

## 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                              | Who                         | Code   | What   |
|-----------------------------------|-----------------------------------|-----------------------------|--|--|
| Week 1                            | <b>Tues 22/01</b><br>09:00-10:00  | Sylvie Le Guyader           | 2  | <b>Microscope types, fluorescence, fluorophores</b><br>Welcome and introduction  |
|                                   |                                   |                             | 2  | Tour of the facility   |
|                                   | 10:10-12:10                       | Sylvie Le Guyader           | 1  | Lecture: Nature of light, basic optics for microscopy. The different types of microscopes  |
|                                   | 13:00-14:00                       | Sylvie Le Guyader           | 1  | Lecture: Fluorescence and different types of fluorophores  |
|                                   | 14:00-15:00                       | Sylvie Le Guyader           | 1  | Lecture: Filter-based vs spectral imaging. Linear unmixing   |
|                                   | 15:15-16:45                       | Sylvie/Gabriela/Tobias/Karl | 2  | Workshop: Anatomy of a microscope  |
|                                   | 16:45-17:15                       | Sylvie/Gabriela/Tobias      | 2  | Discussion about anatomy of a microscope   |
|                                   | 17:15-17:30                       | Gabriela Imreh              | 3  | Tour of the cell culture room (for those with live samples)  |
|                                   | <b>Wed 23/01</b><br>09:00-10:00   | Charlotte Stadler           | 1  | <b>Antibody staining, sample preparation, live cell imaging, imaging protein interactions</b><br>Lecture: Immunostaining troubleshooting |
|                                   | 10:10-11:10                       | Marc Tramier /SLG           | 1  | Lecture: Imaging protein-protein interactions  |
|                                   | 11:10-12:10                       | Erik Manders                | 1  | Lecture: Colocalization  |
|                                   | 13:00-14:00                       | Sylvie Le Guyader           | 1  | Lecture: Live cell imaging, label free imaging   |
|                                   | 14:00-15:00                       | Sylvie/Gabriela             | 2  | Discussion about bleedthrough video and sample preparation videos  |
|                                   | 15:15-17:15                       | Gabriela/Marie/Erik/Sylvie  | 3  | Workshop: Filter/spectral or STORM or Rescan Confocal Microscope or Student imaging challenge  |
| <b>Thurs 24/01</b><br>09:00-10:45 | Sylvie Le Guyader                 | 1                           | <b>Objectives, cameras/detector, unmixing</b><br>Lecture: Objectives, refraction index mismatch and aberrations. Cameras and detectors |  |
| 10:55-11:55                       | Sylvie Le Guyader                 | 2                           | Week 1 quiz and questions  |  |
| 11:55-12:10                       | Sylvie Le Guyader                 | 2                           | Week 1 wrapping up and assignments   |  |
| 13:00-14:30                       | Sylvie/Gabriela/Tobias/Sara       | 2                           | Workshop: The art of bleaching samples   |  |
| 14:30-15:00                       | Sylvie/Gabriela/Tobias/Sara       | 2                           | Discussion about the Art of bleaching workshop   |  |
| 15:15-17:15                       | Gabriela/Marie/Erik/Sylvie        | 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><br>09:00-10:00  | Sylvie Le Guyader           | 3  | <b>Resolution and contrast</b><br>3 Student imaging challenges   |
|                                   | 10:10-12:10                       | Anna Burvall                | 1  | Lecture: Resolution, contrast, point spread function, Airy, Rayleigh, Abbe, Nyquist and MTF curves                                       |
|                                   | 13:00-14:00                       | Sylvie Le Guyader           | 1  | Lecture: Reminder: Resolution, contrast, objectives, camera, sampling rate. introduction to Fourier space and Fourier transforms         |
|                                   | 14:00-15:00                       | Sylvie Le Guyader           | 2  | Discussion about Week 1 Assignment   |
|                                   | 15:15-17:15                       | Tobias/Oliver/Sylvie        | 3  | Workshop: Objectives and Refraction Index or Camera or Student imaging challenge   |
|                                   | <b>Wed 30/01</b><br>09:00-10:00   | Sylvie Le Guyader           | 3  | <b>imaging</b><br>3 Student imaging challenges   |
|                                   | 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                          |
|                                   | 13:00-14:25                       | Sylvie Le Guyader           | 1  | Lecture: Scaling up and speeding up imaging: xyz automation, autofocus, fast imaging, high throughput imaging                            |
|                                   | 14:30-15:00                       | Victoria Menendez Benito    | 1  | Lecture: High throughput screens   |
|                                   | 15:15-17:15                       | Tobias/Oliver/Sylvie        | 3  | Workshop: Objectives and Refraction Index or Camera or Student imaging challenge   |
|                                   | <b>Thurs 31/01</b><br>09:00-10:00 | Sylvie Le Guyader           | 3  | <b>Volume imaging, multiphoton microscopy, super resolution, clearing and expansion</b><br>3 Student imaging challenges                  |
|                                   | 10:10-11:35                       | Sylvie Le Guyader           | 1  | Lecture: Volume imaging, multiphoton, light sheet. Introduction to super resolution microscopy.  |
|                                   | 11:40-12:10                       | David Unnesjö-Jess          | 1  | Lecture: Clearing and expansion microscopy   |
|                                   | 13:00-14:00                       | Tobias Nyberg               | 2  | Discussion about the Objectives and Refraction Index workshop  |
| 14:00-14:30                       | Sylvie Le Guyader                 | 2                           | Week 2 quiz and questions  |  |
| 14:30-14:45                       | Sylvie Le Guyader                 | 2                           | Week 2 wrapping up and assignments   |  |
| 14:45-15:15                       | Sylvie Le Guyader                 | 2                           | Workshop: Zen for confocal crash course (not mandatory, skipping coffee break)   |  |
| 15:15-17:15                       | Tobias/Aurelien/Sylvie            | 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><br>09:00-10:00   | Sylvie Le Guyader           | 3  | <b>Quantitative imaging</b><br>3 Student imaging challenges  |
|                                   | 10:10-12:10                       | Sylvie Le Guyader           | 1  | Lecture: How to deal with images for publications, image formats, image/data management  |
|                                   | 13:00-15:00                       | Sylvie Le Guyader           | 2  | Discussion about Week 2 Assignment- Week 3 quiz  |
|                                   | 15:15-17:15                       | Tobias/Gabriela/Sylvie      | 3  | Workshop: High speed imaging or Widefield vs confocal or Student imaging challenge   |
|                                   | <b>Wed 6/02</b><br>09:00-10:00    | Sylvie Le Guyader           | 3  | <b>Data handling, processing and management, Fiji</b><br>3 Student imaging challenges  |
|                                   | 10:10-12:10                       | Jason Swedlow               | 1  | Lecture: Quantitative imaging  |
|                                   | 13:00-14:45                       | Sylvie Le Guyader           | 1  | Lecture: ImageJ/FIJI. Sample and microscopy requirements for image analysis  |
|                                   | 14:45-15:00                       | Sylvie Le Guyader           | 2  | Week 3 wrapping up and assignments   |
|                                   | 15:15-17:15                       | Neveen/Gabriela/Sylvie      | 3  | Workshop: Light sheet or Widefield vs confocal or Student imaging challenge  |
|                                   | <b>Thurs 7/02</b><br>09:00-09:20  | Sylvie Le Guyader           | 3  | <b>Image processing and quantitative analysis- Cell Profiler and Cell Profiler Analyst</b><br>1 Student imaging challenge                |
|                                   | 09:20-10:00                       | Sylvie Le Guyader           | 2  | Week 3 quiz and questions  |
|                                   | 10:10-12:10                       | Petter Ranefall             | 2  | Workshop: ImageJ/FIJI workshop   |
|                                   | 13:00-15:00                       | Petter Ranefall             | 2  | Workshop: Cell Profiler workshop   |
|                                   | 15:15-17:15                       | Neveen/Sylvie               | 3  | Workshop: Light sheet or Zen crash course or Student imaging challenge   |
| <b>Fri 8/02</b><br>13:00-13:15    | Sylvie Le Guyader                 | 2                           | <b>Examination</b><br>Conclusion and feedback  |  |
| 13:15-...                         |                                   | 2                           | Examination  |  |
| <b>After</b>                      |                                   |                             |  | <b>week 3 assignment</b>   |