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ProductInformation

Breast Tumor Kinase (BRK), Active
Human, recombinant, expressed in *E. coli*

Product Number **B 9810**
Storage Temperature: -70 °C

Synonyms: Protein Tyrosine Kinase 6; PTK6

Product Description

Breast Tumor Kinase is a member of the non-receptor tyrosine kinases (PTKs). The deduced 451-amino acid polypeptide sequence is composed of 3 domains: an SH3 domain, an SH2 domain, and a catalytic domain. The sequence of BRK, unlike that of Src, does not include an N-terminal myristoylation domain.[1] The genomic structure of BRK consists of 8 exons, whose boundaries are distinct from other non-receptor PTK family members.[2] Alternate splicing of the primary BRK transcript generates a distinct mRNA, which encodes a truncated protein consisting of an SH3 domain and a novel C-terminal proline-rich sequence. BRK transcript is expressed in human breast tumor cell lines and expression of a tumor-derived BRK cDNA in mouse embryonic fibroblasts and human mammary epithelial cells supports anchorage independent growth, and in the latter, potentiates the mitogenic response to epidermal growth factor. BRK is expressed in very high levels in colon, in high levels in small intestine and prostate, and in low levels in some fetal tissues. BRK is not found in normal breast, in heart, brain, placenta, lung, liver, skeletal muscle, kidney and pancreas. However, approximately two-thirds of breast tumors express appreciable levels of BRK and 27% of tumors over-express BRK by fivefold or more (up to 43 times). This expression pattern is mirrored in comparison of cell lines derived either from normal mammary epithelial cells or from carcinomas.[3]

Paxillin is the binding partner and substrate of BRK and BRK mediates epidermal growth factor (EGF)-induced paxillin phosphorylation in a novel signalling pathway by which EGF stimulation activates the catalytic activity of BRK, which in turn phosphorylates paxillin at tyrosine 31 and 118. These phosphorylation events promote the activation of small GTPase Rac1 via the function of adapter protein CrkII . Through this pathway, BRK promotes cell motility and invasion and functions as a mediator of EGF-induced migration and invasion. BRK translocates to membrane ruffles, where it co-localizes with paxillin during cell migration. These findings indicate the first potential link between BRK and metastatic malignancy.[4]

The product is active recombinant, full-length human BRK 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, 0.1 mM EDTA, 0.1 mM PMSF and 25% glycerol.

Purity: ≥ 85% (SDS-PAGE)

Molecular weight: ~80 kDa

Specific Activity: ≥ 50 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 the Poly Glu-Tyr substrate 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. Mitchell P. J., et al., Cloning and characterisation of cDNAs encoding a novel non-receptor tyrosine kinase, brk, expressed in human breast tumours., Oncogene, **9**, 2383-2390 (1994).
2. Mitchell P. J., et al., Characterisation and chromosome mapping of the human non receptor tyrosine kinase gene., brk., Oncogene, **15**, 1497-1502 (1997). Erratum in: Oncogene, **17**,129(1998).
3. Barker K.T., et al., BRK tyrosine kinase expression in a high proportion of human breast carcinomas., Oncogene, **15**, 799-805 (1997).
4. Chen, H. Y. et al., Brk activates rac1 and promotes cell migration and invasion by phosphorylating paxillin., Mol Cell Biol., **24**, 10558-10572 (2004).

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