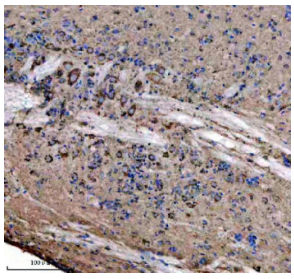
Zebrafish Atp5b Antibody / Atp5f1b / ATP synthase subunit beta (RZ1029)

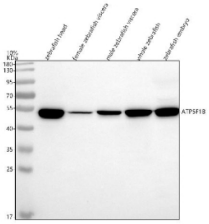
Catalog No.	Formulation	Size
RZ1029	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

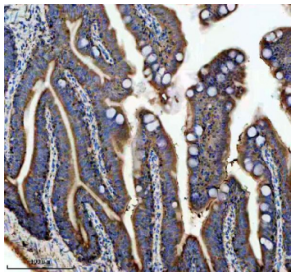
Availability	2-3 weeks
Species Reactivity	Zebrafish
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit Ig
Purity	Antigen affinity chromatography
Buffer	Lyophilized from 1X PBS with 2% Trehalose
UniProt	A8WGC6
Applications	Western Blot : 0.5-1 ug/ml Immunohistochemistry (FFPE) : 2-5 ug/ml Immunofluorescence : 5 ug/ml
Limitations	This Zebrafish Atp5b antibody is available for research use only.



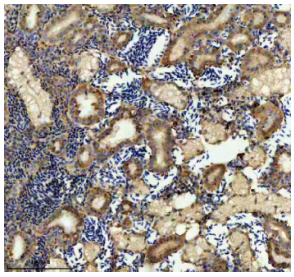
IHC staining of FFPE zebrafish brain tissue with Zebrafish Atp5b antibody. HIER: boil tissue sections in pH8 EDTA for 20 min and allow to cool before testing.



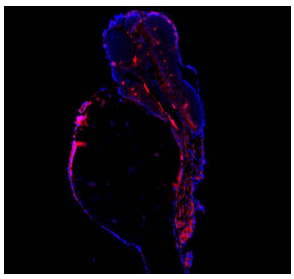
Western blot analysis of Atp5b/ATP5F1B protein using Zebrafish Atp5b antibody and 1) zebrafish head 2) female zebrafish viscera, 3) male zebrafish viscera, 4) whole zebrafish and 5) zebrafish embryo tissue lysate. Predicted molecular weight ~57 kDa.



IHC staining of FFPE zebrafish colon tissue with Zebrafish Atp5b antibody. HIER: boil tissue sections in pH8 EDTA for 20 min and allow to cool before testing.



IHC staining of FFPE zebrafish kidney tissue with Zebrafish Atp5b antibody. HIER: boil tissue sections in pH8 EDTA for 20 min and allow to cool before testing.



Immunofluorescent staining of FFPE zebrafish embryo tissue with Zebrafish Atp5b antibody (red) and DAPI nuclear stain (blue). HIER: steam section in pH8 EDTA buffer for 20 min.

Description

Zebrafish (Danio rerio) Atp5b antibody recognizes Atp5f1b, also known as ATP synthase subunit beta, a core catalytic component of the mitochondrial ATP synthase complex. The zebrafish atp5f1b gene is located on chromosome 23 and encodes a highly conserved enzyme necessary for oxidative phosphorylation and cellular energy production. Atp5f1b resides in the mitochondrial matrix-facing side of the inner mitochondrial membrane where it forms part of the F1 sector of ATP synthase. This subunit is responsible for ATP generation through its catalytic binding sites, producing the majority of cellular ATP during electron transport chain activity. In Danio rerio, Atp5f1b is expressed broadly throughout embryogenesis and is enriched in tissues with high metabolic demands such as brain, somites, developing musculature, heart, and rapidly differentiating endodermal organs.

ATP synthase subunit beta plays a critical role in mitochondrial energy metabolism. During early zebrafish development, embryonic cells rely on increasing oxidative phosphorylation capacity as they transition from maternally deposited energy stores toward fully autonomous metabolic regulation. Atp5f1b is essential for supporting the rapid ATP turnover required for proliferation, morphogenetic movements, and growth of complex organ systems. Its activity influences multiple developmental pathways by providing energy for cytoskeletal remodeling, signaling gradients, transcriptional programs, and ion homeostasis. Because mitochondrial ATP levels strongly affect cell fate decisions, Atp5f1b helps shape metabolic environments that guide differentiation across germ layers.

Disruption of ATP synthase function or mitochondrial metabolism in zebrafish results in profound developmental defects, including impaired heart development, abnormal neural patterning, reduced somite formation, and failures in organogenesis. Atp5f1b contributes to maintaining mitochondrial membrane potential, supporting electron transport chain efficiency, and regulating mitochondrial dynamics. In developing muscle and cardiac tissue, Atp5f1b is required for the assembly of organized mitochondrial networks that sustain contractile function. Neural tissues also depend on Atp5f1b mediated ATP generation for axon outgrowth, synaptic maturation, and neurotransmission-related metabolism.

Beyond its canonical metabolic role, ATP synthase subunit beta is involved in regulating apoptosis, reactive oxygen species balance, and mitochondrial stress responses. Vertebrate studies indicate that altered Atp5f1b expression can modify susceptibility to oxidative stress, influence mitochondrial biogenesis, and affect metabolic reprogramming during development. These functions are relevant in zebrafish models that examine mitochondrial dysfunction, environmental toxicity, or genetic disruption of oxidative phosphorylation pathways. Isoform variation of atp5f1b may reflect fine-tuned metabolic regulation across tissues or developmental stages.

At the molecular level, Atp5f1b forms part of the F1 catalytic headpiece together with alpha, gamma, delta, and epsilon subunits. It undergoes dynamic conformational changes during ATP synthesis and interacts with the F0 sector through rotational coupling driven by proton flow. This highly conserved mechanism generates ATP essential for all vertebrate developmental processes. In zebrafish, proper assembly and stability of ATP synthase complexes depend on balanced expression of Atp5f1b and coordination with mitochondrial chaperones and membrane-associated proteins.

This Zebrafish Atp5b antibody is suitable for detecting Atp5f1b in research focused on mitochondrial metabolism, oxidative phosphorylation, cardiac and muscular development, neural maturation, and metabolic stress responses in zebrafish. It supports studies examining ATP synthase function, mitochondrial network formation, and developmental phenotypes resulting from altered energy production. NSJ Bioreagents provides this reagent within its zebrafish and mitochondrial biology antibody collection.

Application Notes

Optimal dilution of the Zebrafish Atp5b antibody should be determined by the researcher.

Immunogen

An E.coli-derived zebrafish Atp5b/ATP5F1B recombinant protein (amino acids Q112-S517) was used as the immunogen for the Zebrafish Atp5b antibody.

Storage

After reconstitution, the Zebrafish Atp5b antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.