Apoptosis

INPUT 3: XDNAdamage == 0, XDNAdamage\_high == 1, XIGF1 == 0, XlowNutrition == 1

OUTPUT 3: XATG13 == 1, XATG5 == 1, XATM/ATR == 0, XATM/ATR\_2 == 1, XCASP3 == 1, XE2F1 == 0, XEIF4EBP1 == 1, XIL1B == 0, XIL6 == 0, XMTOR == 0, XNFKB1 == 0, XRB1 == 1, XS6K1 == 0, XTNF == 0, XTP53 == 0, XTP53\_s46 == 1, XULK1 == 1

Extra: XADP/ATP == 1, XAMP/ATP == 1, XAMPK == 1, XATP == 0, XBAX == 1, XBCL2 == 0, XCASP9 == 1, XCDK4 == 0, XNFKBIE == 1, XSLC2A4 == 1

Unit step function: H(x); W > 0

H(WATM/ATR\_2 - WRB1 - WPIK3CA \* XPIK3CA + bABL1) = XABL1

WlowNutrition +bADP/ATP > 0

H(WPDK1 \* XPDK1 – WPPARGC1A \* XPPARGC1A + bAKT1) = XAKT1

WlowNutrition + bAMP/ATP > 0

WADP/ATP + WAMP/ATP + WlowNutrition + bAMPK > 0

WULK1 + bATG13 > 0

WULK1 + bATG5 > 0

WFOXO3 \* XFOXO3 + bATM/ATR < 0

WDNAdamage\_high + bATM/ATR\_2 > 0

bATP < 0

WTP53\_s46 - WSIRT1 \* XSIRT1 – WAKT1 \* XAKT1 + bBAX > 0

–WFOXO3 \* XFOXO3 + WAKT1 \* XAKT1 + bBCL2 < 0

WBAX + WCASP9 + bCASP3 > 0

WABL1 \* XABL1 + WBAX – WAKT1 \* XAKT1 + bCASP9 > 0

-WCDKN1A \* XCDKN1A – WCDKN2A \* XCDKN2A + bCDK4 < 0

H(WFOXO3 \* XFOXO3 – WAKT1 \* XAKT1 + bCDKN1A) = XCDKN1A

H(WMAPK14 \* XMAPK14 – WAKT1 \* XAKT1 + bCDKN2A) = XCDKN2A

–WRB1 + bE2F1 < 0

bEIF4EBP1 > 0

H(WMAPK14 \* XMAPK14 + WAMPK + WSIRT1 \* XSIRT1 – WSGK1 \* XSGK1 – WMDM2 \* XMDM2 – WAKT1 \* XAKT1 + bFOXO3) = XFOXO3

H(WFOXO3 \* XFOXO3 + bG6PC) = XG6PC

WSLC2A4 + bGlucose > 0

WG6PC \* XG6PC + WGlucose + bGlycolysis < 0

WATM/ATR\_2 + bHIPK2 > 0

-WTP53\_s46 + bIGF1R < 0

WPDK1 \* XPDK1 + WAKT1 \* XAKT1 – WNFKBIE + bIKBKB < 0

bIL1B < 0

bIL6 < 0

-WlowNutrition + bINSR < 0

bIRS1 < 0

bKRAS < 0

H(WROS \* XROS + bMAP2K3/MAP2K6) = XMAP2K3/MAP2K6

bMAPK1 < 0

H(WMAP2K3/MAP2K6 \* XMAP2K3/MAP2K6 + bMAPK14) = XMAPK14

H(WAKT1 \* XAKT1 + WTP53\_s46 – WABL1 \* XABL1 – WCDKN2A \* XCDKN2A + bMDM2) = XMDM2

WAKT1 \* XAKT1 + WROS \* XROS + WRHEB \* XRHEB – WABL1 \* XABL1 – WAMPK + bMTOR < 0

WAMPK + bNAD+ > 0

-WSIRT1 \* XSIRT1 – WNFKBIE + bNFKB1 < 0

bNFKBIE > 0

H(WPIK3CA \* XPIK3CA – WPTEN \* XPTEN + bPDK1) = XPDK1

bPIK3CA < 0

H(WAMPK + WSIRT1 \* XSIRT1 + bPPARGC1A) = XPPARGC1A

H(WTP53\_s46 – WAKT1 \* XAKT1 + bPTEN) = XPTEN

-WMDM2 \* XMDM2 + bRB1 > 0

H(-WTSC2 \* XTSC2 + bRHEB) = XRHEB

H(-WSOD2 \* XSOD2 + bROS) = XROS

bS6K1 < 0

H(WPDK1 \* XPDK1 +bSGK1) = XSGK1

H(WFOXO3 \* XFOXO3 + WNAD+ +bSIRT1) = XSIRT1

WAMPK + WAKT1 \* XAKT1 + WPPARGC1A \* XPPARGC1A + bSLC2A4 > 0

H(WFOXO3 \* XFOXO3 + bSOD2) = XSOD2

bTCA cycle < 0

bTNF < 0

WAMPK + WMAPK14 \* XMAPK14 – WSIRT1 \* XSIRT1 – WMDM2 \* XMDM2 + bTP53 < 0

WHIPK2 + WMAPK14 \* XMAPK14 – WSIRT1 \* XSIRT1 – WMDM2 \* XMDM2 +bTP53\_s46 > 0

H(WAMPK + WSIRT1 \* XSIRT1 – WAKT1 \* XAKT1 + bTSC2) = XTSC2

-WAMPK + bULK1 > 0

Derived

XHIPK2 == 1

XIGF1R == 0

XINSR == 0

XKRAS == 0

XMAPK1 == 0

XNAD+ == 1

XIKBKB == 0

XGlucose == 1

XGlycolysis == 0

XTCA cycle == 0

XIRS1 == 0