

IB 118 - Host-Microbe Interactions

(4 units)

Course Description:

We live in a microbial world, and microbes have shaped (and continue to shape) plant and animal physiology and evolution through a myriad of contributions – from mutualistic benefits to disease. Recent advances in genomic methodologies have further increased our appreciation of such contributions by highlighting the prevalence of organismal microbial communities and their complex interactions with their hosts. Through lectures and discussions, IB 118 will consider the broad range of host-microbe interactions – from mutualism to pathogenesis, and from pairwise interactions to the microbiome - learning the principles that shape these interactions, the technologies used to interrogate them and the molecular mechanisms underlying them.

Required Textbook:

- Brock Microbiology, 14th Ed
- Articles posted to bCourses, TBD

Pre-requisites:

- Bio 1A
- Bio 1B

Course Requirements:

- Two midterms (25% each)
- Final Exam (40%)
- Written Assignment (10%) – students will be required to read the primary literature and synthesize an original hypothesis or question related to any one of the topics covered in lectures. They will then propose an experiment to address this question.

Tentative Weekly Schedule

- Week 1: Introduction, refresher on evolution
- Week 2: Bacteria and Bacteriophages
- Week 3: Symbiosis – principles and examples
- Week 4: Symbiosis – principles and examples
- Week 5: Bacterial communities – the gut microbiota
- Week 6: Genomics
- Week 7: Horizontal gene transfer and microbial evolution
- Week 8: Immunity
- Week 9: Pathogens
- Week 10: Antibiotics and antibiotic resistance
- Week 11: host-microbe co-evolution
- Week 12: Evasion and manipulation

Week 13: Evolution of immunity

Week 14: Microbiome and evolution

Week 15: RRR week