



CHALLENGES AND PERSPECTIVES IN MICROBIAL BIOLOGY

CU characterization:

CU name:

Challenges and Perspectives in Microbial Biology

Scientific area acronym:

CB-M

Duration:

Biannual

Working hours:

112

Contact hours:

40

ECTS:

4

Observations:

Specific CU of the specialization in Microbiology

Teacher in charge and respective teaching workload in the CU:

João Piedade – 11 hours

Other teachers and respective teaching workloads in the CU:

Ana Armada – 4 hours

Celso Cunha – 4 hours

Filomena Pereira – 4 hours

Isabel Couto – 4 hours

Liliana Rodrigues – 8 hours

Maria Luísa Vieira – 4 hours

Miguel Viveiros – 4 hours

Ricardo Parreira – 4 hours



Intended learning outcomes (knowledge, skills and competences to be developed by the students):

Within this course, students should:

1. Analyze and critically evaluate experimental work protocols in areas of Microbial Biology (broadly defined), relevant to Medical Microbiology, covering Medical Bacteriology, Virology and Mycology;
2. Apply directed autonomous research methodologies, based on scientific papers previously provided by the faculty;
3. Synthesize key ideas from diverse sources of information, previously validated from a scientific standpoint;
4. Acquire skills in formulating scientific hypothesis and problem-solving in Medical Microbiology;
5. Use the basic principles of science communication for the preparation and delivery of an oral presentation.

It is intended that the doctoral candidate's exposure to a large number of research proposals in the field of Microbial Biology contributes to the overall goal of gradually increasing their ability to independently plan a research project throughout the study cycle.

Syllabus:

The concepts and generic analysis tools relevant to Microbial Biology (broadly defined), specifically applied to Medical Microbiology, will be presented. These will be applied to the epidemiology, physiopathology, prophylaxis, laboratory diagnosis, and/or therapy of microbial infections of various etiologies, in their relationship with the infected host. Particular attention will be given to the interpretation and integration of information from new technologies for molecular characterization of microorganisms, both from an epidemiological perspective and as aids to diagnosis. To this end, it is intended that doctoral candidates engage with the various research themes of the Medical Microbiology Research Unit at IHMT, preparing in advance, autonomously, and critically discussing, in tutorial orientation sessions, selected published scientific papers that encompass the specified contents.

Demonstration of the syllabus coherence with the CU learning objectives:

The doctoral candidate is expected to engage with methods and techniques of scientific and experimental analysis in the broad field of Biomedical Sciences, particularly in the areas of genetics and molecular biology, molecular epidemiology, biochemistry, cell biology, among others, enabling them to implement and develop, autonomously, research projects applied to Microbial Biology (broadly defined). The program content is fully aligned with the learning objectives.

Teaching methodologies (including assessment):

The use of a "flipped classroom" approach will allow doctoral candidates to independently explore pre-selected content outside of the classroom, using scientific articles provided beforehand as a starting point. These papers may be supplemented with additional resources for study. Classroom time will be optimized and dedicated to discussions, clarification of doubts, and exploration of key points from each of the articles under analysis, with the aim of deeper understanding of each topic. Sessions will primarily be tutorial in nature.



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Assessment:

- i) Oral presentation on a topic selected from the themes/papers suggested by the faculty for the tutorial sessions, followed by a discussion with the participation of lecturers/tutors and PhD students.
- ii) Written examination with open-ended questions.

Not considering specific cases provided for in applicable legislation, admission to the final assessment requires a minimum attendance of 2/3 of the scheduled face-to-face sessions.

Evidence of the teaching methodologies coherence with the CU intended learning outcomes:

The use of a "flipped classroom" teaching methodology will allow aligning the various program contents, under the responsibility of different specialists involved in the course, with the predefined learning objectives.

References for consultation / mandatory existence:

- Specific scientific papers, to be suggested by the faculty, according to the topics to be addressed.
- Barroso, H.; Meliço-Silvestre, A.; Taveira, N. (Eds.) (2014). *Microbiologia Médica – Volumes 1 e 2*. Lidel Editions, Lisbon. ISBN: 9789897520570 (vol. 1) and 9789727575763 (vol. 2).
- Murray, P.R.; Rosenthal, K.S.; Pfaller, M.A. (2020). *Medical Microbiology*. 9th Ed. Elsevier Mosby Saunders, St. Louis, USA. ISBN: 9780323673228.