

## GDF-11/BMP-11 Protein, Human (HEK293)

<b>Cat. No.:</b>	HY-P70222
<b>Synonyms:</b>	rHuGrowth/differentiation factor 11; Growth/differentiation factor 11; GDF-11; Bone morphogenetic protein 11; BMP-11
<b>Species:</b>	Human
<b>Source:</b>	HEK293
<b>Accession:</b>	O95390 (N299-S407)
<b>Gene ID:</b>	10220
<b>Molecular Weight:</b>	Approximately 14.0 kDa

### PROPERTIES

<b>AA Sequence</b>	<p>N L G L D C D E H S      S E S R C C R Y P L      T V D F E A F G W D      W I I A P K R Y K A</p> <p>N Y C S G Q C E Y M      F M Q K Y P H T H L      V Q Q A N P R G S A      G P C C T P T K M S</p> <p>P I N M L Y F N D K      Q Q I I Y G K I P G      M V V D R C G C S</p>
<b>Appearance</b>	Lyophilized powder.
<b>Formulation</b>	Lyophilized from a 0.2 µm filtered solution of 20 mM Tris-HCl, 50% glycerol, pH 7.4.
<b>Endotoxin Level</b>	<1 EU/µg, determined by LAL method.
<b>Reconstitution</b>	It is not recommended to reconstitute to a concentration less than 100 µg/mL in ddH <sub>2</sub> O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
<b>Storage &amp; Stability</b>	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
<b>Shipping</b>	Room temperature in continental US; may vary elsewhere.

### DESCRIPTION

<b>Background</b>	<p>Bone Morphogenetic Protein 11 (BMP-11; GDF11), also known as growth/differentiation factor 11, is a ligand protein with pleiotropic, belongs to TGFβ family. BMP-11 signals through activin receptors type II, ACVR2A and ACVR2B, and activin receptors type I, ACVR1B, ACVR1C and TGFBR1 leading to the phosphorylation of SMAD2 and SMAD3<sup>[1]</sup>.</p> <p>BMP-11 is highly similar with growth/differentiation factor 8 (GDF8), and exhibits more potent activator of SMAD2/3 and signals more effectively through the type I activin-like receptor kinase receptors ALK4/5/7 than GDF8. Furthermore, signaling by GDF-11/BMP-11 is controlled by extracellular protein antagonists, including FS, FSTL3, GASP1, and GASP2<sup>[1]</sup>.</p> <p>GDF-11/BMP-11 plays pivotal roles during development, including anterior/posterior patterning, formation of the kidney, stomach, spleen and endocrine pancreas. In the embryo, BMP-11 also shows strong expression is seen in the palatal epithelia, including the medial edge epithelial and midline epithelial seam of the palatal shelves. Less pronounced</p>
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expression is also seen throughout the palatal shelf and tongue mesenchyme<sup>[3]</sup>. GDF-11/BMP-11 is lately found expressing in the adult central nervous system (CNS)<sup>[3]</sup>, is an important regulator of CNS formation and fate<sup>[2]</sup>. In the aged brain, exogenous, peripherally delivered GDF-11/BMP-11 may enhance neurogenesis and angiogenesis, as well as improve neuropathological outcomes. Exogenously increasing circulating GDF-11/BMP-11 concentrations may be a viable approach for improving deleterious aspects of brain aging and neuropathology<sup>[2]</sup>.

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## REFERENCES

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- [1]. Walker RG, et al. Structural basis for potency differences between GDF8 and GDF11. *BMC Biol.* 2017 Mar 3;15(1):19.
- [2]. Schafer MJ, et al. The influence of GDF11 on brain fate and function. *Geroscience.* 2019 Feb;41(1):1-11.
- [3]. Cox TC, et al. Mutations in GDF11 and the extracellular antagonist, Follistatin, as a likely cause of Mendelian forms of orofacial clefting in humans. *Hum Mutat.* 2019 Oct;40(10):1813-1825.
- [4]. Hannan NR, et al. BMP-11 and myostatin support undifferentiated growth of human embryonic stem cells in feeder-free cultures. *Cloning Stem Cells.* 2009 Sep;11(3):427-35.
- [5]. Pham HG, et al. BMP11 regulates thermogenesis in white and brown adipocytes. *Cell Biochem Funct.* 2021 Jun;39(4):496-510.
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