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RECOMBINANT HUMAN FGF-2

Recombinant Growth Factor for Defined Media and Cell Therapy Manufacturing



- GMP manufacturing
- Animal-origin-free recombinant production
- Carrier-free and tag-free formulation
- Strict endotoxin control (<0.05 EU/µg)
- Functionally validated bioactivity
- Consistent batch-to-batch performance

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Product Overview

Recombinant human Fibroblast Growth Factor-2 (FGF-2), also known as basic FGF (bFGF), is a potent mitogenic growth factor that regulates cellular proliferation, survival and differentiation in multiple cell types. Through activation of fibroblast growth factor receptors (FGFR1–4), FGF-2 plays a central role in maintaining pluripotency and supporting expansion of stem and progenitor cell populations.

Canvax recombinant human FGF-2 (145 aa) corresponds to the core structured region of the protein sufficient for full biological activity. The protein is produced recombinantly in E. coli under animal-origin-free conditions and supplied carrier-free and tag-free to ensure minimal interference with downstream signaling pathways.

FGF-2 is provided as a highly pure lyophilized protein preparation with recovery >95%, purity ≥98% by SDS-PAGE and endotoxin levels <0.05 EU/µg.

This formulation supports convenient storage and reliable reconstitution for use as a controlled raw material in defined cell culture systems and advanced media formulations.

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Product Specification	
Protein	Human FGF-2 (145 aa)
Bioactivity	EC50 = 0.24 ng/mL (14 pM) Batch representative
Expression system	*E. coli*
Purity	>98%
Endotoxin	<0.05 EU/µg
Formulation	Lyophilized
Animal origin status	Animal origin-free (AOF)
Carrier	None

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Biological Function

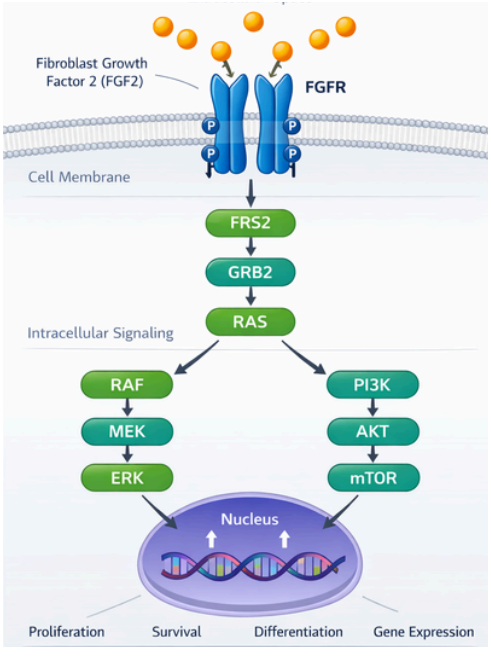
FGF-2 signals through the fibroblast growth factor receptor family (FGFR1–4), a group of transmembrane receptor tyrosine kinases.

Binding of FGF-2 to the extracellular domains of FGFR induces receptor dimerization and activation of intracellular kinase domains, resulting in receptor autophosphorylation.

Activated FGFR recruits adaptor proteins such as FRS2, which initiate intracellular signaling cascades controlling gene expression programs involved in proliferation and survival.

The main signaling pathways activated downstream of FGFR include the RAS–RAF–MEK–ERK (MAPK) pathway and the PI3K–AKT signaling pathway.

Through coordinated activation of these pathways, FGF-2 supports maintenance of stem cell self-renewal, proliferation of mesenchymal cell populations and regulation of differentiation processes.



Simplified representation of FGF-2 signaling through fibroblast growth factor receptors. Ligand binding induces FGFR dimerization and autophosphorylation, activating downstream MAPK and PI3K–AKT signaling pathways that regulate gene expression programs controlling proliferation, survival and differentiation

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Applications in Advanced Cell Culture

Canvax recombinant growth factors are developed as critical raw materials for advanced cell culture systems:

- Designed for defined and serum-free media formulations
- Consistent biological performance across batches
- Scalable supply from research to GMP manufacturing environments

Recombinant human FGF-2 is widely used as a key component of defined culture media where controlled activation of fibroblast growth factor signaling is required. Its ability to regulate proliferation and maintain stem cell identity makes it an essential raw material for advanced cell culture workflows.

Stem cell maintenance and expansion

FGF-2 is a critical component of defined culture systems used to maintain pluripotency in human embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs). Activation of FGFR signaling supports self-renewal pathways and stabilizes pluripotent transcriptional networks.

Mesenchymal stromal cell expansion

FGF-2 is commonly incorporated into culture media designed for expansion of mesenchymal stromal cells (MSCs) and fibroblast-like populations. Controlled FGFR signaling promotes proliferation while preserving cellular phenotype and functionality.

Defined media and regenerative biology models

FGF-2 is widely used in defined media formulations for organoid culture, regenerative biology studies and disease modeling systems. Consistent recombinant production and low endotoxin levels enable reliable performance in advanced cell culture workflows.

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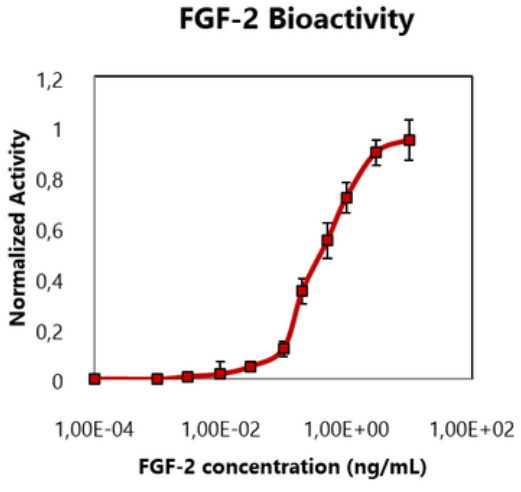
Functional Bioactivity

Biological activity of recombinant human FGF-2 was evaluated using a serum response element (SRE) luciferase reporter assay in transfected HEK293T cells. Cells expressing the reporter construct were treated with serial dilutions of FGF-2 for six hours, and activation of intracellular signaling pathways was quantified by measuring firefly luciferase activity normalized to a Renilla luciferase control.

Dose-dependent activation of the reporter confirmed functional stimulation of FGFR-dependent signaling pathways. Recombinant FGF-2 produced a robust response across the tested concentration range.

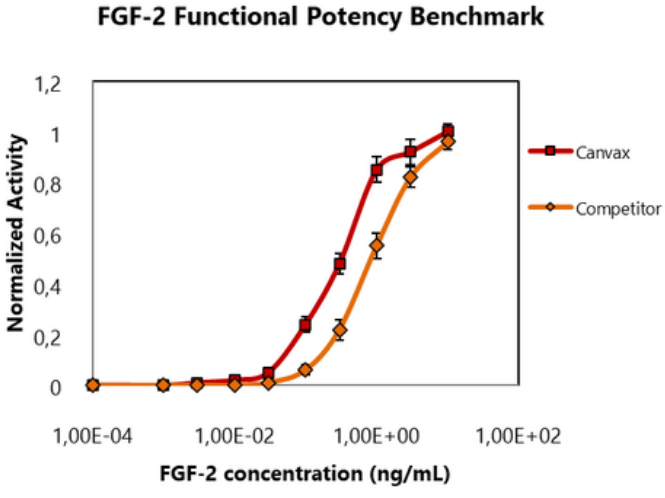
These results demonstrate the ability of the recombinant protein to activate downstream transcriptional responses associated with FGF receptor signaling.

EC50 = 0.24 ng/mL (14 pM)



Dose-response bioactivity of recombinant human FGF-2 measured using a serum response element luciferase reporter assay in transfected HEK293T cells. Dose-dependent activation of the reporter demonstrates robust functional activation of FGFR-dependent signaling pathways.

Functional Bioactivity Benchmark



Functional bioactivity benchmark of recombinant human FGF-2 compared with a commercially available reference protein using the same luciferase reporter assay system. Dose-response curves demonstrate activation of FGFR-dependent signaling pathways

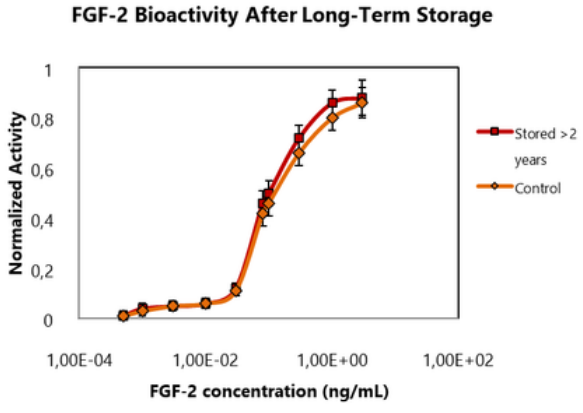
Functional activity of recombinant human FGF-2 was evaluated in parallel with a commercially available reference protein using the same luciferase reporter assay system. Serial dilutions of both proteins were applied to transfected HEK293T cells and activation of the serum response element reporter was quantified.

Dose-response analysis demonstrated activation of FGFR-dependent signaling pathways for both proteins.

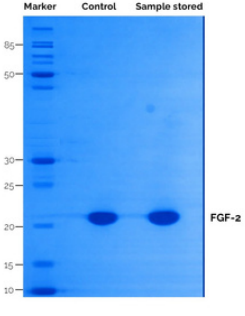
The recombinant FGF-2 displayed an EC50 of 0.35 ng/mL, whereas the reference protein exhibited an EC50 of 1.08 ng/mL under the same experimental conditions.

These results confirm robust functional signaling activity of the recombinant protein in a quantitative cellular assay

Long-term stability



Long-term stability of recombinant human FGF-2 after storage of the lyophilized protein at −80 °C for more than two years. Comparable EC50 values were observed between long-term stored material and a newly produced batch in a luciferase reporter assay.



SDS-PAGE analysis of recombinant human FGF-2 after long-term storage. Lyophilized protein stored at −80 °C for more than two years shows no detectable degradation compared with a newly produced control batch.

Long-term stability of recombinant human FGF-2 was evaluated after extended storage of the lyophilized protein at −80 °C. Functional activity was assessed using a luciferase reporter assay in transfected HEK293T cells.

FGF-2 stored for more than two years retained full biological activity, showing an EC50 of 0.12 ng/mL compared with 0.19 ng/mL for a newly produced batch tested in parallel. These results demonstrate that extended storage does not negatively affect receptor-dependent signaling activity.

Protein integrity was further confirmed by SDS-PAGE analysis under non-reducing conditions, which showed no detectable degradation after long-term storage. Sterility testing also confirmed absence of microbial contamination following storage at −80 °C.

Together, these results demonstrate that lyophilized recombinant FGF-2 remains structurally stable and functionally active after long-term frozen storage.

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Quality and Analytical Characterization

To ensure reliable performance in demanding cell culture systems, recombinant human FGF-2 from Canvax is subjected to multiple analytical and functional quality control assays.

These tests verify the purity, molecular identity and biological activity of the protein and ensure reproducible batch-to-batch performance

Designed as a controlled raw material for defined media and advanced cell culture systems.

Need more info? Request Quality Documents

Parameter	Typical specification
Identity	Correct molecular mass
Protein integrity	Monomeric FGF-2 protein
Purity	>98%
Endotoxin	<0.05 EU/µg protein
Bioactivity	Representative EC50 within expected range
Sterility	No microbial growth detected
Mycoplasma	Negative
Recovery	>95%

GMP-grade material includes an expanded analytical characterization panel covering host cell impurities, protein identity, functional potency testing and others.

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Available Formats and Ordering Information

Product	Reference	Format	Ordering
Recombinant Human FGF-2 (145 aa)	CR001	100 µg (Lyophilized)	Order Online

Research-grade material is intended for evaluation and process development activities. **Additional RUO formats are available upon request.** Contact us.

Product	Reference	Supply format	Ordering
Recombinant Human FGF-2 (145 aa)	CR001-GMP	Bulk supply	Contact us info@canvaxbiotech.com

GMP manufacturing is available upon request for customers requiring controlled production environments and full quality documentation.

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GMP Manufacturing and Quality Capabilities

Canvax operates GMP-certified facilities designed to support biopharmaceutical development programs requiring a controlled transition between early-stage activities and GMP manufacturing environments.

GMP Manufacturing Facilities



GMP-certified facilities designed for the manufacture of biopharmaceutical products, operating under ISO 9001 and ISO 13485 quality systems.

Bulk Supply and Scalability



Manufacturing capacity to support bulk supply requirements, from development-scale batches to larger volumes aligned with program needs.

Fill & Finish and Packaging



Fill and finish capabilities for client-specific formats, supporting controlled dispensing, packaging and labeling under qualified conditions.

Analytical Characterization



Extended analytical capabilities for protein characterization, including identity, purity and bioactivity assessment, supporting robust quality control strategies.

Supply Chain Reliability



Integrated manufacturing and quality systems designed to support consistent supply, change control and long-term program continuity.

Additional information related to manufacturing capabilities, supply formats and GMP programs is available upon request at info@canvaxbiotech.com