SANTA CRUZ BIOTECHNOLOGY, INC.

p-MYPT1 (Thr 696): sc-24531

SANTA CRUZ BIOTECHNOLOGY

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 promotor 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 Ca^{2+} sensitization of smooth muscle contraction. This inhibition is modulated through phosphorylation of MYPT1 by a ZIP-like kinase, which associates with MYPTI and phosphorylates the inhibitory site in smooth muscle. The phosphorylation of MYPT1 by protein kinase C results in altered dephosphoryation of Myosin by attenuating the binding of protein phosphatase 1 catalytic subunit (PP1c) and the phosphorylated 20 kDa Myosin light chain to MYPT1. PP1c interacts with at least four binding sites on the amino-terminus of MYPT1. A novel isoform of MYPT1, MYPT2, also interacts with PPlc. MYPT1 is localized on stress fibers, and is distributed close to the cell membrane and at cell-cell contacts to regulate Myosin phosphatase activity. The phosphorylation of MYPT1 at Serine 695 in response to cyclic nucleotides regulates smooth muscle phosphatase by the exclusion of phosphorylation of Threonine 696 of MYPT1.

REFERENCES

1. Kimura, K., et al. 1996. Regulation of Myosin phosphatase by Rho and Rho-associated kinase (Rho-kinase). Science 273: 245-248.
2. 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.
3. 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.
4. 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. 585: 113-117.
5. Toth, A., et al. 2000. Study of the subunit interactions in Myosin phosphatase by surface plasmon resonance. Eur. J. Biochem. 267: 1687-1697.
6. Machida, H., et al. 2001. Molecular cloning and analysis of the 5'-flanking region of the human MYPT1 gene. Biochim. Biophys. Acta 1517: 424-429.
7. Muranyi, A., et al. 2001. Myotonic dystrophy protein kinase phosphorylates the Myosin phosphatase targeting subunit and inhibits Myosin phosphatase activity. FEBS Lett. 493: 80-84.

CHROMOSOMAL LOCATION

Genetic locus: PPP1R12A (human) mapping to 12q15-q21; Ppp1r12aPpp1r12a (mouse) mapping to 10 C.

RESEARCH USE

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

SOURCE

p-MYPT1 (Thr 696) is a goat polyclonal antibody raised against a short amino acid sequence containing phosphorylated of of origin.

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-24522 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

p-MYPT1 (Thr 853) is recommended for detection of p-MYPT1 of origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for MYPT1 siRNA (h): sc-37240 and MYPT1 siRNA (m): sc-37241.

Molecular Weight of p-MYPT1: 130 kDa.

Positive Controls: HeLa + Rho-kinase, Hela + DMPK: sc-2268 + Rho-kinase.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

STORAGE

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

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.