

Master's projects in comparative genomics in Arbuscular Mycorrhizal Fungi

The organism

Arbuscular Mycorrhizal Fungi are organisms that live in symbiosis with 90% of the land plants. It is believed that they have maintained those interactions for at least 450 MY, coinciding with the colonization from water to land by plants, making them a key organism to study evolution. Because of the difficulties in culturing little is known about their genomic organization. In our lab we developed a method to sequence them using single nuclei sorted directly from the spores.

Qualifications required/desired: Some small experience in bioinformatics and/or genome analysis is encouraged. It can be having cursed some course on the topic.

Projects

The projects here presented will give the student the opportunity to develop further those skills and they will be in an environment that encourages interactive learning at the Evolutionary Biology program.

The projects can be adapted to the student interests and are open to changes if discussed.

- ❖ Testing for heterokaryosis (different genomes within an organism) in arbuscular mycorrhizal fungi. Sequences coming from individual nuclei from single spores in 4 species will be studied to study within organismal variation.
- ❖ One or two semesters project: The Master student will work doing comparative genomics across species of arbuscular mycorrhizal fungi in which sequences are ready to be analyzed.
- ❖ One or two semesters: study of three species of arbuscular mycorrhizal fungi in which sequences are ready in order to assess the possibility of one of them being an hybrid of the other two.
- ❖ Two semesters project: There are some curious strains of arbuscular mycorrhizal fungi that produce spores with two kinds of phenotypes. This project will includes generation of the data in which the nuclei from spores of the different phenotypes will be sorted and sequenced according to our recently developed protocol. The final part of the project will involve working in the sequences doing comparative genomics within spore and between spores to assess a possibility of different genetic blueprint in them.

The group: Rosling Lab.

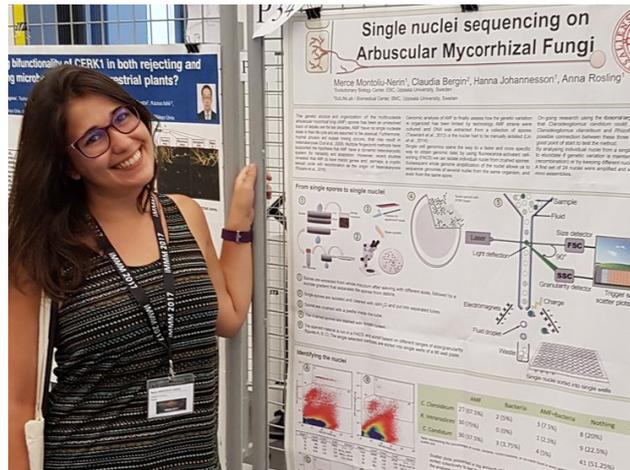
We conduct research in the field of molecular ecology and evolution, working mostly with root-associated fungal communities and their adaptation to soil biogeochemistry and plant host. In 2016 we initiated research on AM fungal genomics within an ERC funded research program. Two PhD students and two post-doc currently work in the project studying genome organization and symbiotic efficiency of AM fungi interacting with diverge hosts.

Webpage: <http://www.ieg.uu.se/evolutionary-biology/rosling/>

People involved in this part of the project and that would supervise the students:



Anna Rosling – PI



Mercè Montoliu-Nerin – PhD Student



Marisol Sanchez-Garcia – Post Doc

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