



BASIC COURSE ON LIGHT AND ELECTRON MICROSCOPY

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

- Time** 12th to 14th October, 2016
- Place** Room 338B and 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** Biocenter Oulu 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, confocal and light sheet fluorescence microscopy. 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 28th September, 2016.

PROGRAMME

Wednesday, Oct 12th, 2016. Room 338B (Kieppi Building 3rd floor, 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*
- 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

Thursday, Oct 13th, 2016. Gathering in the meeting room 487B (Kieppi Building 4th floor, Aapistie 5A) at 8.45 for demonstrations.

9.00-16.00 Demonstrations, 3 groups

Demo 1. Laser scanning confocal and light sheet fluorescence microscopy, Room 421A and 420A
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

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

Hours	1 st group	2 nd group	3 rd group
9.00-11.00	Demonstration 1	Demonstration 2	Demonstration 3
11.00-12.00	Lunch	Lunch	Lunch
12.00-14.00	Demonstration 2	Demonstration 3	Demonstration 1
14.00-16.00	Demonstration 3	Demonstration 1	Demonstration 2

Friday, Oct 14th, 2016. Room 338B and Computer Class KT033

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 KT033
Veli-Pekka Ronkainen, Antti Viklund, Mika Kaakinen

11.45-12.45 *Lunch*

12.45-14.15 Computer-based processing and analysis of electron microscopy images, Computer Class KT033
Ilkka Miinalainen, Antti Viklund, Mika Kaakinen

14.15 Concluding remarks