Session 8	Microbial protein transition players
Pitch Title	Fluidised Bed Riser Adsorption System for Continuous and Integrated Protein Purification
Company	Luxembourg Institute of Science and Technology
Speaker	Lisa-Marie Herlevi
Keywords feedstock	Fungal, bacterial
Keywords technology	Downstream processing, protein purification, integrated bioprocessing
Keywords End-Product	Protein

Abstract:

Fluidised bed riser adsorption system (FBRAS) is a novel technology patented by Luxembourg Institute of Science and Technology (LIST) for continuous downstream processing of biologics. It aims to reduce the number of unit operations by excluding the clarification of harvested feedstock. The adsorbent is recycled throughout the system while the columns remain stationary which reduces the equipment complexity, making it easier to adapt for new applications. Our equipment is also designed to minimize the amount of adsorbent and buffer required by having smaller counter-current columns designated for the wash, elution, regeneration, and equilibration stages in comparison to the traditional fluidised bed adsorption column. According to the initial validation study, the utilisation of fluidised bed technology instead of fixed bed of adsorbents allows the capture of targeted protein directly from the feedstock without impacting the product purity while the resin utilization and productivity were increased by six-fold and over four-fold, respectively. Specialized hydrogel adsorbents with improved mechanical properties were developed to overcome limitations of commercial resins, and they offer potential for a razor-razorblade business model together with the FBRAS equipment. Current work is carried out at LIST as a proof-of-concept project together with industrial partners who are manufacturers of food grade biologics.