Recombinant Human Acidic Fibroblast Growth Factor (aFGF), Animal Component-Free

Cat. No. :	H072E
Alternative Names:	FGF1; FGF-1; Fibroblast growth factor 1; Acidic fibroblast growth factor; aFGF; Heparin-binding growth factor 1; HBGF-1
Species:	Human
Accession No.:	Q5NVQ3
Expression System:	E. coli
Protein Sequence:	aa 16-155
Theoretical MW:	15.84 kDa
Theoretical pI:	7.88
Tag:	Tag-Free.
Formulation buffer:	20 mM PB, 5% Trehalose, 100 mM NaCl and 0.05% Tween 80, pH6.0.
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:	≤0.01 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: Acidic fibroblast growth factor (aFGF), officially designated fibroblast growth factor 1 (FGF1), is the founding member of the FGF family. First purified from bovine brain in the 1970s and human cDNA cloned in 1986, FGF1 is a 155-amino acid heparin-binding protein (~17.2 kDa) notable for lacking a conventional signal peptide. It is secreted via non-classical pathways and exhibits dual localization—cytosolic/nuclear under homeostasis and extracellular upon cellular stress or injury. Widely expressed in brain, kidney, liver, adipose tissue, and endothelium, FGF1 functions as a potent mitogen and morphogen.

FGF1 signals through binding to FGF receptors (FGFR1–4) with heparan sulfate proteoglycans as obligate co-factors, activating RAS/MAPK, PI3K/AKT, and PLCγ pathways. This regulates cell proliferation, migration, differentiation, survival, and extracellular matrix remodeling across diverse cell types including fibroblasts, endothelial cells, neurons, and adipocytes.

Biologically, FGF1 is essential for embryonic development, angiogenesis, wound healing, and neural repair. It promotes neurite outgrowth and exhibits neuroprotective activity. Critically, FGF1 plays a pivotal metabolic role: it enhances insulin sensitivity in adipose tissue and, upon central administration, induces sustained remission of diabetic hyperglycemia in preclinical models by suppressing hypothalamic inflammation. It also modulates inflammatory responses and tissue fibrosis.

Clinically, aberrant FGF1 expression correlates with tumor angiogenesis, diabetic complications, atherosclerosis, and fibrotic disorders. Recombinant FGF1 has been investigated for wound healing and ischemic diseases, though clinical translation has been limited by thermal instability, protease susceptibility, and mitogenic safety concerns. Engineered variants (e.g., heat-stable mutants with reduced proliferative activity) are under development for metabolic disease therapy. FGF1 also serves as a biomarker in oncology and regenerative medicine contexts.

References:

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2. Ornitz DM, Itoh N. The Fibroblast Growth Factor signaling pathway. Wiley Interdiscip Rev Dev Biol. 2015;4(3):215-266.
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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.
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- This product is intended for research use only and is not for use in diagnostic, therapeutic, or clinical procedures.
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