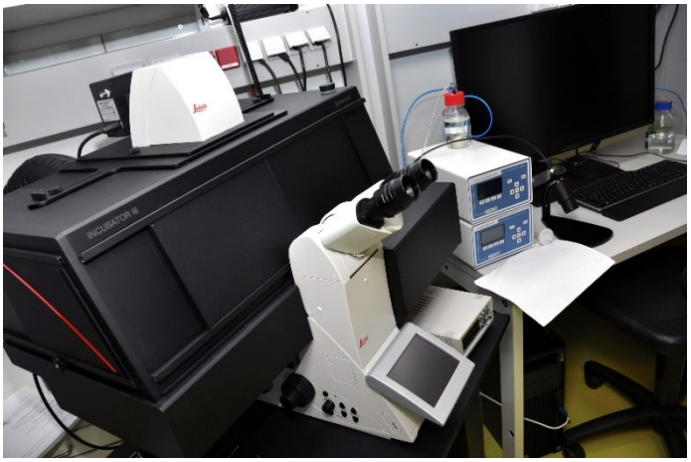
Biooptics Newsletter 12/2017

Biooptics Core Facility-in general

The Biooptics Core Facility of the MUI exists since early 2009 and is located in the CCB, Innrain 80-82, first floor, rooms M01.370 and M01.381. We are currently hosting four microscopes in house and an additional one in cooperation with the Department of Pharmacology at Peter-Mayr-Strasse 1a. You can find more detailed general information on the official website.



Onsite testing of STED and AFM

We will have the opportunity of testing the STEDYCON system in February 2018 in combination with an atomic force microscopy (AFM) setup at the CCB. The onsite test will start from **February, 23rd** on with a general introduction to the systems. The STEDYCON will stay roughly one week and I will organize a schedule for interested people. Briefly, STEDYCON is a "plug-in" STED system that can easily be connected to any existing fluorescence microscope; after this rather simple installation, 2D STED imaging can be started. AFM, which has not yet been implemented at the CCB, can be used to map surface structures e.g. on living cells in 3D, without using a fluorescent label. Moreover, AFM can measure binding affinities (binding forces) e.g. between cell surface receptors and ligands. You can find more information on STEDYCON and AFM online.

The STEDYCON will come with a red depletion laser requiring special secondary antibodies to stain your samples. These antibodies will be available for free upon request (in January 2018) at the core facility biooptics. It will be a great opportunity to have a look on these systems; in case of interest don't hesitate to contact me.

Onsite testing of a Light Sheet Microscope

In autumn we will be testing a light sheet microscope (Zeiss, September 2018). There are currently two major applications for this technology. First, it is used to image larger living samples such as organoids, zebra fish embryos, but also plants. The main advantages are high frame rates and low phototoxicity. Second, it is used for large fixed samples, such as whole mouse brains, which were prepared using any of the numerous available clearing methods (CLARITY, iDISCO, CUBIC, …). Here, the main advantage compared to a standard confocal setup, is the increased axial resolution and improved axial light yield due to the geometry of the light sheet illumination.

The Zeiss system will be able to image both living organisms and cleared samples -details are to be arranged!

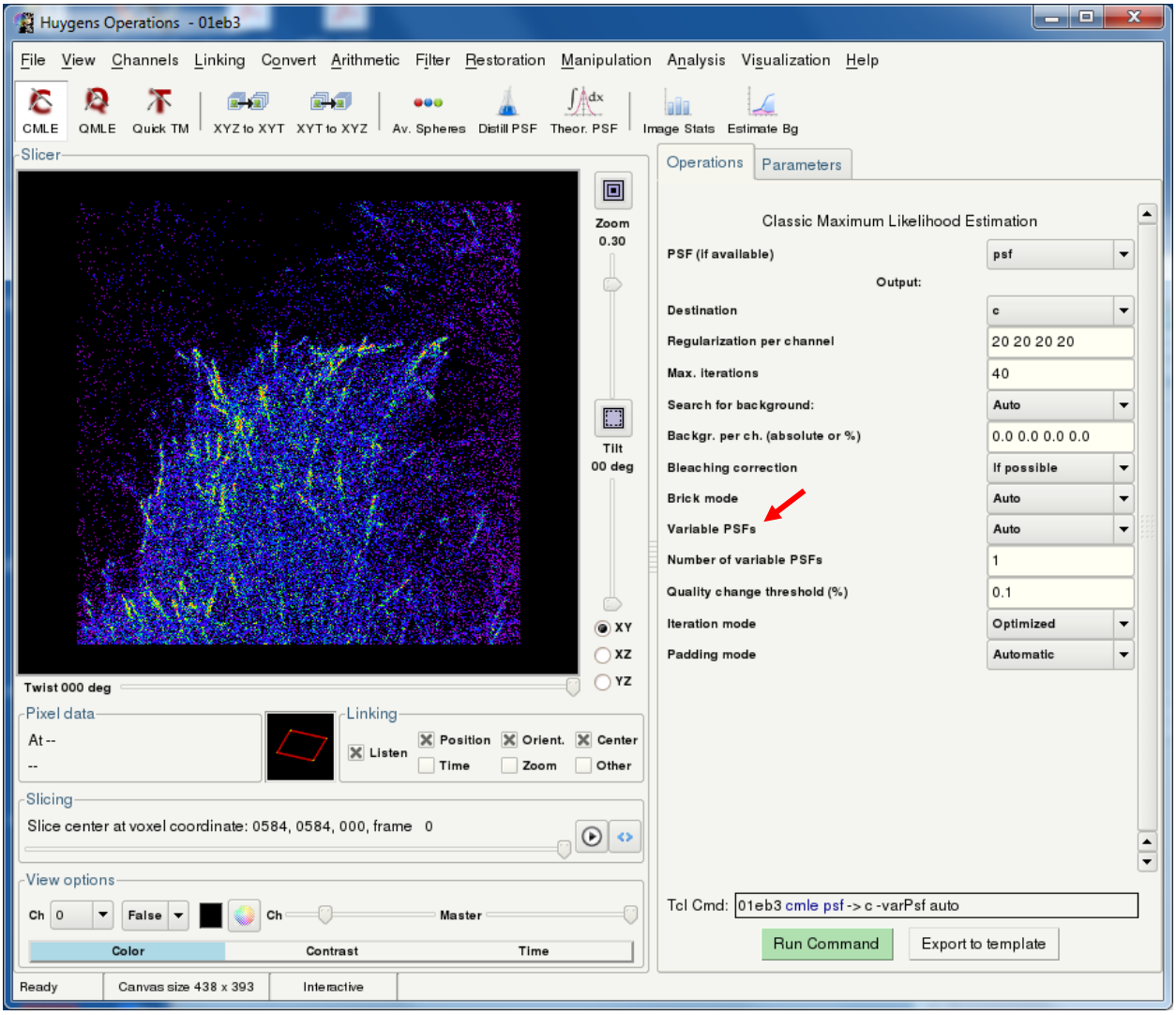
News in Brief

New options in the DMi8 widefield fluorescence microscope:

The DMi8 microscope has a new software feature, called “navigator”. It simplifies several automation tasks quite substantially. You can eg use it to scan and stitch tissue sections in a much easier way than before. It is also quite handy for live cell imaging-please contact me for further details.

New PSF calculation option in Huygens:

Some may have noticed already a new function in the Huygens software. You can now find in the CMLE algorithm a new function “variable PSFs”. You can eg set it to “auto”- it will then assume that the PSF of your sample can vary along the z-axis and try to model it- this should improve the results, especially if you are dealing with thicker samples such as tissues.



A new (STED) embedding medium?

There is a new embedding medium on the market called “prolong glass”- it is supposed to match the refractive index of glass exactly (1.52). It is therefore expected to yield superior images especially with samples that have a rather big z-extension and/or STED samples in combination with any oil immersion objective. It will be tested within the core facility soon-watch out…

Hands-on image processing course in January 2018

There are still some places available for the annual practical image-processing course in January (Digital Imaging 2: Applications). Since scientific image processing is generally of increasing importance, I’ d like to recommend this course, which will give a quite general introduction to the topic. All interested PhD students can register online using i-med inside.

Contact and further information

Martin Offterdinger, PhD
Medical University Innsbruck, CCB
Division of Neurobiochemistry /Biooptics
Innrain 80-82, room 01.370
A-6020 Innsbruck
Austria
phone : +43-512-9003-70287
mail: martin.offterdinger@i-med.ac.at
http://www.i-med.ac.at/neurobiochemistry/neurobiochemistry/Biooptics/Main.html