SANTA CRUZ BIOTECHNOLOGY, INC.

VR1 siRNA (h): sc-36826

BACKGROUND

Vanilloid receptor 1 (VR1), also designated capsaicin receptor, is a nonselective cation channel, structurally related to members of the TRP family of ion channels. VR1 is activated by capsaicin, the active ingredient in chili peppers, by heat and by an increase in protons at sites of infection, inflammation and ischemia. By creating moderately acidic conditions, protons are able to lower the temperature threshold for VR1 activation, thus identifying VR1 as a molecular integrator of chemical and physical stimuli that elicit pain. VR1 is expressed in primary sensory neurons and vagal nerves and activated VR1 induces the influx of cations, particularly Ca^{2+} and Na^{+} ions. The vanilloid receptor may also be a molecular target for endogenous anandamide, in addition to the cannabinoid receptors, in the nervous and cardiovascular systems.

REFERENCES

1. Caterina, M.J., et al. 1997. The capsaicin receptor: a heat-activated ion channel in the pain pathway. Nature 389: 816-824.
2. Tominaga, M., et al. 1998. The cloned capsaicin receptor integrates multiple pain-producing stimuli. Neuron 21: 531-543.
3. Cesare, P., et al. 1999. Ion channels gated by heat. Proc. Natl. Acad. Sci. USA 96: 7658-7663.
4. Sasamura, T., et al. 1999. Peripheral and central actions of capsaicin and VR1 receptor. Jpn. J. Pharmacol. 80: 275-280.

CHROMOSOMAL LOCATION

Genetic locus: TRPV1 (human) mapping to 17p13.2.

PRODUCT

VR1 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 VR1 shRNA Plasmid (h): sc-36826-SH and VR1 shRNA (h) Lentiviral Particles: sc-36826-V as alternate gene silencing products.

For independent verification of VR1 (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-36826A, sc-36826B and sc-36826C.

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

VR1 siRNA (h) is recommended for the inhibition of VR1 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor VR1 gene expression knockdown using RT-PCR Primer: VR1 (h)-PR: sc-36826-PR (20 µl, 345 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Ching, L.C., et al. 2011. Molecular mechanisms of activation of endothelial nitric oxide synthase mediated by transient receptor potential vanilloid type 1. Cardiovasc. Res. 91: 492-501.
2. Miyashita, K., et al. 2012. Anandamide induces matrix metalloproteinase-2 production through cannabinoid-1 receptor and transient receptor potential vanilloid-1 in human dental pulp cells in culture. J. Endod. 38: 786-790.
3. Yang, Y., et al. 2013. Functional TRPV1 expression in human corneal fibroblasts. Exp. Eye Res. 107: 121-129.
4. Yang, Y., et al. 2013. TRPV1 potentiates TGFβ-induction of corneal myofibroblast development through an oxidative stress-mediated p38-SMAD2 signaling loop. PLoS ONE 8: e77300.
5. de Jong, P.R., et al. 2014. Ion channel TRPV1-dependent activation of PTP1B suppresses EGFR-associated intestinal tumorigenesis. J. Clin. Invest. 124: 3793-3806.
6. Bertin, S., et al. 2014. The ion channel TRPV1 regulates the activation and proinflammatory properties of $CD4^{+}$ T cells. Nat. Immunol. 15: 1055-1063.
7. Song, S., et al. 2017. Capsaicin-induced Ca^{2+} signaling is enhanced via upregulated TRPV1 channels in pulmonary artery smooth muscle cells from patients with idiopathic PAH. Am. J. Physiol. Lung Cell. Mol. Physiol. 312: L309-L325.
8. Huang, K.F., et al. 2018. A new copper ionophore DPMQ protects cells against ultraviolet B irradiation by inhibiting the TRPV1 channel. J. Cell. Physiol. 233: 9594-9610.
9. Pham, H.T., et al. 2020. Sesamin induces endothelial nitric oxide synthase activation via transient receptor potential vanilloid type 1. J. Agric. Food Chem. 68: 3474-3484.

RESEARCH USE

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