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PIP5K1A Antibody (N-term)

Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AP8037a

Product Information

Application	WB, E
Primary Accession	Q99755
Reactivity	Human
Predicted	Canine, Rabbit
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	62633
Antigen Region	19-50

Additional Information

Gene ID	8394
Other Names	Phosphatidylinositol 4-phosphate 5-kinase type-1 alpha, PIP5K1-alpha, PtdIns(4)P-5-kinase 1 alpha, 68 kDa type I phosphatidylinositol 4-phosphate 5-kinase alpha, Phosphatidylinositol 4-phosphate 5-kinase type I alpha, PIP5KIalpha, PIP5K1A
Target/Specificity	This PIP5K1A antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 19-50 amino acids from the N-terminal region of human PIP5K1A.
Dilution	WB~~1:1000 E~~Use at an assay dependent concentration.
Format	Purified polyclonal antibody supplied in PBS with 0.09% (W/V) sodium azide. This antibody is prepared by Saturated Ammonium Sulfate (SAS) precipitation followed by dialysis against PBS.
Storage	Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	PIP5K1A Antibody (N-term) is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	PIP5K1A (HGNC:8994)
Function	Catalyzes the phosphorylation of phosphatidylinositol 4- phosphate (PtdIns(4)P/PI4P) to form phosphatidylinositol 4,5- bisphosphate

	(PtdIns(4,5)P2/PIP2), a lipid second messenger that regulates several cellular processes such as signal transduction, vesicle trafficking, actin cytoskeleton dynamics, cell adhesion, and cell motility (PubMed:21477596, PubMed:22942276, PubMed:8955136). PtdIns(4,5)P2 can directly act as a second messenger or can be utilized as a precursor to generate other second messengers: inositol 1,4,5- trisphosphate (IP3), diacylglycerol (DAG) or phosphatidylinositol- 3,4,5-trisphosphate (PtdIns(3,4,5)P3/PIP3) (PubMed:19158393, PubMed:20660631). PIP5K1A-mediated phosphorylation of PtdIns(4)P is the predominant pathway for PtdIns(4,5)P2 synthesis (By similarity). Can also use phosphatidylinositol (PtdIns) as substrate in vitro (PubMed:22942276). Together with PIP5K1C, is required for phagocytosis, both enzymes regulating different types of actin remodeling at sequential steps (By similarity). Promotes particle ingestion by activating the WAS GTPase-binding protein that induces Arp2/3 dependent actin polymerization at the nascent phagocytic cup (By similarity). Together with PIP5K1B, is required, after stimulation by G protein coupled receptors, for the synthesis of IP3 that will induce stable platelet adhesion (By similarity). Recruited to the plasma membrane by the E-cadherin/beta-catenin complex where it provides the substrate PtdIns(4,5)P2 for the production of PtdIns(3,4,5)P3, IP3 and DAG, that will mobilize internal calcium and drive keratinocyte differentiation (PubMed:19158393). Positively regulates insulin-induced translocation of SLC2A4 to the cell membrane in adipocytes (By similarity). Together with PIP5K1C has a role during embryogenesis (By similarity). Independently of its catalytic activity, is required for membrane ruffling formation, actin organization and focal adhesion formation during directional cell migration by controlling integrin-induced translocation of the small GTPase RAC1 to the plasma membrane (PubMed:20660631). Also functions in the nucleus where it acts as an activator of TUT1 adenylyltransferase activity in nuclear speckles, thereby regulating mRNA polyadenylation of a select set of mRNAs (PubMed:18288197).
Cellular Location	Cell membrane. Cytoplasm {ECO:0000250|UniProtKB:P70182}. Nucleus. Nucleus speckle. Cell projection, ruffle. Cell projection, lamellipodium. Note=Colocalizes with RAC1 at actin-rich membrane ruffles (PubMed:20660631). Localizes to nuclear speckles and associates with TUT1 to regulate polyadenylation of selected mRNAs (PubMed:18288197).
Tissue Location	Highly expressed in heart, placenta, skeletal muscle, kidney and pancreas. Detected at lower levels in brain, lung and liver.

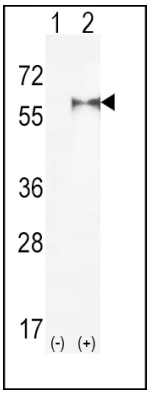
Background

Overexpression of phosphatidylinositol phosphate 5-kinase alpha (PIP5KIalpha), which synthesizes PIP2, suppresses apoptosis, whereas a kinase-deficient mutant does not. Protection by the wild-type PIP5KIalpha isaccompanied by decreases in the generation of activated caspases and of caspase 3-cleaved PARP. Protection is not mediated through PIP3 or Akt activation. An anti-apoptotic role for PIP(2) is substantiated by the finding that PIP5KIalpha is cleaved by caspase 3 during apoptosis, and cleavage inactivates PIP5KIalpha in vitro. Mutation of the P(4) position (D279A) of the PIP5KIalpha caspase 3 cleavage consensus prevents cleavage in vitro, and during apoptosis in vivo. Significantly, the caspase 3-resistant PIP5KIalpha mutant is more effective in suppressing apoptosis than the wild-type kinase. PIP2 is a direct regulator of apical and effector caspases in the death receptor and mitochondrial pathways, and PIP5KIalpha inactivation contributes to the progression of apoptosis.

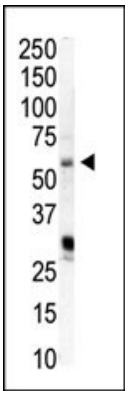
References

Doughman, R.L., et al., J. Biol. Chem. 278(25):23036-23045 (2003).
Loijens, J.C., et al., J. Biol. Chem. 271(51):32937-32943 (1996).
Xie, Y., et al., Cytogenet. Cell Genet. 88 (3-4), 197-199 (2000).

Images



Western blot analysis of PIP5K1A (arrow) using rabbit polyclonal hPIP5K1A-R34 (Cat. #AP8037a). 293 cell lysates (2 ug/lane) either nontransfected (Lane 1) or transiently transfected (Lane 2) with the PIP5K1A gene.



Western blot analysis of anti-PIP5K1A Pab (Cat. #AP8037a) in HeLa cell lysate. PIP5K1A (arrow) was detected using purified Pab. Secondary HRP-anti-rabbit was used for signal visualization with chemiluminescence.

Citations

- Regulation of conformer-specific activation of the integrin LFA-1 by a chemokine-triggered Rho signaling module.
- Gene expression profiling in phosphatidylethanolamine N-methyltransferase knockout mice.

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