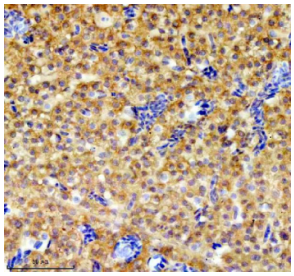
Zebrafish Grpel1 Antibody / GrpE protein homolog (RZ1109)

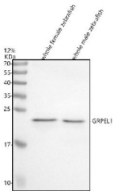
Catalog No.	Formulation	Size
RZ1109	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

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	Q32PS5
Localization	Cytoplasm
Applications	Western blot: 0.5-1 ug/ml Immunohistochemistry (FFPE): 2-5 ug/ml
Limitations	This Zebrafish Grpel1 antibody is available for research use only.



Zebrafish Grpel1 Antibody Liver IHC. Immunohistochemistry staining of FFPE zebrafish liver tissue with Zebrafish Grpel1 antibody. HIER: boil tissue sections in pH8 EDTA for 20 min and allow to cool before testing.



Zebrafish Grpel1 Antibody WB. Western blot analysis of Grpel1 protein using Zebrafish Grpel1 antibody and 1) whole female zebrafish tissue lysate and 2) whole male zebrafish tissue lysate. Predicted molecular weight ~24 kDa.

Description

Zebrafish (Danio rerio) Grpel1 antibody detects Grpel1, a mitochondrial nucleotide exchange factor that promotes protein folding and import by regulating Hsp70 family chaperone activity. In zebrafish, the grpel1 gene encodes a conserved mitochondrial matrix protein homologous to bacterial GrpE, functioning within the mtHsp70 chaperone system to facilitate ATP-driven folding cycles and mitochondrial preprotein translocation. Grpel1 acts as a co-chaperone, stimulating ADP release from mtHsp70 and enabling efficient binding and release of substrate proteins. Because mitochondrial proteostasis is essential for cellular metabolism and early embryonic development, GrpE protein homolog antibody reagents support a wide range of research in mitochondrial biology and developmental physiology.

In zebrafish embryos, grpel1 is expressed strongly in tissues with high metabolic demand, including developing muscle, neural structures, heart, and sensory epithelium. These tissues rely on robust mitochondrial function to support energy production, calcium handling, and biosynthetic processes. Proper Grpel1 activity ensures correct folding and import of mitochondrial proteins encoded by nuclear genes, maintaining respiratory chain integrity and metabolic stability. Disruption of grpel1 function in vertebrate systems impairs mitochondrial protein homeostasis, leading to deficits in oxidative phosphorylation, stress resilience, and tissue differentiation.

At the molecular level, Grpel1 forms homodimers within the mitochondrial matrix and interacts directly with mtHsp70 during preprotein translocation. Its nucleotide exchange activity accelerates the ATP-ADP cycle, allowing mtHsp70 to maintain proper timing of substrate binding and release. This cooperation is essential for guiding polypeptides across the inner membrane into the matrix, where they undergo final folding or assembly. In zebrafish, these processes are critical for supporting rapid organogenesis, neural circuit development, and muscle formation, highlighting Grpel1's importance in controlling mitochondrial proteome maturation.

Beyond its classical role in protein import, Grpel1 contributes to mitochondrial stress responses by supporting chaperone efficiency during periods of increased protein unfolding or elevated metabolic load. Studies in vertebrates indicate that limiting nucleotide exchange factor activity sensitizes cells to heat shock, oxidative stress, and disruptions in membrane potential. In zebrafish, grpel1 activity likely influences mitochondrial quality control, metabolic flexibility, and tissue robustness during early development when metabolic demands shift quickly.

Subcellular localization of Grpel1 is strictly mitochondrial, with enrichment in the matrix compartment where protein import and folding machinery reside. Interaction partners include mtHsp70, translocase of the inner membrane components, and additional chaperones involved in respiratory complex assembly. Conservation of structural motifs across species underscores the fundamental role of Grpel1 in mitochondrial proteostasis, making zebrafish an effective vertebrate model for studying its developmental and metabolic functions.

A Zebrafish Grpel1 antibody is suitable for research applications such as western blotting, immunohistochemistry, and assays examining mitochondrial protein import, chaperone activity, and metabolic regulation. This antibody targets Grpel1 for studies involving mitochondrial development, proteostasis, and cellular energy homeostasis. NSJ Bioreagents provides the Zebrafish Grpel1 antibody to support research in mitochondrial biology and vertebrate embryogenesis.

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

Application Notes

Optimal dilution of the Zebrafish Grpel1 antibody should be determined by the researcher.

Immunogen

An E.coli-derived zebrafish Grpel1 recombinant protein (amino acids Q90-P217) was used as the immunogen for the Zebrafish Grpel1 antibody.

Storage

After reconstitution, the Zebrafish Grpel1 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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