SANTA CRUZ BIOTECHNOLOGY, INC.

Na^+ CP type IXα siRNA (h): sc-94458

BACKGROUND

Voltage-gated sodium channels are selective ion channels that regulate the permeability of sodium ions in excitable cells. During the propagation of an action potential, sodium channels allow an influx of sodium ions, which rapidly depolarizes the cell. Na^+ CP type IXα, also known as SCN9A (sodium channel protein type 9 subunit α), NENA, PN1, Nav1.7 or ETHA, is a 1,988 amino acid multi-pass membrane protein that belongs to the voltage-gated sodium channel family. Expressed in dorsal root ganglion, smooth muscle cells and in the central and peripheral nervous system, Na^+ CP type IXα functions to mediate the voltage-dependent sodium ion permeability of membranes, specifically forming a sodium-selective ion channel through which sodium may pass. Via its ability to control the flow of sodium in and out of excitable membranes, Na^+ CP type IXα plays an important role in the inflammatory pain response. Defects in the gene encoding Na^+ CP type IXα are the cause of primary erythermalgia, autosomal recessive congenital indifference to pain and paroxysmal extreme pain disorder (PEPD), all of which are genetic pain disorders.

REFERENCES

1. Klugbauer, N., et al. 1995. Structure and functional expression of a new member of the tetrodotoxin-sensitive voltage-activated sodium channel family from human neuroendocrine cells. EMBO J. 14: 1084-1090.
2. Sangameswaran, L., et al. 1997. A novel tetrodotoxin-sensitive, voltage-gated sodium channel expressed in rat and human dorsal root ganglia. J. Biol. Chem. 272: 14805-14809.
3. Raymond, C.K., et al. 2004. Expression of alternatively spliced sodium channel α-subunit genes. Unique splicing patterns are observed in dorsal root ganglia. J. Biol. Chem. 279: 46234-46241.
4. Yang, Y., et al. 2004. Mutations in SCN9A, encoding a sodium channel α subunit, in patients with primary erythermalgia. J. Med. Genet. 41: 171-174.
5. Ahmad, S., et al. 2007. A stop codon mutation in SCN9A causes lack of pain sensation. Hum. Mol. Genet. 16: 2114-2121.
6. Drenth, J.P. and Waxman, S.G. 2007. Mutations in sodium-channel gene SCN9A cause a spectrum of human genetic pain disorders. J. Clin. Invest. 117: 3603-3609.

CHROMOSOMAL LOCATION

Genetic locus: SCN9A (human) mapping to 2q24.3.

PRODUCT

Na^+ CP type IXα 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 Na^+ CP type IXα shRNA Plasmid (h): sc-94458-SH and Na^+ CP type IXα shRNA (h) Lentiviral Particles: sc-94458-V as alternate gene silencing products.

For independent verification of Na^+ CP type IXα (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-94458A, sc-94458B and sc-94458C.

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

Na^+ CP type IXα siRNA (h) is recommended for the inhibition of Na^+ CP type IXα 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 60 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

Na^+ CP type IXα (5A11): sc-293298 is recommended as a control antibody for monitoring of Na^+ CP type IXα 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-IgGκ BP-HRP: sc-516102 or m-IgGκ 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-IgGκ BP-FITC: sc-516140 or m-IgGκ 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 IXα gene expression knockdown using RT-PCR Primer: Na^+ CP type IXα (h)-PR: sc-94458-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

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.