SANTA CRUZ BIOTECHNOLOGY, INC.

GCH-I (C-4): sc-271482

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

GTP cyclohydrolase I (GCH-I), a homodecamer, catalyzes the conversion of GTP into dihydroneopterin triphosphate and folate. GCH-I is the first and rate limiting enzyme in tetrahydrobiopterin (BH4) biosynthesis. BH4 is the cofactor for tyrosine hydroxylase, a rate-limiting enzyme for dopamine synthesis and tryptophan hydroxylase, the rate-limiting enzyme for serotonin biosynthesis. Dopamine and serotonin are neurotransmitters involved in depression, which may be associated with a deficiency of BH4. Mutations in the gene encoding GCH-I cause malignant hyperphenylalaninemia, a genetic neurological disorder characterized by abnormally high levels of serum phenylalanine, and dopa-responsive dystonia (DRD), a group of movement disorders characterized by a progressive difficulty in walking which respond to L-dopa.

CHROMOSOMAL LOCATION

Genetic locus: GCH1 (human) mapping to 14q22.2; Gch1 (mouse) mapping to 14 C1.

SOURCE

GCH-I (C-4) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 210-238 at the C-terminus of GCH-I of human origin.

PRODUCT

Each vial contains 200 µg IgG_3 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-271482 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

GCH-I (C-4) is recommended for detection of GCH-I isoform GCH-1 only of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

GCH-I (C-4) is also recommended for detection of GCH-I isoform GCH-1 only in additional species, including canine.

Suitable for use as control antibody for GCH-I siRNA (h): sc-60675, GCH-I siRNA (m): sc-60676, GCH-I shRNA Plasmid (h): sc-60675-SH, GCH-I shRNA Plasmid (m): sc-60676-SH, GCH-I shRNA (h) Lentiviral Particles: sc-60675-V and GCH-I shRNA (m) Lentiviral Particles: sc-60676-V.

Molecular Weight of GCH-I: 26 kDa.

Positive Controls: IMR-32 cell lysate: sc-2409 or GCH-I (m): 293T Lysate: sc-120450.

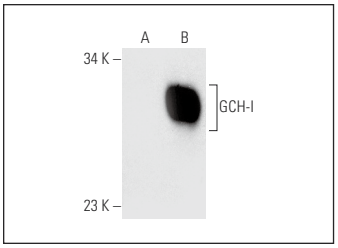
STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

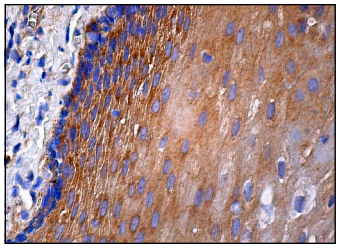
RESEARCH USE

For research use only, not for use in diagnostic procedures.

DATA



GCH-I (C-4): sc-271482. Western blot analysis of GCH-I expression in non-transfected: sc-117752 (**A**) and mouse GCH-I transfected: sc-120450 (**B**) 293T whole cell lysates.



GCH-I (C-4): sc-271482. Immunoperoxidase staining of formalin fixed, paraffin-embedded human esophagus tissue showing cytoplasmic staining of squamous epithelial cells.

SELECT PRODUCT CITATIONS

1. Zhou, Z.W., et al. 2012. Mechanism of reversal of high glucose-induced endothelial nitric oxide synthase uncoupling by tanshinone IIA in human endothelial cell line EA.hy926. Eur. J. Pharmacol. 697: 97-105.
2. Li, P., et al. 2016. Inhibition of aberrant microRNA-133a expression in endothelial cells by statin prevents endothelial dysfunction by targeting GTP cyclohydrolase 1 *in vivo*. Circulation 134: 1752-1765.
3. Chen, L., et al. 2018. MicroRNA-133a impairs perfusion recovery after hindlimb ischemia in diabetic mice. Biosci. Rep. 38: BSR20180346.
4. Jiang, X., et al. 2019. A novel GTPCH deficiency mouse model exhibiting tetrahydrobiopterin-related metabolic disturbance and infancy-onset motor impairments. Metabolism 94: 96-104.
5. Chen, L., et al. 2019. Sodium tanshinone IIA sulfonate improves post-ischemic angiogenesis in hyperglycemia. Biochem. Biophys. Res. Commun. 520: 580-585.
6. Wu, S.H., et al. 2020. Shear stress triggers angiogenesis of late endothelial progenitor cells via the PTEN/Akt/GTPCH/BH4 pathway. Stem Cells Int. 2020: 5939530.
7. Wei, J.L., et al. 2021. GCH1 induces immunosuppression through metabolic reprogramming and IDO1 upregulation in triple-negative breast cancer. J. Immunother. Cancer 9: e002383.
8. Zhang, S., et al. 2022. Manganese induces tumor cell ferroptosis through type-I IFN dependent inhibition of mitochondrial dihydroorotate dehydrogenase. Free Radic. Biol. Med. 193: 202-212.
9. Sprouse, J., et al. 2023. 17β-estradiol suppresses gastric inflammatory and apoptotic stress responses and restores nNOS-mediated gastric emptying in streptozotocin (STZ)-induced diabetic female mice. Antioxidants 12: 758.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.