

CA IX siRNA (h): sc-29869

BACKGROUND

Carbonic anhydrases (CAs) are members of a large family of zinc metalloenzymes that catalyze the reversible hydration of carbon dioxide. CAs are involved in a variety of biological processes including respiration, calcification, acid-base balance and bone resorption, as well as the formation of aqueous humor, cerebrospinal fluid, saliva and gastric juice. They show extensive diversity in distribution and in their subcellular localization. The human CA2 gene, which maps to chromosome 8q21.2, encodes CA II, a cytoplasmic protein that has the highest turnover rate and widest tissue distribution of any known human CA isozyme. The human CA4 gene, which maps to chromosome 17q23.1, encodes CA IV, a membrane-anchored isozyme that is expressed on the luminal surfaces of pulmonary capillaries and proximal renal tubules. The human CA9, CA12 and CA14 genes, which map to chromosomes 9p13.3, 15q22.2 and 1q21.2, respectively, encode transmembrane proteins that have unique patterns of tissue-specific expression. CA IX is specifically expressed in clear-cell renal carcinomas, whereas CA XII is highly expressed in normal tissues, such as kidney, colon and pancreas. Human CA XIV is also expressed in normal tissues, such as brain, but differs from CA XII in its expression pattern.

CHROMOSOMAL LOCATION

Genetic locus: CA9 (human) mapping to 9p13.3.

PRODUCT

CA IX 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 CA IX shRNA Plasmid (h): sc-29869-SH and CA IX shRNA (h) Lentiviral Particles: sc-29869-V as alternate gene silencing products.

For independent verification of CA IX (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-29869A, sc-29869B and sc-29869C.

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

CA IX siRNA (h) is recommended for the inhibition of CA IX expression in human cells.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.

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

CA IX (H-11): sc-365900 is recommended as a control antibody for monitoring of CA IX 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).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor CA IX gene expression knockdown using RT-PCR Primer: CA IX (h)-PR: sc-29869-PR (20 μ l, 543 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

- Duan, Y., et al. 2010. Poly(ethylene glycol)-grafted polyethylenimine modified with G250 monoclonal antibody for tumor gene therapy. *Hum. Gene Ther.* 21: 191-198.
- Fiaschi, T., et al. 2013. Carbonic anhydrase IX from cancer-associated fibroblasts drives epithelial-mesenchymal transition in prostate carcinoma cells. *Cell Cycle* 2: 1791-1801.
- Zheng, G., et al. 2015. ZEB1 transcriptionally regulated carbonic anhydrase 9 mediates the chemoresistance of tongue cancer via maintaining intracellular pH. *Mol. Cancer* 14: 84.
- Kopecka, J., et al. 2015. Carbonic anhydrase XII is a new therapeutic target to overcome chemoresistance in cancer cells. *Oncotarget* 6: 6776-6793.
- Todenhöfer, T., et al. 2021. Evaluation of carbonic anhydrase IX as a potential therapeutic target in urothelial carcinoma. *Urol. Oncol.* 39: 498.e1-498.e11.
- Nguyen, P.L., et al. 2022. Suppression of tumor growth and cell migration by indole-based benzenesulfonamides and their synergistic effects in combination with doxorubicin. *Int. J. Mol. Sci.* 23: 9903.

RESEARCH USE

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