

## TRAINING SCHOOL SCIENTIFIC REPORT

Action number: **CA16212; INDEPTH**

Workshop title: **3D Fluorescence in situ hybridization (FiSH) and Image**

**analysis** Workshop start and end date: **October 15 and 19, 2018**

Organizers: **Christophe Tatout, Sophie Desset and Aline Probst**

Location: **Université Clermont Auvergne, GRéD laboratory, Clermont-Ferrand, France**

### PURPOSE OF THE WORKSHOP:

The school is designed for doctoral students and researchers that need to employ FISH as well as 3D image processing and analysis techniques. The program will give the attendees the opportunity to learn from specialists in the field, to perform their own practical experiments and to present and discuss their research results.

FISH methods are widely used in biology to determine the presence/absence or the position of a nucleic acid sequence (DNA or RNA) within a cell or a nucleus. Our first objective is to train the attendees on recent developments in 3D DNA and RNA-FISH using mainly *Arabidopsis thaliana* as a model species. Whole mount cotyledon, root tip squashes as well as acrylamide embedded methods will be practiced. The second objective will be to give the basic knowledge and practical courses for analyzing images. Trainees will be asked to bring their own laptop in order to install all the required open source softwares during the training session

Website: <https://www.brookes.ac.uk/indepth/>

### DESCRIPTION OF WORK CARRIED OUT DURING THE WORKSHOP

We developed this practical school as a means to carry out your own experiences while ensuring that at each step of the protocol you have the proper material in hands. We thus have prepared a set of probes & slides to be observed. So be relaxed, and enjoy the experiments without stress!

Students were grouped in pairs according to their experience in FISH experiments & skills in image analysis. Then they were trained

- On **FiSH protocols**. Each day began with an introduction to the “protocol of the day” by Pr Paul Fransz (Whole mount DNA FISH), Pr Hank Bass (acrylamide embedding DNA FISH) and Dr Stefanie Rosa (RNA FISH).
- On **two kinds of microscopes** (confocal and structured illumination light) available at the GRéD Imaging platform managed by Caroline Vachias and Sophie Desset. Elise Bertrand from the Zeiss Company was also part of the trainers.
- to **image analysis** using the well-known open source platform called ImageJ by Christophe Chamot, Tristan Dubos and Pierre Pouchin

#### **Attendees and trainers**

Total : 5 local organizers + 7 teachers + 13 students = 25

International : 5 teachers + 11 students: 16

Companies : Stellaris and Zeiss: 2

Academic : 24

Students : 13

### **Teachers from 5 foreign countries**

- 1- Pr Hank Bass (Florida State University, USA);
- 2- Pr Paul Fransz (University von Amsterdam, Netherlands)
- 3- Dr Monica Pradillo (Universidad de Madrid, Spain)
- 4- Dr Stefanie Rosa-Nunes (Swedish University of Agricultural Sciences, Sweden)
- 5- Dr Célia Baroux (Universität de Zürich, Switzerland)

### **Attendees from 10 countries**

- 1- Fathia BENYAHIA (Université Clermont Auvergne), France
- 2- Edouard TOURDOT (Université de Bordeaux), France
- 3- Katerina PERNICKOVA (Institute of Experimental Botany), Czech Republic
- 4- Adela MACHELOVA (CEITEC, Masaryk University), Czech Republic
- 5- Said HAFIDH (IEB ASCR), Czech Republic
- 6- Francesca LOPEZ (National University of Ireland), Ireland
- 7- Ivona KUBALOVA (IPK Gaterslebe), Germany
- 8- Nadia FERNANDEZ (Complutense University of Madrid), Spain
- 9- Armine ASATRYAN (University of Padova), Italy
- 10- Giorgio PERRELLA (University of Glasgow), United Kingdom
- 11- Burcu Nur KECELI (Universiteit Gent), Belgium
- 12- Bilge Seval YILDIRIM (Omer Halisdemir University), Turkey
- 13- Mariem BRADAI (Université de Sfax), Tunisia

### **Trainers from industry:**

Total : 2 ;

Lise Bertrand (Zeiss) and Stellaris has provided RNA probes and kits for RNA-FISH protocol

### **Trainers from academia (other than the 5 Teachers from the foreign countries; see above)**

- 1- Christophe CHAMOT (ENS Lyon) France
- 2- Sophie DESSET (UCA)
- 3- Tristan DUBOS (UCA)
- 4- Christophe TATOUT (UCA)
- 5- Aline PROBST (UCA)

### **DESCRIPTION OF THE MAIN OUTPUTS OF THE WORKSHOP**

The week was very dense but fruitful. Students shared experiences, learned new techniques, presented their research projects, had social events...

The trainers also learned a lot, shared expertise and discuss about FSU facility to store images (OMERO server). This will be a great asset for WG1