

Orai1 siRNA (h): sc-76001

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 sub-unit 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. and Johnstone, L.S. 2007. Biochemical properties and cellular localisation of STIM proteins. *Cell Calcium* 42: 123-132.
3. Cai, X. 2007. Molecular evolution and structural analysis of the Ca^{2+} release-activated Ca^{2+} channel subunit, Orai. *J. Mol. Biol.* 368: 1284-1291.

CHROMOSOMAL LOCATION

Genetic locus: ORAI1 (human) mapping to 12q24.31.

PRODUCT

Orai1 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 Orai1 shRNA Plasmid (h): sc-76001-SH and Orai1 shRNA (h) Lentiviral Particles: sc-76001-V as alternate gene silencing products.

For independent verification of Orai1 (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-76001A, sc-76001B and sc-76001C.

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 (h) is recommended for the inhibition of Orai1 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

Orai1 (G-2): sc-377281 is recommended as a control antibody for monitoring of Orai1 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 Orai1 gene expression knockdown using RT-PCR Primer: Orai1 (h)-PR: sc-76001-PR (20 μl , 542 bp). Annealing temperature for the primers should be $55-60^{\circ}\text{C}$ and the extension temperature should be $68-72^{\circ}\text{C}$.

SELECT PRODUCT CITATIONS

1. Huang, W.C., et al. 2011. Histamine regulates cyclooxygenase 2 gene activation through Orai1-mediated NF κ B activation in lung cancer cells. *Cell Calcium* 50: 27-35.
2. Sobradillo, D., et al. 2014. A reciprocal shift in transient receptor potential channel 1 (TRPC1) and stromal interaction molecule 2 (STIM2) contributes to Ca^{2+} remodeling and cancer hallmarks in colorectal carcinoma cells. *J. Biol. Chem.* 289: 28765-28782.
3. Mehto, S., et al. 2015. *Mycobacterium tuberculosis* and human immunodeficiency virus type 1 cooperatively modulate macrophage apoptosis via Toll like receptor 2 and calcium homeostasis. *PLoS ONE* 10: e0131767.
4. Guéguinou, M., et al. 2016. SK3/TRPC1/Orai1 complex regulates SOCE-dependent colon cancer cell migration: a novel opportunity to modulate anti-EGFR mAb action by the alkyl-lipid Ohmline. *Oncotarget* 7: 36168-36184.
5. Li, G., et al. 2018. Bradykinin-mediated Ca^{2+} signalling regulates cell growth and mobility in human cardiac c-Kit⁺ progenitor cells. *J. Cell. Mol. Med.* 22: 4688-4699.
6. The PLoS ONE Editors. 2020. Expression of concern: the Orai1 and STIM-1 complex controls human dendritic cell maturation. *PLoS ONE* 15: e0231469.
7. Lewuillon, C., et al. 2022. Involvement of Orai1/SOCE in human AML cell lines and primary cells according to ABCB1 activity, LSC compartment and potential resistance to Ara-C exposure. *Int. J. Mol. Sci.* 23: 5555.

RESEARCH USE

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