



Growth Factors & Cytokines for Stem Cell Research

CORE
BIOGENESIS

| Powering the Future of Health |

In partnership with



SCIENTIFIC
LABORATORY
SUPPLIES





Protein Bioactivity is Key for Optimal Cell Culture Performance

Cell culture is a crucial part of disease modelling and new medicines discovery. Using standardized and proven reagents guarantees safe culture conditions. Core Biogenesis recombinant human growth factors and cytokines portfolio offers a specialized and versatile range of reagents for the expansion and differentiation of various cell phenotypes including pluripotent stem cells, adult stem cells and T cells .



Save Time and Money while Satisfying your Demand Needs





Solutions

Stem cell and Immunotherapies promote the repair of diseased, dysfunctional, or injured tissues. **Stem cell research can face many challenges** in regards to reproducibility, and controlling and scaling cell expansion. From a processing perspective, **cell viability, growth rate, and variability can all present serious issues for researchers. Growth factors are critical culture media components** required for the maintenance and differentiation of cells in culture and are widely employed in cell culture processes. However, **they are expensive, and their current supply demands are highly unsatisfied.**

Core Biogenesis is changing the paradigms of protein production and **unlocks the new era of the bioeconomy.** With our **proprietary methods for protein expression and purification**, we obtain **high quality recombinant growth factors and cytokines** improving the standards of bioactivity and purity for cell culture, while being **produced at the scale and costs needed by the field.** Our technology enables to **secure your stock and reserve batches for long-term use**, thanks to the natural preservation of the proteins in our bioproduction platform. As a result, your worries about raw material source, availability, and supply-chain guarantees, all disappear.

Recombinant proteins from Core Biogenesis are produced under the most rigorous criteria **guaranteeing purity $\geq 95\%$, ultra-low endotoxin levels $\leq 0.005\text{EU}/\mu\text{g}$, and 100% animal-free.** Our optimised solutions are designed to facilitate high-yield production and clear, reliable results. We offer our products in a variety of sizes and formats to be used across multiple applications:

- Stable Cell Line Development.
- Generation of high-quality and large cellular yields.
- Stem Cell Differentiation into progenitor and committed phenotypes.

Protein Format



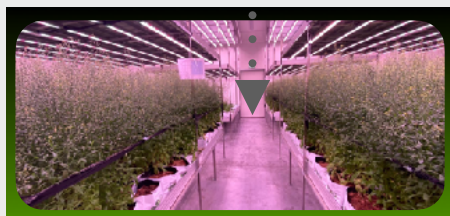
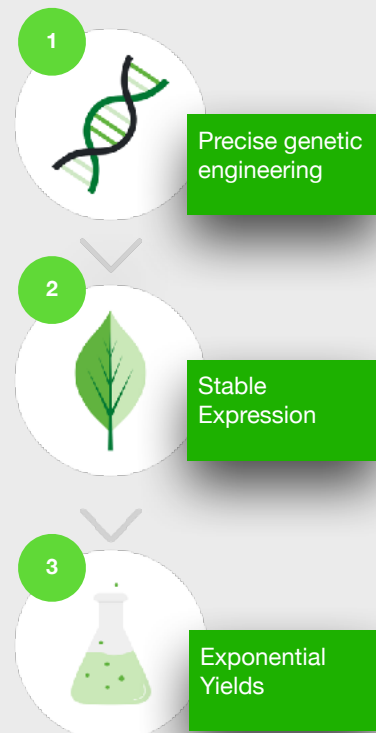
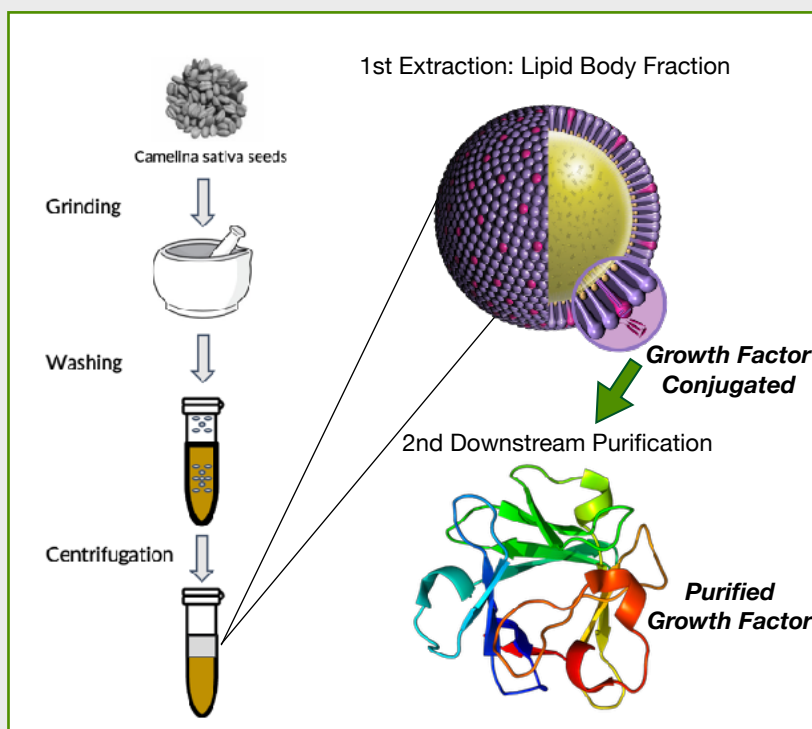
Purified Human Recombinant Growth
Factors

Technology



“ **Core Biogenesis** leverages the oilseed plant *Camelina sativa* for the **stable expression of recombinant proteins in its seeds**, and has developed various technologies to increase the production yields and make the extraction process more efficient and more scalable. **Our bioproduction method enables a targeted isolation of the recombinant protein** of interest within a specific lipid-enriched organelle of the plant located in the seeds, allowing for the development of phase-specific protein purification, which ensures a final product free from impurities. This results in a downstream process with a **scalability comparable to the food industry, with a cGMP quality grade.** ”

Molecular Farming Mode On: The World's Most Scalable Bioproduction Platform



Controlled-environment bioproduction platform

- Biorisk-free ✓
- Ultra Scalable ✓✓
- No Bioreactors ✓✓✓
- Carbon Negative ✓✓✓
- Fully Sustainable ✓✓✓
- Complete traceability ✓✓

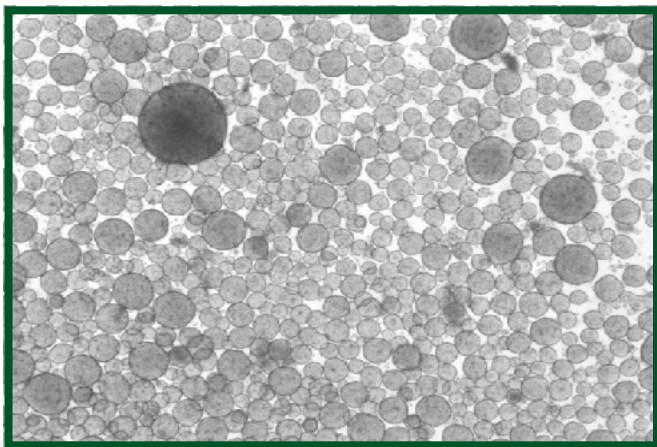


Pure Recombinant Growth Factors

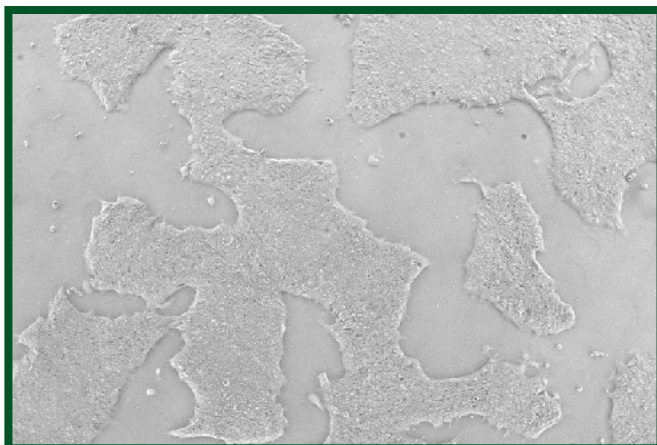


Get Full Control Over Your Cells

Purified growth factors and cytokines from **Core Biogenesis** are produced with recombinant technology allowing precise expression of our proteins thanks to CRISPR/Cas9 genetic engineering. Our **highly pure and bioactive products** have the power to control the signalling cascades that define stem cell fate. More importantly, **we eliminate the batch-to-batch inconsistencies and safety issues** found while using other expression systems such as animal serum, mammalian cells or conditioned media. Discover a full set of molecules available at multiple quantities tackling new supply chain and innovation challenges.

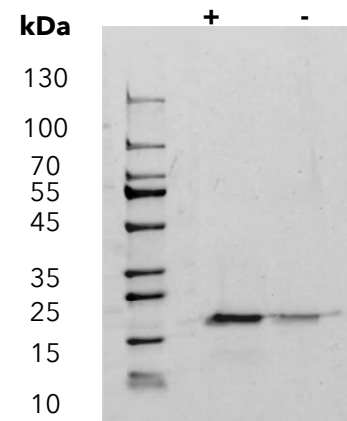


iPSCs derived embryoid bodies (EBs) cultured in suspension for 7 days with 20ng/ml of Core Biogenesis FGF-2.



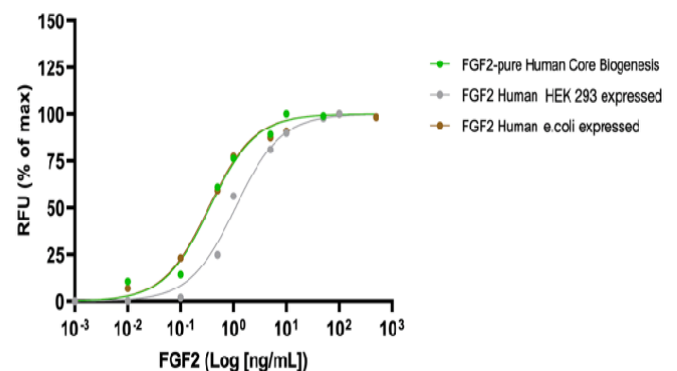
iPSCs cultured in adherent conditions with Matrigel treated plates for 4 days with 20ng/ml Core Biogenesis FGF-2.

Products Available	Species
FGF-2	Human
FGF-2 STAB®	Human
EGF	Human
IGF-1	Human
Products Pipeline	Species
TGFβ1	Human
ALBUMIN	Human
LIF	Human
INSULIN	Human
IL-2	Human
IL-7	Human
IL-15	Human



SDS-PAGE of FGF-2 showing predicted molecular mass at 16.06 kDa

Cell Proliferation Assay for Human FGF2 using NIH/3T3 cells



The biological activity of FGF2-pure Human Core Biogenesis compared to pure FGF2 Human competitors, determined by the dose-dependent proliferation of mouse NIH/3T3 cells.

FGF2-pure Human Core Biogenesis ED₅₀ is 0.36 ng/mL
Pure FGF2 Human competitor "A" ED₅₀ is 1.09 ng/mL
Pure FGF2 Human competitor "B" ED₅₀ is 0.42ng/mL

RESEOURCES AT HAND

Production Capacity

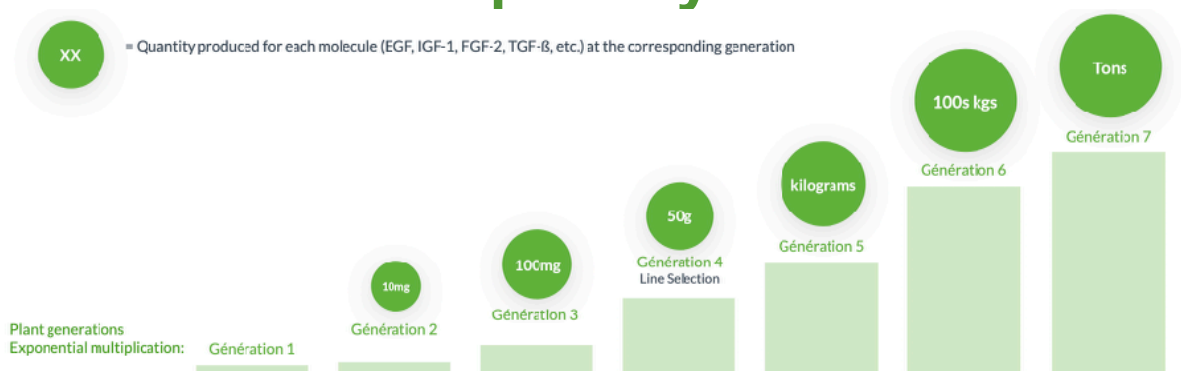


Figure 1. Production capacity of different growth factor products, and scalability schemes corresponding to each plant generation. Core Biogenesis counts with both a controlled environment facility at Strasbourg, France, and open fields in the US. Together, the total protein production capacity comes at scales from Kg to Tons.

Cost Savings

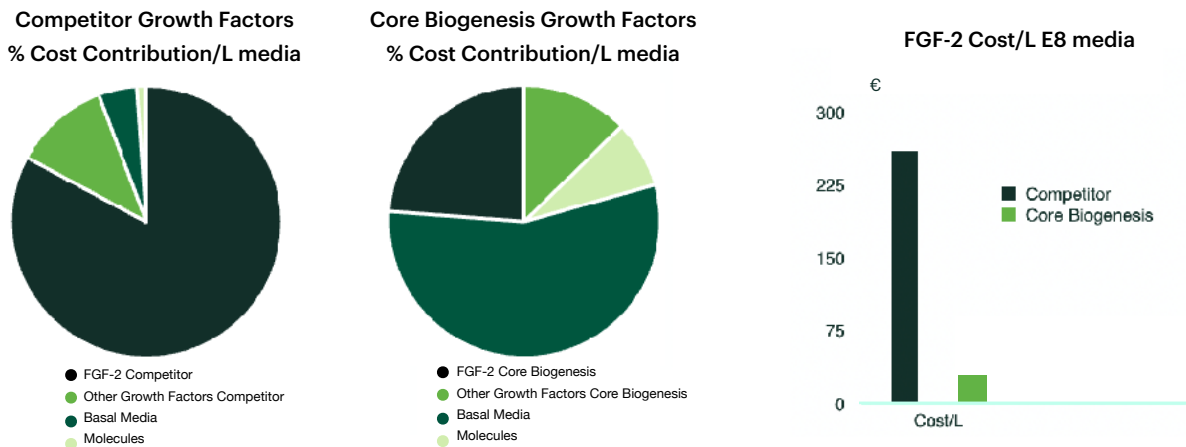


Figure 2. Comparative analysis of the cost contributions of growth factors per litre of media. The concentrations used as standards were 100ng/mL for FGF-2 and 20ng/mL for the rest of growth factors. In the case of FGF-2, a total of 0.1mg is needed to prepare 1 Litre of media. Costs were determined from publicly available prices for 1mg quantities of competitor FGF-2 (e.coli derived) Vs. Core Biogenesis FGF-2 (plant-derived).

Supply Security

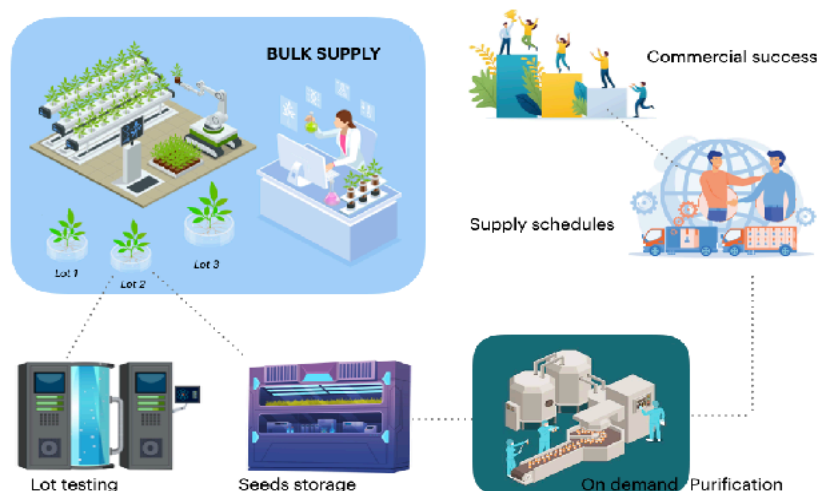


Figure 3. *Camelina sativa* seeds can store proteins up to 5 years without loss of function. Seed-based expression allows decoupling USP to DSP in GFs production. After lot testing and selection, customers are granted access to stock reservation. The subsequent protein purification and product supply is processed on demand, according to supply agreement schedules.



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