

Animal-Free GDF-11/BMP-11 Protein, Human (His)

Cat. No.:	HY-P700020AF
Synonyms:	Growth/Differentiation Factor-11; GDF-11
Species:	Human
Source:	E. coli
Accession:	O95390 (N299-S407)
Gene ID:	10220
Molecular Weight:	Approximately 13.40 kDa

PROPERTIES

AA Sequence	<p>M 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</p> <p>A 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</p> <p>S 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>
Biological Activity	<p>1. Measure by its ability to induce alkaline phosphatase production by ATDC5 cells. The ED₅₀ for this effect is <11 ng/mL.</p> <p>2. Measure by its ability to induce hemoglobin expression in K562 cells. The ED₅₀ for this effect is <4 ng/mL.</p>
Appearance	Lyophilized powder.
Formulation	Lyophilized from a solution containing 20 mM sodium citrate, 0.2 M NaCl, pH 3.5.
Endotoxin Level	<0.1 EU per 1 µg of the protein by the LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 µg/mL in ddH ₂ O.
Storage & Stability	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.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	<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^[1].</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^[1]. GDF-11/BMP-11 plays pivotal roles during development, including anterior/posterior patterning, formation of the kidney,</p>
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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 expression is also seen throughout the palatal shelf and tongue mesenchyme^[3].

GDF-11/BMP-11 is lately found expressing in the adult central nervous system (CNS)^[3], is an important regulator of CNS formation and fate^[2]. 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^[2].

REFERENCES

- [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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