

Supplementary Table 3. IPA upstream analysis

Putative genes, molecules and drugs that could be responsible for changes in gene expression. Genes with FDR \leq 0.05 (from Supplementary Table 1) were analyzed using QIAGEN's Ingenuity® Pathway Analysis. A positive z-score indicates that the regulator, if active, could be responsible for gene changes. Negative z-scores indicate that expression changes are in the opposite direction observed when this molecule is active. Absolute z-score \geq 1.75 shown. Listed by z-score.

P-value of overlap is based on number genes differentially expressed that are also in the list of target genes regardless of direction.

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
SREBF2		-3.90	1.62E-06	transcription regulator	ACLY, ACSL1, DHCR7, ELOVL6, FDFT1, FDPS, HMGCR, HMGCS1, INSIG1, LDLR, LIPA, NEUROD1, NSDHL, SCD, SQLE, THRSP, TM7SF2
HNF1A		-3.50	2.70E-04	transcription regulator	ADAM32, ADCY10, AK2, ALB, ALS2, APOB, ASGR2, B3GALT5, BCL6, C8G, CD55, CDO1, COL27A1, COL3A1, DPP4, FAM107B, FOLR1, GDI2, GJB1, HMGCR, HOPX, HPX, IGF1, ITIH4, KIF13A, LCAT, LIPA, MAPK15, NR1D1, NR5A2, ONECUT1, PAH, PRLR, RNASE4, SERPINA1, SERPING1, SLC26A1, SLC38A4, SSTR1, Sult1d1, TACR3, TRPM2, UGT1A1, Ugt1a7c, UGT1A9 (includes others), VTN, YPEL3, ZNF365
SCAP		-3.37	9.84E-07	other	ACLY, ACSL1, CSAD, DHCR7, EHHADH, ELOVL6, FDFT1, FDPS, HMGCR, INSIG1, LDLR, NSDHL, SCD, SQLE, TM7SF2
ATP7B		-3.16	2.85E-05	transporter	ACLY, CDC20, CP, ELOVL6, FDFT1, FDPS, HMGCR, HMGCS1, LDLR, SQLE, THRSP
SREBF1		-3.05	3.98E-05	transcription regulator	ACLY, ACSL1, APOA5, AR, CSAD, DHCR7, DLK1, EHHADH, ELOVL6, ELOVL7, FDFT1, FDPS, HMGCR, HMGCS1, HSPA1A/HSPA1B, INSIG1, LDLR, LGALS3, NR1H3, NSDHL, PIK3R3, PTGDS, SCD, SQLE, TF, THRSP, TM7SF2

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
wortmannin		-2.91	1.34E-03	chemical - kinase inhibitor	AGTR1, BCL2L11, CKB, COL1A1, COL1A2, COL3A1, E2F1, EIF1AX, ERBB3, FOS, GPD1, IGF1, JUN, MAF, MYH11, NR4A1, PTGER4, PTGS2, PXN, RAP1A, TH, TYMP, VIM
INSR		-2.66	1.53E-04	kinase	ACSL1, ATF3, ATP2A3, ATP5G3, CCNG2, CD83, CDKN2C, CPT1B, DDR2, DHCR7, FBLN1, FDFT1, FDPS, FOS, FURIN, HMGCR, HMGCS1, IGF1, KIT, LCP1, LDB2, MARCKSL1, MYOM2, NR1H3, NSDHL, PAX6, PDK4, RUVBL2, SLC2A4, SQLE, Tpm2
CD3		-2.64	1.49E-01	complex	BCL2L11, BCL6, BTG1, C1R, CXCR4, DUSP14, FOS, HPX, ID3, IGF1, IL16, ITPR1, JUN, MAF, MTHFD2, NFATC2, NOS1, NR4A1, ORAI3, PTGER4, PTGS2, PTPN22, RORA, SEC14L1, SMPDL3B, TOB2, TP73, TSPAN9, VPS4B
isoquercitrin		-2.63	2.09E-05	chemical - endogenous non-mammalian	DHCR7, FDFT1, FDPS, HMGCR, INSIG1, LDLR, SQLE
PP1		-2.62	2.77E-03	chemical - kinase inhibitor	ANGPT2, CXCR4, FOS, GJA1, JUN, LHB, PTGS2
PXR ligand-PXR-Retinoic acid-RXR α		-2.62	1.63E-02	complex	CAT, CYP2C9, GSTA2, PAPSS2, SCD, UGT1A1, UGT1A9 (includes others)
CDKN1A		-2.61	8.46E-02	kinase	AURKB, CDC20, CRYAB, CYR61, DUSP1, FAT2, HSPA1A/HSPA1B, ITGB5, LGALS3, MAF, MCM2, MCM7, POLD1, PRC1, RACGAP1, SOD2, TGFA, TUBB3, WNT3

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
HNF4A		-2.47	5.69E-02	transcription regulator	ABCC6, ACLY, ACSL1, ADCY10, ADCY7, ADPRHL1, AK2, ALS2, APOB, ASGR2, ATF7, ATP6V1D, BAAT, BCAR1, BCL6, BMP7, BTG1, C11orf68, C22orf23, C3, C8G, CALML4, CAMK2D, CCNG2, CD55, CHERP, CHI3L1, CHMP1B, CPT1B, CRY1, CYP2C9, DBP, DISP2, DNAJB9, DUSP3, EFCAB1, EHD3, ENC1, F12, FAM107B, FAM117A, FDPS, FGF13, FLNA, FURIN, FXYD7, FZD1, GABRE, GJB1, GOLIM4, GPR37, GRB14, GRIN2D, GSK3B, HIST1H2BD, HIST1H4B, HPD, HPX, HUNK, IFITM2, IGF1, ISOC1, ITIH4, JUN, JUNB, KCNJ12, KIF15, KLC4, KRT8, LDLR, LGALS3, LIPA, LRSAM1, MAL2, MGST1, MSRB2, MSX2, NDFIP1, NDRG1, NEK7, NR1D1, NR1H3, NR5A2, NUTF2, ONECUT1, OTUD7B, PAN2, PANK1, PCBD1, PCDH20, PDE11A, PDK2, PDK4, PEX6, PFN2, PIK3R3, PNKP, PPL, PPM1D, PPP1R3B, PRLR, PRR3, PTGDS, PYGL, RAB11A, RASGRP3, RASSF5, RNASE4, RNF40, RORA, RPS6, RPS6KA1, RPS6KA6, RUVBL2, SBNO2, SCD, SDC1, SEMA3C, SEMA7A, SERPINA1, SGK1, SLC19A3, SLC22A18, SLC26A1, SLC27A2, SLC38A4, SLC44A1, SOX10, SPATA2, SPP1, SSTR1, TCF7L2, TF, TM7SF2, TMEM63A, TOE1, TOX, TRPC4AP, TSNAXIP1, TTC25, UBQLN2, UCHL1, UGT1A1, UGT1A6, UGT1A9 (includes others), VTN, YPEL3, YWHAB, ZIC2
ATXN1		-2.45	3.50E-05	transcription regulator	ATP2A2, ICMT, INPP5A, ITPR1, PRKCG, SLC1A6, TRPC3
LIPE		-2.45	9.59E-10	enzyme	ACSL1, ATF3, BCL6, CA2, CDO1, CIB2, CITED2, COL1A1, COL1A2, CP, FOS, GJA1, GRB10, HSPA1A/HSPA1B, JUP, KITLG, NR4A1, PAM, PDE8A, PDK4, PER1, PVALB, RBP4, RXRG, SCD, SLC22A2, SLC2A4, ST8SIA4, THRSP

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
AR	-1.38	-2.42	5.80E-09	ligand-dependent nuclear receptor	AR, ARMCX2, ATP13A4, ATP2A2, C3, CA7, CACNA1A, CAMKK2, CASQ2, CDH11, CLDN11, COL3A1, DHCR24, DISP2, EGFR, EHD3, ERBB3, ETV1, GFAP, GJA1, GPR182, IGF1, IGFBP5, ITGB4, KCNJ2, KCNJ3, KITLG, LMOD1, MCM2, MRAS, MTHFD2, NDRG1, Nrgn, PDE9A, PDYN, PENK, PER1, PLAT, PRKCD, PROS1, PTGDS, RHOB, SGK1, SMTN, SRD5A1, TF, TNFAIP2, TPD52L1, TUBB3, VCAN, VIM, WIPF1, ZBTB16
CD28		-2.41	2.04E-01	transmembrane receptor	BTG1, CBLB, CXCR4, DUSP14, FOS, JUN, MAF, NFATC2, NOS1, NR4A1, ORAI3, PTGER4, PTGS2, RORA, TOB1
NR1I2		-2.37	1.35E-02	ligand-dependent nuclear receptor	CTH, CYP2C9, E2F1, ELOVL6, GSTM5, HMGCS1, IGF1, INSIG1, JUN, MGST1, MSX2, PAPSS2, SCD, Sult1d1, TF, UGT1A1, UGT1A6
SOCS1		-2.35	1.00E+00	other	A2M, FOS, H2-T24, IRF7, JUN, Mx1/Mx2, PTGS2
GATA3		-2.25	1.21E-01	transcription regulator	CDKN2C, ELOVL1, ELOVL6, FOS, KIT, LOX, MAF, NR5A2, OPRM1, PPL, RET, TAL1, VIM, ZIC2
PPARGC1B		-2.24	3.72E-05	transcription regulator	C3, CPT1B, DHCR24, EGLN3, FDFT1, FDPS, GGPS1, HMGCR, PDK4, SCD, SLC2A4, SQLE
BCKDK		-2.24	1.22E-04	kinase	CAT, MOG, OLIG2, PLP1, SOD2
MBTPS1		-2.24	9.99E-04	peptidase	FDFT1, FDPS, HMGCR, LDLR, SCD
sildenafil		-2.24	4.95E-02	chemical drug	FGF1, GFAP, PDE5A, PTGS2, VEGFB
MLXIPL		-2.22	5.85E-03	transcription regulator	ACLY, ELOVL6, GPD1, PYGL, SCD, THRSP
TLX3		-2.22	1.51E-04	transcription regulator	CCK, GALR1, GRIN3A, NPY1R, RET, TAC1
NOG	1.45	-2.22	8.56E-02	growth factor	BMP7, ID3, NOG, PTGS2, SPP1, VCAN
pentobarbital		-2.21	1.47E-03	chemical drug	FOS, JUN, JUNB, NR4A1, SUMO1
FOSL1		-2.18	4.25E-01	transcription regulator	ELN, FOS, JUN, JUNB, SERPINE2

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
nimodipine		-2.18	2.09E-03	chemical drug	FOS, LHB, NR4A1, NR4A2, TH
CSHL1		-2.18	3.18E-02	transcription regulator	AR, CA3, FOS, GSK3B, IGF1, ONECUT1, SRD5A1, TOX
4-phenylbutyric acid		-2.17	2.13E-04	chemical - endogenous mammalian	ATP2A3, CNP, EHHADH, GJA1, MOG, PEX11A, PLP1, SEPP1, SERPINA1, SOD2, STK10, TIMP2, USP29, YPEL5
USF2		-2.13	9.06E-02	transcription regulator	APLN, APOA5, CHI3L1, CPT1B, SPEG, SPP1, THRSP
phenobarbital		-2.09	1.96E-02	chemical drug	CYP2C9, CYP4B1, GSTA2, GSTM5, INSIG1, PAPSS2, RAF1, Sult1a1, THRSP, TRPC3, UGT1A1
STAT5A		-2.09	3.23E-02	transcription regulator	A2M, AR, BCL6, CASP4, DUSP5, EGLN3, EPOR, FOS, GJB1, IFITM2, IGF1, MAF, NOL3, NR4A2, ONECUT1, PRLR, TNNT1, TRAF2
mifepristone		-2.06	3.36E-07	chemical drug	Acan, ANXA1, ARG1, ATF3, BCAT1, BMP7, C3, CA2, Cd24a, CHI3L1, COL18A1, DUSP1, FDFT1, FOS, GJA1, HDC, ITGB4, JUN, JUNB, KIT, LDLR, LOX, NDN, NDRG1, NPY1R, NR4A1, OPRM1, PLAT, PRKG2, PTGS2, PTPN5, RELN, RHOB, ROBO1, SERPING1, SFRP2, SLC1A2, SPEG, SPP1, Sult1d1, SUMO1, VCAN
bezafibrate		-2.04	1.57E-04	chemical drug	ACSL1, ALDH1A2, CAT, CPT1B, DLK1, EHHADH, INSIG1, LGALS3, MGLL, NR1H3, PANK1, PDK4, PEX11A, PTGS2, SCD, SLC27A2, TSPO
TBX5		-2.04	2.15E-03	transcription regulator	ATP2A2, CASQ2, COL1A1, COL1A2, COL3A1, GJA1, KCNJ2, NFATC2, S100A4, SCN5A, VIM
testosterone		-2.02	3.57E-08	chemical - endogenous mammalian	A2M, ACSL1, ANXA1, AR, ATP5F1, BMP7, CA3, CAMK4, CAT, CRHR1, CYP26B1, DHCR24, EGFR, FOS, GALR1, GALR2, GDI2, HCN4, HCRTR2, HDC, HMGCR, HSPA1A/HSPA1B, ID3, IGF1, JUN, LHB, MAL, MGST1, Mx1/Mx2, NDRG1, NOS1, PDE5A, PDYN, PRLR, PTGS2, PXN, RAF1, SCNN1A, SDC1, SOD2, SRD5A1, SSTR1, SSTR3, STK11, TF, TGFA, TUBB3, UGT8, VCAN

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
carbohydrate		-2.00	3.85E-02	chemical - endogenous mammalian	ACLY, ELOVL6, PYGL, SCD, THRSP
PAX2		-2.00	4.52E-02	transcription regulator	GRM3, GRM5, PAX6, SFRP2
RASSF5	-1.36	-2.00	1.08E-01	other	DNAJA1, FAT1, NAP1L3, RAP1A
Rb		-2.00	4.25E-01	group	AURKB, E2F1, MCM7, POLD1, SOD2
taurine		-2.00	1.31E-01	chemical - endogenous mammalian	GFAP, PTGS2, SYN1, VIM
miR-141-3p (and other miRNAs w/seed AACACUG)		-1.99	1.31E-01	mature microrna	BCL2L11, CTBP2, TP73, VIM
SERPINF1	-1.72	-1.99	7.89E-02	other	CRYAB, NEFH, OLIG1, OLIG2, SOX10, VIM
cannabidiol		-1.98	4.52E-02	chemical drug	PENK, PTGS2, TAC1, VIM
CD36		-1.98	1.60E-01	transmembrane receptor	APOB, ARG1, ATP2A2, SCD, SLC2A4
CYP7A1		-1.98	1.41E-02	enzyme	FDFT1, FDPS, HMGCR, LDLR
ESRRG		-1.98	2.23E-01	ligand-dependent nuclear receptor	FGF1, HADH, PDK4, VEGFB
RB1		-1.98	3.14E-02	transcription regulator	ANGPT2, AURKB, BCL2L11, CASP4, CITED2, CMAS, DLK1, E2F1, EHD3, FOS, GPS2, HUNK, IGF1, KIT, MAF, MCM2, MCM7, MET, Nefm, PGRMC1, RANBP1, TOB2, TP73, UBR7
SOCS3		-1.98	1.00E+00	phosphatase	ATF3, FOS, JUN, Mx1/Mx2

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
DL-fructose		-1.98	4.20E-03	chemical - endogenous mammalian	ELOVL6, GPD1, SCD, SLC2A5
salicylic acid		-1.98	3.73E-01	chemical drug	GRIN2B, KITLG, PTGS2, SLC2A4
ZFP36		-1.97	6.88E-02	transcription regulator	E2F1, FOS, LATS2, PTGS2
miR-21-5p (and other miRNAs w/seed AGCUUAAU)		-1.97	4.63E-01	mature microrna	BTG2, E2F1, NFIB, TAGLN
Growth hormone		-1.96	2.59E-05	group	ALB, BMP7, CITED2, COL1A1, CRHR1, CX3CL1, DLK1, EGFR, FOS, GFAP, GHR, GSTM5, IGF1, IGFBP5, LDLR, NR1D1, ONECUT1, PDK4, PRLR, SCNN1A, SGK1, SPP1
S-adenosylmethionine		-1.95	1.68E-01	chemical - endogenous mammalian	COL1A1, COL1A2, FOS, MAF
STUB1		-1.95	1.68E-01	enzyme	JUNB, MYH11, NOS1, TAGLN
PD98059		-1.94	2.37E-07	chemical - kinase inhibitor	ACOT7, AGTR1, ANGPT2, ANXA1, AR, ATF3, BCL2L11, BCL6, C3, CA2, CCK, CD83, CDC42EP1, COL1A1, COL1A2, COL3A1, CXCR4, DUSP1, DUSP5, E2F1, EGFR, ELK1, ELN, FAH, FOS, FURIN, GJA1, GPC5, GRIN2C, GSK3B, HPCAL1, ID3, IGF1, ITGB5, JUN, JUNB, KRT8, LDLR, LHB, MET, MGLL, MYH11, NR4A1, PCSK6, PER1, PLAGL1, PLAT, PTAFR, PTGER4, PTGS2, RNASE4, RPS6, S100A4, SCNN1A, SDC1, SEPP1, SERPINA1, SPP1, SQLE, ST6GAL1, TF, TH, TIMP2, TYMP, VCAN, VIM
HDAC4		-1.94	1.77E-04	transcription regulator	ATF3, CALB1, CNKSR2, DGKB, FGF13, FOS, GABRA5, GABRG3, LDB2, NETO1, NR4A1, NR4A2, NTM, Pcp411, PTGS2, SLC17A7, SYN1, TAGLN

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
RELA		-1.92	4.05E-02	transcription regulator	A2M, AR, BCL2L11, BTG2, CFB, CHI3L1, COL1A1, COL1A2, CXCR4, CYP2C9, DUSP1, ELN, FOS, GP1BB, GSTA2, HTR1A, IER2, IGF1, JUNB, KIT, PTGDS, PTGS2, SERPINE2, SLC1A2, SLC2A4, SLC2A5, SOD2, SYTL1, TACR1, TNFAIP2, UGT1A1
ciglitazone		-1.92	1.00E+00	chemical drug	CAT, GPD1, JUN, PTGS2
gemfibrozil		-1.91	1.65E-03	chemical drug	BMP7, CNP, CYP2C9, EHHADH, FURIN, HCRT, LDLR, MOG, NR1H3, PLP1, RTN4, SCD
pitavastatin		-1.91	4.72E-05	chemical drug	CAT, FDFT1, FDPS, HMGCR, HMGCS1, PTGS2, SLC27A2, SQLE
PPARG		-1.85	5.74E-09	ligand-dependent nuclear receptor	ACLY, ACSL1, ARL4D, ATP2A2, ATP6V1D, BCL6, C3, CA2, CAT, CDKN2C, COL1A1, COL1A2, CORIN, CPLX2, CPT1B, CYP4B1, DLK1, EGFR, EHHADH, ELOVL6, FDPS, FGF1, GATA2, GPD1, H6PD, HMGCR, HP, HR, IGF1, IGFBP5, INSIG1, JUN, KLK6, LDLR, MCM7, MGLL, MGST1, NDRG1, NR1D1, NR1H3, NR4A1, PDK4, PEX11A, PEX6, PPP2R2B, PRKG2, PTGS2, PYGL, RBP4, SCD, SDC1, SERPINA1, SLC27A3, SLC2A4, SNCG, SPP1, Tpm2, UGT1A9 (includes others), VIM
methotrexate		-1.84	2.01E-03	chemical drug	ALB, Apoc1, ASS1, BTG2, C1R, C3, C6, CASP4, CFB, CFH, DUSP1, DUSP14, EHHADH, FA2H, HMGCS1, IGFBP5, ITIH4, MET, NR4A2, PFN2, PTGS2, SCD, SEPP1, SERPING1, SLC27A2, SPP1, TOB1, UGT1A6
simvastatin		-1.79	5.14E-04	chemical drug	ANGPT2, Anp32a, APOB, AR, CACNA1G, CD55, CYR61, DDAH1, E2F1, ENC1, FOS, GJA1, HMGCR, HS3ST1, KIT, LDLR, LGALS8, MAP1LC3B, NFIX, PLAT, PTGS2, RAF1, RHOB, SLC2A4, SPP1
NR1I3		-1.79	7.11E-02	ligand-dependent nuclear receptor	CYP2C9, FAM107B, GSTM5, INSIG1, PAPSS2, Sult1a1, Sult1d1, TNFAIP2, UGT1A1, UGT1A3, WISP1

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
sterol		1.76	3.22E-04	chemical - endogenous mammalian	ACLY, ACSL1, DHCR7, FDFT1, FDPS, HMGCR, LDLR, LIPA
MYB		1.77	2.55E-03	transcription regulator	COL1A2, CXCR4, IGF1, IGFBP5, ITPR1, JUN, KIT, KITLG, PAX6, PTGS2, SPP1, TRHR, VIM
morphine		1.77	2.28E-05	chemical drug	CALB1, CCK, EGFR, ERBB3, FOS, GFAP, GHR, GNAS, GRIN2B, JUNB, KCNAB2, KCNJ9, NR4A1, NTRK3, OPR1, OPRM1, PDYN, PENK, PLAT, PTGS2, SLC1A2, TH
CREBBP		1.77	1.80E-05	transcription regulator	AR, BMP7, CAMK2D, COL1A2, CYR61, DCX, EHHADH, FDPS, FOS, GNAS, GRIN2C, GRIN2D, GRM1, HMGCS1, JUN, LDLR, NEUROD1, NR4A1, NR4A2, NR4A3, OPRM1, PRKCD, PTGS2, SERPINE2, SLC1A2, TAGLN, TH, THRSP
KNG1		1.78	2.25E-03	other	COL1A1, COL1A2, EGFR, F12, FOS, IGF1, PTGS2
etoposide		1.78	2.37E-01	chemical drug	ATF3, BCL2L11, CA2, DUSP1, E2F1, IRF7, JUN, NR4A1, PIK3R3, SGK1, SOD2, TP73
SRF		1.81	2.59E-08	transcription regulator	A2M, C1QL3, CALB1, CORIN, CPM, CXCR4, DUSP5, EGR4, ELK1, ETV1, FGF1, FOS, GPATCH4, IER2, IGF1, JUN, JUNB, LDLR, LMCD1, LMOD1, MGST1, MYH11, MYL9, NEUROD6, NFATC2, NR4A1, NR4A2, OPHN1, PAFAH1B1, Pcp4I1, PMFBP1, PTGS2, RAF1, RNF148, SEMA3A, SNX2, SPTBN2, T, TAGLN, TNNT1, Tpm2
DMD		1.82	2.14E-05	other	AIG1, BAALC, BTG2, CASQ1, CDH13, CLIP4, COL23A1, DCX, DGKZ, DYNLRB2, ENTPD3, GABRD, GPD1, HSPB6, MALL, MLF1, NOG, NOS1, PDK4, PVALB, SCN1B, SCN3B, SEPP1, SGCG, SPTB, WBSCR17, WFDC1
arsenic trioxide		1.82	1.19E-01	chemical drug	CTH, DHCR24, DHCR7, FDFT1, FDPS, HMGCR, HMGCS1, MAF, PTGS2, SCD, SQLE, SUMO1
REST		1.82	4.29E-08	transcription regulator	CACNA1H, CBLN1, CD59, DCX, EFNA5, EPHA10, FGF14, GLRA1, GRIK4, GRIN2B, KCNAB2, LRRTM4, NCAM2, NEFH, NEUROD1, NTRK3, OPRM1, OSBP2, PENK, SCG2, SYN1, TAC1, TNNT1, TRPM2, TUBB3

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
cocaine		1.88	7.87E-08	chemical drug	ADCY1, ASMT, DRD2, DUSP1, DUSP14, DUSP5, EGR4, FOS, GABRA6, GABRD, GRM1, GRM5, JUN, JUNB, MNS1, NAB2, NOS1, NR4A1, NR4A3, OPRM1, PDYN, PER1, PPP1R1B, PVALB, SLC1A2, SPAG4, TAC1, TH, TSPO, UBASH3B
Ca2+		1.88	3.98E-09	chemical - endogenous mammalian	Acan, AR, ATF3, ATP2A2, CCK, CD83, CRY1, CXCR4, CYR61, DBP, DUSP1, E2F1, EGFR, ELK1, FOS, GAD2, HDC, HMGCR, ID3, ITPR1, JUN, JUNB, KCND2, KRT1, KRT8, LHB, MAG, MCAM, MEF2D, NDRG1, NOS1, NR1D1, NR4A1, NR4A3, PER1, PER2, PTGS2, SGK1, T, TAC1, TAGLN, TIMP2
cisplatin		1.89	1.57E-05	chemical drug	A2M, AADAT, ADAMTS1, ALB, ANXA1, ASNS, ATF3, BCL2L11, BTG2, CAPN1, CAPN2, CAT, CCNG2, CDO1, CLIP4, COL1A1, CP, CPT1B, DPYSL5, DUSP1, E2F1, EPS8L2, ERBB3, FAM117A, FOS, GHR, GPC5, HEYL, HMGCR, HMGCS1, ITGA7, ITGB4, JUN, LATS2, LGALS3, LIPA, MAP1LC3B, MAPK9, MET, MLF1, NEFL, NREP, PCDH20, PDK4, PEX6, PHLDA3, PLAT, PPM1D, PRTFDC1, PTPRO, PXN, RAB11FIP1, RBP4, RGN, SLC22A2, SPP1, ST6GAL1, STK17B, TARSL2, TOB1, TP73, TYMP, UGT1A3, UGT1A6, USP3, VIM, WNT3, ZMAT3
MED13		1.89	3.68E-04	transcription regulator	CIB2, ELN, ELOVL6, GPD1, PRKAR2B, PYGL, THRSP
nilvadipine		1.89	1.44E-03	chemical drug	CD38, CRYAB, GALR2, LGALS8, PRKCD, PRKCG, Tpm2
n-3 fatty acids		1.90	3.26E-02	chemical drug	CAT, ELOVL6, PTGS2, RGN, SCD, SDC1, SLC2A4
NRG1	-1.38	1.91	2.98E-06	growth factor	AR, CAPN1, CDC42EP1, COL1A1, CXCR4, CYR61, DUSP1, E2F1, ERBB3, FGF1, FOS, GATA2, GPS2, GRIN2C, HMGCR, IER2, ITGB5, JUNB, MGLL, NOS1, NR4A1, NR4A3, PAFAH1B1, PRKG2, PTGS2, PXN, SLC2A4, SLC4A7, TF, TNNI3, TOB2, VEGFB, VIM
CPE		1.93	2.49E-05	peptidase	CCK, HMGCR, LDLR, PAM, PCSK2, PDYN, PENK, SCG2, TAC1

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
entinostat		1.93	4.48E-01	chemical drug	BCL2L11, DUSP1, EGFR, ERBB3
GCG		1.94	8.44E-02	other	BTG2, FDPS, FOS, HMGCR, IGFBP4, NEUROD1, SLC2A4
YAP1		1.94	1.14E-03	transcription regulator	AURKB, BCL2L11, CYR61, E2F1, FGF1, PPP1R3B, RASSF4, TAGLN, TP73
fluphenazine		1.94	2.49E-04	chemical drug	FOS, NR4A1, NR4A2, NR4A3
raclopride		1.94	5.52E-04	chemical drug	FOS, NR4A1, NR4A2, NR4A3
stearic acid		1.94	1.78E-02	chemical - endogenous mammalian	ATF3, BCL2L11, NR1H3, PTGS2
IRF7	1.55	1.94	1.00E+00	transcription regulator	CASP4, DNAJA1, FZD1, IFITM2, IFITM3, IRF7, Mx1/Mx2
PIN1		1.94	4.03E-01	enzyme	COL3A1, LHB, PTGS2, TIMP4
Pdgf (complex)		1.94	4.11E-02	complex	EGFR, FOS, GJA1, JUN, JUNB, LDLR, MCM7, NOV, NR4A2, PIK3R3, PTGS2
linsidomine		1.95	1.08E-01	chemical drug	ALB, CRHR1, NR4A1, PTGS2
CDC42		1.95	4.38E-02	enzyme	ATF3, BCL2L11, FOS, JUN, LHB
GRP		1.96	6.88E-02	growth factor	ELK1, FOS, JUN, PTGS2
mir-145		1.96	2.52E-01	microrna	EGFR, MYH11, SOD2, TAGLN
LCK		1.96	4.95E-02	kinase	ANXA1, ELK1, FOS, JUN, NOTCH2
ITGB3		1.97	7.84E-02	transmembrane receptor	ACLY, COL1A1, COL1A2, FOS, ITGB5, LDLR, PTGS2
CD 437		1.98	1.00E+00	chemical drug	AK2, ATP5G3, CLIC1, DNAJA1, E2F1, FOS, GNAS, ITGA11, JUN, MGST1, NR4A1, SH3BGRL3, SUMO1
EPHB1		1.98	2.82E-03	kinase	FOS, JUN, JUNB, PTGS2
PEX5L	-1.62	1.98	9.99E-04	ion channel	DHCR7, FDFT1, FDPS, HCN1, HMGCR
CD24		1.98	2.43E-01	other	ATF3, DUSP5, FOS, HOMER3, JUN, LPP, MCAM, RAF1, TIMP4

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
FOXC2		1.98	2.97E-01	transcription regulator	CXCR4, ITGB5, PTGS2, SLC2A4
NCR2		1.98	2.21E-02	transmembrane receptor	NR4A1, NR4A2, NR4A3, PTGS2
pCPT-cAMP		1.98	2.82E-03	chemical - kinase inhibitor	FOS, JUN, JUNB, NR4A1
PTGFR		1.98	5.98E-03	g-protein coupled receptor	FOS, NR4A1, PRLR, PTGS2
SQSTM1		1.98	4.02E-02	transcription regulator	CITED2, EGLN3, GSTM5, JUN, MAP1LC3B, PLAT
NFKBIA		1.99	2.66E-02	transcription regulator	A2M, AK2, AURKB, BTG2, C3, CITED4, COL1A2, COL3A1, CRYAB, CXCR4, FOS, GSTM5, HPSE, ITPR1, KRT8, MMP15, MR1, PCDH7, PLAT, PTGS2, RASA3, SDC1, SEMA3F, SLC1A2, SOD2, SORL1, SYCP2, TACR1, TGFB111, TIMP2, TRAF2
GNA13		1.99	8.19E-03	enzyme	FOS, MYH11, PTGS2, TAGLN
MTPN		1.99	8.47E-04	transcription regulator	ANXA1, CASQ1, COL1A1, COL1A2, CP, FBLN1, FOS, H6PD, IGF1, JUN, PLAT, SPP1, TAGLN, TH
KLF4		1.99	1.36E-02	transcription regulator	ALB, BMPER, COL1A1, DUSP1, DUSP5, ETV1, EVX1, ID3, IFITM3, MSX2, MYH11, PCDH18, PPL, SERPINA1, SLC4A7, SOD2, T, TAGLN, TF, VIM, WNT3, ZIC2
TSC22D3		1.99	7.78E-02	transcription regulator	BCL2L11, COL1A1, DUSP1, PTGS2
WNT3A		1.99	1.04E-03	cytokine	Acan, ADAMTS4, CACNA1G, CAMK4, COL1A1, CYR61, EPHA5, ERBB3, FAM101B, FZD1, GSK3B, IGFBP5, JUN, KITLG, LRRC32, MAB21L1, MRGPRF, MSX2, NCALD, NRG1, OLIG1, PTGS2, SFRP2, T, TUBB3, WIF1
BRD4		2.00	8.73E-02	kinase	AURKB, CXCR4, CXCR5, FOS, MAL, MTHFD1L, PTPN22, TYRO3
3-deazaneplanocin		2.00	4.77E-01	chemical drug	AKNA, CLDN11, MVP, NOTCH2
ALDH2		2.00	4.52E-02	enzyme	CTH, GSTA3, MTHFD2, SLC7A3

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
CYP1A2		2.00	3.57E-01	enzyme	CHRNA4, INSC, UGT1A6, Ugt1a7c
FGF19		2.00	4.36E-05	growth factor	ACLY, ACSL1, AMY2A, CLIC6, FDPS, FOS, GAS2, HMGCR, MCAM, PTGDS, SCD, SCN1B, SERPINA1, SGK1, SLC2A5, SQLE, THRSP
MERTK		2.00	2.09E-01	kinase	EPOR, HDC, PLAGL1, SLA
PRKAA2		2.00	4.37E-04	kinase	ACOT7, ALB, CA2, CAMK4, CAMKK1, DDAH1, DLGAP2, IGFBP4, MGST1, NAP1L5, NFIB, NOS1, NPEPL1, PDYN, RAF1, SORL1
IGF2		2.04	6.72E-02	growth factor	GHR, IGF1, IGFBP4, IGFBP5, PTGS2, SLC2A4, SPP1
E. coli B5 lipopolysaccharide		2.06	1.13E-02	chemical - endogenous non-mammalian	ADAMTS1, APOA5, BCL6, CAT, Ccl9, CD83, CX3CL1, CXCR4, DUSP1, EGFR, FOS, IL11, IL16, IRAK3, JUNB, LDLR, NEDD4L, PAH, PTGS2, RHOB, SDC1, SEPHS2, SEPP1, SOD2, SUMO2, VTN
miR-1-3p (and other miRNAs w/seed GGAAUGU)		2.06	2.38E-02	mature microRNA	ADPGK, EGFR, F2, GJA1, HCN2, HCN4, HSPA1A/HSPA1B, IGF1, IP6K2, IQGAP3, ITGB4, KCNJ2, MET, MTHFD2, NOTCH2, SH3BGRL3, SLC44A1, TAC1, TSPAN4, UHMK1, UST
TGFA	-1.52	2.09	5.04E-04	growth factor	ALB, E2F1, EGFR, FOS, GFAP, GJB1, IGFBP4, JUNB, PLAGL1, PLAT, PTGS2, SERPINA1, TGFA, VIM
GNA12	-1.29	2.14	2.06E-02	enzyme	BAIAP2, DDR2, EGFR, FOS, GSTA3, MYH11, PTGS2, PXN, TAGLN, VIM
PRKAA1		2.14	2.26E-04	kinase	ACOT7, ALB, ATF3, CA2, CAMKK1, DDAH1, DLGAP2, IGFBP4, MGST1, NAP1L5, NFIB, NPEPL1, PDYN, SORL1, THRSP
MAPK8		2.16	3.22E-01	kinase	BCL2L11, COL1A1, DUSP1, ELK1, FOS, JUN, LHB, MVP, PTGS2, TAC1, TACR1
PML		2.17	3.35E-01	transcription regulator	CPT1B, EGFR, HMGCR, LDLR, PDK4, SCD
PTH		2.17	1.02E-06	other	Acan, ADAMTS1, ATP2A2, COL1A1, COL1A2, CXCR4, DUSP1, EGFR, FOS, GJA1, IGF1, IGFBP5, IL11, JUN, MSX2, NR4A1, NR4A2, PPP1R1B, PTGS2, PXN, SFRP2, SLC2A4, SLC43A2, SLC9A3, SPP1, ST14, WIF1
MKL1		2.17	2.51E-02	transcription regulator	FOS, MYH11, MYL9, TAGLN, Tpm2

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
gefitinib		2.18	1.41E-03	chemical drug	ADAMTS1, AURKB, BCL2L11, BTG2, C3, COL1A1, EGFR, GHR, GJA1, IGF1, IGFBP5, KIT, MMP15, NRP2, PPP2R2B, PRC1, PRKCG, RHOB, Sult1a1, TIMP2
IL2		2.18	2.48E-01	cytokine	BCL6, C3, CACNG3, CCNG2, CD38, CD59, CD83, CDKN2C, CXCR4, CXCR5, DPP4, DRD5, DUSP5, ENPP2, FOS, GCNT1, GFAP, HSPA1A/HSPA1B, IP6K2, JUN, LDLR, LRRC32, MAF, NAB2, Nrgn, PIK3R3, PPP2R2B, PTGS2, RAF1, RHOB, S100A4, SPP1, STK17B, VIM
CREM		2.18	4.10E-05	transcription regulator	ATF3, ATP2A2, BTG2, CAMK4, COL3A1, DUSP1, DUSP14, EGR4, FOS, HMGCR, HMGCS1, JUNB, LDLR, MNS1, NAB2, NOS1, NR4A1, NR4A2, PDYN, PER1, RHOB, TAC1, TH
IL17A		2.19	5.75E-02	cytokine	APBA3, C3, CD83, CX3CL1, CYR61, CYTH3, FOS, IL16, ITPR1, JUN, LOX, MSX2, PLXNB2, PTGS2, TIMP2, TIMP4, TYMP
IL1R1		2.19	2.54E-01	transmembrane receptor	FOS, GFAP, IGF1, MYH11, PTGS2
JAK2		2.19	2.54E-01	kinase	BMP7, EPOR, FOS, HTR2A, PTGS2, SLC1A3
colchicine		2.19	2.42E-01	chemical drug	ATF3, CYP2C9, FOS, JUN, PTGS2
PTGER2		2.20	7.11E-02	g-protein coupled receptor	CFP, CXCR4, HDC, KIF15, PRC1, PTGS2, PXN, RACGAP1, SPP1, TIMP2, TIMP4
Tgf beta		2.21	2.84E-03	group	ASGR2, CDH11, COL1A1, COL1A2, CXCR4, CYR61, FOS, FURIN, IGF1, IGFBP5, JUN, JUNB, KRT1, LCAT, LOX, MAF, MET, NR4A2, PLAT, PTGS2, RORA, SPP1, TAGLN, TGFA, TIMP2, VIM
acetaldehyde		2.22	1.02E-02	chemical - endogenous mammalian	COL1A1, COL1A2, DDR2, FOS, JUN
asoprisnil		2.22	8.43E-02	chemical drug	DPP4, EGFR, IGF1, RBP4, SGK1

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
ketoconazole		2.22	3.37E-02	chemical drug	CYP2C9, GSTA2, HMGCR, TH, UGT1A1
SCARB1		2.22	1.81E-02	transporter	APOB, CX3CL1, HMGCR, PTGS2, SPP1
GNRH1		2.23	1.06E-03	other	CHRNA4, FOS, IGF1, IGFBP5, JUN, JUNB, LHB, NOS1, PLAT, PRKCD, PTGS2
STAT3		2.23	1.92E-02	transcription regulator	A2M, ARG1, BCL2L11, BCL6, CAT, CDON, CFB, CHI3L1, COL1A2, COL3A1, FOS, GFAP, GJA1, HP, HTR2A, IFITM3, IGFBP5, IL11, IRF7, JUNB, LCAT, MAF, MRAS, NDRG1, NFATC2, NR4A2, PAX6, PTGS2, RET, RORA, RPE65, SERPINE2, SGK1, SLC1A3, SLC9A3, SOD2, SP110, T, VIM
CYP51A1		2.24	9.99E-04	enzyme	DHCR24, HMGCR, NSDHL, SQLE, TM7SF2
Smad2/3-Smad4		2.24	3.85E-03	complex	COL1A1, COL1A2, IGFBP5, IRF7, ITGB5
anisomycin		2.28	4.67E-05	chemical - endogenous non-mammalian	ATF3, DUSP1, FOS, GJA1, JUN, LDLR, NR4A1, PPM1D, SDC1, SLC17A6, SLC17A7, SPP1
isoproterenol		2.29	1.22E-03	chemical drug	APLN, ATF3, ATP1A1, BCL2L11, FOS, HS3ST2, JUN, JUNB, MEF2D, NR4A1, PLAGL1, PLP1, PTGS2, SCD, TH, TIMP2, TUBB3, TYRO3, XRCC1
RAF1	1.29	2.29	1.74E-06	kinase	ACOT7, ANXA1, BCL2L11, BCL6, BTG1, CA2, CDC42EP1, CRYAB, CXCR5, DUSP5, E2F1, ELK1, FOS, HDC, HPCAL1, ID3, IER2, ITGB4, ITGB5, JUN, LHB, MET, MGLL, PCSK6, PLAT, PTGS2, RET, SCNN1A, SDC1, SQLE, TIAM1, Tpm2, YPEL5
Pkc(s)		2.34	2.62E-07	group	APLN, BCL2L11, CD55, CD59, COL3A1, CRHR1, CXCR4, CYR61, DBP, DUSP1, EGFR, FOS, GSTA2, HMGCR, JUN, JUNB, KCNJ2, KRT8, LHB, LIPA, NOS1, NR1D1, NR4A1, NR4A2, NR4A3, PER1, PER2, PTGS2, SLC1A2, SPP1, TAC1, TH
SST		2.34	1.43E-02	other	FOS, GHR, IGF1, PRLR, SSTR1, SSTR3, TOX
WNT5A		2.35	1.71E-06	cytokine	BMP6, CAMK4, CAPN1, CCK, CD38, COL1A1, CRYAB, CXCR4, DGKZ, EGFR, ENPP2, FLNA, KIT, LCP1, NR1H3, PTGS2, RET, SDC1, SPP1, VIM

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
miR-124-3p (and other miRNAs w/seed AAGGCAC)		2.35	5.07E-01	mature microRNA	AK2, CD164, CD59, DHCR24, ELOVL1, FA2H, HADH, HEBP2, JAKMIP1, LDLR, NEUROD1, PAPSS2, RASSF5, TMEM109, UHMK1
L-glutamic acid		2.37	1.54E-03	chemical - endogenous mammalian	ACLY, CALB1, DLK1, FOS, GRM5, JUN, JUNB, MAP1B, MGLL, NOS1, PER1, PTGS2, SLC1A2, SORL1
quinolinic acid		2.38	6.35E-08	chemical - endogenous mammalian	CAT, DRD2, FOS, GFAP, GFRA1, HSPA1A/HSPA1B, JUN, JUNB, NTRK3, PDYN, PENK, PTGS2, RET, TAC1, TH
NFATC3		2.38	3.49E-02	transcription regulator	ATF3, COL1A1, CXCR5, FOS, GJA1, JUN, PTGS2, TNNT3
MAP2K5		2.40	1.02E-03	kinase	FOS, JUN, NR4A1, NR4A3, PTGS2, TH
MAP3K1		2.40	8.06E-03	kinase	ATF3, COL3A1, DUSP1, FOS, JUN, LDLR, LOXL3, NOV, PTGS2
STAT1		2.41	1.09E-01	transcription regulator	A2M, ARG1, BCL2L11, BCL6, BTG1, C3, CASP4, CFB, DPP4, FOS, IFITM2, IFITM3, IGF1, IRF7, JUN, Mx1/Mx2, PCDH17, PTGS2, SERPING1, SP110, TRAF2, TYMP
cephaloridine		2.43	1.00E+00	chemical drug	CYP2C9, E2F1, Folh1, GSTM5, HSPA1A/HSPA1B, KCNH1
desmopressin		2.43	5.80E-03	biologic drug	ALB, Anp32a, ATP1A1, FLNA, FOS, HSPA1A/HSPA1B, PPP1R1B, PXN, SLC2A4, SLC43A2, SLC9A3, SPTBN2, ST14
TBK1		2.43	4.06E-01	kinase	ATF7, HDC, IRF7, Mx1/Mx2, PTGS2, SH3BP5
ARHGAP21		2.45	6.04E-02	other	CITED2, HDC, Mx1/Mx2, PLAT, PTGS2, SH3BP5
SEMA7A	1.28	2.45	2.37E-03	transmembrane receptor	COL1A1, COL1A2, COL3A1, ELN, NOV, WISP1
TWIST1		2.48	2.48E-05	transcription regulator	Acan, ADAMTS1, AKT2, AR, CBX2, CCK, CHI3L1, COL1A1, FOS, IGFBP4, IGFBP5, ITGB5, KIT, MET, PAM, PCDH18, PDZD2, SEMA5A, SPP1, TF, TLL2, VCAN, VIM, WISP1

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
POR		2.49	2.48E-06	enzyme	ACLY, ACSL1, Akr1c14, ALDH1A2, ASNS, CSAD, DHCR24, DHCR7, EHHADH, ELOVL1, ELOVL6, FDFT1, FDPS, FGF1, GSTA3, GSTM5, HMGCR, HMGCS1, HSD17B11, INSIG1, LDLR, MAP3K6, MSX2, NSDHL, PDK4, RPS6KA2, SCD, SQLE, TM7SF2, ZMAT4
TGM2		2.50	3.10E-01	enzyme	Acan, BCL6, BTG2, C3, CA2, CFP, CXCR5, EHD1, FAM101B, GJA1, MSX2, RTKN2, SEMA7A, SLC27A2, SP110, SPP1, TNFAIP2
BCR (complex)		2.52	5.40E-02	complex	BCL2L11, BCL6, CCNG2, CXCR4, CXCR5, FOS, IGSF1, JUNB, PTAFR, PTGS2, PTPN22, ZBTB16
methapyrilene		2.52	5.74E-09	chemical drug	A2M, ALB, Apoc1, ASS1, ATF3, BTG2, CAT, CP, CPS1, DAO, EHHADH, ENPP2, GFRA1, GJB1, GRB14, GSK3B, HMGCR, IGF1, ITIH4, LCAT, MAPK6, Mx1/Mx2, NFIB, OPLAH, Ppp1r15a, RXRG, SCD, SEPP1, SLC27A2, Sult1a1
GNRH		2.54	6.82E-05	group	ATF3, DUSP1, FOS, JUN, LHB, PTGS2, SCG2, SGK1
SMAD3		2.57	3.38E-05	transcription regulator	ADORA1, ALB, APOB, BCL2L11, BMP6, CCNG2, COL1A1, COL1A2, COL3A1, CPT1B, ELN, FBLN1, FOS, HP, ID3, ITGB5, JUN, JUNB, LHB, LPAR1, MEF2D, NOV, RHOB, S100A4, SPP1, TAGLN, TF, TGFA, VIM, WISP1
IPMK		2.58	3.68E-04	kinase	CYR61, FLNA, FOS, JUN, JUNB, MYL9, PER1
ARNTL		2.59	1.19E-04	transcription regulator	CRY1, DBP, ELOVL6, HCRTR2, NR1D1, PER1, PER2, PER3, SCD
EGF		2.59	1.34E-05	growth factor	AR, ATF3, ATP2A2, AURKB, BTG2, CDC42EP1, CDH11, COL1A1, COL1A2, COL3A1, CXCR4, CYR61, DPP4, DUSP1, DUSP5, E2F1, EGFR, ELK1, FOS, GATA2, GFAP, GJA1, GPS2, GSK3B, HMGCS1, IER2, IGF1, IGFBP5, JUN, JUNB, NR4A1, NR4A2, NR4A3, PDK4, PER1, PLAGL1, PLAT, PTGS2, RAB5A, RHOB, RPS6KA1, S100A4, SCG2, SDC1, SERPINA1, SLC1A2, SLC2A4, SLC4A7, SPP1, TGFA, TH, TRAF2, VCAN, VIM
HMGA1		2.59	9.09E-03	transcription regulator	DHCR7, ELK1, GHR, HMGCR, ID3, INSIG1, KIT, KITLG, PTGS2
TRAF2	1.35	2.62	9.90E-02	enzyme	AURKB, EGFR, GPR34, NDRG1, PDE8A, PYGL, ST8SIA6, TRAF2

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
DOCK8		2.65	1.66E-01	other	CITED2, HDC, IRF7, Mx1/Mx2, PLAT, PTGS2, SH3BP5
Calcineurin protein(s)		2.66	8.67E-10	complex	ATP2A2, BCL2L11, CAMK2D, CBLB, CPT1B, DUSP1, DUSP14, FOS, ITPR1, KCNQ3, Lin7a, NR4A1, NR4A2, NR4A3, PTGS2, PVALB, SLC8A2, SPP1, TNNI3
MAP2K1		2.67	4.14E-05	kinase	ASGR2, ATF3, BCL2L11, COL1A1, COL1A2, COL3A1, DPP4, DUSP1, DUSP5, ELK1, FOS, FURIN, HDC, ITGB4, JUN, JUP, LDLR, LGALS3, LHB, MAG, OLIG2, PTGS2, SERPINA1, SERPINE2, UBC
norepinephrine		2.67	7.17E-10	chemical - endogenous mammalian	ADRBK2, ATP2A2, CACNA1G, Ccl9, Cd24a, CITED4, CRY1, CRY2, Dos, DUSP1, ELOVL1, ELOVL6, FOS, GPD1, GRID2, GRIN2B, GRM1, HHIP, HS3ST2, MCAM, NAP1L5, NPY1R, NR4A1, NR4A3, PER1, PLAGL1, PTGS2, RBP4, SGK1, SLC17A6, SLC2A4, THRSP, Vof16
KDM5B		2.73	1.86E-02	transcription regulator	DHCR24, DPY19L1, E2F1, EHD1, INSIG1, MCAM, MCM2, NOL3, REEP1, RNF40, SCNN1A, TMEM14A, UBR7
TRH		2.75	4.13E-04	other	ANGPT2, DUSP1, F2, FOS, JUN, JUNB, NR4A1, PRLR, TRHR
IFNAR1		2.77	2.47E-02	transmembrane receptor	ARG1, ATF3, Ccl9, HMGCR, HMGCS1, IRF7, Mx1/Mx2, PLAT, PTGS2, SDC1, SOD2, SQLE, TNFAIP2
INSIG2		2.77	1.44E-06	other	ACLY, ELOVL6, FDFT1, FDPS, HMGCR, INSIG1, LDLR, SCD
SAMSN1		2.83	2.47E-01	other	CITED2, HDC, IRF7, Mx1/Mx2, PLAT, PTGS2, SDC1, SH3BP5
CLDN7		2.90	1.09E-01	other	ASAP1, C3, CA12, CBX2, CLIP4, CX3CL1, F5, LGALS3, NRG1, PRSS23, SLCO2A1, TIMP2
INSIG1	-1.41	2.97	9.74E-04	other	ACLY, CXCR4, DHCR24, DHCR7, DLK1, ELOVL1, ELOVL6, FDFT1, FDPS, HMGCR, HMGCS1, LDLR, LIPA, SCD, SQLE, TM7SF2
glucagon		3.00	2.10E-03	biologic drug	FOS, NR4A1, NR4A2, NR4A3, PPP1R1B, PXN, SLC2A4, SLC43A2, SLC9A3, ST14
Jnk		3.04	1.41E-03	group	A2M, ALDH1A2, APLN, BCL2L11, BTG1, CD83, COL1A1, COL3A1, CXCR4, DUSP1, FOS, GJA1, IGF1, IL11, JUN, LHB, NR4A1, PLAT, PTGS2, SOD2, TRPC3, VCAN

Upstream Regulator	Fold Chg	Activation z-score	p-value of overlap	Molecule Type	Target genes in dataset
cholic acid		3.06	1.11E-03	chemical - endogenous mammalian	DHCR7, EHHADH, FDFT1, HMGCR, IGFBP5, KRT8, LCAT, MGST1, MVP, NR1H3, PLTP, SQLE, TAGLN
nitrofurantoin		3.08	3.77E-07	chemical drug	A2M, ADAMTS1, ALB, Apoc1, ASNS, ASS1, BTG2, C3, CAPN2, CAT, CP, CPS1, EHHADH, GJB1, HMGCR, HMGCS1, HPX, IGF1, ITGB4, ITIH4, LCAT, LGALS3, LOX, MET, PLAT, SDC1, SEPP1, SERPINA1, SLC27A2, SPP1
potassium chloride		3.15	1.31E-12	chemical drug	AMIGO2, ATF3, ATP1A1, ATP2B3, ATP2B4, BCL2L11, BTG2, CALB1, E2F1, FOS, GABRD, ID3, IGFBP5, JUN, LHB, NOS1, NPAS4, NPTX1, NR4A1, NR4A2, NR4A3, PDYN, PTGS2, SLC8A2, SPP1, TH, TP73
cholesterol		3.33	1.52E-05	chemical - endogenous mammalian	ABCA7, ACLY, ACSL1, ADAM11, APOB, ATF3, COL1A1, COL3A1, DHCR7, FDFT1, FDPS, HMGCR, HMGCS1, LDLR, LGALS3, MAP1LC3B, Meis1, MYH11, NR1H3, NR4A1, NR4A2, NR4A3, NSDHL, PLTP, SCD, SLC2A4, SQLE, TCTE1, TM7SF2
bicuculline		3.46	2.22E-07	chemical - endogenous non-mammalian	ATF3, BTG2, CYR61, DUSP1, EGR4, FOS, IER2, JUN, JUNB, NPAS4, NR4A1, NR4A2, PTGS2
dalfampridine		3.61	4.28E-08	chemical drug	ATF3, BTG2, CYR61, DUSP1, EGR4, FOS, IER2, JUN, JUNB, NPAS4, NR4A1, NR4A2, PTGS2
F2	-3.92	3.84	3.49E-05	peptidase	ANGPT2, CD55, CDC42EP1, CLIC1, COL1A1, CXCR4, CYR61, DUSP1, FOS, GABRD, IER2, IGF1, IGFBP4, IGFBP5, JUN, JUNB, MGLL, MYH11, NR4A3, PLAT, PROS1, PTGS2, RHOB, SMTN, TAGLN3, TRPC3