

Na⁺ CP type V α siRNA (h): sc-42640

BACKGROUND

Voltage-gated sodium channels drive the initial depolarization phase of the cardiac action potential and, therefore, critically determine conduction of excitation through the heart. The sodium channel gene SCN5A, which encodes the Na⁺ CP type V α protein, possesses two fundamental properties, ion conduction and gating. The human SCN5A gene maps to chromosome 3p22.2. Deletions or loss-of-function mutations in SCN5A result in a wide range of arrhythmias, including bradycardia, atrioventricular conduction delay and ventricular fibrillation. Specifically, patients with Brugada syndrome have mutations in the SCN5A gene, which reduces the sodium current. Additionally, gain-of-function mutations are associated with long QT syndrome type III (LQT3), a cardiac disorder that causes sudden death from ventricular tachyarrhythmias, specifically torsade de pointes. The SCN5A gene is expressed in human atrial and ventricular cardiac muscle, but not in adult skeletal muscle, brain, myometrium, liver or spleen.

REFERENCES

1. Wang, Q., et al. 1998. The molecular basis of long QT syndrome and prospects for therapy. *Mol. Med. Today* 4: 382-388.
2. Wang, Q., et al. 1998. Genetics, molecular mechanisms and management of long QT syndrome. *Ann. Med.* 30: 58-65.
3. Cerrone, M., et al. 2001. Long QT syndrome and Brugada syndrome: 2 aspects of the same disease? *Ital. Heart J. Suppl.* 2: 253-257.
4. Grant, A.O. 2001. Molecular biology of sodium channels and their role in cardiac arrhythmias. *Am. J. Med.* 110: 296-305.

CHROMOSOMAL LOCATION

Genetic locus: SCN5A (human) mapping to 3p22.2.

PRODUCT

Na⁺ CP type V α 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 Na⁺ CP type V α shRNA Plasmid (h): sc-42640-SH and Na⁺ CP type V α shRNA (h) Lentiviral Particles: sc-42640-V as alternate gene silencing products.

For independent verification of Na⁺ CP type V α (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-42640A, sc-42640B and sc-42640C.

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

Na⁺ CP type V α siRNA (h) is recommended for the inhibition of Na⁺ CP type V α 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

Na⁺ CP type V α (H-10): sc-271255 is recommended as a control antibody for monitoring of Na⁺ CP type V α 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).

To ensure optimal results, the following support reagents are recommended:

- 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Na⁺ CP type V α gene expression knockdown using RT-PCR Primer: Na⁺ CP type V α (h)-PR: sc-42640-PR (20 μ l, 541 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Gillet, L., et al. 2009. Voltage-gated sodium channel activity promotes cysteine cathepsin-dependent invasiveness and colony growth of human cancer cells. *J. Biol. Chem.* 284: 8680-8691.
2. Mohammed, F.H., et al. 2016. Blockade of voltage-gated sodium channels inhibits invasion of endocrine-resistant breast cancer cells. *Int. J. Oncol.* 48: 73-83.

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.