Recombinant Human LR3 IGF-I/IGF-1 GMP

Catalog Number: 8335D-GMP

DESCRIPTION

Source

E. coli-derived human IGF-I/IGF-1 protein

MFPAMPLSSLFVN	Human LR3 IGF-I/IGF-1 (Gly49-Ala118 (Glu51Arg)) Accession # P05019
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

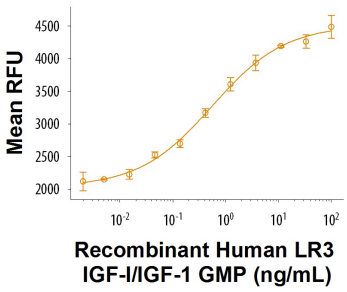
SDS-PAGE	8 kDa, reducing conditions
Activity	Measured in a serum-free cell proliferation assay using MCF-7 human breast cancer cells. Karey, K.P. *et al.* (1988) Cancer Research **48**:4083. The ED_{50} for this effect is 0.3-1.5 ng/mL. IGFBP-3 does not inhibit its activity.
Endotoxin Level	<0.01 EU 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 when tested in a ribosomal RNA hybridization assay.
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 defrost freezer and avoid repeated freeze-thaw cycles.** • 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.

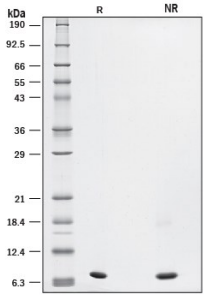
DATA

Bioactivity



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 ED_{50} for this effect is 0.3-1.5 ng/mL.

SDS-PAGE



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.

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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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- Host Cell Protein testing performed by ELISA
- Mycoplasma testing by ribosomal RNA hybridization assay

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