How to set up and run an online journal club

John R. Bracht[1]

[1] Biology Department, American University, Washington DC 20016

Correspondence: jbracht@american.edu

Introduction

A well-run journal club is a powerful tool for building both scientific identity and efficacy. It demystifies the process of reading scientific papers while teaching critical analysis skills, and it builds the habit of reading the academic literature. We read papers and preprints that are relevant to the research in our lab group, or papers of general interest. (For example, during the BroodX cicada emergence of 2021 we read a cicada genomics paper). The format we use is to go figure-by-figure (and within figures panel-by-panel). A different student is responsible for each figure and claims it ahead of time; their assignment involves understanding every aspect of that figure and presenting it to the larger group. A big benefit of this is that the work of preparing is split into bite-size chunks and more students can be engaged in preparing and presenting the work (4-8 per paper, depending on the number of figures). This gives everyone investment in the presentation and it's a lot more fun.

When coupled with Zoom and conducted remotely, guests can easily join from all over the world. I have found that the authors of scientific papers are often eager to join and their contributions make the discussion multi-dimensional while enriching the networking experience for students. Here I outline the setup and operation of this journal club for my lab.

Methods

- Plan 3-4 weeks in advance, even if only loosely. Adjust on the fly as opportunities or needs arise.
- I post the article at least a week in advance (i.e., I post the article for discussion on June 14 on June 7). We use the communication tool Slack for nearly all lab communication so I simply upload the paper into the 'general' channel. I announce the paper, how many figures, and one or two sentences about why the paper is interesting. I then call all lab members to claim a figure. This could probably be done over email but Slack makes it very easy to do this each week.
- Each lab member claims a figure, announces it in the Slack general channel ("Figure 1!" and so on) and has to then prepare to present that figure to all of us. Their assignment is to know everything about that figure.
- I monitor on Slack and 2-3 days before the meeting announce any unclaimed figures. I make sure that all figures are claimed by the journal club date.
- To obtain guests I try to email at least 2 weeks ahead of time. At the end of this document is an email template I have used successfully. I find the vast majority of the time the authors are pleased to join in.
- On journal club date I simply screen-share the paper. I read the title and mention where the research group is located.
- If no guest authors are present:
    - I open with a general comments time. Often students have initial thoughts about the paper and we discuss for 5 minutes or so. We try to save most time for the figures.
    - We walk through figures. Each student presents "their" figure. We discuss confusing aspects. We critique and note missing controls or data that

conflict with the model presented by the paper (this happens surprisingly often).
    - A critical question: "What work is this figure doing in the overall narrative of the paper?"
    - It is important to point out when a figure is poorly done: what not to do! This is also helpful for students who are working on figures.
    - Conversely, a good figure often inspires us to make a similar one in our own publications.
- If the article authors are able to join in:
    - We start with introductions between my lab and theirs. We usually start with myself, giving a brief intro and then passing it on to my lab members. We go person by person; they introduce themselves, what year they are in school and briefly what they work on. Each person has to 'tag' the next person to introduce themselves.
    - We then do the same for the guests, having them introduce all members.
    - I then invite the author(s) to introduce their own article. I like to ask for the story behind the paper. What got them started? I also like to find out a bit about their career path or trajectory, and sometimes this is folded into the same discussion.
    - We then proceed to walk through each figure as above. My lab members present "their" figures and we discuss as above. The critique needs to be sensitive to the presence of the authors. However, we don't want to pull punches and the authors can directly address questions that arise. Often this leads to insights about why the science was performed as it was and the peer review process.
- We intersperse research meetings with article discussions. Research meetings arise when projects are mature enough to be near publication; we walk through our own figures and discuss them.
- **Highly recommended: Build antiracism into your journal club.** We ran a 4-article antiracism series in Summer 2020 that was very impactful for students. It is important for faculty to raise the difficult topic of racism and misogyny in the academy so students are prepared when they encounter them. Below are some articles we recommend:

Hoppe TA, Litovitz A, Willis KA, Meseroll RA, Perkins MJ, Hutchins BI, Davis AF, Lauer MS, Valantine HA, Anderson JM, Santangelo GM. Topic choice contributes to the lower rate of NIH awards to African-American/black scientists. Sci Adv. 2019 Oct 9;5(10):eaaw7238.

Hofstra B, Kulkarni VV, Munoz-Najar Galvez S, He B, Jurafsky D, McFarland DA. The Diversity-Innovation Paradox in Science. Proc Natl Acad Sci U S A. 2020 Apr 28;117(17):9284-9291.

Leslie SJ, Cimpian A, Meyer M, Freeland E. Expectations of brilliance underlie gender distributions across academic disciplines. Science. 2015 Jan 16;347(6219):262-5.

Schell CJ, Dyson K, Fuentes TL, Des Roches S, Harris NC, Miller DS, Woelfle-Erskine CA, Lambert MR. The ecological and evolutionary consequences of systemic racism in urban environments. Science. 2020 Sep 18;369(6510):eaay4497.

Hinton, A.O., Jr, Termini, C.M., Spencer, E.C., Rutaganira, F.U.N., Chery, D., Roby, R., Vue, Z., Pack, A.D., Brady, L.J., Garza-Lopez, E., et al. (2020). Patching the Leaks: Revitalizing and Reimagining the STEM Pipeline. Cell 183, 568–575.

Stevens, K.R., Masters, K.S., Imoukhuede, P.I., Haynes, K.A., Setton, L.A., Cosgriff-Hernandez, E., Lediju Bell, M.A., Rangamani, P., Sakiyama-Elbert, S.E., Finley, S.D., et al. (2021). Fund Black scientists. Cell 184, 561–565.

Email Template:

Hi _____,

I am an associate professor of Biology at American University, where I run a lab focused on evolutionary genomics and genome rearrangements.

I have read with interest your 2019 paper "_____" and my lab is going to talk about it in journal club next week (May 26). We would be delighted if you and/or anyone in your lab were to join us, especially the first author of the work. We meet on Zoom and at 1pm Eastern (US) time.

Our format is to walk through the paper figure-by-figure (each student presents one figure) and we really enjoy when authors can join us. We can also flex the meeting time given time-zone differences.

Best,
John