

CBE Seminar Series – Spring 2021

COVID-19 Discussion Panel

Featuring: Jonathan Dordick, Steven Cramer, & Todd Przybycien

Seminar: Wednesday, March 24, 2021

9:30 a.m. (ONLINE)

<https://rensselaer.webex.com/rensselaer/onstage/g.php?MTID=e2dbb62ed1e6b28e542e95fa400f4e58d>

Password: CBEseminar

“Advances and Challenges in COVID-19 Vaccine Development & Production”

Abstract:

Vaccines for COVID-19 hold the keys to a return to normal life. The rapid development of COVID-19 vaccines has been enabled by breakthrough technologies but challenges still remain to ensure their global success. Join us for a lively discussion hosted by the Department of Chemical and Biological Engineering on the critical enabling technologies and key questions surrounding the current state of COVID-19 vaccines.

Our panelists will present short perspectives, followed by a roundtable discussion. Audience questions will be accepted during the event, and we also encourage you to submit them ahead of time at:

<https://forms.gle/4mHLEAWhkJLivNv4A>

Meet the Panelists:



Jonathan Dordick, Howard P. Isermann Professor of Chemical and Biological Engineering, Senior Advisor to the President for Strategic Initiatives, RPI. Professor Dordick is an internationally leading biochemical engineer in biomolecular science and engineering, biomanufacturing, stem cell engineering, and drug discovery. He has held chemical engineering faculty appointments at the University of Iowa (1987-1998), where he also served as the Associate Director of the Center for Biocatalysis and Bioprocessing, and Rensselaer Polytechnic Institute (1998-present) where he also holds joint appointments in the departments of Biomedical Engineering and Biological Sciences. Prof. Dordick has received numerous awards, including Election to the National Academy of Engineering and the National Academy of Inventors, the Amgen Award in Biochemical and Molecular Engineering, the Food, Pharmaceutical and Bioengineering Award of the AIChE, Marvin J. Johnson Award and the Elmer Gaden Award both of the ACS, the International Enzyme Engineering Award, and an NSF Presidential Young Investigator Award. He is an elected Fellow of the ACS, AAAS, and AIMBE. He presently serves on the Scientific Advisory Boards for several biotechnology companies and venture

capital firms, and has cofounded several companies, including EnzyMed (now part of Albany Molecular Research, Inc.), Solidus Biosciences, Inc., and Redpin Therapeutics. He has also served on multiple White House-sponsored panels and committees in biomanufacturing. Dr. Dordick has published over 400 papers and is an inventor/co-inventor on 46 patents and patent applications. He has graduated over 60 Ph.D. students who have gone on to leading positions in industry and academia. Prof. Dordick received his B.A. degree in Biochemistry and Chemistry from Brandeis University and his Ph.D. in Biochemical Engineering from MIT.



Steven Cramer, William Weightman Professor of Chemical and Biological Engineering, RPI. Professor Cramer was educated in Biomedical Engineering, Brown University (BS degree) and Yale University (MS and PhD degrees). He has been a faculty member of RPI since 1986. His lab is currently conducting research on several areas related to protein-surface interactions and molecular bioprocessing. Many of the past contributions from Professor Cramer and his students to the field of Chromatographic Bioprocessing have had dramatic impacts on the state of the art of this technology and its successful implementation for the biomanufacturing of biological products. Their development of novel adsorption isotherm models of various classes of protein chromatography have been widely employed in academic research and have been utilized worldwide by the biotechnology industry. Their development of a Quantitative Combinatorial Design (QCD) approach has resulted in the discovery of a range of novel displacers and affinity ligands. The Cramer lab was one of the first to employ high throughput screening (HTS) for developing chromatographic bioprocesses which has had a dramatic impact on the way bioprocess development is now carried out in the industry.

Their work on the purification of antibodies using both protein A and mimetic resin systems have had a major impact on the field of antibody purification. They also pioneered a new methodology for the a-priori prediction of protein binding in chromatographic systems from crystal structure which is now being incorporated by many biopharmaceutical companies for process development. Their multidisciplinary work using a combination of biophysics, molecular dynamics simulations and chromatography with protein libraries has provided significant insights into the design of novel multimodal chromatographic systems. Recent work on integrated biomanufacturing and expedited process development is having a dramatic impact on how bioprocess development is carried out in the industry. In addition to his focus on downstream bioprocessing, Professor Cramer is known worldwide for his expertise in separations in general. He served as the Editor-in-Chief of the International journal Separations Science and Technology for 20 years. Professor Cramer has won numerous awards including the ACS National Award in Separations Science and Technology, the ACS BIOT Division's Michaels Award in the Recovery of Biological Products, and several awards from RPI including the Wiley Distinguished Faculty Award and the School of Engineering Outstanding Professor and Research Excellence Awards. He has published extensively in the top peer-reviewed journals in the field with 209 publications and has 11 patents. Importantly, the 50 Ph.D. graduates from the Cramer lab have had a significant impact with many of his former students now playing key leadership roles in the state of the art of industrial bioprocessing at most of the major biopharmaceutical and bioseparations companies worldwide as well as academia.



Todd Przybycien, Professor of Chemical and Biological Engineering, RPI. Professor Przybycien is an expert in the area of biopharmaceutical processing. He has developed and used spectroscopic and biophysical tools to establish structure-function-processing relationships for pharmaceutical proteins. Current research interests include development of: next-generation affinity chromatography media with enhanced selectivity and robustness; fully continuous processes for large scale recombinant protein purification; surrogate virus particles and surrogate antibody-drug conjugates for process performance measurement; nucleic acid-based assays for fail-fast detection of viral and mycoplasma contamination events; and mechanistic isotherm models to support precision affinity chromatography. He has chaired the International HIC/RPC Bioseparations Conference, the ACS Recovery of Biological Products Meeting and the

International BioPartitioning and Purification Conference. He just completed service on the Committee to Identify Innovative Technologies to Advance Pharmaceutical Manufacturing, a NASEM committee sponsored by the FDA; the Committee's report, "Innovations in Pharmaceutical Manufacturing on the Horizon: Technical Challenges, Regulatory Issues, and Recommendations (2021)", was published earlier this month. Prof. Przybycien spent eight years on the faculty at Rensselaer Polytechnic Institute, followed by 20 years at Carnegie Mellon University. There, he served as founding head of the Department of Biomedical Engineering. He re-joined the faculty at Rensselaer in August 2018.

Due to COVID-19, no refreshments will be available for this seminar

For more information, please contact Lisa Martin (swishl@rpi.edu)