

SCIENTIFIC WRITING WORKSHOP

Date : 02 Nov 2022, 12.30 pm to 1.30 pm

Venue : Academia, L1-S3

Presenter : Ms Sruthi Jagannathan, Office of Research, Duke-NUS Medical School

RECAP AND DAY 2 AGENDA

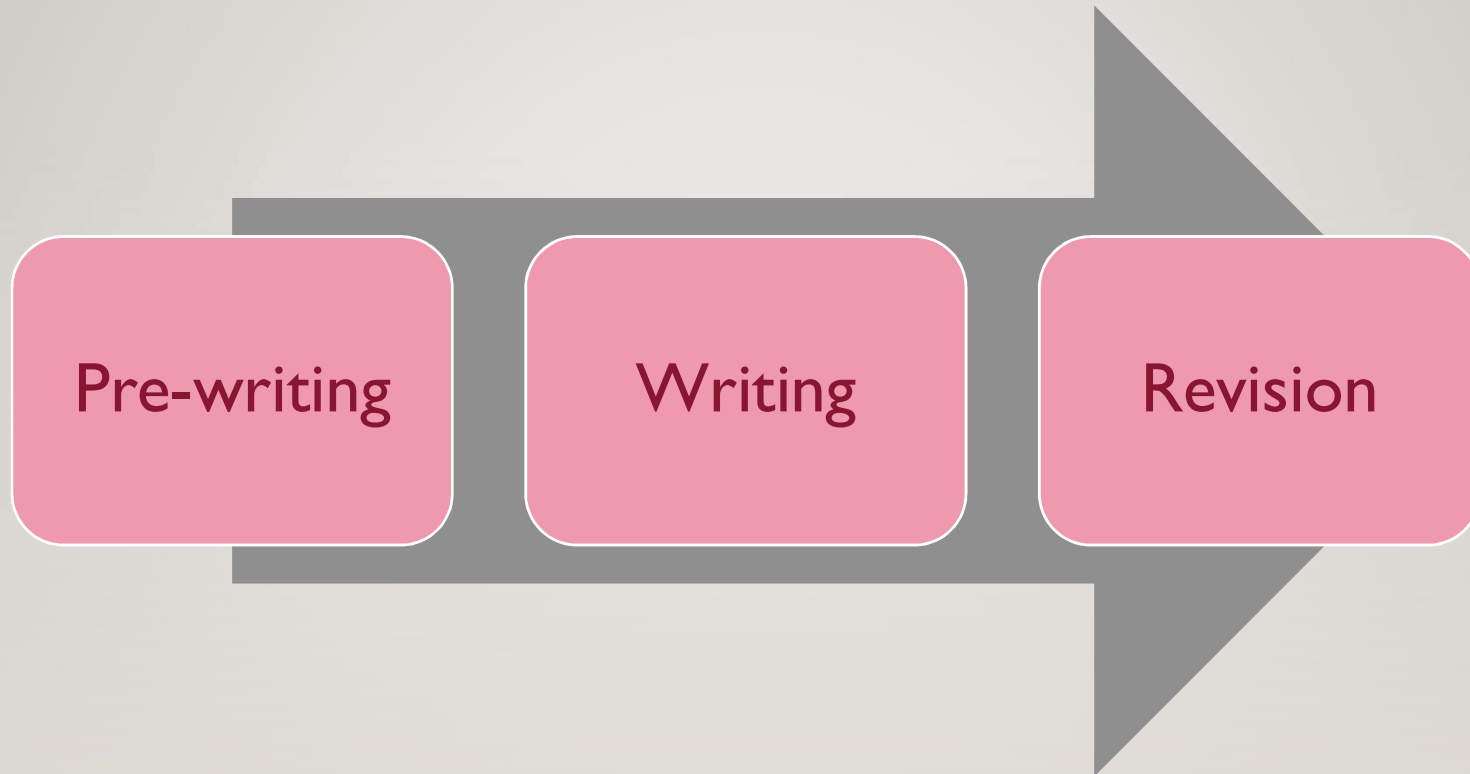
Day 1 Agenda:

- Why effective communication is important in science
- How to write with the reader/audience in mind
- Key elements of scientific writing
- Ways to emphasize the key message in the article
- Language tips to improve writing
- Overview of the writing process

Day 2, Agenda:

- Preparing to write about your research
- Structure of a manuscript
- Composing the various sections of a manuscript
- Structure of a grant proposal
- Composing a convincing grant proposal

OVERVIEW OF THE WRITING PROCESS



THE WRITING PROCESS

Pre-writing

70% of total
time

Collect, generate
and organize
information

Think of key
messages to
present

Develop a rough
outline

Writing

10% of total
time

Put down the
ideas and facts into
organized text

Write the first
draft quickly and
efficiently

Do not revise
while writing

Revision

20% of total
time

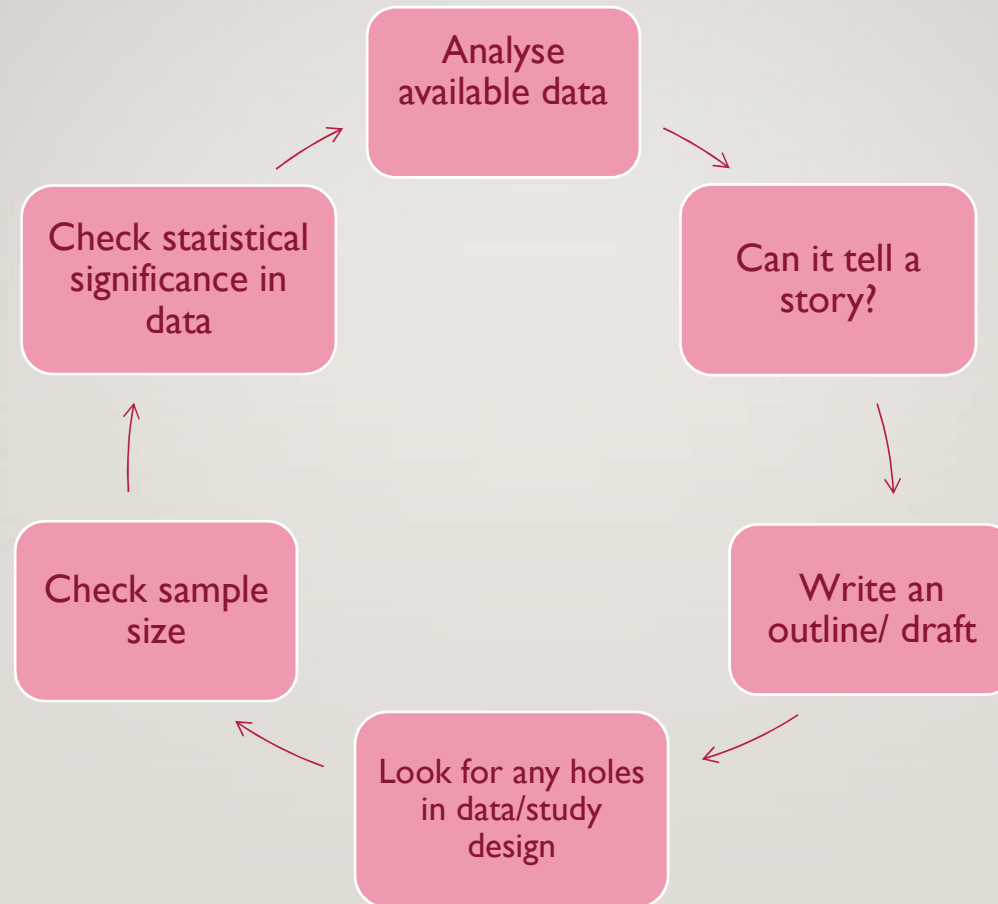
Read your work
out aloud

Eliminate clutter

Do a grammar
check

Get feedback from
others

WHEN TO WRITE A MANUSCRIPT?



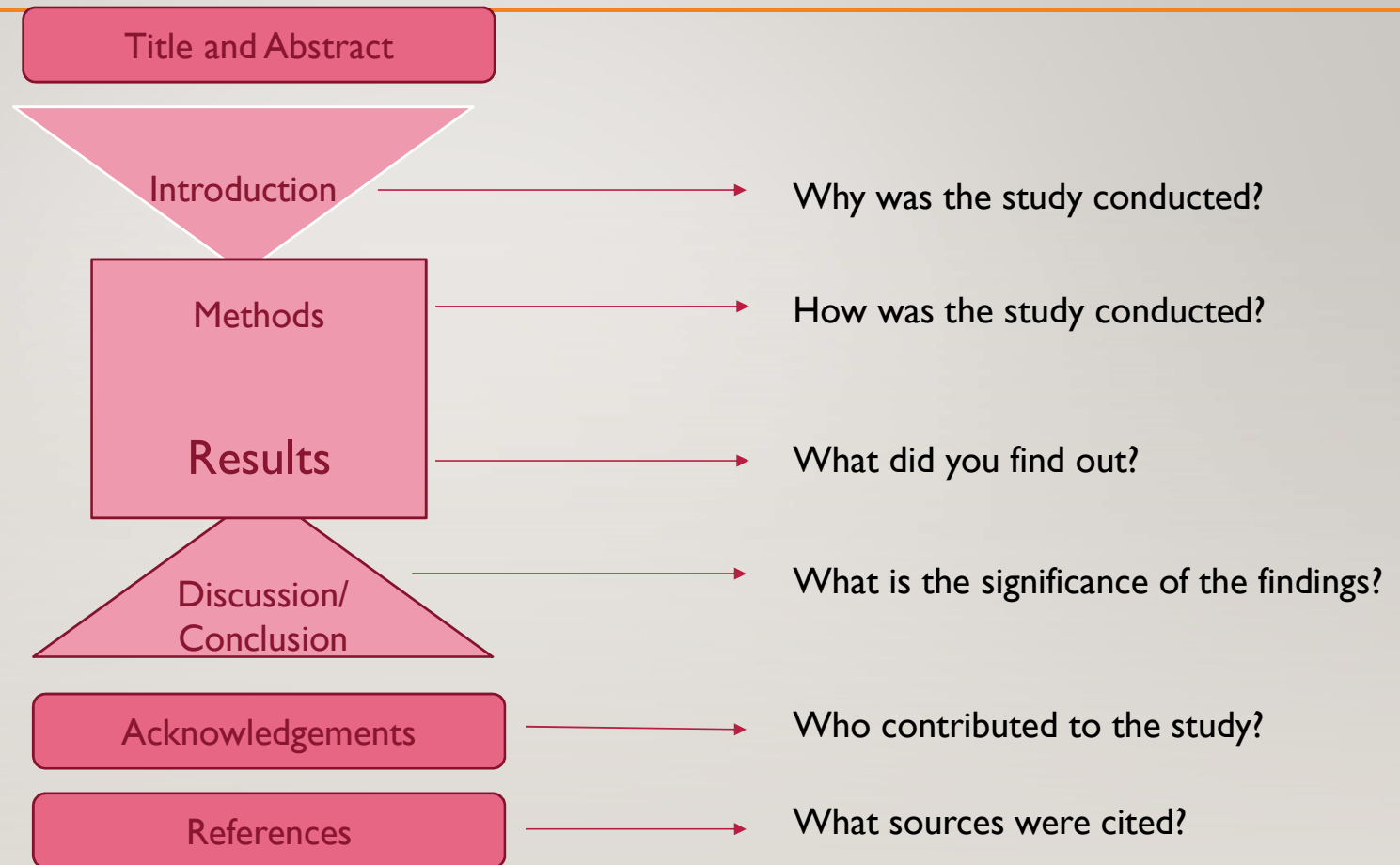
BEFORE WRITING THE PAPER

Before you start writing your paper:

- ✓ Frame your research questions and hypothesis
- ✓ Decide on the journal and audience that you would be writing for

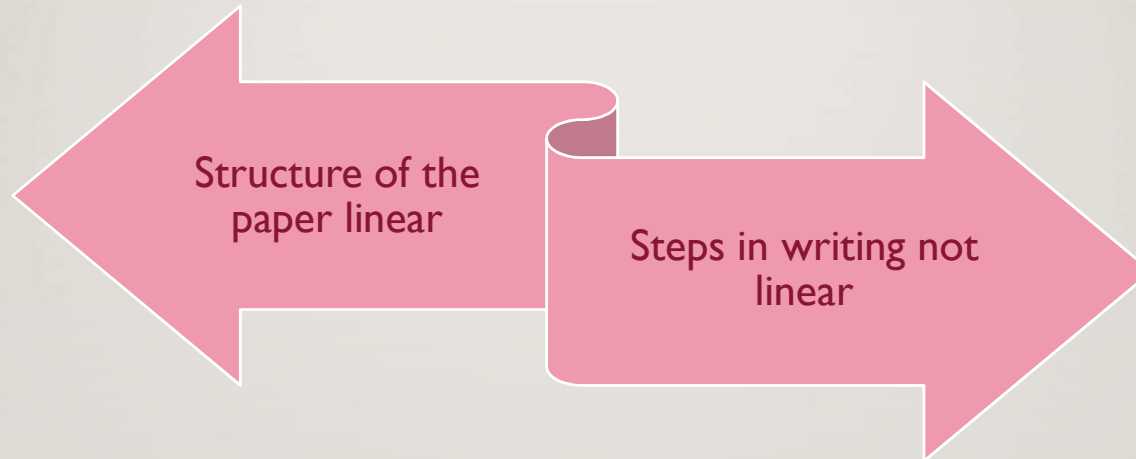


GENERAL STRUCTURE OF A MANUSCRIPT



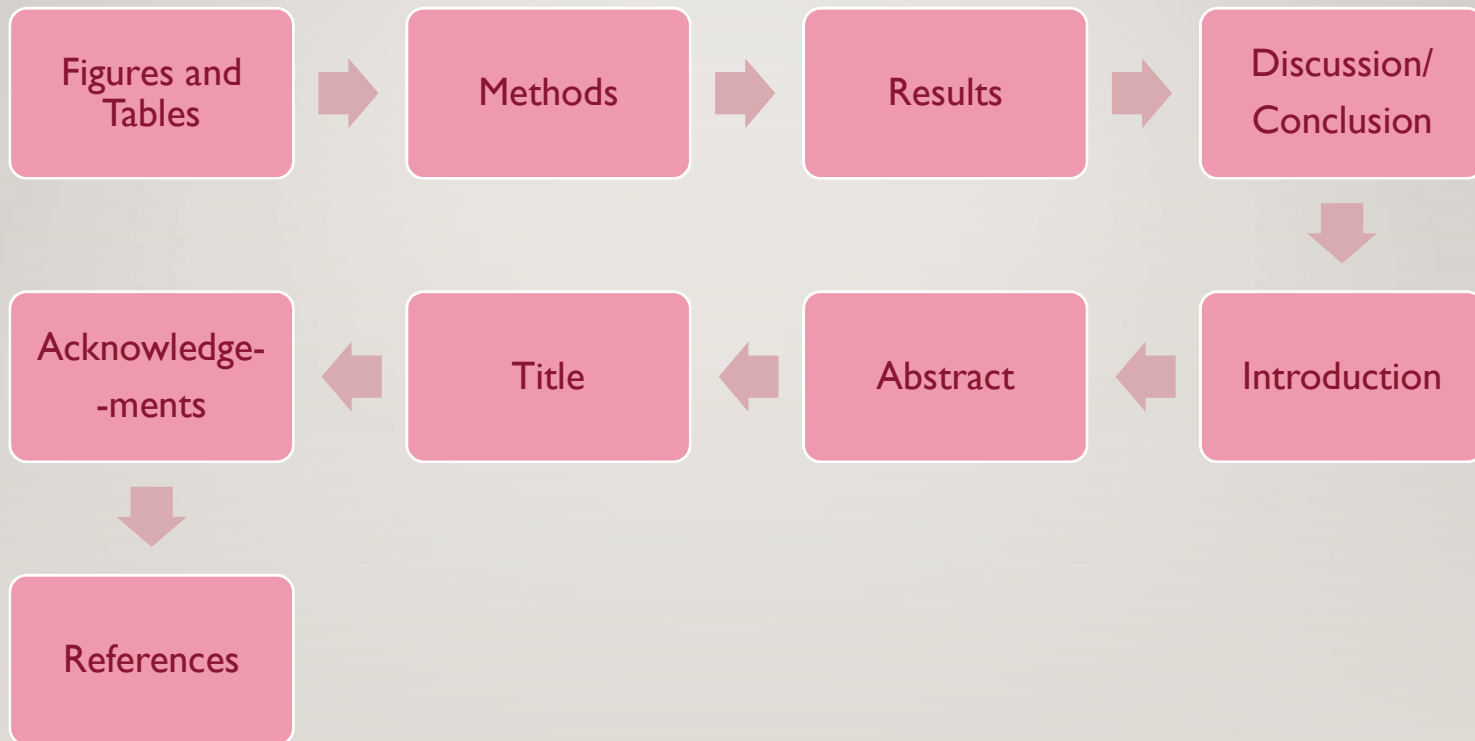
DRAFTING YOUR MANUSCRIPT: THE APPROACH

Which section would you write first?



DRAFTING YOUR MANUSCRIPT: THE APPROACH

Draft your sections in this order:



STEP 1: CREATING FIGURES AND TABLES

Presenting information in a easy-to-understand manner

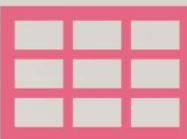
Figures – graphs,
bars, charts,
schematics, photos
Tables

Figures have legends;
tables have titles

Should support the
information
presented in the
results, not duplicate
them

Should be placed in
the order they will
be presented in the
results

Should be self-
explanatory



STEP 2: DRAFTING THE METHODS SECTION

Presents the experimental design in detail

<p>Should give the reader a clear idea of how the study was carried out</p>	<p>Should enable reproducibility</p>	<p>Organized in the order they appear in the results</p> <ol style="list-style-type: none">1. Start with a general statement and get into specific details2. Include material used (strains, cell lines, animal models)	<ol style="list-style-type: none">3. Include approaches to sample preparation and statistical analysis4. Include specific qualitative and quantitative details
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Tips:

- ✓ Use passive voice and past tense
- ✓ Do not discuss results here
- ✓ References can be included, while talking about a protocol described in earlier studies

STEP 3: DRAFTING THE RESULTS SECTION

‘Meat’ of the article: what did you find?

Use this section to answer your research questions

Lead the reader through figures and tables: draw their attention to important findings/ any unusual trends

Describe each figure/table in a separate paragraph

Start of paragraph: introduce the experiment

Middle section: include more details about the experiment

End of paragraph: summarise any meaningful results

Present results in the same order as the Methods section – choose a logical order that tells a story

Use subheadings to organize similar results
For statistical test results, use relevant parameters

To 'sell' your data as significant: What do the result mean?

Tips:

- Avoid use of new terminologies and ideas
- Avoid the use of nonspecific or vague terms, such as increased expression, lower proliferation, and so on. Use quantitative descriptions as much as possible

State how the study contributes to knowledge and impacts research in the field

Summarise the objectives of the study and the key approaches used

Justify the methods and experimental set ups used, and suggest changes or improvements

Compare your findings with findings from similar studies

Include discussions in the context of the results, but do not replicate the results here

STEP 5: DRAFTING THE INTRODUCTION SECTION

What does the study do? Why is it important?

Establish
context of
the study

Gaps in
knowledge
that this
study aims to
fill

Why is it
important to
address this
gap?

Existing
solutions to
the problem

Overview of
the findings-
previewing
results

Introduce
the approach
used and
provide
rationale for
choosing this
approach

Tips:

- ✓ Use highly relevant sources to support the study
- ✓ Use key words from the title to draw readers' attention to the research questions posed in this study
- ✓ Include a clear purpose statement or hypothesis
- ✓ Do not make the section lengthy. Keep it short, clear and concise

STEP 6: DRAFTING THE ABSTRACT SECTION

‘Window’ into your manuscript: gives a brief overview of the entire study

Used as indexing tool, available in electronic databases	Usually contains the same sections as the manuscript, but as very short descriptions – a mini-article	Should be clear and easy to understand and exist as a standalone section	Many people may read just the abstract of your manuscript Make it interesting enough to make the reader read the entire article	Must strictly adhere to length guidelines provided by the journal	Avoid use of scientific jargons, abbreviations, and references Avoid use of passive voice to reduce word count
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The 'catch-it-all' text: the most-read part of a manuscript

useful for indexing
in databases and
reference libraries
identifying the
main topic of the
manuscript

should answer
your main
research question

Should be catchy
to grab readers'
attention

A good title
should describe
the study in the
fewest possible
words

Be concise: title
not a sentence,
avoid filler words

Avoid
abbreviations

Use keywords that
are more likely to
be used as search
terms

can start with a
tentative or
working title,
which will most
likely completely
change at the end

STEP 8: DRAFTING THE ACKNOWLEDGEMENT

Include everyone who contributed to the manuscript, but not to the extent to qualify as co-author

Acknowledging individuals

- provided valuable inputs on study design, interpretation of results,
- helped in proofreading of the manuscript
- provided samples, reagents, any other study material
- provided technical assistance, conducting statistical analysis
- do not include co-authors

Acknowledging funding sources

- Grant agency
- Institutional funding
- Fellowship funding

"Plagiarism is presenting someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgment" - Definition taken from the University of Oxford website

General rules for avoiding plagiarism:

- Writing exactly as someone did: provide reference and include in quotes
- Paraphrasing what others wrote: provide reference, no quotes needed
- Using ideas from others: provide reference

Self-plagiarism/duplication of data: using one's own words or data in different publications (acceptable in Methods section)



GRANT PROPOSAL STRUCTURE

Introduction

Background and Significance

Specific aims

Research design/approach

Timeline and budget

MAIN RULES FOR SUCCESSFUL GRANT WRITING

1

Write to satisfy the funding agency/reviewers

2

Read carefully the guidelines for the specific grant call

3

Organize the grant application clearly

DRAFTING A STRONG SPECIFIC AIMS SECTION

Must fit on one page

Thematically related to the central hypothesis, but yet distinct and not dependent on each other

Hypothesis-driven, not descriptive

Achievable in the given time frame

Uses active language and makes the reader excited

A FEW THINGS TO KEEP IN MIND...

Based on my experience with editing proposals:

- The specific aims are not stated consistently in the different sections of the proposal
- Potential risks/pitfalls, alternate strategies not described in the research design section
- A substantial bio sketch is not provided; study team is not well-described
- Inconsistent terminologies/uncommon acronyms are used
- Weak verbs are used in specific aims



THE SUCCESS FORMULA

A sound scientific
approach



Logical and
achievable aims



Compelling
preliminary results



A winning grant
application

References:

- Coursera: Writing in the Sciences
- <https://rede.tghn.org/workshops2020/manuscript-writing-2021/>
- <https://www.elsevier.com/connect/11-steps-to-structuring-a-science-paper-editors-will-take-seriously>
- How to write an effective research paper:
<https://www.youtube.com/watch?v=cMJWtNDqGzI>
- Formula for grant success: CIRM grant writing webinar:
<https://www.youtube.com/watch?v=AlZb5I17qGs&t=2s>
- Grant writing tips: <https://www.youtube.com/watch?v=WDL5nVJerq0&t=2851s>





Thank you