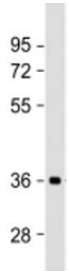
NMNAT1 Antibody (F53836)

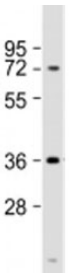
Catalog No.	Formulation	Size
F53836-0.2ML	In 1X PBS, pH 7.4, with 0.09% sodium azide	0.2 ml
F53836-0.05ML	In 1X PBS, pH 7.4, with 0.09% sodium azide	0.05 ml

Bulk quote request

Availability	1-3 business days
Species Reactivity	Human
Predicted Reactivity	Bovine
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit Ig
Purity	Antigen affinity
UniProt	Q9HAN9
Applications	Western Blot : 1:1000-2000
Limitations	This NMNAT1 antibody is available for research use only.



Western blot testing of human brain lysate with NMNAT1 antibody at 1:2000. Predicted molecular weight: 32 kDa, commonly observed at 28-36 kDa.



Western blot testing of human brain lysate with NMNAT1 antibody at 1:1000. Predicted molecular weight: 32 kDa, commonly observed at 28-36 kDa.

Description

NMNAT1 antibody detects Nicotinamide mononucleotide adenylyltransferase 1, an essential nuclear enzyme that catalyzes a key step in nicotinamide adenine dinucleotide (NAD+) biosynthesis. The UniProt recommended name is Nicotinamide mononucleotide adenylyltransferase 1 (NMNAT1). This protein plays a central role in cellular energy metabolism by forming NAD+ from ATP and nicotinamide mononucleotide (NMN), maintaining the NAD+ pool necessary for DNA repair, chromatin remodeling, and stress adaptation.

Functionally, NMNAT1 antibody identifies a 279-amino-acid enzyme that localizes predominantly to the nucleus. It belongs to the NMNAT family, which also includes NMNAT2 and NMNAT3, each with distinct subcellular distributions. NMNAT1 is responsible for sustaining nuclear NAD+ levels that support the activity of critical NAD+-dependent enzymes such as PARPs and sirtuins. By ensuring adequate cofactor supply, NMNAT1 influences transcriptional regulation, DNA repair, and genome stability during oxidative and replicative stress.

The NMNAT1 gene is located on chromosome 1q25.3 and encodes a homomeric enzyme that assembles into a hexameric structure. Each subunit contributes to catalytic activity, forming a symmetric complex that binds both NMN and ATP substrates in the presence of magnesium ions. Through its enzymatic activity, NMNAT1 fuels nuclear NAD+-dependent reactions that maintain epigenetic integrity and promote efficient DNA damage response mechanisms.

NMNAT1 is broadly expressed, with particularly high levels in metabolically active tissues such as brain, retina, and skeletal muscle. In neurons, NMNAT1 supports axonal survival and synaptic maintenance by providing NAD+ for energy metabolism and protein homeostasis. Beyond its catalytic function, NMNAT1 also acts as a molecular chaperone, stabilizing proteins against aggregation under cellular stress conditions. This dual role has positioned NMNAT1 as a critical factor in neuroprotection and cellular longevity.

Pathogenic mutations in NMNAT1 cause Leber congenital amaurosis type 9 (LCA9), an inherited retinal disorder leading to severe early-onset vision loss. These mutations reduce enzyme stability or catalytic efficiency, impairing NAD+ synthesis and compromising photoreceptor viability. Research into NMNAT1-associated retinal degeneration has revealed the importance of NAD+ metabolism in photoreceptor maintenance and energy homeostasis, making NMNAT1 a focal point in therapeutic development for retinal and neurodegenerative diseases.

In the context of cellular metabolism, NMNAT1 regulates NAD+ balance in coordination with cytosolic NMNAT2 and mitochondrial NMNAT3. This cross-compartmental NAD+ communication ensures consistent energy supply and redox balance across organelles. Reduced NMNAT1 activity has been associated with DNA repair deficiency, increased oxidative stress, and aging-related decline in nuclear function. Conversely, enhanced NMNAT1 expression or NAD+ precursor supplementation improves stress resistance and lifespan in multiple experimental systems.

NMNAT1 antibody is widely used in biochemistry, neuroscience, and metabolic research to investigate NAD+ biosynthesis and nuclear energy regulation. It is suitable for applications such as western blotting, immunohistochemistry, and immunofluorescence to monitor NMNAT1 expression, localization, and regulation. This antibody supports studies of NAD+ metabolism, DNA repair dynamics, and neurodegenerative disease mechanisms. In translational research, it aids in evaluating NAD+-related interventions targeting aging, retinal disease, and cellular repair processes.

Structurally, NMNAT1 contains a conserved adenylyltransferase fold composed of Rossmann-like domains that coordinate nucleotide binding and catalysis. The enzymeÃ¢Â€Â™s C-terminal tail mediates nuclear localization, while active-site residues facilitate formation of the NMN-AMP intermediate. NSJ Bioreagents provides NMNAT1 antibody reagents validated for use in metabolic regulation, enzymology, and neuroprotective signaling research.

Application Notes

Titration of the NMNAT1 antibody may be required due to differences in protocols and substrate sensitivity.

Immunogen

A portion of amino acids 171-201 from the human protein was used as the immunogen for the NMNAT1 antibody.

Storage

Aliquot the NMNAT1 antibody and store frozen at -20oC or colder. Avoid repeated freeze-thaw cycles.