

MIM workshop: General principles of scientific writing

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Most important

- Structure building (Intro or whole paper)
 - Skeleton/meat/cosmetics
- Sentence building to create structure (w/ examples)
 - Flexibility of sentence structuring
- Concept of reading like a robot
- Concept of coherence and cohesion
- Preparing and practicing a 1-min talk
- Sketch -> write -> revise
- Finding right questions / knowledge gap (analysis); also where in a manuscript
- Analytical (rather than content-focused) reading
- Re-writing exercise
- “Storyboarding” paper starting from figures/tables/data (not necessarily by chronological order of execution)
- Figure legends (not stating the obvious)

Adding meat: Sentences - Recap and follow up

Power of position:

- “In this study, taking advantage of a well-annotated genome map and effective targeted-mutagenesis techniques, we analyzed the role of Bac17 in pathogenesis by *Candida albicans*.”
→ ?

Subject-verb connection:

- “The pooled effect sizes, both with and without adjustment for environmental risk factors, were larger for DNA-based than RNA-based viruses.”
→ “Dysbiosis can lead to leaky gut syndrome where molecules, such as LPS, a molecule that is part of the bacterial cell wall, can leak out of the gut.”
→ “Dysbiosis can lead to leaky gut syndrome. Under these conditions, the gut (tissue) may become permeable for molecules such as lipo-polysaccharides (LPS), which constitute a (main) part of bacterial cell walls.”

- The topic should be at the front, short and clear

DBIOL

- The main verb should follow it immediately

Adding meat: Flow - Recap and follow up

Introducing many seemingly unlinked topics in the same paragraph cause confusion.

Keeping same topic improves clarity, but may limit flow.

Topic...Stress. Topic (same)...Stress → **List**

Molecules are comprised of covalently bonded atoms. Molecules' reactions are controlled by the strength of the bonds. Molecules, however, sometimes react slower than bond strength would predict.

Elaborating on the stress to develop a new topic generates flow.

Topic...Stress. Topic (previous stress)...Stress → **Story**

Molecules are comprised of covalently bonded atoms. Bond strength controls a molecule's reactions. Sometimes, however, those reactions are slower than bond strength would predict.

Improve clarity: 10 examples of cumbersome writing

S05xE01 - Ten rules to avoid cumbersome expressions

Please download the file: [3.1-A_guide_to_scientific_writing_Chapter3.pdf](#)

In pairs, discuss two rules (of the 10 in total). After that, present these points to all participants.

1. Cluster of nouns
2. Clusters of adjectives
3. Subordinate clauses at beginning of sentence
4. Nouns derived from verbs
5. Filler verbs / words
6. Passive vs active
7. Use of imprecise words
8. Use of compound prepositions
9. Use of multiple negatives
10. Use of unfamiliar abbreviations, symbols and references

Improve clarity: 10 examples of cumbersome writing

■ Cluster of nouns

- Sequence of nouns (noun-noun-noun)

- Example: Difficult child psychology problems

→ Difficult children or difficult problems?

Replace noun with adjective: Difficult child psychological problems

Example: Random leave copper analysis

Use prepositions: Analysis of copper in random leaves

Example: Chemical healing suppression figures

→ Chemical healing or healing suppression?

Use of hyphen: healing-suppression

■ Cluster of adjectives

- Sequence of adjectives

- Example: The maximum net returns above feed cost ration

Improve clarity: 10 examples of cumbersome writing

■ Subordinate clauses at beginning of sentence

- Avoid beginning sentences with subordinate clauses
- Example: Thus, although there were too few plots to show all of the interactions, which we sought, under the conditions of the experiments, copper and zinc acted additively.
- Thus, copper and zinc acted additively under the conditions of the experiments, although they were [...]

Check if necessary or justified to start sentence with:

“Despite the fact that”

“Notwithstanding the fact that”

“While, whilst”

■ Nouns derived from verbs

Example: “Low temperatures caused a reduction in the rate of the reaction”

Reduction → reduce: low temperatures reduced the rate of the reaction

Passive as an alternative? “The rate of the reaction was reduced by low temperatures”

Examples: “Weights of the animals were taken.”

The animals were weighted. We weighted the animals.

Improve clarity: 10 examples of cumbersome writing

- Filler verbs / words

Appear if main verb is already nominalized

Example: “An improvement in digestibility occurred when an increase in the protein content in the diet was made.”

→ Digestibility improved when the protein content in the diet was increased.

- Passive vs active

Use passive when it does not matter who or what performed the action.

Active voice a refreshing sense of directness and involvement.

Improve clarity: 10 examples of cumbersome writing

- Use of imprecise words

Examples: Avoid: “Majority, somewhat, rounding (if data are available elsewhere)”

Avoid “etc.” unless it is clear what follows

- Use of compound prepositions

Avoid compound prepositions (two prepositions): “in the case of”, “in regards to”, “in respect of”, “in order to”,

Improve clarity: 10 examples of cumbersome writing

- Use of multiple negatives

Example:

- not uncommon → common

- Use of unfamiliar abbreviations

- Reduce number of abbreviations used

- Do not use unless commonly known (e.g., “DNA”)

- Can have different meaning in different fields

- AA: amino acids, atomic absorption, anonymous alcoholics,

- Avoid in titles, figure captions

- Could place references at the end of sentences if it helps the reading, unless the intention is to reference individual points.

Report writing - practice

S06xE01 – Structuring (before writing) a scientific research article

Please open the file “[4-Draft_manuscript.docx](#)” and make suggestion how the paragraphs could be improved

a) in terms of format/structure:

- What is the topic each paragraph? What could have been the initial bullet points for each paragraph?
- Are the sentences cohesive? Is the paragraph coherent?
- What is the problem?
- Is it clear why I should care?

→ For each paragraph, try focusing on the question: what is the topic/idea? What could have been the initial bullet points for each paragraph?

b) and by making use of the tools you learned:

- For example: Hour-glass structure, Power of position, Cohesiveness of sentences, Coherence of paragraphs
- Avoid cumbersome expressions, (Appropriate word usage)

Edit this document by identifying issues, making suggestions, pointing out missing information, and importantly being constructive!

Report writing - practice

S06xE02 – Start structuring your report

- Use abstract (draft or bullet points) and start “skeleton” for your report
- Introduction
 - Paragraph 1: background, state-of-the-art on subject
 - Paragraph 2: focus on specific topic
 - Paragraph 3: problem statement
- Results
 - Section header 1 = message 1
 - Section header 2 = message 2
- Discussion
 - Paragraph 1: message 1 in context of problem/question
- Figure:
 - Title: one sentence message, if possible.
 - Legend: what does the figure tell us (rather than describing what the reader looks at)?

Resources

This course - https://sunagawalab.ethz.ch/MIM_SW/HS-2022/

Books

- “A guide to scientific writing”, David Lindsay (basic)
- “The craft of research”, Booth et al (intermediate) → focus on scientific process / practice
- **”Writing Science”, Joshua Schimel (intermediate) → focus on story telling**
- “Style”, Joseph M. Williams (advanced)

Example online resource for scientific writing:

- <https://www.aje.com/en/arc/>

Assignment

- Research report **due on 25. September 2022**
 - send by email to ssunagawa@ethz.ch
- max. 1,500 words, 1 fig and/or 1 table
 - include citations, but no bibliography needed
- You will receive your certificate upon receipt of report