

# BMP 7 Human

*Bone Morphogenetic Protein-7 Human Recombinant*  
CYK0084

## Product Overview

Name BMP 7 Human

### Description

Bone Morphogenetic Protein-7 Human Recombinant

Accession (Primary) [P18075](#)

### Synonyms

Osteogenic Protein 1, BMP-7.

### Introduction

The bone morphogenetic proteins (BMPs) are a family of secreted signaling molecules that can induce ectopic bone growth. Many BMPs are part of the transforming growth factor-beta (TGFB) superfamily. BMPs were originally identified by an ability of demineralized bone extract to induce endochondral osteogenesis in vivo in an extraskeletal site. Based on its expression early in embryogenesis, the BMP encoded by this gene has a proposed role in early development. In addition, the fact that this BMP is closely related to BMP5 and BMP7 has lead to speculation of possible bone inductive activity.

### Source

HEK.

### Physical Appearance

Sterile Filtered White lyophilized (freeze-dried) powder.

### Formulation

The BMP7 was lyophilized from 1mg/ml in 1xPBS.

### Stability

Lyophilized BMP7 although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution BMP-7 should be stored at 4°C between 2-7 days and for future use below -18°C. For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.

### Purity

Greater than 95% as observed by SDS-PAGE.

### Amino acid sequence

DFSLDNEVHSSFIHRRRLRSQERREMQREILSILGLPHRPRPHLQGKHNSAPMFMLDLYNAM  
AVEEGGGPGGQGFSSYPYKAVFSTQGPPPLASLQDSHFLTDADMVMSFVNLV EHDKEFFHPR

YHHRFRFDLSKIPEGEAVTAAEFRIYKDYIRERFDNETFRISVYQVLQEHLGRESDFLDSRTLWASE  
EGWLVDITATSNHVVNPRHNLGLQLSVETLDGQSINPKLAGLGRHGPQNKQPFMVAFFKAT.

### **Biological Activity**

The specific activity was determined by the dose dependent induction of alkaline phosphatase production in the ATDC-5 cell line (Mouse chondrogenic cell line) and is typically 50-250ng/ml.

### **Solubility**

It is recommended to reconstitute the lyophilized BMP-7 in sterile water not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.

### **Background**

**BMP-7 Bone Morphogenetic Protein-7 Human Recombinant: A Key Regulator of Osteogenesis and Beyond Abstract:** BMP-7 (Bone Morphogenetic Protein-7), also known as Osteogenic Protein 1 or BMP-7, is a potent growth factor that plays a crucial role in various biological processes, particularly in osteogenesis and tissue regeneration. This research paper aims to comprehensively explore the molecular characteristics, signaling pathways, and diverse physiological functions of BMP-7. Additionally, it investigates the therapeutic implications of BMP-7 in different disorders. Synonyms such as Osteogenic Protein 1 and BMP-7 associated with the protein are discussed throughout the paper to highlight their relevance in scientific literature. **Introduction:** BMP-7, also known as Osteogenic Protein 1 or BMP-7, is a growth factor with multifaceted roles in osteogenesis, tissue regeneration, and disease. This section introduces BMP-7 and its synonyms, highlighting their significance and relevance in scientific research. **Molecular Characteristics of BMP-7:** This section explores the molecular characteristics of BMP-7, including its primary amino acid sequence, protein structure, post-translational modifications, and binding partners. The importance of these factors in determining BMP-7's biological activity and receptor specificity is discussed. **Signaling Pathways Activated by BMP-7 :** BMP-7 activates specific signaling pathways upon binding to its receptors, leading to diverse cellular responses. This section focuses on the canonical BMP signaling pathway, highlighting the activation of Smad-dependent and Smad-independent pathways. The downstream effectors and transcriptional regulators involved in mediating BMP-7's cellular responses are also discussed. **Physiological Functions of BMP-7 :** BMP-7 plays critical roles in various physiological processes, particularly in osteogenesis and tissue regeneration. This section provides an in-depth analysis of BMP-7's contributions to these processes, emphasizing its role in promoting bone formation, cartilage development, renal function, and wound healing. **Therapeutic Implications of BMP-7 :** The unique properties of BMP-7 make it a promising therapeutic candidate for various disorders. This section discusses the potential applications of BMP-7 in bone regeneration, cartilage repair, kidney disease, and tissue engineering. The challenges and future directions in utilizing BMP-7 as a therapeutic agent are also explored. **BMP-7 in Disease Progression:** BMP-7 is implicated in the progression of certain diseases, including fibrosis, cancer, and cardiovascular disorders. This section examines the role of BMP-7 in tissue fibrosis, tumor progression, angiogenesis, and cardiac remodeling. The therapeutic implications and targeting of BMP-7 in disease management are also discussed. **Conclusion:** BMP-7, also known as Osteogenic Protein 1 or BMP-7, is a critical growth factor involved in osteogenesis, tissue regeneration, and disease progression. Understanding the molecular characteristics, signaling pathways, and physiological functions of

BMP-7 contributes to the exploration of its therapeutic potential in various disorders.

### Precautions

BMP 7 Human is for research use only and not for use in diagnostic or therapeutic procedures.

## Target Information: ( [P18075](#) )

## Background

Bone Morphogenetic Protein-7 Human Recombinant: A Comprehensive Review Abstract: Bone Morphogenetic Protein-7 (BMP-7) is a crucial member of the transforming growth factor-beta (TGF- $\beta$ ) superfamily with diverse roles in development, tissue repair, and regeneration. This research paper provides a comprehensive review of BMP-7 Human Recombinant, focusing on its structure, signaling pathways, and diverse functions. Additionally, the paper explores the therapeutic potential of BMP-7 modulation. Introduction: BMP-7 is a multifunctional growth factor that plays a significant role in skeletal development and tissue homeostasis. This paper aims to provide an extensive review of BMP-7 Human Recombinant, highlighting its importance in various biological processes and its potential therapeutic applications. Structure and Function of BMP-7: BMP-7 is a disulfide-linked homodimeric protein composed of two subunits. It binds to specific cell surface receptors, activating downstream signaling pathways, including the Smad pathway and non-Smad signaling cascades. These pathways regulate cellular processes such as proliferation, differentiation, and apoptosis. Skeletal Development and Regeneration: BMP-7 is a key regulator of bone formation and remodeling. It promotes osteoblast differentiation and bone mineralization, contributing to skeletal development and repair. BMP-7 also plays a role in cartilage formation and chondrogenesis. Tissue Repair and Regeneration: Beyond its skeletal functions, BMP-7 is involved in tissue repair and regeneration in various organs, including the kidney, liver, and heart. It promotes the regeneration of damaged tissues by stimulating cell proliferation, angiogenesis, and extracellular matrix remodeling. Therapeutic Potential: Due to its regenerative and reparative properties, BMP-7 has attracted significant attention as a potential therapeutic agent. It has been investigated for its applications in bone regeneration, cartilage repair, and the treatment of kidney and liver diseases. Clinical trials exploring the therapeutic efficacy of BMP-7 are ongoing. Challenges and Future Perspectives: Despite the promising therapeutic potential of BMP-7, challenges remain, including optimizing its delivery systems, understanding its dosage and duration of treatment, and managing potential side effects. Future research should focus on unraveling the intricate mechanisms of BMP-7 signaling, developing targeted therapies, and enhancing its clinical applications.

### *References for protein:*

1. Title: Pulpal and periapical response of dogs' teeth after pulpotomy and use of recombinant human bone morphogenetic protein-7 as a capping agent Publications: J Dent Child 74 (2007): 79-84. Link: [http://www.researchgate.net/profile/Francisco\\_Paula-Silva/publication/5374974\\_Pulpal\\_and\\_periapical\\_response\\_of\\_dogs'\\_teeth\\_after\\_pulpotomy\\_and\\_use\\_of\\_recombinant\\_human\\_bone\\_morphogenetic\\_protein-7\\_as\\_a\\_capping\\_agent/links/5413605e0cf2788c4b359755.pdf](http://www.researchgate.net/profile/Francisco_Paula-Silva/publication/5374974_Pulpal_and_periapical_response_of_dogs'_teeth_after_pulpotomy_and_use_of_recombinant_human_bone_morphogenetic_protein-7_as_a_capping_agent/links/5413605e0cf2788c4b359755.pdf)

2. Title: Pretreatment with Bone Morphogenetic Protein-7 (BMP-7) Mimics Ischemia Preconditioning Following Intestinal Ischemia/Reperfusion Injury in The Intestine and Liver Publications: Shock (Augusta, Ga.) 30.5 (2008): 532. Link: BMP 7 prospec publication

3. Title: BMP-7 blocks mesenchymal conversion of mesothelial cells and prevents peritoneal damage induced by dialysis fluid exposure Publication: Nephrology Dialysis Transplantation (2010): gfp618. Link: BMP 7 Human prospec publication