SANTA CRUZ BIOTECHNOLOGY, INC.

AMPKα1 (D-19): sc-19126

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

AMPK (for 5'-AMP-activated protein kinase) is a heterotrimeric complex comprising a catalytic α subunit and regulatory β and γ subunits. It protects cells from stresses that cause ATP depletion by switching off ATP-consuming biosynthetic pathways. AMPK is activated by high AMP and low ATP through a mechanism involving allosteric regulation, promotion of phosphorylation by an upstream protein kinase known as AMPK kinase, and inhibition of dephosphorylation. Activated AMPK can phosphorylate and regulate *in vivo* hydroxymethylglutaryl-CoA reductase and acetyl-CoA carboxylase, which are key regulatory enzymes of sterol synthesis and fatty acid synthesis, respectively. The human AMPKα1 and AMPKα2 genes encode 548 amino acid and 552 amino acid proteins, respectively. Human AMPKβ1 encodes a 271 amino acid protein and human AMPKβ2 encodes a 272 amino acid protein. The human AMPKγ1 gene encodes a 331 amino acid protein. Human AMPKγ2 and AMPKγ3, which are 569 and 492 amino acid proteins, respectively, contain unique N-terminal domains and may participate directly in the binding of AMP within the AMPK complex.

REFERENCES

1. Stapleton, D., et al. 1996. Mammalian AMP-activated protein kinase subfamily. J. Biol. Chem. 271: 611-614.
2. Stapleton, D., et al. 1997. AMP-activated protein kinase isoenzyme family: subunit structure and chromosomal location. FEBS Lett. 409: 452-456.
3. Hardie, D.G., et al. 1997. The AMP-activated protein kinase-fuel gauge of the mammalian cell? Eur. J. Biochem. 246: 259-273.
4. Thornton, C., et al. 1998. Identification of a novel AMP-activated protein kinase β subunit isoform that is highly expressed in skeletal muscle. J. Biol. Chem. 273: 12443-12450.
5. Online Mendelian Inheritance in Man, OMIM™. 1998. Johns Hopkins University, Baltimore, MD. MIM Number: 602739. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
6. Cheung, P.C., et al. 2000. Characterization of AMP-activated protein kinase γ subunit isoforms and their role in AMP binding. Biochem. J. 346: 659-669.

CHROMOSOMAL LOCATION

Genetic locus: PRKAA1 (human) mapping to 5p13.1; Prkaa1 (mouse) mapping to 15 A1.

SOURCE

AMPKα1 (D-19) is an affinity purified goat polyclonal antibody raised against a peptide mapping within an internal region of AMPKα1 of human origin.

PRODUCT

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

Blocking peptide available for competition studies, sc-19126 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

AMPKα1 (D-19) is recommended for detection of AMPKα1 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).

AMPKα1 (D-19) is also recommended for detection of AMPKα1 in additional species, including equine, canine, bovine, porcine and avian.

Suitable for use as control antibody for AMPKα1 siRNA (h): sc-29673, AMPKα1 siRNA (m): sc-29674, AMPKα1 shRNA Plasmid (h): sc-29673-SH, AMPKα1 shRNA Plasmid (m): sc-29674-SH, AMPKα1 shRNA (h) Lentiviral Particles: sc-29673-V and AMPKα1 shRNA (m) Lentiviral Particles: sc-29674-V.

Molecular Weight of AMPKα1: 63 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204.

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.

SELECT PRODUCT CITATIONS

1. Molinuevo, M.S., et al. 2009. Effect of Metformin on bone marrow progenitor cell differentiation: *in vivo* and *in vitro* studies. J. Bone Miner. Res. 25: 211-221.
2. Nagel, J.M., et al. 2011. Dietary walnuts inhibit colorectal cancer growth in mice by suppressing angiogenesis. Nutrition 28: 67-75..

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.

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.