.9502946	4.37E-07	4.58E-05	6.52331107
FGF9	-1.6281765	-0.0964357	-6.9382346	4.49E-07	4.68E-05	6.49645558
NDN	-1.3530565	-0.3596313	-6.9291031	4.59E-07	4.74E-05	6.47610846
NAP1L2	-1.0936865	-0.011659	-6.9102132	4.79E-07	4.87E-05	6.43398157
EXPH5	-1.2642618	-0.1625066	-6.8584232	5.39E-07	5.25E-05	6.31823839
CDC42EP3	-1.6830796	-0.3635719	-6.8556253	5.43E-07	5.25E-05	6.31197522
CETN3	-1.1241393	-0.0776251	-6.8548964	5.44E-07	5.25E-05	6.31034346
OLFML3	1.19149377	-0.0317514	6.8395562	5.63E-07	5.39E-05	6.27598452
ELOVL4	-1.8618748	-0.306076	-6.8347222	5.69E-07	5.42E-05	6.26515086
NTNG1	-1.8800007	-0.3713381	-6.7869281	6.36E-07	5.96E-05	6.15787182
UGGT2	-1.0671353	0.05366096	-6.7252842	7.33E-07	6.73E-05	6.01906245
TMPRSS4	1.0107313	0.05256907	6.68560119	8.03E-07	7.32E-05	5.92944279
ITGB5	-1.0004175	-0.0771568	-6.6712358	8.31E-07	7.52E-05	5.89694993
MYO1E	-1.2005965	-0.2171461	-6.6601967	8.52E-07	7.66E-05	5.87196283
HPS5	-1.8177195	-0.1154081	-6.6544378	8.64E-07	7.71E-05	5.85892117
WT1-AS	-1.8650916	-0.3580571	-6.641269	8.90E-07	7.85E-05	5.82908329
RNASE6	1.42007243	0.25941784	6.63834942	8.97E-07	7.85E-05	5.82246506
ITGA3	-1.2984401	-0.1963111	-6.6043882	9.70E-07	8.28E-05	5.74540055
MYO5C	-1.4259962	-0.2504772	-6.6038871	9.71E-07	8.28E-05	5.74426236
MYOZ2	-1.3517529	-0.0631106	-6.5976342	9.86E-07	8.35E-05	5.73005703
FAM98A	-1.2232518	-0.1232258	-6.5602697	1.08E-06	8.94E-05	5.64506901
RAI14	-1.1855824	-0.3354873	-6.5555798	1.09E-06	8.98E-05	5.63438893
ANKMY2	-1.1020475	-0.2018783	-6.5376035	1.13E-06	9.25E-05	5.59342754
SOBP	-1.2833935	-0.2640546	-6.5246358	1.17E-06	9.47E-05	5.56385357
DCN	-1.4487254	-0.2343692	-6.5194387	1.18E-06	9.47E-05	5.55199542
MAFB	-1.9384252	-0.5233065	-6.5171393	1.19E-06	9.47E-05	5.54674771
TENC1	-1.3547252	-0.2454762	-6.5155117	1.19E-06	9.47E-05	5.54303292
LPL	-2.6823938	-0.2046276	-6.5079373	1.22E-06	9.50E-05	5.52574061
FAM20B	-1.0278044	-0.0566268	-6.5044073	1.23E-06	9.53E-05	5.51767924
UBAP2	-1.0810256	-0.2202029	-6.4661958	1.34E-06	0.00010238	5.43031738
MGAT5	-1.2214274	-0.2853956	-6.4586526	1.36E-06	0.00010361	5.41305044
KLK7	-2.1131342	-0.318279	-6.426176	1.47E-06	0.0001093	5.33862915
SEMA3G	-2.7058661	-0.5929961	-6.4164698	1.51E-06	0.0001112	5.316362
CD163	1.24549578	0.18483883	6.40630119	1.54E-06	0.00011325	5.29302183
BST1	-1.0443787	-0.0455858	-6.3774499	1.65E-06	0.00011857	5.22673101
NR3C2	-1.015504	-0.1066248	-6.3646064	1.70E-06	0.0001209	5.19718852
MME	-1.515839	-0.3301851	-6.3514219	1.75E-06	0.00012405	5.16684126
FOXC1	-1.6290318	-0.5305362	-6.3120316	1.93E-06	0.0001347	5.07605188

TPPP3	-2.7827755	-0.2859609	-6.2787298	2.08E-06	0.00014496	4.99915274
IQGAP2	-1.3344296	-0.345759	-6.2639911	2.16E-06	0.00014932	4.96507745
WT1	-1.4419256	-0.3248188	-6.2514247	2.22E-06	0.00015303	4.9360043
FN1	1.07405918	-0.0681225	6.23893226	2.29E-06	0.00015601	4.90708435
CREB3L2	-1.2289073	-0.1100962	-6.2328975	2.32E-06	0.00015604	4.89310737
HTRA1	-1.8646912	-0.5461017	-6.2323843	2.33E-06	0.00015604	4.89191867
FAM114A1	-1.2937789	-0.3900427	-6.2279016	2.35E-06	0.00015663	4.88153338
NFASC	-1.5637639	-0.2289676	-6.2265293	2.36E-06	0.00015663	4.87835371
ZNF804A	-2.2549059	-0.0795392	-6.2195059	2.40E-06	0.00015722	4.86207671
CDKN1C	-2.0137817	-0.3251795	-6.2151851	2.42E-06	0.00015722	4.85206021
RASL11B	-2.0589233	-0.5174132	-6.212784	2.44E-06	0.00015722	4.84649295
PLA2R1	-2.2389074	-0.5604581	-6.2124162	2.44E-06	0.00015722	4.84564015
RASGRP3	-1.6743815	-0.3116248	-6.1919552	2.56E-06	0.00016267	4.79817216
COLGALT2	-1.6848418	-0.1538757	-6.1824079	2.62E-06	0.00016561	4.77600684
JAM3	-1.6092456	-0.0269559	-6.1777399	2.65E-06	0.00016587	4.76516554
AIF1	-1.2276807	-0.303977	-6.1683777	2.71E-06	0.0001688	4.7434151
CD1C	1.17860658	0.35704327	6.16542529	2.73E-06	0.00016919	4.73655389
GHR	-1.8007286	-0.2825092	-6.1310111	2.96E-06	0.00018014	4.65650595
SHROOM2	-1.0312224	-0.0902465	-6.1293655	2.97E-06	0.00018014	4.65267494
TRIB2	-1.3752968	-0.1324355	-6.1272278	2.99E-06	0.00018023	4.6476978
CLIP3	-1.452002	-0.23525	-6.1091769	3.12E-06	0.00018561	4.60565109
HIVEP2	-1.0997168	-0.0780266	-6.1026722	3.17E-06	0.00018683	4.59049046
MIR6872	-1.5884301	-0.2585997	-6.0793747	3.35E-06	0.00019405	4.53615294
LOC101928916	2.47333878	0.60165554	6.07645538	3.37E-06	0.00019456	4.52933989
PALLD	-1.0262244	-0.022879	-6.0732719	3.40E-06	0.00019519	4.52190927
NXN	-1.1331308	-0.240717	-6.055449	3.54E-06	0.00020106	4.48028871
CPEB1	-1.0390146	-0.0328456	-6.0348652	3.72E-06	0.00020941	4.43217799
ZNF91	-2.1692494	-0.0323917	-6.0221092	3.84E-06	0.00021229	4.40234054
NES	-2.515546	-0.614747	-6.0046596	4.00E-06	0.00021793	4.36149638
HS3ST3A1	-2.1961194	-0.4599414	-6.0042524	4.01E-06	0.00021793	4.36054286
C8orf33	-1.3879493	-0.255005	-5.9947195	4.10E-06	0.00022205	4.33821542
CAND2	-1.5464413	-0.2605597	-5.9856806	4.19E-06	0.00022408	4.31703603
SPOCK1	-2.7240241	-0.5912368	-5.9804294	4.24E-06	0.00022508	4.30472774
TSPAN2	-1.879761	-0.4418559	-5.9611842	4.44E-06	0.00023118	4.25959464
BZW2	1.03733453	0.17160782	5.93599875	4.72E-06	0.00024086	4.20047297
VSIG4	1.5766574	0.1186712	5.93101701	4.78E-06	0.00024232	4.18877085
AMIGO2	-2.1694347	-0.5753579	-5.9302952	4.78E-06	0.00024232	4.18707517
EMP2	-1.3693191	0.00925292	-5.9214736	4.89E-06	0.0002447	4.16634622
PEA15	-1.098688	-0.074024	-5.9108858	5.01E-06	0.00024913	4.14145684
ZNF124	-1.6718593	-0.2218831	-5.9046136	5.09E-06	0.00025197	4.12670689
SERPINA3	2.32210552	0.4780048	5.89421188	5.22E-06	0.00025739	4.10223738
NEDD9	-1.0196714	-0.0783763	-5.8843267	5.34E-06	0.00025985	4.07897279
CLDN5	-1.7580211	-0.4886488	-5.8825914	5.37E-06	0.00025985	4.0748878
CLEC10A	1.00523381	0.25621533	5.86706811	5.57E-06	0.00026491	4.03833187
MXRA7	-1.1375239	-0.2371653	-5.8646037	5.60E-06	0.00026553	4.03252617
ETS2	-1.2463371	0.03779188	-5.8592526	5.68E-06	0.00026802	4.01991795
TRIM16	1.00364944	0.1914916	5.84366053	5.89E-06	0.00027632	3.98316408

MYLIP	-1.5838634	-0.0123137	-5.8260977	6.15E-06	0.00028525	3.94173627
MS4A6A	1.86903737	0.37863814	5.81914192	6.25E-06	0.00028907	3.92532044
LCK	1.07460747	0.20354494	5.80572812	6.46E-06	0.00029549	3.89365039
SEC14L1	-1.0698715	-0.0482067	-5.7912306	6.69E-06	0.00030393	3.85940222
PDLIM2	-1.503455	-0.2838953	-5.7835943	6.82E-06	0.00030854	3.84135468
LHFP	-1.1421861	-0.0730113	-5.7729927	6.99E-06	0.0003144	3.81628992
TCEAL2	-2.1919143	-0.5582009	-5.7578358	7.25E-06	0.00032505	3.78043697
F3	-2.1499359	-0.5686988	-5.7516152	7.36E-06	0.00032776	3.76571621
OLFML2A	-1.4626382	0.17278854	-5.7126004	8.09E-06	0.00035667	3.67330814
GPNMB	-1.3355528	-0.1246857	-5.6889139	8.57E-06	0.00037404	3.61713852
MED4	-1.0814342	-0.0735774	-5.6787761	8.79E-06	0.0003796	3.59308262
PTGDS	-2.7357886	-0.8640205	-5.6340371	9.80E-06	0.00041376	3.48681397
OBFC1	-1.2397819	0.06260228	-5.6162122	1.02E-05	0.00042398	3.4444264
NAP1L3	-1.2717976	-0.055533	-5.5946249	1.08E-05	0.00044134	3.39305565
GCNT3	1.08908462	0.20308236	5.57982161	1.12E-05	0.00045614	3.35780627
ATP10A	-1.4062108	-0.3223244	-5.5723003	1.14E-05	0.00046316	3.33988964
LOC730101	-1.360869	-0.1993004	-5.5673322	1.15E-05	0.00046663	3.32805257
SASH3	1.0676222	0.20498586	5.55821788	1.18E-05	0.00047352	3.30633137
FKBP9	-1.0185608	-0.0219957	-5.5475713	1.21E-05	0.00048304	3.28094993
IFIT1	-1.0942167	-0.1735243	-5.5317745	1.26E-05	0.00049691	3.24327377
PCMTD2	-1.2335187	-0.2034356	-5.5296401	1.26E-05	0.00049715	3.23818157
CR1	-1.0556837	-0.1933686	-5.512531	1.32E-05	0.00051531	3.19735014
BEX4	-1.140057	-0.1501772	-5.506477	1.34E-05	0.00051904	3.18289669
SLK	-1.3912386	-0.2362983	-5.4997069	1.36E-05	0.00052161	3.16672998
MOXD1	1.90556198	0.4893945	5.49917482	1.36E-05	0.00052161	3.16545932
SNCA	-1.442806	-0.0466317	-5.4670427	1.47E-05	0.00055781	3.08868074
NME7	-1.2369118	-0.1809513	-5.4635171	1.49E-05	0.00056103	3.08025177
ZBTB10	-1.074309	0.07401408	-5.4616478	1.49E-05	0.000562	3.0757822
TPM2	-1.0184652	-0.1090073	-5.4562552	1.51E-05	0.00056624	3.062887
COL1A2	2.07496537	0.46300229	5.44578602	1.55E-05	0.00057533	3.03784603
MEIS3P1	-1.1102101	-0.0036426	-5.4451588	1.55E-05	0.00057533	3.03634545
WWC3	-1.3763394	0.23423538	-5.4378433	1.58E-05	0.00058209	3.01884271
COL4A5	-1.8065056	-0.4933263	-5.4350877	1.59E-05	0.00058316	3.01224871
HSPA2	-1.2448353	-0.0712463	-5.4060853	1.71E-05	0.00061504	2.94281456
NDNF	-3.1851269	-0.5700294	-5.4055479	1.71E-05	0.00061504	2.9415275
EPB41L5	-1.5168013	0.18224011	-5.4029956	1.72E-05	0.00061722	2.93541409
MYLK3	-2.7197653	-0.4584766	-5.3823195	1.81E-05	0.00063845	2.88587291
MYL9	-1.9794181	-0.3321306	-5.3815606	1.82E-05	0.00063845	2.88405398
VTCN1	1.76858871	0.26639439	5.37826358	1.83E-05	0.00064193	2.87615119
ZBED8	-1.1093411	-0.0369916	-5.3755674	1.84E-05	0.00064448	2.869688
FGF1	-2.1937809	-0.57108	-5.3590069	1.92E-05	0.00066247	2.82997935
GOLIM4	-1.0359071	-0.0466992	-5.3574002	1.93E-05	0.00066336	2.82612579
CPA3	2.03102301	0.63751115	5.3515318	1.95E-05	0.00066805	2.81204937
ITIH5	-1.9144797	-0.4403168	-5.3513641	1.96E-05	0.00066805	2.81164701
C14orf132	-1.6033254	-0.189293	-5.3442817	1.99E-05	0.00067283	2.79465555
CTGF	-1.9896596	-0.2100113	-5.340055	2.01E-05	0.00067468	2.78451379
BMP2	-1.7470447	0.05213416	-5.3339482	2.04E-05	0.00068142	2.76985844

PTPRD	-1.1700828	-0.0384229	-5.3271776	2.08E-05	0.00068873	2.7536074
PHACTR4	-1.4876577	-0.2175744	-5.3191776	2.12E-05	0.00069608	2.73440167
FAM13B	-1.1308847	-0.0431772	-5.3099017	2.17E-05	0.0007034	2.71212763
LINC00472	-1.3831028	-0.3254823	-5.3051089	2.19E-05	0.00070826	2.70061684
APOD	-2.3336264	0.4314273	-5.2946878	2.25E-05	0.00072312	2.67558313
ADH1B	1.70058287	0.34897097	5.27637581	2.35E-05	0.00074737	2.63157776
MS4A4A	1.44675459	0.42617492	5.25828532	2.46E-05	0.00077215	2.58808461
EMCN	-2.0876301	-0.201069	-5.2519965	2.50E-05	0.0007805	2.57296034
C7	2.00705379	0.17314017	5.24883711	2.52E-05	0.00078475	2.56536148
MARCKS	1.20587236	0.29295708	5.24577346	2.54E-05	0.00078884	2.55799222
KCNJ8	1.2014807	0.12569652	5.23719072	2.59E-05	0.0007981	2.53734449
CLIC5	-2.0507399	-0.5177063	-5.2235125	2.68E-05	0.00081794	2.50442966
ACTN4	-1.108503	-0.1239192	-5.2216922	2.69E-05	0.00081973	2.50004847
PCOLCE2	-3.0357988	-1.0393358	-5.2172501	2.72E-05	0.00082686	2.48935656
WFS1	-1.0443951	-0.093865	-5.2155716	2.73E-05	0.00082838	2.48531604
LIMS2	-1.220327	-0.1178023	-5.2069954	2.79E-05	0.00083708	2.46466929
NLK	-1.3320809	0.06998208	-5.2069683	2.79E-05	0.00083708	2.46460406
ZNF302	-1.0251481	-0.1536412	-5.2006908	2.83E-05	0.00084677	2.44948875
COL6A3	2.20929666	0.47089209	5.16899172	3.07E-05	0.00090241	2.37312952
TNNI1	-1.4788434	0.13913321	-5.1637642	3.10E-05	0.00091211	2.360532
DHCR24	1.09708715	0.21922937	5.12889869	3.38E-05	0.00098543	2.27647568
RARRES1	1.94143869	0.55094072	5.09494431	3.68E-05	0.00105093	2.19455928
P2RY14	1.39914566	0.38423462	5.0838595	3.78E-05	0.0010732	2.16780515
CBX7	-1.0810364	-0.2517278	-5.0476699	4.14E-05	0.001154	2.08042104
THBS2	2.01398556	0.19608251	5.04538973	4.16E-05	0.00115809	2.07491341
LUM	2.37461934	0.63772041	5.04316796	4.18E-05	0.00116204	2.06954668
SERINC5	-1.4003145	-0.3537223	-5.0250797	4.38E-05	0.00119769	2.02584666
LTF	3.20361426	1.0217732	5.00969013	4.55E-05	0.00123405	1.98865625
NELL2	1.0604515	0.2617838	4.99855214	4.67E-05	0.00126108	1.96173468
ZNF204P	-1.1948635	-0.125112	-4.9855589	4.83E-05	0.00128883	1.93032313
SLC14A1	-1.520068	-0.1014148	-4.9825078	4.86E-05	0.00129354	1.92294592
ARHGAP28	-1.555429	0.27363391	-4.959326	5.15E-05	0.00135378	1.86688609
CD53	1.6720554	0.17224578	4.94997224	5.27E-05	0.00138009	1.84426096
RARRES3	1.26233578	0.28141891	4.93191733	5.51E-05	0.00142363	1.8005816
HRG	-1.0399418	-0.2344904	-4.9186834	5.70E-05	0.00145415	1.76855905
CDC20	1.02485266	0.31249803	4.9149837	5.75E-05	0.00146475	1.75960591
ARL4C	1.26178789	0.34019534	4.90115041	5.95E-05	0.00150149	1.72612629
RBMS1	-1.164756	-0.2633317	-4.868703	6.45E-05	0.00160916	1.64757653
CD48	1.73670582	0.40911351	4.85716767	6.64E-05	0.00164975	1.61964523
EVI2A	1.83993049	0.39824468	4.85523168	6.67E-05	0.0016546	1.61495718
IL13RA2	-2.409271	-0.2793709	-4.8467336	6.81E-05	0.00168362	1.59437789
APOLD1	-2.0601072	0.18888428	-4.8228551	7.23E-05	0.00176683	1.5365447
HMBOX1	-1.0347803	0.11480676	-4.7937625	7.77E-05	0.00188207	1.46606856
FZD2	-1.8398464	-0.6353513	-4.7882362	7.88E-05	0.00190218	1.45267964
GADD45B	-1.0384621	-0.1027344	-4.7880225	7.89E-05	0.00190218	1.4521618
EHD3	-2.334505	-0.1837545	-4.7840129	7.96E-05	0.00190739	1.44244729
PTPRO	-1.6239951	-0.4208778	-4.7752576	8.14E-05	0.00193534	1.42123386

CD3D	1.64922447	0.44807582	4.7722514	8.20E-05	0.00194638	1.41394969
TRBC1	1.84921943	0.57148554	4.75300644	8.60E-05	0.00202735	1.3673161
PSD3	-1.0007983	0.02274556	-4.7032491	9.74E-05	0.00222351	1.24672871
DDN	-1.9036024	-0.4502267	-4.6837632	0.00010224	0.00229297	1.1994999
CST6	1.03923557	0.22030743	4.68131616	0.00010286	0.00229297	1.19356879
PHYHIP	-1.0607184	-0.1881158	-4.6436888	0.00011298	0.00246441	1.10236664
TDO2	1.5665464	0.56807917	4.63279751	0.00011609	0.00251564	1.07596809
MYLK	-1.0742671	-0.1187087	-4.6288247	0.00011724	0.00253238	1.06633879
CD2	1.44907904	0.52452972	4.6109575	0.00012258	0.0026222	1.02303293
IRF8	1.58324718	0.17347202	4.61093322	0.00012259	0.0026222	1.0229741
WASF3	-1.1125532	-0.0572186	-4.6076135	0.00012361	0.00263973	1.01492809
HIST1H2BK	-1.5943831	-0.3325095	-4.6054326	0.00012428	0.00264984	1.00964217
ROBO1	-1.4600043	-0.4258896	-4.5926513	0.00012831	0.00271315	0.9786648
ITGB2	1.28860094	0.16742303	4.59136642	0.00012872	0.00271381	0.97555075
SBSPON	-1.2342722	0.20143808	-4.5661244	0.00013708	0.00283136	0.91437711
CSRP1	-1.3277556	-0.1547895	-4.5642618	0.00013772	0.00283136	0.90986317
PPFIA4	-1.0267548	0.11374033	-4.553247	0.00014156	0.00287838	0.88317121
C3	2.6799609	0.77577156	4.53676614	0.0001475	0.00295516	0.84323642
PAMR1	-1.595066	0.11264352	-4.5333549	0.00014876	0.00297501	0.83497117
SOWAHC	-1.325626	-0.2909477	-4.5151881	0.00015566	0.00308061	0.79095657
CHN1	-1.1559735	-0.1705286	-4.503134	0.00016041	0.00315079	0.76175481
ALDH1A3	1.0005169	0.26579621	4.48982293	0.00016583	0.00322454	0.72951138
KANK3	-1.4183004	-0.1774388	-4.4897136	0.00016587	0.00322454	0.7292465
MPDZ	-1.0449727	-0.195125	-4.4708836	0.00017385	0.00333727	0.68364078
GADD45A	-1.1318259	-0.1227134	-4.4676663	0.00017525	0.00334892	0.67584935
HPGD	-1.4249228	-0.1808383	-4.4559214	0.00018047	0.00341775	0.64740848
ZBTB16	-1.2617673	-0.0855308	-4.4553172	0.00018074	0.003418	0.64594565
CTSV	-1.8302748	-0.2845664	-4.4442438	0.0001858	0.00348881	0.61913406
PLBD1	-1.1650364	-0.1361406	-4.4294485	0.00019279	0.00358162	0.58331607
TNNC1	-1.1870409	0.26836814	-4.4289653	0.00019302	0.00358162	0.58214648
NQO1	-1.1602048	-0.19483	-4.4263806	0.00019427	0.00359171	0.57588984
SFN	1.10908072	0.36097272	4.41127868	0.00020173	0.00370374	0.53933739
PCDHA1	-1.0043442	-0.1872676	-4.3881641	0.00021371	0.00388051	0.48340503
TYROBP	1.38309974	-0.137322	4.36225003	0.00022798	0.00403721	0.42072043
HLA-DPA1	1.1308684	0.09563268	4.35495458	0.00023217	0.00408626	0.40307764
WISP3	-1.4033828	-0.1844735	-4.3544572	0.00023246	0.00408626	0.40187498
PLCG2	-1.1676663	-0.3275556	-4.3520872	0.00023384	0.00409959	0.39614394
PNMAL1	-1.0203611	-0.1794733	-4.3503268	0.00023487	0.00410588	0.39188713
ACKR1	1.06104959	0.26558028	4.34455463	0.00023827	0.0041381	0.37793072
BCL2L2	-1.1018939	-0.2872519	-4.3413709	0.00024017	0.00415365	0.37023328
GZMK	1.76742319	0.52744638	4.3192398	0.00025381	0.00430712	0.3167384
INTS12	-1.0775546	-0.2642577	-4.3153052	0.00025631	0.00433468	0.30723005
SERPINF1	1.43702436	0.18849146	4.31511845	0.00025643	0.00433468	0.30677867
IL10RA	1.46816246	0.55987627	4.30902454	0.00026036	0.00437868	0.29205339
TLR1	1.06006433	0.17614057	4.30616325	0.00026222	0.00439327	0.28513997
WFDC2	1.91991632	0.35687667	4.29398791	0.00027031	0.00450021	0.25572627
BLNK	1.50476047	0.47657865	4.28283849	0.00027793	0.00459882	0.22879721



SPP1	1.03593415	0.10691798	4.25438877	0.00029836	0.00482179	0.16011121
SERINC1	-1.4669317	-0.3872394	-4.2543686	0.00029838	0.00482179	0.16006255
CRHBP	-1.7391645	-0.0227677	-4.2513914	0.0003006	0.00483961	0.15287713
ARF5	1.0474205	0.16368287	4.24995839	0.00030167	0.00483961	0.14941878
RNF220	-1.1002366	-0.1713192	-4.2428808	0.00030705	0.00490197	0.1323397
MMP7	2.08644947	0.3664965	4.22478643	0.00032121	0.00507628	0.0886884
DHRS3	-1.1434697	-0.3112043	-4.2114708	0.00033205	0.00521305	0.05657762
EFNB2	-1.113034	-0.0313686	-4.2079314	0.00033499	0.00524057	0.04804409
CMAHP	-1.0516211	0.03795875	-4.1803726	0.00035881	0.00552162	-0.0183742
XYLT1	-1.1701675	-0.0557407	-4.1698586	0.00036833	0.00564189	-0.0437007
MRC1	1.40414731	0.06371213	4.15468092	0.00038252	0.00583223	-0.0802484
CORO1A	1.57176437	0.21648793	4.12984691	0.00040692	0.00610649	-0.1400138
GPR171	1.24085613	0.41901385	4.12662865	0.0004102	0.00614088	-0.1477557
CXCL6	2.25836252	0.65950348	4.12376932	0.00041313	0.00617077	-0.1546334
MAP1B	-1.0257065	0.0052139	-4.1198418	0.00041719	0.00621035	-0.1640797
FCER1A	1.23423975	0.44696628	4.1192384	0.00041781	0.00621269	-0.1655307
GZMA	1.80609457	0.69654553	4.1173472	0.00041979	0.006228	-0.1700788
PODXL	-1.9920988	-0.554066	-4.1126651	0.00042471	0.00629394	-0.1813373
CD52	1.68645646	0.51930998	4.0947449	0.00044408	0.00649364	-0.2244132
EML1	-1.1366652	0.21740526	-4.0932036	0.00044578	0.00651139	-0.2281168
NXF3	-1.1233997	0.11601866	-4.0580172	0.00048656	0.00696087	-0.3126178
ARHGAP15	1.00396781	0.1945954	4.05360053	0.00049193	0.00700412	-0.3232172
IL7R	1.58672656	0.51282842	4.04259074	0.00050559	0.00713491	-0.3496321
LY86	1.22161809	0.33488263	4.03842782	0.00051085	0.00719155	-0.3596172
GPR64	1.00908951	0.22370603	4.0274534	0.00052497	0.00730485	-0.3859327
CAPG	1.31122373	-0.1148726	4.02644619	0.00052629	0.00731546	-0.3883474
AP1M2	1.01987783	0.03452392	4.02231648	0.00053172	0.00735997	-0.3982468
PLAT	-2.2454256	-0.0403544	-4.0051053	0.00055495	0.00755495	-0.4394876
SST	-2.176176	-0.1692437	-3.9937655	0.0005708	0.00771515	-0.4666445
IGF1	-1.5083408	0.27170441	-3.9893275	0.00057713	0.0077768	-0.4772695
LAPTM5	1.35202593	0.28701822	3.96816363	0.00060826	0.00809707	-0.5279113
TGFBI	1.32786037	0.16093074	3.9666561	0.00061054	0.00810317	-0.5315169
GPX1	1.17228968	-0.0482937	3.94903574	0.00063783	0.00831506	-0.5736429
CDH10	-1.4872794	0.30203639	-3.9321964	0.00066504	0.0085593	-0.6138718
IGJ	2.54267848	0.81344223	3.92784775	0.00067225	0.00861087	-0.6242558
CCL5	1.60747085	0.43949396	3.92717415	0.00067337	0.0086129	-0.6258641
PYCARD	1.48850665	0.27618415	3.90547555	0.00071058	0.00891191	-0.6776454
HMOX1	1.34860483	0.32673486	3.87839272	0.00075989	0.00935285	-0.7422022
FBXO3	-1.1375499	-0.3163358	-3.8701973	0.00077546	0.00950034	-0.7617208
TIPARP	-1.1896933	0.05277217	-3.8683684	0.00077898	0.0095334	-0.7660757
CCL19	1.93127064	0.73774251	3.86039527	0.00079451	0.00966203	-0.7850556
TYRP1	-1.4565548	0.15758058	-3.8534954	0.00080819	0.00977447	-0.8014746
LINC00341	-1.0097183	-0.068678	-3.8310766	0.00085428	0.01020115	-0.8547829
RAMP3	-1.3121388	-0.2459433	-3.7858595	0.00095526	0.01109974	-0.9621091
ABCA8	1.64670353	0.03788443	3.78006644	0.00096902	0.01123633	-0.9758399
RRM2	1.34926405	0.37174093	3.77840367	0.000973	0.01126844	-0.9797803
CLU	1.68660343	0.02480874	3.76060423	0.00101669	0.01162941	-1.021937

ITGA8	-1.3835246	0.00192619	-3.7598201	0.00101866	0.01163839	-1.0237932
ETNPPL	-1.3354171	-0.160996	-3.7491717	0.00104576	0.01187623	-1.0489912
PLTP	-1.2528221	-0.0554994	-3.7442073	0.00105864	0.01197513	-1.0607334
MTHFD2	-1.2934309	-0.1886762	-3.7260919	0.00110697	0.01242668	-1.1035517
RRAS	-1.174842	-0.1736962	-3.7234234	0.00111427	0.01246703	-1.1098551
TMEM45A	-1.0608455	-0.112351	-3.7213723	0.00111992	0.01251411	-1.1146995
DYNC1H1	-1.5858594	-0.1882073	-3.6938567	0.00119841	0.01311402	-1.1796261
RGS2	-1.1800686	-0.3827164	-3.6933625	0.00119986	0.01311912	-1.1807911
GABRP	1.24528253	0.35370781	3.68168726	0.00123482	0.01339293	-1.2083052
NPHS2	-2.2605297	-0.6909711	-3.6802432	0.00123922	0.01342565	-1.2117069
NELL1	-1.9667911	0.09157661	-3.6154305	0.00145301	0.01496933	-1.3640417
SFRP1	1.42891449	0.20506317	3.6145126	0.00145628	0.01496933	-1.3661943
CETP	-1.0842034	0.0726094	-3.5948998	0.00152799	0.01550153	-1.4121535
BAMBI	-1.1758499	-0.1584885	-3.5866891	0.00155903	0.01567209	-1.4313742
LTB	1.70845662	0.39727288	3.56554773	0.00164182	0.01625743	-1.4808112
RASGRP1	1.24862264	-0.023284	3.55478918	0.00168559	0.01663125	-1.5059387
ITGBL1	-1.0694416	0.35834856	-3.5125796	0.00186863	0.01796876	-1.6043195
GPR18	1.40116608	0.54766837	3.50960602	0.00188223	0.01802985	-1.6112378
TSPAN1	1.37099368	0.15154359	3.50093141	0.00192247	0.01830917	-1.6314104
PPAP2B	-1.3016029	0.05251444	-3.4947387	0.00195171	0.01850765	-1.6458026
ENPEP	-1.1217472	-0.3000815	-3.4788399	0.00202879	0.01897984	-1.6827182
VIM	-1.4663406	-0.3992166	-3.4651263	0.00209765	0.01940667	-1.7145204
CYP24A1	1.44221094	0.43368604	3.46320459	0.00210748	0.01946806	-1.7189739
TLR7	1.33724787	0.42208305	3.4467221	0.00219367	0.02010962	-1.7571411
KDR	-1.2676538	0.1750265	-3.4433225	0.00221187	0.02020275	-1.7650065
AGR2	1.27389812	0.3821019	3.43885678	0.002236	0.0203565	-1.7753349
EVI2B	1.49249104	0.20899801	3.42543422	0.00231008	0.02081594	-1.8063541
RAPGEF4	-1.1163243	0.10251541	-3.4198345	0.00234169	0.02103061	-1.8192839
LYZ	1.52953237	-0.0515875	3.39571031	0.00248276	0.02198311	-1.8749114
FMO3	1.0010121	0.24380604	3.38896643	0.00252366	0.02222535	-1.8904398
IGFBP1	-1.9249852	0.83652451	-3.3670478	0.00266116	0.02308256	-1.9408412
DOCK2	1.00953718	0.19740941	3.36292895	0.0026878	0.02324024	-1.9503006
PFN1	1.24031762	0.13668063	3.35921082	0.00271207	0.02331002	-1.9588365
OLFM4	1.79103101	0.5500843	3.32679973	0.00293286	0.02461553	-2.0331124
HABP2	1.22068939	0.17563035	3.31660045	0.00300588	0.02503767	-2.0564362
FAM153A	-2.0748587	-0.0291549	-3.3135147	0.00302832	0.02516116	-2.063488
LDB2	-1.2698435	0.31073733	-3.3025155	0.00310964	0.02560358	-2.0886058
SGK1	-1.0661942	-0.1806604	-3.2934199	0.00317848	0.02590403	-2.1093552
VILL	-1.1903653	0.10983122	-3.2441161	0.00357815	0.02820489	-2.221482
TNFAIP8	1.15226302	0.25369246	3.22135106	0.00377873	0.02930947	-2.2730508
EGF	-1.2818407	-0.3104703	-3.2211708	0.00378036	0.02930947	-2.2734587
PTPRB	-1.3378635	0.32560012	-3.210998	0.00387351	0.02982177	-2.2964596
PLAC8	1.26290681	0.36269528	3.18118316	0.00415949	0.03141376	-2.363717
KIRREL	-1.2591149	0.45752475	-3.1656445	0.00431651	0.03227372	-2.3986764
COL15A1	1.07040003	0.3263239	3.16159707	0.00435834	0.03242144	-2.407772
GMDS	-1.0447862	-0.391072	-3.1538334	0.00443968	0.03286007	-2.4252061
HOPX	1.0268517	0.10257294	3.14471637	0.00453706	0.03342586	-2.4456586

AKR1B10	1.70544693	0.65519599	3.11141338	0.00491061	0.03556897	-2.5201726
GPR183	1.14713249	0.4440584	3.09834836	0.00506511	0.03621899	-2.5493198
CCDC19	-1.2396695	-0.0581964	-3.0893729	0.00517394	0.03663328	-2.5693152
C4A	1.01295688	0.3028222	3.01509836	0.00616507	0.04147383	-2.7338738
SLC6A8	1.00243815	0.31198609	2.9917247	0.006513	0.04313393	-2.785313
IGLC1	1.82580269	0.49997849	2.97233447	0.00681583	0.04449969	-2.8278558
OGDHL	1.0364712	0.15349228	2.94277786	0.00730351	0.04666266	-2.8924726
REG1A	1.51690213	0.53402818	2.93693197	0.00740383	0.04704025	-2.9052193
IGFBP2	-1.5942445	-0.3751163	-2.8830952	0.00839175	0.05161199	-3.0220734
CRIP1	1.0075262	0.14310469	2.82789123	0.00953449	0.05631655	-3.1408618
PTPRC	1.15349287	0.39453808	2.8182744	0.00974812	0.05727127	-3.1614451
GABBR1	1.20006923	0.18941123	2.79477918	0.0102893	0.05934305	-3.2115918
CHL1	1.0500883	0.14197688	2.78246176	0.01058428	0.06061979	-3.2378005
TAC1	1.6762292	0.77674442	2.76494331	0.01101765	0.0622369	-3.2749788
HRSP12	-1.4719011	-0.5126495	-2.7330841	0.01184913	0.06496626	-3.3422947
UMOD	-1.6261223	-0.364322	-2.7258738	0.01204537	0.0655798	-3.3574757
SOX9	1.03897049	0.11471765	2.69520395	0.01291488	0.06895066	-3.4218232
CYAT1	2.41208866	0.79775508	2.66955112	0.01368726	0.07178398	-3.4753591
MEIS2	-1.0700754	0.10778358	-2.6640234	0.01385929	0.07227057	-3.4868605
SPINK1	1.31725546	0.28569068	2.64888846	0.01434077	0.0739878	-3.5182881
HLA-DRA	1.04235007	0.17182849	2.64415887	0.01449443	0.0743219	-3.5280899
ID3	-1.0888845	-0.3528104	-2.6070885	0.01575344	0.07874096	-3.6045953
TAGLN	1.21705301	-0.0193722	2.51556468	0.01931385	0.09024735	-3.7909693
ADAMDEC1	1.02034338	0.3583858	2.49852815	0.02005433	0.09275654	-3.8252535
CYTIP	1.02005094	-0.0406871	2.49408172	0.02025189	0.09331117	-3.8341799
IGLL3P	1.42860448	0.53533593	2.47450658	0.02114334	0.09614508	-3.8733703
PROM1	1.09826981	0.20030834	2.46799131	0.02144803	0.09719626	-3.8863751
ALDH1A1	1.18781875	0.04599831	2.43420064	0.02309465	0.10279061	-3.9535059
FOSB	-1.8965314	-0.3876091	-2.4051263	0.02460426	0.10712576	-4.0108349
SELL	1.02745436	0.18455069	2.38583668	0.02565556	0.1097154	-4.0486459
CYP26B1	-1.0979139	0.38397581	-2.3591281	0.0271796	0.11402322	-4.1006992
APOH	-1.0323392	-0.3197027	-2.3387246	0.02839949	0.11724325	-4.140226
KRT19	1.13994828	-0.244671	2.3246029	0.02927302	0.11950588	-4.1674611
SIK1	-1.0459855	0.12694337	-2.2359672	0.03534119	0.13473469	-4.3360602
ATF3	-1.4837991	-0.0073945	-2.1804965	0.03969976	0.1457753	-4.4394519



Supplementary Table 3: The sequences of primers used in real-time PCR.

Gene		Sequence(5'-3')
LCK	FOR:	CCGAATGGTGCGACCTGACAAC
	REV:	TCCAGAACGCTCCGAAGGTAGTC
CD48	FOR:	AGCAATCCTGTAAGCAGCGAGAAC
	REV:	GGATAACGTGACCACTAGCCAAGC
CD3D	FOR:	AGTCTGCTACTGGCTACTGTTCTCC
	REV:	AGATGCCTGATGCTGGTGTGTC
ITGB2	FOR:	ACTCGGAGGGCTGCTGGATAAC
	REV:	CCAGATGACCAGGAGGAGGACAC
IL10RA	FOR:	ACCAGGACCAGGATGACAGTGAC
	REV:	GTTCTGCTGCTTCCTCCTTCCATC
IL7R	FOR:	CTGCCAAGCTCCAGAAACACAAATG
	REV:	GAGATGGGCTGTCCTTGAGAACTG
CCL5	FOR:	GACACCACTCCCTGCTGCTTTG
	REV:	CTCTGGGTTGGCACACACTTGG
PTPRC	FOR:	GGCAAGGAACAACCGACGATGG
	REV:	CTTGGCTGCTGAGTGTCTGAGTG
TLR7	FOR:	GGTATGCCACCGAATCTAACGACTC
	REV:	GCCAATCTCGCAGGGACAGTTG
MYD88	FOR:	GTCTCCAGGTGTCCAACAGAAGC
	REV:	GTCGCAGATAGTGATGAACCGTAGG
Nf-kB	FOR:	TGTGGTGGAGGACTTGCTGAGG
	REV:	AGTGCTGCCTTGCTGTTCTTGAG
$\beta$ -actin	FOR:	CACCCAGCACAAATGAAGATCAAGAT
	REV:	CCAGTTTTTAAATCCTGAGTCAAGC

FOR:forward primer;

REV:reverse primer;

**Supplementary Table 4: Hyperparameter selection table for machine learning models**

Parameters	Parameter selection range	Final value
SVM		
Kernel	linear, polynomial, or radial basis function	radial
C	$2^{-2}$ –10	$2^{-1}$
$\gamma$	$2^{-9}$ –1	0.1
RF		
Trees	100–1000	500
features	2–16	4
KNN		
adjacent samples	1–30	3
distance	Manhattan distance or Euclidean distance	Euclidean distance
Adaboost		
maxdepth	1–15	2
mfinal		4

**Supplementary Table 5:** Evaluation metrics for the validation set GSE47183

Model	AUC	Accuracy	Sensitivity	Specificity	Precision	Recall	F1-score
Adaboost	0.899	0.791	0.778	0.812	0.875	0.778	0.824
KNN	0.861	0.791	0.926	0.563	0.781	0.926	0.848
SVM	0.894	0.721	0.630	0.875	0.895	0.630	0.739
RF	0.932	0.837	0.889	0.750	0.857	0.889	0.873

**Supplementary Table 6:** Evaluation metrics for the validation set GSE30529

Model	AUC	Accuracy	Sensitivity	Specificity	Precision	Recall	F1-score
Adaboost	0.891	0.791	0.800	0.783	0.762	0.800	0.781
KNN	0.780	0.767	0.800	0.739	0.727	0.800	0.762
SVM	0.861	0.767	0.850	0.696	0.708	0.850	0.773
RF	0.899	0.837	0.800	0.869	0.842	0.800	0.821