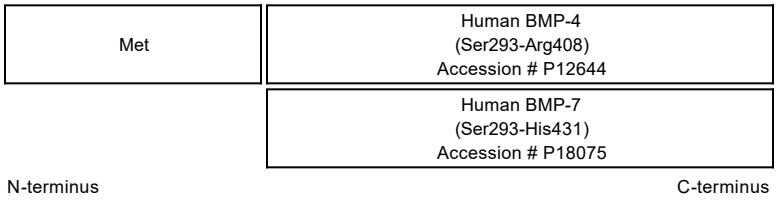
Recombinant Human BMP-4/BMP-7 Heterodimer

Catalog Number: 3727-BP/CF

DESCRIPTION

Source *E. coli*-derived



N-terminal Sequence Analysis	Met (BMP-4) & Ser293 (BMP-7)
Structure / Form	Disulfide-linked heterodimer
Predicted Molecular Mass	13.3 kDa (BMP-4), 15.8 kDa (BMP-7)

SPECIFICATIONS

Activity	Measured by its ability to induce alkaline phosphatase production by ATDC5 mouse chondrogenic cells. Nakamura, K. *et al.* (1999) Exp. Cell Res. **250**:351. The ED_{50} for this effect is 15-75 ng/mL.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE under reducing conditions and visualized by silver stain.
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 sterile 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, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

Human Bone Morphogenetic Protein 4 and 7 (BMP-4 and BMP-7), also known as osteogenic protein 1 (OP-1), belong to distinct BMP subgroups of the TGF-β superfamily and signal through heterodimeric complexes composed of type I and type II BMP receptors. BMP-4 and BMP-7 are widely expressed from early embryogenesis to adult and influence a variety of morphogenic processes (1-3). The human BMP-4 cDNA encodes a 408 amino acid (aa) precursor that includes a 19 aa signal sequence, a 273 aa propeptide, and a 116 aa mature protein (4). The human BMP-7 cDNA encodes a 431 aa precursor that includes a 29 aa signal sequence, a 263 aa propeptide, and a 139 aa mature protein (5). BMP propeptides are removed intracellulaly by proteolysis, enabling mature BMPs to form active disulfide linked homodimers or heterodimers (1). Cell types that express both BMP components can produce the heterodimers. BMP-4 and BMP-7 are each 98% conserved between human and mouse. Human BMP-4 shares 85% aa sequence identity with human BMP-2 and less than 50% aa sequence identity with other BMPs. Human BMP-7 shares approximately 60 - 70% aa sequence identity with BMP-5, -6, and -8 and less than 50% aa sequence identity with other BMPs. BMP-4 and BMP-7, when associated into 36 kDa heterodimers (6, 7), acquire increased potency in *in vitro* osteogenic differentiation assays and *in vivo* bone formation models compared to either homodimer (6-10). Furthermore, BMP-4/BMP-7 heterodimers induce ventral mesoderm and blood formation in mid-blastula *Xenopus* animal cap assays, whereas the homodimers do not (11, 12). BMP-4/BMP-7 as well as either homodimer can modulate mesoderm induction by activin and prevent subsequent dorsalization of the mesoderm (12).

References:

1. Chen, D. *et al.* (2004) Growth Factors **22**:233.
2. Miyazono, K. *et al.* (2005) Cytokine Growth Factor Rev. **16**:251.
3. Simic, P. and S. Vukicevic (2005) Cytokine Growth Factor Rev. **16**:299.
4. Oida, S. *et al.* (1995) DNA Seq. **5**:273.
5. Ozkaynak, E. *et al.* (1990) EMBO J. **9**:2085.
6. Aono, A. *et al.* (1995) Biochem. Biophys. Res. Commun. **210**:670.
7. Hazama, M. *et al.* (1995) Biochem. Biophys. Res. Commun. **209**:859.
8. Kusumoto, K. *et al.* (1997) Biochem. Biophys. Res. Commun. **239**:575.
9. Zhao, M. *et al.* (2005) J. Cell Biochem. **95**:1.
10. Israel, D.I. *et al.* (1996) Growth Factors **13**:291.
11. Suzuki, A. *et al.* (1997) Biochem. Biophys. Res. Commun. **232**:153.
12. Nishimatsu, S. and G.H. Thomsen (1998) Mech. Dev. **74**:75.

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