Recombinant Human BMP-4 GMP

Catalog Number: 314-GMP

DESCRIPTION

Source	Mouse myeloma cell line, NS0-derived human BMP-4 protein Ser293-Arg408 Accession # Q53XC5 Manufactured and tested under current Good Manufacturing Practice (GMP) guidelines.
N-terminal Sequence Analysis	Ser_{293}-Pro-Lys-His-His-Ser-Gln-Arg-Ala-Arg
Structure / Form	Disulfide-linked homodimer
Predicted Molecular Mass	13 kDa (monomer)

SPECIFICATIONS

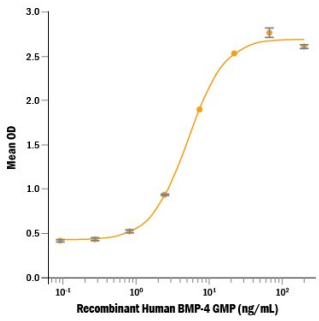
SDS-PAGE	22-25 kDa, reducing conditions 37-41 kDa, non-reducing conditions
Activity	Measured by its ability to induce alkaline phosphatase production by ATDC5 mouse chondrogenic cells. Binnerts, M.E. *et al.* (2004) Biochem. Biophys. Res. Commun. **315(2)**:272. The ED_{50} for this effect is 2.5-15 ng/mL.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE with silver staining, under reducing conditions.
Host Cell Protein	< 5.0 ng per µg of protein when tested by ELISA.
Mycoplasma	Negative when tested in a ribosomal RNA hybridization assay.
Adventitious Virus	Master Cell Bank tested for adventitious viruses
Formulation	Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 50-200 µg/mL in 4 mM HCl.
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.** • A minimum of 6 months when stored at ≤ -20 °C as supplied. Refer to lot specific COA for the Use by Date. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, -70 °C under sterile conditions after reconstitution.

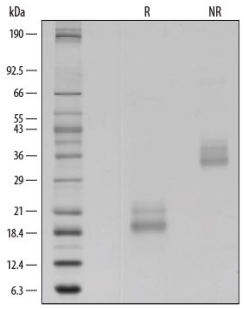
DATA

Bioactivity



GMP-grade Recombinant Human BMP-4 (Catalog # 314-GMP) induces alkaline phosphatase production in the ATDC5 mouse chondrogenic cell line. The ED_{50} for this effect is 2.5-15 ng/mL.

SDS-PAGE



1 µg/lane of GMP-grade Recombinant Human BMP-4 (Catalog # 314-GMP) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by silver staining, showing bands at 19 and 21 kDa, and 35 and 38 kDa, respectively.

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BACKGROUND

BMP-4 is a TGF-β superfamily ligand that is widely expressed from early embryogenesis through adulthood. It plays an important role in mesenchyme formation, epidermal determination, suppression of neural induction, the development of multiple organs, and tissue repair (1-5). The human BMP-4 precursor contains a 273 amino acid (aa) propeptide and a 116 aa mature protein (6). Processing of the propeptide by furin or proprotein convertase 6 enables the formation of the mature disulfide-linked homodimeric BMP-4 and facilitates its secretion. Similar intracellular processes may lead to the formation and recreation of BMP4/BMP7 disulfide-linked heterodimer (7-9). Mature human and mouse BMP-4 share 98% aa sequence identity. Human BMP-4 shares 85% aa sequence identity with human BMP-2 and less than 50% with other human BMPs. Compared to BMP-4 homodimers, BMP-4/BMP-7 heterodimers exhibit a greater potency in inducing osteogenic differentiation (9). In Xenopus, the heterodimers can also induce the formation of mesoderm, whereas BMP-4 homodimers only provide ventralizing signals for existing mesoderm (10). BMP-4 signals through tetrameric complexes composed of type I (primarily Activin RIA or BMPR-IA) and type II (primarily Activin RIIA or BMPR-II) receptors (11, 12). The bioavailability of BMP-4 is regulated by its interaction with multiple proteins and glycosaminoglycans (13-15).

References:

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2. Gambaro, K. *et al.* (2006) Cell Death Differ. **13**:1075.
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MANUFACTURING SPECIFICATIONS

GMP Proteins

R&D Systems, a Bio-Techne Brand's GMP proteins are produced according to relevant sections of the following documents: WHO TRS, No. 822, 1992 Annex 1, Good Manufacturing Practices for Biological Products; USP Chapter 1043, Ancillary Materials for Cell, Gene and Tissue-Engineered Products and USP Chapter 92, Growth Factors and Cytokines Used in Cell Therapy Manufacturing.

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- Monitoring of stability over product shelf-life

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- Post-bottling lot-specific bioassay results (compliance with an established range) and results of microbial bioburden testing (using broth culture, Sabourand's dextrose and blood agar plates with results reported at 3 days and at 7 days)
- Host Cell Protein testing performed by ELISA
- Mycoplasma testing by ribosomal RNA hybridization assay

Additional testing and documentation requested by the customer can be arranged at an additional cost. Testing may include, but is not limited to, USP< 61> bioburden testing, positive identity testing, testing for adventitious agents and testing for residual host cell content.

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