

Product Information

Bone Morphogenetic Protein 7 human

recombinant, expressed in CHO cells
cell culture tested

Catalog Number **B1434**

Storage Temperature -20°C

Synonyms: BMP-7; Osteogenic protein 1; OP-1

Product Description

Bone Morphogenetic Protein 7 (BMP-7) is produced from a DNA sequence encoding the signal peptide and propeptide of human BMP-2 (amino acids 1–282) fused to the human BMP-7 mature chain (amino acids 293–431).¹ It is expressed in a CHO (Chinese hamster ovary) cell line. Mature human BMP-7, generated by the proteolytic removal of the signal peptide and propeptide, is a disulfide-linked homodimeric protein consisting of two 139 amino acid subunits. Each monomer has a calculated molecular mass of 15.7 kDa. Due to glycosylation, the recombinant protein migrates at 30–40 kDa under non-reducing conditions and 18–20 kDa under reducing conditions in SDS-PAGE. Mature human and mouse BMP-7 shares 98% amino acid sequence identity.

Bone Morphogenetic Protein 7 (BMP-7), or osteogenic protein 1 (OP-1), is one of at least 15 structurally and functionally related BMPs, which are members of the TGF- β superfamily of cytokines that affect bone and cartilage formation.^{2–4} Originally identified as protein regulators of cartilage and bone organs, it has been shown that BMPs are also involved in embryogenesis and morphogenesis of various tissues and organs. Similar to other TGF- β family proteins, BMPs are highly conserved across animal species. Mature BMPs are 30–38 kDa proteins that assume a TGF- β -like cysteine knot configuration. Unlike TGF- β , BMPs do not form latent complexes with their propeptide counterparts. Most BMPs are homodimers, but bioactive natural heterodimers have been reported.

BMPs create an environment conducive for bone marrow development by stimulating the production of specific bone matrix proteins and altering stromal cell and osteoclast proliferation.^{5,6} In addition to stimulating ectopic bone and cartilage development, BMPs may be an important factor in the development of the viscera.

BMPs regulate the growth, differentiation, chemotaxis, proliferation, and apoptosis of various cell types (including mesenchymal cells, epithelial cells, hematopoietic cells, and neuronal cells).^{2,7} BMPs also appear to be responsible for normal dorsal/ventral patterning and can be found in tissues that induce bone or cartilage growth, such as demineralized bone and urinary epithelium. Recently it was found that lovastatin (Mevinolin, Catalog Number M2147), widely used for lowering cholesterol, also increases bone formation by turning on a gene (*bmp-2*) that promotes local bone formation.⁸

BMP-2, BMP-4, and BMP-7 induce expression of adrenergic sympathetic neurons.⁹ BMP-7, in the presence of nerve growth factor (NGF), promotes selective dendritic outgrowth from sympathetic neurons.¹⁰ Cellular responses to BMP-7 are mediated by the formation of hetero-oligomeric complexes of type I and type II serine/threonine kinase receptors,¹¹ which play significant roles in BMP binding and signaling. Two BMP type I receptors and one BMP type II receptor have been identified.

Reagent

Supplied as a lyophilized powder from a 0.2 μm filtered solution in 35% acetonitrile and 0.1% trifluoroacetic acid (TFA) containing 50 μg bovine serum albumin per 1 μg cytokine.

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

Reconstitute the contents of the vial using sterile 4 mM HCl containing at least 0.1% human serum albumin or bovine serum albumin. Prepare a stock solution ≥ 10 $\mu\text{g}/\text{ml}$.

Storage/Stability

Store the product at -20 °C.

Upon reconstitution, this product may be stored at 2-8 °C for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing is not recommended. Do not store in a frost-free freezer.

Product Profile

Activity is measured by its ability to induce alkaline phosphatase production by mouse ATDC-5 chondrogenic cells.

ED₅₀: typically 0.2-0.6 µg/ml

The ED₅₀ is defined as the effective concentration of growth factor that elicits a 50 % increase in cell growth in a cell based bioassay.

Purity: >95% (SDS-PAGE)

Endotoxin level: <0.1 ng/µg of cytokine (Limulus amoebocyte lysate [LAL] method)

References

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