

#Boolean rules for the T CD4 cell activation network#

Targets, factors

#General Core Inputs#

CD8086, CD8086

TCR, TCR & ! CTLA4dim  
CD28, CD8086 & ! CTLA4dim  
AP1, rasGTPr  
CD25, IL2G & ! CTLA4dim  
IL2G, NFAT & AP1 & ! NDRG1 & ! RORGT & ! IL21e & ! IL21 | NFKB & NFAT & AP1 & ! NDRG1  
& ! RORGT & ! IL21e & ! IL21 | STAT5 & NFAT & AP1 & ! NDRG1 & ! RORGT & ! IL21e & !  
IL21  
ZAP70, (TCR & LCK) & ! CTLA4dim  
STAT5, CD25 & ! CTLA4dim  
NFAT, CA | CA & AKT  
NFKB, (PKC) | (PKC & PDK1)  
AKT, (CD28 & ! CTLA4dim) | PDK1  
CTLA4, (IL2G & ZAP70)  
CTLA4dim, (CTLA4 & ! CD8086) | (FOXP3 & TGFB)  
BCL2, AKT  
NDRG1, NFAT & ! AKT  
DAG, (PLC) | (AKT & PLC)  
SOS, CD28 | CD28 & CD25  
rasGTPr, LAT & SOS & DAG  
LCK, TCR & ! CTLA4dim  
PDK1, CD25 | CD28  
LAT, ZAP70  
PLC, ZAP70  
PIP2, PLC  
PIP3, PIP2  
CA, PIP3  
PKC, DAG

#Metabolism#

MTOR, CD25 | AKT  
MTORC1, MTOR & ! AMPK  
MTORC2, MTOR & AMPK | MTOR & IL4e  
LKB1, AKT & AMPATPratio  
AMPK, (LKB1 & ! MTORC1) | (CA & AMPATPratio & ! MTORC1) | (AKT & AMPATPratio & !  
MTORC1) | FOXP3  
Glycolysis, MTORC1 & ! AMPATPratio  
OXPHOS, AMPK  
AMPATPratio, Glycolysis & ! OXPHOS

#Phenotype inputs#

IFNGe, IFNGe  
IL12e, IL12e  
#Phenotype nodes#  
TBET, (MTORC1 & IL12e & IFNGe & NFkB & NFAT & AP1) & !IL4 & !IL10 & !GATA3  
IFNG, (TBET & AP1 & NFAT)

#Phenotype inputs#

IL4e, IL4e  
#Phenotype nodes#  
GATA3, ((MTORC2 & IL4e & STAT5 & NFAT) & (!TBET & !TGFB & !IFNG)  
IL4, (GATA3 & !TBET) & !IFNG

#Phenotype inputs#

TGFBe, TGFBe  
IL10e, IL10e  
#Phenotype nodes#  
FOXP3, ((NFAT & STAT5 & AP1 & IL2G & TGFBe & IL10e) | (IL10 & TGFBe & IL10e & CTLA4)  
| (TGFB & TGFBe)) & ! IFNG  
IL10, FOXP3 & TGFBe  
TGFB, FOXP3

#Phenotype inputs#

IL21e, IL21e  
TGFBe, TGFBe  
#Phenotype nodes#  
RORGT, (CD28 & MTORC1 & IL21e & TGFBe) & ! (TBET | FOXP3 | GATA3)  
IL21, ( IL21e | RORGT ) & ! (IFNG | IL4 | IL10 )  
IL17, RORGT