abcam

ab314110

Anti-AKT1 antibody [BLR245L]

Lab Essentials | Recombinant | RabMAb | KO Validated

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	pH: 7.8 - 8.6 Preservative: 0.09% Sodium azide Constituents: 98% Borate buffered saline, 0.1% BSA
Form	Liquid
Clonality	Monoclonal
Immunogen	Synthetic Peptide within Human AKT1 aa 100-150. The exact immunogen used to generate this antibody is proprietary information. Database link P31749
Clone number	BLR245L
Concentration	1 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

Flow Cyt

Tested

Species	Mouse, Human
Dilution info	-
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000
Notes	-

Species	Mouse
Dilution info	-
Notes	-

Target data

See full target information AKT1

Function

AKT1 is one of 3 closely related serine/threonine-protein kinases (AKT1, AKT2 and AKT3) called the AKT kinase, and which regulate many processes including metabolism, proliferation, cell survival, growth and angiogenesis (PubMed:11882383, PubMed:15526160, PubMed:15861136, PubMed:21432781, PubMed:21620960, PubMed:31204173). This is mediated through serine and/or threonine phosphorylation of a range of downstream substrates (PubMed:11882383, PubMed:15526160, PubMed:21432781, PubMed:21620960, PubMed:29343641, PubMed:31204173). Over 100 substrate candidates have been reported so far, but for most of them, no isoform specificity has been reported (PubMed:11882383, PubMed:15526160, PubMed:21432781, PubMed:21620960). AKT is responsible of the regulation of glucose uptake by mediating insulin-induced translocation of the SLC2A4/GLUT4 glucose transporter to the cell surface (By similarity). Phosphorylation of PTPN1 at 'Ser-50' negatively modulates its phosphatase activity preventing dephosphorylation of the insulin receptor and the attenuation of insulin signaling (By similarity). Phosphorylation of TBC1D4 triggers the binding of this effector to inhibitory 14-3-3 proteins, which is required for insulin-stimulated glucose transport (PubMed:11994271). AKT also regulates the storage of glucose in the form of glycogen by phosphorylating GSK3A at 'Ser-21' and GSK3B at 'Ser-9', resulting in inhibition of its kinase activity (By similarity). Phosphorylation of GSK3 isoforms by AKT is also thought to be one mechanism by which cell proliferation is driven (By similarity). AKT also regulates cell survival via the phosphorylation of MAP3K5 (apoptosis signal-related kinase) (PubMed:11154276). Phosphorylation of 'Ser-83' decreases MAP3K5 kinase activity stimulated by oxidative stress and thereby prevents apoptosis (PubMed:11154276). AKT mediates insulin-stimulated protein synthesis by phosphorylating TSC2 at 'Ser-939' and 'Thr-1462', thereby activating the mTORC1 signaling pathway, and leading to both phosphorylation of 4E-BP1 and in activation of RPS6KB1 (PubMed:12150915, PubMed:12172553). Also regulates the mTORC1 signaling pathway by catalyzing phosphorylation of CASTOR1 and DEPDC5 (PubMed:31548394, PubMed:33594058). AKT plays a role as key modulator of the AKT-mTOR signaling pathway controlling the tempo of the process of newborn neurons integration during adult neurogenesis, including correct neuron positioning, dendritic development and synapse formation (By similarity). Part of a

positive feedback loop of mTORC2 signaling by mediating phosphorylation of MAPKAP1/SIN1, promoting mTORC2 activation (By similarity). AKT is involved in the phosphorylation of members of the FOXO factors (Forkhead family of transcription factors), leading to binding of 14-3-3 proteins and cytoplasmic localization (PubMed:10358075). In particular, FOXO1 is phosphorylated at 'Thr-24', 'Ser-256' and 'Ser-319' (PubMed:10358075). FOXO3 and FOXO4 are phosphorylated on equivalent sites (PubMed:10358075). AKT has an important role in the regulation of NF-kappa-B-dependent gene transcription and positively regulates the activity of CREB1 (cyclic AMP (cAMP)-response element binding protein) (PubMed:9829964). The phosphorylation of CREB1 induces the binding of accessory proteins that are necessary for the transcription of pro-survival genes such as BCL2 and MCL1 (PubMed:9829964). AKT phosphorylates 'Ser-454' on ATP citrate lyase (ACLY), thereby potentially regulating ACLY activity and fatty acid synthesis (By similarity). Activates the 3B isoform of cyclic nucleotide phosphodiesterase (PDE3B) via phosphorylation of 'Ser-273', resulting in reduced cyclic AMP levels and inhibition of lipolysis (By similarity). Phosphorylates PIKFYVE on 'Ser-318', which results in increased PI(3)P-5 activity (By similarity). The Rho GTPase-activating protein DLC1 is another substrate and its phosphorylation is implicated in the regulation cell proliferation and cell growth (By similarity). Signals downstream of phosphatidylinositol 3-kinase (PI(3)K) to mediate the effects of various growth factors such as platelet-derived growth factor (PDGF), epidermal growth factor (EGF), insulin and insulin-like growth factor 1 (IGF1) (PubMed:12176338, PubMed:12964941). AKT mediates the antiapoptotic effects of IGF1 (By similarity). Essential for the SPATA13-mediated regulation of cell migration and adhesion assembly and disassembly (PubMed:19934221). May be involved in the regulation of the placental development (By similarity). Phosphorylates STK4/MST1 at 'Thr-120' and 'Thr-387' leading to inhibition of its: kinase activity, nuclear translocation, autophosphorylation and ability to phosphorylate FOXO3 (PubMed:17726016). Phosphorylates STK3/MST2 at 'Thr-117' and 'Thr-384' leading to inhibition of its: cleavage, kinase activity, autophosphorylation at Thr-180, binding to RASSF1 and nuclear translocation (PubMed:20086174). Phosphorylates SRPK2 and enhances its kinase activity towards SRSF2 and ACIN1 and promotes its nuclear translocation (PubMed:19592491). Phosphorylates RAF1 at 'Ser-259' and negatively regulates its activity (PubMed:10576742). Phosphorylation of BAD stimulates its pro-apoptotic activity (PubMed:10926925). Phosphorylates KAT6A at 'Thr-369' and this phosphorylation inhibits the interaction of KAT6A with PML and negatively regulates its acetylation activity towards p53/TP53 (PubMed:23431171). Phosphorylates palladin (PALLD), modulating cytoskeletal organization and cell motility (PubMed:20471940). Phosphorylates prohibitin (PHB), playing an important role in cell metabolism and proliferation (PubMed:18507042). Phosphorylates CDKN1A, for which phosphorylation at 'Thr-145' induces its release from CDK2 and cytoplasmic relocalization (PubMed:16982699). These recent findings indicate that the AKT1 isoform has a more specific role in cell motility and proliferation (PubMed:16139227). Phosphorylates CLK2 thereby controlling cell survival to ionizing radiation (PubMed:20682768). Phosphorylates PCK1 at 'Ser-90', reducing the binding affinity of PCK1 to oxaloacetate and changing PCK1 into an atypical protein kinase activity using GTP as donor (PubMed:32322062). Also acts as an activator of TMEM175 potassium channel activity in response to growth factors: forms the lysoK(GF) complex together with TMEM175 and acts by promoting TMEM175 channel activation, independently of its protein kinase activity (PubMed:32228865). Acts as a regulator of mitochondrial calcium uptake by mediating phosphorylation of MICU1 in the mitochondrial intermembrane space, impairing MICU1 maturation (PubMed:30504268). Acts as an inhibitor of tRNA methylation by mediating phosphorylation of the N-terminus of METTL1,

thereby inhibiting METTL1 methyltransferase activity (PubMed:15861136). In response to LPAR1 receptor pathway activation, phosphorylates Rabin8/RAB3IP which alters its activity and phosphorylates WDR44 which induces WDR44 binding to Rab11, thereby switching Rab11 vesicular function from preciliary trafficking to endocytic recycling (PubMed:31204173).

Storage

Shipped at conditions	Blue Ice
Appropriate short-term storage duration	Up to 12 months
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	+4°C

Notes

REACH authorisation
Abcam has not and does not intend to apply for the REACH Authorisation of customers' uses of products that contain European Authorisation list (Annex XIV) substances.
It is the responsibility of our customers to check the necessity of application of REACH Authorisation, and any other relevant authorisations, for their intended uses.

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	AKT1 also known as Protein Kinase B (PKB) is a serine/threonine kinase involved in various cellular processes. AKT1 plays an important role in mediating signals for cell survival growth and metabolism. This protein has a molecular weight of approximately 56 kDa. AKT1 is ubiquitously expressed in many tissues including the brain heart and lungs showing its importance in multiple physiological contexts. Phosphorylation of AKT1 at serine 473 denoted as p-AKT S473 is an important modification that regulates its activity.
Biological function summary	AKT1 regulates a broad spectrum of cellular functions through signaling pathways. It is an important player in the phosphatidylinositol 3-kinase (PI3K) and AKT pathway forming part of a complex involved in promoting cell survival and growth. AKT1 interacts closely with other proteins such as mTOR influencing cellular metabolism and autophagy. The phosphorylation state of AKT1 is critical for its activity with modifications like p-AKT S473 impacting its interaction with cellular substrates.

Pathways	AKT1 participates in the PI3K/AKT/mTOR signaling cascade instrumental in cell proliferation and metabolism. AKT1 integrates signals from insulin and growth factors modulating pathways that control cell growth and glucose uptake. This pathway involves proteins like mTOR and phospho-AKT which coordinate cellular responses to external stimuli. AKT1's phosphorylation at serine 473 and the involvement of AKT1 E17K a gain-of-function mutation influence these pathways significantly.
Associated diseases and disorders	AKT1 has associations with cancer and metabolic disorders. Dysregulation of the PI3K/AKT/mTOR pathway involving AKT1 and mTOR often results in oncogenic transformation and uncontrolled cellular proliferation. In cancer such as breast cancer AKT1 mutations including AKT1 E17K are implicated altering cell signals for growth. Additionally AKT1 is connected to metabolic disorders such as Type 2 diabetes where it affects insulin signaling and glucose metabolism highlighting its interaction with metabolic proteins like mTOR and phospho-AKT.

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

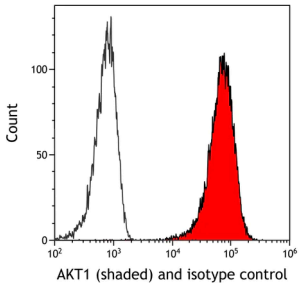
We do not recommend this combination. It is not covered by our product promise.

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.

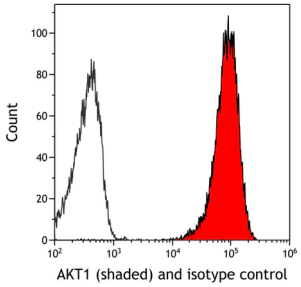
Full details and terms and conditions can be found here:
Terms & Conditions.

6 product images



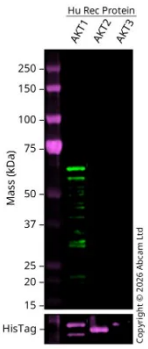
Flow Cytometry - Anti-AKT1 antibody [BLR245L] (ab314110)

Detection of human AKT1 (shaded) in FaDu cells by flow cytometry. Antibody: Rabbit anti-AKT1 recombinant monoclonal antibody [BLR245L] (A700-245) or isotype control (unshaded). Secondary: DyLight® 650-conjugated goat anti-rabbit IgG.



Flow Cytometry - Anti-AKT1 antibody [BLR245L] (ab314110)

Detection of mouse AKT1 (shaded) in CTLL-2 cells by flow cytometry. Antibody :Rabbit anti-AKT1 recombinant monoclonal antibody [BLR245L] (A700-245) or isotype control (unshaded). Secondary: DyLight® 650-conjugated goat anti-rabbit IgG.



Western blot - Anti-AKT1 antibody [BLR245L] (ab314110)

AKT1 Western blot staining using rabbit Anti-AKT1 antibody

Western blot - Anti-AKT1 antibody [BLR245L] staining at 1/1000 dilution, shown in green; Mouse anti-6x His Tag (ab18184) loading control staining at 1/1000 dilution, shown in magenta. To generate this image, samples were run on an SDS-PAGE gel then transferred onto a nitrocellulose membrane. Membranes were blocked in 3pc 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-Rabbit 800CW & Goat anti-Mouse 680RD at 1/20,000 dilution.
All lanes:
Western blot - Anti-AKT1 antibody [BLR245L] (ab314110) at 1/1000 dilution

Lane 1:
Western blot - Recombinant human AKT1 protein (His tag N-Terminus) (ab79792) at 0.2 µg

Lane 2:
Western blot - Recombinant human AKT2 protein (His tag N-Terminus) (ab79798) at 0.2 µg

Lane 3:
Western blot - Recombinant human AKT3 protein (His tag N-Terminus) (ab79799) at 0.2 µg

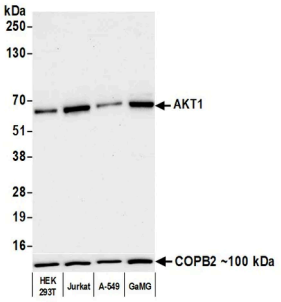
Secondary

Lanes 1 - 3:
Goat anti-Rabbit 800CW at 1/20000 dilution

Lanes 1 - 3:
Goat anti-Mouse 680RD at 1/20000 dilution

Predicted band size: 56 kDa

Observed band size: 58 kDa, 55 kDa



Western blot - Anti-AKT1 antibody [BLR245L] (ab314110)

Samples: Whole cell lysate (10 µg) from HEK293T, Jurkat, A-549, and GaMG cells prepared using NETN lysis buffer. Antibody: Rabbit anti-AKT1 recombinant monoclonal antibody [BLR245L] (A700-245) used at 1:1000. Secondary: HRP-conjugated goat anti-rabbit IgG. Detection: Chemiluminescence with an exposure time of 30 seconds.
All lanes:
Western blot - Anti-AKT1 antibody [BLR245L] (ab314110) at 1/1000 dilution

Lane 1:
HEK293T Whole cell lysate at 10 µg

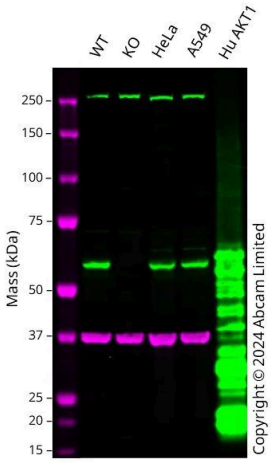
Lane 2:
Jurkat, Whole cell lysate at 10 µg

Lane 3:
A-549 Whole cell lysate at 10 µg

Lane 4:
GaMG Whole cell lysate at 10 µg

Secondary

All lanes:
HRP-conjugated goat anti-rabbit IgG



Western blot - Anti-AKT1 antibody [BLR245L] (ab314110)

Western blot: Anti-AKT1 antibody [BLR245L] (ab314110) staining at 1/1000 dilution, shown in green; Mouse anti-GAPDH antibody [6C5] (ab8245) loading control staining at 1/20000 dilution, shown in magenta. In Western blot, ab314110 was shown to bind specifically to AKT1. A band was observed at 55 kDa in wild-type HCT 116 cell lysates with no signal observed at this size in AKT1 knockout cell line. To generate this image, wild-type and AKT1 knockout HCT 116 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-Rabbit IgG H&L 800CW and Goat anti-Mouse IgG H&L 680RD at 1/20000 dilution.
All lanes:
Western blot - Anti-AKT1 antibody [BLR245L] (ab314110) at 1/1000 dilution

Lane 1:
Wild-type HCT 116 cell lysate at 20 µg

Lane 2:
AKT1 knockout HCT 116 cell lysate at 20 µg

Lane 3:
HeLa cell lysate at 20 µg

Lane 4:
A549 cell lysate at 20 µg

Lane 5:
Recombinant Human AKT1 protein ab116412 cell lysate at 0.2 µg

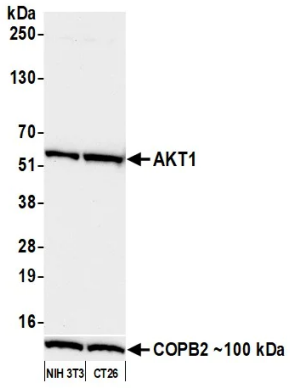
Secondary

All lanes:

Goat anti-Rabbit IgG H&L 800CW and Goat anti-Mouse IgG H&L 680RD at 1/20000 dilution

Performed under reducing conditions.

Observed band size: 55 kDa



Western blot - Anti-AKT1 antibody [BLR245L] (ab314110)

Samples: Whole cell lysate (25 µg) from NIH 3T3 and CT26 cells prepared using NETN lysis buffer. Antibody:Rabbit antiAKT1 recombinant monoclonal antibody [BLR245L] (A700-245) used at 1:1000. Secondary: HRP-conjugated goat anti-rabbit IgG . Detection: Chemiluminescence with an exposure time of 30 seconds. Lower Panel: Rabbit anti-COPB2 antibody.
All lanes:
Western blot - Anti-AKT1 antibody [BLR245L] (ab314110) at 1/1000 dilution

Lane 1:
NIH 3T3 Whole cell lysate at 25 µg

Lane 2:
CT26 Whole cell lysate at 25 µg

Secondary

All lanes:
HRP-conjugated goat anti-rabbit IgG

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