SANTA CRUZ BIOTECHNOLOGY, INC.

CA VB siRNA (h): sc-62034

BACKGROUND

Carbonic anhydrases (CAs) are members of a large family of zinc metalloenzymes responsible for catalyzing the reversible hydration of carbon dioxide. CAs show extensive diversity in their distribution and subcellular localization. They are involved in a variety of biological processes, including calcification, bone resorption, respiration, acid-base balance and the formation of aqueous humor, saliva, gastric juice and cerebrospinal fluid. CA VB, also known as carbonate dehydratase VB, is one of two isoforms of CA V. It localizes to the mitochondria and is involved in metabolic processes. CA VB is predominantly expressed in heart, pancreas, lung, placenta, kidney and skeletal muscle. It exhibits highest homology with family member CA VA (the second isoform of CA V); however, unlike CA VA, it is not expressed in the liver, suggesting that it plays a significantly different physiological role.

REFERENCES

1. Fujikawa-Adachi, K., et al. 1999. Human mitochondrial carbonic anhydrase VB. cDNA cloning, mRNA expression, subcellular localization, and mapping to chromosome x. J. Biol. Chem. 274: 21228-21233.
2. Shah, G.N., et al. 2000. Mitochondrial carbonic anhydrase CA VB: differences in tissue distribution and pattern of evolution from those of CA VA suggest distinct physiological roles. Proc. Natl. Acad. Sci. USA 97: 1677-1682.
3. Nishimori, I., et al. 2001. Carbonic anhydrase isozymes in the human pancreas. Dig. Liver Dis. 33: 68-74.
4. Winum, J.Y., et al. 2006. Carbonic anhydrase inhibitors: clash with Ala65 as a means for designing inhibitors with low affinity for the ubiquitous isozyme II, exemplified by the crystal structure of the topiramate sulfamide analogue. J. Med. Chem. 49: 7024-7031.
5. Vitale, R.M., et al. 2007. Molecular modeling study for the binding of zonisamide and topiramate to the human mitochondrial carbonic anhydrase isoform VA. Bioorg. Med. Chem. 15: 4152-4158.
6. Supuran, C.T., et al. 2007. Carbonic anhydrases as targets for medicinal chemistry. Bioorg. Med. Chem. 15: 4336-4350.
7. Supuran, C.T. 2007. Carbonic anhydrases as drug targets—an overview. Curr. Top. Med. Chem. 7: 825-833.

CHROMOSOMAL LOCATION

Genetic locus: CA5B (human) mapping to Xp22.2.

PRODUCT

CA VB 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 CA VB shRNA Plasmid (h): sc-62034-SH and CA VB shRNA (h) Lentiviral Particles: sc-62034-V as alternate gene silencing products.

For independent verification of CA VB (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-62034A, sc-62034B and sc-62034C.

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

CA VB siRNA (h) is recommended for the inhibition of CA VB 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

CA VB (D-9): sc-393852 is recommended as a control antibody for monitoring of CA VB 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 CA VB gene expression knockdown using RT-PCR Primer: CA VB (h)-PR: sc-62034-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.