

## Live Cell Imaging Facility Microscopy course 21 Jan- 07 Feb 2020

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

All lectures (except 23 Jan morning) will be broadcasted live and held in the **Gene seminar room** (see webinar link and How to find us on our website)

Lectures on the 23rd of Jan will be held in the **DNA seminar room**, just next to the Gene seminar room

### Activity code

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

**Code 2 (Blue): Discussions, quizzes and workshops for course #2870 and course #2871**

**Code 3 (Orange): Workshops for course #2870 only**

	When	Who	Code	What
	Before			Assignments
Week 1	<b>Tues 21/01</b>			<b>Optics, microscope and microscopy types, fluorescence, fluorophores</b>
	09:00-10:00	Sylvie Le Guyader	2	Welcome and introduction, Tour of the facility
	10:10-12:10	Sylvie Le Guyader	1	Lecture: Nature of light, basic optics for microscopy. Types of microscopy. Anatomy of a microscope
	13:00-13:30	Sylvie Le Guyader	1	Lecture: Fluorescence and fluorophores
	13:30-14:00	Sylvie Le Guyader	2	introduction to Anatomy workshop. Presentation of assignments - week 1, 2 and 3
	14:00-15:30	Sylvie/Gabriela/Tobias/Karl	2	Workshop: Anatomy of a microscope
	15:45-16:15	Sylvie/Gabriela/Tobias	2	Discussion about Anatomy of a microscope workshop. Pick the best microscope for your experiment
	16:15-16:55	Sylvie Le Guyader	3	2 Student imaging challenge presentations
	16:55-17:15	Gabriela Imreh	3	Tour of the cell culture room (for those with live samples)
	<b>Wed 22/01</b>			<b>Objectives and refraction index, Cameras and detectors, Multicolour imaging</b>
	09:00-10:00	Sylvie Le Guyader	3	3 Student imaging challenge presentations
	10:10-11:40	Sylvie Le Guyader	1	Lecture: Objectives, refraction index mismatch and aberrations
	11:40-12:10	Sylvie Le Guyader	1	Lecture: Cameras and detectors
	13:00-14:00	Sylvie Le Guyader	1	Lecture: Filter-based vs spectral imaging. Linear unmixing
	14:00-14:30	Sylvie/Gabriela	2	Group discussion about bleedthrough video. Students in pairs explain if they have bleedthrough and their imaging strategy
14:30-15:00	Sylvie/Gabriela	2	Quiz about types of microscopes and filter vs spectral imaging	
15:15-17:15	Gabriela/Sylvie	3	Workshop: Filter/spectral or Student imaging challenge workshop	
<b>Thurs 23/01</b>			<b>Immunostaining, Colocalization</b>	
09:00-10:00	Michael Browning/in DNA	1	Lecture: Immunostaining troubleshooting	
10:10-11:10	Jeremy Adler/in DNA	1	Lecture: Colocalization	
11:10-12:10	Sylvie Le Guyader/in DNA	2	Discussion about sample preparation and Bit depth and saturation videos. Typical sample prep mistakes. Wrapping up week 1	
13:00-14:00	Sylvie/Gabriela/Tobias/Agustin	2	Workshop: The art of bleaching the sample	
14:00-14:30	Sylvie/Gabriela/Tobias	2	Discussion about the Art of bleaching workshop	
14:30-14:50	Gabriela/Sylvie	2	Quiz and questions	
14:50-15:00	Gabriela/Sylvie	2	Wrapping up Week 1	
15:15-17:15	Gabriela/Sylvie	3	Workshop: Filter/spectral or Student imaging challenge workshop	
<b>Friday-Monday</b>				Assignments
Week 2	<b>Tues 28/01</b>			<b>Resolution and contrast, Live cell imaging</b>
	09:00-10:00	Sylvie Le Guyader	3	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	Hans Blom/Ana Agostinho	1	Lecture: Introduction to superresolution microscopy
	14:00-15:00	Sylvie Le Guyader	2	Discussion about week 1 assignments. Quiz
	15:15-17:15	Tobias/Oliver/Gabriela/Sylvie	3	Workshop: Objectives and Refraction Index or Camera or STORM or Student imaging challenge workshop
	<b>Wed 29/01</b>			<b>Confocal and wide field settings. Scaling up: the power of xyz automation, autofocus, fast imaging, High throughput/content</b>
	09:00-10:00	Sylvie Le Guyader	3	3 Student imaging challenge presentations
	10:10-12:10	Sylvie Le Guyader	1	Lecture: Bit depth. Setting parameters on a confocal and a widefield system, saturation. Care of the objectives
	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	Tobias/Oliver/Gabriela/Sylvie	3	Workshop: Objectives and Refraction Index or Camera or STORM or Student imaging challenge workshop
	<b>Thurs 30/01</b>			<b>Volume imaging, light sheet, multiphoton microscopy, super resolution, clearing and expansion</b>
	09:00-10:00	Sylvie Le Guyader	3	3 Student imaging challenge presentations
	10:10-11:40	Sylvie Le Guyader	1	Lecture: Volume imaging, light sheet, multiphoton
11:40-12:10	David Unnersjö-Jess	1	Lecture: Clearing and expansion microscopy	
13:00-14:00	Tobias Nyberg	2	Discussion about the Objectives and Refraction Index workshop	
14:00-14:45	Sylvie Le Guyader	2	Quiz and questions	
14:45-15:00	Sylvie Le Guyader	2	Wrapping up week 2 and presenting week 2 assignments	
15:15-17:15	Tobias/Sylvie	3	Workshop: High speed imaging or Student imaging challenge workshop	
<b>Friday-Monday</b>				Assignments
Week 3	<b>Tues 04/02</b>			<b>Fourier and Superresolution</b>
	09:00-10:00	Sylvie Le Guyader	3	2 Student imaging challenge presentations
	10:10-11:10	Sylvie Le Guyader	1	Lecture: Bridging resolution, contrast, objectives, sampling rate. introduction to Fourier space and Fourier transforms
	11:10-12:11	Gabriela Imreh	1	Lecture: Live cell imaging, label free imaging
	13:00-15:00	Sylvie Le Guyader	2	Discussion about week 2 assignments. Quiz
	15:15-17:15	Tobias/Gabriela/Sylvie	3	Workshop: High speed imaging or Widefield vs confocal or Student imaging challenge workshop
	<b>Wed 05/02</b>			<b>Data handling, processing and management and Fiji</b>
	09:00-10:00	Sylvie Le Guyader	1	Lecture: How to deal with images for publications, image formats, image/data management part 1
	10:10-11:10	Sylvie Le Guyader	1	Lecture: How to deal with images for publications, image formats, image/data management part 2
	11:10-12:10	Gisele Miranda	1	Lecture: ImageJ/FIJI. Sample and microscopy requirements for image analysis
	13:00-14:50	Sylvie Le Guyader	2	Quiz and assignment discussion - week 3
	14:50-15:00	Sylvie Le Guyader	2	Wrapping up week 3 and presenting assignments
	15:15-17:15	Valentina/Sylvie	3	Workshop: Light sheet or Widefield vs confocal or Student imaging challenge workshop
	<b>Thurs 06/02</b>			<b>Image processing and quantitative analysis</b>
	09:00-10:00	Sylvie Le Guyader	2	Questions
10:10-12:10	Petter Ranefall	2	Workshop: ImageJ/FIJI workshop	
13:00-15:00	Petter Ranefall	2	Workshop: ImageJ/FIJI workshop	
15:15-17:15	Valentina/Sylvie	3	Workshop: Light sheet or Student imaging challenge workshop	
<b>Fri 07/02</b>			<b>Examination</b>	
09:30-09:45	Sylvie Le Guyader	2	Conclusion and feedback	
10:00-12:00		2	Examination	
<b>After</b>				Assignments