



## BASIC COURSE ON LIGHT AND ELECTRON MICROSCOPY

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

- Time** May 30<sup>th</sup> to June 1<sup>st</sup> 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 18<sup>th</sup> of May 2018.

## PROGRAMME

**Wednesday, May 30<sup>th</sup>, 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

**Thursday, May 31<sup>st</sup>, 2018.**

- 8.45 Gathering in meeting room 487B (Kieppi Building 4<sup>th</sup> 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

Hours	1 <sup>st</sup> group	2 <sup>nd</sup> group	3 <sup>rd</sup> group
9.00-11.00	Demonstration 1	Demonstration 2	Demonstration 3
11.00-12.00	Lunch break	Lunch break	Lunch break
12.00-14.00	Demonstration 2	Demonstration 3	Demonstration 1
14.00-16.00	Demonstration 3	Demonstration 1	Demonstration 2

**Friday, June 1<sup>st</sup>, 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