Recombinant Human Active NEK2

Catalog Number: 3706-KS

DESCRIPTION

Source	*Spodoptera frugiperda*, *Sf* 9 (baculovirus)-derived Accession # NM_002497
N-terminal Sequence Analysis	Using an N-terminal GST tag

SPECIFICATIONS

SDS-PAGE	76 kDa
Activity	The activity of NEK2 is typically 237-321 nmol/min/mg using a myelin basic protein (MBP) substrate (see Activity Assay Protocol).
Purity	>70%, by SDS-PAGE under reducing conditions and visualized by Colloidal Coomassie® Blue stain at 5 µg per lane.
Formulation	Supplied in 50 mM Tris-HCl, pH 7.5, 150 mM NaCl, 0.25 mM DTT, 0.1 mM EGTA, 0.1 mM EDTA, 0.1 mM PMSF, 25% glycerol.| See Certificate of Analysis for details.

Activity Assay Protocol

Materials

- Active Kinase - Active NEK2 (0.1 µg/µL) diluted with Kinase Dilution Buffer and assayed as outlined in Figure 2. Note: These are suggested working dilutions. *Optimal dilutions should be determined by each laboratory for each application*.
- Kinase Assay Buffer I, pH 7.2 - 25 mM MOPS, 12.5 mM β-glycerolphosphate, 25 mM $MgCl_2$, 5 mM EGTA, 2 mM EDTA. Add 0.25 mM DTT to the Kinase Assay Buffer prior to use.
- Kinase Dilution Buffer, pH 7.2 - Kinase Assay Buffer I diluted at a 1:4 ratio (5-fold dilution) 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.
- [^{33}P]-ATP Assay Cocktail - Prepare 250 µM [^{33}P]-ATP Assay Cocktail in a designated radioactive work area by combining 150 µL of 10 mM ATP Stock Solution, 100 µL of [^{33}P]-ATP (1 mCi/100 µL), and 5.75 mL of Kinase Assay Buffer I.
- Substrate - Myelin basic protein (MBP) substrate diluted in distilled or deionized water to a final concentration of 1 mg/mL.

Assay

1. Thaw the [^{33}P]-ATP Assay Cocktail in a shielded container in a designated radioactive work area.
2. Thaw the Active NEK2, Kinase Assay Buffer I, Substrate, and Kinase Dilution Buffer on ice.
3. In a pre-cooled microfuge tube, add the following reaction components bringing the initial reaction volume up to 20 µL.
   a. Diluted Active NEK2: 10 µL
   b. Substrate (1 mg/mL Stock Solution): 10 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 by the addition of 5 µL [^{33}P]-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 period, 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 (dilute 10 mL of phosphoric acid and make a 1 liter solution with 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 removing the blank control value (see step 4) for each sample and calculate the kinase specific activity as outlined below:

Calculation of [^{33}P]-ATP Specific Activity (SA) (cpm/pmol)
Specific Activity (SA) = cpm for 5 µL [^{33}P]-ATP/pmol of ATP (in 5 µL of a 250 µM ATP stock solution; *i.e.* 1250 pmol)

Calculation of Kinase Specific Activity (SA) (pmol/minutes/µg or nmol/minutes/mg)
Corrected cpm from reaction / [(SA of ^{33}P-ATP in cpm/pmol) x (Reaction time in minutes) x (Enzyme amount in µg or mg)] x [(Reaction volume) / (Spot Volume)]

PREPARATION AND STORAGE

Shipping	The product is shipped with dry ice or equivalent. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	This product is stable at ≤ -70° C for up to 1 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.**

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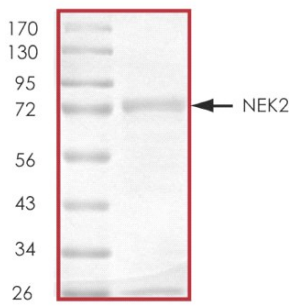
DATA

SDS-PAGE



The approximate molecular weight is 76 kDa and the average purity is 90%.

BACKGROUND

NEK2 is closely related in its catalytic domain to the Serine/Threonine protein kinase NIMA of *Aspergillus nidulans* that is required for entry into mitosis and may function in parallel to the universal mitotic inducer $p34^{cdc2}$. Like NIMA, the NEK2 protein is almost undetectable during G_1 but accumulates progressively throughout S, reaching maximal levels in late G_2 (1). NEK2 is shown to be expressed most abundantly in the testis of the adult tissues examined being localized to the nucleus (2).

References:

1. Schultz, S.J. *et al.* (1994) Cell Growth Differ. **5**:625.
2. Fry, A.M. *et al.* (1995) J. Biol. Chem. **270**:12899.