BASIC COURSE ON LIGHT AND ELECTRON MICROSCOPY

"Across the scales, from electron microscopy to mesoscopic imaging"

Time May 30th to June 1st 2018

Place BCO Light Microscopy (LM) and Electron Microscopy (EM) Core Facility Laboratories, the Main Building of the Medical Campus, University of Oulu, Aapistie 5A, 90220 Oulu, Finland

Credits 1 ETCS

Organisers Health and Biosciences Doctoral Programme and Biocenter Oulu Tissue Imaging Center, University of Oulu, Aapistie 5A, P.O.Box 5000, FI-90014 University of Oulu, Finland, URL: http://www.oulu.fi/biocenter/tic

Aim To get acquainted with light and electron microscopy imaging methods of living and fixed specimens of different sizes. Learn how to apply suitable techniques for image analysis. LM introduction includes basic and confocal fluorescence microscopy and examples of multiphoton techniques. EM part focuses on sample preparation and transmission and scanning electron microscopy.

The course consists of lectures, microscopy demonstrations and computer-based image analysis.

Information Veli-Pekka Ronkainen / Ilkka Miinalainen, Biocenter Oulu, tel: +358 294 486114 / +358 294 486145, e-mail: veli-pekka.ronkainen(at)oulu.fi / ilkka.miinalainen(at)oulu.fi

Registration Lectures are open for all without registration. Registration for the demonstrations is obligatory and preference will be given to Ph.D. students and researchers whose project benefits the topics carried out during the course. Due to space limitations only 18 participants can be accepted. The application with a short description of the applicant’s project should be sent by email to Veli-Pekka Ronkainen (veli-pekka.ronkainen(at)oulu.fi) by 18th of May 2018.
PROGRAMME

Wednesday, May 30th, 2018. Lecture hall F202 (Pharmacology, Aapistie 5A)

Lectures:
9.00-9.05  Opening words and introduction
9.05-10.00 Basics in light/fluorescence microscopy
Veli-Pekka Ronkainen, BCO
10.00-10.15 Coffee break
10.15-11.15 Basics in electron microscopy
Ilkka Miinalainen, BCO
11.15-12.15 Lunch break
12.15-13.15 Principles of advanced fluorescence microscopy techniques
Veli-Pekka Ronkainen
13.15-13.30 Break
13.30-14.30 Methods for preparing biological samples for electron microscopy analysis
Ilkka Miinalainen
14.30-14.45 Introduction to demonstrations
Veli-Pekka Ronkainen


8.45 Gathering in meeting room 487B (Kieppi Building 4th floor, Aapistie 5A) for demonstrations.
9.00-16.00 Demonstrations, 3 groups

Demo 1. Laser scanning confocal and multiphoton microscopy, Room 421A and 492B
Imaging of cells and 3D imaging of thick mesoscopic samples, Veli-Pekka Ronkainen

Demo 2. Transmission electron microscopy and sample preparation, Room 467B and 488B
Imaging of tissue samples and negative staining and imaging of macromolecules,
Mika Kaakinen and Anne Heikkinen

Demo 3. Scanning electron microscopy and sample preparation, Room 320A and 488B
Imaging of tissue and cell samples using different detectors and preparing samples for sputter coating, Ilkka Miinalainen

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Friday, June 1st, 2018. Room 338B and Computer Class K033

9.00-10.00 Introduction to computer-based image processing and analysis, Room 338B
Mika Kaakinen, BCO
10.00-10.15 Coffee break
10.15-11.45 Computer-based processing and analysis of light microscopy images, Computer Class K033
Veli-Pekka Ronkainen, Antti Viklund, Mika Kaakinen
11.45-12.45 Lunch break
12.45-14.15 Computer-based processing and analysis of electron microscopy images, Computer Class K033, Ilkka Miinalainen, Antti Viklund, Mika Kaakinen
14.15 Concluding remarks