SANTA CRUZ BIOTECHNOLOGY, INC.

TS (F-7): sc-376161

BACKGROUND

Thymidylate synthase (TS), also designated TYMS, TMS, TSase and HsT422, uses 5,10-methylenetetrahydrofolate (methylene-THF) as a cofactor in the synthesis of 2'-deoxythymidine-5'-monophosphate (dTMP), an essential precursor for DNA biosynthesis. TS is an RNA-binding protein that can interact with its own mRNA. The TS/mRNA ribonucleoprotein complex can also associate with a number of other cellular mRNAs, including those corresponding to the p53 tumor suppressor gene and the Myc family of transcription factors. Inhibition of DNA replication and cell death resulting from thymidine depletion occurs when TS enzyme activity is inhibited with substrate or cofactor analogs, making the TS enzyme an important target for chemotherapy. Cancer cells are sensitive to thymidine depletion, as they multiply rapidly.

CHROMOSOMAL LOCATION

Genetic locus: TYMS (human) mapping to 18p11.32; Tyms (mouse) mapping to 5 B1.

SOURCE

TS (F-7) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 99-127 within an internal region of TS 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-376161 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

TS (F-7) is recommended for detection of TS 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).

TS (F-7) is also recommended for detection of TS in additional species, including equine, canine and porcine.

Suitable for use as control antibody for TS siRNA (h): sc-44978, TS siRNA (m): sc-44979, TS shRNA Plasmid (h): sc-44978-SH, TS shRNA Plasmid (m): sc-44979-SH, TS shRNA (h) Lentiviral Particles: sc-44978-V and TS shRNA (m) Lentiviral Particles: sc-44979-V.

Molecular Weight of TS: 36 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, RAW 264.7 whole cell lysate: sc-2211 or NIH/3T3 whole cell lysate: sc-2210.

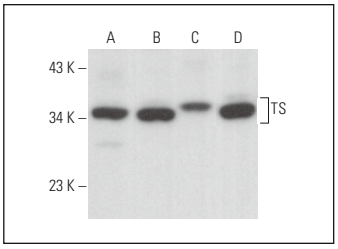
STORAGE

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

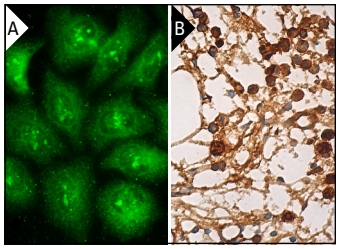
RESEARCH USE

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

DATA



TS (F-7): sc-376161. Western blot analysis of TS expression in HeLa (**A**), NIH/3T3 (**B**), RAW 264.7 (**C**) and BYDP (**D**) whole cell lysates.



TS (F-7): sc-376161. Immunofluorescence staining of methanol-fixed HeLa cells showing nuclear and cytoplasmic localization (**A**). Immunoperoxidase staining of formalin fixed, paraffin-embedded human bone marrow tissue showing nuclear and cytoplasmic staining of hematopoietic cells (**B**).

SELECT PRODUCT CITATIONS

1. Nagaraju, G.P., et al. 2014. HSP90 inhibition downregulates thymidylate synthase and sensitizes colorectal cancer cell lines to the effect of 5FU-based chemotherapy. Oncotarget 5: 9980-9991.
2. Zhao, Y., et al. 2020. 5-fluorouracil enhances the anti-tumor activity of the glutaminase inhibitor CB-839 against PIK3CA-mutant colorectal cancers. Cancer Res. 80: 4815-4827.
3. Mahajan, U.M., et al. 2021. Tumor-specific delivery of 5-fluorouracil-incorporated epidermal growth factor receptor-targeted aptamers as an efficient treatment in pancreatic ductal adenocarcinoma models. Gastroenterology 161: 996-1010.e1.
4. Wu, M.T., et al. 2021. MTHFR knockdown assists cell defense against folate depletion induced chromosome segregation and uracil misincorporation in DNA. Int. J. Mol. Sci. 22: 9392.
5. Mahajan, U.M., et al. 2021. Tumor-specific delivery of 5-fluorouracil-incorporated epidermal growth factor receptor-targeted aptamers as an efficient treatment in pancreatic ductal adenocarcinoma models. Gastroenterology 161: 996-1010.e1.
6. Wu, M.T., et al. 2021. MTHFR knockdown assists cell defense against folate depletion induced chromosome segregation and uracil misincorporation in DNA. Int. J. Mol. Sci. 22: 9392.
7. Liang, Y.Y., et al. 2022. CETSA interaction proteomics define specific RNA-modification pathways as key components of fluorouracil-based cancer drug cytotoxicity. Cell Chem. Biol. 29: 572-585.e8.
8. Zhang, S.M., et al. 2024. Identification and evaluation of small-molecule inhibitors against the dNTPase SAMHD1 via a comprehensive screening funnel. iScience 27: 108907.

PROTOCOLS

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