

MBG FOCUS TALK

Hosted by Simona Radutoiu

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Faculty Club (1870-816)



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Exploring plant-microbe interactions from a phycosphere perspective

In nature, plants are in constant interaction with their environment and their surrounding microbiota, with which they engage in specialized interactions. These microbes in turn have both direct and indirect effects on host survival, while interacting with other microbiota members. By using next generation sequencing approaches, many studies have described the plant-associated microbiota and which biotic or abiotic factors shape their structure. Interestingly, it has been observed that all land plant species interact with a subset or “core” set of microbial groups, regardless of their environment or the host species. In my postdoctoral work, we showed that unicellular soil microalgae also interact with this core microbiota, suggesting that complex anatomical structures are not required for interacting with the core microbiota. To explore the diversity of the core microbiota members in natural conditions, I have performed an amplicon sequencing survey across 152 locations in the Southwest of France and analyzed natural algal populations together with their associated core microbiomes. This has shown that each core group is represented by a variable number of microbial strains, which depend on the host community composition and the environmental characteristics of their habitat. To further explore these interactions under controlled conditions, I have generated a culture collection of more than 400 algal strains, representative of the most prevalent species in natural sites. With this resource, future experimentation will focus on exploring whether specific microbial or host functions are important for establishing core microbiotas, and whether the core microbiota is important for host fitness.