



Frontiers in Plant Sciences: Microbiomics I: The microbiome of the plant-soil system (ETH VVZ 751-5127-00L)

Lecturer: Hartmann Martin, Institute of Agricultural Sciences, ETH Zurich
Location: CHN E 46; refer to vvz.ethz.ch/Vorlesungsverzeichnis
Dates: 10:15 – 12:00 every Thursday in Semester: 20.02.; 27.02.; 06.03.; 13.03.; 20.03.; 27.03.; 03.04.; 10.04.; 17.04.; 08.05.; 15.05.; & 22.05.
Credit Points: 2 ECTS

Course Description

The plant-soil microbiome is an essential component of agroecosystems, regulating crop growth, nutrient use efficiency, stress resilience, and disease resistance. In this course, students will develop a fundamental understanding of (i) how microorganisms shape the functioning of the plant-soil system, (ii) how ecosystem management and global changes are influencing diversity and functioning of these microbial systems, and (iii) how the microbiome might be managed to improve sustainable agricultural production. A strong focus will be placed on getting to know the methodological toolbox to study microbes in the environment including different next-generation DNA sequencing applications such as metabarcoding and metagenomics. Theoretical input lectures will be combined with presentations of current research projects. Flipped classroom assignments will be used to critically discuss research findings of specific publications or to evaluate the strength and limitation of the specific methods.

Learning Objectives

After the course, the participants will be able to

- (1) explain how microorganisms influence and respond to changes in the plant-soil system
- (2) evaluate the strengths and limitations of specific methods used in microbiomics
- (3) critically assess current research findings in this field

Prior Knowledge

The participants should have some basic background in biology and a keen interest in learning and discussing how microorganisms shape the functioning of our planet. Whereas this course unit can be taken as standalone class, it also serves as preparatory class for the hands-on block course on microbiome analysis (Microbiomics II).

Special Note:

This course is prerequisite for Microbiome II.

ETH students (Master & PhD students) have to register via MyStudies only, to ensure valid registration !

Individual Performance and Assessment:

In order to obtain the ECTS points, participants are required to actively participate in the lectures and flipped classroom assignments.