

## Histology and Histopathology of Aquatic Animals (C003881)

<b>Course size</b>	<i>(nominal values; actual values may depend on programme)</i>		
<b>Credits 4.0</b>	<b>Study time 100 h</b>	<b>Contact hrs</b>	36.0h
<b>Course offerings in academic year 2022-2023</b>			
A (semester 2)	English	Gent	
<b>Lecturers in academic year 2022-2023</b>			
Soto, Manu	LEIOA01	lecturer-in-charge	
Feist, Stephen	LEIOA01	co-lecturer	
Izagirre, Urtzi	LEIOA01	co-lecturer	
Marigomez, Ionan	LEIOA01	co-lecturer	
Villalba, Anonio	LEIOA01	co-lecturer	
Zaldibar, Beñat	LEIOA01	co-lecturer	
<b>Offered in the following programmes in 2022-2023</b>			<b>crdts</b>
<a href="#">International Master of Science in Marine Biological Resources</a>			4
			<b>offering</b>
			A

### Teaching languages

English

### Keywords

molluscs, crustaceans, fish, disease, pathogens, tumors, pollution, health assessment

### Position of the course

Topics covered will include the description of the normal and pathological; histology of marine invertebrates and fish, with special emphasis on the effects of chemical pollutants and other sources of environmental stress.

Aims at describing the normal and pathological histology of marine animal species: mainly fishes, molluscs and crustaceans; identifying histopathological alterations of viral, bacterial, parasitic and toxic (due to pollutant exposure) ethiology; and characterising the cellular and molecular mechanisms involved in pathological damage and organismal defence.

At the end of the Unit, the student should be able to conduct histological processing of marine animal tissues, identify normal tissues and cell types at the light microscope in marine molluscs and fish; identify major parasites and histopathological lesions in marine molluscs and fish; and search in the web and literature the relevant information concerning molluscs and fish disease, with emphasis in environmentally relevant syndromes.

### Contents

- 1 Lectures: Comparative histology of marine invertebrates. Normal histology of molluscs. Normal histology of fishes. Basic principles in biopathology, histopathology and parasitology. Molluscs: general histopathology, toxicopathology, neoplastic lesions, natural variability and temporal trends in histopathological lesions. Fish: general histopathology, mechanisms of chemical carcinogenesis, carcinogenic lesions. Histopathology in ecosystem health assessment: quantitative histopathology, quality assurance, monitoring programmess.
- 2 Practicals: Histotechnology preparation of samples. Microscopical examination of molluscan tissues. Microscopical examination of fish tissues. Histopathological examination of marine molluscs. Histopathological examination in fishes.

Navigating through the web in search of data bases and images of aquatic animal histopathology.

3 Workshop on toxicological pathology (mini-symposium).

### **Initial competences**

Basis of bioscience or animal science and environmental sciences.

### **Final competences**

- 1 Be familiar with the form and function of organs and tissues in aquatic animals (comparative histology).
- 2 Understand the normal histological organisation of target tissues in molluscs (integument, kidney, blood, digestive gland).
- 3 Understand the normal histological organisation of target tissues in marine fishes (integument, kidney, spleen, blood, liver).
- 4 Recognise major parasites and pathological lesions in molluscs and fish.
- 5 Know the value of histopathology in ecosystem health monitoring and marine pollution assessment.

### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

### **Teaching methods**

Seminar, Lecture, Seminar: practical pc room classes

### **Extra information on the teaching methods**

Lectures 20

Practicals 18

Computer class 2

### **Learning materials and price**

### **References**

- Pathobiology of marine and estuarine organisms. Couch, JA; Fournie, JW. CRC Press, Boca Raton, Florida, USA, 1993.
- Fish and shellfish pathology. Ellis, AE. Academic Press. London, UK, 1985.
- Systemic fish pathology. Ferguson, HW. Iowa State Univ. Press, 1989.
- Fish diseases and disorders. Vol 2. Non-infectious disorders. Leatherland, JF; Woo PTK. CABI Publ., Oxon, UK, 1995.
- Fish as sentinels of environmental health. Murchelano, RA. NOAA, US Dept, Commerce, Woods Hole MA, USA, 1988.
- Histopathology atlas of the registry of marine pathology. Murchelano, RA; MacLean, SA. NOAA, US Dept. Commerce, Osford MD, USA, 1990.
- Fish Pathology. Roberts, R.J. WB Saunders, London, 2001.
- Fish disease and marine pollution. Vethaak, AD. National Institute for Coastal and Marine Management/RIZK, Amsterdam, 1993.
- Fish diseases and disorders. Vol 1. Protozoan and metazoan infections. Woo, PTK. CABI Publ., Oxon, UK, 1995.

### **Course content-related study coaching**

#### **Assessment moments**

end-of-term assessment

#### **Examination methods in case of periodic assessment during the first examination period**

Skills test, Report

#### **Examination methods in case of periodic assessment during the second examination period**

Skills test, Report

#### **Examination methods in case of permanent assessment**

#### **Possibilities of retake in case of permanent assessment**

not applicable

#### **Calculation of the examination mark**

- practical assessment (30%)
- report (70%)