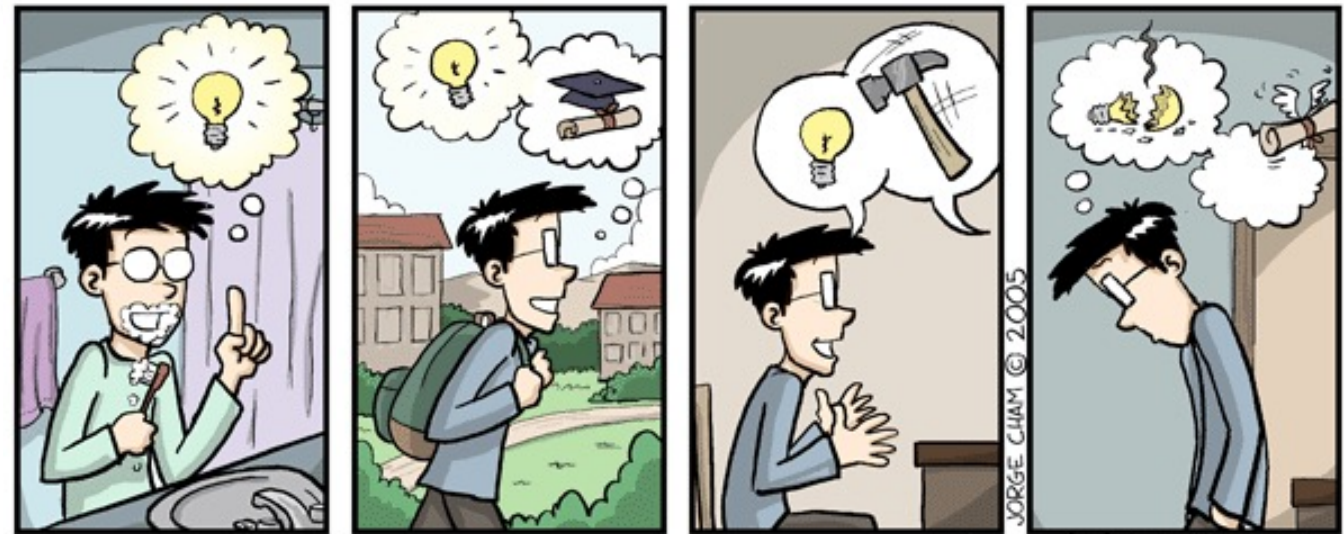
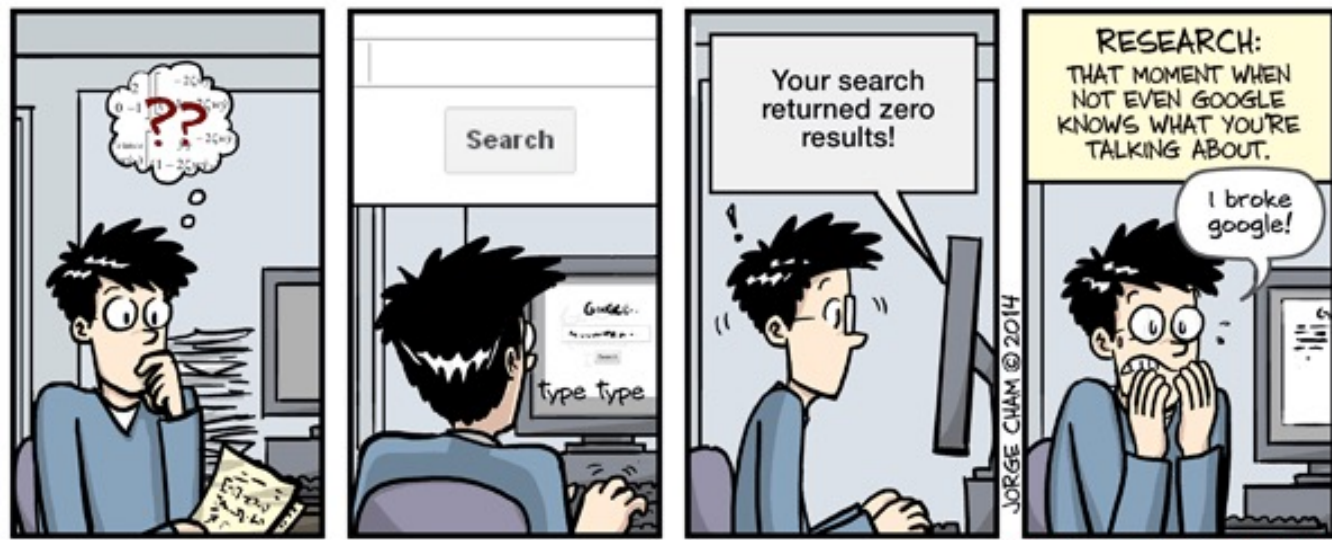


M3D1: Brainstorm ideas for Research Proposal presentation



The final hurdle: the Research Proposal

- Completed in “co-investigator” groups (i.e. lab partners)
- **12 minute talk** (every word counts!)
- Propose a novel project to advance the field of biological engineering
 - Tangentially related to 20.109 via techniques or concepts
 - Can have computational component, but that cannot be the focus
 - No projects that are based on your UROP or other class project
- Project will include:
 - Research question/goal
 - Specific aims to address research goal (including experiments)
 - Alternative approaches to techniques proposed in specific aims
 - Ethical implications of your work

How do you know if you have a novel project?

- Look at the most **recent discoveries** in the field you decide on as a group
 - What is the most recent advancement?
 - What do other scientists say is the biggest unanswered question?
- Start with the most **recent literature** on your topic
 - Look at the Discussion/Future Works section to identify knowledge gaps the authors point out
 - Review papers on a problem often point out knowledge gaps
- Take that gap and figure out how you can apply a new perspective to **solve the problem**
 - Not enough to just follow up on the paper using similar methods

Different approaches to a research proposal

- **Problem-driven**

- I am interested in a problem in biological engineering and want to try and solve it (or make a major contribution to solving it)

- **Technology-driven**

- I have a cool new biological engineering technology and I want to figure out how to apply it to new problems in the field

- Either way you need to produce something tangible

- We are engineers: measure, model, make, manipulate

- Build a device
- Create a new model system
- Genetically engineer a new biological technology
- Produce a database (this one is tricky-- it requires a new application of technology as well)

For today

- Discuss research from Chyna's perspective with her ongoing PhD project
- Talk with your lab partner/co-investigator to talk about ideas and common interests
- Determine the research question/goal you think you would like to pursue for Mod 3 and what you might produce to meet that goal

For M3D2 (11/29)

- Answer the questions about your project on the wiki
- You will use these questions to formulate a 2-3 minute pitch for our next lab session
 - No visuals
 - Briefly explain the problem, how your proposal could contribute, 1-2 approaches you will take in your proposal