

UCP4 (A-5): sc-365295



The Power to Question

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.

CHROMOSOMAL LOCATION

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

SOURCE

UCP4 (A-5) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 17-37 at the N-terminus of UCP4 of human origin.

PRODUCT

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

Blocking peptide available for competition studies, sc-365295 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

UCP4 (A-5) 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), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

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.

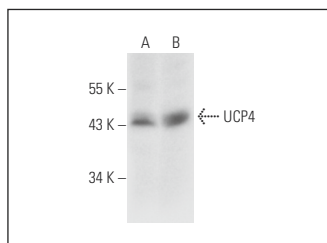
Molecular Weight of UCP4: 36 kDa.

Positive Controls: U-87 MG cell lysate: sc-2411, SK-N-SH cell lysate: sc-2410 or IMR-32 cell lysate: sc-2409.

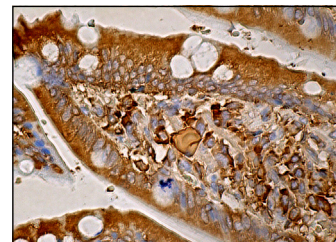
RECOMMENDED SUPPORT REAGENTS

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 Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein L-Agarose: sc-2336 (0.5 ml agarose/2.0 ml). 3) 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. 4) Immunohistochemistry: use m-IgG κ BP-HRP: sc-516102 with DAB, 50X: sc-24982 and Immunohisto-mount: sc-45086, or Organo/Limonene Mount: sc-45087.

DATA



UCP4 (A-5): sc-365295. Western blot analysis of UCP4 expression in SK-N-SH (A) and U-87 MG (B) whole cell lysates.



UCP4 (A-5): sc-365295. Immunoperoxidase staining of formalin fixed, paraffin-embedded human small intestine tissue showing cytoplasmic staining of glandular cells.

SELECT PRODUCT CITATIONS

- Mendez-Romero, O., et al. 2019. Mitochondrial uncoupling proteins UCP4 and UCP5 from the Pacific white shrimp *Litopenaeus vannamei*. J. Bioenerg. Biomembr. 51: 103-119.
- Mendez-Romero, O., et al. 2020. Functional characterization of the mitochondrial uncoupling proteins from the white shrimp *Litopenaeus vannamei*. Biochim. Biophys. Acta Bioenerg. 1861: 148209.
- Zhang, J., et al. 2023. MFN2 deficiency affects calcium homeostasis in lung adenocarcinoma cells via downregulation of UCP4. FEBS Open Bio. 13: 1107-1124.
- Bai, Y., et al. 2023. Effects of oxidative stress on hepatic encephalopathy pathogenesis in mice. Nat. Commun. 14: 4456.
- Wang, Y.Y., et al. 2024. Ucp4 knockdown of cerebellar Purkinje cells induces Bradykinesia. Mol. Neurobiol. 61: 1119-1139.

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.