

MDA5 siRNA (h): sc-61010

BACKGROUND

The gene that encodes MDA5 (interferon induced with helicase C domain protein 1, IFIH1, melanoma differentiation-associated gene 5) is induced during differentiation, cancer reversion, and programmed cell death (apoptosis) and contains both a caspase recruitment domain and supposed DExH group RNA helicase domains. The irregular helicase motifs of MDA5 avert from consensus sequences but are well conserved in a potentially new group of cloned and hypothetical proteins. MDA5 is an early response gene which is activated by IFN and tumor necrosis factor α , and responds primarily to IFN- β . Expression of MDA5 is upregulated in the presence of MEZ (a protein kinase C activating compound). Expression of MDA5 in tissues is low overall, with highest levels observed in the placenta, pancreas and spleen; MDA5 is undetectable in brain, lung and testis tissues. MDA5 also recognizes polyinosine-polycytidylic acid and RNA viruses while playing a critical role in picornavirus detection.

REFERENCES

1. Kang, D.C., et al. 2002. MDA5: an interferon-inducible putative RNA helicase with double-stranded RNA-dependent ATPase activity and melanoma growth-suppressive properties. *Proc. Natl. Acad. Sci. USA* 99: 637-642.
2. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 606951. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>

CHROMOSOMAL LOCATION

Genetic locus: IFIH1 (human) mapping to 2q24.2.

PRODUCT

MDA5 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see MDA5 shRNA Plasmid (h): sc-61010-SH and MDA5 shRNA (h) Lentiviral Particles: sc-61010-V as alternate gene silencing products.

For independent verification of MDA5 (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-61010A, sc-61010B and sc-61010C.

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

MDA5 siRNA (h) is recommended for the inhibition of MDA5 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor MDA5 gene expression knockdown using RT-PCR Primer: MDA5 (h)-PR: sc-61010-PR (20 μ l, 434 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Xing, Z., et al. 2011. Host immune and apoptotic responses to avian influenza virus H9N2 in human tracheobronchial epithelial cells. *Am. J. Respir. Cell Mol. Biol.* 44: 24-33.
2. Inao, T., et al. 2012. Antitumor effects of cytoplasmic delivery of an innate adjuvant receptor ligand, poly(I:C), on human breast cancer. *Breast Cancer Res. Treat.* 134: 89-100.
3. Olganier, D., et al. 2014. Inhibition of dengue and chikungunya virus infections by RIG-I-mediated type I interferon-independent stimulation of the innate antiviral response. *J. Virol.* 88: 4180-4194.
4. Cao, X., et al. 2015. MDA5 plays a critical role in interferon response during hepatitis C virus infection. *J. Hepatol.* 62: 771-778.
5. Yoon, N., et al. 2016. Activated human mesenchymal stem/stromal cells suppress metastatic features of MDA-MB-231 cells by secreting IFN- β . *Cell Death Dis.* 7: e2191.
6. Sung, P.S., et al. 2017. CXCL10 is produced in hepatitis A virus-infected cells in an IRF3-dependent but IFN-independent manner. *Sci. Rep.* 7: 6387.
7. Li, Y., et al. 2018. Characterization of signaling pathways regulating the expression of pro-inflammatory long form thymic stromal lymphopoietin upon human metapneumovirus infection. *Sci. Rep.* 8: 883.
8. Ng, C.S., et al. 2020. Spatio-temporal characterization of the antiviral activity of the XRN1-DCP1/2 aggregation against cytoplasmic RNA viruses to prevent cell death. *Cell Death Differ.* 27: 2363-2382.
9. Sheikh, T.N., et al. 2021. Growth inhibition and induction of innate immune signaling of chondrosarcomas with epigenetic inhibitors. *Mol. Cancer Ther.* 20: 2362-2371.

RESEARCH USE

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