

Call for awarding one Research Fellowship

Ref. BI-MESTRE-SECRET MECHANISMS

One Research Fellowship (Master Degree) is available with **Faculdade de Ciências da Universidade de Lisboa (FCUL)**, in the project "*The secret of a winning strategy: common mechanisms in different symbioses*" (Secret Mechanisms), IF/00964/2013, financed by national funds by Fundação para Ciência e a Tecnologia, I.P. (FCT)/MCTES, under the FCT Investigator Starting Grant, under the following conditions:

1. **Scientific Area:** Biological science and related areas.
2. **Requirements for admission:**
 - 2.1. **Obligatory:**
 - A. Possession of a master degree in Biological Science or related areas;
 - B. Qualifications and experience:
 - Educational background relevant for the chosen project (previous experience in lab and field work);
 - Experience in statistical analysis;
 - Experience in microbial ecology, symbioses, plant-microorganisms interaction and physiological tests applied to plants and/or lichens;
 - Experience in isolation and cultivation of microorganisms of several kinds.
 - C. Communication skills:
 - Effective communication skills both written and verbal,
 - Report writing skills and experience of delivering presentations in English;
 - Experience in organizing and participating in dissemination activities with students and general public.
 - D. Team working: Ability to work as part of a multidisciplinary research team, show enthusiasm, initiative and possess good interpersonal skills.
 - 2.2. **Preferential**

In respect to requirement B, it will be given preference to candidates with:

 - Research experience in the field of lichens and/or mycorrhizas and plant-microbial symbioses;
 - Experience with the use of electronic noses;
 - Possession of scientific publications.

3. **Work plan**

Duration: 1 month

Several species of microorganisms (i.e. yeasts, bacteria, fungi) will be cultivated, alone and in combination, and used to train and calibrate an electronic nose (Cyranose® 320, Sensigent) designed to detect and identify individual chemical compounds and complex chemical mixtures. The most efficient settings of the instruments will be identified to distinguish among the different VOCs produced by the microorganisms.

The Cyranose will be also trained to identify VOCs produced in symbiotic association by several species of lichens and mycorrhizas.

Duration: 2 months

Several species of plants and lichens will be selected and exposed to different biotic and abiotic stresses. Physiological tests (photosynthetic parameters, biomass and N use efficiency determination, pH measurements and thermographic photos) will be performed to check the health status of the samples and monitor the effects of changing environmental conditions (stresses) along the experiment duration.

To respond to current global needs, we aim at investigating response to increasing temperature (climatic change), nitrogen, salt stress and pathogens. Samples will be kept under controlled conditions in a phytotron chamber/greenhouse.

The Cyranose will be used to detect changes in VOCs production in response to abiotic stresses.

Samples taken before and after the treatments will be selected and sent for next generation sequencing for bacterial identification to check the bacteria associated with stress response to verify how the microbiome changes accordingly to environmental conditions and if it can be considered as a functional trait of the holobiomes.

Duration: 1 month

Results obtained with lichens in lab will be tested in the field to verify the possibility to use VOCs production and changes in lichen microbiome as early warnings of environmental changes.

Duration: 2 months

Based on the preliminary results, the use of the Cyranose to detect early warnings of pathogenic infection of plants of economic interest will be tested. Experiments will be designed at purpose in the lab and checked in the field. Besides VOCs production, plant physiological parameters will be measured to assess their health status including:

- Chl *a* fluorescence parameters (Handy Pea fluorimeter, Hansatech);
- Extra and intracellular compartmentation of N (Berthelot reaction);
- Cellular membrane damage expressed as the linkage of intracellular ions (electrical conductivity);
- Total C and N (N and C isotopes) to observe the connections between C and N cycles;
- Analysis of pigments (HPLC);
- pH measurements;
- Biomass;
- Thermographic photos.

4. Legislation framework:

Law No. 40/2004, of August 18th, as amended and republished by Decree-Law No. 202/2012 of August 27th, by Decree-Law No. 233/2012 of October 29th, by Law No. 12/2013, of January 29th, and by Decree-Law No. 89/2013 of July 9th and Lisbon University Fellowships Regulation, published by Order (extract) No. 6977/2015 of June 23th (<https://dre.pt/application/file/67564222>).

5. Place of work:

The work will be developed at the Departamento de Biologia Vegetal, at FCUL.

6. Scientific orientation:

Silvana Munzi, PhD.

7. Fellowship duration:

The fellowship will have the duration of 03 (three) months, expected to start on November 2018, with the possibility to be extended for an equal period of 03 (three) months, to a maximum of 06 (six) months, including the initial duration.



8. Monthly allowance and Social Insurance:

- 8.1. The fellowship amount to € 980 (nine hundred and eighty euros), according to Lisbon University Fellowships Regulation (<https://dre.pt/application/file/67564222>). It will be paid monthly by bank transfer;
- 8.2. The candidate to be hired may exercise his right to social insurance by joining the voluntary social insurance scheme, under the terms of the Statute of the Research Fellowship. The financing entities assume the costs resulting from the contributions provided for this Social Insurance, according to the Statute of the Research Fellowship.

9. Selection criteria:

Candidates will be assessed based on their CV and other documentation, as follows:

The selection method follows the classifications obtained adopting the following weights: 50% for curriculum evaluation and 50% for selection interview. There will be admitted to the selection interview the 2 (two) candidates with the highest classifications obtained in the curriculum evaluation.

10. Selection Committee:

Silvana Munzi, PhD (President), Professor Cristina Maria Nobre Sobral de Vilhena da Cruz Houghton (1st effective member), Maria Teresa Machado Dias, PhD (2nd effective member), Margarida Maria Cabral Lages Azevedo Santana, PhD (1st alternate member) and Professor Maria Manuela Spratley Saraiva de Lemos Carolino (2nd alternate member).

11. Publication/notification of results:

The final results of the evaluation will become public, through a final grade ordered list which will be posted at the entrance hall of Faculdade de Ciências da Universidade de Lisboa, C4 building, Campo Grande, 1749-016 Lisboa.

All applicants will be notified of the results of the evaluation to the email address used for sending the respective application, or by post to the applicant's address.

12. Deadlines:

This call for applications is open from 1st to 15th of October 2018.

13. Application:

Applications may be sent via e-mail to candidaturas@ciencias.ulisboa.pt, with the subject "**BI-MESTRE-SECRET MECHANISMS**", or personally, during office hours (9.30 a.m. to 4.00 p.m.), at the office address of Núcleo de Expediente da Faculdade de Ciências da Universidade de Lisboa, Edifício C5, piso 1, Campo Grande, 1749-016 Lisboa, until the deadline. **Whatever the form of submission of the application, it should mention the reference "BI-MESTRE-SECRET MECHANISMS", under penalty of not being considered in the present call.**

Applications must be accompanied by the following documents

- **In the case of being Portuguese citizen, copy of identification document (ID or citizen card);**
- **In the case of not being Portuguese citizen, copy of identification document (ID card or passport) as well as residence authorization, permanent residence authorization or long-term resident status, if applicable;**
- If you agree to be notified for your post address, please send obligatorily the declaration annexed to this Notice;
- Certificates of qualifications of all obtained academic degrees, with final ranking;
- Curriculum Vitae, detailed and updated, stating obligatorily the full candidate's address;
- Document of employment status, indicating the nature of the bond and functions; this document can be replaced by a declaration under honor commitment if there is any professional activity or the provision of services;
- Cover letter;
- Optionally, letters of recommendation.

DECLARATION

_____ (name of the candidate), declare that if the selection jury chooses to communicate and or notify applicants by e-mail, I agree that such communications and or notifications are made to the email address used for submission of my application.

(Date)

(Signature)