

Course Unit	Evaluation of biological activity		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
Type	Semestral	Semester	2	ECTS credits	4.5
Workload (hours)			121,5	Contact hours	
			T	-	TP
			PL	-	TC
			S	-	E
			OT	-	O
			42		

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, Marcio Soares Carochio

### Learning outcomes and competences

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

1. Recognize the importance of bioactivity of natural products
2. To know the basic mechanisms of antioxidant activity, anticancer, anti-inflammatory, antimicrobial, antimalarial, analgesic activity
3. Relate biological activity to bioactive compounds
4. Distinguish in vivo, in vitro and ex vivo bioassay evaluation procedures
5. Apply in vitro screening techniques for evaluating the biological activity of natural products
6. Analyze and discuss experimental results

### Prerequisites

Not applicable

### Course contents

From the screening of biological activity of natural products to the drug Molecular modeling and prediction of bioactivity Bioactivity of matrices and natural products In vivo, in vitro and ex vivo bioactivity evaluation procedures

### Course contents (extended version)

1. From the screening of biological activity of natural products to the drug
2. Molecular modeling and prediction of bioactivity
3. Bioactivity of matrices and natural products
  - Antioxidant, anticancer, anti-inflammatory activities
  - Antimicrobial, antimalarial, analgesic and antihypertensive activities
  - Basic mechanisms and related bioactive compounds
4. In vivo, in vitro and ex vivo bioactivity evaluation procedures
  - In vitro screening techniques for assessing biological activity
  - Cell culture
  - In vivo and ex vivo assays involving animal experimentation
5. In the laboratory component: screening of biological activity in several matrices, namely:
  - antioxidant, antimicrobial and antitumor activities,
  - establishing a correlation between those activities and the chemical composition of the extracts.

### Recommended reading

1. Rahman A. , Choudhary M. I. , Thompson W. Bioassay Techniques for Drug Development. 2001. Harwood Academic Publishers.
2. William A. Pryor. Bio-Assays for Oxidative Stress Status. 2001. Elsevier
3. Vogel, Hans G. Drug Discovery and Evaluation: Pharmacological Assays. 2008. 3ª Ed. Springer Willow
4. J. H. Liu. Traditional Herbal Medicine Research Methods: Identification, Analysis, Bioassay, and Pharmaceutical and Clinical Studies. 2011

### Teaching and learning methods

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

### Assessment methods

- Unique Alternative - (Regular, Student Worker) (Final, Supplementary, Special)
- Portfolio - 60% (Portfolio of biological activities from a matrix of choice. Communication written on poster.)
- Presentations - 30% (Pitch model presentation)
- Presentations - 10% (Self-evaluation)

### Language of instruction

Portuguese, with additional English support for foreign students.

### Electronic validation

Josiana Adelaide Vaz	Ana Maria Geraudes Rodrigues Pereira	Juliana Almeida de Souza	Adília Maria Pires da Silva Fernandes
01-06-2023	01-06-2023	28-06-2023	28-06-2023