



21<sup>st</sup>  
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BIO

# Let's go from vision to reality

21st.BIO can get you from  
innovation to the market faster with proven  
industrial fermentation technology

# Do you have what it takes to go from innovation to industrial scale in precision fermentation?

As a visionary in the bio-industrial arena, you undoubtedly have several critical questions as you strive to transition from innovation to producing at industrial scale:

**How quickly** can we achieve industrial-scale production of our (recombinant) protein?

Which technology offers a **risk-mitigated path** to achieve optimal cost efficiency both now and in the long run?

**Is it feasible to partner** with a production technology provider, allowing us to concentrate on developing other crucial aspects of our business?

**At 21st.BIO, we have the answers to these questions!** We specialize in precision fermentation technology and knowhow that will enable you to reach your goals faster, cheaper, and with a better impact in this world.



You can now access a world-class industrial production platform that has been demonstrated to perform over many years

## WHAT WE OFFER:

At 21st.BIO, we provide you with access to an unparalleled high-performance strain platform and fermentation protocols optimized for multiple expression systems.

## WHY IS THIS DISTINCT:

21st.BIO's strain platform has been used and optimized for industrial production and offers you a fast and de-risked journey from innovation to upscaling and regulatory approval.

## WE CONTINUE TO OPTIMIZE YOUR PROCESS:

Our primary objective is to develop a production strain with significantly enhanced yields and stability, maximizing the efficiency and reliability of your production process.

Our world-class team remains dedicated to continually optimizing productivity, ensuring that you obtain cost and commercial benefits throughout your product's lifecycle.



21st.BIO has an exclusive license to a library of microbial production strains and molecular tools from Novozymes A/S. The strains have been developed over a period of 40 years and are being used for manufacturing of multiple enzyme products for foods and industrial applications.



**EXAMPLE OF HOW YOU CAN WORK WITH 21st.BIO**  
**Are you looking to produce or source recombinant milk protein at industrial scale?**

21st.BIO now offers a development program, enabling fast and cost-efficient industrial production of Beta-Lactoglobulin (BLG).

The 21st.BIO program capitalizes on a mature fungal production strain that has been successfully employed in numerous industrial food enzyme products. The strain is specifically designed for regulatory approval, significantly mitigating the associated risks.

This program is offered to a limited number of companies who participate and share the development costs. Participants are given a license to use the BLG strain and process for manufacturing BLG protein. Over time, 21st.BIO will continue to optimize the BLG strain and processes, further enhancing productivity.

**You can focus on what you do best!**

By entrusting 21st.BIO to provide your production platform, you can concentrate on building world-class products and market reach.

We firmly believe companies that excel in formulating food products according to consumer preferences will emerge as the winners.

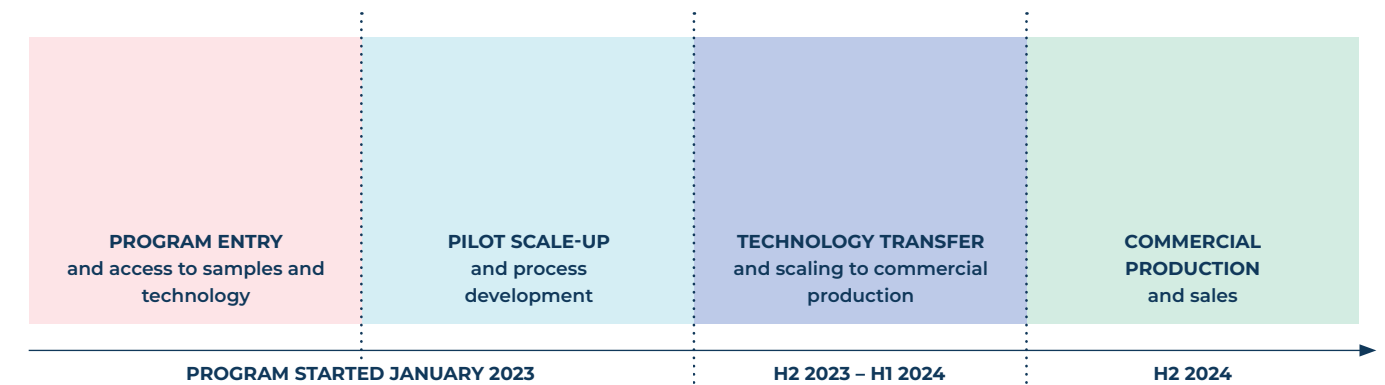
**WHY OFFER BLG IN A PROGRAM?**

BLG is a versatile, nutritious milk protein applicable across various food product categories, including dairy and baked goods. 21st.BIO aims to offer a production technology for a sustainable source of nutrition to meet the needs of the growing population.

**THIS IS JUST THE BEGINNING!**

Stay tuned for more upcoming programs focused on other valuable proteins.

**JOIN THE PROGRAM – TIMELINE TO INDUSTRIAL PRODUCTION WITH 21st.BIO BLG PROCESS**



# Get to industrial production faster and at a lower cost

We build and improve your manufacturing technology with you

PROCESS STEPS

→ You bring the innovation or target protein or peptide.

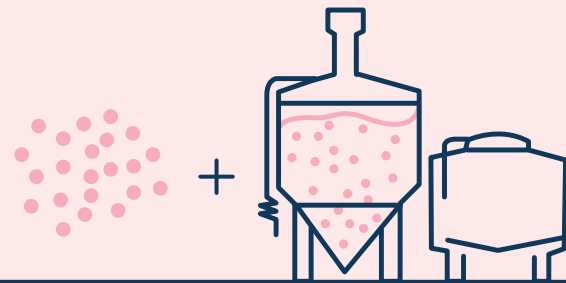
21st.BIO tests expression across several production hosts and develops high yielding strains for production of your target protein or peptide.

Fungi  
Yeast  
Bacteria



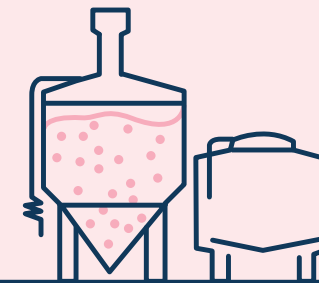
21st.BIO develops fermentation protocols and tests manufacturability to build a robust production system based on your strain.

→ You can focus on application development and product formulation.



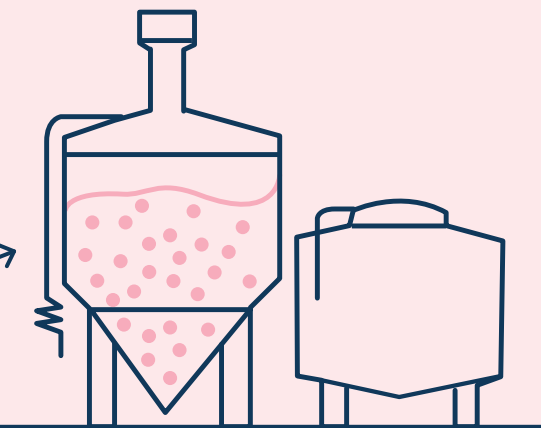
21st.BIO supports you in scaling the production process for commercial trials.

→ You can focus on production and market testing.



→ You can get to commercial production and sales with an economically viable production system

21st.BIO continues to optimize the technology for you after market launch.



12-24 MONTHS

VALUE PROP

You get a production strain designed specifically for your purposes, based on 21st.BIO's world-class industrial production systems and know-how, matured over 40 years.

You get a complete upstream production system to produce your protein or peptide, leveraging on 21st.BIO's proven track record for reaching superior titer levels and quality for industrial production.

You will get assistance with upscaling and producing materials for market testing and regulatory purposes.

You will be able to produce at lower cost with 21st.BIO's high productivity production strain that speeds up the time to economically viable production cost. And you are partnered up to reap the benefits of continued optimization.



## EXAMPLE OF HOW YOU CAN WORK WITH 21st.BIO

Are you looking to increase the speed and reduce the cost of scaling your innovation?

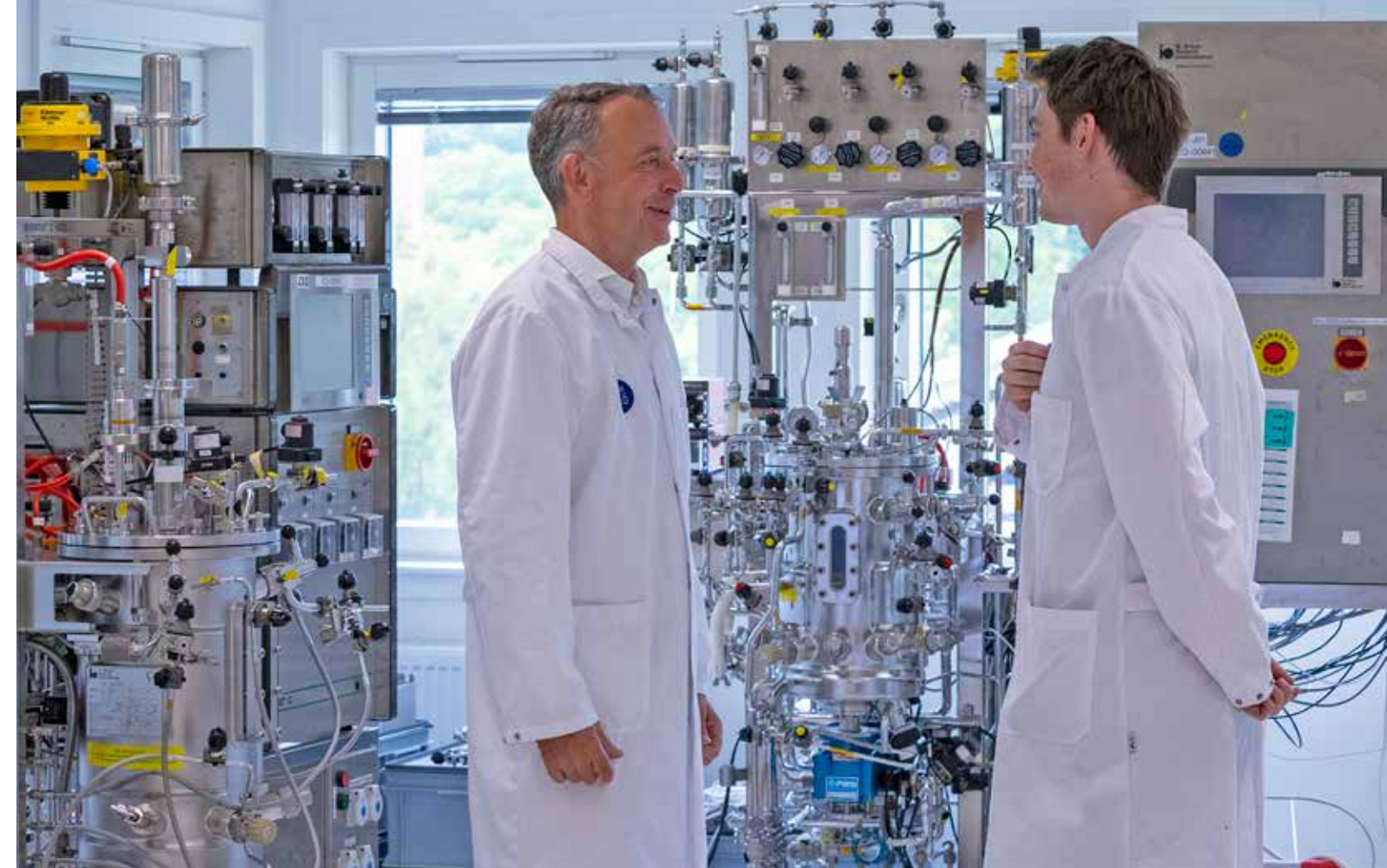
We can help you with a step-change in productivity or starting anew.

21st.BIO collaborates with a robust portfolio of food and materials technology companies, aiming to accelerate the scaling of their innovations and/or enhance productivity. At 21st.BIO, we work closely with you to develop and upscale a production strain and process that not only meets the quality requirements but also aligns with the price point of your innovation in the market. Additionally, we offer support in filing regulatory dossiers and provide you with genetic data for strain characterization.

We guide you through the decision-making process of strain construction strategy-balancing cost, strain diversity, and robustness of results. Our industrial production platforms enable us to test the expression and upscaling of your innovations and assess their manufacturability.

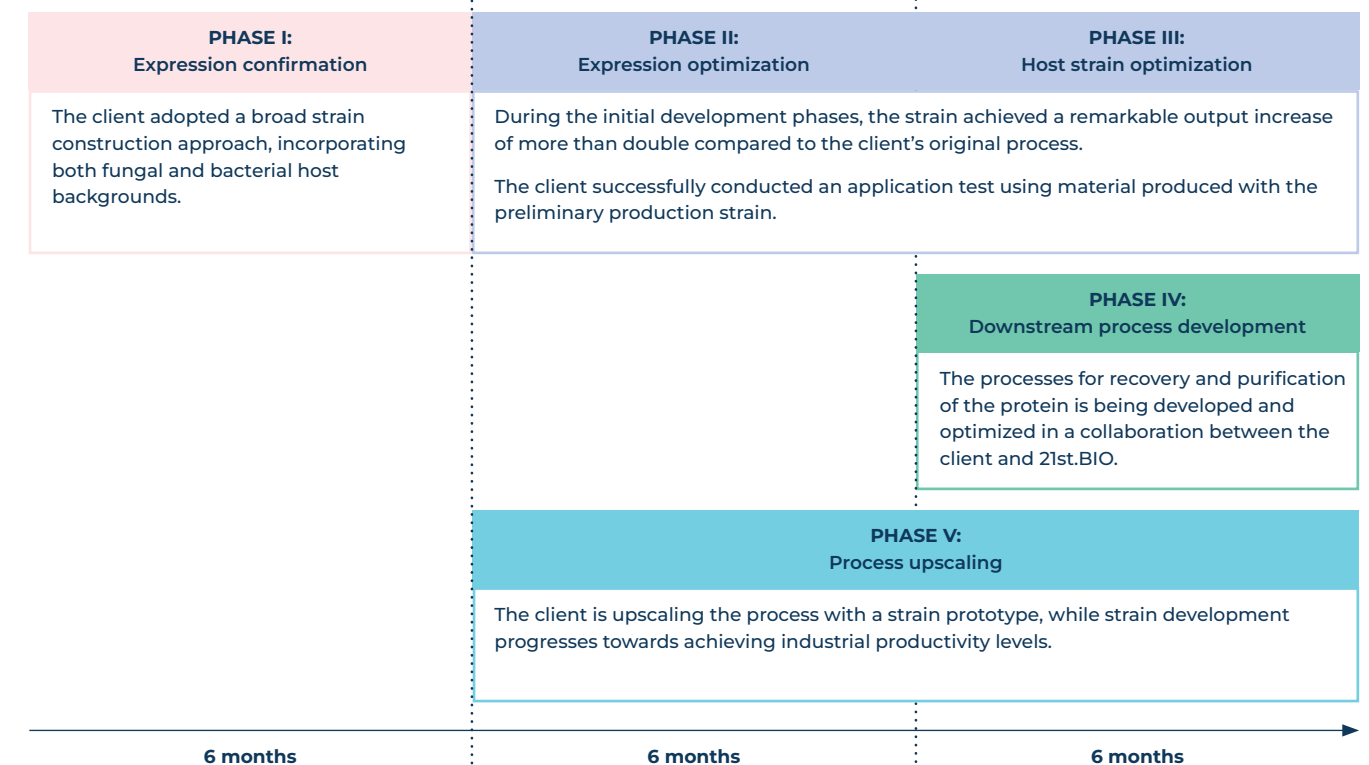
Your success is our priority – we make products, not projects! Once you are content with the process, you can license the strain and commence manufacturing your compound. After product launch, 21st.BIO remains available to continuously optimize the strain and processes, ensuring annual productivity improvements.

### Improvement in Product Titer



## A CLIENT PROJECT LAUNCHED IN 2022 TO ENHANCE THE PRODUCTION ECONOMICS OF A COMPOUND USED IN MATERIALS

A TYPICAL CLIENT DEVELOPMENT PROJECT HAS THE FOLLOWING PHASES:





# 21st.BIO stands on the shoulders of giants

Denmark, a world-leading hub for fermentation, is home to global industrial pioneers who have built their businesses by harnessing the power of nature and taking its inventions to the next level.

**Novozymes** – 21st.BIO's key technology provider – is a global leader in enzymes and proteins for high value products in food, household care, and agriculture, with a market value of approximately \$6 billion USD.

21st.BIO's fermentation technology is in part licensed from Novozymes who has developed it over several decades.

**21st.BIO** offers production technology for proteins, peptides, and more in the fields of food, materials, and agriculture. Precision fermentation is one of the most potent technologies to drive the transformations of the supply chains for food and materials in the World today – to the benefit of food security, climate, and land use.





**21st.BIO**  
offers world leading  
**STRAIN ENGINEERING** and  
**FERMENTATION TECHNOLOGY**  
for **INDUSTRIAL PRODUCTION**  
of your innovation

We have offices in  
Denmark and United  
States.

Please contact us to  
explore how we can  
partner to accelerate  
your business.

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