

Wednesday 24 June – Parallel session

Rhizosphere Microbiome

Convenors: **Rodrigo Mendes**, Brazilian Agricultural Research Corporation, Embrapa Environment, Brazil, and **Phil Poole**, University of Oxford, UK

Convenor talk

Fungal invasion of the rhizosphere microbiome

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The rhizosphere is the infection court where soil-borne pathogens establish a parasitic relationship with the plant. To infect root tissue, pathogens have to compete with members of the rhizosphere microbiome for available nutrients and microsites. In disease-suppressive soils, pathogens are strongly restricted in growth by the activities of specific rhizosphere microorganisms. Here, we sequenced metagenomic DNA and RNA of the rhizosphere microbiome of sugar beet seedlings grown in a soil suppressive to the fungal pathogen *Rhizoctonia solani*. rRNA-based analyses showed that *Oxalobacteraceae*, *Burkholderiaceae*, *Sphingobacteriaceae* and *Sphingomonadaceae* were significantly overrepresented in the rhizosphere upon fungal invasion. Metatranscriptomics revealed that stress-related genes (ppGpp metabolism, oxidative stress) were upregulated in these bacterial families. We postulate that the invading pathogenic fungus induces, directly or via the plant, stress responses in the rhizobacterial community that lead to shifts in microbiome composition and to activation of antagonistic traits that restrict pathogen infection.