



Euro-BioImaging
European Research Infrastructure for Imaging Technologies in Biological
and Biomedical Sciences

WP6
Advanced Light Microscopy – General Access

Task 6.5
Identification of facilities for the operation phase

Deliverable 6.7
List of ALM facilities participating in Euro-BioImaging

Task leaders
UNIVDUN, IEO, ABO

Additional Task Contributors:
EMBL

September 2013

Table of Contents

1	Report Summary.....	3
2	Euro-Biolmaging Open Call for Euro-Biolmaging Nodes	4
2.1	The Independent Evaluation Board (IEB).....	4
2.1.1	Composition and objective.....	4
2.1.2	Organization	4
2.2	Evaluation Procedure	5
2.2.1	Principle of evaluation	5
2.2.2	IEB Meeting	6
3	Result of 1 st Open Call for Euro-Biolmaging Nodes.....	7
3.1	General Feedback from the Independent Evaluation Board on Euro-Biolmaging	7
3.2	Outcome: Expressions of Interest for ALM multi-modal Nodes.....	8
4	Next Steps	10
4.1	Establishing a Euro-Biolmaging Node.....	10
5	Annex	12
5.1	Independent Evaluation Board Members.....	12

1 Report Summary

Euro-BioImaging WP6 aims to create a widely distributed and strongly coordinated infrastructure for multi-modal advanced light microscopy at a pan-European level. The infrastructure established by Euro-BioImaging will consist of a set of geographically distributed but strongly interlinked imaging facilities (Euro-BioImaging Nodes). In 2013, Euro-BioImaging published an open call for Nodes and invited imaging facilities in all ESFRI countries for the first time to express their interest in joining the future Euro-BioImaging infrastructure by becoming a Euro-BioImaging Node¹. In total, 71 Imaging facilities from 19 countries submitted Expressions of Interest (EoI) to Euro-BioImaging. 22 EoIs came from research institutions located in 16 different countries, proposing to operate a multi-modal ALM facility, and 6 were from facilities proposing to offer mixed technologies including ALM. All EoIs were evaluated by the Independent Evaluation Board (IEB) against the set of general and technology specific review criteria defined by the Euro-BioImaging preparatory phase consortium. The IEB then submitted a report and recommendations based on the outcome of their review.

¹ Please find more detailed information about the 1st Open Call on the Euro-BioImaging website [http://www.- Euro-BioImaging.eu/content-page/first-euro-bioimaging-open-call-nodes-general-information](http://www.-Euro-BioImaging.eu/content-page/first-euro-bioimaging-open-call-nodes-general-information)

2 Euro-Biolmaging Open Call for Euro-Biolmaging Nodes

Euro-Biolmaging is a pan-European infrastructure project with a mission to build a distributed imaging infrastructure across Europe that will provide open access to innovative biological and medical imaging technologies for European researchers. The infrastructure established by Euro-Biolmaging will consist of a set of geographically distributed but strongly interlinked imaging facilities (Euro-Biolmaging Nodes). From January to April 2013, Euro-Biolmaging published an open call for Nodes and invited imaging facilities in all ESFRI countries for the first time to express their interest in joining the future Euro-Biolmaging infrastructure by becoming Euro Biolmaging Nodes². Included in this call was an invitation for applications from facilities interested in becoming Multi-modal Advanced Light Microscopy Nodes.

In total, 71 Imaging facilities from 19 countries submitted Expression's of Interest (Eoi) to Euro-Biolmaging. Being committed to an open and comparable Node evaluation mechanism, Euro-Biolmaging and its External Advisory Board installed an Independent Evaluation Board (IEB) consisting of international leading experts for imaging technologies and infrastructures. The IEB evaluated all Eois against the set of general and technology specific review criteria defined by the Euro-Biolmaging preparatory phase consortium during May and June and submitted a report and recommendations based on the outcome of this review.

2.1 The Independent Evaluation Board (IEB)

2.1.1 Composition and objective.

The Independent Evaluation Board (IEB) is a voluntary body supporting Euro-Biolmaging with the 1st open call for Nodes. It comprises non-European international senior experts in imaging technologies and infrastructure with extensive experience and knowledge of imaging infrastructure, technologies and their service to the users. The IEB's main task was to independently evaluate all of the submitted Expressions of Interest for Euro-Biolmaging Nodes and to make recommendations regarding their inclusion in the future European imaging infrastructure. A list of the IEB members is presented in Annex 1 and is publicly available on the Euro-Biolmaging webpage.

2.1.2 Organization

The members of the IEB were appointed by the Euro-Biolmaging preparatory phase External Advisory Board, from candidates nominated by the Euro-Biolmaging Steering Committee and the coordinating contacts for the 23 National Imaging Communities participating in Euro-Biolmaging. To guarantee the independence of the IEB all members are international non-European experts. Advice on the European research infrastructure landscape was provided to the IEB by Eero Vuorio, director of BioCenter Finland, who was present during the final meeting of the IEB as an observer. The IEB is organized into technology specific panels, which were managed by their panel chair. Each panel had at least three members. The IEB as a whole elected Scott Fraser as the IEB Chair and Ian Smith as a Vice chair. The IEB Chair and Vice Chair nominated panel members and chairs, chaired the meeting of the IEB and facilitated the final decision making by the whole IEB,

² Please find more detailed information about the 1st Open Call on the Euro-Biolmaging website <http://www.Euro-Biolmaging.eu/content-page/first-euro-bioimaging-open-call-nodes-general-information>

ensuring at the same time that the evaluations by different panels are based on comparable interpretation of the review criteria and were harmonized.

2.2 Evaluation Procedure

Following the deadline for submission of the Expressions of Interest on the 30th April 2013, the Euro-Biolmaging project management team validated all submitted Eol forms for formal completeness and eligibility (see the General Criteria for Euro-Biolmaging Nodes³ document listing eligibility criteria). Eols with minor sections missing were invited to update their Eol and resubmit with minor corrections. In the name of the IEB Chair, all eligible Eols were forwarded to the technology specific panels. The Euro-Biolmaging project management team supported the IEB Chair with all administrative tasks.

2.2.1 Principle of evaluation

Evaluation by the panels and the IEB was carried out between May 10th and June 16th 2013, based on the general and technology specific review criteria (see General Criteria for Euro Biolmaging Nodes and Technology Specific Review Criteria for Advanced light Microscopy / Molecular Imaging/ Medical Imaging published online⁴).

I) The General Review Criteria cover following topics:

- Scientific and technical excellence of the infrastructure Node
- Quality and scientific field of the academic environment
- Geographic coverage
- Maintenance and update
- European and national significance
- Access and service package
- Use and quality assurance
- User training
- If applicable, evidence of funding commitment by national funders

II) The Technology Specific Review Criteria cover topics as specified in Technology Specific Review Criteria documents⁵.

The Eols were evaluated in three steps:

- by panels members individually
- by each panel together (during conference call, organized by each panel chair)
- by the whole IEB (during physical meeting in Newark, NJ, USA)

Each Expression of Interest was evaluated by at least 3 members of the panel. The final decision on the ranking of all submitted Eols and harmonization of the Eol evaluations across technology domains and between the different organizational frameworks used by different European

³[http://www.Euro-Biolmaging.eu/sites/default/files/General%20Criteria%20for%20Application%20for%20Euro-biolmaging%20Nodes%20Dec.%202012%20\(1\).pdf](http://www.Euro-Biolmaging.eu/sites/default/files/General%20Criteria%20for%20Application%20for%20Euro-biolmaging%20Nodes%20Dec.%202012%20(1).pdf)

⁴ <http://www.Euro-Biolmaging.eu/content-page/required-documents-part-1st-call-euro-bioimaging-nodes>

⁵ <http://www.Euro-Biolmaging.eu/content-page/required-documents-part-1st-call-euro-bioimaging-nodes>

countries was then performed by the whole IEB, facilitated by its Chair, during a meeting in New York.

2.2.2 *IEB Meeting*

On June 15th & 16th 2013, a physical meeting of all IEB members took place in New Jersey, at Newark Airport. This was a two day event (“lunch to early dinner” meeting), during which IEB discussed individual Eols and agreed on the results. All panel chairs were present at the meeting, as well as most of the panel members (25 out of 33 IEB members). In addition, Eero Vourio from Biocenter Finland was present as an observer and European Research Infrastructure expert who advised the IEB on European questions. The Scientific Coordinators of Euro-Biolmaging, Jan Ellenberg (EMBL) and Oliver Speck (University of Magdeburg) were also present as observers.

3 Result of 1st Open Call for Euro-Biolmaging Nodes

3.1 General Feedback from the Independent Evaluation Board on Euro-Biolmaging

The Independent Evaluation Board highly commended the concept of Euro-Biolmaging as a truly pan-European infrastructure network for imaging technologies and stated that it will provide an excellent resource and benefit to the European research community for many years to come. The IEB in particular welcomed the infrastructure model centred on open access to imaging core facilities that will support European users with an easily accessible and integrated service package, along with appropriate training and data handling capabilities.

The IEB acknowledged the overall high quality of submitted Expressions of Interest (EoI), the well-coordinated process of (EoI) submission as well as the transparent provision of clear general and technology specific review criteria. In the opinion of the IEB, the Open Call process provides Euro-Biolmaging with an excellent basis to incorporate the best technologies and technical services into the future distributed infrastructure, which in turn will provide open access to these capabilities to European and hopefully also international scientists.

The IEB acknowledged that the review process was conducted in a transparent and harmonized manner allowing for comparable ratings across all technologies that participated in the first open call. In particular the summarizing presentations of the different technology panels and the comparative discussion of the strengths and weaknesses of each EoI served to standardize recommendations across technologies. In addition the IEB carefully considered both the national and European perspectives across technologies (moderated by the IEB national panel) to provide a national summary view and identify particular strengths and synergies between countries that the IEB hopes will provide useful information for the Euro-Biolmaging Member States.

National and European aspects formulated by the IEB for the consideration of the Euro-Biolmaging Member States:

- *For countries, in which the infrastructure is technologically very mature and/or is already nationally coordinated and/or funded (examples: France, Germany, The Netherlands, United Kingdom) the Euro-Biolmaging upgrades and open access policy will bring significant added value for national and international researchers as well as for the national imaging facilities.*

The leading imaging expertise in these countries mandates them to offer this to European scientists with the best research proposals and to support other countries in their efforts to improve their imaging expertise and infrastructure. These countries are therefore highly encouraged to actively participate in Euro-Biolmaging and provide their expertise and service.

Although in some of these countries national imaging infrastructure networks are in place, establishing national coordinating entities that would create a second layer of access administration for Euro-Biolmaging users in addition to the Euro-Biolmaging Hub was deemed as an unnecessary duplication of efforts by the IEB and might endanger to provide user access as rapidly and directly as possible.

Imaging infrastructures in new Member States (examples: Bulgaria, Czech Republic, Hungary and Slovakia): Although sometimes not offering the full range of imaging technologies or a comparable level of scientific track record when compared to old member states, the applying imaging facilities were often found to have great potential to reach highest excellence and/or to be important for the European region. The IEB proposes to install a concept of mentoring programs by partnering facilities between new and old member states to support these facilities to realize their potential as soon as possible and sees the strongly interlinked Euro-BiolImaging infrastructure as an ideal mechanism to promote this.

3.2 Outcome: Expressions of Interest for ALM multi-modal Nodes

The first Euro-BiolImaging Call for Nodes received in total 71 Expressions of Interest (EoI) for Euro-BiolImaging Nodes, submitted by 221 research institutions located in 19 European countries (see Figure 1).

For operating a multi-modal ALM Euro-BiolImaging Node, 22 EoIs were submitted by interested research institutions.

The purpose of the Euro-BiolImaging Advanced Light Microscopy Multi-modal Technology Nodes is to provide excellence through the integration of multiple imaging technologies within one site. This Node type is considered to be especially suitable for new Member States that wish to build up their imaging infrastructure.

Applicants for Multimodal Advanced Light Microscopy Nodes offer for example: Laser scanning confocal systems, Spinning disc confocal systems, Deconvolution widefield microscopy, Multiphoton systems, TIRF, Fourier Transform Infrared Imaging, Electron Microscopy. In some cases, these Node applicants also offer imaging flagship technologies (super-resolution microscopy, functional imaging, CLEM, high-throughput microscopy) under the multi modal umbrella.

The IEB evaluated all 22 EoIs as being suitable for implementation (8 highly recommended, 6 recommended, 2 recommended with minor improvements, 6 recommended with major improvements).

The EoIs were submitted by institutions located in

- Finland
- Sweden
- Norway
- United Kingdom
- Ireland
- Poland
- Germany
- The Netherlands
- Belgium
- France
- Spain
- Italy

- Bulgaria
- Hungary
- Czech Republic

In addition, 6 Eols were submitted proposing to offer mixed technologies including ALM. Again, the IEB evaluated all 6 Eols as suitable for Euro-BiolMaging (3 highly recommended, 2 recommended with minor improvements, 1 recommended with major improvements).

The Eols were submitted by institutions located in

- Israel
- Spain
- The Netherlands
- Germany
- Czech Republic

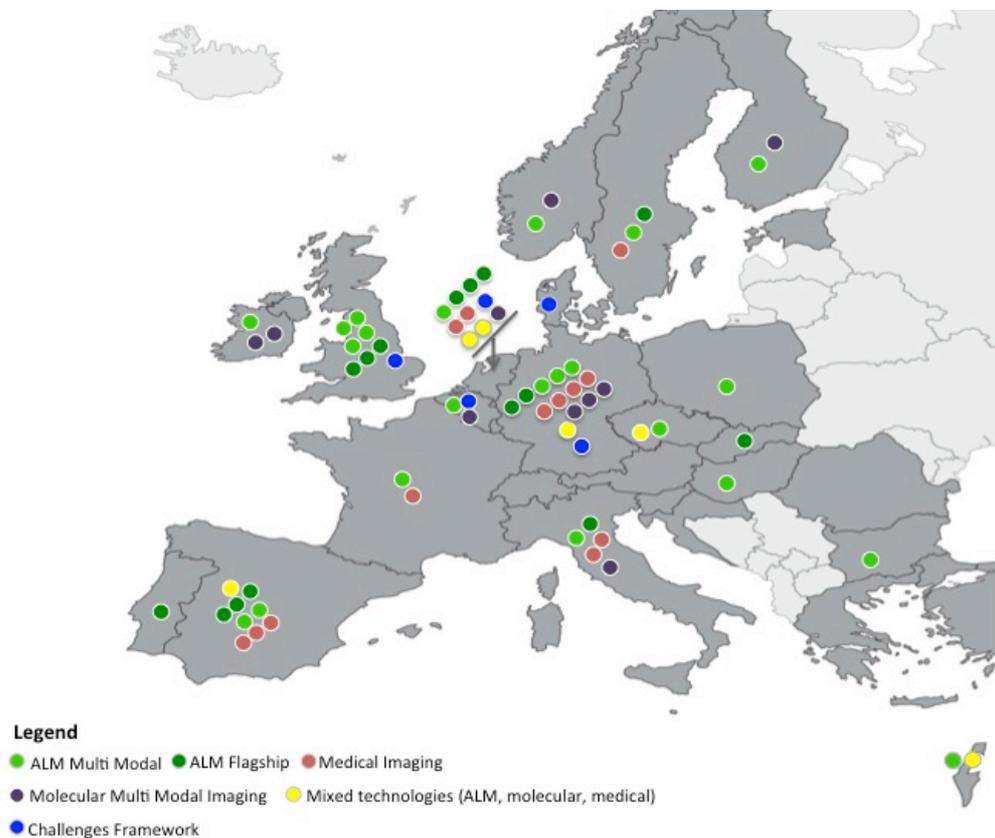


Figure 1. Nodes as proposed by imaging facilities/laboratories from 19 European countries which submitted Eols. For this map submitted Eols are grouped in six categories based on the technologies offered (see legend)

4 Next Steps

This section provides a summary of the information provided to all EoI applicants about the next steps in the construction of Euro-Biolmaging Nodes and some general recommendations to applicants on possible actions they may consider following the evaluation by the Independent Evaluation Board.

4.1 Establishing a Euro-Biolmaging Node

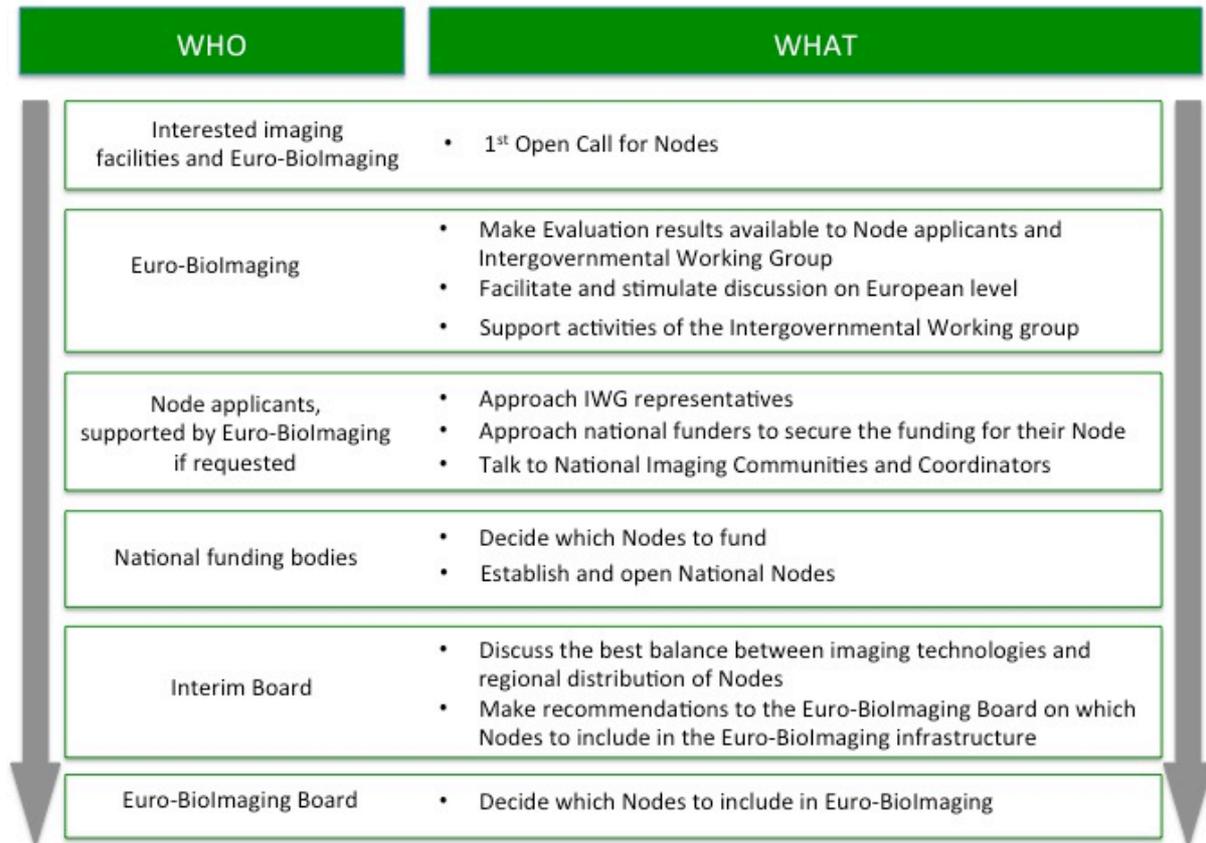
Establishing a Euro-Biolmaging Node is a three step process (see Figure 2):

- 1) **Submission of an Expression of Interest (EoI) by imaging facilities interested in establishing a Euro-Biolmaging Node.** For the 1st Open Call, submitted EoIs have now been evaluated by the Independent Evaluation Board and the results communicated to the imaging facilities. Following this communication the EoIs were forwarded to the Intergovernmental Working Group (composed of national ministry and funding authority representatives) for their information and to support the Node selection and implementation process.
- 2) **Decision by national funders to invest in and build the Nodes.** The Member States and national funders now decide on funding Node construction in each country. They may use the Euro-Biolmaging Open Call evaluation results as a recommendation for their decision-making. *However, there is no mandatory cut-off imposed by the evaluation results and the final decision on which Nodes to establish will remain at the discretion of the Member States.* This means that the funders can decide to fund Nodes which received a comparatively lower ranking if they see the possibility to make improvements and wish to realize the added value they would bring. Overall this second step will result in the construction or upgrade and opening of the national Nodes in many countries.
- 3) **Decision by the future Euro-Biolmaging Board⁶ on which of the funded Nodes to include in the pan-European infrastructure.** Nodes can already function and provide user access at the national level before this decision is made. From the pool of funded national Nodes, the Member State representatives on the Euro-Biolmaging Board will decide which Nodes to include in the Euro-Biolmaging infrastructure.

To start this common European level decision making process, the Euro-Biolmaging project management team has communicated the results of the independent evaluation to the Euro-Biolmaging Intergovernmental Working Group (IWG), which is a forerunner of the Euro-Biolmaging Interim Board and currently consists of representatives of national funding bodies and ministries from 21 European countries as well as EMBL that are engaged with Euro-Biolmaging. The IWG is now preparing the Euro-Biolmaging MoU for signature by their countries. Following this process, the Interim Board will comprise all signatories of the Euro-Biolmaging MoU and it will take all major decisions in the transition phase. The Interim Board will discuss the results of the 1st Open Call for Nodes and start to assess the balance between imaging technologies and regional distribution of Nodes that would be desirable from the funders point of view. At the end of the transition phase, the IWG will hand over decision-making power to the Euro-Biolmaging Board. The Interim Board will likely make recommendations to the Euro-Biolmaging Board on which Nodes to include in the starting phase of the Euro-Biolmaging infrastructure, but the final decision will be made by the Board itself.

⁶ The Euro-Biolmaging Board will be the decision-making body of the future European Research Infrastructure comprising the representatives from all Euro-Biolmaging Member States.

Figure 2: Steps toward the establishing a Euro-Biolmaging Node



5 Annex

5.1 *Independent Evaluation Board Members*

Euro Biolmaging is honored to have the following distinguished imaging experts as members of the IEB.

1. Scott Fraser (IEB Chair), California Institute of Technology
2. Ian Smith (IEB Vice Chair), Monash University
3. Rob Singer, Albert Einstein College of Medicine
4. Hedvig Hricak, Memorial Sloan Kettering Cancer Center
5. Sanford Simon, The Rockefeller University
6. Satyajit Mayor, National Center for Biological Sciences, NCBS
7. Holly Aaron, University of California, Berkeley
8. Alison North, The Rockefeller University
9. Katharina Gaus, The University of New South Wales
10. Teng Leong Chew, Northwestern University
11. Diane Lidke, University of New Mexico
12. Mary Dickinson, Baylor College of Medicine
13. Jennifer Waters, Harvard Medical School
14. Harald Hess, Howard Hughes Medical Institute
15. Doug Murphy, Howard Hughes Medical Institute
16. Paul Wiseman, McGill University
17. Jennifer Lippincott Schwartz, National Institutes of Health
18. Bob Goldman, Northwestern University
19. Simon Ringer, University of Sydney
20. Shimon Weiss, University of California, Los Angeles
21. Allan Johnsson, Duke University
22. Sam Gambhir, Stanford
23. Mike Modo, University of Pittsburgh
24. Mark Pagel, University of Arizona
25. Norbert Pelc, Stanford School of Medicine
26. Enrico Gratton, University of California, Irvine
27. Kevin Eliceiri, University of Wisconsin
28. Graham Galloway, University of Queensland
29. Mark Henkelman, University of Toronto
30. Kamil Ugurbil, University of Minnesota
31. Carl Kesselman, University of Southern California
32. Jeffrey Duerk, Case Western Reserve University
33. Carl Fredrik Westin, Harvard Medical