20.109 Communication Workshop 3: Abstracts

Untitled
Mark Rothko, 1968
Phillips Collection (Washington, DC)

Dr. Prerna Bhargava
Dr. Sean Clarke

MIT BIOLOGICAL ENGINEERING COMMUNICATION LAB

Helping you communicate effectively.
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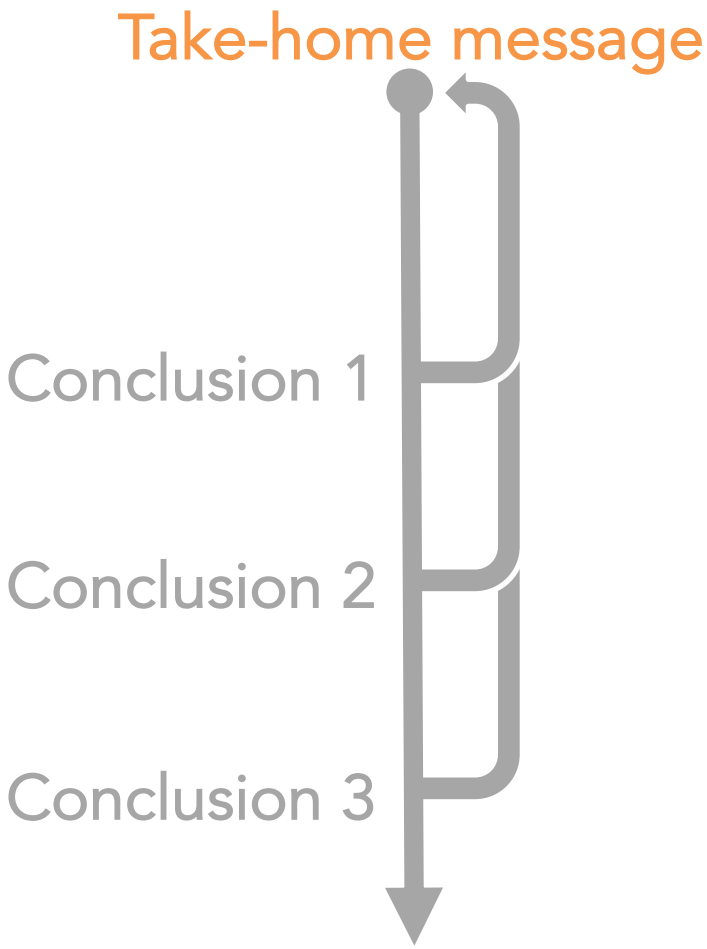
Your title and abstract convey your take-home message

WHAT
Take-home message



Why was this an important study?

How does it further scientific thinking?

Why should anyone read your paper?

In groups of 2-3,

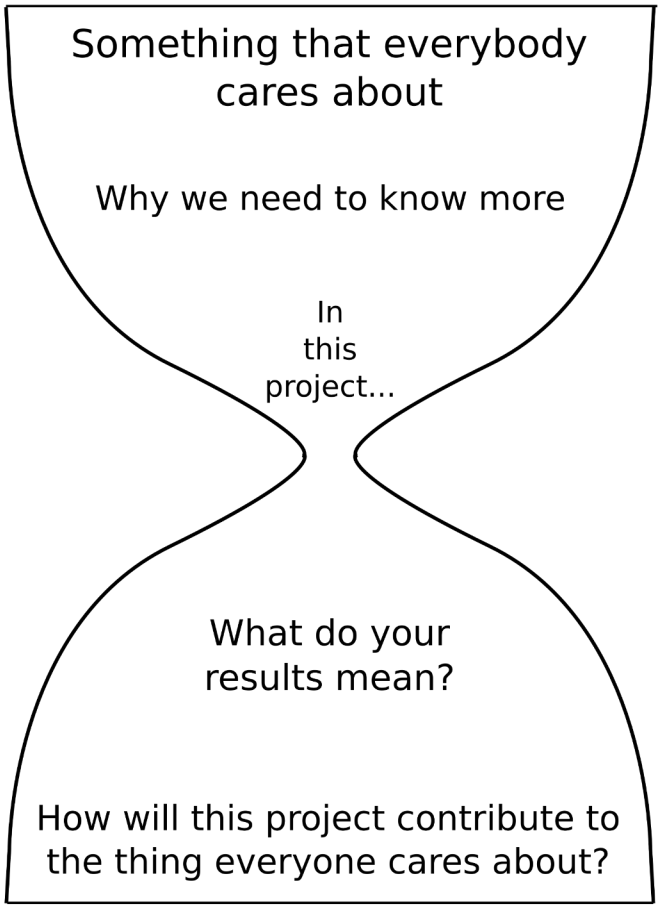
discuss which sentences in your abstract answer the following questions

1. What is the **problem**?
2. Where is the **gap**?
3. What did you **do**?
4. What is the **implication**?

Label sentences with titles like:

- **Background**
- **Results**
- **Take-home message**
- **Significance**
- **Implication**

An effective abstract is an hourglass-shaped message.



General background

Specific background

Knowledge gap, Unknown

Take home message (HERE WE SHOW...)

Results

Implication

Significance

A Small-Molecule Inhibitor to the Cytokine Interleukin-4

Sean P. Quinnell, Becky S. Leifer, Stephen T. Nestor, Kelly Tan, Daniel F. Sheehy, Luke Ceo, Shelby K. Doyle, Angela N. Koehler, and Arturo J. Vegas*

Interleukin-4 (IL-4) is a multifunctional cytokine and an important regulator of inflammation. When deregulated, IL-4 activity is associated with asthma, allergic inflammation, and multiple types of cancer. While antibody-based inhibitors targeting the soluble cytokine have been evaluated clinically, they failed to achieve their end points in trials. Small-molecule inhibitors are an attractive alternative, but identifying effective chemotypes that inhibit the protein−protein interactions between cytokines and their receptors remains an active area of research. As a result, no small-molecule inhibitors to the soluble IL-4 cytokine have yet been reported. Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays. The compound features a nicotinonitrile scaffold with micromolar affinity and potency for the cytokine and disrupts type II IL-4 signaling in cells. Small-molecule inhibitors of these important cell-signaling proteins have implications for numerous immune-related disorders and inform future drug discovery and design efforts for these challenging protein targets.

For every abstract, make sure you consider these key aspects

1. Establish a clear argument, using CER
2. Your title and "here we show" statement convey the same message
3. Your problem statement and "here we show" statement are next to each other
4. Your results reflect your take home message
5. Use your "here we show" to guide the type of background you include
6. The subject of each sentence leads to the subject of the next sentence

Create an argument to convince readers that your work is important

argument = claim + evidence + reasoning

Claim	A statement of our understanding about a phenomenon, about the outcome of a study, or about the author's view of the field
Evidence	Data to support the claim
Reasoning	Justification of the claim that shows **how** the evidence specifically supports the claim

Signaling words help your reader understand what part of the argument you are communicating

Claim	*Here*, we show the bromodomain containing protein, BRD4, regulates transcription of PPAR**γ** and C/EBP**α**.
Evidence	Analysis of BRD4 chromatin occupancy reveals … Inhibition of the bromodomain and extraterminal domain (BET) family of bromodomain-containing proteins impedes … *Furthermore*, silencing of these BRD4-occupied distal regulatory elements at the Pparg locus by CRISPRi demonstrates …
Reasoning	*Together*, these data establish BET bromodomain proteins as time and context-dependent coactivators of the adipocyte cell state transition

Brown, J. D. et al. (2018). BET bromodomain proteins regulate enhancer function during adipogenesis. *PNAS*, *115*(9), 2144–2149.

Signaling words help guide the reader

Question + Experiment	Results	Answer/ Conclusion	Implication
To determine whether…, we…	We found…	We conclude that…	These results suggest that…
We asked whether…	Our results show…	Thus,…	These results may play a role in…
To answer this question, we…	Here we report…	These results indicate that…	Y can be used to…
X was studied by…			

Read lots of abstracts and collect useful phrases, choose clarity over originality.

Your title should reflect your "here we show" take home message claim

A Small-Molecule Inhibitor to the Cytokine Interleukin-4

Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays.

Your knowledge gap and "here we show" statement should come sequentially

but identifying effective chemotypes that inhibit the protein–protein interactions between cytokines and their receptors remains an active area of research. As a result, no small-molecule inhibitors to the soluble IL-4 cytokine have yet been reported.

Knowledge Gap

Here, we describe the first IL-4 small-molecule inhibitor identified and characterized through a combination of binding-based approaches and cell-based activity assays.

Here we show

This is a good check for you and helps your reader

Your results should reflect your take home message

Technology Focus

Here we show that RNA-seq can be used to identify mechanisms of drug action within a cell.

1. What data did you use?
2. What analysis tools?
3. Did you find any interesting pathways?

Biology Focus

Here we use a cell viability assay and analysis of RNA-seq data to understand the mechanism through which target cells have increased survival after drug treatment.

1. What did you learn about the mechanism from these assays?
2. What can you do next?

Be quantitative about the results that you include

To write your background, work backwards from your "here we show" statement

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Use the order of your sentence to guide your reader to the subject of the sentence

Cells were pelleted gently in order to remove supernatant without lysing cells.

In order to remove supernatant, cells were pelleted gently without lysing cells.

Without lysing, cells were pelleted gently in order to remove supernatant.

In order to remove supernatant without lysing cells, cells were pelleted gently.

What is the subject of this sentence?

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Protip: Avoid novelty claims.

- Unless you've read every paper, you don't really know if you're the first to discover something.
- A surprising result: unanticipated, or against common dogma, but not unprecedented
- Appropriately qualified, there are certain "firsts" you do know…

Remember to answer these questions for your reader in your abstract

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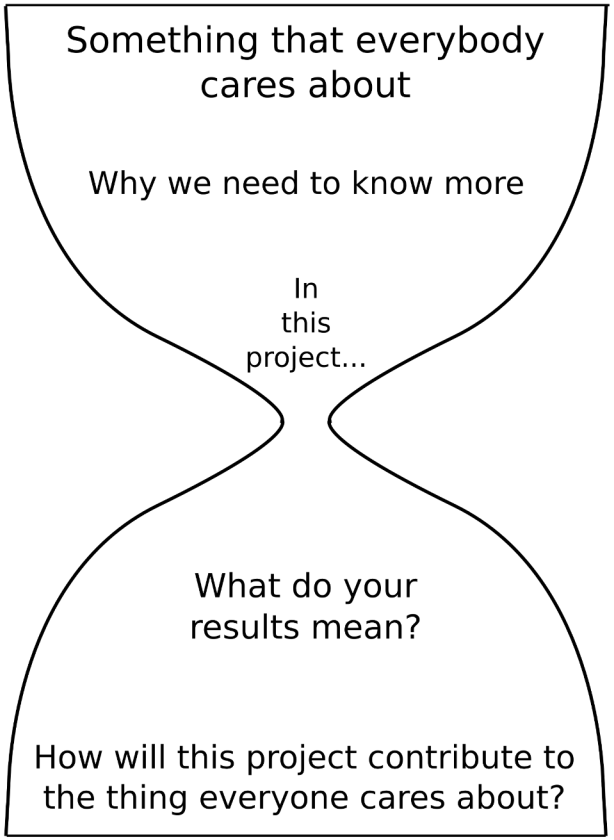

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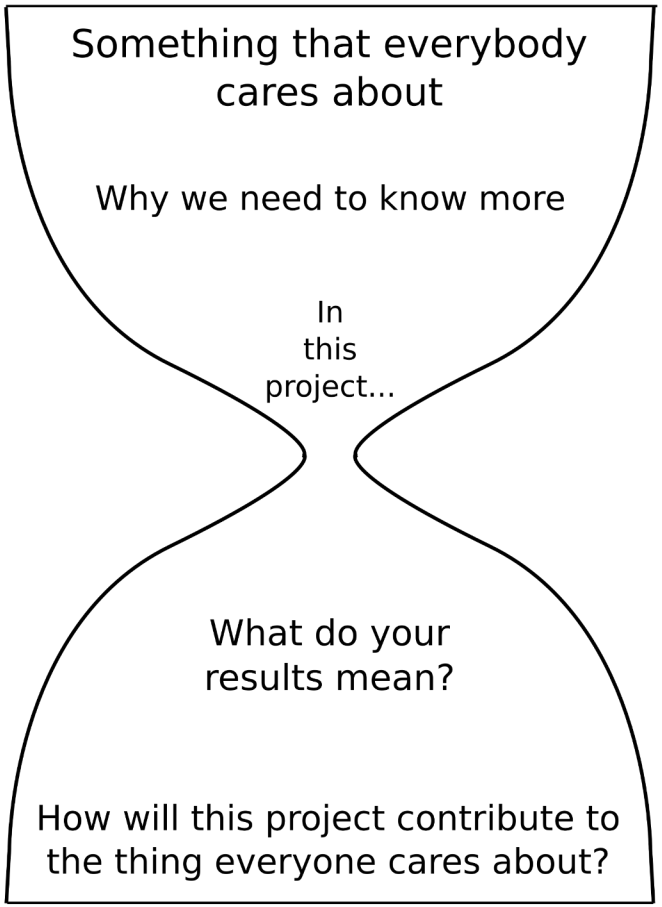

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Knowledge gap, Unknown

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Implication

Significance

Take-homes for Titles and Abstracts:

- **Highlight your take-home** message: identify your research question & your contribution
- Focus on **findings**, not methods.
- Be **succinct**.
- Be **quantitative**.
- Make your titles as **messages**

These are our next steps

- Slides and tips will be on the wiki

Your next steps

- Use the checklists to write great titles and abstracts and design great figures
- Make a Comm Lab appointment to get feedback on your titles/abstracts/figures or anything communication related as you work on your Mod 1 report
- Start thinking about presentations, slide design, and journal clubs as you go to other classes and lectures!