

# Live Cell Imaging Facility Microscopy course 26 Jan- 12 Feb 2021

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

Activity code

**Code 1 (Blue): Lectures and demos, public and broadcasted, no registration needed (see link and instructions on our website)**

	When	Who	Code	What	
	<b>Before</b>			<b>Assignments</b>	
<b>Week 1</b>	<b>Tues 26/01</b>			<b>Optics, image formation, fluorescence, fluorophores, microscope and microscopy types</b>	
	09:00-09:30		2	Welcome and introduction, Virtual tour of the facility	
	09:30-10:20	Sylvie Le Guyader	1	Lecture: Nature of light, basic optics for microscopy, image formation	
	10:30-11:00	Sylvie Le Guyader	1	Lecture: Fluorescence and fluorophores	
	11:00-12:15	Sylvie Le Guyader	1	Workshop: Bleedthrough assessment	
	13:15-14:45	Sylvie Le Guyader	1	Lecture: Anatomy of a microscope	
	15:00-16:30	Sylvie Le Guyader	2	Workshop: The art of bleaching the sample	
	16:30-17:10	Sylvie Le Guyader	2	2 Student imaging challenge presentations	
	<b>Wed 27/01</b>			<b>Objectives and refraction index, Cameras and detectors</b>	
	09:00-10:00			2	3 Student imaging challenge presentations
10:10-12:00	Sylvie Le Guyader	1	Lecture: Objectives, PSF and resolution, Refraction index mismatch and scale distortion		
13:00-17:00	Sylvie Le Guyader	2	Workshop: Anatomy of a microscope, Part 1		
<b>Thurs 28/01</b>				<b>Noise and background, Cameras and detectors, Bit depth and saturation, Multicolour imaging</b>	
09:00-10:00			2	Workshop: Student imaging challenge	
10:10-11:10	Sylvie Le Guyader	1	Lecture: Sensors		
11:10-12:10	Sylvie Le Guyader	1	Lecture: Signal, background and noise		
13:00-13:30	Sylvie Le Guyader	1	Lecture: Bit depth and saturation video and lecture. Care of the objectives		
13:30-14:30	Gabriela Imreh	1	Lecture: Filter-based vs spectral imaging. Linear unmixing		
14:45-16:30		2	Discussion and quiz Week 1		
16:30-17:00		2	Wrapping up Week 1		
<b>Fri 29/01</b>			2	Workshop: Student imaging challenge	
<b>Friday-Monday</b>				<b>Assignments</b>	
<b>Week 2</b>	<b>Mon 01/02</b>		2	Workshop: Student imaging challenge	
	<b>Tues 02/02</b>			<b>Resolution and contrast, Sample preparation, Immunostaining</b>	
	09:00-10:00		2	3 Student imaging challenge presentations	
	10:10-12:10	Anna Burvall	1	Lecture: Resolution, contrast, point spread function, Airy, Rayleigh, Abbe, Nyquist and MTF curves	
	13:00-14:00	Gabriela Imreh	1	Lecture: Sample preparation tips	
	14:00-15:00	Gabriela Imreh	1	Lecture: Immunostaining troubleshooting	
	15:15-16:15	Oliver Garner/Marie Andersson	2	Workshop: Camera	
	16:15-17:15	Gabriela Imreh	2	Workshop: Filter-based vs spectral imaging and linear unmixing	
	<b>Wed 03/02</b>				<b>Nyquist sampling, Confocal and wide field settings, Scaling up and speeding up, High throughput/content</b>
	09:00-10:00			2	3 Student imaging challenge presentations
10:10-11:10	Sylvie Le Guyader	1	Lecture: Bridging concepts: resolution, contrast, objectives, sampling rate + quiz		
11:10-12:10	Sylvie Le Guyader	1	Lecture: Setting parameters on confocal and widefield systems		
13:00-14:30	Sylvie Le Guyader	1	Lecture: Scaling up and speeding up imaging: xyz automation, autofocus, fast imaging		
14:30-15:00	Victoria Menendez Benito	1	Lecture: High throughput/content imaging		
15:15-17:15		2	Discussion and quiz Week 2		
<b>Thurs 04/02</b>				<b>Volume imaging, deconvolution, multiphoton, Clearing and expansion</b>	
09:00-10:00			2	3 Student imaging challenge presentations	
10:10-11:10	Sylvie Le Guyader	1	Lecture: Volume imaging, Deconvolution, Multiphoton, Adaptive Optics		
11:10-11:40	David Unnersjö-Jess	1	Lecture: Clearing and expansion microscopy		
11:40-12:10		2	Assignment discussion and quiz		
13:00-14:00	Tobias Nyberg	2	Workshop: High speed imaging		
14:00-15:00	Gabriela Imreh	2	Workshop: Widefield vs confocal		
15:15-17:00	Tobias Nyberg	2	Workshop: Objectives and Refraction Index		
17:00-17:15		2	Wrapping up Week 2		
<b>Fri 05/02</b>			2	Workshop: Student imaging challenge	
<b>Friday-Monday</b>				<b>Assignments</b>	
<b>Week 3</b>	<b>Mon 08/02</b>		2	Workshop: Student imaging challenge	
	<b>Tues 09/02</b>			<b>Live cell imaging, Fourier, AI, Super Resolution microscopy</b>	
	09:00-10:00		2	3 Student imaging challenge presentations	
	10:10-11:10	Gabriela Imreh	1	Lecture: Live cell imaging, label free imaging	
	11:10-11:40	Sylvie Le Guyader	1	Lecture: Introduction to Fourier space and Fourier transforms	
	11:40-12:10	Simone Lepper	1	Lecture: Artificial Intelligence in microscopy images	
	13:00-14:00	Hans Blom	1	Lecture: Introduction to superresolution microscopy: STED, STORM, SIM, AiryScan, Rescan, DNA Paint	
	14:00-15:00	Sylvie Le Guyader	2	Workshop: Multiphoton microscopy	
	15:15-16:15		2	Workshop: Light sheet	
	16:15-17:15	Gabriela Imreh	2	Quiz, Discussion about Assignments week 2 and Changing your imaging settings assignments	
<b>Wed 10/02</b>				<b>Data handling, OMEROFigure, Requirements for image analysis, Colocalization</b>	
09:00-10:00	Sylvie Le Guyader	1	Lecture: How to deal with images for publications, image formats, image/data management		
10:10-11:10	Gisele Miranda	1	Lecture: Sample and microscopy requirements for image analysis		
11:10-12:10	Petr Walczysko	1	Demo: How to easily make figures for publication with OMEROFigure		
13:00-14:00	Jeremy Adler	1	Lecture: Colocalization		
14:00-15:00	Marie Andersson	2	Workshop: STORM		
15:15-16:45		2	Quiz and discussion - Week 3		
16:45-17:00		2	Wrapping up Week 3		
<b>Thurs 11/02</b>				<b>Image processing and analysis</b>	
09:00-10:00			2	Questions, conclusion and feedback for lectures and workshops	
10:10-12:10	Gisele Miranda	2	Workshop: Image analysis		
13:00-15:00	Gisele Miranda	2	Workshop: Image analysis		
<b>Fri 12/02</b>				<b>Examination</b>	
10:00-12:00				Examination	
<b>After</b>				<b>Assignments</b>	