

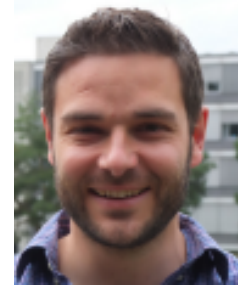
Seminar in Microbiology

Monday, 9th October, 2017

Salle de séminaire, E07.3347.a, CMU

11:30 – 12:30

Prof. Martin Pilhofer



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ETHZ, CH

Structure, function, and evolution of bacterial contractile injection systems

The Pilhofer lab explores bacterial contractile injection systems (CISs). These macromolecular machines have a last common ancestor with contractile bacteriophages. CISs are highly abundant and mediate diverse interactions with eukaryotic cells or other bacteria. Two modes of action divide CISs into extracellular CIS and Type 6 Secretion systems (T6SS). Extracellular CIS resemble headless bacteriophages, are released from a subpopulation of cells by cell lysis, and act on their target cell surface. Examples are antibacterial R-type bacteriocins, insecticidal anti-feeding prophages (Afps), or metamorphosis-inducing arrays of contractile structures (MACs). T6SS function as inverted contractile phage tails in a cell-cell contact-dependent fashion. His lab recently discovered the new conserved subtype 4, which coordinates up to 34 structures in multi-barrel gun-like arrays and allows *Amoebophilus asiaticus* to interact with host cells membranes and then likely phagosome escape.

Recent publications:

- Prophage-triggered membrane vesicle formation through peptidoglycan damage in *Bacillus subtilis*. Toyofuku, ..., **Pilhofer** M, Nomura N, Eberl L. *Nat Commun*. 2017.
- In situ architecture, function, and evolution of a contractile injection system. Böck ... , **Pilhofer** M. *Science*. 2017.
- In Situ Imaging of Bacterial Secretion Systems by Electron Cryotomography. Weiss GL, Medeiros JM, **Pilhofer** M. *Methods Mol Biol*. 2017.
- Stepwise metamorphosis of the tubeworm *Hydroides elegans* is mediated by a bacterial inducer and MAPK signaling. Shikuma NJ, Antoshechkin I, Medeiros JM, **Pilhofer** M, Newman DK. *Proc Natl Acad Sci U S A*. 2016.
- Tunable Single-Cell Extraction for Molecular Analyses. Guillaume-Gentil **Pilhofer** M, Zambelli T, Vorholt JA. *Cell*. 2016.
- Marine tubeworm metamorphosis induced by arrays of bacterial phage tail-like structures. Shikuma NJ, **Pilhofer** M, Weiss GL, Hadfield MG, Jensen GJ, Newman DK. *Science*. 2014.
- Discovery of chlamydial peptidoglycan reveals bacteria with murein sacculi but without FtsZ. **Pilhofer** M, ..., Horn M, Jensen GJ. . 2013