

# PUBLISHING YOUR RESEARCH

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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

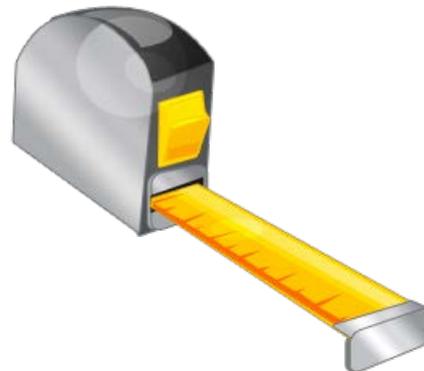
- Report all important findings
- Direct the reader to the data shown in figures and tables. (Create figures and tables that are clear and concise so only brief explanation is needed in the text.)
- *Briefly* interpret your data for the reader – “EGR rate increased to X after X.” Save the discussion,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

# Discussion/Conclusion

- 1<sup>st</sup> 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

