Course Unit	Cytohistochemical Methods			Field of study	Biomedical Laboratory Sciences								
Bachelor in	Biomedical Laboratory Sciences			School	School of Health								
Academic Year	2022/2023	Year of study	3	Level	1-3	ECTS credits	5.0						
Type	Semestral	Semester	1	Code	9995-550-3105-00-22								
Workload (hours)	135	Contact hours	T -	TP 22,5	PL 30	TC -	S -	E -	OT 7,5	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): Celso Tome dos Santos Lopes, Daniela Sofia Carvalho Alves, Jose Pedro dos Santos Neves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. know the contribution of the Cito-Histoquímica in the context of the Laboratory Biomedical Sciences, recognizing its importance as an auxiliary means of diagnosis .
2. Apply and monitor cyto-histochemical methods in biomedical context, taking into account the target cell or tissue.
3. Organize the tasks underlined to the laboratory protocols executing the tasks with rigour for the acquisition of quality results;
4. Interpret and control technical procedures through macro and microscopic observation of the chemical or physical reactions of biological products in order to implement corrective measures
5. Apply the good practices on the laboratory developing the different tasks according to chemical safety and biosafety norms;
6. Manage reagents and materials in an economically and environmentally sustainable way.

Prerequisites

Before the course unit the learner is expected to be able to:
Students should have knowledge of Chemistry, Histology and Histotechnology

Course contents

Coloring theory. Metachromasia and metachromatic solutions. Carbohydrates and Mucosubstances. Connective tissue: collagen, reticulin and elastin. Detection of Microorganisms. Detection of various types of pigments in tissues. Detection of Lipids. Detection of DNA and active enzymes in tissues. Techniques for detection of elements of the nervous system

Course contents (extended version)

1. Staining theory.
   - Sstaining mechanism.
   - Structure and classification of dyes
2. Metachromatic dyes and metachromasia.
   - Action mechanism. Examples in histology.
   - Amilode demonstration methods.
3. Methods to detect Carbohydrates and Mucus Substances.
   - Chemical principles and application examples.
4. Methods to detect connective tissue elements: collagen, elastin and reticulin.
   - Chemical principles and application examples.
5. Methods to detect microorganisms in tissues.
   - Chemical principles and application examples.
6. pigments detection methods in tissues
   - Chemical principles and application examples.
7. lipids detection methods.
   - Chemical principles and application examples.
8. Nucleic acid detection methods.
   - Chemical principles and application examples.
9. methodos to detect elements from nervous sistem.
   - Enzymatic histochemistry techniques.

Recommended reading

1. Bancroft, J. ; Gamble, M. (2002). Theory and Practice of Histological Techniques, 5th edition. London: Churchill Livingstone
2. Cook D. J. (2006) Cellular Pathology: An Introduction to Techniques and Applications, 2nd ed. UK: Scion Publishing, 2006. ISBN 1-904842-30-
3. Kiernan J. A. (2003) Histological & Histochemical Methods – Theory & Practice, 4rd ed. London: Arnold ISBN 978-1-9048424-2-2

Teaching and learning methods

In the theoretical classes will be used expositive, interrogative and active methodologies, focusing on the presentation, discussion and argumentation of scientific texts. In practical lessons will be given to the demonstration method and small group laboratory problem solving strategies. It will be conducted the follow-up of the student with provision of feed-back.

Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final)
   - Final Written Exam - 50% (Theoretical examination for approval minimum mark 8 values)
   - Final Written Exam - 30% (Written exam of the practical component. For approval minimum mark 8 values)
   - Reports and Guides - 20% (Two individual reports)
2. Worker - (Student Worker) (Final, Supplementary)
   - Final Written Exam - 100% (Written exam of the Theoretical and pratical componente.)
3. Examination - (Regular, Student Worker) (Supplementary, Special)
   - Final Written Exam - 100% (Written exam of the Theoretical and pratical componente.)

Language of instruction

English

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Electronic validation

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22-11-2022	25-11-2022	28-02-2023	04-03-2023

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