

DESCRIPTION

Source	<i>E. coli</i> -derived human IGF-I/IGF-1 protein	
	MFPAMPLSSLFVN	Human LR3 IGF-I/IGF-1 (Gly49-Ala118 (Glu51Arg)) Accession # P05019.1
	N-terminus	C-terminus
	Produced using non-animal reagents in an animal-free laboratory. Manufactured and tested under cGMP guidelines.	
N-terminal Sequence Analysis	Met-Phe-Pro-Ala-Met-Pro-Leu-Ser-Ser-Leu	
Predicted Molecular Mass	9 kDa	

SPECIFICATIONS

SDS-PAGE	8 kDa, reducing conditions
Activity	Measured in a serum-free cell proliferation assay using MCF-7 human breast cancer cells. Karey, K.P. <i>et al.</i> (1988) Cancer Research 48:4083. The ED ₅₀ for this effect is 0.3-1.5 ng/mL. IGFBP-3 does not inhibit its activity.
Endotoxin Level	<0.01 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Mass Spectrometry	The result of the major peak from mass spectrometry analysis is 9111 Da, which corresponds to the calculated molecular mass of 9118 Da.
Host Cell Protein	<0.1 ng per µg of protein when tested by ELISA.
Mycoplasma	Negative for Mycoplasma.
Host Cell DNA	<0.0015 ng per µg of protein when tested by PCR.
Formulation	Lyophilized from a 0.2 µm filtered solution in Acetic Acid. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100-200 µg/mL in sterile 100 mM Acetic Acid
Shipping	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	Use a manual frost freezer and avoid repeated freeze-thaw cycles. <ul style="list-style-type: none"> • A minimum of 12 months when stored at ≤ -20 °C as supplied. Refer to lot specific COA for the Use by Date. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, ≤ -20 °C under sterile conditions after reconstitution.

DATA

<p>Bioactivity</p> <p>Recombinant Human LR3 IGF-I/IGF-1 GMP Protein Bioactivity GMP-grade Recombinant Human LR3 IGF-I/IGF-1 (Catalog # 8335D-GMP) stimulates cell proliferation in a serum-free assay using the MCF-7 human breast cancer cell line. The ED₅₀ for this effect is 0.3-1.5 ng/mL.</p>	<p>SDS-PAGE</p> <p>Recombinant Human LR3 IGF-I/IGF-1 GMP Protein SDS-PAGE 2 µg/lane of GMP-grade Recombinant Human LR3 IGF-I/IGF-1 (Catalog # 8335D-GMP) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by Coomassie® Blue staining, showing R and NR bands at 8 kDa.</p>
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BACKGROUND

Insulin-like Growth Factor 1 (IGF-1 or IGF-I), also known as Somatomedin C, is the dominant effector of Growth Hormone (GH) and is structurally homologous to Proinsulin. Human IGF-1 is synthesized as two precursor isoforms with N- and alternative C-terminal propeptides (1). These isoforms are differentially expressed by various tissues (1). The 7.6 kDa mature IGF-1 is identical between isoforms and is generated by proteolytic removal of the N- and C-terminal regions. Mature human IGF-1 shares 94% and 96% amino acid (aa) sequence identity with the mouse and rat orthologs, respectively (2). GH stimulates the production of IGF-1 in most tissues (3). Hepatocytes produce circulating IGF-1, while local IGF-1 is produced by many other tissues in which it has paracrine effects (1). IGF-1 induces the proliferation, migration, and differentiation of a wide variety of cell types during development and postnatally (4, 5). IGF-1 regulates glucose, fatty acid, and protein metabolism, steroid hormone activity, and cartilage and bone metabolism (6-11). It plays an important role in muscle regeneration and tumor progression (1, 12, 13). IGF-1 binds IGF1R, IGF2R, and the Insulin Receptor, although its effects are mediated primarily by IGF1R (14). IGF-1 also binds with strong affinity to IGF binding proteins (IGFBPs), which regulate the availability and biological activities of IGF-1 (15, 16).

Long R3 IGF-1 (LR3 IGF-1) is a 9.2 kDa synthetic analog of IGF-1 that is generated by modifying the aa sequence for mature human IGF-1. These modifications include the substitution of an Arg for Glu at position 3 of the mature IGF-1 sequence and the addition of a thirteen aa N-terminal extension, which is derived from methionyl porcine Growth Hormone (17). These aa changes generate a protein that is still capable of binding to IGF-1 and Insulin receptors, but shows considerably lower affinity binding to IGFBPs compared to wild-type IGF-1 (17, 18). As a result, LR3 IGF-1 has an increased half-life and displays increased biological potency compared to IGF-1 (17-22).

References:

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MANUFACTURING SPECIFICATIONS

GMP Proteins

R&D Systems, a Bio-Techne Brand's GMP proteins are produced according to relevant sections of the following documents: USP Chapter 1043, Ancillary Materials for Cell, Gene and Tissue-Engineered Products and Eu. Ph. 5.2.12, Raw Materials of Biological Origin for the Production of Cell-based and Gene Therapy Medicinal Products.

R&D Systems' quality focus includes:

- Designed, manufactured and tested under an ISO 9001:2015 and ISO 13485:2016 certified quality system
- Documented and controlled manufacturing process
- Control of documentation and process changes by QA
- Personnel training programs
- Raw material inspection and vendor qualification/monitoring program
- Validated equipment, processes and test methods
- Equipment calibration and maintenance schedules using a Regulatory Asset Manager
- Facility/Utilities maintenance, contamination controls, safety and pest control programs
- Material review process for variances
- Robust product stability program following relevant ICH guidelines

R&D Systems strives to provide our customers with the analytical characteristics of each product so that customers may determine whether our products are appropriate for their application. Each product is provided with a lot-specific Certificate of Analysis that contains the product's specifications and test results. Quality control testing may include, but is not limited to:

- N-terminal amino acid analysis
- SDS-PAGE purity analysis
- Molecular weight analysis via mass spectrometry
- Endotoxin assessment per USP <85> and Ph. Eur. 2.6.14 guidelines
- Bioassay analysis
- Microbial testing per USP <71> and Ph. Eur. 2.6.1 guidelines
- Host cell protein assessment
- Host cell DNA assessment
- Mycoplasma assessment

Additional testing and documentation requested by the customer can be arranged at an additional cost.

Production records and facilities are available for examination by appropriate personnel on-site at R&D Systems in Minneapolis and St. Paul, Minnesota USA.

R&D Systems sells GMP grade products for preclinical or clinical *ex vivo* use. They are not for *in vivo* use. Please read the following End User Terms prior to using this product.

Animal-Free Manufacturing Conditions

Our dedicated controlled-access animal-free laboratories ensure that at no point in production are the products exposed to potential contamination by animal components or byproducts. Every stage of manufacturing is conducted in compliance with R&D Systems' stringent Standard Operating Procedures (SOPs). Production and purification procedures use equipment and media that are confirmed animal-free.

Production

- All molecular biology procedures use animal-free media and dedicated labware.
- Dedicated fermentors are utilized in committed animal-free areas.

Purification

- Protein purification columns are animal-free.
- Bulk proteins are filtered using animal-free filters.
- Purified proteins are stored in animal-free containers.

[Please read our complete Animal-Free Statement](#)

PRODUCT SPECIFIC NOTICES

Full terms and conditions of sale can be found online in the Protein Sciences Segment T&Cs at: [Terms & Conditions](#).