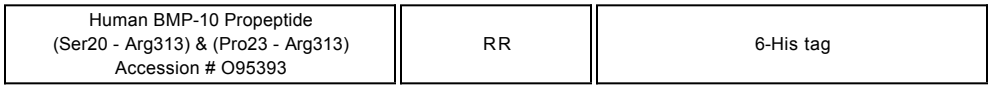
Recombinant Human BMP-10 Propeptide

Catalog Number: 3956-BP

DESCRIPTION

Source Mouse myeloma cell line, NS0-derived



N-terminal Sequence Analysis	Ser20 & Pro23
Predicted Molecular Mass	34.6 kDa

SPECIFICATIONS

SDS-PAGE	42-50 kDa, reducing conditions
Activity	Measured by its ability to inhibit BMP-10-induced alkaline phosphatase production by MC3T3−E1 mouse preosteoblast cells. The ED_{50} for this effect is typically 0.75-3 µg/mL in the presence of 100 ng/mL of rhBMP-10.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>90%, by SDS-PAGE under reducing conditions and visualized by silver stain.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 250 µg/mL in sterile PBS.
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

BMP-10, along with BMP-9, GDF-5, -6, and -7, belongs to a subgroup of sequence related TGF-β superfamily proteins that signal through heterodimeric complexes composed of type I and type II BMP receptors (1 - 3). Proteolytic removal of the propeptide from the 60 kDa proprotein yields a 12 kDa mature BMP-10 which forms disulfide-linked non-glycosylated homodimers (4, 5). In transfectants, BMP-10 is secreted as a cleaved mature dimer, an uncleaved proform dimer, and an uncleaved proform monomer (4). The propeptide of human BMP-10 shares 82% amino acid sequence identity with mouse and rat proBMP-10 and 19% - 34% with the propeptides of human BMP-9, GDF-5, -6, and -7. BMP-10 is critical for the proper development of the heart and first appears at the onset of trabeculation and chamber formation (6 - 8). Homozygous BMP-10 knockout mice die *in utero* due to arrested cardiac development (7). BMP-10 is required for maintaining expression of the cardiogenic transcription factors NKX2.5 and MEF2C in developing myocardium and promoting the growth of embryonic cardiomyocytes (7, 9, 10). The BMP-10 mediated proliferation of these cells requires Notch signaling (11). NKX2.5 itself negatively regulates BMP-10 expression in cardiac myocytes (10). Multiple human congenital heart defects result from mutations in NKX2.5 and require BMP-10 expression (10). In mice, genetic knockout of ErbB leads to a similar phenotype but appears not to involve BMP-10, and knockout of the calcium channel subunit FKBP12 induces BMP-10 overexpression (7). BMP-10 in the postnatal heart promotes increased cardiomyocyte and heart size (8). BMP-10 has been shown to induce signaling through ALK-1, BMPR-IA, BMPR-IB, and BMPR-II in transfectants and non-cardiac cell lines (4, 5). A functional BMP-10 receptor in the heart has not yet been identified, although deletion of BMPR-IA or BMP-10 causes similar cardiac morphogenetic abnormalities (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. Schneider, M.D. *et al.* (2003) Cytokine Growth Factor Rev. **14**:1.
4. Mazerbourg, S. *et al.* (2005) J. Biol. Chem. **280**:32122.
5. David, L. *et al.* (2007) Blood **109**:1953.
6. Neuhaus, H. *et al.* (1999) Mech. Dev. **80**:181.
7. Chen, H. *et al.* (2004) Development **131**:2219.
8. Chen, H. *et al.* (2006) J. Biol. Chem. **281**:27481.
9. Srivastava, D. and E.N. Olson (2000) Nature **407**:221.
10. Pashmforoush, M. *et al.* (2004) Cell **117**:373.
11. Grego-Bessa, J. *et al.* (2007) Dev. Cell **12**:415.
12. Gaussin, V. *et al.* (2002) Proc. Natl. Acad. Sci. **99**:2878.