

## NEWSLETTER SUMMER 2022

### FOCUS ON TECHNOLOGIES

#### VERTICAL-STAGE MICROSCOPE: WHERE PLANTS FEEL WELL

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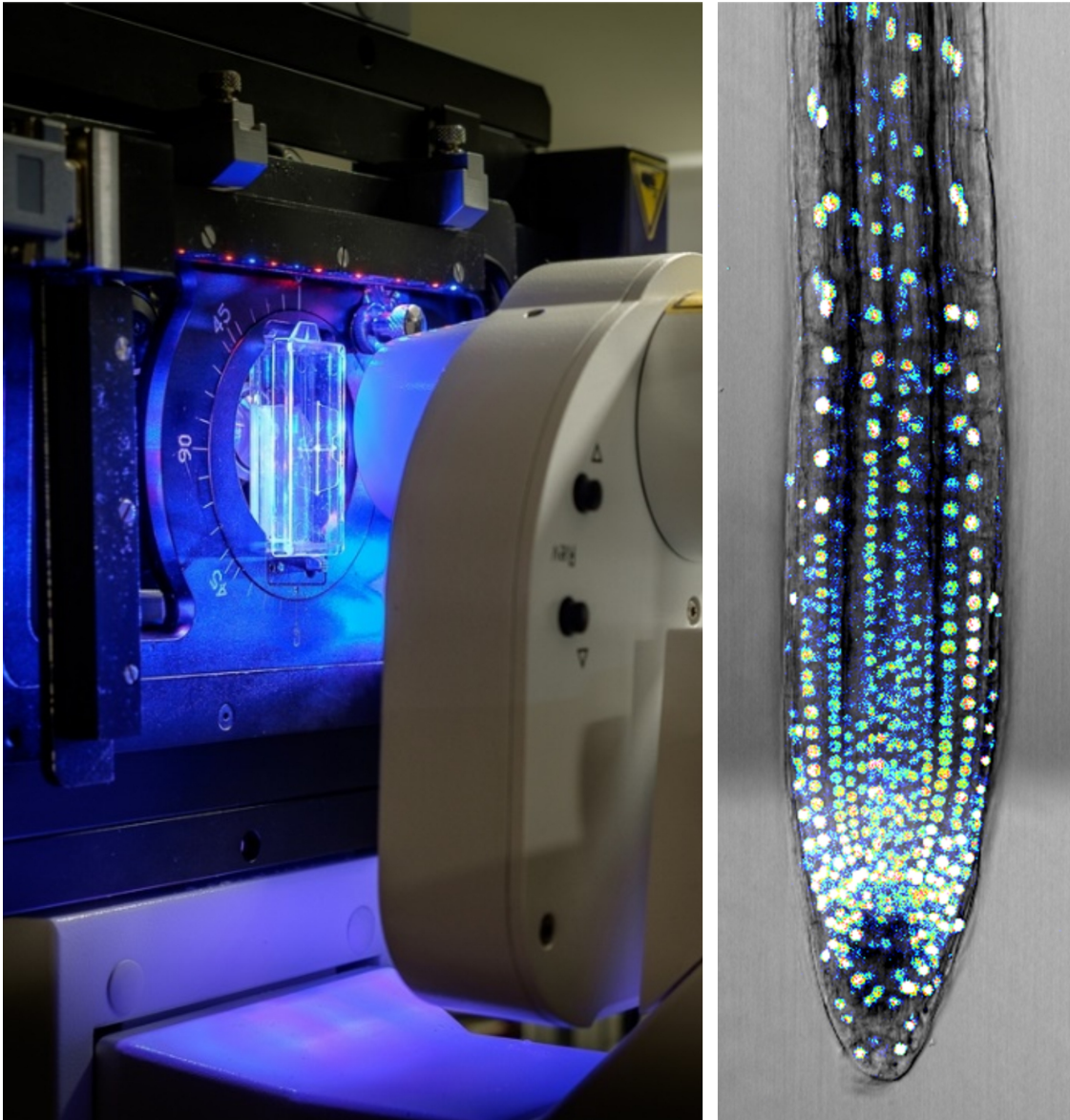
**Noninvasive *in vivo* imaging of living organisms, that is the trend in microscopy today. One of the most significant challenges in plant *in vivo* microscopy is the orientation of the sample. Most microscopes mount the specimen horizontally, while plants grow vertically. For this reason, the Imaging Facility of the Institute of Experimental Botany Czech Academy of Sciences (IFIEB) has installed a customized solution of a confocal microscope optimized for plant research.**

Previously, when inspecting the root with a typical microscope, root attempted to bend downwards, but it was constrained by a slide. The plant was therefore permanently gravi-stimulated. This influenced the obtained data by possible unwanted artefacts and made some experiments on growing roots completely impossible. In 2019, inspired by IST Vienna, local representatives of the Zeiss company have turned their Zeiss LSM 880 with Airyscan detector on its side at a 90 degree angle to optimize it for plant research in the IFIEB. In this setup, vertical sample mounting preserves the natural direction of plant growth and enables long-term imaging on plants aquired with confocal or Airyscan resolution. In addition, the gravity vector can be fine-tuned by a rotary stage insert, which allows the application of the desired gravi-stimulus.

A long-term vertical-stage imaging opened up new challenges that needed to be addressed, including how to compensate for root growth outside of field of view. After initial tile scanning, root growth is now compensated by microscope stage movement, allowing time-lapse imaging in a single frame. In addition, plant leaves can be illuminated to preserve their

photosynthetic activity. These two capabilities were introduced in IFIEB last year and they are still being improved. And who are our users? Our system is currently used to study processes of signal transduction and hormonal regulations during seed germination, root protophloem development or the impact of artificial plant root illumination.

**The technologies and expertise can be accessed via the Czech or Euro-BioImaging portal. For more news about IFIEB follow us on [@IEB\\_Imaging](#) or <http://www.ueb.cas.cz/en/if/about>.**



Plant-optimized Zeiss LSM880 with Airyscan detector enabling vertical sample mounting and root tracking. Growing plant in coverglass chamber is illuminated during long-term experiment (left) and the root fluorescence is imaged (right).

## PAST & UPCOMING EVENTS

### CZECH-BIOIMAGING ANNUAL SCIENTIFIC CONFERENCE

**IMAGING PRINCIPLES OF LIFE**

October 4-5, 2022  
Hustopeče

**CONFERENCE**

**DISCOVER CZECH-BIOIMAGING**

- Outstanding User Contributions
- Lectures by International Speakers:  
Claus Lamm, Julia Fernandez-Rodriguez
- Biological Imaging
- Electron and Light Microscopy
- Medical Imaging
- Poster Session
- Company Presentations
- Introducing New Technologies

Register   
Find more 

[www.czech-bioimaging.cz](http://www.czech-bioimaging.cz)

  
MINISTRY OF EDUCATION,  
YOUTH AND SPORTS

  
Imaging principles of life

The annual Czech-BioImaging scientific conference titled Imaging Principles of Life 2022 will be held in Hustopeče this autumn. The 2-day event starts on 4 October after lunch and concludes the following day around 3 p.m.

The lectures will present over 20 research results achieved by the CzBI users in the fields of medical and biological imaging. Acquisition of these scientific results was either supported, took place or both at the Czech-BioImaging facilities. The conference participants may also view other interesting user contributions presented during the Poster session. Special space in the conference programme will also be allocated for presentations from industrial partners to present current technology novelties, including a corporate exhibition.

Two distinguished international guest speakers also accepted the invitation to the conference. On Tuesday 4/10/2022, the Head of the Centre for Cellular imaging, University of Gothenburg and President of the Core Technologies for Life Sciences, **Julia Fernandez-Rodriguez**, will present her lecture titled *"The Centre for Cellular Imaging – a Research Infrastructure for Correlated Multimodal Imaging"*. **Claus Lamm**, Professor of Biological Psychology and the Head of the Social, Cognitive and Affective Neuroscience Unit at the Faculty of Psychology of the University of Vienna, will deliver his lecture *"Novel multi-method neuroimaging approaches to unravel the complexities of the human social brain"* on Wednesday 5/10/2022.

Last but not least, social program and networking are considered an integral part of the Czech-BioImaging conference because they provide an important space to connect users from different laboratories and fields of imaging. The planned dinner coupled with wine tasting may be a unique opportunity for the participants to build up their professional relationships with the Czech-BioImaging service labs employees.

Find more at <https://www.czech-bioimaging.cz/conference>

Register:



## UPCOMING EDUCATIONAL ACTIVITIES (SUMMER - AUTUMN)



### **METHODICAL PIPELINE FOR LIGHT MICROSCOPY OF SMALL ANIMAL MODELS**

Course | August 30 - 31, 2022 | Institute of Physiology CAS, Prague

### **MULTI-MODAL LIGHT MICROSCOPY IMAGING IN PLANT RESEARCH**

Course | September 22, 2022 | Institute of Experimental Botany CAS, Prague

### **SINGLE MOLECULE MICROSCOPY AND MANIPULATION**

Course | October 10 - 14, 2022 | UK, BIOCEV, Vestec

## MICROSCOPY METHODS IN BIOMEDICINE

Course | October 17 - 21, 2022 | Institute of Molecular Genetics CAS, Prague

## EXPERIMENTAL BIOPHOTONICS

Course | October 2022 | FSI VUT, Technická 2, Brno

## VIRTUAL REALITY TOOLS IN BIOLOGY DATA ANALYSIS

Course | November 3, 2022 | Institute of Physiology CAS, Prague

## FLIM NOT ONLY FOR BIOLOGISTS

Practical course | November 14 - 16, 2022 | UK, BIOCEV, Vestec

## TRANSMISSION ELECTRON MICROSCOPY IN LIFE SCIENCES

Course | November 21 - 25, 2022 | Institute of Molecular Genetics CAS, Prague

## SUPER-RESOLUTION MICROSCOPY METHODS IN BIOLOGY

Course | Autumn 2022 | CEITEC MU, Brno

## NEUROIMAGING: MAPPING THE FUNCTION AND STRUCTURE OF BRAIN

Course | Autumn 2022 | CEITEC MU, Brno

## PROCESSING OF BIOLOGICAL IMAGES: FOCUS ON LIGHTSHEET DATA

Course | Autumn 2022 | CEITEC MU, Brno

## UPCOMING INTERNATIONAL CONGRESSES

### 16<sup>TH</sup> INTERNATIONAL CONGRESS OF HISTOCHEMISTRY AND CYTOCHEMISTRY

**When:** 28 – 31 August 2022

**Where:** Prague

The Society for Histochemistry invite you to Prague in August 2022. The 16th International Congress of Histochemistry and Cytochemistry 2022 brings the worldwide histochemists together to exchange information, closely cooperate and contribute to scientific progress.

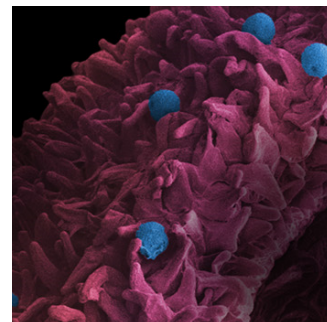


# 16<sup>TH</sup> MULTINATIONAL CONGRESS ON MICROSCOPY

**When:** 4 - 9 September 2022

**Where:** Brno

Join us at the 16th Multinational Congress on Microscopy and become a part of the unique microscopy ecosystem in Brno. The aim of the 16th MCM is to bring together leading academic scientists, researchers, students and the commercial sphere to exchange and share experiences and research results on all aspects of microscopy.



## USEFUL LINKS

[Czech-bioimaging Scientific Conference 2022](#)

[Czech-bioimaging – pro veřejnost](#)

[Czech-bioimaging – technologies](#)

[Euro-BioImaging website](#)

[Velké výzkumné infrastruktury](#)

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EUROPEAN UNION  
European Structural and Investment Funds  
Operational Programme Research,  
Development and Education



[www.czech-bioimaging.cz](http://www.czech-bioimaging.cz)