SANTA CRUZ BIOTECHNOLOGY, INC.

MTHFD1 (A-8): sc-271412

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Methylenetetrahydrofolate dehydrogenase 1 (MTHFD1) is a 935 amino acid, folate-dependent protein that is responsible for the consecutive inter-conversion of tetrahydrofolate derivatives which drive the synthesis of purine, methionine and thymidylate. The cytosolic MRHFD1 contains three subunits, 5,10-methylenetetrahydrofolate dehydrogenase, 5,10-methenyltetrahydrofolate cyclohydrolase and 10-formyltetrahydrofolate synthetase, each with distinct activities. MTHFD1 functions as a homodimer consisting of two major domains, an N-terminal containing the dehydrogenase and cyclohydrolase activities and a larger synthetase domain in the C-terminus. Mutations in the MTHFD1 gene in pregnant women are associated with an increased risk of giving birth to a child with a neural tube defect, along with a possible risk of decreased embryo survival. MTHFD1 also plays a role in migraine development, since folate meta-bolism is involved in migraine pathophysiology, mainly in migraine with aura.

CHROMOSOMAL LOCATION

Genetic locus: MTHFD1 (human) mapping to 14q23.3.

SOURCE

MTHFD1 (A-8) is a mouse monoclonal antibody raised against amino acids 1-120 mapping at the N-terminus of MTHFD1 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.

MTHFD1 (A-8) is available conjugated to agarose (sc-271412 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-271412 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271412 PE), fluorescein (sc-271412 FITC), Alexa Fluor® 488 (sc-271412 AF488), Alexa Fluor® 546 (sc-271412 AF546), Alexa Fluor® 594 (sc-271412 AF594) or Alexa Fluor® 647 (sc-271412 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271412 AF680) or Alexa Fluor® 790 (sc-271412 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

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APPLICATIONS

MTHFD1 (A-8) is recommended for detection of MTHFD1 of 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 MTHFD1 siRNA (h): sc-61082, MTHFD1 shRNA Plasmid (h): sc-61082-SH and MTHFD1 shRNA (h) Lentiviral Particles: sc-61082-V.

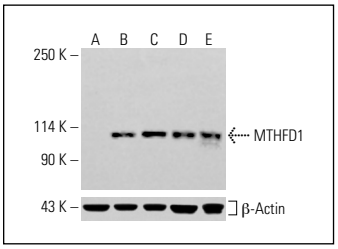
Molecular Weight of MTHFD1: 100 kDa.

Positive Controls: MOLT-4 cell lysate: sc-2233, Jurkat whole cell lysate: sc-2204 or K-562 whole cell lysate: sc-2203.

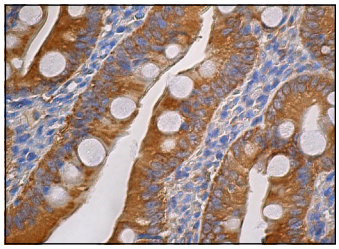
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850. 4) Immunohistochemistry: use m-IgGκ BP-HRP: sc-516102 with DAB, 50X: sc-24982 and Immunohistomount: sc-45086, or Organo/Limonene Mount: sc-45087.

DATA



MTHFD1 (A-8): sc-271412. Western blot analysis of MTHFD1 expression in untreated K-562 (**A**), chemically-treated K-562 (**B**, **C**), HCT-116 (**D**) and HeLa (**E**) whole cell lysates. Detection reagent used: m-IgGκ BP-HRP: sc-516102. β-Actin (C4): sc-47778 used as loading control. Detection reagent used: m-IgG Fc BP-HRP: sc-525409.



MTHFD1 (A-8): sc-271412. Immunoperoxidase staining of formalin fixed, paraffin-embedded human duodenum tissue showing cytoplasmic staining of glandular cells.

SELECT PRODUCT CITATIONS

1. Sdelci, S., et al. 2019. MTHFD1 interaction with BRD4 links folate metabolism to transcriptional regulation. Nat. Genet. 51: 990-998.
2. Lee, W.D., et al. 2021. Tumor reliance on cytosolic versus mitochondrial one-carbon flux depends on folate availability. Cell Metab. 33: 190-198.e6.
3. Shankar, T.S., et al. 2021. Cardiac-specific deletion of voltage dependent anion channel 2 leads to dilated cardiomyopathy by altering calcium homeostasis. Nat. Commun. 12: 4583.
4. Flickinger, K.M., et al. 2023. Conditional lethality profiling reveals anti-cancer mechanisms of action and drug-nutrient interactions. bioRxiv. 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.

PROTOCOLS

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