INVITED TALK:

The root microbiome and plant health

Corné M.J. Pieterse, Giannis Stringlis, Ke Yu, Gilles Vismans, Song Yang, Ronnie de Jonge, Peter A.H.M. Bakker and Roeland L. Berendsen

Plant-Microbe Interactions, Department of Biology, Utrecht University, the Netherlands

In nature, plants are attacked by a multitude of pathogens and pests that cause major crop losses in agriculture. To protect themselves, plants can activate a sophisticated immune system. Moreover, plants nurture a large community of root-associated microbiota, which provide them with essential services, such as enhanced nutrient uptake, growth promotion, and protection against pathogens. Research in the Plant-Microbe Interactions group at Utrecht University is focused on understanding plant-beneficial functions encoded by the root microbiome and the role of plant genes facilitating these functions.

Recently, we demonstrated that upon foliar pathogen infection, plant roots recruit a consortium of synergistic microbes to their rhizosphere that in turn trigger an immune response in the whole plant body. We also discovered that coumarins in root exudates play an important role in the chemical communication between plant roots and the root microbiome. With our research we aim to provide a rational basis for developing sustainable microbiome-based strategies for disease resistance in next-generation crops that produce more with less input of fertilizers or pesticides.

Short bio - Corné Pieterse Ph.D.

Full Professor, Plant-Microbe Interactions group, Utrecht University, the Netherlands

E-mail: C.M.J.Pieterse@uu.nl Web: http://www.uu.nl/en/research/plant-microbe-interactions

Google Scholar: LINK; Personal page: http://www.uu.nl/staff/CMJPieterse

Corné Pieterse (1964) is professor Plant-Microbe Interactions and scientific director of the Institute of Environmental Biology of the Faculty of Science. His research group investigates how the plant immune system protects plants against microbial pathogens and insect herbivores, and how beneficial microbes in the plant root microbiome stimulate plant growth and health.

Short bio - Corné Pieterse Ph.D.

His current research is focused on plant-beneficial functions that are encoded by the root microbiome, the role of plant genes and metabolites (coumarins) that aid in maximizing profitable functions from the root microbiome, and crosstalk between plant defense hormones. With his research he aims to contribute to grand societal challenges, such as food security and sustainable agriculture.

Curriculum vitae

Corné Pieterse studied Plant Breeding and Plant Molecular Biology at the Wageningen University where he graduated cum laude in 1988. He performed his PhD research in Wageningen on the molecular basis of pathogenicity of the potato late blight pathogen Phytophthora infestans.

After obtaining his PhD degree in 1993, he moved to Utrecht University. First as a post-doctoral fellow, and between 1998 and 2004 as an assistant professor in molecular phytopathology at the department of Biology. In 2004 he was appointed as full professor Plant-Microbe Interactions.

In 2010, he was awarded an ERC Advanced Investigator grant by the European Research Council. His research group pioneered research on unravelling the rhizobacteria-induced systemic resistance signalling pathway and the role of phytohormone crosstalk in the regulation of plant immunity.

In 2013 he was elected as a member of the Royal Netherlands Academy of Arts and Sciences (KNAW). Since 2014 he is an ISI Highly Cited Researcher (World's top 1% in the field).

Besides heading the Plant-Microbe Interactions group at the Department of Biology, Corné Pieterse is scientific director of the Institute of Environmental Biology of the Faculty of Science at Utrecht University. Nationally and internationally, he fosters plant microbiome research.