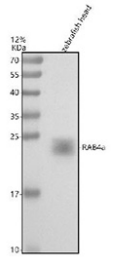
Zebrafish Rab4a Antibody / Rab-4A (RZ1299)

Catalog No.	Formulation	Size
RZ1299	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

Availability	2-3 weeks
Species Reactivity	Zebrafish
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit Ig
Purity	Antigen affinity chromatography
Buffer	Lyophilized from 1X PBS with 2% Trehalose
UniProt	Q6PHI9
Applications	Western Blot: 0.5-1ug/ml
Limitations	This Zebrafish Rab4a antibody is available for research use only.



Zebrafish Rab4a Antibody Head Tissue WB. Western blot analysis of Rab4a protein using Zebrafish Rab4a antibody and zebrafish head tissue lysates. Predicted molecular weight ~24 kDa.

Description

The Zebrafish Rab4a antibody targets Rab4a, also referred to as Rab-4A, a small GTPase that regulates fast recycling endosome trafficking, receptor recycling, and membrane transport dynamics essential for vertebrate development in Danio rerio. Zebrafish, also known as Danio rerio, express rab4a throughout embryogenesis, with enriched expression in epithelial tissues, neural progenitors, somites, and developing endodermal organs where rapid endosomal cycling supports signaling and morphogen distribution. Rab4a localizes primarily to early and recycling endosomes, where it participates in sorting and returning membrane proteins to the plasma membrane, thereby influencing receptor availability and surface signaling profiles.

Rab4a belongs to the Rab family of small GTP-binding proteins and acts as a molecular switch that cycles between an active GTP-bound state and an inactive GDP-bound state. Its activity regulates vesicle budding, cargo selection, and microtubule-dependent vesicle movement. In zebrafish embryos, Rab4a-mediated fast recycling is crucial for maintaining signaling gradients, trafficking adhesion molecules, and supporting dynamic cell behaviors during axis elongation, neural tube formation, cardiac development, and epithelial remodeling. A Zebrafish Rab4a antibody is suitable for detecting Rab4a in endosomal and perinuclear compartments, where its punctate localization provides a clear marker for early endosome to plasma membrane recycling routes.

Functionally, Rab4a is central to rapid recycling of receptors such as integrins, growth factor receptors, and guidance molecules that must be tightly regulated during development. By controlling fast return to the cell surface, Rab4a influences processes such as cell migration, polarity establishment, neurite extension, and tissue-layer organization. In vertebrate systems, Rab4a modulates trafficking of signaling receptors that participate in Wnt, Fgf, Hedgehog, and Notch pathways. In zebrafish, these pathways rely on precise membrane trafficking to achieve proper germ layer specification, mesoderm patterning, neural development, and organogenesis. Disruption of rab4a expression or function may disturb recycling efficiency, alter receptor surface levels, and impair coordinated developmental signaling.

Structurally, zebrafish Rab4a contains conserved motifs required for GTP binding and hydrolysis and interacts with effector proteins involved in endosomal sorting, cargo recognition, and vesicle tethering. Prenylation at the C-terminus anchors Rab4a to recycling endosome membranes, while specific GEFs and GAPs regulate its nucleotide state. The zebrafish rab4a gene maps to chromosome 18 and is regulated by transcriptional programs associated with membrane dynamics, polarity formation, and intracellular transport. Co-localization experiments typically identify Rab4a in early and recycling endosomes, often overlapping with markers such as Rab5, Rab11, and transferrin-recycling pathways.

A Zebrafish Rab4a antibody is suitable for detecting Rab4a in studies focused on endosomal trafficking, membrane recycling, receptor regulation, polarized cell behavior, and developmental transport mechanisms in Danio rerio. Because recycling endosomes influence numerous developmental processes requiring dynamic membrane remodeling, Rab4a serves as an important marker for understanding endocytic recycling and signaling distribution. This antibody is supplied for research use by NSJ Bioreagents.

This Zebrafish antibody is part of a broader Zebrafish / Danio rerio antibody panel offered by NSJ Bioreagents.

Application Notes

Optimal dilution of the Zebrafish Rab4a antibody should be determined by the researcher.

Immunogen

E. coli-derived zebrafish Rab4a recombinant protein (amino acids D105-C213) was used as the immunogen for the Zebrafish Rab4a antibody.

Storage

After reconstitution, the Zebrafish Rab4a antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.

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