



OPTICAL MICROSCOPY AND IMAGE ANALYSIS TRAINING COURSE

DATES: 16th to 20th March 2015

PLACE: Faculty of Fisheries and Protection of Waters USB, Vodnany, Czech Republic

MAIN TRAINERS FOR PRACTICE:

- H. Gadêlha: *Wolfson Centre for Mathematical Biology, Mathematical Institute, University of Oxford*
- C. Matthews, *IBDML, CNRS, Marseille, France.*
- C. Rouvière, *Biologie du développement, CNRS, Villefranche sur mer, France.*
- G. Prulières: *Biologie du développement, CNRS, Villefranche sur mer, France.*

LECTURERS:

- J. Cosson and G. Prokopchuk, *FFPW USB, Vodnany, Czech Republic*
 - **Sperm motility recording; use of high-speed video camera**
- C. Soler Vázquez, *PROISER R+D S.L., Valencia, Spain*
 - **Presentation of some soft-wares = CASA (sperm motility parameters) and cell morphometry**
- G. Prulières, *Biologie du développement, CNRS, Villefranche sur mer, France*
 - **Application of fluorescence and confocal microscopy to aquatic eggs**
- R. Rychtarikova, *FFPW USB, ICS, Nove Hradky, Czech Republic*
 - **Analysis of cell interior - 3D reconstruction**
- D. Stys, *FFPW USB, ICS, Nove Hradky, Czech Republic*
 - **Principles of image build-up in the microscope**
- T. Nahlik, *FFPW USB, ICS, Nove Hradky, Czech Republic*
 - **Training on the use of software dedicated to follow-up of microscope images**
- H. Gadêlha, *Dept of Applied Mathematics and Theoretical Physics, Cambridge, UK*
 - **Modelisation and quantitative predictions of cell behavior**
- B. Dzyuba, *FFPW USB, Vodnany, Czech Republic*
 - **Applications of CASA analysis to fish spermatozoa**

TRAINEES: 12 maximum



PROGRAM MONDAY 16. 3. 2015

- 9:30 – 10:00 Registration (local fees)
10:00 – 10:30 Welcome introduction
Presentation of participants / round table
10:30 – 10:45 *Coffee break*
10:45 – 12:30 Presentation by D. Stys:
Principles of image build-up in the microscope
12:30 – 13:30 *Lunch break*
13:30 – 15:30 Presentation by C. Soler Vázquez:
Presentation of some soft-wares = CASA (sperm motility parameters) and cell morphometry
15:30 – 15:50 *Coffee break*
15:50 – 17:50 Presentations by C. Matthews and C. Rouvière:
Fluorescence & overview of Fluorophores

PROGRAM TUESDAY 17. 3. 2015

- 9:00 – 10:30 Presentations by C. Matthews and C. Rouvière:
Microscopy technics (Bright field / dark field / DIC / Phase / polarization / fluorescence)
10:30 – 10:45 *Coffee break*
10:45 – 12:30 Presentations by C. Matthews and C. Rouvière:
Confocal microscopy
12:30 – 13:30 Lunch break
13:30 – 15:30 **Practice 1** Group A
Practice 2 Group B
Practice 4 Groups C+D
15:30 – 15:50 Coffee break
15:50 – 17:50 **Practice 1** Group C
Practice 2 Group D
Practice 4 Groups A+B

WEDNESDAY 18. 3. 2015

- 9:00 – 10:30 Presentations by C. Matthews and C. Rouvière:
Optical sectioning microscopies
10:30 – 10:45 *Coffee break*
10:45 – 12:30 Presentations by C. Matthews and C. Rouvière,
Image treatment and analysis
12:30 – 13:30 *Lunch break*
13:30 – 15:30 **Practice 1** Group B
Practice 2 Group A
Practice 5 Groups C+D
15:30 – 15:50 *Coffee break*
15:50 – 17:50 **Practice 1** Group D
Practice 2 Group C



18:00 – 19:00 **Practice 5** Groups A+B
Practice 6 Groups A+B

THURSDAY 19. 3. 2015

9:00 – 10:30 Presentation by G. Prulière:
Application of fluorescence and confocal microscopy to aquatic eggs

10:30 – 10:45 *Coffee break*

10:45 – 12:30 **Practice 1**, ImageJ software

12:30 – 13:30 *Lunch break*

13:30 – 15:30 **Practice 2**, "ImageJ" software

15:30 – 15:50 *Coffee break*

15:50 – 17:30 **Practice** / ImageJ macro

18:00 – 19:00 **Practice 6** Group C+D

FRIDAY 20. 3. 2015

9:00 – 10:30 Presentation by R. Rychtarikova:
Analysis of cell interior - 3D reconstruction

10:30 – 10:45 *Coffee break*

10:45 – 12:30 Presentation by H. Gadêlha:
Modelisation and quantitative predictions of cell behavior

12:30 – 13:30 *Lunch break*

13:30 – 15:30 Presentation & training by T. Nahlik:
Training on the use of software dedicated to follow-up of microscope images

15:30 – 15:50 *Coffee break*

15:50 – 17:00 Training by T. Nahlik (**continued**)

PRACTICE GROUPS:

- 4 people/ each group called A, B, C, D
- **Practice 1:** Setting up the microscope, alignment, observations using different optical techniques
- **Practice 2:** Confocal microscopy
- **Practice 3:** Sperm motility (CASA)
- **Practice 4:** fixation and immuno-staining on fixed oocytes **1/2**
- **Practice 5:** immuno-staining and mounting **2/2**
- **Practice 6:** quantitative cell behavior modelisation