

Bioactive Molecules from Marine Animal Biomasses (C004323)

Due to Covid 19, the education and assessment methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0

Study time 75 h

Contact hrs

32.0h

Course offerings in academic year 2021-2022

A (semester 1)

English

Gent

Lecturers in academic year 2021-2022

Guerard, Fabienne

BREST02 lecturer-in-charge

Delannoy, Charles

BREST02 co-lecturer

Kraffe, Edouard

co-lecturer

Offered in the following programmes in 2021-2022

[International Master of Science in Marine Biological Resources](#)

crdts

offering

3

A

Teaching languages

English

Keywords

Position of the course

Contents

The objective is to make the student ready to develop and propose a comprehensive approach for enhancing the value of fisheries and aquaculture products from animal origin (including by-products) for the development of new added-value molecules and ingredients, intended for food, feed, aquaculture, cosmetics, ... Marine biotechnologies are targeting niche markets by offering products with low volumes and high added-values, and also mass markets like bio-sourced polymers.

Introduction: Global overview of how enhancing the value of fisheries and aquaculture products from animal origin: definitions, resources, markets, notion of value chain, current trends, and examples of innovation in Norway.

Chapter 1: Concentrates and isolates of proteins: conventional methods, Ph-shift, pulps.

Chapter 2: Gelatines et collagens: general properties, specificities of marine collagens, impact of process on techno functional properties. Niche and mass applications of gelatines. Innovative uses in nutraceuticals, nutri-cosmetics et biomaterials (tissue engineering, ...)

Chapter 3: Enzymes in industrial processes: 3.1. Fish protein hydrolysates (FPH) with functional properties: pH-stat method, characterisation of peptidic populations, choice of enzymes for FPH. 3.2 Use of enzymes for the controlled deconstruction of complex matrices: application to microalgae.

Chapter 4: Peptides exhibiting biological activities: definitions, examples in food, feed, nutraceutical, cosmetics,

Chapter 5: Biopolymers (chitin and chitosan, chondroitin sulphate, hyaluronic acid: general characteristics, extraction process, properties et example of uses.

Chapter 6: Marine lipids: structures and functions: PUFA and phospholipids

Initial competences

Bases of biology, biochemistry, enzyme engineering, microbial engineering.
Possibly, bases of marine biology and ecology.

Final competences

- 1 Worldwide and comprehensive vision of blue biotechnologies.
- 2 Ability to identify emerging markets and their potential.
- 3 Ability to transpose data and concepts from the scientific literature to R & D approaches integrating scaling-up.
- 4 Capacity to explain biological activities and functionality of molecules to non-specialists while having a dialogue with experts.
- 5 Ability to inject new ideas, and to create innovative products.
- 6 Ability to understand what is hindering and driving the field, and to choose the most appropriate strategy for achieving the final objective.

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

Extra information on the teaching methods

- The course will be held in form of lectures, case studies, analysis of scientific papers. The courses will be complemented by tutorials, during which the class will be broken down into smaller groups under the guidance of the teaching professor.
- Review essays will be used to develop critical assessment of the primary literature.
- All courses will be available on-line.
- Company visits will be organized (2-3 per year)

Learning materials and price

References

Handbook of Marine Biotechnology 2015 SPRINGER
 Marine Biotechnology : Enabling Solutions for Ocean Productivity and Sustainability (2013) OECD
 An Introduction to Biomaterials, Second Edition (2011) Jeffrey O. Hollinger, CRC Press
 Added Value to Fisheries Waste (2008) J.-P. Bergé Ed., © Transworld Research Network, Kerala, India.
 Maximising the Value of Marine By-Products (2007) F. Shahidi Ed In: F. Shahidi (Ed.). Woodhead (GB),
 Improving seafood products for the consumer (2008). T. Børresen (Ed.) Woodhead (GB)
 Seafood research from fish to dish. Quality, safety and processing of wild and farmed fish (2006) Luten J., Jacobsen C., Bekaert K., Saebo A., Oehlenschläger J. (Eds.). Editions Wageningen Academic Publishers (Netherlands),
 Marine Biotechnology I & II (2005), Le Gal & Ulber (Eds.) SPRINGER
 Chitine et chitosane: du biopolymère à l'application (2009), Crini, Badot & Guibal, Presses Univ. Franche-Comté,
 Biofutur N° 301 : Biotechnologies marines (Juillet-Août 2009), Tec & Doc
 Substances naturelles d'origine marine : Chimiodiversité, pharmacodiversité, biotechnologies (2005) Kornprobst JM Tec & Doc

Course content-related study coaching

Assessment moments

end-of-term and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent assessment

Oral examination, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

- A 2 hours examination (50%) in which two questions are to be answered.
- One review essay (30%) (3000 words).
- Each student will deliver a 20 min oral presentation on his/her review essay (20%).

Calculation of the examination mark

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- One review essay (30%) (3000 words).
- Each student will deliver a 20 min oral presentation on his/her review essay (20%).