Software tools in bioinformatics

Best Practices for Scientific Writing

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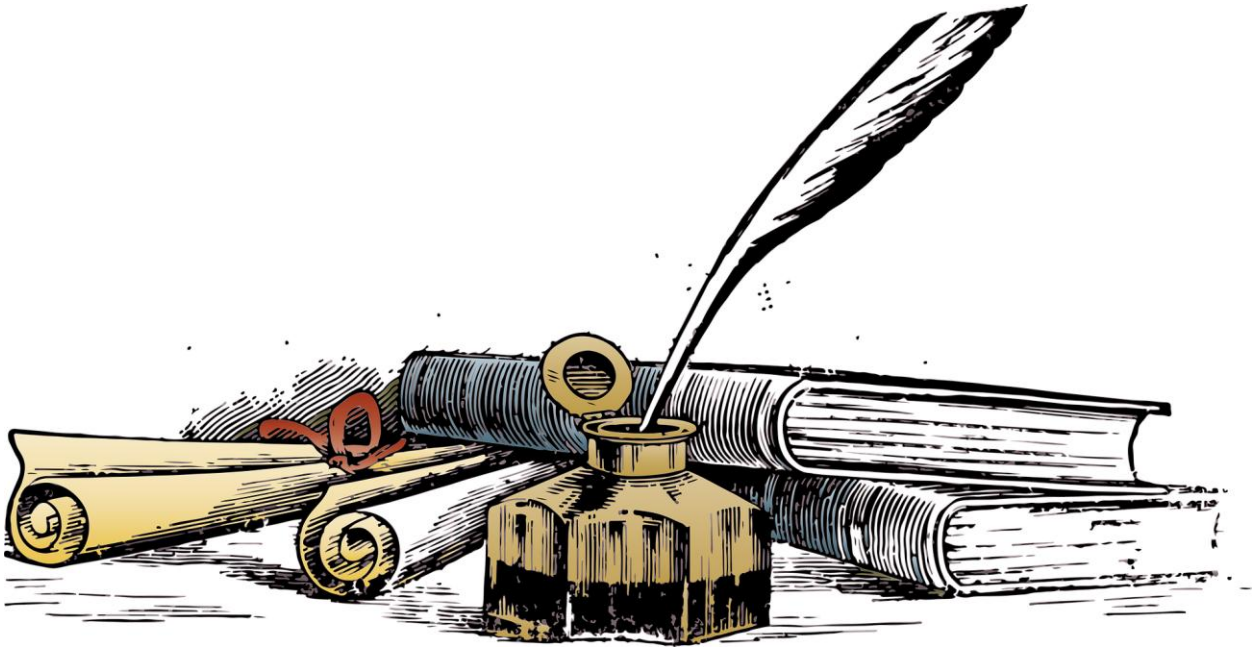


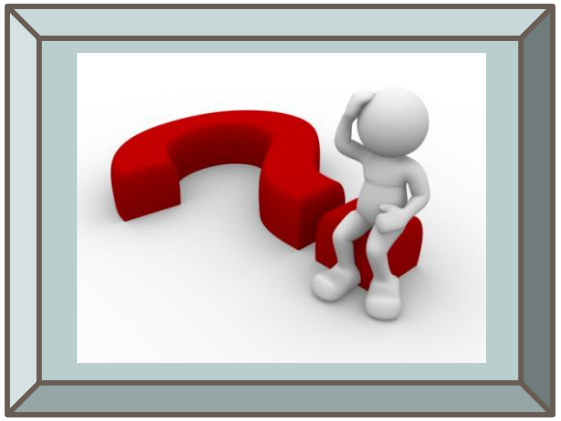
A story with facts!

Mind the…

- Structure
- Content
- Formatting

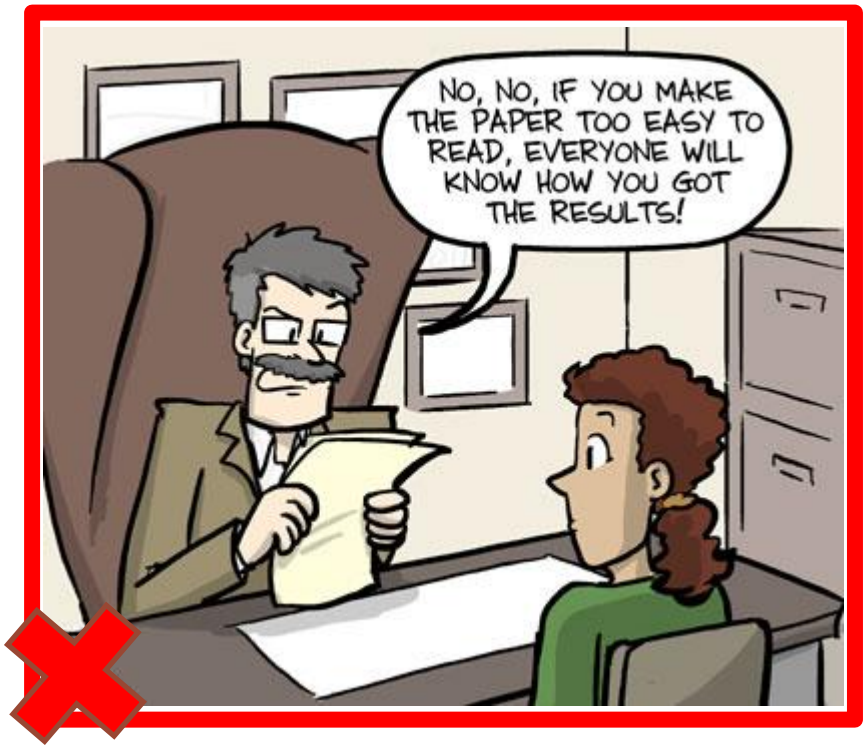
Structure - Introduction

1. Address the problem
   - What is the question
   - Frame the problem and specify it
2. Motivation
   - Why do I do this
   - Why is it necessary to be solved
   - Emphasize the importance
3. Challenges
   - Why is the problem so difficult?



Structure – Main body

4. Expand, explain, prove
   - **What** did you use
   - What steps did you follow
   - **How** did you try to solve the problem
   - What obstacles were faced (if any)
   - How did you deal with them
   - Provide **answers** and **results**

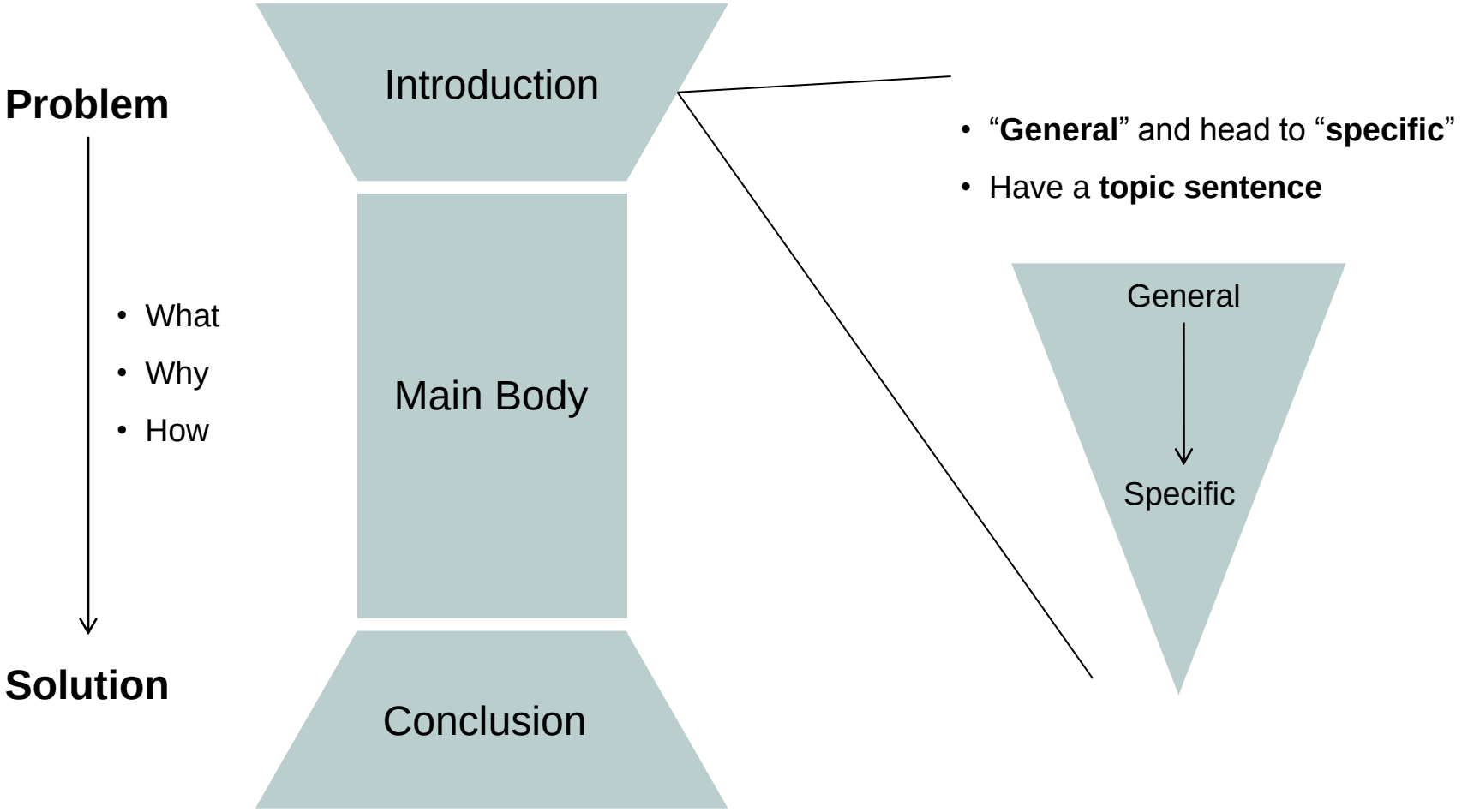


Structure – Conclusion & References

5. Conclusion
   - Summarize
   - **Interpretation** of the results
   - Did you answer the initial question

6. References
   - **Always** use references

Structure - Content



Content

- Stick to the point and keep it **relevant**
- Follow a timeline and avoid the back-and-forth
- Do **not** use many fancy words
- Be precise and accurate
- Use mathematical formulas if needed
- **Explain** graphs, pictures, formulas, tables

$$a = \frac{d\sqrt{b\,c}}{2e} \qquad \text{where } a = (\text{blah blah...}),\ b = \ldots,\ \ldots$$

Formatting

Mathematical formulas

- Symbols in different formulas must be separated by words

  Bad: Consider S_q , $q < p$

  Good: Consider S_q *where* $q < p$

- Don't start a sentence with a symbol.

  Bad: x^n – a has n distinct zeros

  Good: The polynomial x^n – a has n distinct zeros

- Don't just list a sequence of formulas. Tie the concepts together with a running commentary

Formatting

Tables

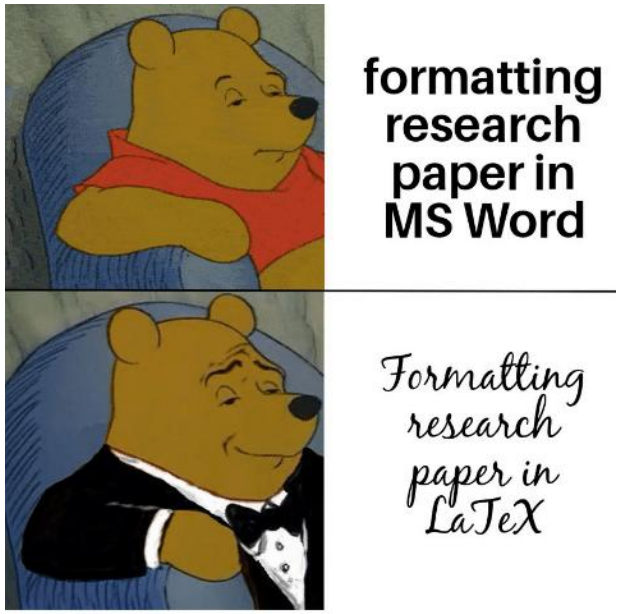
- Keep table titles brief but sufficiently detailed to explain the data included.
- Use headings (or/and sub-headings)
- Do not insert blank columns or rows
- Spell out abbreviations at first mention in tables, even if they have already been defined in the text.

TABLE 5–2. Grain and straw yield in 1993 for 'Jaya' rice under rainfed conditions at Kerala Agricultural University in India, as measured and as calculated using CERES-Rice v3.0.

Date	Grain yield		Straw yield	
	Measured	Calculated	Measured	Calculated
	kg ha^{-1}			
8 June	6100	5689	4,600	7,785
15 June	300	312	100	184
22 June	2300	2160	14,500	16,213
29 June	3200	3207	4,200	6,743

Formatting

- Have an **Introduction,** a **main body** and a **conclusion**
- Give headings and sub-headings if needed
- Check your **grammar**, **syntax** and **punctuation** again
- Short and clear sentences
- Use appendices or supplementary materials
- Choose a citation style (e.g. APA, MLA, etc)
- Do not be afraid to ask for help



…material for help

- Grammarly – Check your grammar
https://www.grammarly.com/grammar-check

- Academic Phrasebank - general resource for academic writers
http://www.phrasebank.manchester.ac.uk

- Latex - a document preparation system for the communication and publication of scientific documents.
https://www.latex-project.org/

- Overleaf – online Latex editor
https://www.overleaf.com

- Google doc.
https://docs.google.com

- EndNote

- Mendeley

- Attending scientific writing seminars in the University

THIS IS WHAT WE WANT FROM YOU ! ! !

Scientific Article

1. **Title**
2. **Abstract**
3. **Introduction**
4. **Materials & Methods**
5. **Results & Discussion**
6. **Acknowledgments** *(optional)*
7. **Literature**
8. **Appendices** *(optional)*

Scientific Article

1. Title

- Simple statement about the content of your article

2. Abstract

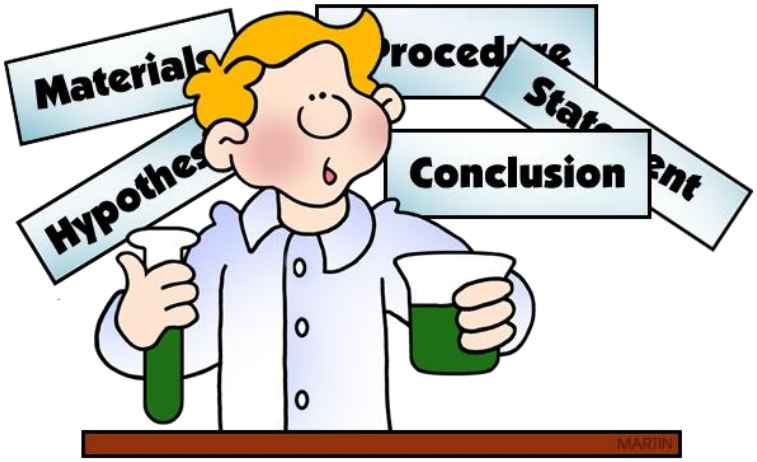
- Summarizes the major aspects of the article
- The question(s) you investigated
- Name the basic methodology used
- Briefly report results which answer your questions
- Brief summary of interpretations and conclusions

Scientific Article

3. Introduction

- Establish the context of the work being reported
- Introduce relevant literature
- Define the problem

4. Materials & Methods

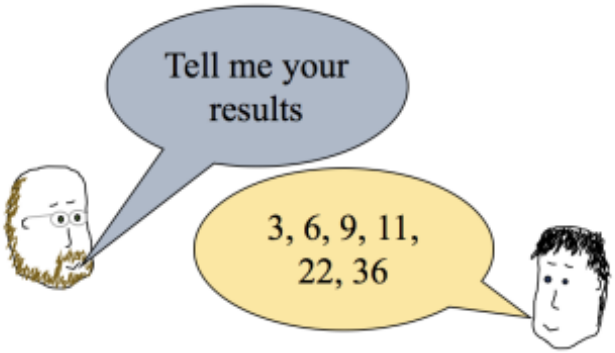


- How did you solve the problem
- What “materials” did you use
- Describe your methods clearly
- Explain statistical procedures

Scientific Article

5. Results & Discussion

- What did you find out and what does it mean
- Interpretation of the results
- Explain differences and similarities
- Report both “positive” and “negative” results
- Do your results provide answers



Numbers mean nothing without context

6. Acknowledgments *(optional)*

- Who helped you and how

7. Literature

- List of previous scientific articles you refer to

8. Appendices *(optional)*

- Extra information (e.g. raw data, graphs, full names of abbreviated terms)

Thank you ! ! !