

UCP4 (D-17): sc-31390

BACKGROUND

A significant portion of the metabolic rate of endotherm is attributable to counteracting uncoupling, wherein a flux of protons down the electrochemical gradient generates heat independently of ATP production. Uncoupling is apparent in thermogenic brown adipose tissue, which expresses tissue-specific uncoupling protein (UCP), suggesting that innate uncoupling and metabolic rate are regulated by UCPS. UCPS are a family of mitochondrial transporter proteins that are implicated in thermoregulatory heat production and maintenance of the basal metabolic rate. A brain-specific novel member of UCP family, UCP4, is most related to UCP3 and possesses features characteristic of mitochondrial transporter proteins. Unlike other known UCPS, UCP4 mRNAs are expressed in both fetal and adult brain tissues. Human UCP4, a 323 amino acid protein, has been speculated on its participation in apoptosis because of its early phylogenetic occurrence. Brain UCP4 mRNA rose by 1.5 fold in response to acute cold exposure, suggesting UCP4 is involved in tissue-specific thermoregulation and metabolic changes. The UCP-specific sequences are found in the first, second and fourth α -helices and are involved in fatty acid anion binding and translocation.

REFERENCES

- Mao, W., et al. 1999. UCP4, a novel brain-specific mitochondrial protein that reduces membrane potential in mammalian cells. *FEBS Lett.* 443: 326-330.
- Adams, S.H. 2000. Uncoupling protein homologs: emerging views of physiological function. *J. Nutr.* 130: 711-714.
- Jezek, P. and Urbankova, E. 2000. Specific sequence of motifs of mitochondrial uncoupling proteins. *IUBMB Life* 49: 63-70.
- Yu, X.X., et al. 2000. Characterization of novel UCP5/BMCP1 isoforms and differential regulation of UCP4 and UCP5 expression through dietary or temperature manipulation. *FASEB J.* 14: 1611-1618.
- Hanak, P. and Jezek, P. 2001. Mitochondrial uncoupling proteins and phylogenesis-UCP4 as the ancestral uncoupling protein. *FEBS Lett.* 495: 137-141.
- Argiles, J.M., et al. 2002. The role of uncoupling proteins in pathophysiological states. *Biochem. Biophys. Res. Commun.* 293: 1145-1152.
- Mattson, M.P., et al. 2003. Mitochondrial potassium channels and uncoupling proteins in synaptic plasticity and neuronal cell death. *Biochem. Biophys. Res. Commun.* 304: 539-549.
- Sokolova, I.M., et al. 2005. Evolution of mitochondrial uncoupling proteins: novel invertebrate UCP homologues suggest early evolutionary divergence of the UCP family. *FEBS Lett.* 579: 313-317.

CHROMOSOMAL LOCATION

Genetic locus: SLC25A27 (human) mapping to 6p12.3; Slc25a27 (mouse) mapping to 17 B3.

SOURCE

UCP4 (D-17) is an affinity purified goat polyclonal antibody raised against a peptide mapping within an internal region of UCP4 of human origin.

PRODUCT

Each vial contains 200 μ g IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-31390 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

UCP4 (D-17) is recommended for detection of UCP4 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

UCP4 (D-17) is also recommended for detection of UCP4 in additional species, including equine, canine, bovine and porcine.

Suitable for use as control antibody for UCP4 siRNA (h): sc-36775, UCP4 siRNA (m): sc-36776, UCP4 shRNA Plasmid (h): sc-36775-SH, UCP4 shRNA Plasmid (m): sc-36776-SH, UCP4 shRNA (h) Lentiviral Particles: sc-36775-V and UCP4 shRNA (m) Lentiviral Particles: sc-36776-V.

Molecular Weight of UCP4: 36 kDa.

Positive Controls: rat brain extract: sc-2392, BC₃H1 cell lysate: sc-2299 or SK-N-SH cell lysate: sc-2410.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

STORAGE

Store at 4° C, ****DO NOT FREEZE****. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

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



Try **UCP4 (A-5): sc-365295**, our highly recommended monoclonal alternative to UCP4 (D-17).