To know more about the...

Master of Science in Medical Biology

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Department of Pharmacology and Toxicology
Master in Medical Biology
“Over 95 percent of the world's population has health problems -- with over a third having more than 5 ailments”.
THE LANCET (June, 2015)
Molecular Mechanisms of Diseases

Translational Research

Master in Medical Biology

Journée des Masters de l’UNIL, 3 mars 2020
Studies of the molecular mechanisms involved in physiology and human pathophysiology
Development of **new diagnostic and therapeutic tools**
OUR COMPETENCES

- Immunology and Cancer
- Metabolism, obesity, diabetes, and cardiovascular pathologies
- Pharmacology & Toxicology
- Medical Microbiology
- Neurosciences

Master in Medical Biology

Journée des Masters de l’UNIL, 3 mars 2020
Journée des Masters de l’UNIL, 3 mars 2020

Organization of the studies: 3 semesters (90 ECTS)

- **Module 1**
  - Common courses (15 credits ECTS)
  - Sept-Dec 2020

- **Module 2**
  - First step research project (15 credits ECTS)
  - May 2021 – Jan 2022

- **Module 3**
  - Filières / Common courses (15 credits ECTS)
  - Feb – May 2021

- **Module 4**
  - Master Research Project: A personal project (45 credits ECTS)
  - May 2021 – Jan 2022

Defense of the Master project
Block 1 Courses: (first 3 weeks of the semester)
- Cell Biology
- Intracellular Signalling
- Mouse Genetics
- Biostatistics
- Immunology
- Medical Microbiology

- Scientific Method:
  How to work in a lab, prepare a poster, a talk, a report, an article, a patent?
Module 1

Block 1 Courses: (first 3 weeks of the semester)
- Cell Biology
- Intracellular Signalling
- Mouse Genetics
- Biostatistics
- Immunology
- Medical Microbiology

Continuous Assessment

- Scientific Method:
  How to work in a lab, prepare a poster, a talk, a report, an article, a patent?
Module 1

Block 1 Courses: (first 3 weeks of the semester)
- Cell Biology
- Intracellular Signalling
- Mouse Genetics
- Biostatistics
- Immunology
- Medical Microbiology

Continuous Assessment

- Scientific Method:
  How to work in a lab, prepare a poster, a talk, a report, an article, a patent?
« An introduction to research... »
AIM: get ready for 6 weeks of 1st step lab work
Organization of the studies: 3 semesters (90 ECTS)

**Module 1**
Common courses (15 credits ECTS)

**Module 2**
First step research project (15 credits ECTS)

**Module 3**
Filières / Common courses (15 credits ECTS)

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

Semester 1
Sept-Dec 2020

Semester 2
Feb – May 2021

Semester 3
May 2021 – Jan 2022

Defense of the Master project
Almost 100 laboratories provide First step or Master projects
Semester 1

Module 1

- Block 2 Courses: (last 2 weeks of the semester)
  - Cardiovascular diseases
  - Metabolic diseases
  - Neurological diseases
  - Cancer
  - Pharmacology

written and oral exams in the January session

AIM: get ready for selecting a filière (track)
Organization of the studies: 3 semesters (90 ECTS)

**Semester 1**
Sept-Dec 2020
- **Module 1**
  Common courses (15 credits ECTS)

**Semester 2**
- **Module 3**
  Filières / Common courses (15 credits ECTS)
  Feb – May 2021

**Semester 3**
- **Module 4**
  Master Research Project: A personal project (45 credits ECTS)
  May 2021 – Jan 2022

**Exams**

**Defense of the Master project**
Module 3

- **Common Course:**
  - Introduction to clinical medicine

- **Optional modules:**
  - Training in animal experimentation
  or
  - Introduction to clinical research

- **Tracks (Filières):**
  - Immunology & Cancer
  - Neurosciences
  - Pharmacology & toxicology
Semester 2

Module 3

- **Common Course:**
  - Introduction to clinical medicine

- **Optional modules:**
  - Training in animal experimentation
  - or
  - Introduction to clinical research

- **Tracks (Filières):**
  - Immunology & Cancer
  - Neurosciences
  - Pharmacology & toxicology
Introduction to clinical medicine (Module 3, common course)

- **Classes** on how to run clinical trials
- **Lectures, examples of FBM** clinical doctors, MD-PhDs or PhDs involved in biomedical research
Module 3

- **Common Course:**
  - Introduction to clinical medicine

- **Optional modules:**
  - Training in animal experimentation
  - Introduction to clinical research

- **Tracks (Filières)**
  - Immunology & Cancer
  - Neurosciences
  - Pharmacology & toxicology
Introductory Course in Laboratory Animal Science

Aims

-To acquire the practical and theoretical skills to work with laboratory animals as requested by legislation (20h theory + 20h practical)

- **Federal accreditation** to perform animal experimentation (Swiss federal veterinary office, module LTK1)
Introduction to Clinical Research

• Get acquainted with the **fundamentals in Clinical Research**
  – Study design
  – Statistics
  – Ethics
  – Regulations and legal requirements, safety, quality controls

• Get the **GCP (Good Clinical Practice) certificate**
Module 3

• **Common Course:**
  - Introduction to clinical medicine

• **Optional modules:**
  - Training in animal experimentation or
  - Introduction to clinical research

• **Tracks (Filières)**
  - Immunology & Cancer
  - Neurosciences
  - Pharmacology & toxicology
Module 3: 3 tracks (Filières)

- Immunology & Cancer
- Pharmacology & Toxicology
- Neuroscience

Sanjiv Luther
Marie-Christine Broillet
Jean-René Cardinaux
IMMUNOLOGY AND CANCER

Infection

Autoimmunity

Cancer

Allergy

Courses cover basic physiology, diseases and treatments

Sanjiv Luther, Department of Biochemistry

Master in Medical Biology
Immunology and Cancer (IC)

**Dangers from outside**
- Infections (viruses, fungi, bacteria, parasites)
- Allergies, asthma

**Dangers from inside**
- Autoimmunity
- Cancer

Subject: highly disease-relevant
Toxicology Visits
Visit of an INDUSTRY research center
From genes to synapses to circuits in order to understand brain function, behaviour and neuropsychiatric disorders.
Filière Neurosciences

6 Modules

- Brain Development
- Sensory Functions
- Neuron-Glia Biology
- Neuronal Death and Repair
- Modulation of Synaptic Transmission
- Introduction to Psychiatric Neuroscience
Organization of the studies: 3 semesters (90 ECTS)

**Semester 1**
- **Sept-Dec 2020**
  - **Module 1**
    - Common courses
    - (15 credits ECTS)

**Semester 2**
- **Feb – May 2021**
  - **Module 3**
    - Filières / Common courses
    - (15 credits ECTS)

**Module 4**
- **Master Research Project**
- **A personal project**
- **(45 credits ECTS)**
- **May 2021 – Jan 2022**

**Defense of the Master project**

**Semester 3**
- **May 2021 – Jan 2022**
  - **Module 2**
    - First step research project
    - (15 credits ECTS)
  - **Exams**
Semesters 2 and 3

Module 4

- Master Project
  - In many laboratories of the affiliated research departments of UNIL, the CHUV or in outside laboratories (LAD, UNIGE, EPFL)
  - Mobility
  - Medical Biology Poster Day
Semesters 2 and 3

Module 4

- Master Project
  - In many laboratories of the affiliated research departments of UNIL, the CHUV or in outside laboratories (LAD, UNIGE, EPFL)
  - Mobility
  - Medical Biology Poster Day
Medical Biology Poster Day
Master Project: Aims

- Read scientific articles and critically evaluate the quality and interpretation of experimental data

- Identify biologically relevant questions based on the scientific literature

- Plan and conduct meaningful experiments

- Learn careful data analysis and data presentation (including statistics)

- Present and discuss experimental data in a clear and convincing way

- Write a comprehensive scientific thesis in English

- Be comfortable to work independently as well as in a TEAM

- Learn to manage a project and to move it forward successfully
Our ambition

- **Multidisciplinary training** in various domains of biomedical sciences (neurosciences, metabolism, cancer, immunology, cardiovascular, pharmacology, toxicology)

- Acquisition of **advanced skills in basic and translational research**
  (genomics, imaging, electrophysiology, transgenesis,...)

- **High quality courses.** Internationally competitive. In English.
  (50% of students come from outside UNIL)
Job Openings

Academic Research
Pharma
Biomedical Industries
Biotechs
Lab Med
Hospitals (FAMH)
Tox Labs
Patent Offices
Regulatory affairs
Governmental Agencies
Scientific journals
Teaching
You want to know more?

http://www.unil.ch/eb-mb/home.html

For further questions: Marie-Christine Broillet (Marie-Christine.Broillet@unil.ch)
You want to know more?

Master of Medical Biology: Information session

March, 23rd 2020

Department of Biochemistry, Room B301
Chemin de Boveresses
155, 1066 Epalinges,
Metro station “Croisettes” (M2)