

The Expansion Microscopy User Group: Cultivating a new scientific community

Having first been put forward as a sample preparation tool in 2015, expansion microscopy is something of a ‘new kid on the block’ in scientific research. The process, involving the physical enlargement of a biological sample by the introduction of a polymer network - thereby enabling the analysis of small structures with standard microscopes – has numerous applications in medical research and other fields. Aware of its enormous potential, scientists across the world are now experimenting with the technique. But how can this growing body of knowledge be harnessed effectively?, and how to spread best practice - alerting budding expansion microscopists to the many pitfalls of the preparation process along the way?

Over the last year, discussions within the light microscopy community in North America have given rise to the Expansion Microscopy User Group – organised by [Canada Biolmaging \(CBI\)](#) and [Biolmaging North America \(BINA\)](#), and now including a counterpart initiative based in Australia (in conjunction with the [University of Melbourne](#)). The initiative receives administrative support from the RMS – overseeing the registration process for meetings and correspondence with attendees.

Virtual meetings are hosted by Canada and Australia to offer workable meeting times for everyone using the emerging technique, right across the globe. The discussions are recorded and uploaded to YouTube, enabling all attendees to gain insights from community members attending both meetings. Alongside this, a growing database of information and online discussion is collated

and made available to members of the group. The group currently consists of 102 members from 23 different countries.



Claire Brown

Among the Canada-based organisers is Associate Professor Claire Brown, Director of the Advanced Biolmaging Facility (ABIF) at McGill University.

She explains: “We wanted to get into expansion microscopy, and I didn’t have any background in the technique myself. In that situation people will traditionally go to the relevant papers explaining a particular technique, and then troubleshoot in the lab. That works eventually, of course, but it isn’t very efficient. So looking at all the existing bioimaging networks that I have been actively involved with, it made perfect sense to set

up a user group for expansion microscopy, within that framework.”

“I think about five or six years ago I began to realise how powerful my professional network is. I realised my scientific knowledge is valuable but if I don’t know the answer to a question or how to apply a new technique, I do know someone I can contact who can answer the question and provide a springboard, pointing me to the best resources and collaborators. I also hope people in my network will reach out to me if I have knowledge or information they need. This way we can really learn from one another and put that knowledge into practice, accelerating scientific progress.”

Natalie Woo, a Master’s Student at McGill working under Claire’s supervision, is leading the



Natalie Woo

experimental efforts to establish the expansion microscopy technique in the Brown lab with plans to disseminate it to the broader McGill community through the ABIF. She sees how the impact of the COVID-19 pandemic

and widespread acceptance of the virtual meeting platform has paved the way for the success of online user groups such as theirs.

Natalie says: “It definitely helps that we are all really used to this way of doing things, so we can meet very quickly and effectively. I think before, there was maybe a bit of a tendency for people not to make the effort to come to virtual meetings, with a preference for in-person meetings where there were some drinks and snacks on offer!”

The inaugural Expansion Microscopy Group Meeting took place in June 2022, and proved to be a huge success. So much so, in fact, that the follow-up interest from microscopists working across the globe posed a new problem for the organisers.

Natalie explains: “At first, we were wondering

if people would even be interested in logging on, but we had so many emails from people around the world that we realised we couldn’t come up with a suitable time for everyone to meet regularly. So we decided that we should have a counterpart meeting in a different time zone, and that is where our colleague, Gabriela Segal at University of Melbourne in Australia stepped in. Meetings are run one month on time that is convenient for the Americas and Europe, and the next month for the Asia Pacific. This allows us to stay in parallel with one another as well as moving forward together as one group. The meetings are now well established, but we know there are still a lot of people we haven’t reached, and we want to make this as global and international as possible.”

Claire adds: “We are currently building a database of resources - for example, protocols, recommended reagents, key publications and a discussion board. We are trying to make everything as accessible for people as possible.”

Speakers and attendees at the meetings, and those contributing to online discussions, come from a very wide range of backgrounds and levels of experience. It’s one of the strengths of the growing community, according to Natalie.

She says: “There are a lot of people doing expansion microscopy who all have their own experiences, and that is the beauty of it. We want to bring in speakers of all levels of experience, as long as they want to talk about the research.”

Another recurring theme of the talks given so far, is an openness and willingness on the part of the speakers to shine a light on ‘what didn’t work’ in their experiments. In an emerging field, the opportunity to hear such cautionary tales can help researchers rapidly adopt the technology.

Claire explains: “The whole idea is to help people get started faster, and I have been really impressed that the experts have been so willing to help and share, and get other people going.

"If you're invited to a seminar, it's natural to want to showcase all your successes, but it might be more useful for the community – and really add value - to talk about things that didn't work and how you solved these challenges. There is a real need to change the culture around science and encourage researchers to talk about challenges and difficult experiments, and with the national and international bioimaging community, I think there is a real opportunity to do that."

Natalie adds: "With this technique there are a lot of little things that can go wrong. For instance, there's a photo-bleaching technique I have been trying out recently, and without some of the insights I have gained from being part of this group, I wouldn't have made the progress I have made."

Still less than a year old, the group has already made huge strides in a short space of time, but what's

next on the horizon?, and how might things look in another 12 months?

Claire says: "I think we are still in the exploratory phase. Right now everything is sharable in the group, but as things grow, the question of how to make information available to the broader research community is something we're looking into."

"This whole experience has been such a great way to see how a young student like Natalie can successfully start her master's project with the expansion microscopy user group acting as a real springboard. Our hope is that many members of this user group will have a similar experience and we will move scientific discovery forward further and faster through this vibrant community."

Read more about the [Expansion Microscopy User Group](#)

Owen Morton

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