

ATPIF1 siRNA (h): sc-78711

BACKGROUND

Mitochondrial ATP synthases (ATPases) transduce the energy contained in membrane electrochemical proton gradients into the energy required for synthesis of high-energy phosphate bonds. ATPases contain two linked complexes: F_1 , the hydrophilic catalytic core; and F_0 , the membrane-embedded protein channel. F_1 consists of three α chains and three β chains, which are weakly homologous, as well as one γ chain, one δ chain and one ϵ chain. F_0 consists of three subunits: a, b and c. A mitochondrial F_1 -ATPase inhibitor protein, ATPIF1 (ATPase inhibitory factor 1), also known as IP, IF1, ATP1 or ATPIP (ATPase inhibitor protein), binds to the C-terminal region of a β subunit of the F_1 -ATPase at low pH values and, via interference of the β and γ subunit interaction, ATPIF1 regulates the activity of the F_1F_0 -ATPase. This reversible ATPIF1 binding to F_1F_0 -ATPase also occurs on the surface of endothelial cells.

REFERENCES

1. Ichikawa, N., et al. 1999. Nucleotide sequence of cDNA coding the mitochondrial precursor protein of the ATPase inhibitor from humans. *Biosci. Biotechnol. Biochem.* 63: 2225-2227.
2. Cabezon, E., et al. 2001. The structure of bovine IF1, the regulatory subunit of mitochondrial F-ATPase. *EMBO J.* 20: 6990-6996.
3. Contessi, S., et al. 2005. Identification of a conserved calmodulin-binding motif in the sequence of F_0F_1 ATP synthase inhibitor protein. *J. Bioenerg. Biomembr.* 37: 317-326.
4. Cortes-Hernandez, P., et al. 2005. The inhibitor protein of the F_1F_0 -ATP synthase is associated to the external surface of endothelial cells. *Biochem. Biophys. Res. Commun.* 330: 844-849.

CHROMOSOMAL LOCATION

Genetic locus: ATPIF1 (human) mapping to 1p35.3.

PRODUCT

ATPIF1 siRNA (h) is a pool of 2 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 ATPIF1 shRNA Plasmid (h): sc-78711-SH and ATPIF1 shRNA (h) Lentiviral Particles: sc-78711-V as alternate gene silencing products.

For independent verification of ATPIF1 (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-78711A and sc-78711B.

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

ATPIF1 siRNA (h) is recommended for the inhibition of ATPIF1 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 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

ATPIF1 (A-3): sc-271614 is recommended as a control antibody for monitoring of ATPIF1 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-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz MarkerTM Molecular Weight Standards: sc-2035, UltraCruz[®] Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ 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 ATPIF1 gene expression knockdown using RT-PCR Primer: ATPIF1 (h)-PR: sc-78711-PR (20 μ l, 417 bp). Annealing temperature for the primers should be 55-60 $^\circ\text{C}$ and the extension temperature should be 68-72 $^\circ\text{C}$.

SELECT PRODUCT CITATIONS

1. Wang, K., et al. 2021. ATPIF1 maintains normal mitochondrial structure which is impaired by CCM3 deficiency in endothelial cells. *Cell Biosci.* 11: 11.

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.