PUBLISHING YOUR RESEARCH

Structure and language
Publishing your research

- **What?** Your evidentiary findings in the lab, not your opinions, speculations, or wishes.
- **Why?** To report your results and advance the field of inquiry.
- **For whom?** The scientific community that wants to stay informed and build upon your work.
- **How?** Conference papers/presentations, scientific journal articles, theses, and dissertations.
- **When?** As soon as the research is ready for public scrutiny.
Getting Started

• Two goals:
  • Provide sufficient context (background) information so readers can understand your research – Structure/Content
  • Capture readers’ interest so they will read the entire paper – Writing Style
Structure

• Develop a detailed outline BEFORE you start writing
  • Introduction (includes Literature Review)
  • Methods & Materials (Experimental Setup)
  • Results
  • Discussion
  • Conclusion
  • Abstract
Introduction

• Keep it short – use a target journal as model
  • Background – include only the most relevant, recent info; this is not a survey of the literature
  • Unknown/Problem
  • Question/Purpose of the Study – “In this paper, we investigate how …”
  • Experimental approach – State briefly. “We simulated X using X.”
Materials and Methods

• Also known as experimental setup

• Provide sufficient details and references to enable a trained scientist to evaluate or repeat the work

• Reference any methods you are borrowing from someone else’s work

• Some authors list the brand and model numbers of the equipment; refer to your target journal for protocol
Results

• Report all important findings
• Direct the reader to the data shown in figures and tables. (Create figures and tables that are clear and concise so only brief explanation is needed in the text.)
• Briefly interpret your data for the reader – “EGR rate increased to X after X.” Save the discussion, however, for the next section, if the two sections are not combined.
Discussion/Conclusion

• 1\textsuperscript{st} para. – Interpretation/Answer based on key findings; supporting evidence – Readers want to know the answer to the question.

• Middle paras. – Comparisons/contrasts to previous studies; limitations of your study; unexpected findings; hypotheses or models

• Last para. (Could be separate Conclusion section – Summary; significance/implication
Abstract

• Usually between 100 and 250 words
• Write this section last; it is the most important piece of your article
• Include one sentence (with specific details, not generalities) for each section
Writing Science

• Eliminate irrelevant overview sentences. Just get to the point.

• Example of a pointless sentence: “To present our results, we first list all components of the macromolecule together with their optima and then describe the outcome of their individual omission.”
Writing Science

- Use past tense for observations, completed action, and specific conclusions
- Use the present tense for generalizations and statements of fact
- Use active voice as much as possible and avoid nominalizations – next slides
- Keep sentences short – most should be 20 words or less
Active vs. Passive Voice

• Active voice has the subject doing the action, e.g. We conducted the experiments using …

• With passive voice, the subject is acted upon or, in this case, invisible: The experiments were conducted using …

• Scientific community is gradually shifting from passive to active voice because active voice is more lively and interesting to read.
Nominalizations

Nominalizations are “abstract nouns derived from verbs and adjectives.”

- Assessment – Assess
- Made the decision – Decide
- Is dependent upon – Depends on
- Is following – Follows
- Formation – Form
- Inhibition – Inhibit
- Measurement – Measure
- Removal – Remove
To sum it all up …

• Science writing follows a logical format – use target journal as a model
• Language is concise and precise
• Publication depends on clarity
• Write, revise, review, revise, and so on