



## Product Specification Sheet

<b>Product Name</b>	Stemfactor™ BMP-4, Human Recombinant
<b>Description</b>	Bone Morphogenetic Protein 4 (BMP-4) is a polypeptide belonging to the TGF- $\beta$ protein super-family. BMP-4 is involved in bone and cartilage development; more specifically, in tooth and limb development fracture repair <sup>1</sup> . In human embryonic development, BMP-4 is a critical signaling molecule required for the early differentiation of the embryo and establishment of a dorsal-ventral axis <sup>2,3</sup> . BMP-4 plays an important role in differentiation of overlying ectodermal tissue. Inhibition of the BMP-4 signal causes the ectoderm to differentiate into the neural plate. In cultured stem cells, BMP-4 plays a distinct role in mouse and human embryonic stem (ES) cells. BMP-4 supports LIF as a positive factor for mouse ES cell self-renewal <sup>4</sup> . In contrast, BMP-4 induces extra-embryonic trophoblast differentiation in human ES cells <sup>5</sup> . Stemfactor BMP-4 is a recombinant protein expressed and purified from human 293 cells as a glycosylated homodimer with a molecular mass of 34 kDa.
<b>Catalog Number</b>	03-0007
<b>Quantity</b>	10 $\mu$ g
<b>Source</b>	Stemfactor BMP-4 was expressed in and purified from human 293 cells.
<b>Formulation</b>	Lyophilized from sterile filtered 50 mM NaOAc, pH 4.5 and 1 M NaCl.
<b>Amino Acid Sequence</b>	SPKHHSQRAR KKNKNCRRHS LYVDFSDVGV NDWIVAPPGY QAFYCHGDPC FPLADHLNST NHAIVQTLVN SVNSSIPKAC CVPELSAIS MLYLDEYDKV VLKNYQEMVV EGCGR
<b>Uniprot Accession No.</b>	P12644, residues 293-408.
<b>Purity</b>	Greater than 95% by SDS-PAGE analysis.
<b>Endotoxin Level</b>	Less than 1.0 EU/ $\mu$ g of BMP-4 as determined by the LAL method.
<b>Biologic Activity</b>	The ED <sub>50</sub> is less than 30 ng/ml as determined by its ability to induce alkaline phosphatase production by mouse chondrogenic ATDC-5 cells.
<b>Sterility</b>	Tested to be negative for <i>Mycoplasma</i> sp. by PCR and microbial contamination by a sterility test.
<b>Storage and Stability</b>	Stemfactor BMP-4 is shipped at room temperature. Lyophilized BMP-4 is stable for up to 6 months from date of receipt when stored at -20°C to -80°C. Reconstituted BMP-4, at concentrations greater than or equal to 0.1 mg/ml, is stable for up to 3 months when stored at -20°C and up to 6 months when stored at -80°C.
<b>Reconstitution</b>	Centrifuge briefly and then reconstitute BMP-4 in 4 mM HCl to yield a stock solution of no less than 0.1 mg/ml. Avoid freeze-thaw cycles as it can result in loss of activity.

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### References

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2. Chen, D., Zhao, M., and Mundy, G.R. (2004) Bone morphogenetic proteins. *Growth Factors* 22: 233-241.
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4. Ying, Q.L., Nichols, J., Chambers, I., and Smith, A. (2003) BMP induction of Id proteins suppresses differentiation and sustains embryonic stem cell self-renewal in collaboration with STAT3. *Cell* 115: 281-292.
5. Xu, R.H., Chen, X., Li, D.S., Li, R., Addicks, G.C., Glennon, C., Zwaka, T.P., and Thompson, J.A. (2002) BMP4 initiates human embryonic stem cell differentiation to trophoblasts. *Nat Biotechnol.* 20: 1261-1264.

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