



Session 3	Artificial Intelligence in service of biomanufacturing
Pitch Title	Fully- Automated Growth Media Optimization Using a Novel Machine Learning Algorithm
Company	LABMaiTE GmbH
Speaker	Eelco Meerdink
Keywords feedstock	Open
Keywords technology	Machine Learning, Microbioreactor, High-throughput cultivation
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Abstract:	
<p>Bioprocessing is vital for producing specialized products like antibiotics and enzymes. A key challenge for biomanufacturing is developing a fermentation medium that meets the nutritional needs of the selected strain, which is often time-consuming and complex. Traditional Design of Experiments (DoE) methods have been the standard for growth media development. While they reduce the number of necessary cultivation experiments, these methods have limitations. Machine Learning (ML) algorithms are emerging as a promising and more efficient alternative.</p> <p>We introduce an innovative, fully automated microbioreactor system that autonomously mixes and tests nutrient media from various stock solutions, significantly reducing manual labor. This system combines a commercial microbioreactor, capable of cultivating 48 cultures with real-time monitoring of vital bioprocess parameters, and a liquid handling system for medium preparation, plate sterilization, and inoculation.</p> <p>Initially, 48 different media compositions are tested. After this first cycle, the system self-cleans and sterilizes the plate, preparing for the next cycle where ML algorithms suggest new media formulations. This iterative process continues until the optimal medium is found. In different application cases, the ML-optimized growth medium shows a 30% higher maximum biomass value compared to the DoE-optimized medium. We plan to diversify and test the ML algorithm with more strains to prove its broad applicability.</p>	