

**GEORGE MASON UNIVERSITY
COLLEGE OF SCIENCE
DEPARTMENT OF BIOLOGY SEMINAR
Fall 2016**

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“Insect immune responses to parasitic nematodes and their mutualistic bacteria”

Insights into the similarities and differences among symbiotic and pathogenic relationships are likely to result from systems that allow the direct study of both types of interactions simultaneously. One of the best-developed approaches for the study of symbioses is a series of associations that have evolved between nematode worms and bacteria. In particular, the bacterial species *Photorhabdus luminescens* lives in a ‘symbiosis of pathogens’ with the nematode *Heterorhabditis bacteriophora*, which invades and kills insects. Unlike other animals associated with bacterial symbionts, *Heterorhabditis* nematodes are viable in the absence of *Photorhabdus*. Consequently, each partner of this symbiotic/pathogenic relationship can be separated and studied in isolation and in combination, thus enabling pathogenesis and symbiosis to be studied separately or together. Our recent work has begun to use the powerful genetic and genomic tools of the model insect host *Drosophila melanogaster* to dissect the complex molecular interactions involved. The great advantage of this unique system is that all three players (*Drosophila*, *Photorhabdus* and *Heterorhabditis*) in the interaction can be genetically manipulated and the availability of the genome sequences for the three organisms facilitates elegant experiments including functional genomics comparisons, reverse genetic screens and systems biology-based approaches. Our goal is to investigate the molecular and evolutionary basis of insect immunity, bacterial symbiosis/pathogenicity and nematode parasitism, and to understand the basic principles of the complex interactions between these important biological processes.

TUESDAY November 29, 2016

3:00-4:15 PM

Innovation Hall Room 131