

Anti-Human/Mouse/Rat α SMA [Clone 1A4] — Biotin

Monoclonal Antibody

Product Information

Product No.: A462
Clone: 1A4
Isotype: Mouse IgG2a k

Product Description

Specificity:

Clone 1A4 activity is specific to alpha-smooth muscle actin (α SMA, SMA, smooth muscle aortic alpha-actin (ACTA2)).

Antigen Distribution:

Alpha-smooth muscle actin (SMA) is expressed by myofibroblasts and is the actin isoform typical of vascular smooth muscle cells. SMA is incorporated into stress fibers and focal adhesions and is also expressed by granulation tissue fibroblasts of healing wounds. Additionally, SMA expression is activated during the early stages of embryonic cardiovascular development. Astrocytes can also express SMA in culture. SMA is highly expressed in cancer-associated fibroblasts.

Background:

Myofibroblasts are specialized connective tissue fibroblasts that use actin-based motors to generate contractile forces that are applied to extracellular matrix adhesion receptors ¹. Alpha-smooth muscle actin (SMA) is a tissue specific actin isoform involved in myofibroblast differentiation, focal adhesion maturation, actin polymerization, tractional remodeling of the extracellular matrix, and the generation and transmission of mechanical forces in connective tissue, i.e., mechanotransduction. These physical forces are important for wound healing, joint and ligament remodeling due to injury or pregnancy, and the maintenance of tissue structure in the urinary bladder. SMA facilitates the generation of contractile forces in myofibroblasts and may contribute to scar formation and fibrocontractive diseases ¹. Additionally, cancer-associated fibroblasts (CAF) play key roles in the tumor microenvironment, affecting tumor development, metabolism, and migration ². SMA is highly expressed in CAFs and is widely used as a marker to identify CAF populations. However, SMA cannot be used for flow-sorting CAF populations for further functional studies because of its intracellular localization.

1A4 was produced using a synthetic decapeptide as immunogen, consisting of the NH₂-terminal peptide of SMA coupled to BSA and a keyhole limpet hemocyanin (Ac-Glu(OBut)-Glu(OBut)-Glu(OBut)-Asp(OBut)-Ser(But)-Thr(But)-Ala-Leu-Val-Cys(Acm)-NH₂) ³. BALB/c mice were immunized and spleen cells were fused with Sp2/0 myeloma cells. Hybridomas were screened by ELISA against bovine aortic actin and further tested by immunofluorescence in chicken gizzard.

Product Datasheet

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Known Reactivity Species:

Human, Mouse, Rat

Format:

Biotin

Immunogen:

N-terminal synthetic peptide corresponding to Human alpha smooth muscle actin.

Formulation

This Biotinylated antibody is formulated in 0.01 M phosphate buffered saline (150 mM NaCl) PBS pH 7.4, 1% BSA and 0.09% sodium azide as a preservative.

Storage and Stability

This biotinylated antibody is stable when stored at 2-8°C. **Do not freeze.**

Other Applications Reported in Literature:

FC

Country of Origin

USA

References

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