SANTA CRUZ BIOTECHNOLOGY, INC.

ATPIF1 siRNA (m): sc-141374

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, ATPI 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

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2. Cabezón, E., et al. 2001. The structure of bovine IF_1, 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_1F_0 ATPsynthase inhibitor protein. J. Bioenerg. Biomembr. 37: 317-326.
4. Cortés-Hernández, 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.
5. Burwick, N.R., et al. 2005. An inhibitor of the F_1 subunit of ATP synthase (IF_1) modulates the activity of angiostatin on the endothelial cell surface. J. Biol. Chem. 280: 1740-1745.
6. Gledhill, J.R. and Walker, J.E. 2006. Inhibitors of the catalytic domain of mitochondrial ATP synthase. Biochem. Soc. Trans. 34: 989-992.
7. García, J.J., et al. 2006. The inhibitor protein (IF_1) promotes dimerization of the mitochondrial F_1F_0-ATP synthase. Biochemistry 45: 12695-12703.

CHROMOSOMAL LOCATION

Genetic locus: Atpif1 (mouse) mapping to 4 D2.3.

PRODUCT

ATPIF1 siRNA (m) 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see ATPIF1 shRNA Plasmid (m): sc-141374-SH and ATPIF1 shRNA (m) Lentiviral Particles: sc-141374-V as alternate gene silencing products.

For independent verification of ATPIF1 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-141374A and sc-141374B.

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

ATPIF1 siRNA (m) is recommended for the inhibition of ATPIF1 expression in mouse 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor ATPIF1 gene expression knockdown using RT-PCR Primer: ATPIF1 (m)-PR: sc-141374-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Maher, P. 2021. Investigations into the role of metabolism in the inflammatory response of BV2 microglial cells. Antioxidants 10: E109.

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.