Recombinant Human BMP-3

Catalog Number: 113-BP

DESCRIPTION

Source	*E. coli*-derived Gln363-Arg472, with an N-terminal Met Accession # P12645.1
N-terminal Sequence Analysis	Met
Structure / Form	Disulfide-linked homodimer
Predicted Molecular Mass	12.5 kDa (monomer)

SPECIFICATIONS

Activity	Measured by its ability to inhibit BMP-2-induced activity in MC3T3-E1 mouse preosteoblast cells. Daluiski, A. *et al.* (2001) Nature Genetics **27**:84. 30 µg/mL of hBMP-3 will antagonize hBMP-2 (0.25 µg/mL) induction of alkaline phosphatase in MC3T3E1 cells by >50%.
Endotoxin Level	<0.10 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 Acetonitrile and TFA with BSA as a carrier protein. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 1 mg/mL in sterile 35% Acetonitrile and 0.1% TFA containing at least 0.1% human or bovine serum albumin.
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

BMP-3, also known as osteogenin, the most abundant BMP in adult bone, is one of at least 15 structurally and functionally related BMPs, which are members of the TGF- β superfamily (1 - 3). BMPs were originally identified as protein regulators of cartilage and bone formation. They have since been shown to be involved in embryogenesis and morphogenesis of various tissues and organs. BMPs also regulate the growth, differentiation, chemotaxis, and apoptosis of various cell types. Similar to most other TGF-β family proteins, BMPs are highly conserved across animal species. At the amino acid sequence level, mature human and rat BMP-3 are 98% identical. BMP-3 is synthesized as a large precursor protein that is cleaved at the dibasic cleavage site (RXXR) to release the carboxy-terminal domain. Biologically active BMP-3 is a disulfide-linked homodimer of the carboxy-terminal 110 amino acid residues that contains the characteristic seven conserved cysteine residues involved in the formation of the cysteine knot and the single interchain disulfide bond (4). The role of BMP-3 in bone is contradictory since, unlike osteogenin purified from bone, recombinant BMP-3 has not shown osteogenic function (5). Several studies indicate that BMP-3 is an inhibitor of osteogenic BMPs. BMP-3 dorsalizes *Xenopus* embryos, the opposite effect of BMP-2 or 4, which cause ventralization. BMP-3 inhibits alkaline phosphatase production and induction of osteoblastic target genes in undifferentiated mesenchymal and osteogenic cell lines that have been treated with BMP-2. BMP-3 also induces the expression of TGF-β /activin responsive genes, but not BMP-responsive genes. Since the inhibitory effect is not due to direct competition with osteogenic BMPs, it has been suggested that BMP-3 activates signaling through an activin pathway, resulting in antagonism of osteogenesis induced by other BMPs.

References:

1. Chen, D. *et al.* (2004) Growth Factors **22**:233.
2. Hino, J. *et al.* (2004) Front. Biosci. **9**:1520.
3. Bahamonde, M.E. and K.M. Lyons (2001) J. Bone and Joint Surgery **83-A** (suppl 1):S156.
4. Wozney, J.M. *et al.* (1998) Science **242**:1528.
5. Daluiski, A. *et al.* (2001) Nature Genetics **27**:84.

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USA TEL 800 343 7475 Canada TEL 855 668 8722 China TEL +86 (21) 52380373
Europe | Middle East | Africa TEL +44 (0)1235 529449