Master in Medical Biology
Responsible Master MB

Marie-Christine Broillet
Département de Pharmacologie & Toxicologie
Rue du Bugnon 27
1005 Lausanne

021 / 692 53.69
Marie-Christine.Broillet@unil.ch
Responsibles of Filières/tracks

Immunology & Cancer
Sanjiv Luther
Sanjiv.Luther@unil.ch
021 692 56 78

Metabolism
Christian Widmann
Christian.Widmann@unil.ch
021 692 51 23

Pharmacology & Toxicology
Marie-Christine Broillet
Marie-Christine.Broillet@unil.ch
021 692 53 69

Neurosciences
Andrea Volterra
Andrea.Volterra@unil.ch
021 692 52 71

and

Jean-René Cardinaux
Jean-rene.cardinaux@chuv.ch
021 314 35 96
Objectives of Master MB

At the **End of the Masters** you will be able to:

1. To take advantage of the acquired knowledge by demonstrating creativity to **solve scientific problems of medical, preclinical and clinical biology.**
2. To reply to a biological question by **lab experimentation** and/or bioinformatic analysis.
3. To rapidly learn (theoretically and experimentally) and adapt as a function of new informations to be considered.
4. To analyze different types of data, coming from either literature as well as from **experiments,** to integrate and make a synthesis of them.
5. To handle bibliographic resources (databases, scientific journals....) and analyze, then synthesize critically the scientific literature linked to a concerned domain, when you elaborate a scientific project and its realization.
6. To make a critical analysis of results of a scientific approach.
7. To react fast and take suggestions during a discussion, in order to **solve problems** (Think on your feet).
8. To organize your work and your individual projects or the team, take initiatives and contacts in order to achieve.
9. **To communicate** your results orally and in a written form, depending on the targeted public: oral communication, presentation of poster, presentation of article, writing a report (FirstStep Report / Master thesis / Grant preparation).
10. To defend a project in front of experts and explain it to people of the economical/political world.
11. To manage scientific English (oral/written) to read scientific texts, write articles and communicate with experts.
Overview Master MB

Module 1
Compulsory and optional courses (15 credits ECTS)

Module 2
First step research project (15 credits ECTS)

Exams

Module 3
Filières / Commun course (15 credits ECTS)

Exams

Module 4
Master Research Project: A personal project (45 credits ECTS)

Defense of the Master project
Overview Master MB

1st semester
- Common courses (courses, seminars, paper, presentations) (MODULE 1)
- First step project (MODULE 2)
- Optional modules:
  → Animal experimentation
  → Clinical research

2nd semester
- Specializations (filières/tracks; courses, seminars) (MODULE 3)
  → Immunology & Cancer
  → Metabolism
  → Neurosciences
  → Pharmacology & Toxicology

  → Common course Clinical Medicine
  → Biostatistics / Bioinformatics (E-learning/Integration into Master project)

2nd/3rd semester
- Master project (MODULE 4)
  → Poster Day of the Medical Master
Module 1 - 7 different courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor(s)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cellular Biology</td>
<td>O. Staub</td>
<td>12 C + 4 S</td>
</tr>
<tr>
<td>Immunology and Cancer</td>
<td>S. Luther</td>
<td>20 C + 12 S</td>
</tr>
<tr>
<td>Microbiology</td>
<td>S. Kunz</td>
<td>18 C + 4 S</td>
</tr>
<tr>
<td>From Memory to Memory Loss: Alzheimer's Disease</td>
<td>A. Volterra, J.-R. Cardinaux</td>
<td>18 C + 4 S</td>
</tr>
<tr>
<td>Cardiovascular Diseases</td>
<td>D. Diviani</td>
<td>20 C + 4 S</td>
</tr>
<tr>
<td>Scientific Method and Communication</td>
<td>M.-C. Broillet, S. Kohler</td>
<td>8 C + 2 S</td>
</tr>
<tr>
<td>Metabolic Diseases</td>
<td>C. Widmann</td>
<td>16 C + 4 S</td>
</tr>
<tr>
<td>Intracellular Signalling</td>
<td>D. Diviani</td>
<td>12 C + 3 S</td>
</tr>
</tbody>
</table>

Optional (choice one):

<table>
<thead>
<tr>
<th>Course</th>
<th>Instructor(s)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTK1 Module: Training in Animal Experimentation</td>
<td>C. Berthonneche</td>
<td>20 C + 20 PW (2 grps)</td>
</tr>
<tr>
<td>Introduction to Clinical Research Module (EH)</td>
<td>L. Tappy</td>
<td>20 C + 20 PW</td>
</tr>
</tbody>
</table>

MB Poster Day

<table>
<thead>
<tr>
<th>Instructor(s)</th>
<th>CHUV/C. Olivier</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. Luther</td>
<td></td>
</tr>
</tbody>
</table>

First Step Project

<table>
<thead>
<tr>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>282 h</td>
</tr>
</tbody>
</table>

Meeting of the School of Biology: 18.09.2018

<table>
<thead>
<tr>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO/Amphi</td>
<td>1 hour</td>
</tr>
</tbody>
</table>

Introduction Master MB: 18.09.2018

<table>
<thead>
<tr>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>POL/340.1</td>
<td>2 hours</td>
</tr>
</tbody>
</table>

Introduction to Biological Security: 20.09.2018

<table>
<thead>
<tr>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>CUB/1</td>
<td>2 hours</td>
</tr>
</tbody>
</table>

Epalinges - Dpt Biochemistry F308
Module 1 - Paper presentation

Presentation of **one scientific article** during the semester

- Groups of 2 students
- Choose article on doc (link provided by e-mail)
- choose until **Friday, September 28** and indicate your choice on (Groups of 2 students):

Informatics information

- MyUNIL
- reseau.unil.ch → wireless
- crypto.unil.ch → papers
- Projects (server of the école de biologie)
- For these services you need a user name and a password (ask at the “Centre informatique”: http://www.unil.ch/ci)
To help you... e-learning training session

<table>
<thead>
<tr>
<th>WEEK 3: 01.10 to 05.10</th>
<th>mo 01</th>
<th>tu 02</th>
<th>we 03</th>
<th>th 04</th>
<th>fr 05</th>
</tr>
</thead>
<tbody>
<tr>
<td>8H</td>
<td>C-ImmunCan SL</td>
<td>C-ImmunCan SL</td>
<td>S-ImmunCan Homework</td>
<td>C-Microbiol SKU</td>
<td></td>
</tr>
<tr>
<td>10H</td>
<td>C-Memory PS</td>
<td>C-Sci Method MCB</td>
<td>C-Microbiol GG</td>
<td>S-ImmunCan ND,SL,WH</td>
<td></td>
</tr>
<tr>
<td>12H</td>
<td></td>
<td></td>
<td></td>
<td>TP First Step Project</td>
<td></td>
</tr>
<tr>
<td>13H</td>
<td>C-Cardiov LM</td>
<td>C-Memory AV</td>
<td>S-ImmunCan Homework</td>
<td>TP First Step Project</td>
<td></td>
</tr>
<tr>
<td>15H</td>
<td>C-Metabol CW</td>
<td>C-Cardiov DD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17H</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Format of presentations

• max. 20 minutes
  - PowerPoint

• Introduction
  - Background, proteins, cell system, physiology
  - Prepares / guides you to the question / hypothesis of the paper

• Question / hypothesis of the paper

• Methods / System
  - experimental setup

• Presentation of data
  - questions asked for each experiment, description of the data, critique

• Summary / Conclusion
  - What has been shown?
  - What are the conclusions?

• Critique!
  - Quality of data?
  - Are the conclusions supported by the data?
  - What else should be done in order to support the conclusions etc.?

• Don’t forget to consider the supplementary material

! Often you have to make a selection of the data, as you cannot not show everything within 20 minutes

These paper presentations are part of the courses, and may be subject at the exams!
Optional modules

- Module LTK1: Introduction to animal experimentation
  - theoretical part: mornings December 3 to December 7, 2018
  - practical part: morning or afternoons December 10 to 14 (2 groups)
  - in order to follow this course you have to make your Master project in a lab that has an authorization for animal experimentation
  - your supervisor will have to provide the authorization number

or

- Clinical Research Module
  - December 10 to 14, 2018 (all day)
  - choose until November 15 (link will be provided in due time)
Module 1 - Exams

- **Written exam** (2 x 2 hours) on the following courses:
  - Intracellular signaling, Immunology/Cancer, Microbiology, From memory to loss of memory

- **Oral exam** (30 minutes, 2 topics out of 3):
  - Cellular Biology, Cardiovascular Diseases, Metabolic diseases

- The exams are taking place in January 2019

- Ask the professors for examples of questions, and for precision on what you are expected to know

- **This will probably be one of the most challenging semester that you ever had** (courses, paper presentation, First-Step project, report, oral presentation,....)

  → you have to organize yourself very well and efficiently
Overview Master MB

Module 1
Compulsory and optional courses
(15 credits ECTS)

Module 2
First step research project
(15 credits ECTS)

Exams

Module 3
Filières / Commun course
(15 credits ECTS)

Module 4
Master Research Project:
A personal project
(45 credits ECTS)

Exams

Defense of the Master project
Almost 100 laboratories provide First step or Master projects
MODULE 2 - First Step Project

• consult the projects online, go and discuss with the research lab, discuss with your colleagues, consult both First Step and Master projects (as explained in the “Introduction by the School of Biology” (18.9.2018)

• a list of the projects can be found on link provided by mail his afternoon

• consider that you have to change research lab for the Master project

• Make your 3 choices for the First Step Project until Friday, September 28, 12 am (noon) on link provided by mail
First Step Projects – Special procedure Master MB

- Choose at least 3 projects, and contact the thesis director and/or the direct supervisor for an interview
- It is compulsory that you have talked to/visited the research lab in which you want to do your First Step project

To help you ....4 sessions of presentations
To help you ....4 sessions of presentations

Monday, September 24th/PHARMACO&TOXICO
15h30-17h, Room Lipari, Dept Pharmacology & Toxicology, Bugnon 27

Tuesday, September 25th/NEUROSCIENCE
15h, Petit Auditoire, Dept Fundamental Neuroscience, Bugnon 9

Wednesday, September 26th/METABOLISM
15h30-17h, Seminar Room, Dept Physiology, Bugnon 7

Thursday, September 27th/IMMUNO&CANCER
15h30-17h30, Room F308, Dept Biochemistry, Epalinges
Visiting the posters of your colleagues
Master students
Charlotte Olivier, CHUV
Friday, October 12th, 13h30
Make your 3 choices for the First Step Project until **Friday, September 28, 12 am (noon)** on link

**Meeting on Friday, September 28, at 3 pm (15h)**
- Projects with only one 1\textsuperscript{st} choice: attributed
- Projects with several 1\textsuperscript{st} choices: Draw
- Remaining Projects with only one 2\textsuperscript{nd} choice: attributed
- Remaining projects with several 2\textsuperscript{nd} choices: Draw
- Remaining projects with only one 3\textsuperscript{rd} choice: attributed
- Remaining projects with several 3\textsuperscript{rd} choices: Draw
First Step Projects-Procedure Summary

• consult the projects on line, go and discuss with the laboratories, discuss with your colleagues, consult both First Step and Master projects (as explained in the “Introduction by the School of Biology” (18.9.2018)

• a list of the projects can be found on link

• consider that you have to change research lab for the Master project

• Make your 3 choices for the First Step Project until Friday, September 28, 12 am (noon) on link

• Meeting on Friday, September 28, at 3 pm (15h)
  - Projects with only one 1st choice: attributed
  - Projects with several 1st choices: Draw
  - Remaining Projects with only one 2nd choice: attributed
  - Remaining projects with several 2nd choices: Draw
  - Remaining projects with only one 3rd choice: attributed
  - Remaining projects with several 3rd choices: Draw

• Every student makes afterwards her/his choice until Sunday, September 30, midnight, on the biology server

• Some projects may also be offered for the Master MLS. If you choose such a project you have to make sure that the project was not attributed to a MLS student
• You are in the research lab as indicated in the “horaire” (We – Fr)

• For the evaluation of your work, you will have to make an **oral presentation** (in December), write a **report** (style: scientific article) and present an **article** (during classes). Moreover, your work in the lab will be evaluated

• **Evaluation:**
  - Article (corresponding Prof.)
  - Report + work in the lab: Director Lab + Supervisor
  - Oral presentation: Professors present at the presentation

• The final **practical mark** is the average of a practical mark, the mark on the report, the mark on the oral presentation, and the mark of the presented article.

• The experimental work takes place between Thursday, October 4 and Friday, November 30, 2018

• A pdf of the report has to be sent until December 21, 2018, midnight ([Marie-Christine.Broillet@unil.ch](mailto:Marie-Christine.Broillet@unil.ch) with copy to Sandrine@unil.ch)

---

Course Scientific Writing: Instructions for writing a report, making an oral presentation, preparing a poster,…..
To help you... an introduction to research...
« scientific methods of communication » course
(Module 1)
Aims of this course

1. Facilitate transition from Bachelor to Master: provide tools and identify problems that you may run into.

2. Introduce a new way of thinking, working and learning:
   "the scientific method".

3. Prepare you for a new form of exams:
   - practical performance in the lab
   - reading, writing
   - presenting your own work

4. Help you find your way in a new field that may lead to career planning and a career.
Organisation 2nd/3rd semester

2nd semester: (MODULE 3)

Specialization en « filière »

- Immunology / Cancer
- Metabolism
- Pharmacology/Toxicology
- Neurosciences

Common course and practical work

- Clinical Medicine
- Bioinformatics/Biostatistics
- Introduction in Biostatistics (e-learning)

2nd/ 3rd semester (MODULE 4)

Master project

- Master Poster Day
Filière Immunology and Cancer

Infection

Autoimmunity

Cancer

Allergy

Courses cover basic physiology, diseases and treatments

Master in Medical Biology
FILIÈRE
METABOLISM

Fueling the brain

Stress and metabolism

Diabetes

Obesity

Hypertension

Cancer cell metabolism

Exercise and performance

Master in Medical Biology
From genes to synapses to circuits in order to understand brain function, behaviour and neuropsychiatric disorders.
PHARMACOLOGY AND TOXICOLOGY
Master Project-Module 4

• 2nd/3rd semester (~ April/May 2019 to January 2020);

• Project descriptions already available on line

• contact research labs that you are interested in and discuss with them, make 3 choices between November 1 - 15, 2017

• Matching between student and directors (November 16 to 30, 2018)

• Projects outside of the FBM (possible, but you should consult Marie-Christine Broillet) have to be announced until November 1st, 2018 to the EB

• They have to be approved by the “Conseil de l’Ecole de Biologie”

• By December 3: communicate choice of filière/track to MCB (link will be provided)
Deadlines

- Choice of First Step project: September 28 → MCB (google doc)
  September 30 → Server EB

- Choice of paper (literature seminar): September 28 → MCB (google doc)

- Choice of Master project outside of UNIL: November 1 → EB, MCB
  (after discussion with OS)

- Choice module (animal or clinical): November 15 → MCB (google doc)

- Choice Master Projects: November 1 - 15 → Server EB

- Choice of filière/track: December 3 → MCB (google doc)

- Report First Step Project: December 21 → MCB (E-mail, pdf)
  (final version)

EB: Ecole de Biologie
MCB: Marie-Christine Broillet (marie-christine.broillet@unil.ch)