

Formalizing RI collaboration: Examples and lessons learned from the Global BioImaging network and the cooperation between partners in Europe and LAC

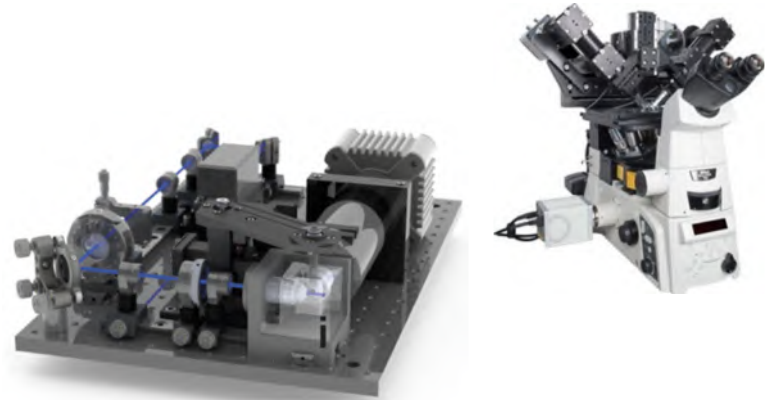
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Dr. Chris Wood, Head of the National Laboratory for Advanced Microscopy, UNAM, Mexico



Research Infrastructure for bioimaging - why do we need it?

- A fundamental technique for life sciences for over four centuries
- Recent explosive growth in the capabilities and power of optical and electron microscopy - *orders of magnitude improvements in spatial resolution, imaging speed, multiple parameter correlation and large-volume capture*
- Techniques such as super-resolution nanoscopy, CryoEM, single molecule imaging, real-time whole-cell and tissue imaging and others are transforming our fundamental knowledge of biology.

Ever-more sophisticated instrumentation requires greater capital investment, dedicated support infrastructure and highly-specialized human resources for operation



Bioimaging is a highly multidisciplinary field

Sample preparation, observation, data analysis and interpretation require integration of knowledge in fields of:

Biology, physiology, chemistry, optical physics, electronics, engineering science, nanotechnology, mathematics, computational science, statistical analysis...

So that means, as with most RI...

Bioimaging RI are ideal platforms to

- integrate multi- and interdisciplinary collaboration,
- democratize access to cutting-edge technologies,
- spark creative interactions,
- promote quality assurance and data interoperability/accessibility
- train current and future generations of scientists to the highest levels.

A background image of a microscope with a blue light source illuminating a slide, creating a scientific and high-tech atmosphere.

EURO BIOIMAGING

The European Research Infrastructure
for Biological and Biomedical Imaging



eurobioimaging.eu



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

Who we are:

- Euro-BioImaging is a distributed research infrastructure with Nodes across Europe
- We represent internationally recognised imaging facilities



16

COUNTRIES &
INTERNATIONAL
ORGANISATIONS



25

NODES



112+

SITES



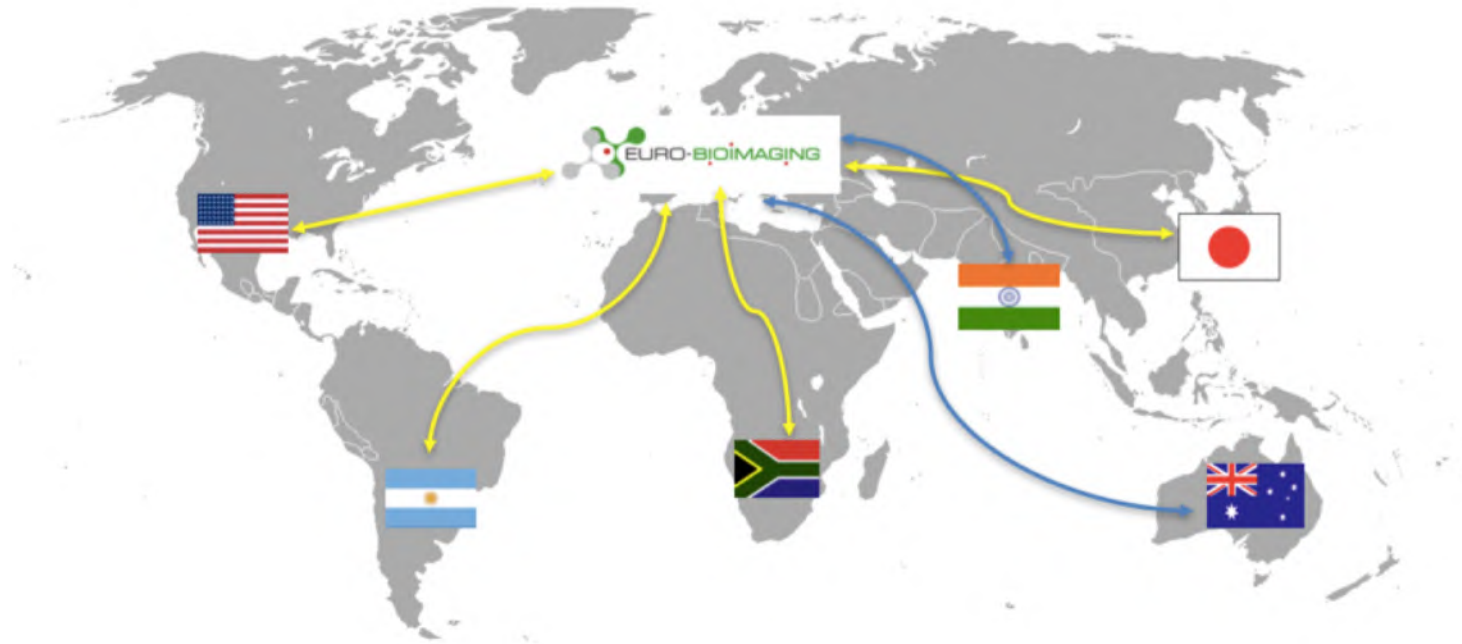
45+

TECHNOLOGIES



- MEMBERS
- OBSERVER
- PROSPECTIVE MEMBERS
- HUB HOSTS
- NODES

A BIT OF HISTORY...



2015: 3-years H2020 international cooperation grant

A BIT OF HISTORY...

Commission and its priorities | Policies, information and services

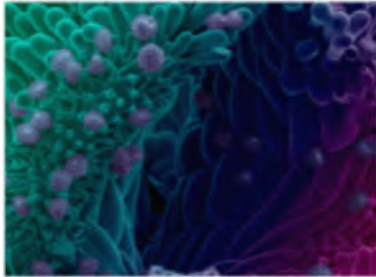
European Commission

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Global network of research infrastructures promotes bioimaging technologies

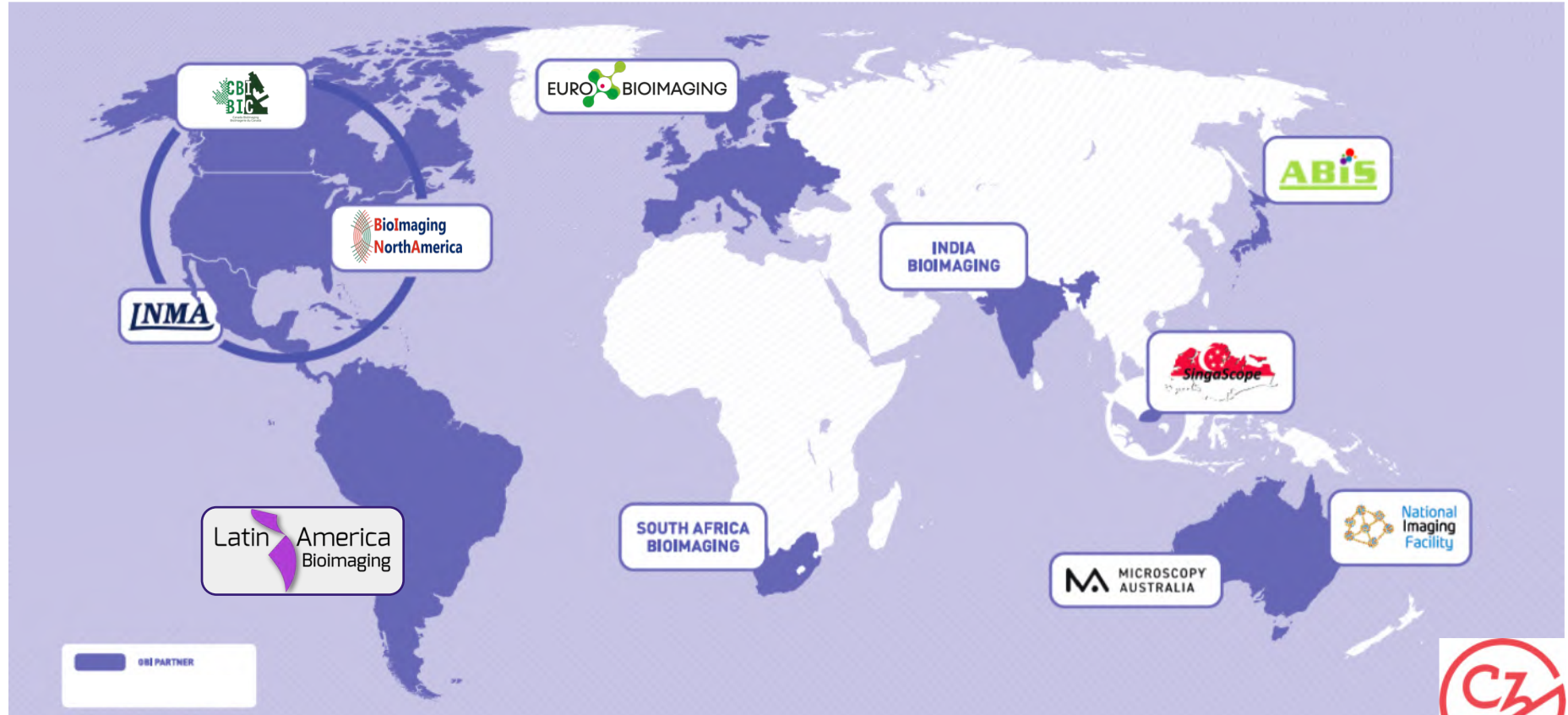
Advanced imaging technologies are revolutionising biological and biomedical science. An EU-funded project enabled researchers worldwide to better access cutting-edge biological and medical imaging technologies, to accelerate the great societal benefits this technological revolution will provide.



The **European Commission** selected Global Biolmaging as a **success story** and published an article in December 2018

http://ec.europa.eu/research/infocentre/article_en.cfm?artid=49826

WHERE WE ARE TODAY



ABOUT US

Global BioImaging is an international network of imaging infrastructures and communities, which brings together imaging facility operators and technical staff, scientists, managers and science policy officers from around the globe, to network, exchange experiences and build capacity internationally.



- To **cooperate** internationally and **propose solutions** to the challenges faced by the imaging community globally
- To **build a strong case that imaging technologies** and research infrastructures **are key** in the advancement of life sciences
- To **build capacity** internationally, leveraging on each other's strengths and capabilities

THE GBI MEMORANDUM OF UNDERSTANDING

WHY

- To work internally towards our long-term sustainability
- To tell the outside world about us and our goals

MODELS

- Bilateral Collaboration Agreements signed by Euro-BioImaging
- EIRO-Forum Charter
- MoU between ESFRI Life Sciences RIs

GUIDING PRINCIPLES

- To foster growth of the international network
- Can coexist with bilateral Collaboration Agreements
- Light structure, NOT legally binding

“This MoU is not intended, and nothing contained herein shall be deemed, to create any partnership, agency or joint venture amongst the Parties or any of the Parties, nor to establish a legal entity constituted amongst any or all of the Parties.”



THE GBI MEMORANDUM OF UNDERSTANDING

Document's structure:

1. Preamble

- Highlights the importance of imaging technologies
- Summarises the benefits that GBI brought to the communities involved
- Acknowledges the **desire of the partners to strengthen their alliance**

2. Purpose

- To establish a **framework for strategic collaboration** amongst the signatories
- NOT legally binding

3. Objectives, e.g.:

- “Facilitate discussions and problem-solving [...] on issues of common interest”
- Provide best practices, e.g. in infrastructure management, user access...
- “Facilitate coordinated representation to the global community [...]”

4. Membership of Global Biolumaging

- Founding members vs new members

5. The Global Biolumaging Management Board

- Our strategic decision making body

6. The Global Biolumaging commitment on diversity and inclusion

- “Global Biolumaging’s **collective success depends on the robust exchange of ideas**”

7. Questions and consultations

- Guiding principle: solve them by consensus

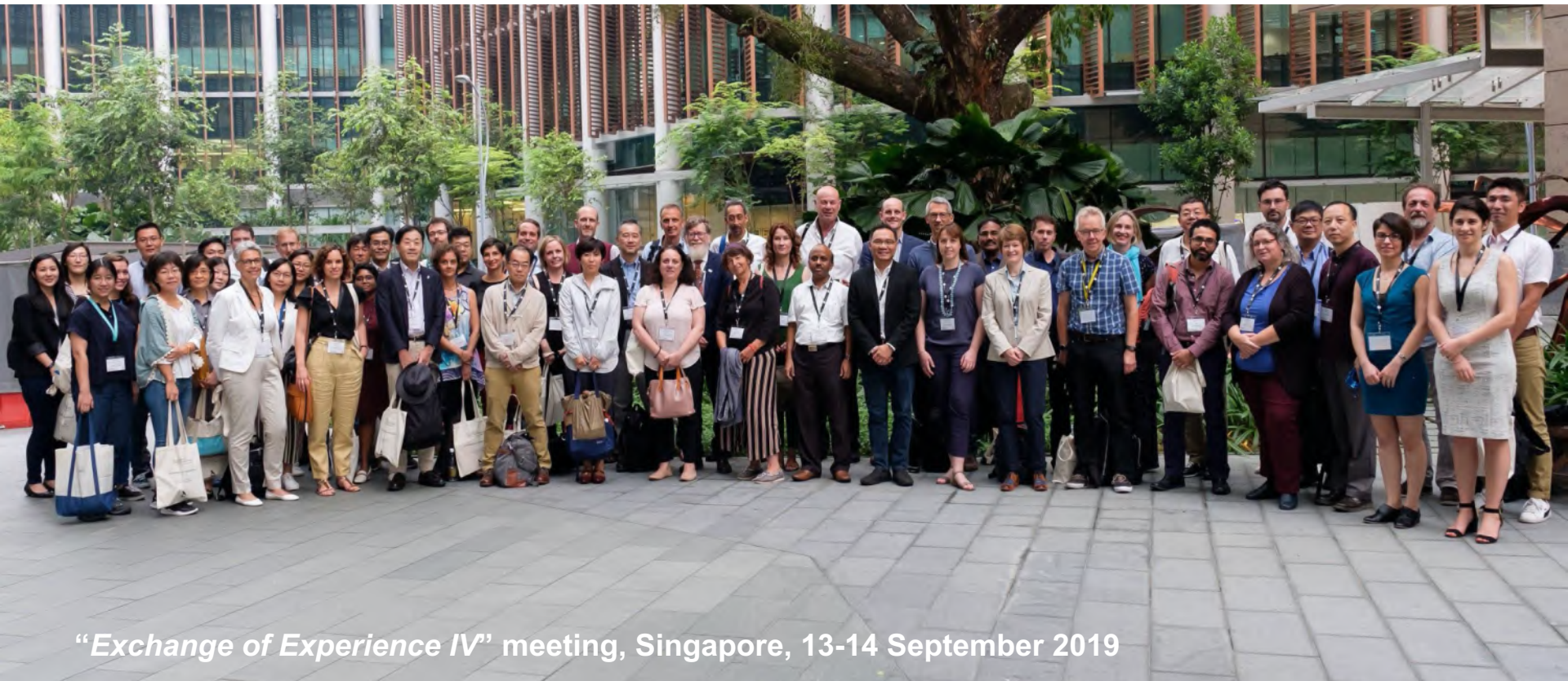


CONTRIBUTION TO THE COMMUNITY

- International recommendations
- Training program
- Staff exchange (Job Shadowing) program
- Working groups
- Thematic workshops
- Exchange of experiences
- Support with local funders



THE COMMUNITY IS THE KEY



“Exchange of Experience IV” meeting, Singapore, 13-14 September 2019



Mexico's first completely open-access optical microscopy facility

Now expanded to three sites across country

Since 2013

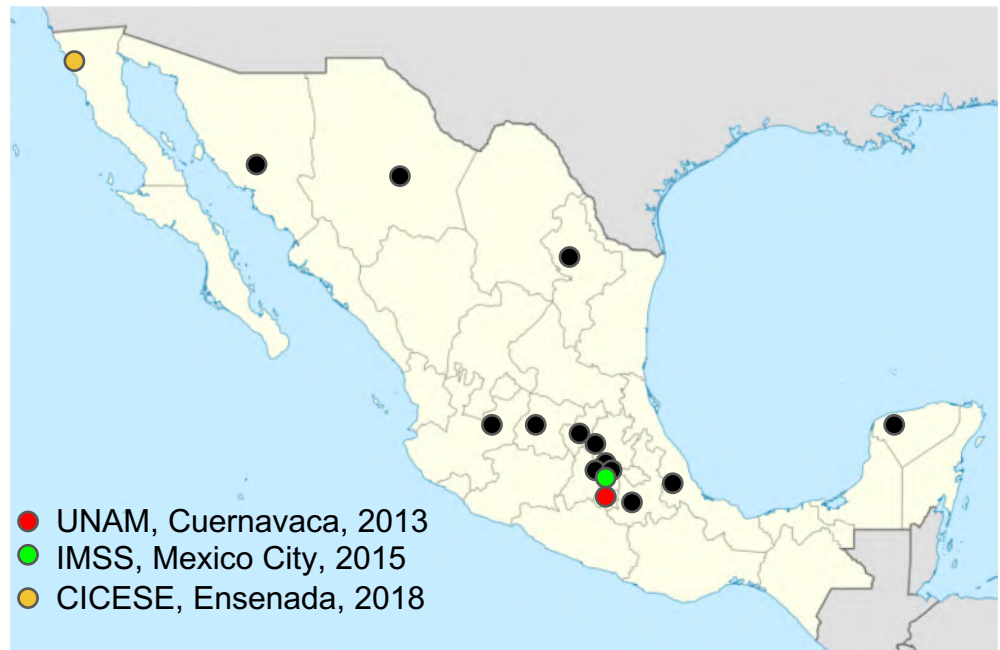
>500 users over three sites

>28000 hours of services delivered (avg 16 hours daily)

>35 papers (authorship) & >90 acknowledgements

\$4.5 million USD raised in direct grant support

Part of a family of >70 National Laboratories established by CONACyT through dedicated RI funding grants from 2011 onwards.



Other institutes with bioimaging centres include UNAM-IBT, UNAM-IFC, UNAM-IIB, UNAM-INB, UNAM/INCAN, IPN, Cinvestav, INECOL, CICY and many others

Estimated 30 - 50 bioimaging confocal microscopes in Mexico

Similar number of electron microscopes

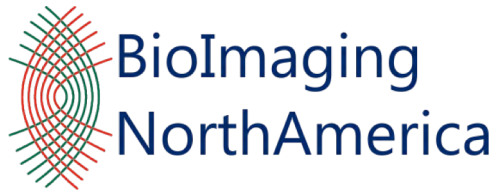
Much work to integrate these resources into a community

Since 2018, LNMA represents Mexican bioimaging community in



Participation in Training, QA, Data Management working groups

Interchange and networking with homologues across the planet



Forge strategic alliances through MOUs
- *first one recently signed with Global BioImaging*

Take home messages from participation -

- *Extremely positive experience*
- *Realization that issues and problems are near-universal, although they vary in scale and priority across the regions*
- *Signposts and pathways towards solutions, adapted to local conditions*
- *Strengthen confidence of local bioimaging communities, overcome “unfamiliarity” barriers*
- *Ability to contribute to wider sector development, obtain agency and diversify initiatives*

Positive experience of LNMA in its interaction with global community helped catalyze...



Proposal Title:

“Cooperative proposal to develop advanced optical imaging capacity with the aim of establishing the Latin-American Light Microscopy Network”

General Objective:

Directly strengthen institutional and academic capacity for light microscopy, and promote inclusion of light microscopy in secondary and tertiary education, and the productive sector, and support establishment of the Latin-American Light Microscopy Network.





Uruguay-Mexico Bilateral Microscopy Initiative

Consultancy for establishing (national) microscopy laboratory in Uruguay - *Advanced Bioimaging Unit founded (2020)*

4 x symposia in Mexico and Uruguay – mixture of academic, non-academic, and public outreach audiences (currently on hold)

Final event – International meeting around theme of the Promotion and Integration of Bioimaging Resources and Services in Latin America

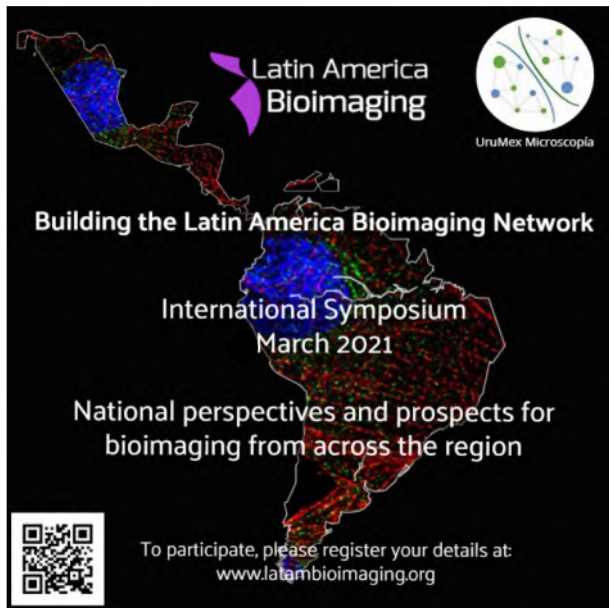


First exchange visit to Uruguay,
May 2019

Consultancy report submitted June
2019

Summer 2020: *Advanced Bioimaging Unit*
founded as joint venture between
Universidad de la República y Institut
Pasteur de Montevideo

Latin America Bioimaging



Latin America
Bioimaging


UruMex Microscopia

Building the Latin America Bioimaging Network

International Symposium
March 2021

National perspectives and prospects for
bioimaging from across the region

To participate, please register your details at:
www.latabioimaging.org



Just beginning activities in 2021

First planned event - introductory
symposium in March 2021

Mission:

Promote bioimaging RI to academic and political communities

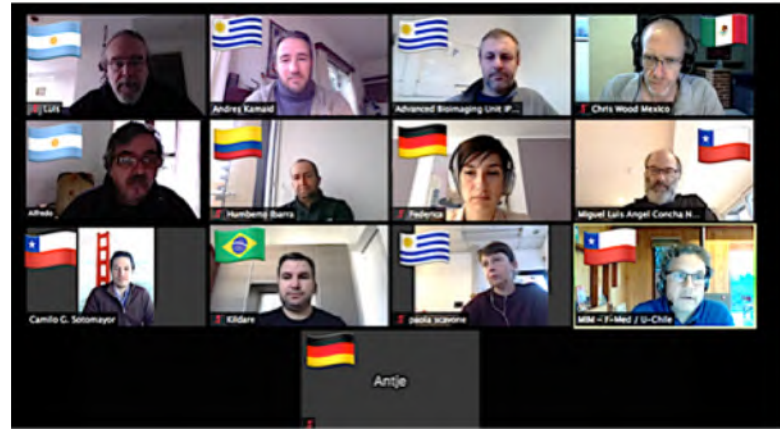
*Develop and support capacity-building activities in the region
(training, best practice, certification, etc)*

*Build databases of bioimaging researchers and microscopy
centres and promote community integration*

Create bridge to international partner organizations



Recent small survey among leading bioimaging scientists in Latin America revealed:



1. Disparities in the level of political support for RI in different countries, ranging from strong support and close access, to very little of the same
2. If funding exists for strengthening RI links, it mainly comes from self-generated funds, or funds diverted from mainstream research activities
3. Consensus that significant resistance to creating/maintaining RI came from within the research community - precious resources diverted into RI are perceived to negatively affect overall funding availability across the community.
4. Consensus across region that RI arises from bottom up initiatives - RI doesn't feature in strategic science policy planning at political level.
5. Recognition of the critical role of human resources to maximize benefit and exploitation of RI, and the need to improve training and skills across the region.

CONCLUSIONS / PERSPECTIVES

1. A pan-European RI for bioimaging is established and Bioimaging RIs are emerging and strengthening across Latin America. **Collaboration between EU and Latin America is growing** under the umbrella of the Global BioImaging network
2. Formalization of the collaboration is being achieved via an international **Memorandum of Understanding**, which focuses on pursuing mutually beneficial activities and areas of collaboration, rather than a rigid legal framework
3. **The barrier** for engaging into a formal collaboration **needs to be low**, especially at the outset, to avoid administrative constraints that hamper the development of the collaboration itself

Expected outcomes

Strengthening of Bioimaging RI across Latin America, through:

1. Greater awareness and improved access to training/capacitation schemes for human resource development, QA, international standards adoption
2. Integration with complementary RI (particularly relevant: data handling and processing, image databases)
3. Improved access and better integration with policymakers and developmental strategy
4. Fostering of intra-regional collaboration and community integration

QUESTIONS FOR DISCUSSION

1. RIs are generally well-valued and enjoy political support in the EU. Through collaboration, how can the Latin American science communities best generate similar recognition and support for RI among their own communities?
1. What are the tangible activities (e.g. training event, staff exchange, thematic workshop) that the audience feels would help in a concrete way to achieve better collaboration between RIs and partners in Latin America and the EU?

Thank you for your attention!

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