Revision 1

Store at -20C

#92570

Apoptosis/Necroptosis Antibody Sampler Kit

1 Kit (8 x 20 microliters)

Cell Signaling TECHNOLOGY®

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

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
Phospho-RIP (Ser166) (D1L3S) Rabbit mAb	65746	20 µl	78-82 kDa	Rabbit IgG
RIP (D94C12) XP® Rabbit mAb	3493	20 µl	78 kDa	Rabbit IgG
Phospho-MLKL (Ser358) (D6H3V) Rabbit mAb	91689	20 µl	54 kDa	Rabbit IgG
MLKL (D2I6N) Rabbit mAb	14993	20 µl	54 kDa	Rabbit IgG
Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb	9664	20 µl	17, 19 kDa	Rabbit IgG
Caspase-3 (D3R6Y) Rabbit mAb	14220	20 µl	35, 19, 17 kDa	Rabbit IgG
Cleaved Caspase-8 (Asp384) (11G10) Mouse mAb	9748	20 µl	10 kDa	Mouse IgG1
Caspase-8 (D35G2) Rabbit mAb	4790	20 µl	10, 57 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 Apoptosis/Necroptosis Antibody Sampler Kit provides an economical means of detecting markers for apoptosis and necroptosis. The kit contains enough primary antibody to perform at least two western blot experiments.

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

Apoptosis is a regulated physiological process leading to cell death (1,2). Caspases, a family of cysteine acid proteases, are central regulators of apoptosis. Caspases are synthesized as inactive zymogens containing a pro-domain followed by large (p20) and small subunits (p10) that are proteolytically processed in a cascade of caspase activity. Initiator caspases (including 8, 9, 10, and 12) are closely coupled to proapoptotic signals. Once activated, these caspases cleave and activate downstream effector caspases (including 3, 6, and 7), which in turn cleave cytoskeletal and nuclear proteins like PARP, α-fodrin, DFF, and lamin A, and induce apoptosis. Cytochrome c released from mitochondria is coupled to the activation of caspase-9, a key initiator caspase. Apoptosis induced through the extrinsic mechanisms involving death receptors in the tumor necrosis factor receptor superfamily activates caspase-8. Activated caspase-8 cleaves and activates downstream effector caspases, such as caspase-1, -3, -6, and -7. Caspase-3 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).

Necroptosis, a regulated pathway for necrotic cell death, is triggered by a number of inflammatory signals, including cytokines in the tumor necrosis factor (TNF) family, pathogen sensors such as toll-like receptors (TLRs), and ischemic injury (3,4). Necroptosis is negatively regulated by caspase-8 mediated apoptosis in which the kinase RIP/RIPK1 is cleaved (5). Furthermore, necroptosis is inhibited by a small molecule inhibitor of RIP, necrostatin-1 (Nec-1) (6). Research studies show that necroptosis contributes to a number of pathological conditions, and Nec-1 has been shown to provide neuroprotection in models such as ischemic brain injury (7). RIP is phosphorylated at several sites within the kinase domain that are sensitive to Nec-1, including Ser14, Ser15, Ser161, and Ser166 (8). Phosphorylation drives association with RIP3, which is required for necroptosis (9-11). Mixed lineage kinase domain-like protein (MLKL) is a pseudokinase that was identified as a downstream target of RIP3 in the necroptosis pathway (12). During necroptosis, RIP3 is phosphorylated at Ser227, which recruits MLKL and leads to its phosphorylation at Thr357 and Ser358 (12). Knockdown of MLKL through multiple mechanisms results in inhibition of necroptosis (13). Phosphorylation of MLKL during necroptosis leads to its oligomerization with pore formation that affects membrane integrity (14-17).

Background References

1. Degterev, A. et al. (2003) *Oncogene* 22, 8543-67.
2. Green, D.R. (1998) *Cell* 94, 695-8.

3. Christofferson, D.E. and Yuan, J. (2010) *Curr Opin Cell Biol* 22, 263-8.
4. Kaczmarek, A. et al. (2013) *Immunity* 38, 209-23.
5. Lin, Y. et al. (1999) *Genes Dev* 13, 2514-26.
6. Degterev, A. et al. (2008) *Nat Chem Biol* 4, 313-21.
7. Degterev, A. et al. (2005) *Nat Chem Biol* 1, 112-9.
8. Ofengeim, D. and Yuan, J. (2013) *Nat Rev Mol Cell Biol* 14, 727-36.
9. Cho, Y.S. et al. (2009) *Cell* 137, 1112-23.
10. He, S. et al. (2009) *Cell* 137, 1100-11.
11. Zhang, D.W. et al. (2009) *Science* 325, 332-6.
12. Sun, L. et al. (2012) *Cell* 148, 213-27.
13. Wu, J. et al. (2013) *Cell Res* 23, 994-1006.
14. Cai, Z. et al. (2014) *Nat Cell Biol* 16, 55-65.
15. Chen, X. et al. (2014) *Cell Res* 24, 105-21.
16. Wang, H. et al. (2014) *Mol Cell* 54, 133-46.
17. Dondelinger, Y. et al. (2014) *Cell Rep* 7, 971-81.

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