INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Pharmacology of natural products			Field of study	Pharmaceutical Sciences		
Master in	Natural Products and Bioprospecting			School	School of Agriculture		
Academic Year	2023/2024	Year of study	1	Level	2-1	ECTS credits	6.0
Type	Semestral	Semester	1	Code	5012-740-1102-00-23		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			30	30	-	-	-	-	4	-

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): Eugenia Conceicao Morais dos Santos Baptista

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Knowing the basic concepts of pharmacology
2. Understanding pharmacokinetics and Pharmacodynamics mechanisms; Identify factors that influence the body's response to certain natural drug compounds.
3. Consult and select sources of information concerning drugs and natural products and identify the groups of natural compounds with pharmacological effects
4. Understand the mechanisms of pharmacological action of different groups of compounds with an interest in pharmacology
5. Apply the concepts of interaction, toxicity and safety
6. Understand concepts of pharmacogenomics and pharmacogenetics and other “omics” and know the main genes responsible for the variation observed in the response to drug metabolism.
7. Understand the importance of gene variants and their impact on the pharmacokinetics and pharmacodynamics of natural products.
8. Identify laboratory techniques and protocols applied in Pharmacogenomics in individualized therapy and clinical trials.

Prerequisites

Before the course unit the learner is expected to be able to:
Understand notions and mechanisms of anatomohistofisiology and biochemistry.

Course contents

1. Basic Pharmacology; 2. Pharmacology of Natural Products; 3- Pharmacogenetics and Pharmacogenomics.

Course contents (extended version)

1. Concepts of Pharmacology
   - Pharmacokinetics. Cycle of drugs in the body. Absorption. Distribution. Metabolization. Elimination
   - Pharmacodynamics. Notion of receptor and drug / receptor interaction. Agonists and antagonists
2. Drug-food-natural product compounds interactions.
3. Toxicity and safety
4. Models used for drugs obtained from natural products
5. Mechanisms, pharmacological actions and effects of groups of natural products compounds
   - Compounds with antimicrobial action
   - Compounds acting on the Central Nervous System
   - Compounds acting on the peripheral nervous system
   - Compounds with action on the Respiratory System
   - Compounds with action on the Digestive System
   - Compounds with action on the Cardiovascular System
   - Compounds with action in the Blood
   - Compounds with action on the endocrine system
   - Compounds with action on the musculoskeletal system
   - Compounds with action on the Skin
6. Pharmacogenomics and Pharmacogenetics: concepts
7. Genetic basis of drug response (enzymes, transport proteins and receptors)
8. Genetic polymorphisms that lead to interindividual variability in drug response
   - SNPs and other variants: available genotyping methods.
9. Pharmacogenetics/pharmacogenomics of natural products: towards personalized medicine
10. Pharmacogenomics in the development of new therapeutic agents
11. Laboratory techniques and protocols of genetics and genomics

Recommended reading

1. Goodman e Guilman, Alfred. “As bases farmacológicas da terapêutica”. 11ª Edição 2007. Mac GrawHill, Brasil.
2. Cunha, A. P. . Plantas e produtos vegetais em fitoterapia. (2009), Fundação Calouste Gulbenkian
3. https: //www. futuremedicine. com/journal/pgs ; https: //www. mdpi. com/journal/genes ; https: //www. mdpi. com/journal/jpm; https: //www. futuremedicine. com/loi/pme
4. Guimarães, S, Moura, D., Silva, P.S. (2014) Terapêutica medicamentosa e suas bases farmacológicas (6ª ed). Porto: Porto Editora
5. Cunha, A. P., Portugal, M. P., Silva, A. P., Cunha, H. P., Costa, M. C., Roque, O. R. (2017) Manual de plantas medicinais: Bases Farmacológicas e Clínicas, Dinalivro

Teaching and learning methods

Active methodologies with clinical and practical situations. Analysis and presentation of scientific articles related to UC content.

Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final, Supplementary, Special)
   - Intermediate Written Test - 65%
   - Work Discussion - 35%
2. Final exam - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100% (The grade is obtained through a final exam)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

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12-06-2024	25-06-2024	26-06-2024	26-06-2024