Recombinant Mouse Pleiotrophin/PTN

Catalog Number: 6580-PL

DESCRIPTION

Source	*Spodoptera frugiperda*, *Sf* 21 (baculovirus)-derived mouse Pleiotrophin/PTN protein Met1-Asp168 Accession # P63089
N-terminal Sequence Analysis	Gly33
Predicted Molecular Mass	15.3 kDa

SPECIFICATIONS

SDS-PAGE	19 kDa, reducing conditions
Activity	Measured by its ability to enhance neurite outgrowth of E16-E18 rat embryonic cerebral cortical neurons. Muramatsu, H. and T. Muramatsu (1991) Biochem. Biophys. Res. Commu. **177**:652. Optimal neurite outgrowth was observed when neurons were plated on 96 well culture plates that had been pre-coated with 100 µL/well of recombinant mouse Pleiotrophin at 3-8 µg/mL.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE under reducing conditions and visualized by silver stain.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100 µg/mL in PBS.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** • 12 months from date of receipt, -20 to -70 °C as supplied. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

Pleiotrophin (PTN), also called heparin-binding growth-associated molecule (HB-GAM), heparin-binding neurotrophic factor (HBNF), heparin-affinity regulatory peptide (HARP), or osteoblast-specific factor (OSF-1), is an 18 kDa secreted, strongly heparin-binding, developmentally regulated cytokine (1 - 3). PTN and midkine share 50% amino acid (aa) sequence identity, share some functions, and constitute a family (1 - 3). The mouse PTN cDNA encodes 168 aa, including a 32 aa signal sequence and two thrombospondin type 1 (TSP1) beta sheet domains separated by a linker and flanked by lysine-rich N- and C-terminal sequences (4). The second TSP1 domain (aa 97 - 129) contains the highest affinity binding site for heparin (4, 5). A 15 kDa form which lacks the C-terminus is mitogenic for glioblastoma cells, while full-length PTN is not (6). PTN is a highly conserved protein; human, mouse, rat, canine, porcine, equine and bovine PTN share 98% aa sequence identity or greater. During development, PTN is involved in development of brain, bone, and organs undergoing branching morphogenesis (3). In the adult, it is induced by PDGF and upregulated in many cancers, hematopoietic stem cells and tissues undergoing remodeling (7 - 10). Cell surface receptors for PTN include Syndecan-3 (which mediates neurite outgrowth) and the receptor tyrosine phosphatase PTPRB, also called RPTPβ/ζ (3, 11 - 13). Heparin binding is necessary for engaging these receptors (7, 8). PTN causes PTPRB dimerization and inactivates its phosphatase activity, which allows increased tyrosine phosphorylation of its substrates (12 - 14). One such substrate is the WNT pathway molecule β-catenin, allowing crosstalk of PTN with WNTs (12). PTN activation of the receptor ALK (anaplastic lymphoma kinase) is indirect through PTPRB, and mediates mitogenic, transforming and angiogenic activities of PTN (2, 5, 6, 13). Increased expression of PTN is correlated with neuronal development or stresses such as brain ischemia and Parkinson's disease (2, 3, 7, 8). Both PTN and midkine have demonstrated bactericidal activity, but only in the absence of heparin (15).

References:

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