

MYPT1 (E-19): sc-17434



The Power to Question

BACKGROUND

Myosin phosphatase target subunit 1 (MYPT1), also called Myosin-binding subunit of Myosin phosphatase, is one of the subunits and an integral component of the Myosin phosphatase. Myosin phosphatase regulates the interaction of Actin and Myosin downstream of the guanosine triphosphatase Rho, which inhibits Myosin phosphatase through the action of Rho-kinase. MYPT1 promoter contains one Sp1 transcription factor binding site, suggesting that MYPT1 is a housekeeping gene. Myotonic dystrophy protein kinase phosphorylates MYPT1 at Tyrosine 654 to regulate Myosin II phosphorylation. Inhibition of Myosin light chain phosphatase results in Ca²⁺ sensitization of smooth muscle contraction. This inhibition is modulated through phosphorylation of MYPT1 by a ZIP-like kinase, which associates with MYPT1 and phosphorylates the inhibitory site in smooth muscle. The phosphorylation of MYPT1 by protein kinase C results in altered dephosphorylation of Myosin by attenuating the binding of protein phosphatase 1 catalytic subunit (PP1c) and the phosphorylated Myosin light chain to MYPT1. PP1c interacts with at least four binding sites on the amino-terminus of MYPT1. MYPT2, a novel isoform of MYPT1, also interacts with PP1c. MYPT1 is localized on stress fibers; it is distributed close to the cell membrane and at cell-cell contacts to regulate Myosin phosphatase activity.

REFERENCES

- Kimura, K., et al. 1996. Regulation of Myosin phosphatase by Rho and Rho-associated kinase (Rho-kinase). *Science* 273: 245-248.
- Takahashi, N., et al. 1997. Localization of the gene coding for Myosin phosphatase target subunit 1 (MYPT1) to human chromosome 12q15-q21. *Genomics* 44:150-152.
- Fujioka, M., et al. 1998. A new isoform of human Myosin phosphatase targeting/regulatory subunit (MYPT2): cDNA cloning, tissue expression, and chromosomal mapping. *Genomics* 49: 59-68.
- Toth, A., et al. 2000. Phosphorylation of MYPT1 by protein kinase C attenuates interaction with PP1 catalytic subunit and the 20 kDa light chain of Myosin. *FEBS Lett.* 484: 113-117.

CHROMOSOMAL LOCATION

Genetic locus: PPP1R12A (human) mapping to 12q21.2; Ppp1r12a (mouse) mapping to 10 D1.

PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-17434 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

STORAGE

Store at 4° C, ****DO NOT FREEZE****. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

For research use only, not for use in diagnostic procedures.

APPLICATIONS

MYPT1 (E-19) is recommended for detection of MYPT1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

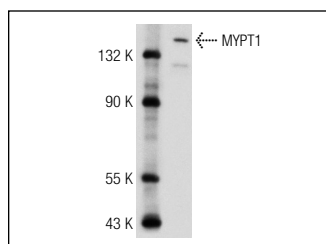
MYPT1 (E-19) is also recommended for detection of MYPT1 in additional species, including canine, bovine, porcine and avian.

Suitable for use as control antibody for MYPT1 siRNA (h): sc-37240, MYPT1 siRNA (m): sc-37241, MYPT1 siRNA (r): sc-156101, MYPT1 shRNA Plasmid (h): sc-37240-SH, MYPT1 shRNA Plasmid (m): sc-37241-SH, MYPT1 shRNA Plasmid (r): sc-156101-SH, MYPT1 shRNA (h) Lentiviral Particles: sc-37240-V, MYPT1 shRNA (m) Lentiviral Particles: sc-37241-V and MYPT1 shRNA (r) Lentiviral Particles: sc-156101-V.

Molecular Weight of MYPT1: 130 kDa.

Positive Controls: DU 145 cell lysate: sc-2268 or 3T3-L1 cell lysate: sc-2243.

DATA



MYPT1 (E-19): sc-17434. Western blot analysis of MYPT1 expression in 3T3-L1 whole cell lysate.

SELECT PRODUCT CITATIONS

- Ohama, T., et al. 2003. Chronic treatment with interleukin-1 β attenuates contractions by decreasing the activities of CPI-17 and MYPT-1 in intestinal smooth muscle. *J. Biol. Chem.* 278: 48794-48804.
- Chiba, Y., et al. 2005. Involvement of RhoA-mediated Ca²⁺ sensitization in antigen-induced bronchial smooth muscle hyperresponsiveness in mice. *Respir. Res.* 6: 4.
- Yoneda, A., et al. 2005. The Rho kinases I and II regulate different aspects of myosin II activity. *J. Cell Biol.* 170: 443-453.
- Sato, K., et al. 2007. Involvement of CPI-17 downregulation in the dysmotility of the colon from dextran sodium sulphate-induced experimental colitis in a mouse model. *Neurogastroenterol. Motil.* 19: 504-514.

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