

Product Specification Sheet

Alpha sarcomeric actin (alpha skeletal and cardiac actin) Antibodies and controls

Cat. # ACTB18-C	Purified bovine cardiac muscle actin protein control for Western	SIZE: 100 ul
Cat. # ACTB18-M	Monoclonal Anti-alpha-sarcomeric (cardiac/skeletal) actin Protein, ascites	SIZE: 100 ul

Muscle (from Latin musculus "little mouse") is contractile tissue of the body and is derived from the mesodermal layer of embryonic germ cells. There are three types of muscles (skeletal, cardiac and smooth): Skeletal muscle or "voluntary muscle" is anchored by tendons to bone. Smooth muscle or "involuntary muscle" is found within the walls of organs and structures such as the esophagus, stomach, intestines, bronchi, uterus, urethra, bladder, and blood vessels, and unlike skeletal muscle, smooth muscle is not under conscious control. Cardiac muscle is also an "involuntary muscle" but is a specialized kind of muscle found only within the heart. Cardiac and skeletal muscle are "striated" in that they contain sarcomeres and are packed into highly-regular arrangements of bundles; smooth muscle has neither. Muscle is mainly composed of muscle cells. Within the cells are myofibrils; myofibrils contain sarcomeres, which are composed of actin and myosin. All three muscles use the movement of actin against myosin to create contraction.

Smooth muscle cells are generally arranged in sheets or bundles and connected by gap junctions. In order to contract the cells contain intracellular contractile filamentous proteins called actin and myosin. Smooth muscle does not contain the proteins troponin or titin, and caldesmon and calponin are significant proteins expressed within smooth muscle. Actin filaments attach to the sarcolemma by focal adhesions or attachment plaques and attach to other actin filaments via dense bodies (acting much like Z-lines in striated muscle).

Actin and myosin are the two major cytoskeleton proteins implicated in cellular movement, secretion, phagocytosis, and kinesis. Actin is one of the most conserved cellular protein. At least 6 actin isoforms have been identified by protein sequence analyses. Four actin isoforms represent the differentiation markers of muscle tissues. There are three α -actins: α -skeletal, α -cardiac, and α -smooth muscle), one β -actin (β -non-muscle), and two γ -actins (γ -smooth muscle and γ -non-muscle). Actin isoform are >90% conserved, except in the N-terminal 18-aa (50-60% homology). Beta-actin protein and mRNA levels are often used as a reference for comparing changes in cellular protein/mRNA levels by Western or Northern blots.

Source of Antigen and Antibodies

Antigen	Purified rabbit striated muscle actin protein
Ab Host/type	Mouse, monoclonal unpurified ascites # ACTB18-M (isotype IgM)
2-Ab	Cat # 40220, goat anti-mouse IgM-HRP (AP, biotin, FITC conjugates also available).
-ve	Cat # 20008-2, Mouse Serum IgM, purified, suitable for ELISA, Western, IHC as –ve control

Bovine cardiac actin (cat # ACTB16-N) was purified (>99%, mol wt ~43 kda) and used for control. For Western blot +ve control (Cat # ACTB18-C) is supplied in SDS-PAGE sample buffer (reduced). Load 10 ul/lane of ACTB18-C for good visibility with antibody Cat # ACTB18-M or other antibodies. Store at –20oC in suitable size aliquots. SDS may crystallize in cold conditions. It should redissolve by warming before taking it from the stock. It should be heated once prior to loading on gels. If the product has been stored for several weeks, then it may be preferable to add 5 ul of fresh 2x sample buffer per 10 ul of the ACTB18-C solution prior to heating and loading on gels. This preparation is not biologically active. It is not suitable for ELISA or other applications where native protein is required. Do not freeze, thaw, or heat repeatedly

Recommended Usage

Western Blotting: monoclonal antibodies at 1:1500-1:2K using Chemiluminescence technique)..

ELISA (1:10-50K; using 50-200 ng control antigen/well).

Monoclonal Anti- α -Sarcomeric Actin (α -sr-1) may be used in the study of muscle differentiation (normal and pathological conditions) using immunoperoxidase or immunofluorescent staining of frozen or formalin-fixed, paraffin-embedded tissue sections.

Storage

Short-term: unopened, undiluted liquid vials for less than a week at 4oC.

Long-term: at –20C or below in suitable aliquots after reconstitution. Do not freeze and thaw and store working, diluted solutions.

Stability: 6-12 months at –20oC or below.

Specificity & Cross-reactivity

Anti-alpha sarcomeric actin is specific for alpha skeletal and alpha-cardiac muscle actins. Due to high degree of alpha actins, the antibodies react with alpha actin from a wide variety of species (rat, rabbit, human, bovine, sheep, carp, snake, frog etc). The antibodies are specific for alpha actin and do not react with smooth muscle tissues. Purified bovine cardiac muscle actin protein control for Western (#ACTB18-C) can be used as positive control for ACTB18-M.

References: (1). Ohmuri H (1995) Gene Accession # S38782; Vandekerchove, J et al (1978) Eur. J. Biochem. 90, 451; Lessard J et al (1988) Cell. Motil Cytoskel. 10, 349; North JA et al (1994) J. Cell Sci. 107, 437;

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