SANTA CRUZ BIOTECHNOLOGY, INC.

UCP2 siRNA (h): sc-42682

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 UCP1. UCP2 is thought to play a role in body weight regulation.

CHROMOSOMAL LOCATION

Genetic locus: UCP2 (human) mapping to 11q13.4.

PRODUCT

UCP2 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 UCP2 shRNA Plasmid (h): sc-42682-SH and UCP2 shRNA (h) Lentiviral Particles: sc-42682-V as alternate gene silencing products.

For independent verification of UCP2 (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-42682A, sc-42682B and sc-42682C.

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

UCP2 siRNA (h) is recommended for the inhibition of UCP2 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

UCP2 (G-6): sc-390189 is recommended as a control antibody for monitoring of UCP2 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 UCP2 gene expression knockdown using RT-PCR Primer: UCP2 (h)-PR: sc-42682-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

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2. Rodrigues, M., et al. 2012. Production of reactive oxygen species by multipotent stromal cells/mesenchymal stem cells upon exposure to fas ligand. Cell Transplant. 21: 2171-2187.
3. Qiao, C., et al. 2015. UCP2-related mitochondrial pathway participates in oroxylin A-induced apoptosis in human colon cancer cells. J. Cell. Physiol. 230: 1054-1063.
4. Pons, D.G., et al. 2015. UCP2 inhibition sensitizes breast cancer cells to therapeutic agents by increasing oxidative stress. Free Radic. Biol. Med. 86: 67-77.
5. Cho, Y.S., et al. 2016. Molecular mechanism of ^{18}F-FDG uptake reduction induced by genipin in T47D cancer cell and role of uncoupling protein-2 in cancer cell glucose metabolism. Nucl. Med. Biol. 43: 587-592.
6. Zhang, R. 2017. Ghrelin suppresses inflammation in HUVECs by inhibiting ubiquitin-mediated uncoupling protein 2 degradation. Int. J. Mol. Med. 39: 1421-1427.
7. Lee, J.H., et al. 2020. Genipin enhances the antitumor effect of elesclomol in A549 lung cancer cells by blocking uncoupling protein-2 and stimulating reactive oxygen species production. Oncol. Lett. 20: 374.
8. Zhang, M., et al. 2021. Neuroprotection of retinal cells by caffeic acid phenylethyl ester (CAPE) is mediated by mitochondrial uncoupling protein UCP2. Neurochem. Int. 151: 105214.
9. Yamaguchi, R., et al. 2022. IL-23 production in human macrophages is regulated negatively by tumor necrosis factor α-induced protein 3 and positively by specificity protein 1 after stimulation of the Toll-like receptor 7/8 signaling pathway. Heliyon 8: e08887.
10. Ren, C., et al. 2023. Molecular mechanisms of oxidative stress relief by CAPE in ARPE-19 cells. Int. J. Mol. Sci. 24: 3565.

RESEARCH USE

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