SANTA CRUZ BIOTECHNOLOGY, INC.

Nox4 siRNA (h): sc-41586

SANTA CRUZ BIOTECHNOLOGY
The Power to Question

BACKGROUND

The superoxide-generating NADPH oxidase includes a membrane-bound flavocytochrome containing two subunits, gp91-phox and p22-phox, and the cytosolic proteins p47-phox and p67-phox. During activation of the NADPH oxidase, p47-phox and p67-phox migrate to the plasma membrane where they associate with the flavocytochrome, cytochrome b558, to form the active enzyme complex. The p22- and gp91-phox subunits also function as surface O_2 sensors that initiate cellular signaling in response to hypoxic conditions. Nox4 (also known as Renox) is a renal gp91-phox homolog highly expressed at the site of erythropoietin production in the proximal convoluted tubule epithelial cells of the renal cortex. Nox4 is also expressed in fetal tissues, placenta, glioblastoma and vascular cells. Like gp91-phox, the enzymatic activity of Nox4 produces superoxide anions. In vascular cells, the addition of Angiotensin II increases Nox4 expression, which suggests a role for Nox4 in vascular oxidative stress response. The gene encoding human Nox4 maps to chromosome 11q14.3.

CHROMOSOMAL LOCATION

Genetic locus: NOX4 (human) mapping to 11q14.3.

PRODUCT

Nox4 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 Nox4 shRNA Plasmid (h): sc-41586-SH and Nox4 shRNA (h) Lentiviral Particles: sc-41586-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

Nox4 siRNA (h) is recommended for the inhibition of Nox4 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Nox4 gene expression knockdown using RT-PCR Primer: Nox4 (h)-PR: sc-41586-PR (20 µl, 482 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Muzaffar, S., et al. 2008. Superoxide from NADPH oxidase upregulates type 5 phosphodiesterase in human vascular smooth muscle cells: inhibition with iloprost and NONOate. Br. J. Pharmacol. 155: 847-856.
2. Tobar, N., et al. 2010. NOX4-dependent Ros production by stromal mammary cells modulates epithelial MCF-7 cell migration. Br. J. Cancer 103: 1040-1047.
3. Pendyala, S., et al. 2011. Nrf2 regulates hyperoxia-induced Nox4 expression in human lung endothelium: identification of functional antioxidant response elements on the Nox4 promoter. Free Radic. Biol. Med. 50: 1749-1759.
4. Manea, A., et al. 2012. Positive regulation of NADPH oxidase 5 by proinflammatory-related mechanisms in human aortic smooth muscle cells. Free Radic. Biol. Med. 52: 1497-1507.
5. Quast, S.A., et al. 2013. Ros-dependent phosphorylation of Bax by wortmannin sensitizes melanoma cells for TRAIL-induced apoptosis. Cell Death Dis. 4: e839.
6. Othman, E.M., et al. 2014. Signaling steps in the induction of genomic damage by insulin in colon and kidney cells. Free Radic. Biol. Med. 68: 247-257.
7. Philip, J.L., et al. 2015. Regulation of mitochondrial oxidative stress by β-arrestins in cultured human cardiac fibroblasts. Dis. Model. Mech. 8: 1579-1589.
8. Li, Q., et al. 2016. Inhibition of CPU0213, a dual endothelin receptor antagonist, on apoptosis via Nox4-dependent Ros in HK-2 cells. Cell. Physiol. Biochem. 39: 183-192.
9. Kim, H., et al. 2017. Regulation of anoikis resistance by NADPH oxidase 4 and epidermal growth factor receptor. Br. J. Cancer 116: 370-381.
10. Vara, D., et al. 2018. Direct activation of NADPH oxidase 2 by 2-deoxyribose-1-phosphate triggers nuclear factor κB-dependent angiogenesis. Antioxid. Redox Signal. 28: 110-130.
11. Yang, Q., et al. 2019. Magnesium isoglycyrrhizinate ameliorates radiation-induced pulmonary fibrosis by inhibiting fibroblast differentiation via the p38MAPK/Akt/Nox4 pathway. Biomed. Pharmacother. 115: 108955.
12. Cheng, Y., et al. 2019. MicroRNA-30e regulates TGF-β-mediated NADPH oxidase 4-dependent oxidative stress by Snai1 in atherosclerosis. Int. J. Mol. Med. 43: 1806-1816.

RESEARCH USE

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