

PRACTICAL WORKSHOP

Methodical pipeline for light microscopy of small animal models

December 4 - 6, 2023

- organized by IPHYS Bioimaging Facility
- suitable for PhD students in bio-related fields who plan to work with animal models
- introduces the basic of image acquisition of zebrafish, mouse, and rat

Venue:

Institute of Physiology CAS, Laboratory of Biomathematics,
Krč CAS campus, building DaI, room 011,
Víteňská 1083, Prague 4, 14220

Short description of the course:

The workshop will provide a brief introduction to animal models in physiology. It will help the participants to understand the pitfalls of adopting animal models in their research and provides experts in this area to answer their questions. The workshop targets the zebrafish and rodent models. The participants will learn how to design an experiment with those models and what legislative aspects it entails. They will be taught how to correctly state their hypotheses before the experiment and how to answer them. They will learn how to prepare zebrafish samples for light-sheet imaging and walk through the methodical pipeline of imaging rodent brain structures through cranial window involving surgery, two-photon microscopy scanning, and image analysis.

Emphasis is put on:

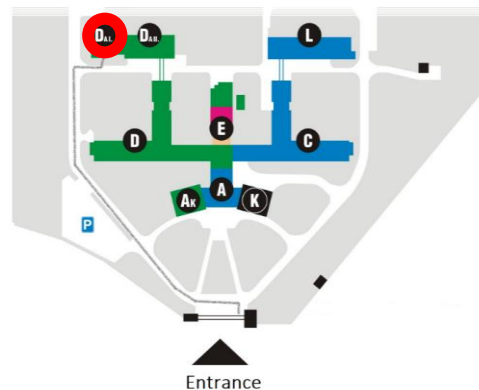
- experimental design
- sample preparation
- data acquisition and analysis

The registration fee is 150 EUR.

Course coordinator: Ing. Mgr. Daniel Hadraba, PhD.

List of instructors:

Ing. Mgr. Daniel Hadraba, PhD.
Mgr. Ondřej Svoboda, PhD.
Mgr. Barbora Radochová, PhD.
Ing. Jiří Černý, Mgr. David Kala, Ing. Martin Blažek
Mgr. Jan Svoboda, Mgr. David Vondrášek
Mgr. Davide Basello, Mgr. Kateřina Štěpánková



Location of Da I. building in the Krč CAS campus

Programme

Monday – 4 December 2023

- 9:15 – 9:30 Welcome (D. Hadraba)
Lecture (IPHYS, meeting room Dal)
- 9:30 – 10:15 Zebrafish models in biological research (O. Svoboda)
Opening Lecture (IPHYS, meeting room Dal)
- 10:15 – 10:30 Coffee break*
- 10:30 – 11:15 Rodent models in biological research (TBA)
Opening Lecture (IPHYS, meeting room Dal)
- 11:15 – 12:00 Design of experiment in animal imaging (D. Hadraba)
Lecture (IPHYS, meeting room Dal)
- 12:00 – 12:30 Lunch*
- 12:30 – 13:00 Zebrafish animal facility (O. Svoboda/ M. Blazek)
Excursion (IMG, zebrafish animal housing - group I/II)
- 13:00 – 14:00 Zebrafish sample preparation for vertical Z1 light-sheet (J. Cerny)
Hands-on (IMG, wet lab. 0.170 - group I/II)
- 14:00 – 15:30 Zebrafish image acquisition at Z1 light-sheet (J. Cerny)
Hands-on (IMG, yellow room 0.173 - group I/II)
- 15:30 – 15:45 Coffee break*
- 15:45 – 16:45 Zebrafish sample preparation for horizontal Leica DLS light-sheet (B. Radochova)
Hands-on (IPHYS, Dal, lab 008 - group I/II)
- 16:45 – 18:15 Zebrafish image acquisition at Leica DLS light-sheet (D. Basello)
Hands-on (IPHYS, Dal, lab 001 - group I/II)

Tuesday – 5 December 2023

- 09:00 – 10:00 Z1 light-sheet data processing (J. Cerny)
Hands-on (IMG, analysis room 0.158 - group I/II)
- 10:00 – 11:00 Leica DLS light-sheet data processing (D. Hadraba)
Hands-on (IPHYS, meeting room Dal - group I/II)
- 11:00 – 11:15 Coffee break*
- 11:15 – 12:45 Surgery implantation of cranial window in mice (J. Svoboda)
Hands-on (IPHYS, lab. D50 - group I/II)
- 12:45 – 13:30 Lunch*
- 13:30 – 15:00 Mock-up surgery implantation of cranial window in 3D printed mice/cadaver bones (D. Kala)
Hands-on (IPHYS, meeting room Dal - group I/II)
- 15:00 – 15:15 Coffee break*
- 15:15 – 17:15 Data acquisition of rodents at Bruker Ultima (D. Vondrasek)
Hands-on (IPHYS, room 009 Dal - group I/II/III)
- 17:15 – 18:00 IPHYS Bioimaging Facility tour with refreshment (D. Vondrasek)
Hands-on (IPHYS, ground floor Dal)

Wednesday – 6 December 2023

- 10:00 – 12:00 Rodents Bruker Ultima data analysis (D. Kala)
Hands-on (IPHYS, meeting room Dal - group I/II/III)
- 12:00 – 13:00 Lunch*
- 13:00 – 15:00 Spinal cord injury (K. Stepankova)
Hands-on (IEM, lab. TBA) – group I/II/III
- 15:00 – 16:00 Farewell and discussion (D. Hadraba)
Hands-on (IPHYS, meeting room Dal)