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ProductInformation

MAP Kinase, Non-activated
rat, recombinant
expressed in *E. coli*

Product Number **M 9426**
Storage Temperature –20 °C

Synonyms: Mitogen activated protein kinase; MAPK; ERK2; Extracellular-signal regulated kinase
CAS# 137632-08-7

Product Description

This product is a recombinant, rat protein with an N-terminal histidine tag, expressed in *E. coli*. The protein has a molecular mass of approximately 42 kDa. It is expressed in *E. coli* as a non-activated enzyme and can be used for studying MAP kinase activation by MEK kinases.

MAP Kinase, mitogen activated protein kinase, is a central enzyme in the signal transduction cascade which bears its name, the MAP Kinase cascade. This cascade involves activation of several membrane signaling molecules followed by sequential stimulation of several cytoplasmic protein kinases.[1,2] MAP Kinases are activated by many extracellular stimuli that influence cell proliferation including growth factors, cytokines, and hormones.[3] There is a correlation between extracellular agents that lead to cell proliferation and stimulation of the MAPK cascade components.

Activation of MAP Kinases requires phosphorylation of both the threonine and tyrosine residues in the sequence Thr-Glu-Tyr. This phosphorylation is catalyzed by a single specific enzyme, MAP Kinase Kinase (MEK).[4] MEK specifically phosphorylates the native form of MAP Kinase only. Inactivation of ERKs is probably achieved by dephosphorylation of the phosphorylated residues by dual specificity threonine/tyrosine phosphatases such as PAC1 and MKP-1.

The MAP Kinase group of proteins includes several proteins, the most commonly known are the extracellular signal-regulated kinases, ERK1 ($p44^{MAPK}$) and ERK2 ($p42^{MAPK}$).[5] It is now clear that the same pattern of MAPK signaling is used by more than one signaling pathway. The pattern uses the sequential activation of distinct isoforms at each level of the cascade.

The product is supplied as a lyophilized powder containing Tris, pH 7.5, NaCl, and EGTA with DTT and trehalose as stabilizers.

Purity: minimum 95% (SDS-PAGE)

Specific Activity: minimum 500 units/mg protein.

Unit definition: One unit of activated MAP kinase will transfer 1 nmole of phosphate from ATP to myelin basic protein per minute at 30 °C. The non-activated MAP kinase should first be phosphorylated by MEK to yield an active MAP kinase. Then the MAP kinase activity can be determined by phosphorylation of myelin basic protein.

Precautions and Disclaimer

This product is for laboratory research use only. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

The product is soluble in water (200 µg/ml).

Storage/Stability

It is recommended to store the lyophilized product desiccated at –20 °C. Under these conditions it is stable for at least 2 years. After reconstitution, store aliquots at –20 °C for long term storage, and at 4 °C for short term storage, up to 10 days.

References

1. Cano, E., and Mehavedan, L.C., TIBS, **20**, 117-122 (1995).
2. Seger, R., and Krebs, E., FASEB J., **9**, 726-735 (1995).
3. Nebreda, A. N., TIBS, **19**, 1-2 (1994).
4. Ward, Y. et al., Nature, **367**, 651-654 (1994).
5. Craig, M. et al., Biochemistry, **88**, 8845-8849 (1991).

TA/GY/NDH/MAM 2/03