SANTA CRUZ BIOTECHNOLOGY, INC.

Dnmt3b siRNA (h): sc-37759

BACKGROUND

Methylation at the 5'-position of cytosine is the only known naturally occurring covalent modification of the mammalian genome. DNA methylation requires the enzymatic activity of DNA 5-cytosine methyltransferase (Dnmt) proteins, which catalyze the transfer of a methyl group from S-adenosyl methionine to the 5'-position of cytosines residing in the dinucleotide CpG motif, and this methylation results in transcriptional repression of the target gene. The Dnmt enzymes are encoded by independent genes. Dnmt1 is the most abundant, and it preferentially methylates hemimethylated DNA and coordinates gene expression during development. Additional mammalian Dnmt proteins include Dnmt2 and Dnmt3. Dnmt2 lacks the large N-terminal regulator domain of Dnmt1, is expressed at substantially lower levels in adult tissues, and is likely involved in methylating newly integrated retroviral DNA. Dnmt3a and Dnmt3b are encoded by two distinct genes, but both are abundantly expressed in embryonic stem cells, where they also methylate CpG motifs on DNA.

REFERENCES

1. Yoder, J.A., et al. 1997. DNA (cytosine-5)-methyltransferases in mouse cells and tissues. Studies with a mechanism-based probe. J. Mol. Biol. 270: 385-395.
2. Okano, M., et al. 1998. Dnmt2 is not required for *de novo* and maintenance methylation of viral DNA in embryonic stem cells. Nucleic Acids Res. 26: 2536-2540.

CHROMOSOMAL LOCATION

Genetic locus: DNMT3B (human) mapping to 20q11.21.

PRODUCT

Dnmt3b siRNA (h) is a pool of 3 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Dnmt3b shRNA Plasmid (h): sc-37759-SH and Dnmt3b shRNA (h) Lentiviral Particles: sc-37759-V as alternate gene silencing products.

For independent verification of Dnmt3b (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-37759A, sc-37759B and sc-37759C.

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 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

Dnmt3b siRNA (h) is recommended for the inhibition of Dnmt3b 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 µM in 66 µl. 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

Dnmt3b (G-9): sc-376043 is recommended as a control antibody for monitoring of Dnmt3b 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).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Dnmt3b gene expression knockdown using RT-PCR Primer: Dnmt3b (h)-PR: sc-37759-PR (20 µl, 533 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Wang, J.X., et al. 2009. Influence of DNA methyltransferase 3b on FHIT expression and DNA methylation of the FHIT promoter region in hepatoma SMMC-7721 cells. HBPD INT 8: 273-277.
2. Wang, J.C., et al. 2015. DNA methyltransferase 3b silencing affects locus-specific DNA methylation and inhibits proliferation, migration and invasion in human hepatocellular carcinoma SMMC-7721 and BEL-7402 cells. Oncol. Lett. 9: 2499-2506.
3. Zhou, W., et al. 2016. Repeated PM2.5 exposure inhibits BEAS-2B cell P53 expression through Ros-Akt-Dnmt3b pathway-mediated promoter hypermethylation. Oncotarget 7: 20691-20703.
4. Zhong, T., et al. 2017. Metformin alters DNA methylation genome-wide via the H19/SAHH axis. Oncogene 36: 2345-2354.
5. Wang, B., et al. 2018. A suppressive role of guanine nucleotide-binding protein subunit β-4 inhibited by DNA methylation in the growth of anti-estrogen resistant breast cancer cells. BMC Cancer 18: 817.
6. Choi, J.A., et al. 2019. ALDH1A2 is a candidate tumor suppressor gene in ovarian cancer. Cancers 11: 1553.
7. Camero, S., et al. 2021. Dnmt3a and Dnmt3b targeting as an effective radiosensitizing strategy in embryonal rhabdomyosarcoma. Cells 10: 2956.
8. Rahman, M.M., et al. 2024. Combinatorial phenethyl isothiocyanate and withaferin A targets multiple epigenetics pathways to inhibit MCF-7 and MDA-MB-231 human breast cancer cells. Cancer Cell Int. 24: 422.

RESEARCH USE

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