

**At Louvain-la-Neuve - 60 credits - 1 year - Day schedule - In English**Dissertation/Graduation Project : **YES** - Internship : **NO**Activities in English: **NO** - Activities in other languages : **NO**Activities on other sites : **NO**Main study domain : **Sciences**Organized by: **Faculty of Science (SC)**Programme acronym: **BIOL2M1** - Francophone Certification Framework: 7**Table of contents**

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## BIOL2M1 - Introduction

### Introduction

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#### Introduction

This master's degree aims to train "generalist" biologists capable of understanding the scientific foundations of the functioning of living organisms.

#### Your future job

Biologists apply their knowledge and know-how, which are very versatile, in very different sectors: in scientific, fundamental or applied research in research institutes or private laboratories, in expertise and resource management in the private or public sector, in education, training and communication.

#### Your programme

The knowledge to be acquired is at two levels of complexity of living organisms: "biochemistry, molecular and cellular biology" on the one hand, and "biology of organisms and ecology" on the other hand, identified by two options. The programme consists mainly of activities borrowed from the first year of the Masters (120 credits) of the same name.

## BIOL2M1 - Teaching profile

### Learning outcomes

The Master in Biology (60 credits) is designed to train "generalist" biologists who can grasp the scientific foundations of how living organisms work. The knowledge they will acquire involves two different levels in the complexity of living organisms which also relate to two option courses: first, biochemistry, molecular and cellular biology, then biology of organisms and ecology. The programme is mostly made up of activities borrowed from the first year of the Master (120 credits) of the same name.

On successful completion of this programme, each student is able to :

1. Mettre en œuvre une approche intégrative des processus fondamentaux régissant le vivant depuis la structure des cellules vivantes et de leurs composants moléculaires jusqu'à leur fonctionnement au sein d'un individu ou au fonctionnement et à l'évolution des populations et des écosystèmes, en fonction de l'option choisie.

1.1 témoigner d'une maîtrise des savoirs dans les domaines développés dans l'option choisie, à savoir

- en biochimie, biologie moléculaire et cellulaire,
- ou en biologie des organismes et écologie.

1.2 décrire, expliquer, synthétiser et discuter

1.2.1 la structure et le fonctionnement des cellules vivantes et de leurs composants moléculaires ou

1.2.2 la diversité et l'évolution biologique, l'écologie des populations, des communautés et écosystèmes, l'autécologie, l'écophysiologie et l'écotoxicologie.

2. Répondre, de manière innovante, à une question inédite de biologie en utilisant des sources d'information appropriées

2.1 intégrer et articuler des concepts théoriques pour comprendre des problématiques variées.

2.2 utiliser et appliquer ces concepts afin d'analyser la valeur scientifique des sources pour donner un avis critique et raisonné.

3. Mettre en œuvre de manière autonome une démarche scientifique pour répondre à une question inédite dans un domaine, et/ou à l'interface de plusieurs domaines de la biologie

3.1 formuler une question scientifique, émettre des hypothèses, programmer et réaliser les expérimentations appropriées, analyser et interpréter les résultats, afin d'objectiver et de conclure,

3.2 mobiliser un savoir-faire technique afin de réaliser des expérimentations avec toute la rigueur scientifique.

4. Communiquer des connaissances scientifiques de base ou spécialisées en français et en anglais

4.1 maîtriser et utiliser les techniques de présentation formelle (poster, diaporama...),

4.2 structurer, rédiger et exposer des idées et concepts scientifiques à des spécialistes comme à des non-spécialistes,

4.3 argumenter et justifier des hypothèses et des données afin de les défendre devant un public de professionnels scientifiques.

5. S'instruire et agir de manière autonome dans une perspective collaborative

5.1. participer activement à une réunion d'équipe en partageant ses idées, ses expériences et ses connaissances,

5.2. écouter les autres, échanger et arriver à un consensus,

5.3. réaliser, en équipe, des recherches ou d'autres types de projets, en répartissant les tâches et les responsabilités,

5.4. préparer une présentation écrite ou orale en collaboration, en combinant les informations apportées par les membres de l'équipe.

6. Agir en scientifique conscient de lui-même et du monde et en universitaire responsable

6.1 mettre en perspective de manière critique l'impact des sciences et des techniques sur l'évolution des sociétés,

6.2 évaluer les enjeux éthiques et sociétaux des nouvelles technologies et des pratiques expérimentales en biologie,

6.3 reconnaître la fraude scientifique et le plagiat comme des comportements inacceptables en sciences.

### Programme structure

The program consists in 20 credits of core courses, an option of 22 or 24 credits and selected courses to complete the program.

## BIOL2M1 Programme

## Detailed programme by subject

### CORE COURSES [20.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2022-2023
- ⊖ Not offered in 2022-2023 but offered the following year
- ⊕ Offered in 2022-2023 but not the following year
- △ ⊕ Not offered in 2022-2023 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

#### ○ Travail de fin d'études (18 credits)

○ LBIOL2990	Mémoire		[FR] [ ] [ ] [18 Credits] 🌐
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#### ○ Philosophie, éthique (2 credits)

2 crédits à choisir parmi

⊗ LSC2001	Introduction to contemporary philosophy	Charles Pence Peter Verdée	[FR] [q2] [30h] [2 Credits] 🌐
⊗ LSC2220	Philosophy of science	Alexandre Guay	[EN] [q2] [30h] [2 Credits] 🌐
⊗ LFILO2003E	Ethics in the Sciences and technics (sem)	Hervé Jeanmart Charles Pence	[FR] [q2] [15h+15h] [2 Credits] 🌐
⊗ LTHEO2840	Science and Christian faith	Benoît Bourguine Dominique Lambert	[FR] [q1] [15h] [2 Credits] 🌐
⊗ ESSPS2101	Science, ethics and development		[FR] [q1] [18h+6h] [3 Credits] 🌐

#### ⊗ Optional courses

These credits are not counted within the 60 required credits.

⊗ LSST1001	IngénieuxSud	Stéphanie Merle Jean-Pierre Raskin (coord.)	[FR] [q1+q2] [15h+45h] [5 Credits] 🌐
⊗ LSST1002M	Information and critical thinking - MOOC	Myriam De Kesel Jean-François Rees	[FR] [q2] [30h+15h] [3 Credits] 🌐

## OPTIONS

The option in Biochemistry, Molecular and Cellular Biology is fully taught in English.

The option in biology of organisms and ecology is mainly taught in French.

The student chooses an option and completes his or her program with a elective subjects.

- > [Option in Biochemistry, Molecular and Cellular Biology](#) [ en-prog-2022-biol2m1-lbiol210o ]
- > [Option in biology of organisms and ecology](#) [ en-prog-2022-biol2m1-lbiol211o ]
- > [Cours au choix](#) [ en-prog-2022-biol2m1-lbiol212o ]

## OPTION IN BIOCHEMISTRY, MOLECULAR AND CELLULAR BIOLOGY [24.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2022-2023
- ⊖ Not offered in 2022-2023 but offered the following year
- ⊕ Offered in 2022-2023 but not the following year
- △ ⊕ Not offered in 2022-2023 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

### Content:

#### ○ Cours obligatoires (11 credits)

○ LBBMC2101	<a href="#">Structural and functional biochemistry</a>	Benoît Desguin (compensates Patrice Soumilion) Pierre Morsomme	EN [q1] [36h+6h] [4 Credits] 🌐
○ LBBMC2102	<a href="#">Integrated molecular and cellular biology</a>	Henri Batoko Frédéric Clotman (compensates Bernard Hallet) Pierre Morsomme Melissa Page	EN [q1] [30h] [3 Credits] 🌐
○ LBRMC2201	<a href="#">Bioinformatics : DNA and protein sequences</a>	Michel Ghislain	FR [q1] [30h+15h] [4 Credits] 🌐

#### ○ Techniques de biochimie et de biologie moléculaire

L'étudiant-e choisit une UE parmi :

Minimum 3 crédit(s)

⊗ LBIRC2101	<a href="#">Biochemical analysis</a>	François Chaumont Pierre Morsomme (coord.)	FR [q1] [22.5h+30h] [4 Credits] 🌐 > English-friendly
⊗ LBRMC2101	<a href="#">Genetic engineering</a>	François Chaumont (coord.) Charles Hachez	FR [q1] [37.5h+15h] [5 Credits] 🌐 > English-friendly
⊗ LBRMC2202	<a href="#">Cell culture technology</a>	David Alsteens Charles Hachez (coord.) Pascal Hols	EN [q1] [30h] [3 Credits] 🌐 > French-friendly

#### ○ UE au choix (10 credits)

L'étudiant-e choisit 2 UE parmi :

⊗ LBBMC2104	<a href="#">Animal physiological biochemistry</a>	Pierre Morsomme Melissa Page	EN [q2] [36h+18h] [5 Credits] 🌐
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⌘ LBBMC2105	Protein engineering and directed evolution	François Chaumont (compensates) Patrice Soumillion Corentin Claeys Bouuaert (compensates) Patrice Soumillion Charles Hachez (compensates) Patrice Soumillion Pierre Morsomme	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2106	Molecular genetics and microbial genomics	Michaël Deghelt (compensates) Bernard Hallet Bernard Hallet Pascal Hols Laurie Thouvenel (compensates) Bernard Hallet	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2107	Microbial cellular physiology	Stephan Declerck Benoît Desguin (compensates) René Rezsöházy Michel Ghislain Pascal Hols Géraldine Laloux (compensates) Bernard Hallet Pierre Morsomme	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2108	Molecular genetics and plant genomics	Henri Batoko François Chaumont Xavier Draye	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2109	Plant cell physiology	Henri Batoko François Chaumont Charles Hachez	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2110	Animal and human molecular genetics and genomics	Françoise Gofflot Nisha Limaye (compensates) Bernard Knoops René Rezsöházy	EN [q2] [36h+18h] [5 Credits] 🌐
⌘ LBBMC2111	Animal and human cellular physiology	Patrick Dumont Bernard Knoops	EN [q2] [36h+18h] [5 Credits] 🌐

**OPTION IN BIOLOGY OF ORGANISMS AND ECOLOGY [22.0]**

- Mandatory
- ⊗ Optional
- △ Not offered in 2022-2023
- ⊖ Not offered in 2022-2023 but offered the following year
- ⊕ Offered in 2022-2023 but not the following year
- △ ⊕ Not offered in 2022-2023 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- (FR) Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

**o Content:****o Cours obligatoires (14 credits)**

○ ESBOE2108	Field training in aquatic ecology (UNamur)		FR [q2] [0h+45h] [2 Credits] 🌐
○ LBOE2109	Field training in terrestrial ecology	Thierry Hance Renate Wesselingh	FR [q2] [0h+45h] [2 Credits] 🌐
○ LBOE2111	Evolution	Caroline Nieberding Karine Van Doninck	EN [q1] [24h] [5 Credits] 🌐
○ LBOE2112	Data analysis and modeling of biological systems	Frederik De Laender Johan Segers	EN [q1] [24h+36h] [5 Credits] 🌐

**o Modules au choix (8 credits)**

L'étudiant-e choisit 1 module parmi :

**⊗ Ecotoxicology**

○ ESBOE2163	Ecotoxicology (UNamur)		EN [q1] [24h+24h] [4 Credits] 🌐
○ ESBOE2162	Ecotoxicology of populations, communities and ecosystems		EN [q1] [12h+12h] [2 Credits] 🌐
○ ESBOE2238	Applied ecotoxicology (UNamur)		EN [q1] [24h] [2 Credits] 🌐

**⊗ Molecular ecology**

○ LBOE2124	Molecular ecology	Alice Dennis Renate Wesselingh	EN [q2] [36h+56h] [8 Credits] 🌐 ⊖
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**⊗ Functional genomics**

○ LBOE2165	Evolutionary genomics and transcriptomics	Alice Dennis Melissa Page	EN [q2] [30h+18h] [4 Credits] ⊕ 🌐
○ ESBOE2169	Ecological proteomics and epigenetics		EN [q2] [30h+18h] [4 Credits] ⊕ 🌐

**⊗ Biologie de la conservation et de la restauration**

○ LBOE2120	Conservation de la biodiversité	Nicolas Schtickzelle	FR [q1] [36h+12h] [4 Credits] 🌐
○ LBOE2125	Biodiversity and humans	Charles-Hubert Born Thierry Hance Charles Pence	FR [q1] [24h] [2 Credits] 🌐
○ LBOE2141	Ecologie de la restauration	Aurélien Kaiser (compensates Hans Van Dyck)	FR [q1] [12h+12h] [2 Credits] 🌐

**⊗ Ecologie spatiale**

○ LGEO1342A	Systèmes d'information géographique (SIG) : partim	Sophie Vanwambeke	FR [q1] [24h+24h] [4 Credits] 🌐
○ LBOE2140	Landscape ecology	Hans Van Dyck	EN [q1] [24h+24h] [4 Credits] 🌐

**⊗ Ecologie des interactions**

○ LBOE2160	Ecologie des interactions	Thierry Hance Hans Van Dyck Renate Wesselingh	FR [q1] [24h] [2 Credits] 🌐
○ LBOE2161	Ecologie comportementale	Hans Van Dyck	FR [q1] [24h+12h] [3 Credits] 🌐
○ LBOE2168	Interactions plantes-environnement	Stanley Lutts Muriel Quinet	FR [q1] [24h+12h] [3 Credits] 🌐

### ⌘ Ecologie et gestion des milieux aquatiques et dulcicoles

○ ESBOE2123	Freshwater Biodiversity (UNamur)		FR [q1] [12h+24h] [3 Credits] 🌐
○ ESBOE2142	Ecology of natural and disturbed aquatic environments (UNamur)		FR [q1] [12h+20h] [2 Credits] 🌐
○ ESBOE2144	Resource management in fisheries and aquaculture		FR [q1] [18h+12h] [3 Credits] 🌐

### ⌘ Ecologie appliquée

○ LBIRF2104A	Ecologie et santé des forêts - Phytosociologie	Claude Bragard Anne Legrève Quentin Ponette Caroline Vincke	FR [q2] [15h] [3 Credits] 🌐 > English-friendly
○ LBOE2166	Lutte biologique	Claude Bragard Thierry Hance	FR [q2] [12h+24h] [3 Credits] 🌐
○ LBOE2185	Evolutionary applications	Hans Van Dyck	EN [q2] [20h] [2 Credits] 🌐



## COURS AU CHOIX

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- Mandatory
- ⊗ Optional
- △ Not offered in 2022-2023
- ⊙ Not offered in 2022-2023 but offered the following year
- ⊕ Offered in 2022-2023 but not the following year
- △ ⊕ Not offered in 2022-2023 or the following year
- Activity with requisites
- ⊕ Open to incoming exchange students
- ⊗ Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

### o Content:

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#### ⊗ Autres cours au choix

L'étudiant-e peut compléter son programme avec des UE choisies dans la liste des cours du master 120 BOE et du master 120 BBMC à l'exception des cours des finalités didactiques, de LBOE2197, LBOE2297, LBOE2240, LBOE2241, LBOE2260, LBOE2261, LBOE2292, LBBMC2103, LBBMC2203, LBBMC2205, LBBMC2215, LBBMC2206, LBBMC2997, LBBMC2998 et LBBMC2201

#### ⊗ Activités de mise à niveau

l'étudiant-e peut choisir, en accord avec le conseiller aux études, jusqu'à 6 crédits d'activités de mise à niveau parmi les cours du bachelier et de l'approfondissement en biologie.

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## Supplementary classes

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**To access this Master, students must have a good command of certain subjects. If this is not the case, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.**

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- △ ⊕ Not offered in 2022-2023 or the following year
- Activity with requisites
- ⊕ Open to incoming exchange students
- ⊗ Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

Click on the course title to see detailed informations (objectives, methods, evaluation...)

### o Enseignements supplémentaires

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## The programme's courses and learning outcomes

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For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

## BIOL2M1 - Information

### Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

General and specific admission requirements for this programme must be satisfied at the time of enrolling at the university.

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

**In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.**

#### SUMMARY

- > [General access requirements](#)
- > [Specific access requirements](#)
- > [University Bachelors](#)
- > [Non university Bachelors](#)
- > [Holders of a 2nd cycle University degree](#)
- > [Holders of a non-University 2nd cycle degree](#)
- > [Access based on validation of professional experience](#)
- > [Access based on application](#)
- > [Admission and Enrolment Procedures for general registration](#)

### Specific access requirements

In addition to the access conditions described below, candidates will have to provide proof of a sufficient command of the French language (level B1 of the CEFR, Common European Framework of Reference for Languages).

Students who wish to be admitted on the basis of a dossier (see tables below) are invited to consult the [criteria for the evaluation of application](#).

Des précisions ont été apportées à ces critères en 2023-2024, vous pouvez y accéder [ici](#).

### University Bachelors

Diploma	Special Requirements	Access	Remarks
<b>UCLouvain Bachelors</b>			
<a href="#">Bachelor in Biology</a>		Direct access	
<a href="#">Bachelor in Chemistry</a>	Si l'étudiant a suivi la Titre inconnu:Iminbiol	Direct access	In some cases, the UCLouvain Enrolment Office, after reviewing their online enrolment or re-enrolment application, will ask the students concerned to provide an enrolment authorisation from the faculty/ school.
<a href="#">Bachelor in Bioengineering</a>		Access with additional training	
<b>Others Bachelors of the French speaking Community of Belgium</b>			
Bachelier en sciences biologiques		Direct access	
		Access with additional training	
<b>Bachelors of the Dutch speaking Community of Belgium</b>			
Bachelor in de biochemie en de biotechnologie		Access based on application	
		Access based on application	
<b>Foreign Bachelors</b>			
		Access based on application	

## Non university Bachelors

> Find out more about [links](#) to the university

Diploma	Access	Remarks
BA - technologue de laboratoire médical - crédits supplémentaires entre 45 et 60	Les enseignements supplémentaires éventuels peuvent être consultés dans <a href="#">le module complémentaire</a> .	Type court
BA en agronomie, orientation agro-industries et biotechnologies - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation agronomie des régions chaudes - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation environnement - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation forêt et nature - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation techniques et gestion agricoles - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation techniques et gestion horticoles - crédits supplémentaires entre 45 et 60		
BA en agronomie, orientation technologie animalière - crédits supplémentaires entre 45 et 60		
BA en chimie, orientation biochimie - crédits supplémentaires entre 45 et 60		
BA en chimie, orientation biotechnologie - crédits supplémentaires entre 45 et 60		
BA en chimie, orientation chimie appliquée - crédits supplémentaires entre 45 et 60		
BA en chimie, orientation environnement - crédits supplémentaires entre 45 et 60		

## Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"		-	
Masters		-	

## Holders of a non-University 2nd cycle degree

### Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about [Validation of priori experience](#).

### Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

The first step in the procedure is to submit a file online ( see <https://uclouvain.be/en/study/inscriptions/futurs-etudiants.html>).

Students who wish to be admitted on the basis of a dossier are invited to consult the [criteria for the evaluation of application](#).

## Admission and Enrolment Procedures for general registration

## Teaching method

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The teaching strategy takes its inspiration from the idea of "taking responsibility for one's own learning". In the core subjects, students have a choice between a series of activities in human sciences and may choose between many elective subjects. Learning is for the most part centred on individual work (e.g. reading, consultation of databases and bibliographic references, field and laboratory work).

## Evaluation

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***The evaluation methods comply with the regulations concerning studies and exams (<https://uclouvain.be/fr/decouvrir/rgee.html>). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".***

Students will mainly be assessed on the basis of individual work (e.g. reading, consultation of databases and bibliographic references, writing monographs and reports, presentation of seminars, dissertation and field work). As far as possible, there will be continuous assessment, including regular 'open book examinations'. Certain activities will not be given a precise mark but will be officially certified.

## Possible trainings at the end of the programme

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Holders of the Master in Biology with an option course in biochemistry, molecular and cellular biology may go on to the degree of Master in Biochemistry, Molecular and Cellular Biology (120 credits) subject to a further year of training and a more advanced dissertation.

Holders of the Master in Biology with an option course in biology of organisms and ecology may go on to the degree of Master in Biology of Organisms and Ecology (120 credits) subject to a further year of training and a more advanced dissertation.

## Contacts

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### Curriculum Management

#### Entity

Structure entity	SST/SC/BIOL
Denomination	(BIOL)
Faculty	Faculty of Science (SC)
Sector	Sciences and Technology (SST)
Acronym	BIOL
Postal address	Croix du sud 4-5 - bte L7.07.05 1348 Louvain-la-Neuve Tel: +32 (0) 10 47 34 89 - Fax: +32 (0) 10 47 35 15 <a href="https://uclouvain.be/fr/facultes/sc/biol">https://uclouvain.be/fr/facultes/sc/biol</a>
Website	

#### Other academic Supervisor(s)

- Pierre Morsomme
- Renate Wesselingh

#### Jury

- Henri Batoko
- Charles Hachez
- André Lejeune

#### Useful Contact(s)

- Aloysia Stephenne
- Bernadette Gravy

