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ProductInformation

MONOCLONAL ANTI-PROTEIN PHOSPHATASE 1α (PP1α)
CLONE PP1-377
Mouse Ascites Fluid

Product Number **P 7607**

Product Description

Monoclonal Anti-Protein Phosphatase 1α (PP1α) (mouse IgG2b isotype) is derived from the PP1-377 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a recombinant protein phosphatase 1 α isoform catalytic subunit, of rabbit origin. The isotype is determined using Sigma ImmunoType™ Kit (Product Code ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Product Code ISO-2).

Monoclonal Anti-Protein Phosphatase 1α (PP1α) recognizes an epitope within the catalytic subunit of protein phosphatase 1α. The antibody reacts with PP1α by immunoblotting (37.5 kDa) and immunocytochemistry. Reactivity has been observed with human, monkey, bovine, rabbit, rat and mouse PP1α.

A large number of cellular processes are regulated by a reversible conformational covalent modification of proteins that results from the reversible phosphorylation of specific serine, threonine or tyrosine residues. Phosphorylation is a ubiquitous cellular regulatory mechanism utilized by all tissues and species. The phosphorylation state of a protein is determined by a dynamic equilibrium between the activities of protein kinase(s) and protein phosphatase(s), that catalyze the phosphorylation and dephosphorylation reactions, respectively. Phosphorylation can be defined as the transfer of the terminal phosphate from ATP to an amino acid residue. Kinases function as catalysts in this process. Phosphatases reverse the effects of kinases by catalyzing the removal of the phosphate group from the amino acid. The effect of these post-translational modifications is to alter the enzymatic activity of a protein, the binding properties of a protein, or both. Dephosphorylation of regulatory molecules whose activity has been modulated by kinases will quickly reverse the effect.

Serine/threonine protein phosphatases control a variety of physiological events, such as cell proliferation and cell cycle. However, regulation of these complex cellular processes proceeds through only a limited number of phosphatases. The protein phosphatase (PP) holoenzyme is a trimeric complex, composed of a regulatory subunit, a variable subunit, and a catalytic subunit.[1] Four prominent types of phosphatase catalytic (C) subunit have been identified, termed PP-1, PP-2A, PP-2B and PP-2C, which are classified according to their substrate preferences, mechanisms of activation and sensitivity to inhibitor proteins or naturally occurring toxins.[2,3] The PP-1 family is composed of subfamily members PP-1α , PP-1β and PP-1γ. Members of this class contain an isoform of the same catalytic subunit (37.5 kDa), but differ in the non-catalytic regulatory subunits that determine the activity, the substrate specificity, and the intracellular location of the phosphatase.[4] They are present with an extreme philogenetic conservation, in all eukaryotic cells, where they play an essential role in such diverse processes as glycogen metabolism, calcium transport, intracellular transport, muscle contraction, protein synthesis and cell division. The activity of PP-1 is regulated by hormones like insulin, glucagon, α- and β-adrenergic agonists, glucocorticoids, and thyroid hormones. One of the properties of PP-1 that distinguishes them from other serine/threonine protein phosphatases, is their sensitivity to inhibition by two proteins, termed *inhibitor 1* and *Inhibitor 2*, or *modulator*.[5] The *modulator* can form a 1:1 complex with the catalytic subunit, and thus inactivates it upon incubation. The best characterized PP-1-binding protein in the nucleus is NIPP-1, a 38.5 kDa protein, which is a potent and specific inhibitor of PP-1.[6] Targeting of PP-1 also proceeds through association with the tumor suppressor accessory protein, p53-binding protein (p53bp2).

This protein modifies the specificity of PP-1, though it is not clear if PP-1 modulates p53 tumor suppressor activity. Antibodies reacting specifically with PP1α are useful tools in the study of the roles of phosphatases in phosphorylation/ dephosphorylation in many pathways in which kinases and phosphatases are essential regulators.

Reagents
Monoclonal Anti-Protein Phosphatase 1α (PP1α) is supplied as ascites fluid containing 15 mM sodium azide.

Precautions and Disclaimer
Due to the sodium azide content a material safety sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution.
Consult the MSDS for information regarding hazardous and safe handling practices.

Storage/Stability
For continuous use, store at 2-8 °C for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended.

If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile
A minimum working dilution of 1:500 is determined by immunoblotting using a whole cell extract of cultured mouse fibroblasts.

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

References

1. Bollen, M., and Stalmans, W., Crit. Rev. Biochem. Molec. Biol., **27**, 227 (1992).
2. Cohen, P., and Cohen, P.T.W., J. Biol. Chem., **264**, 21435 (1989).
3. Cohen, P.T.W., et al., FEBS Lett., **268**, 355 (1990).
4. DePaoli-Roach, A.A. et al., Adv. Enzyme Regul., **34**, 199 (1994).
5. Cohen, P., Ann. Rev. Biochem., **58**, 453 (1989).
6. Faux, M.C., and Scott J.D., Trends Biochem. Sci., **21**, 312 (1996).

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