

# AMPK $\alpha$ 1 (71.54): sc-130394

## BACKGROUND

AMPK (for 5'-AMP-activated protein kinase) is a heterotrimeric complex comprising a catalytic  $\alpha$  subunit and regulatory  $\beta$  and  $\gamma$  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* hydroxy-methylglutaryl-CoA reductase and acetyl-CoA carboxylase, which are key regulatory enzymes of sterol synthesis and fatty acid synthesis, respectively. The human AMPK $\alpha$ 1 and AMPK $\alpha$ 2 genes encode 548 amino acid and 552 amino acid proteins, respectively. Human AMPK $\beta$ 1 encodes a 271 amino acid protein and human AMPK $\beta$ 2 encodes a 272 amino acid protein. The human AMPK $\gamma$ 1 gene encodes a 331 amino acid protein. Human AMPK $\gamma$ 2 and AMPK $\gamma$ 3, 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.

## CHROMOSOMAL LOCATION

Genetic locus: PRKAA1 (human) mapping to 5p13.1.

## SOURCE

AMPK $\alpha$ 1 (71.54) is a mouse monoclonal antibody raised against recombinant AMPK $\alpha$ 1 of human origin.

## PRODUCT

Each vial contains 100  $\mu$ g IgG<sub>2a</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

AMPK $\alpha$ 1 (71.54) is recommended for detection of AMPK $\alpha$ 1 of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)] and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for AMPK $\alpha$ 1 siRNA (h): sc-29673, AMPK $\alpha$ 1 shRNA Plasmid (h): sc-29673-SH and AMPK $\alpha$ 1 shRNA (h) Lentiviral Particles: sc-29673-V.

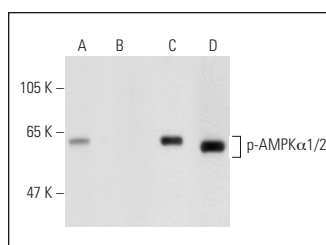
Molecular Weight of AMPK $\alpha$ 1: 63 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, Hep G2 cell lysate: sc-2227 or MCF7 whole cell lysate: sc-2206.

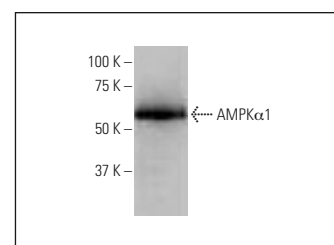
## RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG $\kappa$  BP-HRP: sc-516102 or m-IgG $\kappa$  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 A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

## DATA



Western blot analysis of AMPK $\alpha$ 1 phosphorylation in untreated (**A,C**) and lambda protein phosphatase treated (**B,D**) C2C12 whole cell lysates. Antibodies tested include p-AMPK $\alpha$ 1/2 (Thr 183/172): sc-101630 (**A,B**) and AMPK $\alpha$ 1 (71.54): sc-130394 (**C,D**).



AMPK $\alpha$ 1 (71.54): sc-130394. Western blot analysis of AMPK $\alpha$ 1 expression in Hep G2 whole cell lysate.

## SELECT PRODUCT CITATIONS

1. Wang, K., et al. 2015. Liraglutide activates AMPK signaling and partially restores normal circadian rhythm and Insulin secretion in pancreatic islets in diabetic mice. *Biol. Pharm. Bull.* 38: 1142-1149.
2. Wang, Q., et al. 2017. Deletion of PRKAA triggers mitochondrial fission by inhibiting the autophagy-dependent degradation of DNMI1. *Autophagy* 13: 404-422.
3. Lee, H.Y., et al. 2018. Ca<sup>2+</sup>-dependent demethylation of phosphatase PP2Ac promotes glucose deprivation-induced cell death independently of inhibiting glycolysis. *Sci. Signal.* 11: eaam7893.
4. Liu, B.L., et al. 2018. Effect of the Shensong Yangxin capsule on energy metabolism in Angiotensin II-induced cardiac hypertrophy. *Chin. Med. J.* 131: 2287-2296.
5. Gangwar, A., et al. 2020. Intermittent hypoxia modulates redox homeostasis, lipid metabolism associated inflammatory processes and redox post-translational modifications: benefits at high altitude. *Sci. Rep.* 10: 7899.
6. Alshuniaber, M.A., et al. 2022. Camel milk protein hydrosylate alleviates hepatic steatosis and hypertension in high fructose-fed rats. *Pharm. Biol.* 60: 1137-1147.

## 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.