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ORIGINAL ARTICLE

Global impact through train-the-trainer (TtT) courses

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Abstract

Global BioImaging (GBI) and its regional and national partners, such as Canada BioImaging (CBI), BioImaging North America (BINA), Latin America BioImaging (LABI), the African BioImaging Consortium (ABIC) and Microscopy Australia (MA), have been working to create training opportunities for imaging scientists across the globe. During the COVID-19 pandemic, GBI and its partners developed a virtual training platform for independent learning (GBI Virtual Training Platform), with self-guided training modules spanning from microscope operation to facility management. More recently, in-person train-the-trainer (TtT) frameworks, including the Montreal Light Microscopy Course (MLMC), have been designed to deliver a multiplying effect by providing imaging scientists with the training and resources they need to run microscopy courses in their facilities, institutions, countries, and regions. Major goals of this initiative included empowering the next generation of imaging scientists by sharing resources and expertise, providing training in course logistics and organisation and building an international collaborative network of expert trainers to accelerate access to fundamental and advanced technologies. As of April 2026, the TtT project has consisted of three TtT courses, at least 11 second-generation microscopy fundamentals courses and impacted more than 400 course faculty, corporate partners and trainees from 25 countries.

KEYWORDS
expert trainers, global, imaging, microscopy, train-the-trainer

1 | PURPOSE OF THE PROJECT

Imaging scientists working in microscopy facilities[1] need ongoing technical education to effectively teach others the principles behind fundamental and advanced microscopy technologies. Based on our personal experience, most imaging scientists develop their own training materials, which is a time-consuming process. This work frequently duplicates existing materials, resulting in an inefficient process. In addition, many imaging scientists lack formal training in education or pedagogy, leaving room to enhance the materials by integrating these elements. The *Montreal Light Microscopy Course (MLMC) Fundamentals Train-the-Trainer (TtT)* programme had three goals: (1) to empower imaging scientists by providing comprehensive teaching materials including presentation slides and protocols for hands-on activities; (2) to provide training in course logistics and effective organisation; and (3) the formation of a network of experienced microscopy experts for advice, further discussion and participation as organisers and faculty in future training courses. The result is that imaging scientists can spend their time customising the provided training materials for their application area and regional user needs, developing and practicing their teaching skills, and developing new materials that can be shared with the global community. With a ripple effect, the impact of the TtT framework will only grow with time. One imaging scientist running multiple courses in their institution can only reach a limited number of researchers, but training a group of trainers has a huge amplification effect. For example, a first event could be one trainer training 10 researchers and the second event could be to train 10 more researchers for a total impact on 20 researchers. However, a first event could be one trainer training 10 trainers with the second 'event' being each of those trainers training 10 researchers in their own institutions or research areas. After two cycles this would result in the generation of 10 new trainers and impact on 100 researchers rather than only 20.

2 | HOW THE PROJECT WAS REALISED

All of the TtT courses were 5 days long and included a mix of microscopy training, course logistics and topics on imaging facility management. Networking was built into

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TABLE 1 Statistics and information for train-the-trainer courses and second-generation microscopy fundamentals courses.

Course name	Date	Host country	Location	Number of participants	Number of faculty	Language of training
Montreal Light Microscopy Course—TtT	July 2023	Canada	Montreal	14	17	English
Latin America Light Microscopy Course—TtT	June 2024	Argentina	Buenos Aires	23	10	English
Australia Light Microscopy Course—TtT	November 2025	Australia	Melbourne	29	12	English
Curso de Fundamentos en Microscopía Óptica	April 2024	Uruguay	Montevideo	17	16	Spanish
Cape Microscopy Course	September 2024	South Africa	Cape Town	19	9	English
Capacitación de Usuarios en Microscopía Confocal	November 2024	Argentina	Santiago del Estero	6	4	Spanish
Curso de Fundamentos en Microscopía Óptica	April 2025	Uruguay	Montevideo	17	15	Spanish
Cours Francophone de Microscopie Optique	May 2025	Canada	Montreal	33	13	French
Curso de Fundamentos en Microscopía Óptica	August 2025	Argentina	Buenos Aires	18	9	Spanish
Basic Microscopy Course	January 2026	Singapore	Singapore	64	10	English
Fundamentals of Image Acquisition	February 2026	Australia	Sydney	19	2	English
Hands-On Advanced Optical Microscopy	February 2026	India	Delhi-NCR	27	5	English
Fundamentals of Microscopy in Life Sciences	March 2026	Singapore	Singapore	31	8	English
Microscopía óptica avanzada	March 2026	Chile	Santiago de Chile	13	8	Spanish

all the courses in the form of long refreshment breaks and lunches, poster sessions with a reception and a course dinner. In fact, all courses started out with introductions where each participant prepared 1–2 presentation slides describing themselves, their imaging facility (or laboratory or company), expectations for the course and some hobbies. In our experience, starting a course this way ensures everyone gets to know each other and sharing about hobbies immediately breaks down any social barriers and creates a collaborative rather than hierarchical learning environment. Common areas of interest included cat or dog lovers, people who like to fish, cooks and bakers and those who like to travel. Following inspiration from the Mexico BioImaging Workshops each course included an outreach event to local primary or secondary school students. In general, courses were held during regular working hours between 8 am and 6 pm. Keeping the class sizes to 14–29 participants made sure there was a good participant to faculty ratio and an opportunity to get to know everyone (Table 1).

The first MLMC-TtT, held in July 2023, brought together 14 imaging scientists from North and South America, Europe, and Australia. The course was led by 12 academic faculty and 5 corporate faculty, all with many years of experience developing, organising, and teaching microscopy courses (Table 1). Participants came from imaging facilities, research laboratories, and microscopy companies. Mobility support in the form of travel grants from BINA and GBI made it possible for many participants and instructors to travel from distant locations, and financial support was from the Chan Zuckerberg Initiative (CZI), corporate sponsorship and institutional support. Both financial and logistical support was provided by BINA, CBI, GBI, and Microscopy Australia (MA) (Table 2).

The course content was structured in diverse modules, which covered subjects from light-matter interactions to 3D imaging, all approached with a pedagogical perspective such as setting out clear learning objectives and learning outcomes for subject matter and lectures. Each topic was explored using a mix of lectures, demonstrations of

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TABLE 2 Budget summary for train-the-trainer courses.

	Montreal Light Microscopy Course—TtT	Latin America Light Microscopy Course—TtT	Australia Light Microscopy Course—TtT
Revenue			
Registration fees	6,800€	—	—
Corporate sponsorship	4,700€	1,300€	8,500€
Grant support	8,500€	7,300€	7,300€
Institutional support	2,900€	—	—
Travel funding	BINA, GBI	GBI, LABI	MA, CZI, GBI
Total revenue	**22,900€**	**8,600€**	**15,800€**
Expenses			
Food & beverage	8,500€	6,800€	13,200€
Professional event planner	10,300€	—	—
Others	2,700€	850€	2,100€
Total expenses	**21,500€**	**7,650€**	**15,300€**
Balance	**1,400€**	**950€**	**500€**
Cost per person	739€	261€	385€

hands-on activities, and collective discussions in small groups. In addition, information and guidelines for course organisation and logistics were provided. Due to the interactive nature of the course, both faculty and participants had the chance to share their experiences and talk about which gaps they have encountered in training courses and how best to fill those gaps. By disseminating course materials and combining practical teaching strategies with strong network building, the course helped imaging scientists rapidly become effective microscopy educators capable of driving impact in their imaging facilities and local research environments and gave established educators material to refresh their courses. Another major goal was met with the formation of new connections and the strengthening of existing connections amongst this international network of microscopy educators.

The second TtT course, *Latin America Light Microscopy Train-the-Trainer (LatLM-TtT)*, was held in Buenos Aires, Argentina, in June 2024. LatLM-TtT hosted 23 participants from seven Latin American and African countries and was facilitated by 10 course organisers and faculty (Table 1). The majority of participants were imaging scientists working in imaging facilities, but several participants were from research laboratories where they play a role in training other laboratory members in microscopy techniques. Four participants who were unable to attend the first MLMC-TtT in Canada, due to visa processing issues, were able to gain visas and join the course in Buenos Aires, showcasing the importance of advanced planning and visa facilitation in enabling access to training courses and critical global interactions between scientists.[2] The LatLM-TtT promoted new relationships between Latin American and African communities. These South–South collaborations created new peer-to-peer collaborations, often facilitated by the shared challenges of working in resource-constrained settings. Financial support from GBI and LABI was essential for the success of this course (Table 2). It is a significant challenge for imaging scientists in the global south to locally secure mobility funding for technology training courses. Fortunately, 60% of LatLM-TtT course participants received travel support. The excitement about the course was clear in that many news articles were published in FocalPlane,[3] the CZI newsletter,[4] and the Leloir Institute Foundation Newsletter.[5] Because corporate representation from microscope companies is widely dispersed across South America, there was no in-person corporate faculty or corporate participation at the course. There was some funding for the course dinner provided by a local microscope distributor (Table 2).

A third TtT course was held in Melbourne, Australia in November of 2025 that brought together 12 faculty and 29 course participants from 13 countries. The course expanded the global reach of the project, ensured that Microscopy Australia and Australian imaging scientists were integrated into the international TtT community, facilitated links in the Asia Pacific region (e.g. New Zealand, Singapore, India, Taiwan) and brought in wider international groups (e.g. Sweden, Saudi Arabia). The

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course had excellent financial support and company representatives on site for the week (Table 2). Corporate representatives also served as faculty teaching different aspects of fluorescence imaging and providing a demonstration microscope for the course. As with the other TtT courses, funding for course expenses (Table 2), travel grants and mobility support for faculty and participant travel was critical to the success of the event. This included GBI support for faculty travel, 8 travel awards for participants from GBI and 5 from MA, facilitating participants to take part in the course.

3 | FUTURE TRAIN-THE-TRAINER COURSE CONSIDERATIONS

Delivering a high-level of international participation and sustained training capacity required significant support from multiple funding sources, with a strong emphasis on mobility, accessibility, coordination and planning support from the global bioimaging community. Support for the TtT courses was from the Advanced Bioimaging Unit (UBA) at the Institut Pasteur of Montevideo and the Universidad de la República at Uruguay, CBI, CZI, BINA, GBI, LABI, MA, company sponsorship, registration fees and institutional support (Table 2). Aside from travel support, the major expense for running courses is for food and beverage and these costs vary in different areas of the world. In general, the cost of TtT courses is moderate in relation to the impact and was in the range of 261€ to 740€ per person (Table 2). The higher cost of the MLMC TtT course was due to the need to hire a professional event planner to support logistics and organisation (Table 2).

Travel funding for course participants and faculty can also be highly variable. It depends on travel costs in the region, and the distance people need to travel. Some general guidelines are that partial travel awards can be offered where course participants and faculty have access to supplementary funding. Awards of 500€ may be sufficient for regional travel, longer distance travel might require 1,000€ and long-haul global travel might require 3,000€. Keep in mind that, for countries in the global south full coverage of travel costs (e.g. flight, accommodation, ground transportation) is necessary for full participation. Another consideration is that longer courses mean higher accommodation costs. For a 2- to 3-day course, accommodations may only cost 300€–600€ while stays of a week or more will range from 1,000€ to 3,000€.

These courses are only possible because course organisers and faculty offer hundreds of hours of in-kind support. Work begins 6–12 months before the course begins with regular monthly planning meetings, work between meetings to develop programmes and organise logistics. Often weekly programming and/or logistics meetings are necessary in the months leading up to the course. Additional in-kind support in terms of the free use of institutional space for the events is also necessary.

Funding for the TtT courses was largely from CZI. This includes the bioimaging networks and imaging scientist funding. Training and education funding for GBI, Claire Brown's imaging scientist grant titled 'Training and Mentoring Imaging Scientists and Building Imaging Communities' and mobility funding from BINA, GBI and LABI are all CZI funded projects. Loss of this funding in the next year will leave a large gap in the training ability of the global bioimaging ecosystem. This funding directly translated into measurable outcomes including the training of new course faculty, development of multiple second-generation courses, making training more inclusive with courses taught in French and Spanish and the extension of regional microscopy training capability particularly in Canada, Latin America, Africa, Australia and Southeast Asia. The TtT project has shared lecture and hands-on materials, course organisation, and outreach event guidelines and recommendations with course participants, and has trained 66 participants from 20 countries across 5 continents and involved 34 faculty from 10 countries. To date, the TtT project has involved a total of 100 participants and faculty members from 21 different countries (Table 1). Note that five faculty members participated in more than one course.

4 | PROJECT OUTCOMES AND IMPACT

By design, the project has resulted in the organisation of many second-generation courses where newly trained imaging scientists are teaching the fundamentals of light microscopy. Although more research needs to be done to follow up with all TtT course participants, the programme has resulted in at least eleven trainee-led second-generation courses (Table 1). These courses have been run in several countries and have been tailored to address the training needs in different regions (Table 1). Two editions of the *Curso de Fundamentos en Microscopía Óptica* have been held at the Institut Pasteur de Montevideo, with English course materials, instruction in Spanish, and customisation of hands-on modules for imaging fluorescent immune cells in live zebrafish. Two microscopy fundamentals courses have been run in Argentina: one at the Leloir Institute Foundation (*Curso de Fundamentos en Microscopía Óptica-Buenos Aires*) and one training researchers in the remote region of Santiago del Estero (*Capacitación de Usuarios en Microscopía Confocal*). The *Cape Light Microscopy Course (CLMC)* was held in Cape Town, South Africa, relying on newly trained imaging

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scientists to deliver the course. The MLMC Fundamentals course has been offered annually in Montreal since 2010, but as a result of the TtT initiative, it was taught for the first time in French in 2025 with the *Cours Francophone de Microscopie Optique (CFMO-Montreal*) and will be offered again in 2026. Two courses were offered in Singapore in 2026 based on lessons learned at the TtT course in Melbourne. First, the *Fundamentals Microscopy Course* at the National University of Singapore in 2026 where organisers applied the course organisation framework, tips about coordination and planning, aspects to make the learning environment more engaging (e.g. hands on demonstrations with visual aids) and tips for securing sponsorship. Second, the *A*STAR (Agency for Science, Technology and Research) Evident Course: Fundamentals of Microscopy in Live Sciences* where organisers updated their teaching style and course content and three of the course faculty were participants in the TtT course. A *Fundamentals of Image Acquisition* course was offered as part of the Light Microscopy Australia Symposium in Sydney in 2026. In Chile, a *Fundamentals Microscopy Course* for PhD students in biomedical and bioengineering was updated to include attractive demonstrations to introduce abstract concepts and the presentation slides were improved. This is one of the few light microscopy courses offered in Chile giving graduate students access to in-depth education required for their research projects. In India, a *Hands-on Training Program in Advanced Optical Microscopy* was offered in Delhi-NCR and included virtual guest lectures from two faculty members from Australia and Argentina that the course organiser had met at the Melbourne TtT course. This course included many aspects of the TtT course approach including demonstrations, small-group discussions and an outreach event.

Overall, the MLMC-TtT project has impacted more than 400 faculty and participants from 25 countries (Table 1, Figure 1). Note that since many people have participated in multiple events the numbers in Table 1 for individual courses don't add up to the total number of participants in Figure 1. In addition to the second-generation courses mentioned above, many participants modified their teaching demonstrations and resources for other types of education including advanced microscopy courses, one-on-one training and group training of microscopy facility users. Project participants were from the following countries: Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Finland, Germany, India, Indonesia, Kenya, Malaysia, Mexico, New Zealand, Nigeria, Peru, Saudi Arabia, Singapore, South Africa, Sweden, Taiwan, United Kingdom, United States, and Uruguay.

4.1 | Empowering the next generation of imaging scientists

Surveys were conducted following each course and demonstrated that participants were highly satisfied with the course content, logistics and networking opportunities. Time was set aside during the courses for participants to answer the survey questions ensuring a high rate of feedback. All participants in the MLMC-TtT and LatLM-TtT said they would recommend the course to their colleagues. Things that were consistently valued included small group discussions, the interactive format and the strong emphasis on community and knowledge exchange. Participants also had a chance to suggest areas to improve and these suggestions were acted on in subsequent iterations of the course. For example, during the MLMC-TtT the outreach activity was a full day. Many participants found this length of time with young children, something they were not used to in their regular daily activities, was overwhelming. To address this concern, the outreach activity was planned for half a day in the following TtT courses.

The TtT initiative has transformed early-career imaging scientists, with several rapidly advancing from participants to faculty. Their journeys demonstrate the importance and swift progress that can result from the TtT approach in empowering early career imaging scientists, by giving them a jump start and positively influencing the success of their careers. With access to teaching materials, a structured training model, and support from mentors and peer networks, they were able to advance and become course faculty, train the next generation, and inspire others in their research communities.

Marcela Diaz participated in the MLMC-TtT-2023 course, developed and organised two courses in Montevideo (2024 and 2025), and was a member of the course faculty in the LatLM-TtT course. In terms of the TtT model, her participation in the MLMC TtT directly resulted in her being able to train 34 course participants in Uruguay and 18 in Argentina (Table 1). A key aspect of Marcela's success was the support from mentors in designing and running her first independent course. It is important when moving from a trainee to a trainer to have proper mentors in place to support course design and delivery. In reflecting on her experience, Marcela stated: *'Participating in the LatLM-TtT course was an enriching experience both personally and professionally. I could not have anticipated its far-reaching impact when we began organizing the event. It deepened my understanding of the power and influence of networks on community growth. What I enjoyed most was sharing my personal work experiences with colleagues, exchanging opinions, and discussing different perspectives. After the event, I am eager to continue on this path of helping other colleagues*

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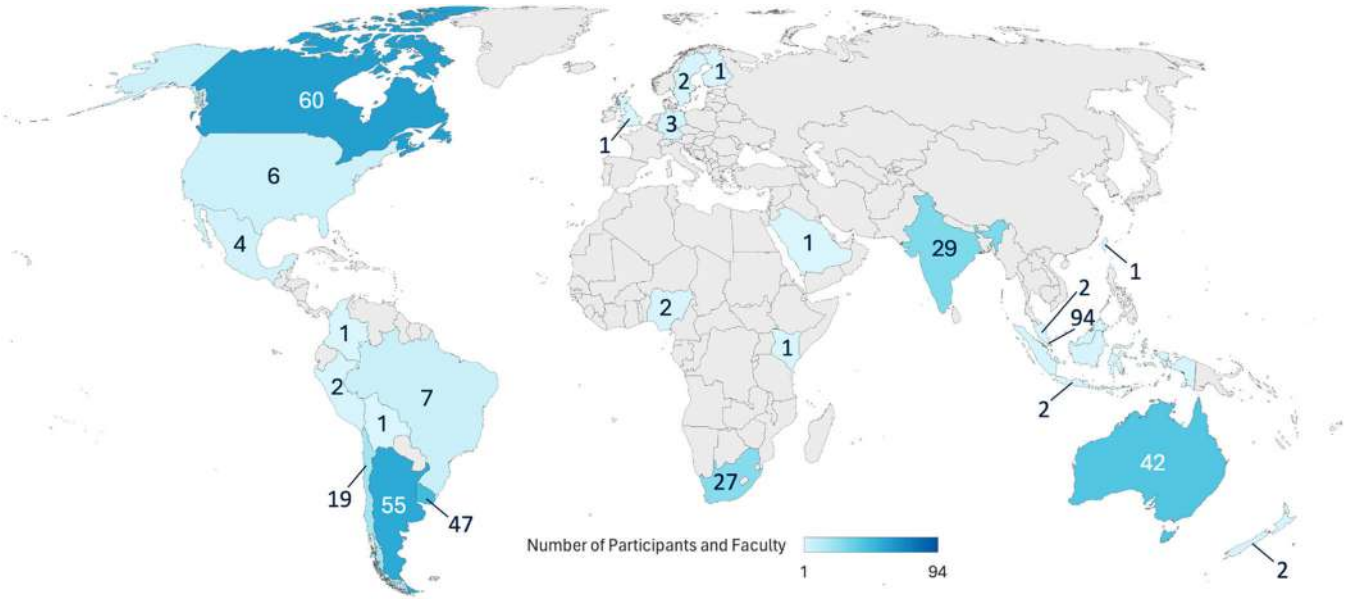

FIGURE 1 The global train-the-trainer network represented across the globe as numbers of participants and faculty who participated in the three TtT courses and eleven second-generation training courses.

develop their own workshops and expand this burgeoning network where we can all support one another'. More details of her journey are provided in her Nature Careers article.[6]

Andres Rossi was the main organiser and host for the LatLM-TtT course and, since then, has been a faculty member in the CFMO course in Montevideo and has organised two courses in Argentina (Table 1). Andres recruited Marcela and several other course faculty who were participants in the LatLM-TtT course to deliver the CFMO in Buenos Aires in August 2025. This course trained 18 participants. In reflecting on his experience, Andres stated: *'The TtT [course] allowed me to overcome the activation threshold for conducting microscopy training in our own environments. As microscopists and early-career imaging scientists, we are constantly training and gaining experience, but teaching requires a different skill set. The TtT [course] gave us the tools—a set of ready-made materials and complete guidance, from logistics to certificates—that empowered us to run courses independently. Just a few days after completing the program, we learned of an isolated institute in a remote region of Argentina with a confocal microscope sitting practically unused. We immediately applied what we had learned and organized the first training cycle with a new team of instructors from different local imaging services. The success of this experience motivated us to continue, leading to the launch of the "Fundamentals of Optical Microscopy" course series in Argentina, joining the regional initiative pioneered in Uruguay'*.

Marcela and Andres have taken on leadership roles with LABI as co-chairs of the training & education working group along with Victoria Repetto.

Naomi Okugbeni participated in the LatLM-TtT course and soon afterwards worked with Caron Jacobs as a faculty member for the Cape Light Microscopy Course (CLMC) where she was involved in training 19 participants (Table 1). In addition to coaching and support for the delivery of select lectures, Naomi and Caron used the TtT experience as well as an understanding of local research contexts to develop appropriate hands-on practical sessions to complement the lecture content. Naomi is now a working group lead for the training & education working group of the Africa BioImaging Consortium (ABIC). In reflecting on her experience, Naomi stated: *'This program [LatLM-TtT] has been instrumental in shaping my approach to microscopy training. Through this experience, I gained valuable insights into the specific challenges researchers face in microscopy, particularly in applying imaging techniques to complex biological questions. Additionally, I was able to incorporate some of the lecture materials from the TtT initiative into my teaching at the Cape Light Microscopy Course, which greatly enriched the session and helped provide a structured learning experience for the participants. This experience has further motivated me to develop a focused workshop at my institute on Live Cell Imaging of Infectious Pathogens and Host-Pathogen Interactions. I look forward to expanding this effort and contributing further to microscopy capacity-building'*.

Rajan Singh participated in the Australia TtT microscopy course in November 2025 and quickly applied what he had learned by running a microscopy course in March 2026 in India (Table 1). He also used what he learned to restructure microscopy workshops at

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his Core Imaging Facility. He introduced a clearer lecture flow, interactive discussions, and guided data analysis sessions to help participants not only learn imaging techniques but gain confidence using them in their own research. He is also actively involved in running courses and workshops with India BioImaging (IBI). In reflecting on his experience, Rajan stated: *'Participating in the TtT program at the University of Melbourne transformed the way I think about scientific training. Beyond technical instruction, the program emphasized clarity, structure, and learner-centered teaching, showing how complex imaging concepts can be made accessible and engaging for young scientists. When I returned to the Core Imaging Facility at Shiv Nadar University in India, I was inspired to restructure our workshops to include clearer lectures, interactive discussions, and guided data analysis so participants gain both skills and confidence in applying imaging technologies to their research. Just as important was the sense of global community among imaging scientists, reinforcing that when we train with purpose and share knowledge openly, we help build confident researchers and stronger scientific communities'*.

The critical mass of researchers who need microscopy training is immense; technologies continue to rapidly evolve and advance, so there is an ongoing demand for experienced trainers. This project has demonstrated the clear need for continued editions of the TtT courses, including the development of programmes for advanced technologies and applications. The framework is ready to be extended to other microscopy training areas, such as live imaging, super-resolution microscopy, spectral imaging, and Fluorescence Lifetime Microscopy (FLIM), to name just a few. To understand the impact of the programme and build in continuous improvement, plans are underway to keep robust data, track the impact on participants, and track course offerings and microscopy-based research outputs.

5 | PROJECT CHALLENGES

Developing and running international TtT courses has its challenges. One challenge was deciding who to accept into the course as a participant. All of the courses had significantly more applicants than could be accommodated. Criteria for acceptance focused on answers to questions in the course application focused on past microscopy experience, what they hoped to learn from the course and how they would apply what they learned when they returned from the training. For maximal impact, preference for course acceptance was for imaging scientists early in their career who were already running or planning to run training courses. Imaging scientists working in individual laboratories who had a role in training their laboratory members in microscopy were also selected. A big challenge was many course applicants had a tremendous amount of experience and had developed their own training materials. These applicants were better suited as course faculty. A future goal of the project will be to address this by having open calls for course faculty for new TtT events. This will be more inclusive and should significantly expand access to training materials and build a diverse network of expert microscopy trainers from more institutions and regions of the world.

Another challenge of the project has been how to effectively share, expand, and customise the teaching materials and ensure proper credit for the project and content creators. Plans are underway to work as a community to determine and realise the best way to do this. The GBI training and education working group and global partners will work together towards this end, including work on an international handbook for course development, organisation and logistics to expand on existing resources.[7,8]

This TtT framework is also a robust model that can be extended to other technology areas, such as existing initiatives for bioimaging analysis training.[9] The creation of additional global communities of expert trainers will ensure researchers have access to the technologies and expertise they need to accelerate scientific discovery and innovation. A challenge will be what area to expand into first? A practical answer to this question may depend on who has the time and resources to develop and run a TtT course and what subject areas are they interested in developing. The project is actively looking for funding opportunities across the globe so that this next step can become a reality.

6 | RUNNING TtT COURSES IN THE FUTURE

Training in advanced technologies remains an important global need, and the scientific community cannot afford to delay action while waiting for 'perfect' programmes to emerge. As G.K. Chesterton famously wrote, *'If a thing is worth doing, it is worth doing badly'*. In other words, the need for training is too urgent to wait until courses can be delivered flawlessly, making a sincere and thoughtful effort is far better than doing nothing at all. Practical models already exist to expand access: for example, the LABI Training and Education Working Group will run a hybrid microscopy theoretical training that will be held in person in Uruguay with live streaming to participants across Latin America during the CFMO in May 2026. Following the theoretical training, participants will have the option

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to participate in hands-on microscopy training at imaging facilities in their regions (e.g. Argentina, Brazil, Uruguay). This model is both democratic in that it reduces the need for extensive travel funding and green because it reduces carbon emissions due to the reduced need for extensive travel. It also empowers regional imaging facilities to gain training expertise, offer hands-on training to local course participants and build their professional network.

For a successful course, start planning early (at least 6 months ahead), put together a solid course logistics team and faculty who are expert in the topic area, plan to meet frequently, divide up tasks and set deadlines. Have a course application stage to ensure selection of the ideal participants who will get the most out of the course and take what they have learned back to their imaging community. Advertise broadly using resources such as Microscopy Database, Focal Plane and the Confocal Listserv. Plan the course based on the budget available. For example, if significant funding is not available then plan a half-day or 1-day event locally or run a virtual or hybrid event. For more tips on planning courses keep an eye out for the GBI Training and Education working group handbook.

Future TtT initiatives, including the next edition at the Indian Institute of Technology Hyderabad in January 2027 in partnership with IBI, will also integrate more formal pedagogy training so that instructors can adopt modern evidence-based teaching practices, address diverse learning styles, and create interactive, engaging learning environments. For example, during the Australia TtT programme, participants emphasised the importance of evaluating training effectiveness and the ability of trainees to apply what they have learned; this effort would benefit from coordinated global approaches that expand existing resources such as MyScope from Microscopy Australia (https://myscope.training/) rather than developing new tools from scratch. Planning for the next TtT course includes bringing in other types of training, for example, how to effectively train about widefield fluorescence microscopy within a 1-week course (current module), versus small group half day training, one-on-one training for a specific project within a facility or virtual training. In this case, the training content may be similar but the method of delivery and interactions with course participants could be optimised depending on the time available, biological application and the number of participants. Efforts are underway to ensure broad access to TtT resources through a structured database and web interface. In the interim, interested users are encouraged to contact the corresponding author to obtain materials, which are shared under a Creative Commons license.[10] Ongoing collaboration with the international community and training and education working groups will support the development of mechanisms for community contributions, ensuring the resource continues to grow while maintaining its relevance and currency.

Keep in mind that the gold standard is in person hands-on training experiences. Therefore, extending technology training with TtT courses requires sustained support from national and international bioimaging communities and funding sources to enable trainers to travel, cover course expenses and provide mobility funding so that participants, particularly those from the Global South, can attend training programmes. Democratic access to fundamental and advanced technologies and training and education is critical for research excellence.[11]

For those in the international light microscopy community interested in getting involved, the most crucial step is simply to begin. Training programmes do not need to start large or perfect. Small efforts, built locally and refined over time, can have meaningful impact. Those interested in developing courses should draw on the experience and resources of the growing global TtT community. Collaborate across facilities, networks, and countries rather than working in isolation. By sharing materials, approaches, and lessons learned, the community can collectively accelerate the development of effective technology training worldwide and accelerate scientific discovery and innovation.

AUTHOR CONTRIBUTIONS

Mar García-Ferrés: Formal analysis; visualisation; writing—original draft; writing—review & editing. **Amy L. Bottomley**: Data curation; formal analysis; investigation; writing—review & editing. **Louise Cole**: Project administration; writing—review & editing. **Marcela Díaz**: Investigation; methodology; project administration. **Neftali Flores-Rodriguez**: Editorial contributions/endorsement. **Gleb Grebnev**: Funding acquisition; project administration; resources. **Adan Guerrero**: Writing—review & editing. **Caron A. Jacobs**: Conceptualisation. **Laurence Lejeune**: Project administration; writing—review & editing. **Xiaoxiao Ma**: Writing—review & editing. **Leonel Malacrida**: Conceptualisation; supervision; writing—review & editing. **Paul J. McMillan**: Funding acquisition; project administration; supervision; writing—review & editing. **Alison J. North**: Supervision; writing—review & editing. **Cameron J. Nowell**: Resources. **María V. Repetto**: Investigation; project administration. **Alejandra M Ross Beraldi**: Data curation; formal analysis; investigation; writing—review & editing. **Andres Hugo Rossi**: Data curation; project administration; resources; writing—review & editing. **Lía I. Pietrasanta**: Conceptualisation; project administration; writing—review & editing. **Rajan Singh**: Writing—review & editing. **Claire M. Brown**: Con-

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ceptualisation; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; supervision; writing—original draft; writing—review & editing.

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