

Lecture Series & Workshops 2019-2021

From Single Organisms to Systems Ecology and Evolution

The leaf microbiota: disassembling and rebuilding to explore plant microbe interactions



Prof. Julia A. VORHOLT

Institute of Microbiology, ETH Zurich

- 8th of January 2020, 12 PM
- Campus Belval, Maison du Savoir; Amphi 3.510

For individual afternoon meetings with Prof. Vorholt, please **register** by mail to secretary@microbiology.lu.

The aerial parts of the plants, which are dominated by leaves, represent one of the largest terrestrial habitats for microorganisms. There is a growing interest to study commensal bacteria to elucidate their interactions with the plants, among each other and to learn how they withstand the hostile conditions of their habitat. Metagenomics and metaproteomics approaches gave insights into the community composition and general bacterial adaptation strategies to the phyllosphere. We conducted large-scale experiments to isolate *Arabidopsis thaliana* leaf bacteria as pure cultures. Individual plants as well as individual leaves were sampled at different European sites to determine their core leaf community. A representative strain collection covering the majority of species living in the phyllosphere of *Arabidopsis* was established and draft genomes of selected isolates were generated. To examine assembly rules of the plant microbiota we used a gnotobiotic *Arabidopsis* model system. We conducted drop-out and late introduction experiments and inoculated plants with synthetic communities from the native bacterial strain collection. Our results showed that community assembly is historically contingent and subject to priority effects. In addition, the examination of plant responses to its microbiota revealed that the plant reacts differently to members of its natural phyllosphere microbiota. A subset of commensals increase expression of defense-related genes and thereby contribute to plant health and performance.

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