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Sharing experiences and expectations can help scientists to create a lab handbook.

LAB HANDBOOKS IMPROVE RESEARCH CULTURE

The documents, which lay out a lab's ethos and practical guidelines, are becoming increasingly popular in the academic community. **By Amanda Heidt**

As a neuroscience postdoc at the MRC Laboratory of Molecular Biology in Cambridge, UK, Letizia Mariotti was part of a core group of friends navigating the early steps of their careers. Even after the four friends scattered to academic posts across Europe they continued to meet virtually to talk through the challenges of launching a laboratory.

It quickly became apparent that their duties as principal investigators far exceeded the bench skills that they'd learnt as postdocs. Mariotti, for example, struggled with the paperwork needed to hire her first international postdoc at the Institute of Neuroscience of the National Research

Council in Padova, Italy. And one of her friends discovered that researchers in France embrace formal academic titles in ways that they hadn't experienced in the United Kingdom. "You could never predict when something would happen that you'd never had to think about before," Mariotti says.

The group collectively recognized that labs need a document that, rather than simply laying out methods and bench protocols, focused on culture and ethos: everything from where to access on-campus resources to intangibles such as a group's shared mission and codes of conduct.

In 2024, Mariotti and her friends held the first of two workshops dedicated to creating

such a manual – an effort that ultimately kick-started the Starting Aware Fair & Equitable (SAFE) Labs initiative. The resulting SAFE Labs handbook, now freely available online, is one of a growing number of resources dedicated to producing lab handbooks and making academia a more-supportive space. As researchers, institutions and funding agencies take notice of them, these documents are encouraging a collective shift away from unrealistic, and sometimes unhealthy, expectations in academia towards those that prioritize cohesion and support.

"These handbooks are for anyone who wants to create a positive and transparent lab space," Mariotti says. "The interest and

overall positive feedback we've gotten really attests to how much this kind of support is needed."

The core tenets

Exactly how many labs, worldwide, have adopted a lab handbook is unclear, but anecdotally, sources say, interest is growing — partly thanks to the broader recognition that academia is due a change.

Scientists across the career spectrum are burnt out, and people are leaving careers in science, technology, engineering and mathematics in startling numbers, particularly those from under-represented groups.

In 2025, the UK Research Excellence Framework announced its intention to focus more heavily on initiatives that "enable positive research culture" — a move also shared by funders such as the biomedical charity Wellcome in London. Institutions have taken notice, too. The University of Liverpool and the University of York, both in the United Kingdom, have held workshops on lab handbooks. And University College London supported Mariotti's workshops, allowing her group to survey researchers from across Europe to learn more about the challenges that researchers are facing while running labs in different countries and disciplines (E. Doná *et al.* Preprint at bioRxiv <https://doi.org/qqdp; 2025>).

At its core, a lab handbook should lay out the research focus and expectations for other members of the lab. Typical elements include which platforms a group uses to communicate, codes of conduct and harassment policies, and what students should anticipate in terms of expectations, mentorship and career development.

Several scientists say that reflecting on their own experiences as students helped while creating their own handbooks. Leonardo Uieda, a geophysicist at the University of São Paulo in Brazil, recalls that his PhD lab lacked a sense of shared identity. "It was always each student for themselves," he says. And although his experience was positive overall, he adds, "I do feel I missed out on the benefits of a cohesive group".

For his lab handbook, Uieda worked with his team to set shared goals and to outline expectations. Students in his lab needn't stick to conventional working hours, for instance, but they should attend weekly meetings and department seminars. He set different priorities for students and staff in the lab, and laid out a clear authorship policy for publications. "That's one of the places I've seen the most conflict in my career, so I try to cover that really early on," he says.

Other academics embraced lab handbooks after experiencing a conflict that they wished they'd handled differently. Ben Marwick, an archaeologist at the University of Washington in Seattle, is committed to the concept of

'open science', for example, but acknowledges that following best practices to make science transparent and accessible to everyone can take time. At one point, he found himself on the PhD committee of a student who didn't adhere to such practices. Bringing the student's data into alignment with Marwick's policies created a lot of extra work for them, Marwick says, including uploading their code into a new repository and annotating it so that it could be replicated.

"Ultimately, they weren't sure if it was worth having me on their committee," Marwick allows, noting that he could have avoided the issue if he had been clearer about his expectations or if he'd asked the student to complete a statement of expectation before Marwick joined his committee. Open science now forms a core part of his lab handbook, and Marwick says that sharing the document with potential students and collaborators has helped to rule

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out projects that don't align with his values early on. "The longer I have it up, the more ways I've found it to be useful in navigating all kinds of professional relationships," he says.

Making them your own

Beyond baseline expectations, lab handbooks might also contain sections that are specific to your research discipline. Some disciplines require field work, for example, or rely heavily on particular types of data. Laying out clear guidelines about how lab members should conduct themselves, and how data should be handled and organized, can prevent future headaches.

Sara Perry, an archaeologist who specializes in public engagement at University College London, has travelled to Tanzania, Egypt and Turkey for field work, and often takes students with her. Some young adults have little experience interacting with cultures outside their own, she says, and missteps can cause lasting damage to sensitive partnerships. She has spent a lot of time developing a field work code of conduct, which she walks through with her team before any research trip.

"Beyond things like maintaining professional boundaries and prioritizing the communities we work in, it's also a chance to talk through the realities of field work," she says. "I think it's important to acknowledge that it isn't always fun. No one should feel unsafe, of course, but students should go in knowing that this work can be intense, emotional and tiring."

In his lab at University Hospital Frankfurt in Germany, cancer biologist Konstantinos

Kokkaliaris works with thousands of tissue samples and digital images, which feed into a complicated system of storage and analysis pipelines. In developing his lab handbook, Kokkaliaris tried to think of the types of question a person joining the lab might have so that he could get them up to speed more quickly. "It's hard when you're joining a new lab and you don't have a sense of how things work," he says. "I've really tried to build something that is easy for anyone to add to, maintain, and use so that we can keep our work reproducible," he says.

Keeping them relevant

Although it's certainly possible for a principal investigator to write a handbook on their own, there are now so many resources available online that it's rarely necessary to start from scratch. The researchers that *Nature* spoke to built them as Google documents or dedicated pages to the guide on their lab website, but others have created them as GitHub repositories with underlying code. Some researchers update the documents periodically, whereas others favour a more organic approach, adding to them as new situations arise. And some principal investigators prefer to be a conduit through which all changes pass, whereas others keep the document open for anyone to edit.

In 2025, Ines Hahn, a neuromuscular cell biologist at the University of York, and her collaborators released a series of resources for academics who want to compile a lab handbook but don't know where to start. For her own handbook, Hahn found it most helpful to organize a meeting with her group in which they walked through a series of prompts to jumpstart discussions. These included 'what does good science mean?' or 'how would an ideal lab group interact with one another?'

Benjamin Tendler, a neurophysicist at the University of Oxford, UK, participated in a similar process in his current lab. The discussions were eye-opening, he says. "They definitely gave me clearer insight into what is considered important for some people, which may not necessarily be considered important for me," he says.

And handbooks can strengthen accountability, adds Mariam Aly, a cognitive neuroscientist at the University of California, Berkeley. Aly began her lab-handbook journey in 2016. Ten years on, the document continues to shape her as an individual and mentor.

"I wrote that I expect my students to approach their work with passion and pride, and that they should be honest when they make mistakes," she explains. "If I fail to meet those expectations, then I let my students down, and so it's become really important that I live by the code I've set down."

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