

# MASTER DEGREE IN MICROBIOLOGY



## MICROBIAL EVOLUTION AND DIVERSITY – Faculty of Sciences

### Objectives:

This unit aims to study the diversity, in terms of structure, function and ecology, of microorganisms belonging to the Domains Bacteria, Archaea and Eucarya (Kingdom Fungi) as well as the processes of evolution of these microorganisms.

### Program:

Theoretical lectures

1. Introduction
  - 1.1. Origin and phylogenetic diversity of microorganisms
  - 1.2. Major milestones in classification systems
2. Brief characterization of some groups of Domains Archaea and Bacteria
3. General characterization of organisms belonging to the Kingdom Fungi and related organisms of the Kingdom Straminipila and Protozoa
4. Study of the Phyla belonging to the Kingdom Fungi
5. Darwinism, Evolution and Microbiology
6. Mutations in bacteria - what situation is helpful to have a high mutation rate?
7. Speciation
8. Evolution of Virulence

Laboratory

Diversity in Bacteria and Eucarya Domains (Kingdom Fungi): morphological and physiological groups of bacteria and fungi.

### Evaluation methodology

Teaching methodologies include lectures and laboratory classes.

Evaluation includes a final written examination about lectures (60%) and laboratory (40%). The approval rating is achieved with a mark a 9.5 (0-20 scale).

### Recommended bibliography:

- \* Ogunseitán O. 2005. Microbial Diversity. Blackwell. London.
- \* Dworkin M et al. (Eds.). 2007. The Prokaryotes. 3rd ed.
- \* Alexopoulos CJ et al. 1996. Introductory Mycology. 4rd. Ed. J. Wiley & Sons:New York.
- \* Deacon JW. 2006. 4rd. Modern Mycology, Ed. Blackwell Scientific Publications: London.
- \* Kendrick B. 2000. The Fifth Kingdom. 3rd. Focus Publishing: Newburyport.
- \* Denamur E et al. 2000. Cell 103: 711-721.
- \* Giraud A et al. 2001. Science 291: 2606-2608.
- \* LeClerc JE et al. 1996. Science 274: 1208-1211.
- \* Levin BR. 1996. Emerging Infectious Diseases 2: 93-102.
- \* Matic I et al. 1996. Trends Microbiol 4: 69-72.
- \* Matic I et al. 1997. Science 277: 1833-1834.
- \* Mayr E. 1991. One Long Argument - Charles Darwin and the Genesis of Modern Evolutionary Thought Penguin Books: London.
- \* Oliver A et al. 2000. Science 288: 1251-1254.
- \* Vulic M, Dionisio F, et al. 1997. PNAS 94: 9763-9767.