Details

Life Imaging Center (LIC) in Hilde Mangold Haus and BIOSS Centre for Biological Signalling Studies, University of Freiburg (LIC)

The Life Imaging Center (LIC) at the Hilde Mangold Haus (HMH) and the BIOSS Centre for Biological Signalling Studies is the central light microscopy facility of the University of Freiburg. It was established in 2001 and with a space of 380 m² it offers the whole spectrum of modern advanced light microscopy techniques for more than 300 users from natural sciences, the medical center and the technical faculty. It is also open to external users from other research institutes. The LIC has 12 confocal microscopes and 9 wide-field microscopes. They can be used for specialized techniques, like two-photon and high-speed microscopy, photo-manipulation and -activation, spinning disk, laser ablation, FLIM as well as ratio imaging, FRET, TIRF and time-lapse imaging. Super-resolution microscopy set-ups for 3D applications using gated STED technology, SIM, STORM or AIRYSCAN are also available. A major research focus of the LIC users is the work with organisms or cell culture systems that are commonly used in developmental biology, systems biology or cell signaling research. Commonly used samples are: Danio rerio, Arabidopsis, Drosophila, Xenopus, C. elegans, mice, as well as primary cells or long-term cultures and cell clusters (e.g. cysts, biopsies). A computer lab with 12 workstations, equipped with latest image analysis tools and visualization software, enables image processing and data analysis from acquisition to publication. At present, the LIC has, besides the head of the facility, three employees (scientists and technical staff). The LIC is founding member of the DFG-Gerätezentrum MIAP (Microscopy and Image Analysis Platform), a tri-national network of core facilities offering access to a big range of different light and electron microscopes, microscopy research and development labs, and image analysis departments in Freiburg, Basel, Strasbourg and Mulhouse.

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Scientific Domain

Primary Subjects:
- Biology
- Medicine
- Materials Science and Engineering

Secondary Subjects:
- Agriculture, Forestry, Horticulture and Veterinary Medicine
- Chemistry
- Computer Science, Electrical and System Engineering

Category

Biomedical Imaging Facilities

Scientific Services

Introduction and supervision of scientists on the following microscope set-ups (number in brackets): Confocal (12), wide-field (6), lightsheet (1), long-time recording up to 14 days (4), stereo with fluorescence (4). Superfusion, temperature control and incubation available on all microscopes. Experimental guidance for: Ratio-imaging (FRET, ion-measurements), TIRF, super-resolution (3D-STED, Airyscan), manipulation (FRAP, FLIP, ablation, photo-activation and conversion, optogenetics), 2-photon microscopy, spectral unmixing, special software for online

multiple object tracing and large area recordings, gravity stimulation of plant growth, execution of pilot experiments together with the scientists. All labs are biosafety level 2. Cell culture lab (3 benches, 6 incubators) and wet-lab for sample preparation. Web-based booking system for resources; server for remote image-deconvolution (256 GB, 16 CPUs, 2 GPUs), assistance with data analysis on 13 workstations with latest software (Arivis Vision 4D, Imaris, Volocity, Huygens, Metamorph, Amira, Origin, LAS X, NIS, ZenBlue, ZenBlack, Adobe Suite, CorelDraw, Videomach, Office), data- and FTP-server and image data base.

Scientific Equipment

- Zeiss Lightsheet Z.1, 2 channels
- Zeiss LSM 880 Examiner / Fast Airyscan with 2-photon laser, upright
- Zeiss LSM 880 Observer / Fast Airyscan with two beam 2-photon laser, inverted
- Nikon A1 CLEM, inverted
- Nikon C2, upright
- Nikon A1 FLIM, inverted
- Nikon dStorm/SIM, inverted
- Leica SP8 gated FLIM, upright
- Leica SP8 gated 3D-STED, inverted
- FEI-TILL Andromeda Spinning disk / TIRF, inverted
- Spinning disk microscope, Zeiss, with ablation, inverted
- TIRF microscope, Zeiss Cell Observer, inverted
- Ratio imaging microscope, Zeiss Observer, inverted
- Celldiscoverer 7/ Zeiss LSM 900 with Airyscan 2
- Zeiss LSM 980 Observer / vertical with Airyscan 2

Keywords

- confocal microscopy
- widefield microscopy
- TIRF microscopy
- 2-photon microscopy
- real-time object tracing
- photo-manipulation
- FLIM
- ratio-imaging
- laser ablation
- live cell microscopy
- FRAP
- FRET
- long-time microscopy
- super-resolution / STED 3D / SIM / PALM
- Lightsheet for live & fixed large samples

Networks

Microscopy and Image Analysis Platform (MIAP)
https://miap.eu

German BioImaging, (GerBI-GMB), Society for Microscopy and Image Analysis
https://www.gerbi-gmb.de

QUAREP-LiMi, Quality Assessment and Reproducibility for Instruments & Images in Light Microscopy
https://quarep.org/

Users per annum

Internal Users: 300
External Users in total: 10
External Users: 5
External Users in the EU: 5
External Users outside of EU: 5