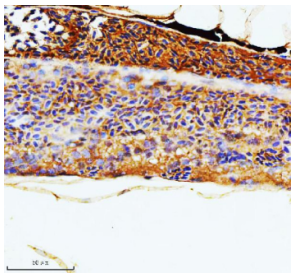
Zebrafish Rac1 Antibody / Rac family small GTPase 1a (RZ1007)

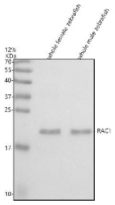
Catalog No.	Formulation	Size
RZ1007	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

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	Q7ZSZ9
Localization	Cytoplasm, cell membrane
Applications	Western blot: 0.5-1 ug/ml Immunohistochemistry (FFPE): 2-5 ug/ml
Limitations	This Zebrafish Rac1 antibody is available for research use only.



Zebrafish Rac1 Antibody Kidney IHC. Immunohistochemistry staining of FFPE zebrafish kidney tissue with Zebrafish Rac1 antibody. HIER: boil tissue sections in pH8 EDTA for 20 min and allow to cool before testing.



Zebrafish Rac1 Antibody WB. Western blot analysis of Rac1 protein using Rac1 antibody and 1) whole female zebrafish and 2) whole male zebrafish tissue lysate. Expected molecular weight ~22 kDa.

Description

Zebrafish (Danio rerio) Rac1 antibody recognizes Rac family small GTPase 1a, a key regulator of actin cytoskeleton dynamics, cell migration, and intracellular signaling in Danio rerio. Rac1a is one of two Rac1 paralogs in zebrafish that arose through genome duplication and is encoded by the rac1a gene on chromosome 2. As a member of the Rho family of small GTP binding proteins, Rac1a cycles between active GTP bound and inactive GDP bound states to coordinate cytoskeletal remodeling, membrane protrusion, vesicular transport, and cell polarity. Rac1a is broadly expressed throughout zebrafish development and is strongly enriched in tissues undergoing active morphogenesis, including neural crest derivatives, brain, somites, vasculature, and migrating epithelial layers.

Rac family small GTPase 1a plays a central role in early zebrafish embryonic movements. It mediates pathways required for epiboly, convergence and extension, neural plate shaping, and coordinated tissue spreading. Rac1a activates actin nucleation through the WAVE complex and Arp2/3 mediated branching to generate lamellipodia and membrane protrusions essential for cell migration and collective movement. Zebrafish studies demonstrate that Rac1a loss disrupts cell adhesion, impairing tissue alignment, boundary formation, and structural integrity during axis formation. Its signaling influences pathways such as Wnt, FGF, and chemokine directed migration that guide cells to proper positions within the developing embryo.

Beyond its morphogenetic roles, Rac1a participates in neuronal differentiation, axonal guidance, and synaptic development. In developing neurons, Rac1a activity regulates growth cone behavior, dendritic branching, and cytoskeletal patterning required for proper network formation. Rac1a also contributes to vascular development, directing endothelial cell migration, lumen formation, and stabilization of nascent vessels. In immune related contexts, Rac1a is involved in leukocyte motility, phagocytosis, and formation of actin driven protrusions that support host defense. Subcellular localization studies show Rac1a concentrated at the plasma membrane, leading edges of motile cells, cell-cell junctions, and actin rich domains.

Rac1a function is tightly regulated by guanine nucleotide exchange factors, GTPase activating proteins, and scaffolding proteins that localize signaling to specific microdomains. Isoform specificity in zebrafish allows Rac1a and Rac1b to perform overlapping yet distinct roles, with Rac1a typically contributing more strongly to early embryonic movements and epithelial remodeling. Disruption of Rac1a expression or signaling results in widespread developmental abnormalities, including defective migration, craniofacial malformations, neural tube defects, and impaired organogenesis. Because of its central role in cytoskeletal control, Rac1a is frequently used as a molecular readout in zebrafish studies of toxicology, mechanotransduction, and cell behavior under environmental stress.

This Zebrafish Rac1 antibody is suitable for detecting Rac family small GTPase 1a in research focused on cytoskeletal regulation, cell migration, embryonic patterning, neuronal development, vascular biology, and immune cell dynamics in zebrafish. It supports studies examining Rac dependent signaling, actin remodeling, collective cell movements, and developmental responses to genetic or environmental perturbation. NSJ Bioreagents provides this reagent within its zebrafish and developmental biology antibody collection.

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

RAC1 is a central regulator of actin cytoskeleton remodeling, cell migration, and intracellular signaling. Researchers investigating these functions can also explore our RAC1 Antibody R32162, which is validated for WB, IHC, IF, and FACS.

Application Notes

Optimal dilution of the Zebrafish Rac1 antibody should be determined by the researcher.

Immunogen

A synthetic peptide corresponding to a sequence at the C-terminus of zebrafish Rac1 was used as the immunogen for the

Zebrafish Rac1 antibody.

Storage

After reconstitution, the Zebrafish Rac1 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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