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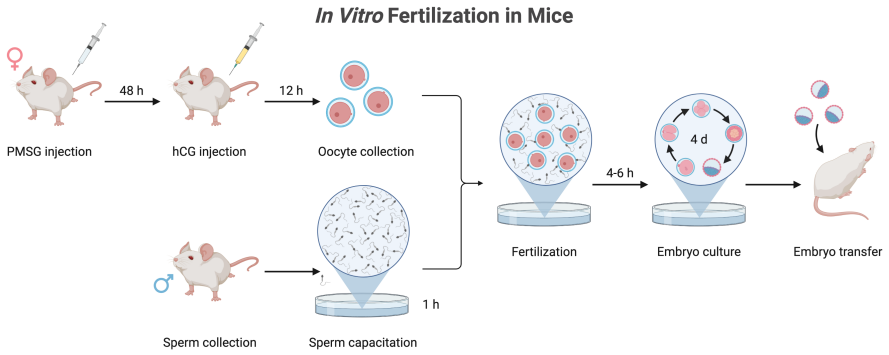
THE UNIVERSITY OF IOWA

Scientific Editing and Research Communication Core

Designing Helpful Schematic Figures



Adapted from "from "In Vitro Fertilization in Mice", by BioRender, 2022, retrieved from https://app.biorender.com/biorender-templates/t-5f873ee54023ea00a1108ef7-in-vitro-fertilization-in-mice Copyright 2022 by BioRender

The value of a good schematic or overview figure:
Schematic figures can transform a grant. On a Specific Aims page, a good schematic can quickly relay the rationale for, and connectedness of, the aims; in a data figure, a good outline of the experimental design can make it easier for the reader to digest the information (illustrated above). On the other hand, a poorly executed schematic can confuse the reader and is not worth the space.

One great source of practical advice for visualizing scientific concepts and data is the Points of View column, a compilation of tips that was written by experts in visualization and originally published in *Nature Methods* (also summarized in the journal's blog, Methagora*). Below, we provide direct links to some of our favorite columns in this series, plus a few other resources, to help you generate your next schematic.

Some rules of thumb:

- Consider the story you want to tell, keep it simple, and make sure the figure matches your message, e.g.:
  - eliminate detail that is not discussed in the accompanying text
  - illustrate the innovative aspects of your method
- Use natural patterns of motion when ordering information
  - from left to right
  - from top to bottom
  - chronologically
- Use color mindfully
  - assign colors (e.g., to a condition or to create relationships) and use them consistently
  - consider difficulties distinguishing colors, such as those related to color blindness
  - consider using alternatives to color
    - color is not always most effective in telling the story
    - color can be misleading
- Use other elements wisely and consistently (typography, arrows, labels)
- Apply grouping principles to illustrate belonging and other relationships
  - similarity
  - proximity
  - connection
  - enclosure
- Highlight only what is most relevant – using color, shape, size, and position
- Use negative space purposefully to provide structure

Other considerations:
Be sure to keep terms and units consistent – within a figure and its legend, across figures, and between figures and the main text. Also, start early enough to get feedback and to revise accordingly. Be open to

Upcoming Opportunities

Have a question about writing grants or research articles? Contact us and we will attempt to answer it in a future newsletter.

American Heart Association
Fall Deadlines: Sept 2022 or later
View the program requirements and begin to prepare the Required Application Documents. Review the characteristics of all Research Awards or watch webinars to become familiar with AHA policies and restrictions.

Write Winning Grant Proposals
Oct 6, 2022
The Research Development Office in the Office of the Vice President for Research is pleased to announce that Dr. John Robertson from Grant Writer's Seminars & Workshops (GWSW) will conduct the *Write Winning Grant Proposals* seminar. Both in-person and virtual options are available.
Register

Resource Library: Learn from Successful Examples
Are you curious about how to structure your proposal to a certain funding agency? Check out the Resource Library to see examples of successful proposals to various funding agencies.
View
(Note: HawkID authentication required)

Maximizing Pivot to Find Funding and Collaborators
Jul 20, 2pm–3pm
Aug 25, 9am–10am
Do you want to reduce the time needed to identify suitable funding opportunities or potential collaborators? Join us to learn how Pivot can save you time and effort.
Register (Jul 20 session)
Register (Aug 25 session)

Hardin Open Workshop – Conducting a Health Sciences Literature Review
Jul 5, 11:00am–12:00pm (zoom)
The session will offer a framework for conducting a quality health sciences literature review for scholarly projects or publication. Learn how to identify sources, use appropriate search techniques, organize results, and synthesize the body of literature to successfully prepare a review. Key differences in search methodology for reviews in the health sciences will be described, with examples provided. Although introductory material regarding systematic and scoping reviews will be provided, the HOW sessions dedicated to these specific types of reviews are recommended if either of these review types is of interest.
Register

Hardin Open Workshop – Endnote Basic
Aug 23, 11:00am–12:00pm (zoom)
EndNote Basic is a web-based citation management software that is freely available to all

trying alternatives because you will learn even from failures, and attempts to illustrate your ideas may help you identify weaknesses. Finally, the process does not have to be technically challenging; consider using a program that provides pre-made icons as starting points (e.g., BioRender).

Additional Resources:

- Data Visualization: A view of every Points of View column *
  - This blog in Methagora, from *Nature Methods*, summarizes the references above and others.
- BioRender loaner license
  - If you are affiliated with the University of Iowa, sign up to borrow a BioRender seat for 1 week.
- BioRender webinars and tutorials
  - Experts illustrate how to effectively use the BioRender tools to create graphics.
- Works of Edward Tufte
  - A pioneer in the field of information design and data visualization, Edward Tufte wrote, designed, and self-published several books on this topic.

UI affiliates. It allows you to import, organize, and format citations for papers, articles, etc. EndNote Basic is not the same as the desktop software, Endnote.
Register

Hardin Open Workshop – Endnote (Desktop version)
Jul 20, 1:00pm–2:00pm (zoom)
Aug 9, 11:00am–12:00pm
Aug 24, 10:00–11:00am (zoom)
EndNote is a reference management tool that allows you to import, organize, and format citations for papers, articles, etc. This session will walk you through the basics of using EndNote to collect and format your citations. The class will be hands-on and there will be time for questions at the end.
Register