



4 Nov 2022

FPI predoctoral position at [CBGP](#), Madrid.

Unlocking the hidden biodiversity of plant-associated microbiota: Functional and community structure dynamics of low-abundance organisms across time and crop conditions

<https://euraxess.ec.europa.eu/jobs/860013>

Project code: CEX2020-000999-S-20-3

Supervisors: Jaime Huerta Cepas and Emilia López Solanilla

Lab websites:

- [Comparative Genomics and Metagenomics](#)
- [Phytopathogenic bacteria](#)
- [Plant symbiotic bacteria](#)

Project description:

Microorganisms have a profound impact on plant health and growth. Many studies have focused on the analysis of abundant plant-associated microbes. However, it is currently acknowledged that microbial biodiversity is dominated by a large number of neglected low-abundance organisms that we have barely started to understand. Recent work suggests that this enormous fraction of elusive organisms might play a role in the plant-microbiome dynamics, affecting plant biomass production and resistance against environmental changes. It has also been postulated that low-abundance organisms could respond to niche adaptations, modulating the community structure of the plant microbiome. Nevertheless, our current understanding of the dynamics of low- versus high-abundance plant-microbiota remains largely anecdotal. Reasons for such a knowledge gap are twofold. Firstly, we lack genomic approaches that allow for phylogenetically-broad and high-throughput exploration of low-abundance plant-associated microbes. Secondly, very few studies have addressed the comparative study of plant microbiota at the large scale, investigating the effect of time, crop type and environmental conditions under the same controlled framework.

Here, we aim at modelling the dynamics of the rare microbial biosphere associated with the phyllo- and rhizosphere, over time, under pathogen infection and at different nutritional conditions on three common crop types: tomato, pea and lentil. To do so, we will use a novel set of customly designed capture enrichment panels targeting the high-depth sequencing of several microbial gene families particularly informative for the evolutionary and functional characterization of plant-associated microorganisms and their interactions.

Profile:

- Candidates should have a clear motivation for a bioinformatics project, but wet lab experience will be valued (i.e. DNA extractions and metagenomic library preparation)
- Desired skills include: big data statistical analysis, programming, use of bioinformatic software and computing clusters and basic knowledge on microbiology and molecular biology techniques.

Candidates must apply via FPI program (deadline ~20th Nov), but are encouraged to discuss the details of the project prior to the application deadline by contacting to j.huerta@csic.es