



# NFATc1 siRNA (h): sc-29412

## BACKGROUND

Members of the NFAT (nuclear factor of activated T cells) family of transcription factors are related to NF $\kappa$ B/Rel proteins and form cooperative complexes with the AP-1 proteins, Fos and Jun, on DNA to regulate cytokine expression in T cells. NFAT proteins are widely expressed and alternatively modified to generate splice variants, and they are localized to both the cytosol (NFATc) and to the nucleus (NFATn). NFATc1 (NFATc), NFATc2 (NFATp) and NFATc3 (NFAT4, NFSTx) are predominantly expressed in immune cells, and NFAT2 and NFAT4 are expressed at high levels in cardiac tissues. In addition to activating cytokine gene transcription, NFATc2 is also implicated in cardiac valve development, and NFATc4 is involved in cardiac hypertrophy. NFAT5 is detected in both immune and nonimmune cells and, like other NFAT proteins, it contains a highly conserved Rel-like binding domain that mediates NFAT proteins associating with specific consensus sequences on DNA. NFAT proteins are activated by increases in intracellular calcium, which leads to the calmodulin-dependent phosphatase, calcineurin, dephosphorylating NFAT proteins. This activating event induces a conformational change in the protein structure that exposes the nuclear localization signal and facilitates the translocation of NFAT proteins from the cytosol into the nucleus.

## REFERENCES

- Hoey, T., et al. 1995. Isolation of two new members of the NFAT gene family and functional characterization of the NFAT proteins. *Immunity* 2: 461-472.
- Park, J., et al. 1996. Characterization of a new isoform of the NFAT (nuclear factor of activated T cells) gene family member NFATc. *J. Biol. Chem.* 271: 20914-20921.

## CHROMOSOMAL LOCATION

Genetic locus: NFATC1 (human) mapping to 18q23.

## PRODUCT

NFATc1 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see NFATc1 shRNA Plasmid (h): sc-29412-SH and NFATc1 shRNA (h) Lentiviral Particles: sc-29412-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  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

NFATc1 siRNA (h) is recommended for the inhibition of NFATc1 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  $\mu$ M in 66  $\mu$ 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

NFATc1 (7A6): sc-7294 is recommended as a control antibody for monitoring of NFATc1 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 NFATc1 gene expression knockdown using RT-PCR Primer: NFATc1 (h)-PR: sc-29412-PR (20  $\mu$ l, 524 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

- Pham, L.V., et al. 2005. Constitutive NF $\kappa$ B and NFAT activation in aggressive B-cell lymphomas synergistically activates the CD154 gene and maintains lymphoma cell survival. *Blood* 106: 3940-3947.
- Liu, S., et al. 2011. Transcriptional regulation of TMP21 by NFAT. *Mol. Neurodegener.* 6: 21.
- Kawahara, T., et al. 2015. The role of NFATc1 in prostate cancer progression: cyclosporine A and tacrolimus inhibit cell proliferation, migration, and invasion. *Prostate* 75: 573-584.
- Wu, L., et al. 2019. FUN14 domain-containing 1 promotes breast cancer proliferation and migration by activating calcium-NFATc1-BMI1 axis. *EBioMedicine* 41: 384-394.
- Zhou, L., et al. 2021. Identification of ascormycin against Zika virus infection through screening of natural product library. *Antiviral Res.* 196: 105210.
- Zhang, Y., et al. 2023. Development of bioactive and ultrasound-responsive microdroplets for preventing ovariectomy (OVX)-induced osteoporosis. *J. Mater. Chem. B* 11: 11344-11356.
- Luo, P., et al. 2024. Microdroplets encapsulated with NFATc1-siRNA and exosomes-derived from MSCs onto 3D porous PLA scaffold for regulating osteoclastogenesis and promoting osteogenesis. *Int. J. Nanomedicine* 19: 3423-3440.

## RESEARCH USE

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