ALPHA DIAGNOSTIC INTERNATIONAL

Product Specification Sheet

Life Technologies™ Your Molecular & Cell Technology Partner

Cardiac Muscle Actin protein

Cat. ACTB18-N-100	Purified cardiac muscle actin Protein (Bovine)	**SIZE**: 100 ug
Cat. ACTB18-N-1000	Purified cardiac muscle actin Protein (Bovine)	**SIZE**: 1 mg

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 cytoskeletal proteins implicated in cellular movements, secretion, phagocytosis, cytokinesis, exocytosis and chromosome movement. At least 6 actin isoforms have been identified by protein sequence analyses. Four actin isoforms represents the differentiation markers of muscle tissues. Actin isoforms are >90% conserved, except the N-terminal 18aa (50-60% homology).

In absence of salts, actin exists as a globular monomeric protein (G-actin). In presence of ATP, a divalent cation (Ca 2+ or Mg 2+) and high salts (KCl, NaCl or MgCl2), the G-actin polymerizes to form a fibrous or filamentous actin (F-actin) which incorporates the cation and ATP. Dialysis of the F-actin solution against water reverses the polymerization.

Source of Protein

Cardiac muscle actin was purified (>99%, ~43 kDa) from bovine cardiac tissues using proprietary methods. It is supplied in stabilizing buffer (5.0 mM Tris-HCl pH 8.0, 0.2 mM CaCl2, 0.2 mM ATP and 0.5 mM DTT) as liquid at 1 mg/ml or lyophilized in the buffer. The protein is biologically active using actin polymerization assay.

The lyophilized powder can be reconstituted at 1mg/ml in distilled water. It can then be used or aliquoted for storage in small aliquots at -70oC or below

Suggested uses

Recommended for use in ELISA or Western as protein control. Antibodies to cardiac muscle actin (# ACTB18-M) are also available.

General References:

Carlier, M. F (JBC) 1991, Vol 266, 1-4; Merck Index, 12th Edition #137 (1996); Hinshaw, D. B et al, Arch. Biochem. Biophys. 288, 311-316 (1991); Small, J. V et al , J. Cell Science, 89, 21 (1988)

*This product is for in vitro research use only.

Related material available from ADI

Antibodies to Human Beta Actin (Polyclonal and Monoclonal)

ACTB18-N-100-1000 71213A

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