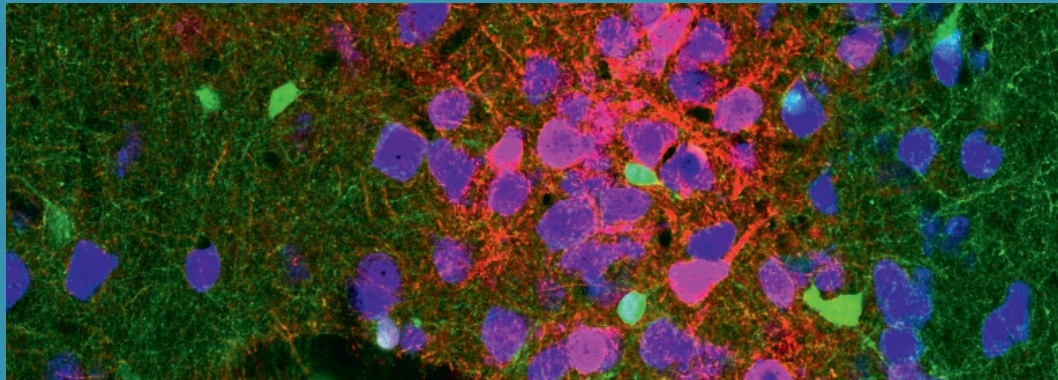


FOR THE ADVANCEMENT OF SCIENCE

Working with European Life Science Research Infrastructures

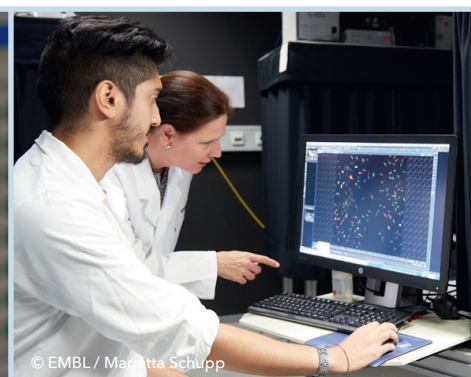


FROM FRAGMENTED RESEARCH TO THE REALISATION OF COMPLEX SCIENTIFIC PROJECTS

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.

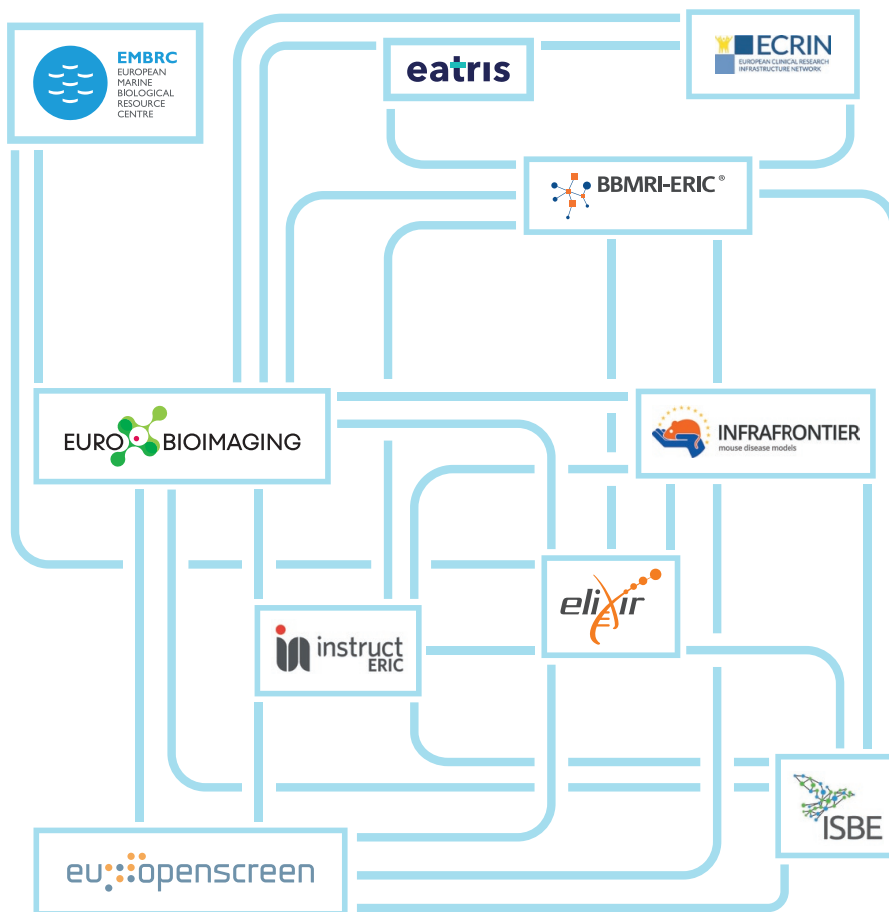
PROOF OF CONCEPT FOR HARMONISED ACCESS TO EUROPEAN LIFE SCIENCE RIs

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:

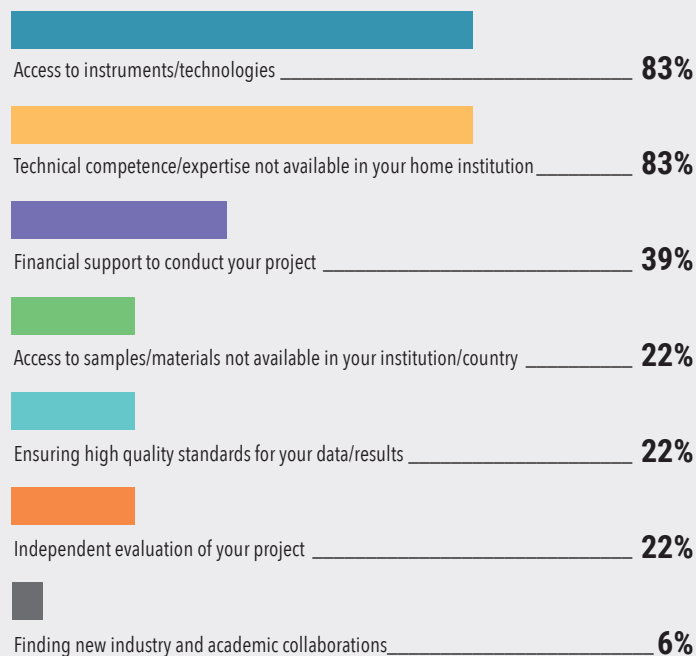
- » a common access environment
- » unified data management
- » common ethical and legal services
- » joint innovation support



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.'

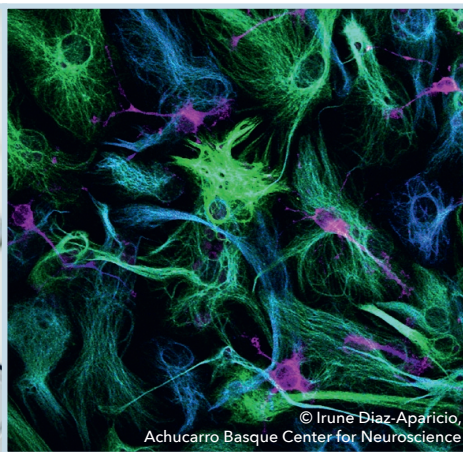
'When we read about the CORBEL Open Call we thought it was a great opportunity to gain access to important Research Infrastructures with experience that is not at all present in our laboratory. Through this call, we have filled a gap improving our research.'

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.



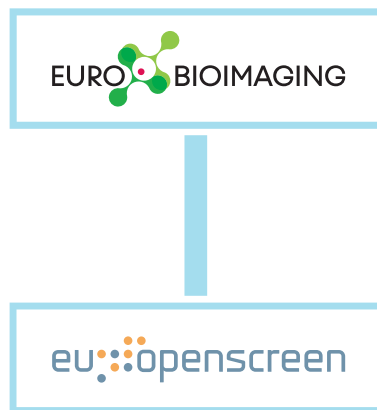
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© Irune Díaz-Aparicio,
Achucarro Basque Center for Neuroscience

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

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



Euro-Biolmaging EMBL-Node

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

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-OPENSOURCE. 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.



'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



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

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

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-OPENSOURCE 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-OPENSOURCE'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.

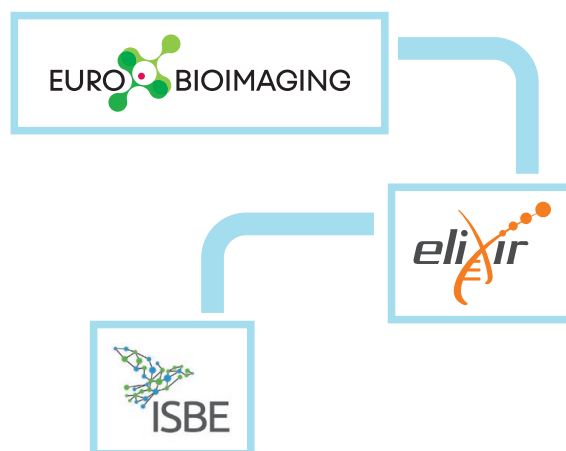


'I had a unique and exciting opportunity to deepen my knowledge in large-scale hit identification. Both through communication and hands-on experience, I learned the details of the high-throughput screening setup, beginning from assay transfer and adaptation and finishing with the statistical methods 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



Euro-Biolmaging EMBL-Node

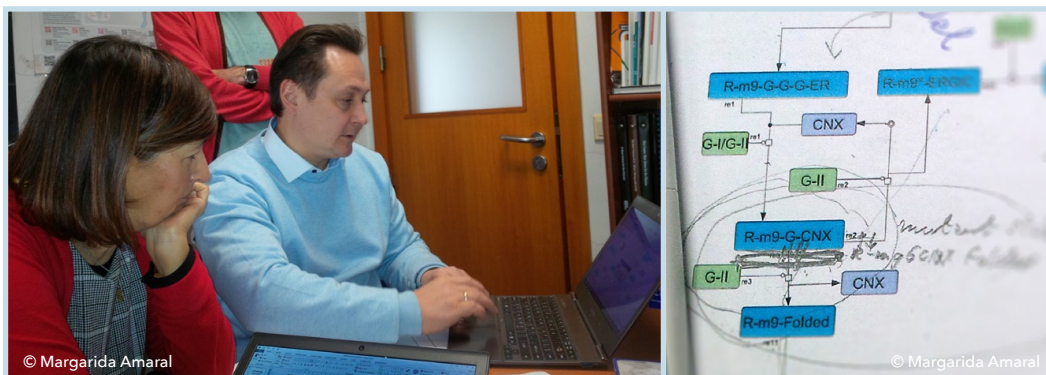
ELIXIR, EMBL-EBI, Hinxton, UK

ISBE, VU Amsterdam, The Netherlands

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-OPENSOURCE 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



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

Euro-Biolmaging EMBL-Node

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-Biolmaging 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.

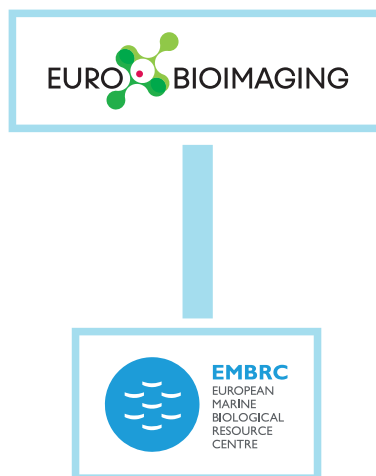


'CORBEL is allowing us access to technologies not available in our lab and to scale-up screening of large compound libraries. This is a big step forward needed for our project.'

Maria Paola Martelli

REVEALING THE MORPHOLOGICAL PLASTICITY OF A CELL IN PLANKTONIC SYMBIOSES

Johan Decelle,
University of Grenoble Alpes, France



Euro-Biolmaging EMBL-Node

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

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.

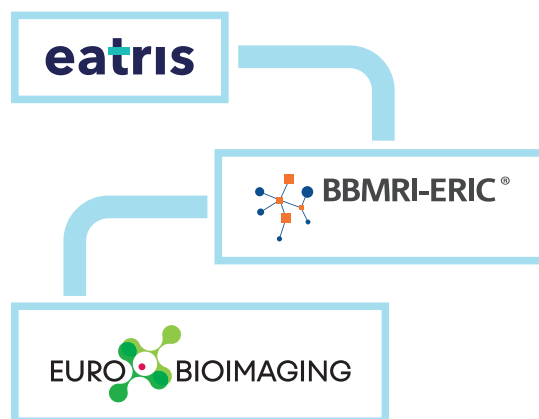


'Learning about these available resources and accessible technologies in Europe was such luck! To have the possibility to go all the way from collecting planktonic cells in the ocean to high-end cutting-edge imaging technologies is a unique opportunity to better understand these ecologically-important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

Johan Decelle

INTEGRATING EU-WIDE CARDIOVASCULAR RESEARCH DATASETS

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



EATRIS Coordination Office, Amsterdam, The Netherlands

BBMRI Headquarters, Graz, Austria

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

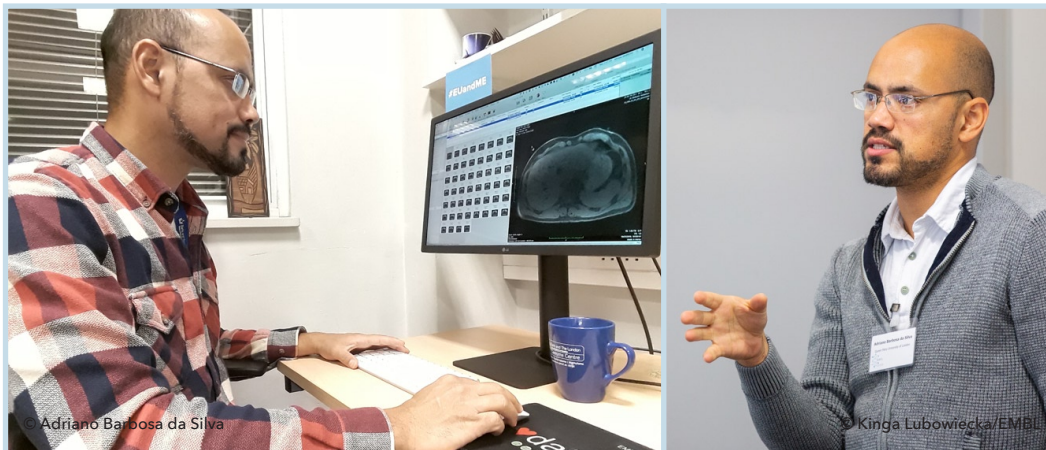
Projects like the UK Biobank aim to improve the prevention, diagnosis and treatment of several diseases, by following the health status of 500,000 volunteer participants, and anonymously capturing changes that could give clues on alterations of health condition, lifestyle or environment that could be 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-BiolImaging 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

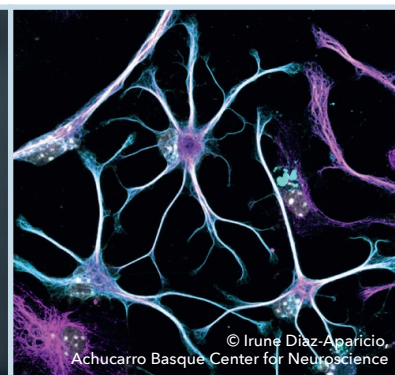
EURO-BIOIMAGING ERIC

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!



© Euro-BioImaging



© Irune Díaz-Aparicio,
Achucarro Basque Center for Neuroscience



ACCESS TO TECHNOLOGY

The technologies offered by Euro-BiolMaging can be accessed at Euro-BiolMaging 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-BiolMaging offers a wide range of image data services. Euro-BiolMaging 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/) 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-BiolMaging offers training courses on many different cutting-edge imaging technologies for scientists as well as imaging facility operators.



info@eurobioimaging.eu



www.eurobioimaging.eu



[@EuroBioImaging](https://twitter.com/EuroBioImaging)

EU-OPENSREEN ERIC

EUROPEAN INFRASTRUCTURE OF OPEN SCREENING
PLATFORMS FOR CHEMICAL BIOLOGY

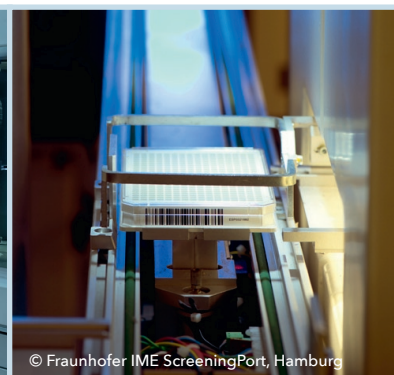
EU-OPENSREEN is a Research Infrastructure (RI) of open screening and medicinal chemistry platforms, which enables small molecule studies in Chemical Biology. Scientists are enabled to use compound screening methods to validate novel therapeutic targets and support basic mechanistic studies addressing 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.



© Fraunhofer IME ScreeningPort, Hamburg



© Fraunhofer IME ScreeningPort, Hamburg



Currently, the offered services include:

- » high-throughput compound/drug screening (HTS)
- » access to the unique EU-OPENSSCREEN 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-OPENSSCREEN partner site Institute of Molecular Genetics (IMG) in Prague.

ACCESS TO TRAINING AND EDUCATION SERVICES

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



office@eu-openscreen.eu



www.eu-openscreen.eu



[@EuOpenscreen](https://twitter.com/EuOpenscreen)

INSTRUCT-ERIC

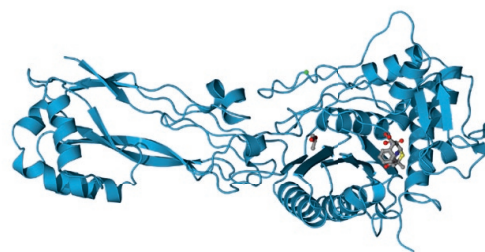
THE EUROPEAN RESEARCH INFRASTRUCTURE FOR STRUCTURAL BIOLOGY RESEARCH

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.

For more information and to submit a research proposal, visit 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.

INTERSHIPS

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



admin@instruct-eric.eu



www.instruct-eric.eu



[@instructhub](https://twitter.com/instructhub)

ELIXIR

A DISTRIBUTED RESEARCH INFRASTRUCTURE FOR BIOLOGICAL DATA

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 buddles 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.



info@elixir-europe.org



www.elixir-europe.org



[@ELIXIREurope](https://twitter.com/ELIXIREurope)

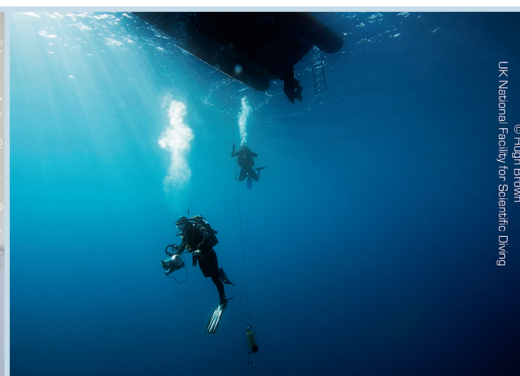
EMBRC-ERIC

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) or by contacting 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.marinettraining.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



info@embrc.eu | access@embrc.eu



www.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.



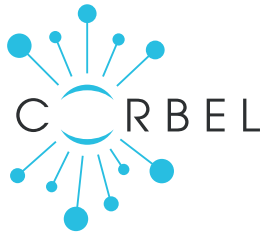
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CORBEL facilitated user access across different European life science research infrastructures (RIs). For each user project, access to a combination of at least two RIs was requested, resulting in a multitude of interconnections. The success of CORBEL 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.

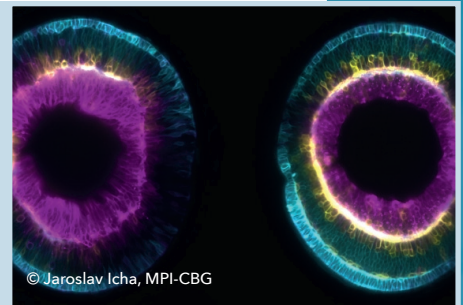


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www.corbel-project.eu



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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654248.

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