

Digital image processing/analysis tools in Light Microscopy: From the basics and beyond”

PROGRAM

1st Day, Monday, June 10

Image analysis - history and present / open source software for bio imaging

8:30 - 9:30	Registration
9:30 - 10:00	<i>Prof. Alice Dautry-Varsat</i> , General director of the Institut Pasteur, will address the personnel of the Hellenic Pasteur Institute and will open the RIIP regional course.
10:00-10:10	<i>Haralabia Boleti</i> , Hellenic Pasteur Institute, Athens, Greece Welcome and opening remarks
10:10-11:00	<i>Stamatis Pagakis</i> , Biomedical Research Foundation Academy of Athens, Athens, Greece “Extraction of Quantitative Information from Digital Images - A historical perspective of Biomedical Image Analysis in Fluorescence Microscopy »
11:00-11:30	<i>Coffee break</i>
11:30-12:30	<i>Jean Christophe Olivo Marin</i> , Institut Pasteur, Paris, France Image analysis at work: from cellular dynamics to animal behavior
12:30 – 13:30	<i>Pavel Tomancak</i> , Max Plank Institute, Dresden, Germany Fiji is Just ImageJ – an open source platform for research in biological image analysis
13:30-14:30	<i>Lunch break</i>

Practical session on computational algorithms – ImageJ/Fiji

14:30-15:00	<i>Pavel Tomancak</i> : Introduction to ImageJ/Fiji
15:00-17:00	ImageJ/Fiji , free software, hands on practical session Quantitative Morphometric analysis, image & video editing <u>Instructors</u> : <i>Pavel Tomancak, Tobias Pietzsch, F.Frischnecht</i>
17:00-17:30	<i>Coffee break</i>
17:30-19:30	ImageJ/Fiji free software, hands on practical session
20:00-22:00	<i>Dinner</i>

2nd Day, Tuesday June 11

Imaging in Infectiology – quantitation of dynamic processes

- 9:00-10:00 *Freddy Frischnecht, U. of Heidelberg Medical School, Germany*
Imaging motile parasites during transmission of malaria
- 10:00-11:00 *Javier Pizarro-Cerda, Institut Pasteur, France*
Automated High Throughput Microscopy-based RNAi
screening of mammalian cell invasion by the bacterial pathogen *Listeria monocytogenes*
- 11:00-11:30 *Coffee break*
- 11:30-12:30 *Isabelle Tardieux, Institut Cochin, France*
Toxofilin Upregulates the Host Cortical Actin Cytoskeleton Dynamics
Facilitating *Toxoplasma* Invasion
- 12:30-13:00 *Fabrice de Chaumont Institut Pasteur, France*
Introduction to “Icy” practical session
- 13:00-14:00 *Lunch break*

Practical session on computational algorithms – “Icy” free software

- 14:00-16:00 “Icy” free software
Instructors: *Fabrice de Chaumont, Alexandre Dufour, Stephane Dallongeville,*
- 16:00-16:30 *Coffee break*
- 16:30-19:00 “Icy” free software, hands on practical session
- 19:30-21:30 *Dinner*

3rd Day, Wednesday June 12

Image analysis in Cell Biology, super resolution and spectral imaging

- 9:00-9:30 *Maria Evangelidou, Hellenic Pasteur Institute, Greece*
Ca⁺² imaging and analysis for the assessment of the functional outcome of neuro-immune interactions
- 9:30-10:00 *Maria Gaitanou, Hellenic Pasteur Institute, Greece*
Subcellular localization and targeting in the mitochondria of the neuronal protein Cend1. Colocalization analysis.
- 10:00-11:00 *Ricardo Henriques, Institut Pasteur, France*
Easy cell super-resolution imaging and analysis with ImageJ and other free tools
- 11:00-11:30 *Coffee break*
- 11:30-12:30 *Costas Balas, Technical University of Crete, Greece*

Dynamic and Spectral Imaging: system design, hardware configurations and applications in *in vivo* and *in vitro* microscopy.

12:30-13:30 *Lunch break*

<p align="center">Practical session on computational algorithms –‘Cell profiler’ & tutorials on Icy, Fiji/ ImageJ</p>
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13:30 -16:00 **‘Cell profiler’**
Instructor: *Javier Pizzaro Cerda*
Quantitative measurement of phenotypes from thousands of images automatically

16:00-16:30 *Coffee break*

16:00 - 19:00 **Informal tutorials with the instructors**
Practice on Icy, Fiji/ ImageJ & Cell Profiler
Instructors: *Fabrice de Chaumont, Alexandre Dufour, Stephane Dallongeville, Freddy Frischnecht, Ricardo Henriques, Javier Pizzaro-Cerda, Tobias Pietzsch, Evangelia Xingi, Isabelle Tardieux.*

20:30-23:00 *Dinner*

4th Day, Thursday June 13

<p align="center">Thick tissue imaging and cell tracking in neuroscience & stem cell biology</p>

9:00-10:00 **Igor Adameyko, Karolinska Institute, Sweden**
Confocal imaging, optical projection tomography and following 3D-reconstructions of whole-mount stained vertebrate embryos applied for stem cell research.

10:00- 11:00 **Dimitra Thomaidou, Hellenic Pasteur Institute, Greece**
Reprogramed astrocytes into the injured mouse brain: analysis of their proliferation and differentiation properties using lineage tree and co-localization analysis.

11:00-11:30 *Coffee break*

11:30-12:30 **Felipe Ortega, Institute of Physiology, Ludwig-Maximilians Univ., Germany**
Long term single cell imaging of Stem Cells using "TTT" (Timm's Tracking Tool) software.

12:30-13:00 **Felipe Ortega**–Short introduction on: time lapse experiments, the advantages and applications of the TTT tool and the Folder /file organization and naming requirements for TTT.

13:00-14:00 *Lunch break*

Practical session on computational algorithms – TTT (Timm's Tracking Tool)

14:00-16:30	TTT (Timm's Tracking Tool), Hands on practical session <u>Instructors:</u> <i>Felipe Ortega, Katerina Aravantinou-Fatorou, Evangelia Xingi</i>
16:30-17:00	<i>Coffee break</i>
17:00-19:00	TTT (Timm's Tracking Tool), Hands on practical session
19:30-21:30	<i>Dinner</i>

5th Day, Friday June 14

Commercial packages for 3D reconstruction, object segmentation & deconvolution

8:30-9:30	<i>Delisa Ibanez Garcia, Bitplane AG,</i> Imaris: at the cutting edge of 3D and 4D image visualization and analysis
9:30-10:30	<i>Vincent Schoonderwoert, Scientific Volume Imaging, The Netherlands</i> Improving 3D image resolution, signal to noise and analysis with Huygens deconvolution.
10:30-11:00	<i>Evangelia Xingi, Hellenic Pasteur Institute, Greece</i> Digital image processing, analysis and visualization tools used in the HPI Light Microscopy Unit
11:00-11:30	<i>Coffee break</i>

Practical session on computational algorithms- Imaris & Scientific Volume Imaging

11:30-13:30	Group 1 Bitplane/Imaris <u>Instructors:</u> <i>Delisa Ibanez Garcia, Georgia Golfis, Igor Adameyko, Evangelia Xingi</i>
	Group 2 Huygens - Scientific Volume Imaging (SVI) <u>Instructor:</u> <i>Vincent Schoonderwoert</i>
13:30 -14:30	<i>Lunch break</i>

Practical session on computational algorithms- Imaris & Scientific Volume Imaging

14:30 -16:00	Group 1 Bitplane/Imaris Cell <u>Instructors:</u> <i>Delisa Ibanez Garcia, Georgia Golfis, Igor Adameyko, Evangelia Xingi</i>
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Group 2	Huygens - Scientific Volume Imaging (SVI) <i>Instructor: Vincent Schoonderwoert</i>
16:00 -16:20	<i>Coffee break</i>
16:20 -17:30	Continuation of Bitplane/Imaris Cell and Huygens practicals
19:00 - 24:00	Cultural and social event Guided tour to the NewAcropolis museum and dinner at the restaurant of the museum.

6th Day, Saturday June 15

Practical session on computational algorithms- Imaris & Scientific Volume Imaging
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9:30 -11:30	
Group 1	Huygens - Scientific Volume Imaging (SVI) <i>Instructor: Vincent Schoonderwoert</i>
Group 2	Bitplane/Imaris Cell <i>Instructors: Delisa Ibanez Garcia, Georgia Golfis, Igor Adameyko, Evangelia.Xingi</i>
11:30-12:00	<i>Coffee break</i>
12:00-13:30	Bitplane/Imaris Cell and Huygens practicals for Groups 1 and 2
13:30 – 14:30	<i>Lunch break</i>
14:30 – 16:30	Bitplane/Imaris Cell and Huygens practicals Groups 1 and 2
Group 1	Huygens - Scientific Volume Imaging (SVI) <i>Instructor: Vincent Schoonderwoert</i>
Group 2	Bitplane/Imaris Cell <i>Instructors: Delisa Ibanez Garcia, Georgia Golfis Igor Adameyko, Evangelia.Xingi</i>
16:30-17:00	<i>Coffee break</i>
17:00-19:00	Informal tutorials Practice on any of the 5 software (Icy, ImagJ/Fiji, Imaris Cell, SVI and TTT)
19:30-21:00	<i>Dinner</i>

7th Day, Sunday June 16

Cultural and Social event

Trip to the island of Aegina and visit to the ancient temple of Aphaia

8th Day, Monday June 17

Practical session on computational algorithms - Participant's Presentations
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9:00 - 11:00	Tutorials and practice
11:00 - 11:30	<i>Coffee break</i>
11:30 - 13:00	Tutorials and practice
13:00 – 14:00	<i>Lunch break</i>
14:00 – 16:00	Student Presentations
16:00 – 16:30	<i>Coffee break</i>
18:00 – 18:30	END of course – closing remarks
20:00-22:00	<i>Dinner</i>