

Introductions – Microscopy

The introduction to microscopy consists of 2 modules taking place on consecutive days.

On day1 (compulsory for everyone) you will learn fundamentals of light microscopy (ca. 2-3h max).

On the following day there will be 2 sessions, of which you can choose either: **Optical Sectioning or WF Microscopy Module OR both.**

Each block will take 2-2.5h.

Compulsory

Day 1 – Fundamental concepts of microscopy

You will learn:

1. Fundamentals of light microscopy: Optical components, numerical aperture and image planes
2. Light paths and geometrical optics: Image formation, reflection and refraction, optical aberrations
3. Diffraction and interference: Abbes diffraction limit and Rayleigh criterion
4. Spatial resolution and contrast
5. Fluorescence

Please choose one of the two modules or both

Day 2 – Optical Sectioning

You will learn:

1. Optical sectioning by point-scanning confocal and spinning disk microscopy
2. Airyscan Microscopy
3. Two-photon Microscopy
4. Lightsheet Microscopy
5. TIRF (total internal reflection microscopy)
6. Digital imaging with a point detector and with a camera – (e.g. pixels size, Nyquist sampling, bit depth, histogram)

Day 2 - WF Microscopy Module

You will learn:

1. Anatomy of a widefield microscope – transmitted light and fluorescence
2. How to properly illuminate your sample (Koehler illumination)
3. Label free contrast methods: Phase Contrast (PhC), Darkfield Contrast (DC), Differential Interference Contrast (DIC)
4. Digital imaging with a camera – (e.g. pixels size, Nyquist sampling, bit depth, histogram)

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