SANTA CRUZ BIOTECHNOLOGY, INC.

UCP1 siRNA (m): sc-42681

BACKGROUND

The uncoupling protein UCP1 (formerly designated UCP) is an integral membrane protein unique to brown adipose tissue mitochondria. UCP1 forms a dimer that acts as a proton channel, which can uncouple oxidative phosphorylation by dissipating the electrochemical potential across the inner mitochondrial membrane. This process induces heat production in brown adipose tissue and is involved in regulation of body temperature and glucose metabolism. UCP2 is a structurally related protein that also uncouples mitochondrial respiration. It is more widely expressed in human and mouse tissues, including white adipose tissue and muscle, than is UCP. UCP2 is thought to play a role in body weight regulation.

REFERENCES

1. Nicholls, D.G., et al 1984. Thermogenic mechanisms in brown fat. Physiol. Rev. 64: 1-64.
2. Jacobsson, A., et al. 1985. Mitochondrial uncoupling protein from mouse brown fat. Molecular cloning, genetic mapping, and mRNA expression. J. Biol. Chem. 260: 16250-16254.
3. Cassard, A.M., et al. 1990. Human uncoupling protein gene: structure, comparison with rat gene, and assignment to the long arm of chromosome 4. J. Cell. Biochem. 43: 255-264.
4. Himms-Hagen, J. 1990. Brown adipose tissue thermogenesis: interdisciplinary studies. FASEB J. 4: 2890-2898.
5. Fleury, C., et al. 1997. Uncoupling protein-2: a novel gene linked to obesity and hyperinsulinemia. Nat. Genet. 15: 269-272.
6. Urbankova, E., et al. 2003. Transport kinetics of uncoupling proteins. Analysis of UCP1 reconstituted in planar lipid bilayers. J. Biol. Chem. 278: 32497-32500.
7. Shabalina, I.G., et al. 2004. Native UCP1 displays simple competitive kinetics between the regulators purine nucleotides and fatty acids. J. Biol. Chem. 279: 38236-38248.
8. Rial, E., et al. 2004. Alkylsulfonates activate the uncoupling protein UCP1: implications for the transport mechanism. Biochim. Biophys. Acta 1608: 122-130.

CHROMOSOMAL LOCATION

Genetic locus: Ucp1 (mouse) mapping to 8 C2.

PRODUCT

UCP1 siRNA (m) 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 UCP1 shRNA Plasmid (m): sc-42681-SH and UCP1 shRNA (m) Lentiviral Particles: sc-42681-V as alternate gene silencing products.

For independent verification of UCP1 (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-42681A, sc-42681B and sc-42681C.

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

UCP1 siRNA (m) is recommended for the inhibition of UCP1 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.

GENE EXPRESSION MONITORING

UCP1 (A-6): sc-518024 is recommended as a control antibody for monitoring of UCP1 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 UCP1 gene expression knockdown using RT-PCR Primer: UCP1 (m)-PR: sc-42681-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. Zhang, Y., et al. 2018. TFEB-dependent induction of thermogenesis by the hepatocyte SLC2A inhibitor trehalose. Autophagy 14: 1959-1975.

RESEARCH USE

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