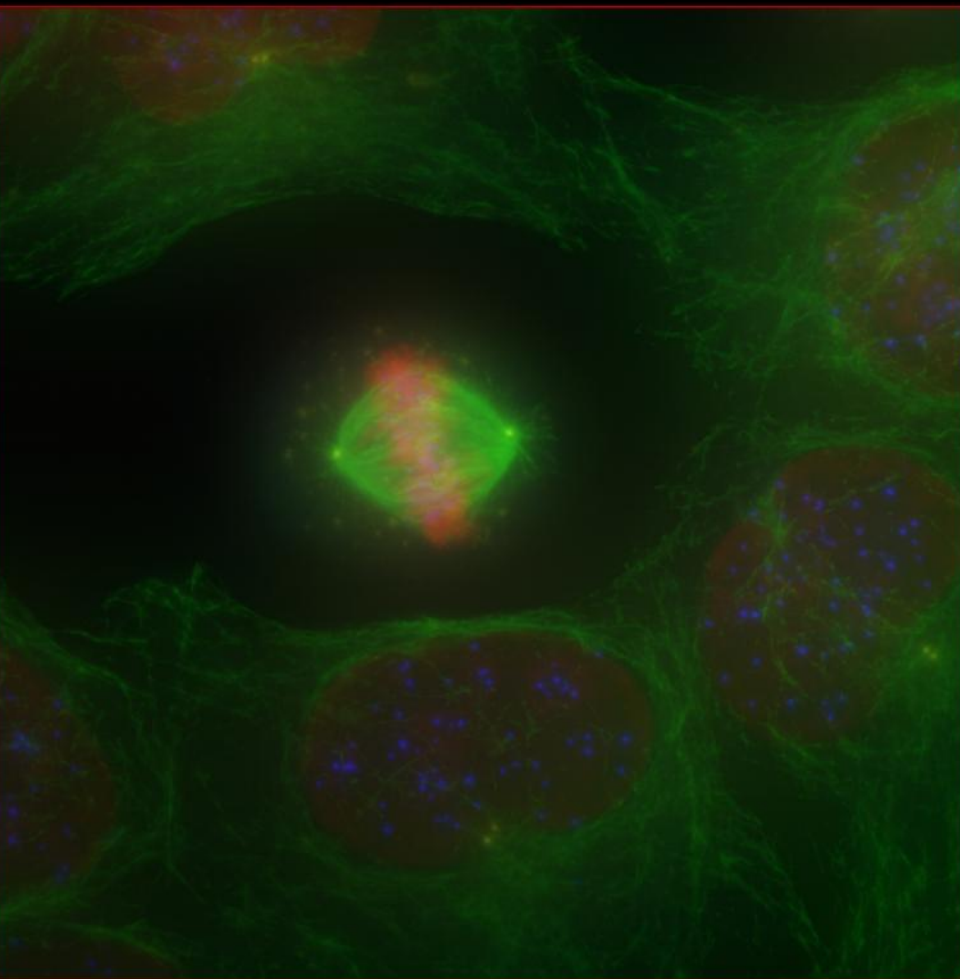
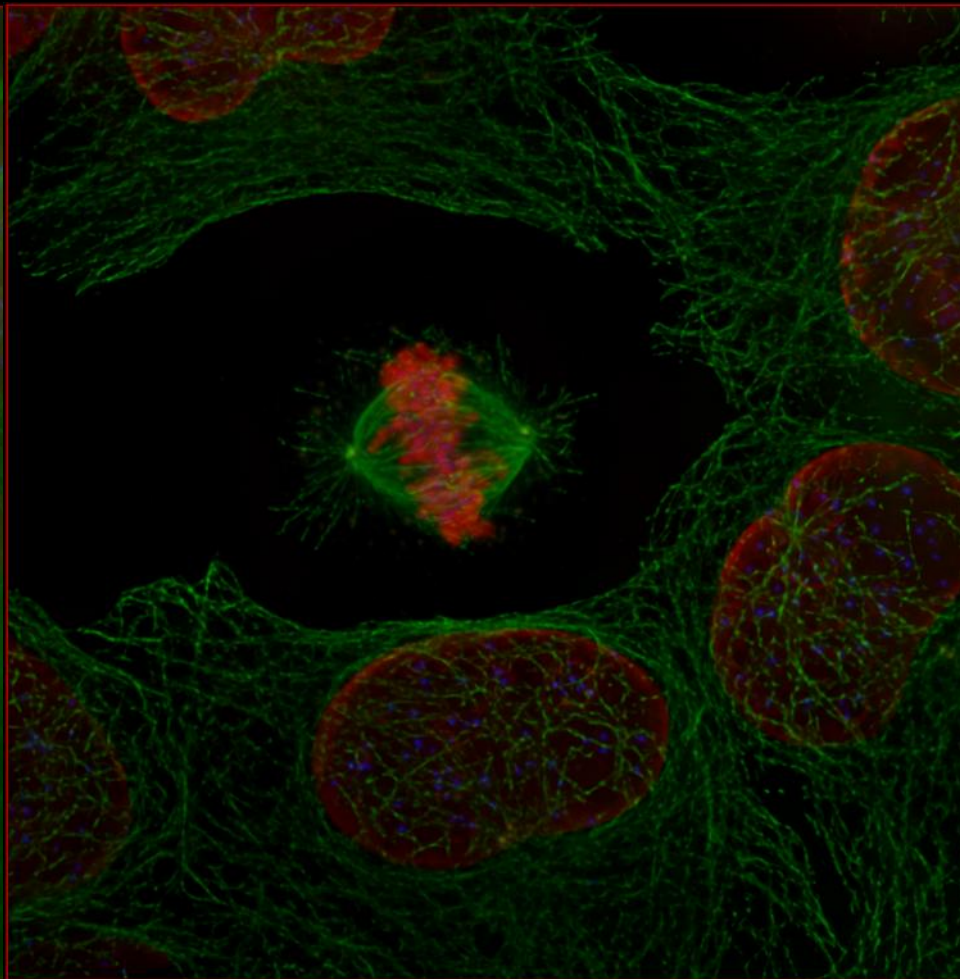


# Cell Imaging ...

Making a clear picture to study cellular functions and processes



raw image max intensity Z-projection



deconvolved image max Z-projection

From image acquisition at the microscope to quantitative image analysis

# Cell Imaging: from light to electrons

## Monday Sept. 14 RH10A Lectures

Presential or Videoconference

General introduction on microscopy

Optical and light microscopy

Fluorescence microscope

Optical sectioning

Labeling for LM

## Tuesday Sept. 15 RH10A Presential or Mixed

Electron microscopy and cryo EM

3D Imaging in EM

Sample prep to image processing

## Wednesday Sept. 16 Practices Imagoseine / Computer Lab presential

Advanced imaging at Imagoseine Imaging Facility

Fluosim: simulator of single molecule dynamics for  
live cell and super resolution imaging.

Quantitative imaging for the study of cells kissing

## Thursday Sept. 17 Practice Computer Lab

Presential

Workshop: Image analysis, using ImageJ/Fiji, Image  
processing.

## Friday Sept. 18 RH10A Presential or mixed

Correlative light and Electron microscopy

Quantitative Biological Imaging using Icy

Group presentation by students (Exam)

## Lecturers

Frédéric Coquelle, Curie Institute, Orsay

Mélina Heuzé, Univ. Paris, Institut Jacques Monod

Stéphane Rigaud, Pasteur Institute, Paris

Olivier Thoumine Neurosciences, CNRS Bordeaux

Jean-Marc Verbavatz, Univ. Paris, Institut Jacques Monod

## Image processing Workshop and Imaging Facility

Frédéric Coquelle, Curie Institute, Orsay

Xavier Baudin, Imagoseine, IJM

Nicolas Moisan Imagoseine, IJM

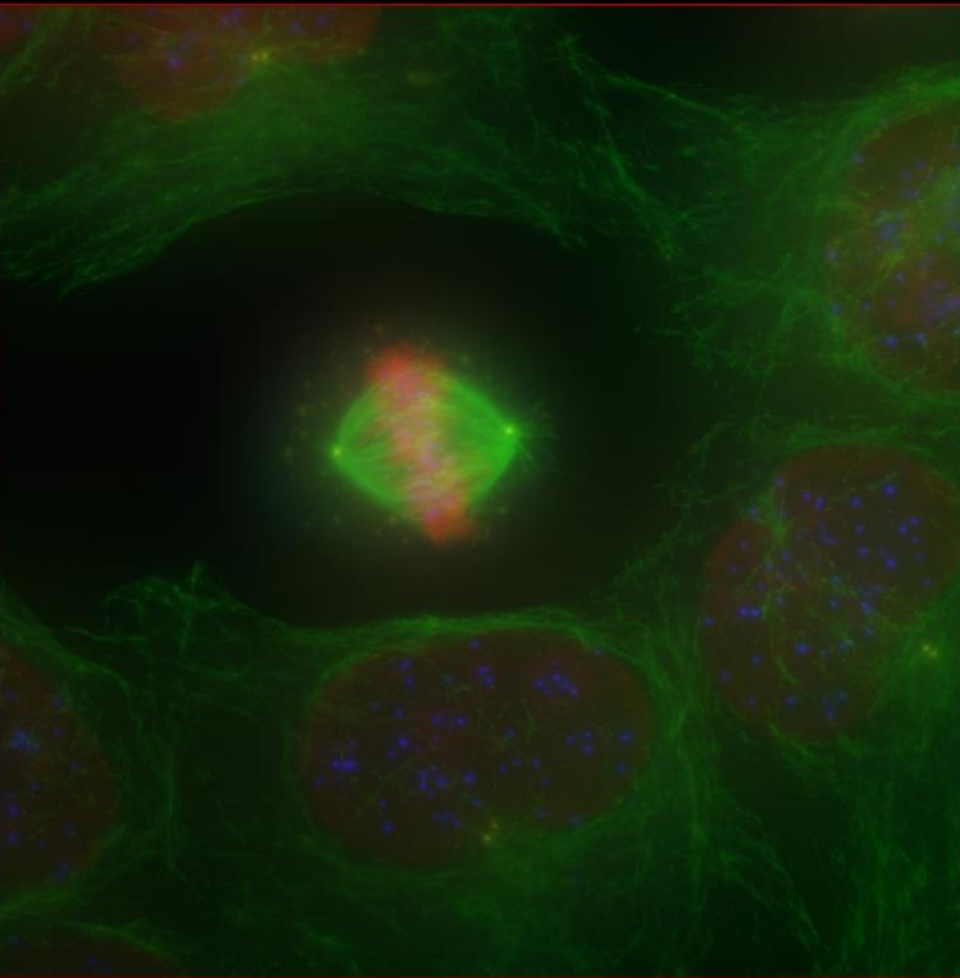
Rémi le Borgne, Imagoseine, IJM

Catherine Durieu, Imagoseine IJM

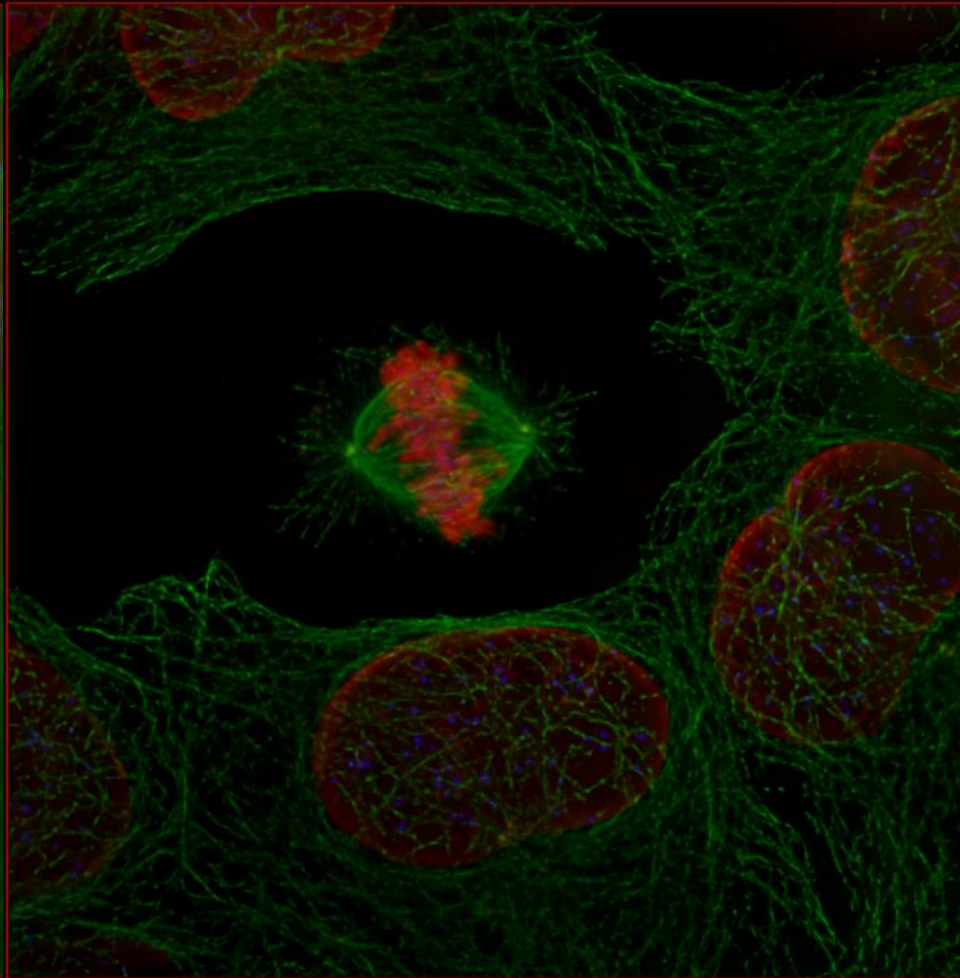
Jean-Marc Verbavatz, Univ. Paris, IJM

Jean-marc.verbavatz@u-paris.fr

# Applications of image processing in light microscopy



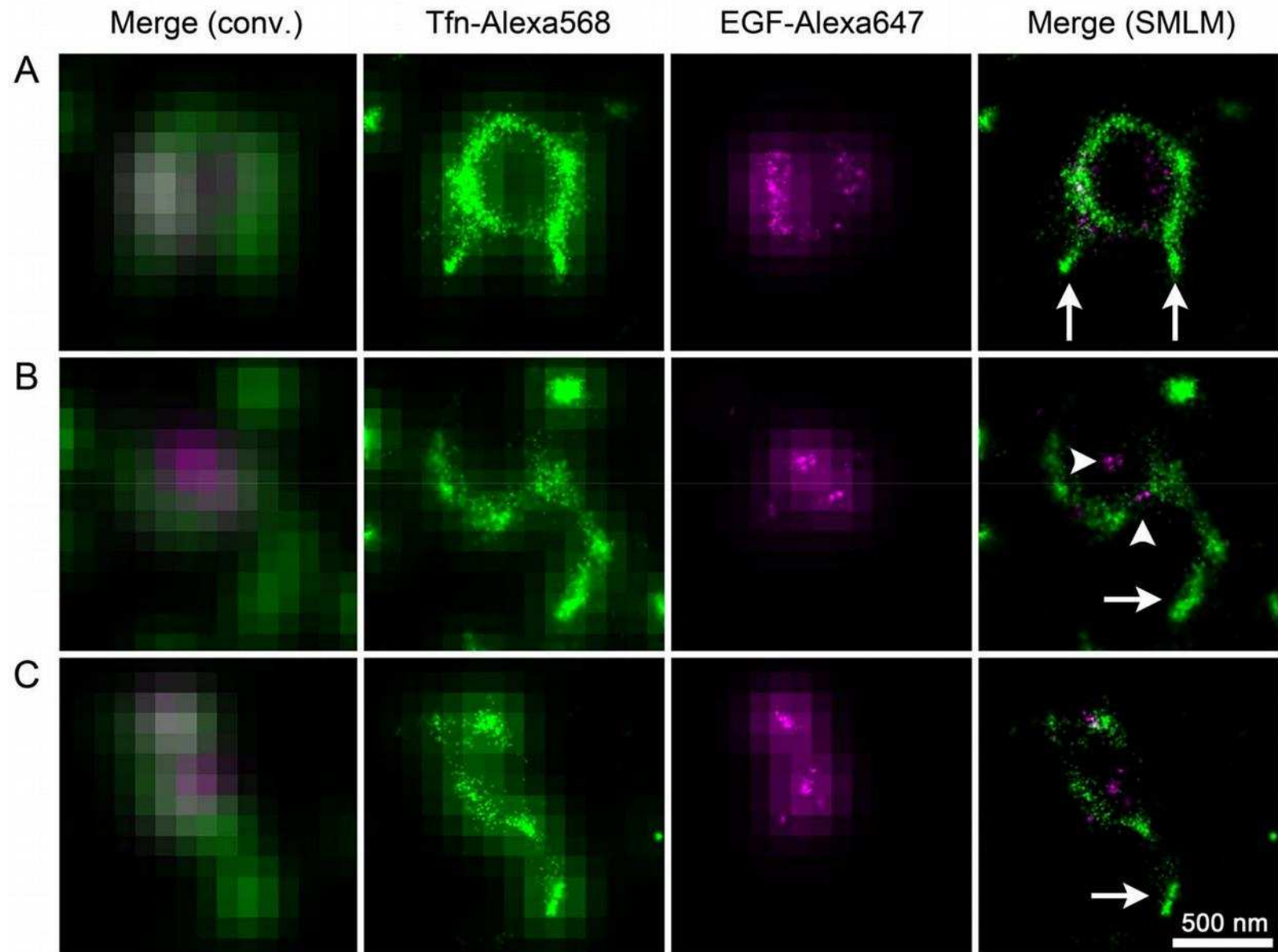
raw image max intensity Z-projection

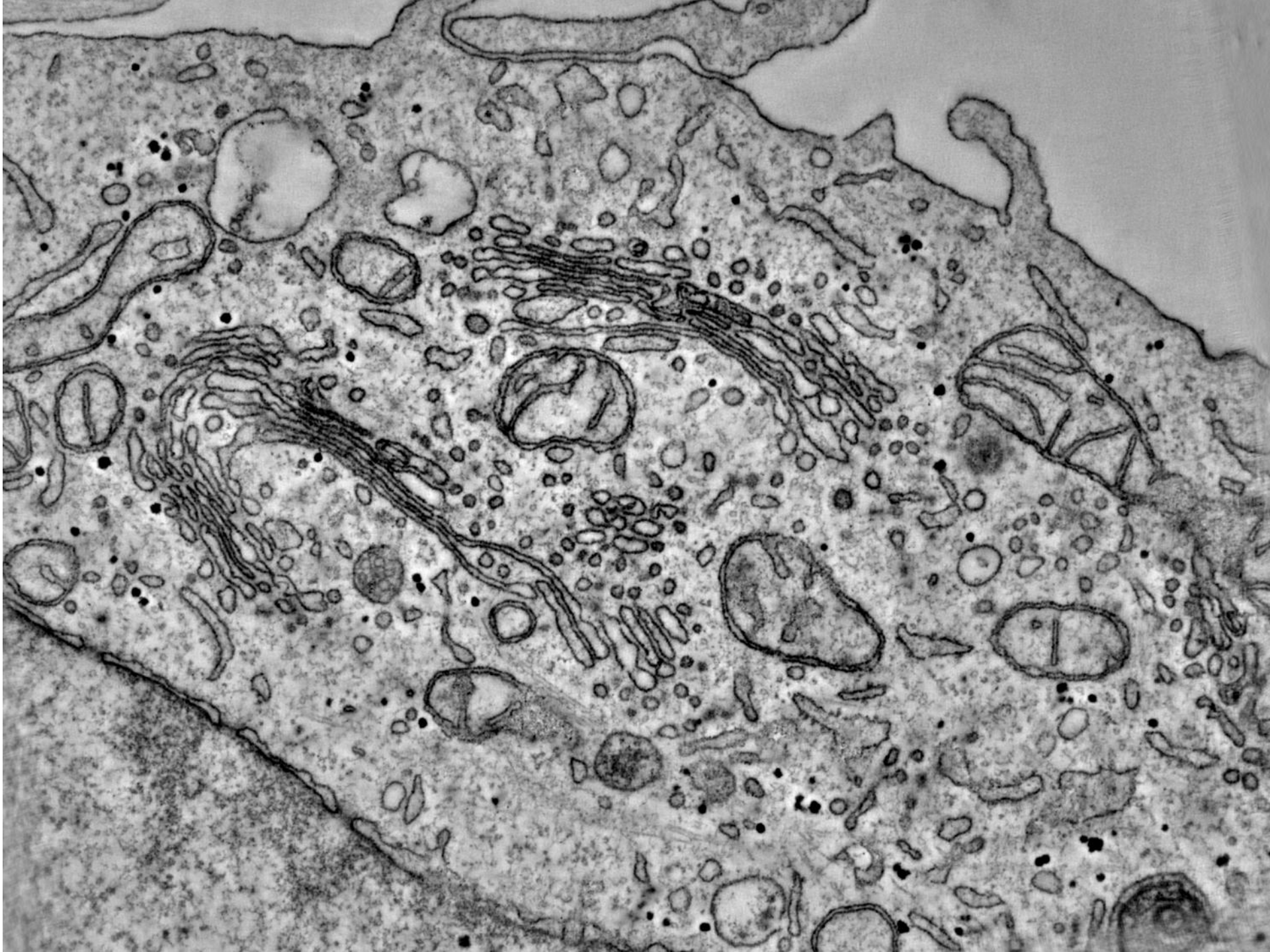


deconvolved image max Z-projection

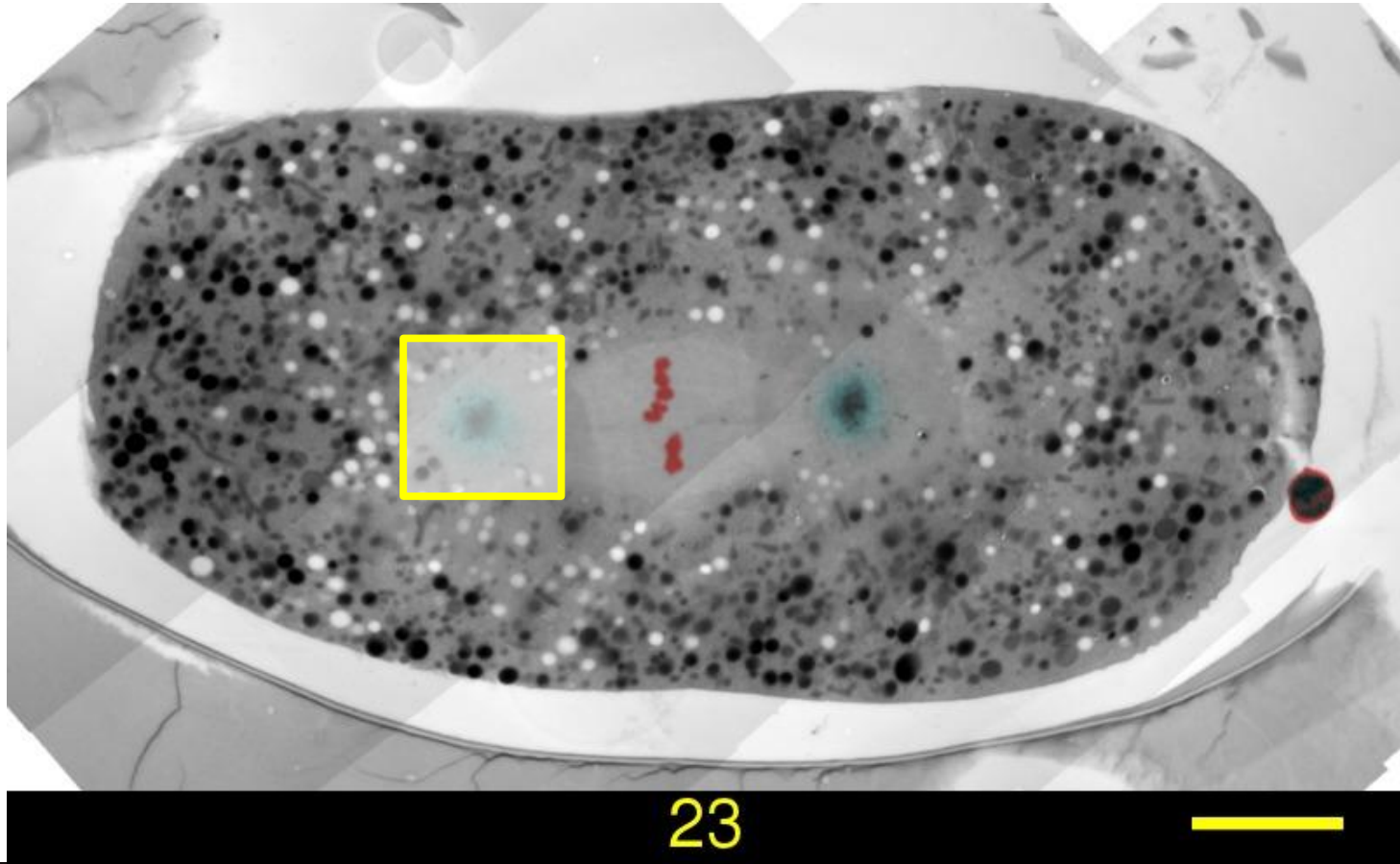
From image acquisition at the microscope to quantitative image analysis

# Super resolution microscopy



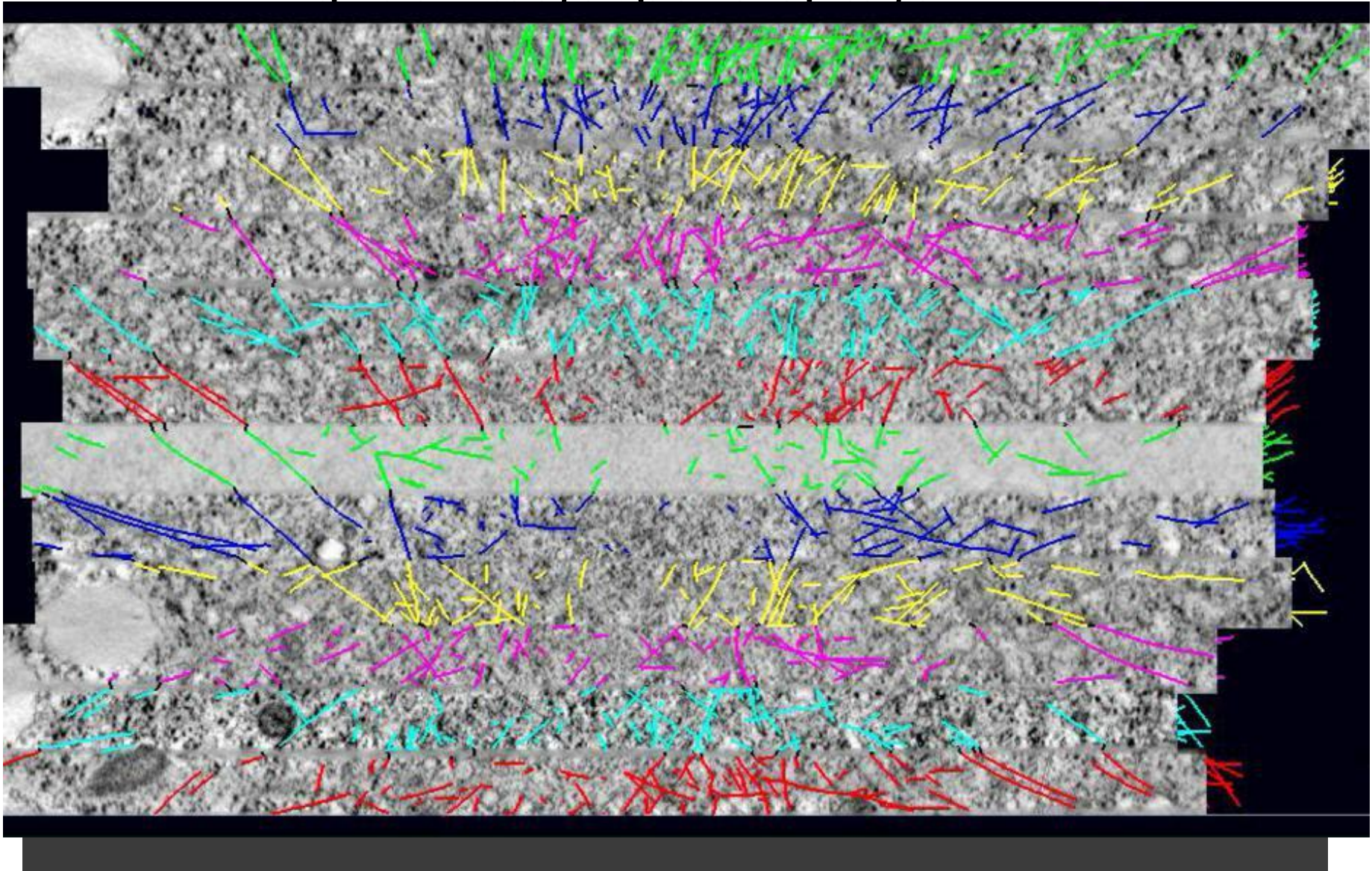


# Time-Resolved Correlation between light microscopy and electron tomography



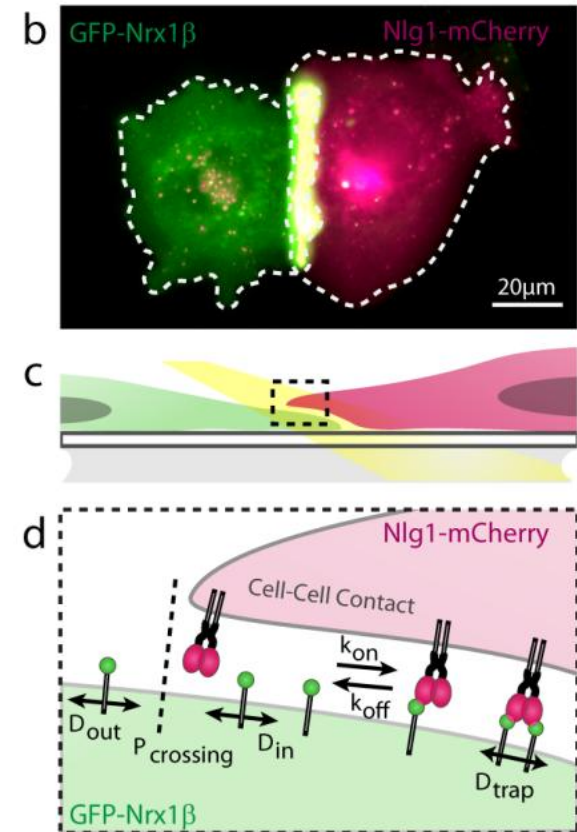
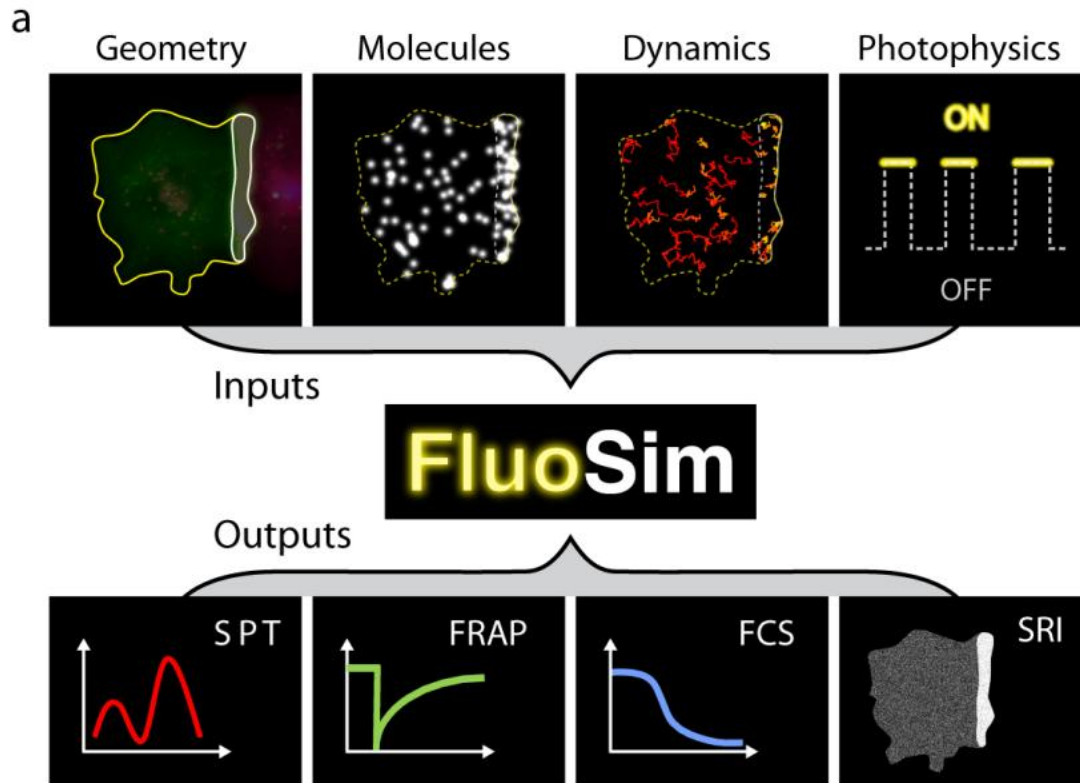
- *C. elegans* metaphase spindle with two centrosomes (300 nm-thick sections)
- Choose one centrosome, obtain tilt series at higher mag.

# 3D reconstruction of centrosome microtubules



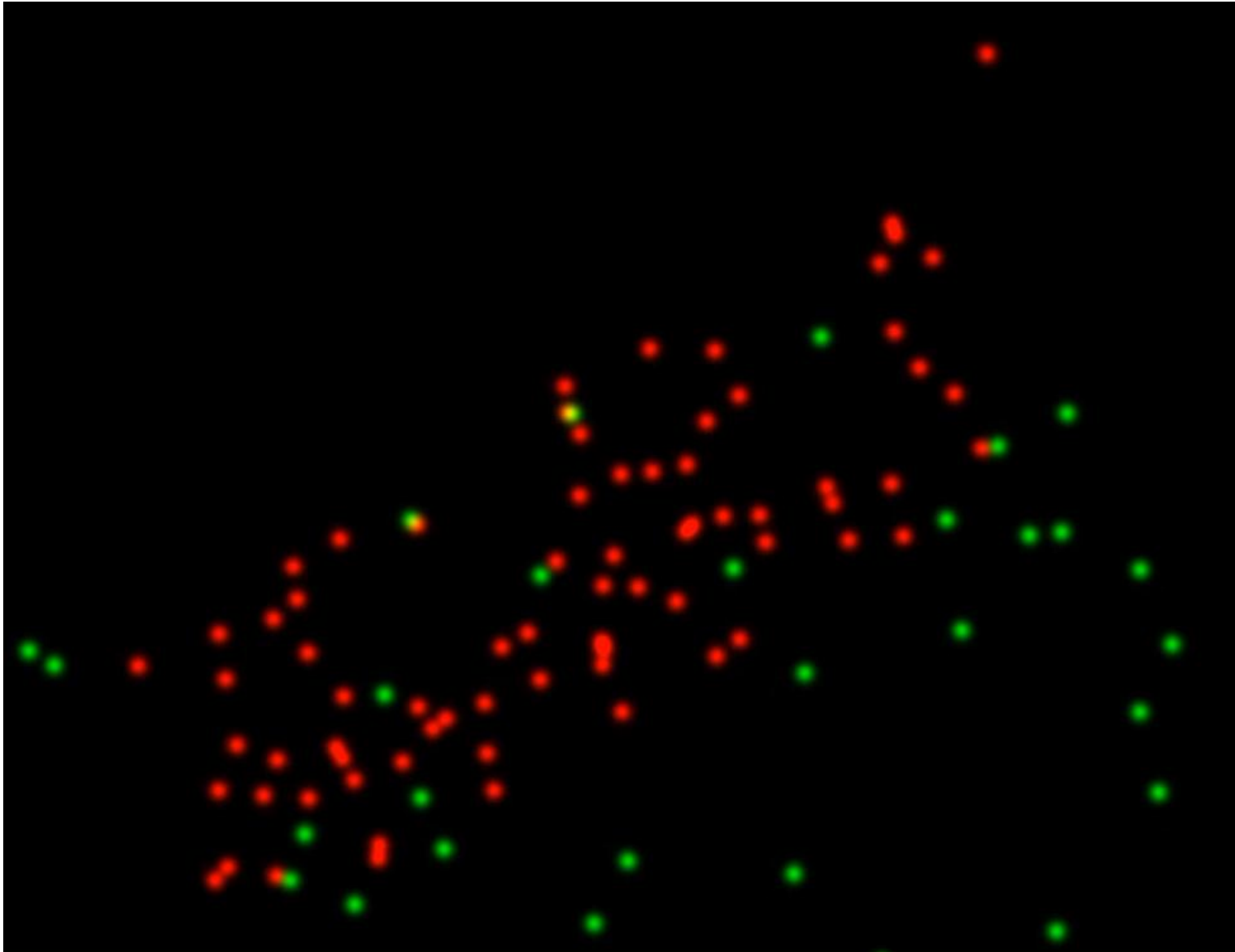
Automated Microtubule segmentation Using the microtubule segmentation fields to flatten and to align sections

# Fluosim: a simulator of single molecule dynamics for live cells



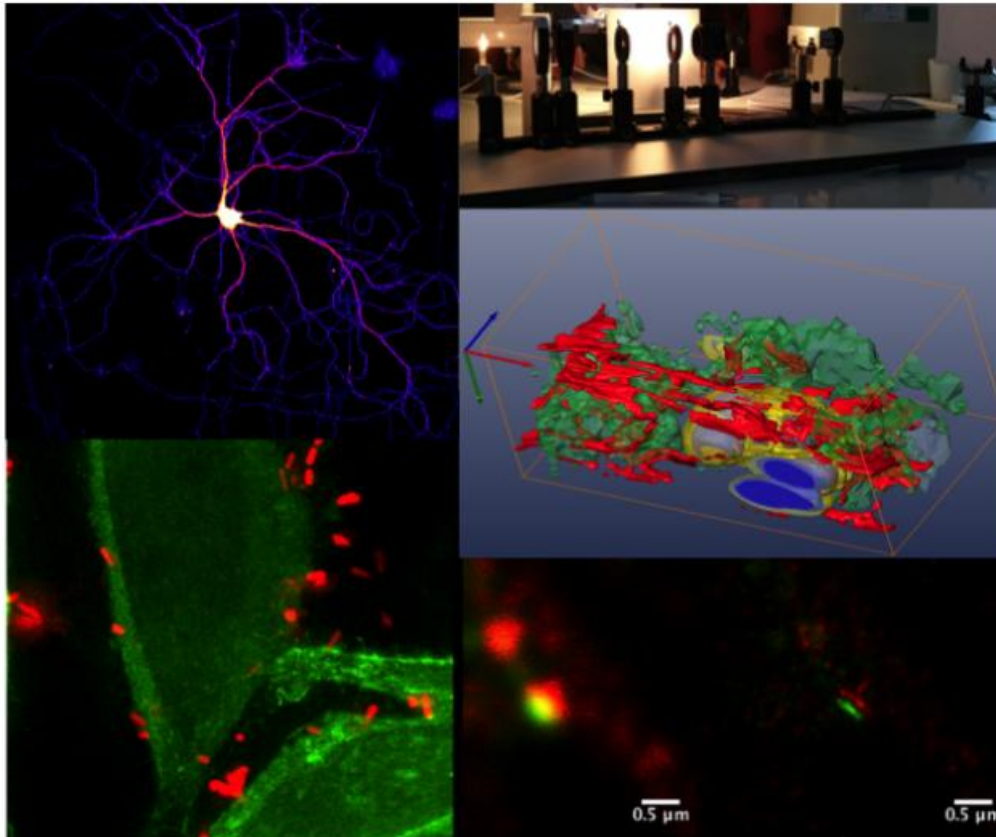


# Fluosim: a simulator of single molecule dynamics for live cells



# *Principles and Applications of Fluorescence Microscopy*

2 – 13 March 2020, Pasteur Institute



*Program*

# Cell Imaging September 14-18 2020

Making a clear picture to study cellular functions and processes

## Monday Sept. 14 2020 Videoconference or Presential ?

Possibility to watch from RH10A

9:00-12:15 Frédéric Coquelle, CURIE Orsay

- General introduction
- Optical and light microscopy

13:30-16:45 Frédéric Coquelle, CURIE Orsay

- Fluorescence microscope
- Optical sectioning
- Labeling for LM

## Tuesday Sept. 15 RH10A (Presential or Mixed)

9:00-12:15 Jean-Marc Verbavatz IJM Paris  
Electron microscopy and cryo EM,

13:30-15:00 Jean-Marc Verbavatz IJM Paris  
3D imaging in EM

15:15-16:45 Jean-Marc Verbavatz IJM Paris  
From sample preparation to image processing

## Wednesday Sept. 16 (Presential practices)

9:00-12:00 ImagoSeine Imaging Facility IM Paris  
Advanced imaging at ImagoSeine:  
Light microscopy, electron microscopy, Image processing

13:00-15:30 HaF442 Olivier Thoumine, Bordeaux  
Fluosim: simulator of single molecule dynamics for live cell and super resolution imaging.

16:00-17:30 Mélina Heuzé IJM Paris  
Quantitative imaging for the study of epithelial cells kissing

## Thursday Sept. 17 HaF 432/442 (Presential practices)

9:00-12:00 – 13:30-16:45 F. Coquelles, J.M. Verbavatz  
Workshop: Image analysis, using ImageJ/Fiji, Image processing.

## Friday Sept. 18 RH10A (Presential or Mixed)

9:00- 10:00 Jean-Marc Verbavatz IJM Paris  
Super Resolution, Correlative light and Electron microscopy

10:00-12:00 Stéphane Rigaud PASTEUR Paris  
Quantitative Biological Imaging using Icy

## 14:00-16:30 Group Presentation by Students

Frédéric Coquelle, Univ. Paris-Sud, Curie Institute, Orsay

Mélina Heuzé, Univ. Paris, IJM

Stéphane Rigaud, Pasteur Institute, Paris

Olivier Thoumine, CNRS Institute for Neuroscience, Bordeaux

Jean-Marc Verbavatz, Univ. Paris, IJM

ImagoSeine Imaging Facility, Institut Jacques Monod

Xavier Baudin, ImagoSeine, IJM

Nicolas Loisel, ImagoSeine IJM

Vincent Contremoulins, ImagoSeine, IJM

Rémi le Borgne, ImagoSeine, IJM

Catherine Durieu, ImagoSeine, IJM

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Master 2

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