Lab methods: animal experimentation

Doenlen Raphaël, Warot Xavier

Cursus

<table>
<thead>
<tr>
<th>Bioingénierie</th>
<th>Sem.</th>
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<tr>
<td>Sciences du vivant</td>
<td>MA1, MA3</td>
<td>Opt.</td>
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<tr>
<td>Sciences et technologies du vivant</td>
<td>MA1</td>
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Language: English
Credits: 2
Withdrawal: Unauthorized
Session: Winter
Semester: Fall
Exam: During the semester
Workload: 60h
Weeks: 14
Hours: 2 weekly
Practical work: 2 weekly

Remarque
Registration with letter of interest and short CV with Xavier Warot and Raphael Doenlen. Attendance to the course is mandatory. A minimum of 8 participants is required.

Summary
Theoretical introduction to the key principles of animal experimentation, with an emphasis on laboratory rodents (mouse and rat) in the context of the EPFL facilities.

Content
• Introduction to arguments and to methods of in vivo studies
• Biology of laboratory mice and rats
• Logistics, housing and care of laboratory animals: husbandry, breeding, health monitoring.
• Genetic engineering of animal models: transgenesis methods, breeding of genetically engineered models
• Phenotyping of animal models: design of experiments, scientific and technical issues. Examples of phenotyping protocols set up at the EPFL
• Ethical considerations and legal requirements of animal experimentation

Keywords
Animal model, Animal experimentation, Laboratory animals, Husbandry, Transgenesis, Phenotyping, Ethics

Learning Prerequisites
Important concepts to start the course
• Basic animal biology
• Basis of molecular biology
• Basis of statistics applied to biology

Learning Outcomes
By the end of the course, the student must be able to:
• Develop a model for human disease
• Interpret in vivo experiments
• Design an animal experiment
• Propose measures to keep a good sanitary status of an animal facility
• Elaborate a breeding strategy for generating experimental and control animals
• Plan a transgenic experiment
• Describe the set-up of an animal house
• Implement ethical principles when performing and planning animal experimentation
• Develop a laboratory animal model for scientific research
• Plan a transgenic experiment
• Propose measures to keep the sanitary status of a facility compliant with the requirements of research
• Describe the set-up of an animal house
• Elaborate a breeding strategy for generating experimental and control animals
• Design an animal experiment
• Interpret in vivo experimental results
• Analyze phenotypic data

Transversal skills
• Respect relevant legal guidelines and ethical codes for the profession.
• Respect the rules of the institution in which you are working.
• Collect data.
• Summarize an article or a technical report.
• Give feedback (critique) in an appropriate fashion.
• Make an oral presentation.
• Demonstrate the capacity for critical thinking

Teaching methods
• Theoretical courses
• Discussion in small groups on a given issue and presentation of the solution envisioned
• Scientific articles analysis and presentation
• Visits of the different facilities of the EPFL

This course will take place on November 12th, 13th and 14th and on November 26th and 27th, 2018. Examination on December 11th, 2018.

Expected student activities
• Attendance to the courses (mandatory)
• Attendance to the visits of the facilities
• Analysis and presentation of a scientific article about in vivo experimentation

Assessment methods
• Written examination at the end of the course
• Oral presentation of a scientific article

Supervision
Office hours No