Causes, consequences, and characterization of the *Wolbachia* endosymbiont in its flea host considering both perspectives

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4/1/2022, 12:00, George Evens Family Auditorium, Sede Boqer Campus

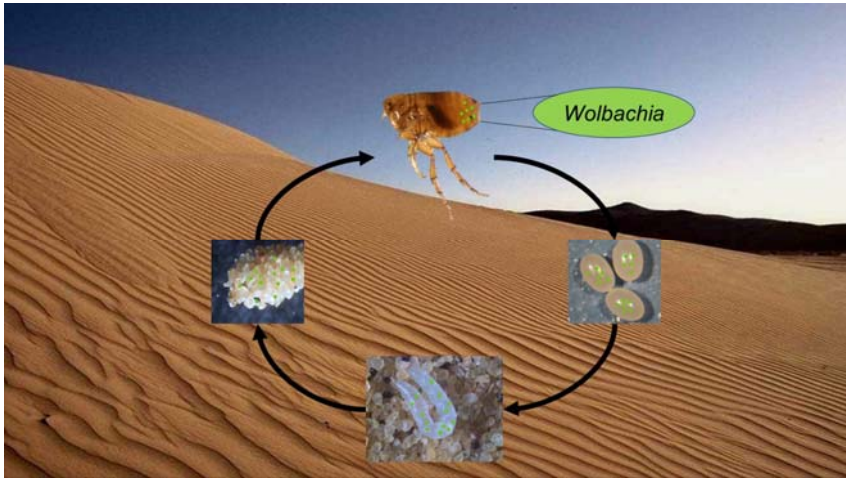
This is Ron's final PhD seminar!

Before the seminar we will gather outside of George Evens Family Auditorium. Drinks and snacks will be provided. You are encouraged to bring your own coffee cups. Please join us at 11:45.

Endosymbionts — microbes that live within and engage in prolonged and intimate associations with their hosts — have gained recognition for their role in plant and animal life. Endosymbionts can influence the host's physiology and behavior, manipulate its reproductive system, and thus have the potential to be used as biological and disease control agents. Over the last two decades, there has been a growing interest in the ecological factors that determine endosymbiont abundance (ecological causes). Two other lines of research aim to explore the effects of the endosymbionts on their hosts (ecological consequences) and genetic characterization of the endosymbionts. However, a comprehensive view of each single system, from both the endosymbiont and host perspectives, is often lacking.

My Ph.D. research aimed to fill this gap by exploring the causes and consequences of *Wolbachia* endosymbionts in their flea hosts and characterizing the endosymbionts therein. First, I looked at the ecological factors that affect *Wolbachia* prevalence and density within its flea host and found not only an extreme female-bias in their distribution, but also an increase in *Wolbachia* density with flea age. Second, I explored the direct effect of the endosymbiont on host fitness by curing fleas of *Wolbachia* and found that the fleas can survive and reproduce, despite their endosymbiont absence without noticeable fitness costs. In addition, I found no evidence for reproductive manipulation imposed by the endosymbiont. Finally, I characterized the endosymbiont via next-generation sequencing and revealed that fleas are often coinfected with at least two genetically distinct *Wolbachia* strains.

Altogether my research demonstrates that, despite the extreme sex-bias, endosymbiont persistency may be maintained without remarkable fitness benefits to the host. This suggests that the mechanism for this high persistency may be related to endosymbiont coinfection. My results highlight the importance of a cross-disciplinary "virtuous cycle" in symbiosis research, in which field surveys inform experiments (and vice versa), and molecular analyses complement the related insights.



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