Revision 1

#4110 Store at -20C

MDA-5 (R470) Antibody

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.

Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
W, IP	H	Endogenous	135	Rabbit	#Q9BYX4	64135

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	1:50

Storage

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

Specificity/Sensitivity

MDA-5 (R470) Antibody detects endogenous levels of total MDA-5 protein.

Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to residues surrouding Arg470 of human MDA-5. Antibody is purified by protein A and peptide affinity chromatography.

Background

Antiviral innate immunity depends on the combination of parallel pathways triggered by virus detecting proteins in the Toll-like receptor (TLR) family and RNA helicases, such as Rig-I (retinoic acid-inducible gene I) and MDA-5 (melanoma differentiation-associated antigen 5), which promote the transcription of type I interferons (IFN) and antiviral enzymes (1-3). TLRs and helicase proteins contain sites that recognize the molecular patterns of different virus types, including DNA, single-stranded RNA (ssRNA), double-stranded RNA (dsRNA), and glycoproteins. These antiviral proteins are found in different cell compartments; TLRs (i.e. TLR3, TLR7, TLR8, and TLR9) are expressed on endosomal membranes and helicases are localized to the cytoplasm. Rig-I expression is induced by retinoic acid, LPS, IFN, and viral infection (4,5). Both Rig-I and MDA-5 share a DExD/H-box helicase domain that detects viral dsRNA and two amino-terminal caspase recruitment domains (CARD) that are required for triggering downstream signaling (4-7). Rig-I binds both dsRNA and viral ssRNA that contains a 5'-triphosphate end not seen in host RNA (8,9). Though structurally related, Rig-I and MDA-5 detect a distinct set of viruses (10,11). The CARD domain of the helicases, which is sufficient to generate signaling and IFN production, is recruited to the CARD domain of the MAVS/VISA/Cardif/IPS-1 mitochondrial protein, which triggers activation of NF-κB, TBK1/IKKε, and IRF-3/IRF-7 (12-15). MDA-5 (16,17), also named Ifih1 (interferon induced with helicase C domain 1), RH116 (RNA helicase-DEAD box protein 116) (18), and Helicard (19) is found to be induced by interferon. During apoptosis, MDA-5 is cleaved by caspases, separating the helicase and CARD domains (19). MDA-5 is uniquely activated by picornavirus (20) and measles virus (21).

Background References

1. Yoneyama, M. and Fujita, T. (2007) *J Biol Chem* 282, 15315-8.
2. Meylan, E. and Tschopp, J. (2006) *Mol Cell* 22, 561-9.
3. Thompson, A.J. and Locarnini, S.A. (2007) *Immunol Cell Biol* 85, 435-45.
4. Imaizumi, T. et al. (2002) *Biochem Biophys Res Commun* 292, 274-9.
5. Zhang, X. et al. (2000) *Microb Pathog* 28, 267-78.
6. Yoneyama, M. et al. (2005) *J Immunol* 175, 2851-8.
7. Yoneyama, M. et al. (2004) *Nat Immunol* 5, 730-7.
8. Hornung, V. et al. (2006) *Science* 314, 994-7.
9. Pichlmair, A. et al. (2006) *Science* 314, 997-1001.
10. Kato, H. et al. (2006) *Nature* 441, 101-5.
11. Childs, K. et al. (2007) *Virology* 359, 190-200.
12. Meylan, E. et al. (2005) *Nature* 437, 1167-72.
13. Xu, L.G. et al. (2005) *Mol Cell* 19, 727-40.
14. Kawai, T. et al. (2005) *Nat Immunol* 6, 981-8.
15. Seth, R.B. et al. (2005) *Cell* 122, 669-82.
16. Kang, D.C. et al. (2002) *Proc Natl Acad Sci U S A* 99, 637-42.
17. Kang, D.C. et al. (2004) *Oncogene* 23, 1789-800.
18. Cocude, C. et al. (2003) *J Gen Virol* 84, 3215-25.
19. Kovacsovics, M. et al. (2002) *Curr Biol* 12, 838-43.
20. Kato, H. et al. (2006) *Nature* 441, 101-5.
21. Berghäll, H. et al. (2006) *Microbes Infect* 8, 2138-44.

Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

Applications Key

W: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: Human

Trademarks and Patents

Limited Uses