

MTHFD1/1L (D-9): sc-376722

BACKGROUND

Methylenetetrahydrofolate dehydrogenase 1 (MTHFD1) is a 935-amino acid, folate-dependent protein that is responsible for the consecutive interconversion 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 metabolism is involved in migraine pathophysiology, mainly in migraine with aura. MTHFD1L (methylenetetrahydrofolate dehydrogenase 1-like) is a 978 amino acid mitochondrial protein that is expressed in a variety of tissues and, like MTHFD1, functions in folate metabolism via the tetrahydrofolate pathway. MTHFD1L exists as two isoforms and may be associated with colorectal carcinogenesis, possibly conferring a growth advantage to cancer-transformed cells.

CHROMOSOMAL LOCATION

Genetic locus: MTHFD1 (human) mapping to 14q23.3, MTHFD1L (human) mapping to 6q25.1; Mthfd1 (mouse) mapping to 12 C3, Mthfd1l (mouse) mapping to 10 A1.

SOURCE

MTHFD1/1L (D-9) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 909-935 at the C-terminus of MTHFD1 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.

MTHFD1/1L (D-9) is available conjugated to agarose (sc-376722 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-376722 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-376722 PE), fluorescein (sc-376722 FITC), Alexa Fluor® 488 (sc-376722 AF488), Alexa Fluor® 546 (sc-376722 AF546), Alexa Fluor® 594 (sc-376722 AF594) or Alexa Fluor® 647 (sc-376722 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-376722 AF680) or Alexa Fluor® 790 (sc-376722 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-376722 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

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STORAGE

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

APPLICATIONS

MTHFD1/1L (D-9) is recommended for detection of MTHFD1 and MTHFD1L 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) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

MTHFD1/1L (D-9) is also recommended for detection of MTHFD1 and MTHFD1L in additional species, including equine, canine, bovine and porcine.

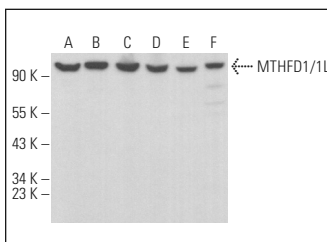
Molecular Weight of MTHFD1/1L: 100 kDa.

Positive Controls: MTHFD1 (h): 293T Lysate: sc-171409, K-562 whole cell lysate: sc-2203 or Jurkat whole cell lysate: sc-2204.

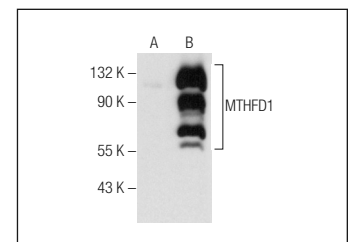
RECOMMENDED SUPPORT REAGENTS

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.

DATA



MTHFD1/1L (D-9): sc-376722. Western blot analysis of MTHFD1/1L expression in K-562 (A), Jurkat (B), A-431 (C), c4 (D), NIH/3T3 (E) and A-10 (F) whole cell lysates.



MTHFD1/1L (D-9): sc-376722. Western blot analysis of MTHFD1 expression in non-transfected: sc-117752 (A) and human MTHFD1 transfected: sc-171409 (B) 293T whole cell lysates.

SELECT PRODUCT CITATIONS

- Zhang, W.C., et al. 2022. MicroRNA-21 guide and passenger strand regulation of adenylosuccinate lyase-mediated purine metabolism promotes transition to an EGFR-TKI-tolerant persister state. *Cancer Gene Ther.* 29: 1878-1894.
- Adriaenssens, E., et al. 2023. Small heat shock proteins operate as molecular chaperones in the mitochondrial intermembrane space. *Nat. Cell Biol.* E-published.

RESEARCH USE

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