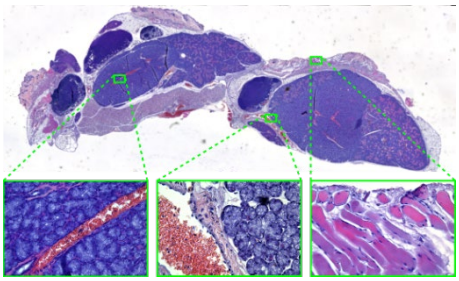
Newsletter September 2022

BIOCEV

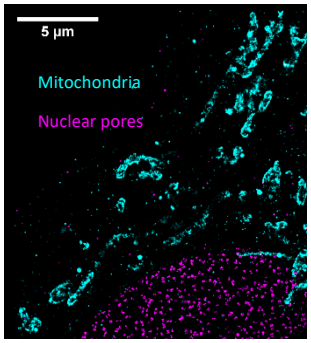
Light microscopy



Leica DMi8 upgrade

In COLOR at last! Our Leica DMi8 inverted microscope was upgraded to enhance the user experience. It is now equipped with a sensitive monochrome camera for fluorescence imaging as well as color camera for imaging of stained samples in transmitted light. The new LAS-X Navigator module enables full utilization of the motorized stage: easy and comfortable navigation in whole slide sections, high-resolution imaging of large areas and more!

NEO software for super-resolution SMLM data analysis



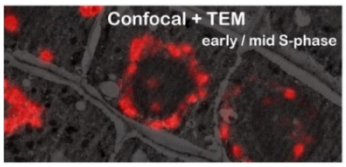
Do you want to make super-resolution SMLM data analysis fun? Try the newly purchased NEO SW from Abbelight, currently available on Workstations 1 & 2. NEO software has a user-friendly interface for analysis and visualization of single molecule localization microscopy (SMLM) data and offers several powerful features, e.g., background removal, drift correction, 2D & 3D multi-color visualization, cluster analysis and particle tracking. A key feature is a unique module for spectral demixing analysis of our Nikon-STORM data.

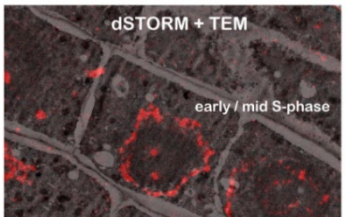
Leica SP8 Upright – Cryo-fluorescence microscope

Are your cells too fast for 3D live cell imaging? Are your structures of interest too unstable for high SNR imaging? Freeze them! And then image as long as you need by our upright confocal fluorescence microscope with a new cryo module. Cryo-fixation preserves samples in native shape and avoids several artifacts induced by traditional chemical fixation. The slightly lower spatial resolution compared to room temperature imaging, is compensated by very low photobleaching rates. In preparations are cryo-correlative light and electron microscopy workflows, which will offer the best match between specificity and ultrastructure in cellular samples.

Electron microscopy

How to find a needle in a haystack?





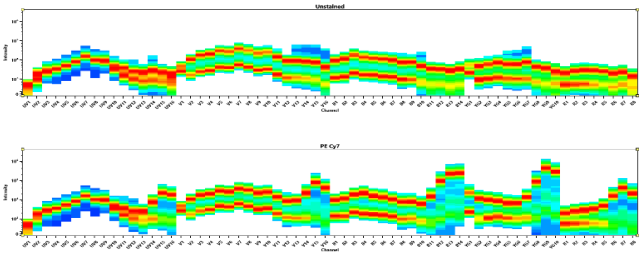
A new “on-section CLEM” method to target ultrastructure in biological samples that are difficult to be localized within 3D-volume of a sample using conventional CLEM approaches has been implemented at IMCF. The difference is that the samples are first fixed and embedded into a suitable resin, and only then the targeted structure is fluorescently labelled on semi-thin sections. Features of interest are registered in both transmitted light & confocal or super-resolution fluorescence images, which enables to track these features in subsequent mapping of ultra-thin sections under the transmission electron microscope, giving very high precision of 3D-correlation.

Launch of the Cryo-EM club – every second Wednesday each month at 13:30

The “Future is cold” sounds out of tune with the global warming paradigm, yet in the field of electron microscopy, there are no doubts the cryo-EM methods will prevail. With an immense potential and impact in structural biology, bioengineering and beyond, cryo-EM is a complex workflow of high-end technologies that allow preservation of intact biological samples in vitreous ice, automated imaging with cryo-electron microscope and 3D-reconstruction of molecular structures using dedicated software tools and algorithms. And yes, we have it at the IMCF! To facilitate exchange of experience, learning of cryo-EM principles and discussions on troubleshooting and future needs of cryo-EM tools in BIOCEV, we have launched the regular *Cryo-EM club* meeting, which is open to everyone interested in ground-breaking EM technology and applications. To get on the Cryo-EM club email list please contact the main organizer Adam Schröfel (Rozbesky lab) or any EM staff from IMCF facility.

Flow cytometry

The full operation and support of the Cytek® Aurora Spectral Cytometer launched

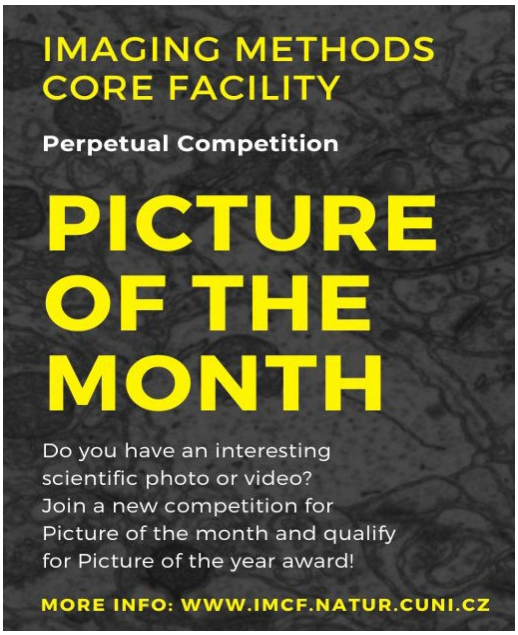


Thanks to the cooperation with the Czech Centre for Phenogenomics, the owner of the device, we can provide you with access and full support to the Aurora - high-end spectral cytometer. Aurora is equipped with 5 lasers and 64 fluorescence detectors, capturing the entire emission spectra from each fluorophore. This enables it to measure up to 40 fluorophores in one tube. It is especially suitable for measuring samples with a large number of fluorophores (12 and more), but the advantages of spectral cytometry stand out even when measuring simple projects, especially for fluorophores with similar spectral characteristics or cells with high autofluorescence. We will be happy to consult with you about whether spectral cytometry could be beneficial for your experiments and provide you support with cytometer setup and operation if needed.

New FlowJo licence available

To increase your comfort when analyzing data, we have purchased one extra USB dongle Flowjo license, which can be remotely connected to your computer with FlowJo installed and you can analyze your data from the comfort of your home/laboratory. You can find the procedure for installing the necessary software on our website in the „How to access“ section.

Picture of the month



In June, we announced the competition **‘Picture of the Month’** and we already know the first winners! If you want to appreciate epic pictures with us from the first three rounds, please see our website: www.imcf.natur.cuni.cz/IMCF/monthly-winners/

A little reminder for others - don’t forget to submit your stunning images or movies for the following months and join the competition. The monthly winners qualify for the **‘Picture of the Year’** and will compete for some nice financial prices.

We are looking forward to see your breathtaking pictures!

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BIOCEV

How can you access our service?

All users access the facility by directly contacting IMCF staff (imcf@natur.cuni.cz).

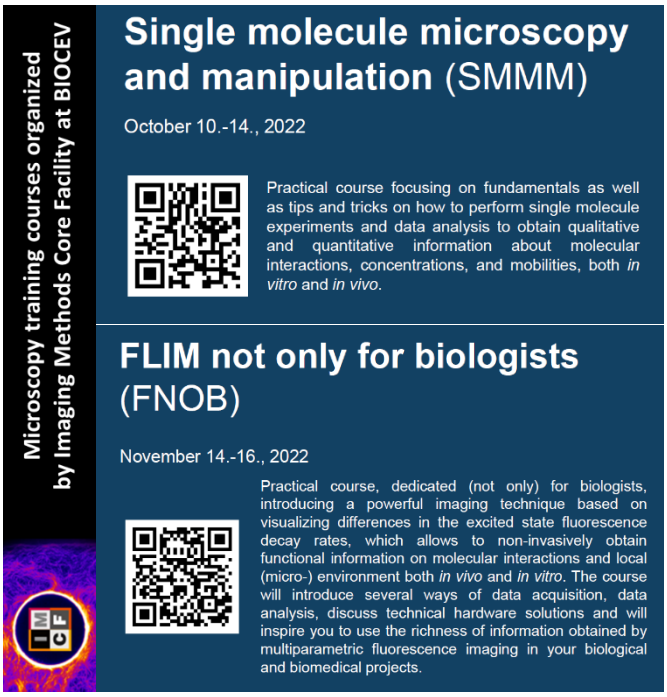
External users (international or outside BIOCEV) are later required to register their project at Euro-BioImaging portal.

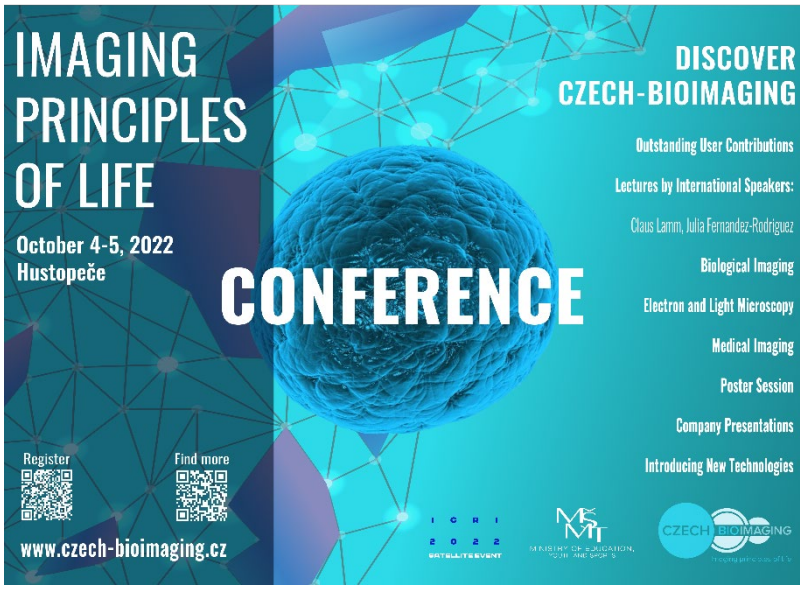
Funding opportunities to cover the instrument and service fees are provided by Czech-BioImaging grant scheme twice a year for any user or by Euro-BioImaging International funding instruments for transnational access.

Current deadline for submitting Czech-BioImaging grant applications: October 10, 2022

Please contact us at least a week before submission to discuss the technical and budgeting aspects of your proposals.

Upcoming events





Your IMCF team

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