

**Supplementary Table S3.** Summary of functional and regulatory annotation of most significant SNPs.

Gene	dbSNP	Chr	Position (hg38)	Ref. allele	Risk allele	PHM <sup>a,b</sup>	EHM <sup>a,b</sup>	eQTL <sup>c</sup>	Regulatory Motifs Changed <sup>d</sup>	Proteins Bound <sup>d</sup>
<i>ADAM30</i>	<i>ADAM30</i> rs2641348	1	119895261	A	G	ESC.H9 ESDR.H1.BMP4.TROP LIV.ADLT BLD.DND41.CNCR	ESC.I3 BLD.CD34.CC BLD.CD15.PC SKIN.PEN.FRSK.FIB.01 SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.KER.03 BRN.GRM.MTRX OVRY PLCNT.FET LIV.ADLT PANC BLD.DND41.CNCR LIV.HEPG2.CNCR BRST.HMEC SKIN.NHEK	9.75•10 <sup>-06</sup> RP5- 104218.7 1.38•10 <sup>-08</sup> NOTCH2 0.0026 REG4	Cphx Hoxb6 Nkx2_10 Nkx2_8	
<i>FTO</i>	<i>FTO</i> rs9939609	16	53786615	T	A	ESC.WA7 BLD.CD8.NPC FAT.MSC.DR.ADIP	ESDR.H1.MSC BLD.CD4.CD25M.CD45RA.NPC BLD.CD4.CD25M.IL17M.PL.TPC BLD.CD8.NPC STRM.MRW.MSC SKIN.PEN.FRSK.KER.03 BRST.MYO BRN.HIPP.MID BRN.ANT.CAUD BRN.CING.GYR BRN.DL.PRFRTL.CRTX FAT.ADIP.NUC MUS.SKLT.F HRT.ATR.R HRT.VENT.L HRT.VNT.R VAS.AOR GI.CLN.SM.MUS GI.STMC.FET GI.S.INT GI.ESO GI.STMC.GAST LNG.FET OVRY PANC.ISLT LNG.A549.ETOH002.CNCR BRST.HMEC SKIN.NHEK		Nanog_disc4 Pou5f1_disc1 Pou5f1_know n1	
<i>HNF1B</i>	<i>HNF1B</i> rs7501939	17	37741165	T	C	ESC.HUES6	ESC.HUES48	9.2•10 <sup>-04</sup>	CEBPB_know	

						ESC.HUES64 ESC.4STAR IPSC.20B IPSC.15b ESDR.CD184.ENDO ESDR.H1.MSC BLD.CD4.CD25M.CD45RA.NPC BLD.CD4.CD25M.IL17M.PL.TPC BLD.CD4.CD25M.CD45RO.MPC BLD.CD4.MPC FAT.ADIP.DR.MSC BRN.CING.GYR FAT.ADIP.NUC GI.CLN.SM.MUS GI.RECT.SM.MUS GI.L.INT.FET GI.CLN.MUC GI.RECT.MUC.29 GI.RECT.MUC.31 GI.STMC.MUC GI.DUO.MUC KID.FET LNG.FET PANC.ISLT LIV.ADLT LNG.A549.ETOH002.CNCR LIV.HEPG2.CNCR	ESC.4STAR IPSC.20B IPSC.18 ESDR.CD184.ENDO ESDR.H1.MSC BLD.CD4.CD25M.CD127M.TREGPC BLD.CD4.CD25M.TPC BLD.CD4.CD25M.CD45RA.NPC BLD.CD4.CD25M.IL17M.PL.TPC BLD.CD4.CD25M.IL17P.PL.TPC BLD.CD4.CD25M.CD45RO.MPC BLD.CD4.MPC BLD.CD8.MPC BLD.CD8.NPC BRN.HIPP.MID BRN.SUB.NIG BRN.CING.GYR GI.DUO.SM.MUS GI.CLN.SM.MUS GI.S.INT.FET GI.L.INT.FET GI.CLN.MUC GI.RECT.MUC.29 GI.RECT.MUC.31 GI.STMC.MUC GI.DUO.MUC PANC.ISLT LIV.ADLT LNG.A549.ETOH002.CNCR LIV.HEPG2.CNCR	HNF1B	n3 DMRT5 DMRT7 p300_disc2	
HNF1B	HNF1B <sub>rs757210</sub>	17	37736525	T	C	ESDR.H1.NEUR.PROG LIV.ADLT	ESC.4STAR IPSC.DF.19.11 ESDR.CD184.ENDO ESDR.H1.MSC BRST.HMEC.35 GI.CLN.MUC PLCNT.AMN PANC LNG.A549.ETOH002.CNCR	0.00177 HNF1B	HES1	
HNF1B	HNF1B <sub>rs4430796</sub>	17	37738049	G	A	IPSC.15b KID.FET LIV.ADLT LNG.A549.ETOH002.CNCR	LNG.IMR90 ESC.WA7 ESC.I3 ESC.HUES48 ESDR.CD56.MESO ESDR.CD184.ENDO ESDR.H1.BMP4.MESO ESDR.H1.MSC STRM.MRW.MSC STRM.CHON.MRW.DR.MSC FAT.ADIP.DR.MSC	0.0024 HNF1B	Maf_disc2	STAT3

							FAT.MSC.DR.ADIP SKIN.PEN.FRSK.KER.03 BRST.HMEC.35 GI.S.INT.FET GI.L.INT.FET GI.CLN.MUC GI.STMC.MUC GI.STMC.GAST PLCNT.AMN PLCNT.FET LIV.ADLT LNG.A549.ETOH002.CNCR MUS.HSMMT BRN.NHA BONE.OSTEO			
JAZF1	JAZF1 <sub>rs10486567</sub>	7	27936944	G	A	LNG.A549.ETOH002.CNCR FAT.ADIP.DR.MSC	LNG.IMR90 ESDR.CD184.ENDO STRM.MRW.MSC STRM.CHON.MRW.DR.MSC FAT.ADIP.DR.MSC FAT.MSC.DR.ADIP SKIN.PEN.FRSK.FIB.01 SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.MEL.01 SKIN.PEN.FRSK.MEL.03 BRN.HIPP.MID BRN.SUB.NIG BRN.CING.GYR BRN.INF.TMP BRN.DL.PRFRTL.CRTX FAT.ADIP.NUC MUS.PSOAS MUS.SKLT.F MUS.SKLT.M MUS.TRNK.FET MUS.LEG.FET HRT.FET HRT.ATR.R GI.CLN.SM.MUS GI.RECT.SM.MUS GI.CLN.SIG GI.RECT.MUC.29 KID.FET LNG.FET PANC.ISLT LNG.A549.ETOH002.CNCR MUS.HSMMT SKIN.NHDFAD BONE.OSTEO		Ik-2_2 Lhx3_2 Mef2_known1 Mef2_known4 Nkx3_2 Zfp410	p300
LTA	LTA <sub>rs1041981</sub>	6	31573007	C	A	ESDR.H1.MSC	IPSC.DF.19.11	2.05•10 <sup>-09</sup>	LBP-1_3	

						BLD.PER.MONUC.PC BLD.CD3.PPC BLD.CD4.CD25I.CD127.TMEMPC BLD.CD3.CPC BLD.CD4.CD25.CD127M.TREGP C BLD.CD4.CD25M.TPC BLD.CD4.CD25M.CD45RA.NPC BLD.CD4.CD25M.IL17M.PL.TPC BLD.CD4.CD25M.IL17P.PL.TPC BLD.CD4.CD25M.CD45RO.MPC BLD.CD4.MPC BLD.CD8.MPC BLD.CD4.NPC BLD.CD8.NPC BLD.CD19.CPC BLD.CD19.PPC BLD.CD56.PC SKIN.PEN.FRISK.FIB.01 SKIN.PEN.FRISK.FIB.02 SKIN.PEN.FRISK.FIB.02 BRST.MYO THYM THYM.FET BRN.INF.TMP BRN.FET.M MUS.SKLT.F HRT.FET GI.RECT.SM.MUS GI.STMC.MUS GI.S.INT GI.CLN.MUC GI.RECT.MUC.29 GI.STMC.MUC GI.DUO.MUC GI.ESO PLCNT.AMN LIV.ADLT BLD.GM12878 CRVX.HELAS3.CNCR LIV.HEPG2.CNCR MUS.HSMMT	ESDR.CD56.MESO ESDR.H1.BMP4.TROP ESDR.H1.MSC BLD.PER.MONUC.PC BLD.CD3.PPC BLD.CD4.CD25I.CD127.TMEMPC BLD.CD3.CPC BLD.CD4.CD25.CD127M.TREGPC BLD.CD4.CD25M.TPC BLD.CD4.MPC BLD.CD8.MPC BLD.CD4.NPC BLD.CD8.NPC BLD.CD14.PC BLD.CD19.CPC BLD.CD34.PC BLD.MOB.CD34.PC.M BLD.MOB.CD34.PC.F BLD.CD34.CC BLD.CD19.PPC BLD.CD56.PC SKIN.PEN.FRISK.FIB.01 SKIN.PEN.FRISK.FIB.02 THYM THYM.FET MUS.SKLT.M HRT.VNT.R GI.STMC.MUS GI.S.INT GI.CLN.MUC GI.RECT.MUC.29 GI.DUO.MUC GI.ESO PLCNT.AMN LIV.ADLT LNG SPLN BLD.GM12878 MUS.HSMMT BLD.CD14.MONO	PSMB9 $3.09 \cdot 10^{-09}$ YIF1B $8.57 \cdot 10^{-07}$ HLA-DRB5 $3.44 \cdot 10^{-06}$ CYP21A1P $3.47 \cdot 10^{-06}$ LY6G6C $1.78 \cdot 10^{-07}$ HCG22 0.0017 AIF1 $2.636 \cdot 10^{-16}$ BAT1 $1.73 \cdot 10^{-04}$ CSNK2B $3.53 \cdot 10^{-04}$ HCP5 $5.15 \cdot 10^{-05}$ LST1 $7.50 \cdot 10^{-12}$ TNF	RFX5_disc1 Sin3Ak- 20_disc6 Znf143_disc3	
MADD	MADD <sub>rs7944584</sub>	11	47314769	A	T	ESC.WA7 BLD.CD4.NPC FAT.ADIP.DR.MSC SKIN.PEN.FRISK.FIB.01 SKIN.NHDFAD	LNG.IMR90 BLD.MOB.CD34.PC.F FAT.ADIP.DR.MSC SKIN.PEN.FRISK.FIB.01 FAT.ADIP.NUC HRT.ATR.R MUS.HSMMT SKIN.NHDFAD	$5.12 \cdot 10^{-06}$ NUP160 $2.42 \cdot 10^{-06}$ SPI1 $9.36 \cdot 10^{-06}$ ACP2 0.0022 CUGBP1	AP-1_known1 AP-1_known2 AP-1_known3 AP-1_known4 AP-4_1 BATF_disc1 Irf_disc2 KAP1_disc1	

							LNG.NHLF BONE.OSTEO	1.29•10 <sup>-07</sup> MADD 1.954•10 <sup>-14</sup> MYBPC3 M ADD	NF- E2_known1	
NOTCH	NOTCH <sub>rs10923931</sub>	1	119975336	G	T	ESC.WA7 ESDR.CD184.ENDO BLD.CD15.PC FAT.MSC.DR.ADIP FAT.ADIP.NUC BLD.CD14.MONO	BLD.CD14.PC BLD.MOB.CD34.PC.M BLD.MOB.CD34.PC.F BLD.CD34.CC BLD.CD15.PC STRM.CHON.MRW.DR.MSC FAT.ADIP.DR.MSC FAT.MSC.DR.ADIP MUS.SAT SKIN.PEN.FRSK.FIB.01 SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.MEL.03 SKIN.PEN.FRSK.KER.02 SKIN.PEN.FRSK.KER.03 BRST.HMEC.35 BRST.MYO BRN.CRTX.DR.NRSPHR THYM BRN.HIPP.MID BRN.SUB.NIG BRN.ANT.CAUD BRN.ANG.GYR BRN.DL.PRFRTL.CRTX FAT.ADIP.NUC MUS.PSOAS MUS.SKLT.F HRT.ATR.R VAS.AOR GI.CLN.SM.MUS GI.RECT.SM.MUS BLD.CD14.MONO GI.CLN.SIG GI.RECT.MUC.29 GI.ESO GI.STMC.GAST LIV.ADLT LNG SPLN BRST.HMEC MUS.HSMMT SKIN.NHDFAD SKIN.NHEK BONE.OSTEO	2.7•10 <sup>-03</sup> REG4 7.3•10 <sup>-06</sup> NOTCH		
RBMS1	RBMS1 <sub>rs7593730</sub>	2	160314943	T	C	STRM.CHON.MRW.DR.MSC	LNG.IMR90	3.31•10 <sup>-07</sup>		

						FAT.ADIP.DR.MSC FAT.MSC.DR.ADIP FAT.ADIP.NUC MUS.SKLT.F MUS.SKLT.M GI.CLN.SM.MUS GI.RECT.MUC.29 MUS.HSMM MUS.HSMMT SKIN.NHDFAD	ESC.WA7 ESC.H9 LNG.IMR90 ESC.WA7 ESC.H9 ESC.I3 ESC.HUES64 ESC.4STAR IPSC.20B ESDR.H9.NEUR.PROG ESDR.H9.NEUR ESDR.CD56.MESO ESDR.H1.BMP4.TROP BLD.CD4.CD25I.CD127.TMEMPC BLD.CD4.CD25M.TPC BLD.CD4.CD25M.CD45RA.NPC BLD.CD4.CD25M.IL17M.PL.TPC BLD.CD4.CD25M.IL17P.PL.TPC BLD.CD4.CD25M.CD45RO.MPC BLD.CD4.MPC BLD.CD8.MPC BLD.CD4.NPC BLD.CD8.NPC STRM.MRW.MSC STRM.CHON.MRW.DR.MSC FAT.ADIP.DR.MSC FAT.MSC.DR.ADIP MUS.SAT SKIN.PEN.FRSK.FIB.01 SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.MEL.01 SKIN.PEN.FRSK.MEL.03 SKIN.PEN.FRSK.KER.03 BRST.MYO BRN.HIPP.MID BRN.ANT.CAUD BRN.DL.PRFRNTL.CRTX FAT.ADIP.NUC MUS.PSOAS MUS.SKLT.F MUS.SKLT.M MUS.TRNK.FET HRT.FET HRT.VENT.L HRT.VNT.R GI.DUO.SM.MUS GI.CLN.SM.MUS GI.RECT.SM.MUS GI.S.INT GI.RECT.MUC.31	RBMS1 1.47•10 <sup>-05</sup> ITGB6		
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						GI.STMC.GAST LNG.FET OVRY LIV.ADLT SPLN LNG.A549.ETOH002.CNCR MUS.HSMM MUS.HSMMT VAS.HUVEC BLD.CD14.MONO BRN.NHA SKIN.NHDFAD LNG.NHLF BONE.OSTEO			
SLC2A2	SLC2A2 <sub>rs11920090</sub>	3	170999732	T	A	ESC.H9 ESDR.CD184.ENDO FAT.ADIP.DR.MSC BRN.ANT.CAUD GI.CLN.SM.MUS GI.DUO.MUC LIV.ADLT LNG.A549.ETOH002.CNCR LIV.HEPG2.CNCR VAS.HUVEC BRN.NHA SKIN.NHEK	LNG.IMR90 ESC.HUES48 ESC.HUES64 ESDR.H9.NEUR.PROG ESDR.H9.NEUR ESDR.CD56.MESO ESDR.CD184.ENDO ESDR.H1.BMP4.MESO ESDR.H1.MSC ESDR.H1.BMP4.MESO ESDR.H1.MSC BLD.CD34.PC BLD.MOB.CD34.PC.M BLD.MOB.CD34.PC.F BLD.CD34.CC STRM.MRW.MSC STRM.CHON.MRW.DR.MSC FAT.ADIP.DR.MSC FAT.MSC.DR.ADIP MUS.SAT SKIN.PEN.FRSK.FIB.01 SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.MEL.03 SKIN.PEN.FRSK.KER.02 SKIN.PEN.FRSK.KER.03 BRST.HMEC.35 BRST.MYO BRN.CRTX.DR.NRSPHR BRN.HIPP.MID BRN.SUB.NIG BRN.ANT.CAUD BRN.CING.GYR BRN.ANG.GYR FAT.ADIP.NUC VAS.AOR GI.DUO.SM.MUS	Prrx2_1	

						GI.CLN.SM.MUS GI.RECT.SM.MUS GI.STMC.MUS GI.S.INT.FET GI.L.INT.FET GI.S.INT GI.CLN.SIG GI.RECT.MUC.29 GI.RECT.MUC.31 GI.STMC.MUC GI.DUO.MUC PLCNT.AMN KID.FET LNG.FET PANC.ISLT ADRL.GLND.FET LIV.ADLT PANC LNG.A549.ETOH002.CNCR CRVX.HELAS3.CNCR LIV.HEPG2.CNCR BRST.HMEC MUS.HSMM VAS.HUVEC BLD.K562.CNCR BRN.NHA SKIN.NHDFAD SKIN.NHEK LNG.NHLF BONE.OSTEO			
THADA	THADA <sub>rs7578597</sub>	2	43505684	T	C	IPSC.18 BRN.DL.PRFRNTL.CRTX OVRY ESC.HUES6 ESC.HUES48 ESC.HUES64 IPSC.18 IPSC.15b ESDR.CD56.ECTO ESDR.CD184.ENDO SKIN.PEN.FRSK.FIB.02 SKIN.PEN.FRSK.KER.03 BRN.GANGEM.DR.NRSPHR BRN.SUB.NIG LNG.FET BLD.CD14.MONO	Foxo_3 Mef2_disc1 Pou5f1_disc1 Sox_10 Sox_13 Sox_15 Sox_16 Sox_18 Sox_19 Sox_2 Sox_4 Sox_5 Sox_9 Zfp105		

Abbreviations: PHM, protomer histone marks; EHM, enhancer histone marks; Ref, reference.

<sup>a</sup> HaploReg v4 based epigenomic changes

<sup>b</sup> CHc15sm, ChromHMM (core 15-state model); CHc25sm, ChromHMM (core 25-state model using 12 imputed marks); H3K4me1/H3K4me3, H3K4me1 and H3K4me3 peaks; H3K27ac/H3K9ac, H3K27ac and H3K9ac peaks



<sup>c</sup> eQTL data from Haploreg v4 (Whole blood).

<sup>d</sup> Functional annotation from the ENCODE based tool HaploReg v4 (website [http://www.broadinstitute.org/mammals/haploreg/haploreg\\_v4.php](http://www.broadinstitute.org/mammals/haploreg/haploreg_v4.php))