

## Product Information

**DAPK1 (1-363), active, GST-tagged, human  
PRECISIO® Kinase  
recombinant, expressed in *Sf9* cells**

Catalog Number **D7069**  
Lot Number 081M0875  
Storage Temperature  $-70^{\circ}\text{C}$

Synonyms: DAPK, DKFZp781I035

### Product Description

Death-associated protein kinase 1 (DAPK1) is a positive mediator of apoptosis induced by interferon- $\gamma$ . Activation of DAPK occurs via dephosphorylation of Ser<sup>308</sup> and subsequent association of calcium/calmodulin.<sup>1</sup> DAPK is rapidly dephosphorylated in response to tumor necrosis factor or ceramide, and then subsequently degraded via proteasome activity. The decline in DAPK expression is paralleled with increased caspase activity and cell apoptosis. Studies suggest the apoptosis regulatory activities mediated by DAPK are controlled both by phosphorylation status and protein stability.<sup>2</sup>

This recombinant product was expressed by baculovirus in *Sf9* insect cells using an N-terminal GST-tag. The gene accession number is NM 004938. It is supplied in 50 mM Tris-HCl, pH 7.5, with 150 mM NaCl, 0.25 mM DTT, 0.1 mM EGTA, 0.1 mM EDTA, 0.1 mM PMSF, and 25% glycerol.

Molecular mass: ~71 kDa

Purity:  $\geq 70\%$  (SDS-PAGE, see Figure 1)

Specific Activity: 42–57 nmole/min/mg (see Figure 2)

### Precautions and Disclaimer

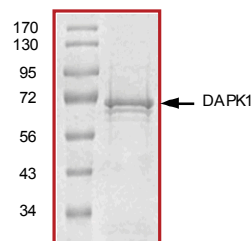
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

### Storage/Stability

The product ships on dry ice and storage at  $-70^{\circ}\text{C}$  is recommended. After opening, aliquot into smaller quantities and store at  $-70^{\circ}\text{C}$ . Avoid repeated handling and multiple freeze/thaw cycles.

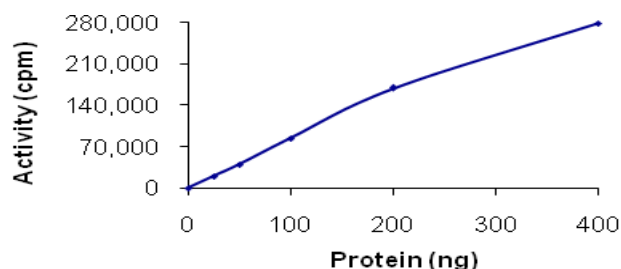
**Figure 1.**

SDS-PAGE Gel of Lot Number 081M0875:  
>80% (densitometry)



**Figure 2.**

Specific Activity of Lot Number 081M0875:  
49 nmole/min/mg



### Procedure

#### Preparation Instructions

Kinase Assay Buffer – 25 mM MOPS, pH 7.2, 12.5 mM glycerol 2-phosphate, 25 mM  $\text{MgCl}_2$ , 5 mM EGTA, and 2 mM EDTA. Just prior to use, add DTT to a final concentration of 0.25 mM.

Kinase Dilution Buffer – Dilute the Kinase Assay Buffer 5-fold with a 50 ng/ $\mu\text{L}$  BSA solution.

Kinase Solution – Dilute the active DAPK1 (0.1 µg/µl) with Kinase Dilution Buffer to the desired concentration. **Note:** The lot-specific specific activity plot may be used as a guideline (see Figure 2). It is recommended the researcher perform a serial dilution of active DAPK1 kinase for optimal results.

10 mM ATP Stock Solution – Dissolve 55 mg of ATP in 10 ml of Kinase Assay Buffer. Store in 200 µl aliquots at –20 °C.

γ-<sup>32</sup>P-ATP Assay Cocktail (250 µM) – Combine 5.75 ml of Kinase Assay Buffer, 150 µl of 10 mM ATP Stock Solution, 100 µl of γ-<sup>32</sup>P-ATP (1 mCi/100 µl). Store in 1 ml aliquots at –20 °C.

Substrate Solution – Dissolve the substrate, myelin basic protein (MBP), in water at a final concentration of 1 mg/ml.

1% phosphoric acid solution – Dilute 10 ml of concentrated phosphoric acid to a final volume of 1 L with water.

#### Kinase Assay

This assay involves the use of the <sup>32</sup>P radioisotope. All institutional guidelines regarding the use of radioisotopes should be followed.

1. Thaw the active DAPK1, Kinase Assay Buffer, Substrate Solution, and Kinase Dilution Buffer on ice. The γ-<sup>32</sup>P-ATP Assay Cocktail may be thawed at room temperature.
2. In a pre-cooled microcentrifuge tube, add the following solutions to a volume of 20 µl:  
 10 µl of Kinase Solution  
 7.5 µl of Substrate Solution  
 2.5 µl of 5 mM CaCl<sub>2</sub> solution containing 0.75 µg Calmodulin
3. Set up a blank control as outlined in step 2, substituting 7.5 µl of cold water (4 °C) for the Substrate Solution.
4. Initiate each reaction with the addition of 5 µl of the γ-<sup>32</sup>P-ATP Assay Cocktail, bringing the final reaction volume to 25 µl. Incubate the mixture in a water bath at 30 °C for 15 minutes.
5. After the 15 minute incubation, stop the reaction by spotting 20 µl of the reaction mixture onto an individually pre-cut strip of phosphocellulose P81 paper.

6. Air dry the pre-cut P81 strip and sequentially wash in the 1% phosphoric acid solution with constant gentle stirring. It is recommended the strips be washed a total of 3 times of ~10 minutes each.
7. Set up a radioactive control to measure the total γ-<sup>32</sup>P-ATP counts introduced into the reaction. Spot 5 µl of the γ-<sup>32</sup>P-ATP Assay Cocktail on a pre-cut P81 strip. Dry the sample for 2 minutes and read the counts. Do not wash this sample.
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 3) from each sample and calculate the kinase specific activity

#### Calculations:

1. Specific Radioactivity (SR) of ATP (cpm/nmole)

$$SR = \frac{\text{cpm of 5 } \mu\text{l of } \gamma\text{-}^{32}\text{P-ATP Assay Cocktail}}{\text{nmole of ATP}}$$

cpm – value from control (step 7)  
 nmole – 1.25 nmole (5 µl of 250 µM ATP Assay Cocktail)

2. Specific Kinase Activity (SA) (nmole/min/mg)

$$\text{nmole/min/mg} = \frac{\Delta\text{cpm} \times (25/20)}{SR \times E \times T}$$

SR = specific radioactivity of the ATP (cpm/nmole ATP)  
 Δcpm = cpm of the sample – cpm of the blank (step 3)  
 25 = total reaction volume  
 20 = spot volume  
 T = reaction time (minutes)  
 E = amount of enzyme (mg)

#### References

1. Deiss, L.P. et al., Identification of a novel serine/threonine kinase and a novel 15 kD protein as potential mediators of the gamma interferon-induced cell death. *Genes Dev.*, **9**, 15-30 (1995).
2. Feinstein, E. et al., Assignment of DAP1 and DAPK: genes that positively mediate programmed cell death triggered by IFN-gamma--to chromosome regions 5p12.2 (sic) and 9q34.1, respectively. *Genomics*, **29**, 305-307 (1995).

PRECISIO is a registered trademark of Sigma-Aldrich Co. LLC.

TD,MAM 09/11-1