UC San Diego
JACOBS SCHOOL OF ENGINEERING
NanoEngineering

UCSD NanoEngineering/Chemical Engineering

SEMINAR SERIES

Wednesday, April 3, 2024
Seminar Presentation: 11:00am – 12:00pm
SME Room 248

"Engineering Protein Self-Assembly for Development of Therapeutic Materials"

Dr. Julie Champion, PhD

William R. McLain Endowed Term Professor
School of Chemical & Biomolecular Engineering
Georgia Institute of Technology

Abstract: Proteins can provide therapeutic functions simply not possible with small molecule drugs, but their large size and folded structure present critical challenges in terms of delivery, stability and activity. We take advantage of protein size, structure and the ability to interact with other proteins to create therapeutic protein materials via self-assembly routes not available for small molecules. The ability to control assembly of therapeutic proteins is essential to manipulating the final physical properties of the material, ensuring retention of protein activity, and directing the interactions between materials and cells. The main goal of our work is to create materials made directly from therapeutic proteins and apply these to autoimmune disease, vaccines and cancer. In each case, we apply a rational protein design strategy and perform extensive characterization to understand the structures formed, their dynamics and stability, and how to tune the material properties for specific applications.

Biosketch: Julie Champion is the William R. McLain Endowed Term Professor in the School of Chemical & Biomolecular Engineering at Georgia Institute of Technology. She earned her B.S.E. in Chemical Engineering from the University of Michigan and Ph.D. in Chemical Engineering at the University of California Santa Barbara. She was a NIH postdoctoral fellow at the California Institute of Technology. Dr. Champion is a fellow of the American Institute for Medical and Biological Engineering and has received awards including American Chemical Society Women Chemists Committee Rising Star, NSF BRIGE Award, Georgia Tech Women in Engineering Faculty Award for Excellence in Teaching, and Georgia Tech BioEngineering Program Outstanding Advisor Award.