The Chinese University of Hong Kong
Biomedical Engineering Seminars Series

Time: 2:30pm-3:30pm, 13 Dec 2016 (Tue)

Venue: Rm. 222, Ho Sin Hang Engineering Building, CUHK

When a virus and an osmolyte come together, lots can happen

Dr. Caryn L. Heldt
Michigan Technological University, Houghton

Abstract

In this age of modern medicine, viral diseases continue to take the lives of millions of people. Our lab is focused on the use of osmolytes to control many different aspects of virus particle associations. This talk will explore the many uses of osmolytes to inactivate, purify and detect virus particles. In particular, we have found that under the right conditions, viruses can be inactivated by osmolytes. Since osmolytes are safe and naturally occurring compounds, this could lead to new therapeutic strategies for viral infections. Another use of osmolytes is in the purification of viral particles for vaccine production. Osmolytes can be used as flocculants by inducing hydrophobic interactions between virus particles that does not occur in most proteins. This allows for an easy separation of the virus from contaminating proteins, potentially reducing the cost of life saving vaccines. Our newest work explores how osmolytes induce flocculation to detect viruses in solution using gold nanoparticles. In the end, this talk will explore how the understanding of virus surface interactions can pave the way to the creation of a myriad of operations that will improve the health and wellbeing of people across the globe.

Biography

Dr. Caryn L. Heldt is the James and Lorna Mack Chair in Bioengineering, an Associate Professor in the Department of Chemical Engineering, and an Adjust Associate Professor in Biological Sciences at Michigan Technological University. She received her B.S. in Chemistry and Chemical Engineering from Michigan Technological University in 2001. She worked for two years at BASF Corporation before commencing her Ph.D. studies. 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. In 2015, Dr. Heldt was awarded an NSF CAREER award to study virus surface chemistry. She is currently on sabbatical as a Visiting Scientist with Pfizer. Her lab is focused on the purification, removal, inactivation and detection of viruses and other pathogens.