



Chemical Engineering

Fall 2023 Seminar Series

Continuous Bioprocessing – New Challenges and Opportunities for Membrane Technology



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66-110

3:00-4:00pm

2:45pm Reception

There is growing interest in the development of integrated continuous bioprocesses for the production of important biotherapeutics due to the potential for enhanced productivity, greater flexibility, and improved product quality. The transition from batch to continuous bioprocessing requires a major re-thinking of the downstream purification process, creating exciting new opportunities for membrane technology. This talk will focus on the use of continuous countercurrent membrane systems for the purification and formulation of monoclonal antibody products. Continuous precipitation provides truly continuous steady-state product capture and purification using a column-free system in which countercurrent staged hollow fiber membrane modules are used for dewatering and washing the precipitated antibody. Countercurrent dialysis can provide high levels of buffer exchange in a single-pass continuous format for product formulation. Finally, proof-of-concept experiments have demonstrated that High Performance Countercurrent Membrane Purification can potentially provide high levels of host cell protein removal in the purification of recombinant protein products. These examples highlight how one can adapt membrane systems to continuous bioprocessing, providing exciting opportunities for improved manufacturing of high-value biopharmaceuticals.