

## Seminar in Microbiology

Monday, February 15, 2016

Salle de séminaire Salle E07.3347.a, CMU

11:30 – 12:30

**Christoph DEHIO**

Infection Biology,  
Biozentrum, Basel



# Bacterial pathogenesis: Evolution of diversified host-targeted effectors from a widely-spread bacterial toxin/antitoxin system

### Type IV secretion systems inject effector proteins into host cells

The goal of the work in our laboratory is to investigate persistent bacterial infections at the molecular level. Our focus is on bacterial effector proteins injected into the host cells by type IV secretion systems. These effector proteins alter targeted signaling pathways and the physiology of the host cells, which means that the bacteria can then survive in the host.

### **Bartonella and Brucella as modal organisms for type IV secretion**

We are studying the closely related pathogens *Bartonella* and *Brucella*, which cause chronic bacterial infections of varying severity in humans and animals. Their type IV secretion systems contribute decisively to establishing persistent infection and are therefore particularly suitable for our experiments in cell cultures and animal models.

From: <http://www.biozentrum.unibas.ch/research/groups-platforms/overview/unit/dehio/>

### Key references:

- Stanger FV, Burmann BM, Harms A, Aragão H, Mazur A, Sharpe T, **Dehio C**, Hiller S, Schirmer T. 2016. Intrinsic regulation of FIC-domain AMP-transferases by oligomerization and automodification. *Proc Natl Acad Sci U S A*. 113(5):E529-37.
- Harms A, Stanger FV, Scheu PD, de Jong IG, Goepfert A, Glatter T, Gerdes K, Schirmer T, **Dehio C**. Adenylation of Gyrase and Topo IV by FicT Toxins Disrupts Bacterial DNA Topology. *Cell Rep*. 2015 Sep 1;12(9):1497-507.
- Rämö et al., 2014. Simultaneous analysis of large-scale RNAi screens for pathogen entry. *BMC Genomics*. 2014 Dec 22;15:1162. doi: 10.1186/1471-2164-15-1162.
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- Pieles K, Glatter T, Harms A, Schmidt A, **Dehio C**. An experimental strategy for the identification of AMPylation targets from complex protein samples. *Proteomics*. 2014 May;14(9):1048-52.
- Québette M, Dick MS, Kaefer V, Schmidt A, **Dehio C**. Dual input control: activation of the *Bartonella henselae* VirB/D4 type IV secretion system by the stringent sigma factor RpoH1 and the BatR/BatS two-component system. *Mol Microbiol*. 2013 Nov;90(4):756-75
- Engel P, Goepfert A, Stanger FV, Harms A, Schmidt A, Schirmer T, **Dehio C**. Adenylation control by intra- or intermolecular active-site obstruction in Fic proteins. *Nature*. 2012 Jan 22;482(7383):107-10.