FGF-2 Protein, Rat

Cat. No.:	HY-P7091
Synonyms:	rRtbFGF; HBGF-2; FGF-2; FGF-b; FGF-basic
Species:	Rat
Source:	E. coli
Accession:	P13109 (A11-S154)
Gene ID:	54250
Molecular Weight:	Approximately 16.0 kDa

PROPERTIES

AA Sequence	A L P E D G G G A F P P G H F K D P K R L Y C K N G G F F L R I H P D G R V D G V R E K S D P H V K L Q L Q A E E R G V V S I K G V C A N R Y L A M K E D G R L L A S K C V T E E C F F F E R L E S N N Y N T Y R S R K Y S S W Y V A L K R T G Q Y K L G S K T G P G Q K A I L F L P M S A K S
Biological Activity	The ED_{50} is <4 ng/mL as measured by 3T3 cells, corresponding to a specific activity of > 2.5×10^5 units/mg.
Appearance	Lyophilized powder
Formulation	Lyophilized after extensive dialysis against PBS or 0.2 μm filtered solution of 20 mM PB, 150 mM NaCl, pH 7.4.
Endotoxin Level	<1.0 EU/μg, determined by LAL method.
Reconsititution	It is not recommended to reconstitute to a concentration less than 100 μg/mL in ddH_2O. For long term storage it is recommended to add a carrier protein (0.1% BSA, 5% HSA, 10% FBS or 5% Trehalose).
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	FGF-2/bFGF is a member of the fibroblast family and has a high affinity for heparin. FGF-2 plays an important role in tendon to bone healing, cartilage repair, bone repair, and nerve regeneration. FGF-2 specifically binds to tyrosine kinase receptors and activates the FGF/FGFR signaling pathway. Subsequently, FGF-2 influences cell proliferation, differentiation and apoptosis, as well as immune regulation by transducing other classical pathways. For example, FGF-2 regulates the JAK-STAT signaling pathway to regulate cartilage metabolism. FGF-2 also acts as a mitotic promoter to accelerate cell proliferation. Therefore, (1) FGF-2 is an important growth factor in the healing process of ligament/tendon injury. In vitro

experiments, low-dose FGF-2 can stimulate the proliferation and differentiation of bone marrow mesenchymal stem cells, and up-regulate the mRNA expression of type I/III collagen and fibronectin. However, high doses of FGF-2 did not stimulate extracellular matrix (ECM) protein proliferation and gene expression. (2) FGF-2 is also an endogenous and intrinsic growth factor in cartilage repair. FGF-2 binds to heparan sulfate proteoglycan and is stored in the ECM of articular cartilage. When cartilage is damaged or degenerated, ECM rapidly releases FGF-2 and activates ERK signaling pathways to promote cartilage regeneration. FGF-2 exhibits a biphasic effect in combination with its specific receptor. FGF-2 combined with FGFR3 promoted the repair of articular cartilage. FGF-2 combined with FGFR1 promoted the degeneration of articular cartilage[1]. FGF-2 is expressed in granulosa cells and colliculus cells, as well as hepatocellular cancer cells, but not in non-cancerous liver tissues. This reveals the role of FGF-2 in brain tumors, particularly glioblastoma. According to studies, FGF-2 is a known carcinogenic factor in GBM. FGF-2 increases the self-renewal of glioblastoma stem cells and contributes to the growth and vascularization of glioma[2]. FGF-2 protein is highly conserved in some species, and the similarity rate of human FGF-2 protein sequence to rat, mouse, and bovine was 97.4%, 95.45%, and 98.71%, respectively.

REFERENCES

[1]. Zhang J, et al. FGF2: a key regulator augmenting tendon-to-bone healing and cartilage repair. Regen Med. 2020 Sep;15(9):2129-2142.

[2]. Jimenez-Pascual A, et al. FGF2: a novel druggable target for glioblastoma? Expert Opin Ther Targets. 2020 Apr;24(4):311-318.

[3]. Westermann R, et al. Basic fibroblast growth factor (bFGF), a multifunctional growth factor for neuroectodermal cells. J Cell Sci Suppl. 1990;13:97-117.

[4]. Rusnati M, et al. Interaction of angiogenic basic fibroblast growth factor with endothelial cell heparan sulfate proteoglycans. Biological implications in neovascularization. Int J Clin Lab Res. 1996;26(1):15-23.

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