

# Regulations for the Use of the Core Unit Fluorescence Imaging at the Rudolf Virchow Center

Effective October 2024/Valid from January 2025

~~~ Only the German version is legally binding ~~~

## 1. General information

The service of the **Core Unit Fluorescence Imaging (CUI)** is intended for researchers at the University and the University Hospital in Würzburg. The rules set forth in these terms of use apply to all users. These terms of use are based on the German Research Foundation (DFG) guidelines "Information on costs for the use of equipment and equipment centers" ([http://www.dfg.de/formulare/55\\_04/55\\_04\\_de.pdf](http://www.dfg.de/formulare/55_04/55_04_de.pdf)).

## 2. Microscopy Platform Services

- Support and training for all instruments according to the fee schedule (<https://www.uni-wuerzburg.de/rvz/cu-fluorescence-imaging/documents/>).
- Advice on assay planning, dye selection, staining, instrument selection, etc.
- Support for image processing and analysis
- Training on the image analysis software (Fiji, Huygens, Imaris, Ilastik, Symphotime, arivis, JupyterHub)
- Creation of images and videos for presentations and publications
- Coordination and planning between users
- System maintenance and upkeep

## 3. Administration and contacts

The contact person for scientific and technical questions is the head of the Core Unit Fluorescence Imaging, Prof. Dr. Katrin Heinze. The technical staff supports users with general and specific questions.

Contact details are listed below.

Prof. Dr. Katrin Heinze (Head of the Core Unit Fluorescence Imaging)

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#### **4. Access to Equipment**

All devices of the Core Unit Fluorescence Imaging are generally accessible to all working groups of the Rudolf-Virchow-Center, the University of Würzburg and the University Hospital of Würzburg after prior consultation with the principal investigator and instruction. External user groups can obtain access authorization by submitting their own informal project application, which will be reviewed by the head of the Core Unit Fluorescence Imaging.

#### **5. Registration**

Before using a Core Unit Fluorescence Imaging instrument for the first time, each user must fill out a registration form requesting general personal and project-related information. In addition, the responsible project manager must indicate the cost center responsible for the user fees, and sign the registration form. The confidentiality of this information is guaranteed. The registration form can be downloaded from the home page (<https://www.uni-wuerzburg.de/rvz/cu-fluorescence-imaging/dokumente/>) or sent upon request.

If a user is working on multiple projects at the same time, all projects or cost center/ project manager information should be provided. Alternatively, a form can be submitted for each project and given to the technical staff.

#### **6. Booking of a device**

The booking should be made exclusively on a separate calendar (<https://rbs.uni-wuerzburg.de/med-cu-imaging/>). The calendar is also used to record the hours booked and to settle the corresponding invoices.

Prerequisite for the activation of the booking system is both the registration and the instruction of the user at the respective device by the staff of the Core Unit Fluorescence Imaging. A brief introduction to the booking system can be found on the Core Facility website (<https://www.uni-wuerzburg.de/rvz/cu-fluorescence-imaging/dokumente/>).

Measurement time will be allocated on a first-come, first-served basis. Multiple simultaneous bookings and time overlaps are prevented by the booking system. Users must check the booking calendar before starting/planning their experiments. However, some live cell experiments may be given priority over fixed cell experiments if the instrument is overbooked

throughout the working week and Prof. Dr. Heinze will mediate between the parties in critical cases. If this does not help, the RVZ board or its representative will decide.

The hours of use of the instruments from 9:00 a.m. to 6:00 p.m. on working days are core times. To ensure fair booking, the booking of consecutive core times is limited to 5 hours per day for each user. More uninterrupted microscopy time can be obtained by booking time outside the core hours. Long-term experiments should be scheduled primarily outside of core hours so that at least two users can use the instrument per day, e.g. User 1 from 7:00 a.m. to 1:00 p.m. and User 2 from 1:00 p.m. to 9:00 p.m. Short measurements of less than 2 hours should be scheduled during off-peak hours if possible, e.g. from 9:00 a.m. to 11:00 a.m. or from 4:00 p.m. to 6:00 p.m., but not from 11:00 a.m. to 6:00 p.m., but not from 11:00 a.m. to 2:00 p.m. to allow other users to use the instrument on the same day. Short-term bookings for short measurement times are possible at any time, 24 hours in advance.

Reservations that exceed a user's daily core time limit can be made on short notice, subject to availability, but cannot be made more than 24 hours in advance.

In general, reservations should be made **no more than 2 weeks** in advance.

Other types of reservations, e.g. for lab course, can only be approved after consultation with the CUI management. The CUI staff reserves the right to postpone or cancel individual appointments for urgent technical or organizational reasons after consultation with the user.

## 7. Supervised Use of Microscopes

Once a user has been instructed on a particular microscope, he or she can perform measurements independently.

If a user wishes to receive assistance and support from the experienced staff of the Fluorescence Imaging Core Facility, the "*full service*" option can be selected in the booking calendar. This option should **only be selected after consultation** with the appropriate person to ensure that assistance is available within the selected time period. If no arrangement has been made, supervision cannot be guaranteed, and no supervision obligation can be derived from the selection in the booking calendar.

## 8. User Groups

When booking a microscope, a distinction is made between three user groups based on the fee schedule (see appendix): "internal", "external" and "special".

*Internal users* are employees of all working groups belonging to the Rudolf Virchow Center.

*External users* are all other employees of the University or the University Hospital Würzburg as well as external research groups.

The "*special*" category must be selected if the project is part of a DFG-funded consortium (e.g. SFB, TransRegio, GRK), in which the user costs are reimbursed by a fixed amount according to the consortia (absolutely necessary!). The request for user fees in a new consortium proposal

should ideally be discussed with the head of the Fluorescence Imaging Core Unit to determine an appropriate amount based on the planned measurements.

To correctly classify a user, if someone chooses the "*special*" category, he/she has to enter the name of the consortium and the subproject he/she is working on. The category to which the planned experiment belongs must always be selected correctly, especially if the user works on several projects at the same time or if he/she belongs to several user groups, e.g. an own project as an internal/external user and a project within a collaboration.

## 9. Cancellations

Reservations that cannot be kept by the user must be cancelled as soon as possible and removed from the booking system. Cancellations received prior to the start of the booked time are free of charge. Due to some unavoidable circumstances in experiments (e.g. missing transfection, cell death) the user may be charged only for the hours used instead of the full booked hours **after immediate consultation with the management** (important). **If the user does not show up without cancellation, the user will be charged the full fee for the reserved time in the price category "external user"**. Similarly, if the user does not show up, the reserved equipment will be available to other users 30 minutes after the start of the reserved time.

## 10. Regulation of usage priorities

In principle, all users have the same priority when booking devices. In the case of full utilization of these devices, the allocation of usage priorities is based on the provided project funding or the requested usage time of the respective device. In case of project-related urgency (e.g. manuscript revision, long-term experiments), users may be given priority for use after consultation with the management.

## 11. Available Devices

| Device                                    | Application                                                                                                | Device class |
|-------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------|
| Leica TCS SP5 I Laser-Scanning-Microscope | CLSM, FRET, FRAP, automated image capture                                                                  | II           |
| Leica TCS SP8 Laser-Scanning-Microscope   | CLSM, FRET, FRAP, automated image capture                                                                  | II           |
| PRIMO / Leica DMI 8 Fluoreszenzmikroskop  | Widefield-Fluorescence, 2D- and 3D-photo-coating and micro-fabrication with Leonardo-Software from Alveole | I            |
| Zeiss LSM980 AiryScan fast                | CLSM, FRET, FRAP, Deconvolution, automated image capture, Super-resolution via the AiryScan2/fast system   | III          |
| Leica TCS SP8 MP Multiphoton microscope   | Multiphoton, automated image capture                                                                       | III          |
| LaVision Biotec Multiphoton microscope    | Multiphoton, automated image capture                                                                       | III          |

|                                                |                                                                        |    |
|------------------------------------------------|------------------------------------------------------------------------|----|
| <b>5x Light sheet fluorescence microscope</b>  | automated image capture                                                | II |
| <b>20x Light sheet fluorescence microscope</b> | automated image capture                                                | II |
| <b>Leica DMI 6000 Fluorescence microscope</b>  | Widefield-Fluorescence, living cells, automated image capture          | I  |
| <b>Zeiss Observer Z1 dSTORM-microscope</b>     | dStorm, TIRF, Widefield-Fluorescence                                   | I  |
| <b>Picoquant FT300 Lifetime spectrometer</b>   | Fluorescence lifetimes, excitation and emission spectra, anisotropy    | I  |
| <b>Workstation 1 / License</b>                 | Data analysis                                                          | -  |
| <b>Workstation 2 / License</b>                 | Data analysis                                                          | -  |
| <b>Software Huygens / License</b>              | Deconvolution                                                          | -  |
| <b>Software Imaris / License</b>               | Image analysis, segmentation, tracking in time series, filament tracer | -  |
| <b>Software Arivis / License</b>               | Image analysis, segmentation, tracking in time series, filament tracer | -  |
| <b>JupyterHub</b>                              | Data analysis (GPU-Node)                                               | -  |

## 12. Flat fee for Analysis Computers & Evaluation Software

CU Imaging charges an annual fee for the use of the analysis computers and commercial image analysis software provided. The amount of the fee depends on the "financial strength" of the group leader, i.e. W1/junior group leaders pay less than W3/chair holders. The fee is payable per user and will be invoiced together with the microscopy fees starting in the first quarter of the year, based on the number of users in the previous accounting year. Beginning in September 2024, this flat fee includes unlimited use of the following evaluation computers and commercial analysis software:

- Workstation 1 (24 cores, 256 GB RAM, Nvidia GeForce RTX 4060 Ti)
- Workstation 2 (24 cores, 320 GB RAM, Nvidia GeForce RTX 4060 Ti)
- CUI-BEE (16 cores, 1024 Gb RAM, NVIDIA Quadro RTX6000, 24GB)
- JupyterHub (24 cores, 320 GB RAM; NVIDIA A4500 (20GB), NVIDIA A5000 (24GB))
- Imaris (2x single user license)
- Huygens (available on CUI-BEE only)
- Zeiss Arivis pro (available on CUI-BEE only)

The evaluation computers and the analysis software must be booked via the booking system and the licenses will be allocated on a first come, first served basis (if all licenses are allocated, the analysis may have to be performed at another time). In addition, all users will have sufficient storage space to cache their data on the data server (HIVE) for the duration of the data analysis (currently approximately 90 TB of free storage space (October 2024)).

To use the HIVE and the JupyterHub you have to apply for a login at CU Imaging (contact: Joachim Schenk & Katherina Hemmen).

### **13. User Obligations and Responsibilities**

Users of the Microscopy Platform are required to

- Acknowledge and comply with the Core Facility's general rules of use.
- Use the equipment independently only after instruction by Core Facility personnel.
- Operate all equipment according to the procedures learned during the initial orientation. Only use methods in which the user has been instructed.
- Immediately report any hardware or software problems to those responsible for the equipment.
- Clear and clean the work area before leaving and close all computer windows after image analysis.
- Before shutting down microscopy systems, check the schedule for reuse. If the microscope is to be used again (within 1 hour), the laser and fluorescent light sources must be left on.
- Notify the core facility management if you are leaving as a user and do not plan to use in the near future.

**If someone violates the user rules or deliberately blocks microscopes by booking without showing up, we reserve the right to block users for a period of up to 3 months and, in severe cases, to exclude them completely.**

### **14. Safety Instructions**

All users must be able to demonstrate, upon request, that they have received appropriate instruction before using the microscope systems for the first time. If necessary, these briefings will be conducted by the Safety Officer on separate dates for internal users. Safety training must be repeated annually (dates and invitations will be sent out in advance).

### **15. Data Storage**

Each user is responsible for data storage. Data may only be stored temporarily on the designated partition of the respective computer. External storage media must be free of viruses. The Core Unit Fluorescence Imaging reserves the right to delete long-term stored data on the microscope computers if necessary.

The Core Unit Fluorescence Imaging will not transfer data from one research group to another without their consent. Unauthorized copying of other users' data is strictly prohibited. In such cases, the user will be denied access to the microscopy facility and the group leader will be informed.

### **16. Compliance and Legal Requirements**

CUI User Policy complies with relevant laws, regulations and ethical standards for data management and privacy.

## 17. Training and Awareness

The CUI provides educational materials and guidance on data management and expects users to follow best practices, security protocols and regulatory requirements. We also promote awareness of privacy and data security among all users.

## 18. Mention of the Microscopy Platform in Publications

As the Fluorescence Imaging Core Unit and in particular the microscopes are partly funded by third parties, it is important that their contribution is mentioned in the acknowledgements of publications and theses.

If images or data sets are used in publications or theses (Bachelor, Master, PhD) that were generated on the instruments, the facility should be mentioned in the acknowledgement: "We thank the Fluorescence Imaging Core Facility of the RVZ, especially [name], for support in fluorescence imaging [data analysis] [image processing]. "A copy of the publication in PDF format should be sent to the management of the core unit. In the case of substantial scientific contributions to a publication by an employee of the Technology Platform, they must be treated as any other co-author.

In addition, for microscopes funded by third parties, it is mandatory to state the funding or project number: *"This publication was made possible in part by DFG project (INST 93/1022-1), Confocal Imaging; Purchase of a Zeiss LSM 980 Airyscan II microscope. The authors would like to thank the Core Unit Fluorescence Imaging of the RVZ at the University of Wuerzburg, especially [name], for support in fluorescence imaging [data analysis] [image processing]."* This number can be found on the instrument and in the table below.

| Device                     | Funding/project number |
|----------------------------|------------------------|
| Zeiss LSM980 AiryScan fast | INST 93/1022-1         |

## 19. Liability

The user or the respective organizational unit is liable for damage to microscopes that can be proven to be the result of improper operation or gross negligence. In such cases, the user or organizational unit will be charged for the resulting repair and maintenance costs.

## 20. User fees

The use of the microscopes is charged by the hour. The booking times are recorded via the online booking system (<https://rbs.uni-wuerzburg.de/med-cu-imaging/>) and invoiced to the group leaders on a quarterly basis. The price list can be found on the homepage (<https://www.uni-wuerzburg.de/rvz/cu-fluorescence-imaging/dokumente/>) and is also included at the end of this document.

Measurements in pure application mode (with little support) may only be performed by experienced users. Measurements are considered "service operations" if staff of the Fluorescence Imaging Core Unit perform the measurement or if time-consuming, project-

specific support is required for the measurement and/or evaluation. The initial training of new users is free of charge.

Equipment usage fees consist of two components: (i) the cost of maintaining basic operations and (ii) project-specific operating costs. The cost of maintaining basic operations includes, but is not limited to, the following costs:

- Maintenance
- Basic Operations Staff

Project-specific costs include, but are not limited to:

- Consumables (e.g. calibration reagents, immersion oil, special sample carriers)
- Laser wear and tear
- Spare parts
- Project-specific data buffering (microscope hard drives)

The project-specific fees for the use of equipment within DFG projects can be claimed as usage costs in the respective DFG funding lines.

| User operation       |         | Cost key        |                            |                                             |
|----------------------|---------|-----------------|----------------------------|---------------------------------------------|
| Device class         | Fee/h   | Basic operation | Project-specific operation | Project-specific operation (personnel cost) |
| <b>internal user</b> |         |                 |                            |                                             |
| I                    | 10.00 € | 0.00 €          | 10.00 €                    | - €                                         |
| II                   | 15.00 € | 0.00 €          | 15.00 €                    | - €                                         |
| III                  | 30.00 € | 0.00 €          | 30.00 €                    | - €                                         |
| <b>external user</b> |         |                 |                            |                                             |
| I                    | 15.00 € | 5.00 €          | 10.00 €                    | - €                                         |
| II                   | 25.00 € | 10.00 €         | 15.00 €                    | - €                                         |
| III                  | 50.00 € | 20.00 €         | 30.00 €                    | - €                                         |

| Serviced operation   |         | Cost key        |                            |                                             |
|----------------------|---------|-----------------|----------------------------|---------------------------------------------|
| Device class         | Fee/h   | Basic operation | Project-specific operation | Project-specific operation (personnel cost) |
| <b>internal user</b> |         |                 |                            |                                             |
| I                    | 35.00 € | 0.00 €          | 10.00 €                    | 25.00 €                                     |
| II                   | 40.00 € | 0.00 €          | 15.00 €                    | 25.00 €                                     |
| III                  | 55.00 € | 0.00 €          | 30.00 €                    | 25.00 €                                     |
| <b>external user</b> |         |                 |                            |                                             |
| I                    | 40.00 € | 5.00 €          | 10.00 €                    | 25.00 €                                     |
| II                   | 50.00 € | 10.00 €         | 15.00 €                    | 25.00 €                                     |
| III                  | 75.00 € | 20.00 €         | 30.00 €                    | 25.00 €                                     |



## Attachment

Usage fees for devices of the Core Unit Fluorescence Imaging

| Device                                      | Internal user group <sup>1</sup> |                    | External user group <sup>2</sup> |                    |
|---------------------------------------------|----------------------------------|--------------------|----------------------------------|--------------------|
|                                             | user operation                   | serviced operation | user operation                   | serviced operation |
| Leica TCS SP5 I Laser-Scanning-Microscope   | 15.00 € / h                      | 40.00 € / h        | 25.00 € / h                      | 50.00 € / h        |
| Leica TCS SP8 Laser-Scanning-Microscope     | 15.00 € / h                      | 40.00 € / h        | 25.00 € / h                      | 50.00 € / h        |
| PRIMO / Leica DMI 8 Fluorescence microscope | 10.00 € / h                      | 35.00 € / h        | 15.00 € / h                      | 40.00 € / h        |
| Zeiss LSM980 AiryScan fast                  | 30.00 € / h                      | 55.00 € / h        | 50.00 € / h                      | 75.00 € / h        |
| Leica TCS SP8 MP Multiphoton microscope     | 30.00 € / h                      | 55.00 € / h        | 50.00 € / h                      | 75.00 € / h        |
| LaVision Biotec Multiphoton microscope      | 30.00 € / h                      | 55.00 € / h        | 50.00 € / h                      | 75.00 € / h        |
| 5x Light sheet fluorescence microscope      | 15.00 € / h                      | 40.00 € / h        | 25.00 € / h                      | 50.00 € / h        |
| 20x Light sheet fluorescence microscope     | 15.00 € / h                      | 40.00 € / h        | 25.00 € / h                      | 50.00 € / h        |
| Leica DMI 6000 Fluorescence microscope      | 10.00 € / h                      | 35.00 € / h        | 15.00 € / h                      | 40.00 € / h        |
| Zeiss Observer. Z1 dSTORM-microscope        | 10.00 € / h                      | 35.00 € / h        | 15.00 € / h                      | 40.00 € / h        |
| Picoquant FT300 Lifetime Spectrometer       | 0.00 € / h                       | 25.00 € / h        | 15.00 € / h                      | 40.00 € / h        |
| Workstation 1 / License                     | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |
| Workstation 2 / License                     | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |
| Software Huygens / License                  | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |
| Software Imaris / License                   | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |
| Software Arivis / License                   | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |
| JupyterHub                                  | 0.00 € / h                       | 25.00 € / h        | 0.00 € / h                       | 25.00 € / h        |

<sup>1</sup> RVZ

<sup>2</sup> Employees of the University Hospital, the University of Würzburg and external research groups