



## UNTIL DEATH DO US APART: LIVING IN A SYMBIOTIC WORLD

**Teachers:** Silvana Munzi (Univ. Lisboa), Cristina Cruz (Univ. Lisboa), Luís Carvalho (Univ. Lisboa) et al.

**Calendar:** February 3<sup>rd</sup>-7<sup>th</sup> 2020

**Schedule:** 9:30-18:30 (36h)

**Objectives:** Symbiosis is a key strategy for life on Earth. Nevertheless, although many research groups have long been committed to the study of symbiosis, its definition and functioning are not fully understood, and its ecological role and relevance are still underestimated.

Symbiotic associations vary from parasitism to mutualism and even simple persistent biological interactions, making the knowledge fragmented and focused on the details of single symbiotic systems. Knowledge of the various symbiotic relationships is rapidly increasing with the development of -omics tools, but without efforts to find common grounds. In this course, we promote a different approach, in which different symbiotic systems are studied to highlight congruencies in symbiotic interactions. The integration and synthesis of existing knowledge on various symbiotic systems at genetic, biochemical, physiological, ecological and social levels can bring out models and tools for the research and exploitation of symbiosis concept in biotechnology, from agriculture to marine science, to global ecosystem functioning.

**General plan:** Examples of different symbiotic associations will be presented by specialists in the field in theoretical-

practical lessons. Morphological, physiological and ecological aspects will be taken in consideration. Great focus will be given to the (known) mechanisms involved in symbiosis establishment, maintenance and breakdown. These mechanisms will be compared among the different symbiotic systems to highlight peculiarities and similarities. Potential applications in technology and social science will be considered.

This course can have recognition of 6 ECTS for FCUL PhD students enrolling in it as part of their first doctoral year and for students from other institutions that recognize the credits. The certificate will be on 'Symbiotic lifestyle: basic notions and potential applications'.

**Nº (min, max) students:** 10 – 20

**Minimum formation:** Bachelor ("Licenciatura") in Biology, Natural Science or related areas

**Directed to:** PhD or MSc students in Biology, Microbiology, Ecology, Environmental Studies or related areas, and postdocs and other professionals working in related topics

**Fee:** free for 1st year PhD students in the Doctoral program in Biology (FCUL), Biodiversity, Genetics and Evolution (BIODIV UL; UP) and Biology and Ecology of Global Changes (BEAG UL, UA) when the course counts credits for their formation, in which case the delivery of a final report done after the course is mandatory; 50 € for more advanced PhD students of cE3c; 80 € for PhD students of the PEERS network (CFE); 125 € for FCUL Master students and unemployed; 180 € for BTI, BI and other PhD students; 250 € for Professional and postdocs.

When the maximum number of students is reached 10 vacancies will be available for non-paying 1st year PhD students mentioned above, being, by order of preference: 1) cE3c students; 2) BIODIV students (not from cE3c); 3) FCUL students (not from cE3c); 4) BEAG students (not from FCUL).

**Deadline for applications:** **NEW DEADLINE: JANUARY 10 2020**

Candidates should send an e-mail to Silvana Munzi (ssmunzi@fc.ul.pt) with a short cv and motivation letter. The cv and letter should be named as *1st-lastNAME-CV.pdf* and *1st-lastNAME-ML.pdf* (that is personalize the name of each file with your first and last name).

**In the email please add the following information:**

Full Name:

E-mail:

Phone:

Professional activity: Professional/Postdoc, BTI, BI (or other non-post-doc research grant), PhD student (with/without scholarship), Lic. (Bachelor)/Master student

Academic formation:

PhD student of the 1st year of Doctoral programme BIODIV (FCUL/FCUP), Biologia (FCUL) or BEAG (FCUL or UA)?:

If yes to the above question, PhD student doing the Course to count credits for 1st year?:

PhD student of cE3c or CEF (Centro de Ecologia Funcional)?:

If PhD student from another programme/centre, which: