

## **Coordinated Research Infrastructures Building Enduring Life-science services - CORBEL -**

### Deliverable D4.4

Framework in place for launching transnational open user access via the common LS (formerly BMS) cluster web portal and RI specific user community communication channels

WP4 – Community-driven cross-infrastructure joint research - Bioscience

Lead Beneficiary: EMBL

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Contributing partner(s): EMBL, UMCU, ICFO, BRFAA, HMGU, CIRMMMP, CSIC, CNRS, SZN, FVB, MDC, VU/VUmc, DKFZ, EU-OS

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## Executive Summary

WP4 has focused on the establishment of common service pipelines between multiple RIs in the biosciences. Via two Open Calls, WP4 identified 37 projects that received support from our service providers and that helped us to test and refine our service offer. We have presented our activities and achievements in this regard already in previous deliverables (especially D4.1 and D4.2) and detail the great impact our users have reported on their scientific output in D4.3 (submitted in parallel). In D4.3, we observe that the Open Calls have enabled cross-cutting interdisciplinary projects, which allow the users to advance in their research and to open new avenues in science. The highly innovative and exploratory nature of the Open Call applications make them a high risk-high reward operation, relying critically on open access programmes and the intense support from LS RI hubs for cross-RI access. All those reports reflected that we achieved the objective of this present deliverable: that we managed to put in place a “framework for launching transnational open user access via the common LS RI cluster web portal and RI specific user community communication channels.” To secure a leading role for Europe in biomedical research and to ensure the technological support needed for cutting-edge scientific projects, it is indispensable to develop mechanisms that will maintain access to these service pipelines also beyond CORBEL. In this deliverable D4.4, we will therefore highlight those parts of the developed framework that are sustainable and that we will continue to offer and improve, even beyond the CORBEL project. An important aspect of our sustainability plan is the transfer of relevant parts of the CORBEL website to a newly developed Life Science RI website, which will function as single entry point to all LS RIs and which will support the joint presentation of our common activities such as offering cross-RI service pipelines to the outside. We also highlight the development of a joint access management system that was in use during the CORBEL Open Calls and that will continue to be in operation at individual RIs. To increase the visibility of all LS RIs towards the scientific community, funding bodies and other relevant stakeholders, we produced a CORBEL brochure and two videos, both show-casing successful user stories, introducing LS RIs and advertising our joint service portfolio. Future engagement and close cooperation between the LS RIs will be crucial to maintain our established service pipelines across RIs, and in recognition of this responsibility, bilateral Collaboration agreements were signed between INSTRUCT-ERIC and Euro-BioImaging ERIC, EU-OPENSREEN ERIC and Euro-BioImaging ERIC, EMBRC ERIC and Euro-BioImaging ERIC. Discussions are ongoing between EMBRC ERIC, ELIXIR, Instruct-ERIC, EU-OPENSREEN ERIC and Euro-BioImaging ERIC for further bilateral CAs.

Those CAs comprise what we consider the most important and relevant activities that should be implemented between the LS RIs, irrespective of currently ongoing cluster projects. Of course, we also encourage the LS RI Strategy Board and EOSC-Life<sup>1</sup> to consider implementing some of those activities in their future action plan. The CAs cover various mechanisms of collaboration, such as exchange visits of RI operational and managerial staff or the promotion of the RIs both collectively as well as individually. They also address the need to provide support for user projects interested in making the transition from one RI to the other, and to consider a fast-track for projects previously scientifically evaluated by the other RI. We also encourage developing a strategy for realizing funds for interdisciplinary projects, as the lack of access funding opportunities is a serious bottleneck for many European scientists.

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<sup>1</sup> <https://www.eosc-life.eu/>

This deliverable is of the type ‘demonstrator’, therefore we will mostly make reference to dedicated material online, accessible via our newly established common Life Science RI website.

## Project objectives

This deliverable has contributed to the following objectives:

- a) Start to establish an infrastructure platform that integrates services for life science and support scientific research projects that require joint services between different ESFRI LS RIs
- b) Start to build cross-ESFRI LS infrastructure pipelines according to specific use case objectives
- c) Start to build the framework for transnational open user access for the sustainable use of the shared services

## Detailed report on the deliverable

### Background

For the launch of the two CORBEL Open Calls in 2016 and 2018, WP4 developed a framework that allowed us to support transnational open user access to common service pipelines across two or more of the participating ESFRI LS RIs. We developed a large part of the CORBEL website, which focused specifically on information relevant for CORBEL Open Call applicants and service providers, and which generated the highest number of visits across the common CORBEL website (see D2.3). For advertising the Open Calls, we established stronger links among the communication channels of all RIs and engaged them in our outreach activities towards the user community. As we have discussed those activities already in detail in previous deliverables (compare especially D4.1 and D4.2.), we will focus this present deliverable on those parts of this framework that are sustainable and that we will continue to offer and improve, even beyond the CORBEL project.

### Description of Work

#### A common LS RI cluster webportal – the Life Science RI website

Over the course of the CORBEL project, the common CORBEL website has become a key point of reference and information in many cases, most importantly for us to advertise the Open Calls, to describe our available services and participating service providers, but also to then later on report about success stories. As the name ‘CORBEL’ was linked to this particular H2020-funded project only, but will not continue to live in the future, and as quite some information on the website became obsolete, it was decided to transfer relevant and forward-looking content onto a new website. This new website was set up having in mind that content should be long-lasting, and focused on sustainable services across the Life Science RI community. Also, maintenance costs should be kept low as no project funding is available anymore in the future. The website was named ‘lifescience-ri.eu’<sup>2</sup>, is operated by the same company as before and currently maintained by BBMRI-ERIC. We will detail the most relevant elements of this website from the WP4 perspective below.

#### Launching transnational open user access - Open Call websites

With the organization of two Open Calls, which resulted in supporting 37 user projects, we were successful in fulfilling our objective to establish a framework that allows to launch transnational open

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<sup>2</sup> <https://lifescience-ri.eu/home.html>

user access calls. Beyond the CORBEL project duration, the group of LS RIs currently does not have the funding to continue supporting excellent scientific projects in the same way by offering financial support to cover costs related to accommodation, travel, consumables and staff. Nevertheless, we have constructed efficient pipelines between the participating RIs and the involved Nodes or RI facilities, and are eager to keep this collaborative engagement and make it sustainable for future RI users. To inform our user community about the possibility to work with several RIs and to showcase what kind of impactful scientific projects can be realized by working with RIs, we established a section on the new LS RI website that introduces our past activities. This section intends to attract scientists and to further increase the awareness of the value of working with excellent facilities as they are part of the LS RI network. We streamlined the content to focus on forward-looking opportunities to work with RIs and encourage scientists to reach out to the individual RIs to further discuss their project ideas.

Link to the Open Call website on the new Life science RI website see footnote<sup>3</sup>.

### **Application management system across RIs**

As previously described (D4.2), we used ARIA, the application management system developed by Instruct-ERIC, for the WP4 Open Calls. In many instances and continuously, this application management system was tailored to our needs and requirements by our colleagues in CORBEL WP5. Thanks to the intense collaboration and continuous improvement of the system, ARIA has developed significantly over time and has matured into a robust system with many useful functionalities. Offering ARIA as a management system for the Open Call has helped the development team to really understand the diverse user needs of managers and users of life science research infrastructures much better. Also partly due to the Open Calls, ARIA had gained a lot of visibility and attracted interest from additional facilities, funding calls (e.g. EASI-Genomics) as well as RIs. It is now in use by several RIs, such as EMBRC-ERIC, EU-OPENSOURCE ERIC, and Euro-BioImaging ERIC, both as software-as-a-service (SaaS) and self-hosted software. Maintaining the ARIA application form that was developed for the CORBEL Open Calls, and which unified the process for all 10 participating RIs, was not directly possible due to the complexity of the set-up, with an ever evolving composition of Nodes for all RIs, and constant changes in the service portfolio through the inclusion of new technologies or the depreciation of outdated ones in RIs where ARIA is not the main tool through which the infrastructure composition and service offer are managed. Nevertheless, harmonized application processes remain as proof-of-concept and can be easily initiated for any groups of RIs using the SaaS version of ARIA wishing to provide combined access. Different options for configuring and managing this are explored in D5.3. Future development on APIs might allow facilitated exchange of user proposals with other software and with RIs who self-host ARIA, alleviating e.g. the burden of multiple applications or scientific review steps. Some developments will also continue in the EOSC-Life project. Link to the ARIA website<sup>4</sup>.

### **Catalogue of Services**

The Catalogue of Services was initially an initiative coming out of the MIUF meetings organized in WP3. WP4 supported information collection together with WP2. The Catalogue of Services provides a high-level overview on the different areas of expertise across the 13 LS RIs. By selecting a question or a request from the provided drop-down menu, the visitor receives a result pointing towards the RIs

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<sup>3</sup> <https://lifescience-ri.eu/access.html>

<sup>4</sup> <http://aria.structuralbiology.eu>

that might be able to fulfill the expressed need. The Catalogue of Services returns a concise summary on the RI that works in the selected area and offers technologies or services that might be suitable. The information content stays on a very general level, and the visitor is advised to visit the respective RI website to collect more in-depth information or to reach out to the nominated contact persons. With respect to sustainability and maintenance, this system has the advantage that the content of these high-level summaries is rather stable and does not need to be adapted regularly. Therefore this developed service from CORBEL can be offered to the scientific community also in the long term. Please visit the catalogue<sup>5</sup>.

## Collaboration Agreements

Working together on common user projects throughout the last four years has shown that there is a particularly strong link and complementarity between certain LS RIs. This became particularly obvious when considering the user requests and what kind of services and technologies they wanted to combine in their projects. We therefore decided to encourage stronger and bilateral cooperation between individual RIs that are independent of currently ongoing cluster projects or other funded activities. As part of D4.2, we developed and offered a template for bilateral Collaboration Agreements and engaged in targeted discussions across the consortium to trigger a good uptake either of this template or the general consideration of developing collaboration agreements. These collaboration agreements are not meant to be of legally binding nature, but should rather be seen as an expression of interest to continue to engage in joint activities for the benefit of the common user community. All RIs were encouraged to use the template, but to also develop it further based on their own unique situation and requirements. Some activities that we suggested as valuable mechanisms of collaboration are presented in the following. As we have seen the benefit of an overall great increase in understanding different operating principles and learning from each other's individual set-ups as RIs, we propose to stimulate exchange visits of RI operational and managerial staff (as continuation of WP9 activities). We also realized the potential of joint participation at conferences, joining forces for common outreach activities and thereby creating more impact and higher visibility. We therefore advise the promotion of RIs both collectively as well as individually also in the future (building on WP2 and WP4 experience). User feedback informed us of the great appreciation for the support they received in working at the interface between multiple RIs and for facilitating the access via the submission of a single proposal, which helped to speed up the process and avoided multiple review periods. RIs signing a CA are therefore encouraged to consider mechanisms how to provide the counselling support for users interested in making the transition from one RI to the other and to consider fast-track access for projects previously scientifically evaluated by the other RI. Developing a strategy for realizing funds for such interdisciplinary projects will also be of high relevance, as the scarce funding landscape for the use of RIs is still a major bottleneck for users to take advantage of these valuable resources.

At the time of submission, bilateral CAs based on the WP4 template have been signed between INSTRUCT-ERIC and Euro-BioImaging ERIC, EU-OPENSREEN ERIC and Euro-BioImaging ERIC, EMBRC ERIC and Euro-BioImaging ERIC. Discussions are ongoing between EMBRC ERIC, ELIXIR, Instruct-ERIC, EU-OPENSREEN ERIC and Euro-BioImaging ERIC for further bilateral CAs. Link to the website<sup>6</sup>.

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<sup>5</sup> <https://lifescience-ri.eu/catalogue-of-services.html>

<sup>6</sup> <https://lifescience-ri.eu/collaborative-activities/collaboration-agreements.html>

## Supporting RI specific user community communication channels

The framework for launching transnational user access also called for action in the communication and outreach field. The knowledge on RIs present in the general scientific community is still very limited and the effective distribution of offers such as the Open Calls posed a challenge that we addressed actively. WP2 as the communication work package was heavily involved in many different activities triggered by ongoing work in WP4. Together, we managed to increase not only awareness for RIs but also appreciation of their work. The connectivity among individual RI communication channels on social media, websites, via newsletters or shared print material has improved significantly. Some RIs are also starting to reference each other on their individual websites, which is a service towards their own user community potentially looking for complementary services, but also a service towards the partner RI that helps to increase their visibility. Link, e.g.<sup>7</sup>.

## Sustainable outreach material for use by multiple RIs

We also included the production of sustainable outreach material into our work, in collaboration with WP2. Knowing of the importance of increasing the overall visibility of all LS RIs, both towards our users but also towards funders and other relevant stakeholders, we decided to capture the success of our CORBEL WP4 activities in two formats, a brochure and two short videos. The main principle behind this material is the goal to make it long-lasting and sustainable, and to advertise the user access pipelines that will still be maintained and supported in the future, based on the bilateral agreements between RIs to continue their joint engagement in user access support. We based the overall design on the CORBEL design to ensure the connection to the CORBEL project, but kept the CORBEL branding in the background as the name as such will disappear with the end of the project. The brochure is structured in three main parts. In the first part, we introduce the concept of LS RIs and our mission. We present the CORBEL project and explain the historical background of our Open Calls. In the second part, we focus on tangible outcomes that were generated through CORBEL and highlight some of our user stories, which turned out to be real success stories. Reading this part will give scientists and potential future users a good impression how they can benefit from working with RIs and what variety of project support we can offer collectively. The third part is an introduction to the participating RIs, and allows a quick overview of their field of expertise, technology portfolio and options to learn more. The brochure was distributed to the RIs, the facilities that were involved in the service provision and the users that are presented, and it will be used at upcoming conferences, workshops and other events to inform scientists and funders alike.

Link to the brochure see footnote<sup>8</sup>.

The video production followed a similar concept, providing a mix of background information on LS RIs and highlighting some user stories to demonstrate the impact of working with RIs. The underlying principle was again to maintain the connection to the CORBEL project by choosing e.g. appropriate color schemes and reusing icons that were developed in CORBEL, but still making the video long-lasting by focusing on core aspects that will stay true for years to come. We decided to develop two short videos that build upon each other, as this allows a more flexible and targeted use depending on the purpose. One video is a short, general introduction to the 13 LS RIs, explaining our basic operating principles and our set-up as pan-European organizations, established to advance and

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<sup>7</sup> <https://www.eurobioimaging.eu/about-us/collaborations-with-our-partner-ris>

<sup>8</sup> <https://lifescience-ri.eu/home.html>

facilitate science. The second video provides concrete use cases of our user projects and highlights the multiple benefits of working with LS RIs. It thereby talks more directly to scientists and invites them to take a closer look at our service offering for their own scientific projects.

Link to Video1 and Video2 see footnotes <sup>9</sup>, <sup>10</sup>.

## Outcome and Recommendations

In our earlier deliverable D4.2., we made some recommendations for future developments that we rated as relevant for realizing a sustainable model for user access to common RI services. These recommendations were the following three: 1. Common access management system and web presence, 2. Common contact person, 3. Bilateral collaboration agreements to sustain frequently requested pipelines. Here, we would like to shortly discuss the progress we have made in moving towards the realization of those recommendations or the gaps that still need to be addressed. Based on our users' feedback, we emphasised the need for a common web presence of the LS RIs, where users can find the most relevant information on our service portfolio in one location. This website spanning multiple RIs could be realized, and we hope the new Life Science RI website<sup>11</sup> will prove to be as useful as the original CORBEL website to our user community, offering one common entry point to all LS RIs. Maintenance of the ARIA application forms as we had set them up for the Open Calls would have required too much effort for maintaining them up-to-date, and no funding source could be identified, so we had to let go of that idea for now.

We also highlighted the relevance of a common contact point at the interface of multiple RIs. Such a contact point fulfils a range of different roles, and is crucial in the successful management and guidance of projects of such complexity. In our experience, this contact person needs to act at a meta-level, establishing a bridge between different RIs, different service providers and different technologies. As funding for keeping such a position is currently not available, fulfilling this role is a key responsibility of the individual participating RIs. Thanks to the increased understanding of our partner RIs, and the experience we have gained through the work with our user projects, we are hopeful that all RIs will be able to identify individuals in their organization that can take on this task. We expect that those individuals will be able to provide some basic project counseling to their users, also in questions related to complementary technologies which could be offered by one of the other LS RIs.

To emphasize the relevance of such cross-RI project support and guidance, we also included this aspect in the template for bilateral collaboration agreements, which was our third recommendation in D4.2. We would like to repeat our message that beyond the lifetime of the CORBEL project and without its common funding for enabling user access, it will be in the hands of individual RIs to sustain these individual pipelines across RIs. Defining common goals and united efforts to continue joined service provision via bilateral CAs can be an essential step in this direction and we expect more RIs to take this step in the near future.

Finishing the CORBEL project, we highly recommend to consider our recommendations also in the framework of newly emerging projects and to develop an action plan for future execution in the context of EOSC-Life and the LS RI strategy board.

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<sup>9</sup> <https://lifescience-ri.eu/home.html>

<sup>10</sup> <https://lifescience-ri.eu/home.html>

<sup>11</sup> <https://lifescience-ri.eu/home.html>

## Next steps

Due to the COVID-19 pandemic, not all of our user projects will be able to finish their experimental plans as visits to the service providers have not been possible anymore since the beginning of March. We will still try to support the conclusion of those projects to the best of our abilities.

This is one out of two final deliverables in WP4. With the submission, we will come to an end of our work in CORBEL. Many of the described activities will continue, either on bilateral grounds between LS RIs or as part of the work in EOSC-Life<sup>12</sup>. The impact we have generated with our efforts in WP4 are described in detail in the other final deliverable D4.3, in which we also present the outcome of our final surveys. The user feedback has been extremely positive, and speaks strongly in favour of continued support for user access across RIs.

## Publications

- Life Science RI brochure: <https://lifescience-ri.eu/home.html>
- <https://www.eventbrite.com/e/sample-preparation-and-multiscale-imaging-of-plankton-tickets-92710506621>
- Colangelo AM, Cirillo G, Alberghina L, Papa M, Westerhoff HV (2019). Neural plasticity and adult neurogenesis: the deep biology perspective. *Neural Regen Res.* 2019 Feb;14(2):201-205. doi: 10.4103/1673-5374.244775.
- Riedel C, Chen HW, Reichart U, Lamp B, Laketa V, Rümenapf T. Real Time Analysis of Bovine Viral Diarrhea Virus (BVDV) Infection and Its Dependence on Bovine CD46. *Viruses.* 2020 Jan 17;12(1). pii: E116. doi: 10.3390/v12010116.
- Sharma RP, Kumar V, Schuhmacher M, Kolodkin A, Westerhoff HV. Development and evaluation of a harmonized whole body physiologically based Enpharmacokinetic (PBPK) model for flutamide in rats and its extrapolation to humans. *Environ Res.* 2020 Mar;182:108948. doi:10.1016/j.envres.2019.108948. Epub 2019 Nov 26.
- Sharma RP, Schuhmacher M, Kumar V. PBPK/PD coupled HPG SB model to analyze the reproductive toxicity of EDs: Case study on mixture effects of DEHP and TCDD. *Toxicology Letters.* October 2018; 295, Suppl. 1, p. S249. doi: 10.1016/j.toxlet.2018.06.1023
- Fernandez JJ, Torres TE, Martin-Solana E, Goya GF, Fernandez-Fernandez MR. PolishEM: image enhancement in FIB-SEM. *Bioinformatics.* 2020 Mar 28. pii: btaa218. doi: 10.1093/bioinformatics/btaa218.
- Wurmus R, Uyar B, Osberg B, Franke V, Gotschan A, Wreczycka K, Ronen J, Akalin A. PiGx: reproducible genomics analysis pipelines with GNU Guix. *Gigascience.* 2018 Dec 1;7(12). doi: 10.1093/gigascience/giy123.
- CORBEL Video on User Access - <https://lifescience-ri.eu/home.html>

## Abbreviations

- BBMRI-ERIC: Biobanking and BioMolecular resources Research Infrastructure

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<sup>12</sup> <https://www.eosc-life.eu>

- BRFAA: Biomedical Research Foundation of the Academy of Athens
- CA: Collaboration Agreement
- CORBEL: Coordinated Research Infrastructures Building Enduring Life-science services
- CNRS: Centre National de la Recherche Scientifique
- CRG: Centre for Genomic Regulation
- CIRMMMP: Consorzio Interuniversitario Risonanze Magnetiche di Metallo Proteine
- CSIC: Agencia Estatal Consejo Superior de Investigaciones Cientificas
- DKFZ: Deutsches Krebsforschungszentrum
- EMBL-EBI: European Molecular Biology Laboratory-European Bioinformatics Institute
- EMBL: European Molecular Biology Laboratory
- EuBI ERIC: Euro-BioImaging ERIC
- EU-OS ERIC: EU-OPENSOURCE ERIC
- FVB: Forschungsverbund Berlin e.V.
- HMGU: Helmholtz Zentrum München für Gesundheit und Umwelt
- ICFO: Fundacio Institut de Ciencies Fotoniques
- ISBE: Infrastructure for Systems Biology in Europe
- LS RI: Life Science Research Infrastructure
- MDC: Max Delbrück Center for Molecular Medicine
- RI: Research Infrastructure
- UMCU: Universitair Medisch Centrum Utrecht
- VUA: Vrije Universiteit Amsterdam
- WP: Work Package
- SZN: Stazione Zoologica Anton Dohrn

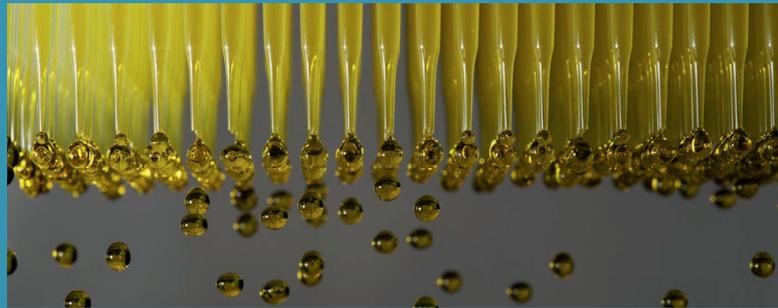
## Delivery and schedule

The delivery is delayed:

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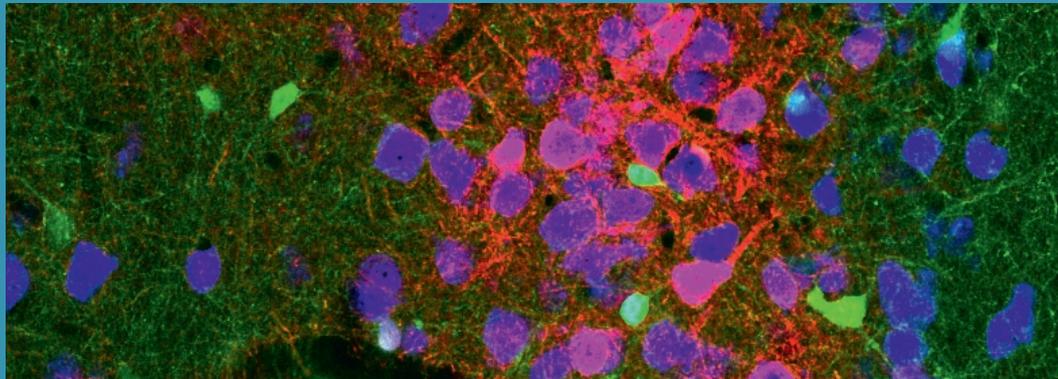
## Appendices

### Appendix 1: Life Science RI brochure



# FOR THE ADVANCEMENT OF SCIENCE

Working with European Life Science Research Infrastructures



# FROM FRAGMENTED RESEARCH TO THE REALISATION OF COMPLEX SCIENTIFIC PROJECTS

As modern research is happening across scientific disciplines, individual scientists and single labs often lack some of the expertise required to address all aspects of a research question. Moreover, researchers often require the use of different, highly complex technologies and resource collections. Access to multiple high-end technologies and services is essential for comprehensive research, but is in most cases not easily available for every scientist. For these reasons, European Research Infrastructures (RIs) were established to overcome a technology-gap and to allow access to much needed technologies in modern research approaches. At the same time, RIs also offer the technical expertise necessary to address the most challenging research questions.

RIs are pan-European organisations, with multiple institutes located in different European countries, that have opened their doors to allow external scientists from academia and industry to benefit from their physical, remote and virtual open access service offers. They have the mission to support cutting-edge science by offering access to the latest technologies, comprehensive resource collections and technical expertise.

Unbiased, open access to technologies and resource collections creates an environment which sets up scientists to perform to the best of their abilities, to develop innovative ideas, and to advance their careers. Creating these open access opportunities will help to retain these excellent scientists in the European Research Area and will produce discoveries, technological advancement and the generation of knowledge.



## THE SHARED USE OF TECHNOLOGIES ENABLES SCIENTIFIC EXCELLENCE

Access to desired technologies, services and resource collections across disciplines allows the realization of cutting-edge projects. The multidisciplinary and complex nature of today's research landscape requires collaborative efforts not only between the scientists and the RIs but also among RIs. Coordinated access to several services and technologies, starting from the application process until the creation of common service pipelines, therefore accelerates scientific progress. This helps RIs and their users to excel in the life sciences, supports Europe to stay at the forefront of science and creates an environment in which excellent scientists can thrive.



## TRAINING SCIENTISTS AND TECHNICAL STAFF CREATES A COMPETITIVE ADVANTAGE

Scientists benefit from RIs beyond access to resource collections, cutting-edge technologies, and acquisition of high quality data. As visiting scientists also receive technical support from expert facility staff, they return home with newly acquired skills in the use of advanced technologies, data analysis and data quality control, thus enhancing their competitiveness and career development. This training will also lead to an increased awareness and application of FAIR (findable, accessible, interoperable, re-usable) data principles.

The technical staff is constantly confronted with the most exciting scientific questions and challenged to adapt a technology to specific needs a project brings along. Therefore, they are constantly trained in the latest technological developments to stay at the forefront of their field of expertise.

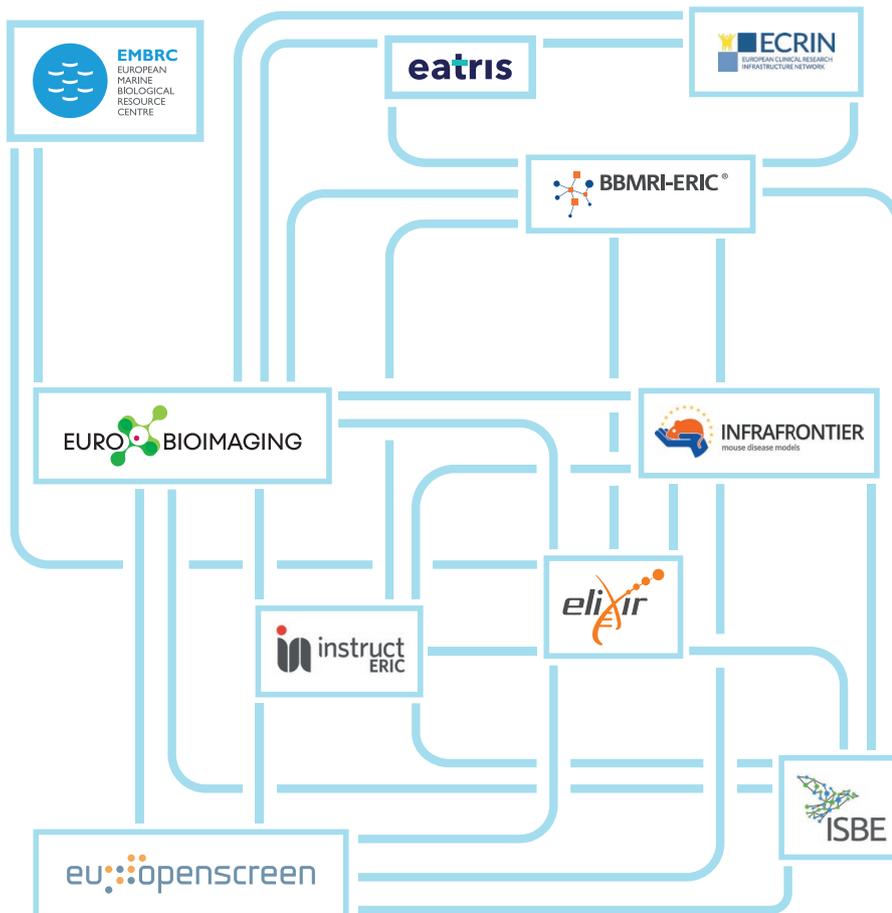
## PROOF OF CONCEPT FOR HARMONISED ACCESS TO EUROPEAN LIFE SCIENCE RIs

The CORBEL project was funded by the European Commission with the ambitious goal to facilitate user access across different RIs, involving multiple scientific fields and a broad range of technologies and services. By coordinating activities across RIs, CORBEL set out to build joint services for the life sciences. Therefore, multiple RIs offered open and free access to users within the European scientific community.

Via Open Calls for advanced projects, excellent scientific projects were identified, selected and supported to work with several of the RIs. Experimental project pipelines across the RIs were established for integrative approaches and gap-free transition from one technology to the next. Users from academia and industry selected exactly the services and the support they needed for their projects. The scientific community welcomed the initiative, proposed numerous projects and demonstrated the high demand for expert advice, open access to pioneering technologies and resource and data collections as offered by the life science RIs. Based on the needs identified in collaboration with the scientific community, the CORBEL consortium created a setting that enables users to access services and resources across the European life science RIs.

### The CORBEL framework for harmonised user access to multiple European life science RIs:

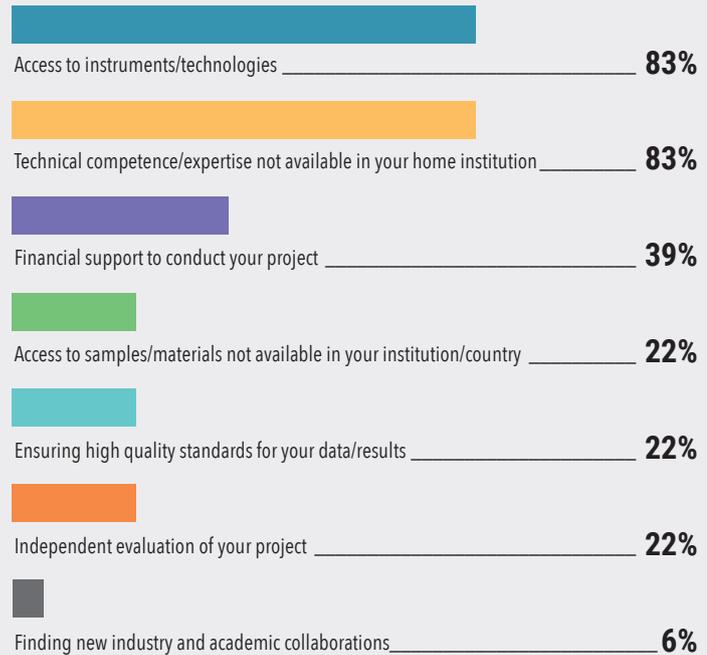
- » a common access environment
- » unified data management
- » common ethical and legal services
- » joint innovation support



*Collaborating to enable advanced research across disciplines: the network of European life science RIs, based on the CORBEL user projects which were selected via Open Calls. For each project, access to a combination of at least two RIs was requested, resulting in a multitude of interconnections (highlighted in blue).*

## USER TESTIMONIALS

### USER MOTIVATION FOR OPEN CALL PARTICIPATION\*



\*multiple selections possible

The opportunity to access multiple European life science RIs in a harmonised procedure via CORBEL was appreciated by the Open Call participants:

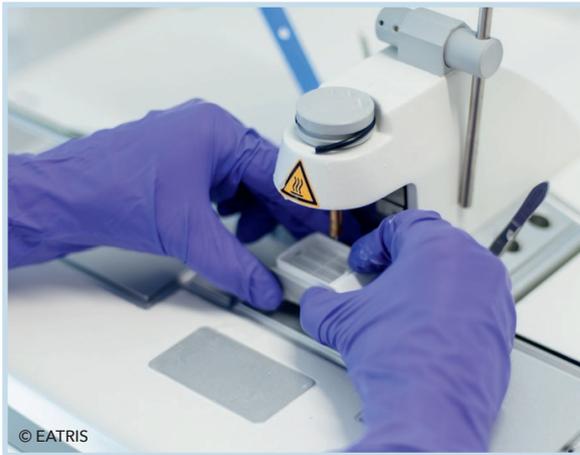
*'CORBEL allowed several European scientists to be connected to improve the scientific value of their research in a friendly and cooperative spirit.'*

*'CORBEL was of indispensable help to boost our research purpose and went over our expectations in some aspects.'*

*'When we read about the CORBEL Open Call we thought it was a great opportunity to gain access to important Research Infrastructures with experience that is not at all present in our laboratory. Through this call, we have filled a gap improving our research.'*

## OUR MISSION - WORKING TOGETHER TO ADDRESS THE BIG SOCIETAL CHALLENGES

The success of the CORBEL project stimulated the participating RIs to establish long-term collaborations for future joined projects, which manifested itself in signing bilateral Collaboration Agreements. This recognises and tackles the need to tear down the silos that currently separate scientific disciplines to generate truly interactive and integrative collaborations. Working together in the life sciences on interdisciplinary and challenging scientific projects can lead to progress in health and disease, combating marine pollution, accelerating drug discovery and improvements in many other areas, as illustrated by the success stories on the following pages.



## ESTABLISHING HIGH-THROUGHPUT METHODS TO STUDY 'MINI-GUTS'

Jenny Ostrop, Norwegian University of Science and Technology Trondheim, Norway

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Euro-BioImaging EMBL-Node

EU-OPENSREEN, Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP), Berlin, Germany

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The human gastrointestinal tract is a highly sophisticated organ. The gut epithelium consists of several specialized cell types in a distinct spatial arrangement that enable efficient nutrient uptake and form a barrier against commensal bacteria and pathogens.

CORBEL user Dr. Jenny Ostrop from the Centre of Molecular Inflammation Research at NTNU in Trondheim, is using organoids - 'mini-guts' that form characteristic crypts and villi - to study the intestinal epithelium. Her scientific interest lies in the differentiation of stem cells into the diverse epithelial cell lineages.

'We are trying to find the molecular 'switches' that determine which cell types develop from the stem cells and how the epithelium is composed', explains Jenny. The organoids are grown in a collagen matrix and their handling is challenging and time-consuming.

Having heard about the CORBEL Open Call for research projects from colleagues, Jenny applied for access to the high-throughput screening facilities at EU-OPENSREEN. During her visit, Jenny was able to automate several working steps in her experimental pipeline, thereby accelerating the workflow. This allowed her to screen a library of compounds that might influence organoid development for their effect on cell differentiation and organoid composition.

As the next step, based on the screening results, Jenny is planning to visit Euro-Biolmaging to quantify the three-dimensional morphology of the organoids following certain treatments, using advanced microscopy techniques and automated image analysis.



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*'I would definitely recommend other researchers to apply for access to the European research infrastructures. Their offer means a great chance to use instruments that you would normally not have access to and to benefit from their expertise.'*

*Jenny Ostrop*

## A MULTIDISCIPLINARY APPROACH AGAINST BREAST CANCER

Alexey Koval, University of Geneva, Switzerland

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Instruct, Center of Magnetic Resonance /  
Interuniversity Consortium (CERM/CIRMMP), Florence, Italy

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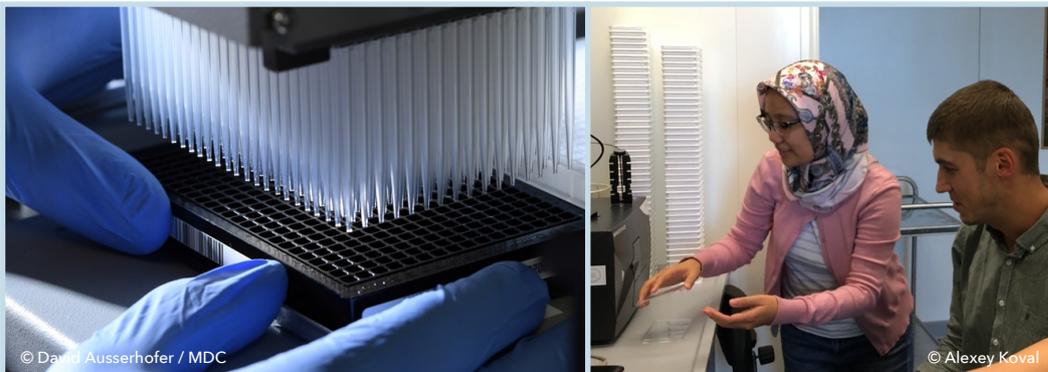
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Triple-negative breast cancer (TNBC) is a particularly aggressive form of breast cancer. Although only 15-20% of all cases belong to this molecular subtype, it accounts for about 50% of breast cancer related deaths. The current treatment plan is surgery, chemotherapy and radiation. A targeted therapy would greatly improve treatment options and enhance survival rates.

CORBEL user Dr. Alexey Koval's goal is to find drug candidates which can be developed further into a targeted therapy. Alexey, a senior researcher from the Katanaev lab, identified a promising drug target, for which he wants to identify small molecules that act on this target protein. A drug discovery project requires multidisciplinary efforts.

Alexey started the CORBEL project already with lead compounds in the pipeline. He is now working together with EU-OPENSSCREEN and Instruct on searching for new active compounds as well as improving the chemical properties of existing ones until a promising drug candidate evolves. In EU-OPENSSCREEN's screening unit Alexey was able to significantly increase the portfolio of the potential drug candidates to about a dozen sub-micromolar novel and specific compounds.

Meanwhile, the Instruct Node has carried out structural studies to analyze the interaction of novel candidates with the target. This process typically undergoes several rounds of optimization, for which specific expertise of the CORBEL facilities is extremely helpful to Alexey.



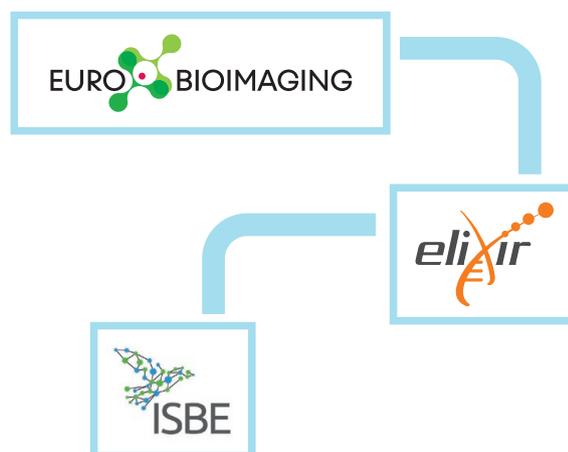
*'I had a unique and exciting opportunity to deepen my knowledge in large-scale hit identification. Both through communication and hands-on experience, I learned the details of the high-throughput screening setup, beginning from assay transfer and adaptation and finishing with the statistical methods of quality control and large dataset treatment. Our project will strongly benefit from the results obtained [...] at the requested CORBEL facilities.'*

*Alexey Koval*

## CYSTIC FIBROSIS – IDENTIFICATION OF POTENTIAL DRUG TARGETS WITH MICROSCOPY AND COMPUTATIONAL METHODS

Margarida Amaral and Hugo Botelho  
University of Lisbon, Portugal

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Euro-BioImaging EMBL-Node

ELIXIR, EMBL-EBI, Hinxton, UK

ISBE, VU Amsterdam, The Netherlands

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Cystic fibrosis (CF) patients suffer from recurrent lung infections and typically have a shortened life expectancy due to dysregulation of fluid transport into the lung. CF is caused by mutations in the CFTR gene, encoding an ion channel membrane protein. Prof. Margarida Amaral's research focuses on normal and mutant protein CFTR, namely on the most frequent mutation which prevents correct traffic of the channel to the plasma membrane.

She and her team member Dr. Hugo Botelho have been working with Euro-Biolmaging to gain access to the high-throughput microscopy facility to identify putative drug targets. She is further remotely accessing ISBE and ELIXIR Nodes. At the ISBE Node the identified screen hits are prioritized to build dynamical network models of the endoplasmic reticulum quality control, responsible for preventing the mutant protein from reaching the cell surface. Together with ELIXIR target prediction models are then applied to predict likely targets for novel compounds that have an effect on CF. The identification of novel compounds to treat CF has proven to be an ambitious goal, since the complexity of appropriate approaches is high. Their implementation in a large database, such as ChEMBL, and the use of the EMBL-EBI computational infrastructure, facilitated by CORBEL, can significantly contribute to the identification of novel drug candidates for CF.

The group has plans to use EU-OPENSREEN facilities in the future for compound screens.



*'CORBEL enabled us to explore our data in a way we could not have done by ourselves. We have gained new insights on CFTR folding and maturation. The model will be a valuable tool for the community.'*

*Hugo Botelho and Margarida Amaral*

## SCREENING FOR ACTIVE COMPOUNDS AGAINST ACUTE MYELOID LEUKEMIA

Maria Paola Martelli, University of Perugia, Italy

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EU-OPENSREEN, Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP), Berlin, Germany

Euro-BioImaging EMBL-Node

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Prof. Maria Paola Martelli focuses her research on acute myeloid leukemia (AML) with the aim to translate her findings into novel diagnostic tools and therapies. AML affects the maturation of myeloid blood cells leading to accumulation of abnormal cells and ultimately to bone marrow failure. AML accounts for about 80% of acute leukemia in adults with a grim prognosis in particular for elderly patients, often leaving allogeneic stem cell therapy as the only treatment option.

Prof. Martelli is primarily interested in a genetic alteration, present in about one-third of AML cases, which was discovered by Brunangelo Falini, when she was a researcher in his lab and has remained a central research interest throughout her career. This mutation alters the properties of a phosphoprotein, which in its mutant form accumulates in the cytoplasm.

Prof. Martelli's CORBEL project aims to identify small molecule compounds, which attack either the mutated phosphoprotein or a key partner. To this end, the first set of experiments was carried out by Prof. Martelli's PhD student Roberta Ranieri at the EU-OPENSOURCE Node. Access to EU-OPENSOURCE allowed her to screen their libraries against AML cell lines, which she characterized in her lab. After screening is completed and hits are analysed, selected molecules will be further evaluated using advanced imaging technologies at the Euro-BioImaging Node.

This project will hopefully be a step towards novel therapy options for AML, which are desperately needed and will have a positive impact on human health.



© Maria Paola Martelli

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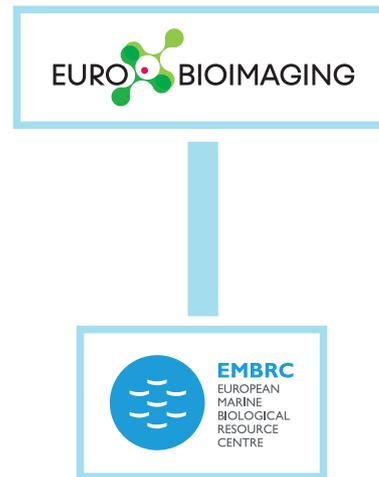
*'CORBEL is allowing us access to technologies not available in our lab and to scale-up screening of large compound libraries. This is a big step forward needed for our project.'*

*Maria Paola Martelli*

## REVEALING THE MORPHOLOGICAL PLASTICITY OF A CELL IN PLANKTONIC SYMBIOSES

Johan Decelle,  
University of Grenoble Alpes, France

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Euro-BioImaging EMBL-Node

EMBRC, CNRS Marine Observatory, Villefranche-sur-mer, France

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Symbiotic interactions with microalgae are widespread among today's oceanic plankton and play a significant role in the functioning of marine ecosystems. However, their basic functioning and the subcellular mechanisms by which a cell can accommodate and engineer an intracellular microalgal cell remain unknown.

Dr. Johan Decelle, a young group leader at the University of Grenoble Alpes, has focused on revealing these mechanisms in his research. The goal of his project is to unveil the structural architecture of the microalgal cell and its integration into a host cell using cutting-edge imaging technologies. Working with the EMBRC Node has allowed him to collect his study material despite being based away from the sea with his institute. This site offers a favorable oceanographic context for the presence of symbiotic plankton in near-shore waters, which facilitate experiments on live cells. At the Euro-Biolmaging Node, he used the 3D imaging technique FIB-SEM (Focused Ion Beam scanning electron microscopy) to visualize subcellular modifications of the photosynthetic machinery and the microalgal cell at high imaging volume before and during symbiotic interaction.

What started as a project selected via the CORBEL Open Call developed into a long-term collaboration. All partners agree that this project will improve our knowledge of the functioning of planktonic symbioses and bring new evolutionary insights into chloroplast acquisition in eukaryotes.



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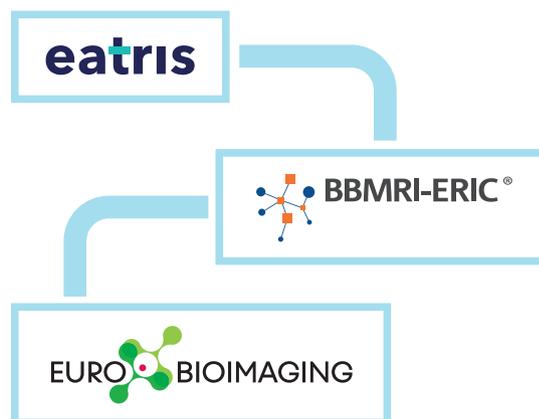
*'Learning about these available resources and accessible technologies in Europe was such luck! To have the possibility to go all the way from collecting planktonic cells in the ocean to high-end cutting-edge imaging technologies is a unique opportunity to better understand these ecologically-important cells!'*

*Johan Decelle*

## INTEGRATING EU-WIDE CARDIOVASCULAR RESEARCH DATASETS

Adriano Barbosa da Silva, Queen Mary University of London (QMUL), United Kingdom

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EATRIS Coordination Office, Amsterdam, The Netherlands

BBMRI Headquarters, Graz, Austria

Euro-BioImaging, Population Imaging Node Rotterdam (BIGR),  
Rotterdam, The Netherlands

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Projects like the UK Biobank aim to improve the prevention, diagnosis and treatment of several diseases, by following the health status of 500,000 volunteer participants, and anonymously capturing changes that could give clues on alterations of health condition, lifestyle or environment that could be associated with the onset of diseases, such as cardiovascular diseases (CVD).

Dr. Adriano Barbosa's CORBEL project aims to extend the impact of large population studies, such as the UK Biobank, by identifying and collecting additional European CVD datasets that could be analysed in parallel in order to validate insights observed in the UK Biobank on an independent dataset. In this respect it was of critical importance for him to gain access to European Research Infrastructures (RIs) that could help with this task.

A bulk search conducted by BBMRI using their negotiator service towards the BBMRI catalogue of biobanks identified 465 matches. In parallel, EATRIS coordination and support office, through its proprietary database of capacity available within the RI partner institutions, identified five institutions. Further discussions between Adriano and principal investigators at the identified institutions enabled by EATRIS allowed to scale down to two institutions with the datasets fully matching Adriano's CVD query: Fondazione Ri.MED (Italy) and St. Anne's University Hospital (Czech Republic).

EATRIS helped to establish a Data Protection Agreement between Adriano's university and Ri.MED via engagement with the respective data protection officers. Additionally, EATRIS supported Adriano with setting up a Memorandum of Understanding between his university and the Czech hospital as a first step to establish the necessary framework to have their data used in the scope of the project.

Through the Euro-Biolmaging Node in Rotterdam, preliminary work was performed for the deployment of the XNAT.bmia.nl imaging archive key for the integration of imaging datasets. Further support will be provided for the extraction of imaging features from the medical imaging data sets allowing QMUL to apply machine learning methods to stratify cardiovascular patients based on machine learning.



*'CORBEL support during my project was fundamental to address the legal requirements needed prior to data sharing. Without RI support it would have been particularly challenging to liaise with the matched biobanks and make sure that their datasets could be used in my research.'*

*Adriano Barbosa da Silva*

## EURO-BIOIMAGING ERIC

EUROPEAN RESEARCH INFRASTRUCTURE FOR IMAGING  
TECHNOLOGIES IN BIOLOGICAL AND BIOMEDICAL SCIENCES

Innovative imaging technologies have revolutionised the life sciences by allowing researchers to visualise and measure a broad spectrum of molecular and cellular processes and events with an accuracy and coverage that have been out of reach until now. For the first time in history, we can visualise the molecular processes of life and the basis of human disease, such as tumorigenesis or Alzheimer's disease, in living cells and tissues in real time. These technologies allow breakthrough biological discoveries and their translation into medical applications. Imaging technologies are thus the central technology platform driving fundamental research in most disciplines of the life sciences, in both biological and biomedical research. Euro-BioImaging ERIC offers life scientists open access to imaging instruments, expertise, training opportunities, and data management services that they do not find at their home institutions or among their collaboration partners. All scientists, regardless of affiliation, area of expertise, or field of activity, can benefit from these pan-European open access services. Euro-BioImaging will ensure excellent research and development across the life sciences in Europe. For most technologies, scientists are invited to receive hands-on training at the imaging set-up of their choice so that they can generate the desired data sets themselves and expand their technological knowledge. Visits can vary in length between single days to several weeks, depending on the project's need and individual circumstances. Scientists interested in accessing Euro-BioImaging services are invited to submit a project description any time via the online application portal. Senior scientists will offer expert advice on the project's scope and experimental set-up. Once the project has been rated as technically feasible, the planning of the first access visit can start!





## ACCESS TO TECHNOLOGY

The technologies offered by Euro-BioImaging can be accessed at Euro-BioImaging Nodes, which are internationally renowned imaging facilities distributed across Europe. They cover the whole spectrum of biological and pre-clinical imaging, with an ever-growing portfolio of cutting-edge instruments. New technologies are included continuously to offer access to the most innovative and pioneering technologies on the market.

Currently, the offered services include about 40 different technologies, among others:

- » biological imaging (e.g. LSCM/CLSM, STED, FCS, CLEM, SPIM)
- » multi-modal molecular imaging (e.g. (Micro)-PET, (Micro)-SPECT)
- » biomedical imaging (e.g. High-Field MRI, Phase contrast imaging)

## ACCESS TO DATA SERVICE

Euro-BioImaging offers a wide range of image data services. Euro-BioImaging Nodes support their users in data management and quality control, primary data analysis and the transfer of large data sets to the home base. The BioImage Archive ([www.ebi.ac.uk/bioimage-archive/](http://www.ebi.ac.uk/bioimage-archive/)) was launched as public central archive for biological and biomedical image data, which will make it easier for researchers around the world to store, share, access and analyse images. This wealth of scientific images can now start to be reused, reanalysed, and interconnected to create new knowledge. New computational tools for image analysis and processing accessible via the cloud will complement the offered services.

## ACCESS TO TRAINING SERVICE

Euro-BioImaging offers training courses on many different cutting-edge imaging technologies for scientists as well as imaging facility operators.



[info@eurobioimaging.eu](mailto:info@eurobioimaging.eu)



[www.eurobioimaging.eu](http://www.eurobioimaging.eu)



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## EU-OPENSREEN ERIC

### EUROPEAN INFRASTRUCTURE OF OPEN SCREENING PLATFORMS FOR CHEMICAL BIOLOGY

EU-OPENSREEN is a Research Infrastructure (RI) of open screening and medicinal chemistry platforms, which enables small molecule studies in Chemical Biology. Scientists are enabled to use compound screening methods to validate novel therapeutic targets and support basic mechanistic studies addressing fundamental questions in cellular physiology - across human, animal and plant systems - using chemical biology methods. In fact, EU-OPENSREEN integrates high-capacity screening platforms throughout Europe, which jointly use a rationally selected compound collection, comprising up to 140.000 commercial and proprietary compounds collected from European chemists. EU-OPENSREEN offers to researchers from academic institutions, SMEs and industrial organisations open access to its shared resources. EU-OPENSREEN will collaboratively develop novel molecular tool compounds with external users from various disciplines of the life sciences.

### ACCESS TO TECHNOLOGIES

The offered technologies can be accessed at EU-OPENSREEN partner sites: advanced screening platforms and medicinal chemistry facilities. EU-OPENSREEN offers a jointly used rationally designed compound collection and operates an open-access bioactivity database, which will be accessible on a global basis. Users are requested to submit project proposals to the EU-OPENSREEN central office. Depending on the project requirements, the RI can be accessed remotely or on-site.



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Currently, the offered services include:

- » high-throughput compound/drug screening (HTS)
- » access to the unique EU-OPENSREEN small molecule collection (~140.000 compounds)
- » assay adaption
- » chemical optimization and profiling of preliminary 'hits'
- » bioprofiling of donated compounds

## PROVISION OF STANDARDISED DATA

All data generated through QC/bioprofiling activities and primary screening will be published in the open-access European Chemical Biology Database (ECBD) with an optional 'grace' period of up to 3 years (i.e. delayed publication of data). The ECBD is in its planning phase and will be a web portal with powerful search and analysis capabilities. It will contain validated output from screening centres in a public as well as pre-release environment. The ECBD will be hosted by the Czech EU-OPENSREEN partner site Institute of Molecular Genetics (IMG) in Prague.

## ACCESS TO TRAINING AND EDUCATION SERVICES

EU-OPENSREEN offers training of second (master) & third (PhD) cycle students, postdoctoral scientists and principal investigators in chemical biology, compound management, process automation, IT, assay development and screening.

## ACCESS TO PROJECT FUNDING

EU-OPENSREEN supports scientists through grant application processes to secure funding for screening and medicinal chemistry projects at EU-OPENSREEN ERIC partner sites.



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[www.eu-openscreen.eu](http://www.eu-openscreen.eu)



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## INSTRUCT-ERIC

### THE EUROPEAN RESEARCH INFRASTRUCTURE FOR STRUCTURAL BIOLOGY RESEARCH

Structural biology is a diverse and far-reaching field. By deciphering the structure and dynamics of biomolecules, structural biology is unlocking the crucial mechanisms that underpin health and disease, and changing the way that we interpret molecular and cellular functions. The field is also in the midst of a revolution driven by advances in technology and methods, allowing scientists to correlate atomic-level structure and dynamics with functionality at the cellular level.

Instruct-ERIC is at the frontier of the integrative approach to structural biology, providing a single point of access to technology, training and expertise. Our research facilities in Europe offer access to a catalogue of technologies, from sample preparation to biomolecular and 3D structural analyses. As well as providing Open Access to scientific infrastructure, Instruct-ERIC delivers an extensive training programme in emerging methods, offers fully-funded internships, and awards pump-priming R&D funds for technology development. The services offered by Instruct-ERIC are available to academic and industry researchers worldwide, and fully-funded access is available to academic researchers from Instruct Member countries.



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PDB ID: 3OCL / Sainsbury S. et al. J. Mol. Biol. 2011;405:173-84.



## TECHNOLOGIES

Through our specialist research centres, Instruct-ERIC offers access to over 60 different services, enabling a multidisciplinary approach to solving multi-scale problems in structural biology. Technologies available through Instruct include:

- » Sample preparation - macromolecular and membrane protein crystallisation, nanobody production.
- » Biomolecular analysis - native and proteomic mass spectrometry, molecular biophysics.
- » 3D structural analysis - cryo-electron microscopy, bio-SAXS, NMR.
- » For more information and to submit a research proposal, visit [instruct-eric.eu/platform-catalogue](http://instruct-eric.eu/platform-catalogue).

For more information and to submit a research proposal, visit [instruct-eric.eu/platform-catalogue](http://instruct-eric.eu/platform-catalogue).

## TRAINING

Instruct-ERIC offers a variety of training courses in structural biology methods to equip scientists with knowledge of the latest technologies and how to get the most from them. Our annual programme of hands-on workshops are delivered by international experts on a broad range of topics.

To discover the Instruct training programme, visit [instruct-eric.eu/instruct-training-events-annual](http://instruct-eric.eu/instruct-training-events-annual).

## INTERNSHIPS

The Instruct-ERIC internship programme funds three- to six-month research placements at our Centres across Europe. Our internships establish valuable collaborations and allow early-career scientists to develop expertise to enhance their research.

Find out about internship calls at [instruct-eric.eu/internships](http://instruct-eric.eu/internships)



[admin@instruct-eric.eu](mailto:admin@instruct-eric.eu)



[www.instruct-eric.eu](http://www.instruct-eric.eu)



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## ELIXIR

### A DISTRIBUTED RESEARCH INFRASTRUCTURE FOR BIOLOGICAL DATA

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ELIXIR, the European life-science infrastructure for biological information, is a unique and unprecedented initiative that consolidates Europe's national centres, services, and core bioinformatics resources into a single, coordinated infrastructure.

ELIXIR brings together Europe's major life-science data archives and connects these with national bioinformatics infrastructures throughout ELIXIR's member states, of which there are 22 across Europe. By coordinating local, national and international resources the ELIXIR infrastructure supports the data-related needs of Europe's life-scientists.

ELIXIR offers researchers access to bioinformatics expertise, data, tools, compute resources and training for their research. These provisions are made possible through extensive collaboration, consolidating the expertise and outputs of such a broad range of institutes.

### ELIXIR AREAS OF ACTIVITY

ELIXIR unites Europe's leading life science organisations in managing and safeguarding the increasing volume of data being generated by publicly funded research. It coordinates, integrates and sustains bioinformatics resources across its member states and enables users in academia and industry to access services that are vital for their research. The ELIXIR distributed and virtual Infrastructure brings together the most relevant national bioinformatics resources of 22 countries plus EMBL-EB that are made accessible as ELIXIR Services for Life Science Scientist in Academia and Industry. Currently, ELIXIR provides access (via the ELIXIR Nodes) to more than 150 services that are periodically reviewed by external experts and that ELIXIR Nodes have committed to sustaining long term. Furthermore, ELIXIR Services are contextualised organised around through alignment with the 5 ELIXIR Platforms (Data, Compute, Tools, Interoperability and Training). Finally, ELIXIR has robust mechanisms to allocate certain Services to Key Service Collections In addition key collection of services have been identified including (ELIXIR Core Data Resources, ELIXIR Deposition Databases and ELIXIR Recommended Interoperability Resources)

### ACCESS TO DATA SERVICES

ELIXIR facilitates virtual open and free access to more than 150 high-quality bioinformatics Services periodically reviewed and sustained by the ELIXIR Nodes (22 national Nodes + EMBL-EBI). All of them accessible via the ELIXIR Service Catalogue. Furthermore, ELIXIR has developed easy to search registries



to offer simplified access to bioinformatics tools (bio.tools), benchmarking (open ebench.bsc.es), training (tess.elixir-europe.org), data standards (fairsharing.org) and software containers (biocontainers.pro). The types of services offered include those associated with:

- » compute power, to aid large scale data analysis
- » specific data resources, to aid analysis and hypothesis generation
- » interoperability and data standards, to improve compatibility between tools as well as data
- » software tools, to carry out specific analyses
- » training, to aid researchers and developers in using and developing services

In addition, ELIXIR promotes access to key ELIXIR 'Key Service Collections' that are recognised by public funders as recommended services for Life Sciences, for instance:

- » ELIXIR Core Data Resources
- » ELIXIR Deposition Databases (EDD)
- » ELIXIR Recommended Interoperability Resources (RIR)

The next step in the evolution of the way ELIXIR externalises its Services will be to explore the concept of ELIXIR Service Bundles. These will be collections of Services, of any type, that are required to meet a particular scientific need, drawing on the work already done to define the Key Service Collections and Node Services. In addition to the collection of services ELIXIR bundles will also facilitate access to ELIXIR Experts and actual implementations

## ACCESS TO TRAINING SERVICES

ELIXIR puts training at the heart of their activities and has developed a Training e-Support System (TeSS, tess.elixir-europe.org) to catalogue the training events and online resources that are useful for the life sciences community, whether that be for developers, bioinformaticians or wet-lab researchers. It also allows individuals and institutions to add their own events to the portal.



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[www.elixir-europe.org](http://www.elixir-europe.org)



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## EMBRC-ERIC

EUROPEAN MARINE BIOLOGY RESOURCE CENTRE

The oceans represent the highest biodiversity on Earth, with every lineage of the tree of life being present on or below the waves. It thus offers a large number of biological research models with application and relevance in a broad number of disciplines, including evolution and development, regenerative biology, and cancer research. The oceans offer many opportunities for biodiscovery, bioprospecting, and biotechnological application. With more than 30 marine centres in 9 European countries, EMBRC-ERIC functions as a service provider, or as an integral support to a project, for research, exploration, and innovation purposes, requiring marine organisms or access to marine ecosystems.

### ACCESS TO RESOURCES

EMBRC provides wild type organisms (sampled on request), culture collections of a wide selection of microorganisms, and marine model organisms grown in the lab with full control of their life cycles. Genetically modified mutants are also available, and can be provided made to measure for some microorganism, as can growing organisms on demand and at specified life stages. Users can either visit the EMBRC sites or have their requested biological resources shipped to their home institutions. For users opting to work onsite, a wide variety of modular experimental facilities for manipulating organisms or manipulating their environment are available and can be set up to accommodate most experimental designs. On site, users can benefit from fully equipped laboratories and analytical platforms, enabling users to carry out in depth analyses. Prior to a visit, a dialogue is established between the user and the relevant platforms to determine the needs of the user and their set-up requirements.





Users retain full Intellectual Property rights of the work they carry out during their visit. All services and organisms can be explored on the EMBRC web portal ([www.embrc.eu](http://www.embrc.eu)) or by contacting [access@embrc.eu](mailto:access@embrc.eu).

The EMBRC offered services include:

- » biological resources - microorganisms (culture collections, wild types), macroorganisms (laboratory models, wildtypes), animals, plants, fungi and bacteria
- » ecosystem access - coastal research vessels, scientific diving, submersibles (ROV/AUV), in-situ sampling facilities and monitoring equipment
- » experimental facilities - aquaria and mesocosms, wet and dry laboratories, climate rooms
- » technology platforms - aquaculture, biological analysis, imaging, molecular biology and omics, remote sensing and telemetry, structural and chemical analysis
- » expertise advice - feasibility studies, experiment design, environmental impact studies, biological sample identification
- » supporting facilities - conference and meeting facilities, training facilities, in-house catering and lodging

## TRAINING AND EDUCATION SERVICES

EMBRC-ERIC offers an overview of current Marine and Maritime training opportunities through the Marine Training platform ([www.marinetraining.eu](http://www.marinetraining.eu)). A variety of training courses are available in EMBRC and can be found on the Marine Training portal.

Learn more at [www.assembleplus.eu/access/transnational-access](http://www.assembleplus.eu/access/transnational-access)



[info@embrc.eu](mailto:info@embrc.eu) | [access@embrc.eu](mailto:access@embrc.eu)



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## EATRIS ERIC

### EUROPEAN RESEARCH INFRASTRUCTURE FOR TRANSLATIONAL MEDICINE

EATRIS is the Research Infrastructure dedicated to facilitate effective translation of advances in biomedical science from laboratory to patient. The drug development journey is long, costly and fails too often. Translational research is an essential multi-disciplinary and complex undertaking. A major challenge in developing new innovations is understanding what steps need to be taken, and what expertise and technologies are suitable to perform these steps. Researchers from academia and industry in need of support can approach EATRIS to provide guidance, by means of clinical, biological and technological expertise available within the academic infrastructure. Subsequently, EATRIS will match the user's need with the capabilities and expertise of member academic institutions. In this way, EATRIS facilitates cross-sector collaboration among academics, industry, clinicians as well as regulators and patients.

### PRODUCT PLATFORMS

EATRIS focuses on preclinical and early clinical development of drugs, vaccines and diagnostics. Solutions are provided in the fields of advanced therapy medicinal products, biomarkers, imaging and tracing, small molecules and vaccines. The wide-ranging services portfolio focuses on supporting early decision-making and de-risking of projects.

Examples include validation and development of in vitro and in vivo biomarkers for patient stratification, molecular imaging tracers for drug development programmes, GMP manufacturing of cellular therapy products, patient-derived xenograft models, and many more highly specialised capabilities.





## ACCESS TO TECHNOLOGIES AND SERVICES FOR BIOMEDICAL INNOVATION

By bringing together Europe's best in academic translational medicine, EATRIS has created a portfolio of research services focused on predicting the performance of a potential product, finding and engaging appropriate key opinion leaders and partners, selecting the right patient, and entering clinical development as safely and effectively as possible. The EATRIS network covers an extensive range of potential industry partners.

In order to ensure that each project has a comprehensive team and best chance of success to progress closer to the patient, EATRIS also provides matchmaking services, offers regulatory advice and assessment and support on innovation management matters. Researchers can also obtain support with grant application processes, ensuring that the translational potential of their project is fully optimized.

EATRIS engages with other biomedical research infrastructures to set up projects in translational medicine. Such projects are featured in the CORBEL Open Call and through an alliance formed between EATRIS, ECRIN and BBMRI to further strengthen health research in Europe.

## ACCESS TO TRAINING AND EDUCATION SERVICES

EATRIS offers training through courses, workshops and webinars on various themes relating to translational research. EATRIS' very own e-learning platform TRANSMED Academy offers an online course available free of charge for any party interested in translational research. Webinars are organized on specific areas of expertise in biomedical science, such as a recently held series on neuroimaging. A two-day workshop training can be arranged (subject to funding) on all aspects of setting up public-private research collaborations. This workshop aims to equip research scientists in academia with everything they will need to set up successful collaborations with other academic entities and with industry. EATRIS also organizes a yearly course to train the next generation of translational scientists.



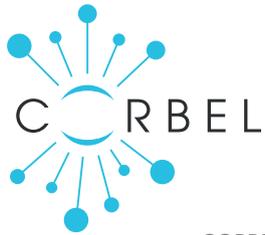
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CORBEL facilitated user access across different European life science research infrastructures (RIs). For each user project, access to a combination of at least two RIs was requested, resulting in a multitude of interconnections. The success of CORBEL stimulated the participating RIs to establish long-term collaborations for future joined projects, recognising and tackling the need to tear down the silos that currently separate scientific disciplines.

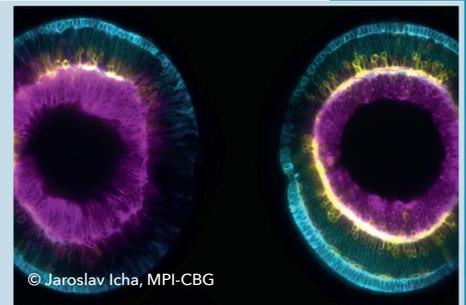


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