abcam

ab110036

Anti-AMPK alpha 1 antibody [2B7]

Lab Essentials | KO Validated

Key facts

Isotype	IgG1
Host species	Mouse
Storage buffer	Preservative: 0.05% Sodium azide Constituents: PBS
Form	Liquid
Clonality	Monoclonal
Immunogen	Recombinant Fragment Protein within Human PRKAA1. The exact immunogen used to generate this antibody is proprietary information. Database link Q13131
Clone number	2B7
Purification technique	Affinity purification Protein G
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →
Purification notes	Purified from tissue culture supernatant.

Reactivity data

Flow Cyt

Tested

Species	Rat
Dilution info	1/200 - 1/1000

Notes	ab170190 - Mouse monoclonal IgG1, is suitable for use as an isotype control with this antibody.

Expected

Species	Human, Mouse, African green monkey
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

ELISA

Tested

Species	Recombinant fragment
Dilution info	1/10000
Notes	-

Expected

Species	Rat, Human, Mouse, African green monkey
Dilution info	Use at an assay dependent concentration.
Notes	-

WB

Tested

Species	Human
Dilution info	1/500 - 1/2000
Notes	-

Species	Mouse
Dilution info	1/500 - 1/2000
Notes	-

Species	African green monkey
Dilution info	1/500 - 1/2000
Notes	-

Expected

Species	Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

IHC-P

Tested

Species	Human
Dilution info	1/200 - 1/1000
Notes	-

Expected

Species	Rat, Mouse, African green monkey
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/200 - 1/1000
Notes	-

Expected

Species	Rat, Mouse, African green monkey
Dilution info	Use at an assay dependent concentration.
Notes	-

Not recommended

Species	Recombinant fragment
Dilution info	-
Notes	-

Target data

See full target information PRKAA1

Function

Catalytic subunit of AMP-activated protein kinase (AMPK), an energy sensor protein kinase that plays a key role in regulating cellular energy metabolism (PubMed:17307971, PubMed:17712357, PubMed:24563466, PubMed:31492851, PubMed:37821951, PubMed:40233740). 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 (PubMed:17307971, PubMed:17712357). AMPK acts via direct phosphorylation of metabolic enzymes, and by longer-term effects via phosphorylation of transcription regulators (PubMed:17307971, PubMed:17712357). 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 (By similarity). Promotes lipolysis of lipid droplets by mediating phosphorylation of isoform 1 of CHKA (CHKalpha2) (PubMed:34077757). Regulates insulin-signaling and glycolysis by phosphorylating IRS1, PFKFB2 and PFKFB3 (By similarity). 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 (By similarity). 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 (PubMed:11518699, PubMed:11554766, PubMed:15866171, PubMed:17711846, PubMed:18184930). Acts as a key regulator of glucose homeostasis in liver by phosphorylating CRTC2/TORC2, leading to CRTC2/TORC2 sequestration in the cytoplasm (By similarity). In response to stress, phosphorylates 'Ser-36' of histone H2B (H2BS36ph), leading to promote transcription (By similarity). Acts as a key regulator of cell growth and proliferation by phosphorylating FNIP1, TSC2, RPTOR, WDR24 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 (PubMed:14651849, PubMed:18439900, PubMed:20160076, PubMed:21205641). Also phosphorylates and inhibits GATOR2 subunit WDR24 in response to nutrient limitation, leading to suppress glucose-mediated mTORC1 activation (PubMed:36732624). In response to energetic stress, phosphorylates FNIP1, inactivating the non-canonical mTORC1 signaling, thereby promoting nuclear translocation of TFEB and TFE3, and inducing transcription of lysosomal or autophagy genes (PubMed:37079666). In response to nutrient limitation, promotes autophagy by phosphorylating and activating ATG1/ULK1 (PubMed:21205641). In that process, it also activates WDR45/WIPI4 (PubMed:28561066). Phosphorylates CASP6, thereby preventing its autoprocessing and subsequent activation (PubMed:32029622). In response to nutrient limitation, phosphorylates transcription factor FOXO3 promoting FOXO3 mitochondrial import (By similarity). Also acts as a regulator of cellular polarity by remodeling the actin cytoskeleton; probably by indirectly activating myosin (PubMed:17486097). AMPK also acts as a regulator of circadian rhythm by mediating phosphorylation of CRY1, leading to destabilize it (By similarity). May regulate the Wnt signaling pathway by phosphorylating CTNNB1, leading to stabilize it (By similarity). Also has tau-protein kinase activity: in response to amyloid beta A4 protein (APP) exposure, activated by CAMKK2, leading to phosphorylation of MAPT/TAU; however the relevance of such data remains unclear in vivo (By similarity). Also phosphorylates CFTR, EEF2K, KLC1, NOS3 and SLC12A1 (PubMed:12519745, PubMed:20074060). Regulates hepatic lipogenesis. Activated via SIRT3, represses sterol regulatory element-binding protein (SREBP) transcriptional activities and ATP-consuming lipogenesis to restore cellular energy balance. Upon stress, regulates mitochondrial fragmentation through phosphorylation of MTFR1L (PubMed:36367943). Phosphorylates ALDH7A1 in response to cellular stress, such as hypoxia or ferroptotic stress, promoting ALDH7A1 recruitment to membranes (PubMed:31492851, PubMed:40233740).

Storage

Shipped at conditions Blue Ice

Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

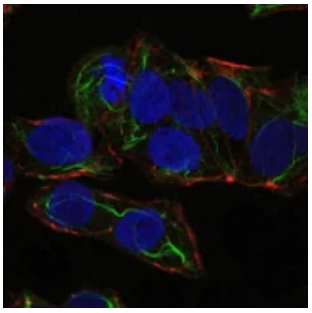
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

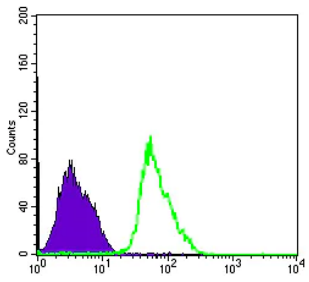
7 product images



Immunocytochemistry/ Immunofluorescence - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

AMPK alpha 1 Immunocytochemistry/ Immunofluorescence staining using mouse Anti-AMPK alpha 1 antibody

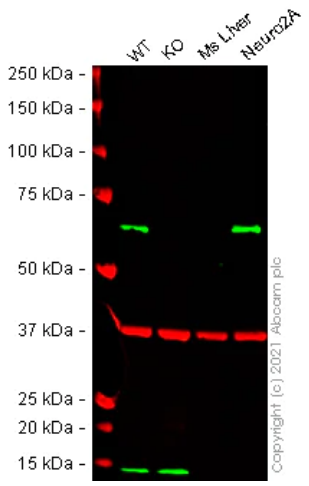
ab110036 at 1/200 dilution staining AMPK alpha 1 in NTERA-2 cells (green) by Immunofluorescence. The nuclei are stained with DRAQ5 fluorescent DNA dye (blue) and the Actin filaments have been labeled with Alexa Fluor-555 phalloidin (red).



Flow Cytometry - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

AMPK alpha 1 Flow Cytometry staining using mouse Anti-AMPK alpha 1 antibody

ab110036 used in Flow cytometric analysis of PC-2 cells (green). The negative control is indicated in purple.



Western blot - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

AMPK alpha 1 Western blot staining using mouse Anti-AMPK alpha 1 antibody

False colour image of Western blot: Anti-AMPK alpha 1 antibody [2B7] staining at 1/500 dilution, shown in green; Rabbit Anti-GAPDH antibody [EPR16891] (ab181602) loading control staining at 1/20000 dilution, shown in red. In Western blot, ab110036 was shown to bind specifically to AMPK alpha 1. A band was observed at 64 kDa in wild-type RAW 264.7 cell lysates with no signal observed at this size in PRKAA1 knockout cell line ab280055 (knockout cell lysate ab280114). To generate this image, wild-type and PRKAA1 knockout RAW 264.7 cell lysates were analysed. First, samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3 % milk in TBS-0.1 % Tween® 20 (TBS-T) before incubation with primary antibodies overnight at 4°C. Blots were washed four times in TBS-T, incubated with secondary antibodies for 1 h at room temperature, washed again four times then imaged.Secondary antibodies used were Goat anti-Mouse IgG H&L (IRDye® 800CW) preabsorbed (ab216772) and Goat anti-Rabbit IgG H&L (IRDye® 680RD) preabsorbed (ab216777) at 1/20000 dilution.
All lanes:
Western blot - Anti-AMPK alpha 1 antibody [2B7] (ab110036) at 1/500 dilution

Lane 1:
Wild-type RAW 264.7 cell lysate at 20 µg

Lane 2:
PRKAA1 knockout RAW 264.7 cell lysate at 20 µg

Lane 2:
Western blot - Mouse PRKAA1 knockout RAW 264.7 cell line (ab280055)

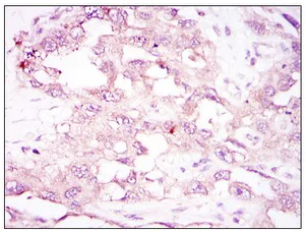
Lane 3:
Mouse Liver cell lysate at 20 µg

Lane 4:
Neuro2A cell lysate at 20 µg

Performed under reducing conditions.

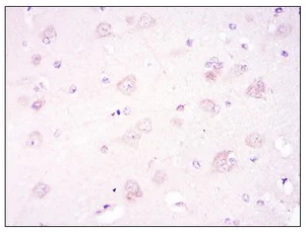
Predicted band size: 64 kDa

Observed band size: 64 kDa



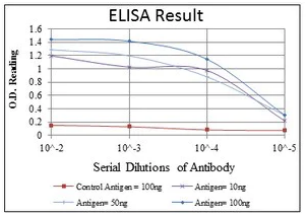
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

ab110036 at 1/200 dilution staining AMPK alpha 1 in paraffin-embedded ovarian cancer by Immunohistochemistry.



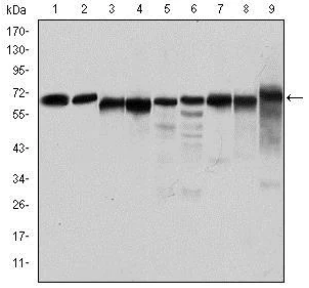
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

ab110036 at 1/200 dilution staining AMPK alpha 1 in paraffin-embedded brain tissues by Immunohistochemistry.



ELISA - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

The proposed dilution of ab110036 is 1/10000.



Western blot - Anti-AMPK alpha 1 antibody [2B7] (ab110036)

All lanes:
Western blot - Anti-AMPK alpha 1 antibody [2B7] (ab110036) at 1/500 dilution

Lane 1:
Jurkat cell lysate.

Lane 2:
HeLa cell lysate.

Lane 3:
HepG2 cell lysate.

Lane 4:
MCF-7 cell lysate.

Lane 5:
Cos7 cell lysate.

Lane 6:
NIH3T3 cell lysate.

Lane 7:
K562 cell lysate.

Lane 8:
HEK293 cell lysate.

Lane 9:
PC-12 cell lysate.

Predicted band size: 64 kDa

Observed band size: 64 kDa

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.