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ProductInformation

Nek 2, Active
Human, recombinant, expressed in *E. coli*

Product Number **N 4787**
Storage Temperature: -70 °C

Synonyms: Never In Mitosis Gene A-Related Kinase 2; NIMA-Related Kinase 2

Product Description
Nek2 is a cell cycle-regulated protein kinase with maximal activity at the onset of mitosis that localizes to the centrosome. It is closely related to the serine/threonine protein kinase NIMA of *Aspergillus nidulans*, which is required for entry into mitosis. Like NIMA, the Nek2 protein is almost undetectable during G1 but accumulates progressively throughout S, reaching maximal levels in late G2. [1] Recombinant Nek2 is active as a serine/threonine-specific protein kinase and may undergo autophosphorylation. Both human Nek2 and fungal NIMA phosphorylate a similar, but not identical, set of proteins and synthetic peptides.[2] Nek2, is shown to be expressed most abundantly in adult testis.[3] Increased levels of Nek2 protein lead to accumulation of multinucleated cells with supernumerary centrosomes. These data highlight the Nek2 kinase as a potential target for chemotherapeutic intervention in breast cancer.[4] DNA damage results in cell cycle arrest in G2. Damaged cells fail to activate Nek2 and both Nek2 levels and activity are reduced after DNA damage. Thus, centrosome separation and cell growth are impaired in the absence of Nek2.[5]

The product is active recombinant, full-length human Nek2 containing an N-terminal GST tag. It is supplied at a concentration of approximately 100 µg/mL in 50 mM Tris-HCl, pH 7.5, 150 mM NaCl, 0.25 mM DTT, 0.1 mM EGTA and 30% glycerol.

Purity: ≥ 85% (SDS-PAGE)

Molecular weight: ~80 kDa

Specific Activity: ≥ 10 units/mg protein (Bradford). Please refer to the Certificate of Analysis for the lot-specific activity.

Unit Definition: One unit will incorporate one nanomole of phosphate into myelin basic protein (MBP) per minute at 30 °C at pH 7.2 using a final concentration of 50 µM [^{32}P] ATP.

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.

Preparation instructions
For maximum product recovery, after thawing, centrifuge the vial before removing the cap

Storage/Stability
Stable for at least 12 months when stored as undiluted stock at –70 °C. After initial thawing, store in smaller, working aliquots at –70 °C. Use the working aliquots immediately upon thawing. Avoid repeated freeze-thaw cycles to prevent denaturing of the protein. Do not store in a frost-free freezer.

References:
1. Schultz S.J., et al., Cell cycle-dependent expression of Nek2, a novel human protein kinase related to the NIMA mitotic regulator of *Aspergillus nidulans*., Cell Growth Differ., **5,** 625-635 (1994).
2. Fry A. M., et al., Substrate specificity and cell cycle regulation of the Nek2 protein kinase, a potential human homolog of the mitotic regulator NIMA of *Aspergillus nidulans*., J. Biol. Chem., **270,** 12899-12905 (1995).
3. Rhee K. and Wolgemuth D. J., The NIMA-related kinase 2, Nek2, is expressed in specific stages of the meiotic cell cycle and associates with meiotic chromosomes., Development. **124,** 2167-2177 (1997).

4. Hayward, D. G. et al., The centrosomal kinase Nek2 displays elevated levels of protein expression in human breast cancer., Cancer Res., **64**, 7370-7376 (2004).

5. Fletcher, L., et al., Inhibition of centrosome separation after DNA damage: a role for Nek2., Radiat. Res., **162**, 128-135 (2004).

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