UCLA Engineering
HENRY SAMUELI SCHOOL OF
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BIOENGINEERING

PRESENTS

Understanding cell expansion in walled organisms: mechanics and materials

THURSDAY, April 9th, 2020
12:00 – 1:00 PM
Zoom Link:
https://ucla.zoom.us/j/3578398609

Siobhan Braybrook, Ph.D.
UCLA
Assistant Professor of Molecular, Cell and Developmental Biology

ABSTRACT:

Almost all kingdoms of life on earth contain organisms with cell walls. From bacteria, algae, seaweeds, plants, and even some animals, cell walls are a common physical feature of cells in our world. The presence of a cell wall surrounding a cell presents a mechanical challenge to cell expansion (growth): in order for a cell's volume to increase, its cell wall must yield and deform. Our research group is interested in the physio-chemical aspects of cell expansion such as: what are the material structure and properties of a cell wall? How does this change to allow and prohibit cell expansion? We develop testing methods to probe the elastic and viscous properties of cell walls in vivo and models to interpret our measurements, with a major focus on atomic force microscopy. In multicellular walled organisms, organs and tissues can be thought of as cellular solids; however, unlike commonly investigated cellular solid materials (metal or polyethylene foams) these materials are composed of heterogeneous soft matter that displays viscoelastic properties and non-uniform cellular geometry. As such,our mechanical testing and interpretations for tissue-level understanding require further development. While cellular solids such as those found in plants and seaweeds are biologically relevant for the survival and growth of these organisms, we can also take mimetic materials and explore their utility in human health and medicine. Come find out how!

BIOGRAPHY:

Siobhan obtained her BSc Honors in Plant Biology from the University of Guelph, Canada, and her Ph.D. in Plant Molecular Biology from the University of California at Davis, USA with John Harada. She began researching plant mechanics during her NSF-funded post-doc in the lab of Cris Kulemeier in Bern, Switzerland. Siobhan moved to Cambridge in January 2013 to set-up The Plant Mechanics Group at The Sainsbury Laboratory, University of Cambridge. In July of 2017, the lab moved to the Department of Molecular, Cell and Developmental Biology at UCLA. Siobhan likes anything to do with shapes in plants, from sunflower patterning to pavement cell shape.