

Montpellier, 20 January 2023

Dear MRI users,

The entire MRI team wishes you all a very happy new year !

MRI has had an exceptional year in 2022 and we have no doubt that 2023, the year of MRI's 20th anniversary, will be just as eventful! This message summarises the main achievements of 2022 and what is planned for 2023.

2022, an exceptional year in terms of new technologies made available via CPER, ReactEU, ERC (A.Copic), ITMO Cancer, FRC, IBISA, contributions from laboratories and Labex and MRI's own funds :

- A [Blaze Ultramicroscope](#) (light sheet microscopy for large samples) at the MRI-IGH facility
- An [Imagestream](#) (image cytometry) at the MRI-IGMM facility
- A [spinning disk SR](#) (with resolution improvement) at the MRI-CRBM facility
- A [Lattice Light Sheet 7](#) at the MRI-CRBM facility, currently being installed and taken into use. This is the first system installed in France
- An [Aurora CS spectral sorter](#) at the MRI-IRMB facility - replaces the Aria sorter and is already available. This spectral cytometer is a real technological revolution and was the second system installed in France.

2022, an exceptional year in terms of new, more « classic » machines mainly thanks to the support of the Region and the European funds of the Europe ReactEU recovery plan, but also to the contributions of the Bettencourt Foundation (M.Lagha), the Units, the Montpellier University and MRI's own resources. Thank you to the project leaders who made it possible to obtain this funding!

MRI was thus able to update several microscopes with the purchase of more efficient and innovative systems:

- A Zeiss LSM980 Airyscan 2 confocal microscope at MRI-IGH facility - replaces the LSM780 confocal microscope and is already available for booking
- A Zeiss LSM980 NLO (FLIM, variable beam FCS) confocal microscope at the MRI-CRBM facility - replaces the LSM780 NLO confocal (FLIM, variable beam FCS) and is already available for booking
- A Zeiss LSM980 Airyscan 2 confocal microscope at the MRI-CRBM facility - replaces the Leica SP5 confocal microscope and is already available for booking
- An upgrade of the CSU-X1 spinning disk at the MRI-CRBM facility with a new laser bench and an Inscoper control and software
- A Nanozoomer brightfield slide scanner at the MRI-INM facility - replaces the old Nanozoomer and is already available for booking

2022, an exceptional year in terms of training provided by MRI:

- 725 autonomy training on MRI systems, an increase of 28% compared to 2019. This represents a significant amount of engineering time when you consider that a session can take between 2 and 4 hours depending on the complexity of the system.
- 7 different Biocampus workshops were given this year by the MRI engineers, including 2 new workshops: "Basics of cytometry" and "3D image analysis". These two workshops were successful with 11 and 14 participants respectively.

2022, an exceptional year in terms of computing:

- Scheduled upgrades of the computers associated acquisition stations
- 9 new analysis workstations better equipped for processing or 3D visualisation of big data.
- An additional Imaris licence and new Huygens deconvolution options (LargeGPU, STED, SPIM, Lighsteed, Sted-Stabilizer).
- The renewal of a part of our operating servers and the complete renewal of our storage system, i.e. 400Tb divided essentially between the Sftp server and OMERO.
- Internal 10Gb/s networks on 3 facilities (INM and CRBM already operational, IGH in the process of being installed), serving several equipments producing large amounts of data in order to facilitate data transfer to the analysis stations.
- An access to the Meso@LR mesocenter has been technically opened from the MRI servers. The first data transfer tests are underway. We would like to evaluate whether the mesocenter could eventually be the "storage" center (Sftp and OMERO) and the computing center (for image analysis) for your data produced on MRI.

2022, an exceptional year in terms of scientific publications: The MRI platform is acknowledged in more than 120 publications per year. **Thank you and congratulations to you!**

16 publications in 2021 and 6 publications in 2022 have one or more engineers as co-authors in the scientific collaborations.

4 MRI engineers were particularly involved in a recent publication in The Journal of Cell Biology [10.1083/jcb.202107093](https://doi.org/10.1083/jcb.202107093), relating to the evaluation of the quality of optical microscopy using metrology approaches. These tools and protocols are regularly used by our engineers to monitor the performance of the microscopes and to ensure the reproducibility and quantification of the experiments performed.

MRI will celebrate its 20th anniversary in 2023 with an equally exciting programme:

Creating 3 new technical facilities:

- **optical MRI-IRCM facility:** very soon, we will announce the official opening of the optical MRI-IRCM platform whose technical manager is Céline Talignani, AI UM at the IRCM (50% MRI). This platform consists of 3 microscopes: an AxioImager Zeiss Apotome microscope and a Leica Thunder microscope already existing at the IRCM but also a new brightfield and fluorescence slide scanner. This is the Panoramic system from the company 3D-Histech, which has been installed at the end of 2022 (ReactEU Saphir and Rotary's Jetons le Cancer project). This project of scanner was carried out by the RHEM platform and will be made available to the community on the MRI-IRCM-optical facility.
- **optical MRI-PHIV-DIADE facility:** plant imaging is being strengthened at the IRD with the creation of an MRI platform. The technical manager of this facility will be Carole Gauron, IRD engineer (50% MRI). This platform currently includes a Zeiss Axiozoom and will be enriched by the Plant'Envi CPER in 2023 with a confocal microscope closer to the greenhouses. This microscope will not be exclusive to plants and will be accessible to the whole community like all the other MRI systems. Again, the official opening will be announced very soon by e-mail.
- **MRI-electron microscopy platform:** MRI undertakes with the Biologie Santé Pole to creating an electron microscopy platform near the MEA at the University of Montpellier. The technical manager of this platform will be Laurence Berry, IR CNRS (50% MRI) and she will be supported

by Léa Robresco CDD IE (50% MRI). A [Zeiss Gemini 360](#) scanning microscope equipped with an in situ serial sectioning module, a STEM detector and ATLAS5 software allows numerous electron microscopy applications applied to cell biology, in particular 3D electron imaging (serial block face and array tomography) and 2D high-resolution large-area electron imaging (Nanotomy). The microscope was installed at the very end of 2022 (ReactEU Occit'EM 34) and will require a period of learning and familiarisation by the team. This innovative technology will be presented to you and the opening of the platform will be announced in the coming weeks or months.

Structuring the image analysis service: the image processing and analysis offer has existed within MRI for many years (provision of free or paid software and analysis stations; training activity; development of analysis and automation tools; definition of a multi-software analysis pipeline; development of customised tools) but in 2023 we plan to structure our offer and highlight the services we can provide to the community.

Providing a data management plan of a structure: you are increasingly asked by your funders to write project data management plans (DMPs). With the help of different working groups, WG France BioImaging Data Management and WG DMP BioCampus, MRI is working on drafting a DMP and making it accessible by 2023 via the dsw application. You will be informed by e-mail about the availability of this structure DMP, hoping that it will help you in your own project DMPs. The solutions are still evolving and the first versions may not be interoperable with your own DMPs. This will be the expected evolution that the communities are working on.

Making new investments:

- A spectral analysis cytometer at the MRI-IRMB facility (MUSE, IRMB, MRI)
- A wide-field and super-resolution microscope coupled with microfluidics for multiplexed DNA- and RNA-fish projects at the MRI-IGH platform (ITMO Cancer, Edouard Bertrand team, Bernard de Massy team, IGF, IGH, MRI)
- A new confocal microscope at the MRI-PHIV-La Gaillarde (CPER Plant'Envi) to replace the actual SP8 confocal microscope
- Replacement of two wide-field microscopes at the MRI-IGH and MRI-CRBM facilities
- And other funding applications are underway....

And of course, an official celebration of 20 years of MRI, in the autumn with you. We will tell you more soon !

We have many great prospects ahead of us and this is our way of helping to make your scientific projects possible.

To find out more: follow us throughout the year via the homepage of our website www.mri.cnrs.fr or our twitter account [@MRI_Montpellier](https://twitter.com/MRI_Montpellier).

All this activity is possible thanks to a team of more than 30 MRI engineers who are always mobilized, who acquire new skills regularly and whose members are very involved in working groups and national or international professional networks (France BioImaging, RTmFm, GDR Imabio, INRAe microscopists' network, QuaREP, RIME, AFC...).

We wish you all an excellent year of discovery!

The MRI team