

CASE STUDY: ADVANCING CULTURED MEAT PRODUCTION

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01 INTRODUCTION

Growth factors are among the most expensive components in cultivated meat production.

Current sources (animal-derived or recombinant systems) are expensive, variable, and difficult to scale.

02 OBJECTIVE

Develop optimized microbial expression systems for key growth factors.

Apply bioprocess engineering to enhance yield and reduce cost.

03 METHODOLOGY

Strain Engineering: Synthetic promoters, codon optimization, secretion tags.

High-throughput screening for candidate selection.

Precision Fermentation: Design of experiment, fed-batch fermentation.

Downstream Development: Purification via membrane-based TFF and chromatography.

Functional Validation: Bioactivity testing using bovine, human and avian cell lines.

ALAGENE SERVICES



Computational Design & Cell Engineering



High-Throughput Screening & Bio-Assay Development



Fermentation Process Development



Downstream Process & Analytics

04 RESULTS

Achieved >6-fold yield improvement vs. baseline strains.

1000-fold reduction in production cost through optimized fermentation and DSP.

Maintained full bioactivity comparable to commercial recombinant growth factors.

Demonstrated scalable process 150mL → 2L → 50L bioreactors.



05 CONCLUSION

Synthetic biology with bioprocess engineering delivers cost-effective growth factors for cultivated meat.

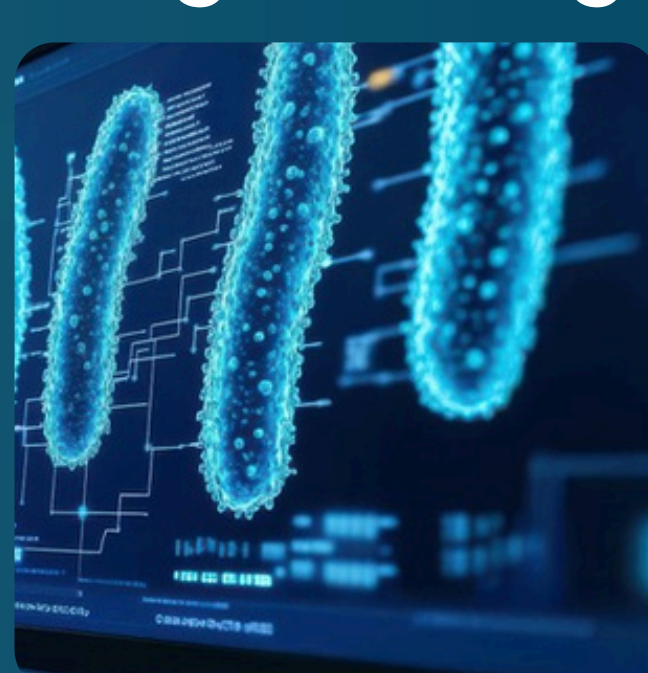
This platform technology can accelerate commercial viability of cellular agriculture.

Alagene leverages synthetic biology and process development to engineer microbial strains for high-yield, scalable production of functional biomolecules.



Genetic Optimization (10X)

Gene Optimization & Host Engineering



Cell Screening



Process Optimization (X-fold)

Precision Fermentation



Protein Purification & Preparation



Validation

Bioactivity Testing

