SANTA CRUZ BIOTECHNOLOGY, INC.

SOD-2 siRNA (h): sc-41655

BACKGROUND

The superoxide dismutase family is composed of three metalloenzymes (SOD-1, SOD-2 and SOD-3) that catalyze the oxido-reduction of reactive oxygen species (Ros) such as superoxide anion. The SOD-2 precursor is a 222 amino acid protein that is encoded by nuclear chromatin, synthesized in the cytosol and imported posttranslationally into the mitochondrial matrix. Unlike SOD-1, which is a homodimeric cytosolic Cu-Zn enzyme, SOD-2 is a homotetrameric manganese enzyme (also known as MnSOD) that functions in the mitochondrion. Ros are implicated in a wide range of degenerative processes, including Alzheimer's disease, Parkinson's disease and ischemic heart disease. Homozygous mutant mice, which lack SOD-2, exhibit dilated cardiomyopathy, accumulation of lipid in liver and skeletal muscle, metabolic acidosis, oxidative DNA damage and respiratory chain deficiencies in heart and skeletal muscle. Polymorphisms in the SOD-2 gene have also been implicated in nonfamilial, idiopathic, dilated cardiomyopathy in humans.

REFERENCES

1. Wispé, J.R., et al. 1989. Synthesis and processing of the precursor for human mangano-superoxide dismutase. Biochem. Biophys. Acta 994: 30-36.
2. Nishi, H., et al. 1995. DNA typing of HLA class II genes in Japanese patients with dilated cardiomyopathy. J. Mol. Cell. Cardiol. 27: 2385-2392.

CHROMOSOMAL LOCATION

Genetic locus: SOD2 (human) mapping to 6q25.3.

PRODUCT

SOD-2 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 SOD-2 shRNA Plasmid (h): sc-41655-SH and SOD-2 shRNA (h) Lentiviral Particles: sc-41655-V as alternate gene silencing products.

For independent verification of SOD-2 (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-41655A, sc-41655B and sc-41655C.

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

SOD-2 siRNA (h) is recommended for the inhibition of SOD-2 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

SOD-2 (E-10): sc-137254 is recommended as a control antibody for monitoring of SOD-2 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 SOD-2 gene expression knockdown using RT-PCR Primer: SOD-2 (h)-PR: sc-41655-PR (20 µl, 430 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Tang, D., et al. 2010. Endogenous HMGB1 regulates autophagy. J. Cell Biol. 190: 881-892.
2. Burlet, E. and Jain, S.K. 2013. Manganese supplementation reduces high glucose-induced monocyte adhesion to endothelial cells and endothelial dysfunction in Zucker diabetic fatty rats. J. Biol. Chem. 288: 64.
3. Hart, P.C., et al. 2015. MnSOD upregulation sustains the Warburg effect via mitochondrial Ros and AMPK-dependent signalling in cancer. Nat. Commun. 6: 6053.
4. Song, C., et al. 2017. Melatonin-mediated upregulation of Sirt3 attenuates sodium fluoride-induced hepatotoxicity by activating the MT1-PI3K/AKT-PGC-1α signaling pathway. Free Radic. Biol. Med. 112: 616-630.
5. Jung, C.H., et al. 2019. Mitochondrial superoxide dismutase 2 mediates γ-irradiation-induced cancer cell invasion. Exp. Mol. Med. 51: 14.
6. Young, B.M., et al. 2019. Expression of a CARD slows the retinal degeneration of a geographic atrophy mouse model. Mol. Ther. Methods Clin. Dev. 14: 113-125.
7. Torrens-Mas, M., et al. 2019. Mutant p53 induces SIRT3/MnSOD axis to moderate Ros production in melanoma cells. Arch. Biochem. Biophys. 679: 108219.
8. Noh, J.K., et al. 2021. SOD-2- and NRF2-associated gene signature to predict radioresistance in head and neck cancer. Cancer Genomics Proteomics 18: 675-684.

RESEARCH USE

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