How to write a fundable research proposal

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Summer research timeline

- Nov/Dec: Start looking for potential Yale mentors
- Mid Jan 2023: finalize lab mentor
- Jan/Feb 2023: start working with your mentor on your grant proposal
- Feb 10: STARS Summer application due
- March 8: First Year Summer Fellowship application due
- Feb 23: Dean’s Fellowship application due
- March 2: Tetelman Fellowship application due

What we look for in a summer fellowship applicant

Applicant's potential to be a future scientist

- 2 strong letters of recommendation-a mentor letter plus a second STEM recommender (non-STEM letter OK if that letter will be strong)
- past STEM activities
- "distance travelled"
- CV
- (grades)

Quality of the research proposal

- shows clear understanding of the science conducted
- shows collaboration between applicant and mentor

Quality of the mentoring environment

- What is the availability of PI and immediate mentor during the training period?
- mentor's letter must state how the applicant will be trained

You need to engage your mentor to craft your summer research proposal

You are not expected to come up with a research proposal by yourself!

Your research mentor should brainstorm projects with you

- Give you research papers to read
- Give you an idea of the types of projects offered in the lab
- You need to understand the science that you will be working on

You and your mentor will come up with the specific aims in your research proposal together

- Your mentor will help you craft the questions you need to address in your proposal
- You must write the proposal entirely by yourself, incorporating feedback from the mentor. Start early!
- You must NEVER copy your mentor's past research proposal and pass it off as yours

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12 pt Times new Roman, 1.5 spacing, normal margins, 8 page limit (not including references)

Abstract: summarizes your proposal in 500 words. Identify the problem you are investigating, why this problem is significant, the hypothesis you are testing.

Summarize key experiments that address the hypothesis. The concluding sentence should be ‘Completion of this proposal will lead to…”

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Background and significance: tell us why the problem you've chosen is significant. Lead the reader from the general to the specific. Definitely include a figure to illustrate your points to help your reader wade through the information. Remember, your reviewers might not have expertise in your exact area of research so make their job easier. Define all jargon and abbreviations.
3 pages max.

Hypothesis (1 sentence): formulate a hypothesis that you are testing in your grant proposal. For example:

"I hypothesize that the Delta D457K mutation promotes increased affinity with the ACE2 receptor to enhance viral entry into cells"

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Two specific Aims: these are the research questions to test your hypothesis that you wish to address in your proposal. For example:

Specific Aim 1: To determine mechanistically how the S protein D457K mutation promotes increased affinity with ACE2 in lung epithelial cells.

Rationale: briefly describe why you are interested in this question.

Proposed experiments: briefly describe the experiments you will perform that will support or refute your hypothesis.

Anticipated results: briefly describe what you expect to find.

Potential pitfalls and alternative strategies: what are some of the problems with your experimental approach? What strategies could you use to fix them?

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References

Use this format: Chang, S. Chromosomes going to POT1. *Nature Genetics* (2018); 14:342-247.