**Infection biology**

**Blokesch Melanie**

**Cours**

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<th>Sciences du vivant</th>
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<td>Sciences et technologies du vivant</td>
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**Language**: English  
**Credits**: 5  
**Session**: Summer  
**Semester**: Spring  
**Exam**: Written  
**Workload**: 150h  
**Weeks**: 14  
**Hours**: 5 weekly  
**Lecture**: 3 weekly  
**Exercises**: 2 weekly

**Summary**

Infectious diseases (ID) are still a major problem to human health. But how do pathogens make us sick? How do they evolve and spread? The discovery and use of antibiotics and vaccination has changed the outcome of some IDs. But resistance mechanisms have evolved and are of major concern.

**Content**

- Impact of infectious diseases (pandemics, epidemics)
- Evolution of pathogens and horizontal gene transfer
- Bacterial infections (intra vs. extracellular bacteria)
- Identification of virulence factors using molecular approaches
- Diarrheal diseases
- Respiratory diseases
- Symbiosis
- The human microbiota
- Antimicrobials
- Viral infections
- Eukaryotic pathogens (Plasmodium, Trypanosome, Worms)
- Pathogenic fungi
- Bioethics

**Keywords**

Infection Biology; bacterial pathogens; viruses; eukaryotic pathogens; antibiotics and resistance mechanisms; virulence factors; global impact of infectious diseases.

**Learning Prerequisites**

**Required courses**

An *Introductory Microbiology* course is a prerequisite. Exchange students will only be accepted after presentation of a certificate indicating that they have followed a basic microbiology course.

**Recommended courses**

Immunology and basic cell biology.

**Important concepts to start the course**
Basic microbiology; knowledge of prokaryotic specialities (ribosomes, cell wall etc).

Learning Outcomes
By the end of the course, the student must be able to:
• Judge the impact of infectious diseases on human health
• Assess / Evaluate the need for new therapeutics to fight infectious diseases
• List and explain current vaccination regimes
• Describe molecular mechanisms that underly pathogenicity
• Analyze and present publications on Infection Biology

Transversal skills
• Communicate effectively, being understood, including across different languages and cultures.
• Use a work methodology appropriate to the task.
• Set objectives and design an action plan to reach those objectives.
• Plan and carry out activities in a way which makes optimal use of available time and other resources.
• Access and evaluate appropriate sources of information.
• Summarize an article or a technical report.
• Write a scientific or technical report.

Teaching methods
Ex cathedra + discussion of relevant publications + exercises

Expected student activities
Participating students are expected to engage in this course by attending lectures, reading additional material, understanding and presenting recent state-of-the-art publications, and completing exercises.

Assessment methods
Written exam

Supervision
Office hours Yes
Assistants Yes
Forum No
Others Moodle webpage (EPFL-SV-Master Infection Biology; BIO-477)

Resources
Bibliography

Ressources en bibliothèque
Moodle Link

- http://moodle.epfl.ch