

MIT OpenCourseWare  
<http://ocw.mit.edu>

## 7.13 Experimental Microbial Genetics

Fall 2008

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.

# Writing a Primary Research Report (a scientific paper)

# Components of a Scientific Paper

Title

Authors

Authors' affiliations

Abstract

(Keywords)

\*Introduction

\*Material and Methods

\*Results

\*Discussion

Acknowledgments

References

\*IMRAD = Introduction, Methods, Results, and Discussion

The next section you write will be  
the **Introduction**

2-3 pages  
double-spaced  
title  
references

# Purpose of the Introduction

- Establish your credibility as an author
- Provide background and context
- State scientific problem
- Give a sneak preview: the basic outcome of experiments

# In other words...

- What should you include? How much detail should you go into?
- How should you begin?



# That depends on... your Audience

- What background knowledge can you assume?
- What do you need to explain and in how much detail?

# Audience

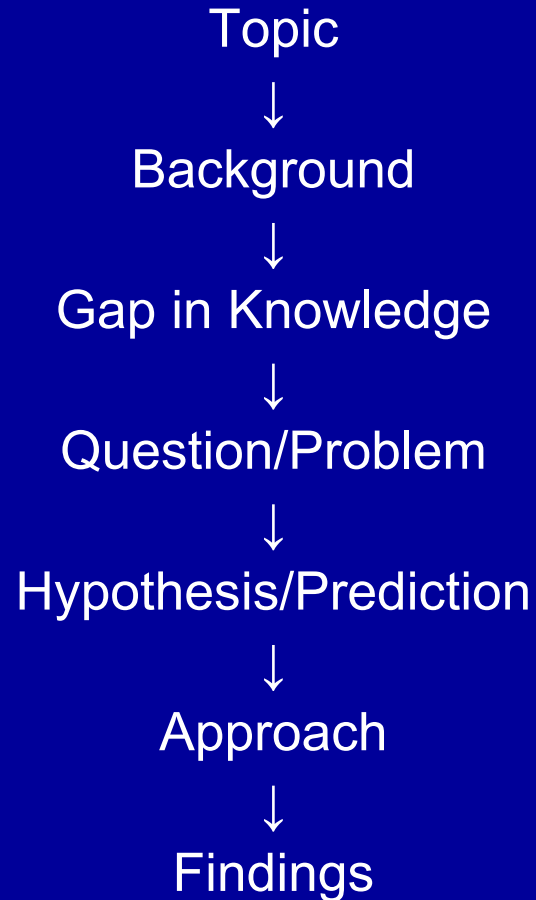
For this paper—  
assume that your audience  
is your classmates



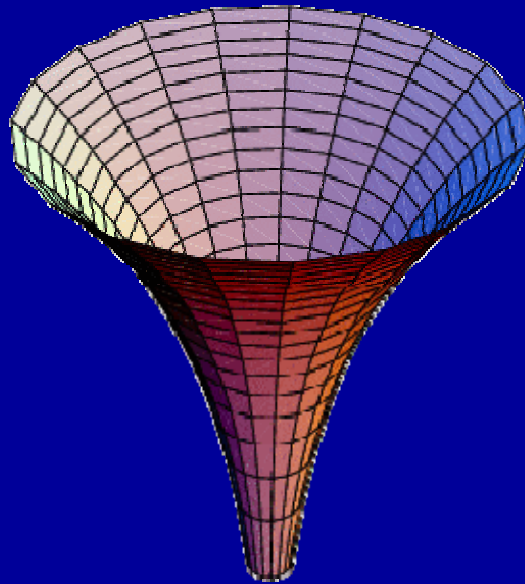
## *Avoid...*

- Ever since the dawn of civilization, scientists have been interested in the structure of living things...

# Components and Order



Think of the Introduction as  
having a funnel-like structure:  
from general to specific



Ask yourself...

*What does the reader need to know in order to understand the nature and importance of the scientific problem?*

# CITATIONS: APA format

This system includes the author's last name  
and date of publication in the text

# Examples

(parenthetical at the end of the sentence)

*In vitro*, the Sonic hedgehog signaling molecule has been shown to induce developing neurons in the midbrain to differentiate into cells that produce dopamine (Hynes, 1995).

Bacterial restriction systems have been shown to prevent transformation, and several restriction enzymes have been identified in the *Rhodococcus strains* (Roberts and Macelis, 1997).

They have also proven to be of immense use in a range of biotransformations (Bell et al., 1998).

Also...you can include more than one citation

Two isolates, *I24* and *B264-1*, have also been found to oxygenate a variety of indandiols (Buckland et al., 1998; Chartrain et al., 1998).

# You can integrate the citation into the sentence

Dabbs (1987) describes a generalized transducing phage...

Desomer et al. (1991) exploited IR as a mutagenesis system...

Desomer and his colleagues exploited IR as a mutagenesis system... (Desomer et al., 1991).

...based on the method described by Hilleman et al. (1991).



You can even credit someone for  
information conveyed verbally

The lack of pO88 transformants in either  
configuration is consistent with unpublished  
observations (P. Lessard, MIT Dept. of Biology,  
personal communication).