

## 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 phosphatidylinositide (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.<sup>1</sup> PDK1 then activates PKB<sup>2</sup> 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 Thr<sup>308</sup> of PKB $\alpha$  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 $\alpha$  and potentiate the IGF1-induced phosphorylation of PKB $\alpha$  at Thr<sup>308</sup>.<sup>3</sup>

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

Purity: ≥ 75% (SDS-PAGE)

Molecular weight: ~59 kDa

Specific Activity: ≥ 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 µM [<sup>32</sup>P] 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 $\alpha$ ., *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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