Reviews in Quantitative Biology

Introduction
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
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<tbody>
<tr>
<td>11:00-11:20</td>
<td>Introduction</td>
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<tr>
<td>11:20-11:45</td>
<td>How to write a review</td>
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<td>11:45-12:00</td>
<td>Break</td>
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<td>12:00-12:45</td>
<td>Guest presentation</td>
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<td>12:45-13:00</td>
<td>Q&amp;A</td>
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How many people...

• Know what is a review?
• Have read a review?
• Have written a review?
• Have published a review?
Course in a nutshell

Hear a
Write a
Evaluate a

\{ Review \}
Why review the literature?

• Discover and learn new topics
• Identify relevant research questions
• Build upon existing work
Why write a review?

• Introduce proposals, research plans, theses, papers...
• Improve your writing skills
• Improve your science communication skills
• Think/understand through writing
Why peer review?

• Be a good citizen
• Stay at the forefront of research
•Sharpen your critical thinking skills
• Impress the editor
Learning outcomes

• Recognize current QB topics
• Identify relevant papers
• Organize and summarize relevant work in a clear, coherent, concise, and correct review
• Provide critical and constructive peer reviews
• Improve your work from peer reviews
Organization

• Main tutorial (11am – 1pm)
  • 1 hr on specifics of the writing and reviewing process
  • 1 hr review on a special topic by an invited speaker
• Presence mandatory!
Assignments

Write 1 review and do 2 peer reviews

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<th>1st Friday</th>
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<th>3rd Friday</th>
<th>4th Friday</th>
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<td><strong>Topic</strong></td>
<td>Topic in class (Daron)</td>
<td>Your paper due</td>
<td>Get peer review for your paper</td>
<td>Revision for your paper due</td>
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<td>Your paper due</td>
<td>Get peer review for your paper</td>
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<td>Your paper due</td>
<td>Get peer review for your paper</td>
<td>Revision for your paper due</td>
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<td>Your paper due</td>
<td>Get peer review for your paper</td>
<td>Revision for your paper due</td>
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Your peer review due
RQB 2022 Friday Schedule

Location: see table below (or 📞https://unil.zoom.us/my/natashaglover)

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Location</th>
<th>11:00-12.00</th>
<th>12:00-13.00</th>
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<tbody>
<tr>
<td>1st</td>
<td>Nov 04</td>
<td>Génopode C</td>
<td>Introduction &amp; How to write a review</td>
<td>Dr. Josquin Daron (Université de Montpellier): Transposable elements and population genetics in mosquitos</td>
</tr>
<tr>
<td>2nd</td>
<td>Nov 11</td>
<td>Génopode A</td>
<td>Writing science in plain English</td>
<td>Prof. Jolanda van Leeuwen (CIG): Conservation of genetic interaction properties</td>
</tr>
<tr>
<td>3rd</td>
<td>Nov 18</td>
<td>Cubotron III</td>
<td>Editing &amp; Peer review</td>
<td>Dr. Sina Majidian (DBC): Applications of k-mer analysis in quantitative biology</td>
</tr>
<tr>
<td>4th</td>
<td>Nov 25</td>
<td>Génopode A</td>
<td>How to get published</td>
<td>Prof. Sebastian Soyk (CIG): Dissecting quantitative variation by genome editing</td>
</tr>
</tbody>
</table>

Participants not assigned to one topic plan to write their own review.
Writing and Independent review

• You **must** get your advisor to agree to review your paper
• Paper is due **2 weeks** from today!
Co-authoring reviews

• Reviews are written in groups
• Include a statement of author contribution at the end, e.g.:

  *JS wrote most of the introduction and section on PPI network and produced Table 1. CD wrote most of the section on regulatory network and produced the figures.*
Manuscript

• Quality matters more than quantity, but ~2000 words is a typical length.
• Write with Google Docs + Paperpile (recommended)
• Initially submit as a PDF only with a References section and any images and tables.
• Submit revised version as a PDF with a cover letter addressing the referees’ criticisms.
Course homepage

- https://lab.dessimoz.org/teaching/rqb/
  - Course details
  - Schedule
  - Slides
- Article management webpage (EasyChair):
  https://easychair.org/my/conference?conf=rqb22
Authorship according to Genome Biology

To qualify as an author one should:

1) Have made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data;

2) Have been involved in drafting the manuscript or revising it critically for important intellectual content; and

3) Have given final approval of the version to be published.

4) Acquisition of funding, collection of data, or general supervision of the research group, alone, does not justify authorship.
Share credit with lecturer

• Reviews written in this course heavily draw from the presentation.

• Thus, the speaker is typically listed as last author on your submission.

• Note that if this was a *real* submission, the other two requirements would also need to be fulfilled.
My expectations

• Demanding tutorial
• Presence and participation on Fridays
• Strong commitment to both review and peer-review
• Intellectual honesty: no plagiarism nor fabrication!
Your expectations

• What do you expect from this course?
• What topics do you want to learn about in the paper-writing process?
• Questions, concerns?
Writing a review
Purpose of a review

• “[To] carefully identify and synthesize relevant literature to evaluate a specific research question, substantive domain, theoretical approach, or methodology and thereby provide readers with a state-of-the-art understanding of the research topic.”

Palmatier et al. Review articles: purpose, process, and structure. https://doi.org/10.1007/s11747-017-0563-4
Purpose of a review

• Synthesize current state of knowledge
• Identify inconsistencies in results
• Evaluate methodology
• “Develop conceptual frameworks to reconcile and extend past research”
• Resolve definition ambiguities
• Identify gaps in knowledge
• Point to future research directions

*Not every review paper does ALL of these things*
Standards of a review

• Enough past research in the domain exists to make having a review paper worthwhile
• Review must be well done
  • Good coverage of literature (collection, breadth, depth)
  • Compelling writing style
• Review must offer significant new insights
  • Not a “book report” that describes past research!

Palmatier et al. Review articles: purpose, process, and structure. https://doi.org/10.1007/s11747-017-0563-4
## Difference between research article and review article

<table>
<thead>
<tr>
<th></th>
<th>Research article</th>
<th>Review article</th>
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<tbody>
<tr>
<td><strong>Viewpoint</strong></td>
<td>Presents the viewpoint of the author</td>
<td>Critiques the viewpoint of other authors on a particular topic</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td>New content</td>
<td>Assessing already published content</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>Depends on the word limit provided by the journal you submit to</td>
<td>Tends to be shorter than a research article, but will still need to adhere to words limit</td>
</tr>
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https://authorservices.taylorandfrancis.com/publishing-your-research/writing-your-paper/how-to-write-review-article/
Purpose of a review

• “A literature review …is generally considered a secondary source since it may analyze and discuss the method and conclusions in previously published studies.”

https://en.wikipedia.org/wiki/Literature_review
https://en.wikipedia.org/wiki/Review_article
The writing process

1. Find/read relevant papers
2. Organize ideas, structure narrative
3. Write first draft
4. Edit and revise
Find/read relevant papers
Finding papers

- Google Scholar
- Pubmed
- How to access the literature for free
Shiny new research topic
Paper hopping

- Find original idea or result, evidence, influential papers
- Find dependent work, follow-up, criticism, falsification
- Google scholar cited by, related articles

[HTML] Evolution by gene duplication: an update
Zhang - Trends in ecology & evolution, 2003 - Elsevier
... gene duplication play in the evolution of genomes and organisms? Detailed molecular characterization of individual gene.....Changes of gene expression after gene duplication appear to ...
How to read a paper?

• Identify (possibly record) key points:
  • Hypothesis? Approach? Findings? Significance?

• Order:
  • Start with Title and Abstract
  • Then, read Introduction
  • Figures and Tables (captions are often self-contained)
  • If it’s not relevant, stop reading!

*Some papers you skim, some important papers you read in depth

See: How to Read an Academic Article by Holly Walters
Citation managers

Paperpile

- No-fuss reference management for the web
- Manage your research library right in your browser.
- Save time with a smart, intuitive interface
- Access your PDFs from anywhere
- Add citations and bibliographies to Google Docs

New: Paperpile for iOS, Android, Word

Start Paperpile

30 day free trial

Mendeley

EndNote™

zotero
Organize ideas, structure narrative
Key Questions

• What is the hypothesis/problem/question?
• Why is it interesting?
• What answers are provided by current literature? How did they do it? Implications?
• Which studies are particularly interesting and why?
• What is unsatisfactory about current literature? What remains unanswered?
Distill the answers into your synthesis

SO WHATS
YOUR POINT?
More questions

- Do parallel literatures exist for this topic?
- In which subject areas has the topic been studied?
- What are the main perspectives on this topic in previous research?
- What have been the main research questions?
- What are the main conclusions on previous research in this area?
- Where are the gaps in literature?
- Which existing work could be extended?
- Where is existing knowledge “thin”?
- Which work is subject to challenge?
- Who are these “others”?
- How is this topic approached by others?
- Which aspects of this work are of most relevance to my study?
- What are the key areas of debate in this area?
- What are the key concepts in this area?

Coherent synthesis of past and present research in the domain of study

From: Writing a Literature Review, Hazel Hall Professor at Edinburgh Napier University
Typical structures

- Chronological
- Conceptual (e.g. pro/contra)
- Experimental/Methodological
- Centered on Implications

But: remember your point!

Ridley, “The Literature Review”. 
Write first draft
Know your reader

• What can the reader be assumed to know?
  • Read the journal editorial policy
  • Read similar articles published there
  • Err on side of caution, but avoid condescending or educational tone

• For this course, assume that your reader is a Masters student in Biology

• But keep a formal tone
The Title

• Signals the field and scope
• Includes your main point
• Gets readers interested
The Abstract

• Introduces field in 1-2 sentence(s)
• Motivates your review
• Announces important points (reformulates subheadings and main point)
• Includes relevant keywords (for indexing)
The Introduction

• Set the context from general to specific
  • Show that the research area is important/interesting/relevant.

• Establish a niche
  • Show need for your work (the review)

• Occupy the niche
  • Announce your main point
  • Indicate structure of article
The Main Body

• Use subheadings for each section
  • One sentence summary/conclusion
  • Helps non-linear reading

• If appropriate, use figures and/or tables
  • Review figures are often schema/cartoons
  • Use captions to make them self-descriptive
The Conclusion

• Specific -> general
  • Mini summary
  • Broader implications, future directions
Drafting

- Make an **outline**
- Every claim needs to be backed by some evidence (in reviews, typically a reference)
  - Either report the findings only
  - Or paraphrase their approach and findings
  - Or use quotations (do not distort context)
- Best way to start writing is to start writing
Beware of plagiarism!

• If you include exact wording, use quotation marks and reference
• If you paraphrase, use a reference only
Edit and revise
Improve flow

• Start each paragraph with a topic sentence
  • It signals paragraph content to the reader

• Improve cohesion
  • Connect sentences through conjunctions, parallel structures, repeated keywords, pronouns, “old-new” pattern, etc.

• Remove unneeded/redundant words
Final checks

• Spelling: use automated spell-checker and proofread your text carefully.

• Verify one more time
  • That references are accurate and complete
  • That each claim is backed by citation
  • That your narrative is coherent
  • That the article meets editorial policy (in particular length requirements)

• Ask a colleague for feedback on the draft
Resources