1. GENERAL INFORMATION

MRI-EM4Bio is a specialised electron microscopy facility for biology. It provides a range of services, including sample preparation, ultramicrotomy, 2D and 3D image acquisition and processing. The equipment can be used to study a wide range of biological specimens in cell and tissue biology research at room temperature. However, it is not suitable for projects at the molecular level or those requiring a cryo-microscopy approach.

This document details the technical and scientific support available for your project, from defining your requirements to acquiring and sharing data.

2. FEASIBILITY ASSESSMENT

Preliminary meeting

All new projects are subject to a preliminary meeting with the facility engineers. During this meeting, the project leaders will explain the scientific context and specify the scientific question being addressed. This discussion helps to determine the most appropriate methodological approach, establish whether the facility has the necessary equipment and expertise, and whether the project requires the development of a new method.

If the project can be handled by the facility, there are several possible scenarios

- The model is known, and the project does not require any particular development. A service quote will be drawn up.
- The project requires the development of methods. It may be the subject of an R&D programme, defined on a case-by-case basis.

Following this meeting, a project sheet is drawn up and an initial quote is provided based on the services to be provided.

Receipt of samples:

A sample sheet is completed for each batch of samples by the person responsible for preparation and sent to the facility in digital format.

Quality control

The samples are prepared and subjected to quality control, including the acquisition of 2D images using the technique decided upon during the preparatory meeting. This test determines:

- The validity of the preparation technique,
- The quality of the biological sample's preservation,
- The relevance of the proposed imaging method,
- The acquisition parameters required to answer the biological question.

At the end of this stage, the facility will issues a favourable opinion for the continuation of the project and a more complete estimate is drawn up, taking into account the number of samples, the technique chosen and the estimated acquisition time.

The facility may issue an unfavourable opinion in the following cases:

- The quality of the biological samples is insufficient.
- The preparation protocol/imaging technique is not suitable.
- The project requires an R&D approach, which the facility may or may not propose after review.

3. PROJECT IMPLEMENTATION

The project will begin once the project leader has approved the project sheet and sent the order form.
Samples will be prepared as close as possible to the submission date, depending on the availability of staff and equipment and the complexity of the project.
The processing time for the project on the microscope is subject to the following rules:

- An estimated processing time will be provided, but this cannot be guaranteed. This may be postponed in the event of a breakdown or technical intervention on the facility's equipment, or in the event of unforeseen staff absence.
- Acquisitions requiring the Volutome are grouped together in campaigns and scheduled according to a specific calendar.
- Image analysis requirements will be assessed on a case-by-case basis. In cases of excessive complexity, users may be redirected to MRI-CIA.

Sample preparation:

Sample preparation and cutting are carried out by facility staff. In some cases training in preparation and/or sectioning will be proposed, after which trained users will be authorised to reserve and use the facility's equipment independently.

Image acquisition:

The quality controls defined in the project sheet are carried out by the facility staff.
The final acquisitions may be carried out by the facility staff, in the presence or absence of the applicant, or may be carried out by the user, provided that they have received the relevant training and that their level of autonomy has been validated by the facility staff.

Image processing and analysis:

The facility provides an image analysis station and the expertise of its staff to help develop workflows based on existing solutions, as well as to provide training in their use. If specific tools need to be developed, the user may be referred to the MRI Image Analysis Centre (MRI-CIA).

Results and deliverables:

The facility implements all the necessary measures to ensure traceability of each project stage, from sample receipt to result delivery. All preparation stages are recorded in the CNRS electronic laboratory notebook. The project leader will obtain a PDF copy upon request.

Once quality control has been validated, the MRI-EM4Bio facility undertakes to provide images of a quality equivalent to that requested under the tested conditions, but cannot under any circumstances guarantee that an answer to the biological question posed will be obtained.

The final images obtained will be delivered to the user as appropriate, and depending on volume, via the MRI FTP server, via the file transfer tool provided by Renater, or on a hard drive provided by the user.

In addition to the images, the facility can provide, upon request, a complete set of materials and methods, written in English. Engineers can also offer assistance in interpreting and commenting on the results for publication.

4. END OF THE PROJECT

The project will end if the project leader decides to terminate it. Any services already provided will be invoiced. A project may be suspended at the project leader's request for financial or HR reasons. In this case, the facility will keep samples and preliminary results for up to one year, with the possibility of extension upon request.
In all other cases, a project is considered completed when the final data is published or if the project leader does not respond within one year of receiving the latest results.

5. COMMUNICATION AND PROMOTION OF RESULTS.

Unless the applicant explicitly states otherwise, the project title may be mentioned in the facility's and MRI's communication materials (activity reports, oral presentations, posters, etc.). The biological results of the study will not be disclosed without the applicant's prior consent.

MRI acknowledgements

When publishing data acquired using our MRI facilitys, we ask our users to include the acknowledgement statement provided below. This allows us to quantify our overall contribution to research, which is vital for obtaining funding to acquire equipment.

Contribution of facility staff:

The MRI-EM4Bio facility offers a service that is still rare in France. It requires a great deal of development and a high level of personal investment on the part of the facility staff. Billing for services only covers the costs of consumables, maintenance contracts, and contract staff salaries. Our engineers' expertise and intellectual contribution add value to your project, so they should be considered collaborators, and their contribution to scientific publications should be evaluated like any other collaborator's, in proportion to their contribution.