Recombinant Human bFGF (Heat Stable) Protein

Product Name

Recombinant Human bFGF (Heat Stable) Protein

Size / Catalog Number

50μg / TL787-0050

Product Information

Synonyms: FGF2, FGFB, FGF basic, HBGF-2

Accession: UniProt P09038-1

Expressed Region: Gly59-Ser210 with an N-terminal methionine and several site mutations

Tag: Tag free

Expression system: *E. coli*

Predicted Molecular weight: 17.0 kDa

Purity: > 90% as determined by SDS-PAGE

Endotoxin: < 0.1 EU per 1 μg of protein (LAL method)

Activity: Measured in a cell proliferation assay using HUVEC cells, corresponding to a specific activity of ≥ 1.0×10^6 IU/mg.

Form: Lyophilized from sterile PBS (pH7.4), typically supplemented with 6% mannitol as a protectant.

Background

As a core member of the FGF family, bFGF selectively binds to FGFR1c/2c/3c/4 receptor subtypes via its β-trefoil structure, activating the Ras-MAPK and PI3K-AKT signaling axes to regulate critical physiological processes, including cell proliferation, migration, differentiation, and angiogenesis. In cell therapy applications, bFGF serves as an essential component of serum-free stem cell culture systems, sustaining the undifferentiated state of human pluripotent stem cells (hPSCs) through sustained ERK1/2 pathway activation while stabilizing Nanog/Oct4 expression. It further synergizes with BMP inhibitors to prevent spontaneous germ layer differentiation.

This recombinant thermostable human basic fibroblast growth factor (bFGF-HS) is engineered via an AI-driven protein design platform and produced in *E. coli* as a tag-free protein. While preserving the native heparin-binding domain (residues 128-144) and biological activity, the optimized sequence significantly enhances thermal stability and in vitro potency. Compared to wild-type bFGF, this mutant exhibits an extended half-life in culture systems, reducing medium replenishment frequency and contamination risks, making it particularly suitable for large-scale stem cell culture, tissue engineering, and regenerative medicine research.

Stability & Storage

Lyophilized powder: Stable for 12 months at -80°C or 6 months at -20°C when stored in the original sealed container under desiccant.

Reconstitution: Dissolve in sterile water for injection, 0.9% NaCl, or PBS (pH7.4), maintaining a final concentration ≥ 100 μg/mL to prevent adsorption.

Handling: Aliquot to avoid repeated freeze-thaw cycles.

References

1. Amir Ali Khan, Tee Jong Huat, Abdullah Al Mutery, *et al*. Significant transcriptomic changes are associated with differentiation of bone marrow-derived mesenchymal stem cells into neural progenitor-like cells in the presence of bFGF and EGF. Cell Biosci. 2020 Oct 28;10(1):126.

2. Dmitriy Bazhenov, Valentina Mikhailova, Igor Nikolaenkov, *et al*. The uteroplacental contact zone cytokine influence on NK cell cytotoxicity to trophoblasts. Gynecol Endocrinol. 2020;36(sup1):1-6.

3. Peng Chen, Hongguang Zhang, Qingtao Zhang, *et al*. Basic Fibroblast Growth Factor Reduces Permeability and Apoptosis of Human Brain Microvascular Endothelial Cells in Response to Oxygen and Glucose Deprivation Followed by Reoxygenation via the Fibroblast Growth Factor Receptor 1 (FGFR1)/ERK Pathway. Med SciMonit. 2019 Sep 25;25:7191-7201.

4. Dvorak P, Bednar D, Vanacek P, *et al*. Computer-assisted engineering of hyperstable fibroblast growth factor 2. Biotechnol Bioeng. 2018 Apr;115(4):850-862.

Intended Us

For research and manufacturing purposes only.