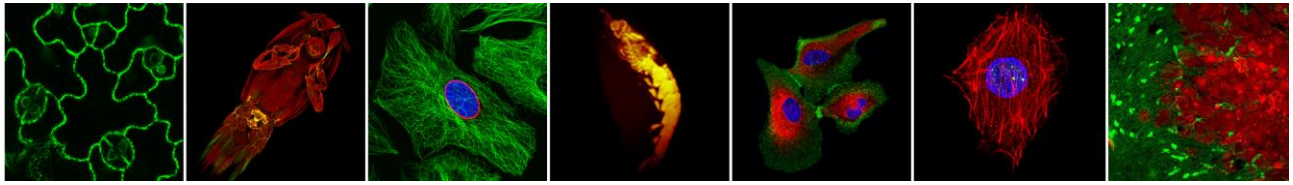
MIC
Molecular Imaging Center



Invitation to the 13th MIC confocal microscopy course
at the Dept. of Biomedicine, University of Bergen
21st of March – 44th of March 2017

MIC is happy to announce our 12th confocal course. The course is aimed at those of you who want to learn how to use a confocal microscope and will help you get started in the field of confocal imaging either you use the equipment at MIC or at your local institution. The principles of confocal imaging and the parameters to be aware of to be able to acquire the optimal images are the same regardless of which imaging system you use.
Some previous experience in confocal microscopy is clearly an advantage but not a prerequisite.

MIC has 2 confocal systems: Leica SP5 (AOBS) and Zeiss LSM 510 META.
You will be introduced to one of the systems depending on your preference indicated on the registration form (if available space).

When? 21st-24th of March 2017

Where? Molecular Imaging Center, Inst. of Biomedicine, Jonas Lies vei 91, 5009 Bergen

Course fee? 4.500,- (incl. course material, dinner on the second evening and lunch on the last day)

The course has limited capacity of 18 participants and registration deadline is 20th of February 2017.

For registration please fill in this form: https://skjemaker.app.uib.no/view.php?id=3026262

Course program:

Day 1 (Tuesday 21st of March)*		**Day 2 (Wednesday 22nd of March)***		**Day 3 (Thursday 23rd of March)***		**Day 4 (Friday 24th of March)**	
1000-1015	Welcome, intro, *coffee*	0900-1100	Software presentation and demonstration - group B	0900-1000	Imaris (H)	0830-1030	**Workshop 4**
1015-1100	Basics of confocal microscopy (H)	1100-1115	*Coffee break*	1000-1015	*Coffee break*	1030-1045	*Coffee break*
1100-1145	Optimal image acquisition (E)	1115-1200	Sample preparation (M)	1015-1100	Introduction to super-resolution microscopy (H)	1045-1245	**Workshop 5**
1145-1230	*Lunch*	1200-1245	*Lunch*	1100-1145	Do and don’ts in image processing (M)	1245-1330	*Common lunch with evaluation* ***(Seminar room 7th floor)***
1230-1300	*Continuous:* Optimal image acquisition (E)	1245-1345	Photoshop (M)	1145-1230	*Lunch*	1330-1530	**Workshop 6**
1300-1345	Fluorochromes & fluorescent proteins (H)	1345-1430	Image J / Fiji (E)	1230-1430	**Workshop 2**		
1345-1400	*Coffee break*	1430-1445	*Coffee break*	1430-1445	*Coffee break*		
1400-1500	Image representation and processing (E)	1445-1645	**Workshop 1**	1445-1645	**Workshop 3**		
1500-1700	Software presentation and demonstration - group A						
		1800-	Common dinner				

***All presentations in Histologisal 3, 4th floor** *H: Hege A Dale* *M: Michaël Marie* *E: Endy Spriet*

Additional information:

- In order to fit everyone into the schedule, all groups will have some free time during the scheduled workshops.
- We invite participants to bring their own samples to the course. The second confocal hands on session is dedicated to imaging of own samples. If you don't' have own samples you may borrow from us.
- The workshops involving confocal imaging will be at Leica confocals; SP5 and SP8. If you have other confocal brands available the software will be different but the principles of confocal imaging is still the same as is the things to consider for optimal image acquisition.
- Information regarding accommodation: Haukeland hotel (55209200) and Regines Gjestehus (55979600) are both within a short walking distance, but practically all hotels in the city centre will be quite close to a bus stop for the lines 2, 3, 12 and 80 that will take you to the bus stop Haukeland Nord. The bus takes approx. 10 minutes.

The lectures:

Basics of confocal microscopy:

We will compare conventional fluorescence microscopy and confocal microscopy, focusing on the basic principles of confocal imaging.

Optimal image acquisition:

What is a digital image? Resolution in 3 dimensions. What limits the resolution of confocal images? How to acquire the optimal image?

Fluorochromes and fluorescent proteins (FPs):

How to combine different fluorochromes?

An overview will be given of the many different FPs, focusing on advantages and disadvantages of the most commonly used ones.

Sample preparation:

Optimal sample preparation is the most important prerequisite of successful confocal imaging. We will focus on different strategies of preparing your samples, potential problems and tricks to try when things get tough.

Imaging representation and processing:

A digital image can be processed in many ways, either to make it look better or to carry out measurements or quantifications. We will see how simple display adjustments change the perception of an image. We will learn how to use the histogram and lookup-table to optimize image representation. We will also briefly cover the role of human perception.

Introduction to super-resolution microscopy:

Super-resolution microscopy is light microscopy imaging below the diffraction limit of 200 nm. In recent years several commercial systems based on different super-resolution technologies have become available and we will introduce the most common ones. We will also discuss the possibilities and obstacles these techniques imply compared to confocal imaging.

Presentation of Leica software:

Introduction to the Leica hardware and software.

Presentation of Adobe® Photoshop® software:

Introduction to the commercial Adobe® Photoshop® software.

Presentation of Imaris software with focus on colocalization analysis:

Introduction to the commercial, scientific image visualization and analysis software Imaris.

Presentation of Fiji software:

Introduction to the free, scientific image visualization, processing and analysis software Fiji.

DO's and DON'Ts in image processing:
What is image processing and what is manipulation? Which guidelines do I have to follow when creating a figure panel for a publication? What is a "representative" image?

The workshops:

General training will be with Endy or Hege on a Leica confocal. We will go through the most common operating modes of the confocal microscopes, learn how to acquire a correct image and how to acquire Z-stacks, and if time allows it go through more specialized operation modes.

We will have two **confocal hands on** sessions where people are divided into groups of 3 people. On the second session you will be at the microscope mostly on your own and practice what you have recently learnt. In the second session you can also bring your own samples.

Software sessions on Photoshop, Imaris and Fiji will be held at a PC-station with 4 PCs. We will give out some tasks for you to solve to learn simple image processing, and tip you on some useful freeware to download at "home".