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AKT2 Rabbit pAb

Catalog # AP96802

Product Information

Application	WB, IHC-P, IHC-F, IF
Primary Accession	P47197
Other Accession	P47197
Reactivity	Rat, Mouse
Predicted	Pig, Rabbit, Horse
Host	Rabbit
Clonality	Polyclonal
Calculated MW	55543
Physical State	Liquid
Immunogen	KLH conjugated synthetic peptide derived from rat AKT2
Epitope Specificity	21-120/481
Isotype	IgG
Purity	affinity purified by Protein A
Buffer	0.01M TBS (pH7.4) with 1% BSA, 0.02% Proclin300 and 50% Glycerol.
SIMILARITY	Belongs to the protein kinase superfamily. AGC Ser/Thr protein kinase family. RAC subfamily. Contains 1 AGC-kinase C-terminal domain. Contains 1 PH domain. Contains 1 protein kinase domain.
SUBUNIT	Interacts (via PH domain) with MTCP1, TCL1A AND TCL1B. Interacts with CLK2, PBH2 and TRAF6.
Post-translational modifications	Note=Defects in AKT2 are a cause of susceptibility to breast cancer (BC). AKT2 promotes metastasis of tumor cells without affecting the latency of tumor development. With AKT3, plays also a pivotal role in the biology of glioblastoma. Diabetes mellitus, non-insulin-dependent (NIDDM) [MIM:125853]: A multifactorial disorder of glucose homeostasis caused by a lack of sensitivity to the body's own insulin. Affected individuals usually have an obese body habitus and manifestations of a metabolic syndrome characterized by diabetes, insulin resistance, hypertension and hypertriglyceridemia. The disease results in long-term complications that affect the eyes, kidneys, nerves, and blood vessels. Note=The disease is caused by mutations affecting the gene represented in this entry. Hypoinsulinemic hypoglycemia with hemihypertrophy (HIHGHH) [MIM:240900]: A disorder characterized by hypoglycemia, low insulin levels, low serum levels of ketone bodies and branched-chain amino acids, left-sided hemihypertrophy, neonatal macrosomia, reduced consciousness and hypoglycemic seizures. Note=The disease is caused by mutations affecting the gene represented in this entry.
Important Note	This product as supplied is intended for research use only, not for use in human, therapeutic or diagnostic applications.
Background Descriptions	This gene is a putative oncogene encoding a protein belonging to a subfamily of serine/threonine kinases containing SH2-like (Src homology 2-like) domains. The gene was shown to be amplified and overexpressed in 2 of 8 ovarian carcinoma cell lines and 2 of 15 primary ovarian tumors. Overexpression contributes to the malignant phenotype of a subset of human ductal pancreatic cancers. The encoded protein is a general protein kinase capable of phophorylating several known proteins. [provided by RefSeq, Jul

2008]

Additional Information

Gene ID	25233
Other Names	HIHGHH; PKBB; PKBBETA; PRKBB; RAC-BETA; 2410016A19Rik; PKB; AKT2_HUMAN; AKT2; Protein kinase Akt-2; Protein kinase B beta (PKB beta); RAC protein kinase beta (RAC-PK-beta); 2.7.11.1; AKT2_MOUSE; RAC-PK-beta; AKT2_RAT;
Dilution	WB=1:500-2000,IHC-P=1:100-500,IHC-F=1:100-500,IF=1:100-500
Storage	Store at -20 °C for one year. Avoid repeated freeze/thaw cycles. When reconstituted in sterile pH 7.4 0.01M PBS or diluent of antibody the antibody is stable for at least two weeks at 2-4 °C.

Protein Information

Name	Akt2 {ECO:0000312|RGD:2082}
Function	Serine/threonine kinase closely related to AKT1 and AKT3. All 3 enzymes, AKT1, AKT2 and AKT3, are collectively known as AKT kinase. AKT regulates many processes including metabolism, proliferation, cell survival, growth and angiogenesis, through the phosphorylation of a range of downstream substrates. Over 100 substrates have been reported so far, although for most of them, the precise AKT kinase catalyzing the reaction was not specified. AKT regulates glucose uptake by mediating insulin-induced translocation of the SLC2A4/GLUT4 glucose transporter to the cell surface. Phosphorylation of PTPN1 at 'Ser-50' negatively modulates its phosphatase activity preventing dephosphorylation of the insulin receptor and the attenuation of insulin signaling. Phosphorylation of TBC1D4 triggers the binding of this effector to inhibitory 14-3-3 proteins, which is required for insulin-stimulated glucose transport. 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. Phosphorylation of GSK3 isoforms by AKT is also thought to be one mechanism by which cell proliferation is driven. AKT also regulates cell survival via the phosphorylation of MAP3K5 (apoptosis signal- related kinase). Phosphorylation of 'Ser-83' decreases MAP3K5 kinase activity stimulated by oxidative stress and thereby prevents apoptosis. AKT mediates insulin-stimulated protein synthesis by phosphorylating TSC2 at 'Ser-939' and 'Thr-1462', thereby activating mTORC1 signaling and leading to both phosphorylation of 4E-BP1 and in activation of RPS6KB1. 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. In particular, FOXO1 is phosphorylated at 'Thr-24', 'Ser-256' and 'Ser-319'. FOXO3 and FOXO4 are phosphorylated on equivalent sites. 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). 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. AKT phosphorylates 'Ser- 454' on ATP citrate lyase (ACLY), thereby potentially regulating ACLY activity and fatty acid synthesis. Activates the 3B isoform of cyclic nucleotide phosphodiesterase (PDE3B) via phosphorylation of 'Ser-273', resulting in reduced cyclic AMP levels and inhibition of lipolysis.

Phosphorylates PIKFYVE on 'Ser-318', which results in increased PI(3)P- 5 activity. The Rho GTPase-activating protein DLC1 is another substrate and its phosphorylation is implicated in the regulation cell proliferation and cell growth. 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. 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). AKT mediates the antiapoptotic effects of IGF1. Essential for the SPATA13-mediated regulation of cell migration and adhesion assembly and disassembly. May be involved in the regulation of the placental development (PubMed:21432781, PubMed:21620960). In response to lysophosphatidic acid stimulation, inhibits the ciliogenesis cascade. In this context, phosphorylates WDR44, hence stabilizing its interaction with Rab11 and preventing the formation of the ciliogenic Rab11-FIP3-RAB3IP complex. Also phosphorylates RAB3IP/Rabin8, thus may affect RAB3IP guanine nucleotide exchange factor (GEF) activity toward Rab8, which is important for cilia growth (By similarity). Phosphorylates PKP1, facilitating its interaction with YWHAG and translocation to the nucleus, ultimately resulting in a reduction in keratinocyte intercellular adhesion (By similarity). Phosphorylation of PKP1 increases PKP1 protein stability, translocation to the cytoplasm away from desmosome plaques and PKP1- driven cap-dependent translation (By similarity).

Cellular Location

Cytoplasm {ECO:0000250|UniProtKB:Q60823}. Nucleus {ECO:0000250|UniProtKB:Q60823}. Cell membrane; Peripheral membrane protein. Early endosome {ECO:0000250|UniProtKB:Q60823}. Note=Through binding of the N-terminal PH domain to phosphatidylinositol (3,4,5)-trisphosphate (PtdIns(3,4,5)P3) or phosphatidylinositol (3,4)-bisphosphate (PtdIns(3,4)P2), recruited to the plasma membrane. Cell membrane recruitment is facilitated by interaction with CLIP3. Colocalizes with WDFY2 in early endosomes (By similarity). Localizes within both nucleus and cytoplasm in proliferative primary myoblasts and mostly within the nucleus of differentiated primary myoblasts (By similarity) {ECO:0000250|UniProtKB:P31751, ECO:0000250|UniProtKB:Q60823}

Tissue Location

Expressed in adipocytes and hepatocytes (at protein level). Expressed at low levels in skeletal muscle (at protein level)

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