האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

PLANT - PATHOGEN RELATIONSHIPS - 72587

Last update 29-12-2015

HU Credits: 3

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: life sciences

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Prof Alex Levine

Coordinator Email: AlexLevine@huji.ac.il

Coordinator Office Hours: By appointment, 2-468

Teaching Staff:

Dr. Alex Levine

Course/Module description:

The course presents strategies of different organisms in response to pathogenic and symbiotic organisms

Course/Module aims:

Analysis and comparison of the strategies used by different organisms and the responses of plants and animals to pathogenic and symbiotic organisms

Learning outcomes - On successful completion of this module, students should be able to:

1. Identify organismal responses to virulent and avirulent pathogens.
2. Compare plant and animal responses.
3. Differentiate between innate and cellular immunity.

Attendance requirements(%):

80%

Teaching arrangement and method of instruction: Lecture and seminar

Course/Module Content:

1. Plant pathogens and general plant defense strategies (physical and bio-chemical defenses, preformed and induced resistance, history of PPI)
2.Compatible/incompatible interactions, host/ non-host resistance, specific/ general resistance, multigenic (horizontal) resistance.
3. Gene-for-gene hypothesis I (virulence and avirulence genes in the pathogen, cloning host (plant) resistance genes)
4. Hypersensitive response, Oxidative burst and Programmed cell death (PCD) as defense strategy, defense signal transduction.
5. type III secretion system (pathogen attack strategies, quorum sensing, suppression of host defenses by interfering with plant signal tranduction)
6. Gene-for-gene hypothesis II (resistance genes, cloning and mode of action, detecting pathogen-associated molecular patterns (PAMPs), defense (PCD) signal transduction)
7. Defense signaling pathways (molecular biology and genetics of resistance pathways, calcium, defense genes signaling, role of MAP kinases)
8. Plant hormones in defense pathways (salicylic acid, jasmonic acid, abscisic acid, ethylene)
9. Systemic acquired resistance (induced resistance) and plant Innate immunity

10. Symbiotic interactions (mycorhizae)
11. Symbiotic interactions (rhizobium, Biological Nitrogen fixation)

Required Reading:
http://www.plantcell.org/site/teachingtools/TTPB22.xhtml

Additional Reading Material:
None

Course/Module evaluation:
End of year written/oral examination 0 %
Presentation 15 %
Participation in Tutorials 5 %
Project work 80 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
None