

BOKU Core Facility Multiscale Imaging (MSI)

MSI offers high-end research light microscope and related applications for imaging and monitoring uni-or multi-cellular model organisms or biomolecules either in their native environment (“*in vivo*”) or in artificial matrices. The facility offers wide-field fluorescence and confocal microscopes and label-free technologies like Raman and FT-IR microspectrometry. Starting in July 2026, cryopreparation and scanning (SEM) as well as transmission electron microscopy (TEM) were added to our portfolio.

General policy

Microscopes of the facility MSI can be only used after receiving a training or proving relevant personal skills. Training on the various microscope setups must be given by the head of the facility or a senior staff member. (**Trained user mode**)

In **full service mode** the facility staff perform the experiments, evaluate the data and generate report.

The staff provides project discussions – free of charge –, in order to choose the most appropriate microscope for the planned experiments. As the project progresses, further discussions are always possible.

Use of the facility’s infrastructure is restricted to material that is classified as safety level S1 (no infectious or hazardous material).

Service fees and prices are specified in various categories (e.g. depending on the user's affiliation and the funding of the project), and users can always see the hourly rate when booking a specific instrument/microscope via PPMS management software. MSI reserves the right to update prices at any time. Users and project leaders can receive customized offers per email after a project discussion and before starting experiments. Updates of service fees and prices apply for ongoing projects, too.

To start any new project, please contact the person responsible for the service area of interest (see *Communication*) to discuss the possibilities available and instructions on how to order service. Users are encouraged to have some initial information ready, such as previous attempts, papers that show results similar to those the user would like to obtain, and - last but not least - a clear idea of what one would like to see and what question(s) one would like to answer.

Infrastructure of the facility

List of available light microscopes:

- ZEISS LSM980 – AiryScan2 confocal microscope
- Leica TCS SP5 confocal microscope
- Leica TCS SP8 – STED super-resolution confocal microscope
- Leica TIRF microscope
- Leica DMI6000B fluorescence microscope
- Leica LMD6500 laser microdissection microscope
- Horiba XploRA INV Raman microscope
- Bruker LUMOS II FT-IR microscope
- Bruker Hyperion 2000 FT-IR microscope

List of available electron microscopes and preparatory equipment:

- SEM FEI Apreo VolumeScope
- TEM FEI Tecnai G20
- High-pressure freezer Leica HPM100
- Freeze etcher Leica ACE900 with Leica VCT500 and VCM (cryotransfer)
- Critical Point Dryer Leica CPD030
- Sputter Leica SCD005

There is also a dedicated workstation for image analysis which can be reserved as the above-mentioned microscopes. An account for HuygensEverywhere online image analysis software can be created for any user upon request. The software usage is tracked automatically and will be charged accordingly.

Training

Autonomous work in the MSI facility is exclusively allowed after receiving a training by the facility staff. A training only applies for a selected microscope. Users are not allowed to train newcomers. To schedule a training, please contact the facility head. During training, future users will be informed about safety and booking regulation. If training is not successful or if the user does not comply with the rules of the facility, in particular safety rules, facility staff can ban individual users temporarily or permanently from the utilization of instrumentation or the facility.

Biosafety and Lab safety

General rules for biosafety and lab safety are available in a separate document. Use of MSI services and infrastructure is restricted to material that is classified as safety level S1 (no infectious or hazardous material).

Instrument Booking

Instruments must be booked in advance via the PPMS management software calendar and users must confirm usage in the PPMS calendar and in the provided paper logbooks when automated online tracker is not implemented. Users are encouraged to report any error message/failure of functions that occur during their work. Problems with samples should not be recorded.

Novice users get a short introduction to the PPMS management software during their first training session; they learn how to properly administer their bookings. If not cancelled, the booked instrument time will be charged. Users who repeatedly do not log their slots will be banned from using the infrastructure.

MSI reserves the right to cancel bookings – even on short notice -, when instrument maintenance or repair is necessary. Preventive maintenance will be scheduled to minimize impact on usage. Booking restrictions for a given microscope will be provided during training. No restrictions for booking apply to MSI staff for carrying out co-operation projects or for maintenance. If instruments become unavailable, facility staff will inform all affected users at the earliest possibility.

It is self-evident that every microscope should be used with utmost care, that resources should be used wisely, that users check back with facility staff immediately if anything is unclear or if problem occurs during operation, despite the instructions laid down in protocols and given by *MSI* staff.

User's samples and reagents

All samples, buffers and reagents that are brought to the facility by users must be clearly labeled, at least with a designation of the sample material, the name of the user and the date. These items must be taken when the user leaves the facility at the end of the reserved slot. Samples, buffers and reagents may be stored in the facility upon request. For temporary storage, please consult the facility head. For safety reasons and cleanliness, unlabeled and unattended samples will be discarded by the staff without previous warning.

The MSI facility takes absolutely no responsibility for properties left in their laboratories. Therefore, users are kindly asked to pick up any material left in the facility. Any shipping costs resulting from returning samples to off-campus locations must be fully covered by the user.

Waste management

All (biological) samples and disposables they came in contact with must be discarded in containers labelled with:



Dirty labware (bottles, beakers etc.) must be placed on designated trays.

Data transfer and storage

Raw data acquired on MSI microscopes and workstations can be saved locally or on the facility's server and must immediately be transferred to the user's own BOKU servers or external servers. Data may temporarily be stored on the facility's server or on the system computer of the microscope in use, but they are subject to deletion when storage capacities are limited.

Users will be informed before data removal.

Any data saved on the server or on system computers 2 years before current date can be deleted by the facility head without prior warning!

Usage of USB sticks is strictly prohibited!

Publications, acknowledgement

If users present their data obtained with support of facility staff, they must acknowledge in publications or oral/poster presentations the facility and the person. Citing the facility in the acknowledgement is the only way we can track the

impact of our services. We would appreciate receiving a copy of all publications for which the infrastructure was used. Please contact the staff for help with preparing a manuscript discussing data generated via MSI services (e.g. presentation of data or description of the methodology). Fair scientific practice demands that members of the facility who intellectually contributed to a publication are considered as co-authors.

Possible variants:

1. “This project was supported by ... and the BOKU Core Facilities Multiscale Imaging.” (In this case, there was no need for any guidance or support from the staff during work with facility instruments)
2. “We thank X.Y. for his/her help with microscope experiments. The ... microscope was kindly provided by the BOKU Core Facilities Multiscale Imaging.”
3. Core facility staff member listed as author, and “The ... microscope was kindly provided by the BOKU Core Facilities Multiscale Imaging.”

Mailing

To request project discussion prior experiments, service or training, please email:

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Rene.Ladurner@boku.ac.at

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Feedback and evaluation

Users are highly encouraged to give feedback about the performance of the facility and make suggestions for improvement at any time to the facility head & staff.