



## **CU Legionella Infections**

### ***CU characterization:***

#### ***CU name:***

Legionella Infections

#### ***Scientific area acronym:***

XXXX

#### ***Duration:***

Semiannual

#### ***Working hours:***

168

#### ***Contact hours:***

T 16 TP 16 PL 1 S 1 E

T (Theoretical), TP (Theoretical-practical), PL (Laboratory Practice), S (Seminar),  
E(Internship).

#### ***ECTS:***

2

#### ***Observations:***

Observations

### ***Teacher in charge and respective teaching load in the CU:***

Maria de Jesus Chasqueira – 37 hours

### ***Other teachers and respective teaching load in the CU:***

Lúcia Rodrigues – 19 hours

Carolina Bernardino – 6.5 hours

Bernardo Pereira – 6.5 hours

Ana Alexandra Pereira – 1.5 hours

Ricardo Santos – 1.5 hours

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

-Understand the epidemiology, main clinical aspects, diagnosis and treatment of infection by Legionella;



- Understand the importance of maintenance of equipment associated with the production of aerosols and disease prevention measures.
- Understand the Portuguese and European surveillance systems of the legionnaire disease

#### ***Syllabus:***

- General characteristics and epidemiology of Legionnaires disease: clinical and therapeutic. The importance of early diagnosis;
- Prevention and surveillance: the importance of maintenance of equipment associated with the production of Nosocomial Infection aerosols: definitions, prevention and surveillance measures;
- Laboratory diagnosis: Culture of biological samples in BCYE  $\alpha$  and GVPC. Search antigen in respiratory specimens by direct immunofluorescence. Antibodies in sera by indirect immunofluorescence. L.pneumophila sg1 antigen in urine, for immunochromatography;
- Analysis and interpretation of results;
- Typing by molecular biology;
- Cell Culture;
- Study of gene expression;
- Molecular biology in clinical diagnosis
- Study of susceptibility to antibiotics and research of resistance genes.

#### ***Evidence of the syllabus coherence with the CU intended learning outcomes:***

The program provides the tools that will enable students to achieve its objectives, including the general principles of epidemiology and associated clinical (lectures) and the different steps of the laboratory diagnosis, typing of Legionella and susceptibility to antibiotics (laboratory practical classes).

#### ***Teaching methodologies (including assessment):***

The lectures are taught by teachers of curricular unit, depending on the respective specializations. The form of lecture, in which they will address issues considered essential by providing data to guide students to an individual study.

Laboratory practical classes will enable all students to practice the different methodologies used in the diagnosis and typing.

Student assessment – Written examination finally multiple choice test of 25 questions (duration 40 minutes) 50%.

Oral presentation and discussion of topics by groups of two students. Themes are distributed in 1st class and the presentation of each theme has duration of 15 minutes + 5 minutes for discussion 50%.

The student will be excluded if the exam grade is less than 9.5.

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

The objectives of understanding the epidemiology, clinical and therapeutic aspects of Legionella infection, as well as the importance of maintenance of equipment associated with the production of aerosols and prevention of the disease will be taught during the lectures.



Diagnosis and typing require contact with the different laboratory methodologies, which will be guaranteed by practical classes in the laboratory.

***References for consultation / mandatory existence:***

- Viasus D, Calatayud L, McBrown MV, Ardanuy C, Carratalà J. Urinary antigen testing in community-acquired pneumonia in adults: an update. *Expert Rev Anti Infect Ther.* 2019 Feb;17(2):107-115. doi: 10.1080/14787210.2019.1565994.
- Herwaldt LA, Marra AR. Legionella: a reemerging pathogen. *Curr Opin Infect Dis.* 2018 Aug;31(4):325-333. doi: 10.1097/QCO.0000000000000468.
- Mou Q, Leung PHM. Differential expression of virulence genes in *Legionella pneumophila* growing in *Acanthamoeba* and human monocytes. *Virulence.* 2018 Jan 1;9(1):185-196. doi: 10.1080/21505594.2017.1373925.
- Pierre DM, Baron J, Yu VL, Stout JE. Diagnostic testing for Legionnaires' disease. *Ann Clin Microbiol Antimicrob.* 2017 Aug 29;16(1):59. doi: 10.1186/s12941-017-0229-6
- Cristovam E, Almeida D, Caldeira D, Ferreira JJ, Marques T. Accuracy of diagnostic tests for Legionnaires' disease: a systematic review. *J Med Microbiol.* 2017 Apr;66(4):485-489. doi: 10.1099/jmm.0.000454
- David S, Afshar B, Mentasti M, Ginevra C, Podglajen I, Harris SR, Chalker VJ, Jarraud S, Harrison TG, Parkhill J.. Seeding and Establishment of *Legionella pneumophila* in Hospitals: Implications for Genomic Investigations of Nosocomial Legionnaires' Disease. *Clin Infect Dis.* 2017 May 1;64(9):1251-1259. doi: 10.1093/cid/cix153.
- Essig A et al. Microbiological diagnosis and molecular typing of *Legionella* strains during an outbreak of legionellosis in Southern Germany.. *Int J Med Microbiol.* (2016) Feb;306(2):109-14. doi: 10.1016/j.ijmm.2016.01.001.
- Mercante JW, Winchell JM. Current and emerging *Legionella* diagnostics for laboratory and outbreak investigations. *Clin Microbiol Rev.* 2015 Jan;28(1):95-133. doi: 10.1128/CMR.00029-14.
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- Gomez-Valero L, Buchrieser C. Genome dynamics in *Legionella*: the basis of versatility and adaptation to intracellular replication. *Cold Spring Harb Perspect Med.* 2013 Jun 1;3(6). pii: a009993. doi: 10.1101/cshperspect.a009993