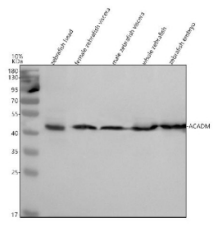
Zebrafish Mcad Antibody / Acadm (RZ1138)

Catalog No.	Formulation	Size
RZ1138	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
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit Ig
Purity	Antigen affinity chromatography
Buffer	Lyophilized from 1X PBS with 2% Trehalose
UniProt	A2CG95
Applications	Western Blot : 0.5-1 ug/ml
Limitations	This Zebrafish Mcad antibody is available for research use only.



Western blot analysis of Acadm/Mcad protein using Zebrafish Mcad 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 ~46 kDa.

Description

Zebrafish (Danio rerio) Mcad antibody detects Mcad, a mitochondrial enzyme essential for the beta-oxidation of medium-chain fatty acids. In zebrafish, the acadm gene encodes this medium-chain acyl-CoA dehydrogenase, a core component of the fatty acid oxidation pathway that converts medium-chain acyl-CoA substrates into enoyl-CoA intermediates. This reaction initiates a sequence of mitochondrial beta-oxidation steps that generate acetyl-CoA and reducing equivalents needed for ATP production. Because metabolic regulation is fundamental to embryonic growth and tissue differentiation, Zebrafish Mcad antibody reagents are valuable tools for studying energy homeostasis, metabolic adaptation, and mitochondrial function during vertebrate development.

Mcad plays a particularly important role in tissues with high oxidative capacity. In zebrafish embryos, acadm is expressed in the developing heart, skeletal muscle, brain, and hepatic tissues, all of which depend on mitochondrial beta-oxidation to support rapid proliferation and functional maturation. During early development, when carbohydrate stores are limited, fatty acid oxidation provides a critical energy source that sustains morphogenesis and organogenesis. Impaired Mcad activity disrupts ATP production, increases reliance on anaerobic metabolism, and can lead to accumulation of fatty acid intermediates that impair cellular function.

In vertebrates, deficiency in medium-chain acyl-CoA dehydrogenase is associated with metabolic disorders characterized by hypoglycemia, impaired ketogenesis, and sensitivity to fasting stress. Although zebrafish do not fully recapitulate human metabolic disease states, disruptions in acadm expression produce comparable metabolic vulnerabilities, affecting cardiac output, muscle performance, and neurodevelopment. These parallels underscore the conserved nature of Mcad function across species.

At the biochemical level, Mcad is a mitochondrial matrix enzyme that functions as a homotetramer. It utilizes FAD as a cofactor and participates in the first dehydrogenation step of medium-chain fatty acid breakdown. Its activity is tightly linked to pathways governing oxidative phosphorylation, mitochondrial biogenesis, and reactive oxygen species management. In zebrafish, Mcad contributes to the metabolic flexibility required during transitions such as yolk utilization, organ maturation, and shifts in nutrient availability.

Expression of acadm is dynamically regulated during development and responds to metabolic cues such as nutrient composition, oxidative stress, and hormonal signaling. High levels of Mcad support aerobic metabolism in rapidly growing tissues, while regulatory adjustments help maintain energy balance under fluctuating environmental or developmental conditions. Because zebrafish embryos are transparent and amenable to metabolic imaging, they provide an excellent model for studying mitochondrial adaptations controlled by enzymes such as Mcad.

Subcellular localization of Mcad is strictly mitochondrial, where it associates with additional beta-oxidation enzymes and metabolic complexes. Its activity affects not only fatty acid energy production but also lipid homeostasis, acetyl-CoA availability for biosynthetic pathways, and the timing of metabolic transitions during growth and differentiation. These roles position Mcad as a key regulator of vertebrate metabolic physiology.

A Zebrafish Mcad antibody is suitable for research applications such as western blotting, immunohistochemistry, and assays examining mitochondrial metabolism, fatty acid oxidation, and developmental energy regulation. This antibody targets Mcad for studies involving metabolic stress responses, organ-specific energy use, and vertebrate metabolic development. NSJ Bioreagents provides the Zebrafish Mcad antibody to support research in mitochondrial biology and developmental metabolism.

Application Notes

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

Immunogen

An E.coli-derived zebrafish Acadm/Mcad recombinant protein (amino acids S43-E406) was used as the immunogen for the Zebrafish Mcad antibody.

Storage

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