

DESCRIPTION

Source Chinese Hamster Ovary cell line, CHO-derived
Gln283-Arg396
Accession # P12643

Structure / Form Disulfide-linked homodimer

Predicted Molecular Mass 13 kDa (monomer)

SPECIFICATIONS

SDS-PAGE 15-16 kDa, 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 ED₅₀ for this effect is typically 40-200 ng/mL.

Endotoxin Level <1.0 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 with BSA as a carrier protein. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Reconstitute at 100 µg/mL in sterile 4 mM HCl containing at least 0.1% human or bovine serum albumin.

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.

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BACKGROUND

Bone morphogenetic protein 2 (BMP-2) is a member of the BMP subgroup of the TGF-β superfamily. It plays a dominant role in embryonic dorsal-ventral patterning, organogenesis, limb bud formation, and bone formation and regeneration (1, 2). Human BMP-2 is synthesized as a 396 amino acid (aa) preproprotein that contains a 23 aa signal sequence, a 259 aa prosegment, and a 114 aa mature region (3). Proteolytic removal of the propeptide enables mature BMP-2 to form active disulfide linked homodimers and heterodimers with BMP-7 (2). Mature monomeric BMP-2 is an 18 kDa glycosylated peptide with seven conserved cysteines that form a cystine knot structure (4). Mature human BMP-2 shares 100% aa sequence identity with mouse and rat BMP-2. It shares 85% aa sequence identity with human BMP-4 and less than 51% with other BMPs. BMP-2 signals through heterodimeric complexes composed of a type I receptor (Activin RI, BMPRI-IA, or BMPRI-IB) and a type II receptor (BMPRII or Activin RIIIB) (2, 5). BMP-2 induces chondrocyte proliferation, endochondral bone formation, longitudinal bone growth, and bone and cartilage repair (6, 7). It induces ectopic bone formation or calcification by promoting osteogenic and chondrogenic differentiation in mesenchymal cells, stem cells, and vascular smooth muscle cells (2, 8 - 10). BMP-2/BMP-7 heterodimers are significantly more potent than BMP-2 homodimers at inducing bone formation *in vivo* (11). BMP-2 also promotes the maintenance and repair of colonic epithelium, suppresses neuronal dopamine synthesis and release, induces apoptosis in medulloblastoma cells, and is required for cardiac contractility (12 - 15).

References:

1. Kishigami, S. and Y. Mishina (2005) *Cytokine Growth Factor Rev.* **16**:265.
2. Chen, D. *et al.* (2004) *Growth Factors* **22**:233.
3. Wozney, J. *et al.* (1988) *Science* **242**:1528.
4. Sun, P.D. and D.R. Davies (1995) *Annu. Rev. Biophys. Biomol. Struct.* **24**:269.
5. Sebald, W. *et al.* (2004) *Biol. Chem.* **385**:697.
6. De Luca, F. *et al.* (2001) *Endocrinology* **142**:430.
7. Davidson, E.N.B., *et al.* (2007) *Arthritis Res. Ther.* **9**:R102.
8. Ryoo, H.-M. *et al.* (2006) *Gene* **366**:51.
9. Kramer, J. *et al.* (2000) *Mech. Dev.* **92**:193.
10. Li, X. *et al.* (2008) *Atherosclerosis* January 5 epub.
11. Zhu, W. *et al.* (2004) *J. Bone Miner. Res.* **19**:2021.
12. Peiris, D. *et al.* (2007) *Am. J. Physiol. Gastrointest. Liver Physiol.* **292**:G753.
13. Kano, Y. *et al.* (2005) *Endocrinology* **146**:5332.
14. Hallahan, A.R. *et al.* (2003) *Nat. Med.* **9**:1033.
15. Wang, Y.-X. *et al.* (2007) *Cardiovasc. Res.* **74**:290.