

SIRT1 siRNA (r): sc-108043

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 homologs, 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. SIRT1 has the closest homology to the yeast Sir2p and is widely expressed in fetal and adult tissues. SIRT1 is highly expressed in heart, brain and skeletal muscle, with low expression in lung and placenta. SIRT1 regulates the p53-dependent DNA damage response pathway by binding to and deacetylating p53, specifically at Lys 382.

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. Afshar, G., et al. 1999. Characterization of a human gene with sequence homology to *Saccharomyces cerevisiae* SIR2. *Gene* 234: 161-168.

CHROMOSOMAL LOCATION

Genetic locus: Sirt1 (rat) mapping to 20p11.

PRODUCT

SIRT1 siRNA (r) 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 SIRT1 shRNA Plasmid (r): sc-108043-SH and SIRT1 shRNA (r) Lentiviral Particles: sc-108043-V as alternate gene silencing products.

For independent verification of SIRT1 (r) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-108043A, sc-108043B and sc-108043C.

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

SIRT1 siRNA (r) is recommended for the inhibition of SIRT1 expression in rat 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

SIRT1 (B-10): sc-74504 is recommended as a control antibody for monitoring of SIRT1 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 SIRT1 gene expression knockdown using RT-PCR Primer: SIRT1 (r)-PR: sc-108043-PR (20 μ l, 510 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Liang, X., et al. 2011. Role of SIRT1-FoxO1 signaling in dietary saturated fat-dependent upregulation of liver adiponectin receptor 2 in ethanol-administered mice. *Antioxid. Redox Signal.* 15: 425-435.
2. Xu, Y., et al. 2012. Resveratrol protects against hyperglycemia-induced oxidative damage to mitochondria by activating SIRT1 in rat mesangial cells. *Toxicol. Appl. Pharmacol.* 259: 395-401.
3. Shao, Y., et al. 2016. Mir-217 promotes inflammation and fibrosis in high glucose cultured rat glomerular mesangial cells via SIRT1/HIF-1 α signaling pathway. *Diabetes Metab. Res. Rev.* 32: 534-543.
4. Ji, L., et al. 2016. The antioxidant edaravone prevents cardiac dysfunction by suppressing oxidative stress in type 1 diabetic rats and in high-glucose-induced injured H9c2 cardiomyoblasts. *Can. J. Physiol. Pharmacol.* 94: 996-1006.
5. Xue, F., et al. 2016. Nrf2/antioxidant defense pathway is involved in the neuroprotective effects of SIRT1 against focal cerebral ischemia in rats after hyperbaric oxygen preconditioning. *Behav. Brain Res.* 309: 1-8.
6. Lin, Y., et al. 2018. Berberine protects renal tubular cells against hypoxia/reoxygenation injury via the SIRT1/p53 pathway. *J. Nat. Med.* 72: 715-723.
7. Li, S., et al. 2019. Fibroblast growth factor 21 protects the heart from angiotensin II-induced cardiac hypertrophy and dysfunction via SIRT1. *Biochim. Biophys. Acta Mol. Basis Dis.* 1865: 1241-1252.

RESEARCH USE

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