

Nrf2 siRNA (h): sc-37030

BACKGROUND

The NF-E2 DNA binding protein is composed of two subunits, p45 and MafK. It regulates expression of globin genes in developing erythroid cells through interaction with Maf recognition elements (Mares). A family of NF-E2-related proteins, which are collectively known as the Cap "n" collar (CNC) family and include Nrf1 (also designated TCF11), Nrf2 and Nrf3, are bZIP transcription factors that heterodimerize with Maf proteins to bind Maf sequences. The Nrf proteins also bind the antioxidant response element (ARE) and are implicated in the regulation of detoxification enzymes and the oxidative stress response. They do so by heterodimerizing with Jun family members (c-Jun, Jun B and Jun D) to activate gene expression, specifically the detoxifying enzyme NQO1. Nrf2 is widely expressed and is thought to translocate to the nucleus after treatment with xenobiotics and antioxidants, which stimulate its release from its repressor protein, Keap1.

REFERENCES

- Chan, J.Y., et al. 1995. Chromosomal localization of the human NF-E2 family of bZIP transcription factors by fluorescence *in situ* hybridization. *Hum. Genet.* 95: 265-269.
- Chan, K., et al. 1996. Nrf2, a member of the NF-E2 family of transcription factors, is not essential for murine erythropoiesis, growth, and development. *Proc. Natl. Acad. Sci. USA* 93: 13943-13948.

CHROMOSOMAL LOCATION

Genetic locus: NFE2L2 (human) mapping to 2q31.2.

PRODUCT

Nrf2 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Nrf2 shRNA Plasmid (h): sc-37030-SH and Nrf2 shRNA (h) Lentiviral Particles: sc-37030-V as alternate gene silencing products.

For independent verification of Nrf2 (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-37030A, sc-37030B and sc-37030C.

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

Nrf2 siRNA (h) is recommended for the inhibition of Nrf2 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 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

Nrf2 (H-6): sc-518033 is recommended as a control antibody for monitoring of Nrf2 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 Nrf2 gene expression knockdown using RT-PCR Primer: Nrf2 (h)-PR: sc-37030-PR (20 μ l, 371 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

- Pae, H.O., et al. 2006. 1,2,3,4,6-penta-O-galloyl- β -D-glucose up-regulates heme oxygenase-1 expression by stimulating Nrf2 nuclear translocation in an extracellular signal-regulated kinase-dependent manner in Hep G2 cells. *World J. Gastroenterol.* 12: 214-221.
- Huang, C., et al. 2015. Activation of the UPR protects against cigarette smoke-induced RPE apoptosis through up-regulation of Nrf2. *J. Biol. Chem.* 290: 5367-5380.
- Kim, J.M., et al. 2016. Chemopreventive properties of genipin on AGS cell line via induction of JNK/Nrf2/ARE signaling pathway. *J. Biochem. Mol. Toxicol.* 30: 45-54.
- Zhu, C., et al. 2017. Hesperetin protects against H₂O₂-triggered oxidative damage via upregulation of the Keap1-Nrf2/HO-1 signal pathway in ARPE-19 cells. *Biomed. Pharmacother.* 88: 124-133.
- Olagnier, D., et al. 2018. Nrf2 negatively regulates STING indicating a link between antiviral sensing and metabolic reprogramming. *Nat. Commun.* 9: 3506.
- Su, R., et al. 2019. NGF protects neuroblastoma cells against β -Amyloid-induced apoptosis via the Nrf2/HO-1 pathway. *FEBS Open Bio.* 9: 2063-2071.
- Song, I., et al. 2020. The Nrf2-mediated defense mechanism associated with HFE genotype limits vulnerability to oxidative stress-induced toxicity. *Toxicology* 441: 152525.

RESEARCH USE

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