

## Outline

### IRTG 914 Basic Principles Seminar and Advanced Methods Course

Topic: “Principles of host-pathogen interactions”

In the course of an infection pathogens employ a broad range of sophisticated strategies to manipulate and exploit host cells. In this context virulence factors such as type 3 (T3SS) and type 4 secretion systems (T4SS) are of special importance. Within this advanced method course we will use two pathogenic model organisms (*Legionella pneumophila*<sup>[1]</sup> and *Helicobacter pylori*<sup>[2]</sup>) to study some aspects of host-pathogen interactions. *Legionella pneumophila* as an intracellular pathogen and will be used to demonstrate the migration inhibition of a model amoeba organism. Within the *Helicobacter pylori* part of the course we will study the importance of defined protein-protein interactions during infection and the time course of toxin injection into the host cells. In this advanced method course we will mainly concentrate on confocal microscopy (*Legionella pneumophila*) and a plate reader based beta-lactamase assay (*Helicobacter pylori*) for our experiments. In addition, we would like to present an organ explant imaging system that enables ex vivo monitoring of pathogen - host cell interactions.

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Supervisors AMC: Ina-Kristin Behrens  
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Literature:

- [1] S. Simon, M. A. Wagner, E. Rothmeier, A. Muller-Taubenberger, H. Hilbi, *Cell Microbiol* **2014**, 16, 977-992.
- [2] W. Fischer, *FEBS J* **2011**, 278, 1203-1212.