SANTA CRUZ BIOTECHNOLOGY, INC.

mSHMT (F-11): sc-390641

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) Lys71, Arg80 and Asp89 residues influence intra-subunit ionic interactions essential for catalytic activity; Tyr72, Asp227 and His356 residues in the active site interact with PLP and maintain the tetrameric structure. The cDNA for the mitochondrial enzyme encodes a mature protein of 474 residues.

CHROMOSOMAL LOCATION

Genetic locus: SHMT2 (human) mapping to 12q13.3; Shmt2 (mouse) mapping to 10 D3.

SOURCE

mSHMT (F-11) is a mouse monoclonal antibody raised against amino acids 435-504 mapping at the C-terminus of mSHMT 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.

mSHMT (F-11) is available conjugated to agarose (sc-390641 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-390641 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-390641 PE), fluorescein (sc-390641 FITC), Alexa Fluor® 488 (sc-390641 AF488), Alexa Fluor® 546 (sc-390641 AF546), Alexa Fluor® 594 (sc-390641 AF594) or Alexa Fluor® 647 (sc-390641 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-390641 AF680) or Alexa Fluor® 790 (sc-390641 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

APPLICATIONS

mSHMT (F-11) is recommended for detection of mSHMT 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 mSHMT siRNA (h): sc-40942, mSHMT siRNA (m): sc-40943, mSHMT shRNA Plasmid (h): sc-40942-SH, mSHMT shRNA Plasmid (m): sc-40943-SH, mSHMT shRNA (h) Lentiviral Particles: sc-40942-V and mSHMT shRNA (m) Lentiviral Particles: sc-40943-V.

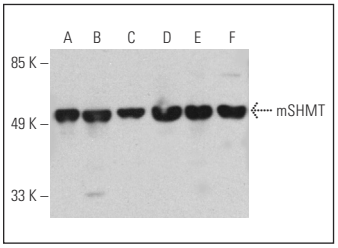
Molecular Weight of mSHMT: 52 kDa.

Positive Controls: A-431 whole cell lysate: sc-2201, c4 whole cell lysate: sc-364186 or Raji whole cell lysate: sc-364236.

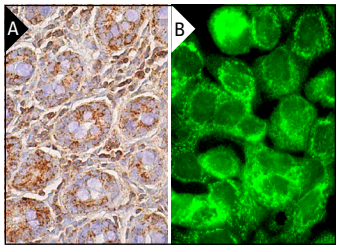
STORAGE

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

DATA



mSHMT (F-11) HRP: sc-390641 HRP. Direct western blot analysis of mSHMT expression in A-431 (**A**), Raji (**B**), WEHI-231 (**C**), EOC 20 (**D**), F9 (**E**) and c4 (**F**) whole cell lysates.



mSHMT (F-11): sc-390641. Immunoperoxidase staining of formalin fixed, paraffin-embedded human colon tissue showing cytoplasmic staining of glandular cells and endothelial cells (**A**). Immunofluorescence staining of formalin-fixed A-431 cells showing mitochondrial, cytoplasmic and nuclear localization (**B**).

SELECT PRODUCT CITATIONS

1. Yang, X., et al. 2018. SHMT2 desuccinylation by SIRT5 drives cancer cell proliferation. Cancer Res. 78: 372-386.
2. Adamus, A., et al. 2018. GCSH antisense regulation determines breast cancer cells' viability. Sci. Rep. 8: 15399.
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. Son, S.I., et al. 2020. Garcinol is an HDAC11 inhibitor. ACS Chem. Biol. 15: 2866-2871.
5. Liu, C., et al. 2021. Cytoplasmic SHMT2 drives the progression and metastasis of colorectal cancer by inhibiting β-catenin degradation. Theranostics 11: 2966-2986.
6. Aslan, M., et al. 2021. Oncogene-mediated metabolic gene signature predicts breast cancer outcome. NPJ Breast Cancer 7: 141.
7. Pranzini, E., et al. 2022. SHMT2-mediated mitochondrial serine metabolism drives 5-FU resistance by fueling nucleotide biosynthesis. Cell Rep. 40: 111233.
8. Hwang, Y., et al. 2023. Co-inhibition of glutaminolysis and one-carbon metabolism promotes ROS accumulation leading to enhancement of chemotherapeutic efficacy in anaplastic thyroid cancer. Cell Death Dis. 14: 515.

RESEARCH USE

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

PROTOCOLS

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