UCLA Engineering
HENRY SAMUELI SCHOOL OF
ENGINEERING AND APPLIED SCIENCE

BIOENGINEERING

PRESENTS

Plant cell biomechanics: Understanding 'growth' in biological cellular solids

THURSDAY, March 7, 2019
12:00 – 1:00 PM
2101 ENGINEERING V

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ABSTRACT:

Plants are made up of irreversibly connected cells, tethered together by their cell walls. Within the cell wall of each cell, a pressure of up to 10bar can be generated and the wall must either resist that pressure or yield to it, thus allowing expansion of the cell. Our lab has been investigating the mechanical properties of plant cell walls, and the cellular solids they constitute on organ levels. We have developed AFM-based indentation methods to examine the elastic and viscoelastic behaviours of plant cell walls in vivo and cell wall material mimics in vitro. The cell wall is a composite material comprising a hydrogel matrix (pectin) reinforced by cellulose fibres. Recently we have been examining the link between calcium-based crosslinking of the pectin hydrogel and the mechanical properties of cell walls, with the hope of linking these properties to cell growth and elongation. Several cases will be presented where altering pectin crosslinking potential leads to altered growth and altered cell wall mechanics.

BIOGRAPHY:

Siobhan Braybrook is an Assistant Professor of Molecular, Cell, and Developmental Biology at UCLA. Her background is in plant developmental biology and pattern formation. Her research group is focused on understanding how shapes and patterns are physically grown in biological systems - with a focus on walled organisms (plants and seaweeds). The group comprises biologists, engineers, and mathematicians working in a multidisciplinary setting to understand biological phenomenon.