SANTA CRUZ BIOTECHNOLOGY, INC.

SIRT3 siRNA (m): sc-61556

BACKGROUND

The silent information regulator (SIR2) family of genes are highly conserved from prokaryotes to eukaryotes and are involved in diverse processes, including transcriptional regulation, cell cycle progression, DNA-damage repair and aging. In *S. cerevisiae,* Sir2p deacetylates histones in an NAD-dependent manner, which regulates silencing at the telomeric, rDNA and silent mating-type loci. Sir2p is the founding member of a large family, designated sirtuins, which contain a conserved catalytic domain. The human homologues, which include SIRT1-7, are divided into four main branches: SIRT1-3 are class I, SIRT4 is class II, SIRT5 is class III and SIRT6-7 are class IV. SIRT3 is a NAD-dependent deacetylase that contains one deacetylase sirtuin-type domain. The SIRT3 protein is widely expressed and localizes to the mitochondira where it is processed by mitochondrial processing peptidase (MPP) to yield a final product. This processing is most-likely necessary for its enzymatic activity.

REFERENCES

1. Frye, R.A. 1999. Characterization of five human cDNAs with homology to the yeast SIR2 gene: SIR2-like proteins (sirtuins) metabolize NAD and may have protein ADP-ribosyltransferase activity. Biochem. Biophys. Res. Commun. 260: 273-279.
2. Frye, R.A. 2000. Phylogenetic classification of prokaryotic and eukaryotic SIR2-like proteins. Biochem. Biophys. Res. Commun. 273: 793-798.

CHROMOSOMAL LOCATION

Genetic locus: Sirt3 (mouse) mapping to 7 F5.

PRODUCT

SIRT3 siRNA (m) 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 SIRT3 shRNA Plasmid (m): sc-61556-SH and SIRT3 shRNA (m) Lentiviral Particles: sc-61556-V as alternate gene silencing products.

For independent verification of SIRT3 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-61556A, sc-61556B and sc-61556C.

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

SIRT3 siRNA (m) is recommended for the inhibition of SIRT3 expression in mouse 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

SIRT3 (F-10): sc-365175 is recommended as a control antibody for monitoring of SIRT3 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 SIRT3 gene expression knockdown using RT-PCR Primer: SIRT3 (m)-PR: sc-61556-PR (20 µl, 552 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Dai, S.H., et al. 2014. Sirt3 attenuates hydrogen peroxide-induced oxidative stress through the preservation of mitochondrial function in HT22 cells. Int. J. Mol. Med. 34: 1159-1168.
2. Liu, J., et al. 2017. SIRT3 protects hepatocytes from oxidative injury by enhancing ROS scavenging and mitochondrial integrity. Cell Death Dis. 8: e3158.
3. Xie, Z., et al. 2018. LanCL1 attenuates ischemia-induced oxidative stress by SIRT3-mediated preservation of mitochondrial function. Brain Res. Bull. 142: 216-223.
4. Qin, S.G., et al. 2018. 3-bromo-4,5-dihydroxybenzaldehyde protects against myocardial ischemia and reperfusion injury through the Akt-PGC1α-SIRT3 pathway. Front. Pharmacol. 9: 722.
5. Yan, W.J., et al. 2018. SIRT3-mediated autophagy contributes to resveratrol-induced protection against ER stress in HT22 cells. Front. Neurosci. 12: 116.
6. Liu, J.X., et al. 2018. Honokiol protects hepatocytes from oxidative injury through mitochondrial deacetylase SIRT3. Eur. J. Pharmacol. 834: 176-187.
7. Li, D., et al. 2018. 1,3,6,7-tetrahydroxy-8-prenylxanthone ameliorates inflammatory responses resulting from the paracrine interaction of adipocytes and macrophages. Br. J. Pharmacol. 175: 1590-1606.
8. Zhang, T., et al. 2019. SIRT3 promotes lipophagy and chaperon-mediated autophagy to protect hepatocytes against lipotoxicity. Cell Death Differ. E-published.

RESEARCH USE

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