GLUD1 Antibody / Glutamate dehydrogenase 1 (FY12988)

Catalog No.	Formulation	Size
FY12988	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
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	P00367
Applications	ELISA : 0.1-0.5ug/ml Flow Cytometry : 1-3ug/million cells Immunoprecipitation : 2-4ug/500ug of lysate Immunofluorescence : 5ug/ml Immunohistochemistry : 2-5ug/ml Immunocytochemistry : 5ug/ml Western Blot : 0.25-0.5ug/ml
Limitations	This GLUD1 antibody is available for research use only.

Description

GLUD1 antibody detects Glutamate dehydrogenase 1, a mitochondrial enzyme that catalyzes the reversible oxidative deamination of glutamate to alpha-ketoglutarate and ammonia. The UniProt recommended name is Glutamate dehydrogenase 1, mitochondrial (GLUD1). This enzyme connects amino acid metabolism to the tricarboxylic acid (TCA) cycle, serving as a key regulator of nitrogen balance and cellular energy production.

Functionally, GLUD1 antibody identifies a 558-amino-acid enzyme located in the mitochondrial matrix. GLUD1 catalyzes the interconversion of glutamate and alpha-ketoglutarate with the reduction or oxidation of NAD(P)+ cofactors. This reaction controls the flow of carbon and nitrogen through metabolic networks, linking amino acid catabolism, the TCA cycle, and oxidative phosphorylation. In the brain, GLUD1 contributes to the glutamate-glutamine cycle, influencing neurotransmitter turnover and synaptic function.

The GLUD1 gene is located on chromosome 10q23.3 and encodes a hexameric enzyme regulated allosterically by ADP, GTP, leucine, and other metabolites. GLUD1 activity increases during energy demand, providing substrates for ATP synthesis, while its inhibition by GTP prevents excessive ammonia production. Mutations in GLUD1 cause hyperinsulinism-hyperammonemia (HI/HA) syndrome, characterized by dysregulated insulin secretion due to elevated oxidative deamination in pancreatic beta cells.

In hepatic tissue, GLUD1 participates in ammonia detoxification and urea synthesis by controlling the balance between glutamate oxidation and synthesis. In pancreatic islets, its activity modulates insulin release in response to amino acids. In neurons, GLUD1 provides energy intermediates and regulates excitatory neurotransmission. Dysregulation of GLUD1 is implicated in neurodegenerative diseases, metabolic syndromes, and hyperinsulinemic disorders.

GLUD1 antibody is widely used in research involving metabolism, neurobiology, and endocrinology. It is suitable for immunoblotting, immunofluorescence, and enzyme localization studies to assess mitochondrial distribution and activity. This antibody enables detection of GLUD1 in tissues such as liver, brain, and pancreas, where it plays distinct metabolic roles. In cancer research, GLUD1 expression correlates with metabolic reprogramming, supporting tumor cell growth through glutamine oxidation.

Structurally, GLUD1 forms a hexameric complex with alternating catalytic and regulatory domains. The enzyme's activity is modulated by phosphorylation, redox state, and energy charge. NSJ Bioreagents provides GLUD1 antibody reagents validated for use in mitochondrial metabolism, neurochemistry, and metabolic disease research.

Application Notes

Optimal dilution of the GLUD1 antibody should be determined by the researcher.

Immunogen

E.coli-derived human GLUD1 recombinant protein (Position: A210-T558) was used as the immunogen for the GLUD1 antibody.

Storage

After reconstitution, the GLUD1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.