Cycle A: Infection Biology

Coordinator: Urs Jenal

A1.1: New Trends in Developmental and Molecular Immunology - 13167
(2 hrs/week; 2 CP)

A1.2: Immune Disorders and Immune Therapy - 16515
(2 hrs/week; 2 CP)

D. Finke, T. Rolink

In the present lecture series various diseases caused by abnormalities within the immune system will be discussed. During the first hour of each lecture an overview of the clinical aspects of such a disease will be given while during the second hour the immunological basis of this will be discussed in the form of a journal club.

A2: Molecular Virology - 12412
(2hrs/week; 2CP)


This course covers the biological principles of viruses in vertebrates, invertebrates, plants, and in bacteria. Lectures will focus on virion and genome organization; molecular mechanisms of the replication cycle; technical tools for studies in virology; virus-host interaction including innate immune responses and oncogenic transformation; molecular aspects of transmission and epidemiology; virus evolution and mechanisms of molecular pathology; translational exploitation in biotechnology and therapy.

A3.1: Microbial Cell Structures and Drug Targets - 14466
(1 hr/week; 1 CP)

S. Gagneux, U. Jenal

This course will give an introduction to antimicrobials, their most prominent cellular targets and action mechanisms. Mechanisms of antibiotic resistance will be discussed as well as their impact on the fight against the clinically most relevant infections. Finally, the course will give some insights into the efforts to identify promising chemotherapeutical targets and develop novel antimicrobials.

A3.2: Microbial Cell Structures and Drug Targets (Journal Club) - 39341
(1hr/week; 1CP)

M. Basler
The Infection Biology Journal Club discusses recent papers of our guest speakers. Subjects covered include organisms, models, methods, biological questions. The aim is to learn new techniques that help us actively participate in seminars and ask interesting questions.

**A4.1: Recent Progress in Infection Biology - 39402**  
(1hr/week; 1CP)

M. Basler, P. Broz, D. Bumann, Ch. Dehio, U. Jenal, J. Pieters

This course will cover various topics of cutting-edge research in infection biology. We have invited internationally renowned guest speakers who will present and discuss their recent findings.

**A4.2: Recent Progress in Infection Biology (Journal Club) - 39403**  
(1hr/week; 1CP)

M. Basler

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**A5: Signaling in Inflammation - 15467**  
(1hr/week; 1CP)

P. Broz

After a general introduction on innate immunity, the course will cover the molecular basis of cell signaling during inflammation in response to pathogenic infections. This will include chemotaxis signaling, phagocytosis signaling, pathogen recognition and NF-KB activation mechanisms. Emphasis will be placed on fundamental properties of signaling, such as specificity and signaling dynamics, as well as a systems biology approach to inflammation.

**A6.1: Recent Advances in Systems Biology of Infection - 30638**  
(1hrs/week; 1CP)

D. Bumann, Ch. Dehio

This introductory course to Systems Biology of Infection will focus on data and knowledge-based modeling and model-driven analysis of microbial infection processes. We will discuss recent advances in understanding the interaction of the host with bacterial and viral pathogens by integrative analysis of genome-wide and spatio-temporal data sets using computational approaches that can employ this data to generate models of host-pathogen interaction. We will further discuss how such systems-level approaches may facilitate the identification of diagnostic biomarkers and potential drug targets for novel anti-infectives and possibly allow exploring novel strategies for personalized therapy.
A6.2: Recent Advances in Systems Biology of Infection (Journal Club) - 41271
(1hrs/week; 1 CP)

M. Basler

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A7: Molecular Parasitology - 12384
(2hrs/week; 2CPs)

H.-P. Beck, I. Felger

This course on molecular parasitology will broadly cover the molecular basis of parasite-host interactions focussing on protozoan parasites. This will include antigenic variation, parasite invasion strategies, protein transport of intracellular parasites, and evasion mechanisms of parasites. It also will cover host polymorphisms involved in parasitic infections. During the course recent findings will be presented and critically discussed. During the course molecular techniques and research strategies will also briefly be presented.