MIT BE
BIOLOGICAL ENGINEERING

Communication Lab

20.109 Communication Workshop 3: Journal Clubs

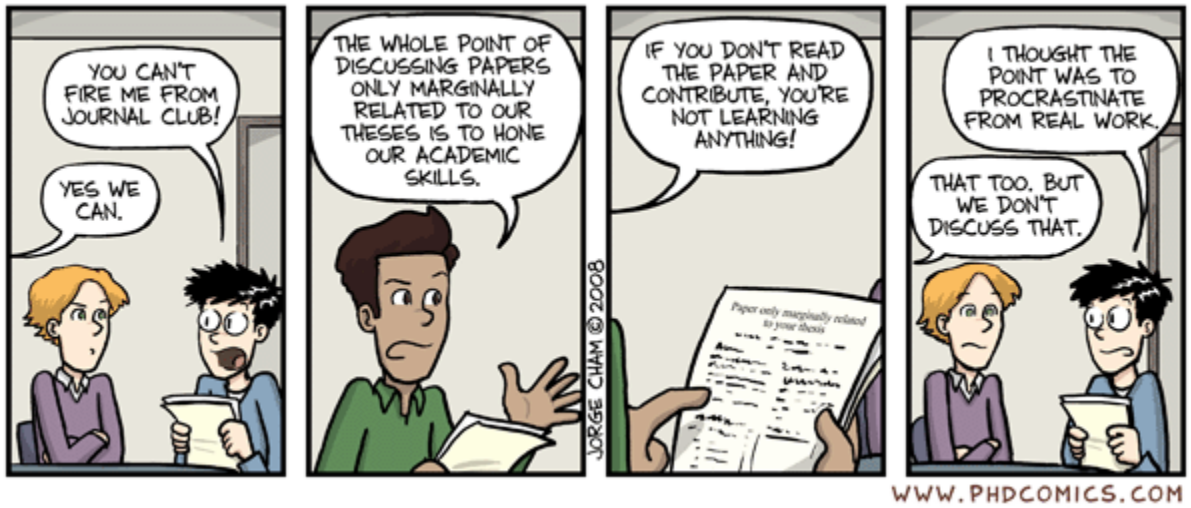
Sean Clarke & Prerna Bhargava
BE Communication Lab Instructors
Fall 2017

be.mit.edu/communicationlab
Helping you communicate effectively.

Workshop structure

1. Why subject matters
2. Discuss an example from the field
3. Derive principles and strategies
4. Practice
5. Leave with a checklist/rubric

How many of you have been to a journal club meeting before?



Why are they actually useful?

Journal clubs build helpful skills (finding and presenting important parts of scientific work)

- Helps to learn how to critically evaluate a paper
- Helps you communicate YOUR work better
- Required professional activity
  - Stay up-to-date
  - Learn collaboratively

Review assignment rubric

Category	Elements of a strong presentation	Weight (%)
Knowledge and explanation of subject matter:	• conveys *big picture* understanding • presents the essential information (saves minor details for Q&A) • accurate description of facts, procedures, hypotheses, etc.	65
Introduction	• introduce yourself and credit the authors of the paper • clear and concise description of the central question addressed by the paper, *and* its significance • contains sufficient background needed to understand the results	(15)
Methods	• gives information necessary (and no more!) to understand results • shows overview of experimental flow/approach if appropriate	(10)
Data	• related to central question • complete and concise explanations • integrated results + discussion	(30)
Summary/Conclusions	• key findings reiterated and put into context of past and/or future work	(5)
Q&A	• answers that convey understanding • when you lack knowledge, tell how you would approach the question based on what you *do* know	(5)

Overall organization of talk	• logical, easy-to-follow narrative • main points emphasized, repeated (preview/tell/review) • transition statements between ideas	10
Overall effectiveness of slides (text and visuals)	• slide titles convey key message • good balance of text and figures • text/figures large enough to be seen (including axis labels!) • considered use of color • not too many or too few slides	15
Overall effectiveness of delivery	• confident, enthusiastic delivery • main points verbally emphasized • get to main points quickly • strong eye contact • limited gestures • use of both technical and informal language as appropriate • 10' length (+/- 0.5 min)	10

Avoid common 20.109 pitfalls

DON'T	DO
Start so late you don't have time to digest the paper	Give yourself time to read the paper 2-3 times
Be exhaustive List experiments chronologically	Be selective Tell a story
Go outside the 9.5-10.5 minute time	**Practice** until you know you can hit the time limit
Forget to cite the paper	Include citation in your title slide
Say "we did this"	"The authors did this"
Use illegible labels	Use ≥20pt font Make your own figure labels if helpful Use legible font colors

Skills we'll discuss today

1. Crafting a story
2. Identifying key parts of a scientific work
3. Designing effective slides
4. Presenting well

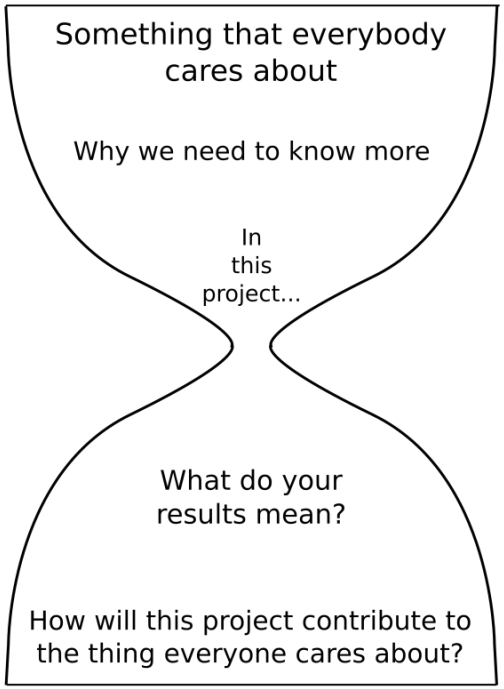
1. Craft a story

"Excellent students tell a story." -Noreen

You only have 10 minutes for your journal club presentation.

What content will you include?

Recall the Hourglass Model for Abstracts



Introduction	• introduce yourself and credit the authors of the paper • clear and concise description of the central question addressed by the paper, *and* its significance • contains sufficient background needed to understand the results	(15)
Methods	• gives information necessary (and no more!) to understand results • shows overview of experimental flow/approach if appropriate	(10)
Data	• related to central question • complete and concise explanations • integrated results + discussion	(30)
Summary/Conclusions	• key findings reiterated and put into context of past and/or future work	(5)

Chronology confuses us

The authors wanted to engineer a calcium sensor's binding sensitivity.

They ligated DNA into a plasmid,

then they transformed it into cells,

and then they looked at fluorescence data.

But WHY?

Storytelling conveys logic & motivation

The authors wanted to engineer a calcium sensor's binding sensitivity.

To change the binding site, they did site-directed mutagenesis,

then they expressed the mutant protein in cells,

and then they assessed its binding properties with a fluorescent assay.

Tell us a story

- Identify the question/message
- Include only essential results
- Connect all results back to the question/message
- Use titles & transitions that explain logic & motivation

2. Identifying the key parts of a scientific work

Activity 1: You only have 10 minutes for your journal club presentation.

What content will you include?
Which 2-3 figures (or parts of figures) would you choose to present?
What is their significance to the main question?

Specific Gene Repression by CRISPRi System Transferred through Bacterial Conjugation

Weiyue Ji,[†,‡,□] Derrick Lee,[†,‡,□] Eric Wong,[†,‡,□] Priyanka Dadlani,[†,‡] David Dinh,[†,‡] Verna Huang,[†,‡] Kendall Kearns,[†,‡] Sherry Teng,[†,‡] Susan Chen,[†,§] John Haliburton,[†,∥] Graham Heimberg,[†,§] Benjamin Heineike,[†,§] Anusuya Ramasubramanian,[†,∥,#,∇] Thomas Stevens,[†,‡,⊥] Kara J. Helmke,*[,†,‡] Veronica Zepeda,[†,‡] Lei S. Qi,[†,○,◆,¶] and Wendell A. Lim*[,†,‡,⊥]

Overall effectiveness of slides (text and visuals)	• slide titles convey key message • good balance of text and figures • text/figures large enough to be seen (including axis labels!) • considered use of color • not too many or too few slides	15

3. Designing effective slides

Example: Converting a paper figure to a presentation figure

Susan McConnell (Stanford)

Designing effective scientific presentations

https://youtu.be/Hp7Id3Yb9XQ?t=1150

Simplify & break up figures to avoid overwhelming your audience.

- **Title** = take-home message
- Show **minimal essential data**
- **Maximize signal-to-noise**
  - Control viewing pace: separate/mask panels
  - Add/remove labels
- **Effective redundancy**: align visual, written, & oral

"What would help my audience understand this faster?"

If you're not going to talk about it, leave it out.

Make slide titles take-home messages

	DON'T use	DO use
	General descriptions	*Sentences that answer "so what?"*
Methods	EMK-1 Knockdown	EMK1/Par1 was knocked down in MDCK (kidney) cells using siRNA
Results	Ca-switch	MDCK cells form a lumen after changing extracellular [Ca^{+2}]
	Mitochondrial ROS induction in cell lines	Mitochondrial ROS induction is decreased in adk^{-} cells
	Comparison of primer specificity	Primer 1 is better than Primer 2 at differentiating closely-related HIV strains

Avoid light or bright colors and tiny fonts

Am I legible?

Am I legible?

Am I legible?

Am I legible?

Am I legible?

Am I legible?

Activity 2: Practice adapting a figure

Pick one figure and break it down as you would for a slide.
What would you show?
What text would you add?

- Title = take-home message
- Show minimum essential data
- Remove clutter, improve clarity
  - Separate/mask panels
  - Add/move/remove labels
- Effective redundancy: align visual, written, & oral

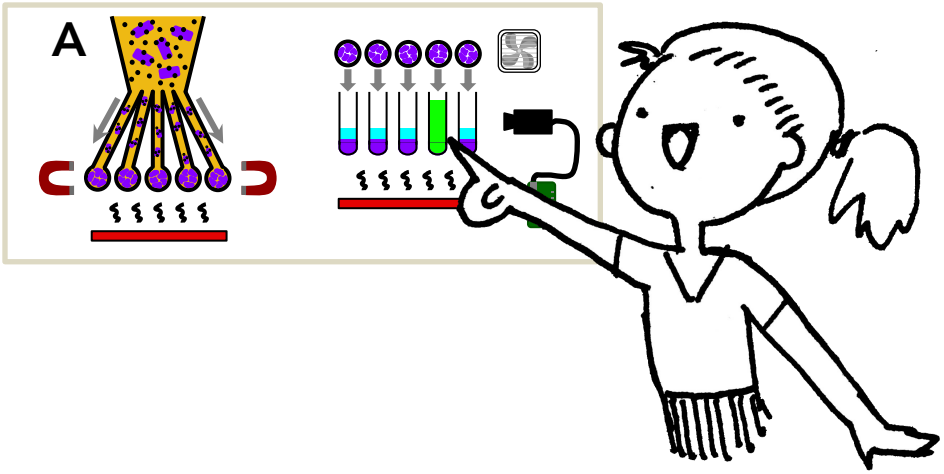
"What would help my audience understand this *faster*?"

4. Oral presentation skills

We're a friendly audience, help us out

- **Practice** the take-home messages and transitions
- **Record yourself** for **10-minute** timing
- If you're **not going to talk about it, it doesn't belong**
- We'll ask you about **methods**

You can also use gestures to guide the audience through complicated data.



Manage nerves by accepting them

Be **kind** to yourself.

Use your nervousness for positive things like **steady breathing and eye contact** instead of trying to suppress it.

"I'm nervous because I'm ***excited*** *to present."*

Q&A: Give yourself time to think.

Make sure you understand the question (maybe restate or paraphrase).

You'll be the expert, but it takes practice.

Overall effectiveness of delivery	• confident, enthusiastic delivery • main points verbally emphasized • get to main points quickly • strong eye contact • limited gestures • use of both technical and informal language as appropriate • 10' length (+/- 0.5 min)	10

Q&A	• answers that convey understanding • when you lack knowledge, tell how you would approach the question based on what you *do* know	(5)

Additional help

- Practice your presentation with a Communication Fellow http://be.mit.edu/becommunicationlab
- Susan McConnell (Stanford), *Designing effective scientific presentations* https://youtu.be/Hp7Id3Yb9XQ