



# Evolution of journal clubs: fostering collaborative learning in modern research

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Journal clubs have been a staple in scientific communities, facilitating discussions on recent publications. However, the overwhelming volume of biomedical information poses a challenge in literature selection. This article provides an overview of journal club types and their efficacy in training potential peer reviewers, enhancing communication skills, and critical thinking. Originating in the 19th century, journal clubs have evolved from traditional in-person meetings to virtual or hybrid formats, accelerated by the COVID-19 pandemic. Face-to-face interactions offer personal connections, while virtual events ensure wider participation and accessibility. Organizing journal clubs demands effort, but it has several benefits, including promoting new publications and providing a platform for meaningful discussions. The virtual CardioRNA J-club experience exemplifies successful multidisciplinary collaboration, fostering international connections and inspiring new research. Journal clubs remain a vital component of academic research, equipping senior researchers with the latest developments and nurturing the next generation of scientists. As millennial and Gen Z researchers join the scientific field, journal clubs continue to evolve as a fertile ground for education and collaborative learning in an ever-changing scientific landscape.

**Keywords** Journal clubs • Scientific learning • Debate • Training • Soft skills

## Introduction

Journal clubs (J-clubs) are regular scientific meetings aiming to discuss recently published papers. Nevertheless, the flood of information in the biomedical field poses a challenge on how to select relevant literature from a multitude of daily publications. With different eyes, J-clubs can be seen as a form of scientific collaboration through which scientists can debate and exchange ideas about new experiments and find out what is new in the world of research. In this article, we aim to provide a clear overview of the different types of J-clubs existing currently and how they are effective approaches in the training of potential peer reviewers while exercising communication skills and critical thinking. Furthermore, we will describe how the CardioRNA J-club experience contributed to a supportive research culture within the consortium, which is an essential component to tackle the increasing complexity of biomedical research.

## Journal clubs: the past and present

The earliest known mention of a 'journal club' was in 1835 by Sir James Paget, a British surgeon, who started a club at St Bartholomew's Hospital in London where medical students could convene to read journals.<sup>1</sup> The 'journal club' in a more formal context was founded in 1875 by Sir William Osler at McGill University in Canada and later at John Hopkins University in Baltimore, USA, in 1889.<sup>2</sup> By the early 1920s, the idea had spread throughout Europe, the UK, and the USA, and J-clubs appeared as a versatile tool not only in the academic learning arsenal but also for healthcare professionals (such as clinicians and nurses). Today, J-clubs have become an invaluable moment in the life of many research teams and an important piece in the puzzle of 'soft skills' required to develop a successful research career (specifically developing critical appraisal skills and improving professional reading habits).<sup>3</sup>

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The COVID-19 pandemic has expedited the transition from the initial in-person (onsite) J-clubs in institutional meeting rooms to an online (virtual) or hybrid (both onsite and online) form.

## Discussion

### Online, onsite, or hybrid?

Each J-club format comes with its own set of advantages and disadvantages (Figure 1). Face-to-face interactions offer a level of personal connection and depth that virtual settings struggle to match. Through direct eye contact, body language, and real-time communication, participants can establish stronger connections and develop meaningful relationships. This high level of participant engagement fosters active discussions and encourages collaborative problem-solving, leading to more effective outcomes. On the other hand, the transition to virtual events has resulted in an increase in attendance and wider dissemination of knowledge. With online platforms, geographical barriers are eliminated, allowing individuals from different parts of the world to participate without the need for travel. This broader reach ensures that valuable information reaches a wider, more diverse audience, fostering greater collaboration and knowledge exchange among researchers. The flexibility of recording and re-watching presentations is a significant advantage of virtual events. Attendees can access recordings at their convenience, enabling them to revisit content, reinforce learning, or catch up on missed sessions. Moreover, online platforms can offer features like closed captioning, screen readers, and customizable interfaces, making the content more inclusive and easily accessible for individuals with

various disabilities. This inclusivity ensures that researchers from diverse backgrounds can engage with and contribute to the knowledge-sharing process. The shift towards virtual formats not only enhances productivity and collaboration but also aligns with environmental sustainability objectives, making it a win-win situation for individuals, organizations, and the planet.

Unfortunately, each format also has its shortcomings. While virtual platforms can accommodate a large number of participants, which is a major drawback of in-person meetings, there may still be technical or logistical constraints that prevent some individuals from joining. For example, internet connectivity issues, access to necessary technology, or time zone differences might hinder participation. Virtual events may face challenges in maintaining the same level of attendee engagement as in-person gatherings. With the ease of multitasking in a virtual setting, participants might be more prone to distractions, leading to reduced attention and interaction during sessions. Lastly, although virtual events attempt to provide networking opportunities, they may not match the spontaneous and informal interactions that occur in face-to-face settings. The lack of physical presence can hinder the development of personal connections and impromptu discussions, making it harder for virtual participants to engage in meaningful networking experiences.

### Does it pay off?

Though the organization and coordination of onsite, online, and hybrid J-clubs do require a significant amount of time and work, this is by no means time wasted as there are several advantages of organizing these sessions, as depicted hereafter. The organizers of a J-club (regardless of

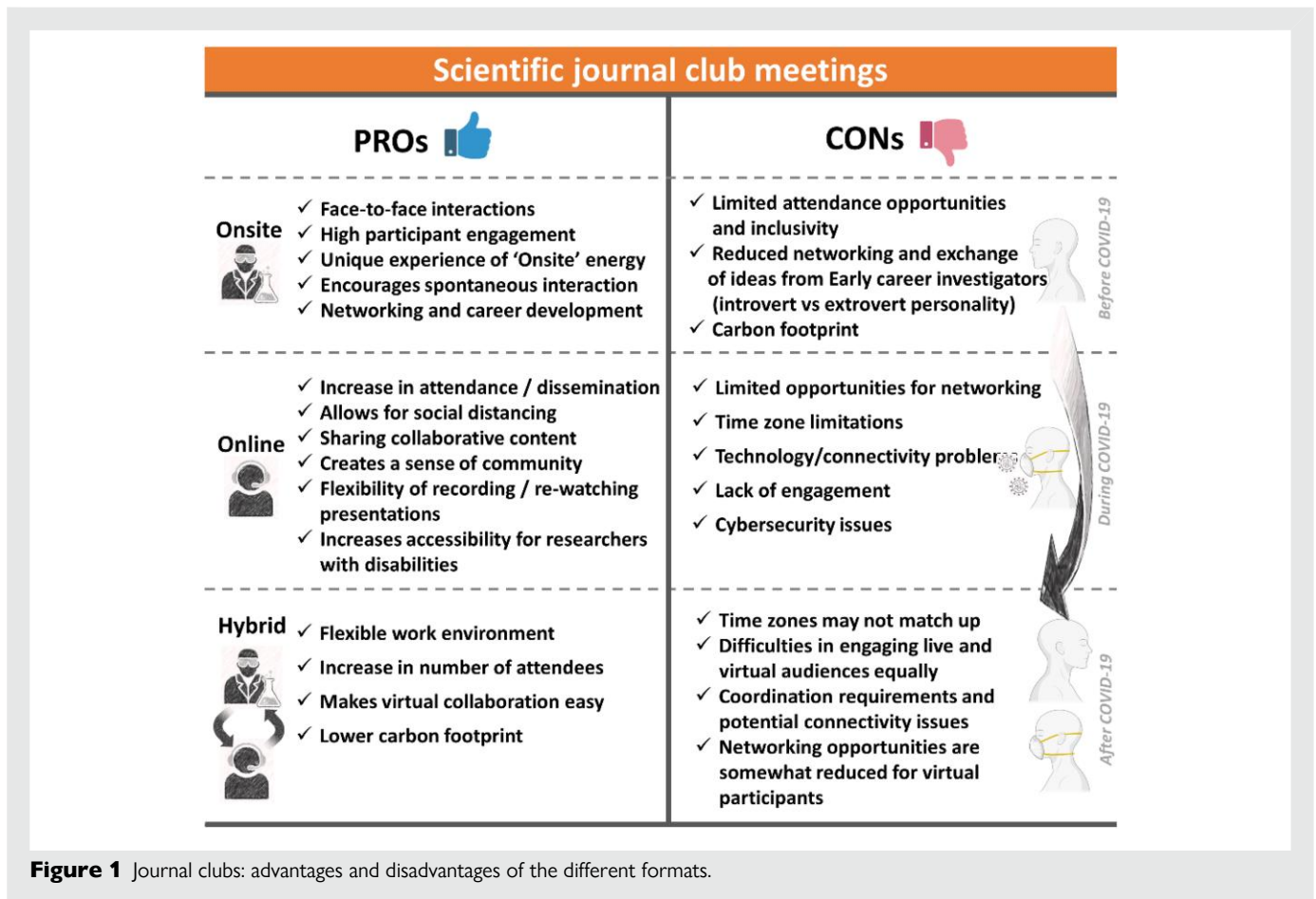


Figure 1 Journal clubs: advantages and disadvantages of the different formats.

its format) will promote and support the dissemination of new publications and also provide the intended audience with a platform and the opportunity to ask questions, share ideas, and learn from peers. An important duty of the organizer is the effective selection and refinement of relevant literature from a wealth of available information while maintaining the reading habits and critical appraisal skills of the attendees. Another critical task of the organizer to ensure J-club success is to send out the publication to be discussed to attendees a few days prior to the meeting to allow time for reading, critical thinking, and preparation of questions or topics of discussion.

While most scientists have experienced the onsite 'canonical' J-clubs, the virtual format of these meetings is becoming increasingly popular. Since the online/hybrid sessions are planned well in advance and generally do not exceed an hour in time, early career investigators (ECIs) can schedule their workday efficiently, as many of them would otherwise be engaged in teaching sessions or in the midst of laboratory work. Although ECI participation in J-clubs is voluntary, it must be strongly encouraged, as 'lack of time', motivation, or lack of experience in critical appraisal are the main reasons why some research students decline to engage in this activity, so important for their career development.

The J-club also serves the speakers as a valuable stimulatory experience for fine-tuning their presentation skills, largely improving their confidence and reducing their inhibitions or shyness when presenting in front of a large audience.

## CardioRNA J-club experience

CardioRNA COST Action (CA17129; [www.cardiorna.eu](http://www.cardiorna.eu)) created a pan-European network of multidisciplinary members including clinicians, scientific researchers, policy makers, and industrial partners, all sharing the collective aim of accelerating the field of cardiovascular transcriptomics by leveraging experimental evidence into translational applications for improving patient outcomes.<sup>4</sup> CardioRNA J-clubs are scheduled monthly to discuss the most recent research from the network and outside the network. Since the 250+ members of CardioRNA COST Action are spread over 36 countries across Europe and in other parts of the world, it was decided to host the J-clubs online, at a pre-determined time and date each month that is suitable for most attendees. A typical J-club session lasts for 1 h and is scheduled on the third Monday of the month, at 3 p.m. CET. The planning and management of the CardioRNA J-club are overseen by a small team of ECIs of the COST Action. The session starts with a short slide presentation by a pre-selected ECI, usually lasting 20–25 min, followed by a ~30-min discussion. During this time, attendees ask questions to the presenter and even propose ways to improve research outcomes. The session is generally moderated by one of the CardioRNA J-club organizers, and priority is given to questions/comment from other ECIs while also ensuring the inclusion of constructive feedback from experienced principal investigators on specific topics. On many instances, we have also invited ECIs from outside the COST Action, who have recently published outstanding scientific articles. This has led to a bi-directional exchange of ideas for future collaborative work both within and outside of the COST Action. Started in June 2022, the CardioRNA J-club recently held its 14th edition on 25 September 2023.

## Learning points

### What does the future hold?

Journal clubs have clearly evolved since the times of Sir James Paget and Sir William Osler. Today, they are a vital component of the academic research trajectory, serving as a useful tool to keep senior researchers up to date on the most recent and relevant developments in their working fields and train the next generation of young researchers.

Active participation in J-clubs can also serve as an invaluable opportunity to ECIs to scrutinize the recent research in their respective domain of interest, in the form of a community-peer review process.<sup>5</sup> While these 'preprint clubs' focus solely on early access manuscripts (preprints), they provide ECIs with the opportunity to participate in the open peer review process but posting their feedback and questions on these preprints to the authors.

Whether J-clubs are organized in an online, onsite, or hybrid format, they continue to encourage impactful communication between researchers to improve research outputs and catalyze further collaborative work. It is clear that an ideal J-club format does not exist, and it can vary across different training programmes. It can still be done onsite, at the level of a lab or department, but it can very well be extended online, at the level of a multidisciplinary collaborative network as exemplified by the CardioRNA experience. With the millennial and Gen Z generation of young scientists bringing fresh perspectives, J-clubs (particularly hybrid/online) remain a fertile area of educational research where participants can develop their communication and critical appraisal skills.

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## Data availability

No new data were generated or analysed in support of this research.

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