SANTA CRUZ BIOTECHNOLOGY, INC.

Xanthine Oxidase siRNA (h): sc-41691

BACKGROUND

The process of metabolizing purines to a common molecule known as xanthine is an essential process for the proper shuttling of uric acid. Xanthine Oxidase is a flavoprotein enzyme that coordinates molybdenum and utilizes NAD^+ as an electron acceptor to catalyze the oxidation of hypoxanthine to xanthine and then to uric acid. The predominant form of this enzyme is xanthine dehydrogenase, which is a homodimer that can be converted to Xanthine Oxidase by sulfhydryl oxidation or proteolytic modification. Xanthine Oxidase is present in species ranging from bacteria to human and is ubiquitously expressed in mammalian tissues. In the oxidase form, this enzyme is coupled to the generation of free radicals. Individuals showing marked elevation of serum Xanthine Oxidase is suggestive of chronic liver disease and cholestasis, which is a condition defined by hepatic obstruction. Hepatic obstruction causes bile salts, the bile pigment bilirubin, and fats to accumulate in the blood stream instead of being eliminated normally. The clinical consequences of defects in Xanthine Oxidase range from mild to severe and even contribute to fatal disorders. The human Xanthine Oxidase gene maps to chromosome 2p23.1 and encodes a 1,333 amino acid protein.

CHROMOSOMAL LOCATION

Genetic locus: XDH (human) mapping to 2p23.1.

PRODUCT

Xanthine Oxidase 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 Xanthine Oxidase shRNA Plasmid (h): sc-41691-SH and Xanthine Oxidase shRNA (h) Lentiviral Particles: sc-41691-V as alternate gene silencing products.

For independent verification of Xanthine Oxidase (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-41691A, sc-41691B and sc-41691C.

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

Xanthine Oxidase siRNA (h) is recommended for the inhibition of Xanthine Oxidase expression in human cells.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.

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

Xanthine Oxidase (A-3): sc-398548 is recommended as a control antibody for monitoring of Xanthine Oxidase 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 Xanthine Oxidase gene expression knockdown using RT-PCR Primer: Xanthine Oxidase (h)-PR: sc-41691-PR (20 µl, 464 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Lebedeva, I.V., et al. 2008. Mechanism of *in vitro* pancreatic cancer cell growth inhibition by melanoma differentiation-associated gene-7/interleukin-24 and perillyl alcohol. Cancer Res. 68: 7439-7447.
2. Huang, C.C., et al. 2015. Autophagy-regulated ROS from Xanthine Oxidase acts as an early effector for triggering late mitochondria-dependent apoptosis in cathepsin S-targeted tumor cells. PLoS ONE 10: e0128045.
3. Woo, S.M., et al. 2017. Up-regulation of 5-lipoxygenase by inhibition of cathepsin G enhances TRAIL-induced apoptosis through down-regulation of survivin. Oncotarget 8: 106672-106684.
4. Zhou, H., et al. 2018. Ripk3 regulates cardiac microvascular reperfusion injury: the role of IP3R-dependent calcium overload, XO-mediated oxidative stress and F-action/filopodia-based cellular migration. Cell. Signal. 45: 12-22.
5. Chang, T.T., et al. 2020. Hydralazine improves ischemia-induced neovasculogenesis via Xanthine-Oxidase inhibition in chronic renal insufficiency. Pharmacol. Res. 151: 104509.
6. Yabuuchi, N., et al. 2021. Suppressed hepatic production of indoxyl sulfate attenuates cisplatin-induced acute kidney injury in sulfotransferase 1a1-deficient mice. Int. J. Mol. Sci. 22: 1764.
7. Chiang, C.H., et al. 2023. Xanthine oxidase/NADPH oxidase inhibition by hydralazine attenuates acute kidney injury and prevents the transition of acute kidney injury to chronic kidney disease. Life Sci. 327: 121863.

RESEARCH USE

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