

## Aquatic Microbial Community Management (I002086)

**Cursusomvang** *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

**Studiepunten 3.0** **Studietijd 75 u**

**Aanbodsessies en werkvormen in academiejaar 2024-2025**

A (semester 1) Engels Gent hoorcollege

**Lesgevers in academiejaar 2024-2025**

Defoirdt, Tom LA25 Verantwoordelijk lesgever

**Aangeboden in onderstaande opleidingen in 2024-2025**

	stptn	aanbodsessie
<a href="#">International Master of Science in Health Management in Aquaculture</a>	3	A
<a href="#">International Master of Science in Marine Biological Resources</a>	3	A
<a href="#">Master of Science in Aquaculture</a>	3	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: landbouwkunde (niveau master-na-bachelor)</a>	3	A

**Onderwijstalen**

Engels

**Trefwoorden**

Micro-organisms, communities, microbiota, microbiome, functionality, ecological selection, bio-floc technology.

**Situering**

The purpose of this course is to familiarize the students with the importance of the micro-organisms that are present in (the different compartments of) aquaculture systems, and how these can be managed. The students will learn that by the targeted manipulation of the microbiota in aquaculture systems, the disease risk for the cultured animals can considerably be decreased and production output can be increased.

**Inhoud**

### Chapter 1 Microorganisms in aquaculture systems

- 1.1 Microorganisms and microbial communities
- 1.2 Methods to study microorganisms
- 1.3 Sources of microorganisms in aquaculture systems
- 1.4 Growth of microorganisms
- 1.5 Densities of microorganisms in aquaculture systems
- 1.6 Functions of microorganisms in aquaculture systems

### Chapter 2 Removing bacteria

- 2.1 Physical inactivation
- 2.2 Disinfection
- 2.3 Antibiotics
- 2.4 Phage therapy
- 2.5 Managing the entrance of microorganisms

### Chapter 3 Adding bacteria: probiotics

- 3.1 Probiotics in aquaculture
- 3.2 Modes of action
- 3.3 Selection of probiotics
- 3.4 Registration, production, delivery
- 3.5 The black box of probiotics

### 3.6 Probiotics

## Chapter 4 Analysis and steering of the microbial community

- 4.1 Aquaculture microbiomes
- 4.2 Analysis of diversity
- 4.3 Management based on diversity
- 4.4 r/K selection
- 4.5 Management based on r/K selection

## Chapter 5 Bacterial activity management

- 5.1 Virulence factors
- 5.2 Inhibition of virulence factor production
- 5.3 Regulation of virulence factors
- 5.4 Quorum sensing (QS)
- 5.5 Quorum sensing interference (QSI)
- 5.6 Advantages of antivirulence therapy

## Chapter 6 Biofloc technology

- 6.1 Waste generation in aquaculture
- 6.2 Removal of nitrogen waste
- 6.3 Manipulation of the C/N ratio
- 6.4 Aeration
- 6.5 Bioflocs as feed
- 6.6 Microbial ecology of bioflocs

### Begincompetenties

General biology, chemistry, biochemistry and basic knowledge on aquaculture.

### Eindcompetenties

- 1 The student is aware of the significance of the natural microbiota in aquaculture systems.
- 2 The student is able to describe and discuss the microbial compartments in aquaculture systems.
- 3 The student knows the methods that are available to study microorganisms and microbial communities.
- 4 The student is able to make funded suggestions and recommendations to improve the microbial community composition and functionality with the aim of maximizing animal health and culture performance.
- 5 The student knows the methods that can be used to manipulate the microbial community, and can approach this in both in a qualitative and quantitative way.

### Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

### Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

### Didactische werkvormen

Hoorcollege

### Toelichtingen bij de didactische werkvormen

Theory lectures and calculation exercises: lectures based on powerpoint presentations.

### Studiemateriaal

Type: Slides

- Naam: Aquatic Microbial Community Management: lecture notes
- Richtprijs: € 10
- Optioneel: ja
- Taal : Engels
- Beschikbaar op Ufora : Ja
- Online beschikbaar : Nee
- Beschikbaar in de bibliotheek : Nee
- Beschikbaar via studentenvereniging : Nee

## **Referenties**

### **Vakinhoudelijke studiebegeleiding**

Study guidance upon request by email or on appointment.

### **Evaluatiemomenten**

periodegebonden evaluatie

### **Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode**

Schriftelijke evaluatie

### **Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode**

Schriftelijke evaluatie

### **Evaluatievormen bij niet-periodegebonden evaluatie**

### **Tweede examenkans in geval van niet-periodegebonden evaluatie**

Examen in de tweede examenperiode is mogelijk

### **Toelichtingen bij de evaluatievormen**

Period aligned evaluation.

Theory: written closed book exam.

Calculations: written open book exam.

### **Eindscoreberekening**

Out of 20: 13 points attributed to closed book theory exam and 7 points attributed to open book calculations exam

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.