

# Notes on How to Write Scientific Papers

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## Before Writing the Paper

Take notes of your work regularly. A good practice is to use Jupyter notebooks, which allow you to write code, display figures, and include markdown notes. For clarity, it is preferable not to store all the code inside the notebook; instead, import functions from external libraries.

## Main Steps

According to Pochet (2009), the main steps to prepare a scientific paper are:

- Take notes, record results, and maintain a clean bibliography.
- Assess the work.
- Choose the target journal or conference.
- Read the guide for authors.
- Define the list of authors.
- Ask yourself:
  - What do we know now that we did not know before?
  - How did we obtain these results?
  - Why is this work important and interesting?
- Choose a provisional title and define the main sections.

The structure of papers may vary depending on the journal. Therefore, read previously published papers in the target journal, identify common structures, and follow them.

- Identify the key elements of the article.
- Request permission, if necessary, to use external material.
- Select the tables and figures to include.
- Write the first draft.

The title, keywords, and abstract should be written with great care, as they are the most frequently read parts.

## **Abstract**

The abstract should answer the following questions:

- Why was this research carried out?
- What was done and how?
- What were the main findings?
- What do these results mean?

## **Introduction**

The introduction should:

- Present the problem.
- Briefly review related work.
- Justify the hypothesis.
- Optionally outline the conclusions.

## **Materials and Methods**

Clearly explain what was done and how it was done, justifying the methods used (e.g., with citations or detailed descriptions). This section should be written in the past tense.

## **Results**

Present the results without interpretation or discussion. Prefer figures and tables. Ideally, the results should be understandable by examining figures and tables alone.

## **Figures**

- Provide clear and explicit legends.
- Use appropriate scales.
- Add arrows and annotations to improve clarity.

## **Discussion and Conclusions**

This section should:

- Present the interpretation of results.
- Highlight strengths and limitations.

## Revision Process

- Wait a few days before revising.
- Proofread the paper carefully.
- Read the text aloud.
- Rewrite sentences that are difficult to understand.
- Read sentences in random order to detect grammar and spelling errors.
- Prepare the reference list.
- Check the structure and style.
- Ask colleagues for feedback.
- Review the guide for authors again.
- Perform a final check.

Before writing the full paper, it is useful to draft a skeleton (e.g., a bullet-point outline). This helps validate the structure before refining the style.

## Style Guidelines

This section summarizes recommendations from Gopen and Swan (1990):

- Place verbs close to their subjects.
- Each unit of discourse should convey a single idea.
- Important information should appear at the end of sentences (stress position).
- Use colons to split long sentences and emphasize key elements.
- Begin sentences with the topic (what the sentence is about).
- Ensure new information appears in the stress position.
- Maintain logical flow between sentences.
- Prefer active verbs (e.g., “A inhibits B” rather than “There is an inhibition of A by B”).
- Avoid unnecessary words.

## **After Writing the Paper**

Ask yourself the following questions:

- Is the contribution new and original?
- Is the title appropriate?
- Do the abstract and keywords accurately describe the paper?
- Are the objectives aligned with the content?
- Are all sections necessary?
- Is the presentation clear, logical, and well organized?
- Should any sections be reorganized, expanded, or condensed?
- Are the materials and methods sufficiently detailed?
- Are all figures and tables necessary?
- Are the conclusions consistent with the results?
- Is the bibliography complete and correct?