

γ -GCSc (D-4): sc-166382

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, cadmium 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. Cadmium 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.

CHROMOSOMAL LOCATION

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

SOURCE

γ -GCSc (D-4) 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 μ g IgG₁ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

γ -GCSc (D-4) 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 μ g per 100-500 μ g 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.

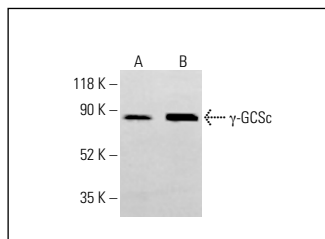
Molecular Weight of γ -GCSc: 73 kDa.

Positive Controls: K-562 whole cell lysate: sc-2203, HCT-116 whole cell lysate: sc-364175 or RPMI2650 whole cell lysate: sc-364192.

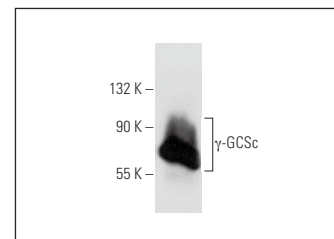
STORAGE

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

DATA



γ -GCSc (D-4): sc-166382. Western blot analysis of γ -GCSc expression in K-562 (A) and HCT-116 (B) whole cell lysates. Detection reagent used: m-IgG Fc BP-HRP: sc-525409.



γ -GCSc (D-4): sc-166382. Western blot analysis of γ -GCSc expression in RPMI2650 whole cell lysate.

SELECT PRODUCT CITATIONS

1. Benassi, B., et al. 2013. USP2a alters chemotherapeutic response by modulating redox. *Cell Death Dis.* 4: e812.
2. Akaboshi, T. and Yamanishi, R. 2014. Certain carotenoids enhance the intracellular glutathione level in a murine cultured macrophage cell line by inducing glutamate-cysteine-ligase. *Mol. Nutr. Food Res.* 58: 1291-1300.
3. Matzinger, M., et al. 2019. AMPK leads to phosphorylation of the transcription factor Nrf2, tuning transactivation of selected target genes. *Redox Biol.* 29: 101393.
4. Zhao, B., et al. 2020. Rhizoma Paradisi total saponins alleviate H_2O_2 -induced oxidative stress injury by upregulating the Nrf2 pathway. *Mol. Med. Rep.* 21: 220-228.
5. Amara, I., et al. 2020. Effect of di(2-ethylhexyl) phthalate on Nrf2-regulated glutathione homeostasis in mouse kidney. *Cell Stress Chaperones* 25: 919-928.
6. Tsai, T.L., et al. 2021. Overcoming radiation resistance by iron-platinum metal alloy nanoparticles in human copper transport 1-overexpressing cancer cells via mitochondrial disturbance. *Int. J. Nanomedicine* 16: 2071-2085.
7. Li, J., et al. 2021. Hesperetin ameliorates hepatic oxidative stress and inflammation via the PI3K/AKT-Nrf2-ARE pathway in oleic acid-induced Hep G2 cells and a rat model of high-fat diet-induced NAFLD. *Food Funct.* 12: 3898-3918.
8. Eiro, N., et al. 2022. Conditioned medium from human uterine cervical stem cells regulates oxidative stress and angiogenesis of retinal pigment epithelial cells. *Ophthalmic Res.* 65: 556-565.

RESEARCH USE

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