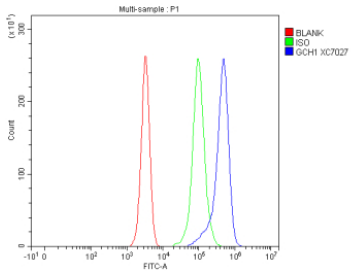
GCH1 Antibody / GTP cyclohydrolase 1 (FY12931)

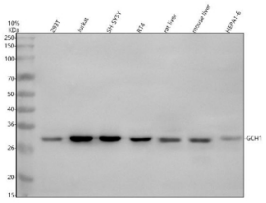
Catalog No.	Formulation	Size
FY12931	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

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	P30793
Applications	Western Blot : 0.25-0.5ug/ml Flow Cytometry : 1-3ug/million cells ELISA : 0.1-0.5ug/ml
Limitations	This GCH1 antibody is available for research use only.



Flow Cytometry analysis of Jurkat cells using anti-GCH1 antibody. Overlay histogram showing Jurkat cells stained with (Blue line). To facilitate intracellular staining, cells were fixed with 4% paraformaldehyde and permeabilized with permeabilization buffer. The cells were blocked with 10% normal goat serum. And then incubated with rabbit anti-GCH1 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 without incubation with primary antibody and secondary antibody (Red line) was used as a blank control.



Western blot analysis of GCH1 using anti-GCH1 antibody. Electrophoresis was performed on a 10% SDS-PAGE gel at 80V (Stacking gel) / 120V (Resolving gel) for 2 hours. Lane 1: human 293T whole cell lysates, Lane 2: human Jurkat whole cell lysates, Lane 3: human SH-SY5Y whole cell lysates, Lane 4: human RT4 whole cell lysates, Lane 5: rat liver tissue lysates, Lane 6: mouse liver tissue lysates, Lane 7: mouse HEPA1-6 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-GCH1 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 an ECL Plus Western Blotting Substrate. The expected molecular weight of GCH1 is ~28 kDa.

Description

GCH1 antibody detects GTP cyclohydrolase 1, the first and rate-limiting enzyme in the biosynthesis of tetrahydrobiopterin (BH4), an essential cofactor for aromatic amino acid hydroxylases and nitric oxide synthases. The UniProt recommended name is GTP cyclohydrolase 1 (GCH1), also known as GTP-CH-I, guanosine triphosphate cyclohydrolase I, and dopa-responsive dystonia protein. GCH1 converts GTP to dihydroneopterin triphosphate, a critical step in the BH4 biosynthetic pathway, thereby controlling the availability of BH4 for dopamine, serotonin, and nitric oxide production.

GCH1 antibody applications extend across neuroscience, cardiovascular research, and metabolic disorders. BH4 deficiency due to mutations in GCH1 results in disorders such as dopa-responsive dystonia (Segawa's disease) and hyperphenylalaninemia. GCH1 expression is tightly regulated by inflammatory signals, oxidative stress, and cytokines such as TNF-alpha and IFN-gamma. In endothelial cells, GCH1 controls endothelial nitric oxide synthase (eNOS) coupling and NO production, influencing vascular tone, blood pressure, and oxidative balance. Dysregulation or polymorphisms of GCH1 have been associated with hypertension, diabetes, and neuropathic pain syndromes.

At the cellular level, GCH1 antibody helps characterize tissue-specific expression patterns and study enzyme regulation in neuronal, hepatic, and vascular tissues. The GCH1 enzyme functions as a homodecamer, with allosteric regulation mediated by the feedback regulatory protein GFRP (GTP cyclohydrolase I feedback regulatory protein). Together, GCH1 and GFRP form a complex controlling BH4 biosynthesis according to phenylalanine and BH4 levels. GCH1 is encoded by the GCH1 gene located on chromosome 14q22.1-q22.2, producing a 250-amino acid cytosolic protein. Mutations include both autosomal dominant and recessive variants leading to enzymatic dysfunction and neurotransmitter deficiency syndromes.

Beyond metabolic function, GCH1 expression increases in response to oxidative stress and acts as a cellular protector by enhancing antioxidant capacity. Overexpression can reduce reactive oxygen species, while silencing sensitizes cells to oxidative damage. NSJ Bioreagents offers validated reagents targeting GCH1 across species for applications including immunoblotting, enzyme activity studies, and analysis of neuronal tissues.

Application Notes

Optimal dilution of the GCH1 antibody should be determined by the researcher.

Immunogen

E.coli-derived human GCH1 recombinant protein (Position: M1-S250) was used as the immunogen for the GCH1 antibody.

Storage

After reconstitution, the GCH1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.