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Product Information

PDK1, Active

Human, recombinant, expressed in *E. coli*

Product Number **P 7498**

Storage Temperature: -70 °C

Synonym: 3-Phosphoinositide-dependent Protein Kinase

Product Description

The initial steps in insulin signal transduction occur at the plasma membrane and lead to activation of phosphatidylinositol (PtdIns) 3-kinase and the formation of PtdIns(3,4,5)P₃ in the inner leaflet of the plasma membrane which is then converted to PtdIns(3,4)P₂ by a specific phosphatase. PDK1, or 3-phosphoinositide-dependent protein kinase, is activated by the presence of PtdIns(3,4,5)P₃ or PtdIns(3,4)P₂.¹ PDK1 then activates PKB² which, in turn, inactivates glycogen synthase kinase-3 (GSK3). The phosphorylation of other proteins by PKB and GSK3 may mediate many of the intracellular actions of insulin. Thus, PDK1 plays a key role in mediating many of the actions of the second messengers PtdIns(3,4,5)P₃ and/or PtdIns(3,4)P₂. Human PDK1 is a 556-residue monomeric enzyme comprised of a catalytic domain that is most similar to the PKA, PKB and PKC subfamily of protein kinases and a C-terminal pleckstrin homology domain. The PDK1 gene is located on human chromosome 16p13.3 and is expressed ubiquitously in human tissues. Human PDK1 is homologous to the *Drosophila* protein kinase DSTPK61, which has been implicated in the regulation of sex differentiation, oogenesis and spermatogenesis. PDK1 and DSTPK61 phosphorylate Thr³⁰⁸ of PKB α only in the presence of PtdIns(3,4,5)P₃ or PtdIns(3,4)P₂. Overexpression of PDK1 in 293 cells has been reported to activate PKB α and potentiate the IGF1-induced phosphorylation of PKB α at Thr³⁰⁸.³

The product is active recombinant, full-length human PDK1. It is supplied at a concentration of approximately 100 μ g/mL in 50 mM Tris-HCl, pH 7.5, 150 mM NaCl, 0.25 mM DTT, 0.1 mM EGTA and 30% glycerol.

Purity: \geq 75% (SDS-PAGE)

Molecular weight: ~59 kDa

Specific Activity: \geq 10 units/mg protein (Bradford). Please refer to the Certificate of Analysis for the lot-specific activity.

Unit Definition: One unit will incorporate one nanomole of phosphate into the PDKtide substrate (KTFCGTPEYLAPEVRREPRILSEEEQEMFRDFDYIAD WC) per minute at 30 °C at pH 7.2 using a final concentration of 50 μ M [³²P] ATP.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation instructions

For maximum product recovery, after thawing, centrifuge the vial before removing the cap

Storage/Stability

Stable for at least 12 months when stored as undiluted stock at -70 °C. After initial thawing, store in smaller, working aliquots at -70 °C. Use the working aliquots immediately upon thawing. Avoid repeated freeze-thaw cycles to prevent denaturing of the protein. Do not store in a frost-free freezer.

References

1. Cohen P, et al., PDK1, one of the missing links in insulin signal transduction?, *FEBS Lett.*, **410**, 3-10 (1997).
2. Alessi D. R. et al., Characterization of a 3-phosphoinositide-dependent protein kinase which phosphorylates and activates protein kinase B α ., *Curr. Biol.* **7**, 261-269 (1997).
3. Alessi D.R. et al., 3-Phosphoinositide-dependent protein kinase-1 (PDK1): structural and functional homology with the *Drosophila* DSTPK61 kinase., *Curr. Biol.*, **7**, 776-789 (1997).

AH,PHC 05/05-1

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