

Animal-Free GDF-5 Protein, Human (His)

Cat. No.:	HY-P700023AF
Synonyms:	Cartilage-Derived Morphogenetic Protein-1; Growth/Differentiation Factor-5; GDF-5; CDMP-1
Species:	Human
Source:	E. coli
Accession:	P43026 (A382-R501)
Gene ID:	8200
Molecular Weight:	Approximately 14.52 kDa

PROPERTIES

AA Sequence	M A P L A T R Q G K R P S K N L K A R C S R K A L H V N F K D M G W D D W I I A P L E Y E A F H C E G L C E F P L R S H L E P T N H A V I Q T L M N S M D P E S T P P T C C V P T R L S P I S I L F I D S A N N V V Y K Q Y E D M V V E S C G C R
Biological Activity	Measure by its ability to induce alkaline phosphatase production by ATDC5 cells. The ED ₅₀ for this effect is <14 ng/mL
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>GDF-5 Protein plays a pivotal role in bone and cartilage formation, intricately regulating chondrogenic tissue differentiation through dual pathways. Firstly, it positively influences chondrogenic tissue differentiation by binding with high affinity to BMPRII and with lower affinity to BMPRI, leading to the induction of SMAD1-SMAD5-SMAD8 complex phosphorylation and subsequent SMAD protein signaling transduction. Simultaneously, it negatively regulates chondrogenic differentiation through interaction with NOG. This protein is essential for preventing excessive muscle loss upon denervation, a function mediated by phosphorylated SMAD1/5/8. Additionally, GDF-5 binds bacterial lipopolysaccharide (LPS) and mediates LPS-induced inflammatory responses, including TNF secretion by monocytes. Structurally, it forms homodimers linked by</p>
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disulfide bonds and interacts with serine proteases HTRA1 and HTRA3. Following LPS binding, GDF-5 may form a complex with CXCR4, HSP90AA1, and HSPA8. Moreover, it interacts with high affinity with NOG to inhibit chondrogenesis and with BMPR1B and BMPR1A to positively regulate chondrocyte differentiation through SMAD-dependent signaling. Additionally, it engages in interactions with FBN1 and FBN2.

Caution: Product has not been fully validated for medical applications. For research use only.

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA