

BHMT (3D6): sc-69708

BACKGROUND

Betaine-homocysteine methyltransferase (BHMT) is a zinc-dependent cytosolic protein that catalyzes the conversion of betaine and homocysteine to dimethylglycine and methionine, respectively. BHMT is highly expressed in rat liver, and its expression is regulated by dietary methionine and choline. In humans, S-adenosylmethionine (SAM) down-regulates BHMT expression by inducing NFκB, which acts as a repressor for the BHMT gene. Lowered BHMT levels can lead to ER (endoplasmic reticulum) stress. Mutations in the gene encoding for BHMT may lead to hyperhomocysteinemia, a medical condition characterized by abnormally large amounts of homocysteine in the blood which may be a risk factor for cardiovascular and cerebrovascular diseases.

REFERENCES

1. Park, E.I. and Garrow, T.A. 1999. Interaction between dietary methionine and methyl donor intake on rat liver betaine-homocysteine methyltransferase gene expression and organization of the human gene. *J. Biol. Chem.* 274: 7816-7824.
2. Garrow, T.A. 2002. Random mutagenesis of the zinc-binding motif of betaine-homocysteine methyltransferase reveals that Gly 214 is essential. *Arch. Biochem. Biophys.* 399: 73-80.
3. Evans, J.C., et al. 2002. Betaine-homocysteine methyltransferase: zinc in a distorted barrel. *Structure* 10: 1159-1171.
4. Forestier, M., et al. 2003. Betaine-homocysteine methyltransferase: gene cloning and expression analysis in rat liver cirrhosis. *Biochim. Biophys. Acta* 1638: 29-34.
5. Weisberg, I.S., et al. 2003. Investigations of a common genetic variant in betaine-homocysteine methyltransferase (BHMT) in coronary artery disease. *Atherosclerosis* 167: 205-214.
6. Lee, M.B., et al. 2004. A nuclear-magnetic-resonance-based assay for betaine-homocysteine methyltransferase activity. *Anal. Biochem.* 330: 199-205.
7. Castro, C., et al. 2004. Dissecting the catalytic mechanism of betaine-homocysteine S-methyltransferase by use of intrinsic tryptophan fluorescence and site-directed mutagenesis. *Biochemistry* 43: 5341-5351.

CHROMOSOMAL LOCATION

Genetic locus: BHMT (human) mapping to 5q14.1; Bhmt (mouse) mapping to 13 C3.

SOURCE

BHMT (3D6) is a mouse monoclonal antibody raised against full length recombinant BHMT of human origin.

PRODUCT

Each vial contains 100 µg IgG_{2a} in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

RESEARCH USE

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

APPLICATIONS

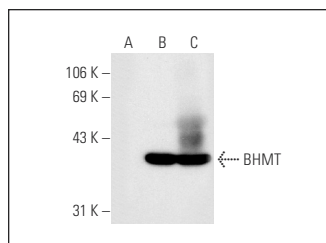
BHMT (3D6) is recommended for detection of BHMT of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)] and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for BHMT siRNA (h): sc-91965, BHMT siRNA (m): sc-141697, BHMT shRNA Plasmid (h): sc-91965-SH, BHMT shRNA Plasmid (m): sc-141697-SH, BHMT shRNA (h) Lentiviral Particles: sc-91965-V and BHMT shRNA (m) Lentiviral Particles: sc-141697-V.

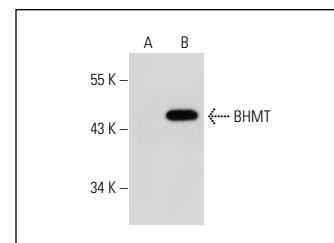
Molecular Weight of BHMT: 45 kDa.

Positive Controls: BHMT (m): 293T Lysate: sc-118804, mouse liver extract: sc-2256 or human kidney extract: sc-363764.

DATA



BHMT (3D6): sc-69708. Western blot analysis of BHMT expression in non-transfected: sc-117752 (A) and mouse BHMT transfected: sc-118805 (B) 293T whole cell lysates and mouse liver tissue extract (C).



BHMT (3D6): sc-69708. Western blot analysis of BHMT expression in non-transfected: sc-117752 (A) and mouse BHMT transfected: sc-118804 (B) 293T whole cell lysates.

SELECT PRODUCT CITATIONS

1. Yuan, B., et al. 2017. From the cover: metabolomics reveals a role of betaine in prenatal DBP exposure-induced epigenetic transgenerational failure of spermatogenesis in rats. *Toxicol. Sci.* 158: 356-366.
2. Saande, C.J., et al. 2019. Dietary egg protein prevents hyperhomocysteinemia via upregulation of hepatic betaine-homocysteine S-methyltransferase activity in folate-restricted rats. *J. Nutr.* 149: 1369-1376.
3. Singhal, N.K., et al. 2020. Betaine restores epigenetic control and supports neuronal mitochondria in the cuprizone mouse model of multiple sclerosis. *Epigenetics* 15: 871-886.
4. Sternbach, S., et al. 2021. The BHMT-betaine methylation pathway epigenetically modulates oligodendrocyte maturation. *PLoS ONE* 16: e0250486.
5. Hirabayashi, T., et al. 2023. Hepatic phosphatidylcholine catabolism driven by PNPLA7 and PNPLA8 supplies endogenous choline to replenish the methionine cycle with methyl groups. *Cell Rep.* 42: 111940.

STORAGE

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