Community-driven online initiatives have reshaped scientific engagement

James P. K. Armstrong1✉, Irene de Lázaro2,3✉, Natalie J. Kirkland4,5✉, Wilson Poon6,7,6,8 and Shrey Sindhwani2,9

Scientists have reacted to COVID-19 restrictions by organizing virtual seminars and journal clubs to maintain engagement. We reflect on our experiences and lessons learned from organizing such initiatives and highlight how, far from being temporary substitutes of in-person counterparts, they can help foster more diverse, inclusive and environmentally friendly scientific exchange.

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As an independent initiative, we were able to accommodate this change in scope and fully support these discussions.

Furthermore, we strongly advocate free-to-access, accessible science and are proud to have attracted more than 1,000 registrants across six continents (Fig. 1c). We have welcomed attendees not affiliated with any scientific institution, with speakers frequently inviting friends and family to watch their talks. This has created an openness about the events, and attendees have commented on how it is less intimidating to ask questions online than in-person. We regularly attracted more than 100 attendees per seminar in the early series but, following the easing of restrictions and reopening of laboratories, it has been challenging to maintain the high attendances required for effective engagement. Therefore, after 84 seminars, we concluded this series in September 2021.

**Nanomedicine Journal Club**

This online journal club started in March 2020 and was initially intended for a small group of affiliated laboratories. However, with encouragement from the online nanomedicine community, it evolved into a public series that continues to run twice a month and gives trainees an opportunity to present their own work or studies conducted by others. Three goals were established at the outset. First, to allow speakers to select seminal papers to re-evaluate evidence of key concepts that have shaped the field and address fundamental gaps in knowledge. Second, to expose our audience to the latest work involving technologies and techniques that are not commonly used in nanomedicine but could add significant value. With the excitement around nanoparticle-based COVID-19 vaccines, we included studies on vaccine development, immunological assays, genetic engineering and molecular biology techniques. We hope that this scope broadens our understanding of future nanomedicine studies and enables researchers to effectively communicate with the public. Third, we want to have rigorous discussion after each presentation, delving deep into the results and methodology that support the claims.

Traditional journal clubs comprising one or two research groups can often become entrenched in similar viewpoints. The broad knowledge base and dynamic participation of individuals from different laboratories (Fig. 1f) has enriched our discussions. To date, the journal club has featured more than 35 presenters from across North America, Europe and Asia, and we will continue
as long as there is interest and active participation from the community.

Lessons learned and moving forward

Community-driven online initiatives have played an important role in maintaining scientific engagement during the COVID-19 pandemic. They have enabled scientists, especially early-career researchers, to build networks that are valuable for career progression, to find jobs and to learn about different research laboratories. More generally, they have provided a sense of community in a time when many have faced isolation. These initiatives have successfully adopted the regularity and format of traditionally small events (for example, research group journal clubs and departmental seminars), while attracting global audiences. This geographical diversity has enriched scientific discussions, and online engagement has removed many of the barriers to participation for those with caring responsibilities, disabilities or availability and financial restrictions. Indeed, it may be argued that such initiatives have not only maintained engagement but broadened engagement. Notably, the online format enables this increase in breadth while minimizing travel. The resulting, ameliorating effect upon climate change is another considerable benefit.

We hope that such initiatives are not seen as temporary substitutes, in place only for the duration of the pandemic. Instead, we believe that they can reshape scientific engagement to make it a more diverse, inclusive and environmentally friendly activity. However, the increasing offer of online events, video-conferencing fatigue and the progressive return to normal working patterns can pose challenges to participation. Thus, a key question is how these initiatives can evolve to provide continued engagement beyond the pandemic. Events that existed in-person before COVID-19 might benefit from a hybrid model that allows presenters and attendees to participate either in-person or virtually. In all cases, tuning the frequency of events may help to maintain a regular, but not exhausted, audience. We also advocate the use of social media to reach a large, diverse audience, outside of institutional or society mailing lists. Finally, financial support from funders would greatly aid event logistics, in particular, by enabling the use of licensed webinar platforms that provide full cybersecurity options.

Overall, we are delighted with the engagement that community-driven online events have fostered during the COVID-19 pandemic and hope that the steps outlined above can help to incorporate many of its positive aspects in the new normal of scientific exchange.

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Acknowledgements

I.d.L. acknowledges the Topics in Bioengineering organization team at the Harvard John A. Paulson School of Engineering and Applied Sciences for their contributions running the seminar during the COVID-19 pandemic, as well as invited speakers for their time and enthusiastic participation. J.P.K.A. and N.J.K. acknowledge B. Aguado and S. Quackenbush, who have helped to organize and co-chair several Virtual Seminars in Biomedical Science, as well as the speakers that have contributed to the success of the series. W.P. and S.S. wish to acknowledge all presenters and journal club attendees for their participation and continued support.

Competing interests

The authors declare no competing interests.

Publisher’s note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

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