SANTA CRUZ BIOTECHNOLOGY, INC.

COQ2 siRNA (h): sc-62144

BACKGROUND

COQ2 is a 374 amino acid protein encoded by the mouse gene Coq2. Coenzyme Q (COQ) is an isoprenoid quinine that functions as an electron carrier in the mitochondrial respiratory chain in eukaryotes. COQ proteins having shorter isoprenoid chains, especially COQ1 and COQ2, selectively inhibit the *in vitro* activity of eukaryotic DNA polymerase (pol) γ, which is a mitochondrial pol. These compounds do not influence the activities of nuclear DNA replicative pols such as α, δ and ε, and nuclear DNA repair-related pols such as β, ι, κ and λ. COQ may also inhibit DNA topoisomerase II (Topo II) activity, although the enzymatic characteristics, including modes of action, amino acid sequences and three-dimensional structures, are markedly different from those of pol γ. These compounds do not inhibit the activities of prokaryotic pols such as *Escherichia coli* pol I, and other DNA metabolic enzymes such as HIV reverse transcriptase, T7 RNA polymerase and bovine deoxyribonuclease I. COQ1, which has the shortest isoprenoid chains, has the strongest inhibitory effect on pol γ and Topo II activities among COQ1-COQ10, with 50% inhibitory concentration (IC50) values of 12.2 and 15.5 microM, respectively. COQ1 has been shown to prevent the growth of human promyelocytic leukemia cells, HL-60.

REFERENCES

1. Forsgren, M., et al. 2004. Isolation and functional expression of human COQ2, a gene encoding a polyprenyl transferase involved in the synthesis of CoQ. Biochem. J. 382: 519-526.
2. Esaka, Y., et al. 2005. Coenzyme Q2 induced p53-dependent apoptosis. Biochim. Biophys. Acta 1724: 49-58.
3. Yonezawa, Y., et al. 2006. Inhibitory effect of coenzyme Q on eukaryotic DNA polymerase γ and DNA topoisomerase II activities on the growth of a human cancer cell line. Cancer Sci. 97: 716-723.
4. Quinzii, C., et al. 2006. A mutation in para-hydroxybenzoate-polyprenyl transferase (COQ2) causes primary coenzyme Q10 deficiency. Am. J. Hum. Genet. 78: 345-349.
5. Montero, R., et al. 2006. Muscle coenzyme Q10 concentrations in patients with probable and definite diagnosis of respiratory chain disorders. Biofactors 25: 109-115.

CHROMOSOMAL LOCATION

Genetic locus: COQ2 (human) mapping to 4q21.23.

PRODUCT

COQ2 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 COQ2 shRNA Plasmid (h): sc-62144-SH and COQ2 shRNA (h) Lentiviral Particles: sc-62144-V as alternate gene silencing products.

For independent verification of COQ2 (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-62144A, sc-62144B and sc-62144C.

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

COQ2 siRNA (h) is recommended for the inhibition of COQ2 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

COQ2 (2B4): sc-517107 is recommended as a control antibody for monitoring of COQ2 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 COQ2 gene expression knockdown using RT-PCR Primer: COQ2 (h)-PR: sc-62144-PR (20 µl, 500 bp). 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.