

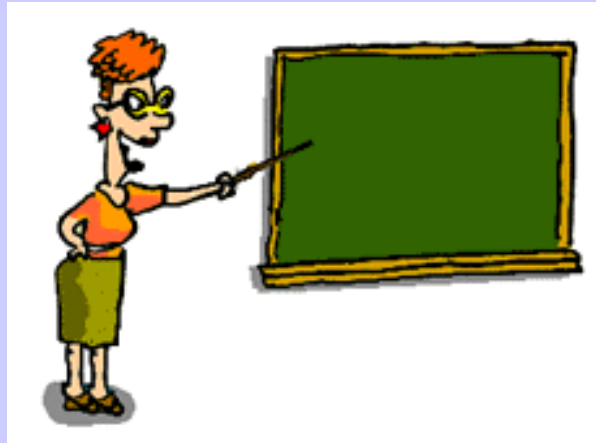
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7.13 Experimental Microbial Genetics

Fall 2008

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Results & Discussion



And...

Illustrations

and

Abstract

In this order:

1. Results
2. Illustrations
3. Discussion
4. Abstract

Results

Think of the Results as...
the news story

And the Discussion as

The commentary or editorial

Results

In the context of this class,
***what constitutes
a result?***

How should I order my results?

- The order should be **logical** rather than chronological.

In other words...

The order in which you present your results may *differ* from the order in which you did your experiments.

How should I proceed in writing the Results?

- Begin by making figures.
- Lay out your figures in the best (most logical) order.
- For each figure, write a paragraph:
describe what you see and draw your
reader's attention to what you think is
important.

Remember...

All data that you refer to in the text must either be shown (in an illustration) or referred to as “data not shown”.

Results: The Road Trip...

Now imagine that you are taking a trip and that your figures are pictures of the main attractions.



The Road Trip...

- If this were Paris, you might have: the Eiffel Tower, the Arc de Triomphe, Sacre Coeur, and Les Invalides.
- The descriptions of the figures would correspond to what you might write on the postcards showing the sites.



Photo courtesy of Eustaquio Santimano on [Flickr](#).



Photo courtesy of Ricardo Martins on [Flickr](#).

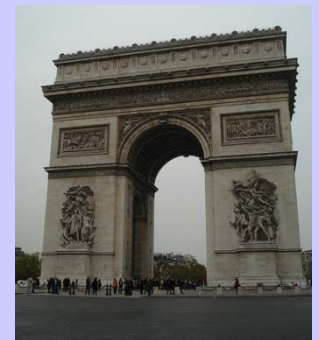
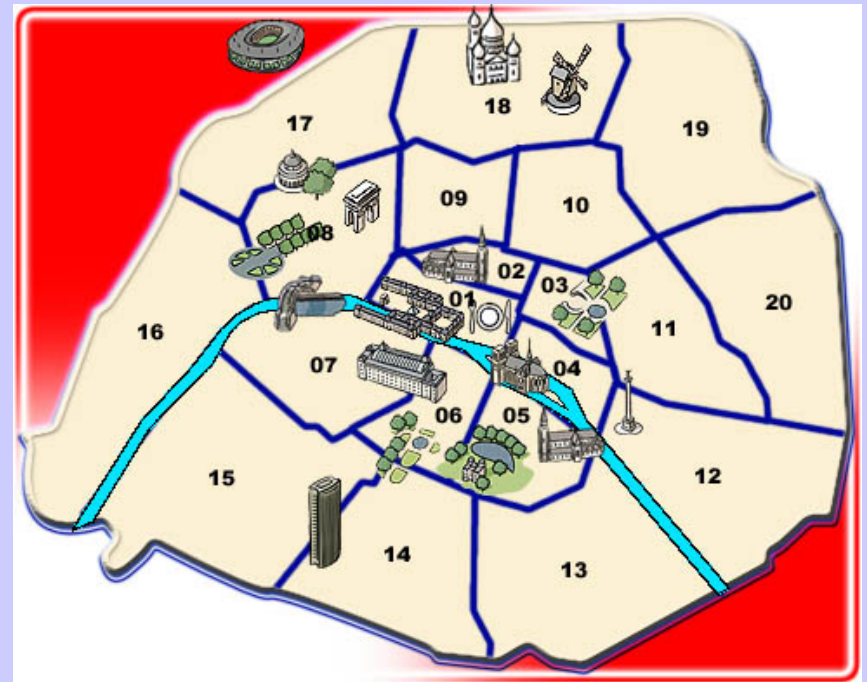


Photo courtesy of Ricardo Martins on [Flickr](#).

Mapping the journey

- Now use your writing to create the path you took from one site to another.
- The path is your experimental strategy



How do I create that “path”?

- Write transitions from one paragraph to the next such that your research seems to have proceeded in a logical manner.
- One experiment (or procedure) should seem to have led to another; there should be a reason for everything you did.
- Use such phrases as:
 - *Given that...*
 - *Once it had been determined that...*
 - *After verifying that the fragment we had cloned was... we next ...*

Experimental research is messy...

There are detours
and dead ends



Photo courtesy of Chris Lugosz on [Flickr](#).

Your Results section doesn't
need to reflect this!

Your Results section should essentially be a “sanitized” version of your experimental work



Some important details

- Every illustration (table and figures) must be referenced, at least once in the text.
- Use past tense to report your results (as if you have done the experiment once).
- Describe results obtained with controls.
- Use third person. Passive voice is acceptable, but use sparingly.
- Be selective in writing about your data, but do not ignore “sticky,” inconvenient, or anomalous data.

Illustrations

Tables

Figures

- Graphs
- Schematic diagrams
- Photographs
- Flowcharts

Tables

- Numbered I, II, III...
- Title, but no legend
- Number and title go on top
- Can include footnotes at bottom

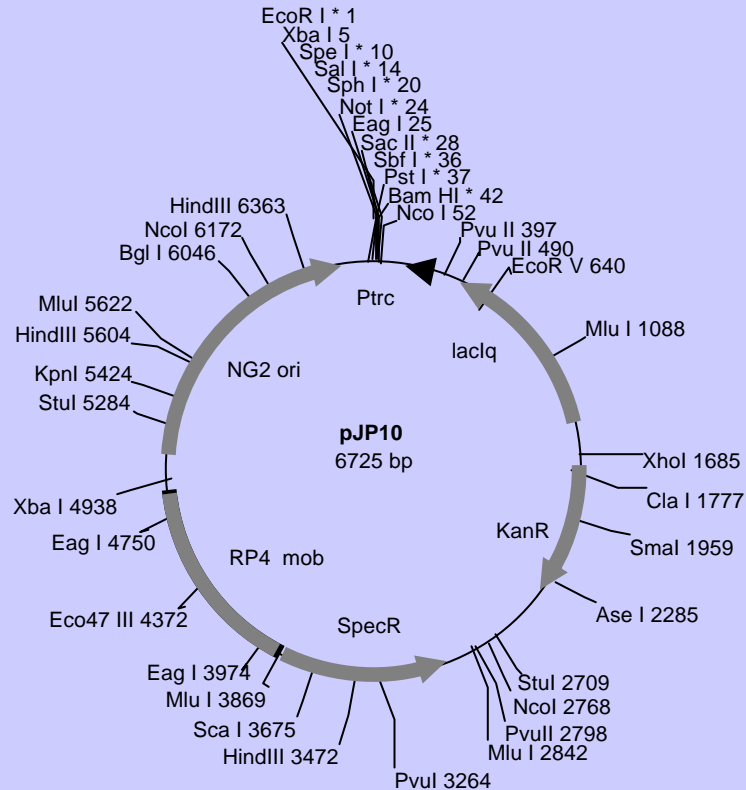
Figures

- Numbered 1, 2, 3...
- Title often includes reference to the method used
- Include a legend: A brief explanation of how the data were obtained and what the symbols and abbreviations refer to. Should not be redundant with main text

Figures... continued

- Number, title, and legend go below
- In graphs, be sure to label axes
- Identify units

Sample figure: what's wrong?



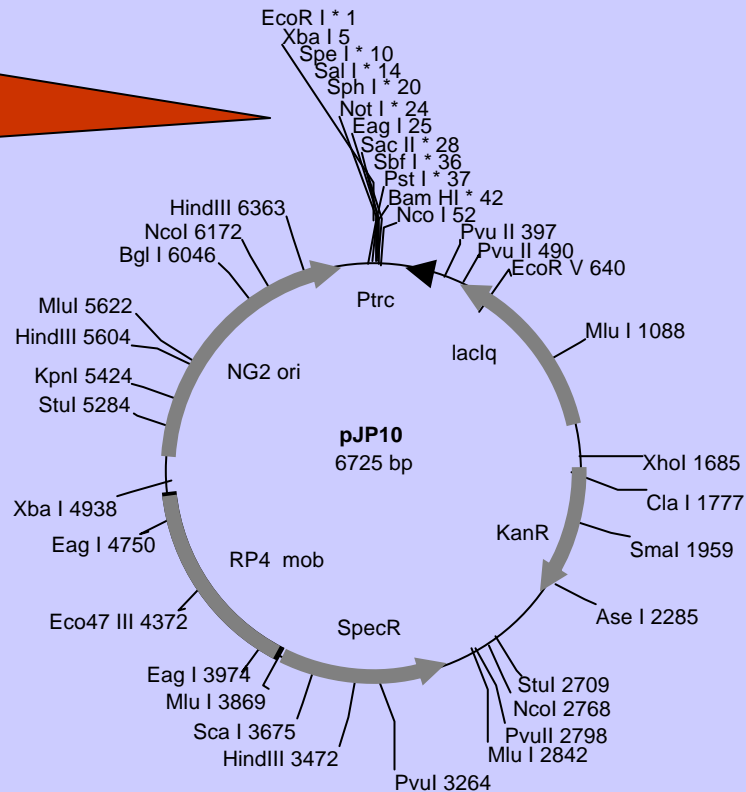
No figure number & this is not much of a legend

Plasmid name: pJP10
Plasmid size 6725

Courtesy of
P. Lessard

Sample figure: what else is wrong?

Map has
more details
than needed



Plasmid name: pJP10
Plasmid size 6725

Courtesy of
P. Lessard

Revised Version

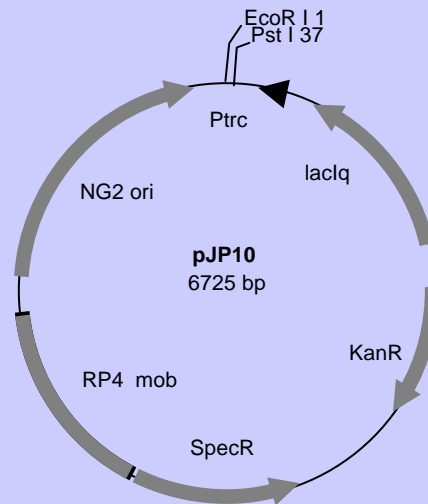


Figure 2. pJP10 carries the *trc* promoter (*Ptrc*), genes encoding the *lacI^Q* repressor, kanamycin resistance (*KanR*) and spectinomycin resistance (*SpecR*). *RP4 mob* permits conjugal transfer of the plasmid from *E. coli* S17-1, while the *NG2 ori* permits replication in both *E. coli* and *Rhodococcus*. Gene products were ligated into the *EcoRI* and *PstI* sites. [Courtesy of P. Lessard]

Discussion: Content

What do I need to cover?

- The Discussion should consist of a summary and analysis of the Results
- The more literature you can bring into the Discussion -- and the more connections you can draw to the literature -- the richer it will be

Discussion: Style

The modus operandi is—*argumentation*

(Remember the newspaper analogy?)

Imagine a graphic representation of the paper as an hourglass

The Discussion section resembles the Introduction in its scope: here, you reconnect to the published literature



To develop your Discussion...

- Pay special attention to unexpected results
- Show the relevance of your work to previous published research: discuss related themes and observations of others
- Discuss any discrepancies with previous findings
- Point out how your results contribute to the next step in a larger project
- Create a cohesive story

Remember those detours and dead ends?

- Meaningfully reflect on the project. From the problems you encountered, select those that are worthy of discussion.
- Consider whether other methods might have been used.

Discussion:

How do I proceed?

- Begin by briefly restating the aims of your study
- Consider organizing the Discussion so it shadows the Results
- Tie the results together, through analysis and interpretation

Common Problems!

- Focusing too narrowly on the data (“rehashing” details from the Results)
- Ignoring relationships to the literature
- Ideas brought up but not fully explained or explored

Abstract

- A first (often the only) impression
- Therefore, it's a stand-alone section
- Most frequently read
- 250 words or less
- Single spaced
- Should emphasize the original contribution the paper makes

Proportions of the Abstract

Introduction	1-2 sentences
M & M	1 sentence ?
Results	3-4 sentences
Discussion	1 sentence

Assignment

First draft of Results, Discussion, & Abstract (including illustrations); include title and reference section

due Wed., 11/26

Questions???