Recombinant Bovine Basic Fibroblast Growth Factor (bFGF), Animal Component-Free

Cat. No. :	B027E
Alternative Names:	FGF2; Fibroblast Growth Factor 2; FGF-2; Basic Fibroblast Growth Factor; bFGF; Heparin-Binding Growth Factor 2; HBGF-2; FGFB
Species:	Bovine
Accession No.:	P03969
Expression System:	E. coli
Protein Sequence:	Pro10-Ser155
Theoretical MW:	16.4 kDa
Theoretical pI:	9.59
Tag:	Tag-Free.
Formulation buffer:	10mM PB NaCl, 5% Mannitol and 0.01% Tween 80, pH7.4.
Appearance:	Lyophilized Powder.
Purity:	≥95% as determined by SDS-PAGE.
Bioactivity:	The activity was assessed in a cell proliferation assay with NIH3T3 mouse embryonic fibroblasts, with a determined ED_{50} of ≤2.0 ng/mL.
Endotoxin Level:	≤0.2 EU/μg, as determined by the LAL assay.
Application:	Cell Culture; Activity Assays.

Preparation & Storage

Reconstitution: Reconstitute with sterile double-distilled water (ddH_2O).

⚠ Centrifuge the vial briefly before opening to ensure full recovery of the solution. Avoid vortexing and minimize vigorous pipetting to maintain protein stability.

❄ Immediately aliquot the reconstituted protein solution and store under recommended conditions. Avoid repeated freeze-thaw cycles.

Shipping: Shipped on dry ice. Short-term transit on cold packs (2-8℃) is acceptable.

Storage: **Use a manual defrost freezer and avoid repeated freeze-thaw cycles.**

- 12 months from date of receipt, -20 to -80℃ as supplied.
- 2-7 days at 2 to 8℃ under sterile conditions after reconstitution.
- 3-6 months at -20 to -80℃ under sterile conditions after reconstitution.

Protein Description

Background: Basic fibroblast growth factor (bFGF), designated fibroblast growth factor 2 (FGF2), holds foundational significance in growth factor biology as the first FGF family member purified to homogeneity. Isolated initially from bovine pituitary (1974) and subsequently from bovine brain (late 1970s), bovine FGF2 (UniProt: P03969) is a 155-amino acid heparin-binding protein (~ 18 kDa low-molecular-weight isoform) lacking a canonical signal peptide. It is secreted via non-classical pathways and may exist in nuclear-localized high-molecular-weight variants. Bovine FGF2 shares ~ 96% amino acid sequence identity with human FGF2, preserving the conserved β-trefoil fold, receptor-binding interfaces, and heparin-binding domains critical for biological activity.

Functionally, bovine FGF2 binds fibroblast growth factor receptors (FGFR1 - 4) with heparan sulfate proteoglycans as obligate co-factors, activating RAS/MAPK, PI3K/AKT, and PLCγ signaling cascades. It drives proliferation, migration, survival, and differentiation of fibroblasts, endothelial cells, neural cells, chondrocytes, and stem/progenitor cells. Historically, bovine-derived FGF2 served as the prototype for elucidating FGF-mediated angiogenesis, wound healing mechanisms, neural development, and mesenchymal-epithelial interactions. Its biochemical characterization established core principles of FGF biology, including heparin dependence for receptor activation and thermal instability.

In research and biotechnology, recombinant bovine FGF2 has been extensively utilized as a standard reagent in cell culture media (e.g., for endothelial tube formation assays, neural stem cell expansion, and bovine embryo culture systems). Structural studies employing bovine FGF2 provided early high-resolution insights into FGF-heparin-FGFR ternary complex architecture. While direct in vivo studies in cattle remain limited, bovine FGF2 underpins foundational knowledge applicable across mammalian systems. Its historical role catalyzed therapeutic development of engineered FGF variants for regenerative medicine, though species-specific applications in veterinary contexts (e.g., tissue repair in livestock) are emerging.

References:

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2. Baird A, Schubert D, Ling N, Guillemin R. Characterization of a fibroblast growth factor from bovine brain. Proc Natl Acad Sci USA. 1979;76(3):1430-1434.
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4. Rapraeger AC, Krufka A, Olwin BB. Requirement of heparan sulfate for bFGF-mediated fibroblast growth. Science. 1991;252(5006):1705-1708.
5. Presta M, Ronca R, Chiodelli P, et al. Fibroblast growth factor/fibroblast growth factor receptor system in angiogenesis. Cytokine Growth Factor Rev. 2005;16(2):159-178.
6. Beenken A, Mohammadi M. The FGF family: biology, pathophysiology and therapy. Nat Rev Drug Discov. 2009;8(3):235-253.

Product Disclaimer

- This product is intended for research use only and is not for use in diagnostic, therapeutic, or clinical procedures.
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