

MIT Chemical Engineering Department

Fall 2019 Seminar Series

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Downstream Processing in Biomanufacturing: Multimodal Chromatography, Affinity Precipitation and Integrated Bioprocessing



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3:00 PM (Reception at 2:45 PM)
66-110

Abstract: This talk will present some recent advances in the state of the art of downstream bioprocessing. Chromatographic investigations with protein and multimodal ligand libraries, molecular dynamics simulations and biophysical studies are employed to provide fundamental insights into the basis of selectivity in multimodal systems. New classes of protein and chromatographic surface cluster arising from these studies are then employed in machine learning predictive models. pH and ligand chemistry are used to create targeted shifts in domain contributions, facilitating mAb separations. In addition, advances in the use of affinity precipitation with smart biopolymers is presented for the purification of mAb and non-mAb biologics in batch and continuous modes of operation. An *in-silico* method for the rapid development of integrated downstream processes as well as new approaches for creating orthogonally selective separations is also presented. Finally, some ideas are presented for the implications of big data in bioprocessing.