Undergraduate Summer Research Experience Program: Communicating Your Science

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Overview

- Tips for papers and differences between research and review papers
- How to search for journal articles - libraries
- Knowing your audience and when to give an oral presentation vs. poster
- Posters
- Oral presentations
- Open questions
Review Papers and Research Papers

Research
- Original Research
- Authors Collect and analyze Raw data
- Adds to the understanding of a topic

Review
- Not Original Research
- Summarize the existing literature on a topic
- Gives an idea of what has been done and needs to be done for a topic

Functional characterisation of metal(loid) processes *in planta* through the integration of synchrotron techniques and plant

Biological Invasions (2006) 8:1409–1424
DOI 10.1007/s10530-005-0710-6

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Review

On the numerous concepts in invasion biology

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Key words: alien, concepts, exotic, indigenous, introduced, invasion, invasive, native, pest
Tips for Reading Research Journal Articles

- **Abstract**
  - Gives brief summary of entire experiment and findings
- **Introduction**
  - Introduces readers to topic, previous work in area of study
  - Significance
  - Objectives or hypothesis
- **Methods**
- **Results**
  - States the principle finding of the study
- **Discussion**
  - Discusses the results and ties work done to topics introduced in the discussion
- **Conclusion**
  - Briefly states significance, main finding and what should happen next
Tips for Reading Research Journal Articles (continued)

HOW TO READ SCIENTIFIC PAPERS

Much of a scientist's work involves reading research papers. Because scientific articles are different from other texts, like novels or newspaper stories, they should be read differently. Here are some tips to be able to read and understand them.

1. SKIM

First get the "big picture" by reading the title, key words, and abstract carefully; this will tell you the major findings and why they matter.

- Quickly scan the article without taking notes; focus on headings and subheadings.
- Note the publishing date; for many areas, current research is more relevant.
- Note any terms and parts you don't understand for further reading.

2. RE-READ

Read the article again, asking yourself questions such as:

- What problem is the study trying to solve?
- Are the findings well supported by evidence?
- Are the findings unique and supported by other work in the field?
- What was the sample size? Is it representative of the larger population?
- Is the study repeatable?
- What factors might affect the results?

If you are unfamiliar with key concepts, look for them in the literature.

3. INTERPRET

- Examine graphs and tables carefully.
- Try to interpret data first before looking at captions.
- When reading the discussion and results, look for key issues and new findings.
- Make sure you have distinguished the main points. If not, go over the text again.

4. SUMMARIZE

- Take notes; it improves reading comprehension and helps you remember key points.
- If you have a printed version, highlight key points and write on the article. If it's on screen, make use of markers and comments.

http://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper
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Conferences

- **Types**
  - International
  - National
  - Regional
  - Local
  - Topic Specific
  - Student run

- **Broad** – many Sessions
- **Specific** – single session
Conferences

- Networking
  - Students and Scientists in your field, related fields, industry
  - Potential collaborators, grad school advisors, employers

- Your Research (Abstract)
  - Oral Presentations
  - Poster
### How to decide – Poster or Presentation?

<table>
<thead>
<tr>
<th>Poster</th>
<th>Oral Presentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Findings are preliminary</td>
<td>Nearly complete project</td>
</tr>
<tr>
<td>Not confident in public speaking</td>
<td>Confident in speaking in public</td>
</tr>
</tbody>
</table>

- Depends on:
  - Advisor Preference
  - Abstract Submission

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Digital Posters – Presenting research at a meeting you cannot attend
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WHAT IS THE PURPOSE OF A POSTER?


https://s-media-cach-ak0.pinimg.com/736x/e8/2c/6d/e82c6df56ee61bd1311a6b03c7474d7--frank-sinatra-band-posters.jpg

POSTER vs ORAL PRESENTATION

- Amount of novel research / data
- Target audience / Anticipated interaction
- Nature of the conference
- Ask your supervisor!
GENERAL POSTER SET UP

- Use PowerPoint
  - Custom slide size
- Beware of the guidelines of the conference (especially size)
- Choose an appropriate colour scheme
- Use the correct font size for each section
  - ~60-70 for title
  - ~40-50 for names & affiliations
  - ~30-40 for the main text
DO THIS

[Diagram showing a well-structured poster layout with clear sections for context, points, conclusions, summary, and statements.]

NOT THIS

[Diagram showing a messy poster layout with overlapping sections, tiny figures, even spacing, and no headings.]

http://www.nuigalway.ie/remedi/poster/media/Posters_Good_and_bad.pdf
BAD POSTER DESIGN: OUCH!

Your name, Department of Applied Curiosity, University of Life, England. Leave out your contact details or e-mail address.

Abstract
Repeat all the information provided in the book of abstracts.

Don’t give background
Dive straight in with lots of meaty text. Don’t give the impression you know why you are doing anything.

A thousand words speak a picture
Write a short novel here to describe your key results
Include the raw data

Don’t say what’s next
Leave the reader guessing at what you’re planning to do next!

More is less
Make it brash and gaudy
Make it look gimmicky
Use a nice splash of colour
Play around a bit

Don’t bother selecting references
Just include all of them or none at all. Don’t link them to any relevant points.

Forget acknowledgements
Don’t thank anyone.

http://www.nuigalway.ie/remedi/poster/media/Posters_Good_and_bad.pdf
- Clear layout – distinguishable blocks
- “Easy on the eye” colour scheme
- Good balance between text and graphics
- Unidirectional flow of information

http://www.nuigalway.ie/remedi/poster/media/Posters_Good_and_bad.pdf
• Practice, Practice, and Practice!
• Make eye contact / be pleasant
• Dress appropriately
• It’s a competition after all, so impress the judges
Dr Dave Whitworth
Senior Lecturer in Biochemistry
Aberystwyth University
Young Microbiologist of the Year Head Judge

Focus on explaining and illustrating the key messages from your research, and don’t forget to make it visually appealing. The aesthetic impact of a poster is often overlooked, but can be nearly as important as the scientific content.

Dr Donna MacCallum
Senior Lecturer in Microbiology
University of Aberdeen
Young Microbiologist of the Year Judge

A good poster should be logically laid out. Most of the poster should consist of large, clear figures, with text kept to a minimum (mainly introduction and discussion).

TOP TIPS

1. Choose one key point to get across – don’t overcrowd the poster.
2. Remember to check requirements from the conference organisers and your institution/funders, such as for branding, poster size, and poster orientation.
3. Relax! Show visitors why you’re interested in your work.
4. Memorise a quick introduction to help start conversations.
5. Don’t be afraid of questions. Most people aren’t trying to catch you out and are genuinely interested in your work.
THANK YOU
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Oral Presentations

- Set up (same as poster)
  - Introduction
    - Knowing your audience for suitable background
  - Objectives
    - Clearly stated
  - Methods
    - Brief without every detail (hence knowing your audience)
  - Results/Discussion
    - Restate the objectives and discuss how your results relate to them

- You are telling a story
  - The flow of your presentation is important (slide transitions)
Tips for a good oral presentation

1. Talk to the Audience
   - Clear, not too fast, look at them

2. Less is More
   - Talk about only what is relevant/important
   - Use Picture and Figures as often as possible
   - Less text is better

3. Text on slides not too small
   - 21 to 24 point
   - Use sans serif fonts

Serif Font
- Eg. Times, Times New Roman

Sans serif Font
- Eg. Arial, Verdana
Tips for a good oral presentation

4. Get feedback on your presentation
   - Asking peers or advisor what you can do to improve
   - Questions from the audience can help too

5. Practice your presentation

6. Use notes where possible for reminders

7. Use background and text colour that is easy to read!
   - Try to avoid red, green and blue
*Examples of Slides

Methods

PCR and diagnostic triple restriction enzyme digest for *Cytochrome Oxidase subunit I (COI)*, separation by capillary electrophoresis (Qiagen QiAxcel)

- Works even if DNA quality is poor or degraded
- Works well with museum specimens
- Restriction Digest cost is 1/10\textsuperscript{th} the cost of sequencing
*Examples of Slides

Methods - Nuclear *wingless* (*wg*)

- Sequences generated by the Marcus Lab 2005-2016
  - 298 specimens (most not published previously)
- Heterozygotes for single nucleotide polymorphisms (SNPs) identified
- Genotypes for each variable position for each individual entered into PHASE v2.1.1
  - Run using recombination model (MR)
  - Most likely alleles identified for each individual
- Data from PHASE entered into GENEPOP v4.0.10
  - Used to test for genetic differentiation
- Sequential Bonferroni method was used to correct for multiple comparisons
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Thank you!