

Laboratory of Electron Microscopy
University of Turku, Finland

Faculty of Medicine Postgraduate Education Unit (PGE)

University of Turku, Turku, Finland

A POSTGRADUATE COURSE, Autumn 2017:

PRINCIPLES AND USE OF LIGHT MICROSCOPES

ORGANIZER AND LECTURER: Professor Lauri J. Pelliniemi, Laboratory of Electron
Microscopy, lauri.pelliniemi@utu.fi, tel. 045-2302245

DATE AND TIME: September-December

REGISTRATION: Required; Participants are accepted in the order of registration before the 22nd of
September 2017 to Anne Johansson (phone 8421), Lääketieteellinen
tiedekunta, Medisiina, Kiinamylynkatu 10, 20520 Turku. E-mail:
amjohan@utu.fi

LANGUAGE: English

PLACE: Medisiina B127 1st floor, Kiinamylynkatu 10, 20520 Turku

TARGET GROUPS: - Graduate students
- Postdoctoral fellows
- Other interested persons

COURSE CONTENT: The aim is to give you the knowledge and skills required for proper use of
light microscopes for research. You will learn relevant basics of optics and
to use and adjust the microscope for visual observation and photography in
ordinary, dark field, phase contrast, differential interference contrast, and
fluorescence microscopies. Introduction is given to confocal, two photon,
STED, STORM, PALM, CARS, and SSIM techniques. Other advanced
light, scanning probe or electron microscopy techniques are included on
demand basis.

BACKGROUND: <http://www.light2015.org/Home/ScienceStories/Discoverers-of-Light--.html>

VOLUME: 16 hours lectures and practicals 2 ECTS

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TIME: Tuesdays at 10.15---11.45

Program

- 26.09.2017 1. Introduction to the program and the laboratory, tailoring of the program
- 03.10.2017 2. Basic Concepts in Light Microscopy
- 10.10.2017 3. Optimal adjustment of light path: Köhler illumination (includes hands-on practice)
- 17.10.2017 4. Darkfield Microscopy
Phase Contrast Microscopy
Differential Interference Contrast Microscopy
Fluorescence Microscopy
- 24.10.2017 5. Laser Scanning Confocal Microscopy
Two photon Excitation Laser Scanning Microscopy
Second Harmonic Microscopy
Stimulated emission depletion microscopy (STED)
Stochastic optical reconstruction microscopy (STORM)
Photoactivated localization microscopy (PALM)
Coherent anti-Stokes Raman scattering (CARS) microscopy
Saturated structured illumination microscopy (SSIM)
- 31.10.2017 6. Image recording and processing.
- Image recording and publication
- 07.11.2017 7. Correlation of light microscopy with electron microscopy
- 14.11..2017 8. Interpretation of image and occupational safety in microscopies.
Tour in the microscopy facilities in the Laboratory of Electron Microscopy
- 21.11.2017 Optional day