SANTA CRUZ BIOTECHNOLOGY, INC.

p-AMPKα1/2 (Thr 183/172): sc-101630

SANTA CRUZ BIOTECHNOLOGY
The Power to Question

BACKGROUND

5'-AMP-activated protein kinase, known as AMPK, is a heterotrimeric complex that comprises of a catalytic α subunit, and regulatory β and γ. AMPK protects cells from stresses that cause ATP depletion by switching off ATP-consuming biosynthetic pathways. AMPK is activated by high AMP and low ATP via a mechanism involving allosteric regulation, promotion of phosphorylation by an upstream protein kinase known as AMPK kinase (AMPKK), 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 major regulatory site phosphorylated by AMPKK on AMPKα has been identified as Thr 172 within the activation loop between the DFG and APE motifs of the α subunits.

REFERENCES

1. Stapleton, D., et al. 1996. Mammalian AMP-activated protein kinase subfamily. J. Biol. Chem. 271: 611-614.
2. Hawley, S.A., et al. 1996. Characterization of the AMP-activated protein kinase kinase from rat liver and identification of Threonine 172 as the major site at which it phosphorylates AMP-activated protein kinase. J. Biol. Chem. 271: 27879-27887.

CHROMOSOMAL LOCATION

Genetic locus: PRKAA1 (human) mapping to 5p13.1, PRKAA2 (human) mapping to 1p32.2; Prkaa1 (mouse) mapping to 15 A1, Prkaa2 (mouse) mapping to 4 C6.

SOURCE

p-AMPKα1/2 (Thr 183/172) is a rabbit polyclonal antibody raised against a short amino acid sequence containing Thr 172 phosphorylated AMPKα1 of human origin.

PRODUCT

Each vial contains 100 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

p-AMPKα1/2 (Thr 183/172) is recommended for detection of Thr 183 phosphorylated AMPK α1 and Thr 172 phosphorylated AMPK α2 isoforms of the catalytic subunit of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500).

Positive Controls: Hep G2 cell lysate: sc-2227 or lambda protein phosphatase treated C2C12 whole cell lysate.

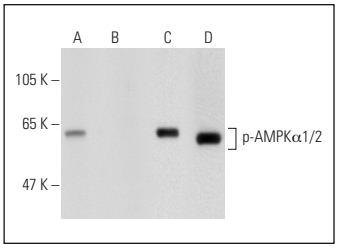
STORAGE

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

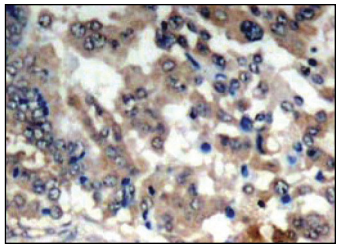
RESEARCH USE

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

DATA



Western blot analysis of AMPKα1 phosphorylation in untreated (**A,C**) and lambda protein phosphatase treated (**B,D**) C2C12 whole cell lysates. Antibodies tested include p-AMPKα1/2 (Thr 183/172): sc-101630 (**A,B**) and AMPKα1 (71.54): sc-130394 (**C,D**).



p-AMPKα1/2 (Thr 183/172): sc-101630. Immunoperoxidase staining of formalin-fixed, paraffin-embedded human lung carcinoma tissue showing cytoplasmic localization.

SELECT PRODUCT CITATIONS

1. Vazquez-Martin, A., et al. 2009. Mitotic kinase dynamics of the active form of AMPK (phospho-AMPKαThr172) in human cancer cells. Cell Cycle 8: 788-791.
2. Vazquez-Martin, A., et al. 2009. The active form of the metabolic sensor: AMP-activated protein kinase (AMPK) directly binds the mitotic apparatus and travels from centrosomes to the spindle midzone during mitosis and cytokinesis. Cell Cycle 8: 2385-2398.
3. Chanda, D., et al. 2009. Hepatocyte growth factor family negatively regulates hepatic gluconeogenesis via induction of orphan nuclear receptor small heterodimer partner in primary hepatocytes. J. Biol. Chem. 284: 28510-28521.
4. Vazquez-Martin, A., et al. 2012. Polo-like kinase 1 directs the AMPK-mediated activation of myosin regulatory light chain at the cytokinetic cleavage furrow independently of energy balance. Cell Cycle 11: 2422-2426.
5. Tang, Q., et al. 2013. Resveratrol-induced apoptosis is enhanced by inhibition of autophagy in esophageal squamous cell carcinoma. Cancer Lett. 336: 325-337.
6. Liao, K.C., et al. 2013. Activation of the NIrp1b inflammasome by reduction of cytosolic ATP. Infect. Immun. 81: 570-579.
7. Corina, H., et al. 2013. Profiling of the kinome of cytomegalovirus-infected cells reveals the functional importance of host kinases Aurora A, ABL and AMPK. Antiviral Res. 99: 139-148.
8. Karpe, P.A. and Tikoo, K. 2014. Heat shock prevents Insulin resistance-induced vascular complications by augmenting angiotensin-(1-7) signaling. Diabetes 63: 1124-1139.
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10. Baldelli, S., et al. 2014. PGC-1α buffers ROS-mediated removal of mitochondria during myogenesis. Cell Death Dis. 5: e1515.