abcam

Product datasheet

Anti-AMPK alpha 2 antibody ab3760

6 Abreviews 18 References 5 Images

Overview

Product name	Anti-AMPK alpha 2 antibody
Description	Rabbit polyclonal to AMPK alpha 2
Host species	Rabbit
Specificity	Does not cross-react with AMPK alpha 1.
Tested applications	**Suitable for:** ICC/IF, WB, IP, IHC-P
Species reactivity	**Reacts with:** Mouse, Rat, Cow, Human **Predicted to work with:** Rabbit, Guinea pig, Pig, Chimpanzee, Rhesus monkey, Gorilla, Chinese hamster, Orangutan, Elephant
Immunogen	Synthetic peptide (Human) - which represented a portion of AMP activated protein kinase, alpha-2 catalytic subunit encoded within exon 7.
Positive control	HepG2 whole cell lysate (ab7900) can be used as a positive control in WB.

Properties

Form	Liquid
Storage instructions	Shipped at 4°C. Upon delivery aliquot and store at -20°C. Avoid freeze / thaw cycles.
Storage buffer	Preservative: 0.1% Sodium azide Constituents: 0.021% PBS, 1.764% Sodium citrate, 1.815% Tris
Purity	Immunogen affinity purified
Clonality	Polyclonal
Isotype	IgG

Applications

Our Abpromise guarantee covers the use of **ab3760** in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

Application	Abreviews	Notes
ICC/IF		Use a concentration of 1 µg/ml.

Application	Abreviews	Notes
WB	★★★★★	1/500 - 1/5000. Predicted molecular weight: 63 kDa.
IP		Use a concentration of 2 - 8 µg/ml.
IHC-P	★★★★★	Use at an assay dependent concentration.

Target

Function

Catalytic subunit of AMP-activated protein kinase (AMPK), an energy sensor protein kinase that plays a key role in regulating cellular energy metabolism. In response to reduction of intracellular ATP levels, AMPK activates energy-producing pathways and inhibits energy-consuming processes: inhibits protein, carbohydrate and lipid biosynthesis, as well as cell growth and proliferation. AMPK acts via direct phosphorylation of metabolic enzymes, and by longer-term effects via phosphorylation of transcription regulators. Also acts as a regulator of cellular polarity by remodeling the actin cytoskeleton; probably by indirectly activating myosin. Regulates lipid synthesis by phosphorylating and inactivating lipid metabolic enzymes such as ACACA, ACACB, GYS1, HMGCR and LIPE; regulates fatty acid and cholesterol synthesis by phosphorylating acetyl-CoA carboxylase (ACACA and ACACB) and hormone-sensitive lipase (LIPE) enzymes, respectively. Regulates insulin-signaling and glycolysis by phosphorylating IRS1, PFKFB2 and PFKFB3. Involved in insulin receptor/INSR internalization (PubMed:25687571). AMPK stimulates glucose uptake in muscle by increasing the translocation of the glucose transporter SLC2A4/GLUT4 to the plasma membrane, possibly by mediating phosphorylation of TBC1D4/AS160. Regulates transcription and chromatin structure by phosphorylating transcription regulators involved in energy metabolism such as CRTC2/TORC2, FOXO3, histone H2B, HDAC5, MEF2C, MLXIPL/ChREBP, EP300, HNF4A, p53/TP53, SREBF1, SREBF2 and PPARGC1A. Acts as a key regulator of glucose homeostasis in liver by phosphorylating CRTC2/TORC2, leading to CRTC2/TORC2 sequestration in the cytoplasm. In response to stress, phosphorylates 'Ser-36' of histone H2B (H2BS36ph), leading to promote transcription. Acts as a key regulator of cell growth and proliferation by phosphorylating TSC2, RPTOR and ATG1/ULK1: in response to nutrient limitation, negatively regulates the mTORC1 complex by phosphorylating RPTOR component of the mTORC1 complex and by phosphorylating and activating TSC2. In response to nutrient limitation, promotes autophagy by phosphorylating and activating ATG1/ULK1. AMPK also acts as a regulator of circadian rhythm by mediating phosphorylation of CRY1, leading to destabilize it. May regulate the Wnt signaling pathway by phosphorylating CTNNB1, leading to stabilize it. Also phosphorylates CFTR, EEF2K, KLC1, NOS3 and SLC12A1. Plays an important role in the differential regulation of pro-autophagy (composed of PIK3C3, BECN1, PIK3R4 and UVRAG or ATG14) and non-autophagy (composed of PIK3C3, BECN1 and PIK3R4) complexes, in response to glucose starvation. Can inhibit the non-autophagy complex by phosphorylating PIK3C3 and can activate the pro-autophagy complex by phosphorylating BECN1.

Sequence similarities

Belongs to the protein kinase superfamily. CAMK Ser/Thr protein kinase family. SNF1 subfamily. Contains 1 protein kinase domain.

Domain

The AIS (autoinhibitory sequence) region shows some sequence similarity with the ubiquitin-associated domains and represses kinase activity.

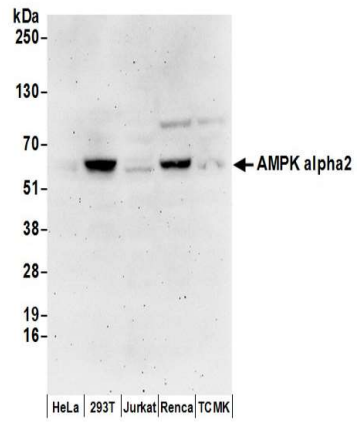
Post-translational modifications

Ubiquitinated.
Phosphorylated at Thr-172 by STK11/LKB1 in complex with STE20-related adapter-alpha

(STRADA) pseudo kinase and CAB39. Also phosphorylated at Thr-172 by CAMKK2; triggered by a rise in intracellular calcium ions, without detectable changes in the AMP/ATP ratio. CAMKK1 can also phosphorylate Thr-172, but at much lower level. Dephosphorylated by protein phosphatase 2A and 2C (PP2A and PP2C). Phosphorylated by ULK1; leading to negatively regulate AMPK activity and suggesting the existence of a regulatory feedback loop between ULK1 and AMPK. Dephosphorylated by PPM1A and PPM1B at Thr-172 (mediated by STK11/LKB1).

Cellular localization Cytoplasm. Nucleus. In response to stress, recruited by p53/TP53 to specific promoters.

Images



Western blot - Anti-AMPK alpha 2 antibody (ab3760)

All lanes : Anti-AMPK alpha 2 antibody (ab3760) at 0.4 µg/ml

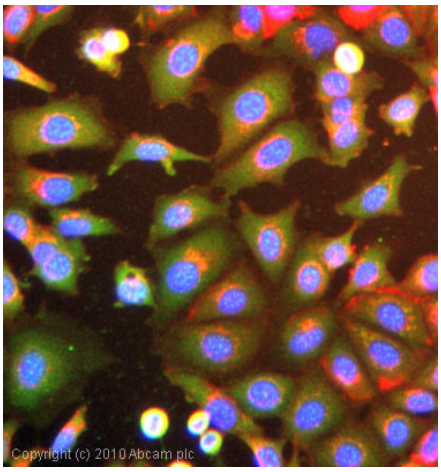
Lane 1 : HeLa whole cell lysate
Lane 2 : 293T whole cell lysate
Lane 3 : Jurkat whole cell lysate
Lane 4 : Mouse Renca whole cell lysate
Lane 5 : TCMK whole cell lysate

Lysates/proteins at 50 µg per lane.

Predicted band size: 63 kDa

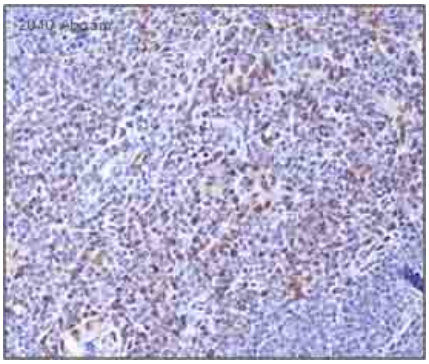
Exposure time: 3 minutes

Chemiluminescence detection.



Immunocytochemistry/ Immunofluorescence - Anti-AMPK alpha 2 antibody (ab3760)

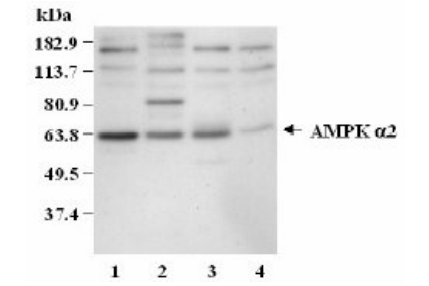
ICC/IF image of ab3760 stained MCF7 cells. The cells were 100% methanol fixed (5 min) and then incubated in 1%BSA / 10% normal goat serum / 0.3M glycine in 0.1% PBS-Tween for 1h to permeabilise the cells and block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab3760, 1µg/ml) overnight at +4°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-rabbit IgG (H+L) used at a 1/1000 dilution for 1h. Alexa Fluor® 594 WGA was used to label plasma membranes (red) at a 1/200 dilution for 1h. DAPI was used to stain the cell nuclei (blue) at a concentration of 1.43µM.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-AMPK alpha 2 antibody (ab3760)

Image courtesy of an anonymous Abreview.

ab3760 staining AMPK alpha 2 in murine thymus tissue by Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections). Tissue was fixed with formaldehyde and a heat mediated antigen retrieval step was performed using citrate buffer. Samples were then blocked with 2% BSA for 1 hour at 25°C followed by incubation with the primary antibody at a 1/100 dilution for 18 hours at 4°C. An HRP-conjugated anti-rabbit was used as secondary antibody at a 1/50 dilution. ab3760 presents in both the nuclear and the cytoplasm in mouse thymus.



Western blot - Anti-AMPK alpha 2 antibody (ab3760)

Samples: Extracts from

1. Bovine aortic endothelial cells

2. Rat aortic smooth muscle cells

3. HepG2 cells

4. Human aortic endothelial cells

Antibody: Affinity purified Rabbit anti-AMPK alpha 2 (ab3760) used at 2ug/ml (1/500).

Samples: Extracts from

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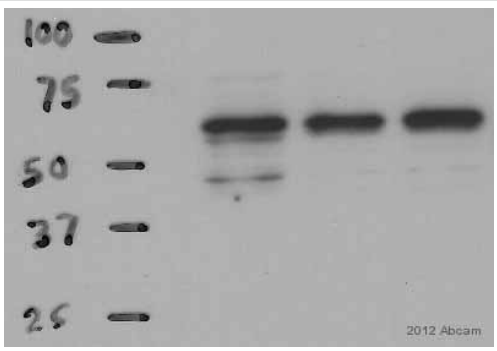

Western blot - Anti-AMPK alpha 2 antibody (ab3760)

Image courtesy of an anonymous Abreview.

All lanes : Anti-AMPK alpha 2 antibody (ab3760) at 1/1000 dilution

Lane 1 : Murine hepatocytes cultured in Williams Medium E for 9 hours

Lane 2 : Murine hepatocytes cultured in Williams Medium E for 57 hours

Lane 3 : Murine hepatocytes cultured in Williams Medium E for 57 hours with 0.1% DMSO

Lysates/proteins at 24 µg per lane.

Secondary

All lanes : HRp conjugated goat anti-rabbit IgG polyclonal at 1/5000 dilution

Developed using the ECL technique.

Predicted band size: 63 kDa
Observed band size: 63 kDa

Exposure time: 30 minutes

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