Manuscript Preparation and Publication – the Basics

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Outline

- Science and publications
- The hierarchy of what we know
- The role of publications in the cycle of scientific research
- Begin writing!
  - The basic process of writing a manuscript
  - Principles
  - Title, abstract, closing
- Typical mistakes to avoid in content and style
- The editorial process and the five rules of rejection
- Editorial services and how to find one

Reasons for writing a manuscript

- To be allowed to graduate
- To satisfy career requirements
- To get tenured
- To please your supervisor
- **To share scientific information and knowledge**
- Your grant proposal requires publications
- To generate citations as a measure of your abilities and research performance
- and so on...

SCIENTIFIC LITERATURE IS NOT SCIENCE

IT IS INFORMATION AND KNOWLEDGE, SHARED IN PUBLICATIONS AND STORED ON VARIOUS MEDIA

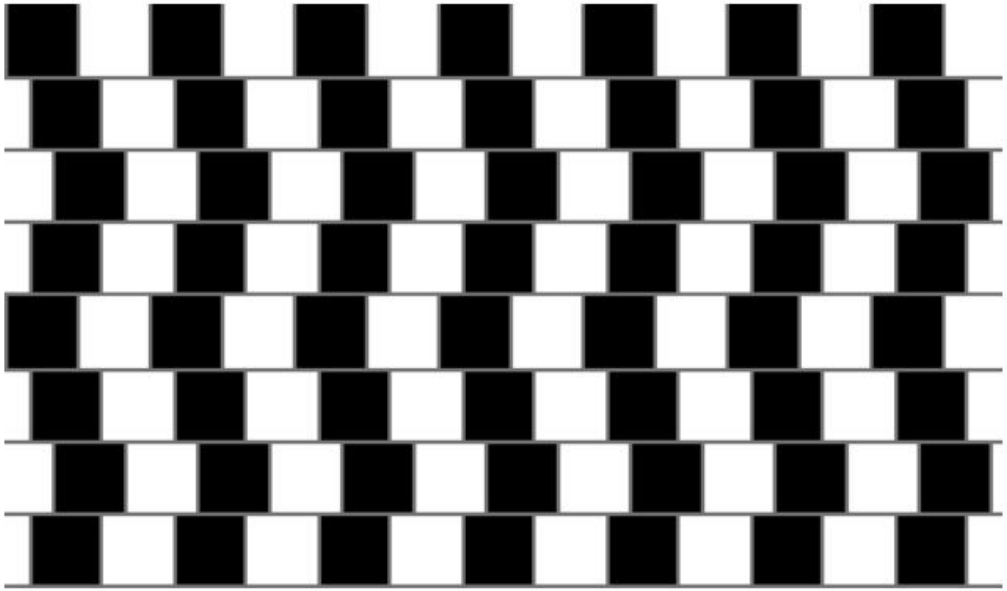
Articles and presentations

- Both **describe a topic to an audience**. The goal is to inform and convince others.
  - Scientific presentation: Graphic dominated, text aided; could be for any audience. It makes a one-time impression to the audience. There is an OPTIMAL amount of new information (you lose your audience only once). **Too much is BAD!**
  - Scientific article: text dominated, graphic aided; typically for expert audience and peers. Members of the audience can read the article repeatedly, so it could be extensive and highly technical.

WHY DON'T WE REMEMBER EVERYTHING?

We are constantly bombarded by impulses from accidental observations and hearsay, which is filtered and interpreted by our brain based on knowledge (personal experience and acquired knowledge)

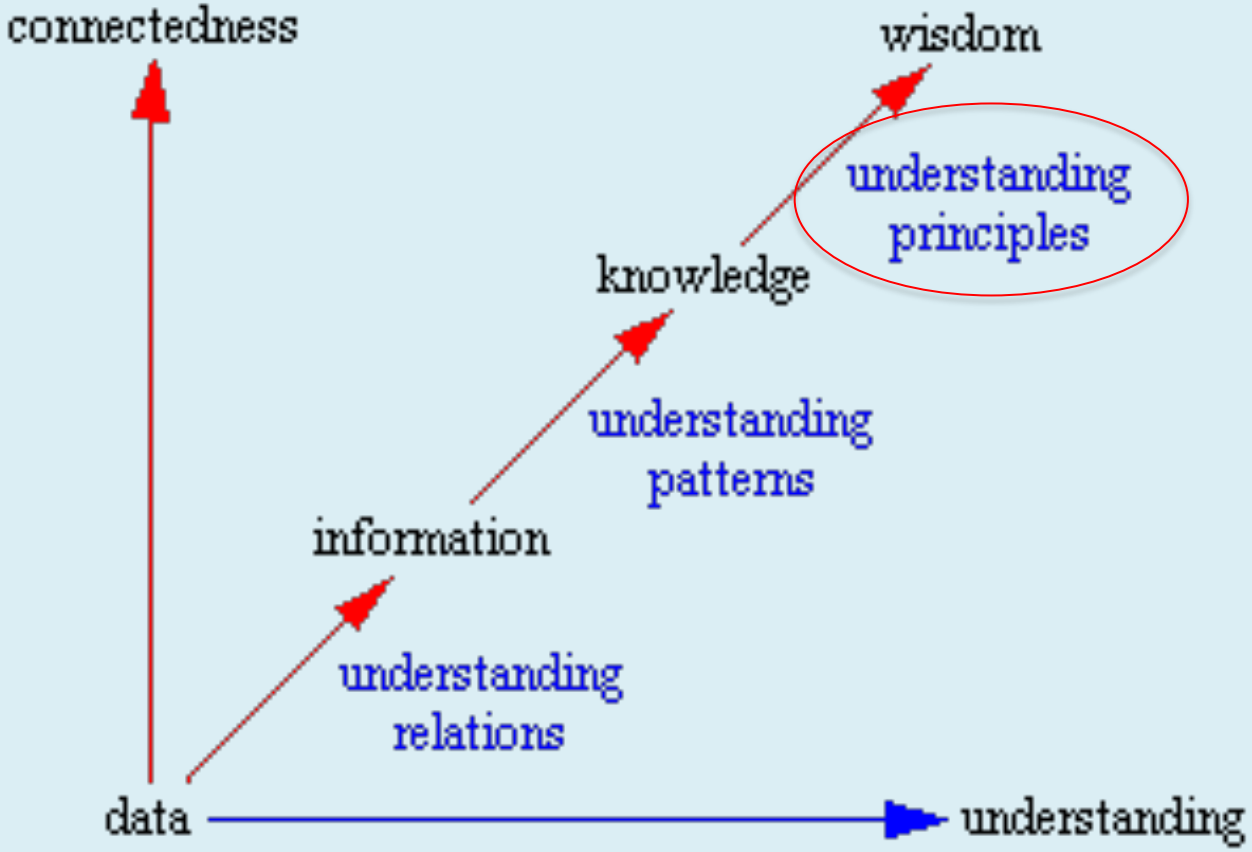
Human brain is powerful!



Are the horizontal lines parallel or do they slope?

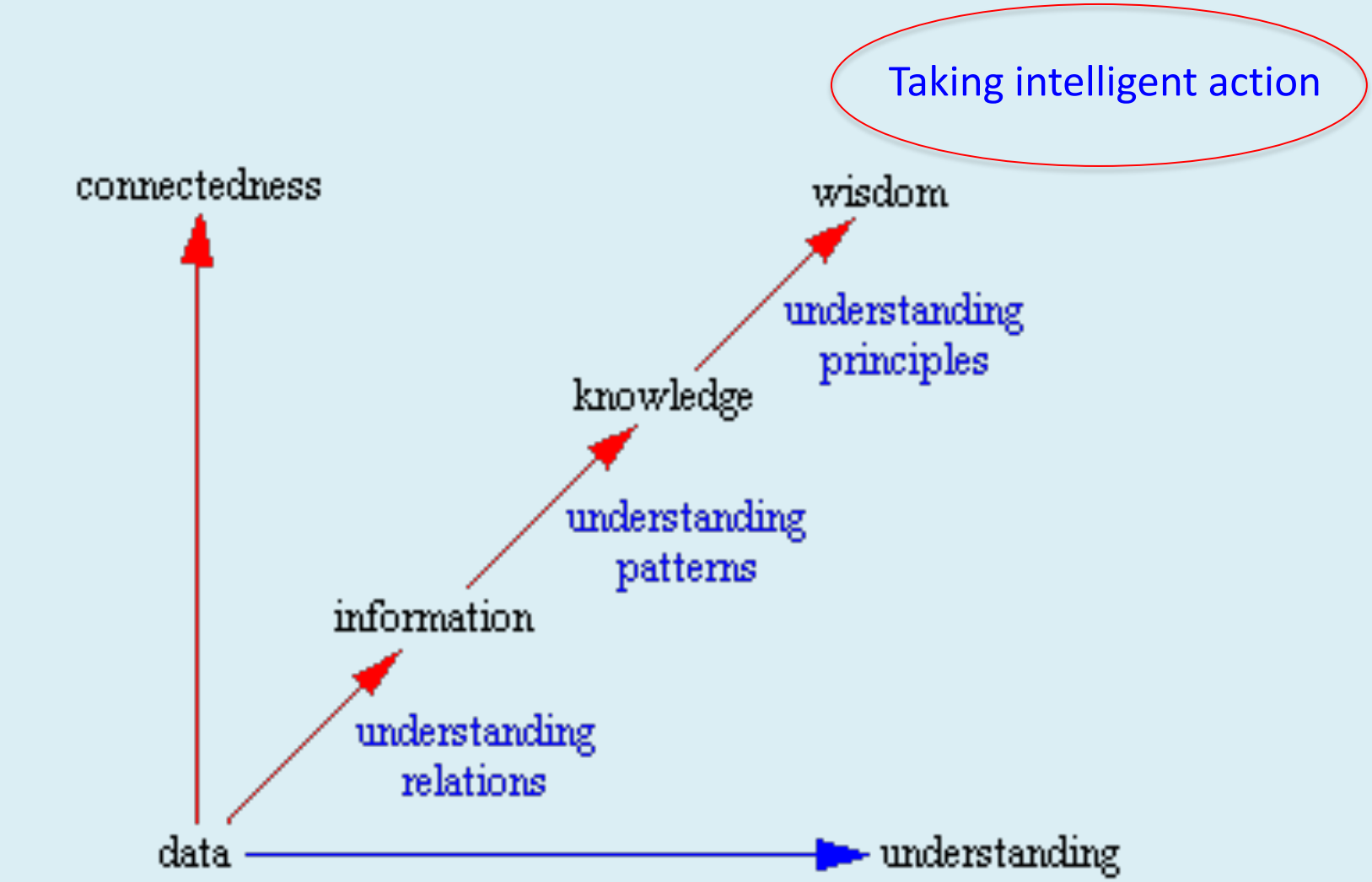
What we ”see” is the result of our brain’s interpretation, and our brain decides whether it is important for us or not

Hierarchy of what we know



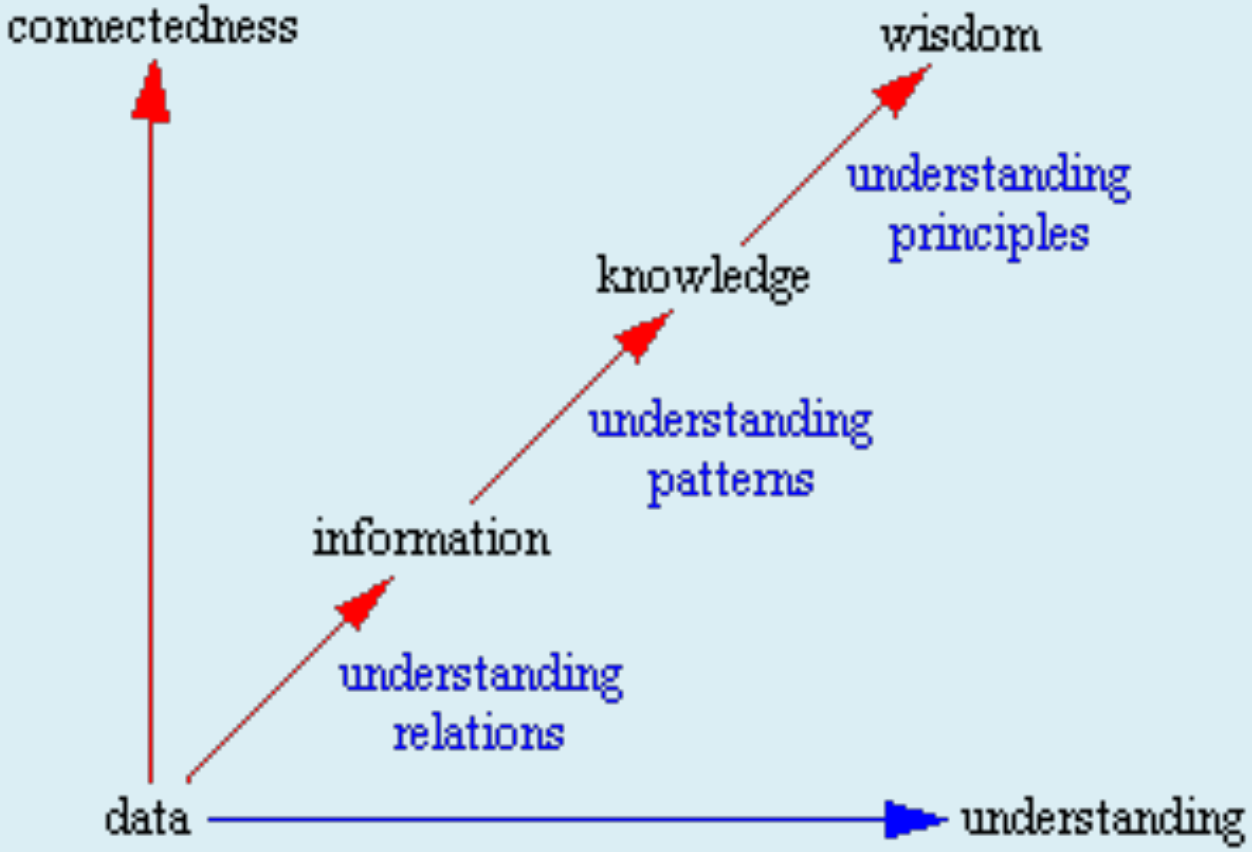
Observe and measure
with intent

Hierarchy of what we know



Hierarchy of what we know

Taking intelligent action



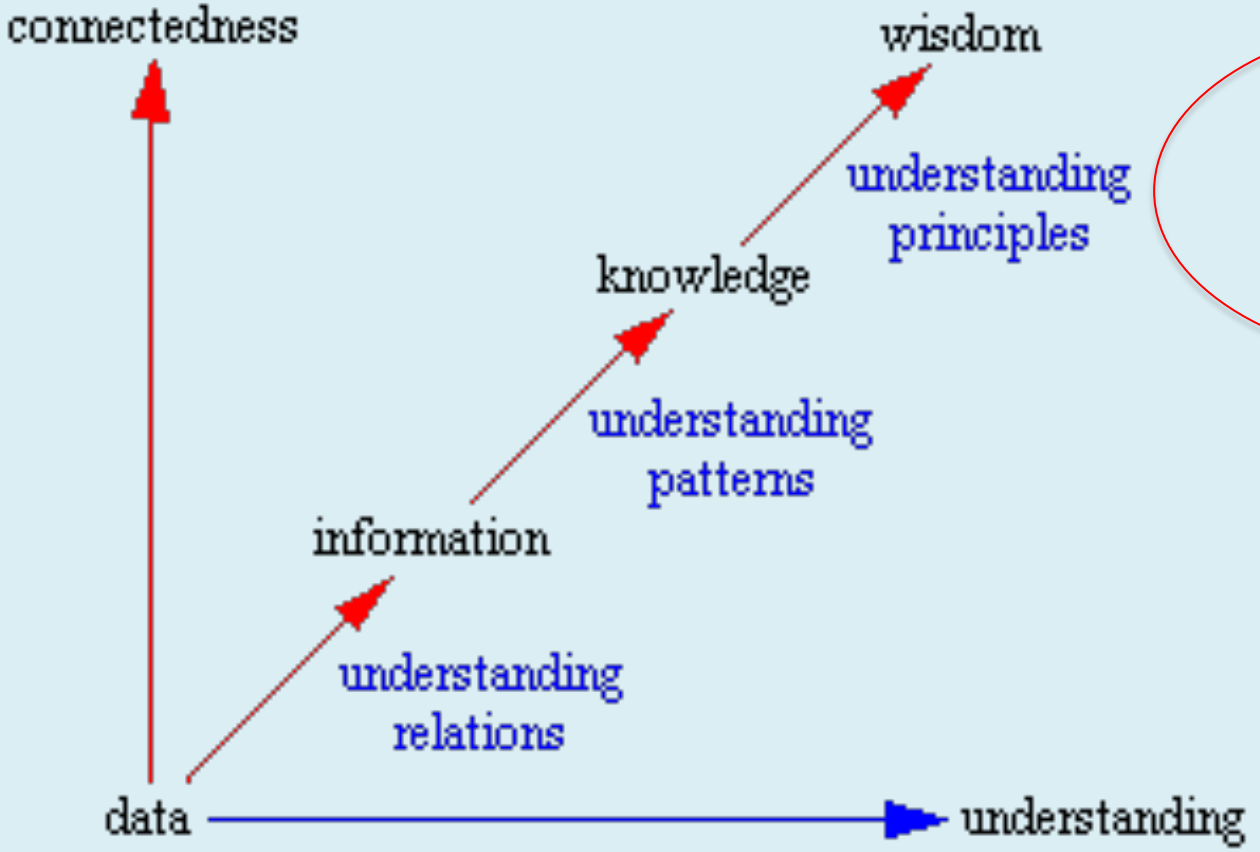
Simplify complexity:

$E=mc^2$

SIMPLIFYING COMPLEXITY MAKES QUANTITATIVE PREDICTIONS POSSIBLE

Hierarchy of what we know

Taking intelligent action



Simplifying complexity:

$E=mc^2$

accidental observations and hearsay

THE ESSENCE IS SIMPLE, ONLY THE DETAILS ARE COMPLICATED

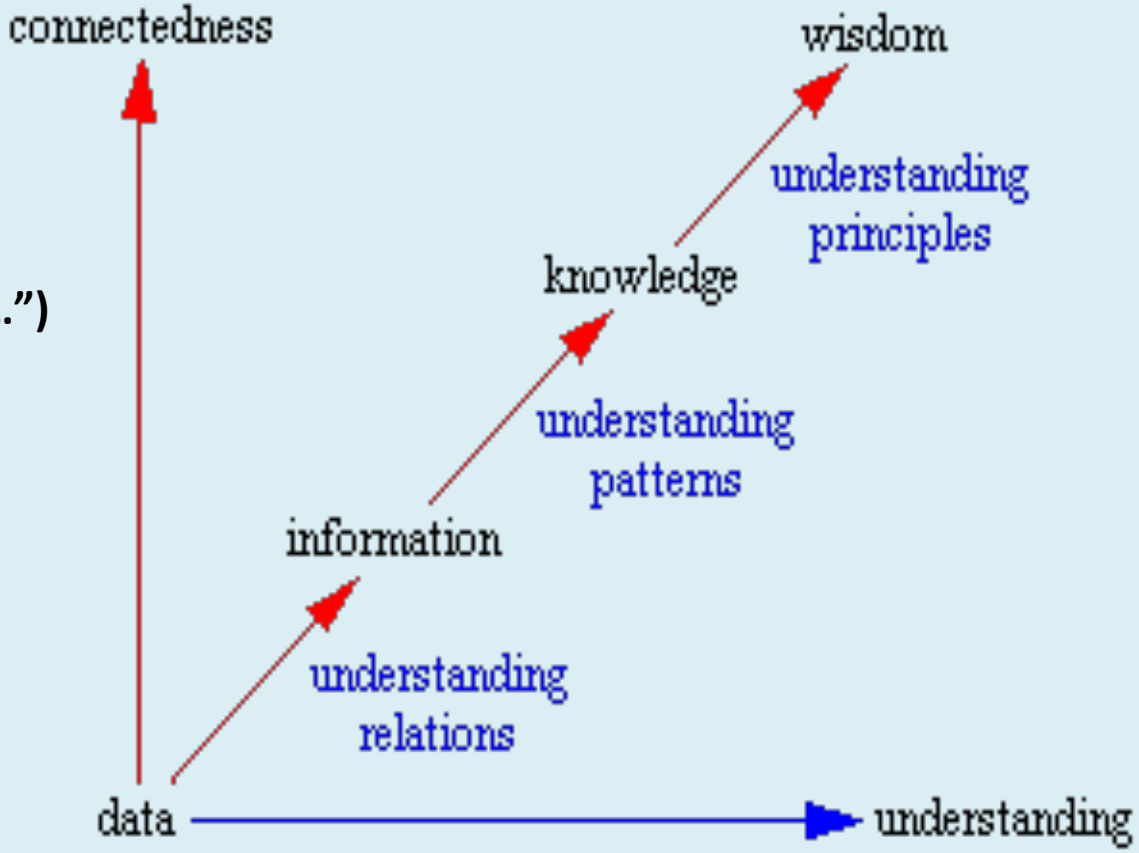
The role of a publication is to provide knowledge and information based on data to better understand the world

GAPS IN OUR WISDOM

↓

Hypothesis (“I think it works this way…”)

PLAN and PERFORM EXPERIMENTS to gather data (some ‘good’, some ‘bad’)



The role of a publication is to provide data, information, and knowledge to better understand the world

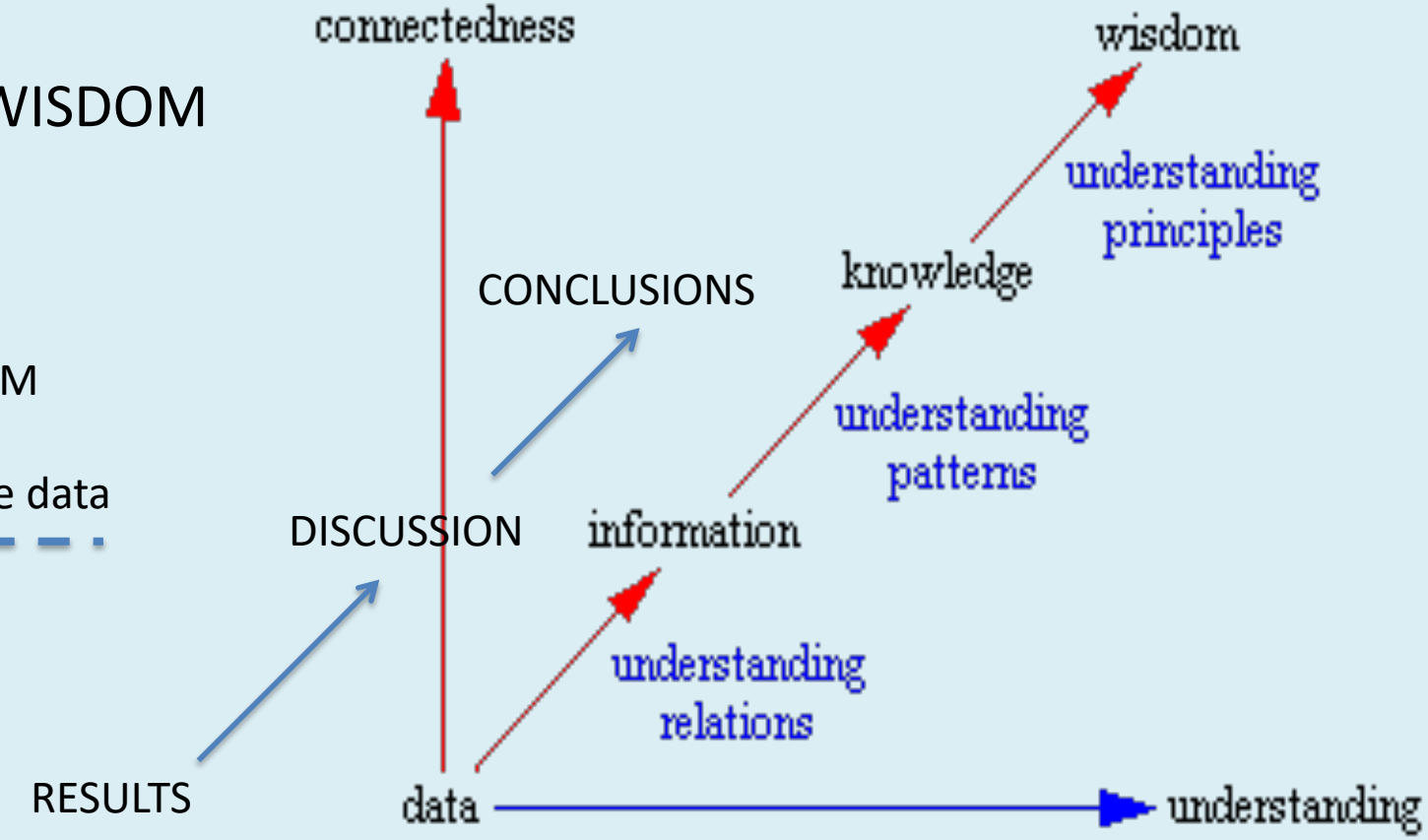
GAPS IN OUR WISDOM

Hypothesis

PLAN and PERFORM
EXPERIMENTS
To collect reproducible data

INTRODUCTION

EXPERIMENTAL PART: Materials, Methods, Conditions



The role of an article is to provide new information contributing to knowledge

GAPS IN OUR WISDOM

Hypothesis

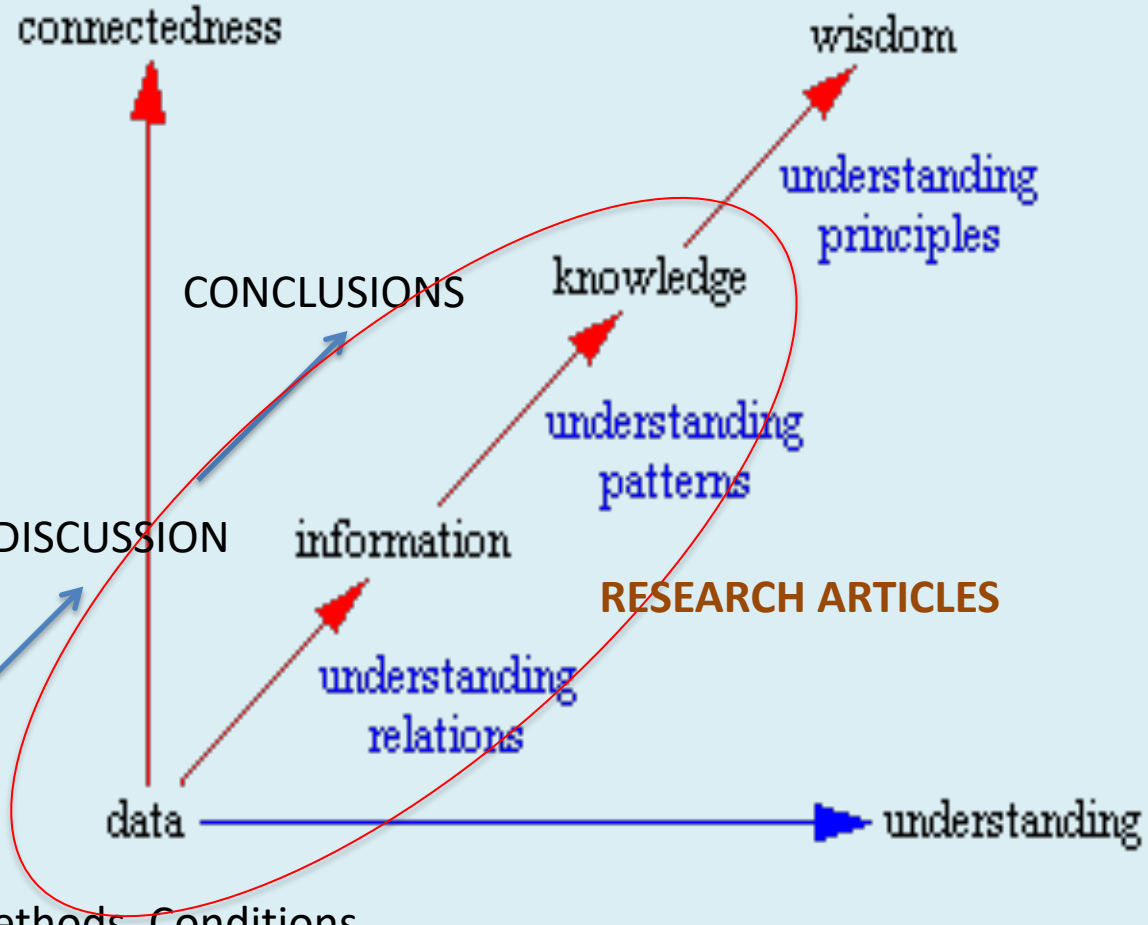
PLAN and PERFORM EXPERIMENTS

INTRODUCTION

RESULTS

DISCUSSION

CONCLUSIONS



EXPERIMENTAL PART: Materials, Methods, Conditions

The role of a review is to reconciliate knowledge and clarify principles

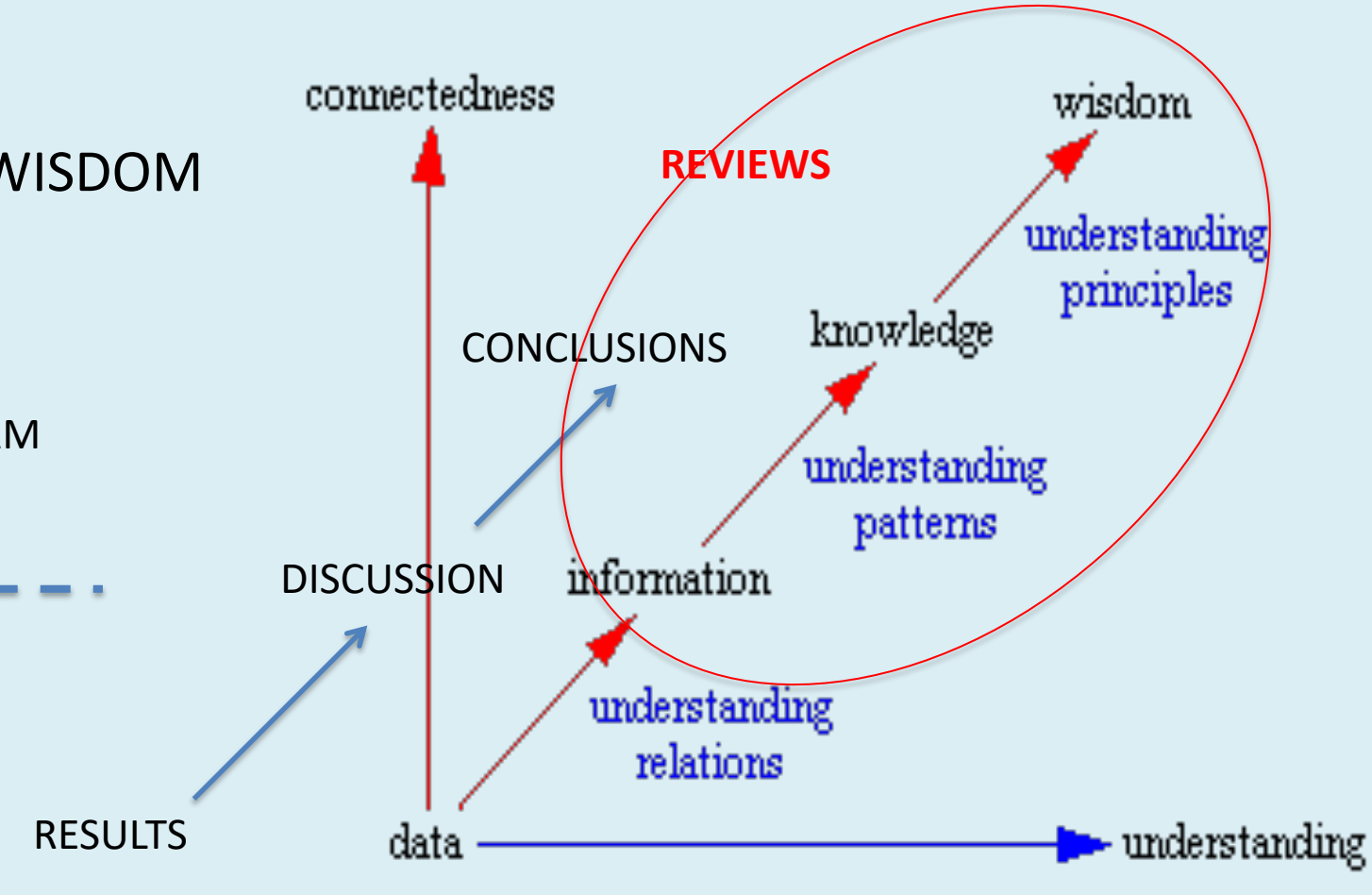
GAPS IN OUR WISDOM

Hypothesis

PLAN and PERFORM EXPERIMENTS

INTRODUCTION

EXPERIMENTAL PART: Materials, Methods, Conditions



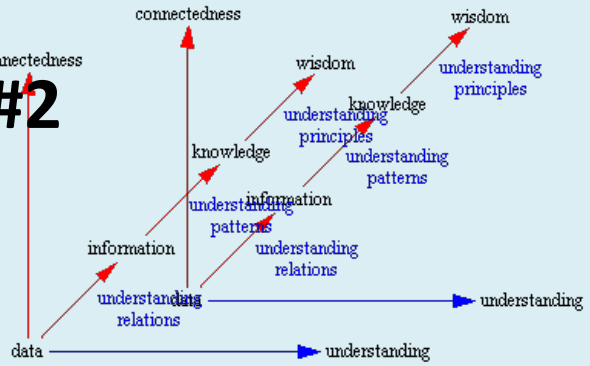
The process is repeated over and over for every publication…

Papers must have reliable data and connect through verifiable conclusions to provide a new piece of knowledge to improve common wisdom

Publication #2

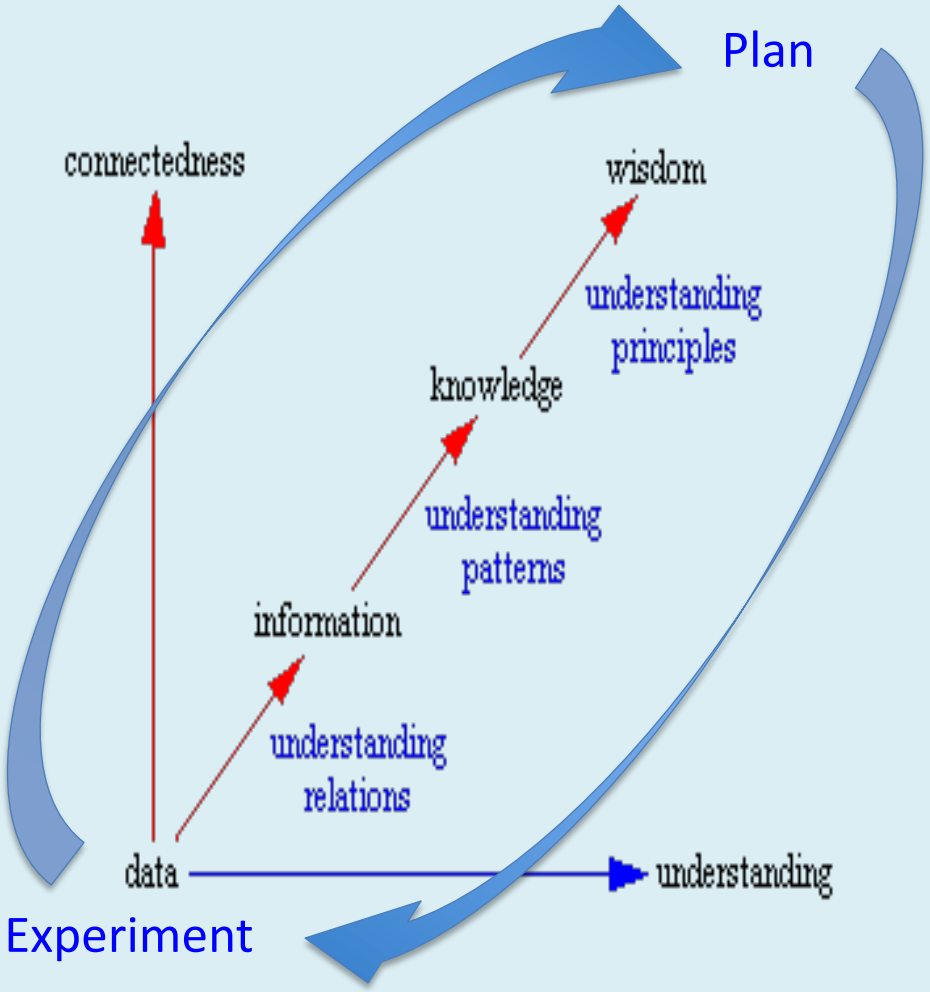
Publication #1

Publication #0



New knowledge is built upon existing knowledge and reproducible new information

The cycle of scientific research requires knowledge and skills



to better understand principles, we create a hypothesis, then plan and run experiments to

- gather data
- analyze the data to understand relations to create information
- Identify patterns to form new knowledge
- Share our information and knowledge with others to contribute to common knowledge;

BASIC RESEARCH IS NEVER FINISHED, IT JUST RUNS OUT OF MONEY AND TIME...

Writing your manuscript:

Sharing your data, information, and knowledge in order to inform and convince others

You wish to publish your paper in a prestigious journal and get many citations

YOU WOULD USUALLY ALSO PREFER TO:

- To not spend a lot of time writing the manuscript
- Send it to the right journal
  - Get good reviews
  - Get accepted quickly
- Publish it in a short time (this is not always up to you)

To achieve these goals you need **readers**

PRNANO

ANDOVER HOUSE

A scientific manuscript is a simple, logical, and systematic description of complicated things

It is NOT a complicated, illogical, and sophisticated description of simple things

The writing process:

1. CONTENT

2. LANGUAGE

3. FORMAT

The basic process of writing a research paper

Imagine, you are going to tell a story to other people about your trip to an interesting place.

It is a good idea to put together a photo album first (group your data, find the best way to show them)

TELL US:

1. Why did you go there? (motivation, hypothesis)
2. Who were there before? What did they see? How did they get there? (background)
3. How did you get there? (methods, materials)
4. What happened? (observations, measurements)
5. What do you think all about this? (discussion)
6. What is your advice for us and for the future? (conclusions)
7. Don’t forget to thank those, who made your trip possible! (Acknowledgement)

Five steps of writing a manuscript

#1: Identify a topic. What is your story?

- Write down everything you have as it comes (data and their relations, i.e., create pieces of information and find patterns between them).
- Identify what is the new knowledge

#2: Simplify your language and check for grammar. Make sure you are saying what you intended to say.

#3: Select target journal, download, and read author information, download templates (if any), and transfer your content into the required format (don't yet care about limitations)

#4: Apply style and limitations

#5: Refine your style

The process of writing
Step 1: START WRITING

- First draft:
  - Decide what is your goal by telling this story
  - Start writing as it comes (JUST DO IT!)
  - Describe methods and collect data
  - Organize data
    - Compose tables, create graphs
  - Write down a brief account for the findings (pieces of information)
  - Figure out how can those be explained (patterns – supporting, contradicting, comparing to)
  - Are they consistent with your hypothesis?
  - Are your conclusions supported by your data?

The process of writing:
Step 2: CREATE YOUR CONTENT

- Second version:
  - Decide on the journal and the type of your future paper
  - Read the Author Instructions, download template(s)
  - Apply required format, reorganize your manuscript according to requirements
  - Compose first version of introduction
  - Reorganize your data, figures, and tables
  - Discuss your data (transform data to information by explaining them)
  - Is there any new knowledge? What is it?
  - Describe how this new knowledge may be useful for others

Principles

DON’T FORGET:

- Articles are written for OTHERS and not for yourself.
- Have a good story, keep it simple to read, easy to understand, *plus* make it good-looking
- Your reader knows only as much, as you have told him/her
- Always explain how this is useful for others
- Someone, who is trying to reproduce your work is a potential collaborator – provide all necessary experimental details!

The paper should move the field forward!

What do people buy?

- What they need
- What they find interesting
- What is beautiful or at least good-looking
- What is easy to get (or ‘free’)

What do you read?

- What is useful for you
- What you find interesting
- What is good-looking (projects thoroughness and pays attention to details)
- What is simple to read and easy to understand

The way YOU read papers of others, is the way others read YOUR paper

T I T L E

Continue? Y/N

ABSTRACT

Continue with downloading paper? Y/N

Figures, Conclusion

Continue? Y/N

Body of paper

Continue? Y/N

Supporting material

CAN I REPRODUCE THE RESULTS?

The number of those who continue always decreases…

Title

The title is the first thing that the reader will see, and this will determine whether they will read further. It also sets expectations.

The title needs to encapsulate the subject of the article in a few words. Try to make your title interesting and inclusive, but not blunt.

Hint: Start writing by defining the topic of the manuscript (your story) and convert it to a title as the last step to capture the attention of your audience.

Good titles

Nanomedicine and nanotoxicology: two sides of the same coin

TNF-α in Cancer Treatment: Molecular Insights, Antitumor Effects, and Clinical Utility

Synthesis of 5-Aryl-1,4-Benzodiazepine Derivatives Attached in Resorcinaren-PAMAM Dendrimers and their Anti-Cancer Activity

What is the difference?

Quantum dot nanoparticles for optimization of breast cancer diagnostics and therapy in a clinical setting

Optimization of breast cancer diagnostics and therapy by quantum dots in a clinical setting

Clinical optimization of breast cancer diagnostics and therapy

Quantum dot nanoparticles for optimization of breast cancer diagnostics and therapy

Bad titles

Do Endothelial Cells Dream of Eclectic Shape?

Heat-assisted Amplification of Plasmonic Circular Dichroism in Dynamic Gold Nanorod Oligomers: Surfactant Bilayer Mediated Chirality Transfer

Engineering design of functionalized molybdenum sulfide nanosheets for image-guided targeting therapy of drug-resistant MCF-7 cancer

Abstract

- 1. An abstract gives the reader a "preview" of what's to come. Abstracts are published separately in bibliographical sources. They allow other scientists to quickly scan the large scientific literature and decide which articles they want to read in depth. The abstract should be a little less technical than the article itself; you don't want to scare away your potential audience from reading your paper.
- 2. The abstract should be one paragraph, of 100-250 words, which summarizes the purpose, methods, results and conclusions of the paper. Start by writing a summary that includes whatever you think is important, and then gradually refine it down to size by removing unnecessary words, while still retaining the necessary concepts.
- 3. It should stand alone without any citations and footnotes. Avoid abbreviations.

Closing

- **Acknowledgements**

Thank those who either helped with the experiments, or made other important contributions, such as discussing the protocol, commenting on the manuscript. ALWAYS thank for funding!

- **References**

Whenever you draw upon previously published work, you must acknowledge the source. Any information not from your experiment and not "common knowledge" should be recognized with a citation. (Refer to the guide for authors for the specific journal.)

- **Supplementary material**

in one word: DETAILS. These should be sufficient to reproduce your experiment and your data).

EDIT YOUR PAPER

A major part of any writing is re-writing

1. Write accurately.

Scientific writing must be accurate. Although writing instructors may tell you not to use the same word twice in a sentence, it's okay for scientific writing, which must be accurate.

Use the Thesaurus to find the best word, but do not use words you don't know.

2. Make sure you say what you mean.

Instead of: The rats were injected with the drug. (sounds like a syringe was filled with drug and ground-up rats and both were injected together) *Write:* I injected the drug into the rat.

Check your grammar, spelling and punctuation

- Use a spellchecker but be aware that they don't catch all mistakes. (*"When we consider the animal as a hole,..." Student's paper)*
- Your spellchecker may not recognize scientific terms.
- Don't, use, unnecessary, commas.
- Proofread (or have someone proofread) carefully to see if you any words out.
- Use the Thesaurus to color your sentences if needed.
- Do not use words if you are not sure about their meaning!

Typical mistakes in content

- You talk about what you have done instead of telling a story
- You tell everything you have done
- No justification (readers don't know why have you elected to use a particular method)
- Too much is in one figure ("Chartjunk")
- Incomplete figures
  - Lack of experimental information
  - Observation is not information ("and you can see…")
  - No conclusion
  - Only data on the slide, no information
- Too much generalities and sales-talk, not enough specifics

Typical mistakes in style

AVOID:

- Using terms that (a) don't carry information ("blah-blah"), (b) project uncertainty, or (c) may result in unjust generalization
  - "the nanoparticle" 'PARTICLE' means a solid piece of material with a permanent shape. Anything that bounds to the surface of a nanoscale object becomes part of the nano-system, and the object is not just a 'nanoparticle' anymore. A micelle is not a particle.
  - "successfully", "significantly", "obviously", "about", "some" , "approximately", etc. BE SPECIFIC!
- 'Cure cancer' – Cancer is a collective name for many illnesses that are heterogeneous and continually changing.
- Blurring the border between clinical use and research topics
- Cells (receptors) can only be targeted in vivo!
- Emphasizing only the positive aspects
- Neglecting system characteristics and consider only one component of all possible interactions ("gold nanoparticles")
- Lousy characterization of the components and materials used

The editorial process:

FORMAT?

CONTENT?

LANGUAGE?

Editorial process

When a paper arrives at a journal's editorial office, a few things happen:

1. The Managing Editor reviews the manuscript for formal requirements
2. EiC evaluates merit and rejects or considers the manuscript. It may be assigned to an Associate Editor
3. Editor or AE finds and invite Peer Reviewers
4. Critiques are received and evaluated
5. First decision is made, and evaluations are shared with the authors
6. Revision and review cycle
7. Decision is finalized
8. The paper goes to publishing

Formal check (staff)

Did the author follow the Instructions of the journal?

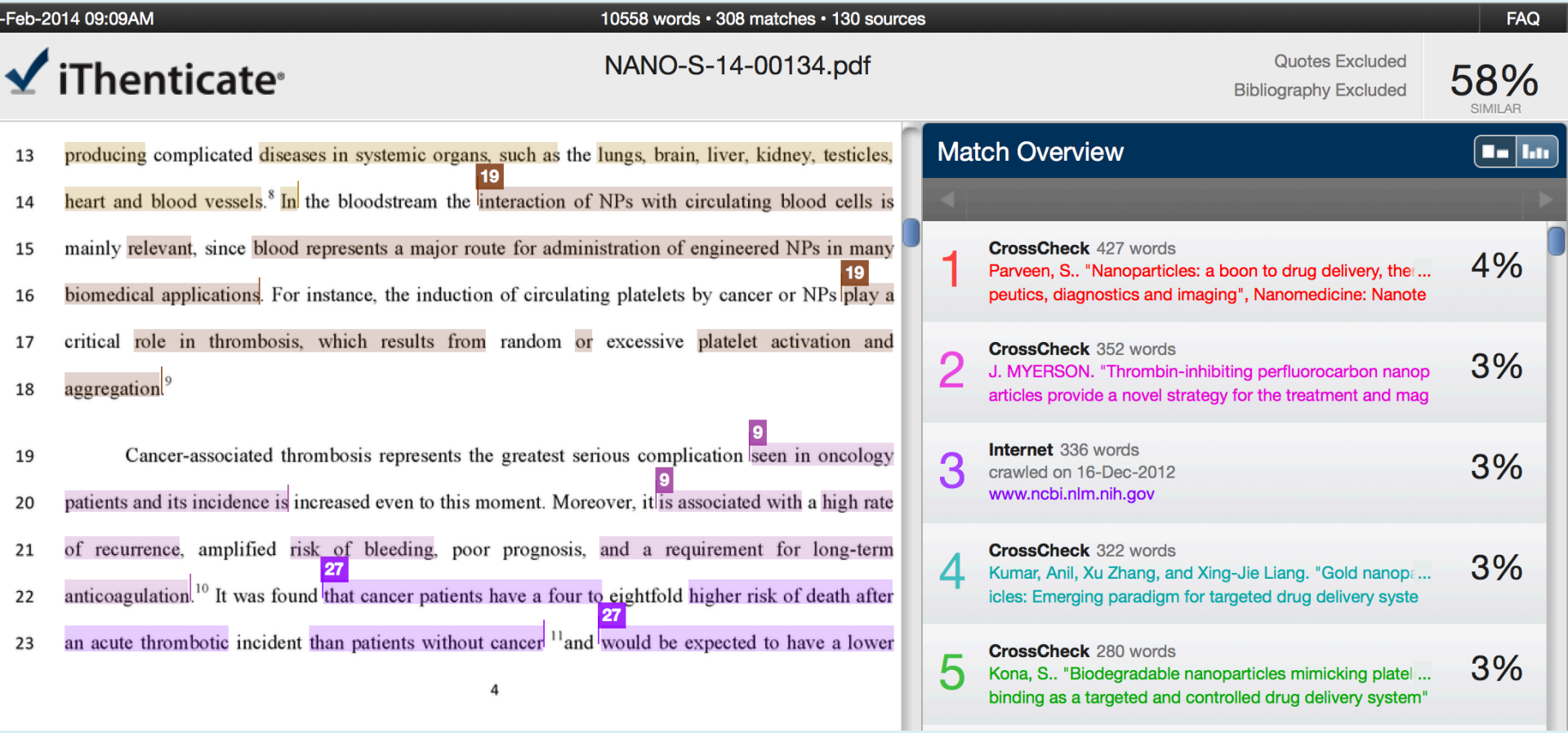
- Is the article formatting correct (Abstract, Introduction, Methods, Results, Discussion, Conclusion, Refs)?
- Are figures of sufficient quality?
- Has every required document been uploaded?

    - If the answer is no, the manuscript is returned…

EiC checks:

1. Appropriateness for the journal
    - Is the topic relevant to the journal's scope?
    - Is the topic original/novel?
    - Is the topic significant?
    - Does the study have scientific merit?
    - Is the manuscript of good enough quality?

How the editor sees your manuscript



- Don’t copy sentences/paragraphs without referring to it
- Don’t pass of the works of others as your own
- Acknowledge citation sources

The five rules of rejection without review

- **Plagiarism**
- **Out of scope**
- **Too preliminary** – observation is not knowledge!
  - Single dose studies with very few animals, no dose-response studies.
  - In-vitro assays with single dose or at very high concentration, one cell line only, no healthy cells as control, No proper controls.
- **Lack of novelty**
  - Copied from somewhere without critique (reviews)
  - Repeats well-known data and conclusions
  - Use of assays, which are not internationally recognized as valid and relevant
- **Lack of quantitative data/specifics**
  - Not using correct models and statistics
  - Lack of sufficient information or irreproducible
- **Too much sales-talk**

You never have a second chance to make a first impression

- When editors and reviewers first read your manuscript, they already make up their mind before evaluating your actual results. Lack of thoroughness and mistakes in the manuscript makes the editor and the reviewer think that the same is true for the experiments.

- There are many editorial services to help authors (and mostly themselves)

How to spot a phony editorial service

- Spelling and grammatical errors on web page
- You don’t know who you would be working with
- The editors’ credentials cannot be verified
- The service is located in a country, which is not known for scientific achievements (www.whois.com/whois/)
- The business does not have a verifiable location, a postal address, and a tax ID number
- You are asked to use only web forms to communicate
- Prices either too high or too low
- They ask you to have your manuscript reviewed by a native English speaker

Mc²

https://Manuscriptclinic.us

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Dr. Lou Balogh, Executive Editor
Editor-in-Chief, Nanomedicine NBM 2008-2016

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Suggestions

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Why Manuscript Clinic?

Less time wasted, higher acceptance rate, more citations.

The Editor understands the underlying science and can help you to improve the content.

WE DON'T DO PROOFREADING. PROOFREADING ALONE WILL NOT HELP YOU.

For more, contact me at office@mceditors.com

Thank you for your attention!

Questions?