Course Unit	Advanced Diagnostic Methodologies			Field of study	Biotechnology		
Master in	Applied Health Sciences - Biotechnology			School	School of Health		
Academic Year	2022/2023	Year of study	1	Level	2-1	ECTS credits	4.5
Type	Semestral	Semester	2	Code	5055-669-1204-00-22		

Workload (hours)	121,5	Contact hours	T -	TP -	PL -	TC -	S -	E -	OT -	O -

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): Josiana Adelaide Vaz

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 c ell 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. Kiern an J. A. (2003) “Histological & Histochemical Methods – Theory & Practice”, 4rd ed. London: Arnold
4. M. Sales, D. Vasconcelos. (2013) “Citometria de fluxo aplicações no laboratório clinico e pesquisa”, Atheneu
5. C. M. Niemeyer, C. A. Mirkin (Eds.), (2004) “Nanobiotechnology: Concepts, Applications and Perspectives” W iley-VCH, Weinhein, 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)
   - Work Discussion - 50% (Oral presentation and Discussion)
   - Projects - 50% (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 Geraldes Rodrigues Pereira	Juliana Almeida de Souza	Adília Maria Pires da Silva Fernandes
21-03-2023	21-03-2023	28-06-2023	28-06-2023