

Laboratory of Electron Microscopy
University of Turku, Finland

Faculty of Medicine Postgraduate Education Unit (PGE)

University of Turku, Turku, Finland

A POSTGRADUATE COURSE, Autumn 2018:

PRINCIPLES AND USE OF LIGHT MICROSCOPES

ORGANIZER AND LECTURER-1: Professor Lauri J. Pelliniemi, Laboratory of Electron Microscopy, lauri.pelliniemi@utu.fi, tel. +358 45-2302245

Lecturer-2: Professor Eeva-Liisa Eskelinen, Biolääketieteen laitos, eeva-liisa.eskelinen@utu.fi, tel. +358 29 450 3996 | +358 50 511 5631

Lecturer-3: Docent Pieta Mattila, Biolääketieteen laitos, pieta.mattila@utu.fi, tel. +358-50 574 0780

DATE AND TIME: October - November

REGISTRATION: Required; Registration via [Konsta](#). Maximum 10 students are selected to the course based on registration order. Registration opens on September 3rd 2018. More information on registration from PGE Study secretary Sanni Grönlund sanni.gronlund@utu.fi.

LANGUAGE: English

PLACE: Room D2082, Medisiina D, Entrance: Kiinamyllynkatu 10, 20520 Turku

TARGET GROUPS: - Graduate students, postdoctoral fellows and 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, TIRF, 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

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PLACE: Kiinamyllynkatu 10, 20520 Turku

TIME: Wednesdays at 10.15---11.45

Program

- 03.10.2018 1. Introduction to the program and the laboratory, tailoring of the program
- 10.10.2018 2. Basic Concepts in Light Microscopy
- 17.10.2018 3. Optimal adjustment of light path: Köhler illumination
- 24.10.2018 4. Darkfield Microscopy
Phase Contrast Microscopy
Differential Interference Contrast Microscopy
Fluorescence Microscopy
- 31.10.2018 5. Pieta Mattila:

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)

Total internal reflection fluorescence microscopy (TIRF)
Coherent anti-Stokes Raman scattering (CARS) microscopy
Saturated structured illumination microscopy (SSIM)
- 07.11.2018 6. Image recording and processing.
- Image recording and publication
- 14.11.2018 7. Eeva-Liisa Eskelinen:

Correlation of light microscopy with electron microscopy
- 21.11.2018 8. Interpretation of image and occupational safety in microscopies.
Tour in the microscopy facilities in the campus