

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
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 Na ₂ HPO ₄ .
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.

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 immunohistochemical 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.