

## Usage guidelines for the Advanced Light Microscopy Technology Platform (ALM) at the Max-Delbrück-Center, Berlin

The following guidelines apply to all internal and external user of the ALM. The purpose of these rules is to guarantee that all users are provided fair access to the infrastructure and resources provided by the ALM, that they use them carefully and know about responsibilities.

These guidelines are in accordance with recommendations by the ESF (04/2011) and the DFG (11/2011).

ALM welcomes feedback from the user groups about its infrastructure, provided support and service, especially about future needed imaging techniques, methods and technical upgrades.

We encourage groups to discuss advanced imaging projects in detail in advance to be able to work out optimal workflows for sample preparation, image acquisition and data processing.

More detailed usage rules (incl. booking system, cleaning objectives, general and laser safety) are handed out to each ALM user during the practical training.

### 1. Staff, Contact & Location

**Dr. Anje Sporbert** ([asporb@mdc-berlin.de](mailto:asporb@mdc-berlin.de)) – Head of ALM, administration, scientific support, microscopy support, image analysis

Office: room 1001, Tel. 9406-2734/ FAX: 9406-3722

**Dr. Anca Margineanu** ([anca.margineanu@mdc-berlin.de](mailto:anca.margineanu@mdc-berlin.de)) – Scientist, scientific support, microscopy support, image analysis

**Matthias Richter** ([m.richter@mdc-berlin.de](mailto:m.richter@mdc-berlin.de)) – Research technician, microscopy support, ALM IT and infrastructure, image analysis

**Konstantin Grohmann** ([konstantin.grohmann@mdc-berlin.de](mailto:konstantin.grohmann@mdc-berlin.de)) - Student helper, general microscopy support

Office: room 1008, Tel. 9406-2662/3781

Part-time (DFG-funded project-based user support)

**Dr. Vitali Matiash** – ([vitali.matiash@mdc-berlin.de](mailto:vitali.matiash@mdc-berlin.de)) - in-vivo imaging, microscopy support

**Dr. Zoltan Cseresnyes** ([zoltan.cseresnyes@mdc-berlin.de](mailto:zoltan.cseresnyes@mdc-berlin.de)) – customised image analysis/processing

Max Delbrück House (Building 31.1)

Microscope Rooms: 1069, 1069.1/2, 1068, Image analysis room: 1066

## 2. Accessibility & Inter-/Intranet presentation

ALM provides a list of its resources, access and user registration guidelines listed on the MDC main website: [http://www.mdc-berlin.de/en/research/core\\_facilities/](http://www.mdc-berlin.de/en/research/core_facilities/)

**Internal users** can follow a link to the online “ShareALM” facility management software on the MDC intranet site for online registration, project description, booking and more detailed information about ALM resources: [http://www.mdc-berlin.info/en/infrastruktur/core\\_facilities/](http://www.mdc-berlin.info/en/infrastruktur/core_facilities/)

**External users** are requested to contact Anje Sporbart with a short description of the planned projects.

## 3. Resources & Services provided by ALM

The aim of ALM is to provide researchers with a wide range of high-end fluorescence microscopes suitable for acquiring high-quality 2D to 5D imaging data and expertise on different imaging methods, especially for advanced in-vivo imaging.

Advanced **microscopy techniques** offered by the ALM include confocal and widefield fluorescence microscopy, multiphoton microscopy, TIRF microscopy, laser-microdissection, light-sheet microscopy and stereo fluorescence microscopy.

The ALM technology platform allows users to investigate a wide range of **microscope specimens**, including live and fixed cells and tissue sections, in-vivo and in-vitro organs, as well as live animals and model organisms. We offer support for advanced **imaging methods** from short/long-term live imaging to functional imaging (e.g. FRET, FLIM; calcium imaging), photomanipulation techniques (e.g. photoswitching/ bleaching, laser manipulation) to large tissue 3D tile-scan imaging and non-linear imaging techniques (two photon microscopy, SHG/THG).

**Image analysis** software tools for 3D/4D reconstructions, cell tracking, object tracing, colocalisation analysis, quantitative measurements and deconvolution are installed on dedicated high-capacity PCs in the image analysis area of the ALM.

ALM offers **lab space** for sample preparation, a cell culture bench and incubator for live samples. A dedicated server is available for short-term **storage of user data**.

In regular monthly **microscopy seminars** ALM is teaching both new and experienced users the fundamentals of light and fluorescence microscopy as well as advanced imaging techniques.

In **individual practical training** (one-to-one) ALM users are trained with their samples on the competent operation of the ALM microscopes.

We offer ALM users **advice** on instrument choice and specific experimental questions (e.g. sample preparation) as well as on possible solutions for image analysis.

In **project-based collaborations** we support users throughout the entire imaging process, including advice and help with experiment design and sample preparation, optimisation of data acquisition, customised image processing and analysis.

Upon request, **full service support** is possible on specific applications for internal and external users.

#### 4. User responsibilities:

Autonomous booking of microscopes requires ALM users to receive a practical training and a second assisted session, as well as an instruction on laser safety and acceptance of general rules for working in the ALM including rules for biological/ chemical safety, working alone and booking.

Each user is responsible for the equipment during the booked session which means the correct usage, start-up and shut-down procedure as well as cleaning of the equipment.

Technical problems which arise during the usage must be reported to the ALM personnel in person or via the **“Report Incident”** system of the **“ShareALM”** online facility management software.

Problems with handling of ALM equipment should always be communicated to the ALM staff to provide ad-hoc help or to arrange further assisted sessions.

#### 5. Acknowledgment & Authorship for ALM facility and staff

**General user support:** When users trained by ALM staff publish images acquired with microscopes located at and maintained by the ALM platform or image analysis results obtained with software installed in the ALM, these users should acknowledge the ALM in the Acknowledgement part of their publication (scientific publications, master/doctoral theses, conference contributions).

Example: *“We thank XX (supporting person(s)) and the Advanced Light Microscopy Technology Platform of Max-Delbrück-Center for Molecular Medicine, Berlin for the general and technical support.”*

Users should inform ALM about these publications as they are important references for the evaluation of the ALM activity by the MDC boards, as well as by DFG and BIH. PDF-files of the scientific publication can be provided via the upload-option in the **“ShareALM”** facility management software.

**Collaborative project-based user support:** If an ALM staff member spends substantially more time with a user on a specific project providing technological or scientific support, (e.g. by testing, establishing and optimising image acquisition/sample preparation conditions, customising image analysis, discussing experimental design or evaluating obtained imaging data) the ALM member should be rewarded for the extra effort by becoming co-author on the paper that resulted from this work. As far as involved in the project, the ALM member also takes responsibility for the validity of the acquired imaging data.

The details should be discussed between the respective project leader and the ALM head.

#### 6. User access

Priority is given for researchers from MDC/BIMSB and ECRC (internal users). If capacities allow ALM is also open for external users after contacting the ALM head.

For **registration** as internal user of ALM, please provide all required information in the on-line registration form found in the **“ShareALM”** user management software found on the ALM internet and intranet site (<https://mdccoop.mdc-berlin.de/sites/mbp/>). MDC credentials (provided by the IT department and available for all MDC employees and registered guests) are needed for registration.

Access to ALM platform requires:

- a detailed discussion of the aim of the imaging project and selection of the appropriate microscope or imaging method and sample preparation;
- attendance of the microscopy seminar on “Fundamentals of light and fluorescence microscopy”
- a general introduction to ALM rules, including booking rules, guidelines for S1 work, working alone, data storage and a laser safety instruction
- a one-on-one practical training session at the selected microscope and assisted sessions until the user is confidently and properly handling the microscope

After these 4 steps, access by MDC card will be provided to the appropriate microscope room and imaging sessions can be booked via the online microscope booking calendar in the “ShareALM” management software (<https://mdccoop.mdc-berlin.de/sites/mbp/>)

Additional assisted sessions of registered ALM users can also be arranged via “**Request assistance**” or “**Request new training**” form in the “ShareALM” management software. These sessions are highly encouraged to improve the quality of the acquired images, to clarify the experimental requirements and to discuss specific applications.

## 7. Data storage & Archiving, Image analysis

Users have to store data files in a **folder with their name** in the **research group folder** on the **User data folder** at the microscope computer.

It is the responsibility of each ALM user to safely store and transfer their experimental data. **Data stored on the microscope computers are not considered safe.** ALM does not provide backup service for files stored on the microscope computers. These files may be lost in case of computer problems.

All microscope computers are offline for security reason. Users should save data files on a DVD/CD, hard disks or transfer them to the MDC group file servers and delete data if not used anymore. Because of computer viruses, **no external hard disk/USB sticks are allowed on the microscope computers.**

User data can be transferred to the MDC Group File server (for long-term storage), to the ALM server (i.e. for image analysis) or to external hard disks via the transfer computer in each microscope room. MDC account credentials (from the IT department) are necessary to connect to the MDC file servers.

To provide always sufficient storage space for new experimental data, **data files have to be removed in regular intervals** which are communicated several days in advance. In case of shortage of storage space on the microscope computers, user data will be deleted, oldest data first.

Image processing and analysis should only be done on the dedicated, high-capacity computers in the image analysis area of ALM. Software can be booked after an introductory session via the ShareALM facility management software.

## 8. Booking rules & general rules for working in the ALM

### ***Booking rules:***

Before use, booking of the microscope in the online calendar of the “ShareALM” facility management software is obligatory: <https://mdccoop.mdc-berlin.de/sites/mbp/>.

**Reduction in booking duration or cancelations will be automatically announced via the “Share ALM” facility software to all other users of that microscope to make best use of the available capacities.**

Users are requested to check whether the next user booked is really using the microscope (esp. in the afternoon and before weekends). If not sure, they are required to switch off the microscope system. An online computer is available in every microscope room to check microscope bookings.

If a reserved time slot is not being utilised by the original user within 30 min of start, any user can take over the time slot and this usage time will NOT count against his/her quota.

Bookings are generally limited to 14 calendar days in advance.

**Daily quota:** 4 hours per day per person per equipment (peak time);

**Weekly quota:** 12 hours per week per person per equipment (peak time);

**Peak time bookings:** time slots that start and/or end during peak hours, i.e. from 8 a.m. to 6 p.m. (inclusive), Monday to Friday; only peak time bookings are counted against quota

**Last minute bookings:** same-day bookings which are not counted against the quota;

**Overnight bookings:** maximum two bookings per week (Mo-Thu) per equipment must NOT start before 6 p.m. and MUST end by 9 a.m. next day; they cannot be combined with peak-time bookings for the same day. Same-day bookings together with overnight time slots are possible and are not counted against this quota.

**Exemptions** from these rules are possible and should be discussion with the facility staff. Exemptions are only given for a limited time.

### ***Working with live specimen of biological safety level S1, in-vivo/intravital imaging:***

General rules for working in a biological safety (BS) level S1 area apply in all microscopy rooms of ALM (e.g. wearing a lab coat, no eating/drinking, special waste disposal). S1 safety instructions remain in the responsibility of the research group leaders.

Working with live specimen of **BS level S1** is only allowed after extension of the S1 area of the respective research group to include the used microscope room.

Working with live specimen of level **BS level S2** is not allowed.

For **intravital/in-vivo** microscopy an approved permission for the conduct of animal experiments (Tierversuchsantrag) has to be presented to the ALM head. Details of in-vivo/intravital projects should be discussed before with the ALM head.

***Laser safety regulations:***

A laser safety instruction by the ALM staff is obligatory before working independently on microscopes of the ALM. This laser safety instruction has to be yearly repeated.

***General safety regulations:*****Working alone, late and at weekends:**

Upon request, working in the facility is possible for experienced users around the clock and during weekends. ALM staff is usually present between 8 am and 7 pm on weekdays. If no ALM personnel is present, the users must ensure that they are not on their own and are able to call for help in case of an accident. Telephones are installed in all microscope rooms, but accessing the doors from the outside is possible only for trained users.

It is in the responsibility of the group leaders to inform their group members about the regulations for working alone, late and at weekends.

**Guests of ALM platform:**

Not-registered guests of registered users should be announced to the ALM staff **before entering the microscope rooms** and must always be attended by a registered ALM user. They are not allowed to operate the microscopes of the ALM.