UNIVERSITY OF DELAWARE
ENGINEERING
DEPARTMENT OF CHEMICAL AND BIOMOLECULAR ENGINEERING

SEMINAR SERIES

OCTOBER 28, 2022

VICTORIA MUIR

PRINCETON UNIVERSITY

Presidential Postdoctoral Research Fellow

B.S.ChE., University of Delaware, 2018

Attend virtually: https://udel.zoom.us/j/91314568641

BIOENGINEERING WITH GRANULAR HYDROGELS

Hydrogels are a class of soft materials that are beneficial for many bioengineering applications, from regenerative medicine to environmental science. To enhance the versatility and functionality of traditional bulk hydrogel biomaterials, recent efforts have turned to the fabrication of granular hydrogels. Granular hydrogels consist of hydrogel microparticle building blocks, or "microgels", that are assembled into a jammed state to form a soft granular medium. The granular structure allows for flowability and injectability, while the void space between microgels creates microscale porosity for enhanced cell movement. Microgel building blocks can also be mixed and patterned to further enhance material functionality. This seminar will describe my work using granular hydrogels across bioengineering fields, including efforts to explore the granular hydrogel design space to tune biomaterial properties, to translate granular hydrogels for injectable musculoskeletal tissue repair and extrusion (bio) printing, and to build three-dimensional cell culture platforms to study both mammalian and microbial cell behavior in soft granular environments. Overall, granular hydrogels make a significant impact as functional and tunable soft materials for bioengineering applications.

ABOUT THE SPEAKER

Dr. Victoria Grace Muir is a Presidential Postdoctoral Research Fellow at Princeton University in the lab of Professor Sujit S. Datta. She completed her B.S.ChE. at the University of Delaware (2018) and her Ph.D. at the University of Pennsylvania (2022) under the advisement of Professor Jason A. Burdick. Her research interests center on designing granular hydrogels for bioengineering applications spanning biomedicine, environmental science, and additive manufacturing. Victoria has been a recipient of multiple recognitions including the Goldwater Scholarship (2016), NSF Graduate Research Fellowship (2019), AIChE Poddar Award for Rising Chemical Engineers (2019), and Penn Prize for Excellence in Teaching by Graduate Students (2020). She is currently the global chair of AIChE's Young Professionals Community (YPC).