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

OUTPUT 1: XATG13 == 0, XATG5 == 0, XBCL2 == 1, XCASP3 == 0, XCDKN2A == 1, XEIF4EBP1 == 0, XIL1B == 1, XIL6 == 1, XMTOR == 1, XNFKB1 == 1, XS6K1 == 1, XTNF == 1, XULK1 == 0

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

H(-WRB1 \* XRB1 - WPIK3CA \* XPIK3CA + bABL1) = XABL1

H(-WATP \* XATP +bADP/ATP) = XADP/ATP

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

H(WATP \* XATP + bAMP/ATP) = XAMP/ATP

H(WADP/ATP \* XADP/ATP + WAMP/ATP \* XAMP/ATP + bAMPK) = XAMPK

bATG13 < 0

bATG5 < 0

H(WDNAdamage + WFOXO3 \* XFOXO3 +bATM/ATR) = XATM/ATR

bATM/ATR\_2 < 0

H(WGlycolysis \* XGlycolysis + WTCA cycle \* XTCA cycle + bATP) = XATP

H(WTP53\_s46 \* XTP53\_s46 - WSIRT1 \* XSIRT1 - WBCL2 – WAKT1 \* XAKT1 + bBAX) = XBAX

WMAPK1 \* XMAPK1 + WNFKB1 – WFOXO3 \* XFOXO3 + WAKT1 \* XAKT1 + bBCL2 > 0

WBAX \* XBAX + WCASP9 \* XCASP9 + bCASP3 < 0

H(WABL1 \* XABL1 + WBAX \* XBAX – WAKT1 \* XAKT1 – WMAPK1 \* XMAPK1 + bCASP9) = XCASP9

H(-WCDKN1A \* XCDKN1A – WCDKN2A + bCDK4) = XCDK4

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

WMAPK14 \* XMAPK14 – WAKT1 \* XAKT1 + bCDKN2A > 0

WROS + bDNAdamage > 0

bDNAdamage\_high < 0

H(WATM/ATR \* XATM/ATR – WRB1 \* XRB1 + bE2F1) = XE2F1

-WMAPK1 \* XMAPK1 – WMTOR + bEIF4EBP1 < 0

H(WMAPK14 \* XMAPK14 + WAMPK \* XAMPK + WSIRT1 \* XSIRT1 – WMAPK1 \* XMAPK1 – WSGK1 \* XSGK1 – WMDM2 \* XMDM2 – WAKT1 \* XAKT1 + bFOXO3) = XFOXO3

H(WFOXO3 \* XFOXO3 + bG6PC) = XG6PC

H(WSLC2A4 \* XSLC2A4 + bGlucose) = XGlucose

H(WG6PC \* XG6PC + WGlucose \* XGlucose – WNFKB1 + bGlycolysis) = XGlycolysis

bHIPK2 < 0

bIGF1 > 0

H(WIGF1 – WTP53\_s46 \* XTP53\_s46 + bIGF1R) = XIGF1R

H(WPDK1 \* XPDK1 + WAKT1 \* XAKT1 – WNFKBIE \* XNFKBIE + bIKBKB) = XIKBKB

WNFKB1 + bIL1B > 0

WNFKB1 + bIL6 > 0

bINSR > 0

H(WINSR + WIGF1R \* XIGF1R – WS6K1 – WIKBKB \* XIKBKB + bIRS1) = XIRS1

H(WINSR + WIGF1R \* XIGF1R + bKRAS) = XKRAS

H(WDNAdamage + WROS + bMAP2K3/MAP2K6) = XMAP2K3/MAP2K6

H(WKRAS \* XKRAS + WNFKB1 + bMAPK1) = XMAPK1

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

H(WAKT1 \* XAKT1 + WTP53\_s46 \* XTP53\_s46 – WABL1 \* XABL1 – WCDKN2A – WS6K1 + bMDM2) = XMDM2

WAKT1 \* XATK1 + WROS + WRHEB \* XRHEB – WABL1 \* XABL1 – WAMPK \* XAMPK + bMTOR > 0

H(WAMPK \* XAMPK + bNAD+) = XNAD+

-WSIRT1 \* XSIRT1 – WNFKBIE \* XNFKBIE + bNFKB1 > 0

H(WNFKB1 – WIKBKB \* XIKBKB + bNFKBIE) = XNFKBIE

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

H(WKRAS \* XKRAS + WIRS1 \* XIRS1 + bPIK3CA) = XPIK3CA

H(WE2F1 \* XE2F1 + WAMPK \* XAMPK + WSIRT1 \* XSIRT1 + WMTOR + bPPARGC1A) = XPPARGC1A

H(WTP53\_s46 \* XTP53\_s46 – WAKT1 \* XAKT1 – WIKBKB \* XIKBKB + bPTEN) = XPTEN

H(-WCDK4 \* XCDK4 – WMDM2 \* XMDM2 + bRB1) = XRB1

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

WDNAdamage + WTCA cycle \* XTCA cycle – WSOD2 \* XSOD2 + bROS > 0

WMTOR + bS6K1 > 0

H(WPDK1 \* XPDK1 +bSGK1) = XSGK1

H(WFOXO3 \* XFOXO3 + WNAD+ \* XNAD+ - WE2F1 \* XE2F1 +bSIRT1) = XSIRT1

H(WAMPK \* XAMPK + WAKT1 \* XAKT1 + WPPARGC1A \* XPPARGC1A + bSLC2A4) = XSLC2A4

H(WFOXO3 \* XFOXO3 + bSOD2) = XSOD2

H(WGlycolysis \* XGlycolysis + bTCA cycle) = XTCA cycle

WNFKB1 + bTNF > 0

WAMPK \* XAMPK + WATM/ATR \* XATM/ATR + WMAPK14 \* XMAPK14 – WSIRT1 \* XSIRT1 – WMDM2 \* XMDM2 + bTP53 < 0

H(WMAPK14 \* XMAPK14 – WSIRT1 \* XSIRT1 – WMDM2 \* XMDM2 +bTP53\_s46) = XTP53\_s46

H(WAMPK \* XAMPK + WSIRT1 \* XSIRT1 – WAKT1 \* XAKT1 – WMAPK1 \* XMAPK1 + bTSC2) = XTSC2

-WAMPK \* XAMPK – WMTOR + bULK1 < 0

blowNutrition < 0

Derived

XTP53 == 0

XATM/ATR\_2 == 0

XINSR == 1

XROS == 1

XHIPK2 == 0