

p85 α

Phosphoinositide 3-Kinase α , regulatory subunit
bovine, recombinant, *Leishmania tarentolae*

Cat. No.	Amount
PR-342	20 μ g

For *in vitro* use only
 Quality guaranteed for 12 months
 Store at -20°C

Avoid freeze / thaw cycles

Form

Liquid. Supplied in 25 mM HEPES, pH 8.0, 25 mM NaCl, 2.5 mM MgCl₂, 50% glycerol.

Molecular weight

p85 α : 83.5 kDa

Purity

>90% by SDS PAGE

Description

p85 α acts as regulatory subunit of the class IA PI3-kinase isoforms α , β , and δ . It contains two SH2 domains that bind to tyrosine-phosphorylated growth factor receptors or substrate adaptor proteins.

It also contains a BH (breakpoint cluster region homology) domain that shows GAP activity towards the small GTPases Rab4, Rab5, Cdc42, Rac1 and to a lesser extend towards Rab6 and Rab11.

It was shown that PI3K α catalytic subunit mediated phosphorylation of the p85 α adapter reduces the lipid kinase activity of the heterodimer and this gives hints for PI3K-dependent signaling events not requiring production of 3'-phosphorylated phosphoinositides.

PI3K α protein kinase activity has been implicated in IRS 1 serine phosphorylation in insulin-treated adipocytes and in STAT3 and IRS 1 phosphorylation upon activation of the type 1 IFN receptor by IFN α .

General

Phosphoinositide 3-kinases (PI3Ks) phosphorylate phosphatidylinositols (PIs) at their 3' OH position generating lipid second messengers and thereby regulate numerous biological processes including cell growth, differentiation, survival, proliferation, migration and metabolism. On the basis of structural similarities and substrate specificity, the PI3K family can be subdivided into three classes termed I, II, and III.

All human class I members are heterodimers consisting of a catalytic subunit (MW approx. 110 kDa) and a non-catalytic subunit (MW 50, 55, 85, or 101 kDa) and are known to phosphorylate phosphatidylinositol (PI), phosphatidylinositol-4-mono-phosphate (PIP) and phosphatidylinositol-4,5-bisphosphate (PIP2) *in vitro*. The class I members can be further subdivided into class IA and IB PI3Ks. Class IA exists in three isoforms (p110 α , p110 β and p110 δ); whereas the only class IB member is termed p110 γ .

Class IA PI3Ks are activated by adaptor proteins such as Ras or BCAP, or tyrosine-kinase-associated receptors including antigen, co-stimulatory and cytokine receptors (e.g. CD19, CD28, Insulin receptor, EGFR, and PDGFR). p110 γ is activated by G-protein-coupled receptors (GPCRs). Effectors of class I PI3Ks are pleckstrin-homology domain proteins such as Akt/PKB, BTK, TEC, ITK, BAM32, and small GTPases (e.g. Cdc42, Rac, or Ras).

The action of PI3Ks is regulated by the phosphatidylinositol-3,4,5-trisphosphate phosphatases SHIP and

p85 α

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PTEN.

Selected References:

Chamberlain et al. (2008) Disrupted RabGAP Function of the p85 Subunit of Phosphatidylinositol 3-Kinase Results in Cell Transformation. *J. Biol. Chem.* **283**:15861-15868

Chamberlain et al. (2004) The p85 α Subunit of Phosphatidylinositol 3'-Kinase Binds to and Stimulates the GTPase Activity of Rab Proteins. **277**:40390.

Cantrell, D.A. (2001) Phosphoinositide 3-kinase signalling pathways. *J. Cell Sci.* **114**:1439.

Pirola et al. (2001) Activation Loop Sequences Confer Substrate Specificity to Phosphoinositide 3-Kinase α (PI3K α). *J. Biol. Chem.* **276**:21544.