

Guide to research work For the Master of Science in Biology



The purpose of this guide is to provide practical information on the research work carried out during the Master's programme. As a reminder, the General Regulations for Bachelor's and Master's studies and the Specific Regulations for the Master of Science in Biology "Medical Biology", "Behaviour, Evolution and Conservation" and "Molecular Life Sciences" are authoritative.





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Introduction

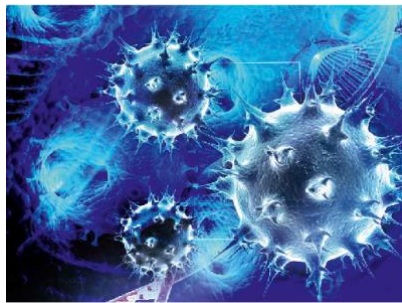
The School of Biology offers 3 different Masters of Science in biology, focusing on the strong research topics at the Faculty of Biology and Medicine (FBM) of the University of Lausanne (UNIL). All three Masters are offered in English, but vary in length and in the number of credits awarded:

- Master of Science in Behaviour, Evolution and Conservation (MSc BEC) – 4 semesters - 120 ECTS
- Master of Science in Medical Biology (MSc MB) – 3 semesters - 90 ECTS
- Master of Science in Molecular Life Sciences (MSc MLS) – 4 semesters - 120 ECTS

The degree awarded for each of these 3 Masters is as follows:



**Master of Science in
Behaviour, Evolution and
Conservation
(MSc BEC)**



**Master of Science in
Medical Biology
(MSc MB)**



**Master of Science in
Molecular Life Sciences
(MSc MLS)**

Particular emphasis is placed on practical work/research projects throughout the Master's programme with:

- A **First-step research project** equivalent to 15 ECTS for the BEC and MB Masters and 25 ECTS for the MLS Master.
- A **Master research project** equivalent to 45 ECTS.

During these projects, students have the opportunity to join cutting-edge laboratories and research groups, thereby contributing to science progress at the frontiers of knowledge in their chosen field.

The supervision of the practical work is carried out by directors¹ from the various departments of the Basic Sciences and Clinical Sciences sections of the FBM, within UNIL, CHUV and Unisanté, but also in collaboration with other neighbouring institutions, such as EPFL or certain museums and foundations, or with foreign institutions.

This guide to research projects in biology is intended for Master students and their supervisors. It aims at providing practical information on how to get the *First-step research project* and the *Master research project* off to a good start, and how to write the Master thesis. It also details the modalities and objectives of the *Master research project*. However, only the information contained in each [Master's Study Regulations](#) is authoritative.

¹ Unless an exception is granted by the School of Biology, project directors must belong to the UNIL teaching staff and hold a UNIL academic title (MA, MER, PD, Professor).

Objectives

The learning objectives of the *First-step research project* (initiation) and the *Master research project* (consolidation) are the following ones:

- Develop the ability to understand a biological system.
- Learn to develop a research question, formulate a hypothesis and define an appropriate experimental approach to answer it.
- Develop analytical and critical thinking skills.
- Integrate into a research group.
- Communicate results orally and in writing.
- Develop autonomy in conducting a research project.

First-step and Master research projects

To achieve their objectives, the three School of Biology's Master's programmes offer two hands-on training courses (*First-step* and *Master research project*) that students follow consecutively.

The ***First-step research project*** is an introduction to laboratory research. It takes place during the 1st semester for the BEC and MB Masters and is equivalent to 15 ECTS; while it extends over the whole the 2nd semester for the MLS Master and is equivalent to 25 ECTS.

The ***Master research project*** offers students the opportunity to work at the frontiers of knowledge and is equivalent to 45 ECTS. It spans over the 2nd and 3rd semesters for the MB Master's programme, over the 2nd to 4th semesters for the BEC Master's programme, and over the 3rd and 4th semesters for the MLS Master's programme. This practical work finishes with the writing of a Master's thesis and an oral defence.

For each of these research projects, the student is supervised by a director² who offers the project and is responsible for its successful completion. The student may also have a "direct supervisor", usually a member of the same laboratory, who follows the project and the student closely. For each of the two hands-on training courses, three aspects are evaluated:

- Practical work
- Writing a report for the *First-step research project* or a thesis for the *Master research project*
- Oral defence

For the BEC and MLS Masters, a fellowship writing exercise related to the *Master research project* topic is scheduled at the beginning of the practical work, equivalent to 5 ECTS, and in which the directors are also involved.

² Unless an exception is granted by the School of Biology, project directors must belong to the UNIL teaching staff and hold a UNIL academic title (MA, MER, PD, Professor).

Project submission

Each year, UNIL faculty members receive an e-mail from the School of Biology³, between August 1 and the first week of September for Master BEC and MB, inviting them to submit, as project director, *First-step* and *Master research projects* to the database (SylviaAcad), following the procedure described in the [Appendix I](#). For the MLS Master's programme, projects must be submitted between October 1 and 31 for *First-Step research projects*, and between mid-January and the end of January for *Master research projects*.

The project Director guarantees the feasibility of the research project within the given deadlines and ensures that the necessary skills and resources are available to the student to complete the work. In principle, to ensure a good balance between the number of *First-Step* and *Master research projects* offered, a *First-step project* must be submitted to enable the submission of a *Master research project*.

The heads of each Master's programme ensure that each project offered by a project director corresponds to the learning objectives (p.4). Once the project has been validated, it can be looked up by students.

Animal experimentation is submitted to strict regulations.

Please note that **the director** of a *Master research project* containing animal experimentation **must provide the veterinary authorization number when submitting the project to the database (SylviaAcad)**. The student selected for such a project will have to take and validate an animal experimentation course before starting carrying out the project.

Animal experiments listed below can be carried out by students as part of their *First-step* or *Master research projects* without having to take and validate the animal experimentation course:

- Observations
- Weaning
- Sex determination
- Metabolic cages
- Behaviour analyses

As a reminder, *First-step research projects* are not authorized to contain any animal experimentation other than the ones described above.

Project selection

The School of Biology keeps a database of *First-step* and *Master research projects* offered by project directors. The procedure for accessing this database and selecting research projects is described in [Appendix II](#).

³ This mailing list includes all members of the teaching staff involved in biology teaching and holding a UNIL academic title (Full, Associate and Assistant Professors, Privat-Doctent, MER and MA).

Exceptional authorization may be granted by the School of Biology, upon motivated request and CV submission, to any person affiliated and stabilized at UNIL, holding a doctorate, and taking part in biology courses.

In principle, except in exceptional cases as mentioned above, CHUV Research Associates are not eligible to apply as directors of *First-step* or *Master research projects*. They may, however, be listed as supervisors alongside an academic director.

Student registration for the *First-step research project*

Access to the database, reading all project descriptions, and registration process depends on the Master's programme:

- ❖ For BEC and MB Master's programmes: access is possible from the first week of the autumn semester until mid-November. Registration for *First-step research* projects is possible during the first two weeks of the autumn semester.
- ❖ For MLS Master's programme: access is possible from the beginning of November (as soon as the projects entered by the directors have been validated). Registration for *First-step research* projects takes place between mid-November and mid-December.
- ❖ Students are expected to meet the supervisors (*i.e.* directors and supervisors) of the *First-step* projects they are interested in before making their selection and registration in the database. Each student then selects three projects, ranking them in order of preference. Students can read the number of times a project has been selected as Priority 1 by other students. Please keep in mind that students are not allowed to carry out their *Master research project* in the same research group as the one chosen for their *First-step research project*.
- ❖ Please note that the *First-step research project* cannot contain animal experimentation.

Student registration for the *Master research project*

Access to the database, reading all project descriptions, and registration process depends on the Master's programme:

- ❖ For BEC and MB Master's programme: access is possible from the first week of the autumn semester until mid-November. Registration for *Master research* projects is only possible from November 1 to November 15.
- ❖ For MLS Master's programme: access is possible from the first week of the spring semester until mid-April. Registration for *Master research* projects is only possible from April 1 to May 1.
- ❖ Students are required to meet the supervisors of the *Master research* projects they are interested in during the first week of the concerned semester, before making their selection and registration into the database. Project directors have to meet with a minimum of 2 seeker students up to registration opening. Each student then selects three projects, ranking them in order of preference. Students can read the number of times a project has been selected as Priority 1 by other students. For information, see [Appendix III](#) for registration and project assignment process.
- ❖ It is important to note that if a *Master research project* involves animal experimentation, the student must first take a theoretical and a practical course recognized by the Swiss Association of Cantonal Veterinarians. For the MB and MLS Master's programmes, the corresponding course is entitled '*Training in Animal Experimentation (RESAL Module 1)*'. For the BEC Master's programme, the course is entitled '*Animal experimentation and wild animals*'. With the exception of a few non-invasive manipulations (listed on p.5), all animal experimentation is formally forbidden without first validating this course.

Project assignment

First-step and *Master research projects* are officially assigned by the School of Biology. For this reason, project directors are not authorized to assign *First-step* or *Master research projects* before registration closes.

Projects are assigned according to the following general rules:

First-step research projects for BEC & MB Master's programmes

First-step research projects are assigned automatically by the computer system, complying with the students' three choices. If there are several students competing for the same project, then the School of Biology will assign projects randomly and computationally.

First-step research projects for MLS Master's programme

Whenever possible, the School of Biology assigns the project listed as the student's first choice. If more than one student selected the same project as their first choice, the School of Biology will contact the project director, who will decide which student to take on. In this case, the projects selected by the other students as second and third priorities will be considered, and the procedure repeated.

Master research projects for all Masters' programmes:

Whenever possible, the School of Biology assigns the project listed as the student's first choice. If more than one student selected the same project as their first choice, the School of Biology will contact the project director, who will decide which student to take on. In this case, the projects selected by the other students as second and third priorities will be considered, and the procedure repeated.

Master research project outside UNIL

The *First-step research project* must be carried out in a laboratory affiliated to UNIL, with the exception of the bioinformatics specialisation of the MLS Master's programme for which the laboratory may be affiliated to the Swiss Institute of Bioinformatics (SIB).

Students wishing to perform their *Master research project* at another university or institution have to submit a complete file to the School of Biology office, containing:

- The registration form
- A *curriculum vitae* of the external Director, if he or she has not previously supervised a student from the School of Biology
- The project description form
- A motivation letter from the student
- The signed « Responsibilities of the UNIL Master's curriculum Co-Director form »

The “*registration form*”, the “*project description form*” and the document « *Responsibilities of the UNIL Master's Co-Director* » are available on the School of Biology website, page Master – Research project⁴.

The application file will be evaluated by the Council of the School of Biology for approval and formal validation, therefore:

⁴ <https://www.unil.ch/ecoledebiologie/home/menuintst/masters/research-project.html>

- The project description must enable the Council members to evaluate the scientific content and feasibility of the proposed project, and to decide whether it corresponds to the level expected for a *Master research project*.
- **The CV of the external Director** must enable the Council members to assess whether she or he has the necessary skills, experience and working environment to supervise the practical work, data analysis and Master thesis writing carried out by the student, and thus to ensure whether overall she or he has the necessary qualities to enable a *Master research project* to run smoothly.
- **The choice of the UNIL Co-Director** is also important to consider, as it will ensure that the work produced corresponds to the expectations of a UNIL *Master research project*. We encourage students interested in a *Master research project* outside UNIL to discuss this first with the head of their Master's programme.

In the case of a *Master research project* in a public or non-profit organization outside UNIL, the student may be eligible for additional, albeit limited, financial support (e.g. for field travel expenses). For this, the student has to enclose with his or her application file a detailed budget, produced and signed by the external director, certifying that the cited costs cannot be covered by the host organization. This document must also be validated by the UNIL Co-Director.

As file submission for a *Master research project* outside UNIL does not guarantee its acceptance by the Council of the School of Biology, students must also follow the regular procedure and thus select and register for 3 *Master research projects* at UNIL.

Deadline for complete file submission is on:

- November 30 for BEC and MB Master's programmes
- April 15 for MLS Master's programme

No time extension will be granted.

Tasks and responsibilities

The procedure for the *First-step* and *Master research projects*, as well as the tasks and responsibilities of students, *Master research project* directors and direct supervisors, are described in [Appendix III](#).

Leave

Students have the right to take holidays during the *Master research project*. However, holiday entitlement is not regulated by the School of Biology and must be agreed between students and their project director and direct supervisor.

Master thesis

The *Master research project* ends with the writing of a Master thesis and an oral defence.

The aim of the Master thesis is to materialise work results and communicate them to others in a written form.

The format of the thesis must meet all the requirements for scientific publication, *i.e.* an introduction demonstrating a good level of knowledge in the research field in its current context,

a description of the methodology used, a presentation of the results, a final discussion demonstrating critical thinking and an appreciation of the quality and limitations of the results obtained, and a conclusion providing possible perspectives in the research field.

The Master thesis must be written in English and must contain the following elements:

- Title page provided by the School of Biology
- Abstracts both in English and in French for MB Master's programme; and in English only for BEC and MLS Master's programmes.
- List of abbreviations
- Table of contents
- List of figures and tables
- Introduction
- Materials and methods
- Results
- Discussion - Conclusion
- References

Plagiarism

Students write their own Master thesis in compliance with UNIL Directives⁵ 0.3 and 4.2 concerning plagiarism and scientific integrity, respectively. UNIL reserves the right to use similarity detection softwares to analyse documents submitted by its students (Directive 3.5).

Failure to comply with these two directives is considered as misconduct, liable to sanctions by UNIL, or even legal proceedings.

Cases of plagiarism will be reported to the Dean's Office, which will decide on the sanctions to be applied according to the seriousness of the offence, which may range from a reprimand to work invalidation, to failure of one or more modules or even to exclusion from the Faculty.

Master thesis assessment

The Master thesis is assessed by a jury.

Jury members must include at least the director (and/or the co-director for *Master research projects* outside UNIL) and an external expert holding a doctorate. The external expert must be independent of the director's (or co-director's) research group, but does not need to be recruited outside the host department.

Oral defense of the *Master research project*

In order to defend their Master research project, students must have first submitted their Master thesis to their jury members (director, co-director if applicable, external expert) by the deadline, *i.e.* 5 weeks before the beginning of the next semester. The oral defence of the *Master research project* must take place no later than 2 weeks before the beginning of the next semester. No extension may be granted without prior request for one semester extension. Failure to meet these deadlines without valid justification will result in failure of Module 4.

Each Master's programme defines the duration and terms of the oral defence.

The oral defence of the *Master research project* is public.

⁵ <https://www.unil.ch/central/fr/home/menuintst/organisation/documents-officiels/textes-legaux/directives-internes-de-lunil.html>

The entire jury must be present at the oral defence of the *Master research project*. The external director may either be present at the oral defence or provide his/her assessment on a written form. Upon motivated request addressed to the Director of the School of Biology, the presence of a member of the jury by videoconference may be exceptionally authorized.

Evaluation of the *Master research project*

The *Master research project* is worth a total of 45 ECTS.

The School of Biology sends to the *Master research project* director/co-director the evaluation protocol I, in which the jury copies the 3 marks awarded (respectively for the written thesis, the oral defence and the practical research work) and indicates any modifications to be made to the thesis manuscript, as well as the evaluation protocol II, which will accompany the submission of the final manuscript.

The UNIL director or co-director returns the original Evaluation Protocol I completed with the marks to the School of Biology as soon as possible after the oral defence.

The student has 2 weeks after the oral defence to incorporate all corrections asked for by jury members and submit the final version of the Master thesis to the director (or UNIL co-director).

The director (or UNIL co-director) checks, approves and accepts this final version. If the work is carried out outside UNIL, the external director must first give his/her approval to the UNIL co-director, who in turn approves the final version. The director (or UNIL co-director) then sends a complete and definitive version in digital format to the School of Biology, together with the filled evaluation protocol II.

Copyright & privacy

As author, the intellectual property of the Master thesis belongs to the student. However, UNIL retains ownership of the intellectual property rights to all technical creations and research results obtained by members of the teaching staff while employed at UNIL.

The School of Biology will archive Master theses in digital format. If results obtained must be kept confidential, the project director must inform the School of Biology.

Useful links

For more information, here is a list of useful links (in French) :

[Règlement général des études relatif au cursus de Bachelor et de Master \(RGE\) de l'UNIL](#)

[Règlement d'études – Master universitaire ès Sciences en biologie médicale](#)

[Règlement d'études – Master universitaire ès Sciences en comportement, évolution et conservation](#)

[Règlement d'études – Master universitaire ès Sciences moléculaires du vivant](#)

Directive de la Direction 0.3 bis

[Formulaire, Code de déontologie en matière d'emprunts, de citations et d'exploitation de sources diverses](#)

Directive de la Direction 4.2

[Intégrité scientifique dans le domaine de la recherche et procédure à suivre en cas de manquement à l'intégrité](#)

Directive de la Direction 3.15

[Traitement des cas de plagiat dans le cadre de l'enseignement](#)

All these documents can be looked at :

www.unil.ch/ecoledebiologie > Welcome > Regulations

Appendix I

Step-by-step procedure to select *First-step* or *Master research projects* - **for Directors**

Project preparation

The *First-step* and *Master research project* descriptions should:

- provide the students a clear and concise understanding of the proposed project.
- be in English.
- be divided into the following subsections: Title, Introduction, Aim of the project, Experimental approach, Significance, and (if desired) References.

The total length of the description should not exceed 3000 characters (including spaces); for subsection-specific character limitations, please check directly on the submission website.

Access to the website for project submission

1. Go to the School of Biology website (English version)/« For teachers »/« Master Research Projects »: www.unil.ch/ecoledbiologie/en/home/menust/masters/research-project.html
2. Select « Project submission (for teachers) ».
3. Click on the « Research project submission » button.
4. Enter your login details (as for UNIL email).

For a better visibility of the pages, please open the web page on your computer screen as wide as possible.

Step-by-step procedure for project submission

If you are also registered a director of Master projects for the School of Medicine, select “School of Biology”.

1. Please check your personal details. For any mistake, please let us know by e-mail.
Do not pay attention to the direct supervisor at this time (this will be taken care of at step 9 below).
2. To submit your project, click on « Add a new project » (at the bottom of the page).
3. Select the type of project (***First-step*** or ***Master research project***). Each project Director must have submitted a ***First-step research project*** to be entitled to propose a ***Master research project*** as well.
4. Fill in the boxes with the appropriate subsection of the project description.
5. Select your department or service (use the predefined list by clicking on the box with the three dots “...”).
6. Select the Master’s programme for which the project will be offered (more than one can be selected).
7. Select the subject area(s) related to the project (optional).
8. Click on « Save » to save the project.

A summary of the project appears.

9. You can now modify:
 - the name of the direct supervisor* by clicking on the « Edit » button on the top of the page.
 - the project description by clicking on the « Edit » button at the bottom of the page.
10. To submit another project or review your projects, click on « return » written in red on the top-left side.
11. When you are finished, log out on the top-right side of the window.
12. To modify the direct supervisor or the project description at a later time, go to the « Project submission » page as above, save again at the bottom and click on « Edit ».

* The direct supervisor can be, for example, a lab postdoc or a senior PhD student. If the name you entered elicits a « Direct supervisor inconnu » response, fill in the form “[Direct supervisor unknown](#)” and send it back to us.

Contact

ecoledbiologie@unil.ch / 021/692 40 10

Appendix II

Step-by-step procedure to select *First-step* or *Master research projects* - **for Students**

Access to the website for project selection

The access is similar for the First-step and Master research projects

1. Go to the School of Biology website (English version)/« For students»/« Master Research projects».
<http://www.unil.ch/ecoledbiologie/en/home/menuinst/masters/research-project.html>
2. Select « Project selection & registration (for students) ».
3. Click on the « Registration to research projects » button.
4. Enter your login details (as for UNIL email).

For a better visibility of the pages, please open the web page on your computer screen as wide as possible.

5. A list of the available projects will appear. This list can be sorted using the following categories:
 - Master's programme
 - Department
 - Name of the project Director
 - Subject area (keywords)
6. Click on the red numbers to display all the projects listed in the corresponding category.
For example, if you click on the red number next to the project theme « behaviour », all projects related to behaviour concepts will appear.

Step-by-step procedure for project selection

The registration procedure is similar for the First-step and Master research projects.

1. Click on the description of the project in the category which interests you.
*You will see the title in red and the description in black.
In the "First choice" column, you can see if the project has already been selected by other students**
2. To select a project, simply click on the red title and the project will be added to your choices.
It will appear in the box above the table named «My Inscriptions ».

At the end of the process, each project will be assigned to only one student.

If you want to remove (**deselect**) a chosen project, click on the square with a « minus » on the right-hand side.

* 0 = nobody has selected this project yet; 1 or more = number of students who have also selected this project.

WARNING

To register for the **First-step research project**: You must select 3 projects of interest (to be classified in order of priority).

To register for the **Master research project**: You must select 3 projects of interest (to be classified in order of priority).

The First-step and the Master research projects must be carried out in different labs. Don't forget to consider this when selecting your First-step project!

We encourage students to contact and discuss with Directors whose project(s) is/are of interest to you.

Contact

ecoledbiologie@unil.ch / 021/692.40.10

Appendix III

Respective responsibilities of *Master research project* director, direct supervisor and student:

The information below is taken from the study regulations for each Master's programme.

- The **project director**, a member of the UNIL teaching staff or, with the authorization of the School of Biology, any doctoral student involved in teaching, is the person who offers a research project. He/she guarantees the feasibility of the project within the allocated time and ensures that the necessary skills and resources are available to the student to carry out his/her work.
- In principle, the **project director** must offer at least one *First-step research project* in order to offer a *Master research project*. Exceptions may be granted upon request to the corresponding Head of the Master and the School of Biology.
- It is the **student's** responsibility to find a teacher willing to direct his/her *Master research project* from the beginning of the Master's programme and before November 30 for the BEC and MB Master's programmes, or before May 15 for the MLS Master's programme.
- The *Master research project* and the Director must be different from those of the *First-step research project*.
- The **School of Biology** assigns *First-step* or *Master research projects* to students. If several students choose the same *Master research project* as their first choice, the project director is contacted by the School of Biology to indicate which student has been selected for his/her project.
- The **School of Biology** provides UNIL project directors with a lump sum for supervision, enabling them to finance part of the resources needed to carry out the student's work.
- The **project director** may enlist the help of a **direct supervisor** to supervise the student. However, the project director remains the contact reference for the Master's supervisor and the School of Biology.
- The **project director** is responsible for supervising the student and follow the progress of his/her work. The School of Biology recommends regular, close discussions between the project director, the direct supervisor and the student, particularly at the beginning of the Master thesis.
- The **School of Biology** asks project directors and students about the progress of the *Master research project* half-way through the project.
- The project director is responsible for identifying an **external expert**, possibly in agreement with the student. The external expert must be independent of the director's research group, but does not need be recruited outside UNIL or the host departments.
- **Students** must submit a copy of their Master thesis to each member of their jury at the end of the third semester of the Master's programme, but no later than 5 weeks before the start of the next semester.
- Upon receipt of the Master thesis, the **project director** must inform the School of Biology of the date and place of the oral defence, as well as the name of the external expert.

- The **project director** sends the evaluation protocol I and evaluation protocol II, together with the final manuscript in digital form, to the School of Biology by the deadlines specified in the schedule in [Appendix II](#).