NU COMMLAB

NU Communication Lab

Posters & Presenting

David Farina, Chemical Engineering

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“I have found that all ugly things are made by those who strive to make something beautiful,

and that all beautiful things are made by those who strive to make something useful.”

-Oscar Wilde

Introduction: Overall Plan of Poster

How should I approach my poster?

Introduction

"Scientific posters … are best thought of as support for oral presentations, not as written documents."

– Jean-luc Doumont

1. Tell your story
2. Effective Planning for Audience
3. Mindful Design

A poster is a conversation starter

A poster is a conversation starter

Craft your pitch

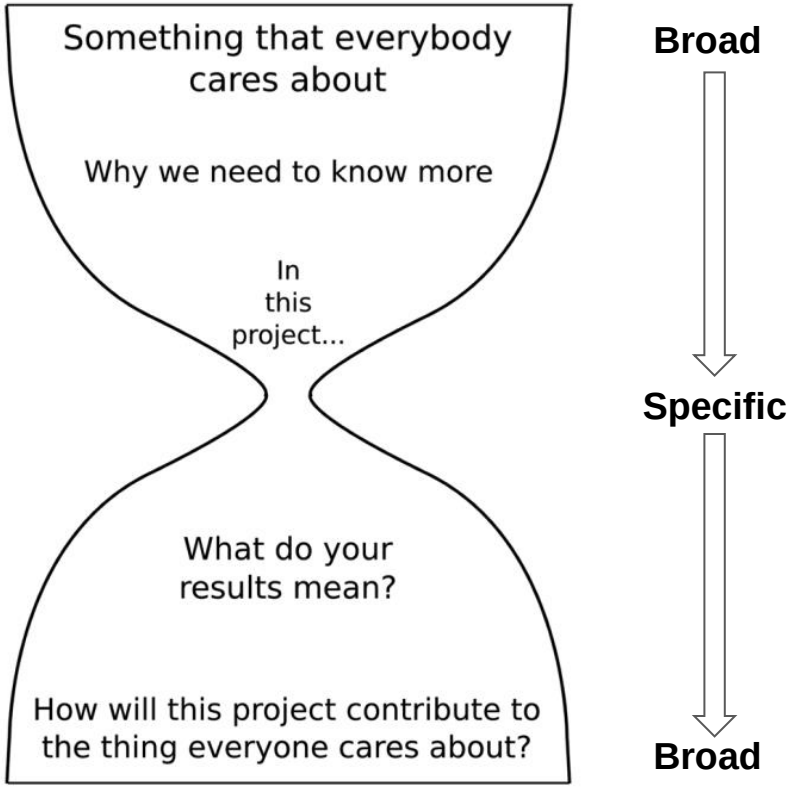
Have interest

Adapt to your audience

Talk openly

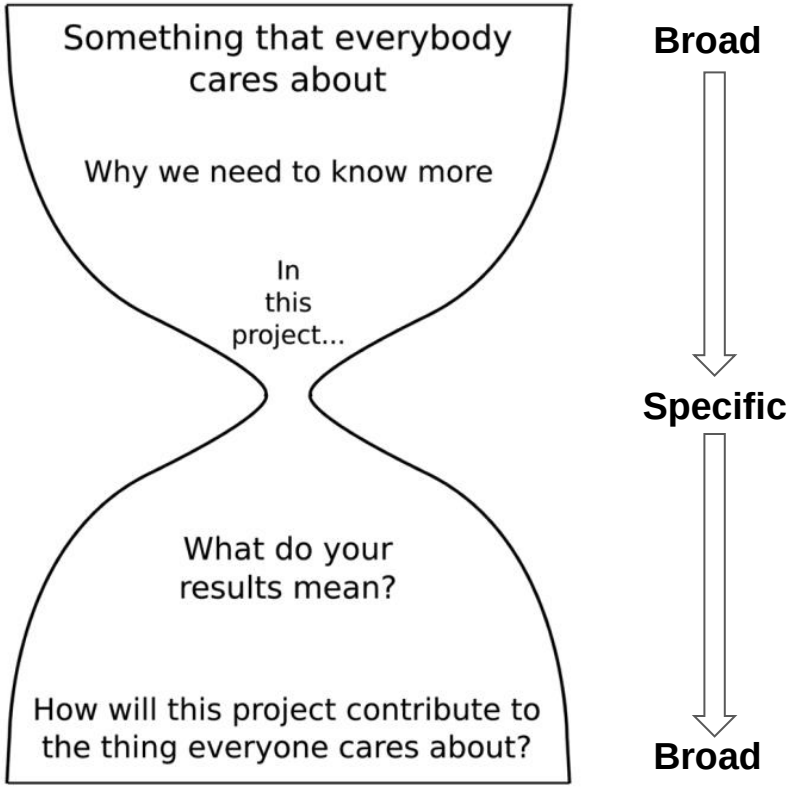
Craft your pitch

Use the hourglass approach!



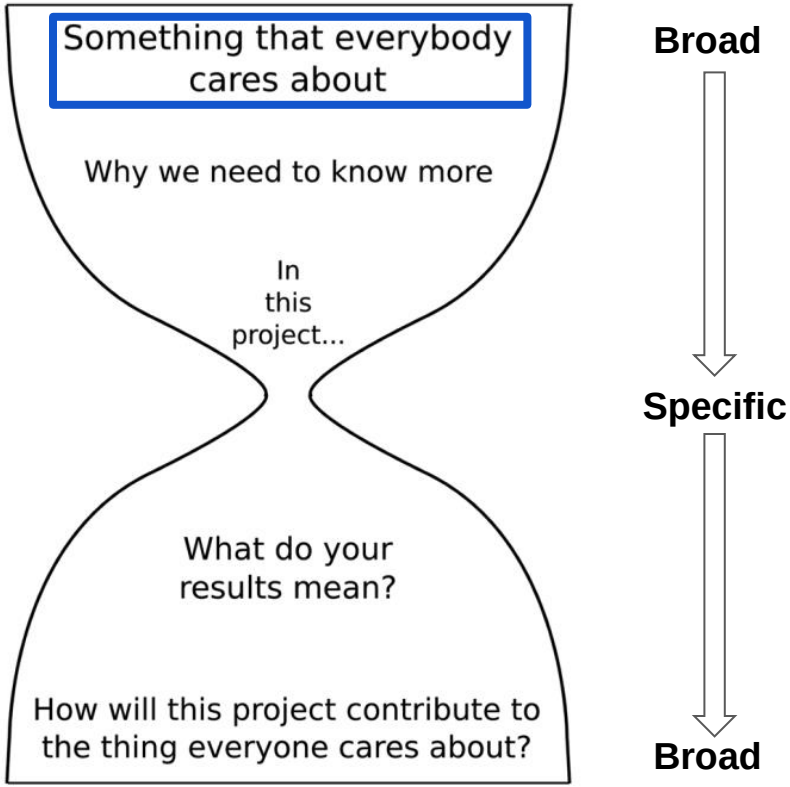
Craft your pitch

1. Your pitch is not a detailed explanation of your research!



Craft your pitch

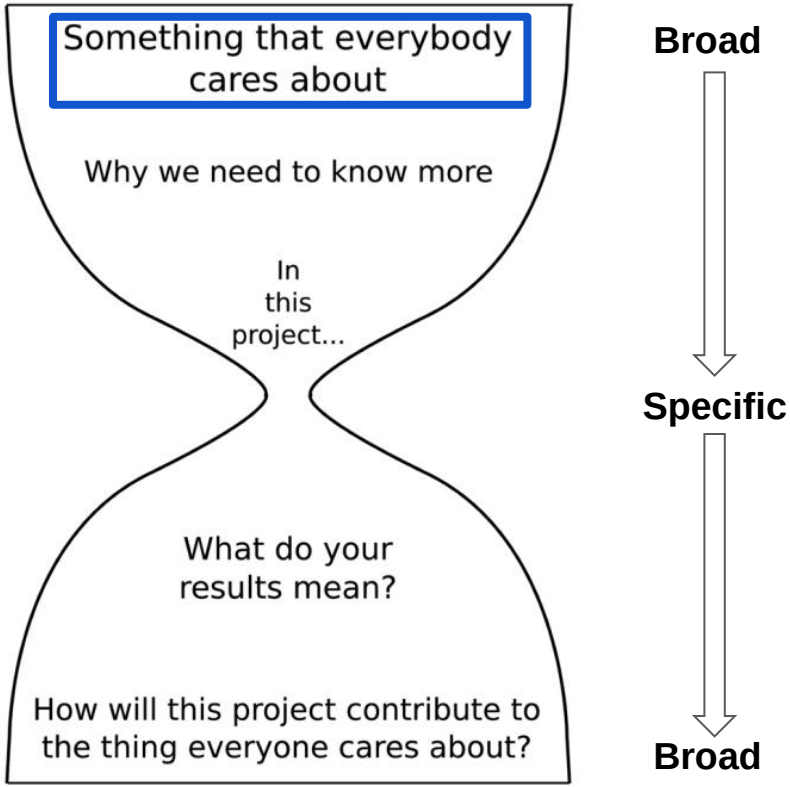
2. Components:
   a. Attention getter



Craft your pitch

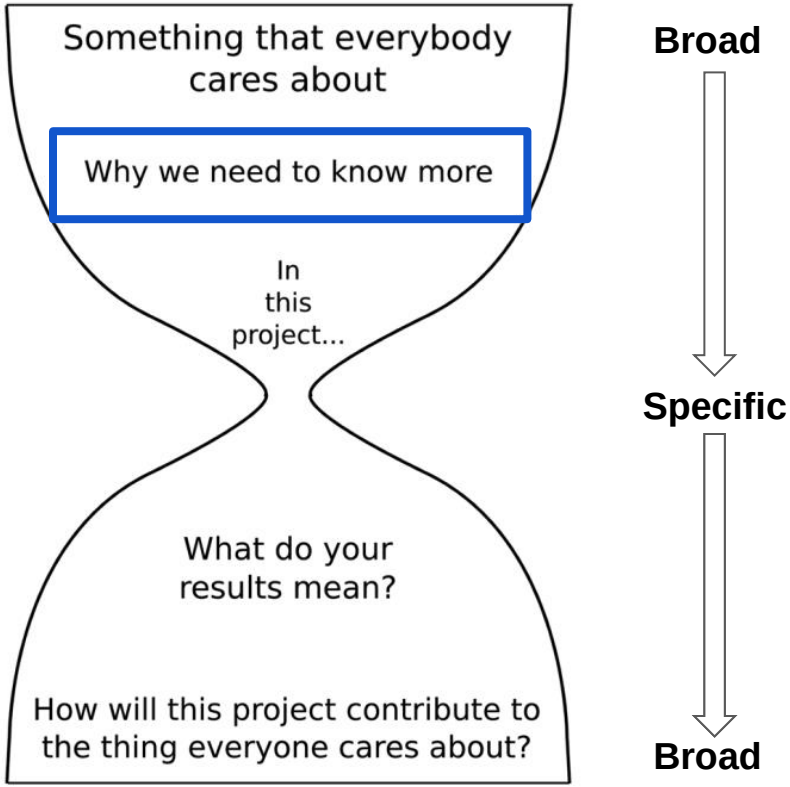
2. Components:
   a. Attention getter

Example: The number one cause of death in the United States is atherosclerosis, a vascular disease characterized by plaque build-up in blood vessels.



Craft your pitch

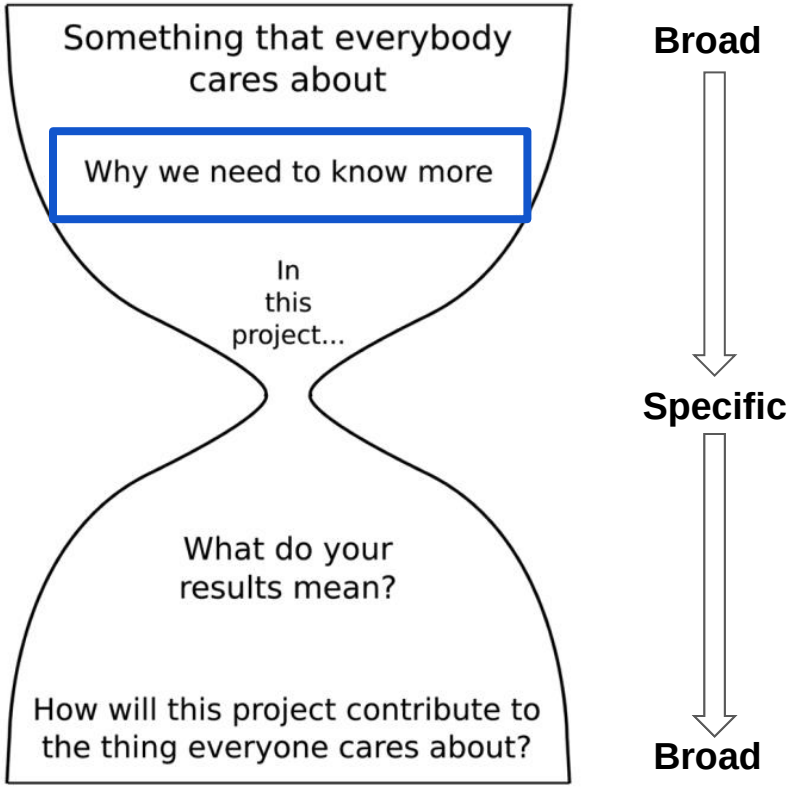
2. Components:
   a. Attention getter
   b. Need



Craft your pitch

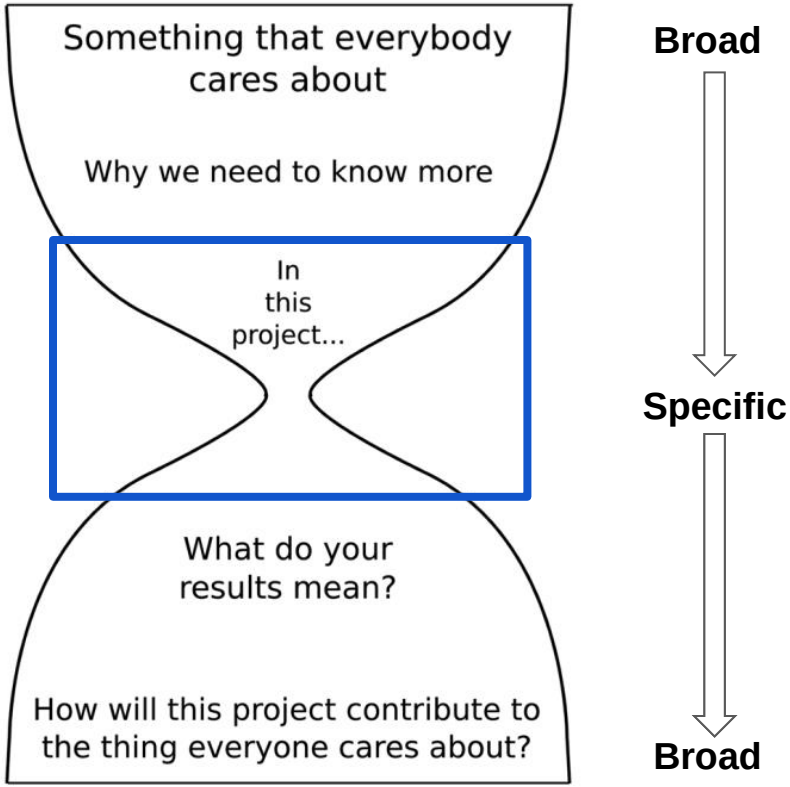
2. Components:
   a. Attention getter
   b. Need

Example: Despite current treatments for atherosclerosis, its prevalence and financial burden are tremendous.



Craft your pitch

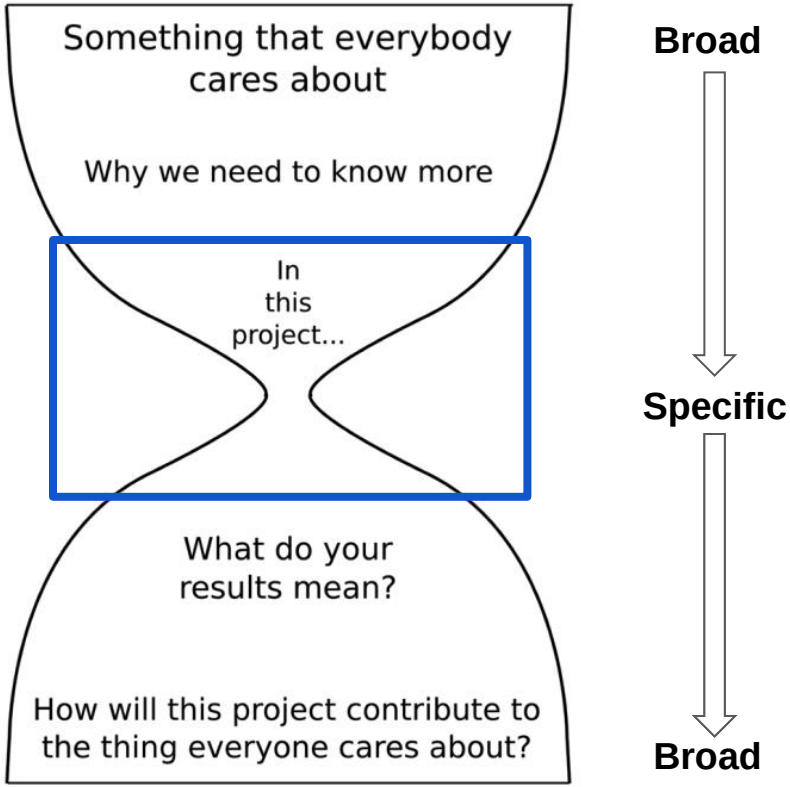
2. Components:
   a. Attention getter
   b. Need
   c. Task



Craft your pitch

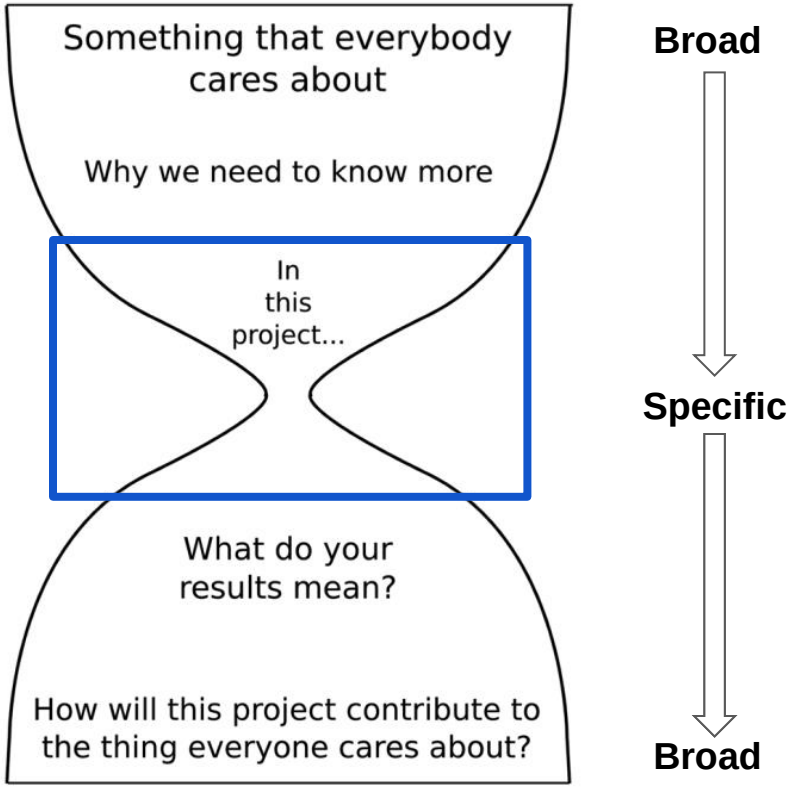
2. Components:
   a. Attention getter
   b. Need
   c. Task

Example: In this project, I investigated the role of the endothelial glycocalyx, a sugar layer lining the inside of blood vessels, on the development of atherosclerosis.



Craft your pitch

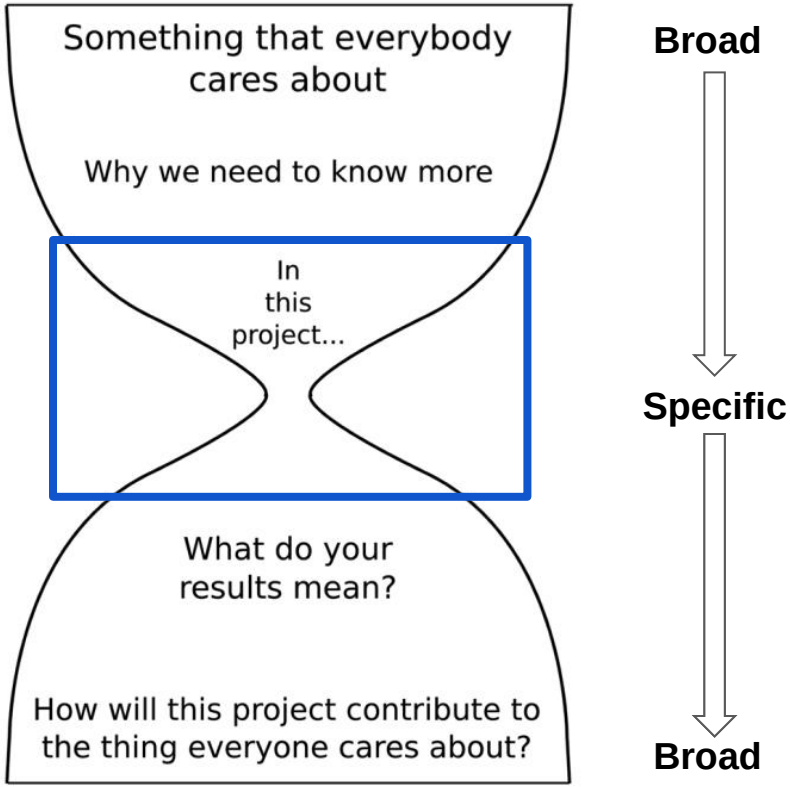
2. Components:
   a. Attention getter
   b. Need
   c. Task
   d. Findings



Craft your pitch

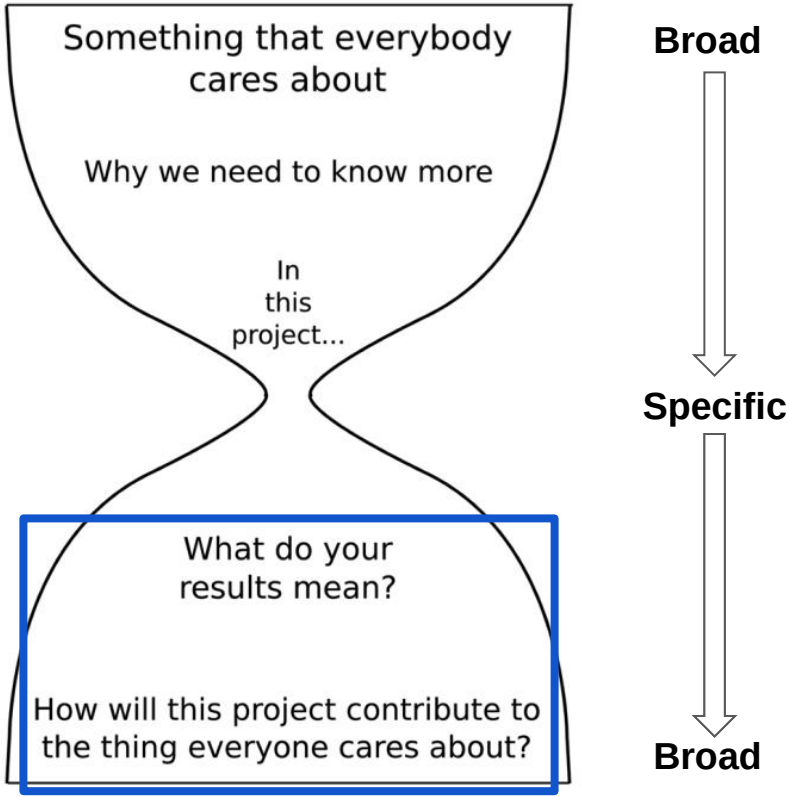
2. Components:
   a. Attention getter
   b. Need
   c. Task
   d. Findings

Example: I found that glycocalyx expression correlates with atherosclerosis localization and may contribute to the disease via the regulation of atherosclerosis-relevant molecules.



Craft your pitch

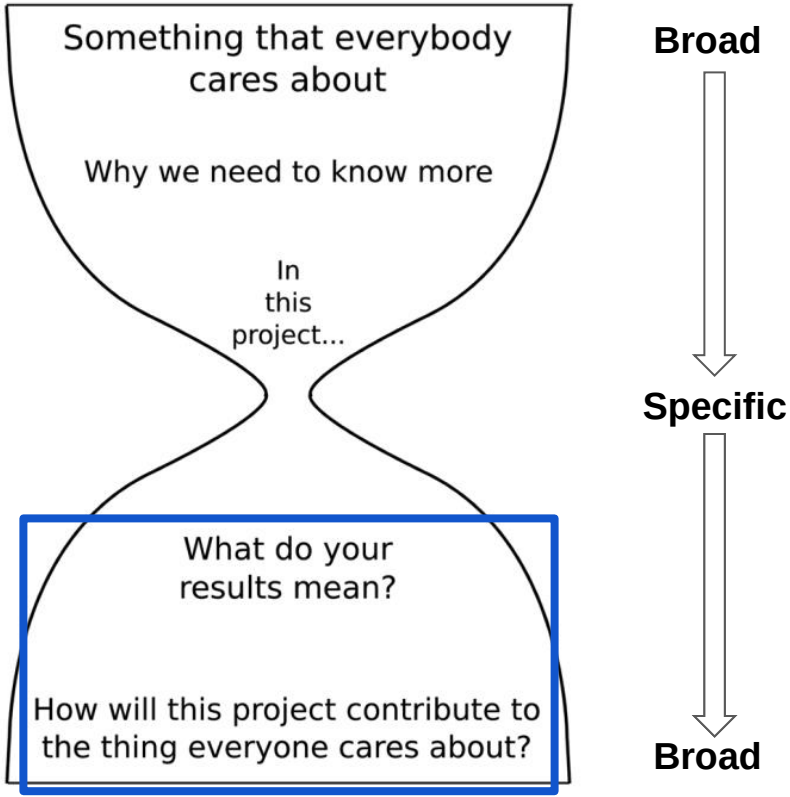
2. Components:
   a. Attention getter
   b. Need
   c. Task
   d. Findings
   e. Consequences



Craft your pitch

2. Components:
   a. Attention getter
   b. Need
   c. Task
   d. Findings
   e. Consequences

Example: My results suggest that glycocalyx expression could influence the development of atherosclerosis. This information may help design therapeutics that reduce the frequency and cost of atherosclerosis.



A poster is a conversation starter

Craft your pitch

Have interest

Adapt to your audience

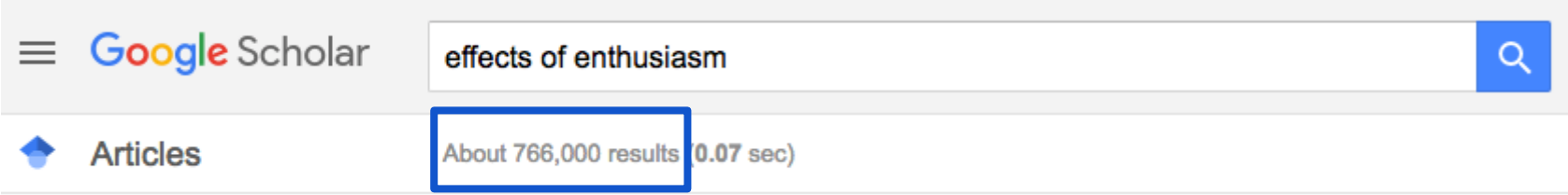
Talk openly

Have interest

Show interest in your topic and the people in front of you

Have interest

1. Be enthusiastic!



Have interest

1. Be enthusiastic!
2. Maintain eye contact

Original Articles

Eye contact: A nonverbal determinant of speaker credibility

Steven A. Beebe

Pages 21-25 | Published online: 18 May 2009

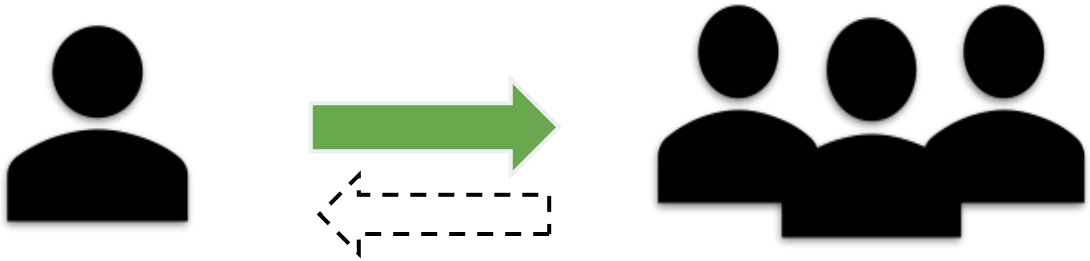
Download citation https://doi.org/10.1080/03634527409378052

Effects of Eye Contact, Posture and Vocal Inflection upon Credibility and Comprehension.

Beebe, Steven A.

Have interest

1. Be enthusiastic!
2. Maintain eye contact
3. Speak WITH your audience



Have interest

1. Be enthusiastic!
2. Maintain eye contact
3. Speak WITH your audience
4. Body language: squarely face your audience

A poster is a conversation starter

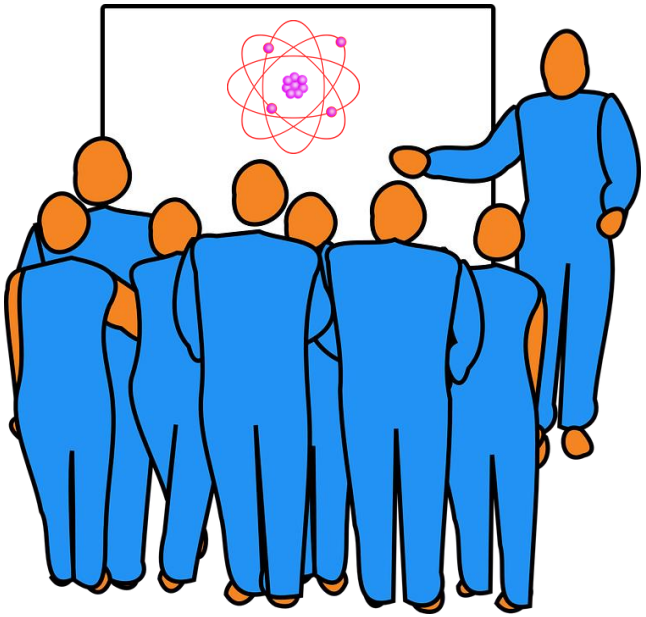
Craft your pitch

Have interest

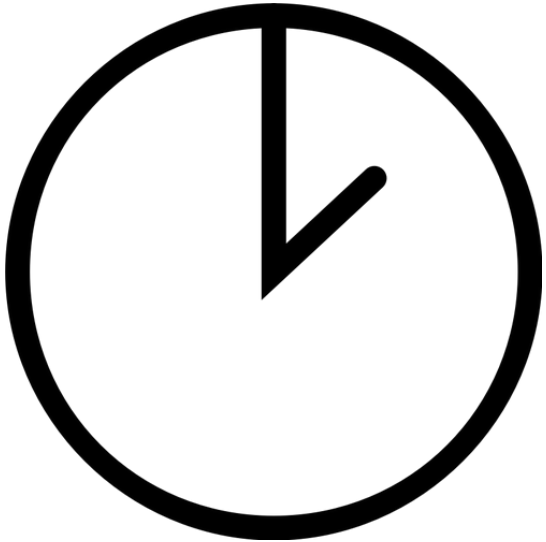
Adapt to your audience

Talk openly

Your audience has different backgrounds and constraints



Who is your audience?



How much time?

Adapt to your audience

1. Find out who your audience is

Adapt to your audience

1. Find out who your audience is:
    a. Hi, I'm…
    b. The main question of my research is…
    c. The main finding of my research is….
    d. Let me know if you have questions!

Adapt to your audience

1. Find out who your audience is
2. Audience level of familiarity

Adapt to your audience

1. Find out who your audience is
2. Audience level of familiarity:
    a. What is their background?
    b. Be prepared to paraphrase technical terms!

A poster is a conversation starter

Craft your pitch

Have interest

Adapt to your audience

Talk openly

Talk openly

Don’t be afraid to talk openly about your research

Talk openly

1. Be open to suggestions and differences in interpretations

Talk openly

1. Be open to suggestions and differences in interpretations
2. View it as a free reviewer response

Remember: A poster is a conversation starter

Craft your pitch

Have interest

Adapt to your audience

Talk openly

Your poll will show here

1

Install the app from
pollev.com/app

2

Make sure you are in
Slide Show mode

Still not working? Get help at pollev.com/app/help

or

Open poll in your web browser

1. Tell your story
2. Effective Planning for Audience
3. Mindful Design

How to plan your poster

1. **Title-** What did you do?
2. **Background-** Why should we care?
3. **Methods-** What approach did you take?
4. **Results-** What did you learn?
5. **Conclusions-** What are the implications?
6. **Acknowledgements**
7. **References**

Title: What did you do?

Optogenetic Systematic Stimulation of Superior Cervical Ganglia and Intracardiac Ganglia

Title: What did you do?

Optogenetic Systematic Stimulation of
Superior Cervical Ganglia and Intracardiac Ganglia

Optogenetic Stimulation of the
Autonomic Nervous System

Title: What did you do?

Optogenetic Systematic Stimulation of
Superior Cervical Ganglia and Intracardiac Ganglia

Optogenetic Stimulation of the
Autonomic Nervous System

Should be broad and relatively short

Background: Why should we care?

The autonomic nervous system can be one of the reasons for heart failure.

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An increase in sympathetic parts of the autonomic nervous system can physically change cardiomyocyte phenotype and lead to heart failure.

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An increase in sympathetic parts of the autonomic nervous system can physically change cardiomyocyte phenotype and lead to heart failure.

Clearly state motivation and hypothesis

Methods: What approach did you take?

Superior Cervical ganglia and Intracardiac ganglia are put into a well plate with adeno associated viruses that encode for the ChrimsonR or Chronos opsins that can be individually stimulated at different wavelengths.

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Neural types are separately transduced with AAVs coding for ChrimsonR or Chronos opsins

Methods: What approach did you take?

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Neural types are separately transduced with AAVs coding for ChrimsonR or Chronos opsins

Keep it general

Figure 2. Neurons innervating heart cells

Results: What did you learn?

Figure 2. Neurons innervating heart cells

Figure 2. Neurons seeded in a 3D gel environment are able to extend neurites throughout and innervate heart cells.

Results: What did you learn?

Figure 2. Neurons innervating heart cells

Figure 2. Neurons seeded in a 3D gel environment are able to extend neurites throughout and innervate heart cells.

Title each figure with a take home message

Conclusions: What are the implications?

This work demonstrated successful neurite extension through cardiomyocytes.

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These techniques will be used to better understand the effects of the nervous system as a contributor to heart disease.

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This work demonstrated successful neurite extension through cardiomyocytes.

These techniques will be used to better understand the effects of the nervous system as a contributor to heart disease.

Bring it back to the big picture: “So What?”

Acknowledgements and References

Acknowledgements

#1638325

References

[1] Parasympathetic nervous system and heart failure, Colucci et al, 2008.

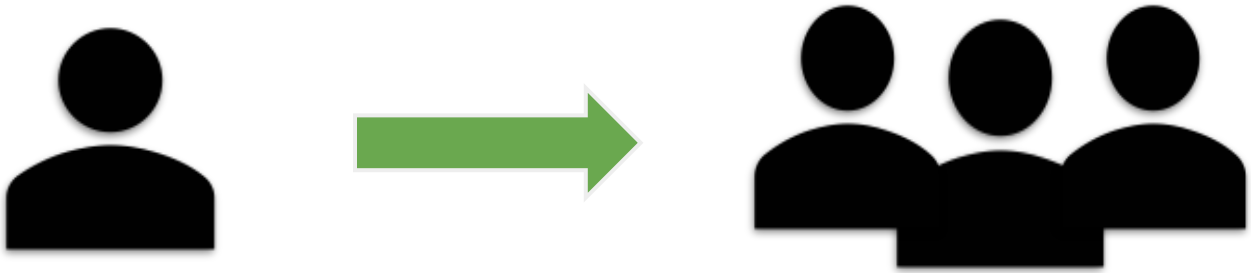
In summary...

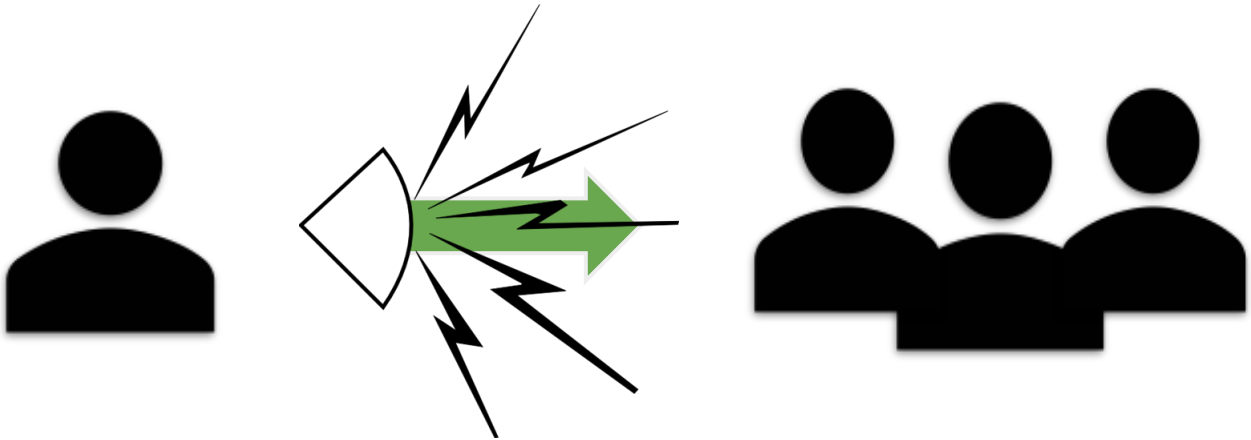
1. **Title-** Broad, legible, relatively short
2. **Background-** Clearly convey motivation and hypothesis
3. **Methods-** General, not too much detail
4. **Results-** Figure titles should have take home message
5. **Conclusions-** Bring the implications of the work back to the big picture
6. **Acknowledgements-** Include symbols and grant number
7. **References -** put credit where credit is due

Take home message

Find the sweet spot between being too broad and too specific for your audience.

1. Tell your story
2. Effective Planning for Audience
3. Mindful Design





Maximize your signal-to-noise ratio

- **Arrange** sections into a logical pattern
- **Preserve** background and avoid using too much color
- **Limit** content to what serves your purpose and suits the audience

What NOT to do: Treat your poster like a suitcase

- Overpacking
- Putting in extra things for no clear reason
- Stuffing things in anywhere that they fit

Arrange sections into a logical pattern

- Make visual navigation as easy as possible: left to right, top to bottom
- Coordinate all sizing and positioning for structure and harmony

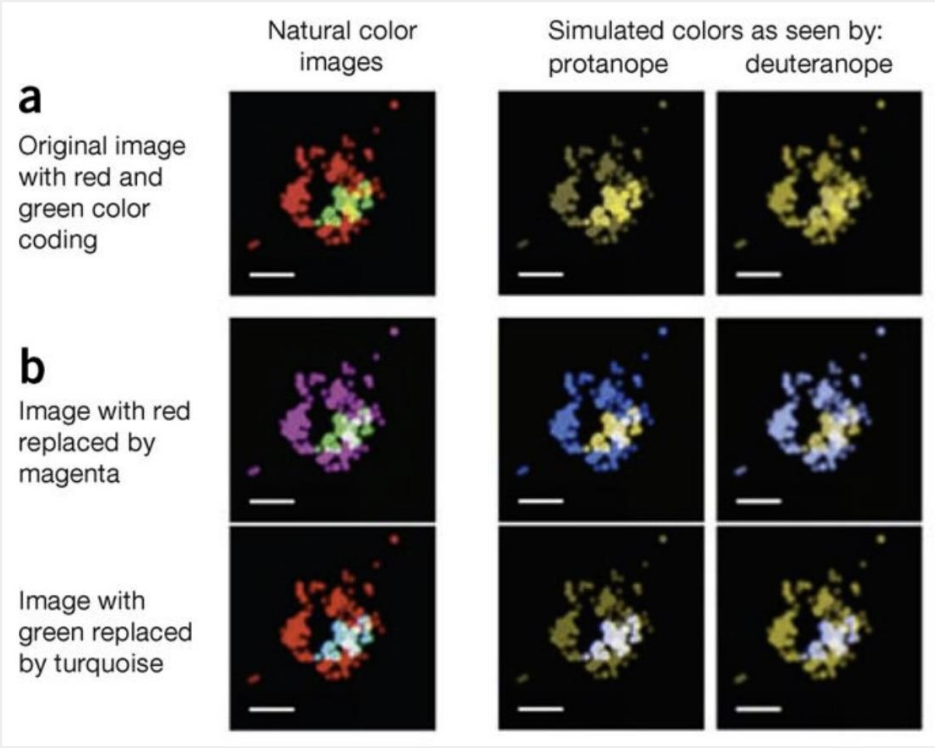
Preserve background and avoid too much color

- Only use color for indicating significance
- Be consistent with color schemes
- When in doubt, simplify

Preserve background and avoid using too much color

Accommodate vision-impaired colleagues

a. For single instances of color, use high contrast (like this)
b. For color coding, avoid red-green
c. Keep themes monochromatic
   e.g. grayscale



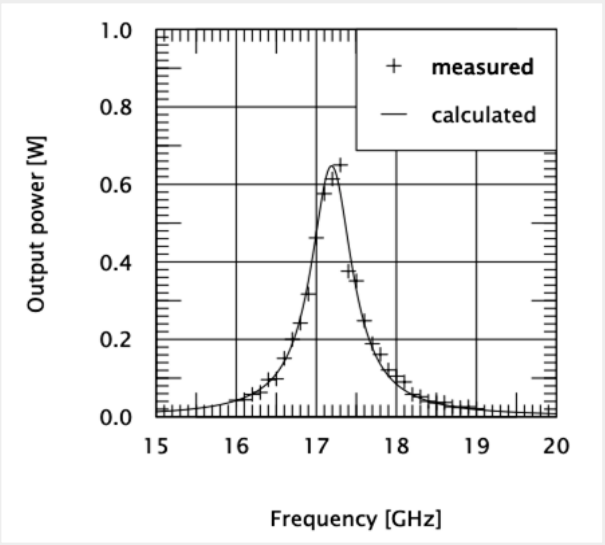
*Replacing **red** with magenta or **green** with turquoise can improve visibility for red-green impaired individuals*

Wong 2011 *Nature Methods*

Limit content to best serve your purpose & suit the audience

- Simplify your graphics to make a clear point
- Aim to convey a message with as little text as possible
- When you must have text, use bullet-style over paragraphs

- **Simplify your graphics to make a clear point**



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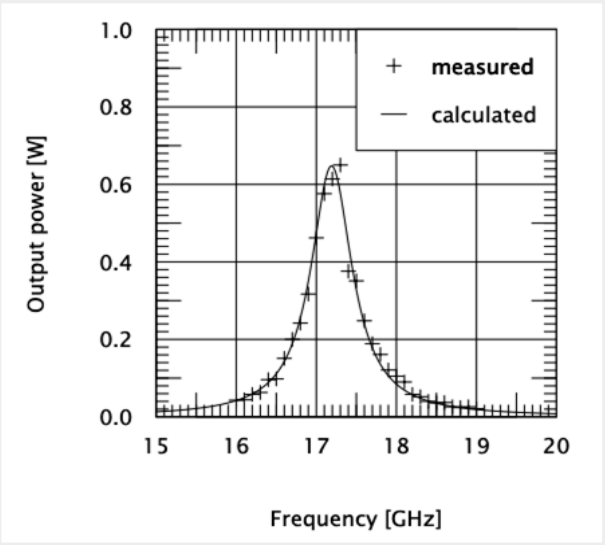
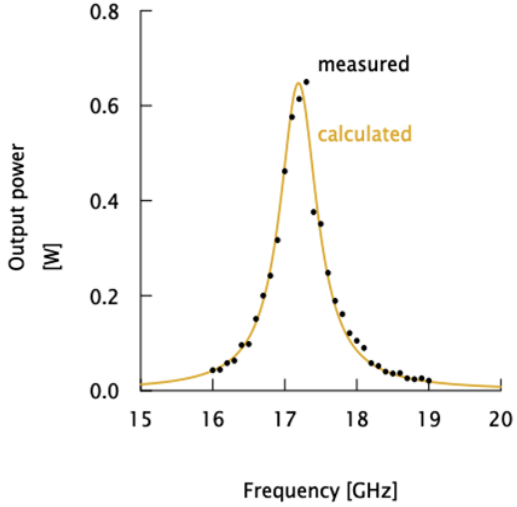
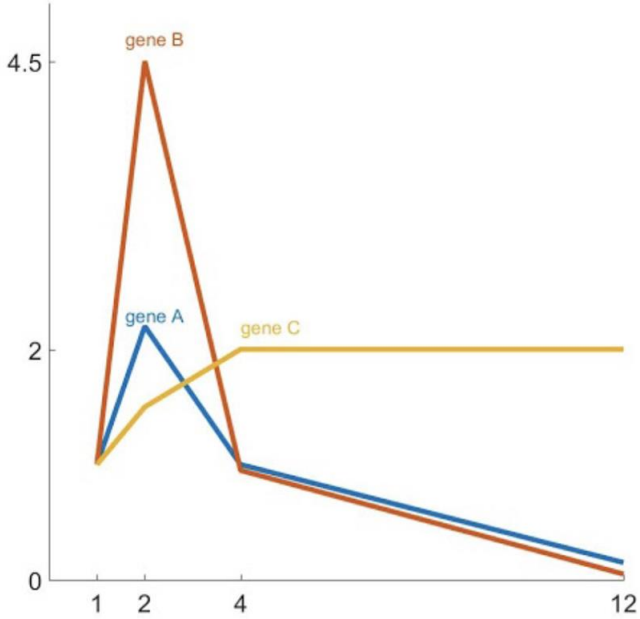




Use shape & color to differentiate data sets.
Be consistent!

- **Simplify your graphics to make a clear point**

	1 hr	2 hr	4 hr	12 hr
gene A	1.0	2.2	1.0	.15
gene B	1.0	4.5	.95	.05
gene C	1.0	1.5	2.0	2.0



Use tables or figures depending on how effectively they communicate your message

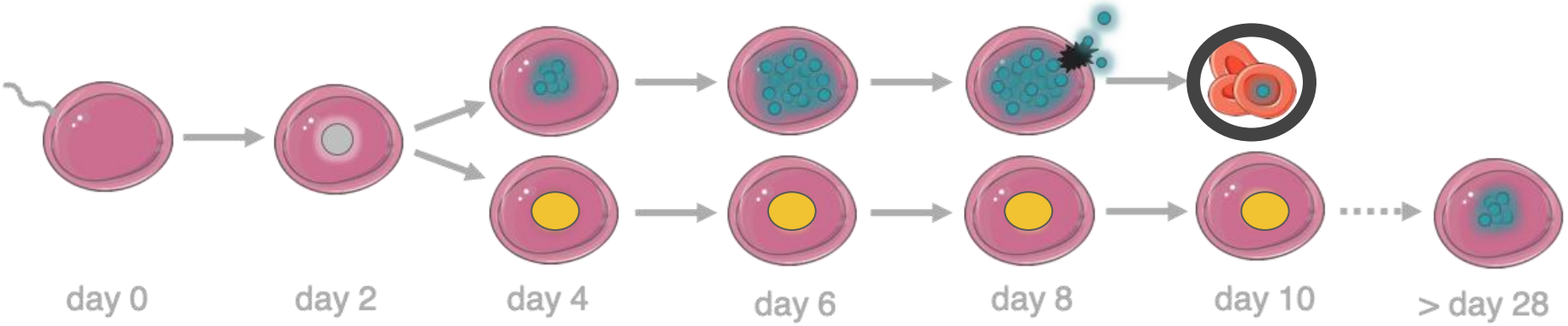
- Simplify your graphics to make a clear point
- **Aim to convey a message with as little text as possible**

INTRODUCTION

Malaria eradication remains a challenge to global health due to the complex life cycle of *Plasmodium* parasites. Malaria is initiated by *Plasmodium* sporozoite-infected mosquitoes during a blood meal. Upon inoculation, sporozoites are carried by the circulation to the liver where they infect hepatocytes and mature into schizonts. Over time, this liver-stage form develops hundreds of merozoites which, upon hepatocyte lysis, enter the circulation, infect erythrocytes, and give rise to disease. Though human malaria is caused by five different species of *Plasmodium* parasites, *Plasmodium vivax (P. vivax)* is the most challenging to eradicate. Not only do *P. vivax* sporozoites give rise to merozoite-forming schizonts, they also produce latent liver forms, or hypnozoites, which hibernate indefinitely in the liver before suddenly reactivating and initiating disease relapse.

- Simplify your graphics to make a clear point
- **Aim to convey a message with as little text as possible**

Upon **hepatocyte** infection, a proportion of *P. vivax* parasites **hibernate**, before ultimately **activating** and initiating **blood-stage** malaria



- Simplify your graphics to make a clear point
- Aim to convey a message with as little text as possible
- **When you must have text, use bullet-style over paragraphs**

Transcription of the 5S RNA genes in the egg extract is TFIIIA-dependent. This is surprising, because the concentration of TFIIIA is the same as in the oocyte nuclear extract. The other transcription factors and RNA polymerase III are presumed to be in excess over available TFIIIA, because tRNA genes are transcribed in the egg extract. The addition of egg extract to the oocyte nuclear extract has two effects on transcription efficiency. First, there is a general inhibition of transcription that can be alleviated in part by supplementation with high concentrations of RNA polymerase III. Second, egg extract destabilizes transcription complexes formed with oocyte but not somatic 5S RNA genes.

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- **When you must have text, use bullet-style over paragraphs**

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Egg Extract Addition to Oocyte Nuclear Extract

- 5S RNA transcription is *TFIIIA-dependent*
- tRNA genes are transcribed
  - Indicates other transcription factors are in *excess*
- *Two effects* on transcription efficiency:
  1. Transcription inhibition
  2. Destabilized transcription complexes formed with oocyte genes *but not* somatic 5S RNA

Take home message

Maximize your signal-to-noise ratio
by limiting clutter, color, and content.

Optogenetic Systematic Stimulation of the Autonomic Nervous System to the Heart *In Vitro*

northeastern.edu/in[redacted]northeastern.edu/abrel

Background

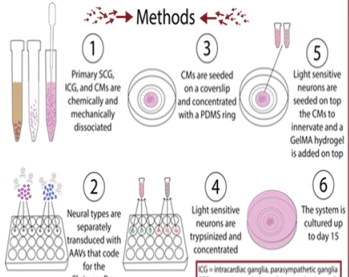
The autonomic nervous system (ANS) controls involuntary bodily functions such as eye dilation, respiration, and heartbeat. The Sympathetic and the Parasympathetic pathways counter balance to meet demand in response to external stimuli.

An increase in sympathetic and decrease in parasympathetic activity can lead to physical changes of the heart myocardium leading to heart failure. *The underlying mechanisms of ANS imbalance and cardiac remodeling remain poorly understood. [1,2]*

Studying the mechanisms will give a better understanding of upstream nerve modulation to employ for stimulation treatment. We can stimulate these neuron pathways using optogenetics, a tool that allows for systematic and specific stimulation with light. [3]

Hypothesis: Mechanisms of the autonomic imbalance can be studied in *in vitro* models with systematic and targeted stimulation.

Methods



ICG = intracardiac ganglia, parasympathetic ganglia
SCG = superior cervical ganglia, sympathetic ganglia
CMs = cardiomyocytes, heart muscle cells
PDMS = polydimethylsiloxane
araC = cytosine arabinoside, anti-mitotic
AAV = adeno-associated virus

Results

Timeline of Observation: Day

0 Dissociate, seed, transduce SCG and ICG; 1 Dissociate, seed CMs add araC to ICG, SCG show outgrowths; 2 Dissociate, seed CMs, add araC to ICG; 3 Re-plate neurons. CMs beating spontaneously; 6 Visible outgrowth of SCG; 13 Aggregation of CMs; 15 Proliferation of Glia

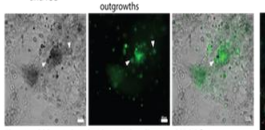


Figure 1. SCG transduced with AAV8/Syn-Chronos-GFP [3] fluoresce green. White arrows indicate SCG, we note autofluorescence of dead cells. Scale bars = 50μm

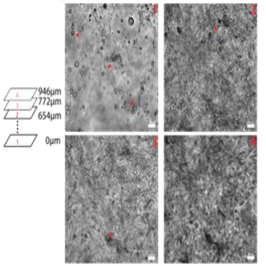


Figure 2. Cells are seeded in a 3D environment in the gel and on the surface, and innervate the CMs. Scale bars = 50μm

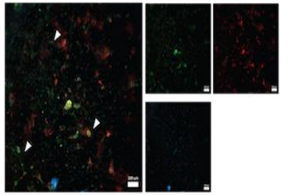


Figure 3. Triculture of CMs, SCG, and ICG on day 10. Neurons (green) are able to extend their neurites towards on another. NeuN, sarcomeric α actin, DAPI Scale bars =100μm

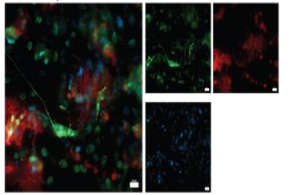


Figure 4. Triculture on day 10. Neurons (green) innervate CMs (red). NeuN, sarcomeric α actin, DAPI Scale bars =20μm

Conclusions

- SCG and ICG can be transduced seperately
- SCG and ICG can be seeded directly onto CMs
- SCG and ICG can be seeded in 3D in the gel
- Able to see SCG innervate CMs

Current Challenges

- Glial cell growth overrunns the system
- Not clear where ICG are in brightfield
- CMs are not able to be stimulated by neurons

Future Directions

-In vitro model will be electrophysically assessed on a micro-electrode array

-CM phenotype will be studied by systematically stimulating the neurons with optogenetics

-Stimulation frequency and ratio of stimulation between the two neuron types will be tested

Acknowledgments
This project is supported by Northeastern University and NSF grant #1638325

References
[1]Parasympathetic nervous system and heart failure, Colucci et al., 2008.
[2]Sympathetic Activation and Loss of Reflex Sympathetic Control, Blanchi et al., 1995.
[3]Independent optical excitation of distinct neural populations, Boyden et al., 2014.

Effect of Microbial Legacy on Nitrogen Cycle and Restoration Success

[redacted]

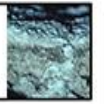
University of Texas at Austin

Introduction

- Nitrogen(N) cycle plays a key role in ecosystem and every transformation of the N cycle driven by microbes.
- Restoration attempts on converting abandon rangelands in south Florida back to the native scrub ecosystems allow a unique opportunity to study persistent effects of previous vegetation left on the microbial community and ecological processes.
- Biological crust is essential for native ecosystem.

What is Crust?

- A surface layer of "Living Soil", consisting primarily of cyanobacteria, algae, fungi and their byproducts.
- Supports many biological functions like N fixation and water infiltration control.



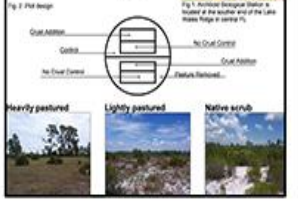
Questions

- How does native crust affect microbial legacy?
- Which impacts the N-cycle more? Microbial abundance or composition?

Field Site: Native scrub lands and abandoned pastures at Archbold Biological Station.

- Sites are abandoned pastures and native scrub lands subjected to pasture removal treatments and crust addition treatment(Fig.2).

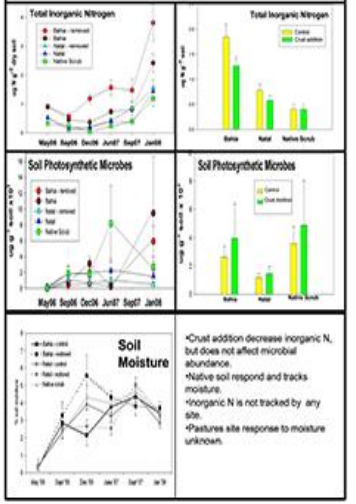
Fig 1. Archbold Biological Station is located at the souther end of the Lake Wales Ridge in central FL



Method

- Biogeohemical
  - KCl extraction
  - Photosynthetic activity determine by fluorometry.
- Molecular approach
  - PCR
  - RFLP
  - Direct sequence analysis

Soil Nitrogen, Photosynthetic Microbes Abundance, and Moisture changes over time and treatment

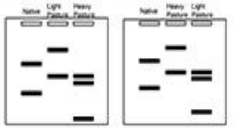


- Crust addition decrease inorganic N, but does not affect microbial abundance.
- Native soil respond and tracks moisture.
- Inorganic N is not tracked by any site.
- Pastures site response to moisture unknown.

Possible mechanisms

- Pasture vegetation has caused a shift in soil microbe community and chemistry.
- Frequent disturbance favor more resilient microbes and changes community composition.

Sample restriction fingerprint



- DNA based fingerprints allow characterization of community difference.
- Couple with clone library will allow identification of species.

Conclusion

- Inorganic nitrogen increases over time, and pasture sites both have higher inorganic nitrogen than the native.
- Crust treatment helps increase nitrogen fixation, but does not increase microbial abundance significantly.
- The microbial abundance does not track N, but does track moisture.
- Composition may be the more important factor in N-cycling.

Acknowledgment

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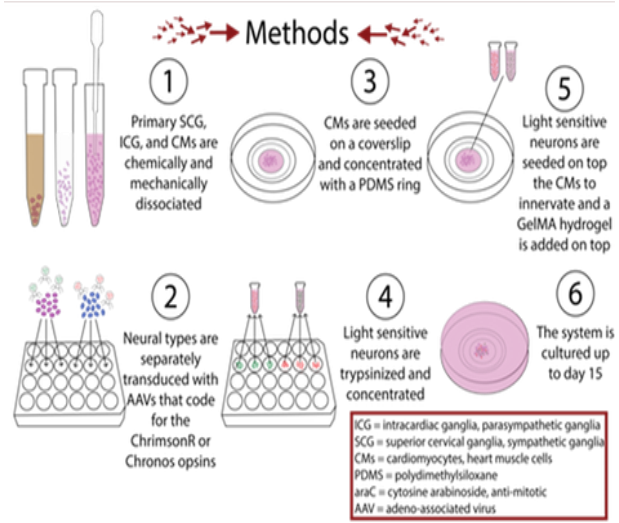
- Special thanks to all members of the Hawkes lab, Juenger lab,and Manges Lab.



A

Method

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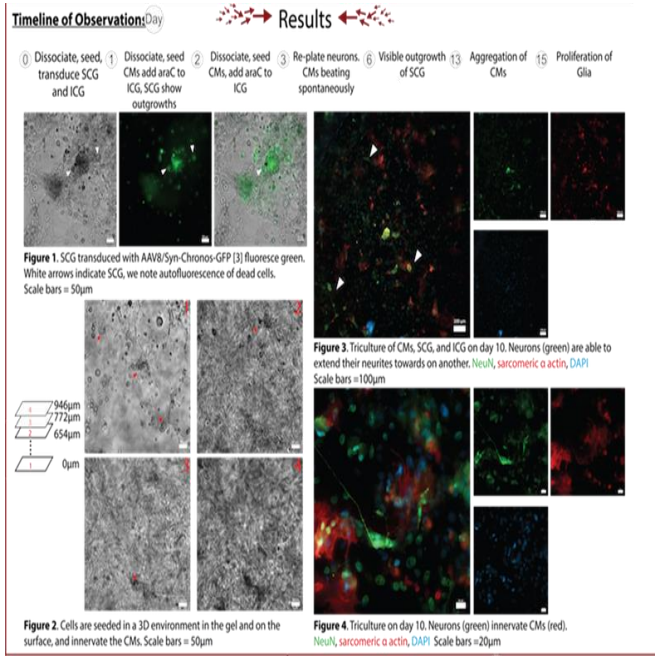
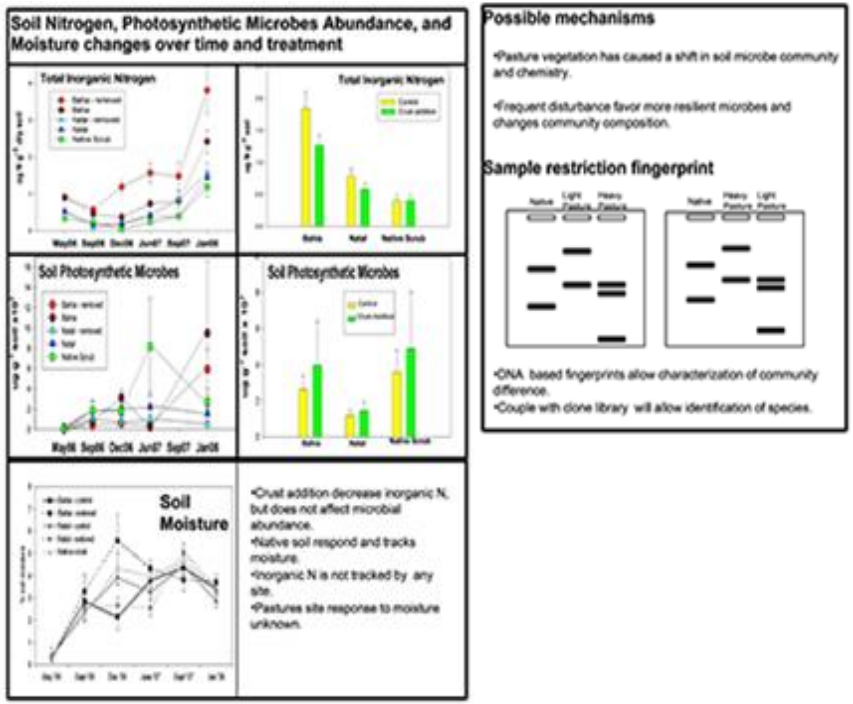
B


Timeline of Observation: Day
Results
0 Dissociate, seed, transduce SCG and ICG
1 Dissociate, seed CMs add araC to ICG, SCG show outgrowths
2 Dissociate, seed CMs, add araC to ICG
3 Re-plate neurons. CMs beating spontaneously
6 Visible outgrowth of SCG
13 Aggregation of CMs
15 Proliferation of Glia
Figure 1. SCG transduced with AAV8/Syn-Chronos-GFP [3] fluoresce green. White arrows indicate SCG, we note autofluorescence of dead cells. Scale bars = 50μm
946μm
772μm
654μm
0μm
Figure 2. Cells are seeded in a 3D environment in the gel and on the surface, and innervate the CMs. Scale bars = 50μm
Figure 3. Triculture of CMs, SCG, and ICG on day 10. Neurons (green) are able to extend their neurites towards on another. NeuN, sarcomeric α actin, DAPI Scale bars =100μm
Figure 4. Triculture on day 10. Neurons (green) innervate CMs (red). NeuN, sarcomeric α actin, DAPI Scale bars =20μm

A


Soil Nitrogen, Photosynthetic Microbes Abundance, and Moisture changes over time and treatment
Total Inorganic Nitrogen
Total Inorganic Nitrogen
Soil Photosynthetic Microbes
Soil Photosynthetic Microbes
Soil Moisture
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•Native soil respond and tracks moisture.
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B

Now you are ready to design AND present an excellent poster.

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A poster is a conversation starter - remember C.H.A.T.!

2. Effective Planning for Audience

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