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 block course 2025

Location: Swiss Tropical and Public Health Institute (Swiss TPH) Kreuzstrasse 2, 4123 Allschwil
Language: English
Dates/Info: **6-week block course** / 15 ECTS

Description

In this block course, you will examine cell biological as well as epidemiological concepts of medically important pathogens, such as the malaria-causing parasite ***Plasmodium falciparum*.** You will learn about fascinating processes of infections **from the molecule to the organism** and consequences of pathogen-host interactions and **drug resistance**. 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 cell biology**. This includes hands-on work in a biosafety level 2 (BSL-2) laboratory. You will further be introduced to and learn how to apply basic **bioinformatics approaches**, including those used for analysing whole genome sequencing data.

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, e.g. host-pathogen interactions and antigenic variation.
- Employing reverse genetic tools to study pathogen factors.
- Getting familiar with concepts of drug resistance and vaccine/drug discovery

Focus pathogens

- *Plasmodium falciparum* – the causative agent of malaria tropica
- (second pathogen will be announced at a later time point, but likely includes viruses or helminths)

Schedule

- first 2.5 weeks:
  - epidemiological concepts and practicals
- 3.5 weeks:
  - cell biological concepts of the two focus pathogens
  - wet laboratory work with the two focus pathogens

Epidemiology practicals

→ disease frequencies and burden
→ designing and planning a study
→ outbreak investigation
→ meta analysis

Wet laboratory practicals & bioinformatics

→ handling transgenic pathogens
→ drug screening and drug resistance
→ studying the function of pathogen proteins
→ genomic data analysis

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