Revision 1

#8357 Store at -20°C

Stress and Apoptosis Antibody Sampler Kit

1 Kit (8 x 20 microliters)

Cell Signaling TECHNOLOGY®

Orders: 877-616-CELL (2355) orders@cellsignal.com

Support: 877-678-TECH (8324)

Web: info@cellsignal.com cellsignal.com

3 Trask Lane | Danvers | Massachusetts | 01923 | USA

For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
Phospho-MAPKAPK-2 (Thr334) (27B7) Rabbit mAb	3007	20 µl	49 kDa	Rabbit IgG
Phospho-HSP27 (Ser82) (D1H2F6) XP® Rabbit mAb	9709	20 µl	27 kDa	Rabbit IgG
Phospho-SAPK/JNK (Thr183/Tyr185) (81E11) Rabbit mAb	4668	20 µl	46, 54 kDa	Rabbit IgG
Phospho-c-Jun (Ser73) (D47G9) XP® Rabbit mAb	3270	20 µl	48 kDa	Rabbit IgG
Phospho-p53 (Ser15) (16G8) Mouse mAb	9286	20 µl	53 kDa	Mouse IgG1
Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb	9664	20 µl	17, 19 kDa	Rabbit IgG
Cleaved PARP (Asp214) (D64E10) XP® Rabbit mAb	5625	20 µl	89 kDa	Rabbit IgG
Phospho-p38 MAPK (Thr180/Tyr182) (D3F9) XP® Rabbit mAb	4511	20 µl	43 kDa	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat
Anti-mouse IgG, HRP-linked Antibody	7076	100 µl		Horse

Please visit cellsignal.com for individual component applications, species cross-reactivity, dilutions, protocols, and additional product information.

Description

The Stress and Apoptosis Antibody Sampler Kit provides an economical means of evaluating stress and apoptotic responses of each protein. The kit contains enough primary and secondary antibody to perform two western blot experiments per primary antibody.

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at –20°C. Do not aliquot the antibody.

Background

Cells respond to environmental or intracellular stresses through various mechanisms ranging from initiation of prosurvival strategies to activation of cell death pathways that remove damaged cells from the organism. Many of the proteins and cellular processes involved in normal signaling and survival pathways also play dual roles in cell death-promoting mechanisms. Apoptosis is a regulated cellular suicide mechanism characterized by nuclear condensation, cell shrinkage, membrane blebbing, and DNA fragmentation. Caspase-3 (CPP-32, Apoptain, Yama, SCA-1) is a critical executioner of apoptosis, as it is either partially or totally responsible for the proteolytic cleavage of many key proteins such as the nuclear enzyme poly (ADP-ribose) polymerase (PARP) (1). PARP appears to be involved in DNA repair in response to environmental stress (2). This protein can be cleaved by many ICE-like caspases *in vitro* (3,4) and is one of the main cleavage targets of caspase-3 *in vivo* (5,6). PARP helps cells to maintain their viability; cleavage of PARP facilitates cellular disassembly and serves as a marker of cells undergoing apoptosis (7). The p53 tumor suppressor protein plays a major role in cellular response to DNA damage and other genomic aberrations. Activation of p53 can lead to either cell cycle arrest and DNA repair or apoptosis (8). DNA damage induces phosphorylation of p53 at Ser15 and Ser20 and leads to a reduced interaction between p53 and its negative regulator, the oncoprotein MDM2 (9). MDM2 inhibits p53 accumulation by targeting it for ubiquitination and proteasomal degradation (10,11). Stress-activated protein kinases (SAPK)/Jun amino-terminal kinases (JNK) are members of the MAPK family that are activated by a variety of environmental stresses, inflammatory cytokines, growth factors, and GPCR agonists. Stress signals are delivered to this cascade by small GTPases of the Rho family (Rac, Rho, cdc42) (12). SAPK/JNK, when active as a dimer, can translocate to the nucleus and regulate transcription through its effects on c-Jun, ATF-2, and other transcription factors (12,13). c-Jun is a member of the Jun Family, containing c-Jun, JunB, and JunD, and is a component of the transcription factor AP-1 (activator protein-1). Extracellular signals from growth factors, chemokines, and stress activate AP-1-dependent transcription. The transcriptional activity of c-Jun is regulated by phosphorylation at Ser63 and Ser73 through SAPK/JNK (reviewed in 14). AP-1 regulated genes exert diverse biological functions including cell proliferation, differentiation, and apoptosis, as well as transformation, invasion and metastasis, depending on cell type and context (13, 15-17). p38 MAP kinase (MAPK), also called RK (18) or CSBP (19), is the mammalian orthologue of the yeast HOG kinase that participates in a signaling cascade controlling cellular responses to cytokines and stress (17-20). MKK3, MKK6, and SEK activate p38 MAP kinase by phosphorylation at Thr180 and Tyr182. MAPKAPK-2 is a direct target of p38 MAPK (17). Multiple residues of MAPKAPK-2 are phosphorylated *in vivo* in response to stress. However, only four residues (Thr25, Thr222, Ser272 and

Thr334) are phosphorylated by p38 MAPK in an *in vitro* kinase assay (21). Phosphorylation at Thr222, Ser272, and Thr334 appears to be essential for the activity of MAPKAPK-2 (6). Heat shock protein (HSP) 27 is one of the small HSPs that are constitutively expressed at different levels in various cell types and tissues. In response to stress, the expression level of HSP27 increases several-fold to confer cellular resistance to the adverse environmental change. HSP27 is phosphorylated at Ser15, Ser78, and Ser82 by MAPKAPK-2 as a result of the activation of the p38 MAP kinase pathway (19,22).

Background References

1. Fernandes-Alnemri, T. et al. (1994) *J Biol Chem* 269, 30761-4.
2. Satoh, M.S. and Lindahl, T. (1992) *Nature* 356, 356-8.
3. Lazebnik, Y.A. et al. (1994) *Nature* 371, 346-7.
4. Cohen, G.M. (1997) *Biochem J* 326 (Pt 1), 1-16.
5. Nicholson, D.W. et al. (1995) *Nature* 376, 37-43.
6. Tewari, M. et al. (1995) *Cell* 81, 801-9.
7. Oliver, F.J. et al. (1998) *J Biol Chem* 273, 33533-9.
8. Levine, A.J. (1997) *Cell* 88, 323-31.
9. Shieh, S.Y. et al. (1997) *Cell* 91, 325-34.
10. Chehab, N.H. et al. (1999) *Proc Natl Acad Sci U S A* 96, 13777-82.
11. Honda, R. et al. (1997) *FEBS Lett* 420, 25-7.
12. Kyriakis, J.M. and Avruch, J. (2001) *Physiol Rev* 81, 807-69.
13. Leppä, S. and Bohmann, D. (1999) *Oncogene* 18, 6158-62.
14. Davis, R.J. (2000) *Cell* 103, 239-52.
15. Shaulian, E. and Karin, M. (2002) *Nat Cell Biol* 4, E131-6.
16. Weiss, C. and Bohmann, D. (2004) *Cell Cycle* 3, 111-3.
17. Rouse, J. et al. (1994) *Cell* 78, 1027-37.
18. Han, J. et al. (1994) *Science* 265, 808-11.
19. Lee, J.C. et al. *Nature* 372, 739-46.
20. Freshney, N.W. et al. (1994) *Cell* 78, 1039-49.
21. Ben-Levy, R. et al. (1995) *EMBO J* 14, 5920-30.
22. Landry, J. et al. (1992) *J Biol Chem* 267, 794-803.

Trademarks and Patents

Limited Uses