

A photograph of two scientists in a laboratory setting. They are wearing white lab coats and safety glasses. One scientist is pointing at a computer monitor. The background shows laboratory equipment and windows with blinds.

CASE STUDY III



METHANOL-INDUCED BIVALENT VHH PRODUCTION IN PICHIA MAXIMIZING PRODUCT TITER AND SPECIFIC PRODUCTIVITY



Case Study III: Development of a methanol-induced *Pichia* protein production process for maximization of process performance reaching 31 g/L for a bivalent VHH in *Pichia pastoris*

Key Achievements

ENHANCED STRAIN ENGINEERING LEVERAGING UNLOCK PICHIA® TECHNOLOGY

By harnessing our UNLOCK PICHIA® toolbox, we developed a high-performance *Pichia pastoris* strain capable of secreting 21 g/L of bivalent VHH applying one of our generic standard protocols.

ADVANCED PROCESS OPTIMIZATION

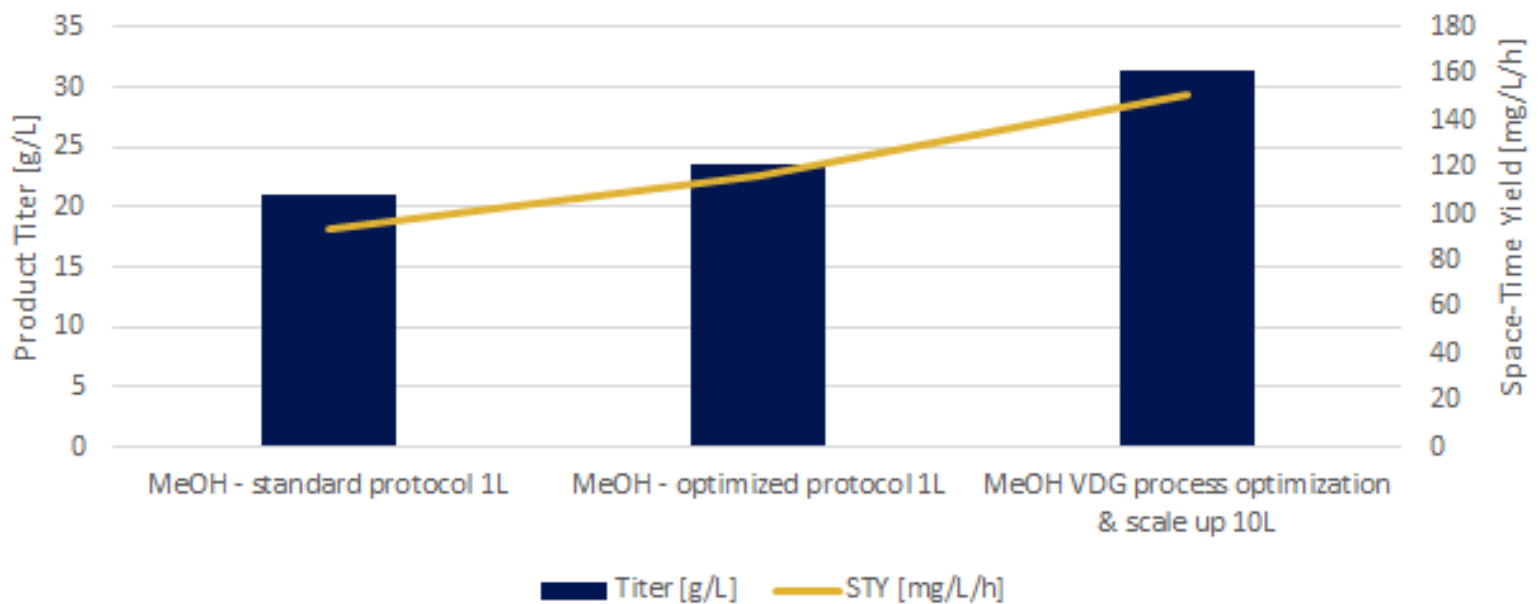
Through sophisticated process development and optimization strategies we achieved a ~50% increase in product titer, boosting final yields to an impressive 31 g/L in just 111 hours cultivation.

Productivity Highlights

SPECIFIC PRODUCTIVITY

Improved cultivation conditions through process optimization and scale-up significantly boosted cell performance, resulting in a remarkable ~80% increase in specific productivity.

UNLOCK PICHIA® MeOH-induced protein production



Case study III aimed to develop a high-performance methanol-inducible production process for the expression of a bivalent VHH

Using a VALIDOGEN generic standard protocol 21 g/L of bivalent VHH was secreted in 1 L bioreactors. In an initial development phase existing VALIDOGEN optimization protocols were applied to this strain in small-scale trials. This resulted in an increase of yield to 24 g/L, and a notable improvement in specific productivity.

By subsequently applying a targeted process development and optimization strategy at the 10 L bioreactor scale we achieved an impressive titer of 31 g/L, alongside a remarkable ~80% improvement in specific productivity compared to the standard methanol process. A customized methanol feeding strategy was developed specifically for this strain, enabling both a successful scale-up and further enhancement of productivity.

These results demonstrate the exceptional potential of VALIDOGEN's UNLOCK PICHIA® platform and Pichia expert know-how to develop high-performance protein production processes for commercial application.

Our platform provides extensive customization options, including both methanol-induced and methanol-free expression strategies. This flexibility, combined with our expertise in Pichia process development & optimization, enables us to develop robust, scalable, and economically viable processes that significantly reduce the cost of goods for protein manufacturing.

Please contact us if you are interested to learn more about VALIDOGEN's UNLOCK PICHIA® technology or our services directly by speaking to our team.

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