



Euro-BioImaging is one of four new biomedical sciences projects included in the update of the roadmap of the European Strategic Forum on Research Infrastructures (ESFRI) that was published in December 2008.

Euro-BioImaging brings together key research areas in imaging technologies stretching from basic biological imaging with advanced light microscopy, *in vivo* molecular imaging of single cells to animals up to the clinical and epidemiological level of medical imaging of patients and populations. It will address the imaging requirements of both biological and medical imaging communities by creating a coordinated and harmonized plan for infrastructure deployment in Europe. Euro-BioImaging infrastructures will meet the challenge for access to state of the art equipment across the full scale of biological and medical applications, will coordinate collaboration for use of infrastructures, will provide training and continue the development of imaging technologies in an integrated manner, allowing translation of new developments from laboratory to clinical use.

Breakup sessions – Work packages of Euro-BioImaging

The work of the preparatory phase of Euro-BioImaging will be divided into work packages and progress towards the overall objectives will be measured by deliverables and milestones. The planned Breakup Sessions for Work packages during the Stakeholder Meeting are the following:

WP Legal and Governance

The purpose of this work package is to identify an appropriate legal and governance structure for the construction and operation phase of Euro-BioImaging, allowing for a sustainable and long-term infrastructure. One of the challenges will be to find a legal and governance structure that supports Euro-BioImaging's distributed nature. The governance model needs to take account of the roles and expectations of the new stakeholders and the funders of Euro-BioImaging. Clearly the governance model must be such that it meets the expectations of the funders and stakeholders within the legal structure that is proposed. Input from the other Euro-BioImaging Work packages will provide insight into the scope and operation of Euro-BioImaging and their development especially that of WP Process Plan and WP Finance Planning.

WP Process Plan

The objective of this work package is to define the scope, role and benefits of Euro-BioImaging, including a coordinated and harmonized plan for the infrastructure deployment in Europe. In close collaboration with the technical ALM and Medical Imaging Work packages, WP Process Plan will provide a strategic review of current European biomedical imaging resources in terms of their technical equipment, external user accessibility, their international context and their funding and stability. From this information it will develop a plan for the future organization and infrastructure support for

Euro-Biolmaging. WP Process Plan will develop strategies for inclusion of all relevant stakeholders and define a working plan for the construction phase of Euro-Biolmaging.

WP Finance

The objective of this work package is to create a concept for funding and financing of Euro-Biolmaging, considering financial support from the full spectrum of public and private funding bodies as well as industry. Costs for construction or upgrades and operation will be evaluated, funding sources will be identified, and funding mechanisms and strategies will be surveyed. Based on results of the surveys a business plan for the construction and operation phase of the new infrastructure will be developed.

WP ALM – General Access Nodes

In most ESFRI member states, access to advanced light microscopy instrumentation and training is a limitation for life science research. While many local imaging facilities exist, the few openly accessible sites that give access to visitors do not have the capacity to satisfy a growing demand. To address this need at the pan-European level, Euro-Biolmaging plans to create a distributed infrastructure of General Access Nodes. These high-end ALM imaging facilities will provide access to a broad range of imaging methods to visiting scientists and should become reference centers to the regional scientific communities. These Euro-Biolmaging nodes will develop harmonized access protocols for European life scientists, and establish unified training platforms. In addition they will work closely with Euro-Biolmaging Specialized Access Nodes (see below) for the adoption of new imaging technologies during the operation phase. Many ESFRI member states have already expressed their strong interest in establishing Advanced Light Microscopy (ALM) General Access Nodes.

WP ALM – Specialized Access Nodes

Specialized nodes will provide access to state-of-the-art imaging technologies which are not easily accessible for the broader imaging community, because they are new and still under development, require knowledge and training from experts, are not yet commercially available or are simply too expensive for individual institutes. So far, the key technologies *super-resolution light microscopy*, *functional imaging of live cells*, *correlative light and electron microscopy* and *high throughput microscopy for systems biology* will be evaluated and planned as specialized access nodes during the preparatory phase.

WP Medical Imaging-Technical Innovation

The accent in these nodes will be on the use and improvement as well as validation of new imaging technologies. Each node will focus on a specific imaging technology with the goal to improve, implement, train and give access to the respective technology. Nodes can be more or less centralized but collaboration of institutions in multiple locations in a technology platform will be an additional main objective.

This work package addresses currently the Euro-Biolmaging nodes *X-ray based phase contrast imaging*; *Methods and applications of ultra-high-field MRI*; *Design and testing of novel agents*. During the preparatory phase surveys on existing infrastructures will be performed and a plan for their integration in Euro-Biolmaging will be generated. Additional technological innovations can be added upon needs of the stakeholders.

WP Medical Imaging- Animal to Population

The accent of these nodes will be to create a coordination platform that will deliver knowledge and expertise, will allow exchange of methodologies and the joint use of

acquired data. The nodes will focus on the different levels of biomedical imaging from molecule to population with use of different imaging technologies. The coordination platform will serve a large number of collaborating centers with a possibility for many existing imaging research institutions or laboratories to contribute to the respective node. The added value of the centrally organized platform will be to provide access and exchange of methods, results, data, knowledge, training, consulting, etc. Participation of the centers will be granted based on expertise and adhesion to the rules of collaboration. *Population based imaging; Clinical research in imaging and Multi-modal imaging of animal models* represent the nodes that will be represented by this work package. Nodes will provide the infrastructure for prospective epidemiological studies in healthy or diseased populations, for planning and conducting large clinical multi-centre trials for the assessment of imaging technologies and will give access to methods for imaging from tissue function to whole animals.

WP Data management

The objectives of this work package are to develop concepts for a computing infrastructure for image data generated by present and future biomedical imaging technologies. Database models for quantitative imaging data will be identified. Synergies with the ESFRI initiative ELIXIR and other databases regarding a development of central digital repositories for large scale quantitative datasets will be evaluated. The work package will also investigate solutions for addressing the specific image processing and analysis needs of the medical and biological imaging communities. A platform will be created to federate the development of novel algorithms and to give users access to documented, state-of-the art imaging software and protocols.

WP Access

This Work package has the aim to develop an integrated plan for access to Euro-Biolmaging infrastructures. Therefore it will undertake an inventory of existing or foreseen platforms in core partners and associates of Euro-Biolmaging that will be open for external access. Furthermore, it will survey user community as to which infrastructures they would like access to, what typical use cases are and develop a model for evaluation of access holders and project based applications as well as establish user access protocols for Euro-Biolmaging infrastructure.

WP Training

The goal of this work package is to develop a pan-European training program making imaging methods available to students, post-graduates and senior scientists. A number of basic and advanced courses including national activities as well as international workshops hosted by the Euro-Biolmaging nodes will be established. During the preparatory phase work will focus on surveys of currently offered teaching initiatives as well as on specific needs of user communities. Accordingly, an integrated training concept will be developed.