

GCLC Antibody / Glutamate-cysteine ligase catalytic subunit (FY13385)

Catalog No.	Formulation	Size
FY13385	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	P48506
Applications	ELISA : 0.1-0.5ug/ml Flow Cytometry : 1-3ug/million cells Immunofluorescence : 5ug/ml Immunohistochemistry : 2-5ug/ml Western Blot : 0.25-0.5ug/ml
Limitations	This GCLC antibody is available for research use only.

Description

GCLC antibody detects Glutamate-cysteine ligase catalytic subunit, a key enzyme encoded by the GCLC gene located on chromosome 6p12.1. GCLC catalyzes the first and rate-limiting step in glutathione (GSH) biosynthesis, forming gamma-glutamylcysteine from glutamate and cysteine. This enzyme plays an essential role in maintaining redox homeostasis, detoxifying reactive oxygen species (ROS), and protecting cells from oxidative stress. GCLC is expressed ubiquitously, with highest levels in liver, kidney, and lung, where glutathione metabolism is most active.

Structurally, GCLC is a 73 kDa cytosolic enzyme that functions as the catalytic component of the heterodimeric glutamate-cysteine ligase complex, together with the modifier subunit GCLM. It contains ATP-binding and substrate-recognition domains that mediate the ligation reaction. GCLC belongs to the ATP-dependent ligase family and serves as the principal control point in GSH biosynthesis. Co-localization studies show cytoplasmic distribution in metabolically active tissues, aligning with its antioxidant role.

Functionally, GCLC maintains cellular antioxidant defenses by providing the precursor for glutathione synthesis.

Glutathione serves as a cofactor for numerous detoxification enzymes, including glutathione peroxidases and glutathione S-transferases. Through GSH production, GCLC supports redox regulation, protein thiol homeostasis, and protection against electrophilic stress. In immune cells, GCLC-derived glutathione regulates T-cell activation and macrophage inflammatory responses. Known substrates include L-glutamate, L-cysteine, and ATP.

Deficiency or dysregulation of GCLC results in decreased glutathione levels, leading to oxidative stress, hemolytic anemia, and liver dysfunction. Mutations in GCLC are associated with glutathione synthetase deficiency and neurological disorders linked to oxidative damage. Overexpression is observed in certain cancers, conferring chemoresistance through enhanced antioxidant capacity. Pathway associations include glutathione metabolism, oxidative stress response, and xenobiotic detoxification. During development, GCLC supports organogenesis by protecting proliferating cells from oxidative injury.

Immunohistochemical staining using GCLC antibody reveals cytoplasmic localization in hepatocytes, renal tubules, and bronchial epithelial cells. The GCLC antibody from NSJ Bioreagents is an excellent reagent for studies involving redox biology, detoxification mechanisms, and glutathione metabolism.

Application Notes

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

Immunogen

E.coli-derived human GCLC recombinant protein (Position: R24-H388) was used as the immunogen for the GCLC antibody.

Storage

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