Senescence

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

OUTPUT 1: XATG13 == 0, XATG5 == 0, XATM/ATR == 1, XATM/ATR\_2 == 0, XBCL2 == 1, XCASP3 == 0, XCDKN1A == 1, XCDKN2A == 1, XE2F1 == 0, XEIF4EBP1 == 0, XIL1B == 1, XIL6 == 1, XMTOR == 1, XNFKB1 == 1, XRB1 == 1, XS6K1 == 1, XTNF == 1, XTP53 == 1, XTP53\_s46 == 0, XULK1 == 0

Extra: XADP/ATP == 0, XAMP/ATP == 0, XAMPK == 0, XATP == 1, XCASP9 == 0, XNFKBIE == 0

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

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

-WATP +bADP/ATP < 0

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

-WATP + bAMP/ATP < 0

WTP53 + bAMPK < 0

bATG13 < 0

bATG5 < 0

WDNAdamage + WFOXO3 \* XFOXO3 + bATM/ATR > 0

bATM/ATR\_2 < 0

WGlycolysis + WTCA cycle + bATP > 0

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

WMAPK1 + WNFKB1 – WTP53 – WFOXO3 \* XFOXO3 + WAKT1 \* XAKT1 + bBCL2 > 0

WBAX \* XBAX + bCASP3 < 0

WABL1 \* XABL1 + WBAX \* XBAX – WAKT1 \* XAKT1 – WMAPK1 + bCASP9 < 0

-WCDKN1A – WCDKN2A + bCDK4 < 0

WTP53 + WFOXO3 \* XFOXO3 – WAKT1 \* XAKT1 + bCDKN1A > 0

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

WATM/ATR – WRB1 + bE2F1 < 0

-WMAPK1 – WMTOR + bEIF4EBP1 < 0

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

H(WFOXO3 \* XFOXO3 + bG6PC) = XG6PC

H(WSLC2A4 \* XSLC2A4 + bGlucose) = XGlucose

WG6PC \* XG6PC + WGlucose \* XGlucose – WNFKB1 + bGlycolysis > 0

bHIPK2 < 0

WIGF1 – WTP53 + bIGF1R > 0

WPDK1 \* XPDK1 + WAKT1 \* XAKT1 + bIKBKB > 0

WNFKB1 + bIL1B > 0

WNFKB1 + bIL6 > 0

bINSR > 0

H(WINSR + WIGF1R – WS6K1 – WIKBKB + bIRS1) = XIRS1

WINSR + WIGF1R + bKRAS > 0

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

WKRAS + WNFKB1 + bMAPK1 > 0

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

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

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

bNAD+ < 0

-WSIRT1 \* XSIRT1 + bNFKB1 > 0

WNFKB1 – WIKBKB + bNFKBIE < 0

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

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

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

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

-WMDM2 \* XMDM2 + bRB1 > 0

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

H(WDNAdamage + WTCA cycle – WSOD2 \* XSOD2 + bROS) = XROS

WMTOR + bS6K1 > 0

H(WPDK1 \* XPDK1 + WTP53 +bSGK1) = XSGK1

H(WFOXO3 \* XFOXO3 – WTP53 +bSIRT1) = XSIRT1

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

H(WFOXO3 \* XFOXO3 + bSOD2) = XSOD2

WGlycolysis + bTCA cycle > 0

WNFKB1 + bTNF > 0

WATM/ATR + WMAPK14 \* XMAPK14 – WSIRT1 \* XSIRT1 – WMDM2 \* XMDM2 + bTP53 > 0

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

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

-WMTOR + bULK1 < 0

Derived

XHIPK2 == 0

XIGF1R == 1

XINSR == 1

XKRAS == 1

XMAPK1 == 1

XCDK4 == 0

XNAD+ == 0

XIKBKB == 1

XGlycolysis == 1

XTCA cycle == 1