

Global Biolmaging Project

D6.3 Draft collaboration agreements prepared for signature by Argentina, Japan, South Africa, as well as Unites States, and the Euro-Biolmaging Board

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Abstract

As soon as the organizational structure of a given Global BioImaging international partner has reached maturity, Euro-BioImaging works with it for the preparation and signature of a collaboration agreement, to better define their alliance and the reciprocal use of their services. This deliverable reports on the signed collaboration agreements between Euro-BioImaging and its international partners in Australia, India and Japan as well as the draft ready for signature with Singapore's SingaScope. It also describes the *status quo* of the progress towards signing such agreements with the partners in Argentina, Canada, Mexico, South Africa and the USA.

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1. Introduction

The Global Biolmaging Project facilitates the development of a global network of imaging research infrastructures and communities by preparing the global interoperability and outreach of Euro-Biolmaging with peer organizations in Africa, Asia, Australia, North and South America. It builds a network of imaging facility managers and directors, technical staff, scientists and science policy officers to address the political, scientific, technical and data challenges faced by the Biolmaging community around the globe – from access to cutting-edge instrumentation to data challenges and funding bottlenecks. It also aims at establishing common infrastructure services such as virtual platforms for training material and image data tools, and at pursuing whenever possible collaboration agreements on the reciprocal use, openness and co-financing of their services.

As soon as the organizational structure of a given GBI international partner has reached maturity, Euro-Biolmaging (EuBI) works with it for the preparation and signature of a collaboration agreement, to better define their alliance and the reciprocal use of their services. At the moment of writing this report, Euro-Biolmaging had signed 4 collaboration agreements (with the Australian Microscopy and Microanalysis Research Facility, Australia's National Imaging Facility, India-Biolmaging and Japan's Advanced Biolmaging Support) and was in advanced stages of negotiation with Singapore's SingaScope.

For Euro-Biolmaging, the agreements were signed by the Euro-Biolmaging Preparatory Phase II Coordinator, Jan Ellenberg and by the EuBI Interim Board Chair, Benny Geiger. When the Global Biolmaging project was launched it was foreseen that such collaboration frameworks were going to be stipulated between the Euro-Biolmaging Board and its international counterparts. However, this was not possible because significant delays were accumulated over time both in the intergovernmental negotiations amongst the future EuBI ERIC members and in the consultation with the European Commission (EC DG TAXUD) on matters of 'Tax and excise duty exemptions', which significantly delayed the establishment of the Euro-Biolmaging ERIC.¹ The ERIC launch is now foreseen to take place in 2019.

The present deliverable comprises the signed collaboration agreements between Euro-Biolmaging and its international partners in Australia, India and Japan as well as the draft ready for signature with Singapore's SingaScope. It also briefly reports on the *status quo* of the progress towards signing such agreements with the partners in Argentina, Canada, Mexico, South Africa and the USA.

2. Renewal of existing Collaboration Agreements

At the project outset, 3 collaboration agreements existed. They were signed between Euro-Biolmaging on the one hand and i) the Australian Microscopy and Microanalysis Research Facility (AMMRF), ii) the National Imaging Facility (Australia) and iii) India-Biolmaging on the other. These agreements set the basis of the Global Biolmaging grant, structuring the first collaborative work of Euro-Biolmaging with its international counterparts.

¹ At the moment of writing this report the application to the European Commission to set up the Euro-Biolmaging ERIC was at the "step-2" stage.

The collaborations proved to be very fruitful and beneficial for the involved imaging communities. Hence, they were all renewed with a small but formal ceremony on the occasions of the “Exchange of Experience II” and “Exchange of Experience III” workshop, in 2017 and 2018 respectively.

2.1 Australia

Australia’s participation in Global Biolmaging is represented by two different Research Infrastructures: the Australian Microscopy and Microanalysis Research Facility (AMMRF) – now Microscopy Australia² – and the National Imaging Facility (NIF). The two infrastructures represent the biological and medical imaging research communities respectively, which in Europe are under the same umbrella of Euro-Biolmaging.

The start of the collaboration between Euro-Biolmaging and the **Australian Microscopy and Microanalysis Research Facility (AMMRF)** dates back to 2012, when the first Collaboration Framework was signed. This was followed by 3 renewals in 2013, 2015 and finally in 2017 at the 2nd “Exchange of Experience” workshop in Bangalore India (see Figure 1).

The 2017 collaboration framework’s main goal is to continue the alliance between Euro-Biolmaging and AMMRF (now Microscopy Australia) as well as building on it, with a particular focus on identifying sustainable funding mechanisms to guarantee international partnership of the involved national infrastructure facilities (see Annex I).



Figure 1 – Jan Ellenberg and David Sampson signing the 2017 collaboration framework between Euro-Biolmaging and AMMRF; NCBS Bangalore, India, 15 September 2017

Euro-Biolmaging also has a Memorandum of Understanding for a collaborative framework in place with the **National Imaging Facility (NIF)** since 2016. It was built in recognition of the fact that both consortia have common visions, face analogous challenges and have embarked on a similar roadmap for the development of capabilities to manage world-leading technology.

In the continuation of this, a new agreement was signed in Sydney in September 2018, on the occasion of the 3rd “Exchange of Experience” workshop (see Annex I).

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Figure 2 – Jan Ellenberg and Graham Galloway signing the 2018 Memorandum of Understanding for a collaborative framework between Euro-BioImaging and NIF; University of Sydney, Australia, 14 September 2018.

2.2 India

India BioImaging was inaugurated in September 2012 and 1 years later, in September 2013, signed the first collaboration framework with Euro-BioImaging. The agreement recognized that both parties aim at creating a sustainable infrastructure by opening resources to external users and is functional to increasing local and international visibility.

The collaboration framework was renewed in September 2017, on the occasion of the “Exchange of Experience” workshop in Bangalore, India (Annex I).



Figure 3 – Jan Ellenberg and Satyajit Major sign the second collaboration framework between Euro-BioImaging and India BioImaging; NCBS Bangalore, India, 15 September 2017

3. Euro-BioImaging-ABiS (Japan) Collaboration Agreement

The collaboration between Euro-BioImaging and Japan's Advanced Bioimaging Support (ABiS) grew very strongly during the Global BioImaging project.

ABiS provides open access and support to users in cutting-edge technologies for advanced light microscopy, electron microscopy, magnetic resonance imaging and bioimage analysis. Launched only in 2016, it already provides services to hundreds of users per year, hence the associated imaging facilities are highly interested in learning about the Euro-BioImaging infrastructure model and experiences.

In addition, Japan, together with Europe and the USA, is leading in the development of innovative imaging technologies. The introduction of novel technologies in open access imaging facilities poses challenges at various levels, including for training of staff and data management. International collaborations, such as the ones fostered by the GBI project, are regarded as a key means to address these challenges and some concrete steps have already been taken in this direction. For instance, an international BioImage Analysis training course was held at the Okinawa Institute of Science and Technology (OIST) on October 31-November 4th, 2018 (http://www.nibb.ac.jp/abis/gbi-abis_training?lang=en), with the participation of trainers and experts from Europe and Japan. In addition ABiS has volunteered to host the 5th "Exchange of Experience" workshop in Okinawa, in fall 2020.

The recognition of the mutual benefits of the interaction between Euro-BioImaging and ABiS has produced the signature of their 1st Collaboration Framework in September 2018, on the occasion of the 3rd "Exchange of Experience" workshop (see Annex I)



Figure 4 – Jan Ellenberg and Naoto Ueno sign the first collaboration framework between Euro-Biolmaging and Japan’s ABIS; University of Sydney, Australia, 14 September 2018

4. Preparation of the Euro-Biolmaging-SingaScope (Singapore) Collaboration Agreement

Following the establishment of SingaScope in 2017 – supported by Euro-Biolmaging and Global Biolmaging via a Letter of Support – the Singapore’s participation in the Global Biolmaging activities strengthened and several activities either took place or have been planned.

For example, Graham Wright, A*STAR Microscopy Platform Director and SingaScope Coordinator, has taken active part in the discussions regarding the future of Global Biolmaging, beyond the duration of the current H2020 grant.³ He also attended the “*Exchange of Experience III*” workshop in Sydney and was part of the international Working Group on the GBI international recommendation on Quality Management.

Dr. Wah Ing Goh from A* STAR and SingaScope took part in the GBI international Job Shadowing program as an external visitor (i.e. not supported by the GBI project in her travel expenses). She visited EuBI’s Finnish Advanced Light Microscopy Node not only to exchange on the common challenges faced by staff and managers in running imaging core facilities but also to learn about Euro-Biolmaging’s tools, procedures and *modus operandi* (see her testimony in this video <https://www.youtube.com/watch?v=TNEJLuUplbl&feature=youtu.be>).

Importantly, SingaScope has volunteered to host the 2019 “*Exchange of Experience*” workshop in Singapore, in September 2019. The workshop’s theme has also been decided and will be “career path for facility staff”, as this topic is gaining more and more interest in the scientific community.

³ See also D2.4 “Sustainable plan for funding future activities of Global Biolmaging including reciprocal use, training, virtual platforms for data handling”

Recognizing the benefits of these international interactions, the negotiations between Euro-BioImaging and SingaScope for the signing of their first Collaboration Agreements are at a very advanced stage at the moment of writing this report. The document has been drafted (see Annex II) and approved by both parties. The signature will be finalized as soon as Singascope will receive its official inauguration letter from the research ministry in Singapore (expected in December 2018).

5. Towards Collaboration Agreements with Argentina, Canada, Mexico, South Africa and the USA

The preparation of Collaboration Agreements between Euro-BioImaging and its partners in Argentina, Canada, Mexico, South Africa and the USA is at a less advanced stage compared to the ones described above. The reasons for this differ depending on the specific situation in each of the partner countries. However, in general, all international partners recognize the benefits of signing collaboration frameworks with Euro-BioImaging. At the same time, the lack of a formalized national mandate to represent internationally their imaging community makes it premature for them to start the negotiation of an agreement.

In **Canada**, following the participation of the GBI Project Manager at the inaugural meeting of the Canadian Network of Scientific Platforms (CNSP) in May 2017,⁴ the work on the construction of Canada BioImaging started, led by Claire Brown (President of CNSP). Canada BioImaging aims at bringing together all the imaging communities across Canada and since the meeting, has been collecting letters of support from Canadian universities, imaging core facilities and imaging associations such as the Canadian Cytometry and Microscopy Association (CCM) and the Microscopical Society of Canada (MSC) to build the case of the importance of such a network. Thus, Canada BioImaging is working to put the basis for a common collaboration agreement to be signed with Euro-BioImaging as soon as possible.

Mexico is a new partner in Global BioImaging. Following the participation of Christopher Wood of the Mexican National Laboratory for Advanced Microscopy (LNMA) in the “*Frontiers in Microscopy Technologies and Strategies for Bioimaging Centers Network*”,⁴ held at the Janelia Research Campus/HHMI in February 2018, initiatives to increase the integration and coordination of the bioimaging community in Mexico have been planned, with the LNMA currently taking the first steps to reach out to the wider community.

Mexico is also part of the **BioImaging North America** (BINA) network, whose formation was another outcome of the February 2018 workshop at the Janelia Research Campus, co-organized by GBI. BINA connects centers throughout the North American continent (Canada, the United States and Mexico) and provides a platform for exchange to instrument inventors, imaging probe/sensor developers, software engineers, data scientists and advanced end-users. BINA intends to support the bioimaging community in North America to organize and to have a collective voice. It aims to be a representative bioimaging partner with which funding agencies can conduct a strategic dialogue and global peer organizations form a closer alliance. However, because of its nature and organization, it currently is not in the position of signing a collaboration framework with Euro-BioImaging. Also for what concerns the **United States of America**, the situation remains quite fragmented at the national

⁴ For more details see D 6.2 “Report on outcome of international workshops in Argentina, Japan, South Africa, as well as USA”

level, and despite the existence of strong collaborations and similarity of intents between Euro-BioImaging and institutions such as the Janelia Research Campus, the lack of central coordination make the negotiation of a collaboration agreement premature.

In **South Africa**, the organization of the BioImaging community is advancing. Following a workshop held at the University of Cape Town in October 2016,⁴ the first SA BioImaging symposium (and second meeting with GBI representation) took place in Stellenbosch in October 2018. About 25 Principal Investigators and scientists from South Africa participated in the meeting, presenting both their research and the challenges they face in running imaging core facilities in their institutes. Jan Ellenberg (as EuBI PPII Coordinator and GBI Scientific Coordinator) and Federica Paina (GBI Project Manager) also took part in the symposium and presented Euro-BioImaging and the benefits international collaboration can bring to national communities. Romilla Maharaj also attended the meeting, representing the National Research Foundation (NRF) – the main agency funding research in South Africa – and demonstrating the South African government interest on the subjects discussed.

During the meeting the whole bioimaging community advocated for more funding to be dedicated to instrument investments, maintenance and staff training.

In September 2018, the Department of Science and Technology (DST) has published a *White Paper on Science, Technology and Innovation*⁵ after 22 years from the previous one. From this a decadal plan for science, technology and innovation (STI) will be developed to serve as an implementation plan for the White Paper over the period 2019 to 2029. The timing is therefore very appropriate for a conversation with the NRF and the DST on the role of imaging technologies in the modern Research Infrastructures landscape and the South African imaging community representatives in GBI Ben Loos (Stellenbosch University) and Trevor Sewell (University of Cape Town) are liaising with them to advocate for the inclusion of imaging in the South African Research Infrastructure Roadmap.

Finally, the difficult economical situation in **Argentina** has made it difficult for their research community to take part in the Global BioImaging activities in the second half of the project. Hence, they are still regarded as an emerging partner in GBI and will be invited to take part in the activities planned from 2019 onwards³ in order to strengthen their relationships with the international imaging community.

6. Conclusion

During the duration of the Global BioImaging project Euro-BioImaging has strengthened its relationship with all its international partners – albeit in different ways and with different speeds, depending on the circumstance specific of each partner country.

Whenever the maturity of the organizational structure of a given GBI international partner allowed for it, Euro-BioImaging worked with it for the preparation and signature of a collaboration agreement. Work in this respect is still ongoing and will be continued even after the end of the H2020 GBI grant.

In parallel, the Global BioImaging partners are discussing the drafting of a shared Memorandum of Understanding (MoU) which will bring all the GBI partners under the same umbrella and that can be signed alongside the bilateral collaboration agreements. Indeed, the bilateral collaboration

⁵ https://www.dst.gov.za/images/2018/white-pate-on-STI-7_09-FINAL.pdf

agreements between Euro-BioImaging and its international partners can coexist with the MoU, which is meant to have a less formal and binding character.



COLLABORATION FRAMEWORK

This document recognises the desire of both the Australian Microscopy and Microanalysis Research Facility and Euro-Biolmaging to continue the mutually beneficial alliance started in 2012 on the operation of national infrastructures for the support of research in the areas of biological and medical sciences.

Preamble

Australian Microscopy and Microanalysis Research Facility

The Australian Microscopy and Microanalysis Research Facility (AMMRF) is a national grid of leading edge expertise and instrumentation in microscopy and microanalysis using electrons, X-rays, ion beams and laser light. It provides microscopy, microanalysis and imaging capability and services to researchers in disciplines such as the biological and medical sciences, physical and chemical sciences, the earth and environmental sciences, various fields of engineering, agriculture, archaeology, and emerging integrative fields such as nanotechnology and biotechnology.

With laboratories located in major capital cities and regional centres around Australia, the AMMRF offers access to a vast array of instrumentation on a truly national basis. By combining new flagships with existing capabilities, the facility offers a complete, modern suite of instruments accessible to all Australian publicly funded researchers on a merit basis in accordance with AMMRF access principles and policy. These principles include access for international researchers of merit who are publicly funded and when such access is mutually beneficial.

Euro-Biolmaging

Euro-Biolmaging (EuBI) is the pan-European research infrastructure project for imaging technologies in biological and medical sciences, which has been on the ESFRI Roadmap since 2008. EuBI is completing the final steps to become a European Research Infrastructure Consortium (ERIC) while, since May 2016, it is already operating *ad interim* as a distributed research infrastructure. It provides open user access to a broad range of state-of-the-art imaging technologies in biological and biomedical imaging. It is also finalising the definition of its offer in terms of image data services and training for infrastructure users and providers, as well as continuously evaluating and acquiring new imaging technologies to ensure the sustained delivery of cutting-edge services.

Euro-Biolmaging consists of a set of complementary, strongly interlinked and geographically distributed Nodes that provide physical access to high-end imaging technology to European scientists. The EuBI ERIC will be empowered by a strong supporting and coordinating Hub which, governed by participating European

Members States and advised by independent scientific experts. EuBI will ensure a coordinated and complementary infrastructure deployment, so that investments in imaging infrastructure will be used in the most cost-effective way with the highest quality standards.

As of September 2017, the Euro-Biolmaging Memorandum of Understanding, which formally brings Member States and intergovernmental organizations together to implement the pan-European research infrastructure, was signed by 16 countries (Austria, Belgium, Bulgaria, Czech Republic, Finland, France, Hungary, Israel, Italy, Norway, Portugal, Poland, Slovakia, Spain, The Netherlands, United Kingdom) and EMBL. The DFG (representing Germany), Denmark and Sweden have been following EuBI as Observers during its Interim and Preparatory Phases, thereby showing high interest in EuBI.

Goals and Objectives of Collaboration

The goal of this collaboration is to continue the alliance started with the signature of the previous three Collaboration Frameworks between AMMRF and EuBI in 2012, 2013, and 2015, and which has mutually benefitted the AMMRF and Euro-Biolmaging by linking imaging infrastructures internationally, to support research in the areas of biological and medical sciences. The collaboration has established a foundation for a long-term alliance of mutual benefit between the AMMRF and Euro-Biolmaging. The current collaboration framework aims at continuing the alliance as well as building on it, with a particular focus on identifying sustainable funding mechanisms to guarantee international partnership of the involved national infrastructure facilities.

The AMMRF and Euro-Biolmaging aspire to:

1. provide best practice in the areas of user access and experience, training, operation, management and stakeholder reporting, as relevant to these significant national facilities
2. benchmark performance in the areas of training, user satisfaction, instrument or facility usage, areas of research supported, publication output, research outcomes, creation of registrable intellectual property and any other mutually agreed metrics
3. prepare a pathway for users to access facilities at either AMMRF or Euro-Biolmaging that will support the research needs of those users
4. diversify the portfolio of research projects supported by the facilities through the provision of complimentary and correlative characterisation techniques
5. develop joint research programs in the areas of biological and medical sciences, advanced light microscopy and imaging techniques and instrumentation
6. identify sustainable funding mechanisms for international collaborations of national and European imaging infrastructures.

Mechanism of Collaboration

This Collaboration reflects the desire and intention of the parties to collectively collaborate and co-operate to achieve the joint objectives such as, but not limited to, the following:

1. exchange (visits) of facility operational staff such as laboratory managers, facility staff or specialist technical officers as nominated by the AMMRF Operations Team and Euro-Biolmaging Node (Candidate)s. Administrative support to facilitate these visits will be provided by both AMMRF and Euro-Biolmaging members.
2. exchange (visits) of research and academic staff including Principal Investigators, Research Fellows, Research Associates and students. Administrative support to facilitate these visits will be provided by both AMMRF and Euro-Biolmaging. Exchange of staff, sharing of resources and user access will be subject to the respective user access policy of AMMRF and Euro-Biolmaging Node (Candidate)s.
3. joint development of online learning material to be integrated in the AMMRF's platform MyScope™ to support research in the areas of biological and medical sciences.¹
4. participation by staff nominated by the AMMRF Operations Team and Euro-Biolmaging Working Groups in annual strategic planning workshops, stakeholder meetings, annual user meetings other similar facility events.
5. advising potential users about AMMRF and Euro-Biolmaging capabilities and facilitate the engagement of users with relevant facilities where appropriate.
6. advising potential users about possible sources of Australian and European Union funding that would enable facility access.
7. promotion of AMMRF and Euro-Biolmaging in relevant forums using a variety of media including web and printed materials.
8. jointly seeking funding opportunities to develop research programs of mutual interest as well as aiming at ensuring sustainable international collaborations.

Staff exchange between Europe and Australia is currently funded by European Commission, via the Horizon 2020-Global Biolmaging project. Continuation of the EC funding line will be sought in the upcoming framework research programs. In addition, if visits of Australian scientists to Europe serve the Australian national interest, funding by the Australian Government would be an alternative option.

All costs associated with these activities such as travel, accommodation and promotional expenses will be provided by the respective facility that incurs the cost.

Terms of Collaboration

This Collaboration will serve as a basis for both AMMRF and Euro-Biolmaging to seek support from both public and private sources, which will help accelerate the growth of the collaborations between the AMMRF and Euro-Biolmaging.

¹ A Memorandum of Understanding between AMMRF and Euro-Biolmaging defining in more details the scope of the collaboration on this topic was signed on the 05th of September 2016.

Additional agreements may be developed between AMMRF and Euro-Biolmaging to foster joint research activities that may commence as a result of this Collaboration Framework. Where required, individual programs of activity developed under this framework will be the subject of and governed by individual legally binding agreements in writing and signed by relevant parties, and where appropriate will be jointly planned and conducted by the nominees of both parties. Such agreements will be negotiated in good faith.

The collaboration described by this framework is non-exclusive and each party is free to engage with and enter into strategic partnerships with other institutions or organisations from time to time.

This document can be modified, amended, expanded or reduced by mutual agreement between AMMRF and Euro-Biolmaging or by the provision of six month's written notice by either party. This document is not intended to create legal or binding obligations on either party. It serves only as a record of the parties' current intentions.

This Collaboration Framework is effective from the date of signing until 30 September 2019 unless terminated at an earlier date by mutual consent.

Signed this 15th day of September 2017



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National
Imaging
Facility



Memorandum of Understanding

For a collaborative framework between National Imaging Facility and Euro-Biolmaging

This Memorandum of Understanding recognises the desire of both the National Imaging Facility and Euro-Biolmaging to maintain a mutually beneficial alliance in the operation of national infrastructures to support research in the areas of biological and medical sciences.

Preamble

The Partners

National Imaging Facility

The National Imaging Facility (NIF), established in 2007, is an Australia-wide network of world-class imaging infrastructure that merges cutting-edge imaging technologies with highly specialised expertise from 10 universities and research institutes, along with Australian Nuclear Science and Technology Organisation (ANSTO), to develop advanced imaging solutions and drive innovation. In the 2010 Strategic Roadmap for Research Infrastructure, imaging was identified as a platform technology, providing cross-cutting capability required across Australia's research priorities. Key to the NIF platform is the discovery of new biomarkers, development tools for assessing and monitoring pre-clinical models of disease, and translation of these tools to human research. NIF advocates that all NIF-funded instruments have an associated Facility Fellow, an experienced scientist, who understands the technology and has a wide-ranging perspective of its applications.

NIF recognises eResearch as a critical component of modern research, but identifies a need for far better stakeholder engagement and the provision of capability in data analysis and modelling as essential research infrastructure. Such capability needs a matrix approach to work effectively - it needs to be embedded in core facilities such as the NIF, but at the same time be connected into a disciplinary eResearch network.

NIF is committed to collaborative research and collaborative infrastructure, including open access and sharing of expertise. The plans for growth are based on ensuring that NIF is able to deliver capability and capacity. Capability, that is equal to anything available in the world, Capacity that ensures all meritorious research has access to the technology that the scientists of Australia and beyond demand and deserve.

Euro-BioImaging

The European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences (Euro-BioImaging ERIC, EuBI) provides open physical user access to state-of-the-art imaging technologies for life scientists. It offers image data support and training for infrastructure users and providers and continuously evaluates and includes new imaging technologies to ensure sustainable cutting-edge services. EuBI consists of a set of complementary, strongly interlinked and geographically distributed Nodes – specialised imaging facilities – to reach European scientists in all Member States. The infrastructure is empowered by a strong supporting and coordinating entity, the EuBI Hub. The Hub provides the virtual entry point from which users are directed to their desired imaging technology as served by the respective EuBI Nodes. Since May 2016, EuBI has opened Interim Operation and provides open access to 28 Node Candidates in 11 countries and at EMBL, offering 36 imaging technologies.

Advanced and innovative imaging technologies are becoming increasingly important for analysis of molecular dynamics in cells and organisms, delivering crucial information more easily than standard biochemical methods. Nevertheless, European life scientists often lack access to pioneering imaging technologies. EuBI reduces this gap by coordinating a distributed imaging infrastructure offering open access to external users from other European research institutions. Such open access model brings numerous benefits to the scientific community: it mitigates the scarcity of expert staff and the high costs for individual institutions to install innovative imaging technologies; it increases international cooperation and boosts transfer of knowledge among European researchers. EuBI allows life scientists working in academia, health care and industry to gain access to a broader range of much-needed advanced imaging technologies and knowledge, building bridges from basic biological to medical and clinical research. In practice, the EuBI ERIC provides: i) physical access to cutting-edge imaging technologies at the Nodes, including advanced probes, expertise and training, methods, software and analysis tools, and ii) virtual access to common image data services provided by the Hub such as software tools for image processing, common repositories for reference image data sets for sharing and re-use, academically owned cloud storage and compute services.

The EuBI Interim Board, composed of 16 countries and EMBL, has identified the European Research Infrastructure Consortium (ERIC) as the appropriate legal model for this infrastructure, and the EuBI ERIC step-2 application with the EC was submitted on 19th January 2018, signed by Finland, Bulgaria, Czechia, Hungary, Italy, Norway, Portugal and EMBL. The tripartite Hub is hosted by Finland (legal seat), Italy (medical imaging), and EMBL (biological imaging). EuBI partners are now finalizing the preparation work so that all services will be in place on the official launch of the EuBI ERIC.

The partners, the National Imaging Facility and Euro-Biolmaging, desire to maintain the mutually beneficial alliance in the operation of national infrastructures to support research in the areas of biological and medical sciences.

Goals and Objectives of Collaboration

In recognition of the fact that the National Imaging Facility and the Euro-Biolmaging consortium have common visions, have both embarked on a similar roadmap for the development of capability and are both committed to open access to world-leading technology;

Also, in recognition of the fact that they each contribute unique expertise and perspective, and both value the opportunity to share, to learn and to plan;

Also, in recognition of the fact that the two partners face analogous challenges;

Also, since this framework is premised on the collaborative use of infrastructure and, while science discovery is the driver, NIF and Euro-Biolmaging wish to share expertise on effective operation of a collaborative infrastructure facility to build an imaging community and engage with the wider scientific user community.

We hereby jointly acknowledge that building bridges between NIF and Euro-Biolmaging would strengthen our respective missions within a network of collaboration, to build an organisation that is far stronger, more productive, effective and efficient, than can be achieved through a competitive approach to infrastructure.

The goal of this collaboration is to establish and maintain an alliance, which will mutually benefit the NIF and Euro-Biolmaging in providing national infrastructures to support research in the areas of biological and medical sciences. In doing so, this collaboration will establish a foundation for a long-term alliance of mutual benefit between the NIF and Euro-Biolmaging during ongoing operational phases of these national infrastructure facilities.

The NIF and Euro-Biolmaging aspire to explore possibilities for:

1. Sharing operational procedures for delivery of infrastructure, including laboratory induction procedures, instrument time management and booking systems, financial systems for usage charges, including objective independent measures of the economic and scientific benefits of collaborative infrastructure.
2. Jointly developing potential career progression paths of scientists who provide the expertise to users of the infrastructure. Develop metrics for academic progression for scientists and engage with employers to have these metrics and associated review recognised in academic progression and by funding agencies.
3. Developing common protocols to facilitate large multi-site, multi-national trials.
4. Jointly developing systems to facilitate the sharing of data, to support large scale multi-site, multi-national collaboration. Data could include normative human and pre-clinical data, data-models and experimental data to reduce the burden on researchers.

5. Developing joint research programs in the areas of biological and medical sciences, animal models, biomarkers, imaging techniques and instrumentation.
6. Developing a shared, open training platform, with modules including, but not limited to:
 - a. Staff development, ensuring best-practice delivery of infrastructure, including negotiating user engagement;
 - b. Quality control processes for both staff and clients;
 - c. Data curation and data protection to build of trust that individual's intellectual effort is protected.
7. Jointly developing opportunities to collaborate with other infrastructure agencies, including but not limited to Therapeutic Innovation Australia (TIA), European Advanced Translational Research Infrastructure in Medicine (EATRIS), European Clinical Research Infrastructure Network (ECRIN).
8. Jointly pursuing opportunities to develop collaborations with other international agencies, which provide open, collaborative access to world-leading imaging infrastructure.
9. Jointly developing legal models to further support researchers, to alleviate transnational legal obstacles to research, to protect the legal rights of researchers and institutions while maintaining open access to the results.

Mechanism of Collaboration

This collaboration reflects the desire and intention of the parties to collectively collaborate and co-operate to achieve the joint objectives including, but not limited to, the following:

1. Exchange (visits) of facility operational staff such as Facility Fellows, as nominated by the NIF Operations Committee and Euro-Biolmaging member facilities. Administrative support to facilitate these visits will be provided by both NIF and Euro-Biolmaging members.
2. Workshops for operational staff, as nominated by the NIF Operations Committee and Euro-Bioimaging member facilities.
3. Exchange of Facility Directors of NIF and Euro-Biolmaging for International Advisory Panels, Strategic Planning Workshops.
4. Promote the facilities of each partner and facilitate access by users to capability that is not available locally.
5. Advise potential users about possible sources of Australian and European Union funding that would enable facility access.
6. Promotion of NIF and Euro-Biolmaging in relevant forums using a variety of media including web and printed materials.

7. Jointly participate in infrastructure workshops with other related infrastructure agencies.

Terms of Collaboration

This collaboration will serve as a basis for both NIF and Euro-Biolmaging to seek support from both public and private sources, which will help accelerate the growth of the collaborations between the NIF and Euro-Biolmaging.

This Memorandum of Understanding does not purport to define the terms for any collaborative research, but only to facilitate the communications to develop opportunities for research projects. This Memorandum of Understanding is a statement of principles which will be used as the basis for those discussions.

NIF is comprised of nodes at various universities and medical research institutes around Australia, which have entered into an Unincorporated Joint Venture Agreement, dated 14th April, 2014 (the UJVA) to govern their operation. For clarity, this Memorandum of Understanding does not purport to bind any of the parties to the UJVA, either individually or collectively. NIF is not a legal entity and is unable to enter into contractual arrangements in its own right. This document is a non-binding memorandum of understanding between NIF and Euro-Biolmaging.

Where required, individual programs of activity developed under the collaboration will be the subject of and governed by individual legally binding agreements in writing and signed by relevant parties, and where appropriate will be jointly planned and conducted by the nominees of both parties. Such agreements will be negotiated in good faith.

The collaboration described by this Memorandum of Understanding is non-exclusive and both NIF and Euro-Biolmaging are free to engage with and enter into strategic partnerships with other institutions or organisations at any time.

This Memorandum of Understanding can be modified, amended, expanded or reduced by mutual agreement between NIF and Euro-Biolmaging. In particular, this Memorandum of Understanding foresees the inclusion of other international partners, if it is collectively accepted that this is in the interests of the development of an internationally sustainable research infrastructure.

This Memorandum of Understanding is not intended to create legal or binding obligations on either NIF or Euro-Biolmaging, or any parties to the NIF UJVA or any signatories of the Euro-Biolmaging Memorandum of Understanding. It serves only as a record of their current intentions.

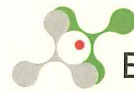
All costs associated with the conduct of the above activities such as travel, accommodation and promotional expenses will be provided by the respective facility that incurs the cost.

However, NIF and Euro-Biolmaging will actively seek opportunities to fund the operation of the collaboration, and support each other in applications to potential funding agencies such as the European Commission through Horizon 2020, and the Australian Government, for funding to further develop excellence in the delivery of collaborative infrastructure.

This Memorandum of Understanding is effective from the date of signing until 30th June 2021 unless terminated at an earlier date by mutual consent.



National
Imaging
Facility



EURO-BIOIMAGING

Memorandum of Understanding

For a collaborative framework between
National Imaging Facility
and
Euro-BioImaging

Signed this 14th day of Sep 2018 in Sydney, Australia.

Prof. Graham Galloway
Chief Executive Officer
National Imaging Facility
Office of Deputy Vice-Chancellor (Research)
The University of Queensland
St Lucia, QLD 4072
Australia

Professor Dr. Benny Geiger
Chair, Euro-BioImaging Interim Board
Weizmann Institute, Israel

Dr. Jan Ellenberg
Coordinator
Euro-BioImaging Preparatory Phase II
European Molecular Biology Laboratory
Meyerhofstrasse 1
DE-69117 Heidelberg
Germany

COLLABORATION FRAMEWORK

Preamble

This document acknowledges the desire of both India Biolmaging and Euro-Biolmaging to continue the mutually beneficial alliance regarding the operation of imaging infrastructures to support research in the areas of biological and medical sciences. It does not create legally binding obligations on either Partner.

Partners

India Biolmaging

India Biolmaging was founded as an inclusive network of Indian biological imaging facilities on September 21st, 2012, in Bangalore, by the representatives of 13 Indian biological imaging facilities coming from public research institutions distributed in all of India as well as the company Strand.

The objective of India Biolmaging is to create a sustainable national infrastructure of Indian biological imaging facilities for increasing communication and collaboration among Indian facilities, opening their resources to users among each other, and creating national and international visibility by speaking with one voice to stakeholders, funders and international collaboration partners.

A major focus of India Biolmaging is optimizing user access to imaging facilities, developing future common training activities for users as well as high-level training for facility staff in all aspects of facility management, and developing common solutions for image data storage and analysis.

India Biolmaging exchanges and further develops best practice of infrastructure management and coordinates how to address challenges of infrastructure implementation, maintenance and updating.

By all this, India Biolmaging leads to a coordinated deployment of a first-rate national imaging infrastructure, builds up the urgently needed expertise in advanced imaging technologies and enables excellent research in life sciences in India and attracts world-class researchers to come to India for work and collaboration.

In addition, India Biolmaging represents Indian imaging facilities on the international level and allows the national imaging infrastructure to engage in international collaborations with other imaging infrastructure initiatives such as the future pan-European research infrastructure Euro-Biolmaging.

India Biolmaging is currently coordinated by Prof. Satyajit Mayor (National Center for Biological Sciences, Bangalore).

Euro-Biolmaging

Euro-Biolmaging (EuBI) is the pan-European research infrastructure project for imaging technologies in biological and medical sciences, which has been on the ESFRI Roadmap since 2008. EuBI is completing the final steps to become a European Research Infrastructure Consortium (ERIC) while, since May 2016, it is already operating *ad interim* as a distributed research infrastructure. It provides open user access to a broad range of state-of-the-art imaging technologies in biological and biomedical imaging. It is also finalising the definition of its offer in terms of image data services and training for infrastructure users and providers, as well as continuously evaluating and acquiring new imaging technologies to ensure the sustained delivery of cutting-edge services.

Euro-Biolmaging consists of a set of complementary, strongly interlinked and geographically distributed Nodes that provide physical access to high-end imaging technology to European scientists. The EuBI ERIC will be empowered by a strong supporting and coordinating Hub which, governed by participating European Members States and advised by independent scientific experts. EuBI will ensure a coordinated and complementary infrastructure deployment, so that investments in imaging infrastructure will be used in the most cost-effective way with the highest quality standards.

As of September 2017, the Euro-Biolmaging Memorandum of Understanding, which formally brings Member States and intergovernmental organizations together to implement the pan-European research infrastructure, was signed by 16 countries (Austria, Belgium, Bulgaria, Czech Republic, Finland, France, Hungary, Israel, Italy, Norway, Portugal, Poland, Slovakia, Spain, The Netherlands, United Kingdom) and EMBL. The DFG (representing Germany), Denmark and Sweden have been following EuBI as Observers during its Interim and Preparatory Phases, thereby showing high interest in EuBI.

In March 2017 the formal procedure for the establishment of the EuBI ERIC was started by submission of the step-1 ERIC application to the European Commission. The conclusion of the procedure is foreseen for April 2018.

A major aim of Euro-Biolmaging is its integration into the existing European and global research infrastructure landscape to collaborate with international partners, e.g. on training for facility staff, exchange of best practice, and exchange of staff and users.

India Biolmaging and Euro-Biolmaging will be called "Partner" or "the Partners" hereinafter.

Goals and Objectives of the Collaboration Framework India Biolmaging – Euro-Biolmaging

The goal of this Collaboration Framework is to continue the alliance, which was started with the signature of the first Collaboration Framework in 2013, and which has mutually benefited India Biolmaging and Euro-Biolmaging in providing imaging infrastructures to support research in the areas of biological and medical sciences.

Also in the future, the Partners aspire to:

1. Provide best practice in the areas of user access and experience, user and facility staff training, operation, management and stakeholder reporting that are relevant to these significant research infrastructures.
2. Benchmark performance in the areas of training, user satisfaction, instrument or facility usage, areas of supported research, publication output, research outcomes, creation of registrable intellectual property and any other mutually agreed metrics.
3. Facilitate pathways for Indian users to access Euro-Biolmaging after its implementation, and later on access of European users to India Biolmaging that will support the research needs of those users.
4. Facilitate pathways for Indian facility staff to access Euro-Biolmaging staff training activities.
5. Diversify the portfolio of research projects supported by the imaging facilities through the provision of complementary and correlative characterisation techniques.
6. Develop joint research programs in the areas of biological and medical sciences, advanced light microscopy and imaging techniques and instrumentation.
7. Increase the awareness for imaging technology and image data needs of the life science community globally and support commonly the development of a global research infrastructure for biological and medical imaging technologies.

Mechanism of Collaboration

This Collaboration reflects the desire and intention of the parties to collectively collaborate and co-operate to achieve these joint objectives through for example the following mechanisms:

1. Exchange (visits) of facility operational staff such as laboratory managers or specialist technical officers as nominated by the Partner's member facilities dependent on their previous approval. Administrative support to facilitate these visits will be provided by both Partners' members.
2. Exchange (visits) of research and academic staff including Principal Investigators, Research Fellows and Research Associates and students. Administrative support to facilitate these visits will be provided by both Partners. Exchange of staff, sharing of resources and user access will be subject to the respective user access policy of the Partners' member facilities.

3. Participation by staff nominated by both Partners' Working Groups in annual strategic planning workshops, stakeholder meetings, annual user meetings other similar facility events.
4. Advise potential users about the Partner's capabilities and facilitate the engagement of users with relevant facilities where appropriate.
5. Advise potential users about possible sources of Indian and European Union funding that would enable facility access.
6. Promotion of India BioImaging and Euro-BioImaging in relevant forums using a variety of media including web and printed materials.
7. Jointly seek funding opportunities to develop research programs of mutual interest.

Staff exchange between Europe and India is currently funded by European Commission, via the Horizon 2020-Global BioImaging project. Continuation of the EC funding line will be sought in the upcoming framework research programs. In addition if visits of Indian scientists to Euro-BioImaging Nodes serve the Indian national interest, funding by the Indian Government would be an alternative option.

All costs associated with these activities such as travel, accommodation and promotional expenses will be provided by the respective facility that incurs the cost.

The use of the Partner's logos in any of the aforementioned activities will require approval by the respective Partner.

Terms of the Collaboration Framework

This Collaboration Framework will serve as a basis for the Partners to seek support from both public and private sources, which will help accelerate the growth of the collaborations between the Partners.

Additional agreements may be developed between the Partners to foster joint research activities that may commence as a result of this Collaboration Framework. Where required, individual programs of activity developed under this Collaboration Framework will be the subject of and governed by individual legally binding agreements in writing and signed by relevant parties, and where appropriate will be jointly planned and conducted by the nominees of both parties. Such agreements will be negotiated in good faith.

The collaboration described by this Collaboration Framework is non-exclusive and each Partner is free to engage with and enter into strategic partnerships with other institutions or organisations.

This document can be modified, amended, expanded or reduced by mutual agreement between the Partners or by the provision of six month's written notice by either Partner. This document is not intended to create legal or binding obligations on either Partner. It serves only as a record of the parties' current intentions.

The Collaboration Framework is effective from the date of signing until 30th September 2019 unless terminated at an earlier date by mutual consent.

Signed 15th September 2017



Professor Satyajit Mayor

On behalf of

India Biolmaging Coordinator

Director

National Centre for Biological Science (NCBS)

UAS-GKVK Campus, Bellary Road,

Bangalore 560 065, Karnataka

India



Dr. Jan Ellenberg

Euro-Biolmaging

Preparatory Phase II Coordinator

EMBL

Meyerhofstrasse 1, Heidelberg

Germany



COLLABORATION FRAMEWORK

This document recognises the desire of both the Advanced Bioimaging Support - Japan and EuBI to start a mutually beneficial alliance on the operation of national imaging infrastructures for the support of research in the areas of biological and medical sciences.

Preamble

Advanced Bioimaging Support - Japan

In the field of life science, imaging techniques are widely used on many scales, from molecules to cells to intact tissues and individuals. The demand for bioimaging has increased in recent years. However, due to advances in imaging technologies, i.e., the diversification and sophistication of special imaging equipment, advances in operations technology, increased costs of advanced imaging equipment, and advances in image analysis technologies, individual research institutes (including universities) have encountered increasing difficulties related to the acquisition and operation of imaging equipment.

The supporting platform, ABiS (Advanced Bioimaging Support) in Japan, has introduced cutting-edge apparatuses for light microscopy, electron microscopy, magnetic resonance imaging, and other methods. ABiS was established by domestic partner organizations in Japan that owned and operated multiple types of advanced specialized imaging equipment, in order to provide comprehensive support for advanced imaging in the field of life science.

Euro-BioImaging

The European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences (Euro-BioImaging ERIC, EuBI) provides open physical user access to state-of-the-art imaging technologies for life scientists. It offers image data support and training for infrastructure users and providers and continuously evaluates and includes new imaging technologies to ensure sustainable cutting-edge services. EuBI consists of a set of complementary, strongly interlinked and geographically distributed Nodes – specialised imaging facilities – to reach European scientists in all Member States. The infrastructure is empowered by a strong supporting and coordinating entity, the EuBI Hub. The Hub provides the virtual entry point from which users are directed to their desired imaging technology as served by the respective EuBI Nodes. Since May 2016, EuBI has opened Interim Operation and provides open access to 28 Node Candidates in 11 countries and at EMBL, offering

36 imaging technologies.

Advanced and innovative imaging technologies are becoming increasingly important for analysis of molecular dynamics in cells and organisms, delivering crucial information more easily than standard biochemical methods. Nevertheless, European life scientists often lack access to pioneering imaging technologies. EuBI reduces this gap by coordinating a distributed imaging infrastructure offering open access to external users from other European research institutions. Such open access model brings numerous benefits to the scientific community: it mitigates the scarcity of expert staff and the high costs for individual institutions to install innovative imaging technologies; it increases international cooperation and boosts transfer of knowledge among European researchers. EuBI allows life scientists working in academia, health care and industry to gain access to a broader range of much-needed advanced imaging technologies and knowledge, building bridges from basic biological to medical and clinical research. In practice, the EuBI ERIC provides: i) physical access to cutting-edge imaging technologies at the Nodes, including advanced probes, expertise and training, methods, software and analysis tools, and ii) virtual access to common image data services provided by the Hub such as software tools for image processing, common repositories for reference image data sets for sharing and re-use, academically owned cloud storage and compute services.

The EuBI Interim Board, composed of 16 countries and EMBL, has identified the European Research Infrastructure Consortium (ERIC) as the appropriate legal model for this infrastructure, and the EuBI ERIC step-2 application with the EC was submitted on 19th January 2018, signed by Finland, Bulgaria, Czechia, Hungary, Italy, Norway, Portugal and EMBL. The tripartite Hub is hosted by Finland (legal seat), Italy (medical imaging), and EMBL (biological imaging). EuBI partners are now finalizing the preparation work so that all services will be in place on the official launch of the EuBI ERIC.

Goals and Objectives of Collaboration

The collaboration shall establish a foundation for a long-term alliance of mutual benefit between the ABiS and EuBI by linking their imaging infrastructures internationally, and to support research in the areas of biological and medical sciences. The collaboration framework aims at building the alliance, with a particular focus on identifying sustainable funding mechanisms to guarantee international partnership of the involved national infrastructure facilities.

The ABiS and EuBI aspire to:

1. provide best practice in the areas of user access and experience, training, operation, management and stakeholder reporting, as relevant to these significant national facilities
2. benchmark performance in the areas of training, user satisfaction, instrument or facility usage, areas of research supported, publication output, research outcomes, creation of registrable intellectual property and any other mutually agreed metrics
3. prepare a pathway for users to access facilities at either ABiS or EuBI that will support the research needs of those users
4. diversify the portfolio of research projects supported by the facilities through the provision of complimentary and correlative characterisation techniques
5. develop joint research programs in the areas of biological and medical sciences, advanced light microscopy and imaging techniques and instrumentation

6. identify sustainable funding mechanisms for international collaborations of national and European imaging infrastructures.

Mechanism of Collaboration

This Collaboration reflects the desire and intention of the parties to collectively collaborate and co-operate to achieve the joint objectives such as, but not limited to, the following:

1. exchange (visits) of facility operational staff such as laboratory managers, facility staff or specialist technical officers as nominated by ABiS and EuBI Node (Candidate)s. Administrative support to facilitate these visits will be provided by both ABiS and EuBI members.
2. exchange (visits) of research and academic staff including Principal Investigators, Research Fellows, Research Associates and students. Administrative support to facilitate these visits will be provided by both ABiS and EuBI. Exchange of staff, sharing of resources and user access will be subject to the respective user access policy of ABiS and EuBI Node (Candidate)s.
3. participation by staff nominated by the ABiS and EuBI Working Groups in annual strategic planning workshops, stakeholder meetings, annual user meetings other similar facility events.
4. advising potential users about ABiS and EuBI capabilities and facilitate the engagement of users with relevant facilities where appropriate.
5. advising potential users about possible sources of Japanese and European Union funding that would enable facility access.
6. promotion of ABiS and EuBI in relevant forums using a variety of media including web and printed materials.
7. jointly seeking funding opportunities to develop research programs of mutual interest as well as aiming at ensuring sustainable international collaborations.

Staff exchange between Europe and Japan is currently funded by European Commission, via the Horizon 2020-Global BiImaging project. Continuation of the EC funding line will be sought in the upcoming framework research programs. In addition, if visits of Japanese scientists to Europe serve the Japanese national interest, funding by the Japanese Government would be an alternative option.

All costs associated with these activities such as travel, accommodation and promotional expenses will be provided by the respective facility that incurs the cost.

Terms of Collaboration

This Collaboration will serve as a basis for both ABiS and EuBI to seek support from both public and private sources, which will help accelerate the growth of the collaborations between the ABiS and EuBI.

Additional agreements may be developed between ABiS and EuBI to foster joint research activities that may commence as a result of this Collaboration Framework. Where required, individual programs of activity developed under this framework will be the subject of and governed by individual legally binding agreements in writing and signed by relevant parties, and where appropriate will be jointly planned and conducted by the nominees of both parties. Such agreements will be negotiated in good faith.

The collaboration described by this framework is non-exclusive and each party is free to engage with and enter into strategic partnerships with other institutions or organisations from time to time.

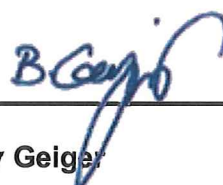
This document can be modified, amended, expanded or reduced by mutual agreement between ABiS and EuBI or by the provision of six month's written notice by either party. This document is not intended to create legal or binding obligations on either party. It serves only as a record of the parties' current intentions.

This Collaboration Framework is effective from the date of signing until 30 September 2020 unless terminated at an earlier date by mutual consent.

Signed this 14th day of September 2018



Dr. Masayuki Yamamoto
Director-General, National Institute for
Basic Biology



Prof. Benny Geiger
Chairman
EuBI Interim Board



Dr. Keiji Imoto
Director-General, National Institute for
Physiological Sciences



Dr. Jan Ellenberg
EuBI
Preparatory Phase II Coordinator
EMBL

Contact:
Dr. Antje Keppler (GBI Coordinator)
Head of Imaging Infrastructure Strategic Development
EMBL, Meyerhofstrasse 1
D-69117 Heidelberg
Germany
Keppler@embl.de

Annex I: Signed Collaboration Agreement between Euro-BioImaging and AMMRF, NIF, India-BioImaging and ABiS

Annex II: Draft Collaboration Agreement between Euro-Biolmaging and SingaScope



COLLABORATION FRAMEWORK

This document recognises the desire of both the SingaScope and EuBI to start a mutually beneficial alliance on the operation of national imaging infrastructures for the support of research in the areas of biological and medical sciences.

Preamble

SingaScope – Singapore

With the recent award of the National Research Foundation (NRF) Shared Infrastructure Support (SIS) grant the imaging community in Singapore is now establishing and developing SingaScope, building from an initial partnership of Singapore's five leading microscopy facilities and subsequently expanding to include further platforms with the intention of being inclusive and comprehensive.

SingaScope enables scientists in Singapore to identify (through a searchable online database) and access microscopy resources (both instrumentation and expertise) with the key principle that all researchers have access to valuable microscopy resources. SingaScope leverages on the existing well-equipped microscopy platforms, continuing to develop them with strategic acquisition of emerging technologies. Conversely advanced instrumentation, and the relevant expertise, has more limited availability, restricting the number of researchers with access and potentially leading to inefficient use of the resources. They aim to develop Singapore's human capital, raise service standards and cement Singapore as the regional centre of excellence for microscopy training by educating scientists at all levels and training facility staff in both technical and managerial/operational skills. They provide a forum for the exchange of experience and information between microscopists in Singapore and with the international community.

Euro-Biolmaging

The European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences (Euro-Biolmaging ERIC, EuBI) provides open physical user access to state-of-the-art imaging technologies for life scientists. It offers image data support and training for infrastructure users and providers and continuously evaluates and includes new imaging technologies to ensure sustainable cutting-edge services. EuBI consists of a set of complementary, strongly interlinked and geographically distributed Nodes – specialised imaging facilities – to reach European scientists in all Member States. The infrastructure is empowered by a strong supporting and coordinating entity, the EuBI Hub. The Hub provides the virtual entry point from which users are directed to their desired imaging technology as served by the respective EuBI Nodes. Since May 2016, EuBI has opened Interim Operation

and provides open access to 28 Node Candidates in 11 countries and at EMBL, offering 36 imaging technologies.

Advanced and innovative imaging technologies are becoming increasingly important for analysis of molecular dynamics in cells and organisms, delivering crucial information more easily than standard biochemical methods. Nevertheless, European life scientists often lack access to pioneering imaging technologies. EuBI reduces this gap by coordinating a distributed imaging infrastructure offering open access to external users from other European research institutions. Such open access model brings numerous benefits to the scientific community: it mitigates the scarcity of expert staff and the high costs for individual institutions to install innovative imaging technologies; it increases international cooperation and boosts transfer of knowledge among European researchers. EuBI allows life scientists working in academia, health care and industry to gain access to a broader range of much-needed advanced imaging technologies and knowledge, building bridges from basic biological to medical and clinical research. In practice, the EuBI ERIC provides: i) physical access to cutting-edge imaging technologies at the Nodes, including advanced probes, expertise and training, methods, software and analysis tools, and ii) virtual access to common image data services provided by the Hub such as software tools for image processing, common repositories for reference image data sets for sharing and re-use, academically owned cloud storage and compute services.

The EuBI Interim Board, composed of 16 countries and EMBL, has identified the European Research Infrastructure Consortium (ERIC) as the appropriate legal model for this infrastructure, and the EuBI ERIC step-2 application with the EC was submitted on 19th January 2018, signed by Finland, Bulgaria, Czechia, Hungary, Italy, Norway, Portugal and EMBL. The tripartite Hub is hosted by Finland (legal seat), Italy (medical imaging), and EMBL (biological imaging). EuBI partners are now finalizing the preparation work so that all services will be in place on the official launch of the EuBI ERIC.

Goals and Objectives of Collaboration

The collaboration shall establish a foundation for a long-term alliance of mutual benefit between the SingaScope and EuBI by linking their imaging infrastructures internationally, and to support research in the areas of biological and medical sciences. The collaboration framework aims at building the alliance, with a particular focus on identifying sustainable funding mechanisms to guarantee international partnership of the involved national infrastructure facilities.

The SingaScope and EuBI aspire to:

1. provide best practice in the areas of user access and experience, training, operation, management and stakeholder reporting, as relevant to these significant national facilities
2. benchmark performance in the areas of training, user satisfaction, instrument or facility usage, areas of research supported, publication output, research outcomes, creation of registrable intellectual property and any other mutually agreed metrics
3. prepare a pathway for users to access facilities at either SingaScope or EuBI that will support the research needs of those users
4. diversify the portfolio of research projects supported by the facilities through the provision of complimentary and correlative characterisation techniques

5. develop joint research programs in the areas of biological and medical sciences, advanced light microscopy and imaging techniques and instrumentation
6. identify sustainable funding mechanisms for international collaborations of national and European imaging infrastructures.

Mechanism of Collaboration

This Collaboration reflects the desire and intention of the parties to collectively collaborate and co-operate to achieve the joint objectives such as, but not limited to, the following:

1. exchange (visits) of facility operational staff such as laboratory managers, facility staff or specialist technical officers as nominated by SingaScope and EuBI Node (Candidate)s. Administrative support to facilitate these visits will be provided by both SingaScope and EuBI members.
2. exchange (visits) of research and academic staff including Principal Investigators, Research Fellows, Research Associates and students. Administrative support to facilitate these visits will be provided by both SingaScope and EuBI. Exchange of staff, sharing of resources and user access will be subject to the respective user access policy of SingaScope and EuBI Node (Candidate)s.
3. participation by staff nominated by the SingaScope and EuBI Working Groups in annual strategic planning workshops, stakeholder meetings, annual user meetings other similar facility events.
4. advising potential users about SingaScope and EuBI capabilities and facilitate the engagement of users with relevant facilities where appropriate.
5. advising potential users about possible sources of Singapore and European Union funding that would enable facility access.
6. promotion of SingaScope and EuBI in relevant forums using a variety of media including web and printed materials.
7. jointly seeking funding opportunities to develop research programs of mutual interest as well as aiming at ensuring sustainable international collaborations.

Staff exchange between Europe and Singapore is currently funded by European Commission, via the Horizon 2020-Global BioImaging project. Continuation of the EC funding line will be sought in the upcoming framework research programs. In addition, if visits of scientists from Singapore to Europe serve Singapore's national interest, funding by the Government in Singapore would be an alternative option.

All costs associated with these activities such as travel, accommodation and promotional expenses will be provided by the respective facility that incurs the cost.

Terms of Collaboration

This Collaboration will serve as a basis for both SingaScope and EuBI to seek support from both public and private sources, which will help accelerate the growth of the collaborations between the SingaScope and EuBI.

Additional agreements may be developed between SingaScope and EuBI to foster joint research activities that may commence as a result of this Collaboration Framework. Where

required, individual programs of activity developed under this framework will be the subject of and governed by individual legally binding agreements in writing and signed by relevant parties, and where appropriate will be jointly planned and conducted by the nominees of both parties. Such agreements will be negotiated in good faith.

The collaboration described by this framework is non-exclusive and each party is free to engage with and enter into strategic partnerships with other institutions or organisations from time to time.

This document can be modified, amended, expanded or reduced by mutual agreement between SingaScope and EuBI or by the provision of six month's written notice by either party. This document is not intended to create legal or binding obligations on either party. It serves only as a record of the parties' current intentions.

This Collaboration Framework is effective from the date of signing until 30 September 2020 unless terminated at an earlier date by mutual consent.

Signed this XXth day of YYYYYY 2018

Dr. Graham Wright
Coordinator SingaScope

Prof. Benny Geiger
Chairman
EuBI Interim Board

Dr. Jan Ellenberg
EuBI
Preparatory Phase II Coordinator
EMBL

Contact:
Dr. Antje Keppler (GBI Coordinator)
Head of Imaging Infrastructure Strategic Development
EMBL, Meyerhofstrasse 1
D-69117 Heidelberg
Germany
Keppler@embl.de

Annex III: EuBI-GBI Letter of Support for the SingaScope proposal

Grant Management Secretariat
National Research Foundation
Shared Infrastructure Support (SIS)
Prime Minister's Office
1 CREATE Way
#12-02 CREATE Tower
Singapore 138602

September 20, 2017

Letter of support for the *SingaScope* proposal for the NRF-SIS grant

Dear Sir/Madam,

Herewith, in our role as Coordinator of the Euro-Biolmaging Preparatory Phase II Project and Coordinator of Global Biolmaging Project, we wish to express our support for the NRF-SIS *SingaScope* proposal for national coordination of access to light microscopy technologies. The aims and approaches of the *SingaScope* proposal align well with the Euro-Biolmaging's principles of enabling open access to cutting-edge biological imaging technologies with high-level user support by expert technical staff, and advanced training for both users and importantly the providers of imaging technologies. We understand that the planned consortium will be truly national and that it is planned that other complementary centres can also be included into the *SingaScope* consortium in the future.

Euro-Biolmaging (EuBI) is the pan-European research infrastructure for biological and biomedical imaging on the ESFRI roadmap, currently in its Interim Operation towards launch of the EuBI ERIC. The mission of EuBI is to provide access, service and training to state-of-the-art imaging technologies. EuBI coordinates the Global Biolmaging Project (GBI), which is funded by the European Union. The international GBI consortium is developing a global network of cutting-edge imaging research infrastructures. In GBI, Euro-Biolmaging reaches out and collaborates with existing and newly emerging life sciences imaging research infrastructures in other regions including Africa, Asia, Australia, and North and South America by establishing common infrastructure services such as virtual platforms for training material and image data tools, and by pursuing collaboration agreements on the reciprocal use and openness of their infrastructure services.

Euro-Biolmaging will be happy to fulfil a consultative and advisory role to share our experience with the *SingaScope* coordinator and committee as they implement the proposal.

Euro-Biolmaging support Singapore's inclusion into the Global Biolmaging initiative should the *SingaScope* proposal be funded.

CONTACT

Dr. Antje Keppler
EMBL, Meyerhofstraße 1
D-69117 Heidelberg, Germany
Tel: +49 6221 3878847
keppler@embl.de

Based on the advanced preparations and plans, its national and inclusive nature, we can confirm that the contribution *SingaScope* plans is relevant to the GBI strategy of expanding its network to the benefit of its international partners. We are very much looking forward to their valuable input to Euro-BioImaging and Global BioImaging project.

Yours sincerely,



*Dr. Jan Ellenberg
EuBI PP II Coordinator
Heidelberg, 20.09.17*



*Dr. Antje Keppler
GBI Coordinator
Heidelberg, 20.09.17*
