

MASTER DEGREE IN MICROBIOLOGY



MEDICAL MICROBIOLOGY – Faculty of Medicine

Objectives:

After completing this course the students will be able to:

- Describe the main mechanisms of microbial pathogenesis.
- Explain the circumstances of human infection
- Describe the strategies for etiological diagnosis.
- Explain infection control measures.
- Know and determine the mechanisms of antimicrobial resistance.
- State prophylactic measures of human infections.
- Interpret results of microbiological analysis.
- Discuss the rationale for etiologic therapy of infections.

Program:

Microbial pathogenesis:

Pathogenesis and pathogenic agent. Host-parasite interaction. Herpesvirus pathogenesis. Infectious cycle. Animal models for the study of viral pathogenesis.

Diagnosis in Clinical Microbiology:

Laboratory diagnosis in clinical microbiology. Types of human samples and collection methods. Diagnostic methods and detection of pathogenic microorganisms.

Infection Control:

Antimicrobial agents. Antimicrobial resistance: genetic basis, expression, detection and epidemiological and clinical implications. Detection of outbreaks: molecular epidemiology studies, applicability and limitations.

Prophylaxis of infection. Impact of vaccines.

Diagnosis and antimicrobial susceptibility testing in parasitology – malaria model.

Concepts and aspects of laboratory diagnosis of malaria. Methods of Plasmodium detection.

Diagnosis of malaria, epidemiological studies and development of vaccines.

Evaluation methodology

Teaching methodologies involve theoretical and laboratory classes.

The final grade will include the contribution of two assessment elements:

1 - Final exam - 70% - The exam is mandatory. A minimal grade of 9.5/20 values is required.

2 - Laboratory work - 30% - Practical sessions will take place throughout the semester and will be evaluated based on reports to be delivered by the students. Presence in all lab classes is mandatory.

Recommended bibliography:

- Flint, et al. 2009. Principles of Virology. ASM Press.
- Simas et al. 1998, Trends in Microbiology 6: 276-82.
- Stevenson et al, 2009, Virology 90:2317-30.
- Rodrigues et al, 2009, The EMBO Journal 6;28:1283-95.
- Milho et al. 2009. Journal of General Virology 90: 21-32.
- Murray et al. 2008. Medical Microbiology. 6th ed. Mosby.
- Mims et al, 2007. 4a Edição. Medical Microbiology. London. Mosby
- Siber et al. Pneumococcal vaccines. 2008. Washington, DC. ASM Press.
- Aguiar et al, 2010, Vaccine 2010; 28: 5167-5173.

- Aguiar et al, 2008, Clin Microbiol Infect, 14: 835–843.
- Wilson and Salyers. 2010. Bacterial Pathogenesis: A Molecular Approach. ASM Press.
- Fischetti et al., 2006. Gram-positive pathogens. ASM Press.
- Moat et al. 2002. Microbial physiology. Wiley-Liss.
- Telford et al. 2006. Nat Rev Microbiol 4:509-19.
- Ambur et al. 2009. FEMS Microbiol. Rev 33:453-470.
- Mainardi et al. 2008. FEMS Microbiol. Rev 32:386-408.
- Papanikou et al. 2007. Nat. Rev. Microbiol 5:839-851