Writing Proposals and Getting Funded at a Primarily Undergraduate Institution

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with contributions from
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Who are we? What is our experience?

- Martin Wong – at Colgate, a small liberal arts undergraduate university since 2005
  - Involved in NSF proposals as a graduate student
  - Three NSF grants funded at Colgate (Two to EAR-Tectonics and one MRI grant to upgrade our SEM lab)
  - Frequent NSF reviewer

- Jennifer Anderson – at Winona State, public four-year university, since 2005
  - Never even saw a proposal until after PhD!!
  - Participated on two NASA review panels, NAGT/SERC and NASA proposal workshops, external reviewer for NASA programs
  - Collaborator, then Co-I on proposal with senior colleague
  - Submitted my NASA proposal four times before it was funded!

Proposal Experience?

- What has been your experience with proposals up to this point in your career?
  - Funded? Written? Reviewer? Read some? Nothing?

- What agencies are you most likely to apply to for research funding?

PUIs compared to Research Institutions...

- What are strengths or advantages to PUIs?

- What are challenges (perceived or real)?

Let’s Review Some Successful Proposals at PUIs...

- Read or scan your assigned proposal...
- Take notes on the handout.

- Then form a group to compare proposals...
  - What commonalities do you observe about great proposals?
  - Why might these proposals be well-suited for a PUI?

Critical Pieces of a Proposal

- A clearly articulated, doable project
  - State hypothesis or research questions clearly

- A well-formulated argument for why this is important, how this fits into previous work, and why you are the one to do it

- A definite plan for implementation
  - What will success look like?

- A track record
  - Preliminary data/previous publications/pilot projects
  - Partnerships with recognized experts
Proposal Review

- **What are the criteria?**
  - NSF
    - Criterion 1: Intellectual Merit
    - Criterion 2: Broader Impacts
    - Program Guidelines
    - Your institution

- **Who are the reviewers?**

Writing a Strong Proposal

- **Grant writing as a persuasive essay**
  - What do you want to do?
  - Why is it important?
  - How will you do it?
  - Why are you the best person to do this?
  - What do you need to succeed?

- **Clear, concise, compelling**

- **Follow the rules!!**

Strengths/Advantages of a PUI

- PUI is hard-money – not dependent on funding for a paycheck.
- Institutional expectations are variable, but generally less pressure to get funded compared to R1.
- External grants are wonderful for University and students.
- Undergraduates are very inexpensive!

Selling yourself at a PUI…

- Find established collaborators
- Demonstrate a track-record
- In general, PUIs are less expensive
- In particular, undergraduate students are much less expensive than graduate students
- Convince reviewers you have the time to achieve your goals
- Leverage your PUI status to add something unique to the proposal (e.g., Broader Impacts at NSF). What can you build on to your research that a large R1 institution can’t/won’t?
- NSF has a special RUI (Research at Undergraduate Institution) statement that is an add on to a proposal!
National Funding Opportunities*

- National Science Foundation
  - RUI: Research in Undergraduate Institutions
  - ROA: Research Opportunity Award
- NSF-REU: Research Experience for Undergraduates
- Sites vs. Supplements
- American Chemical Society Petroleum Research Fund
  - UNI: Undergraduate New Investigator Grants
- UR: Undergraduate Research
- EDMAP: Education component of National Cooperative Geological Mapping Program
- NASA: Early Career Fellowship Program

* Many more details and links on slides at end of presentation!

Regional Funding Opportunities

- State or county agency funds or projects
- Alumni businesses or donations?
  - Check with your institution!
    ** You can actually get quite a lot done with not very much money!! **

Student Funding Opportunities

- Geological Society of America
  - Northeastern, South-Central, and Southeastern Sections
- Sigma Xi
  - Grants in aid of research program
- AEG
  - Multiple award types
- Check with your own institution as well!!
  - Student research funding and/or student travel funding

Words of Wisdom

- Know what you want and why you want it
- Avoid upsetting reviewers - take care to cite relevant sources, give credit where due, follow the rules!
- Approach it as a 'hypothesis testing' proposal rather than 'voyage of discovery' proposal.
- Contact relevant program officer – questions about ideas, mechanics – before submission
- Sell your research at a PUI and think about what you can contribute that a large R1 can’t (Broader Impacts)

Read successful proposals

- On-site proposal collection
- Proposal collection on the Cutting Edge website
  http://serc.carleton.edu/NAGTWorkshops/earlycareer/research/funding.html
- Get yourself on a proposal review panel!!
Funding Opportunities

**NSF-RUI: Research in Undergraduate Institutions**
- Support PUI faculty in research
- Builds capacity for research at their home institution
- Supports the integration of research and undergraduate education

**NSF-ROA: Research Opportunity Award**
- Support PUI faculty research
- Allow faculty to work as visiting scientists at research-intensive organizations where they collaborate with other NSF-supported investigators.
- May be a new collaboration between PUI and another institution, a supplement to an existing award at research institution, or a re-budget of an existing award to support PUI faculty


**American Chemical Society Petroleum Research Fund**

**UNI: Undergraduate New Investigator Grants**
- $55,000 over 2 years
- PI in department without doctoral program
- Seed money to demonstrate proof of principle
- Related to research in the petroleum field

**UR: Undergraduate Research**
- $70,000 over 3 years
- PI in department without doctoral program
- Related to research in the petroleum field

[https://www.acs.org/content/acs/en/funding-and-awards/grants/prf/programs.html](https://www.acs.org/content/acs/en/funding-and-awards/grants/prf/programs.html)

**EDMAP**
- Education component of National Cooperative Geological Mapping Program.
- Faculty request funds to support students in one year mentored mapping project on specific geographic area.
- Every Federal dollar that is awarded is matched with university funds.
- Ugrad projects limited to $7500 (plus match)

[http://ncgmp.usgs.gov/about/edmap.html](http://ncgmp.usgs.gov/about/edmap.html)

**National Aeronautics and Space Administration**

- Loads of programs for science funding
- NSPIRES →
  - NASA Solicitation and Proposal Integrated Review and Evaluation System
  - [https://nspires.nasaprs.com/external](https://nspires.nasaprs.com/external)
- Planetary Geology → ROSES
  - Research Opportunities in Space and Earth Science
  - 95 different programs in ROSES 2018

**Sigma Xi**
- Grants in aid of research program

**AEG**
- Multiple award types
- [https://www.aegfoundation.org/16450/funds/](https://www.aegfoundation.org/16450/funds/)