

## Live Cell Imaging Facility Microscopy course 22 Jan- 08 Feb 2019

Schedule subject to last minute changes. Always check the latest update on this page.  
All lectures will be held in the **Gene** seminar room (see How to find us on our website, course webpage)

### Activity code

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

**Code 2 (Blue): Workshops for course #2870 and course #2871**

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

	When	Code	What
Week 1	<b>Tues 22/01</b>		<b>Microscope types, fluorescence, fluorophores</b>
	09:00-10:00	2	Welcome and introduction
		2	Tour of the facility
	10:10-12:10	1	Lecture: Nature of light, basic optics, anatomy of a microscope, filter-based or spectral detection
	13:00-13:55	1	Lecture: Fluorescence and different types of fluorophores
	14:00-15:00	1	Lecture: Linear unmixing
	15:15-16:45	2	Workshop: Anatomy of a microscope
	16:45-17:15	2	Discussion about anatomy of a microscope
	17:15-17:30	3	Tour of the cell culture room (for those with live samples)
	<b>Wed 23/01</b>		<b>Antibody staining, sample preparation, live cell imaging, imaging protein interactions</b>
	09:00-10:00	1	Lecture: Immunostaining troubleshooting
	10:10-11:05	1	Lecture: imaging protein-protein interactions
	11:10-12:10	1	Lecture: Colocalization
	13:00-14:00	1	Lecture: Live cell imaging, label free imaging
14:00-15:00	2	Discussion about bleedthrough video and sample preparation videos	
15:15-17:15	3	Workshop: Filter/spectral or STORM or Rescan Confocal Microscope or Student imaging challenge	
Week 2	<b>Thurs 24/01</b>		<b>Objectives, cameras/detector, unmixing</b>
	09:00-11:00	1	Lecture: Objectives, refraction index mismatch and aberrations, Cameras and detectors (break in the middle)
	11:10-11:55	2	Quiz and questions
	11:55-12:10	2	Wrapping up week 1 and presenting assignments
	13:00-14:00	2	Workshop: The art of bleaching samples
	14:00-15:00	2	Results of the Art of bleaching workshop
	15:15-17:15	3	Workshop: Filter/spectral or STORM or Rescan Confocal Microscope or Student imaging challenge
<b>Friday-Monday</b>			<b>week 1 assignment</b>
Week 2	<b>Tues 29/01</b>		<b>Resolution and contrast</b>
	09:00-10:00	3	3 Student imaging challenges
	10:10-12:10	1	Lecture: Resolution, contrast, point spread function, Airy, Rayleigh, Abbe, Nyquist and MTF curves
	13:00-15:00	2	Quiz and assignment discussion - week 1
	15:15-17:15	3	Workshop: Objectives and Refraction Index or Camera or Student imaging challenge
	<b>Wed 30/01</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	3	3 Student imaging challenges
	10:10-12:10	1	Lecture: Setting parameters on a confocal and a widefield system, saturation, bit depth
	13:00-14:25	1	Lecture: Scaling up and speeding up imaging: xyz automation, autofocus, fast imaging, high throughput imaging
	14:30-15:00	1	Lecture: High throughput screens
	15:15-17:15	3	Workshop: Objectives and Refraction Index or Camera or Student imaging challenge
	<b>Thurs 31/01</b>		<b>Volume imaging, multiphoton microscopy, super resolution, clearing and expansion</b>
	09:00-10:00	3	3 Student imaging challenges
	10:10-11:35	1	Lecture: Volume imaging, multiphoton, super resolution
11:40-12:10	1	Lecture: Clearing and expansion microscopy	
13:00-14:30	2	Workshop: Refraction index mismatch analysis	
14:30-14:45	2	Wrapping up week 2 and presenting assignments	
14:45-15:15	2	Workshop: Zen for confocal crash course (not mandatory, skipping coffee break)	
15:15-17:15	3	Workshop: High speed imaging or Primo or Student imaging challenge	
<b>Friday-Monday</b>			<b>week 2 assignment</b>
Week 3	<b>Tues 5/02</b>		<b>Quantitative imaging</b>
	09:00-10:00	3	3 Student imaging challenges
	10:10-12:10	1	Lecture: Quantitative imaging
	13:00-15:00	2	Quiz and assignment discussion - week 2
	15:15-17:15	3	Workshop: High speed imaging or WF vs confocal or Student imaging challenge
	<b>Wed 6/02</b>		<b>Data handling, processing and management, Fiji</b>
	09:00-10:00	3	3 Student imaging challenges
	10:10-12:10	1	Lecture: How to deal with images for publications, image formats, image/data management
	13:00-14:45	1	Lecture: ImageJ/FIJI. Sample and microscopy requirements for image analysis
	14:45-15:00	2	Wrapping up week 3 and presenting assignments
	15:15-17:15	3	Workshop: Light sheet or WF vs confocal or Student imaging challenge
	<b>Thurs 7/02</b>		<b>Image processing and quantitative analysis- Cell Profiler and Cell Profiler Analyst</b>
	09:00-09:20	3	1 Student imaging challenge
	09:20-10:00	2	Questions
10:10-12:10	2	Workshop: ImageJ/FIJI workshop	
13:00-15:00	2	Workshop: Cell Profiler workshop	
15:15-17:15	3	Workshop: Light sheet or Student imaging challenge	
<b>Fri 8/02</b>		<b>Image processing and quantitative analysis- Cell Profiler and Cell Profiler Analyst</b>	
13:00-13:15	2	Conclusion and feedback	
13:15-...	2	Examination	
<b>After</b>			<b>week 3 assignment</b>

**Lecturers and workshop leaders: see next page**

<b>Lecturers</b>	<b>Affiliation</b>
Charlotte Stadler	SciLive Lab/KTH
David Unnersjö-Jess	SciLive Lab/KTH
Eric Manders	Confocal.nl
Ilaria Testa	SciLive Lab/KTH
Jason Swedlow	University of Dundee, Scotland UK
Marc Tramier	University Rennes 1, France
Sylvie Le Guyader	LCI/KI
Victoria Menendez Benito	KI

<b>Workshop leaders</b>	<b>Affiliation</b>
Eric Manders	Confocal.nl
Gabriela Imreh	LCI/KI
Marie Andersson	Nikon/Bergman Labora
Mehmet Deniz Akyz	Alveole, France
Neveen Hosny	M-Squared Lasers, UK
Oliver Garner	Nikon/Bergman Labora
Petter Ranefall	SciLife Lab/Uppsala University
Rodrigo Lozano	KI
Sara Göransson	KI
Sylvie Le Guyader	LCI/KI
Tobias Nyberg	LCI/KTH