

CASE-STUDY DIATEC MONOCLONALS

ENABLING DIATEC MONOCLONALS' OPTIMIZATION OF SMALL-SCALE ANTIBODY PRODUCTION

CASE STUDY OVERVIEW

Customer: Diatec Monoclonals

Project / Application: Small scale production of antibodies

DWK Life Sciences products featured:
WHEATON® CELLLine™ 1000 Flask

About the Company

Diatec Monoclonals is a Norwegian biotechnology company with more than 25 years' experience in antibody production and conjugation. The company is based in Oslo, where it has both ISO and GMP production facilities. Diatec supports a wide range of customers and offers services including the custom production of monoclonal antibodies (both on a small and large scale) downstream processing and conjugation to enzymes and dyes, cell banking, the re-cloning and optimizing of cell lines and the establishment of new cell lines.

Throughout the company's history, the Diatec team have been working to develop an optimized process for small scale antibody production, capable of producing yields of between 25 mg and 100 g.

Optimizing the Cell Culture Environment

In order to maximize the efficiency of their small-scale antibody production process, the Diatec team required a cell culture flask that was capable of delivering an enhanced environment for cell growth when compared to more traditional small-scale methods, such as the use of T-Flasks. Where possible the team wanted to reflect the conditions typically seen in large scale bioreactors, especially those where hollow fibers are used as semi-permeable membranes.

Diatec decided to place WHEATON® CELLLine™ 1000 Flasks at the heart of their small-scale process. The flasks are designed to support the type of high-density cell culture being carried out by the team. The flasks feature two compartments. The top compartment is designed to hold media and features an easy-to-access media port. Beneath the media compartment sits a separate cell compartment, separated by a cellulose membrane designed to enable the exchange of nutrients and waste products between the media and cell compartment, optimizing the growing conditions of the cells. Beneath the cell compartment at the base of the flask is a second membrane. This semi permeable silicone membrane enables the exchange of oxygen and carbon dioxide between the cell compartment and the external environment, serving to further enhance the growing conditions of the cells.

Developing a method around WHEATON® CELLLine™ 1000 Flasks

The Diatec team have now been working with WHEATON® CELLLine™ 1000 Flasks for more than 20 years and have been able to optimize their wider production method based on their use. Typical customer projects see the team using anywhere between one and 24 flasks to deliver the required yield. The high antibody concentrations achieved using CELLLine™ support easier downstream processing. In addition to the flask's ability to optimize the conditions for cell growth, the CELLLine™ design supports ease of processing within the laboratory. The team are also able to easily change the growth medium in the large media compartment, which they typically only have to do twice a week so limiting the amount of resource and handling required for the flasks. The harvesting process is also supported by a dedicated port for the cell compartment. Additionally, the team are able to stack flasks where required to optimize space. Diatec typically use an individual flask for between five and ten weeks, which further contributes to the high yield per flask output.



WHEATON® CELLLine™ in action at Diatec Monoclonal.
Image courtesy of Diatec Monoclonal AS

Supporting high yield outputs

While the team chose to adopt CELLLine™ flasks during the early stages of the company's development, the enhanced output they provide is still easy to appreciate.

Virginie Follin-Arbelet, Diatec's Research and Development Manager, said: "We are able to obtain a yield of between 0.1 milligrams per liter up to 5 milligrams per liter, depending on the exact clone and serum we are working with. In comparison the yields from some T-Flasks can only provide a maximum yield of 50 micro-grams in some cases."

The effectiveness of the process developed by the Diatec team is based in part on their ability to create the conditions typically seen in large-scale cell culture production but on a smaller level.

Virginie added: "The WHEATON® CELLLine™ 1000 Flasks are the best small-scale solution for mimicking what is happening in a larger-scale hollow fiber bioreactor. This is particularly useful if we are carrying out test productions for customers."

Diatec is required to share details of its processes with many of its customers as Standard Operating Procedures (SOPs) and the use of CELLLine™ 1000 Flasks has provided the basis for a small-scale antibody production method with high levels of reproducibility. The team are continuing to improve their production process, with focuses on optimizing the harvesting approach and handling methods used during projects.

RESULTS

WHEATON® CELLLine™ 1000 Flasks have enabled Diatec Monoclonal to:

- Develop a viable small-scale antibody production process, based on the ability to obtain yields of up to 5 mg per liter
- Continue to improve this process by working with an established product, capable of delivering reproducible results

Resources

- Diatec Monoclonal - <https://diatec.com/services/>



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