

Supplementary Tables to ‘ON/OFF and Beyond - a Boolean Model of Apoptosis’

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Remark on used notation in the Supplementary Tables:

The interactions of the model are given in the notation of the CellNetAnalyzer.

- A logical NOT is represented by “!”.
- A logical AND is represented by “+”.
- The value of a node precedes the name of the node.
- The requirements of an interaction on the left side and its result on the right side are separated by “=”.

Table S1. Abbreviations, number of used discrete levels and descriptions of the network nodes

name of node	levels	trivial name or description
A20	1	Inhibitor A20
AdCy	1	Adenylate cyclase
Apaf-1	1	Apoptotic protease-activating factor 1
apopto	1	Apoptosome complex
apoptosis	1	Apoptosis output node
Bad	1	Bcl-xL/Bcl-2 associated death promoter
Bad-14-3-3	1	Heterodimer of Bad and 14-3-3
Bax	1	Bcl-2-associated X protein
Bcl-xL	1	B-cell lymphoma x-Large
Bid	1	Bcl-2 Interacting Domain
BIR1-2	1	Baculovirus inhibitory repeats 1 and 2
C3*-c-IAP	1	Complex of activated caspase 3 and c-IAP
C3*p17	2	P17 form of activated caspase 3
C3*p20	2	P20 form of activated caspase 3
C3*-XIAP	1	Heterodimer of activated caspase 3 and XIAP
C6	1	Caspase 6
C8*	2	Activated form of caspase 8
C8*-comp2	1	Heterodimer of activated caspase 8 and complex2
C8*-DISC*	2	Heterodimer of activated caspase 8 and the DISC
C8*-FLIP	1	Heterodimer of activated caspase 8 and FLIP
C9*	1	Activated form of caspase 9
CAD	1	Caspase activated DNase
cAMP	1	Cyclic adenosine monophosphate
c-IAP	2	Cellular inhibitor of apoptosis protein
comp1	1	TNFR-1 signaling complex1
comp1-IKK*	1	Complex of complex1 and activated IKK
comp2	1	TNFR-1 signaling complex 2
cyt-c	1	Cytochrome c
DISC*	2	Activated death inducing signalling complex
ERK1/2	1	Extracellular signal-regulated kinase 1/2
FADD	1	Fas associated death domain
Fas	2	Fas receptor
FasL	2	Fas ligand
FLIP	2	Cellular FLICE inhibitory protein
Gelsolin	1	Gelsolin
Glucagon	1	Glucagon
GR	1	Glucagon receptor
Grb2-SOS	1	Heterodimer of growth factor receptor bound protein 2 guanine-nucleotide exchange releasing factor Son of sevenless
GSK-3	1	Glycogen synthase kinase 3
Housekeeping	1	Housekeeping function
ICAD	1	Inhibitor of caspase activated DNase
I-kBa	1	Inhibitor of κB α
I-kBb	1	Inhibitor of κB β

I-kBe	1	Inhibitor of κB ε
IKK*	1	Activated form of Ikappa kinase
IKKdeact	1	Inactive IKK form
IL-1	1	Interleukin-1β
Insulin	1	Insulin
IR	1	Insulin receptor
IRS	1	Unphosphorylated Insulin receptor substrate
IRS-P	1	Tyrosine phosphorylated Insulin receptor substrate
IRS-P2	1	Serine phosphorylated insulin receptor substrate
JNK	1	C-Jun N-terminal kinase
MEK	1	MAP-Erk kinase
NF-κB	1	Nuclear factor kB
NIK	1	NF-κB-inducing kinase
P	1	Unknown factor in type 2 apoptosis
P14-3-3	1	14-3-3 protein
p38	1	<i>p38 MAP Kinase</i>
Pak1	1	<i>P21-Activating Kinase 1</i>
PARP	1	Poly-ADP-ribose polymerase
PDK1	1	Pleckstrin homology (PH) domain containing serine protease
PI3K	1	Phosphoinositide-3'-OH kinase
PIP3	1	Phosphatidylinositol (3,4,5)-trisphosphate
PKA	1	Protein kinase B
PKB	1	Protein kinase B
PKC	1	Protein kinase C
proC8	1	Pro-caspase 8
Rac	1	Small GTPase Rac
Raf	1	Small GTPase Raf-1
Ras	1	Small GTPase Ras
RIP	1	Receptor associated receptor kinase 1
RIP-deubi	1	Deubiquitinated form of RIP
Shc	1	Src Homology 2 Domain Containing
Smac	1	Second mitochondrial derived activator of apoptosis
smac-mimetics	1	Smac-mimetics
smac-XIAP	1	Heterodimer of smac and XIAP
T2R	1	Type 2 receptor
T2RL	1	Type 2 receptor ligand
tBid	1	Truncated Bid
TNF	1	Tumor necrosis factor α
TNFR-1	1	TNF receptor 1
TRADD	1	TNF receptor associated-protein with death domain
TRAF2	1	TNF receptor associated protein 2
UV	2	UVB irradiation
XIAP	2	X-linked inhibitor of apoptosis

Table S2. List of all logical equations of the model (inputs/outputs excluded)

interaction	timescale τ	reference	organism
housekeeping = FADD	0	Harper <i>et al</i> , 2003, Muzio <i>et al</i> , 1998	<i>Homo sapiens</i>
housekeeping = IKKdeact	0	Devin <i>et al</i> , 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
housekeeping = IRS	0	reviewed by White 1998	<i>Homo sapiens</i> , <i>Mus musculus</i>
housekeeping = P14-3-3	0	Masters <i>et al</i> , 2001	<i>Homo sapiens</i>
housekeeping = proC8	0	Lavrik <i>et al</i> , 2003	<i>Homo sapiens</i>
housekeeping = RIP	0	Wang <i>et al</i> , 2008, Devin <i>et al</i> , 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
housekeeping = TRADD	0	Hsu <i>et al</i> , 1995, Hsu <i>et al</i> , 1996	<i>Homo sapiens</i>
comp1 + IKKdeact = comp1-IKK*	2	Devin <i>et al</i> , 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
comp1 = NIK	2	Senftleben <i>et al</i> , 2001, Xiao <i>et al</i> , 2001	<i>Homo sapiens</i> , <i>Mus musculus</i>
TNF = JNK	2	Liu <i>et al</i> , 1996	<i>Homo sapiens</i>
TNF = TNFR-1	2	Tartaglia <i>et al</i> , 1993	<i>Homo sapiens</i>
TNFR-1 + RIP + TRADD + TRAF-2 + c-IAP = comp1	2	Boldin <i>et al</i> , 1996, Hsu <i>et al</i> , 1995, Rothe <i>et al</i> , 1995, Mahoney <i>et al</i> , 2008	<i>Homo sapiens</i> , <i>Mus musculus</i>
C8*-comp2= C8*	3	Wang <i>et al</i> , 2008, Chen and Goeddel, 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
proC8 + comp2 = C8*-comp2	3	Chen and Goeddel, 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
RIP-deubi + comp1 + FADD = comp2	3	Boldin <i>et al</i> , 1996, Wang <i>et al</i> , 2008	<i>Homo sapiens</i> , <i>Mus musculus</i>
smac = RIP-deubi	3	Wang <i>et al</i> , 2008	<i>Mus musculus</i>
smac-mimetics = smac	3	Li <i>et al</i> , 2004, Wang <i>et al</i> , 2008	<i>Homo sapiens</i>
!BAD-14-3-3 + !Bcl-xl = Bax	4	Cheng <i>et al</i> , 2001	<i>Mus musculus</i>
!I-kBa + !I-kBe = NF- κ B	4	Baeuerle and Baltimore, 1988, Kearns <i>et al</i> , 2006	<i>Homo sapiens</i> , <i>Mus musculus</i>
!PARP + !ICAD = CAD	4	Enari <i>et al</i> , 1998, Sakahira <i>et al</i> , 1998, reviewed by Cryns and Yuan, 1998	<i>Homo sapiens</i> , <i>Mus musculus</i>
!PKB = GSK-3	4	Datta <i>et al</i> , 1997, reviewed by Nystrom and Quon, 1999	<i>Homo sapiens</i> , <i>Mus musculus</i>
!UV = Bcl-xl	4	Zhang and Rosdahl, 2005	<i>Homo sapiens</i>
1 C3*p20 = 1 C3*p17	4	Han <i>et al</i> , 1997	<i>Homo sapiens</i>
1 C8* = 1 C3*p20	4	Han <i>et al</i> , 1997	<i>Homo sapiens</i>
1 C8*-DISC* = 1 C8*	4	Lavrik <i>et al</i> , 2003	<i>Homo sapiens</i>
1 DISC* + proC8 = 1 C8*-DISC*	4	Lavrik <i>et al</i> , 2003	<i>Homo sapiens</i>
1 Fas + FADD =1 DISC*	4	Boldin <i>et al</i> , 1996	<i>Homo sapiens</i>
1 FasL = 1 Fas, 2 FasL = 2 Fas	4	Lavrik <i>et al</i> , 2007, Itoh and Nagata, 1993	<i>Homo sapiens</i> , <i>Mus musculus</i>
2 C3*p20 + 2 !XIAP = 2 C3*p17	4	Deveraux <i>et al</i> , 1997, Li <i>et al</i> , 2004, Chai <i>et al</i> , 2000, Verhagen <i>et al</i> , 2000, Rehm <i>et al</i> , 2006	<i>Homo sapiens</i> , <i>Mus musculus</i>
2 C8* = 2 C3*p20	4	Han <i>et al</i> , 1997	<i>Homo sapiens</i>

2 C8*-DISC* = 2 C8*	4	Lavrik <i>et al</i> , 2003	<i>Homo sapiens</i>
2 DISC* + proC8 = 2 C8*-DISC*	4	Lavrik <i>et al</i> , 2003	<i>Homo sapiens</i>
2 FAS + FADD = 2 DISC*	4	Boldin <i>et al</i> , 1996	<i>Homo sapiens</i>
AdCy = cAMP	4	Jelinek <i>et al</i> , 1993	<i>Homo sapiens, Rattus norvegicus</i>
Apaf-1 = apopto	4	Zhou <i>et al</i> , 1997, Deveraux <i>et al</i> , 1998, Li <i>et al</i> , 1997	<i>Homo sapiens</i>
appto = C9*	4	Zhou <i>et al</i> , 1997, Li <i>et al</i> , 1997, Slee <i>et al</i> , 1999, Srinivasula <i>et al</i> , 1998	<i>Homo sapiens</i>
BAD + P14-3-3 = BAD-14-3-3	4	Datta <i>et al</i> , 1997	<i>Homo sapiens, Mus musculus</i>
Bax = cyt-c	4	Madesh <i>et al</i> , 2002, Wang <i>et al</i> , 1996, Desagher <i>et al</i> , 1999	<i>Homo sapiens</i>
Bax = smac	4	Madesh <i>et al</i> , 2002, Wang <i>et al</i> , 1996, Desagher <i>et al</i> , 1999	<i>Homo sapiens, Mus musculus</i>
C3*p17 + c-IAP = C3*-c-IAP	4	Deveraux <i>et al</i> , 1997	<i>Homo sapiens</i>
C3*p17 = C3*-XIAP	4	Deveraux <i>et al</i> , 1997	<i>Homo sapiens</i>
C3*-XIAP = BIR1-2	4	Rehm <i>et al</i> , 2006	<i>Homo sapiens</i>
C8* + !XIAP = C3*p17	4	Li <i>et al</i> , 2004, Chai <i>et al</i> , 2000, Verhagen <i>et al</i> , 2000, Rehm <i>et al</i> , 2006	<i>Homo sapiens, Mus musculus</i>
C8* + P = tBid	4	Zhao <i>et al</i> , 2003, Roucou <i>et al</i> , 2002	<i>Mus musculus</i>
C8*-DISC* + !FLIP = C8*	4	Lavrik <i>et al</i> , 2007, Irmler <i>et al</i> , 1997, Tschoopp <i>et al</i> , 1998	<i>Homo sapiens, Mus musculus</i>
C8*-DISC* + FLIP = C8*-FLIP	4	Lavrik <i>et al</i> , 2007, Irmler <i>et al</i> , 1997, Tschoopp <i>et al</i> , 1998	<i>Homo sapiens</i>
C9* = 2 C3*p20	4	Slee <i>et al</i> , 1999	<i>Homo sapiens</i>
CAD + !PARP + !gelsolin = apoptosis	4	Enari <i>et al</i> , 1998, Sakahira <i>et al</i> , 1998, reviewed by Cryns and Yuan 1998	<i>Homo sapiens, Mus musculus</i>
cAMP = PKA	4	Cheng <i>et al</i> , 1998	<i>Homo sapiens, Mus musculus</i>
cyt-c + smac = Apaf-1	4	Zhou <i>et al</i> , 1997	<i>Homo sapiens</i>
Glucagon = GR	4	Jelinek <i>et al</i> , 1993	<i>Homo sapiens, Rattus norvegicus</i>
GR = AdCy	4	Jelinek <i>et al</i> , 1993	<i>Homo sapiens, Rattus norvegicus</i>
Grb2-SOS = Ras	4	reviewed by Kolch 2000	<i>Homo sapiens, Mus musculus</i>
housekeeping + !C3*p17 = gelsolin	4	Kothakota <i>et al</i> , 1997, Janicke <i>et al</i> , 1998	<i>Homo sapiens, Mus musculus</i>
housekeeping + !IKK* + !comp1-IKK* + 2 !UV = I-kBa	4	Mercurio <i>et al</i> , 1997, DiDonato <i>et al</i> , 1997	<i>Homo sapiens</i>
housekeeping + !IKK* + !comp1-IKK* + 2 !UV = I-kBb	4	Mercurio <i>et al</i> , 1997, DiDonato <i>et al</i> , 1997	<i>Homo sapiens</i>

housekeeping + !IKK* + !comp1-IKK* + 2 !UV = I-kBe	4	Mercurio <i>et al</i> , 1997, DiDonato <i>et al</i> , 1997	<i>Homo sapiens</i>
housekeeping + !P = Bid	4	McKenzie <i>et al</i> , 2008, Kramps <i>et al</i> , 2007	<i>Mus musculus</i>
housekeeping + 2 !C3*p17 = PARP	4	Enari <i>et al</i> , 1998, Lazebnik <i>et al</i> , 1994, Sakahira <i>et al</i> , 1998	<i>Homo sapiens</i> , <i>Mus musculus</i>
housekeeping + 2!C3*p17 = ICAD	4	Kothakota <i>et al</i> , 1997, Janicke <i>et al</i> , 1998	<i>Homo sapiens</i> , <i>Mus musculus</i>
IL-1 + IKKdeact = IKK*	4	Poeppelmann <i>et al</i> , 2005, Barisic <i>et al</i> , 2008, Kothny-Wilkes <i>et al</i> , 1999	<i>Homo sapiens</i>
Insulin + !IRS-P2 = IR	4	reviewed by Gual <i>et al</i> , 2005	<i>Homo sapiens</i> , <i>Mus musculus</i>
IR + IRS = IRS-P	4	reviewed by White 1998, Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
IRS-P = PI3K	4	Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
IRS-P = Shc	4	Saltiel and Kahn, 2001, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
NIK + IKKdeact = IKK*	4	Senftleben <i>et al</i> , 2001, Xiao <i>et al</i> , 2001	<i>Homo sapiens</i> , <i>Mus musculus</i>
Pak1 = MEK	4	reviewed by Kolch 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
Pak1 = Raf	4	reviewed by Kolch 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
PDK1 = PKB	4	Good <i>et al</i> , 1998, Vanhaesebrock <i>et al</i> , 2000	<i>Homo sapiens</i>
PDK1 = PKC	4	Pruett <i>et al</i> , 1995, Good <i>et al</i> , 1998	<i>Homo sapiens</i>
PI3K + IKKdeact = IKK*	4	Datta <i>et al</i> , 1997	<i>Homo sapiens</i> , <i>Mus musculus</i>
PI3K = PIP3	4	Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
PI3K = Rac	4	Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
PIP3 = PDK1	4	Vanhaesebrock <i>et al</i> , 2000, Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
PKB = BAD	4	Datta <i>et al</i> , 1997	<i>Homo sapiens</i> , <i>Mus musculus</i>
PKC = Raf	4	reviewed by Kolch 2000	<i>Homo sapiens</i> , <i>Mus musculus</i>
Rac = Pak1	4	Saltiel and Kahn, 2001, reviewed by Nystrom and Quon, 1999, reviewed by White 2002	<i>Homo sapiens</i> , <i>Mus musculus</i>
Raf + IKKdeact = IKK*	4	Lin <i>et al</i> , 1999	<i>Homo sapiens</i>

Ras = ERK1/2	4	reviewed by Kolch 2000	<i>Homo sapiens, Mus musculus</i>
Ras = p38	4	reviewed by Kolch 2000	<i>Homo sapiens, Mus musculus</i>
Shc = Grb2-SOS	4	Pruett <i>et al</i> , 1995, Saltiel and Kahn, 2001, reviewed by White 2002	<i>Homo sapiens, Mus musculus</i>
smac = smac-XIAP	4	Li <i>et al</i> , 2004, Chai <i>et al</i> , 2000, Verhagen <i>et al</i> , 2000, Rehm <i>et al</i> , 2006	<i>Homo sapiens, Mus musculus</i>
smac-XIAP + 1 C8* = 2 C3*p17	4	Li <i>et al</i> , 2004, Chai <i>et al</i> , 2000, Verhagen <i>et al</i> , 2000, Rehm <i>et al</i> , 2006	<i>Homo sapiens, Mus musculus</i>
T2R + C8 = C8*	4	based on Scaffidi <i>et al</i> , 1998, Walter <i>et al</i> , 2008	<i>Homo sapiens, Mus musculus</i>
T2R = P	4	based on Scaffidi <i>et al</i> , 1998, Walter <i>et al</i> , 2008	<i>Homo sapiens, Mus musculus</i>
T2RL = T2R	4	based on Scaffidi <i>et al</i> , 1998, Walter <i>et al</i> , 2008	<i>Homo sapiens, Mus musculus</i>
tBid = Bax	4	Wei <i>et al</i> , 2001, Madesh <i>et al</i> , 2002, Wang <i>et al</i> , 1996, Desagher <i>et al</i> , 1999, Zhao <i>et al</i> , 2003	<i>Homo sapiens, Mus musculus</i>
TNF + IRS = IRS-P2	4	Gual <i>et al</i> , 2005	<i>Homo sapiens, Mus musculus</i>
UV = Bax	4	Chen <i>et al</i> , 2007	<i>Mus musculus</i>
!BIR1-2 = C3*p17	5	Rehm <i>et al</i> , 2006, Deveraux <i>et al</i> , 1997	<i>Homo sapiens</i>
!C3*p17 = Bcl-xl	5	Cheng <i>et al</i> , 1998, Clem <i>et al</i> , 1998	<i>Homo sapiens, Rattus norvegicus</i>
!PKA = Raf	5	reviewed by Kolch 2000	<i>Homo sapiens, Mus musculus</i>
!PKC = IRS-P	5	Fea and Roth, 1997, Ravichandran <i>et al</i> , 2001	<i>Homo sapiens, Mus musculus</i>
!smac = c-IAP	5	Wang <i>et al</i> , 2008	<i>Homo sapiens</i>
2 C3*p17 = C9*	5	Zhou <i>et al</i> , 2003, Rehm <i>et al</i> , 2006, Deveraux <i>et al</i> , 1997	<i>Homo sapiens</i>
C3*p17 = C6	5	Cowling and Downward 2002, Murphy <i>et al</i> , 2004	<i>Homo sapiens</i>
C6 = C8*	5	Murphy <i>et al</i> , 2004	<i>Homo sapiens</i>
PKB = IRS-P	5	Paz <i>et al</i> , 1999, reviewed by Nystrom and Quon, 1999	<i>Homo sapiens, Rattus norvegicus</i>
!A20 = comp1-IKK*	10	Song <i>et al</i> , 1996, Wertz <i>et al</i> , 2004, Lee <i>et al</i> , 2000	<i>Homo sapiens, Mus musculus</i>
!NF-κB = JNK	10	Tang <i>et al</i> , 2001	<i>Mus musculus</i>
housekeeping = c-IAP	10	Poeppelmann <i>et al</i> , 2005, Barisic <i>et al</i> , 2008	<i>Homo sapiens</i>
housekeeping = FLIP	10	Poeppelmann <i>et al</i> , 2005	<i>Homo sapiens</i>
housekeeping = XIAP	10	Poeppelmann <i>et al</i> , 2005	<i>Homo sapiens</i>
housekeeping = TRAF-2	10	Krikos <i>et al</i> , 1992	<i>Homo sapiens</i>
NF-κB = 2 XIAP	10	Barisic <i>et al</i> , 2008	<i>Homo sapiens</i>
NF-κB = 2 c-IAP	10	Barisic <i>et al</i> , 2008	<i>Homo sapiens</i>

NF-κB = 2 FLIP	10	Kreuz <i>et al</i> , 2001, Micheau <i>et al</i> , 2001, Barisic <i>et al</i> , 2008	<i>Homo sapiens</i> , <i>Mus musculus</i>
NF-κB = A20	10	Song <i>et al</i> , 1996, Krikos <i>et al</i> , 1992	<i>Homo sapiens</i> , <i>Mus musculus</i>
NF-κB = Bcl-xl	10	Lee <i>et al</i> , 1999, Tamatani <i>et al</i> , 1999, Chen <i>et al</i> , 2000	<i>Homo sapiens</i> , <i>Rattus norvegicus</i>
NF-κB = I-kBa	10	Tian <i>et al</i> , 2005	<i>Homo sapiens</i>
NF-κB = I-kBb	10	Tian <i>et al</i> , 2005	<i>Homo sapiens</i>
NF-κB = I-kBe	10	Rothe <i>et al</i> , 1995, Wang <i>et al</i> , 1998	<i>Homo sapiens</i> , <i>Mus musculus</i>
NF-κB = TRAF-2	10	Poeppelmann <i>et al</i> , 2005, Barisic <i>et al</i> , 2008, Kothny-Wilkes <i>et al</i> , 1999	<i>Homo sapiens</i>

Table S3. 13 interactions are excluded from logical steady state computation.

no.	interaction
1	!A20 = comp1-IKK*
2	!BIR1-2 = C3*p17
3	!NF-κB = JNK
4	!PKA = Raf
5	!PKC = IRS-P
6	!smac = c-IAP
7	2 C3*p17 = C9*
8	C3*p17 = C6
9	C6 = C8*
10	NF-κB = I-kBa
11	NF-κB = I-kBb
12	NF-κB = I-kBe
13	PKB = IRS-P

Table S4. The model contains 14 non-monotone interactions.

1 C3*p20 = 1 C3*p17
1 C8* = 1 C3*p20
1 C8*-DISC* = 1 C8*
1 DISC* + proC8 = 1 C8*-DISC*
1 FAS + FADD = 1 DISC*
1 FASL = 1 FAS
2 C3*p17 = C9*
2 C3*p20 + 2 !XIAP = 2 C3*p17
2 C8* = 2 C3*p20
2 C8*-DISC* = 2 C8*
2 DISC* + proC8 = 2 C8*-DISC*
2 FAS + FADD = 2 DISC*
2 FASL = 2 FAS
smac-XIAP + 1 C8* = 2 C3*p17

Table S5. Relative participation of network components in all feedback loops on the respective timescale.

$\tau = 5$		$\tau = 10$			
positive & negative feedback loops	positive feed-back loops	negative feed-back loops	positive & negative feedback loops	positive feed-back loops	negative feed-back loops
C3*p17 (89 %) C8 (71 %) Bax (69 %) C3*p20 (63 %) smac (57 %) Bcl-xl (49 %) complex2, C8*-comp2 (40 %) C6 (31 %) C9* (29 %) apopto, Apaf-1 (23 %) tBid, RIP-deubi, complex1, c-IAP (20 %) cyt-c (11 %) smac-XIAP, PIP3, PI3K, PDK1, IRS-P (6 %) PKC, PKB, C3*-XIAP, BIR1-2 (3 %)	C3*p17 (92 %) C8, C3*p20 (69 %) Bax (65 %) smac (50 %) C6, Bcl-xl (42 %) C9* (38 %) Apaf-1, apopto (31 %) RIP-deubi, C8*-comp2, complex2 (27%) tBid (23 %) cyt-c (15 %) smac-XIAP (8 %) IRS-P, PI3K, PIP3, PDK1, PKB (4 %)	Bax, smac, complex1, complex2, C8*-comp2, C8, C3*p17, c-IAP (78 %) Bcl-xl (67 %) C3*p20 (44 %) tBid, C3*-XIAP, BIR1-2, IRS-P, PI3K, PIP3, PDK1, PKC (11 %)	Bax (76 %) C3*p17 (75 %) smac (72 %) complex1 (66 %) C8* (64 %) NF-κB (63 %) c-IAP (62 %) Bcl-xl (56 %) C3*p20 (40 %) I-κBε, I-κBα, comp1-IKK* (32 %) NIK, FLIP, IKK* (29 %) C6, tBid (20 %) XIAP (17 %) complex2, C8*-comp2 (15 %) C9* (11 %) Apaf-1, apopto (8 %) RIP-deubi (7 %) TRAF2, cyt-c (4 %) IRS-P, PI3K, PIP3, PDK1, A20, smac-XIAP (2 %) C3*-XIAP, BIR1-2, PKB, PKC (1 %)	Bax (79 %) C3*p17 (78 %) smac (74 %) complex1, NF-κB (68 %) C8* (66 %) c-IAP (63 %) Bcl-xl (57 %) C3*p20 (41 %) FLIP, I-κBα, IKK*, comp1-IKK*, I-κBε, NIK (34 %) C6 (23 %) tBid (22 %) XIAP (20 %) C9* (12 %) Apaf-1, apopto (10 %) complex2, C8*-comp2, RIP-deubi (9 %) cyt-c, TRAF2 (5 %) smac-XIAP (2 %) IRS-P, PI3K, PIP3, PDK1, PKC (8 %)	complex1, complex2, C8*-comp2, C8*, C3*p17, c-IAP, Bax, smac (54 %) Bcl-xl (46 %) NF-κB, C3*p20 (31 %) A20, I-κBα, comp1-IKK*, I-κBε (15 %) tBid, C3*-XIAP, BIR1-2, IRS-P, PI3K, PIP3, PDK1, PKC (8 %)

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