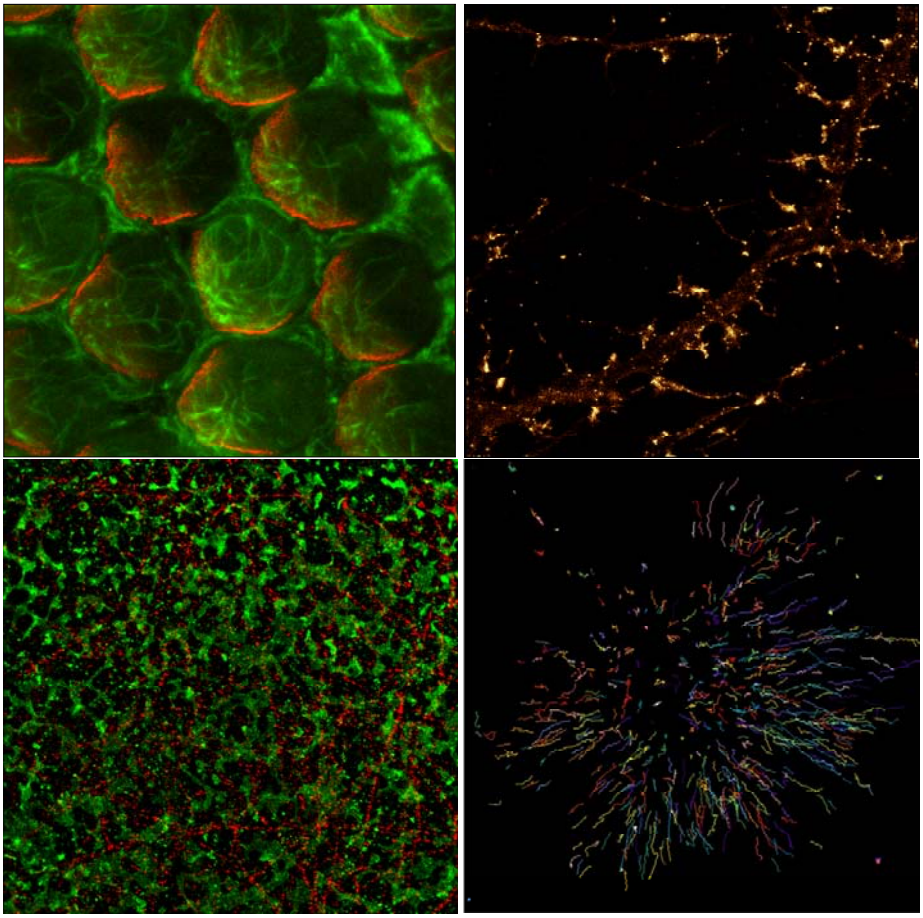
Workshop

Imaging techniques

From basics to practice

Tuesday 20th to Friday 23rd of November 2012

in Bordeaux



SyMBaD
International Research and Training program
Synapses: from Molecules to Brain and Diseases

Imaging techniques:
From basics to practice
Tuesday 20th to Friday 23rd of November 2012

Where

Bordeaux Imaging Center and UMR 5297, IINS
Institut François Magendie, 146 rue Léo-Saignat, Université de Bordeaux II
Centre de génomique fonctionnelle
146 rue Léo-Saignat, Université de Bordeaux II

Aim

To provide theoretical and practical training in photonic microscopy

- Widefield microscopy
- Confocal scanning and spinning-disk microscopy
- Multiphoton microscopy
- F-techniques
- High resolution techniques
    - STED microscopy
    - PALM and STORM or GSD microscopy
    - Structured illumination microscopy

Participants:

Doctoral researchers

Program

Theoretical sessions:

1) Introduction to photonic microscopy and fluorescence
2) Confocal scanning and spinning-disk microscopy
3) Multiphoton microscopy
4) F-techniques
5) Introduction to super resolution techniques in microscopy
6) Principles and experiment set-up of super resolution techniques
7) Interest, advantages and limitations of each technique
8) Photo-physics of fluorescent probes for super-resolution
9) Samples preparation for super resolution techniques

Scientific presentations:

For each super resolution techniques, a scientific presentation by advanced to highlight theirs advantages and limitations

Practical sessions:

Practical sessions will strengthen the link between theory and application of different biological samples. Laboratory systems and commercial systems will be available and several experiments will be presented.

All participants:

For epifluorescence, confocal scanning microcopy, spinning-disk microscopy, multiphoton microscopy, F-techniques: 2 sessions of 2 hours to choose

8 participants

For each super resolution techniques STED and PALM / dSTORM / GSDIM: 2 sessions of 2 hours
Available systems:

- Several epifluorescence, confocal scanning and spinning-disk microscopes
- 3 STED microscopes: 2 laboratory pulsed STED (single-photon excitation and multi-photon excitation) and 1 pulsed STED 2 colors (commercial system)
- 3 PALM/dSTORM microscopes: 1 (spt) PALM laboratory system and 1 dSTORM laboratory system, 1 GSDIM commercial system.

Images analysis:

Techniques PALM / STORM / GSDIM are based on the location of individual molecules. A 2-hours practical session on computers will dissect the principles of image analysis in two and three dimensions.

Round table and discussion:

The last day will conclude with a roundtable discussion to go back on the benefits and limitations of different techniques of super-resolution microscopy.

Program

	Day 1		Day 2		Day 3		Day 4
9h-9h30	Introduction/ Présentation	**9h-9h30**	Introduction/ Présentation	**9h-10h**	Photoswitching fluorophores for super-resolution microscopy Ulrike Endesfelder	**9h-9h45**	Sample preparation : the crucial points to obtain the best SR image Nathalie Garin
9h30-10h30	Basics of microscopy Philippe Legros/ Christel Poujol	**9h30-10h30**	STED microscopy Philippe Legros	**10h-11h**	STED microscopy in living brain slices Valentin Nägerl	**10h-11h**	Structured Illumination Microscopy Vincent Studer
Pause							
11h-12h30	Basics of microscopy Philippe Legros/ Christel Poujol	**11h-12h30**	Single particle based microscopy Jean-Baptiste Sibarita	**11h-30 12h30**	The inner life of adhesion sites: Integrin dynamics at the nano-scale Olivier Rossier	**11h-30 12h30**	To be determined: Seminar on SIM microscopy
Déjeuner							
14h-16h	Practical session Confocal microscopy	**14h-16h**	Practical session STED/ PALM-GSDIM	**14h-16h**	Practical session STED/ PALM-GSDIM	**14h-16h**	Image analysis
Pause							
16h-18h	Practical session Spinning-disk microscopy	**16h-18h**	Practical session STED/ PALM-GSDIM	**16h-18h**	Practical session STED/ PALM-GSDIM	**16h-17h**	Round table/discussion

SPEAKERS

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