



NanoScience Technology Center

UNIVERSITY OF CENTRAL FLORIDA

GRADUATE RESEARCH SEMINAR SERIES

Friday
November 17, 2017

12:00 PM

Research Pavilion
NSTC
Conference Room 169

*Pizza and drinks
will be provided*

Nanoscale Characterization for Sustainable Agriculture: A Closer Look at *Xanthomonas Perforans*

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Dr. Laurene Tetard's Group

Bacteria's biomechanical properties have been shown to contribute to their ability in becoming infectious. The chemical, physical, and biological properties of bacteria developing resistance have been explored in animal based bacteria while plant bacteria have been largely neglected. Thus, the ability to probe changes in stiffness, adhesion, binding interactions and molecular traits of bacteria causing plant diseases is of great interest to develop a new generation of more potent, yet sustainable, pesticides. Our study aims to investigate the mechanical and chemical properties of bacterial systems, in particular their cell walls. Building upon this fundamental understanding of the cells, we also investigate the biophysicochemical responses associated to multivalent nanoparticle-based bactericide treatments on bacterial systems identified as pathogens in plant diseases.



Here we focus on developing a novel protocol to support the design and accelerate the development of pesticides and treatments against *Xanthomonas perforans*, a strain known for causing bacterial spot in tomatoes and causing close to 50% losses in production. By comparing bacteria pre- and post-treatment with a multivalent silica core shell nanoparticle using a combination of Raman spectroscopy and atomic force microscopy (AFM)-based techniques, we identify attributes that can potentially serve as markers to track the bacterial responses to the treatment. Finally, we will discuss the exciting implications of this work, such as potential clues for the development of more potent treatments for resistant bacteria.