

Usage Policy of the Bioimage Core Facility

The **Bioimage Core Facility** for Light Microscopy and Image Analysis (BICORE) was founded and is now run by the Department of Biology and the Section of Medicine of the University of Fribourg.

The core facility provides access to shared instrumentation and software for state-of-the-art light microscopy. The core facility staff's mission is to assist you along the path *from sample to knowledge* with our experience in optimized image acquisition and our expertise in image analysis and data mining.

Who can access the facility?

All research groups from the University of Fribourg and associated Institutes (e.g. Adolphe Merkle Institute) can get access to the facility after registration. With research groups we refer to group leaders or principal investigators (PI) who have her/his own funding (research grants) including the collaborators paid via financial resources of the PI. An official list of research groups is maintained and updated by the administration of each department.

The core facility is also accessible to external users. Using the core facility without an UNIFR informatic account requires additional preparation. However, this procedure is not covered in this document and will be directly communicated to future facility users when needed.

How to get access the facility?

If it is the first contact with the facility, the preferred way is to schedule a meeting with the core facility staff. Future users will be presented with an overview of the services of the facility, and get an opportunity to discuss applications and how to best implement them. Invitations from research groups for a meeting with all/several interested lab-members are appreciated.

Once users have decided on which instrument to use for their experiment, the instrument access procedure has to be completed (see *get access to an instrument* [section](#))

What we do

- Maintain and upgrade a comprehensive set of high quality optical imaging systems
- Advise users on experimental design and measurement strategies
- Provide training and guidance in the use of the instruments maintained by the core facility
- Maintain and upgrade high-end image analysis software and powerful image analysis workstations
- Operate servers to save and handle imaging data
- Provide all relevant information and a reservation calendar on our website
- Disseminate knowledge on optical imaging through formal teaching, workshops and hands-on training
- Favour the dissemination of open-source solutions for image acquisition and analysis
- Follow the current development in the field of light microscopy

What we do not do

- Carry out experiments on your behalf
- Perform image analysis on your behalf
- Repair and maintain your 'private' microscope (i.e. instrument not part of the core facility)

Using the facility resources

All facility users have to complete a training session with the facility staff for any given instrument they intend to use. While we encourage colleagues to share their expertise in microscopy with their lab-members, first time users of core facility instruments still have to complete training given by the core facility staff.

Training sessions for all instruments are **free of charge**. Users can also re-schedule training sessions to refresh their knowledge or to further improve their microscopy skills with a given instrument as needed.

The facility also retains the right to impose subsequent training sessions for microscope users if the facility staff comes to the conclusion that additional instructions are needed or if insufficient proficiency becomes manifest.


Determine the best instrument for the job

When new experiments are planned, we recommend getting in touch with core facility staff members before you submitting the training request. Send us an e-mail ¹ with the following information:

- Specimen (cell lines, tissue sections, etc.)
- Staining (fluorophores and their targets, tissue staining , etc.)
- Sample preparation (fixed, live, embedding medium, etc.)
- Carrier (e.g. glass slide, petri-dish, multiwell plate, etc.)
- What is the approximate size of the smallest structure of interest
- What needs to be analysed/quantified

With the above information we can determine which of the instruments is best suited for the task.

Get access to an instrument

1. Submit a training request for a given instrument on the booking system ² by clicking on the  icon of scheduled-resource panel and indicate date/time preferences in the *comment* field of the request form. Core facility staff will then schedule the training session (also see IRIS documentation ³)
2. After completion of the training you will be granted:
 - Access to the booking calendar of the instrument
 - Access to the facility premises (campus card)
 - The right to use the instrument autonomously


Routine instrument usage

The microscopes under the care of our core facility are complex and expensive instruments. Please handle them with care. If in doubt, please ask the core facility staff for assistance and advice. Below you find the checklist for each session:

1. Always reserve your time slot (see IRIS documentation ³)
2. Visual check of the system (no obvious defect, make sure to work with clean objectives for best results)
3. Start the system (see manual pages on bioimage wiki ⁴)
4. Do you measurements
(soak up the immersion liquid on the objective with a Kimwipe between slide changes)
5. Save the data on a secure location (see [section](#) on *data management*)
6. Shutdown the system (see manual pages on bioimage wiki ⁴)
7. Clean the objectives with lens cleaning paper and alcohol
8. Clean the work surfaces, keyboard and mouse with alcohol and (normal) cleaning tissue
9. Order for refills if necessary (cleaning utensils, immersion liquids)
report irregularities (see [section](#) on *assistance and issue reporting*)

Assistance and issue reporting

Type	Communication Channel	Examples
Real time assistance	Boris: 8881 Felix: 8545	Software does not start, hardware does not repond, ... something that keeps you from being able to perform your measurements.
Request to resolve in due time	IRIS ²	Refill of consumables needed: used the last cleaning tissue, immersion liquid bottle ran empty, something is missing, c: drive of the computer is almost full ...
Log book entry	IRIS ²	Unexpected, unusual or unexplainable observations: strange noise, little deffects on the hardware that do not compromise the entire system ...
Consulting	e-mail ¹	Which system is best suited for the type of measurement? How can I optimise my sample preparation? Optimisation of the data acquisition (speed, sampling, etc.). Discussion of measurement strategies. Questions concerning data handling. Help with the data analysis.

To submit an issue use our booking system described IRIS documentation ³. Once logged into IRIS, find the resource you are working with and use the pen-icon  in the upper right-hand corner of the instrument panel to open an issue.

Material breaks... and when it does, the core facility staff's concern is not who to blame, but how to fix it swiftly. Reporting issues is the facility users contribution to ensure the smooth operation of the infrastructure. Importantly, failing to report issues in timely manner is treated as negligence.

When reporting an issue please ensure to include the following:

- Short description of the problem
- Minimal, precise steps to reproduce the problem
- Illustrating screenshots/photos/(video) of the problem/error message

For software issues please read the following best practices ⁵.

Access to facility premises

Access to the core facility premises is controlled by locks with card readers. The facility together with SELOG established a procedure to program the campus card depending on the instruments that need to be accessed. Once the UNIFR account has granted the access, the campus card needs to be updated at one of the campus card machines ⁶.

University staff

After completed training, the core facility staff will contact SELOG directly to program the additional door access for the new facility users.

Bachelor and master students

Students without a work contract need to fill out a form and have it signed by their group leader (PI). Once it is filled out it needs to be sent directly to the UNIFR administration. After completion of the training and upon request, the form (with the door numbers pre-filled) can be obtained from the facility staff.

Mailing lists

The core facility uses several mailing lists for different information channels:

- The list `bioimage@unifr.ch` is used for important announcements to inform facility users (demos, courses, new equipment, etc).
- The `bioimage-admin@unifr.ch` list is to address the entire core facility staff.

Facility users are encouraged consult the university's mailing list server ⁷ and subscribe to the lists of interest.

Booking rules

Booking rules were implemented to give all facility users equal chance to access the instruments and ensure concise booking slots.

Definition of *office-hour-slot* and of the *office-hour-slot-count* (N_{oh})

All workdays, Monday to Friday, have the following two four-hour office-hour-slots:

1. 8:00-12:00
2. 13:00-17:00.

N_{oh} is the number of times your booking is overlapping with an *office-hour-slot*.

For example; a booking 8:00-11:00 has $N_{oh} = 1$ and a booking 9:00-14:00 has $N_{oh} = 2$.

Saturday and Sunday do not have any *office-hour-slots*.

The following booking rules apply:

1. Microscopists book exclusively their own slots.
2. Maximum *office-hour-slot-count*:
 - From any present time onwards every microscopist has to count $N_{oh}^{total} \leq 3$ for all their bookings ending in the future.
 - Whenever possible, microscopists try to occupy only one *office-hour-slot* per day $\rightarrow N_{oh}^{day} < 2$.
3. Each microscopist can occupy only one instrument at the time. Exceptions are: fully automated instruments like slide scanners (IC-3) and image processing workstations (IC-4).
4. Cancellation must be done before the booked slot has started.
Once the slot started OpenIRIS will not allow cancellation anymore and the regular usage fees apply for the entire duration of the slot.
5. When finishing a session before the end of a booking, please inform the next user or potentially interested colleagues.

Usage fees

To cover the running costs of the core facility, research groups contribute to the its budget according to their equipment usage. The billing is calculated for all members of each research group and invoices are sent at the end of each trimester (four times a year) to the head of the laboratory (PI).

Definitions

We distinguish three **user types** (UT):

- **UT-I:** Platform internal -> Department of Biology and Section of Medicine (equal contributors to yearly maintenance budget)
- **UT-U:** University internal -> All the staff of the University of Fribourg and associated institutes (maintenance costs financed via rates)
- **UT-E:** External -> All persons not associated with the University of Fribourg

The **yearly ceiling** determines the maximum number of usage hours per year and **instrument group** that a research group will be charged. Anything usage time beyond the ceiling will be subtracted to calculate the billable usage hours. The maximum amount may vary for instrument groups that include several different hourly rates (e.g. IC-1.1 and IC-1.2).

The different **instrument categories** define two things:

1. **Hourly rate** [CHF/h] for associated instruments.
2. **Instrument group** (first integer of the category name). I.o.w. instruments contributing to one usage hour total a ceiling is applied to.

Rates

INSTRUMENT CATEGORY (IC)	INSTRUMENTS	UT-I		UT-U	UT-E
		RATE [CHF/h]	YEARLY CEILING [h]	RATE [CHF/h]	RATE [CHF/h]
IC-1.1 Confocal	Leica TCS SP5 (Med), Leica TCS SP5 (Bio), Leica TCS SPE-II	15.00	250	30.00	60.00
IC-1.2 Cutting-edge confocal	Leica STELLARIS 8 FALCON	20.00		35.00	65.00
IC-2 (Live-Cell)	Visitron CSU-W1 (Spinning Disk Confocal), GE DeltaVision Elite, Leica DMI600B (Bio)	7.50	250	25.00	45.00
IC-3.1 Slide-Scanner	Hamamatsu NanoZoomer 2.0 HT	0.00	-	10.00	15.00
IC-3.2 Slide-scanner fluo	Leica DM6B Navigator, Hamamatsu NanoZommer S60	5.00	250	10.00	15.00
IC-4 Miscallenious	Image Processing Workstations, etc.	0.00	-	0.00	NA
IC-5 Cell imager	Agilent-BioTek Cytation5 BioSpa8	3.00	250	17.00	21.00
Data storage	Charges of the DIT are forwarded to the enduser *	**	-	170	NA

* Concerns: OMERO image database ⁸ . Huygens Remote Manager ⁹

** Central IT (DIT) server fees ¹⁰

NA = Not available

The fees listed in the following table, comprise direct costs (consumables, salaries, maintenance fees) and indirect costs (rent, admin. , etc.etc.). For detailed explanations about the cost calculations and what budget you can use to pay the fees (SNF, EU, etc) please contact the core facility ¹.

Laboratory safety

The future facility user acknowledges to have studied the information and policies of the SCIMED Faculty ¹¹.

Laser safety

Certain of our systems use lasers for illumination, photo-bleaching or photo-ablation. Users need to make themselves aware of the safety precautions provided in the manuals of these systems. While the safety mechanisms of the microscopes give a good protection, users need to be careful of mirror-like reflections that their samples might cause.

Data management and data safety

Control computers of any of our instruments are not intended for data storage. Use file servers or external hard drives to store your data (also see our wiki ⁴ for more detailed information). A full hard drive compromises the effective operation of the instrument. To keep the systems running data saved on the PC hard drive will be deleted on a regular basis and **without prior notice**. As a consequence, to ensure the data safety, once you leave the microscope the data should be transferred from the microscope's computer to an appropriate storage medium.

Data security

Sensitive data (e.g., samples from human patients) need to be treated according to data protection laws. Before bringing such samples for measurements with core facility instruments, users have to assert that those samples are anonymised.

Certain computers have large hard drives, accessible by all users of that machine that serves as a buffer space between acquisition and transfer to a permanent data storage. To avoid accidental sharing of sensitive datasets, even anonymised, those data need to be removed from the microscope computers and image processing workstations immediately after their acquisition/processing.

For projects handling such data, make sure that the risk analysis provided by the university's security officer (it-security@unifr.ch) and the security measures are known and implemented.

Accreditation

Core facilities provide the wider research community with state-of-the-art instrumentation and expertise, which not only adds to, but also improves research outputs and funding bids. It is important to recognise the contributions of facility staff to the advancement of scientific research, both formally and informally, in all instances of technical assistance (for more detail see Kivinen et al. ¹²). Therefore we ask scientists to acknowledge the BICORE in the following settings:

- Presentations of scientific work (seminars, conferences)
- Grant applications
- Publications in scientific journals

The type of recognition that is most appropriate will vary dependent upon the contribution provided by the core facility:

1. All publications resulting from the use of instruments within the facility should, at the very least, acknowledge the as a whole, e.g. *'the authors gratefully acknowledge the **Bioimage Core Facility** of the University of Fribourg for their support & assistance in this work'*
2. Where users have had significant help from a particular member of core facility staff and/or if they have generated additional data for the core facility user, this staff member should be acknowledged by name, alongside the center.
3. If scientists from the core facility contributed more than just routine techniques, they should be co-authors on publications that use such data. Examples of such task include: Development or adaptation of protocols to suit samples or materials, (re)designing experiments, performing extensive data analysis and interpretation, implementation of the image processing pipeline, providing custom software tools (code, Jupyter notebooks, ImageJ plugins, etc.)

Please send a reprint of the paper, or an e-mail ¹ including the reference information for the publication, to core the facility. ¹³

Duties of the core facility user:

- Follow the directives described in this document
- Provide a cost center who's owner (PI) agrees to cover the charges of the Bioimage Core Facility
- Be informed (documentation, announcements, etc. on the website ¹⁴)
- Communicate with the core facility staff (see *issue tracker* [section](#), *mailing lists* [section](#), *booking rules* [section](#))
- Acknowledge the core facility staff's work (see *accreditation* [section](#))
- Email ¹ a signed copy of this document to the Bioimage Core Facility

I took note of the service scope provided by the Bioimage Core Facility and I agree to the terms of usage described in this document. I understand that bad conduct and breaking these terms can result in the withdrawal of my access to this core facility.

First name:

Last name:

Date:

Digital signature:

1. bioimage-admin@unifr.ch [↗](#) [↗](#) [↗](#) [↗](#) [↗](#)

2. <https://iris.science-it.ch/timeline/?provider=p1344&organization=244> [↗](#) [↗](#) [↗](#)

3. <https://www.unifr.ch/scimed/facilities/resources/iris/> [↗](#) [↗](#) [↗](#)

4. <http://bioimage-wiki.unifr.ch> (intranet only) [↗](#) [↗](#) [↗](#)

5. https://imagej.net/Bug_reporting_best_practices (sections 1-4) [↗](#)

6. <https://www.unifr.ch/campuscard/de/geraete/standorte.html> [↗](#)

7. <https://lists.unifr.ch/sympa/lists#b> [↗](#)

8. <https://omero-web.unifr.ch> [↗](#)

9. <https://biomage-hrm.unifr.ch> [↗](#)

10. <http://www.unifr.ch/dit> [↗](#)

11. <https://www.unifr.ch/scimed/en/safety> [↗](#)

12. <https://doi.org/10.15252/embr.202255734> [↗](#)

13. Adapted from the "Publication Core Facility Policy" by Natasha Stephe of the Plymouth Electron Microscopy Centre [↗](#)

14. <https://www.unifr.ch/scimed/facilities/facilities/bioimage/> [↗](#)