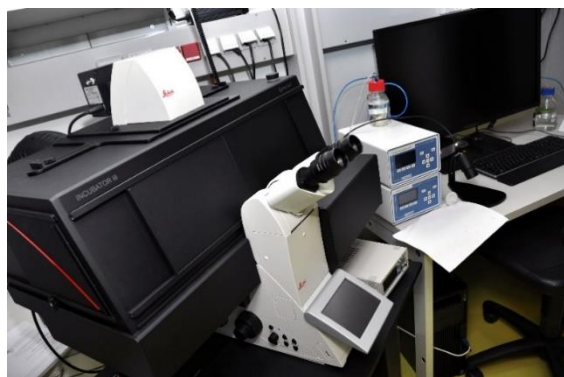


Biooptics Core Facility-in general



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, a neuron-tracing instrument in cooperation with the Department of Pharmacology at Peter-Mayr-Strasse 1a and a 2-photon microscope in cooperation with the Department of Physiology, Schöpfstrasse 41. You can find more information on the [official website](#).

New booking system

The Core Facility Biooptics is using a new booking system, enabling a much better administration of all microscopes. The new booking system is in use since April, 1st and can be accessed via the biooptics website.

SP8 STED upgrade (06/2019)

We will receive a major upgrade on the SP8 gSTED microscope. The current system is equipped with a 592 nm STED depletion laser for green fluorophores and rather thin samples (10 to 15 μm). STED imaging was generally associated with high bleaching rates. It will be upgraded with a 775 nm pulsed STED depletion laser and a corrected 93x glycerol STED objective. The upgrade is expected to overcome the aforementioned limitations. The pulsed 775 STED depletion laser will enable the use of far-red STED chromophores. This will on the one hand result in highly **improved bleach properties**, since the overall energy transferred to the sample is much lower (pulsed and far-red STED light compared to continuous and orange STED light). Second the glycerol STED objective in combination with the 775 far-red laser enables **STED-imaging of thick material** such as **tissue sections** (20-50 μm and above). **Multi-color STED** will be easier to perform as well. For 775 STED far-red STED fluorophores are required. For immunofluorescence, typical chromophores are StarRed (Abberior, best choice) and Alexa 594 or Star580 (Abberior). Small aliquots of secondary antibodies (mouse/rabbit) will be available from the core facility. If you are interested in live-cell imaging, I recommend to check the Spirochrome dyes (SiR-Dyes, Tebu-Bio, Spirochrome). The upgrade will be finished at June, 5th and the new system will be available from June, 6th on.

2-Photon microscope

Recently, a 2-photon (2P-) microscope was purchased. The 2P-microscope is capable of measuring **fluorescence in thick tissue samples** (up to several 100 microns) beyond the capabilities of a normal confocal laser scanning microscope. The system is located at the Department of Physiology (Prof. Dr. Michaela Kress, Schöpfstrasse 41). MUI and external researchers are allowed to use the 2P-microscope after training or as collaboration. The 2P-microscope can be booked via the regular booking system

(after training). This “biooptics-associated” instrument will be primarily supervised by Dr. Michiel Langeslag, who will also organize user trainings. It will be upgraded in the future to enable live cell and live animal imaging. Presently, the most useful application is the **imaging of thick fixed samples** (>100 μm), which cannot easily be imaged on a standard LSM (like the SP5 or SP8). Compared to confocal imaging, it is capable of optical sectioning and imaging at 2 wavelengths over non-descanned detectors (PMTs). One internal detector is available for 2nd harmonic imaging or fluorescence at any wavelength.

WANTED: SP5 successor (reinvestment in 2020)

The SP5 is getting old and we are planning to replace it - if possible - in 2020. In order to get in the most useful instrument for all research groups at the Medical University of Innsbruck, we are planning several on-site demos of possible successor candidates of the SP5. Zeiss and Leica have agreed to demonstrate their latest confocal microscopes at the core facility in Innsbruck. Demos are already scheduled and everyone is invited to attend the theoretical talks and to bring his/her own research samples. Please use this excellent opportunity, test the systems and express your opinion. The decision for (or against) a certain instrument will certainly concern all users of light microscopy for many years - it is therefore very important for everyone!

On-site Demo of LSM980 AiryScan 2 (Zeiss)

LSM980 (with AiryScan 2) is the latest confocal from Zeiss (launched in April, 2019). It harbors two major detection systems, which can be tested.

The first one is a sensitive 32-channel spectral detector, which is supposed to be very useful for multi-color samples. It is able to separate up to 7 to 8 colors directly. Some current users in the facility have 4 to 5 colors, which should be easy to separate with this detector. If you are interested in this detector please prepare your multi-color samples and single color controls (one color only!).

The second one is the AiryScan 2 detector, which is able to catch much more light and geometric information during the scan than a standard detector. It consists of 32 channels as well, which are arranged in a circular way. The detector is very light efficient and fast. I have briefly tested the precursor instrument (LSM880) in February 2019 and the AiryScan detector showed a very good performance and low bleaching on a live (low expressing) yeast sample. This detector can be used for a limited number of colors, but is very useful for high-speed, low bleaching, low noise, superresolution or general confocal (live) imaging. Please find an overview of the system here:

<https://www.zeiss.com/microscopy/us/products/confocal-microscopes/confocal-microscope-with-multiplex-mode-lsm-980-airyscan-2.html>.

In addition to the LSM980/AiryScan2 Zeiss will also show the automated imaging platform “Cell Discoverer”.

Save the date: Zeiss on-site demo

- Introduction/Talks: 01.08.2019, 9:30 to 13:00, seminar room M01.470
- Hands-on sessions (to be scheduled): 01.08. afternoon to 07.08.2019: Biooptics core facility

On-site Demo of SP8 FALCON Lightning (Leica)

Sp8 FALCON is the latest confocal from Leica. One important new development is the FALCON software, which is an easy-to-use time correlated fluorescence software, which enables fluorescence lifetime measurements and fluorescence correlation spectroscopy. In addition, the system is equipped with the new software module “Lightning”, which is a highly improved online deconvolution algorithm. The other elements are mostly based on the SP8 confocal, which is well known to many users of the CFB. Please find more information on the Leica system here: <https://www.leica-microsystems.com/de/produkte/konfokalmikroskope/p/sp8-falcon/>

In addition to the SP8 FALCON Leica will also show the novel wide-field imaging platform “Thunder”.

Save the date: Leica on-site demo

- Introduction/Talks: 24.09.2019, 9:30 to 13:00, room M01.470
- Hands-on sessions (to be scheduled): 24.09. afternoon to 27.09.2019: Biooptics core facility

Contact and further information

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