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Product Information

Anti-Actin, cardiac Antibody,
Mouse monoclonal, clone AC1-20.4.2
purified from hybridoma cell culture

Catalog Number **A9357**

Product Description

Anti-Actin, cardiac Antibody, Mouse monoclonal (mouse IgG1 isotype) is derived from the hybridoma AC1-20.4.2 produced by the fusion of mouse myeloma cells and splenocytes from BALB/c mice immunized with a synthetic NH_2-terminal decapeptide of cardiac isoform of actin.[1] The isotype is determined using a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents, Catalog Number ISO2.

Anti-Actin, cardiac Antibody, Mouse monoclonal, recognizes human, bovine, chicken, rat, and mouse cardiac α actin. The antibody may be used in various immunochemical techniques including ELISA, immunoblotting (~ 42 kDa), immunocytochemistry, and immunohistochemistry.[1]

The two major cytoskeletal proteins implicated in cell motility are actin and myosin. Actin and myosin are constituents of many cell types and are involved in a myriad of cellular processes including locomotion, secretion, cytoplasmic streaming, phagocytosis and cytokinesis. Although actin is one of the most conserved eukaryotic proteins, it is expressed in mammals and birds as at least six isoforms characterized by different electrophoretic mobility and amino acid sequence.[2-4] Four of these isoforms represent differentiation markers of muscle tissues and two are found practically in all cells. There are three α-actin (skeletal, cardiac and smooth muscle), one β-actin (β-non muscle) and two γ–actins (smooth muscle and nonmuscle). Actin isoforms show >90% overall sequence homology, but only 50-60% homology in their 18 N-terminal residues.[5] The N-terminal region of actin appears to be a major antigenic region, and may be involved in the interaction of actin with other proteins such as myosin.

The skeletal α-actin and the cardiac α-actin are highly homologous, and their amino acid sequences differ by only four residues. Cardiac α actin is the predominant expressed isoform in fetal and adult myocardium, in fetal and regenerating skeletal muscle, and in cell cultures of cardiomyocytes and skeletal myoblasts.[6]

Mutation in these genes underlie a subset of cases of dilated cardiomyophathy,[7] and hypertrophic cardiomyopathy.[8]

Reagent

Supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide as a preservative.

Antibody concentration: ~ 1.0 mg/mL

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

For continuous use, store at 2-8 °C for up to one month. For extended storage, freeze at –20 °C in working aliquots. Repeated freezing and thawing, or 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

Indirect immunohistochemistry: a working antibody concentration of 10-20 µg/mL was determined for staining cardiac muscles of digested, formalin-fixed, paraffin-embedded rat heart tissue.

Note: In order to obtain the best results using various techniques and preparations, we recommend determining optimal working dilutions by titration.

References

1. Franke, W.W., et al., *Differentiation*, **60**, 245-250 (1996).
2. Herman, I., *Curr. Opin. Cell Biol.*, **5**, 48-55 (1993).
3. Vandekerchove, J., and Weber, K., *Eur. J. Biochem.*, **90**, 451-462 (1978).

4. Drew, J.S., et al., *Amer. J. Physiol*., **260**, C1332-C1340 (1991).
5. Lessard, J.L., *Cell Motil. Cytoskel*., **10**, 349-362 (1988).
6. Ilkovski, B., et al., *Neuromuscul. Disord.,* **15**, 829-835 (2005)
7. Olson, T.M., et al., *Science*, **280**, 750-752 (1998).
8. Olson, T.M., et al., *J. Mol. Cell Cardiol*., **32**, 1687-1694 (2000).

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