

3. References

3.1 Apoptosis-related parameters – Abbreviations and References

Parameter	Full length name	Reference	Roche Applied Science product
AIF	Apoptosis inducing factor	● Susin S. A. et al. (1996) <i>J. Exp. Med.</i> 184 , 1331.	
Apaf	Apoptotic protease activating factor	● Zou H. et al. (1997) <i>Cell</i> 90 , 405. ● Li P. et al. (1997) <i>Cell</i> 91 , 479.	
APO-2 (L)	Apoptosis receptor/ligand	● Masters S. A. et al. (1996) <i>Curr. Biol.</i> 6 , 750. ● Pit R. M. et al. (1996) <i>J. Biol. Chem.</i> 271 , 12687.	
APO-3 (L)	Apoptosis receptor/ligand	● Masters S. A. et al. (1996) <i>Curr. Biology</i> 6 , 1669. ● Chinnaiyan A. M. et al. (1996) <i>Science</i> 274 , 990.	
Apopain		● Schlegel J. et al. (1996) <i>J. Biol. Chem.</i> 271 , 1841.	
Bad		● Yang E. et al. (1995) <i>Cell</i> 80 , 285.	
Bak		● Sattler M. et al. (1997) <i>Science</i> 275 , 983. ● Orth R. & Dixit V. M. (1997) <i>J. Biol. Chem.</i> 272 , 8841.	
Bax		● Bargou R. C. et al. (1995) <i>Eur. J. Immunol.</i> 25 , 770. ● Zhan Q. M. et al. (1994) <i>Oncogene</i> 9 , 3743. ● Yang E. et al. (1995) <i>Cell</i> 80 , 285.	
Bcl-2		● Craig W. C. (1995) <i>Cancer Biology</i> 6 , 35. ● Yang E. et al. (1995) <i>Cell</i> 80 , 285.	
Bcl-x _L		● Yang E. et al. (1995) <i>Cell</i> 80 , 285.	
Bcl-x _S		● Williams G. T. & Smith C. A. (1993) <i>Cell</i> 74 , 777. ● Yang E. et al. (1995) <i>Cell</i> 80 , 285.	
bik		● Orth R. & Dixit V. M. (1997) <i>J. Biol. Chem.</i> 272 , 8841.	
Ca ²⁺		● McConkey D. J. et al. (1995) <i>J. Immunology</i> 155 , 5133. ● Kataoka A. et al. (1995) <i>FEBS Letters</i> 364 , 264. ● Sokolova I. A. et al. (1995) <i>Biochimica et Biophysica Acta – Mol. Cell Res.</i> 1266 , 135.	
CAD	Caspase activated DNase	● Enari, M. et al. (1998) <i>Nature</i> 391 , 43.	
Calpain		● Kikuchi H. & Imajohohmi S. (1995) <i>Cell Death and Differentiation</i> 2 , 195. ● Slukvin I. I. & Jerrelis T. R. (1995) <i>Immunopharmacology</i> 31 , 43.	Calpain inhibitor I, Cat. No. 11 086 090 001 Calpain inhibitor II, Cat. No. 11 086 103 001
Caspase	Cysteine protease cleaving an aspartic acid residue	● Cohen G. M. (1997) <i>Biochem. J.</i> 326 , 1. ● Alnemri E. S. et al. (1996) <i>Cell</i> 87 , 171. ● Nicholson D. W. & Thornberry N. A. (1997) <i>TIBS</i> 22 , 299.	
ced-3	Caenorhabditis elegans cell death gene	● Yuan J. et al. (1993) <i>Cell</i> 75 , 641. ● Miura M. et al. (1993) <i>Cell</i> 75 , 653.	
ced-9	Caenorhabditis elegans cell death gene	● Henegartner M. O. & Horovitz H. R. (1994) <i>Cell</i> 76 , 665.	
Ceramide		● Wiegmann K. et al. (1994) <i>Cell</i> 78 , 1005.	
c-Jun		● Grand R. J. A. et al. (1995) <i>Exp. Cell Res.</i> 218 , 439.	
c-Myc		● Wang Y. et al. (1993) <i>Cell Growth Differ.</i> 4 , 467. ● Schwartz L. M. & Osborne B. A. (1993) <i>Immunol. Today</i> 14 , 582.	
CPP32		● Darmon A. J. et al. (1995) <i>Nature</i> 377 , 446.	Anti-PARP, Cat. No. 11 835 238 001
crm A	Cytokine response modifier A	● Zhou Q. et al. (1997) <i>J. Biol. Chem.</i> 272 , 7797. ● Ogasawara J. et al. (1993) <i>Nature</i> 364 , 806.	
Cytochrome C		● Liu X. et al. (1996) <i>Cell</i> 86 , 147. ● Krippner A. et al. (1996) <i>J. Biol. Chem.</i> 271 , 21629. ● Yang J. et al. (1997) <i>Science</i> 275 , 1129. ● Li P. et al. (1997) <i>Cell</i> 91 , 479.	



Parameter	Full length name	Reference	Roche Applied Science product
D4-GDP-DI	DI = dissociation inhibitor	● Danley D. E. et al. (1996) <i>J. Immunology</i> 157 , 500.	
Daxx	Death-domain-associated protein xx	● Yang X. L. et al. (1997) <i>Cell</i> 89 .	
DcR1	Decoy receptor 1	● Pan G. et al. (1997) <i>Science</i> 277 , 815. ● Sheridan J. P. et al. (1997) <i>Science</i> 277 .	
DD	Death Domain	● Muzio M. et al. (1996) <i>Cell</i> , 85 , 817.	
DED	Death Effector Domain	● Chinnaiyan A. M. et al. (1996) <i>J. Biol. Chem.</i> 271 , 4961.	
DISC	Death Inducing Signal Complex	● Muzio M. et al. (1996) <i>Cell</i> , 85 , 817.	
DNA-Fragmentation		● Wyllie A. H. et al. (1980) <i>Int. Rev. of Cytol.</i> 68 , 251. ● Burgoyne L. A. et al. (1974) <i>Biochem. J.</i> 143 , 67. ● Stach R. W. et al. (1979) <i>J. Neurochem.</i> 33 , 257.	Apoptotic DNA Ladder Kit, Cat. No. 11 835 246 001 Cell Death Detection ELISA ^{PLUS} , Cat. No. 11 744 425 001 Cell Death Detection ELISA, Cat. No. 11 544 675 001 Cellular DNA Fragmentation ELISA, Cat. No. 11 585 045 001 <i>In Situ</i> Cell Death Detection Kit, Fluorescein, Cat. No. 11 684 795 001 <i>In Situ</i> Cell Death Detection Kit, TMR, Cat. No. 12 156 792 001 <i>In Situ</i> Cell Death Detection Kit, AP, Cat. No. 11 684 809 001 <i>In Situ</i> Cell Death Detection Kit, POD, Cat. No. 11 684 817 001
DNA-PK _{CS}	DNA-dependent protein kinase catalytic subunit	● Casiarosen L. et al. (1996) <i>J. Exp. Med.</i> 183 , 1957.	
DNA-repair		● De Murcia G. & De Murcia J. (1994) <i>TIBS</i> 19 , 172.	Anti-PARP, Cat. No. 11 835 238 001
DR3	Death Receptor	● Chinnaiyan A. M. et al. (1996) <i>Science</i> 274 , 990.	
DR4	Death Receptor	● Pan G. H. et al. (1997) <i>Science</i> 276 , 111.	
DR5	Death Receptor	● Walczak H. et al. (1997) <i>EMBO J.</i> 16 , 5386. ● Sheridan J. P. et al. (1997) <i>Science</i> 277 .	
Endonuclease		● Walker P. R. & Sikorska (1994) <i>Biochem. and Cell Biology</i> 72 , 615. ● Dini L. et al. (1996) <i>Exp. Cell Res.</i> 223 , 340.	Nuclease S7, Cat. No. 10 107 921 001 Nuclease P1, Cat. No. 10 236 225 001 Nuclease S1, Cat. No. 10 818 348 001 DNase I, RNase free, Cat. No. 10 776 785 001 DNase I, grade I, Cat. No. 10 104 132 001 DNase I, grade II, Cat. No. 10 104 159 001
FADD/MORT-1	FADD = Fas-associated death domain	● Chinnaiyan A. M. et al. (1995) <i>Cell</i> 81 , 505. ● Chinnaiyan A. M. et al. (1996) <i>J. Biol. Chem.</i> 271 , 4961. ● Vincenz C. & Dixit V. M. (1997) <i>J. Biol. Chem.</i> 272 , 6578.	
FAK	Focal adhesion kinase	● Crouch D. H. et al. (1996) <i>Oncogene</i> 12 , 2689. ● Hungerford J. E. et al. (1996) <i>J. Cell Biol.</i> 135 , 1383.	
Fas	Synonyms: Fas = CD 95 = Apo1	● Trauth et al. (1989) <i>Science</i> 245 , 301.	Anti-Fas, Cat. No. 11 922 432 001
Fas-ligand CD 95/fas (receptor)	Synonyms: Fas = CD 95 = Apo1	● Nagata S. & Goldstein P. (1995) <i>Science</i> 267 , 1449. ● Lynch D. H. et al. (1995) <i>Immunol. Today</i> 16 , 569. ● Tanaka M. et al. (1998) <i>Nature Medicine</i> 4 , 1, 31.	
FLICE/MACH	FADD like ICE	● Muzio M. et al. (1996) <i>Cell</i> 85 , 817. ● Boldin M. P. et al. (1996) <i>Cell</i> 85 , 803. ● Fernandes-Alnemri T. et al. (1996) <i>Proc. Natl. Acad. Sci. USA</i> 93 , 7464. ● Scaffidi C. et al. (1997) <i>J. Biol. Chem.</i> 272 , 43, 26953.	

Parameter	Full length name	Reference	Roche Applied Science product
FLIP	FLICE-inhibitory proteins	<ul style="list-style-type: none"> ● Thome M. et al. (1997) <i>Nature</i> 386, 517. ● Irmeler M. et al (1997) <i>Nature</i> 388, 190. 	
Fodrin		<ul style="list-style-type: none"> ● Martin S. J. et al. (1995) <i>J. Biol. Chemistry</i> 270, 6425. 	
fos		<ul style="list-style-type: none"> ● Smeyne R. J. et al. (1995) <i>Nature</i> 363, 166 and Erratum <i>Nature</i> 365, 279. ● Colotta F. et al. (1992) <i>J. Biol. Chem.</i> 267, 18278. 	
G-Actin		<ul style="list-style-type: none"> ● Boone D. L. & Tsang B. K. (1997) <i>Biology and Reproduction</i> 57, 813. 	
Gas-2		<ul style="list-style-type: none"> ● Brancolini C. et al. (1997) <i>Cell Death and Diff.</i> 4, 247. 	
Gelsolin		<ul style="list-style-type: none"> ● Kothakota S. et al. (1997) <i>Science</i> 278, 294. 	
Glucocorticoid/ Glucocorticoid- Receptor		<ul style="list-style-type: none"> ● Schwartzman R. A. & Cidlowski J. A. (1994) <i>Int. Arch. of Allergy and Immunology</i> 105, 347. ● Perrinwolff M. et al. (1995) <i>Biochem. Pharmacology</i> 50, 103. ● Kiefer J. et al. (1995) <i>J. Immunology</i> 155, 4525. 	
Granzyme A, B		<ul style="list-style-type: none"> ● Irmeler M. et al. (1995) <i>J. Exp. Med.</i> 181, 1917. ● Peitsch M. C. & Tschopp J. (1994) <i>Proteolytic Enzymes</i> 244, 80. ● Nakajima H. et al. (1995) <i>J. Exp. Med.</i> 181, 1037. ● Smyth M. J. & Trapani J. A. (1995) <i>Immunology Today</i> 16, 202. ● Darmon A. J. et al. (1995) <i>Nature</i> 377, 446. ● Quan L. T. et al. (1996) <i>Proc. Nat. Acad. Sci.</i> 93, 1972. 	
hnRNPs C1/C2	Heteronuclear Ribonucleoproteins	<ul style="list-style-type: none"> ● Waterhaus N. et al. (1996) <i>J. Biol. Chem.</i> 271, 29335. 	
ICAD	Inhibitor of CAD	<ul style="list-style-type: none"> ● Enari M. et al. (1998) <i>Nature</i> 391, 43. 	
ICE	Interleukin-1 β / converting enzyme	<ul style="list-style-type: none"> ● Whyte M. & Evan G. (1995) <i>Nature</i> 376, 17. ● Atkinson E. A. & Bleackley R. C. (1995) <i>Critical Reviews in Immunology</i> 15, 359. ● Kumar S. & Harvey N. L. (1995) <i>FEBS Letters</i> 375, 169. 	Interleukin-1 β , human, Cat. No. 11 457 756 001 Interleukin-1 β , mouse, Cat. No. 11 444 590 001
JNK	Jun N-terminal kinase	<ul style="list-style-type: none"> ● Hibi M. et al. (1993) <i>Genes Dev.</i> 7 (11), 2135. 	
Lamin A, B		<ul style="list-style-type: none"> ● Weaver V. M. et al. (1996) <i>J. of Cell Science</i> 109, 45. 	
MAP	Mitogen activated pro- tein kinase	<ul style="list-style-type: none"> ● Meyer C. F. et al. (1996) <i>J. Biol. Chem.</i> 271, 8971. 	
MCL-1		<ul style="list-style-type: none"> ● Williams G. T. & Smith C. A. (1993) <i>Cell</i> 74, 777. 	
Mdm-2		<ul style="list-style-type: none"> ● Chen J. D. et al. (1996) <i>Mol. and Cellular Biol.</i> 16, 2445. ● Yu K. et al. (1997) <i>Cell Growth & Diff.</i> 8. 	
MEKK-1	MAP Kinase Kinase 1	<ul style="list-style-type: none"> ● Cardone M. H. et al. (1997) <i>Cell</i> 90. ● Meyer C. F. et al. (1996) <i>J. Biol. Chem.</i> 271, 8971. 	
MORT-1 (see FADD)		<ul style="list-style-type: none"> ● Boldin M. P. (1995) <i>J. Biol. Chem.</i> 270, 7795. ● Chinnaiyan A. M. et al. (1995) <i>Cell</i> 81, 505. ● Chinnaiyan A. M. et al. (1996) <i>J. Biol. Chem.</i> 271, 4961. 	
NEDD		<ul style="list-style-type: none"> ● Gu Y. et al. (1995) <i>J. Biol. Chemistry</i> 270, 18715. 	
NF- κ B	Nuclear factor kappaB	<ul style="list-style-type: none"> ● Wiegmann K. et al. (1994) <i>Cell</i> 78, 1005. 	
NuMa	Nuclear matrix protein	<ul style="list-style-type: none"> ● Guethhallonet C. et al. (1997) <i>Exp. Cell Res.</i> 233. ● Weaver V. M. et al. (1996) <i>J. Cell science</i> 109, 45. ● Hsu H. L. & Yeh N. H. (1996) <i>J. Cell science</i> 109, 277. 	
p53		<ul style="list-style-type: none"> ● Yonish-Rouach E. et al. (1993) <i>Mol. Cell Biol.</i> 13, 1415. ● Zambetti G. P. (1993) <i>FASEB J.</i> 7, 855. ● Lowe S. W. et al. (1993) <i>Cell</i> 74, 957. 	p53 ELISA, Cat. No. 11 828 789 001
PAK-2	p21 activated kinase	<ul style="list-style-type: none"> ● Rudel T. & Bokoch G. M. (1997) <i>Science</i> 276. 	
PARP	Poly-ADP-ribose- polymerase	<ul style="list-style-type: none"> ● Lippke J. A. et al. (1996) <i>J. Biol. Chem.</i> 271, 1825. ● De Murcia G. & De Murcia J. (1994) <i>TIBS</i> 19, 172. 	
Perforin		<ul style="list-style-type: none"> ● Nakajima H. et al. (1995) <i>J. Exp. Med.</i> 181, 1037. ● Schroter M. et al. (1995) <i>Europ. J. Immunol.</i> 25, 3509. ● Lowin B. et al. (1996) <i>Int. Immunology</i> 8, 57. 	

Parameter	Full length name	Reference	Roche Applied Science product
Phosphatidyl-serine		● Vermes I. et al. (1995) <i>J. Immunol. Methods</i> 184 , 39.	Annexin-V-Alexa 568, Cat. No. 11 985 485 001, (new Cat. No. 03 703 126 001) Annexin-V-FLUOS, Cat. No. 11 828 681001 Annexin-V-Biotin, Cat. No. 11 828 690 001
PITSLRE		● Beyaert R. et al. (1997) <i>J. Biol. Chem.</i> 272 , 11694.	
PKC δ	Protein kinase C	● Emoto Y. et al. (1995) <i>EMBO J.</i> 14 , 6148. ● Ghayur T. et al. (1996) <i>J. Exp. Med.</i> 184 , 2399.	
pRb	Retinoblastoma protein	● Hansen R. et al. (1995) <i>Oncogene</i> 11 , 2535. ● Haaskogan D. A. et al. (1995) <i>EMBO J.</i> 14 , 461. ● Picksley S. M. (1994) <i>Curr. Opinion in Cell Biology</i> 6 , 853.	
Presenilin		● Loetscher H. et al. (1997) <i>J. Biol. Chem.</i> 272 .	
prICE		● Smyth M. J. et al. (1996) <i>Biochem. Journal</i> 316 , 25.	
RAIDD	RIP associated ICH-1/CED-3 homologous protein with a death domain	● Duan & Dixit (1997) <i>Nature</i> 385 , 86.	
Ras		● Krueger G. R. F. et al. (1995) <i>Pathologie</i> 16 , 120. ● Wang H. G. et al. (1995) <i>J. Cell Biol.</i> 129 , 1103. ● Fernandez A. et al. (1995) <i>Oncogene</i> 10 , 769.	
RIP	Receptor interacting protein	● Stanger B. Z. et al. (1995) <i>Cell</i> 81 , 513. ● Hsu H. et al. (1996) <i>Immunity</i> 4 , 387. ● Grimm S. et al. (1996) <i>Proc. Natl. Acad. Sci.</i> 93 , 10923.	
Sphingo-myelinase		● Heller R. A. & Kronke M. (1994) <i>J. Cell Biol.</i> 126 , 5. ● Kolesnik R. & Golde D. W. (1994) <i>Cell</i> 77 , 325.	
SREBPs	Sterol-regulatory element binding proteins	● Wang X. D. et al. (1996) <i>EMBO J.</i> 15 , 1012.	
TNF- α	Tumor necrosis factor	● Leist M. et al. (1994) <i>J. Immunol.</i> 153 , 1778.	TNF- α , human, Cat. Nos. 11 371 843 001, 11 088 939 001
TNF- α receptor		● Nagata S. (1997) <i>Cell</i> , 88 , 355. ● Tartaglia L. A. et al. (1993) <i>Cell</i> 74 , 845.	TNF- α , mouse, Cat. No. 11 271 156 001 TNF- α ELISA, human, Cat. No. 11 425 943 001
TRADD	TNFR1-associated death domain	● Hsu H. et al. (1995) <i>Cell</i> 81 , 495.	
TRAF2	TNF receptor associated factor	● Liu Z.-G. et al. (1996) <i>Cell</i> 87 , 565.	
TRAIL -R1, -R2, -R3	TNF-related apoptosis inducing ligand	● Wiley S. R. et al. (1995) <i>Immunity</i> 3 , 673. ● Walczak H. et al. (1997) <i>EMBO Journal</i> 16 , 5386. ● Degl'Espositi M. A. et al. (1997) <i>J. Exp. Med.</i> 186 , 1165. ● Sheridan J. P. et al. (1997) <i>Science</i> 277 , 818.	
Trans-glutaminase		● Zhang L.-X. et al. (1995) <i>J. Biol. Chemistry</i> 270 , 6022. ● Melino G. et al. (1994) <i>Mol. and Cell Biology</i> 14 , 6584.	
U1-70 kDa snRNP	U1 small nuclear ribonucleoprotein protein	● Rosena & Casciolarosen L. (1997) <i>J. Biol. Chem.</i> 64 , 50.	
YAMA	Synonyms: CPP32, Apopain	● Tewari M. et al (1995) <i>Cell</i> 81 , 801.	

▲ **Table 20:** Published sources that contain more information about the components of the apoptosis pathways (Figure 2, page 5).

Synonyms

Proteases	Synonyms
Caspase-1	ICE
Caspase-2	ICH-1
Caspase-3	CPP32, Yama, Apopain
Caspase-4	ICErel-II, TX, ICH-2
Caspase-5	ICErel-III, TY
Caspase-6	Mch2
Caspase-7	Mch3, ICE-LAP3, CMH-1
Caspase-8	FLICE, MACH, Mch5
Caspase-9	ICE-LAP6, Mch6
Caspase-10	Mch4 / FLICE 2
Caspase-11	ICH-3
Caspase-12	
Caspase-13	ERICE
Caspase-14	MICE
Granzyme B	CTL proteinase-1, Fragmentin-2, RNKP-1

Receptor	Synonyms
CD95	APO-1, Fas
DcR1	TRID, LIT and TRAIL-R3
DcR2	TRAIL-R4
DcR3	
DR-3	APO-3, TRAMP, WSL-1, LARD
DR-4	TRAIL-R1
DR-5	TRAIL-R2, TRICK2, KILLER
DR-6	
DR-1	TNF-R1
DR-2	CD95
RANK	

Ligands	
CD95L	Fas ligand, APO-1L
TRAIL	APO-2L
TWEAK	APO-3L
RANK L	TRANCE

Apaf	Synonyms
Apaf-1	(no alternative, homologue to ced-4)
Apaf-2	Cytochrome C
Apaf-3	Caspase 9 (homologue to ced-3)

