

Supp Table S5. Pathway analysis of RNA-sequencing data in pancreatic islets isolated from control E2f1fl/fl and beta-cell specific E2f1beta-/- deficient mice islet

Upstream Regulator	Expr Log Ratio	Molecule Type	Predicted	Activation	Notes	Bias Term	Bias-corrected z-score	p-value of
ABP1		transcription regulator	Inhibited	-2.581	bias	-0.771	0.482	1.7E-11
HNF1A		transcription regulator	Inhibited	-3.955	bias	-0.915	-0.337	2.33E-10
NEUROD1		transcription regulator	Inhibited	-2.762	bias	-0.947	-0.145	3.93E-09
DHTRD1		enzyme						8.21E-09
PDX1	-0.576	transcription regulator	Inhibited	-2.442	bias	-0.795	-0.501	9.09E-09
NEUROG3		transcription regulator	Inhibited	-2.423	bias	-1	0	1.08E-07
FAM6A		transcription regulator						2.1E-06
PAX6		transcription regulator		-1.759	bias	-0.316	-0.822	4.68E-06
GLIS3	-0.401	transcription regulator						1.18E-05
ERN1		kinase	Inhibited	-2.135	bias	-0.57	-0.549	1.21E-05
G protein alpha		group	Inhibited	-2.646	bias	-0.828	-0.455	1.27E-05
ERCC1		enzyme						1.81E-05
THRA		ligand-dependent nuclear receptor		0.2		-0.132	0.489	0.00033
CD38		enzyme	Inhibited	-2.804	bias	-0.907	-0.262	3.72E-05
BAD		other						6.58E-05
NKX2-2		transcription regulator						8.32E-05
CGA		other		0.896		0.103	0.645	9.42E-05
TGFA		transcription regulator		-1.263		-0.237	-0.515	9.63E-05
PCSK2		peptidase						0.00011
MAFA		transcription regulator						0.000142
MED1		transcription regulator	Inhibited	-2.2	bias	-0.905	-0.21	0.000146
MGAT4A		enzyme						0.000196
METTL4		enzyme						0.000224
TGFB		transcription regulator	Inhibited	-2.779	bias	-0.446	-1.54	0.000256
ACACB		enzyme						0.000274
SLC13A5		transporter						0.00039
SOX6		transcription regulator						0.000395
MAP4K4		kinase		0.816	bias	0.932	-1.466	0.000395
SPOP		other						0.000466
LEP		growth factor		-0.333		-0.202	0.222	0.000479
ATF6		transcription regulator						0.000486
Histone h3		group						0.000507
ISL1		transcription regulator	Inhibited	-2.213		-0.146	-1.889	0.000554
HTT		transcription regulator						0.000577
SREBF1		transcription regulator		-1.801	bias	-0.739	0.382	0.000606
OGT		enzyme		-0.277		0.125	-0.451	0.000618
CEL		enzyme						0.000647
TAF10		transcription regulator						0.000647
TRPC3		ion channel						0.000647
IL5		cytokine	Inhibited	-2.646	bias	-0.956	-0.118	0.000716
PRLR	-0.983	transmembrane receptor						0.000944
SST		other						0.000944
ERCC3		enzyme						0.000966
ERCC4		enzyme						0.000966
GHR	-0.488	transmembrane receptor						0.00127
NTRK2	-0.677	kinase						0.00127
FGFR4		kinase						0.00134
Hedgehog		group						0.00134
CNTN1		transcription regulator						0.00134
SHCBP1		other						0.00134
SLC2A2		transporter						0.00134
TRH		other						0.00134
P2RY14		G-protein coupled receptor						0.00149
ATP5IF1		other						0.00173
CCDC80		other						0.00178
Calcineurin A		group						0.00178
MUC1		other		-1.044	bias	-0.472	-0.104	0.00184
BSCL2		other						0.00195
PHF21A		other						0.00228
SHANK3		other						0.00228
PTCH1		transmembrane receptor						0.00241
CK3DL1		cytokine						0.00255
FGF3		growth factor		-0.485		-0.171	-0.152	0.00255
PPARG		ligand-dependent nuclear receptor	Inhibited	-2.917	bias	-0.342	-1.92	0.00278
LAMTOR5		other						0.00284
RELN		peptidase						0.00284
DIO3		enzyme		-1.741		0.135	-2.066	0.00297
CAV1		transmembrane receptor						0.00302
NR1A1		ligand-dependent nuclear receptor	Activated	2.449		0.246	1.847	0.00311
CCAR2		peptidase						0.00335
THRB		ligand-dependent nuclear receptor		-0.659		-0.079	-0.484	0.00342
DLX6-AS1		other						0.00345
KL8		enzyme						0.00345
NR2C2		ligand-dependent nuclear receptor						0.00345
TAF1		transcription regulator						0.00345
TAF5		transcription regulator						0.00345
NCOA1		transcription regulator		1	bias	0.415	0.17	0.0036
IRS2		enzyme						0.00362
TGSI		enzyme						0.0039
GIC		transcription regulator						0.00411
INHBB		growth factor						0.00411
NKX6-1	-0.538	transcription regulator						0.00411
STK24		kinase						0.00411
PTTG1		transcription regulator		1.067	bias	0.487	0.102	0.00414
Histone h4		group						0.00439
F2		peptidase						0.00449
FFAR3		G-protein coupled receptor						0.00484
RNF40		enzyme						0.00484
STK11		kinase		-0.447		-0.202	0.005	0.00544
MEN1		transcription regulator						0.00548
EPICAM		other						0.00561
PIK3CB		kinase						0.00561
TM6IM6		other						0.00561
PTX2		transcription regulator	Inhibited	-2	bias	-0.553	-0.895	0.0058
MED13		transcription regulator						0.00621
MAP2K2		kinase						0.00644
MAPK13		kinase						0.00644
NAE1		enzyme						0.00644
PRKDC		kinase						0.00644
RBMS-AS1		other						0.00644
SMC1A		transporter						0.007
MAZ		transcription regulator						0.00732
STMN1		other						0.00732
FGF21		growth factor						0.00741
GYP19A1		enzyme		-1.729		-0.089	-1.576	0.00758
FOXA2		transcription regulator	Inhibited	-2.219		-0.206	-1.762	0.00772
S430416N02Rk		other						0.00813
ABCC5		transporter						0.00813
ABHD11		enzyme						0.00813
AIDA		other						0.00813
ALG10		enzyme						0.00813
ALG5		enzyme						0.00813
ALG6		enzyme						0.00813
ALG8		enzyme						0.00813
ARFGEF3		other						0.00813
BAIAP2L1		other						0.00813
CALCOCO1		transcription regulator						0.00813
COL5A3		other						0.00813
CSH1/CSH2		other						0.00813
CXXC4		other						0.00813
Ces1b/Ces1c		enzyme						0.00813
DDOST		enzyme						0.00813
DRAXIN		other						0.00813
ENHO	-0.613	enzyme						0.00813
FBXO31		enzyme						0.00813
FBXO4		enzyme						0.00813
FKHR		group						0.00813
FRMPD1		other						0.00813
FXN		kinase						0.00813
GPR142		G-protein coupled receptor						0.00813
HADH	-0.812	enzyme						0.00813
HADHA		enzyme						0.00813
INSRR		kinase						0.00813
KHK		kinase						0.00813
UNC01370		other						0.00813
MARK3		kinase						0.00813
MGAT4C		enzyme						0.00813

IKR1		enzyme						0.00813
MOGS		enzyme						0.00813
Mannosidase2		group						0.00813
Mkm1		enzyme						0.00813
NNAT		transporter						0.00813
PQB1		transcription regulator						0.00813
PHPT1		phosphatase						0.00813
PLAC1		other						0.00813
PNLIP		enzyme						0.00813
RHAG		peptidase						0.00813
RHOXF2/RHOXF2B		transcription regulator						0.00813
Rac		group						0.00813
Rhox11		other						0.00813
Rhox8		other						0.00813
SLC17A9	-0.546	transporter						0.00813
SLC19A2		transporter						0.00813
SLC30A8		transporter						0.00813
SLCSA1		transporter						0.00813
SLCSA10		transporter						0.00813
SLC9B2		transporter						0.00813
TOB2		other						0.00813
UBE2D3		enzyme						0.00813
UCN3		other						0.00813
WDR13		other						0.00813
mic-500		microma						0.00815
DNMT3B		enzyme	0.447	bias	0.456		-0.572	0.00815
AQP7		transporter						0.00825
ATR		kinase						0.00825
ITM2		enzyme						0.00825
IGFBP5	-0.747	other						0.00825
RPS6KA3		kinase						0.00825
FMR1		translation regulator	1.34	bias	0.339		0.59	0.00883
MBD1		transcription regulator						0.00924
RAPGEF3		other						0.00924
RASSF1		other						0.00924
IGF1R		transmembrane receptor	Inhibited	-2.577	bias	-0.629		-0.955
MFAP5		other						0.00968
ELL2		transcription regulator						0.0107
PTPN11	-0.341	phosphatase						0.0107
SMARCA2		transcription regulator						0.0107
NFATC1		transcription regulator						0.0112
ATXN1		transcription regulator						0.0113
MED30		transcription regulator						0.0113
SPZ1		transcription regulator						0.0113
IL6ST		transmembrane receptor						0.0123
miR-30c-5p (and other m		mature microma						0.0123
NFB (complex)		complex	Inhibited	-2.588	bias	-0.837		-0.421
KAT2A		enzyme	Inhibited	-2	bias	-0.446		-1.107
LDLR		transporter						0.0145
MYCN		transcription regulator						0.0145
LCAT		enzyme						0.0149
MPZ		other						0.0149
SREBF2		transcription regulator						0.016
IGF1		growth factor	-0.841	bias	-0.329			-0.136
Akr1b7		enzyme						0.0162
BCAT2		enzyme						0.0162
BCLAF1		transcription regulator						0.0162
CALM1 (includes others		other						0.0162
CDC27		other						0.0162
CERT1		kinase						0.0162
Ces1g		enzyme						0.0162
DAPK3		kinase						0.0162
EIF4H		translation regulator						0.0162
GCKR		other						0.0162
GOPC		transporter						0.0162
GPC3		other						0.0162
GPD2		enzyme						0.0162
GPR119		g-protein coupled receptor						0.0162
GPR68		g-protein coupled receptor						0.0162
INS3		growth factor						0.0162
IP6K1		kinase						0.0162
KCNQ2		ion channel						0.0162
LCLAT1		enzyme						0.0162
LRIG3		other						0.0162
NEIL1		enzyme						0.0162
NPFFR2		g-protein coupled receptor						0.0162
PAPPA		peptidase						0.0162
PARL		peptidase						0.0162
PASK		kinase						0.0162
PDHA1		enzyme						0.0162
PLAAT3		enzyme						0.0162
PRDX3		enzyme						0.0162
PRLH		cytokine						0.0162
PTPRF		phosphatase						0.0162
REM2		enzyme						0.0162
RPRD1B		other						0.0162
RRAD		enzyme						0.0162
SLC9A6		transporter						0.0162
SLURP1		cytokine						0.0162
SNCB		other						0.0162
SNIP1		other						0.0162
SRI		transporter						0.0162
SRPK2		kinase						0.0162
STX4		transporter						0.0162
Slk		group						0.0162
TP53INP1		other						0.0162
VICAM1		transmembrane receptor						0.0162
VENTX		transcription regulator						0.0162
ZNF322		transcription regulator						0.0162
miR-101-5p (miRNAs w/o		mature microma						0.0162
miR-185-3p (and other m		mature microma						0.0162
miR-501-3p (and other m		mature microma						0.0162
p38 Sapk		group						0.0162
ARNTL		transcription regulator						0.0166
BCL2L11		other						0.0175
FGF19		growth factor						0.0175
JARID2		transcription regulator						0.0175
RNF20		enzyme						0.0175
BDNF		growth factor						0.0177
DNMT3A		enzyme	0.152		0.2		-0.244	0.0186
CASR		g-protein coupled receptor	Inhibited	-2	bias	-0.593		-0.813
GPBAR1		g-protein coupled receptor						0.0188
WNT1		cytokine						0.0216
ADIPOQ		other	-0.413		-0.178		-0.081	0.0218
CRTC2		other						0.0231
RPS6KB1		kinase						0.0231
TCF7L2		transcription regulator	Inhibited	-2.592	bias	-0.88		-0.312
AGAP2		enzyme						0.0242
ANK1		other						0.0242
ATAD2		enzyme						0.0242
ATOX1		transporter						0.0242
BANP		other						0.0242
CACNA1B		ion channel						0.0242
CARTPT		other						0.0242
DACT3		other						0.0242
DNAJB4		other						0.0242
FLOT1		other						0.0242
FREM1		other						0.0242
GN37		enzyme						0.0242
GPC6		transmembrane receptor						0.0242
GRIP1		transcription regulator						0.0242
HINT2		enzyme						0.0242
HOXB13		transcription regulator						0.0242
HSPBP1		other						0.0242
INPP5K		phosphatase						0.0242
Isa4		other						0.0242
KLHL2		other						0.0242
KMT2B		transcription regulator						0.0242
LHX5		transcription regulator						0.0242
LINC01006		other						0.0242
MAT2B		enzyme						0.0242
MBD5		other						0.0242

MOHR1		g-protein coupled receptor					0.0242
MOGAT2		enzyme					0.0242
NDUFAF3		other					0.0242
NIBAN2		transcription regulator					0.0242
NOP58		enzyme					0.0242
NPTX1		other					0.0242
NSD3		enzyme					0.0242
NUCKS1		kinase					0.0242
OLA1		enzyme					0.0242
PSMD14		peptidase					0.0242
PTGDS		enzyme					0.0242
PTTG1IP		other					0.0242
RAD50		enzyme					0.0242
RANBP9		other					0.0242
RDH16		enzyme					0.0242
RIMS2		other					0.0242
SERP1		other					0.0242
SERTAD1		transcription regulator					0.0242
SH2B2		other					0.0242
SLC39A4		transporter					0.0242
SNW1		transcription regulator					0.0242
SRGAP1		other					0.0242
THRSF		other					0.0242
UZAF2		other					0.0242
WAPL		other					0.0242
WIF1		other					0.0242
ZIC1		transcription regulator					0.0242
EGF		growth factor					0.0245
ADAM10		peptidase					0.0246
BTG2		transcription regulator					0.0246
GTF2B		transcription regulator					0.0246
SFRP1		transmembrane receptor					0.0246
RETNLB		other					0.0258
ROR2		kinase					0.0258
Hmgdh3		other					0.0262
JH1		enzyme					0.0262
TCF		group					0.0267
INS	-0.71	other	-0.277	-0.041	-0.197		0.0276
Nr1h		group	0.152 bias	0.382	-0.606		0.0276
A2M		transporter					0.0278
CTNNA1		transcription regulator	-1.147 bias	-0.507	-0.152		0.0278
EIF2AK3		kinase	-1.989 bias	-0.843	-0.31		0.0283
HIF1A		transcription regulator	-1.352 bias	-0.444	-0.198		0.0292
CXCR4		g-protein coupled receptor					0.0294
DLK1		other					0.0311
RAF1		kinase					0.0311
MAPK1		kinase	-0.816	0.088	-1.033		0.0321
ADRA2B		g-protein coupled receptor					0.0321
AGAP2-AS1		other					0.0321
AGTRAP		g-protein coupled receptor					0.0321
AKAP5		other					0.0321
AP2M1		other					0.0321
ARF1		enzyme					0.0321
ATP2A1		transporter					0.0321
BRS3		g-protein coupled receptor					0.0321
CACNA1D		ion channel					0.0321
CDC25B		phosphatase					0.0321
CHP		other					0.0321
CPT1		group					0.0321
Cathepsin		group					0.0321
DDX19B		enzyme					0.0321
DKK2		other					0.0321
FFAR2		g-protein coupled receptor					0.0321
GALR1	-0.816	g-protein coupled receptor					0.0321
GH2		other					0.0321
IGFBP4		other					0.0321
ITPRID2		other					0.0321
IIS3		other					0.0321
KRT10		other					0.0321
LAMB1		other					0.0321
MIR3662		microma					0.0321
MUCL1		other					0.0321
MYBPC3		other					0.0321
NASP		other					0.0321
NR2F1-AS1		other					0.0321
ORAI3		other					0.0321
PITPNA		transporter					0.0321
PPP1R3C		phosphatase					0.0321
PRKAB2		kinase					0.0321
RAB11A		enzyme					0.0321
SEMA3E		other					0.0321
SGMS1		enzyme					0.0321
SHBG		other					0.0321
SIDT2		transporter					0.0321
SLC2A8		transporter					0.0321
SLC11B3		transporter					0.0321
SNRK		kinase					0.0321
STEAP4		enzyme					0.0321
SUFU		transcription regulator					0.0321
TACS1D2		other					0.0321
TBC1D4		other					0.0321
TCF1EF		group					0.0321
TEX11		other					0.0321
VTGN1		other					0.0321
ZFP42		transcription regulator					0.0321
mi-184		microma					0.0321
GSK3B		kinase					0.0321
IGF2		growth factor					0.0328
Mapk		group					0.0328
FOXA1		transcription regulator	-1.982	0.02	-2.023		0.0329
HMGAI		transcription regulator					0.0341
PTH		other					0.0341
SMAD2		transcription regulator					0.0341
PDPK1		kinase					0.0364
GLI1		transcription regulator	-0.227	0.204	-0.792		0.0369
IL10RA		transmembrane receptor	-1.633	-0.024	-1.575		0.0369
DSCAML1		other					0.0371
GH1		growth factor					0.0382
KDM3A		transcription regulator					0.0382
MLX		transcription regulator					0.0382
MYBL2		transcription regulator					0.0382
mi-30		microma					0.0382
SLC13A1		transporter					0.0392
ACACA		enzyme					0.04
AKIRIN2		other					0.04
APBB1		transcription regulator					0.04
ARAF		kinase					0.04
AXIN1		other					0.04
CDH16		enzyme					0.04
CHRM3		g-protein coupled receptor					0.04
CXCL14		cytokine					0.04
FZR1		kinase					0.04
GATM		enzyme					0.04
GNAS1		enzyme					0.04
GPR39		g-protein coupled receptor					0.04
GY2		enzyme					0.04
HCFC1		transcription regulator					0.04
HINFP		transcription regulator					0.04
HTR2C		g-protein coupled receptor					0.04
INSL5		other					0.04
LGALS12	-0.797	other					0.04
MIR3936HG		other					0.04
Muc1		transmembrane receptor					0.04
NDN		transcription regulator					0.04
Nesdh		other					0.04
PITX1		transcription regulator					0.04
PORCN		enzyme					0.04
PRMT2		enzyme					0.04
PXN		other					0.04
RAD51C		enzyme					0.04
RBBP8		enzyme					0.04
RNF187		enzyme					0.04

RUVBL2		transcription regulator					0.04
SIX3		transcription regulator					0.04
STX2		transporter					0.04
TPPP2		other					0.04
WFS1	-0.375	enzyme					0.04
WNT7B		other					0.04
WRN		enzyme					0.04
ZMY2		transcription regulator					0.04
miR-193a-3p (and other		mature microma					0.04
miR-455-3p (miRNAs w/		mature microma					0.04
miR-455		microma					0.04
miR-489		microma					0.04
HDL-cholesterol		complex					0.04
LGALS3		other					0.0403
CYP11A1		enzyme					0.0414
CYP27B1		enzyme					0.0419
DRD2		g-protein coupled receptor					0.0419
AKT1		kinase					0.0425
OSCAM		other					0.0425
TSC2		other					0.0427
EGFR		kinase	-1.503 bias	-0.714	0.061		0.0427
MECP2		transcription regulator					0.0435
SLC25A13		transporter					0.0435
PIK3CA		kinase					0.0435
Gmb		group					0.044
IFNG		cytokine	0.43 bias	-0.474	1.887		0.0454
SNAI2		transcription regulator					0.0458
TOB1		transcription regulator					0.0458
RGS2		enzyme					0.0459
KLIF4		transcription regulator	Inhibited	-2.19 bias	-0.598	-0.88	0.0461
EIF2S1		translation regulator					0.0478
NRG1		growth factor					0.0478
ACOT13		enzyme					0.0478
AKAP12		transporter					0.0478
ANK3PTL6		other					0.0478
ANKHD1/ANKHD1-EIF4		other					0.0478
CBR3-AS1		other					0.0478
CCND2		other					0.0478
CDK5R1		kinase					0.0478
CTNBP1		other					0.0478
DLX1		transcription regulator					0.0478
DMTF1		transcription regulator					0.0478
EOGT		enzyme					0.0478
ERVW-1		other					0.0478
FSTL3		other					0.0478
GLP1R	-0.806	g-protein coupled receptor					0.0478
GPAM		enzyme					0.0478
GUCY2C	-0.659	kinase					0.0478
HPRT1		enzyme					0.0478
IGFBP7		transporter					0.0478
MC3R		g-protein coupled receptor					0.0478
MEIT1L		enzyme					0.0478
MRAS		enzyme					0.0478
Npy4r		g-protein coupled receptor					0.0478
OBP2B		transporter					0.0478
PDCD5		other					0.0478
PDC3A		enzyme					0.0478
PLSCR1		enzyme					0.0478
PRKAB1		kinase					0.0478
PRKG2		kinase					0.0478
Pdgf Ab		complex					0.0478
SH2D5		other					0.0478
SLC7A11-AS1		other					0.0478
TFE2		other					0.0478
VGF		growth factor					0.0478
mir-637		microma					0.0478
PI3K (complex)		complex	-1.091 bias	-0.714	0.312		0.0486
Raf		group					0.0498