

Product Information

Fibroblast Growth Factor-18 human, recombinant expressed in *Escherichia coli*

Catalog Number **F7301**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

Product Description

Fibroblast growth factors (FGFs) are members of a large family of structurally related polypeptides (17–38 kDa) that exert biological activities toward cells of mesenchymal, neuronal, and epithelial origin.^{1,2} All members of the FGF superfamily have two conserved cysteine residues and a conserved 120 amino acid core region that contains six identical, interspersed amino acids.^{3–5} All FGFs share 30–50% amino acid sequence identity. FGFs are involved in normal development, wound healing and repair, angiogenesis, and a variety of neurotrophic activities. They are also involved in hematopoiesis as well as in tissue remodeling and maintenance. FGFs are potent physiological regulators of growth and differentiation for a variety of cells of mesodermal, ectodermal, and endodermal origin. They have been implicated in pathological conditions such as tumorigenesis and metastasis. To date, the FGF family consists of 23 members designated FGF-1 through FGF-23.⁵

Four distinct tyrosine kinase FGF receptors (FGFRs) from four separate genes have been identified: FGFR-1 (flg, cek-1), FGFR-2 (bek, cek-3), FGFR-3 (cek-2), and FGFR-4.^{6–8} The high affinity cell surface FGF receptors have an extracellular region containing three immunoglobulin-like domains, a transmembrane region, and a cytosolic tyrosine kinase domain activated by ligand binding. Multiple additional variants (isoforms) arising from alternative splicing have also been reported.⁷ Ligand-binding specificity, signal transduction, and membrane attachment may be modified by alternative splicings.

Fibroblast Growth Factor-18 (FGF-18), a secreted, heparin binding glycoprotein, was originally isolated from rat embryos using homology-based PCR. FGF-18 is most similar to FGF-8 and FGF-17, sharing 52% amino acid identity. Because of this homology, the gene may code for alternate splice forms.

FGF-18, a heparin binding growth factor, stimulates the proliferation and activation of cells that express the FGF receptors. It is expressed in a number of tissues, most notably the liver and small intestine. FGF-18 is expressed in both fetal and adult tissues, and appears to be involved in lung physiology since it is present in both the adult and fetal respiratory systems.⁹ FGF-18 may be the endogenous ligand for FGF receptor 3.¹⁰

Recombinant, Human Fibroblast Growth Factor-18 (FGF-18) is produced from a DNA sequence encoding mature human FGF-18.^{9,11} This FGF-18 product is a 20.1 kDa protein consisting of 173 amino acid residues, resulting from C-terminal truncation of the full length protein. Human FGF-18 shares ~99% amino acid identity with both mouse and rat FGF-18.^{9,11}

The product is supplied as ~25 μg of protein lyophilized from a 0.2 μm filtered solution of 10 mM Tris, pH 8.0 with 20 mM NaCl.

The Fibroblast Growth Factor-18 activity is determined by the dose-dependent stimulation of thymidine uptake by BaF3 cells expressing FGF receptors. The ED_{50} is defined as the effective concentration of growth factor that elicits a 50% increase in cell growth in the cell based bioassay.

The ED_{50} for this effect is $\leq 0.5\text{ ng/ml}$, corresponding to a specific activity of $\geq 2 \times 10^6$ units/mg.

Purity: >95% (SDS-PAGE, visualized by silver stain)

Endotoxin level: <0.1 ng/ μg protein (LAL, Limulus amoebocyte lysate, method)

Preparation Instructions

Reconstitute the contents of the vial using sterile water to a concentration of 0.1–1.0 mg/ml. This solution can then be diluted into other aqueous buffers and stored at 2–8 °C for up to one week or –20 °C for future use. Repeated freezing and thawing will result in some loss of activity.

Storage/Stability

Store the product at –20 °C. It remains active for up to a few weeks at room temperature. For extended storage, the reconstituted product should be stored in working aliquots at –20 °C. Repeated freezing and thawing is not recommended. Do not store in a frost-free freezer.

References

1. Givol, D., and Yayon, A., *FASEB. J.*, **6**, 3362 (1992).
2. Baird, A., et al., *Curr. Opin. Neurobiol.*, **4**, 78 (1994).
3. Fernig, F.G., and Gallagher, J.T., *Prog. Growth Factor Res.*, **5**, 353 (1994).
4. Kirkoshi, J., et al., *Biochem. Biophys. Res. Commun.*, **274**, 337 (2000).
5. Nishimura, T., et al., *Biochem. Biophys. Acta.*, **1492**, 203 (2000).
6. Bernard, O., and Matthew, P., *Guidebook to Cytokines and Their Receptors*, Oxford Press, (New York, NY: 1994).
7. Galzie, Z., et al., *Biochem. Cell Biol.*, **75**, 669 (1997).
8. Callard, R., and Gearing, A., *The Cytokine Facts Book*, Academic Press, (New York, NY: 1994).
9. Hu, M., et al., *Mol. Cell Biol.*, **18**, 6063 (1998).
10. Ohuchi, H., et al., *Mech. Dev.*, **95**, 55 (2000).
11. Ohbayashi, N., et al., *J. Biol. Chem.*, **273**, 18161 (1998).

AF, JM, KAA, MAM 04/09-1

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