Swiss TPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse
Associated Institute of the University of Basel

Infection Biology and Epidemiology 2023

Location: Swiss Tropical and Public Health Institute (Swiss TPH) Kreuzstrasse 2, 4123 Allschwil
Language: English
Dates/Info: 6-week block course, 6 Nov - 22 Dec 2023 / 15 ECTS / Course # 11992

Description

The Infection Biology and Epidemiology (IBE) block course examines the phenomena of infection with medically important pathogens at several levels. You will learn about fascinating processes of infections **from the molecule to the organism** and consequences of parasite-host interactions. Further, you will become familiar with epidemiological factors determining the frequency and spread of infections as well as the resulting disease in a host population. The block course places a **specific focus on practical work** and you will use diverse techniques in **molecular biology**, **immunology** and **epidemiology**. Bioinformatics have become indispensable for modern biology, which is why you will learn how to apply basic **bioinformatics approaches**, including the analysis of whole genome sequencing data, to draw conclusions from your data.

Knowledge taught in the elective course "Parasitology and Parasitism" is recommended.

Epidemiological perspective:

- Observing the significance of infections for individuals and society using interdisciplinary approaches.
- Analysing host-parasite relationships and proposing control measures.

Infection biology perspective:

- Understanding the molecular basis of infections (antigenic variation, transmission, adaptation to host milieus, host cell invasion, etc.).
- Understanding the immunology of different infections and concepts in vaccine and drug discovery.

IBE focus pathogens

- *Mycobacterium tuberculosis* – tuberculosis
- *Neisseria meningitides* – meningococcal disease
- *Plasmodium falciparum* – malaria tropica
- *Trypanosoma brucei gambiense/rhodesiense* – African sleeping sickness
- *Leishmania major/tropica* – cutaneous leishmaniasis
- *Schistosoma mansoni* – intestinal schistosomiasis
- Human Immunodeficiency Virus – AIDS

Schedule

- Week 1: General course introduction and epidemiological concepts
- Week 2: Epidemiological concepts and practicals
- Weeks 3-4: Infection biology and epidemiology practicals
- Weeks 5-6: Infection biology practicals

Epidemiology practicals (weeks 2-4)

→ Disease frequencies and burden
→ Designing and planning a study
→ Outbreak investigation
→ Meta analysis

Wet laboratory practicals & bioinformatics (weeks 4-6)

→ Parasite chemotherapy (*Plasmodium, Schistosoma*)
→ Cell biology (*Plasmodium, Trypanosoma*)
→ Microbiology (*Mycobacteria*)
→ Immunology (*Mycobacteria, Schistosoma*)

Organisers: Nicolas Brancucci and Jan Hattendorf

Lecturers: Julia Bohlius, Claudia Daubenbeger, Sebastien Gagneux, Christof Grüring, Manuel Hetzel, Jennifer Keiser, Stefanie Knopp, Christian Lengeler, Pascal Mäser, Daniel Mäusezahl, Pie Müller, Christian Nsanzabana, Peter Odermatt, Gerd Pluschke, Damien Portevin, Martin Röösli, Matthias Rottmann, Till Voss, Sergio Wittlin, Jakob Zinsstag and many Swiss TPH collaborators

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