

BIO-477

Infection biology

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Cursus	Sem.	Type
Life Sciences Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	5
Session	Summer
Semester	Spring
Exam	Written
Workload	150h
Weeks	14
Hours	5 weekly
Courses	3 weekly
Exercises	2 weekly
Number of positions	

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)
- Virulence factors including toxins and secretion systems
- Identification of virulence factors using molecular approaches
- Diarrheal diseases
- Respiratory diseases
- Viral infections
- Symbiosis
- Human microbiota
- Vaccines
- Antimicrobials
- Eukaryotic pathogens including pathogenic fungi
- Bioethical aspects of ID research

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

Basic microbiology (prerequisite), immunology, basic cell biology, and genetics and genomics.

Important concepts to start the course

Basic microbiology; knowledge of prokaryotic specialities (ribosomes, cell wall etc).

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

Others Moodle webpage (EPFL-SV-Master Infection Biology; BIO-477)

Resources

Bibliography

- "Bacterial pathogenesis: a molecular approach / Brenda A. Wilson ... [et al.]. Year:2011. ISBN:978-1-55581-418-2
- "Microbiology: an evolving science / Joan L. Slonczewski, John W. Foster. Year:2011. ISBN:978-0-393-11824-7
- "Principles of virology" / S.J. Flint ... [et al.]. Year:2009. ISBN:978-1-55581-443-4

Ressources en bibliothèque

- [Bacterial pathogenesis: a molecular approach / Brenda A. Wilson ... \[et al.\]](#)
- [Microbiology: an evolving science / Joan L. Slonczewski, John W. Foster.](#)
- [Principles of virology" / S.J. Flint ... \[et al.\]](#)

Moodle Link

- <https://go.epfl.ch/BIO-477>