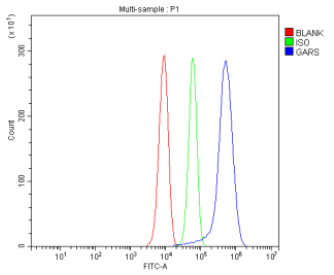
GARS1 Antibody / Glycyl-tRNA synthetase (FY12966)

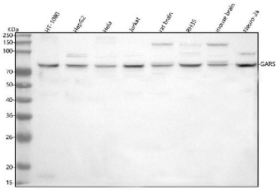
Catalog No.	Formulation	Size
FY12966	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

Availability	1-2 days
Species Reactivity	Human, Mouse, Rat
Format	Lyophilized
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	P41250
Applications	Western Blot : 0.25-0.5ug/ml Flow Cytometry : 1-3ug/million cells ELISA : 0.1-0.5ug/ml
Limitations	This GARS1 antibody is available for research use only.



Flow Cytometry analysis of HepG2 cells using anti-GARS1 antibody. Overlay histogram showing HepG2 cells stained with (Blue line). The cells were fixed with 4% paraformaldehyde and blocked with 10% normal goat serum. And then incubated with rabbit anti-GARS1 antibody (1 ug/million cells) for 30 min at 20oC. DyLight 488 conjugated goat anti-rabbit IgG (5-10 ug/million cells) was used as secondary antibody for 30 minutes at 20oC. Isotype control antibody (Green line) was rabbit IgG (1 ug/million cells) used under the same conditions. Unlabelled sample (Red line) was also used as a control.



Western blot analysis of GARS1 using anti-GARS1 antibody. Lane 1: human HT-1080 whole cell lysates, Lane 2: human HepG2 whole cell lysates, Lane 3: human Hela whole cell lysates, Lane 4: human Jurkat whole cell lysates, Lane 5: rat brain tissue lysates, Lane 6: rat RH35 whole cell lysates, Lane 7: mouse brain tissue lysates, Lane 8: mouse Neuro-2a whole cell lysates. After electrophoresis, proteins were transferred to a nitrocellulose membrane at 150 mA for 50-90 minutes. Blocked the membrane with 5% non-fat milk/TBS for 1.5 hour at RT. The membrane was incubated with rabbit anti-GARS1 antibody at 0.5 ug/ml overnight at 4oC, then washed with TBS-0.1%Tween 3 times with 5 minutes each and probed with a goat anti-rabbit IgG-HRP secondary antibody at a dilution of 1:5000 for 1.5 hour at RT. The signal was developed using enhanced chemiluminescent. The expected molecular weight of GARS1 is ~83 kDa.

Description

GARS1 antibody detects Glycyl-tRNA synthetase, an essential enzyme that catalyzes the attachment of glycine to its corresponding tRNA during protein translation. The UniProt recommended name is Glycyl-tRNA synthetase (GARS1), a class II aminoacyl-tRNA synthetase that ensures fidelity in decoding genetic information into functional proteins. GARS1 is critical for both cytoplasmic and mitochondrial protein synthesis, as it charges tRNAGly with glycine using ATP-dependent activation.

Functionally, GARS1 antibody identifies a 739-amino-acid enzyme that performs the aminoacylation reaction in two steps: activation of glycine to form glycyl-adenylate, followed by transfer to tRNAGly. This reaction supplies aminoacyl-tRNA for translation elongation, ensuring proper incorporation of glycine into nascent polypeptides. GARS1 operates as a homodimer and belongs to the multi-synthetase complex in higher eukaryotes, coordinating translation efficiency and cellular growth. Its catalytic precision is essential for maintaining proteome integrity and translational accuracy.

The GARS1 gene is located on chromosome 7p15.3 and is ubiquitously expressed in all tissues, reflecting its fundamental role in protein biosynthesis. Mutations in GARS1 cause Charcot-Marie-Tooth disease type 2D (CMT2D) and distal spinal muscular atrophy type V, which are characterized by axonal degeneration and motor neuron dysfunction. These mutations often alter enzyme dimerization or substrate binding, impairing aminoacylation activity and disrupting neuronal protein synthesis.

Beyond its canonical translation function, GARS1 exhibits moonlighting roles in signaling and neuroprotection. It can interact with neuropilin-1 and vascular endothelial growth factor (VEGF) receptors to modulate axonal guidance and angiogenesis. In response to cellular stress, GARS1 may relocate to stress granules, linking protein translation to adaptive stress responses. Overexpression or aggregation of mutant GARS1 variants contributes to neuronal toxicity and mitochondrial dysfunction, highlighting its importance in neurodegenerative disease models.

GARS1 antibody is used in molecular biology and neurobiology research to examine aminoacylation, translation control, and disease-associated mutations. It is suited for immunoblotting, enzyme activity assays, and immunofluorescence studies of cytoplasmic and mitochondrial distribution. In cancer research, increased GARS1 expression has been linked to enhanced translation rates and tumor proliferation. Its detection also provides insights into translational stress responses in metabolic and neurological disorders.

Structurally, GARS1 consists of a catalytic domain containing the active-site lysine responsible for ATP-dependent amino acid activation, a tRNA-binding domain, and a dimerization interface. The enzyme's activity is modulated by phosphorylation and association with other aminoacyl-tRNA synthetases within multi-enzyme assemblies. NSJ Bioreagents provides GARS1 antibody reagents validated for use in translational biology, neurodegeneration, and metabolic research.

Application Notes

Optimal dilution of the GARS1 antibody should be determined by the researcher.

Immunogen

E.coli-derived human GARS1 recombinant protein (Position: E61-D673) was used as the immunogen for the GARS1 antibody.

Storage

After reconstitution, the GARS1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.