

Product Information

Anti-phospho-Myristoylated Alanine-Rich Protein Kinase C Substrate (MARCKS) (pSer^{152/156}) produced in rabbit, affinity isolated antibody

Catalog Number **P0370**

Synonym: Anti-phospho-MARCKS (pSer^{152/156})

Product Description

Anti-phospho-Myristoylated Alanine-Rich Protein Kinase C Substrate (pSer^{152/156}) is produced in rabbit using as immunogen a synthetic phosphorylated peptide derived from the region of rat MARCKS that is phosphorylated on serine 152/156. The antiserum is affinity purified using epitope-specific affinity chromatography. The antibody is preadsorbed to remove any reactivity to non-phosphorylated MARCKS and MARCKS phosphorylated on serine irrespective of the sequence. Anti-phospho-MARCKS (pSer^{152/156}) specifically recognizes human, mouse and rat MARCKS (80 kDa) phosphorylated at serine 152/156. It is used in immunoblotting applications.

MARCKS is a major *in vivo* substrate of protein kinase C (PKC), implicated in macrophage activation, neurosecretion and growth-factor-dependent mitogenesis. Myristoylation of MARCKS is required for effective binding to the plasma membrane. MARCKS is a filamentous actin crosslinking protein with activity that is inhibited by PKC-mediated phosphorylation and by binding to calcium-calmodulin. Modulation of the actin crosslinking activity of the MARCKS protein by calmodulin and MARCKS phosphorylation represents a potential convergence of the calcium-calmodulin and protein kinase C signal transduction pathways in the regulation of the actin cytoskeleton.¹

PKC phosphorylation of MARCKS on serine residues (serine 152, 156 and 163) within the effector domain results in the disruption of both the calmodulin and actin binding properties of MARCKS as well as loss of membrane binding.² Li, et al., demonstrated that MARCKS is a key regulatory molecule mediating mucin granule release by bronchial epithelial cells. Phosphorylation of MARCKS releases the protein from the plasma membrane into the cytoplasm, where it is dephosphorylated by protein phosphatase 2A (PP2A). Dephosphorylated MARCKS interacts with mucin granule membranes and links the granules to the contractile cytoskeleton, mediating their movement to the cell periphery and subsequent exocytosis.³

The MARCKS protein is highly expressed in brain, particularly during development. MARCKS-deficient mice died before or within a few hours of birth due to high frequencies of midline defects, particularly in cranial neurulation. This suggests that MARCKS plays a vital role in the normal developmental processes of neurulation, hemisphere fusion, forebrain commissure formation, and formation of cortical and retinal laminations.⁴ MARCKS phosphorylation is also potentiated by glutamate activation of the N-methyl-D-aspartate receptor and subsequent activation of MAP kinase in hippocampal neurons. This potentiation effect is long lasting.⁵

Reagent

Supplied as a solution in 10 mM HEPES, pH 7.5, containing 150 mM NaCl, 100 µg/ml BSA and 50% glycerol.

Storage/Stability

Store at -20 °C. The antibody contains 50% glycerol and remains liquid at -20 °C for further aliquoting. Due to the viscosity of glycerol the solutions need to be mixed well prior to aliquoting. Working dilution samples should be discarded if not used within 12 hours. The antibody is stable for at least 6 months when stored appropriately.

Product Profile

Immunoblotting: a recommended working dilution of 1:1,000 is determined using rat brain hippocampal tissue homogenates.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration test.

References

1. Hartwig, J. H., et al., MARCKS is an actin filament crosslinking protein regulated by protein kinase C and calcium-calmodulin. *Nature*, **356**, 618-622 (1992).
2. Palmer, R. H., et al., PRK1 phosphorylates MARCKS at the PKC sites: serine 152, serine 156 and serine 163. *FEBS Lett.*, **378**, 281-285 (1996).

3. Li, Y., et al., MARCKS protein is a key molecule regulating mucin secretion by human airway epithelial cells in vitro. *J. Biol. Chem.*, **276**, 40982-40990 (2001).
4. Stumpo, D. J., et al., MARCKS deficiency in mice leads to abnormal brain development and perinatal death. *Proc. Natl. Acad. Sci. USA*, **92**, 944-948 (1995).
5. Ohmitsu, M., et al., Phosphorylation of Myristoylated Alanine-rich Protein Kinase C Substrate by Mitogen-activated Protein Kinase in Cultured Rat Hippocampal Neurons following Stimulation of Glutamate Receptors. *J. Biol. Chem.*, **274**, 408-417 (1999).

JJJ,PHC 08/12-1