COST Action 19116 Trace metal metabolism in plants PLANTMETALS

Training School:
TRACE METAL SENSING, REGULATION AND TRANSPORT IN PLANTS

Dates: Tuesday, **21st** – Friday, **24th May 2024**
Attendance type: Face to face

Location: Research Centre in Biodiversity and Genetic Resources, CIBIO, from the University of Porto, Portugal https://cibio.up.pt/en/

Application and selection: The course can host and fund ten trainees, and is aimed at young researchers (PhD students and Postdocs). To participate, send an email to agla@cibio.up.pt until **15th of April 2024**, with a short CV and a short (approx. 200 words) motivation letter. The decisions, after evaluating the applications, will be communicated on **19th April 2024**. Priority will be given to PhD students.

Description
This training school is organized by Workgroup 1 "Metal transport and pathways of trace metals (TMs) from the soil and through the plant", and it addresses TM sensing, regulation and transport in plants. The training school is organized in lectures and laboratory exercises:

- The lectures will cover up-to-date knowledge on the molecular and physiological mechanisms underlying trace metal homeostasis, with a focus on membrane transporters and transcription factors. The lectures topics and the research interest of the trainees will be further discussed in round-tables. The trainees will be invited to present in groups a critical analysis of a research paper of their interest.
- The laboratory exercises will provide examples and hand-on-experience with the observation of gene expression, protein localization and sensor activity using histochemical and fluorescent reporters. The analyses will be performed in Arabidopsis seedlings exposed to varying concentrations of TM micronutrients.

PROGRAM

Day 01 **May 21, 2024**

09.30-10.00 Introduction to the Training School

10.00-11.00 Opening Lecture. **Ute Krämer** (Ruhr Univ Bochum, GE)
Metal homeostasis in *Arabidopsis thaliana*

11.00-11.30 Coffee break

11.30-12.30 Lecture. **Ana Assunção** (Univ Copenhagen and CIBIO/BIOPOLIS, Univ Porto)
The zinc deficiency response in land plants

12.30-13.30 Lunch break

13.30-15.30 Short presentations by the students of their research projects

15.30-17.00 Round table: points for discussion related with the Training School topic.

Day 02 **May 22, 2024**

09.30-10.30 Lecture. **Cathy Curie** (IPSiM, INRAE, Univ Montpellier, FR) **Manganese in plant cells: its unsung functions, dedicated transporters and tune-up**

10.30-11.00 Coffee break

11.00-12.00 Lecture. **Pedro Humberto Castro** (CIBIO/BIOPOLIS, Univ Porto, PT) **Functional strategies from *Arabidopsis thaliana* to crops**

12.00-13.00 Lunch break

13.00-17.00 Practical lab exercise

Day 03 **May 23, 2024**

09.30-10.30 Lecture. **Sébastien Thomine** (I2BC, Univ Paris-Saclay, FR) **Metal transporters at the crossroad between essential metal nutrition and toxicity**

10.30-11.00 Coffee break

11.00-12.00 Lecture.

12.00-13.00 Lunch break

13.00-17.00 Practical lab exercise

Day 04 **May 17, 2024**

09.30-10.30 Closing Lecture. **Manuel González-Guerrero** (Univ Politécnica Madrid, ES) **Metal transport in plant-microbe interactions**

10.30-11.00 Coffee break

11.00-13.00 Critical analysis of a research paper – group work.

13.00-14.00 Lunch break

14.00-16.30 Group presentations and Discussion

16.30-17.00 Closing session

Practical

Analysis of *Arabidopsis thaliana* seedlings grown in MS media and exposed to different TM concentrations. In *exercise 1*, *A. thaliana* lines transformed with different TM transporter gene promoters fused with GUS will be analysed through histochemical GUS staining. In *exercise 2*, *A. thaliana* lines expressing a TM transporter gene fused with a fluorophore or expressing FRET TM sensor will be analysed with fluorescence microscope. The interpretation and discussion of results in these exercises will be based on information from the theoretical lectures early in the training school.