ChE SEMINAR

The development of whole - bioprocess models

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ABSTRACT

Critical quality attributes (CQAs) drive the selection of critical process parameters (CPPs) for each unit-operation in a bioprocess. However, such CPPs are traditionally evaluated independently for each unit-operation. Here, we study an idealised process as a first step towards evaluating global rather than local CPPs. A cell culture step and two polishing chromatographic steps are considered as the critical operations for a case-study involving glycosylated variants of a product protein. The polishing separation steps, including ion exchange and hydrophobic interaction chromatography, are analysed using glycoform quality as a critical parameter. These global results also quantify the extent of interaction among unit operations, and can be used to select steps that constitute a globally robust process.

About the Speaker

Ajoy Velayudhan is a Professor of Bioprocess Engineering and Biotechnology in the Department of Biochemical Engineering at University College London; he also holds an EPSRC Manufacturing Fellowship. He has ten years of experience in biotechnology companies in the USA, including Johnson & Johnson and Bristol-Myers Squibb. He has led development groups in all areas of process development, including technology transfer. He earned his undergraduate degree in Chemical Engineering from the Indian Institute of Technology, Madras. He has MS and PhD degrees in Chemical Engineering from Yale University, where Professor Csaba Horvath was his supervisor. He did post-doctoral work at Purdue University with Professor Michael Ladisch. His interests are focused on the development and validation of industrially relevant whole-bioprocess models, which will allow a seamless understanding of interactions across the process and provide a systematic framework for optimisation, control, monitoring and troubleshooting.