SANTA CRUZ BIOTECHNOLOGY, INC.

cSHMT (A-2): sc-365203

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Mammalian serine hydroxymethyltransferase (SHMT) is a tetrameric, pyridoxal phosphate (PLP)-dependent enzyme that catalyzes the reversible interconversion of serine and tetrahydrofolate to glycine and methylenetetrahydrofolate in the cytoplasm (cSHMT, SHMT1) and mitochondria (mSHMT, SHMT2). cSHMT preferentially supplies one-carbon units for thymidylate biosynthesis, depletes methylenetetrahydrofolate pools for S-adenosylmethionine (SAM) synthesis by synthesizing serine, sequesters 5-methyltetrahydrofolate and inhibits SAM synthesis. Sheep liver cytosolic recombinant SHMT (scSHMT) Lys-71, Arg-80 and Asp-89 residues influence intra-subunit ionic interactions essential for catalytic activity; Tyr-72, Asp-227 and His-356 residues in the active site interact with PLP and maintain the tetrameric structure. Human cSHMT and mSHMT genes map to 17p11.2 and 12q13, respectively. The cDNA for the mitochondrial enzyme encodes a mature protein of 474 residues.

REFERENCES

1. Online Mendelian Inheritance in Man, OMIM™. 1998. Johns Hopkins University, Baltimore, MD. MIM Number: 138450. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
2. Liu, X., et al. 2001. Lack of catalytic activity of a murine mRNA cytoplasmic serine hydroxymethyltransferase splice variant: evidence against alternative splicing as a regulatory mechanism. Biochemistry 40: 4932-4939.
3. Trivedi, V., et al. 2002. Crystal structure of binary and ternary complexes of serine hydroxymethyltransferase from *Bacillus stearothermophilus:* insights into the catalytic mechanism. J. Biol. Chem. 277: 17161-17169.

CHROMOSOMAL LOCATION

Genetic locus: SHMT1 (human) mapping to 17p11.2; Shmt1 (mouse) mapping to 11 B2.

SOURCE

cSHMT (A-2) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 171-201 near the C-terminus of cSHMT 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.

cSHMT (A-2) is available conjugated to agarose (sc-365203 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-365203 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-365203 PE), fluorescein (sc-365203 FITC), Alexa Fluor® 488 (sc-365203 AF488), Alexa Fluor® 546 (sc-365203 AF546), Alexa Fluor® 594 (sc-365203 AF594) or Alexa Fluor® 647 (sc-365203 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-365203 AF680) or Alexa Fluor® 790 (sc-365203 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-365203 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

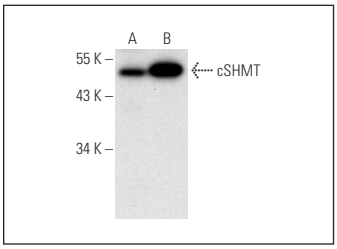
cSHMT (A-2) is recommended for detection of cSHMT of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), 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).

Suitable for use as control antibody for cSHMT siRNA (h): sc-40940, cSHMT siRNA (m): sc-40941, cSHMT shRNA Plasmid (h): sc-40940-SH, cSHMT shRNA Plasmid (m): sc-40941-SH, cSHMT shRNA (h) Lentiviral Particles: sc-40940-V and cSHMT shRNA (m) Lentiviral Particles: sc-40941-V.

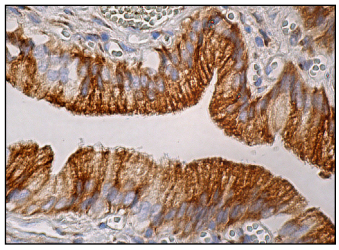
Molecular Weight of cSHMT: 52 kDa.

Positive Controls: human liver extract: sc-363766, mouse liver extract: sc-2256 or HeLa whole cell lysate: sc-2200.

DATA



cSHMT (A-2): sc-365203. Western blot analysis of cSHMT expression in mouse liver (**A**) and human liver (**B**) tissue extracts.



cSHMT (A-2): sc-365203. Immunoperoxidase staining of formalin fixed, paraffin-embedded human gall bladder tissue showing cytoplasmic staining of glandular cells.

SELECT PRODUCT CITATIONS

1. Adamus, A., et al. 2018. GCSH antisense regulation determines breast cancer cells' viability. Sci. Rep. 8: 15399.
2. Kumari, R., et al. 2019. Caspase-10 inhibits ATP-citrate lyase-mediated metabolic and epigenetic reprogramming to suppress tumorigenesis. Nat. Commun. 10: 4255.
3. Moreno-Felici, J., et al. 2019. Phosphoenolpyruvate from glycolysis and PEPCK regulate cancer cell fate by altering cytosolic Ca^2. Cells 9: 18.
4. Lee, Y.G., et al. 2021. LONP1 and ClpP cooperatively regulate mitochondrial proteostasis for cancer cell survival. Oncogenesis 10: 18.
5. Spizzichino, S., et al. 2021. Cytosolic localization and *in vitro* assembly of human *de novo* thymidylate synthesis complex. FEBS J. E-published.

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.