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The HOWARD P. ISERMANN
DEPARTMENT OF CHEMICAL AND
BIOLOGICAL ENGINEERING

CBE Seminar Series – Fall 2020

Dr. Caryn L. Heldt

James and Lorna Mack Chair in Bioengineering | Professor of Chemical Engineering
Michigan Technological University

Seminar: Wednesday, December 2, 2020

12:00 p.m. (ONLINE)

<https://rensselaer.webex.com/rensselaer/onstage/g.php?MTID=e630e9772211874fe05b4876c93177618>

Password: CBEseminar

“Biophysical Virus Characterization to Improve Purification and Stability”

Abstract:

The manufacturing of viral products often leads to low yields of poorly characterized products. My lab is focuses on many of these issues, trying to find ways to bring viral products to market by reducing the time needed in development and increasing yields. This talk will be an overview of some of the questions we ask and the methods we employ to answer these questions. We have developed a single-particle method using an AFM to characterize the binding properties of viral particles. We have described ionic and hydrophobic interactions with this method. We are currently trying to determine if we can predict binding and elution conditions of chromatography with this method. In the purification space, we are focused on using aqueous two-phase systems (ATPS) to purify virus. We are exploring additives that will reduce the viscosity of the system, to improve the processability of this continuous process. The understanding of the viral surface chemistry is being used to narrow our system parameters. To thermally stabilize viral particles, we are exploring dense polyelectrolyte systems that encapsulate and concentrate virus. This system could be used for formulation of gene therapy vectors or thermally sensitive vaccines. Overall, our work is informing the vaccine and gene therapy industry on how to better process and stabilize viral particles.

Biography:



Dr. Caryn L. Heldt is the Director of the Health Research Institute, Technical Lead on the CLIA certified COVID testing lab at Michigan Tech, the James and Lorna Mack Chair in Bioengineering, a Professor in the Department of Chemical Engineering, and an Affiliate Professor in Biological Sciences at Michigan Technological University. She received her B.S. in Chemistry and Chemical Engineering from Michigan Technological University in 2001. Upon receiving her Ph.D. in Chemical Engineering from North Carolina State University in 2008 under the guidance of Dr. Ruben Carbonell, she joined Rensselaer Polytechnic Institute for her 2-year postdoctoral training under the guidance of Dr. Georges Belfort. In 2010, Dr. Heldt began as an Assistant Professor at Michigan Technological University and was promoted to Associate Professor in 2015 and Professor in 2020. In 2015, Dr. Heldt was awarded an NSF CAREER award to study virus surface chemistry. Her lab is focused on the purification, removal, inactivation and detection of viruses and gene therapy vectors.

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

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