

Supplemental Table 4

Upstream Regulator	Expr Log Ratio	Molecule Type	Predicted Activation State	Activation z-score	p-value of overlap	Target Molecules in Dataset	Mechanistic Network
Upstream Regulator							© 2000-2020 QIAGEN. All rights reserved.
TBX21		transcription regulator		0.205555556	3.37E-04	HAVCR2,ICOS,IL12RB2,TNFSF11	
IL7		cytokine		0.273611111	7.11E-04	DARS2,HAVCR2,ICOS,KLF2,TNFSF11	
IL15		cytokine		0.533333333	1.31E-03	DARS2,HAVCR2,ICOS,IL12RB2,ITGB5,KLF2,TNFSF11,ZFP36	
methylselenic acid		chemical reagent			1.35E-03	ITGB5,NCOA1,RND3,SH3BP5,UGT2B15,UGT2B17	
CD24		other			1.81E-03	BIK,HS2ST1,NRIP1,ZNF302	
CD3 group		group			2.10E-03	HAVCR2,KLF2,PLA2G4C	
NCOR2		transcription regulator			2.58E-03	KLF2,UGT2B15,UGT2B17	
OSMR		transmembrane receptor			3.43E-03	ADGRE1,TNFSF11,ZFP36	
NEUROG1		transcription regulator			3.75E-03	C1orf115,MTARC2,RIPOR2	
DMD		other			3.92E-03	CENPM,CFL2,PSTPIP2,RAP1GAP2,RIPOR2	
CSNK2A1		kinase			4.07E-03	KLF2,ZFP36	
U0126		chemical - kinase inhibitor	-0.692		4.38E-03	ADGRE1,ALDH1L1,ICOS,ITGB5,RND3,SIRPA,TNFSF11,ZFP36	
FANCC		other			4.44E-03	ANKRD6,FHL2,RND3	
diacyl lipopeptide		chemical - other			4.78E-03	TNFSF11	
UBAP1		other			4.78E-03	DEPTOR	
USP49		peptidase			4.78E-03	FKBP4	
ASB11		transcription regulator			4.78E-03	BIK	
CHMP4C		other			4.78E-03	DEPTOR	
CXCR5		G-protein coupled receptor			4.78E-03	TNFSF11	
mir-219		microRNA			4.78E-03	ICOS	
CUL5		ion channel			4.78E-03	BIK	
Cr3+		chemical reagent			4.78E-03	TNFSF11	
ZBTB16 (PLZF)		transcription regulator	Activated	2.000	4.97E-03	CD180,ICOS,KLF2,TNFSF11	
IL27		cytokine		0.502083333	5.35E-03	ADGRE1,ICOS,IL12RB2,TNFSF11	
SFTPA1		transporter			6.47E-03	AMOT,KLF2,ST3GAL1	
arotinoid acid		chemical toxicant			6.84E-03	FOLR2,TNFSF11	
ESR1		ligand-dependent nuclear receptor	-1.320		7.11E-03	CENPM,CFL2,FKBP4,HNRNPDI,ICA1,KLHL13,LATS2,NCOA1,PLA2G4C,RND3	
MAP2K2		kinase			7.36E-03	ALDH1L1,ICOS	
LTF		peptidase			7.36E-03	SKP1,TNFSF11	
CD47		transmembrane receptor			7.90E-03	IL12RB2,TNFSF11	
vismodegib		chemical drug			8.46E-03	ADGRE1,TNFSF11	
PRKDC		kinase			9.04E-03	UGT2B15,UGT2B17	
TCF3		transcription regulator	-1.342		9.12E-03	ARHGEF18,BIK,ICOS,INTS13,KLF2,RIPOR2	
ipilimumab		biologic drug			9.55E-03	ICOS	
FBLIM1		other			9.55E-03	TNFSF11	
STAM		other			9.55E-03	DEPTOR	
BAZ1A		other			9.55E-03	TNFSF11	
UBE2M		enzyme			9.55E-03	ETFA	
TRIM54		other			9.55E-03	FHL2	
potassium superoxide		chemical toxicant			9.55E-03	IL12RB2	
ADAM10		peptidase			1.04E-02	ABAT,ICOS,TSPAN15	
PDPK1		kinase			1.09E-02	KLF2,TNFSF11	
PD 0325901		chemical drug			1.15E-02	DEPTOR,KLF2	
HDL-cholesterol		complex			1.35E-02	DEPTOR,HNRNPDI	
CSF2		cytokine	-0.563		1.38E-02	CD180,FOLR2,HOXB4,ICOS,ITGB5,RIPOR2,ZFP36	
TCF12		transcription regulator			1.40E-02	ICOS,INTS13,KLF2	
des-Arg(10)-kallidin		chemical reagent			1.43E-02	TNFSF11	
ITGBL1		other			1.43E-02	TNFSF11	
YY1AP1		other			1.43E-02	LATS2	
methylprednisolone		chemical drug		0.295833333	1.44E-02	ABAT,FKBP4,ITGB5,RND3,SIRPA,UGT2B17,ZFP36	
F7		peptidase			1.65E-02	RND3,ZFP36	
IL12 (complex)		complex		0.680555556	1.78E-02	ADGRE1,HAVCR2,ICOS,IL12RB2	
KDM1A		enzyme			1.78E-02	IQQAP2,KLF2,LATS2,ZBTB20	
LRP4		other			1.90E-02	TNFSF11	
LBX1		transcription regulator			1.90E-02	FHL2	
SIRT4		enzyme			1.90E-02	ADGRE1	
AKR1C3		enzyme			1.90E-02	FKBP4	
nintedanib		chemical drug			1.90E-02	RND3	
NEDD8		enzyme			1.90E-02	ETFA	
CHRM4		G-protein coupled receptor			1.90E-02	ITGB5	
GGT1		enzyme			1.90E-02	TNFSF11	
PHC1		transcription regulator			1.90E-02	HOXB4	
SIX4		transcription regulator			1.90E-02	DEPTOR	
selinexor		chemical drug			1.90E-02	HOXB4	
elcatonin		biologic drug			1.90E-02	TNFSF11	
vitamin K		chemical - endogenous mammalian			1.90E-02	TNFSF11	
DP-001		chemical drug			1.90E-02	TNFSF11	
paraquat		chemical toxicant			1.95E-02	ADGRE1,KLF2,UNC13C	
IL12A		cytokine			2.05E-02	ICOS,IL12RB2	
ICOS	0.857638889	transmembrane receptor			2.05E-02	ICOS,KLF2	

cyclosporin A	biologic drug	0.092	2.12E-02	HS2T1,ICOS,IL12RB2,IQGAP2,MARF1,TNFSF11
IL23	complex		2.13E-02	ICOS,TNFSF11
IgG	complex	0.000	2.17E-02	FOLR2,IL12RB2,RND3,ZFP36
MIR17HG	other		2.22E-02	HEG1,HOXB4,KLF2
IL4	cytokine	0.6201388889	2.23E-02	ADGRE1,CPFB3,DARS2,ICOS,IL12RB2,PLA2G4C,SAMSN1,SIRPA,TNFSF11,ZFP36
FGF1	growth factor		2.27E-02	ADGRE1,UGT2B15,UGT2B17
13,14-dihydro-15-ketoprostaglandin D2	chemical - endogenous mammalian		2.37E-02	TNFSF11
olmesartan	chemical drug		2.37E-02	TNFSF11
FAF1	other		2.37E-02	TNFSF11
PPP1R13B	phosphatase		2.37E-02	LATS2
N-lauroyl-L-phenylalanine	chemical reagent		2.37E-02	KLF2
UBA3	enzyme		2.37E-02	ETFA
perfluorodecanoic acid	chemical toxicant		2.37E-02	TSPO
fish oils	chemical drug		2.39E-02	NCOA1,NRIP1
galactosylceramide-alpha	chemical reagent		2.57E-02	ICOS,IL12RB2
FHL2	transcription regulator	0.2604166667	2.57E-02	ADGRE1,FHL2
WBP2	transcription regulator		2.76E-02	ALPK2,SLC10A3,TEF
Am 580	chemical toxicant		2.76E-02	FOLR2,TNFSF11
CD28	transmembrane receptor	0.26875	2.83E-02	HAVCR2,ICOS,IL12RB2,KLF2,TNFSF11
SERCA	group		2.84E-02	ZFP36
MN1	other		2.84E-02	TNFSF11
SNHG15	other		2.84E-02	KLF2
CD27	transmembrane receptor		2.84E-02	BIK
HOXB1	transcription regulator		2.84E-02	HOXB4
CXCL5	cytokine		2.84E-02	TNFSF11
mir-28	microRNA		2.84E-02	HAVCR2
F13A1	enzyme		2.84E-02	TNFSF11
leukotriene D4	chemical - endogenous mammalian		2.86E-02	KLF2,ZFP36
pyridaben	chemical toxicant		2.86E-02	KLF2,UNC13C
FOSL2	transcription regulator		2.86E-02	FOLR2,UGT2B15
IFNA2	cytokine		2.94E-02	ADGRE1,IL12RB2,RIPOR2,SAMSN1
EBI3	cytokine		2.95E-02	HAVCR2,IL12RB2
di(2-ethylhexyl) phthalate	chemical toxicant		2.95E-02	TSPO,ZFP36
MSC	transcription regulator		3.05E-02	FCRL5,HAVCR2
HNF1A	transcription regulator		3.07E-02	FRK,TEF,TSC22D2,UGT2B15,UGT2B17,ZBTB20
RARA	ligand-dependent nuclear receptor	0.000	3.07E-02	CENPM,FOLR2,HNRNPD,HOXB4,IL12RB2
TICAM1	other		3.19E-02	CCNL2,PSTPIP2,TNFSF11
ZAP70	kinase		3.25E-02	ETFA,HS2T1
triamcinolone hexacetonide	chemical drug		3.30E-02	TNFSF11
PRCP	peptidase		3.30E-02	KLF2
PDCD10	other		3.30E-02	KLF2
ZNF521	transcription regulator		3.30E-02	TNFSF11
SDC4	other		3.30E-02	KLF2
SF3B2	other		3.30E-02	HOXB4
HIVEP3	transcription regulator		3.30E-02	TNFSF11
ITGB8	other		3.30E-02	ITGB5
PHC2	other		3.30E-02	HOXB4
MFAP2	other		3.30E-02	TNFSF11
SLC19A1	transporter		3.30E-02	SKP1
CB-5083	chemical drug		3.30E-02	BIK
diazepam	chemical drug		3.30E-02	TSPO
ASARM-PO4	chemical reagent		3.30E-02	TNFSF11
phosphatidic acid	chemical - endogenous mammalian		3.30E-02	TNFSF11
TCR	complex	0.19375	3.39E-02	ICOS,IL12RB2,KLF2,MARF1,TNFSF11
PTF1A	transcription regulator		3.46E-02	ABAT,LAMP5
CSF1	cytokine		3.47E-02	FHL2,FOLR2,ITGB5,KLF2
KITLG	growth factor		3.47E-02	BIK,FRK,HOXB4,SAMSN1
IL6ST	transmembrane receptor		3.67E-02	ICOS,TNFSF11
ATP5IF1	other		3.67E-02	ACADSB,ETFA
maneb	chemical toxicant		3.67E-02	KLF2,UNC13C
Calcineurin B	group		3.76E-02	ICOS
RC3H2	enzyme		3.76E-02	ICOS
parathyroid hormone-related protein	biologic drug		3.76E-02	TNFSF11
TTN	kinase		3.76E-02	FHL2
APCS	other		3.76E-02	SIRPA
FBXO2	enzyme		3.76E-02	SKP1
LY86	other		3.76E-02	CD180
PIWIL2	enzyme		3.76E-02	LATS2
filgotinib	chemical drug		3.76E-02	TNFSF11
TNRC6A	other		3.76E-02	LATS2
PBX2	transcription regulator		3.76E-02	UGT2B17
PCBP1	translation regulator		3.76E-02	HNRNPD

MM-401	chemical reagent	3.76E-02	DEPTOR
RABL6	other	3.99E-02	ABAT,BIK
CD3E	transmembrane receptor	3.99E-02	ICOS,TNFSF11
TRIM28	transcription regulator	4.10E-02	KLF2,ZNF302
Igm	complex	4.21E-02	BIK,SAMSN1
MYD88	other	4.23E-02	CCNL2,PSTPIP2,SH3BP5,TNFSF11
abatacept	biologic drug	4.23E-02	ICOS
TGFBR	group	4.23E-02	TNFSF11
CK2	complex	4.23E-02	ZFP36
TFCP2L1	transcription regulator	4.23E-02	SIRPA
CPEB4	other	4.23E-02	ZBTB20
GUSB	enzyme	4.23E-02	EXOC4
PANDAR	other	4.23E-02	BIK
cyclopentenone	chemical reagent	4.23E-02	TNFSF11
CTLA4	transmembrane receptor	4.32E-02	ICOS,IL12RB2
PRKAG3	other	4.55E-02	KLF2,NRIP1,ZFP36
FOXA1	transcription regulator	4.55E-02	FKBP4,NRIP1,UGT2B17
ZFPM1	transcription regulator	4.67E-02	IL12RB2,RGS13
MEF2D	transcription regulator	4.67E-02	KLF2,ZFP36
ZFAS1	other	4.68E-02	KLF2
IL20	cytokine	4.68E-02	TNFSF11
miR-346 (and other miRNAs w/seed GUCUGCC)	mature microRNA	4.68E-02	NRIP1
NCF4	enzyme	4.68E-02	ST3GAL1
HOXB3	transcription regulator	4.68E-02	HOXB4
PHEX	peptidase	4.68E-02	TNFSF11
PIM3	kinase	4.68E-02	IL12RB2
CXCL13	cytokine	4.68E-02	TNFSF11
PCBP2	other	4.68E-02	HNRNPD
gossypol	chemical drug	4.68E-02	NCOA1
KDM8	enzyme	4.78E-02	UGT2B15,UGT2B17
PAX7	transcription regulator	4.78E-02	DEPTOR,FRK
E. coli B4 lipopolysaccharide	chemical toxicant	4.81E-02	BIK,SAMSN1,ST3GAL1,TSPO
raloxifene	chemical drug	4.90E-02	BIK,NCOA1,TNFSF11
NOD2	other	4.90E-02	KLF2,TNFSF11