

MTH1 siRNA (h): sc-62647

BACKGROUND

MTH1, also known as NUDT1 (nudix (nucleoside diphosphate linked moiety X)-type motif 1), is a 179 amino acid cytoplasmic protein that is a member of the nudix hydrolase family. Highly expressed in testis, thymus and proliferating blood lymphocytes, MTH1 functions as an antimutagenic that hydrolyzes oxidized purine nucleoside triphosphates to their corresponding monophosphates. Through its ability to enzymatically hydrolyze ATP and GTP to AMP and GMP, respectively, MTH1 prevents misincorporation of GTP into DNA, thus preventing A:T to C:G transversions. The cytoplasmic location of MTH1, along with its antimutagenic capabilities, suggests that it may also be involved in the sanitization of nucleotide pools for both mitochondrial and nuclear genomes. Four isoforms of MTH1 exist—three of which are formed due to alternative splicing events and one of which is formed via a single-nucleotide polymorphism. Overexpression of MTH1 is implicated in prostate and cell lung carcinomas.

REFERENCES

1. Furuichi, M., et al. 1994. Genomic structure and chromosome location of the human mutT homologue gene MTH1 encoding 8-oxo-dGTPase for prevention of A:T to C:G transversion. *Genomics* 24: 485-490.
2. Takama, F., et al. 2000. Mutation analysis of the hMTH1 gene in sporadic human ovarian cancer. *Int. J. Oncol.* 17: 467-471.
3. Kennedy, C.H., et al. 2003. Expression of human MutT homologue (hMTH1) protein in primary non-small-cell lung carcinomas and histologically normal surrounding tissue. *Free Radic. Biol. Med.* 34: 1447-1457.
4. Kohno, T., et al. 2006. Association of polymorphisms in the MTH1 gene with small cell lung carcinoma risk. *Carcinogenesis* 27: 2448-2454.

CHROMOSOMAL LOCATION

Genetic locus: NUDT1 (human) mapping to 7p22.3.

PRODUCT

MTH1 siRNA (h) is a pool of 2 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see MTH1 shRNA Plasmid (h): sc-62647-SH and MTH1 shRNA (h) Lentiviral Particles: sc-62647-V as alternate gene silencing products.

For independent verification of MTH1 (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-62647A and sc-62647B.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNases and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 μ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330 μ l of RNase-free water makes a 10 μ M solution in a 10 μ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

MTH1 siRNA (h) is recommended for the inhibition of MTH1 expression in human cells.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 μ M in 66 μ l. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

MTH1 (H-1): sc-271082 is recommended as a control antibody for monitoring of MTH1 gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

To ensure optimal results, the following support reagents are recommended:

1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ 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) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor MTH1 gene expression knockdown using RT-PCR Primer: MTH1 (h)-PR: sc-62647-PR (20 μ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kawamura, T., et al. 2016. Proteomic profiling of small-molecule inhibitors reveals dispensability of MTH1 for cancer cell survival. *Sci. Rep.* 6: 26521.
2. Moukengue, B., et al. 2020. TH1579, MTH1 inhibitor, delays tumour growth and inhibits metastases development in osteosarcoma model. *EBioMedicine* 53: 102704.

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.