

Specifications and Use

- Source** ♦ Recombinant human PDK-1 was expressed by baculovirus in *Sf9* insect cells using an N-terminal His tag. The gene accession number is NM_002613.
- Molecular Mass** ♦ The approximate molecular weight is 67 kDa (see Figure 1 below).
- Purity** ♦ The purity was determined to be > 90% by densitometry (see Figure 1 below).
- Formulation** ♦ Supplied in 50 mM sodium phosphate (pH 7.0), 300 mM NaCl, 0.25 mM DTT, 150 mM imidazole, 0.1 mM PMSF, and 25% glycerol.
- Size** ♦ 10 µg.
- Concentration** ♦ 0.1 µg/µL.
- Activity** ♦ The specific activity of PDK-1 was determined to be 110 nmol/min/mg using a synthetic peptide substrate (see Activity Assay Protocol).
- Storage** ♦ This product is stable at ≤ -70 °C for up to one year from the date of receipt. For optimal storage, aliquot into smaller quantities after centrifugation and store at recommended temperature.
♦ **Avoid repeated freeze-thaw cycles.**

PDK-1

PDK-1 (3-phosphoinositide-dependent protein kinase) is activated by the presence of PtdIns(3,4,5)P3 or PtdIns(3,4)P2 (1). PDK-1 then activates protein kinase B (PKB) that, in turn, inactivates glycogen synthase kinase-3 (GSK-3). The phosphorylation of other proteins by PKB and GSK-3 is likely to mediate many of the intracellular actions of insulin. Thus, PDK-1 plays a key role in mediating many of the actions of the second messenger(s) PtdIns(3,4,5)P3 and/or PtdIns(3,4)P2. Human PDK-1 is a 556 amino acid residue monomeric enzyme comprised of a catalytic domain that is most similar to the PKA, PKB, and PKC subfamily of protein kinases.

References

1. Cohen, P. *et al.* (1997) FEBS Letter **410**:3.
2. Alessi, D.R. *et al.* (1997) Current Biol. **7**:261.

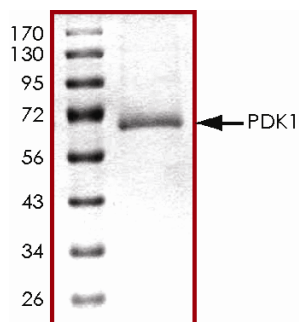


Figure 1: The approximate molecular weight is 67 kDa and the purity is > 90%.

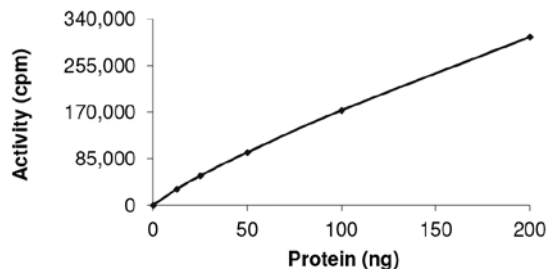


Figure 2: The specific activity of this lot of PDK-1 was determined to be 110 nmol/min/mg as per the Activity Assay Protocol (on reverse).

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Activity Assay Protocol

Solutions Required

- **Active Kinase** - Active PDK-1 (0.1 µg/µL) diluted with Kinase Dilution Buffer III.
Note: These are suggested working dilutions. Optimal dilutions should be determined by each laboratory for each application.
- **Kinase Assay Buffer I** - 25 mM MOPS pH 7.2, 12.5 mM β-glycerolphosphate, 25 mM MgCl₂, 5 mM EGTA, 2 mM EDTA. Add 0.25 mM DTT to the Kinase Assay Buffer prior to use.
- **Kinase Dilution Buffer III** - Kinase Assay Buffer I diluted at a 1:4 ratio (5-fold) with 50 ng/µL BSA solution.
- **10 mM ATP Stock Solution** - Prepare the ATP Stock Solution by dissolving 55 mg of ATP in 10 mL of Kinase Assay Buffer I. Store 200 µL aliquots at ≤ -20 °C.
- **[³³P]-ATP Assay Cocktail** - Prepare 250 µM [³³P]-ATP Assay Cocktail in a designated radioactive work area by combining 150 µL of 10 mM ATP Stock Solution, 100 µL of [³³P]-ATP (1 mCi/100 µL), and 5.75 mL of Kinase Assay Buffer I. Store 1.0 mL aliquots at ≤ -20 °C.
- **Substrate** - PDKtide synthetic peptide substrate (KTFCGTPEYLAPEVRREPRILSEEEQEMFRDFDIADWC) diluted in distilled or deionized water to a final concentration of 1.0 mg/mL.

Assay Procedure

1. Thaw the [³³P]-ATP Assay Cocktail in a shielded container in a designated radioactive work area.
2. Thaw the Active PDK-1, Kinase Assay Buffer I, Substrate, and Kinase Dilution Buffer III on ice.
3. In a pre-cooled microfuge tube, add the following reaction components bringing the initial reaction volume up to 20 µL.

| Reaction Component | Amount |
|-------------------------------|--------|
| Diluted Active PDK-1 | 10 µL |
| Substrate (1.0 mg/mL; on ice) | 5.0 µL |
| Distilled H ₂ O | 5.0 µL |

4. Set up the blank control as outlined in step 3, excluding the addition of the substrate. Replace the substrate with an equal volume of distilled or deionized water.
5. Initiate the reaction with the addition of 5.0 µL [³³P]-ATP Assay Cocktail, bringing the final volume up to 25 µL. Incubate the mixture in a water bath at 30 °C for 15 minutes.
6. After the 15-minute incubation, terminate the reaction by spotting 20 µL of the reaction mixture onto individual pre-cut strips of phosphocellulose P81 paper.
7. Air dry the pre-cut P81 strip and sequentially wash in a 1% phosphoric acid solution (add 10 mL of phosphoric acid to 990 mL of distilled or deionized water) with constant gentle stirring. It is recommended that the strips be washed a total of three times for approximately 10 minutes each.
8. Count the radioactivity on the P81 paper in the presence of scintillation fluid in a scintillation counter.
9. Determine the corrected cpm by subtracting the blank control value (see step 4) for each sample and calculate the kinase specific activity as outlined below.

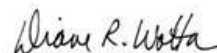
Calculation of [³³P]-ATP Specific Activity (SA) (cpm/pmol)

Specific Activity (SA) = cpm for 5.0 µL [³³P]-ATP/pmole of ATP (in 5.0 µL of a 250 µM ATP stock solution, *i.e.* 1250 pmoles)

Calculation of Kinase Specific Activity (SA) (pmol/min/µg or nmol/min/mg)

Corrected cpm from reaction / [(SA of ³³P-ATP in cpm/pmol) x (Reaction time in minutes) x (Enzyme amount in µg or mg)] x [(Reaction volume) / (Spot Volume)]

Diane Wotta



Quality & Regulatory Affairs