SANTA CRUZ BIOTECHNOLOGY, INC.

KCNQ5 siRNA (h): sc-42505

BACKGROUND

Voltage-gated K^+ channels in the plasma membrane control the repolarization and frequency of action potentials in neurons, muscles and other excitable cells. KCNQ proteins contain six transmembrane domains and function as tetramers. KCNQ4 forms heteromeric channels with KCNQ3 and is expressed in several tissues, including the cochlea, where it is present in outer hair cells. KCNQ5 expression is highest in the brain and muscle. Out of the three splice variants of KCNQ5, the longest variant, KCNQ5 type III, is the predominant form expressed in skeletal muscle. The gene encoding human KCNQ5 maps to chromosome 6q13. Mutations in the gene encoding KCNQ2, but not in the gene encoding KCNQ5, lead to benign familial neonatal convulsions, while mutations in the genes encoding for KCNQ1 and KCNE1 lead to cardiac disease because they directly impair electrical signaling. Mutations in KCNQ4 are implicated in the onset of deafness.

REFERENCES

1. Takumi, T., et al. 1988. Cloning of a membrane protein that induces a slow voltage-gated potassium current. Science 242: 1042-1045.
2. Wang, Q., et al. 1996. Positional cloning of a novel potassium channel gene: KVLQT1 mutations cause cardiac arrhythmias. Nat. Genet. 12: 17-23.
3. Chouabe, C., et al. 1997. Properties of KvLQT1 K^+ channel mutations in Romano-Ward and Jervell and Lange-Nielsen inherited cardiac arrhythmias. EMBO J. 16: 5472-5479.
4. Kubisch, C., et al. 1999. KCNQ4, a novel potassium channel expressed in sensory outer hair cells, is mutated in dominant deafness. Cell 5: 437-446.
5. Schroeder, B.C., et al. 2000. A constitutively open potassium channel formed by KCNQ1 and KCNE3. Nature 13: 196-199.
6. Lerche, C., et al. 2000. Molecular cloning and functional expression of KCNQ5, a potassium channel subunit that may contribute to neuronal M-current diversity. J. Biol. Chem. 275: 22395-22400.
7. Kananura, C., et al. 2000. The new voltage gated potassium channel KCNQ5 and neonatal convulsions. Neuroreport 11: 2063-2067.
8. Schroeder, B.C., et al. 2000. KCNQ5, a novel potassium channel broadly expressed in brain, mediates M-type currents. J. Biol. Chem. 275: 24089-24095.

CHROMOSOMAL LOCATION

Genetic locus: KCNQ5 (human) mapping to 6q13.

PRODUCT

KCNQ5 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 KCNQ5 shRNA Plasmid (h): sc-42505-SH and KCNQ5 shRNA (h) Lentiviral Particles: sc-42505-V as alternate gene silencing products.

For independent verification of KCNQ5 (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-42505A, sc-42505B and sc-42505C.

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

KCNQ5 siRNA (h) is recommended for the inhibition of KCNQ5 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

KCNQ5 (2E2): sc-293305 is recommended as a control antibody for monitoring of KCNQ5 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 KCNQ5 gene expression knockdown using RT-PCR Primer: KCNQ5 (h)-PR: sc-42505-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.