Recombinant Human BMP-4
E. coli-expressed

Catalog Number: 314-BPE

DESCRIPTION

Source	*E. coli*-derived human BMP-4 protein Lys303-Arg408 Accession # P12644.1
N-terminal Sequence Analysis	Lys303
Structure / Form	Disulfide-linked homodimer
Predicted Molecular Mass	12 kDa

SPECIFICATIONS

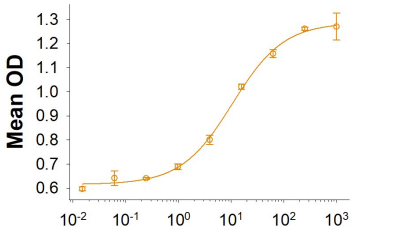
SDS-PAGE	8-9 kDa, under reducing conditions
Activity	Measured by its ability to induce alkaline phosphatase production by ATDC5 mouse chondrogenic cells. Binnerts, M.E. *et al.* (2004) Biochem. Biophys. Res. Commun. **315(2)**:272. The ED_{50} for this effect is 6-48 ng/mL.
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
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 100 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.** • 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, -70 °C under sterile conditions after reconstitution.

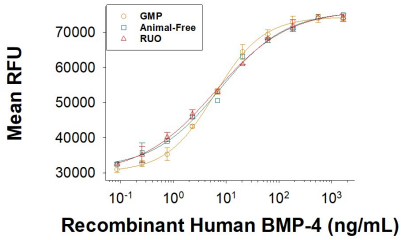
DATA

Bioactivity



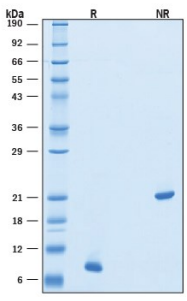
Recombinant Human BMP-4 (E. coli-expressed) Protein Bioactivity Recombinant Human BMP-4 (*E. coli*-expressed) (Catalog # 314-BPE) induces alkaline phosphatase production in ATDC5 mouse chondrogenic cell line. The ED_{50} for this effect is 6-48 ng/mL.

Bioactivity



Equivalent Bioactivity of GMP, Animal-Free, and RUO grades of Recombinant Human BMP-4. Equivalent bioactivity of GMP (Catalog # 314-GMP), Animal-Free (Catalog # AFL314E) and RUO (Catalog # 314-BPE) grades of Recombinant Human BMP-4 as measured by its ability to induce BMP responsive SEAP reporter activity in HEK293 human embryonic kidney cells (orange, green, red, respectively).

SDS-PAGE



Recombinant Human BMP-4 (E. coli-expressed) Protein SDS-PAGE 2 µg/lane of Recombinant Human BMP-4 (*E. coli*-expressed) (Catalog # 314-BPE) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by Coomassie® Blue staining, showing major bands at 9 kDa and 21 kDa, respectively.

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BACKGROUND

Bone morphogenetic protein 4 (BMP-4) is a TGF-beta 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). It is an integral part of many stem cell differentiation pathways, including lung tissue, (6), adipogenesis (7) and osteogenesis (8, 9). The human BMP-4 precursor contains a 273 amino acid (aa) propeptide and a 116 amino acid (aa) mature protein (10). 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 (11-13). 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. In Xenopus, BMP-4 dimers provide ventralizing signals for existing mesoderm (14). 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 (15, 16). The bioavailability of BMP-4 is regulated by its interaction with multiple proteins and glycosaminoglycans (17-19).

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