The DCI-Lausanne cryo-EM center

General Policies

DCI-Lausanne
EPFL and UNIL
DCI Lausanne
BSP 407 / Cubotron
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Website : dci-lausanne.ch

Director: Dr. Alexander Myasnikov
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1. General Rules:

We are committed to delivering the latest cryo-EM technology to users of DCI-Lausanne. If you would like to access the facilities, please contact the DCI staff:

dci.team@groupes.epfl.ch

We will be happy to assist you in any and all aspects. Before initiating your new project, you will be required to fill out and sign a User Agreement Form.

Microscope time and prices vary depending on your host institution:

EPFL, UNIL, and UNIGE users: first priority, no overhead

Industry users: limited access, full fees (full cost recovery)

Swiss academics: limited access, special fees (recovery)

Non-Swiss academics: limited access, full fees (full cost recovery)

2. Access to the facility:

The DCI-Lausanne evaluates the technical feasibility and requirements of the projects. Access to DCI-Lausanne is granted solely based on these criteria and not on the biological question/relevance of the project.

Only authorized and trained personnel are permitted to access the DCI-Lausanne. Before getting access to the sample preparation room and microscope rooms, you must undergo training and adhere to the lab safety policies established by the DCI-Lausanne in agreement with EPFL/UNIL. Depending on your host institutions, you will get access to the DCI-Lausanne by different entry points:

(i) **UNIGE users**: please contact and coordinate with the DCI-Geneva before contacting DCI-Lausanne

(ii) **EPFL-SV users**: please either contact us directly or coordinate with **Protein Production and Structure Core Facility (PTPSP)**.

(iii) **EPFL users**: please contact us directly.

(iv) **UNIL users**: please contact us directly.

(v) **All others**: please contact us directly.

Please note that the DCI-Lausanne may recommend you to contact another facility for sample preparation, cryo-CLEM, etc. In such cases, you will make the contract with other facilities independent from DCI-Lausanne. DCI-Lausanne is not responsible for prices and billing from other facilities.

3. Booking of any instruments:

Before using any of instruments and accessory equipment in DCI-Lausanne or performing any cryo-EM experiments in DCI-Lausanne, please:

(i) Contact the members of the DCI-Lausanne via email:

dci.team@groupes.epfl.ch or alexander.myasnikov@epfl.ch

to discuss your project and receive the **User Agreement Form**. This is the only the way to gain the access to the Project management system of DCI-Lausanne (PPMS from Stratocore Inc). Once **User Agreement Form** has been correctly filled and signed by both the user and user's supervisor (necessary for invoicing system), please send it back to:

alexander.myasnikov@epfl.ch

(ii) Once you are allowed to use instruments autonomously means you completed the various training at DCI-Lausanne for the various instruments (Freezing machines, microscopes, etc.), you will be able to make reservations on the PPMS booking system by yourself at the following address

https://sv-ppms.epfl.ch/start/

The DCI-Lausanne only will cancel fees if the data collection is not possible due to technical defects of the instruments. Fees will not be cancelled if the results do not meet expectations and are not usable for the project due to sample/grid quality. Fees will not be cancelled if you failed to cancel in time your session (please refer to **Session cancellation rules**).

4. Grid making and access to the sample preparation rules:

Only authorized and trained personnel are allowed to access the sample preparation room during working hours (9.00 to 17.00) at DCI-Lausanne. By doing any experiment in this room, you agree that:

(i) You have passed the training provided by DCI-Lausanne only. You have been instructed and you comply with the lab safety policies by DCI-Lausanne. And you are authorized to handle any instrument, equipment, and/or materials that may be considered biohazardous as defined by DCI-Lausanne.

(ii) Before initiating any experiments, you must check the status of the tools and instruments and report if any instruments have been previously damaged. If you have damaged or failed to report a damaged instrument, you or the

previous user will be held responsible for the damage (see **18. Misconduct and failure to report).**

(iii) Clean up the experimental area and return it to its original state immediately after your experiment.

(iv) P2 sample is not allowed in the current DCI-Lausanne sample preparation room. For P2 sample preparation, please refer to the following P2 section.

5. P2 sample handling and grid preparation:

Only authorized and trained personnel are allowed to access the P2 sample preparation room. Before getting access to this sample room, you need to:

(i) Be registered as EPFL or UNIL member. The P2 lab is only accessible to user belonging to those universities for security reason. Any guest or invited user must contact the P2 office after having talk to DCI-Lausanne.

(ii) It is required to go through P2 training and obtaining certification of P2 training from EPFL or UNIL (i.e: FOBS 3 from EPFL and later for UNIL) and you need to contact the responsible for the laboratory safety policies (alexander.myasnikov@epfl.ch).

(iii) Complete the training at P1 laboratory first.

(iv) Grids must be stored in a specific dewar dedicated for P2 sample only.

(v) For loading the grids onto the microscope, please refer to rules concerning the clipping and loading of samples (see **Clipping and Loading grids into the microscope rules**).

(vi) Clipped grids from other facilities/customers will be checked by the DCI-Lausanne staff (see **Clipping and Loading grids into the microscope rules**).

6. Rules for Clipping and Loading grids into the microscope:

Only authorized and trained personnel are permitted to load and operate Titan Krios and Glacios. The DCI-Lausanne staff authorize only users whom they judge to have appropriate skills to operate the instruments independently. Trainings can be required and reiterated as long as needed until the user meets expectations for safe instrument operation.

(i) Any bended, broken, or improperly clipped grids will not be loaded.

(ii) P2 samples need to be clipped in P2 room and the grids need to be discarded according to P2 regulation in a P2 lab.

(iii) Grids/Cassette/Nanocab from the P2 lab should be used and returned only from/to P2 lab

(iv) **P2 sample** can be loaded in microscopes from Monday to Friday morning. An exception is for the Glacios where the sample can be loaded on Friday but the sample must be unloaded by 17.00.

(v) The microscopes can be used in "warm condition" i.e. not cooled down by liquid nitrogen. In such case, the sessions are limited on all microscopes to the day after a cryo-cycle, means mostly on Monday. User must state clearly before hands the demand for "warm condition".

7. Sample storage:

The center will provide the storage space for the grids until your session day using a puck grid boxes storage system in the liquid nitrogen dewar. However, after the data collection, DCI-Lausanne is not responsible for preserving and storing samples long-term. The center does not have the capacity to store grids beyond three months after your session. The users should keep track of their samples and retrieve old grids from DCI-Lausanne during these three months period. **After this three-month period, with a short notice, samples will be discarded.**

8. Reservation of a microscope and session day:

When booking the Titan Krios or Glacios, users are encouraged to use the pre-defined time blocks as shown in the PPMS booking system.

(i) **Glacios booking for screening and data collection:**

Users can reserve the Glacios for one day screening from 9.00 to 17.00. The screening process should be finished by 17.00. In case of data collection for an overnight session until next morning, the setup of the data collection must be completed before 18.00. Users should indicate which grids should be saved for further data collection and provide grid boxes to store to DCI-Lausanne stuff (see rule **Prior to the session**).

(ii) **Titan Krios booking and data collection:**

The booking time changes depending on the week with or without cryo-cycle**.**

Week with cryo-cycle:

Three sessions with two-day sessions Monday - Wednesday morning (48 hours), Wednesday-Friday morning (48 hours), and Friday – Sunday (48 hours))

Two sessions with three days. Monday - Thursday morning (72hours), Thursday-Friday 6.00pm or Saturday morning (60 hours or 72 hours).

For the week **without** the cryo-cycle:

The Friday session can be extended until next Monday morning. If someone wants to use less Titan time – it is also possible.

(iii) Each reservation for Titan **should not exceed three consecutive days**.
If you need to reserve an instrument for longer than three days, please contact the staff, and we will do our best to accommodate your request.
In case of instrument unavailability due to issues or maintenance, users will be moved to the end of the queue. However, this will not go beyond Monday of the second week from the moment of the issue.

The next reservation for any of the microscope is allowed only after the current session is done/canceled.

In exceptional cases, it is allowed to use Titan microscopes for screening the same way as Glacios.

9. Prior to the session:

Users are required to deposit the grids at least 24 hours in advance for loading into any microscope. Failure to adhere to this deadline means DCI-Lausanne is not responsible for delays in the session start, and the center reserves the right to unilaterally cancel the session if staff assistance is unavailable due to late sample arrival. If a user fails to show up with grids or does not cancel the session at **least 24 hours before its start**, DCI-Lausanne will charge for the microscope usage.

10. Requirements to access the screening microscope - Glacios:

Glacios is a microscope that can be used for screening cryo-samples (**up to 12 grids per session**) and is also capable of high-resolution data collection.

To access the Glacios:

(i) Loading the grids onto the microscope as referred to DCI-Lausanne rules concerning the clipping and loading of samples (see **Clipping and Loading grids into the microscope rules**).

(ii) Ensure that the samples have been characterized using biochemically and/or biophysically methods and approved by DCI-Lausanne staff.

(iii) Negative staining EM is generally required prior to screening. The users must provide the results of the 2D classification from negative staining data.

(iv) For P2 sample, please refer to the section: **Clipping and Loading grids into the microscope rules**.

It is user's responsibility to provide any relevant information of the samples such as the molecular size in Angstrom and the desired data collection details such as total dose, pixel size. If users do not provide these parameters, DCI-Lausanne staff will take decisions and decide on the relevant parameters. In such cases, the staff is not responsible for results not meeting expectations.

11. Requirements to access the cryo-TEM Titan Krios:

To access the Titan Krios microscope (please see rule **#3 for booking of any instruments**), cryo-sample screening must be conducted using the Glacios microscope at DCI-Lausanne or a similar instrument at another facility. If you have conducted cryo-sample screening elsewhere, you must provide the results to DCI-Lausanne before gaining access to the Titan Krios. If you cannot provide the screening data, screening will need to be performed by DCI-Lausanne and billed accordingly by DCI-Lausanne.

This policy also applies to users from SV who have performed screening at DCI-Lausanne under the supervision of PTPSP.

Both cryo-TEM Titan Krios instruments are intended for data collection aimed at high-resolution structures. To access the Krios, the sample must have been screened on a screening microscope such as Glacios or similar instruments to establish suitability of the sample for the data collection using Krios. The DCI-Lausanne staff ask for the 3D density map and corresponding FSC (in case of SPA) from screening (it should be clearly better than 6-8A). **Titan1 with SelectrisX is mostly dedicated for cryo-tomography projects**, and **Titan2 for Single Particle Analysis (SPA)**, but both can be used for cryo-ET as well as for SPA. Depending on your project and availability of the microscope, you will be directed to either the usage of Titan 1 or Titan 2.

For single particle project:

(i) No more than four grids per session should be loaded onto the microscope, following DCI-Lausanne rules concerning the clipping and loading of samples.

(ii) The user must provide details about the type of grids.

(iii) The user must provide details of the data collection from the screening session: number of particles per micrograph together with pixel size.

(iv) The user must provide Atlas of the selected grids for the data collection.

(v) The user must provide Initial 2D classification showing a good class average.

(vi) The user must provide the refined 3D density map and Fourier shell correlation (FSC) curve.

(vii) For P2 sample, please refer to the section: Clipping and Loading grids into the microscope rules.

For tomography project:

(i) Up to 12 grids per session can be loaded onto the microscope (**can be up to 12 grids**) following DCI-Lausanne rules concerning the clipping and loading of samples.

(ii) Screening can be done using Titan Krios.

(iii) For P2 sample, please refer to the section: **Clipping and Loading grids into the microscope rules**.

It is user's responsibility to provide any relevant information of the samples such as the molecular size in Angstrom and the desired data collection details such as total dose, pixel size. If users do not provide these parameters, DCI-Lausanne staff will take decisions and decide on the relevant parameters. In such cases, the staff is not responsible for results not meeting expectations. In challenging, non-conventional cases, or in instances of uncertainty, the DCI-Lausanne staff has the privilege to decide if a sample is suitable for Titan Krios data collection.

12. Session setup:

Staff of DCI-Lausanne will provide support and help you to set up data acquisition in any microscope from the center.

(i) For the Glacios, DCI-Lausanne staff will ensure that the microscope is in proper condition for screening and data acquisition. Users who have undergone the necessary training and are authorized to operate the Glacios independently can conduct the screening of their samples. Additionally, the DCI-Lausanne staff can perform the screening of grids for the user. This is considered an Extra Service and is billed separately based on the number of hours spent on the screening session.

(ii) For Titan Krios, DCI-Lausanne staff will ensure that the microscope is in proper condition for high-resolution data acquisition. DCI-Lausanne staff will assist the user in setting up automatic data acquisition. Users who have completed the required training and are authorized to operate the Titan Krios independently can set up automatic data acquisition. However, the proper loading of grids into the cassette and ensuring the cassette is correctly placed in the Nanocab must be checked by DCI-Lausanne staff.

13. Public holidays and Over-weekend data collection:

The DCI-Lausanne staff is available to provide support for data collection by Titan Krios. However, over the weekends and holidays, minimal support can be provided by agreement with DCI-Lausanne staff. Support during weekends/holidays will not be provided without prior notification.

For Glacios screening, the support is available from Monday to Friday. However, during weekends and holidays, minimal support can be provided by agreement with DCI-Lausanne staff.

14. Session cancellation rules:

To ensure efficient use of microscope time, users are required to report session cancellations at least 24 hours before the scheduled start. Cancellations must be communicated via email to the DCI-Lausanne team. This notice period is met, no

charges will apply for the cancellation. However, exceeding this timeframe will result in the full charge being applied.

15. On-the-fly preliminary data analysis at DCI-Lausanne facility:

The DCI-Lausanne staff can set up on-the-fly image processing to monitor the quality of data acquisition. Users can also utilize an 8GPU node for advanced image processing, typically using no more than 2 GPUs since others are engaged in on-the-fly image processing. If necessary, staff can configure direct data transfer to EPFL/SCITAS or another preferred storage if the user provides sufficient space and access to the resources.

Users are allowed to process their data only during the time of data collection or screening. Data is stored at the DCI-Lausanne for a maximum of two weeks in a single copy.

16. Data analysis service at DCI-Lausanne:

The DCI-Lausanne staff can also assist in image processing and/or model building. If help with data processing is needed, it is considered an **Extra Service** and will be billed separately based on the number of hours spent on the project.

17. Confidentiality at the DCI-Lausanne:

When users visit DCI-Lausanne, they may encounter unpublished data belonging to other groups. This information is considered confidential, and users agree not to disclose any of these findings outside of DCI-Lausanne. Failure to comply will be considered misconduct, leading to sanctions such as temporary or definitive suspension of access to the DCI-Lausanne center.

18. Misconduct and failure to report:

Cases of misconducts:

Using an instrument without booking. The PPMS booking system must keep track of any user booking an instrument.

Having damaged any tools and instilments during your session without reporting to DCI-Lausanne staff.

Preparing P2 sample at DCI-Lausanne P1 sample preparation room.

Not respecting the clipping/loading rules.

In the cases mentioned above (not excluding other special misconducts), especially in case of repetitive misconducts, DCI-Lausanne staff will report the misconduct to the user's supervisor and decides on sanctions which resulting definitive or temporary suspension of access to DCI-Lausanne.

19. Data storage:

Data at DCI-Lausanne is stored for **a maximum of two weeks** in a single copy. Raw data will be provided in all instances, and pre-processed data will be available if the on-the-fly option is selected. Definitive deletion of data will occur after two weeks with short notice. It's important to note that DCI-Lausanne is not responsible for data storage and does not maintain any copies of data.

20. Data transfer:

The user is required with organizing and overseeing the transfer of data from DCI-Lausanne to their chosen infrastructure. It is the user's full responsibility to ensure the transfer of their data.

21. Acknowledgement:

Users agree to acknowledge DCI-Lausanne in any publication(s) resulting from the usage of the facilities.

The user should use the following sentence in the publication acknowledgement section: **'The Cryo-EM data collection and initial image processing was performed at Dubochet Center for Imaging Lausanne (a common initiative from EPFL, UNIGE, UNIL, UNIBE) with the help of A. Myasnikov, B. Beckert, S. Nazarov, and E. Uchikawa.**'

It is obligatory to communicate the outcomes of facility usage to the DCI-Lausanne staff. These outcomes encompass image analysis results, maps, structures, publications, grants or grant proposals, awards, media exposure, etc.

22. Collaboration

DCI-Lausanne is a service center that provides a service for determined fees and cannot enter into collaborations resulting in reduced fees. EPFL/UNIL/UNIGE/UNIBE groups with external collaborations can access DCI-Lausanne as part of the collaboration. The DCI-Lausanne staff is not responsible for checking the nature of the collaboration. External users can access DCI-Lausanne by requesting access. Such projects have lower priority.

DCI-Lausanne operates as a service center with fixed fees and cannot engage in collaborations that lead to reduced fees. EPFL/UNIL/UNIGE.UNIBE groups involved in external collaborations can access DCI-Lausanne as part of the collaboration. The type of the collaboration is not verified by DCI-Lausanne staff. External users can access DCI-Lausanne directly by requesting access.

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23. DCI-Lausanne center staff Research and Development project

The DCI-Lausanne staff is allowed to dedicate up to 20% of their time to Research and Development projects. Such projects aim to explore new technologies and approaches in order to potentially offer them as a service once they are mature. These projects can be performed using user samples with their agreement. The Research and Development projects comply with the strategic development goals of DCI-Lausanne. The staff writes short proposals concerning the projects they plan to work on, and the DCI steering committee authorizes them via email circulation.

	Instrument/ Service	Units	DCI-members (2) CHF	Other Swiss Academia CHF	Other Non-Swiss Academia/Industry (3) CHF
Service					
	Chameleon (2hours)	4 grids	200	240	600
	Data analysis	1 hour	78	93.6	130
	Model Building	1 hour	78	93.6	130
Autonomous work	Titan Krios SelectrisX	1 day*	696	835.2	3600
	Titan Krios	1 day*	696	835.2	3360
	Glacios	1 hour	29	34.8	110
	Vitrobot	1 hour	10	12	50
	Leica	1 hour	10	12	50
	Sputter Coater	1 hour	10	12	50
Assisted work (4)	Titan Krios SelectrisX	1 day*	1008	1210	4120
	Titan Krios	1 day*	1008	1210	3880
	Glacios	1 hour	29+1h*78	34.8+1h*93.6	110+1h*130
	Vitrobot	1 hour	88	12+93.6	50+130
	Leica	1 hour	88	12+93.6	50+130
	Sputter Coater	1 hour	88	12+93.6	50+130
Operator		1 hour	78	93.6	130

Current list of prices (1):

Training	Units	DCI-members (2) CHF/hr	Other Swiss Academia CHF/hr	Other Non-Swiss Academia/Industry (3) CHF/hr
Vitrobot	1 hour	free	93.6	130
Leica GP2	1 hour	free	93.6	130
EPU data collection	1 hour	free	93.6	130
Tomo data collection	1 hour	free	93.6	130
Image processing	1 hour	78	93.6	130
Model building	1 hour	78	93.6	130

The above rates or prices are valid as of July 1, 2022 and EPFL reserves the right to adapt those rates, such adjustment to take effect at the earliest from July 1, 2023. All the above-mentioned rates or prices exclude any VAT, which shall be payable in addition to said rates or prices.

(1) All prices in CHF, and without guarantee. Contact us for definite prices.

(2) Members are EPFL, UNI Lausanne and Uni Geneva.

(3) Prices are exclusive of tax.

(4) Assisted work:

*Titan: Titan time plus 4h of operator

*Glacios: Glacios time plus 6h of operator

Vitrobot: Vitrobot time plus 1h of operator

Leica: Leica time plus 1h of operator

A day corresponds to twenty-four (24) hours.

If you have any questions, please do not hesitate to contact the staff.

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