## Live Cell Imaging Facility Microscopy course 30 Jan - 17 Feb 2023

### Schedule subject to last minute changes. Always check the latest update on this page.

#### Week 1

**Mon 30/01**
- **10:00-10:10** Welcome and introduction, introduction to week 1, tour of the facility
- **10:30-11:30** Lecture: Volume imaging: Deconvolution, Multiphoton, Adaptive Optics
- **13:00-14:00** Student imaging challenge symposium
- **14:15-15:20** Lecture: Introduction to Fourier space and Fourier transforms
- **15:40-16:40** Student imaging challenge symposium
- **16:40-17:15** Group discussion: most common problems encountered and tips

**Tues 31/01**
- **09:00-09:30** Working with light: Lecture: Nature of light
- **09:30-10:00** Working with light: Lecture: Basic optics for light microscopy
- **10:10-10:40** Working with light: Lecture: Image formation
- **10:40-11:10** Sylvie Le Guyader: Quizzes and discussion about Basic optics and image formation
- **11:10-12:00** Sylvie Le Guyader: Biodistribution assessment, Part 2
- **13:00-13:30** Sylvie Le Guyader: Biodistribution assessment, Part 3

**Wed 01/02**
- **09:00-10:00** Anatomy of a microscope: Lecture: Anatomy of a microscope, Part 1
- **10:10-11:30** Sylvie Le Guyader: Lecture: Anatomy of a microscope, Part 2
- **12:30-13:30** Sylvie Le Guyader: Lecture: Anatomy of a microscope, Part 3
- **13:30-14:30** Sylvie Le Guyader: Anatomy of a microscope workshop, Part 1
- **14:15-15:15** Sylvie Le Guyader: Anatomy of a microscope workshop, Part 2

**Thurs 02/02**
- **09:00-10:00** Sylvie Le Guyader: Working with objectives
- **10:10-11:10** Sylvie Le Guyader: Lecture: Objectives
- **11:20-12:00** Sylvie Le Guyader: Lecture: Point Spread Function and resolution
- **13:00-13:30** Sylvie Le Guyader: Lecture: Refraction index mismatch
- **13:30-14:30** Jianjiang Hu: Workshop: Objectives and Refraction index mismatch
- **15:15-17:00** Sylvie Le Guyader: Quiz and group discussion about Objective, PSF and RI mismatch
- **17:00-17:15** Sylvie Le Guyader: Presentation of the week end assignments

#### Week 2

**Tues 07/02**
- **09:00-09:30** Sylvie Le Guyader: Samples
- **09:30-10:20** David Unnersjö-Jess: Feedback about week 1 and introduction to week 2
- **10:30-11:30** Gabriela Imreh: Preparing and imaging live samples
- **12:30-13:45** Sylvie Le Guyader: Workshop: The art of bleaching the sample
- **13:45-15:00** Sylvie Le Guyader: Group assignment: how to improve the sample preparation for each project?
- **15:15-17:15** Sylvie Le Guyader: Group presentations. Discussion: What is the ideal sample for light microscopy?

**Wed 08/02**
- **09:00-10:30** Sylvie Le Guyader: Capturing light
- **10:40-12:00** Sylvie Le Guyader: Lecture: Sensors, Introduction to pixel size
- **12:40-14:40** Gabriela Imreh: Workshop: Camera
- **14:50-16:00** Sylvie Le Guyader: Lecture: Saturation, underexposure, bit depth and image display
- **16:30-16:40** Sylvie Le Guyader: Discussion about saturation
- **16:40-17:00** Sylvie Le Guyader: Presentation of evening assignments

**Thurs 09/02**
- **09:00-11:00** Anna Burvall: The digital image
- **10:00-10:40** Sylvie Le Guyader: Lecture: Resolution, contrast, Nyquist sampling and MTF curves
- **11:00-11:30** Sylvie Le Guyader: Lecture: xyz automation, autofocus, fast imaging
- **12:30-14:00** Sylvie Le Guyader: Lecture: Bridging concepts: resolution, contrast, objectives, sampling rate
- **14:15-15:15** Sylvie Le Guyader: Discussion about sampling
- **15:15-16:00** Sylvie Le Guyader: Lecture: Setting parameters on confocal and widefield systems
- **16:00-17:00** Sylvie Le Guyader: Group discussion about the Nyquist theorem

**Fri 10/02**
- **10:00-12:00** Sylvie Le Guyader: Assignments and Workshop: Student imaging challenge

#### Week 3

**Tues 14/02**
- **09:00-10:30** Victoria Menendez Benito: Volume imaging, Live cell imaging, Super resolution
- **10:40-12:00** Hans Blom: Lecture: Introduction to super resolution microscopy
- **13:00-14:15** LIVE: Lecture: Ethics
- **14:30-17:00** Sylvie Le Guyader: Project reports in groups with peer assessment

**Wed 15/02**
- **09:00-10:00** Sylvie Le Guyader: Lecture: Introduction to Fourier space and Fourier transforms
- **10:10-11:10** Simone Lepper: Lecture: Artificial Intelligence in microscopy
- **11:20-12:10** Jeremy Adler: Lecture: Colocalization
- **13:00-14:00** Sylvia Le Guyader: Data management
- **15:00-17:00** Petr Walczyk: Lecture: How to deal with images for publications, Image formats

**Thurs 16/02**
- **09:00-10:00** Giselle Miranda: Lecture: Introduction to Bioimage analysis
- **13:00-13:50** G. Miranda/C. Avenel/A. Klemm: Workshop: Image analysis
- **16:40-17:00** Sylvie Le Guyader: Conclusion, questions and feedback

**Fri 17/02**
- **10:00-12:00** Examination