Vereinigung für Allgemeine und Angewandte Mikrobiologie

14. VAAM Industry-Academia Panel

11.07.2024, 4 pm, online via Zoom

„Microbial bioprocess development in small scale cultivation systems"

Prof. Dr. Robert Huber, Hochschule München
Parallel small scale cultivation systems with online-monitoring for applied microbiology

Small scale cultivation systems, such as shake flasks or microtiter plates, are the most widespread bioreactors in applied microbiology. Furthermore, microbioreactors become more and more important.
For these cultivation systems there is a huge need and a clear trend towards more online-monitoring, which in turn can dramatically increase the knowledge gained in parallel experiments.

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Dr. Kyra Hoffmann, Scientific Bioprocessing Inc. (sbi), Baesweiler
Multi-parameter sensors for shake flasks: Removing black boxes for improved bioprocess development

Shake flasks are often used for microbial bioprocess development due to their cost-effectiveness and ability to achieve high throughputs. However, they differ significantly from industrial production bioreactors in design, operation, and size, and are often considered black boxes due to the lack of compatible sensor technology. This makes it difficult to translate results from shake flask screening steps to production conditions.

In this presentation, we introduce the mechanism of novel Multiparameter Sensor (MPS) and Dissolved Oxygen (DO) Sensor Pills designed to unlock these black boxes in shake flask processes. We then demonstrate how these new sensors helped identify bottlenecks in protein production in Pichia pastoris. Using the MPS and DO Sensor Pills, we successfully translated typical bioreactor process conditions (e.g., batch, fed-batch, methanol adaptation, and induction) to shake flasks, gaining valuable insights into protein production in our strains. This approach provided higher data density and improved the protein production process in a significantly shorter time compared to bioreactor screenings.