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ProductInformation

Anti-Caveolin-1
Developed in Rabbit
IgG Fraction of Antiserum

Product Number **C 3237**

Product Description

Anti-Caveolin-1 is developed in rabbit using a synthetic peptide corresponding to a region at the N-terminus of human caveolin-1 (amino acids 2-20) conjugated to KLH as immunogen. This sequence is highly conserved in many species, e.g., identical in rat, mouse, bovine, and dog caveolin-1. This sequence is not found in caveolin-2 or caveolin-3. Whole antiserum is fractionated and then further purified by ion-exchange chromatography to provide the IgG fraction of antiserum that is essentially free of other rabbit serum proteins.

Anti-Caveolin-1 recognizes caveolin-1 by various immunochemical techniques including immunoblotting (~22 kDa) and indirect immunofluorescence. Staining of caveolin-1 in immunoblotting is specifically inhibited with caveolin-1 immunizing peptide (human, amino acids 2-20).

Caveolae are cholesterol/sphingolipid-rich, flask-shaped microdomains of the inner side of the plasma membrane with a diameter of 50 to 100 nm.[1,2] Caveolae may play an important role in numerous essential cellular functions, including signaling, transport, lipid metabolism, cellular growth control, and tumor suppression.[3-5] Caveolae are present in many cell types, and are most abundant in endothelial cells, fibroblasts, smooth muscle cells, and adipocytes.[3,4]

Caveolin, a 20-24-kDa integral transmembrane protein, has been identified as a principal component of caveolae membranes. It was first identified as a major v-Src substrate in Rous sarcoma virus-transformed cells.[6] Caveolin (also termed VIP21) exists in several isoforms termed caveolin-1, caveolin-2 and caveolin-3. Caveolin-1 (20-22 kDa) can exist as two isoforms, caveolin-1α and -1β due to alternative splicing of the mRNA. Caveolin-1 and -2 have similar tissue distribution. Caveolin-2 colocalizes with caveolin-1 and forms a hetero-oligomeric complex with caveolin-1 *in vivo*.[7] In contrast, caveolin-3 is a distinct isoform that is restricted to smooth, skeletal, and cardiac muscle.[8]

Caveolin family members function as scaffolding proteins to organize and concentrate specific lipids such as cholesterol and glycosylphosphatidylinositol (GPI) and lipid modified signaling molecules within caveolae membranes.[5,9,10] Caveolin can simultaneously recognize GPI-linked proteins and interact directly with a number of caveolae-associated downstream signaling molecules, such as H-Ras, hetero-trimeric G-proteins, annexin-II, EGF receptor, protein kinase C, src-family tyrosine kinases, and nitric oxide synthase (NOS) isoforms.[5,11,12] Caveolae and caveolin-1 are both down-regulated in response to activated oncogenes such as H-Ras and v-Abl.[13] In PC12 cells, caveolin-1 is upregulated during NGF-induced differentiation.[14] Knockout mice lacking the caveolin-1 gene also lack caveolae. The absence of this organelle impairs nitric oxide and calcium signaling in the cardiovascular system, causing aberrations in endothelium-dependent relaxation, contractility and maintenance of myogenic tone.[15,16] In addition, the lungs of caveolin-1 knockout mice display thickening of alveolar septa due to uncontrolled endothelial cell proliferation and fibrosis, resulting in severe physical limitations.

Reagent

Anti-Caveolin-1 is supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Precautions and Disclaimer

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

Storage/Stability

For continuous use, store at 2-8 °C for up to one month. For prolonged storage, freeze in working aliquots at –20 °C. Repeated freezing and thawing is not recommended. Storage in frost-free freezers is also not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

Product Profile
A minimum working dilution of 1:2,000 is determined by immunoblotting using a whole extract of human umbilical vein endothelial HUVEC cell line and rat fibroblast Rat-1 cell line.

A minimum working dilution of 1:500 is determined by indirect immunofluorescence using mouse NIH/3T3 fibroblasts.

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

References

1. Lisanti, M.P., et al., Mol. Membr. Biol., **12**, 121 (1995).
2. Okamoto, T., et al., J. Biol. Chem., **273**, 5419 (1998).
3. Smart, E.J., et al., Mol. Cell. Biol., **19**, 7289 (1999).
4. Li, S., et al., J. Biol. Chem., **271**, 29182 (1996).
5. Anderson, R.G., et al., Ann. Rev. Biochem., **67**, 199 (1998).
6. Glenney, J.R., and Soppet, D., Proc. Natl. Acad. Sci. USA, **89**, 10517 (1992)
7. Scherer, P.E., et al., J. Biol. Chem., **272**, 29337 (1997).
8. Song, K.S., et al., J. Biol. Chem., **271**, 15160 (1996).
9. Sargiacomo, M., et al., Proc. Natl. Acad. Sci. USA, **92**, 9407 (1995).
10. Li, S., et al., J. Biol. Chem., **271**, 568 (1996).
11. Couet, J., et al., J. Biol. Chem., **272**, 30429 (1997).
12. Oka, N., et al., J. Biol. Chem., **272**, 33416 (1997).
13. Engelman, J.A., et al., J. Biol. Chem., **272**, 16374 (1997).
14. Galbiati, F., et al., Proc. Natl. Acad. Sci. USA, **95**, 10257 (1998).
15. Drab, M., et al., Science, **293**, 2 (2001).
16. Razani, B., et al., J. Biol. Chem., **276**, 38121 (2001).

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