

Event summary: Brainstorming a Canadian Reproducibility Network to improve research rigour and reproducibility

Robert Thibault, Noémie Aubert Bonn, Gracielle Hicino, Elizabeth Phillips

The first community discussion about the Canadian Reproducibility Network (CaRN) was held on March 10th, 2022. We posted [an open invitation on Twitter](#) calling on anyone involved in the Canadian research ecosystem to participate in an online brainstorming session.

Thirty people participated. They ranged in career stage from undergraduate to faculty and represented diverse stakeholders including students, researchers, funders, and learned societies. While many participants were based in the health sciences, others worked in ecology, psychology, and neuroscience.

The event aimed to solicit diverse inputs to explore the formation of the Canadian Reproducibility Network. We had two overarching goals:

1. **To connect** researchers and other stakeholders in research who want to improve the Canadian research ecosystem.
2. **To crowdsource** input from a range of researchers and stakeholders in research to help form a Canadian Reproducibility Network that addresses the needs of our research community.

The event began with a presentation from the co-founder and chair of the UK Reproducibility Network (UKRN), Prof. Marcus Munafò. His presentation highlighted the advances this network has made in the UK and how other countries are joining the effort. [The presentation is available here.](#)

Participants then divided into breakout rooms to discuss one of three broad topics:

1. Education & training (in Open Research, rigour, reproducibility, etc; across career stages)
2. Open Scholarship (e.g., open data, open code, research data management, preregistration)
3. Assessment (e.g., of research, researchers, funding applications, journals, hiring & promotion)

The following paragraphs summarize the discussion content from each breakout room.

The **Education and Training breakout room** framed their discussion with two overarching questions: Who will be the agents of transformation toward a reproducible

research environment in Canada, and who should be trained in reproducible and transparent research practices. Participants raised the importance of implementing a training strategy that uses inclusive language and includes indigenous people. They acknowledged the need for distinct training strategies for different strata of transformation agents, including undergraduate and graduate students, senior researchers, and academic staff. On the one hand, students are often early adopters and can carry the transformation forward as they become senior researchers. On the other hand, senior researchers and academic staff provide the support and training for students and early career researchers. The group highlighted training initiatives that are already running in Canada, such as the [Open Science class for undergraduate biology students at the University of British Columbia - Okanagan](#) and the Living Data project, which provides [Open Science training for graduate students](#). International initiatives such as the [Framework for Open and Reproducible Research Training \(FORRT\)](#) and [Open Life Sciences](#) were also discussed. Participants proposed that training should cover statistical rigour, reproducible design of animal studies, [FAIR](#) and [CARE](#) principles, and reviewing each stage of a research project. The group acknowledged the importance of collaborating widely to achieve these goals. For example, by partnering with journals, funders, and interest groups in statistics and information sciences to align incentives.

The **Open Scholarship breakout room** discussed the involvement of government, funders, and early career researchers. The group touched on initiatives from the Government of Canada, including policy documents from the Office of the Chief Science Advisor such as the [Roadmap for Open Science](#) and the [Departmental Open Science Action Plans](#). Participants who represented funders presented their positions on open science, shared the policies of their organizations, and weighed interest in supporting a Canadian Reproducibility Network. Participants discussed platforms and groups which are currently supporting open access and reproducible research, including [Research Space](#) and the [Digital Research Alliance](#). The conversation then shifted to how we can better involve PhD students and Early-Career Researchers (ECRs) in the movement to improve research—what do they need and how can we support them? This led to a discussion of broader issues, including the need to establish clear goals for CaRN and how to best take an interdisciplinary and inclusive approach. Lastly, the discussion focused on Open Scholarship. Although Canada has some infrastructure and policies for Open Scholarship, we lack an overarching culture that rewards research transparency.

The **Assessment breakout room** recommended that research assessment form an integral part of CaRN and extend beyond reproducibility to also include responsible and rigorous research. Participants highlighted the need to create an inclusive network with cross-disciplinary appeal where everyone feels they have a voice and the ability to provide meaningful contributions. They discussed the need to fund the network and a participant representing a funder suggested that CaRN collect data to demonstrate the

importance of reproducibility. Participants pointed out that current assessment metrics are not evidence based and can hinder quality research. Moreover, they mentioned that current assessment methods are deeply ingrained in our research culture and that updating assessment exercises would require a substantial change in the perspectives and priorities among stakeholders. The breakout room concluded that CaRN could help raise awareness and facilitate a collective voice to mobilize improvements in Canadian research.

Overall, there was enthusiasm for a coordinated approach. Whereas, some participants worked at institutions with a clear dedication to improving research, other participants could not identify initiatives at their institutions related to Open Research. Across the breakout rooms, participants agreed that CaRN's purview should extend beyond reproducibility and include research improvement broadly.

We hope this brainstorming session serves as the beginning of a larger conversation on improving research culture and Open Research practice in the Canadian context.