SANTA CRUZ BIOTECHNOLOGY, INC.

DUOX2 siRNA (h): sc-60552

BACKGROUND

Dual oxidase 1 (DUOX1), a homolog of glycoprotein p91phox, is expressed in airway epithelium and generates reactive oxygen species (ROS). Dual oxidase 2 (DUOX2), also designated NADPH thyroid oxidase 2, p138 thyroid oxidase or large NOX2, localizes to the apical membrane of epithelial cells. DUOX1, also designated NADPH thyroid oxidase or large NOX1, and DUOX2 are multi-pass membrane proteins predominantly expressed in thyrocytes, tracheal surface epithelial cells as well as thyroid, colon, duodenum, trachea and bronchium. DUOX1 and DUOX2 generate hydrogen peroxide, which is crucial for thyroid peroxidase and lactoperoxidase. In mucosa, DUOX proteins are involved in thyroid hormone biosynthesis and lactoperoxidase-mediated antimicrobial defense. Defects in the gene encoding for DUOX2 cause congenital hypothyroidism (CH), a disorder characterized by a defect in hydrogen peroxide production in the thyroid gland.

REFERENCES

1. Geiszt, M., et al. 2003. Dual oxidases represent novel hydrogen peroxide sources supporting mucosal surface host defense. FASEB J. 17: 1502-1504.
2. Vigone, M.C., et al. 2005. Persistent mild hypothyroidism associated with novel sequence variants of the DUOX2 gene in two siblings. Hum. Mutat. 26: 395.
3. Wang, D., et al. 2005. Identification of a novel partner of DUOX: EFP1, a thioredoxin-related protein. J. Biol. Chem. 280: 3096-3103.
4. Harper, R.W., et al. 2005. Differential regulation of dual NADPH oxidases/peroxidases, DUOX1 and DUOX2, by Th1 and Th2 cytokines in respiratory tract epithelium. FEBS Lett. 579: 4911-4917.

CHROMOSOMAL LOCATION

Genetic locus: DUOX2 (human) mapping to 15q21.1.

PRODUCT

DUOX2 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 DUOX2 shRNA Plasmid (h): sc-60552-SH and DUOX2 shRNA (h) Lentiviral Particles: sc-60552-V as alternate gene silencing products.

For independent verification of DUOX2 (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-60552A, sc-60552B and sc-60552C.

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

DUOX2 siRNA (h) is recommended for the inhibition of DUOX2 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

DUOX2 (E-8): sc-398681 is recommended as a control antibody for monitoring of DUOX2 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 DUOX2 gene expression knockdown using RT-PCR Primer: DUOX2 (h)-PR: sc-60552-PR (20 µl, 443 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Wang, Y., et al. 2018. Chemerin/ChemR23 axis triggers an inflammatory response in keratinocytes through ROS-SIRT1-NFκB signaling. J. Cell. Biochem. 120: 6459-6470.
2. Yamaguchi, R., et al. 2018. Di-(2-ethylhexyl) phthalate suppresses IL-12p40 production by GM-CSF-dependent macrophages via the PPARα/TNFAIP3/TRAF6 axis after lipopolysaccharide stimulation. Hum. Exp. Toxicol. 37: 596-607.
3. Yamaguchi, R., et al. 2020. TRIM28/TIF1β and Fli-1 negatively regulate peroxynitrite generation via DUOX2 to decrease the shedding of membrane-bound fractalkine in human macrophages after exposure to Substance P. Cytokine 134: 155180.
4. Chou, W.C., et al. 2021. Galectin-3 facilitates inflammation and apoptosis in chondrocytes through upregulation of the TLR-4-mediated oxidative stress pathway in TC28a2 human chondrocyte cells. Environ. Toxicol. 37: 478-488.
5. Yamaguchi, R., et al. 2022. IL-23 production in human macrophages is regulated negatively by tumor necrosis factor α-induced protein 3 and positively by specificity protein 1 after stimulation of the toll-like receptor 7/8 signaling pathway. Heliyon 8: e08887.

RESEARCH USE

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