BIOCENTER OULU, Light Microscopy Core Facility Course

**BASIC COURSE ON LIGHT MICROSCOPY**

**Place**
Auditorium P117 and BCO Light Microscopy Core Facility Laboratories, the Main Building of the Medical Campus, University of Oulu, Aapistie 5A, 90220 Oulu, Finland

**Time**
11th to 13th June, 2014

**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](http://www.oulu.fi/biocenter/tic)

**Aim**
To get acquainted with light and fluorescence imaging methods of living and fixed microscopic specimens. Learn how to apply suitable techniques for analysis of images and time lapse movies. Introduction includes basic microscopy, laser scanning and spinning disc confocal microscopy and light sheet fluorescence microscopy.

**Information**
Veli-Pekka Ronkainen, Biocenter Oulu, Aapistie 5A, P.O.Box 5000, FI-90014, University of Oulu, Finland, tel. +358 294 486114, e-mail: veli-pekka.ronkainen(at)oulu.fi
The course consists of lectures, independent learning, microscopy demonstrations and computer-based image analysis.

**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 23th May, 2014.
PROGRAMME

**Wednesday, June 11th, 2014.** Auditorium P117 (Pathology)

**Lectures:**

9.00-9.05 Opening words and introduction  
Sinikka Eskelinen, Biocenter Oulu

9.05-10.00 Basics in light/fluorescence microscopy  
Sinikka Eskelinen

10.00-10.15 *Coffee break*

10.15-11.00 Confocal microscopy techniques  
Veli-Pekka Ronkainen, Biocenter Oulu

11.00-11.15 *Break*

11.15-12.15 Challenges in live cell imaging  
Group work in 2-3 person groups  
Veli-Pekka Ronkainen, Janne Capra and Fumi Suomi, Biocenter Oulu

12.15-13.15 *Lunch*

13.15-14.00 Principles of light sheet fluorescence microscopy  
Veli-Pekka Ronkainen

14.00-14.15 *Break*

14.15-15.15 Examples of practical applications utilizing light microscopy  
Invited speakers from local research groups, short talks

15.15-16.00 Introduction to demonstrations  
Veli-Pekka Ronkainen
Thursday, June 12th, 2014. Gathering in the meeting room 487B, Biocenter Oulu 4th Floor, Aapistie 5A at 8.45 a.m. for demonstrations.

9.00-16.00 Demonstrations, 3 groups

Demo 1. Laser scanning confocal microscopy, Room 421A
Imaging of hypoxic living cells and 3D imaging of thick specimens
Veli-Pekka Ronkainen, Biocenter Oulu

Demo 2. Spinning disc confocal microscopy, Room 422A
Live cell fluorescence and time lapse overnight imaging, molecular dynamics (FRAP)
Fumi Suomi, Biocenter Oulu

Demo 3. Imaging colocalization with a confocal microscope, Room 423A
Imaging and visualization of colocalization in multi-labelled samples
Janne Capra, Biocenter Oulu

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9.00-10.00 Computer-based image processing and analysis, Meeting Room 487B
Basic introduction to image processing
Neslihan Bayramoglu, Center for machine vision research, University of Oulu
Segmentation of fluorescently labeled cells in 3D matrix,
Saad Ullah Akram, Center for machine vision research, University of Oulu

10.00-10.15 Coffee break

10.15-11.00 Computer-based processing and analysis of captured images and time lapse movies, Computer Class KT285
Veli-Pekka Ronkainen, Antti Viklund, Fumi Suomi

11.00-12.00 Lunch

12.00-14.00 Computer-based processing and analysis of captured images and time lapse movies continues, Computer Class KT285
Veli-Pekka Ronkainen, Antti Viklund, Fumi Suomi

14.00 Concluding remarks, Veli-Pekka Ronkainen