האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

INTERACTION BETWEEN MICROORGANISMS AND ARTHROPODS - 71953

Last update 10-04-2024

HU Credits: *2*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Animal Husbandry and Veterinary Sciences*

Academic year: *0*

Semester: *2nd Semester*

Teaching Languages: *Hebrew*

Campus: *Rehovot*

Course/Module Coordinator: *Prof Yuval Gottlieb*

Coordinator Email: *gottlieb.yuval@mail.huji.ac.il*

Coordinator Office Hours: *Appointment*

Teaching Staff:
Prof Gottlieb Yuval

Course/Module description:
Microorganisms inhabiting arthropods influence the biology of their hosts. Effects which include changes in behavior, reproductive biology, resistance to environmental conditions and natural enemies, the immune system and the ability to transfer pathogens. During the course, we will examine different types of symbiosis between microorganisms and arthropods, and discuss the interaction between different microorganisms within the host, with emphasis on medical and agricultural implications of these interactions. In addition, we will learn about ways to use microorganism-host relations in programs for pest and disease control.

Course/Module aims:
Revealing the symbiotic relationships between microorganisms and arthropods and understanding their impact on the biology of the partners.

Learning outcomes - On successful completion of this module, students should be able to:
To implement and understand symbiotic relationship in various research themes.

Attendance requirements(%):
100

Teaching arrangement and method of instruction: Lectures, Seminars

Course/Module Content:
Introduction: symbiosis-axis from mutualism to parasitism.
Pathogens transmitted by arthropods: transient symbionts.
From transient to persistent symbiont: Symbiont establishment in the host.
Obligatory symbionts: nutrition and survival.
Facultative symbionts: resistance, protection, and reproduction.
Modes of Transmission: different (and obscure) ways to inter-intra-generational transmission, and on evolutionary scale.
Genomes of endosymbiont: How low can you go?
"Super Symbiont" Wolbachia in arthropods and nematode.
Interactions between different microorganisms in hosts: symbiont based control.

Required Reading:

Bourtzis K, and Miller TA (eds) 2003, 2006, 2006. Insect Symbiosis Vol. 1-3, CRC Press, USA.

Zchori-Fein, E. and Bourtzis, K. (eds). 2011, Manipulative tenants – Bacteria associated with arthropods. CRC press.

Zindel R, Gottlieb Y, Aebi A. 2011, Arthropod symbioses: a neglected parameter in pest- and disease-control programmes. J Appl Ecol. In press.

Hoerauf A, and Rau RU (eds) 2007. Wolbachia: A bug's life in another bug. Mahy BWJ (ed) Issues in Infectious Diseases. Basel, Karger, Vol 5.

Miller TA. 2007, Applying insect transgenic technology: Scientific and regulatory experiences. Entomol Res 37 (2007) 67–75

Werren JH, Baldo L, and Clark ME. 2008, Wolbachia: master manipulators of invertebrate biology. Nature Rev Microbiol 6: 741-751

Gross R, Vavre F, Heddi A, Hurst GDD, Zchori-Fein E, and Bourtzis K. 2009, Immunity and symbiosis, Mol Microbiol. 73: 751-759.

Brownlie JC, and Johnson KN. 2009, Symbiont nediated protection in insect hosts. TIM 17: 348-354.

Additional Reading Material:

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Grading Scheme:

Presentation / Poster Presentation / Lecture/ Seminar / Pro-seminar / Research proposal 70 %

Submission assignments during the semester: Exercises / Essays / Audits / Reports / Forum / Simulation / others 30 %

Additional information:

If the course is given in English, it will be able for interested students, to present seminars in Hebrew, the presentation and discussion will be held in English.