

# **Reviews in Quantitative Biology**

Review Writing



Christophe Dessimoz

# Purpose of a Review

“Reviews synthesise for a non-specialist readership current topics in [a particular] field”

**Trends** in **Genetics**

# Purpose of a Review

“A literature review is a body of text that aims to review the critical points of current knowledge and or methodological approaches on a particular topic.”

“Literature reviews are secondary sources, and as such, do not report any new or original experimental work.”



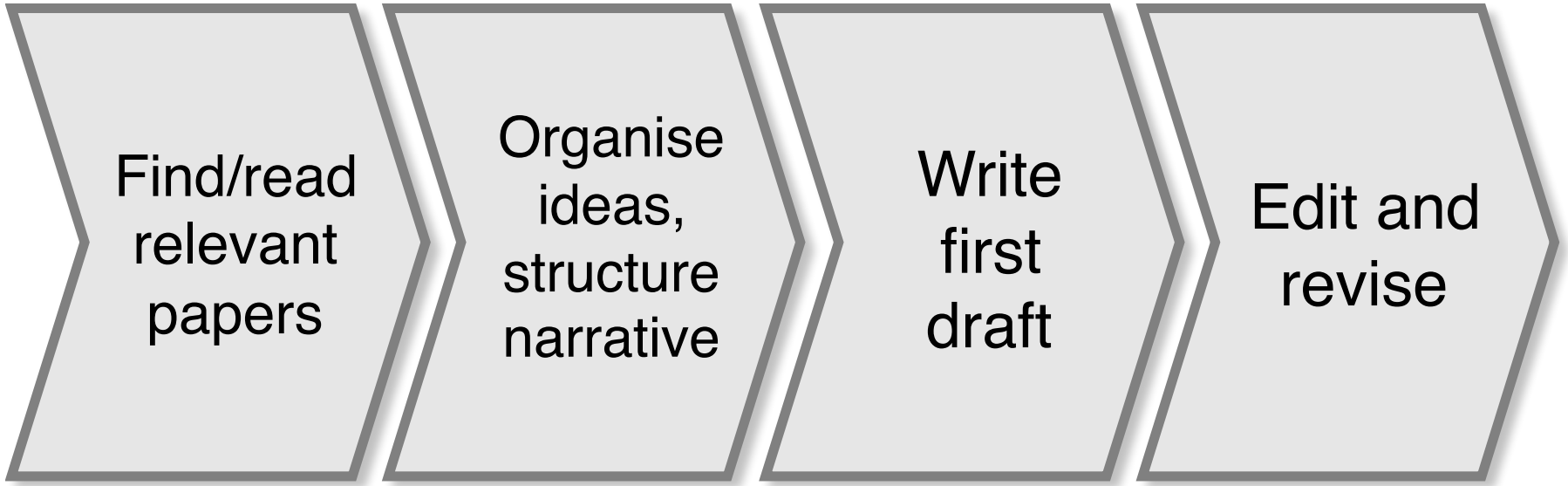
**WIKIPEDIA**  
*The Free Encyclopedia*

# Purpose of a Review

“Key aims of reviews are to provide systematic and substantial coverage of mature subjects, evaluations of progress in specified areas, and/or critical assessments of emerging technologies.”



# The Writing Process



```
graph LR; A[Find/read relevant papers] --> B[Organise ideas, structure narrative]; B --> C[Write first draft]; C --> D[Edit and revise];
```

Find/read  
relevant  
papers

Organise  
ideas,  
structure  
narrative

Write  
first  
draft

Edit and  
revise



**Find/read  
relevant papers**

Google Scholar

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Search Search History Marked List (0)

### ALL DATABASES

Search for:

Example: oil spill\* mediterranean in Topic

AND in Author

AND in Publication Name

Example: Cancer\* OR Journal of Cancer Research and Clinical Oncology

Add Another Field >>

Search Clear

Limit to: All Years

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Quickly find information in sciences this version  
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Custom  
Sign In  
• Save refer  
Web integ  
• Save  
• Creat  
• Choo  
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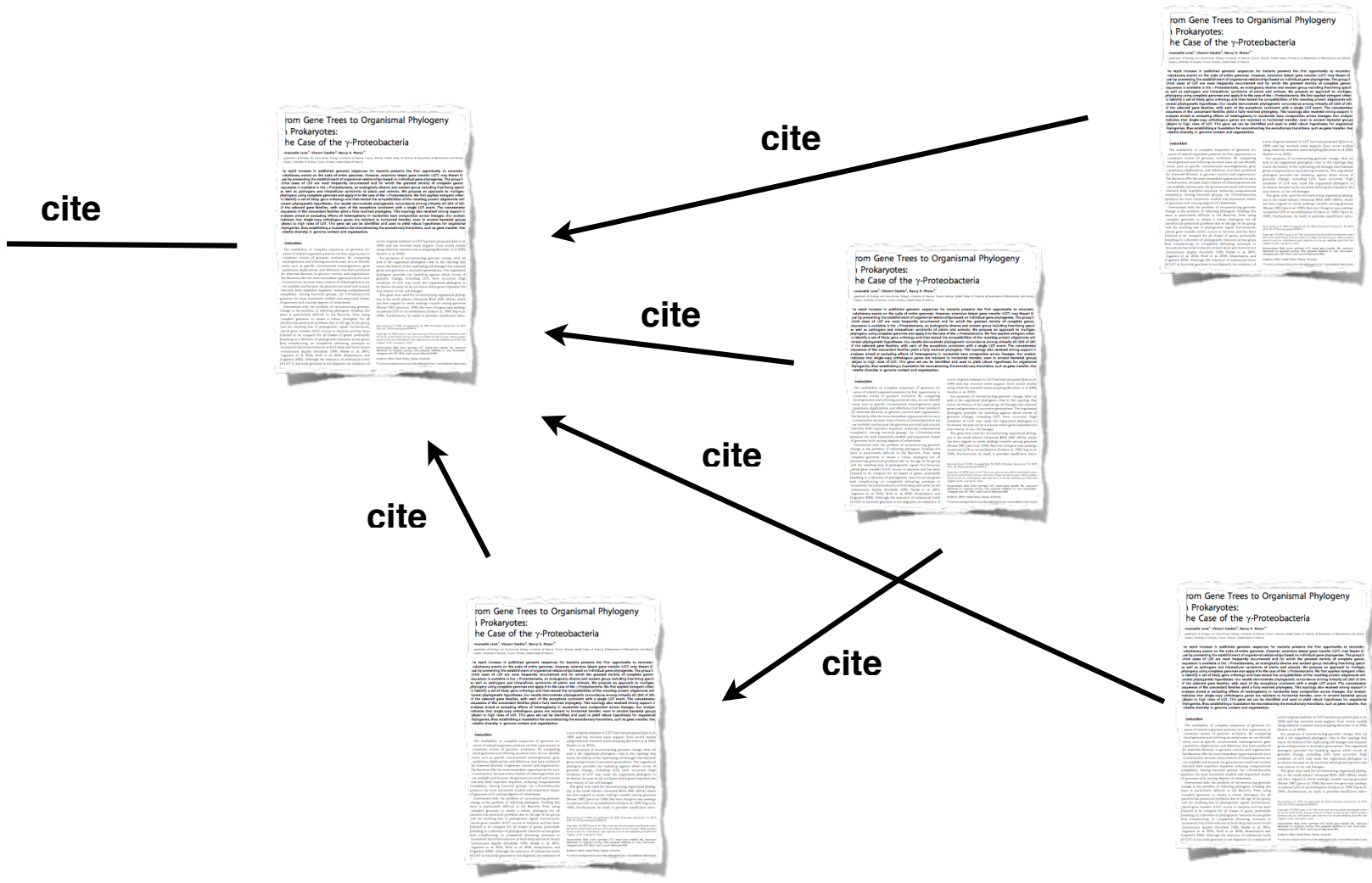
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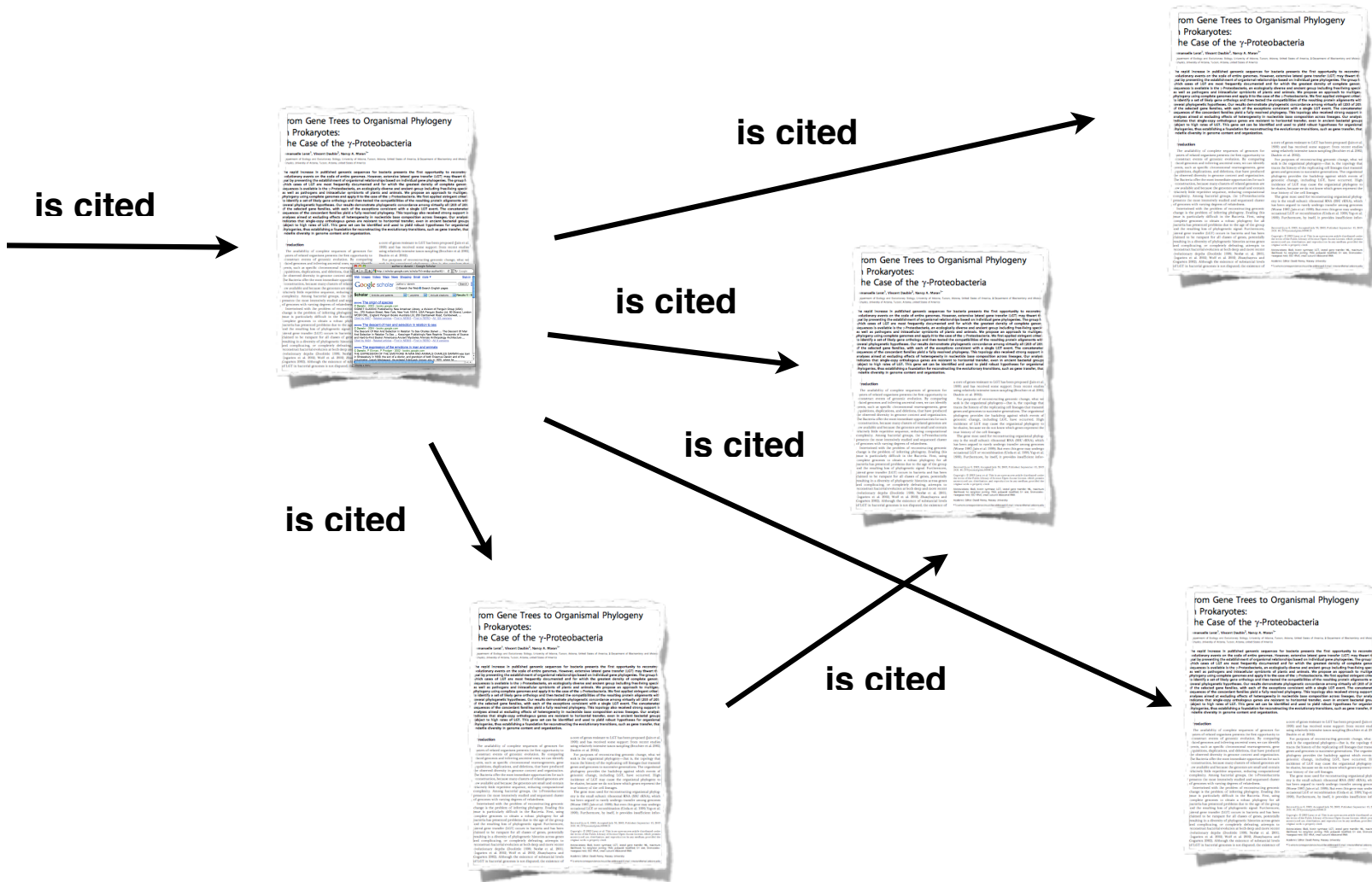
# Paper hopping



Find original idea or result, evidence, influential papers



# Paper hopping



Find dependent work, follow-up, criticism, falsification

# Paper hopping

is cited



author:c-darwin - Google Scholar

http://scholar.google.com/scholar?hl=en&q=author%3Ac-darwin

Google scholar

author:c-darwin

Search

Search the Web Search English pages

Scholar

Articles and patents

anytime

include citations

Results 1 - 10

[book](#) [The origin of species](#)

**C Darwin** - 2003 - books.google.com

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[book](#) [The expression of the emotions in man and animals](#)

**C Darwin, P Ekman, P Prodger** - 2002 - books.google.com

THE EXPRESSION OF THE EMOTIONS IN MAN AND ANIMALS CHARLES DARWIN was born in Shrewsbury in 1809, the son of a doctor, and grandson of both Erasmus Darwin and of the industrialist Josiah Wedgwood. He entered Edinburgh University in 1825, where he ...

Display a menu

Find dependent work, follow-up, criticism, falsification

TIME

# Paper hopping

is cited



The screenshot shows a Google Scholar search interface. The search query is 'author:c-darwin'. The results are filtered to 'Articles and patents' and 'anytime'. The first result is 'The origin of species' by Charles Darwin, published in 2003. The second result is 'The descent of man and selection in relation to sex' by Charles Darwin, published in 2004. The third result is 'The expression of the emotions in man and animals' by Charles Darwin, P Ekman, and P Prodger, published in 2002. The 'Cited by' link for the first result is circled in red.

is c

Find dependent work, follow-up, criticism, falsification

TIME

# How to read a paper?

- **Identify (possibly record) key points:**  
Hypothesis? Approach? Findings?  
Significance?
- **Order**
  - Start with title and abstract
  - Then, read introduction
  - Figures and tables  
(captions often self-contained)
- **If not relevant, stop reading!**

# Paperpile

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**Organize ideas,  
structure narrative**

# **Key Questions**

- **What is the hypothesis/problem/question?**
- **Why is it interesting?**
- **What answers are provided by current literature? How did they do it? Implications?**
- **Which particular studies are particularly interesting and why?**
- **What is unsatisfactory about current literature? What remains unanswered?**

**Distill the answers into  
your synthesis**

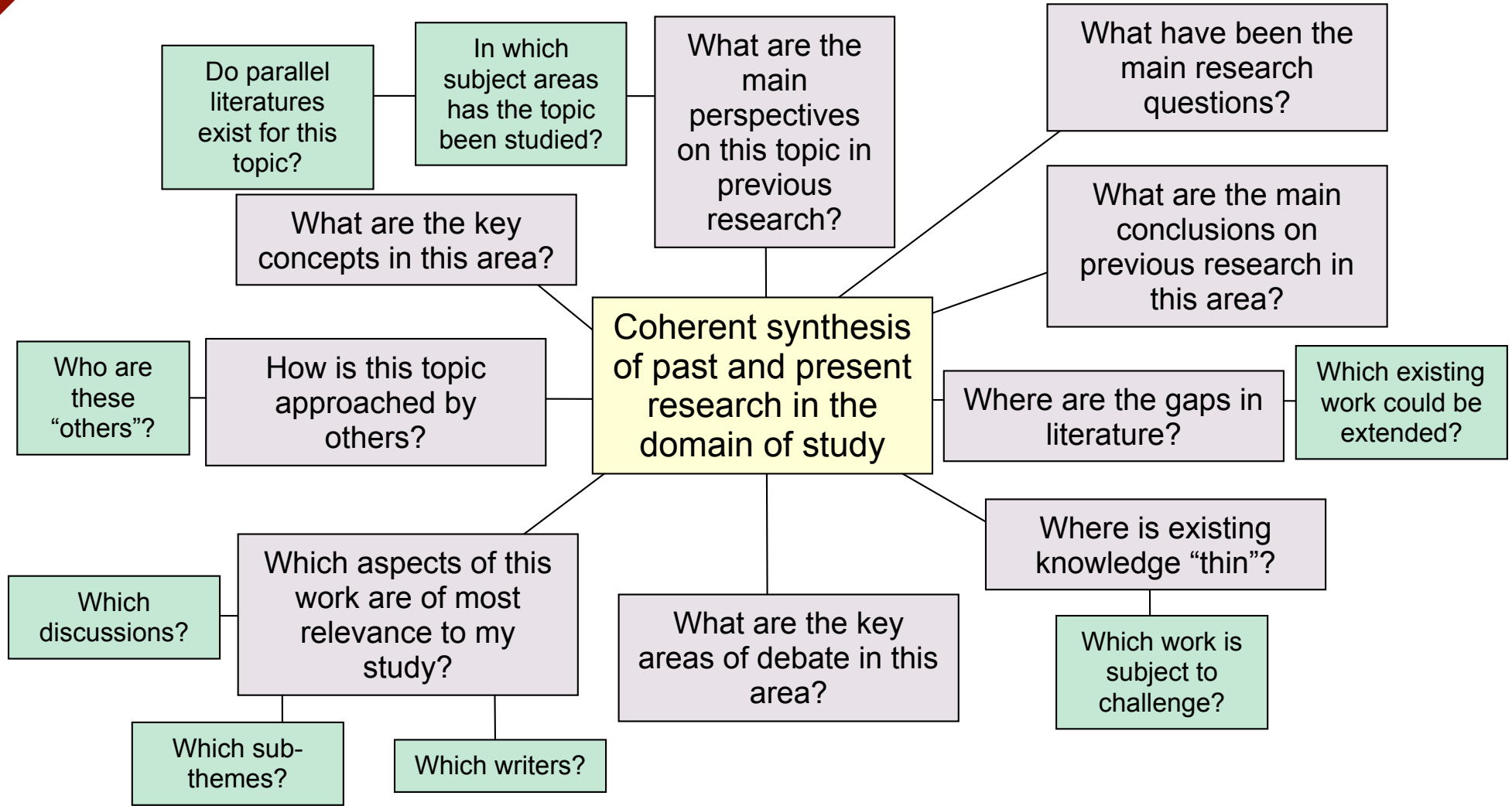
In other words:

**What is your point?**



Reference Only

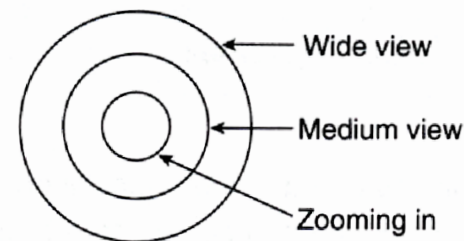
# More Questions



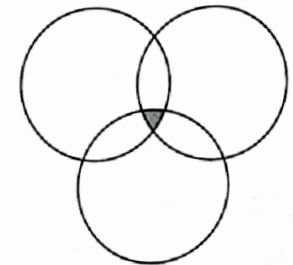
# Typical structures

- Chronological
- Conceptual (e.g. pro/contra)
- Experimental/  
Methodological
- Centered on  
Implications

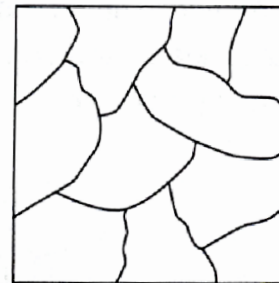
**But: remember your point!**



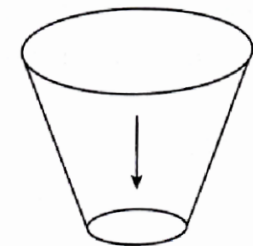
(a) Zooming



(b) Finding intersections



(c) Patch working



(d) Funelling

Ridley, "The Literature Review",



**Write first draft**

# Know your reader

- **What can the reader be assumed to know?**
  - Read the journal editorial policy
  - Read similar articles published there
  - Err on side of caution, but avoid condescending or educational tone
- **For this course, assume that your reader is a Masters student in Biology**
- But keep a formal tone

# The Title

- **Signals the field and scope**
- **Includes your main point**
- **Arouses interest of the readers**

# The Abstract

- **Introduces field in 1-2 sentence(s)**
- **Motivates your review**
- **Announces important points**  
(reformulates subheadings and main point)
- **Includes relevant keywords** (for indexing)

# The Introduction

- **Set the context from general to specific**
  - Show that the research area is important/interesting/relevant.
- **Establish a niche**
  - Show need for your work (the review)
- **Occupy the niche**
  - Announce your main point
  - Indicate structure of article

# The Main Body

- **Use subheadings for each section**
  - One sentence summary/conclusion
  - Helps non-linear reading
- **If appropriate, use a figures and/or tables**
  - Review figs are often schema/cartoons
  - Use caption to make them self-descriptive



# The Conclusion

- **Specific → general**
  - Mini summary
  - Broader implications, future directions

# Drafting: outline

## Introduction

### Identity of research:

This report will discuss using solid particles as the heat transfer medium in a solar central receiver. Requirements for such a heat transfer medium include

- (1) Heat transfer medium must withstand temperatures up to 800°C
- (2) Convective losses from medium must not be too high (define "too high")
- (3) What else?

### Reasons that research is important:

- (1) Diversifies solar energy applications by obtaining higher temperatures than those obtainable from current designs
- (2) Allows for high-temperature experiments and modeling

### Background material (heat transfer media):

- (1) *Water/steam*. Advantages: utilities familiar with; test data available. Disadvantages: not efficient enough; difficult to control in two-phase flow.
- (2) *Molten Salt*. Advantages: relatively high heat capacity; high storage capacity; single-phase fluid. Disadvantages: freezing in pipes; corrosive nature.

# Drafting (con't)

- **Keep in mind that every claim needs to be backed by some evidence (in reviews, typically a reference)**
  - Either report the findings only
  - or paraphrase their approach and findings
  - or use quotations (do not distort context)
- **Best way to start writing is to start writing**

# Beware of Plagiarism!

- If you include exact wording, use quotation marks and reference
- If you paraphrase, use a reference only



(Full text linked from course homepage)

WETTER: Zürich 4°



«Outdoor»: Der Sportmarkt ignoriert Menschen ab 50. Schön blöd.



«Sweet Home on Sunday»

«Mamahlog» · Ein Märchen



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## Kantone starten Technologie-Offensive gegen Plagiate



Der Plagiatsvorwurf an Guttenberg bringt Schweizer Bildungsbehörden zum Handeln: Zehn Kantone ergreifen konkrete Massnahmen gegen Schummelschüler – mit Hilfe von modernster Technik. [Mehr.](#)

News

## Plagiarism case professor hanged himself

MATTHEW COOPER | TUESDAY 10 NOVEMBER 1998

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### Latest in News

Up to 25 killed in Damascus blast, says Syria

David Cameron targets patient care improvement

Rebekah Brooks' former PA arrested by phone hack police

From Afghanistan to the ambulance: the warzone drug that will save hundreds of lives

Independent Appeal: Working with terminally ill children is Lucy's dream job – but it takes its toll

A DEPRESSED university professor hanged himself in front of his girlfriend after being sacked for plagiarising a student's work, an inquest heard yesterday.

Birmingham Coroner's Court heard Ian Connell "walked into" a makeshift noose at his home after telling his partner: "I've got something to show you."

He died almost immediately.

The academic felt he had been "left high and dry" after losing his position at Wolverhampton University, his long-term partner said.

Suzanne Orsler told how Dr Connell, 49, hanged himself with a

### Suggested Topics

[Wolverhampton](#)

[University Of The Arts London](#)

[Higher Education](#)

[Unemployment](#)



**Edit and revise**

# Improve Flow

- **Start each paragraph with a topic sentence** It signals paragraph content to the reader
- **Improve cohesion**  
Connect sentences through conjunctions, parallel structures, repeated keywords, pronouns, “old-new” pattern, etc.
- **Remove unneeded/redundant words**

# Final checks

- **Spelling: use automated spell-checker (e.g. ispell) *and* proofread your text carefully.**
- **Verify one more time**
  - that references are accurate and complete
  - that each claim backed by citation
  - that your narrative is coherent
  - that the article meets editorial policy (in particular length requirements)
- **Ask a colleague for feedback on draft**



# Resources

Joseph M Williams, “Style”, 1990

Diana Ridley, “The Literature Review”, 2008

Rowena Murray “Writing for Academic Journals”, 2004

Cargill and O'Connor, “Writing Scientific Research Articles: Strategy and Steps”, 2009

Scott Montgomery, “The Chicago Guide to Communicating Science”, 2002

Michael Alley, “The Craft of Scientific Writing”, 1996