Recombinant Human BMP-4 Protein

Product Name

Recombinant Human BMP-4 Protein

Size / Catalog Number

50μg / TL607-0050

Product Information

Synonyms: Bone Morphogenetic Protein-4, BMP-2B, DVR4

Accession: UniProt P12644

Expressed Region: Ser293-Arg408

Tag: Tag free

Predicted Expression system: HEK293 cells

Molecular weight: 26.2 kDa (Non-reduced SDS-PAGE)

Purity: > 90% as determined by SDS-PAGE

Endotoxin: < 0.1 EU per 1 μg of protein (LAL method)

Activity: Determined by its ability to induce alkaline phosphatase production in ATDC-5 cells, the ED_{50} is ≤ 100 ng/mL.

Form: Lyophilized from sterile PBS (pH7.4), typically supplemented with 6% mannitol as a protectant.

Background

BMP-4 is a disulfide-stabilized homodimeric growth factor and core member of the Bone Morphogenetic Protein (BMP) subfamily within the TGF-β superfamily. It specifically binds type I (BMPR1A) and type II (BMPR2) receptors to activate SMAD1/5/8-SMAD4 signaling, precisely governing mesodermal lineage commitment, neurogenesis, and angiogenesis. This protein induces osteogenic differentiation of mesenchymal stem cells via Runx2/Osterix transcriptional programs and coordinates with PTHRP to regulate mammary ductal morphogenesis and hair follicle suppression. Its activity is tightly modulated by extracellular antagonists (e.g., Noggin/Chordin), with dysregulation linked to pathologies like Fibrodysplasia Ossificans Progressiva (FOP). For cell therapy applications, BMP-4 serves as a pivotal differentiation inducer with dual functions: 1) Temporal gradient dosing in 3D hiPSC cultures efficiently generates mesodermal progenitors for cardiac regenerative therapies; 2) Synergy with ROCK inhibitors to engineer vascular networks in organoids, enhancing *in vivo* integration and vascularization of osteochondral grafts. Produced via mammalian cell transient transfection and chromatographic purification, this product retains native dimeric conformation and full bioactivity.

Stability & Storage

Lyophilized powder: Stable for 12 months at -80°C or 6 months at -20°C when stored in the original sealed container under desiccant.

Reconstitution: Dissolve in sterile water for injection, 0.9% NaCl, or PBS (pH7.4), maintaining a final concentration ≥ 100 μg/mL to prevent adsorption.

Handling: Aliquot to avoid repeated freeze-thaw cycles.

References

1. van den Wijngaard A, Weghuis DO, Boersma CJ, *et al*. Fine mapping of the human bone

morphogenetic protein-4 gene (BMP4) to chromosome 14q22-q23 by in situ hybridization. Genomics.

2. Oida S, Iimura T, Maruoka Y, *et al*. Cloning and sequence of bone morphogenetic protein 4 (BMP-4) from a human placental cDNA library. DNA Seq. 1995;5(5):273-5.

3. Knöchel S, Dillinger K, Köster M, *et al*. Structure and expression of Xenopus tropicalis BMP-2 and BMP-4 genes. Mech Dev. 2001 Nov;109(1):79-82.

4. Cha M, Han N, Pi J, *et al*. Expression and Purification of Biologically Active Human Bone Morphogenetic Protein-4 in Recombinant Chinese Hamster Ovary Cells. J Microbiol Biotechnol. 2017 Jul 28;27(7):1281-1287.

Intended Us

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