

# PIP5K1A Antibody (N-term)

Purified Rabbit Polyclonal Antibody (Pab)

Catalog # AP8037a

## Product Information

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Application	WB, E
Primary Accession	<a href="#">Q99755</a>
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	62633
Antigen Region	19-50

## Additional Information

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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

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Name	PIP5K1A ( <a href="#">HGNC:8994</a> )
Function	Catalyzes the phosphorylation of phosphatidylinositol 4- phosphate (PtdIns(4)P/PI4P) to form phosphatidylinositol 4,5- bispophosphate (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)P<sub>2</sub> can directly act as a second messenger or can be utilized as a precursor to generate other second messengers: inositol 1,4,5- trisphosphate (IP<sub>3</sub>), diacylglycerol (DAG) or phosphatidylinositol- 3,4,5-trisphosphate (PtdIns(3,4,5)P<sub>3</sub>/PIP<sub>3</sub>) (PubMed:[19158393](#), PubMed:[20660631](#)). PIP5K1A-mediated phosphorylation of PtdIns(4)P is the predominant pathway for PtdIns(4,5)P<sub>2</sub> 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 IP<sub>3</sub> 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)P<sub>2</sub> for the production of PtdIns(3,4,5)P<sub>3</sub>, IP<sub>3</sub> 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 {ECO:0000250 | UniProtKB:P70182}. 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

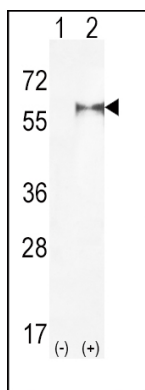
Overexpression of phosphatidylinositol phosphate 5-kinase alpha (PIP5KIalpha), which synthesizes PIP<sub>2</sub>, suppresses apoptosis, whereas a kinase-deficient mutant does not. Protection by the wild-type PIP5KIalpha is accompanied by decreases in the generation of activated caspases and of caspase 3-cleaved PARP. Protection is not mediated through PIP<sub>3</sub> 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. PIP<sub>2</sub> 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

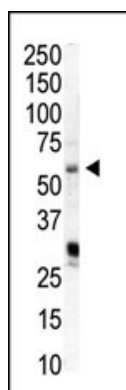
- Doughman, R.L., et al., J. Biol. Chem. 278(25):23036-23045 (2003).  
 Loijens, J.C., et al., J. Biol. Chem. 271(51):32937-32943 (1996).  
 Xie, Y., et al., Cytogenet. Cell Genet. 88 (3-4), 197-199 (2000).

## Images

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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

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- [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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