SANTA CRUZ BIOTECHNOLOGY, INC.

ASM siRNA (h): sc-41650

BACKGROUND

Acid sphingomyelinase (ASM) is a lysosomal protein that hydrolyzes sphingomyelin to ceramide and phosphocholine. The ASM gene encodes three proteins, ASM-1, ASM-2 and ASM-3, of which ASM-1 is the only ASM gene product that is a catalytically active enzyme. Deficiency of ASM is associated with type A and type B Niemann-Pick disease. Type A is a fatal neurodegenerative disorder seen in infancy and resulting in death by age three, whereas type B is a non-neuropathic disease that has a later onset. During monocytic cell differentiation, the expression of ASM is upregulated by the combined actions of AP-2 and Sp1 transcription factors.

REFERENCES

1. Quintern, L.E., et al. 1987. Acid sphingomyelinase from human urine: purification and characterization. Biochim. Biophys. Acta 922: 323-336.
2. Schuchman, E.H., et al. 1991. Human acid sphingomyelinase. Isolation, nucleotide sequence and expression of the full-length and alternatively spliced cDNAs. J. Biol. Chem. 266: 8531-8539.
3. Levran, O., et al. 1991. Niemann-Pick disease: a frequent missense mutation in the acid sphingomyelinase gene of Ashkenazi Jewish type A and B patients. Proc. Natl. Acad. Sci. USA 88: 3748-3752.
4. Takahashi, T., et al. 1992. Identification and expression of five mutations in the human acid sphingomyelinase gene causing types A and B Niemann-Pick disease. Molecular evidence for genetic heterogeneity in the neuronopathic and non-neuronopathic forms. J. Biol. Chem. 267: 12552-12558.

CHROMOSOMAL LOCATION

Genetic locus: SMPD1 (human) mapping to 11p15.4.

PRODUCT

ASM siRNA (h) is a target-specific 19-25 nt siRNA 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 ASM shRNA Plasmid (h): sc-41650-SH and ASM shRNA (h) Lentiviral Particles: sc-41650-V as alternate gene silencing products.

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

ASM siRNA (h) is recommended for the inhibition of ASM 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

ASM (4H2): sc-293189 is recommended as a control antibody for monitoring of ASM 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 ASM gene expression knockdown using RT-PCR Primer: ASM (h)-PR: sc-41650-PR (20 µl, 428 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Garnett, T.O., et al. 2007. Bid is cleaved upstream of caspase-8 activation during TRAIL-mediated apoptosis in human osteosarcoma cells. Apoptosis 12: 1299-1315.
2. Bennaceur, K., et al. 2009. Different mechanisms are involved in apoptosis induced by melanoma gangliosides on human monocyte-derived dendritic cells. Glycobiology 19: 576-582.
3. Bao, J.X., et al. 2012. Lysosome-membrane fusion mediated superoxide production in hyperglycaemia-induced endothelial dysfunction. PLoS ONE 7: e30387.
4. Getz, T., et al. 2016. Quantum dot-mediated delivery of siRNA to inhibit sphingomyelinase activities in brain-derived cells. J. Neurochem. 139: 872-885.
5. Duan, F., et al. 2021. α1-nAchR-mediated signaling through lipid raft is required for nicotine-induced NLRP3 inflammasome activation and nicotine-accelerated atherosclerosis. Front. Cell Dev. Biol. 9: 724699.
6. Liu, S., et al. 2022. HHcy induces pyroptosis and atherosclerosis via the lipid raft-mediated NOX-ROS-NLRP3 inflammasome pathway in apoE$^{-/-}$ mice. Cells 11: 2438.

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.