SANTA CRUZ BIOTECHNOLOGY, INC.

Orai1 siRNA (m): sc-76002

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The Power to Question

BACKGROUND

Orai1 (ORAI calcium release-activated calcium modulator 1), also known as ORAT1, CRACM1 (calcium release-activated calcium modulator 1) or TMEM142A (transmembrane protein 142A), is a 301 amino acid multi-pass membrane protein that belongs to the Orai family of proteins. Localizing to the plasma membrane, Orai1 plays an important role in store-operated calcium (SOC) entry, a process involving Ca^{2+} influx and replenishment of Ca^{2+} stores formerly emptied through the action of inositol 1,4,5-trisphosphate production and other Ca^{2+} mobilizing agents. Specifically, Orai1 functions as a pore subunit of the store-operated calcium release-activated calcium channel (CRAC) and is essential for proper function of the CRAC channel. CRAC channels are responsible for mediating calcium influx in T cells and play an important role in the immune response. Mutations in the gene encoding Orai1 can result in severe combined immunodeficiency (SCID).

REFERENCES

1. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 610277. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
2. Dziadek, M.A., et al. 2007. Biochemical properties and cellular localisation of STIM proteins. Cell Calcium 42: 123-132.
3. DeHaven, W.I., et al. 2007. Calcium inhibition and calcium potentiation of Orai1, Orai2, and Orai3 calcium release-activated calcium channels. J. Biol. Chem. 282: 17548-17556.
4. Gross, S.A., et al. 2007. Murine Orai2 splice variants form functional Ca^{2+} release-activated Ca^{2+} (CRAC) channels. J. Biol. Chem. 282: 19375-19384.

CHROMOSOMAL LOCATION

Genetic locus: Orai1 (mouse) mapping to 5 F.

PRODUCT

Orai1 siRNA (m) 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 Orai1 shRNA Plasmid (m): sc-76002-SH and Orai1 shRNA (m) Lentiviral Particles: sc-76002-V as alternate gene silencing products.

For independent verification of Orai1 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-76002A, sc-76002B and sc-76002C.

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

Orai1 siRNA (m) is recommended for the inhibition of Orai1 expression in mouse 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 Orai1 gene expression knockdown using RT-PCR Primer: Orai1 (m)-PR: sc-76002-PR (20 µl, 580 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Sundivakkam, P.C., et al. 2012. The Ca^{2+} sensor stromal interaction molecule 1 (STIM1) is necessary and sufficient for the store-operated Ca^{2+} entry function of transient receptor potential canonical (TRPC) 1 and 4 channels in endothelial cells. Mol. Pharmacol. 81: 510-526.
2. Bhavsar, S.K., et al. 2013. AMPKα1-sensitivity of Orai1 and Ca^{2+} entry in T-lymphocytes. Cell. Physiol. Biochem. 32: 687-698.
3. Antony, C., et al. 2015. Regulation of L-type voltage gated calcium channel CACNA1S in macrophages upon *Mycobacterium tuberculosis* infection. PLoS ONE 10: e0124263.
4. Vashishta, M., et al. 2015. Pneumococal surface protein A (PspA) regulates programmed death ligand 1 expression on dendritic cells in a Toll-like receptor 2 and calcium dependent manner. PLoS ONE 10: e0133601.
5. Goldberg, J., et al. 2020. Targeting of intracellular Ca^{2+} stores as a therapeutic strategy against age-related neurotoxicities. NPJ Aging Mech. Dis. 6: 10.
6. Zhang, L., et al. 2021. Upregulated SOCC and IP3R calcium channels and subsequent elevated cytoplasmic calcium signaling promote nonalcoholic fatty liver disease by inhibiting autophagy. Mol. Cell. Biochem. 476: 3163-3175.

RESEARCH USE

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

PROTOCOLS

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