

Recombinant LONG^{R3}IGF-1 and rTransferrin Improved Growth and Productivity of Two Suspension Chinese Hamster Ovary Cell Lines

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Summary

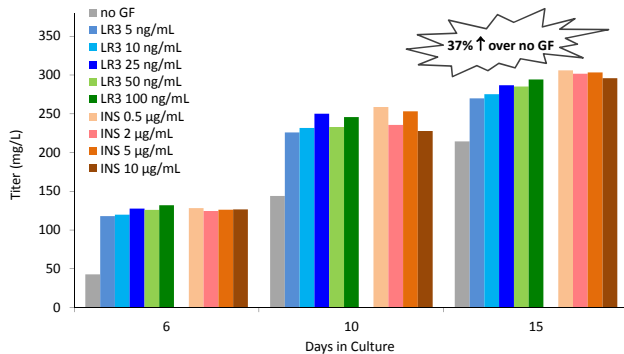
LONG^{R3} IGF-1 is a human IGF-1 analog containing a 13 amino acid N-terminal extension and a mutation at position 3. It activates the Type 1 IGF receptor, which is responsible for growth-promoting and protein synthesis effects in CHO cells. A common growth factor supplement used in CHO media, insulin, acts primarily through the IGF-R.

LONG^{R3} IGF-1 has previously been shown to increase CHO productivity. However, past characterization studies used primarily DMEM/F12 media. As serum-free media development has progressed, media have become richer and more complex. To establish the effect of LONG^{R3} IGF-1 in media that meet today's industry standards, the effect of LONG^{R3} IGF-1 on the productivity of two antibody-expressing cell lines was compared to that of insulin and no growth factor supplemented media. The studies were carried out in TPP Tubespin 50mL bioreactor tubes. Media with LONG^{R3} IGF-1 gave superior titers versus no growth factor or insulin in several instances. In addition, it was demonstrated that combination of LONG^{R3} IGF-1 and rTransferrin gave higher titer than commercial ITS (rInsulin, rTransferrin, Selenium) solution in several modern commercial media types.

LONG^{R3} IGF-1 is used at low, 10 – 100 ng/mL, concentrations in cell culture and is currently used in several commercial antibody manufacturing processes. It represents a regulatory-friendly method of enhancing serum-free cell culture performance. LONG^{R3} IGF-1 should, therefore, be considered as a media supplement to further optimize a protein-free process or to replace insulin in existing processes.

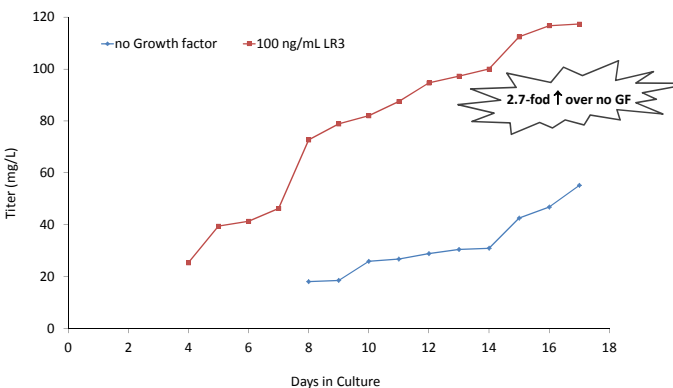
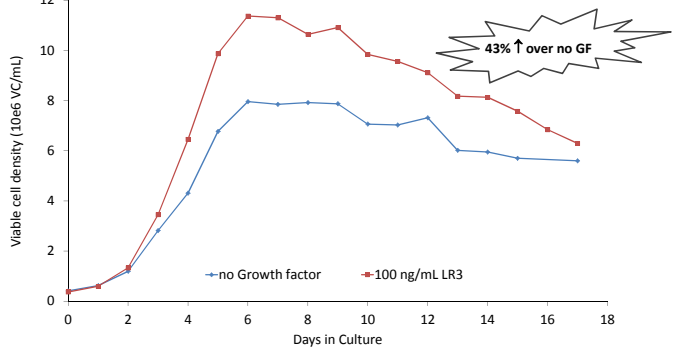
LONG^{R3}IGF-1 and rInsulin Supplementation Significantly Increased Titer in Fed-batch Culture using CD OptiCHO Medium – Cell Line A

• Feed: Efficient Feed A



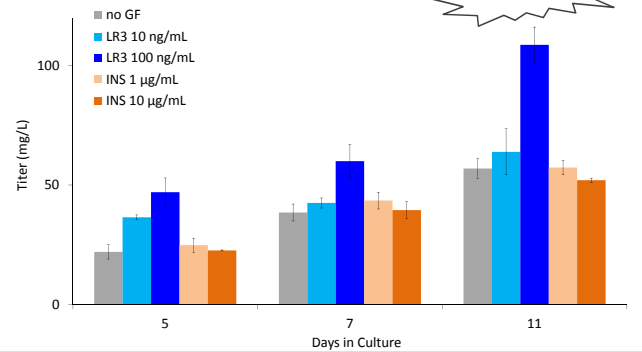
LONG^{R3}IGF-1 Supplementation Significantly Increased the Growth and Productivity of Cell Line A in 5-Liter Bioreactors using CD OptiCHO Medium

• 5L CellGen BIU bench-scale bioreactor
• Fed-batch culture: Medium: OptiCHO; Feed: Efficient Feed A



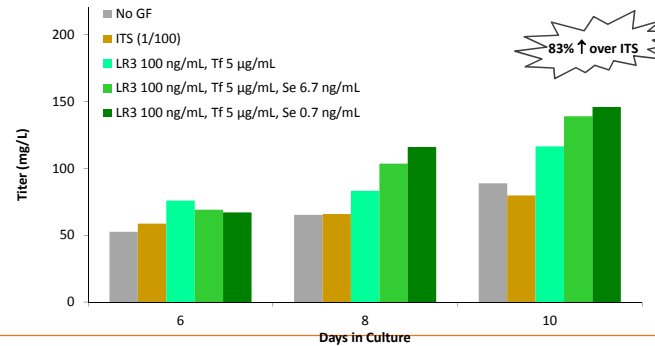
LONG^{R3}IGF-1 Yielded Significantly Higher Titer than rInsulin in Fed-batch Culture using CD OptiCHO Medium – Cell Line B

• Feed: Efficient Feed A

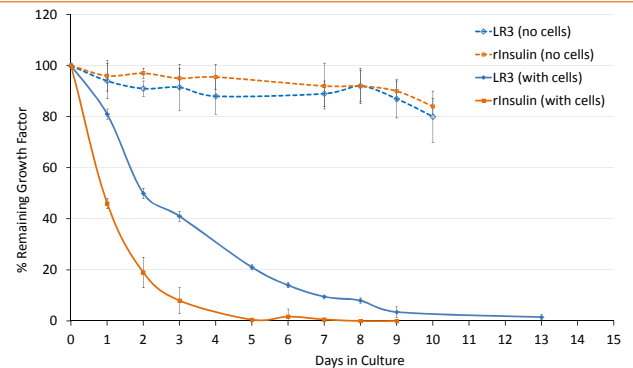


LONG^{R3}IGF1-rTransferrin-Selenium Combination Yielded Significantly Higher Titer than ITS in Fed-batch Culture using CD FortiCHO Medium

• Feed: Efficient Feed A



LONG^{R3}IGF1 Had Better Stability than rInsulin in CD OptiCHO Medium



Conclusions

- Application data for LONG^{R3}IGF1 and rTransferrin were generated using recombinant CHO cell lines and modern commercial chemically-defined, Animal-Derived-Component free media and feeds
- LONG^{R3}IGF1 is more effective than rInsulin in increasing protein synthesis from recombinant CHO cell lines when supplemented to growth factor free media
- LONG^{R3}IGF1-rTransferrin combination is more potent than rInsulin-rTransferrin-Selenium solution in increasing the productivity of recombinant CHO cell lines
- LONG^{R3}IGF1 yielded higher or comparable titer to rInsulin when used at 1000-fold lower concentration. It is therefore a very powerful mitogenic growth factor that is economical to use
- LONG^{R3}IGF1s produced in a validated, cGMP (ICH Q7) compliant, manufacturing process with no animal derived components; Final product is released by QC testing
- Ask us about other applications of our growth factors growthfactors@repligen.com
 - CHO culture: cell line development, cell banking
 - Stem cell culture and regenerative medicine