DEPARTMENT OF NEUROSCIENCE

C4F5239, Behavioural Analysis in Rodents: Classic and Novel Approaches, 1.5 credits (hec)

Beteendeanalys i gnagare: klassiska och nya metoder, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by The Committee for Doctoral Education on 2023-12-05, and was last revised on 2026-09-08. The revised course syllabus is valid from spring semester 2027.

Responsible department

Department of neuroscience, Faculty of Medicine

Contributing department/s

Department of Neurobiology, Care Sciences and Society

Prerequisite courses, or equivalent

No prerequisite courses, or equivalent, demanded for this course.

Purpose & Intended learning outcomes

Purpose

The course is aimed at students working with or interested in behavioral analyses in rodents, particularly mice. The purpose of the course is (1) to enable the students to acquire a solid understanding of basic behavioral tests to use for the phenotypic characterization of rodents, with special emphasis on neurodegenerative and psychiatric diseases, and (2) to allow the students to acquaint themselves with modern, advanced technical procedures for behavioral analysis.

Intended learning outcomes

At the end of the course, the participants should be able to:

1. to *choose* the behavioral tasks that most effectively address their research questions, *justify*

their selections by explaining the reasoning, and *compare* the selected tasks with others.
2. to *describe* the advantages of recent methodological breakthroughs in analyzing rodent behavior.

Course content

The course will provide students with the knowledge needed to apply classical and advanced methodologies to study behavioral paradigms used to phenotypically characterize rodent models of neurodegenerative and psychiatric diseases, as well as to evaluate novel drugs.

During the course, students will learn how to design experiments, analyze behavioral paradigms, and interpret data.

The student will also get a first introduction to deep learning image analysis, end point measurements, optogenetics en and automated analysis of multiple behavioral outputs using the IntelliCage system.

The course will include a practical part, where students will visit the Animal Behavior Core Facility at KM-B and get hands-on-experience on the equipment and the most common protocols used.

Forms of teaching and learning

The course is partly theoretical, partly practical, with integrated lectures, laboratory demonstrations and practical sessions. During the practical sessions, the students will be divided in groups, which will be asked to design a behavioral study in a particular rodent model of disease, with data collection and final analysis.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

All sessions and activities are necessary for the students to successfully complete the course. When absences are justified, missed parts of the course may be compensated in agreement with the course director.

Forms of assessment

The students will be divided in groups (of 2-3) and will be assigned a research article including a specific behavioral methodology/methodologies. The students will give a presentation at the end of the course, interpreting the finding, highligting strenghts and weaknesses, and propose alternative experimental designs.

Course literature

Recommended literature

1. Jacqueline N. Crawley What's Wrong With My Mouse?: Behavioral Phenotyping of Transgenic and Knockout Mice. Second Edition. Hoboken (New Jersey): John Wiley & Sons, 2007.
2. de Angelis MH, Chambon P, Brown S. Standards of Mouse Model Phenotyping. Wiley-Blackwell 2006.
3. Wahlsten D. Mouse Behavioral Testing How to Use Mice in Behavioral Neuroscience. Academic Press 2010.
4. Buccafusco JJ Methods of Behavior Analysis in Neuroscience, 2nd edition. CRC Press/Taylor & Francis, 2009.