

Academic Workshop:

CULTUROMICS: establishing a microbial culture collection for exploring the diversity and functions of plant-associated microorganisms

Viviane Cordovez Ph.D.

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Microorganisms inhabiting plant roots and leaves provide a number of beneficial functions, such as plant growth promotion and protection against biotic and abiotic stresses. In this workshop, we will discuss the potential of microbial culture collections for studying these beneficial functions. In the first part of the workshop, the basic steps for the isolation, cultivation, storage and characterization of plant-associated microorganisms will be introduced. Additionally, different in vitro and in vivo experimental set-ups will be explored to investigate the microbial functions for plant growth promotion and protection against pathogens. In the second part, we will review key microbiome studies to illustrate the power of this culture-dependent approach to validate specific microbial functions found with culture-independent approaches, such as 16S rRNA sequencing and Metagenomics.

Short Professional Biography

Dr. Viviane Cordovez is a scientist at the Department of Microbial Ecology at the Netherlands Institute of Ecology in Wageningen, The Netherlands. She is interested in exploring the diversity and functions of plant-associated microorganisms and the mechanisms underlying plant-microbe interactions. Currently, together with Danish and American academic partners, she investigates the microorganisms inhabiting the aerial surfaces and the internal tissues (the phyllosphere microbiome) of wheat plants for protection against pathogens. She is also involved in collaborative projects between NIOO and USFQ, where they investigate the impact of plant domestication on the microbiomes of wild and modern tomato plants grown in native and agricultural soils.

Areas of Expertise

- Plant-microbe interactions
- Rhizosphere and phyllosphere microbiomes
- Microbial and plant chemical communication
- Biocontrol and plant growth promoting microorganisms

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Education

- 2016: PhD Wageningen University, Wageningen, The Netherlands (Plant-microbe interactions)
- 2011: MSc Wageningen University, Wageningen, The Netherlands (Plant Biotechnology)
- 2008: State University of Maringa, Brazil (Biology)

Selected publications

Cordovez V., Rotoni C., Dini-Andreote F., Oyserman B., Carrión V.J., Raaijmakers J.M. (2021). Successive plant growth amplifies genotype-specific assembly of the tomato rhizosphere microbiome. *Science of the Total Environment* 772, 144825.

Moisan K., Raaijmakers J.M, Dicke M., Lucas-Barbosa D., Cordovez V. (2021). Volatiles from soil-borne fungi affect directional growth of roots. *Plant, Cell & Environment* 44:339-345.

Carrión V.J., Perez-Jaramillo J., Cordovez V., Tracanna V., De Hollander M. et al. (2020). Pathogen-induced activation of disease-suppressive functions in the endophytic root microbiome. *Science* 366 (6465), 606-612.

Cordovez V., Dini-Andreote F., Carrión V.J., Raaijmakers J.M. (2019). Ecology and evolution of plant microbiomes. *Annual Review of Microbiology* 73, 69-88.

Complete list

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