Department of Molecular and Cellular Biology

Graduate Seminar MCB*6500

Friday, Oct. 20, 2017 in SSC 2315@ 12 noon

presented by:

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(Advisor: R. Merrill)

"Characterizing Scabin as a putative toxin in the pathogenicity of *Streptomyces scabies*"

The increased incidence of antibiotic drug resistance presents a challenge in the treatment of infectious diseases. An alternative to antibiotics is the use of antivirulence compounds, which target secreted virulence factors. These compounds allow the host immune system to respond to the infection, reducing the occurrence of resistance. Mono ADP-ribosyltransferase (mART) toxins are a family of virulence factors secreted by pathogenic bacteria, which catalyze the transfer of an ADP-ribose moiety from NAD^+ to a target macromolecule. This modification disrupts vital cellular processes within a host cell, often leading to cell death. This project focuses on Scabin, a mART toxin secreted by *Streptomyces scabies*. This bacterium causes the common scab disease in potato and root crops, which is characterized by the formation of corky lesions. Scabin is a unique mART toxin as it targets DNA; however, the key residues involved in DNA binding and the target DNA sequence are largely unknown. Therefore, this project will focus on using a selection and amplification binding assay to determine the target DNA sequence recognized by Scabin. Next, protein variants will be used to study DNA-binding kinetics. Lastly, its effect on plant cells will be investigated by treating *Arabidopsis thaliana* seedlings with Scabin.