SANTA CRUZ BIOTECHNOLOGY, INC.

γ-GCSc (G-12): sc-166345

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The GCLC gene consists of 16 exons and encodes the 636 amino acid protein γ-GCSc (γ-glutamylcysteine synthetase heavy subunit), also designated γ-L-glutamate-L-cysteine ligase catalytic subunit (GLCLC). γ-GCSc is expressed in hemocytes, brain, liver and kidney. γ-GCSc associates with a regulatory or modifier subunit, γ-GCSm (γ-glutamylcysteine synthetase light subunit), to form a heterodimer, γ-GCS. γ-GCS is the first enzyme involved and the rate determining step in glutathione biosynthesis. Oxidants, cadium and methyl mercury upregulate the transcription of γ-GCS. H_2O_2 regulation depends on the Yap1 protein and the presence of glutamate, glutamine and lysine. Cadium regulates transcription through proteins Met-4, Met-31 and Met-32. Cbf1, a DNA binding protein, inhibits transcription of γ-GCS. Chemopreventive compounds cause increased levels of γ-GCSc in kidney tissues, which may protect against chemically-induced carcinogenesis. A His370Leu amino acid change in γ-GCSc causes deficiencies in activity, which are responsible for hemolytic anemia and low red blood cell glutathione levels.

REFERENCES

1. Lunn, G., et al. 1979. Transport accounts for glutathione turnover in human erythrocytes. Blood 54: 238.
2. Sierra-Rivera, E., et al. 1995. Assignment of the gene (GLCLC) that encodes the heavy subunit of γ-glutamylcysteine synthetase to human chromosome 6. Cytogenet. Cell Genet. 70: 278-279.
3. Walsh, A.C., et al. 1996. Genetic mapping of GLCLC, the human gene encoding the catalytic subunit of γ-glutamylcysteine synthetase, to chromosome band 6p12 and characterization of a polymorphic trinucleotide repeat within its 5' untranslated region. Cytogenet. Cell Genet. 75: 14-16.
4. Stephen, D.W., et al. 1997. Amino acid-dependent regulation of the *Saccharomyces cerevisiae* GSH1 gene by hydrogen peroxide. Mol. Microbiol. 23: 203-210.
5. Thompson, S.A., et al. 1999. Induction of glutamate-cysteine ligase (γ-glutamylcysteine synthetase) in the brains of adult female mice subchronically exposed to methylmercury. Toxicol. Lett. 110: 1-9.

CHROMOSOMAL LOCATION

Genetic locus: GCLC (human) mapping to 6p12.1; Gclc (mouse) mapping to 9 E1.

SOURCE

γ-GCSc (G-12) is a mouse monoclonal antibody raised against amino acids 338-637 mapping at the C-terminus of γ-GCSc of human origin.

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

STORAGE

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

APPLICATIONS

γ-GCSc (G-12) is recommended for detection of γ-GCSc 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) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for γ-GCSc siRNA (h): sc-41978, γ-GCSc siRNA (m): sc-41979, γ-GCSc shRNA Plasmid (h): sc-41978-SH, γ-GCSc shRNA Plasmid (m): sc-41979-SH, γ-GCSc shRNA (h) Lentiviral Particles: sc-41978-V and γ-GCSc shRNA (m) Lentiviral Particles: sc-41979-V.

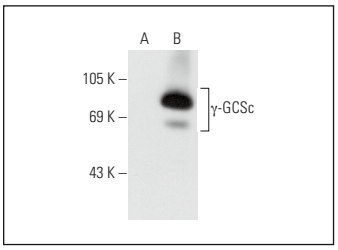
Molecular Weight of γ-GCSc: 73 kDa.

Positive Controls: γ-GCSc (h): 293T Lysate: sc-115522, Hep G2 cell lysate: sc-2227 or A549 cell lysate: sc-2413.

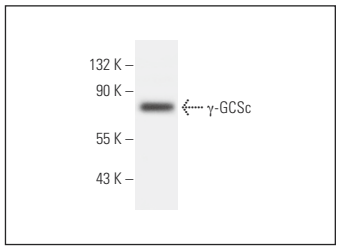
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



γ-GCSc (G-12): sc-166345. Western blot analysis of γ-GCSc expression in non-transfected: sc-117752 (**A**) and human γ-GCSc transfected: sc-115522 (**B**) 293T whole cell lysates.



γ-GCSc (G-12): sc-166345. Western blot analysis of γ-GCSc expression in A549 whole cell lysate.

SELECT PRODUCT CITATIONS

1. Koyani, C.N., et al. 2016. Activation of the MAPK/Akt/Nrf2-Egr1/HO-1-GCLc axis protects MG-63 osteosarcoma cells against 15d-PGJ2-mediated cell death. Biochem. Pharmacol. 104: 29-41.
2. Bebber, C.M., et al. 2021. Ferroptosis response segregates small cell lung cancer (SCLC) neuroendocrine subtypes. Nat. Commun. 12: 2048.

RESEARCH USE

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