

Course Unit	Advanced Diagnostic Methodologies	Field of study	Biotechnology
Master in	Applied Health Sciences - Biotechnology	School	School of Health
Academic Year	2023/2024	Year of study	1
Type	Semestral	Semester	2
Workload (hours)	121,5	Contact hours	T - TP - PL - TC - S - E - OT - O -
		Level	2-1
		ECTS credits	4.5
		Code	5055-669-1204-00-23

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s)

#### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Recognize the main immunoassay methods: immunohistochemical and immunocytochemistry most used in the diagnosis.
2. Apply techniques of flow cytometry and immunophenotyping: technique execution and results analysis.
3. Distinguir aplicações de bionanotecnologia no campo do diagnóstico médico e investigação biomédica.

#### Prerequisites

Not applicable

#### Course contents

Immunohistochemistry and immunocytochemistry. Flow cytometry and immunophenotyping. Bionanotechnology in diagnosis.

#### Course contents (extended version)

1. Immunohistochemistry and immunocytochemistry
  - Antigen-Antibodies
  - Mono and polyclonal serum
  - Immunofluorescence
  - Immunoenzyme
  - Multiple Marking
2. Flow cytometry and immunophenotyping
  - Analysis, detection and quantification of cell populations
  - Cell function studies.
  - Diagnosis and follow-up of diseases.
  - Immunological evaluation in transplants.
3. Bionanotechnology in diagnosis
  - Applications in bionanodetection.
4. Diagnostic imaging
  - Nuclear medicine techniques, Magnetic Resonance, Computerized Axial Tomography
  - Different image modalities

#### Recommended reading

1. H. Liu, M. Wilkerson, C. Schuerch (2011), "Handbook of Practical Immunohistochemistry" Springer
2. Cook D. J. (2006) "Cellular Pathology: An Introduction to Techniques and Applications, 2nd ed. UK: Scion Publishing",
3. Kiernan J. A. (2003) "Histological & Histochemical Methods – Theory & Practice", 4rd ed. London: Arnold
4. M. Sales, D. Vasconcelos. (2013) "Citometria de fluxo aplicações no laboratório clínico e pesquisa", Atheneu
5. C. M. Niemeyer, C. A. Mirkin (Eds. ), (2004) "Nanobiotechnology: Concepts, Applications and Perspectives" Wiley-VCH, Weinheim, Germany

#### Teaching and learning methods

The lectures are taught using videoconferencing technology and shared with Professor Elsa Cardoso from IPG. The lecture, tutorial, demonstrative, active, problem solving and simulation methods are integrated in the different types of teaching learning: theoretical-practical (TP), Seminars (S), and tutorial orientation.

#### Assessment methods

- Unique Alternative - (Regular, Student Worker) (Final, Supplementary, Special)
- Projects - 100% (Develop a short Review article presented in poster)

#### Language of instruction

Portuguese, with additional English support for foreign students.

#### Electronic validation

Josiana Adelaide Vaz	Ana Maria Gerales Rodrigues Pereira	Luis Migue Fernandes Nascimento	Adília Maria Pires da Silva Fernandes
04-05-2024	23-05-2024	24-05-2024	31-05-2024