

Paul Schulze-Lefert

Max Planck Institute for Plant Breeding Research

Plant microbiota assembly and functions in plant growth and health

Healthy plants in nature are extensively colonized by multi-kingdom microbial consortia, including bacteria and fungi. The sum of these microbial cells that inhabit a plant host is called the plant microbiota. Our work is focused on the root microbiota and aims at a deeper understanding of how root-associated microbial commensals contribute to plant growth and health. We have established systematic culture collections of the bacterial root microbiota and root-associated fungi of *Arabidopsis thaliana* grown in natural soils and this has enabled us to purify the majority of bacterial and fungal taxa associated with healthy roots. We then use defined consortia of the isolated root commensals, called synthetic communities, in co-cultivation experiments with germ-free *Arabidopsis* plants to reconstitute the root microbiota in laboratory environments. Microbiota reconstitution biology permits controlled perturbation of microbial community composition and, in combination with genetic tools of *Arabidopsis*, insights into microbiota assembly and commensal functions in plant growth and health.

Host: Lionel Navarro

Email: lionel.navarro@ens.fr

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SALLE FAVARD - IBENS
46 Rue d'Ulm - 75005 Paris

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