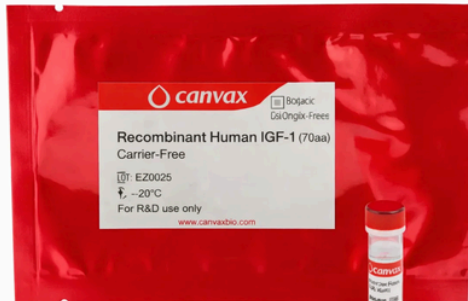




RECOMBINANT HUMAN IGF-1

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

Insulin-like Growth Factor-1 (IGF-1) is a key regulator of cell growth, survival, and differentiation across multiple tissues and cell types. As a principal mediator of growth hormone signaling, IGF-1 plays a central role in developmental biology and in the maintenance of proliferative cellular states.

IGF-1 exerts its biological effects primarily through binding to the insulin-like growth factor 1 receptor (IGF1R), a transmembrane receptor tyrosine kinase that triggers intracellular signaling pathways regulating cell proliferation, metabolism, and survival.

Activation of IGF1R leads to phosphorylation cascades that control gene expression programs associated with growth and cellular maintenance.

In modern cell culture systems, recombinant IGF-1 is widely used as a critical component of defined media formulations supporting the expansion and maintenance of pluripotent stem cells, mesenchymal stromal cells, and other proliferative cell populations.

Its ability to stimulate survival signaling and promote controlled proliferation makes it an important growth factor for advanced cell culture models, organoid systems, and regenerative biology research.

Product Specification

Protein	Human IGF-1 (70 aa) ~7.6 kDa
Bioactivity	EC ₅₀ = 3.5 ng/mL (0.45 nM) Batch representative
Expression system	<i>E. coli</i>
Purity	>98%
Endotoxin	<0.05 EU/μg
Formulation	Lyophilized
Animal origin status	Animal origin-free (AOF)
Carrier	None

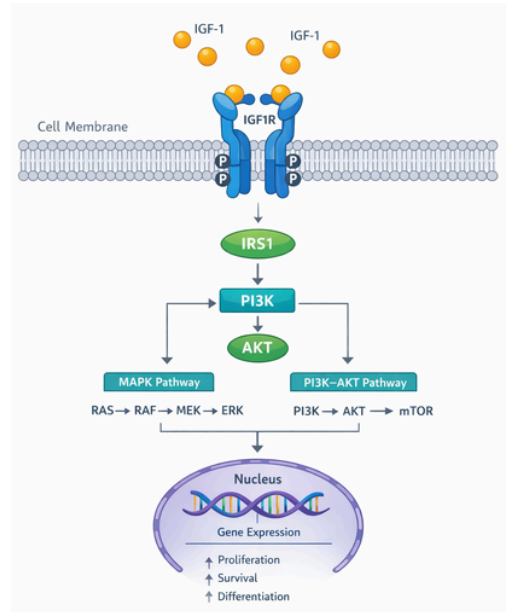
Biological Function

IGF-1 binds to the extracellular domain of the insulin-like growth factor-1 receptor (IGF1R), a transmembrane receptor tyrosine kinase. Ligand binding promotes receptor dimerization and autophosphorylation of intracellular tyrosine residues within the receptor kinase domain.

Activated IGF1R recruits adaptor proteins such as insulin receptor substrate-1 (IRS1), which initiate downstream signaling cascades.

These events lead to activation of major intracellular pathways including the MAPK (RAS-RAF-MEK-ERK) pathway and the PI3K-AKT signaling axis.

These pathways regulate transcriptional programs controlling cell proliferation, survival, metabolism, and differentiation, explaining the central role of IGF-1 in growth regulation and stem cell biology.



Simplified representation of IGF-1 signaling. IGF-1 binding to IGF1R induces receptor autophosphorylation and recruitment of adaptor proteins such as IRS1, leading to activation of PI3K-AKT and MAPK signaling pathways that regulate 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

IGF-1 is widely used in advanced cell culture systems where controlled activation of growth and survival signaling pathways is required. In defined media formulations, IGF-1 supports proliferation, metabolic activity, and long-term viability of multiple stem and progenitor cell populations.

Pluripotent Stem Cell Culture

IGF-1 is commonly incorporated into defined media used for the maintenance and expansion of human pluripotent stem cells. Activation of IGF1R signaling supports cellular survival and proliferation while helping maintain the undifferentiated state in optimized culture systems.

Mesenchymal Stromal Cell Expansion

IGF-1 promotes proliferation and metabolic activity in mesenchymal stromal cells (MSCs) and other mesenchymal cell populations. Its use in culture media formulations supports efficient cell expansion while maintaining functional cellular properties.

Defined Media and Organoid Systems

Recombinant IGF-1 is frequently used in chemically defined culture media designed for advanced cellular models including organoids and engineered tissue systems. Controlled activation of IGF signaling pathways supports cellular growth, viability, and differentiation programs in complex culture environments.

Functional Bioactivity

The biological activity of recombinant IGF-1 was determined using a serum response element (SRE) luciferase reporter assay in transfected MCF-7 cells.

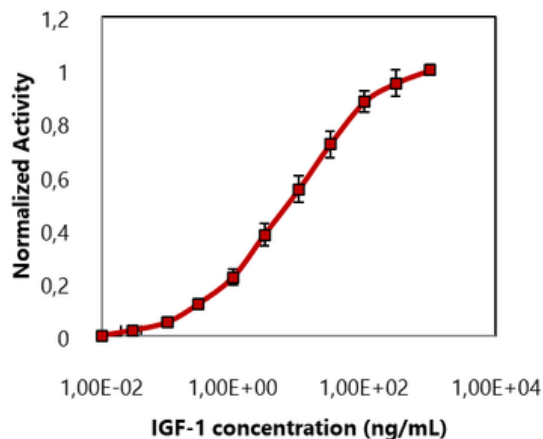
Cells were treated with a serial dilution of IGF-1 for 4 hours, and firefly luciferase activity was measured as an indicator of pathway activation.

Luciferase activity was normalized to control Renilla luciferase activity to correct for transfection efficiency and cell number.

Dose-dependent activation of the reporter system demonstrated robust stimulation of IGF-responsive signaling pathways.

EC₅₀ = 3.5 ng/mL (0.45 nM)

IGF-1 Bioactivity



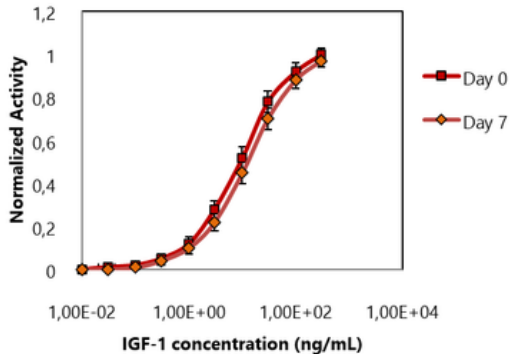
Dose-dependent activation of an IGF-responsive luciferase reporter assay in transfected MCF-7 cells. Firefly luciferase activity was normalized to Renilla luciferase activity. Recombinant IGF-1 shows potent activation of IGF signaling with an EC₅₀ of 3.5 ng/mL.



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Long-term stability

IGF-1 Stability in cell culture media



IGF-1 bioactivity following 7-day incubation in cell culture media. HEK293T reporter cells were stimulated with IGF-1 pre-incubated in cell culture media, demonstrating preserved signaling activity after prolonged exposure to culture conditions.

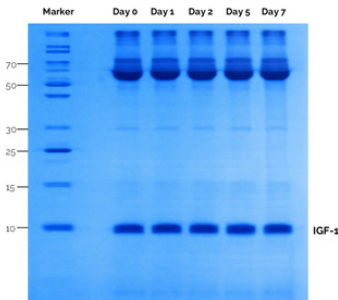
Recombinant IGF-1 remained functionally active following incubation in cell culture media for extended periods.

Stability was evaluated by pre-incubating the protein in cell culture media for seven days prior to performing the bioactivity assay.

Bioactivity was assessed using an IGF-responsive firefly luciferase reporter assay in transfected HEK293T cells.

The protein retained robust activity following incubation, demonstrating stability under typical cell culture conditions.

These results indicate that IGF-1 maintains functional activity and structural integrity during extended exposure to cell culture media.



IGF-1 structural integrity following incubation in cell culture media. SDS-PAGE analysis shows preservation of the monomeric IGF-1 band after extended incubation, indicating maintained protein integrity.



Quality and Analytical Characterization

To ensure reliable performance in demanding cell culture systems, recombinant human IGF-1 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 IGF-1
Purity	>98%
Endotoxin	<0.05 EU/ μ g protein
Bioactivity	Representative EC ₅₀ 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.



Available Formats and Ordering Information

Product	Reference	Format	Ordering
Recombinant Human IGF-1 (70 aa)	CR011	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 IGF-1 (70 aa)	CR011-GMP	Bulk supply	Contact us info@canvaxbiotech.com

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



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