# Oral Presentations

## 20.109 Communication Workshop 4

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MIT BE
BIOLOGICAL ENGINEERING

Communication Lab

Helping you communicate effectively.
**mitcommlab.mit.edu/be/**

# Feedback: titles and abstracts

- What did you think?
- Only graded for communication efficacy, not scientific accuracy
- General comments:
  - Finding “right” level of granularity in methods/results description
  - Ordering of methods used vs. insights drawn: takeaway first!
- More tips:
  - As a writing tool, varying sentence length intentionally can help keep your writing engaging.
  - Sentence tense (past/present) varies depending on existing knowledge vs. new work being described

# TIP: varying sentence length can help your reader to stay engaged

TAR DNA-binding protein of 43 kDa (TDP-43) is an ubiquitous protein crucial to RNA processing. TDP-43 aberrant mislocalization to and aggregation in the cytoplasm is a common feature in many neurodegenerative diseases, including amyotrophic lateral sclerosis (ALS), and Alzheimer's disease (AD), making it an appealing therapeutic target. However, chemical probes directly targeting TDP-43 at a high affinity are lacking. Their discovery would prove useful to better elucidating mechanism to study the disease pathway of TDP-43, or perhaps to prevent TDP-43 aggregation. Here, we show that compound 95877382, a putative small molecule binder of TDP-43 identified by small molecule microarray (SMM) screening, appears to increase aggregation of TDP43-RRM12 in plate and can potentially alter endogenous TDP-43 localization to favor either the nucleus or the cytoplasm depending on dosage.

**New/important knowledge – shorter sentences**

Known/less critical knowledge – longer sentences

# TIP: verb tense varies throughout abstract

Present Tense | Past Tense

**Abstract**

It is currently thought that life-long blood cell production is driven by the action of a small number of multipotent haematopoietic stem cells. Evidence supporting this view has been largely acquired through the use of functional assays involving transplantation. However, whether these mechanisms also govern native non-transplant haematopoiesis is entirely unclear. Here we have established a novel experimental model in mice where cells can be uniquely and genetically labelled in situ to address this question. Using this approach, we have performed longitudinal analyses of clonal dynamics in adult mice that reveal unprecedented features of native haematopoiesis. In contrast to what occurs following transplantation, steady-state blood production is maintained by the successive recruitment of thousands of clones, each with a minimal contribution to mature progeny. Our results demonstrate that a large number of long-lived progenitors, rather than classically defined haematopoietic stem cells, are the main drivers of steady-state haematopoiesis during most of adulthood. Our results also have implications for understanding the cellular origin of haematopoietic disease.

Current/Existing knowledge – **present** tense

New work done to add to knowledge – **past** tense

# Our Communication Workshops support your large assignments

| | |
|---|---|
| Workshop 1: Figures (overview) | |
| Workshop 2: Figure Captions & Titles | Mod 1 Report |
| Workshop 3: Abstracts & Titles | |
| **Workshop 4: Oral Presentations** | **Journal Article Presentation** |
| Workshop 5: Manuscripts | Mod 2 Report |
| Workshop 6: Proposals | Research Proposal |

If you've been to an oral presentation of a journal article, what is it like?

For everyone, what do you think a journal article presentation could be good for?

# Why do we present journal articles?

- Learn how work has been done
- Practice evaluating what might be done differently or next
- Improve YOUR communication and scientific reasoning skills

# 109 goal: Show that you understand the paper

**Clearly present** to us:

- the **take-home** message
- why the experiments were done and how (**methods!**)
- How the **conclusions** were drawn from the results

# Today we'll cover 3 aspects of presenting well

1. Craft a **story**
2. Design effective **slides**
3. Clearly **present** your slide deck

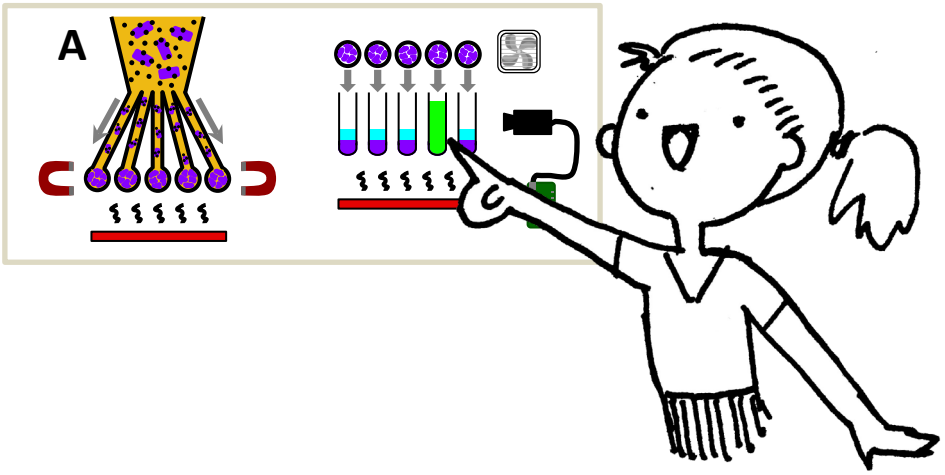



*Image: Diana Chien*

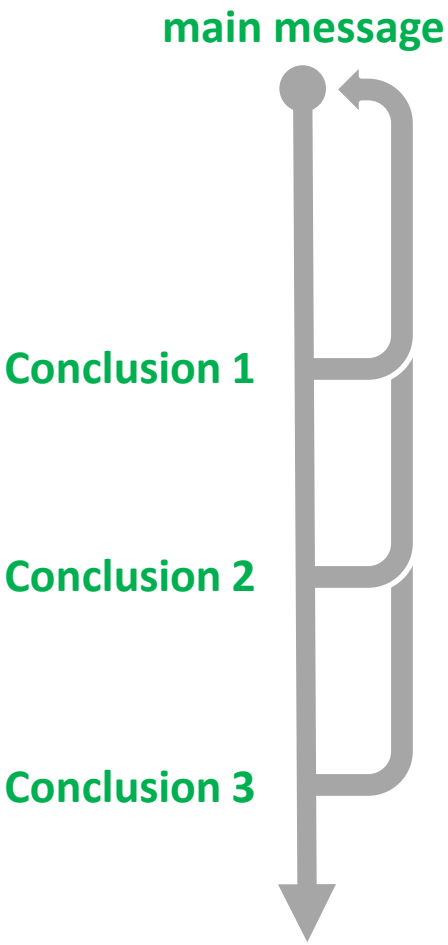
# 1. Craft a storyline from the paper

"Excellent students tell a story."

-Noreen

# Create a single storyline.

Identify a **take-home message**; everything else leads to it.



# Straight chronology is a common trap, but it's actually confusing.

The authors ligated DNA into a plasmid,

then they transformed it into cells,

then they looked at fluorescence data,

and then they had a calcium sensor.

But why did they do these things?

# A story conveys logic & motivation

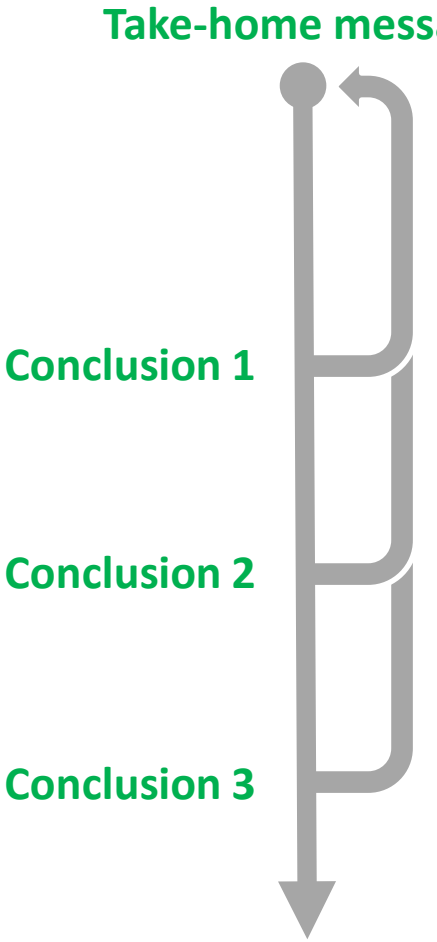
The authors wanted to engineer a calcium sensor's binding sensitivity.

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

then they expressed the mutant protein in cells,

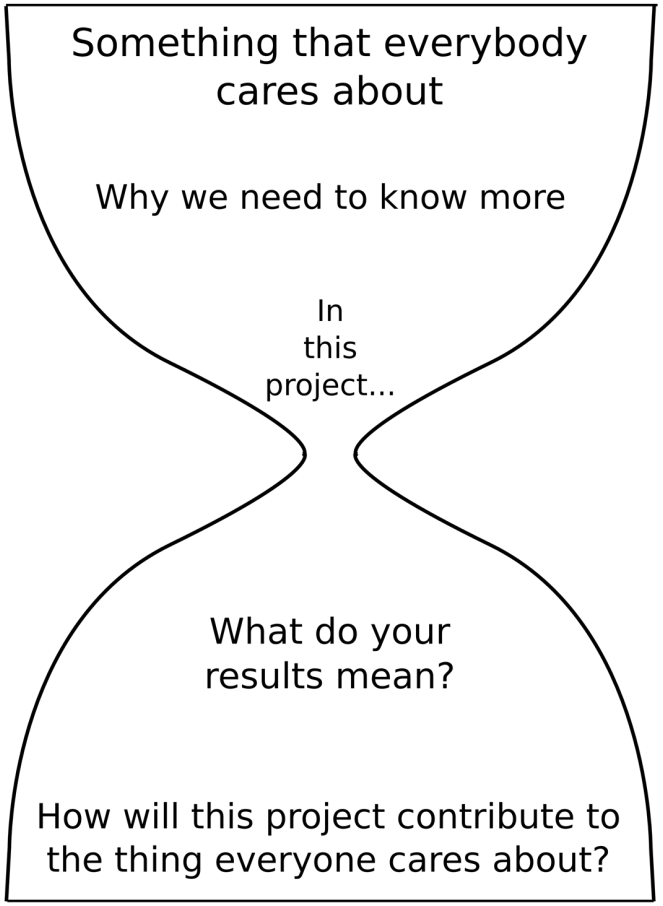
and then they assessed its binding properties with a fluorescent assay.

# Organize your journal article presentation to **tell us a story**




- Identify the **main question/message**
- Include only the **essential** results, key experiments and relevant data
- **Connect** results back to the message
- Explain **logic & motivation** with titles & transitions

# The hourglass structure from abstracts helps with this storyline




**General background**

**Specific background**

**Knowledge gap, Unknown**

**HERE WE SHOW…**

**Results**

**Implication**

**Significance**

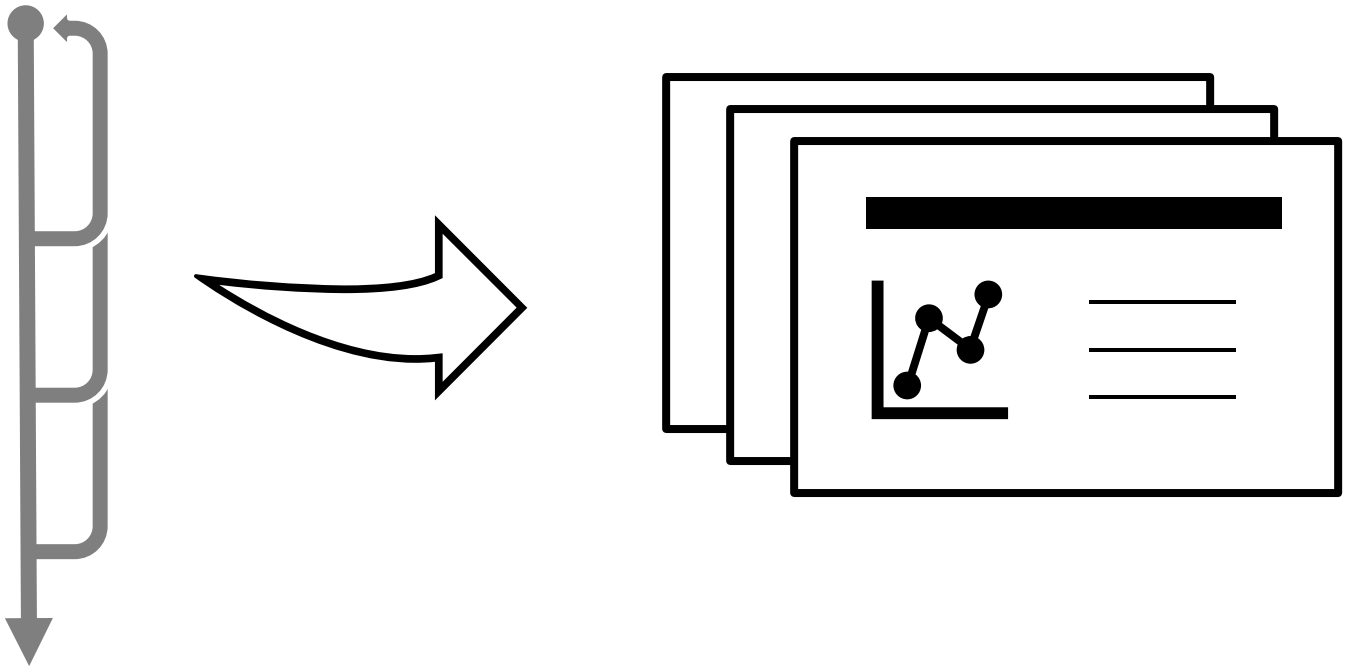
# For your journal article presentation…

The authors told a story in their paper that you can follow in your presentation

**…but you don't have to** (and probably *can't* tell the whole thing in 10 minutes.)

Think about the story you want to tell and structure your presentation around that.

# 2. Design effective slides to convey the story



# Good slides are a lot like good figures

"What would help my audience understand this faster?"

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

- Make slide **title** a take-home message
- Show **minimal essential data**
- Maximize **signal-to-noise ratio**

  Control time and space by separating, adding, and subtracting the original figures
- **Effective redundancy**: align visual, written, + spoken!

# Make slide titles take-home messages

| | DON'T use | INSTEAD use |
|---|---|---|
| | *General descriptions of "what"* | ***Sentences that answer "so what?"*** |
| Method | EMK-1 Knockdown | **EMK1 was knocked down in MDCK (kidney) cells using siRNA** |
| Results | Ca-switch | **MDCK cells form a lumen after extracellular calcium changes** |
| | Mitochondrial ROS induction in cell lines | **Mitochondrial ROS induction is decreased in adk knockout cells** |
| | Comparison of primer specificity | **Primer 1 is better than Primer 2 at differentiating closely-related HIV strains** |

# Use all parts of your slide to support your message.

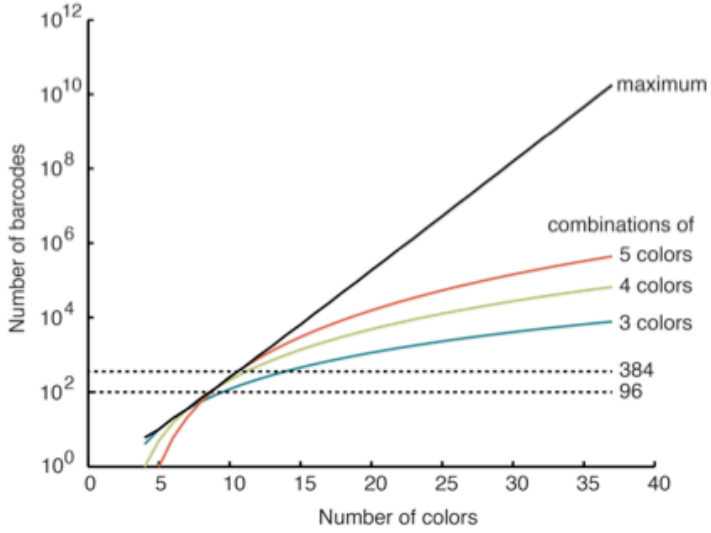
The **title** conveys the *"so what"*

**One message per slide: only include data that supports that message**

**No unnecessary content**: only figures you discuss

**Text** supports the message, not a script
(make sure font size is large enough!)

## Optical barcoding scheme is easily scalable to ultrahigh library complexity (>384 combinations)




Only 9 colors needed for library of 96
Only 11 colors needed for library of 384

14

*Tony Kulesa, Georgia Lagoudas*

# 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?

# Templates are just visual noise. Avoid them.

My name - Today - Where we are

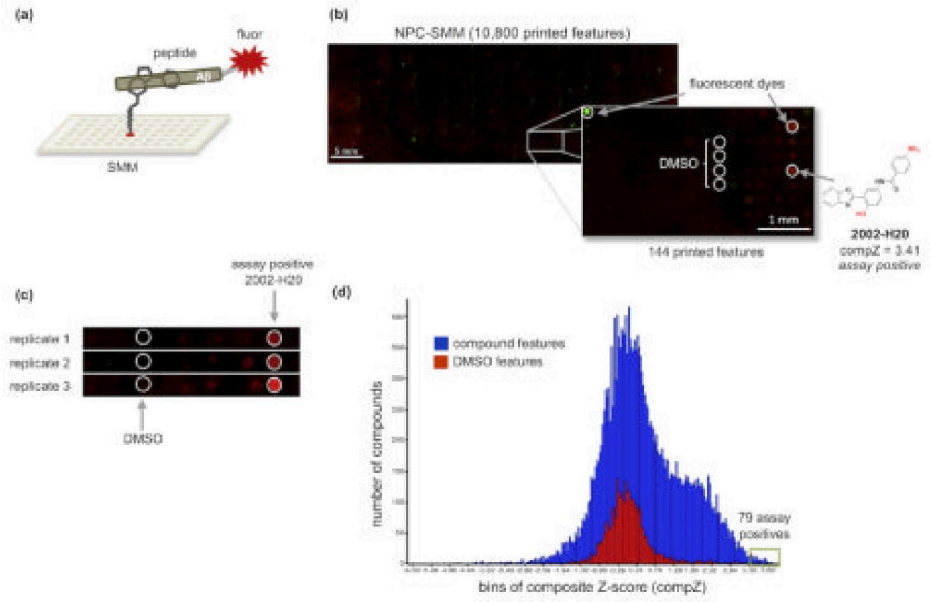
Susan McConnell (Stanford),
*Designing effective scientific presentations*
https://youtu.be/Hp7Id3Yb9XQ

**Activity:**

How would you improve the slides you made?

Think about the tricks we just discussed!

What other modifications are you curious about?




Chen et al, 2010

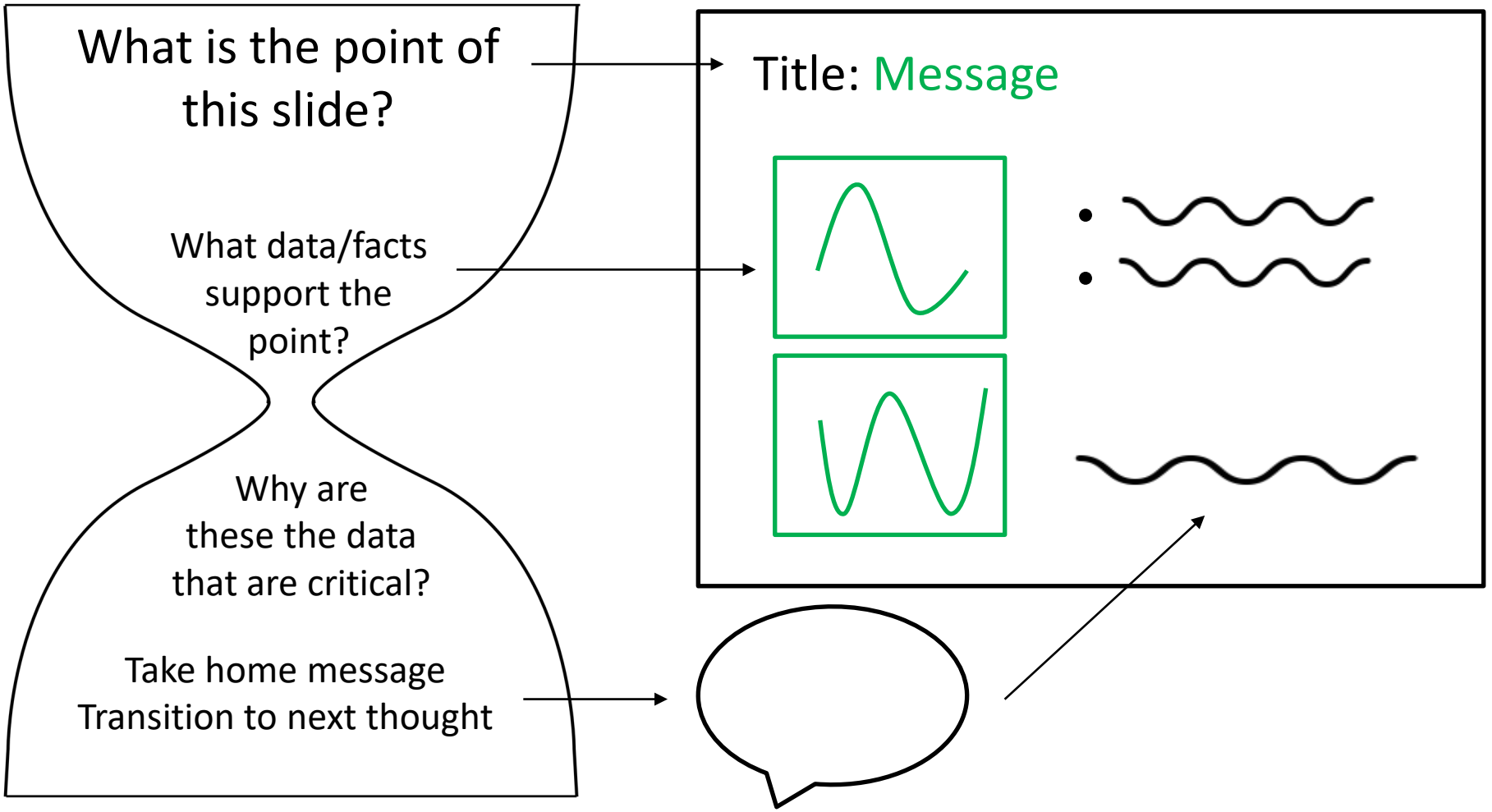
# 3. Present your story clearly

# We’re a friendly audience, so help us out

- **Practice** the take-home messages and transitions
- **Record yourself** to get timing right **(<u>10 min</u>)**
- If you’re ***not*** going to talk about it, **take it out**

We’ll ask you about **<u>METHODS</u>, be ready** to explain how things work and how the authors know things

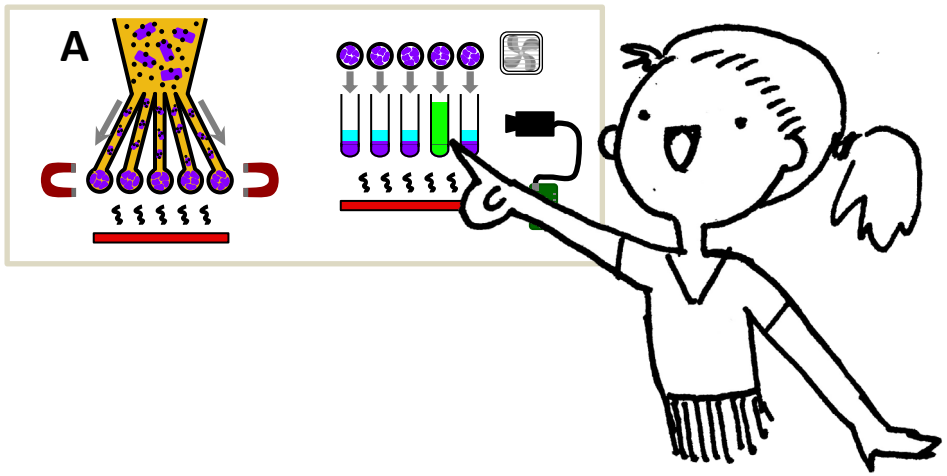
# Think about what you'll say with each slide!




Try not to read off a script.

Practice with a script then convert to bullet points

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



# Manage nerves by accepting them

Who doesn't get nervous? Be **kind** to yourself.

Reframe it:

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

Channel the feeling, don't fight it.

**steady belly breathing**

**eye contact**

**smile**

# What happens at the end? hint

**Time**

Let the questioner finish.

Give yourself time to think.

**Thought**

Make sure you understand the question.

Do your best, use your reasoning,

but don't guess or just say you'll look into it.

(What goes on the screen?)

# It’s easy to avoid common pitfalls

| DON’T | DO |
| --- | --- |
| Start so late you don’t have time to digest the paper | Give yourself time to read the paper carefully 2-3 times |
| Be exhaustive (it’s exhausting)<br>List experiments chronologically | Be selective about what you present<br>Tell a story |
| Lose points for time (9.5-10.5 min) | **Practice** until you hit the time limit |
| Forget to cite which paper it is | Include citation in your title slide |
| Say “we did this” | “The authors did this” |
| Use illegible labels | Use ≥20pt font<br>Make your own helpful figure labels<br>Use legible colors |

# Getting help is a sign of strength!

Ask us if you are unsure or have an idea you want to try

Practice your presentation with a Comm Fellow
mitcommlab.mit.edu/be

Watch the rest of *Designing effective scientific presentations*
https://youtu.be/Hp7Id3Yb9XQ

Susan McConnell, Stanford

# These are our next steps

- Slides and tips will be on the wiki

## Your next steps

- Refer back to these tips, put together effective journal article presentations, and practice!
- Make a Comm Lab appointment to get feedback on your oral delivery/slides or anything communication related
- Keep thinking about presentations and slide design as you go to other classes and lectures!