TULIP-GS call for offers: PhD Tutorial Assignation

Objective: Allow PhD students from the SEVAB and ED305 doctoral schools, working in one of the 6 TULIP laboratories, to have a first tutoring experience by joining one of the two eligible 2024 Junior Lab projects of the Master in Functional Biology and Ecology. PhD students will join a team of Junior Lab scientific tutors for a five-month assignment (average of 6 hours of work per month), starting at the end of January 2024. At the end, each tutor assignment will lead to the validation of 30h of training by the SEVAB or ED305 doctoral schools. The PhD tutors will contribute, in collaboration with the scientific tutors, to the theoretical and practical guidance of the Master students involved in the Junior Lab projects. A brief description of the four Junior Lab projects is attached to this document.

Maximum number of PhD Laureates this year: 3.

Selection criteria (by order of priority):

1. Motivation of the candidate

2. Good correspondence between the candidate expertise and the theme of the selected Junior Lab project

Our selection procedure will guarantee equal opportunities to all applicants

Expected structure of the application (in English):

1. A short CV (half a page)
2. A letter of motivation indicating which Junior Lab project the candidate wants to integrate and a statement indicating that the candidate has informed his/her PhD supervisor
3. A short description of the adequation between the candidate expertise and the selected junior lab project (250 words)

Applications must be sent as one single pdf file to jean-marc.deragon@univ-perp.fr

Calendar:

1. Publication of the call: November 9, 2023
2. Deadline to respond: January 12, 2024
3. Publication of results: January 19, 2024

The PhD Tutorial Assignation will start for five months on January 22, 2024

Project 1: 3D genome reprogramming during plant-microbe symbioses

Legumes can form beneficial symbioses with soil bacteria capable of fixing atmospheric nitrogen. In this case, a specialized root organ called a nodule is formed to host the microbial symbiont intracellularly. Nodulation relies on strict spatiotemporal activation of symbiotic genes leading to transcriptional reprogramming of root cells. Several lines of unexplored evidence strongly suggest the importance of epigenetic reprogramming and 3D nuclear organization during the initiation of the symbiotic program and its maintenance in mature nodules. These include the expression of genes encoding specific histone variants and chromatin remodelers potentially involved in the transcriptional reprogramming. We propose that the student develop a project that will establish the importance of epigenetic reprogramming and 3D nuclear organization during the initiation and maintenance of the symbiotic program. This project should lead to the development of novel skills in molecular biology, microscopy including single cell resolution live-cell imaging, and bioinformatics.

This project will benefit from the complementary expertise of the two host laboratories: the Endosymbiotic Infection and Nodule Development (ENOD) team at LIPME and the Epigenetic Mechanism and Chromatin Architecture (MEAC) team at LGDP. This project will ideally be carried out by four students, two based in Toulouse and two in Perpignan, with regular meetings by Zoom and in person. Please note that transport costs between Toulouse and Perpignan during the project will be covered by EUR TULIP.

Keywords: plant-microbe symbiosis, chromatin remodeling, histone variants, molecular reprogramming, live-cell microscopy

Supervised by: Nathalie Picault, Guillaume Moissiard, Frédéric Pontvianne (LGDP), Andreas Niebel, Matthias Benoit (LIPME)

Sites: Perpignan and Toulouse ***(in this case, please specify if you are applying for a position in Perpignan or in Toulouse)***

Project 2: Non-genetic mechanisms of 'adaptation' to environmental change across the symbiotic spectrum of aquatic systems

The effects of environmental change, in particular global climate change, are increasingly affecting all major ecosystems on planet Earth. As genetic adaptation may be outpaced by the rate of environmental change in long-lived organisms, different fields are increasingly investigating the roles of 'non-genetic' mechanisms of adaptation, such as epigenetic modifications, physiological adjustment, or changes to overall microbiome composition. In this five-months practical course, we will explore such mechanisms across 'the symbiotic spectrum' in different aquatic systems, specifically in mutualistic (cnidarian-algae symbiosis) and parasitic (schistosomiasis pathosystem) host-microbe relationships. Students will obtain a solid understanding of physiological and molecular toolboxes to interrogate these symbiotic systems, practical experience in the lab, and will be involved in a complete scientific workflow from experimental planning to data analysis and report writing.

Supervised by: Ronaldo de Carvalho Augusto (IHPE), Claudia Pogoreutz (CRIOBE)

Site: Perpignan