

DCAMKL1,	Active
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Full-length recombinant protein expressed in Sf9 cells

Catalog # D14-10G Lot # B2177-6

Product Description

Full-length recombinant human DCAMKL1 was expressed by baculovirus in Sf9 cells using an N-terminal GST tag. The gene accession number is <u>NM_004734</u>.

Gene Aliases

DCLK1; DCDC3A; DCLK; KIAA0369

Formulation

Recombinant protein stored in 50mM Tris-HCl, pH 7.5, 150mM NaCl, 10mM glutathione, 0.1mM EDTA, 0.25mM DTT, 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

DCAMKL1 or doublecortin-like kinase 1 contains two Nterminal doublecortin domains (which bind microtubules and regulate microtubule polymerization), a C-terminal serine/threonine protein kinase domain (which shows substantial homology to Ca2+/calmodulin-dependent protein kinase), and a serine/proline-rich domain in between the doublecortin and the protein kinase domains (which mediates multiple protein-protein interactions) (1). DCAMKL1 is a microtubule-associated kinase that can undergo autophosphorylation. DCAMKL1 has microtubule-polymerizing activity that is independent of its protein kinase activity (2). DCAMKL1 is involved in several different cellular processes, including neuronal migration, retrograde transport, neuronal apoptosis and neurogenesis.

References

- Ohmae, S. et.al: Molecular identification and characterization of a family of kinases with homology to Ca(2+)/calmodulin-dependent protein kinases I/IV. J. Biol. Chem. 281: 20427-20439, 2006.
- 2. Lin, P. T. et,al: DCAMKL1 encodes a protein kinase with homology to doublecortin that regulates microtubule polymerization. J. Neurosci. 20: 9152-9161, 2000.

Specific Activity



The specific activity of DCAMKL1 was determined to be **3.9 nmol** /min/mg as per activity assay protocol.

Purity



The purity was determined to be >95% by densitometry. DCAMKL2 Approx. MW 110kDa.

DCAMKL1, Active

Full-length human recombinant protein expressed in Sf9 cells

Catalog Number	D14-10G
Specific Activity	3.9 nmol/min/mg
Lot #	B2177-6
Purity	>95%
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

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.

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Activity Assay Protocol

Reaction Components

Active Kinase (Catalog #: D14-10G)

Active DCAMKL1 $(0.1\mu g/\mu l)$ diluted with Kinase Dilution Buffer IV (Catalog #: K24-09) 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 DCAMKL1 for optimal results).

Kinase Dilution Buffer IV (Catalog #: K24-09)

Kinase Assay Buffer II (Catalog #: K02-09) diluted at a 1:4 ratio (5X dilution) with final 50ng/µl BSA solution.

Kinase Assay Buffer II (Catalog #: K02-09)

Buffer components: 25mM MOPS, pH 7. 2, 12.5mM β -glycerol-phosphate, 20mM MgC1₂, 12.5mM MnC1₂, 5mM EGTA, 2mM EDTA. Add 0.25mM DTT to Kinase Assay Buffer prior to use.

[³³P]-ATP Assay Cocktail

Prepare 250μ M [³³P]-ATP Assay Cocktail in a designated radioactive working area by adding the following components: 150 μ l of 10mM ATP Stock Solution (Catalog #: A50-09), 100 μ l [³³P]-ATP (1mCi/100 μ l), 5.75ml of Kinase Assay Buffer II (Catalog #: K02-09). 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 II (Catalog #: K02-09). Store 200 μ l aliquots at -20°C.

Substrate (Catalog #: A15-58)

Autocamtide 2 synthetic peptide substrate (KKALRRQ-ETVDAL-amide) diluted in distilled H₂O to a final concentration of 1mg/ml.in distilled H₂O to a final concentration of 1mg/ml.

Assay Protocol

- Step 1. Thaw [³³P]-ATP Assay Cocktail in shielded container in a designated radioactive working area.
- Step 2. Thaw the Active DCAMKL1, 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 DCAMKL1 (Catalog #D14-10G)

- **Component 2.** 5µl of 1mg/ml stock solution of substrate (Catalog #A15-58)
- Component 3. 5µl distilled H₂O (4°C)
- 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 H₂O.
- Step 5. Initiate the reaction by the addition of 5μl [³³P]-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 20µl 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 H₂O) 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 [P³³]-ATP Specific Activity (SA) (cpm/pmol)

Specific activity (SA) = cpm for 5µl [³³P]-ATP / pmoles of ATP (in 5µl of a 250µM ATP stock solution, i.e., 1250 pmoles)

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

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

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