

## Product Information

### **BMP-7, active, human recombinant, expressed in *Nicotiana benthamiana***

Catalog Number **B0814**  
Storage Temperature  $-20\text{ }^{\circ}\text{C}$

Synonyms: Bone morphogenetic protein 7, OP1, osteogenic protein

#### **Product Description**

The bone morphogenetic proteins (BMPs) are a family of secreted signaling molecules that can induce ectopic bone growth. BMPs were originally identified by the ability of demineralized bone extract to induce endochondral osteogenesis *in vivo* in an extraskelatal site.

Bone morphogenetic protein 7 (BMP-7), also known as osteogenic protein 1 (OP1), is a widely expressed TGF- $\beta$  superfamily member with important functions during embryogenesis, in the adult, and in disease.<sup>1,2</sup> BMP-7 plays a role in a variety of organ systems. It promotes new bone formation and nephron development,<sup>3,4</sup> inhibits the branching of prostate epithelium,<sup>5</sup> and antagonizes epithelial mesenchymal transition.<sup>6,7</sup> In pathological conditions, BMP-7 inhibits tumor growth and metastasis,<sup>8</sup> ameliorates fibrotic damage in nephritis,<sup>6</sup> and promotes neuroregeneration following brain ischemia.<sup>9</sup>

Recombinant human BMP-7 is produced by transient expression of BMP-7 in non-transgenic plants. It contains a 6-His-tag at the N-terminal end.

BMP-7, active is purified by sequential chromatography (FPLC). It is an animal component-free product, containing no animal-derived components or impurities. The recombinant protein is lyophilized from a solution of 0.05 M Tris-HCl, pH 7.4

Molecular mass:  $\sim 16.5$  kDa

Sequence: single chain, containing 144 amino residues  
HHHHHHSTGSKQRSQNRSKTPKNQEALRMANVAEN  
SSSDQRQACKKHELYVSFRDLGWQDWIIAPEGYAAY  
YCEGECAPFLNSYMNATNHAIVQTLVHFINPETVPKP  
CCAPTQLNAISVLYFDDSSVILKKYRNMVVRACGCH

Purity:  $>97\%$  (SDS-PAGE)

ED<sub>50</sub>:  $\leq 40$  ng/mL

Biological activity: The biological activity of BMP-7 is measured by its ability to induce alkaline phosphatase production by ATDC5 cells.

Endotoxin:  $<0.04$  EU/ $\mu\text{g}$  of the protein (LAL method)

#### **Precautions and Disclaimer**

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

#### **Preparation Instructions**

The lyophilized protein should be reconstituted in water to a concentration of 50 ng/ $\mu\text{L}$ . It is recommended to use a carrier protein (0.1% HSA or BSA).

#### **Storage/Stability**

The product is shipped ambient. Upon receiving, store it immediately at  $-20\text{ }^{\circ}\text{C}$ .

Upon reconstitution, this enzyme can be aliquoted and stored under sterile conditions at  $-20\text{ }^{\circ}\text{C}$ . Avoid repeated freeze/thaw cycles.

## References

1. Chen, D. et al., Bone morphogenetic proteins. *Growth Factors*, **22**, 233–241 (2004).
2. Kishigami, S., and Mishina, Y., BMP signaling and early embryonic patterning. *Cytokine Growth Factor Rev.*, **16**, 265–278 (2005).
3. Sampath, T.K. et al., Recombinant human osteogenic protein-1 (hOP-1) induces new bone formation *in vivo* with a specific activity comparable with natural bovine osteogenic protein and stimulates osteoblast proliferation and differentiation *in vitro*. *J. Biol. Chem.*, **267**, 20352 (1992).
4. Kazama, I. et al., Podocyte-specific deletion of BMP7 leads to growth defect of nephrons with inactivation of P38MAPK. *J. Am. Soc. Nephrol.*, **19**, 2181–2191 (2008).
5. Grishina, I.B. et al., BMP7 inhibits branching morphogenesis in the prostate gland and interferes with Notch signaling. *Dev. Biol.*, **288**, 334–347 (2005).
6. Zeisberg, M. et al., BMP-7 counteracts TGF-beta1-induced epithelial-to-mesenchymal transition and reverses chronic renal injury. *Nat. Med.*, **9**, 964-968 (2003).
7. Yu, M.A. et al., HGF and BMP-7 ameliorate high glucose-induced epithelial-to-mesenchymal transition of peritoneal mesothelium. *J. Am. Soc. Nephrol.*, **20**, 567–581 (2009).
8. Buijs, J.T. et al., BMP7, a putative regulator of epithelial homeostasis in the human prostate, is a potent inhibitor of prostate cancer bone metastasis *in vivo*. *Am. J. Pathol.*, **171**, 1047–1057 (2007).
9. Chou, J. et al., Neuroregenerative effects of BMP7 after stroke in rats. *J. Neurol. Sci.*, **240**, 21–29 (2006).

SC,MAM 05/12-1