

PI(3)K γ ^{His}

Phosphoinositide 3-Kinase p110 γ
human, recombinant, Sf9 insect cells

Cat. No.	Amount
PR-343	10 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 Tris-HCl pH 8.0, 50 mM NaCl, 0.5 mM MgCl₂ and 50% glycerol.

Activity

4,500 units/mg (1 unit is defined as 1 picomole phosphate transferred to PIP₂ per minute).

Molecular Weight

126.3 kDa

Purity

>95% by SDS-PAGE

Description

PI3K γ is highly expressed in cells of hematopoietic origin. It plays an important role in dendritic cell (DC) trafficking and in the activation of specific immunity. PI3K γ ^{-/-} mice showed a reduced ability to respond to chemokines, and had a selective defect in the number of skin Langerhans cells and in lymph node CD8 α -DCs. In macrophages, the chemokine RANTES/CCL5 activates the small GTPase Rac1 and its downstream target PAK2. This response depends on Gi activation and largely on the subsequent triggering of PI3K γ .

Recombinant full length PI3K γ is expressed in Sf9 insect cells and carries a N-terminal His8 affinity Tag.

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 noncatalytic 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 PTEN.

Selected References:

Stoyanov *et al.* (1995) Cloning and characterization of a G protein-activated human phosphoinositide-3 kinase. *Science* **269**:690.

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- Fuchikami *et al.* (2002) A Versatile High-Throughput Screen for Inhibitors of Lipid Kinase Activity: Development of an Immobilized Phospholipid Plate Assay for Phosphoinositide 3-kinase γ . *J. Biomol. Scr.* **7**:441.
- Leopoldt *et al.* (1998) Gbetagamma stimulates phosphoinositide 3-kinase-gamma by direct interaction with two domains of the catalytic p110 subunit. *J. Biol. Chem.* **273**:7024.
- Lopez-Illasaca *et al.* (1997) Linkage of G protein-coupled receptors to the MAPK signaling pathway through PI 3-kinase gamma. *Science* **275**:394.
- Stoyanova *et al.* (1997) Lipid kinase and protein kinase activities of G-protein-coupled phosphoinositide 3-kinase gamma: structureactivity analysis and interactions with wortmannin. *Biochem. J.* **324**:489.
- Foster *et al.* (2003) The phosphoinositide (PI) 3-kinase family. *J. Cell Science.* **116**:3037.
- Kerchner *et al.* (2004) Differential Sensitivity of Phosphatidylinositol 3-Kinase p110g to Isoforms of G Protein $\beta\gamma$ Dimers. *J. Biol. Chem.* **279**:44554.
- Del Prete *et al.* (2004) Defective dendritic cell migration and activation of adaptive immunity in PI3Kgamma-deficient mice. *EMBO J.* **23**:3505.
- Weiss-Haljiti *et al.* (2004) Involvement of phosphoinositide 3-kinase gamma, Rac, and PAK signaling in chemokine-induced macrophage migration. *J. Biol. Chem.* **279**:43273.
- Heller *et al.* (2008) Overlapping and distinct roles for PI3K β and isoforms in S1P-induced migration of human and mouse endothelial cells. *Cardiovascular Research* **10.1093/cvr/cvn159**.