SANTA CRUZ BIOTECHNOLOGY, INC.

GSS (C-5): sc-365863

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

GSS (glutathione synthetase) is a 474 amino acid protein encoded by the gene located at human chromosome 20q11.22. GSS consists of three loops projecting from an antiparallel β-sheet, a parallel β-sheet and a lid of anti-parallel sheets, which provide access to the ATP-binding site. Although Southern blot and gene analysis suggest that GSS may be the only member of a unique family, the crystal structure indicates that GSS belongs to the ATP-GRASP superfamily. GSS is expressed in hemocytes and nucleated cells, including the brain. GSS occurs as a homodimer. There are two steps in the production of glutathione, begining with γ-GCS and ending with GSS. In an ATP-dependent reaction, GSS produces glutathione from γ-glutamylcysteine and glycine precursors. Partial hepatectomy, diethyl maleate, buthionine sulfoximine, tert-butylhaydroquinone and thioacetamide increase the expression of GSS, which causes an increase in glutathione levels. An inherited autosomal recessive disorder, 5-oxoprolinuria (pyroglutamic aciduria), is caused by GSS deficiencies, which leads to central nervous system damage, hemolytic anemia, metabolic acidosis and urinary excretion of 5-oxoproline. A missense mutation in the gene encoding GSS leads to a GSS deficiency restricted to erythrocytes, which causes only hemolytic anemia.

REFERENCES

1. Webb, G.C., et al. 1995. The gene encoding human glutathione synthetase (GSS) maps to the long arm of chromosome 20 at band 11.2. Genomics 30: 617-619.
2. Gali, R.R. and Board, P.G. 1995. Sequencing and expression of a cDNA for human glutathione synthetase. Biochem. J. 310: 353-358
3. Shi, Z.Z., et al. 1996. Mutations in the glutathione synthetase gene cause 5-oxoprolinuria. Nat. Genet. 14: 361-365.
4. Polekhina, G., et al. 1999. Molecular basis of glutathione synthetase deficiency and a rare gene permutation event. EMBO J. 18: 3204-3213.

CHROMOSOMAL LOCATION

Genetic locus: GSS (human) mapping to 20q11.22; Gss (mouse) mapping to 2 H1.

SOURCE

GSS (C-5) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 357-385 within an internal region of GSS of human origin.

PRODUCT

Each vial contains 200 µg IgG_{2b} 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-365863 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

STORAGE

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

APPLICATIONS

GSS (C-5) is recommended for detection of GSS of mouse, rat, human, and, to a lesser extent, hamster 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).

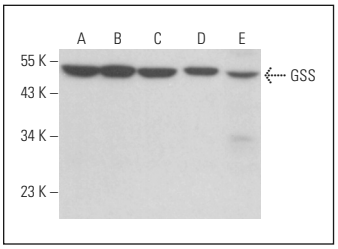
GSS (C-5) is also recommended for detection of GSS in additional species, including equine, canine, bovine, porcine and avian.

Suitable for use as control antibody for GSS siRNA (h): sc-41980, GSS siRNA (m): sc-41981, GSS shRNA Plasmid (h): sc-41980-SH, GSS shRNA Plasmid (m): sc-41981-SH, GSS shRNA (h) Lentiviral Particles: sc-41980-V and GSS shRNA (m) Lentiviral Particles: sc-41981-V.

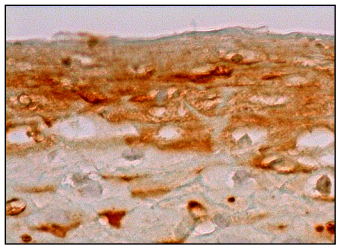
Molecular Weight of GSS: 52 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, COLO 205 whole cell lysate: sc-364177 or mouse brain extract: sc-2253.

DATA



GSS (C-5): sc-365863. Western blot analysis of GSS expression in HeLa (**A**), COLO 205 (**B**), Hep G2 (**C**) and EOC 20 (**D**) whole cell lysates and mouse brain tissue extract (**E**).



GSS (C-5): sc-365863. Immunoperoxidase staining of formalin fixed, paraffin-embedded human uterine cervix tissue showing cytoplasmic staining of squamous epithelial cells.

SELECT PRODUCT CITATIONS

1. Yin, Z.X., et al. 2017. PARP-1 inhibitors sensitize HNSCC cells to APR-246 by inactivation of thioredoxin reductase 1 (TrxR1) and promotion of Ros accumulation. Oncotarget 9: 1885-1897.
2. Li, S., et al. 2019. Glutathione contributes to efficient post-Golgi trafficking of incoming HPV16 genome. PLoS ONE 14: e0225496.
3. Jara, O., et al. 2020. Do connexin mutants cause cataracts by perturbing glutathione levels and redox metabolism in the lens? Biomolecules 10: 1418.
4. Patten, D.A., et al. 2021. Altered mitochondrial fusion drives defensive glutathione synthesis in cells able to switch to glycolytic ATP production. Biochim. Biophys. Acta Mol. Cell Res. 1868: 118854.

RESEARCH USE

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