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CAMK1, Active

Full-length recombinant protein expressed in E-coli cells

Catalog # C07-10G
Lot #K270-1

Product Description

Recombinant full-length mouse CAMK1 was expressed in E-coli cells using an N-terminal GST tag. The gene accession number is NM_133926.

Gene Aliases

AI505105; D6Ertd263e

Formulation

Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 0.25mM DTT, 0.1mM EGTA, 0.1mM EDTA, 0.1mM PMSF, 25% glycerol.

Storage and Stability

Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles.

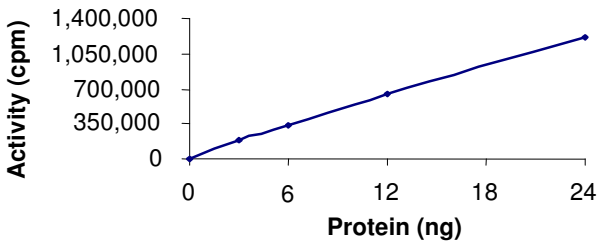
Scientific Background

CAMK1 is a serine/threonine protein kinase that is a member of the multifunctional calcium/calmodulin-dependent protein kinase family. CAMK1 is ubiquitously expressed and phosphorylates a number of proteins including SYN1, SYN2, CREB and CFTR. In addition, Numb family of proteins may also be intracellular targets for CAMK1, and they may also be regulated by phosphorylation-dependent interaction with 14-3-3 protein (1). CAMK1 also plays an important role in the trafficking of HDAC7 between the cytoplasm and the nucleus. CAMK1 phosphorylates HDAC7 on multiple sites that lead to alteration in localization of HDAC7 (2).

References

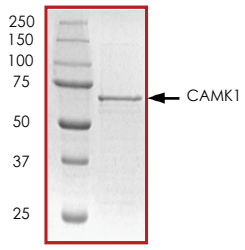
1. Tokumitsu, H. et al: Phosphorylation of Numb family proteins. Possible involvement of Ca2+/calmodulin-dependent protein kinases. J Biol Chem. 2005 Oct 21;280(42):35108-18.
2. Gao, C. et al: CRM1 mediates nuclear export of HDAC7 independently of HDAC7 phosphorylation and association with 14-3-3s. FEBS Lett. 2006 Sep 18;580(21):5096-104.

Specific Activity



The specific activity of CAMK1 was determined to be **3214 nmol /min/mg** as per activity assay protocol.

Purity



The purity of CAMK1 was determined to be **>90%** by densitometry, approx. MW **~70kDa**.

CAMK1, Active

Full-length recombinant protein expressed in E-coli cells

Catalog Number	C07-10G
Specific Activity	3214 nmol/min/mg
Specific Lot Number	K270-1
Purity	>90%
Concentration	0.1 µg/µl
Stability	1yr At –70°C from date of shipment
Storage & Shipping	Store product at –70°C. For optimal storage, aliquot target into smaller quantities after centrifugation and store at recommended temperature. For most favorable performance, avoid repeated handling and multiple freeze/thaw cycles. Product shipped on dry ice.

Activity Assay Protocol

Reaction Components

Active Kinase (Catalog #: C07-10G)

Active CAMK1 (0.1μg/μl) diluted with Kinase Dilution Buffer III (Catalog #: K23-09) and assayed as outlined in sample activity plot. (Note: these are suggested working dilutions and it is recommended that the researcher perform a serial dilution of Active CAMK1 for optimal results).

Kinase Dilution Buffer III (Catalog #: K23-09)

Kinase Assay Buffer I (Catalog #: K01-09) diluted at a 1:4 ratio (5X dilution) with 50ng/μl BSA solution.

Kinase Assay Buffer I (Catalog #: K01-09)

Buffer components: 25mM MOPS, pH 7. 2, 12.5mM β-glycerol-phosphate, 25mM $MgC1_2$, 5mM EGTA, 2mM EDTA. Add 0.25mM DTT to Kinase Assay Buffer prior to use.

[^{32}P]-ATP Assay Cocktail

Prepare 250μM [^{32}P]-ATP Assay Cocktail in a designated radioactive working area by adding the following components: 150μl of 10mM ATP Stock Solution (Catalog #: A50-09), 100μl [^{32}P]-ATP (1mCi/100μl), 5.75ml of Kinase Assay Buffer I (Catalog #: K01-09). Store 1ml aliquots at –20°C.

10mM ATP Stock Solution (Catalog #: A50-09)

Prepare ATP stock solution by dissolving 55mg of ATP in 10ml of Kinase Assay Buffer I (Catalog #: K01-09). Store 200μl aliquots at –20°C.

Substrate (Catalog #: A15-58)

Autocamtide-2 synthetic peptide substrate (KKALRRQETVDAL-amide) diluted in distilled H_2O to a final concentration of 1mg/ml.

Assay Protocol

Step 1. Thaw [^{32}P]-ATP Assay Cocktail in shielded container in a designated radioactive working area.

Step 2. Thaw the Active CAMK1, Kinase Assay Buffer, Substrate and Kinase Dilution Buffer on ice.

Step 3. In a pre-cooled microfuge tube, add the following reaction components bringing the initial reaction volume up to 20μl:

- **Component 1.** 10μl of diluted Active CAMK1 (Catalog #C07-10G)
- **Component 2.** 7.5μl of 1mg/ml stock solution of substrate (Catalog #A15-58)
- **Component 3.** 2.5μl of Ca^{2+}/Calmodulin Solution, 10x (Catalog #C02-39)

Step 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 H_2O.

Step 5. Initiate the reaction by the addition of 5 μl [^{32}P]-ATP Assay Cocktail bringing the final volume up to 25μl and incubate the mixture in a water bath at 30°C for 15 minutes.

Step 6. After the 15 minute incubation period, terminate the reaction by spotting 20 μl of the reaction mixture onto individual pre-cut strips of phosphocellulose P81 paper.

Step 7. Air dry the pre-cut P81 strip and sequentially wash in a 1% phosphoric acid solution (dilute 10ml of phosphoric acid and make a 1L solution with distilled H_2O) with constant gentle stirring. It is recommended that the strips be washed a total of 3 intervals for approximately 10 minutes each.

Step 8. Count the radioactivity on the P81 paper in the presence of scintillation fluid in a scintillation counter.

Step 9. Determine the corrected cpm by removing the blank control value (see Step 4) for each sample and calculate the kinase specific activity as outlined below.

Calculation of [P^{32}]-ATP Specific Activity (SA) (cpm/pmol)

Specific activity (SA) = cpm for 5 μl [^{32}P]-ATP / pmoles of ATP (in 5 μl of a 250 μM ATP stock solution, i.e., 1250 pmoles)

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

Corrected cpm from reaction / [(SA of ^{32}P-ATP in cpm/pmol)*(Reaction time in min)*(Enzyme amount in μg or mg)]*[(Reaction Volume) / (Spot Volume)]

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