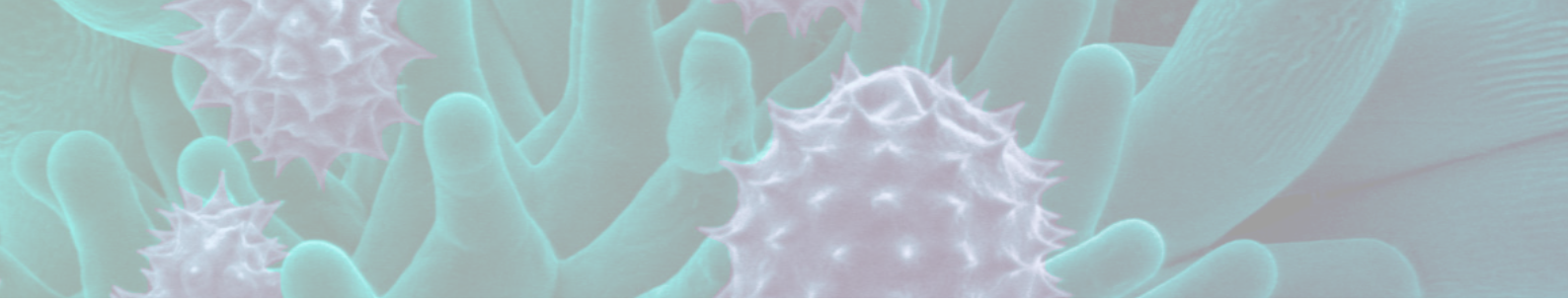
ADDED VALUE OF OPEN ACCESS IMAGING CORE FACILITIES

GLOBAL BIOIMAGING
growing collaboration



GLOBAL BIOIMAGING PUBLICATIONS, PART 2:

OPEN ACCESS IMAGING CORE FACILITIES

International publication on open access imaging core facilities – Benefits for researchers, imaging communities, industry and national funders

Written and published by the members of the Global BioImaging (GBI) Management Board (www.globalbioimaging.org)

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By coordinating and integrating national investments in open access research infrastructures, countries can support their scientific communities to achieve and maintain recognition and become leaders in the global landscape. National engagement and coordinated investment in open access imaging infrastructure provides long-term sustainability and drives research output to tackle the critical challenges of today's world, including health of their people[1] , climate change, sustainable agriculture and environmental protection.

Investment in Research Infrastructures (RIs) has the potential to lead to sustainable economic, social and environmental advances. It will foster national as well as international partnerships and services, which are necessary to address socio-economic challenges, the sharing of good practices, knowledge transfer and a rapid adaptation to scientists' needs. The development of new technologies, sustainable RI service models and the democratisation of disruptive innovation require quality-managed RI access, expert imaging scientists and are critical elements to tackle societal challenges such as those summarized in the Sustainable Development Goals identified by the UN[2].

Imaging core facilities support top-level research activities in the life, medical as well as material sciences, by providing access to advanced imaging technologies, expertise and related services. They operate suites of diverse imaging instruments and offer expert support for assay development, sample preparation, image acquisition, as well as training on instrument use, image analysis and data management services.

Open access imaging core facilities enable cross-disciplinary research, provide equitable access to all scientists and exploit re-usability of imaging data to produce new research at the frontier of science3. National imaging facilities and RIs are major promoters of Open Science4 providing FAIR5 (meeting the principles of Findability, Accessibility, Interoperability, and Reusability) and quality-assured open image data, thus contributing to the success and amplifying the impact of national research and innovation agendas. Overall this leads to strengthening of national contributions to their global scientific community.

1 https://www.euro.who.int/en/health-topics/health-policy/one-health
2 https://sdgs.un.org/goals
3 https://op.europa.eu/en/publication-detail/-/publication/78e87306-48bc-11e6-9c64-01aa75ed71a1
4 https://en.unesco.org/science-sustainable-future/open-science
5 https://www.go-fair.org

Added Value of Establishing and Operating Sustainable Open Access Imaging Core Facilities

1. FOR SCIENTISTS

» Transparent, efficient and coordinated access to quality-managed imaging instruments and services

» Access to continually optimized imaging services, including development of dedicated applications or adaptations of imaging technology to specific research project requirements, thanks to continuous evaluation of user satisfaction by the facility

» Access to 'generational' know-how associated with relevant research tools and services associated with imaging (incl. fluorescent probes, plasmids, antibodies, etc.), thereby increasing number of feasible user applications and efficiency from experimental design to implementation (important for studies or degrees that need completion within 1-2 years, e.g. MSc programs)

» Access to facilities certified under local or international programmes (e.g. ISO) where adopted, to ensure high-quality reproducible quantitative data

» Data acquisition and support with the use of FAIR principles for publication and open science data sharing, following requirements of funders and publishers

» Support by imaging scientists and core facility experts to harness the full potential of advanced imaging technologies for leading research

» Theoretical and hands-on training opportunities in the applications and best use of imaging instruments, delivered by highly-skilled imaging scientists and core facility staff, and associated knowledge transfer

» Training of MSc and PhD students, hence impacting skills development and human capacity building

» Security for long-term research planning and lowered barriers to innovation and diversification within research groups through continuity of access to optimised resources and expertise

» Ability to partner with imaging facilities and imaging scientists for rapid research and development (R&D) of new and novel applications, protocols, image acquisition and analysis methods

» Enhanced opportunities for establishing novel collaborations between researchers, interdisciplinary and translational research as well as networking with other scientific communities

» Networking and new career opportunities for scientists in imaging facilities and beyond, as well as with manufacturers supplying imaging instruments and tools

» Potential for in-depth testing under real experimental conditions of new instruments before purchase

2. FOR IMAGING SCIENTISTS AND CORE FACILITY EXPERTS (I.E. RESEARCH INFRASTRUCTURE STAFF)

» Exposure to a diversity of new research projects, applications and research collaborations which external scientists bring to the facility

» Longer-term career perspectives for highly skilled imaging scientists and experts based on sustainable core facilities' business models

» Networking and sharing of tools and experiences with other imaging scientists and core facility experts across coordinated research infrastructures nationally and internationally (national infrastructure (e.g. SingaScope [6], regional network (e.g. Latin America BioImaging[7]), and international network (e.g. Global BioImaging[8]))

» Networking with industries (as manufacturers and as users of imaging services)

» Visibility on the national and international level and recognition by peers, funders and future employers

» Opportunities to work on quality assurance and management systems of facility services, thereby developing new, transferable skill-sets

» Opportunity to collaborate with researchers on the development of new applications, protocol, and image acquisition and analysis methods, including adaptation of imaging set-ups for specific user projects, with R&D potential

3. FOR MANUFACTURERS OF IMAGING INSTRUMENTATION

» Optimal installation and use of commercial imaging equipment in partnership with well managed imaging facilities and expert imaging scientists

» Further commercialization possibilities as imaging scientists and facility users develop sufficient experience and productivity to justify acquiring their own equipment

» Direct contact with diverse academic sectors to understand and develop novel applications potentially opening up new markets

» Innovative, often multidisciplinary, technology and application development with imaging facilities can facilitate start-up company creation and intellectual property licensing

» Imaging core facilities as sites for early-adoption, industry expert feedback from imaging scientists for continuous improvement, showcasing new technology and demonstration to prospective clients

6 https://www.singascope.sg/
7 https://www.latambioimaging.org/
8 https://globalbioimaging.org/

4. FOR NATIONAL DECISION-MAKERS AND FUNDERS

- Coordination of national efforts in imaging infrastructure investments, in collaboration with institutional, local, regional and international initiatives
- Alignment of imaging infrastructure to strategic and national priorities
- Minimized duplication of efforts through coordination and reduced investment costs by understanding instrument and technology landscapes across the nation and the region
- Shared infrastructure that provides scientists equitable and open access to advanced instruments, expertise and services nationwide
- Accelerated development and import of cutting-edge techniques, applications and technologies that maintain and improve competitiveness of many scientific sectors
- Leverage research funding opportunities for national and international users
- Recruit and retain highly trained imaging scientists and core facility experts and expertise in national research institutions and universities (i.e. turn brain-drain into brain-gain)
- Develop and strengthen a connected national community of imaging scientists and core facility experts to generate new knowledge, exchange experiences and form research collaborations across scientific disciplines and national borders
- Gain access to essential and quality-managed scientific tools in the country, to tackle key societal questions (e.g. the current pandemic)

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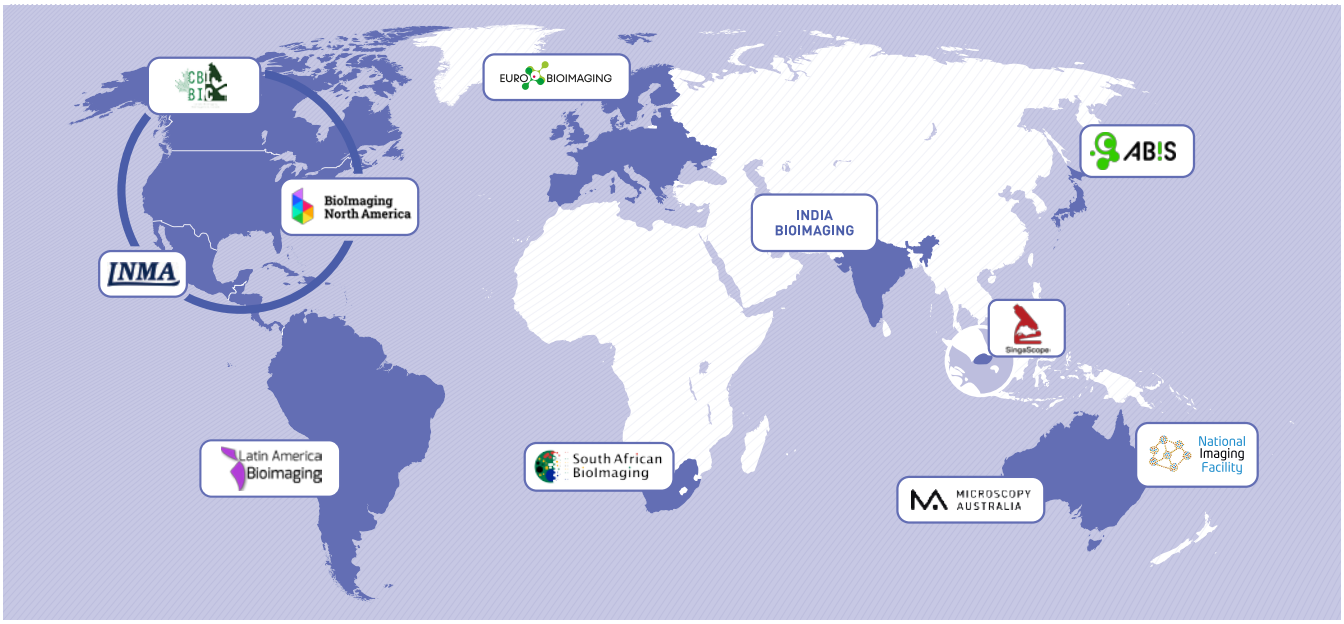
CHAN ZUCKERBERG INITIATIVE

GLOBAL BIOIMAGING

Global BioImaging (GBI)[9] is an international, open network of imaging infrastructures and communities, which was initiated in 2015 by Euro-BioImaging and partners in India and Australia with the mission to cooperate internationally and propose solutions to the challenges faced by the imaging community globally. Furthermore, the partners support each other to build a strong case towards the funders that imaging technologies and research infrastructures are key in the advancement of life and health sciences; and the GBI activities aim to build capacity internationally, leveraging on each other's strengths and capabilities.

Initially supported by a European "Horizon 2020" grant from the European Commission, since January 2020 GBI is funded by the Chan Zuckerberg Initiative[10] and now includes 11 partners and 26 countries around the globe: Euro-BioImaging ERIC[11] in Europe, Advanced BioImaging Support (ABiS)[12] in Japan, Microscopy Australia (MicroAU)[13] and the National Imaging Facility (NIF)[14] in Australia, Canada BioImaging[15], the National Laboratory for Advanced Microscopy (LNMA)[16] in Mexico, Latin America Bioimaging[17], South Africa BioImaging (SABI), the India BioImaging Consortium, BioImaging North America (BINA)[18], and SingaScope[19] in Singapore.



9 https://globalbioimaging.org/
10 https://chanzuckerberg.com/science/programs-resources/imaging/
11 www.eurobioimaging.eu
12 https://www.nibb.ac.jp/abis/about-platform?lang=en
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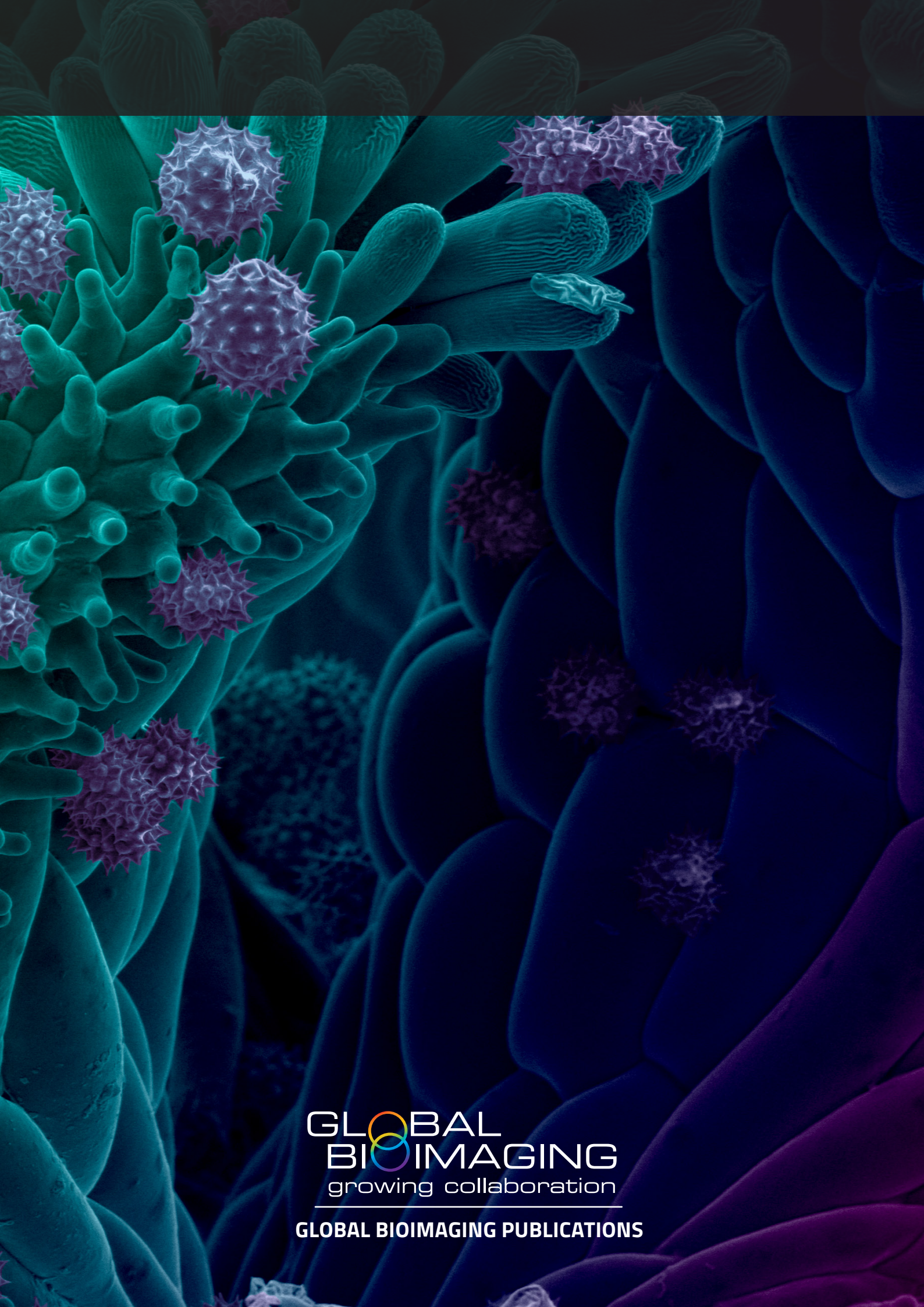
19 https://www.singascope.sg/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