3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-521-8956 • (314) 771-5765
Fax 800-325-5052 • (314) 771-5757
sigma-aldrich.com

ProductInformation

Anti-KIF3A
Developed in Rabbit
IgG Fraction of Antiserum

Product Number **K 3513**

Product Description

Anti-KIF3A is developed in rabbit using a synthetic peptide corresponding to the C-terminus of mouse KIF3A (amino acids 682-701) conjugated to KLH as immunogen. This sequence is identical in human KIF3A. 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-KIF3A recognizes mouse, rat, and human KIF3A (85 kDa). Applications include the detection of KIF3A by immunoblotting and by immunofluorescence. Staining of KIF3A in immunoblotting is specifically inhibited by the KIF3A immunizing peptide (amino acids 682-701).

The kinesin superfamily (KIFs) of proteins consists of a class of microtubule-dependent motors that plays a major role in many cellular and developmental functions, including organelle transport, mitosis, meiosis, and possibly long-range signaling in neurons.[1,2] The KIF proteins are primarily associated with anterograde transport of vesicles and organelles in neurons, epithelial cells, and melanosomes with bidirectional transport of mitochondria and mediating transport between the endoplasmic reticulum (ER) and the Golgi complex. The kinesin superfamily is encoded by a large number (>30) of genes.[1,3,4]

The KIF3 motors are a functionally diverse subgroup of the kinesin superfamily characterized by a N-terminal motor domain (N-IV class).[3,5] KIF3 motor complex (also termed kinesin-II) is composed of the KIF3A, KIF3B, and KIF3C motor subunits, that associate as heterodimers, in which KIF3B and KIF3C are alternative partners of KIF3A.[6-8] The property of KIF3 subunits to form distinct KIF3A/B and KIF3A/C complexes may explain their ability to translocate different cargoes. The KIF3 heterodimer is associated with a third non-motor accessory subunit, the kinesin-associated protein KAP3, thus forming a heterotrimeric complex.[6,7] KAP3 is thought to regulate the cargo binding of KIF3. KIF3A/B has been shown to function *in vivo* as a motor for the anterograde fast axonal transport of membrane-bound organelles in neurons.[6,7,9] KIF3A and KIF3B form a heterodimer of 50 nm consisting of two globular heads 10 nm in diameter, a stalk, and a tail domain. The KIF3A/B heterodimer exhibits a plus end-directed microtubule sliding activity.

KIF3A/B is abundantly expressed in neuronal tissue and ubiquitously expressed in other tissues in lower amounts.

KIF3 plays a crucial role during development. KIF3A-/- and KIF3B-/- mice do not survive beyond midgestation. Embryos lacking KIF3A and KIF3B display randomization of left-right (L-R) asymmetry and numerous morphological abnormalities.[10,11] The earliest detectable abnormality in KIF3A/B knockout embryos is loss of cilia on cells of the embryonic node, which is thought to play an important role in setting initial L-R asymmetry, suggesting that both KIF3A and KIF3B are necessary for embryonic ciliary morphogenesis and act at an early step in L-R axis determination.

Reagent

Anti-KIF3A 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 rat brain homogenate and a whole cell extract of rat pheochromocytoma PC12 cell line.

A minimum working dilution of 1:100 is determined by indirect immunofluorescence using frozen sections of rat cerebellum.

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

References

1. Hirokawa, N., Science, **279**, 519-526 (1998).
2. Hirokawa, N., Traffic, **1**, 29-34 (2000).
3. Aizawa, H., et al., J. Cell Biol., **119**, 1287-1296 (1992).
4. Nakagawa, T., et al., Proc. Natl. Acad. Sci. USA, **94**, 9654-9659 (1997).
5. Kondo, S., et al., J. Cell. Biol., **125**, 1095-1107 (1994).
6. Yamazaki, H., J. Cell Biol., **130**, 1387-1399 (1995).
7. Yamazaki, H., Proc. Natl. Acad. Sci. USA, **93**, 8443-8448 (1996).
8. Muresan, V., et al., Mol. Biol. Cell, **9**, 637-652 (1998).
9. Takeda, S., et al., J. Cell Biol., **148**, 1255-1265 (2000).
10. Marszalek, J.R., et al., Proc. Natl. Acad. Sci. USA, **96**, 5043-5048 (1999).
11. Takeda, S., et al., J. Cell Biol., **145**, 825-836 (1999).

ER/KAA 06/02