How to write a proposal

At least one…

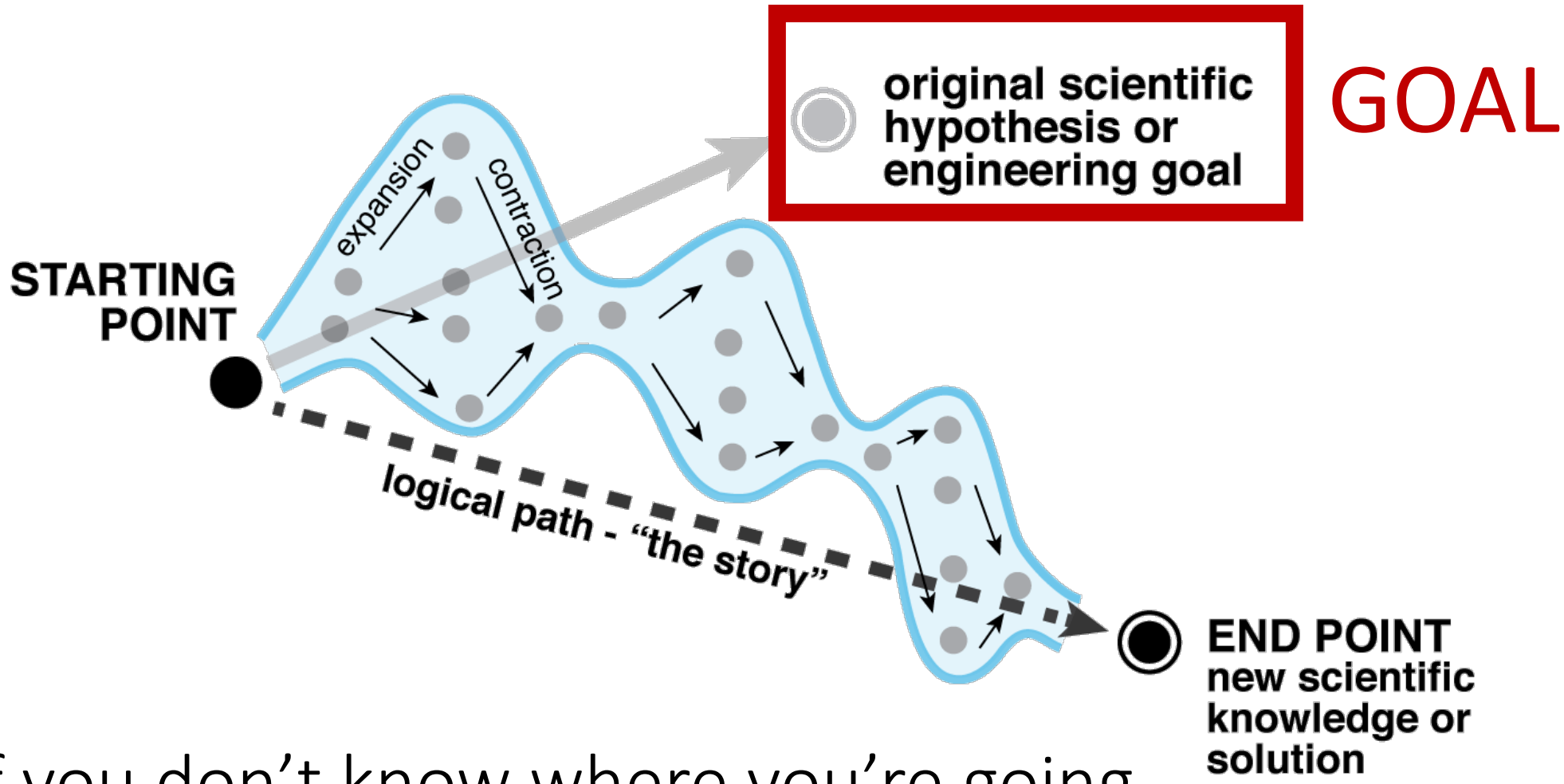
Katie Galloway

STAND BACK

I'M GOING TO TRY

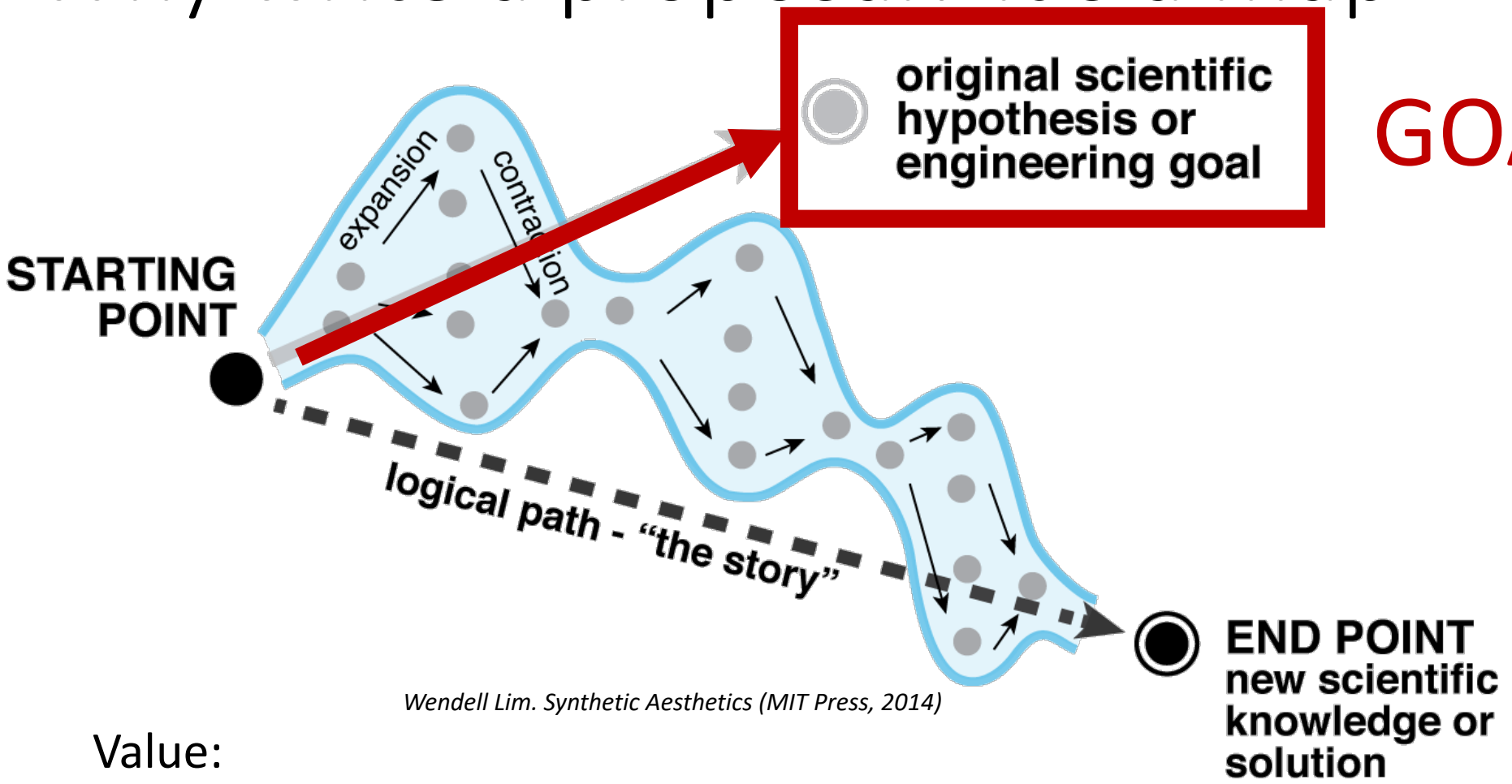
SCIENCE

The map needs a well-defined goal!



If you don't know where you're going, how will you know if you got there?

Why write a proposal? It's a map

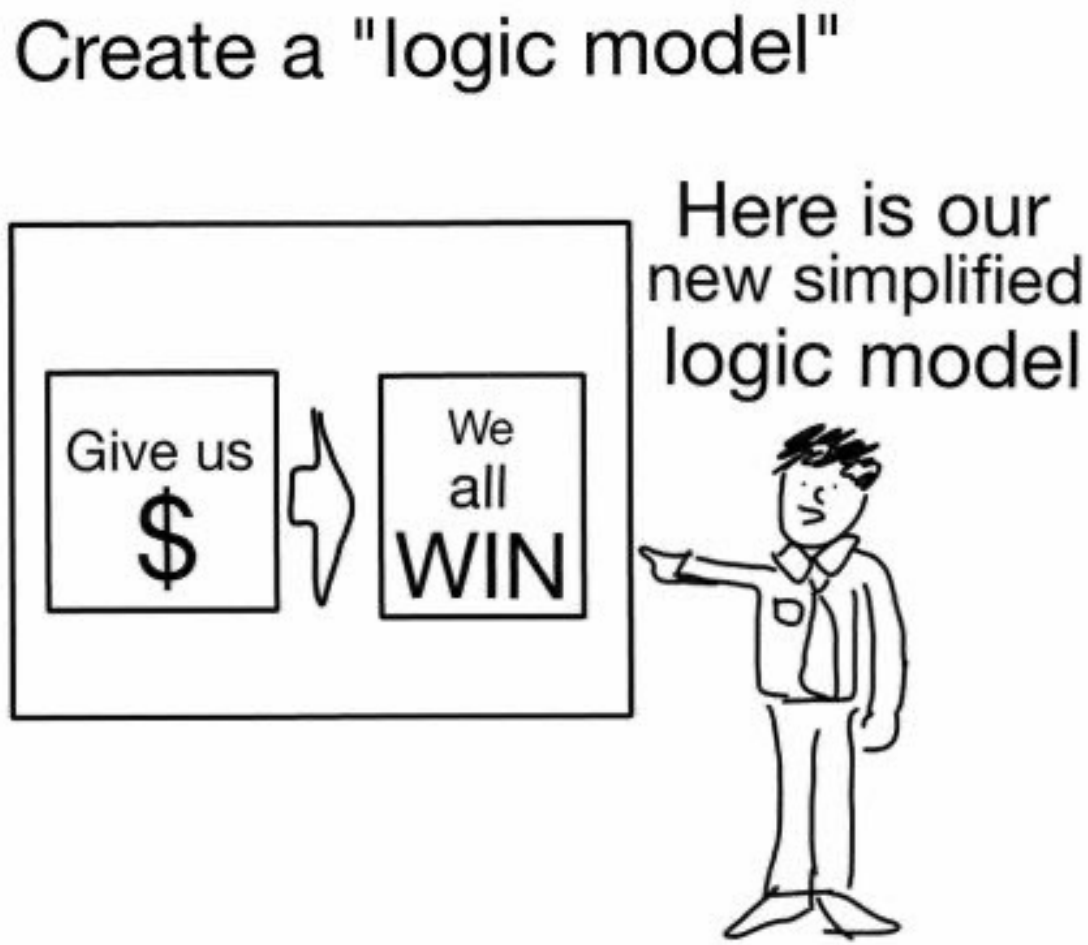


Wendell Lim. Synthetic Aesthetics (MIT Press, 2014)

Value:

1. You have outlined the journey and where you expect to reach
2. You can share that goal and plans with others!
3. They might even give you money for your map
4. You can reflect on where deviations occur

A proposal can be simple but must answer some key questions



Step 1: A good proposal needs to answer some questions and the most important is…why?

Two questions are buried in this why.

1. Why is what you are doing exciting?

2. Why is your approach novel and/or why will it succeed where others have not?

You must FIRST convince yourself if you want to convince others!

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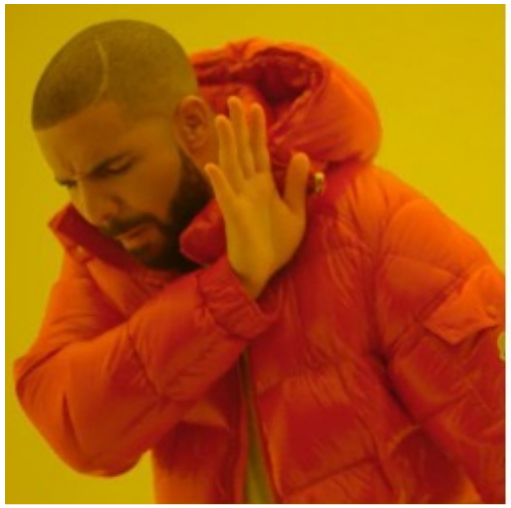
To answer these “why” question we need context!

Blocking and promoting yeast mating behaviors

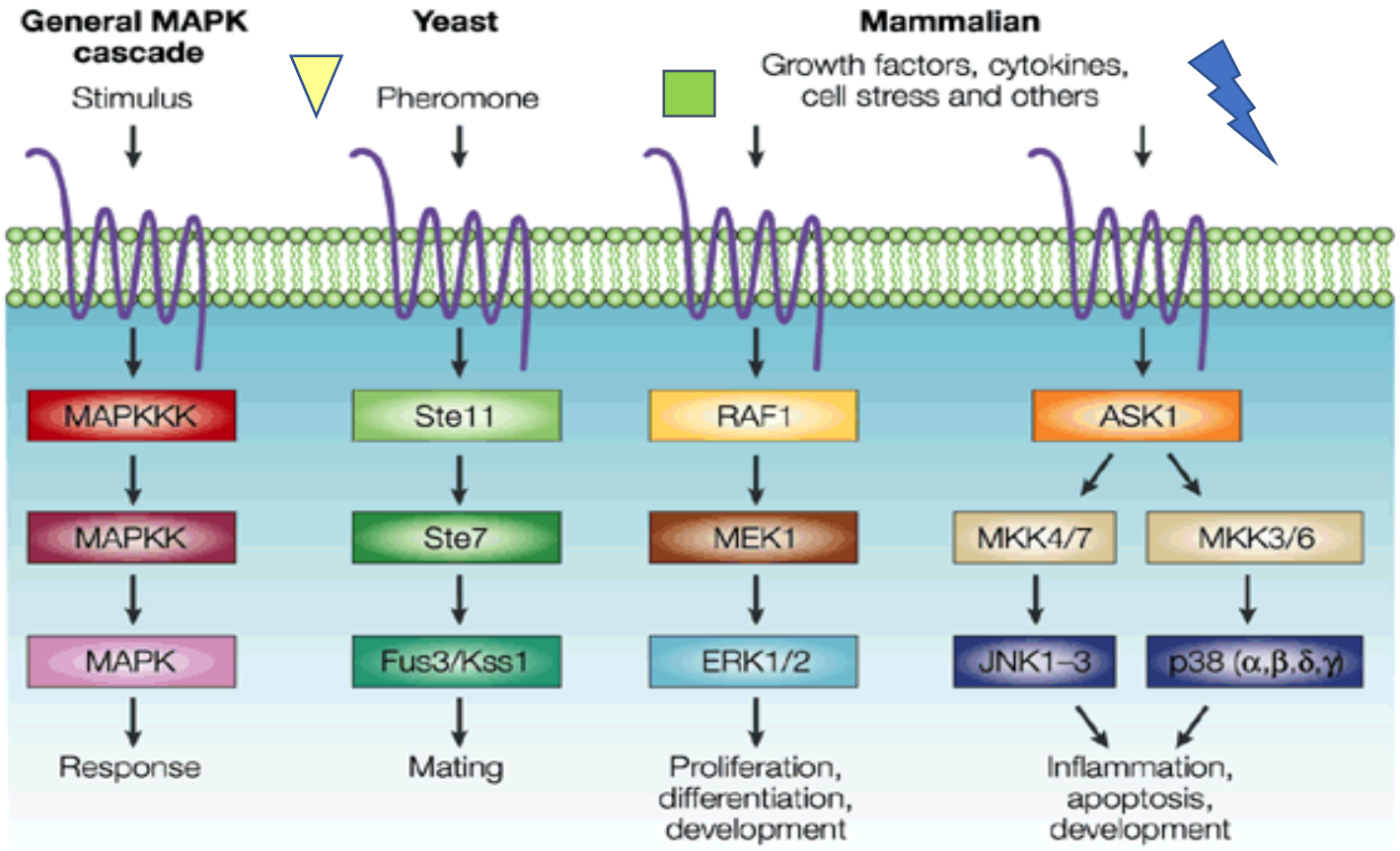
Yes, really, this was my PhD thesis.



meddling in the sex lives of microoganisms

“I should not talk so much about myself if there were anybody else whom I knew as well.” –

The development of RNA-based control systems to regulate signaling and dictate cell fate in a model MAPK pathway



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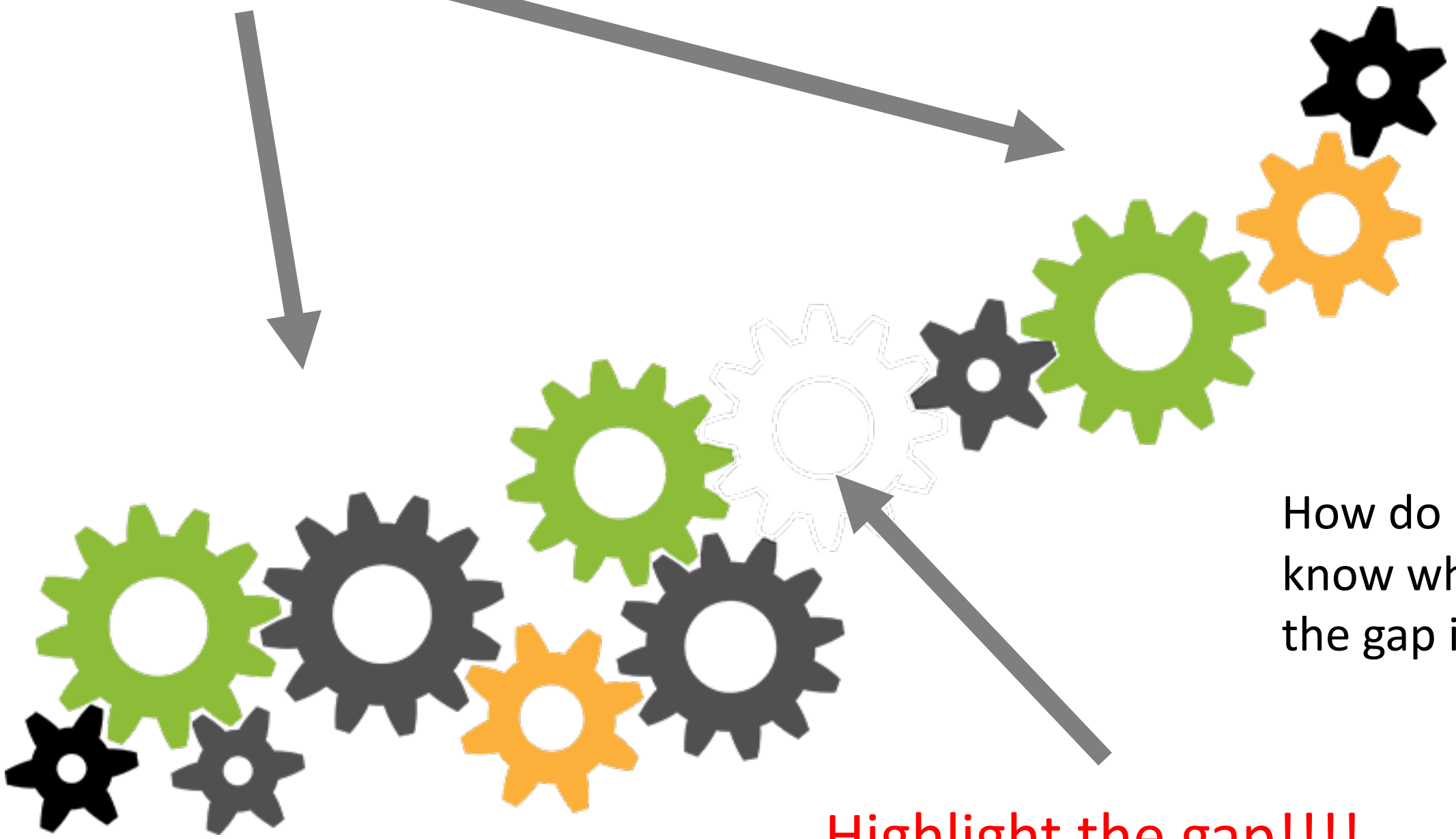
Context…



How do I know what the gap is?

Highlight the gap!!!!

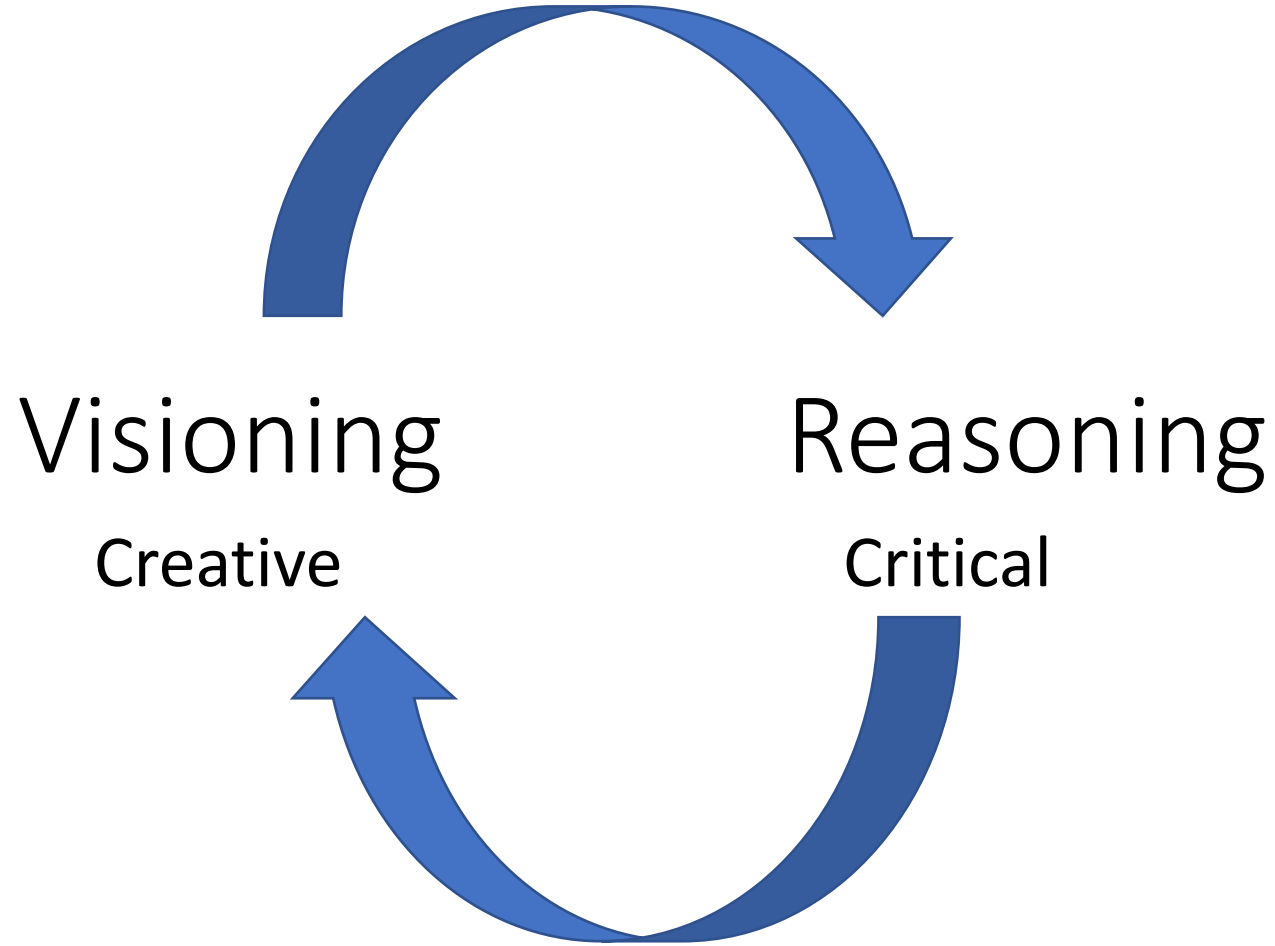
Context…

Your research fits right here!

First rule of writing your proposal:
You cannot write a proposal…

…until you draw it!

Iterative proposal “writing” process



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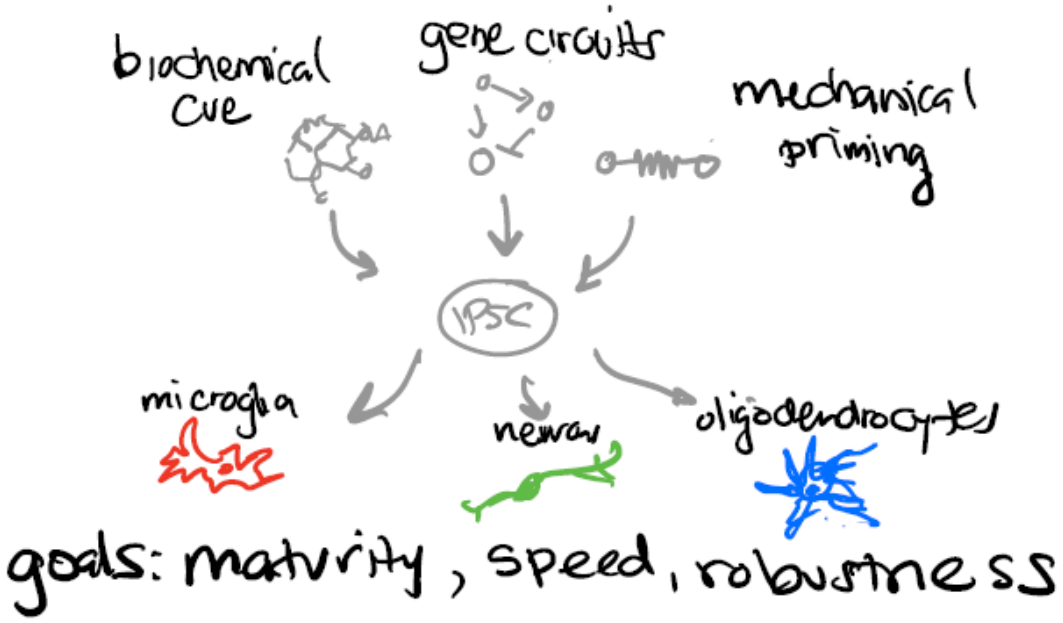

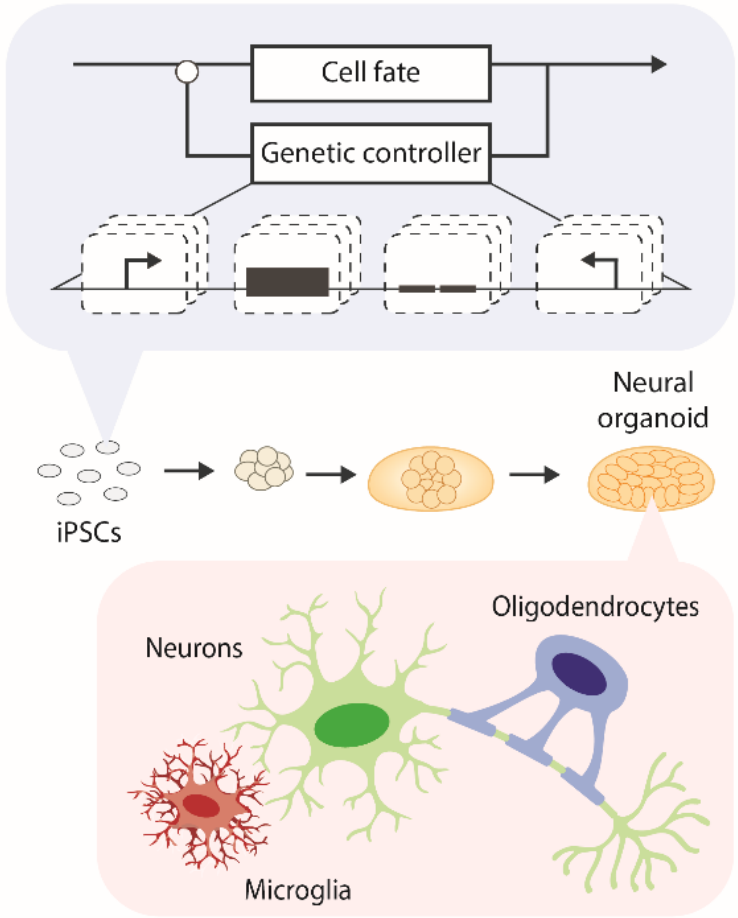

Eventually polish the ideas!

NSF Reproducible Cells and Organoids via Directed- Differentiation Encoding (RECODE)

Polished figures courtesy of Kasey Love

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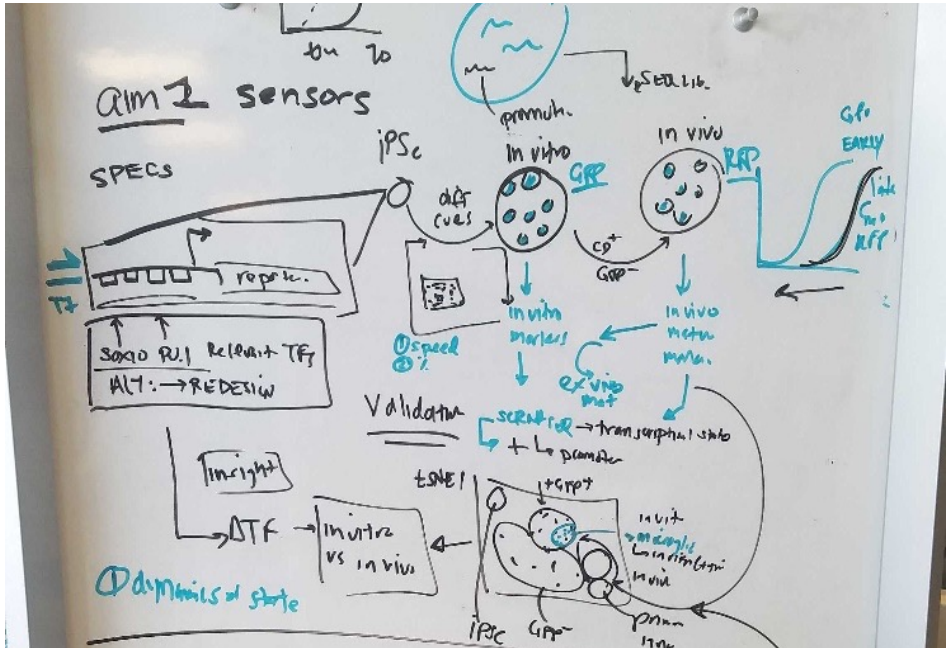

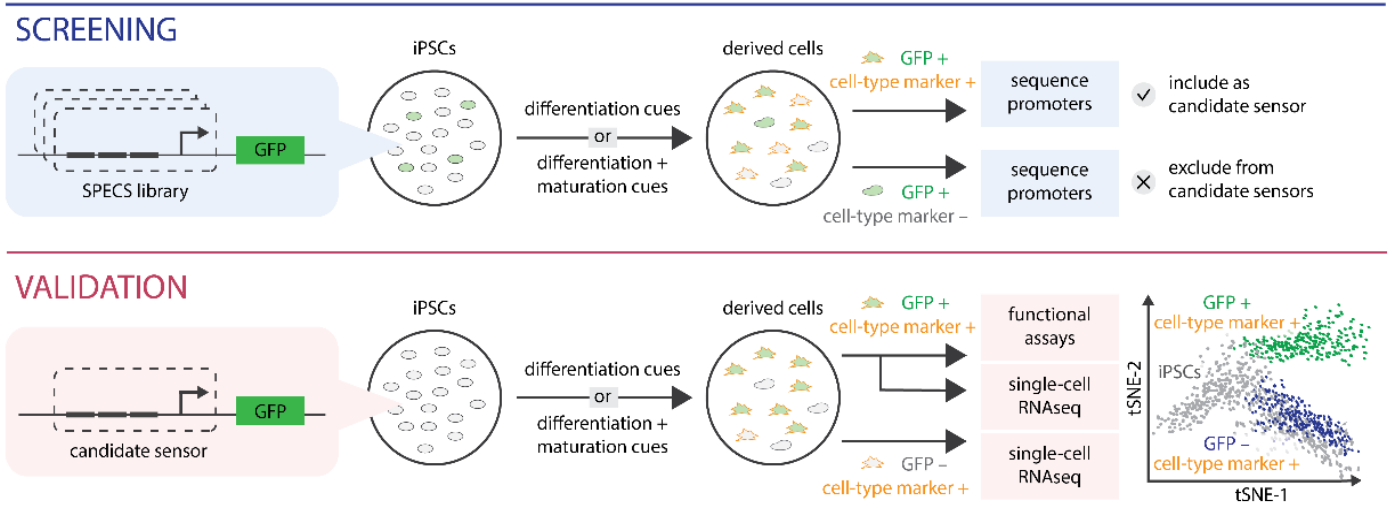

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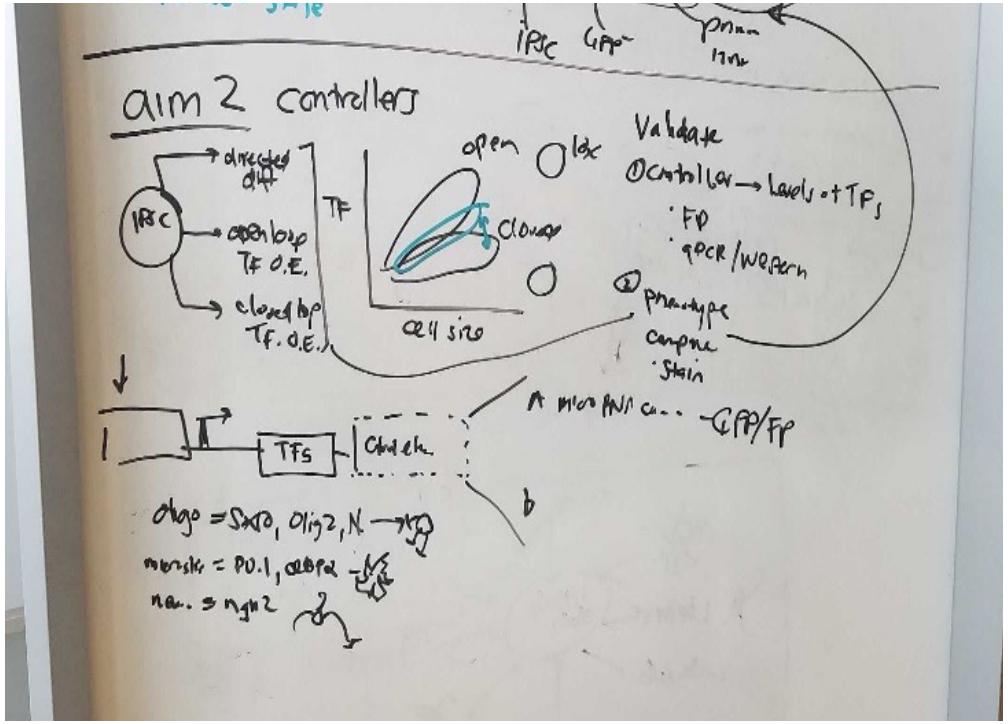

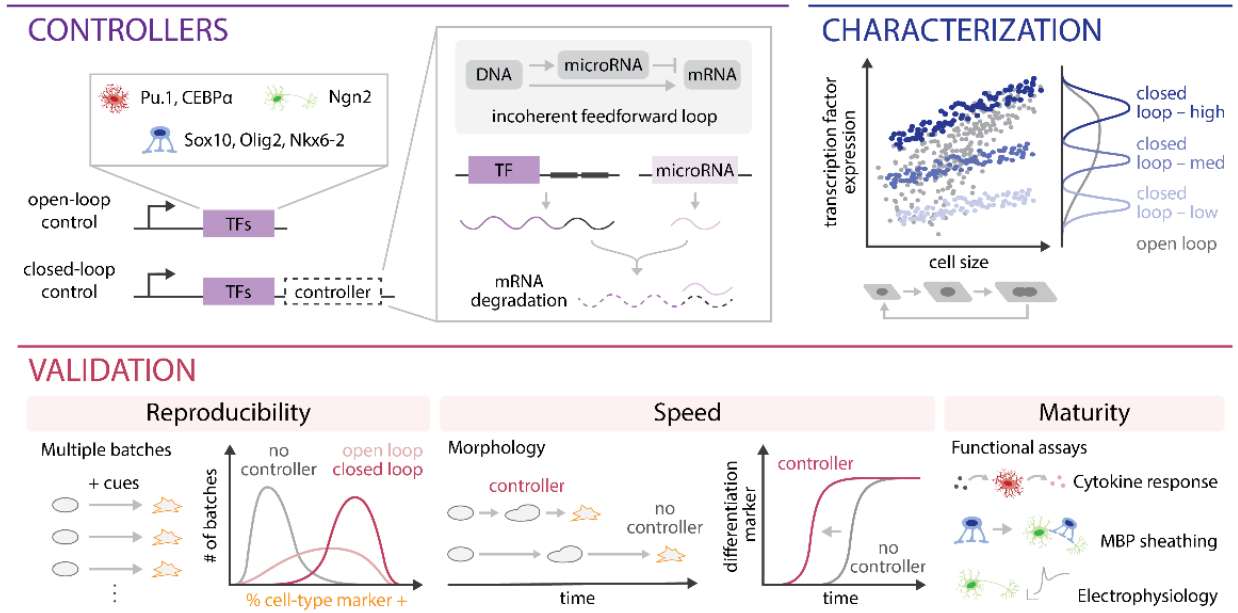

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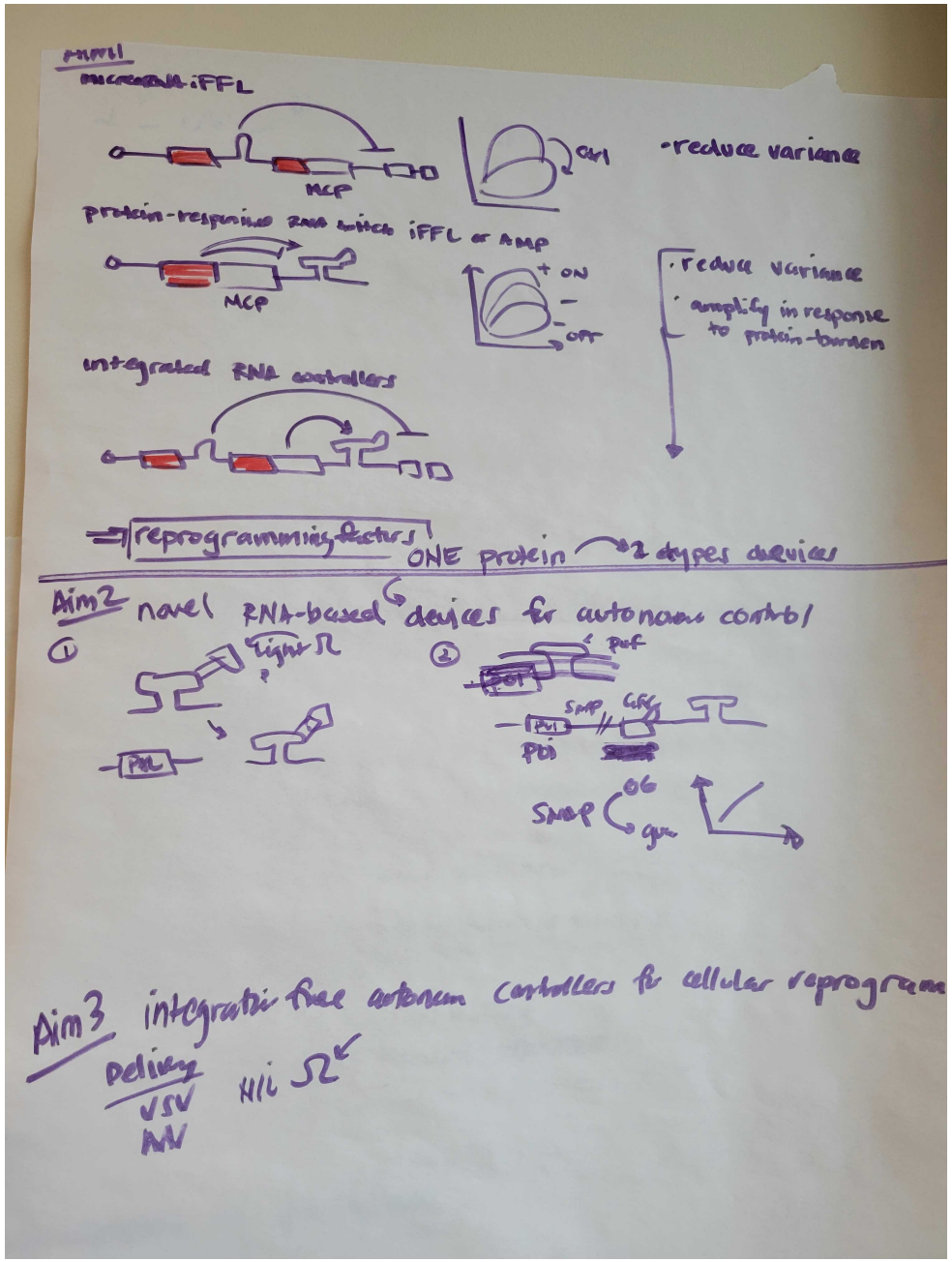

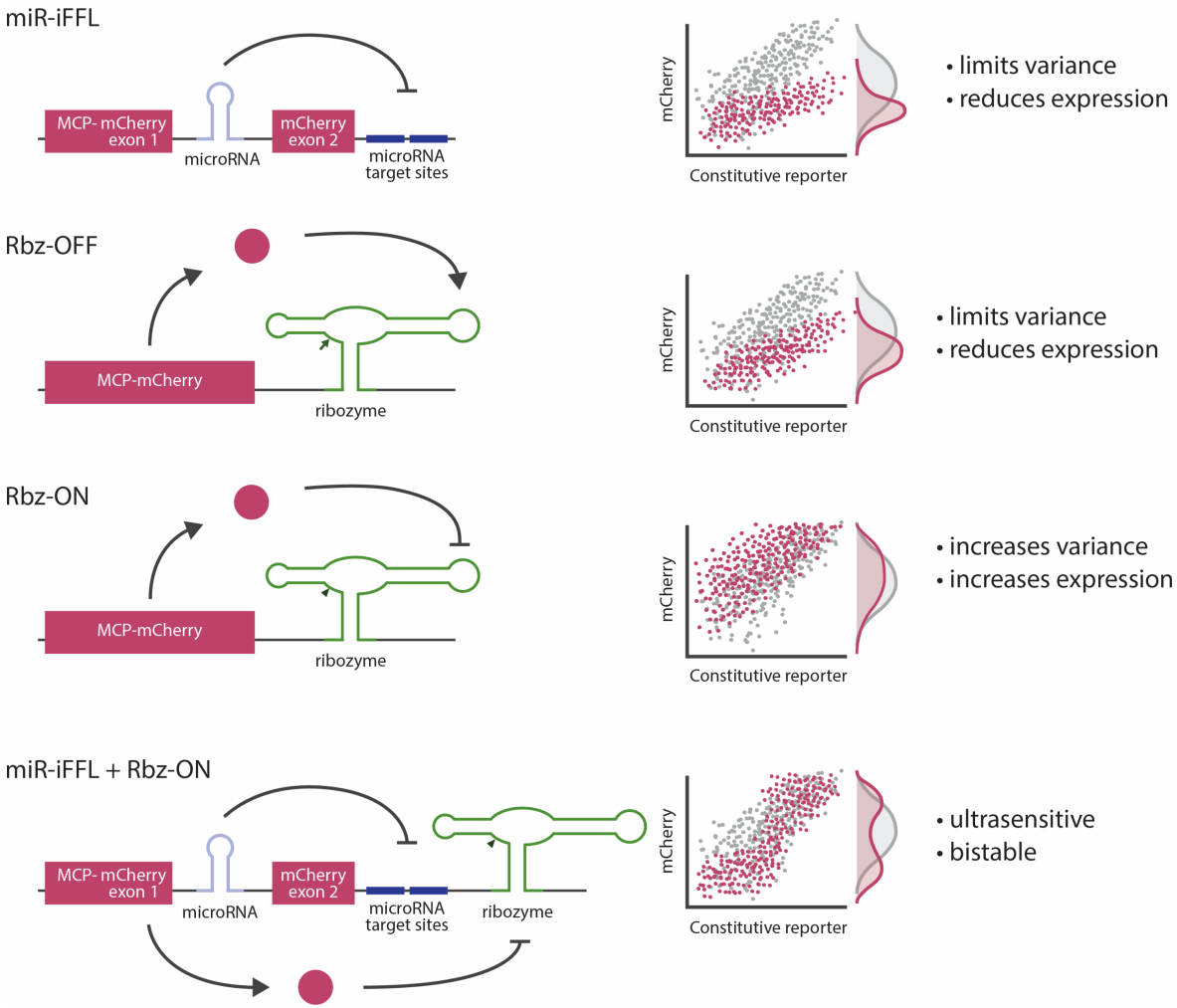

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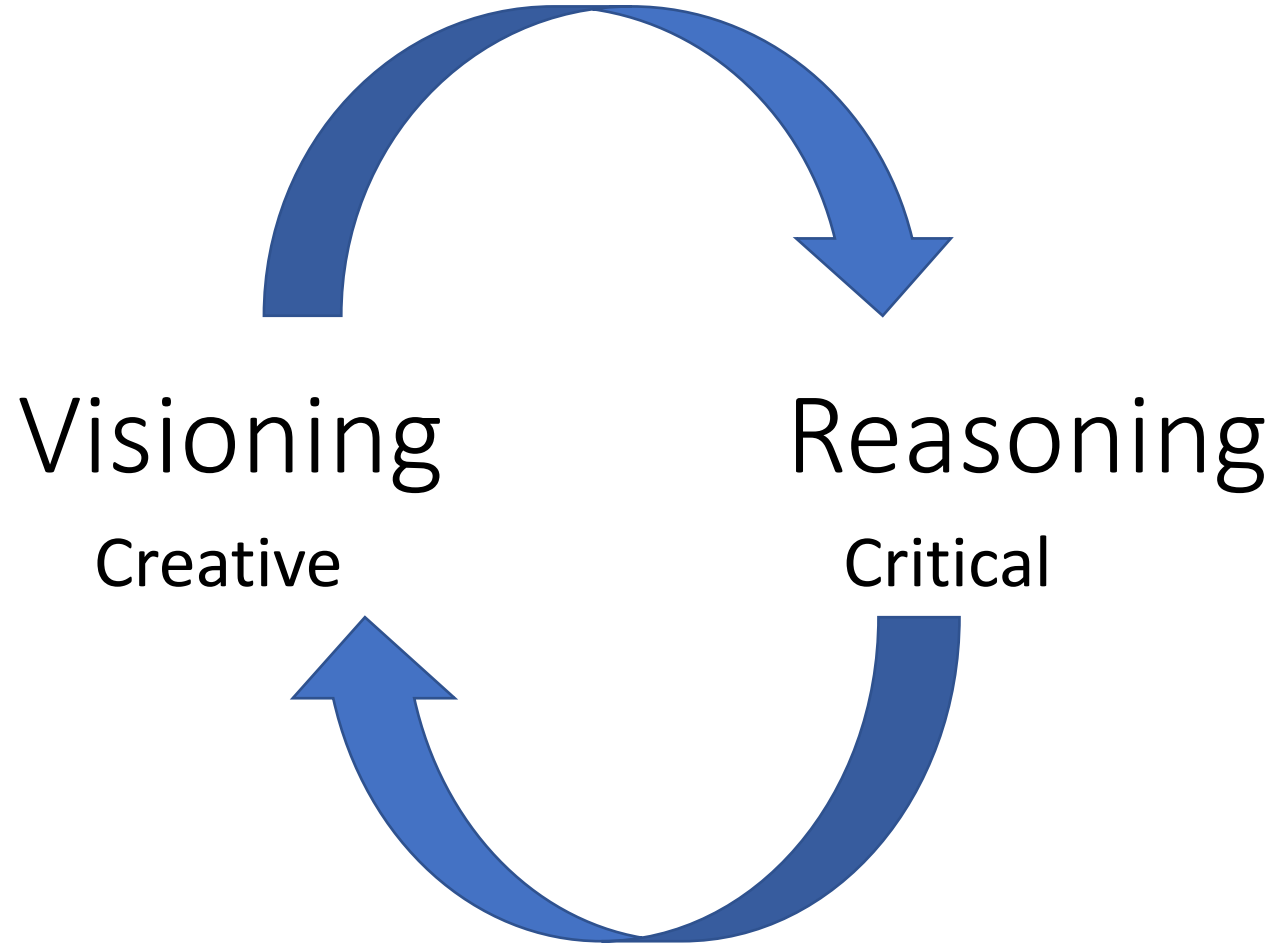
Iterative proposal “writing” process



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a. innovation: what new tech/approach/model are you bringing in this proposal? Why do you think it will work?

Step 2: Now that you have outlined why, we need to fill in the details of how and what which we did introduce a bit through why

1. What system will you choose? What makes it the best choice?
2. What will you measure? How will you measure it? Is there more than one way to measure, quantify?
3. What controls do you need?
4. What alternative systems or approaches might be used if your first approach fails?
5. What do you expect to find? What is your hypothesis?

Step 3: Now that you have outlined why, how and what, you need to figure out how to fill that info into the proposal format

1. **Get the proposal format!** 2 page? 1 in margins? 0.5 in margins 12 pt font? Times or arial?
2. **Sections?** If not specified, create some! No one wants to read an unstructured page of text, this isn't Dickens!
3. **Outline first!!!** Iterate with feedback!

Form should support function!

Here's one suggested outline:

1. Lay summary/abstract
2. Intro/background/prelim data
3. Objectives/aims
4. Summary/Future outlook
5. References

Also use bold, spacing, underline to help draw the reader to important parts of the text.

OUTLINE FIRST!!!!

No amount of data or good writing can save a terrible framing

Tear it down, start over

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4. **Get examples of successful proposals!**

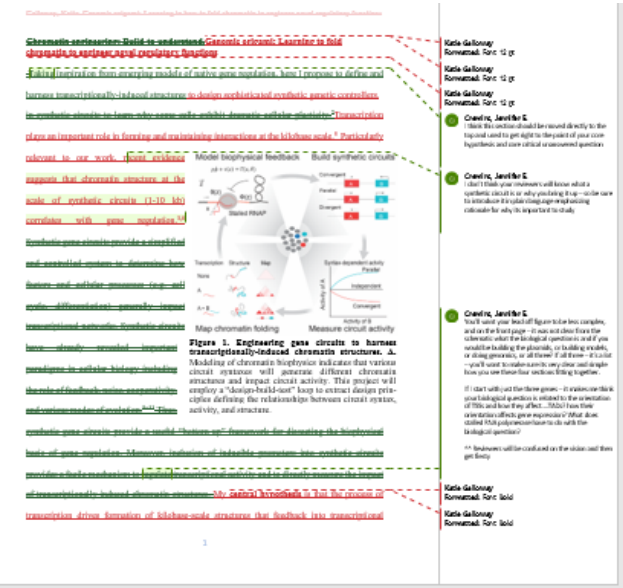
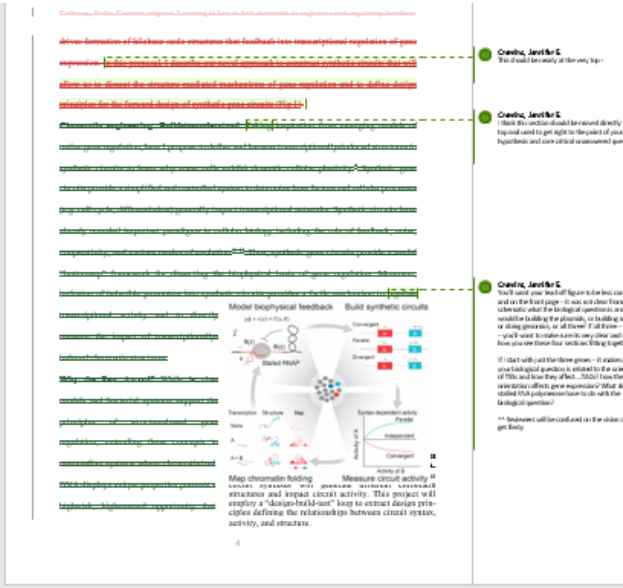
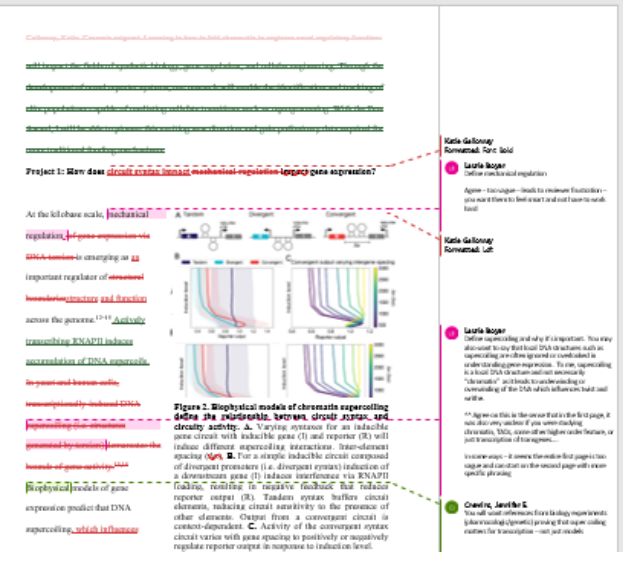
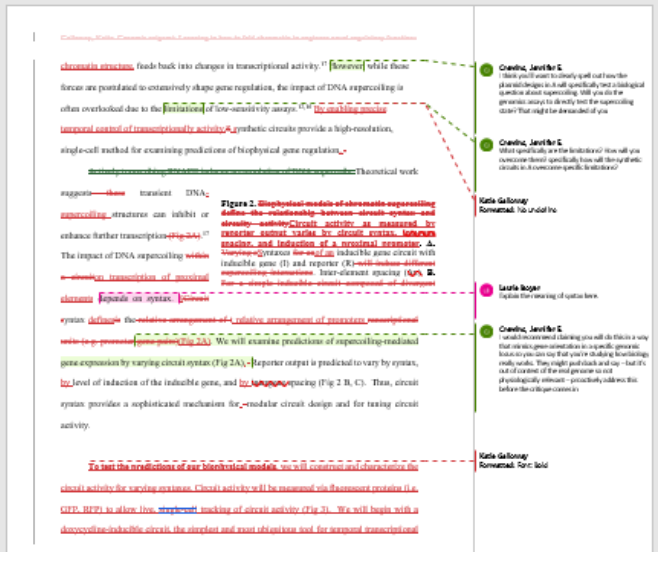
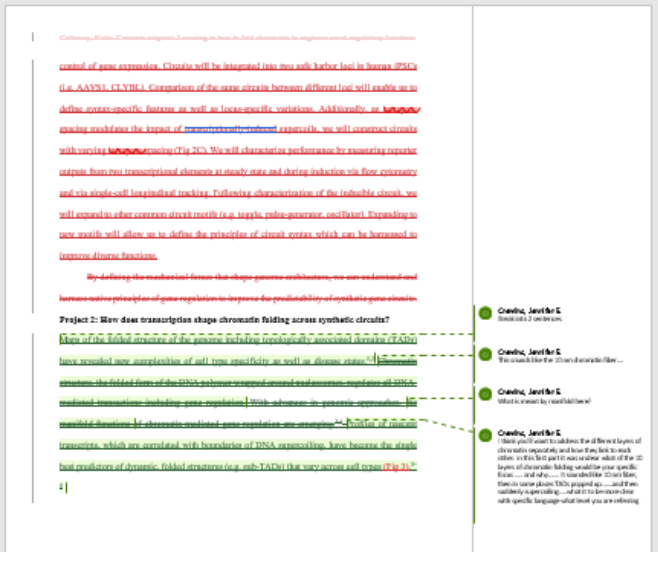
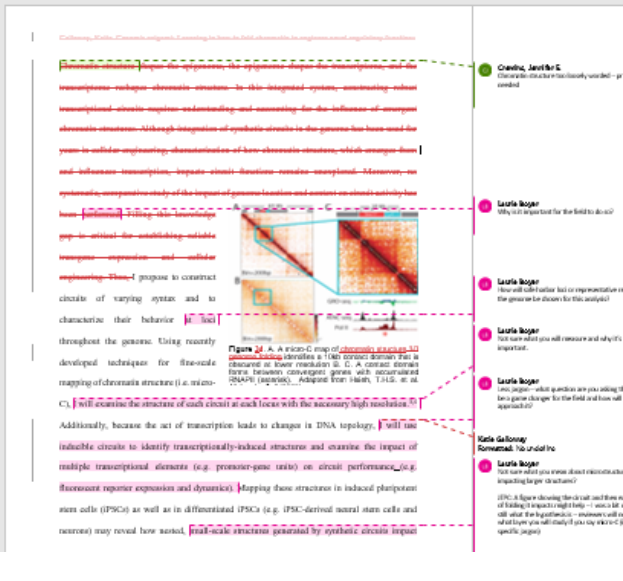
Other tips and tricks…

Feedback!

Get feedback from peers from mentors and iterate!

References for NSF GRFP

MIT-Broad Comm Kit:
Proposal: https://mitcommlab.mit.edu/broad/commkit/nsf-research-proposal/
Personal statement: https://mitcommlab.mit.edu/broad/commkit/nsf-personal-statement/
Ritu Raman video tutorial on NSF GRFP: https://youtu.be/sgfmf1Wzjyc
Alex Lang detailed web site on NSF GRFP: https://www.alexhunterlang.com/nsf-fellowship
Dan Laurie example: http://danlurie.org/2018/07/example-of-a-successful-nsf-grfp-application/

Other tips and tricks…

Feedback!