

Product Information

PKAc γ Active
human, recombinant
GST-tagged, expressed in Sf9 cells

Catalog Number **K3643**
Lot Number 019K1588
Storage Temperature $-70\text{ }^{\circ}\text{C}$

Synonyms: KAPG; PKAr; cAPK γ

Product Description

PKA C-gamma (PKAc γ) is a third isoform of the catalytic subunit of cAMP-dependent protein kinase. It was isolated from a human testis cDNA library and was clearly derived from a gene distinct from C-alpha and C-beta, and showed tissue-specific expression. Whereas, at the amino acid level C-alpha and C-beta show 93% homology, C-gamma shows only about 80% homology to both C-alpha and C-beta.¹ The PRKACG gene is intronless, contains remnants of a poly(A) tail, is flanked by direct repeats, and is co-linear with the PRKACA gene²

This recombinant product was expressed by baculovirus in Sf9 insect cells using an N-terminal GST-tag. The gene accession number is NM 002732. 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: ~65 kDa

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

Specific Activity: 128–174 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 $-70\text{ }^{\circ}\text{C}$ is recommended. After opening, aliquot into smaller quantities and store at $-70\text{ }^{\circ}\text{C}$. Avoid repeated handling and multiple freeze/thaw cycles.

Figure 1.
SDS-PAGE Gel of Lot Number 019K1588:
>90% (densitometry)

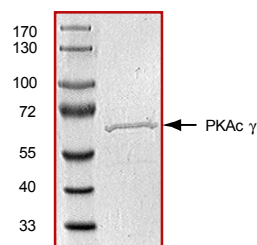
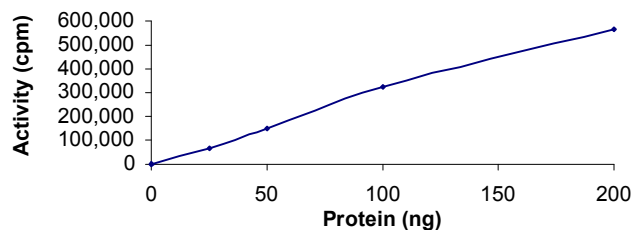


Figure 2.
Specific Activity of Lot Number 019K1588:
145 nmole/min/mg



Procedure

Preparation Instructions

Kinase Assay Buffer – 25 mM MOPS, pH 7.2, 12.5 mM glycerol 2-phosphate, 25 mM MgCl₂, 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/ μ l BSA solution.

Kinase Solution – Dilute the Active PKAC γ (0.1 $\mu\text{g}/\mu\text{l}$) 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 that the researcher perform a serial dilution of Active PKAC γ 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 $-20\text{ }^{\circ}\text{C}$.

γ - ^{32}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 - ^{32}P -ATP (1 mCi/100 μl). Store in 1 ml aliquots at $-20\text{ }^{\circ}\text{C}$.

Substrate Solution – Dissolve the synthetic peptide substrate (KRREILSRPSYR) 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 ^{32}P radioisotope. All institutional guidelines regarding the use of radioisotopes should be followed.

1. Thaw the Active PKAC γ , Kinase Assay Buffer, Substrate Solution, and Kinase Dilution Buffer on ice. The γ - ^{32}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
 - 10 μl of Substrate Solution
3. Set up a blank control as outlined in step 2, substituting 10 μl of cold water ($4\text{ }^{\circ}\text{C}$) for the Substrate Solution.
4. Initiate each reaction with the addition of 5 μl of the γ - ^{32}P -ATP Assay Cocktail, bringing the final reaction volume to 25 μl . Incubate the mixture in a water bath at $30\text{ }^{\circ}\text{C}$ 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 - ^{32}P -ATP counts introduced into the reaction. Spot 5 μl of the γ - ^{32}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)

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

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)

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

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. Beebe, S.J. et al., Molecular cloning of a tissue-specific protein kinase (C gamma) from human testis-representing a third isoform for the catalytic subunit of cAMP-dependent protein kinase. *Molec. Endocr.*, **4**, 465-475 (1990).
2. Reinton, N. et al., The gene encoding the C gamma catalytic subunit of cAMP-dependent protein kinase is a transcribed retroposon. *Genomics*, **49**, 290-297 (1998).

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