

Johns Hopkins University

Department of  
Chemical & Biomolecular Engineering

Fall 2022 Seminar Series

**Professor Lily Cheung**

**Georgia Tech**

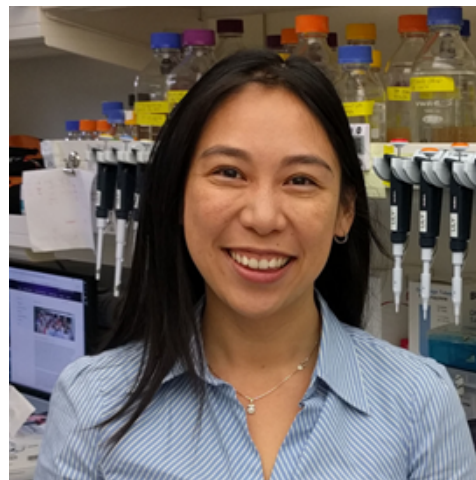
Thursday, October 20, 2022

10:30 a.m.

Mudd Hall 26

Zoom Meeting ID: 919 5918 2879

Passcode: 270887



**Title:** Characterizing Sugar Transporters Biosensors and Cheminformatics

**Abstract:** SWEETs are membrane sugar transporters that play critical roles in plant physiology, crop yields, and biotechnology. We recently reported the design of a biosensor consisting of a plant SWEET and a conformation-sensitive fluorescent protein that translates sugar binding to the transporter into a fluorescence response. We named this biosensor SweetTra1 and showed with a mass action kinetics model that changes in fluorescence intensity correspond to particular molecular events in the transport cycle. Furthermore, we demonstrate how biosensors combined with cheminformatics techniques can be used to decipher the variety of molecules that a transporter can recognize and provide suggestions on how to use biosensors for protein engineering.

**Bio:** Dr. Lily Cheung started her research career at Rutgers University, where she graduated Summa Cum Laude with a B.S. in Chemical Engineering in 2008. She then earned her Ph.D. in Chemical Engineering from Princeton University in 2013. Under Stanislav Shvartsman, she characterized gene regulatory networks using a combination of molecular biology, genetics, and reaction-diffusion modeling.

During her postdoctoral training with Wolf Frommer at the Carnegie Institution for Science, she designed biomolecular sensors to quantify sugar transport in plants. Her current interests include using high-throughput quantitative techniques and mathematical modeling to advance our understanding of how metabolic and gene regulatory networks interact to control plant growth. Lily is the recipient of an NSF NPGI Postdoctoral Fellowship in Biology, an NSF CAREER Award, and a Human Frontier Science Program Early Career Award.