NSF-RUI PROGRAM

Strategies and Tips for Success

Vicki Cameron  August 2009
Overview of the Presentation

1. Description of the program and relevant web sites
2. The review process
3. Proposal preparation
4. Characteristics of good/bad proposals
5. Funding rates
Objectives of the NSF-RUI Program

• “To support high-quality research by faculty members of predominantly undergraduate institutions

• To strengthen the research environment in academic departments that are oriented primarily toward undergraduate instruction

• To promote the integration of research and education.”
“Involvement of undergraduate students is an important feature of RUI, providing them with research-rich learning environments. However, the overriding purpose of RUI is the support of faculty research, which maintains faculty members' intellectual vibrancy in the classroom and research community.”
Two essential components to the proposal

- Most important is the scientific merit of the work as that directly addresses the issue of supporting excellent faculty research at PUls

- Second is the demonstration of the involvement of undergraduates and how that involvement impacts their future
Useful Websites and URLs

NSF Home Page:
http://www.nsf.gov/

Guide to Programs
http://www.nsf.gov/funding/browse_all_funding.jsp

Grant Proposal Guide (GPG)

FastLane Home Page:
https://www.fastlane.nsf.gov/fastlane.jsp

Search NSF Awards:
http://www.nsf.gov/awardsearch/

NSF Custom News Service:
http://www.nsf.gov/mynsf/
NSF Merit Review Process

Electronic Receipt of Proposal → NSF Program Officer → Peer Review
- Ad Hoc
- Panel
- Combination

Merit Review Criteria
- Intellectual Merit
- Broader Impacts

Higher Level Review

Program Officer Recommendation (Award/Decline)

Award → Decline

Program Officer Recommendation (Award/Decline)
Proposal Process

- PI writes, revises, and submits the proposal
- Program administrator sends each proposal out for external review: usually two to four reviews are received.
- Proposal is reviewed during a regular meeting of the study section. Usually two individuals read the proposal in detail. These reviewers have access to the external reviews provided.
- After the meeting the program administrator reviews how much money is available and based on ranking, which proposals to support.
- If your proposal is funded, you will likely hear fairly soon after the study section meeting. If not, you may not hear for a while.
- If you are not funded, review the comments and think about resubmission. Be sure to address any criticisms.
Review of RUI Proposals

- Review occurs during meetings of the “regular” study sections, which also evaluate proposals from research intensive universities, CAREER proposals and other proposals

- RUIs require additional information:
  - Certification of RUI Eligibility
  - RUI Impact Statement
• RUI proposals are evaluated in competition with all other proposals submitted to the Foundation in the same area of research, using the standard NSF review criteria.

• Special RUI reviewer instructions, calling attention to the Impact Statement and the special circumstances under which RUI investigators work, are supplied with the request for reviews.
What is the intellectual merit of the proposed activity?

• How important is the research to the field?
• How well qualified is the PI?
• How well organized is the proposed activity?
• Are the resources sufficient?

What are the broader impacts of the proposed activity?

• Does the research advance discovery while promoting teaching, training, and learning?
• Does the research include underrepresented groups?
• Does the research enhance infrastructure for research and education?
• How will the results be disseminated?
• What might be the benefits to society?
Intellectual/scientific merit

– Hard for PIs at PUIs to compete with RO1 institutions
– Easiest ways to compete:
  • Find a niche
  • Find a collaborator

Broader impacts

• Fairly easy to justify this in terms of student training
• Very important to provide actual evidence
  – How is the institution committed to undergraduate research
  – How has your prior work contributed to the infrastructure
  – How will this work continue to contribute
Difficulty with RUI review

- Most permanent members of the study section are from RO1 institutions.
- At the time I was last on one of these panels, members from PUIs were recruited but were generally ad hoc members.
- If you are on such a panel, it is very important to keep reminding reviewers about the reality of research at PUIs.
From my 2002 Proposal

“…..all the experiments described above were carried out by myself and my undergraduate students. The lab has no technician, no graduate students and no post-doctoral fellows. The students are working part-time during the academic year, and with the heavy teaching load at Ithaca College, I am also devoting only part of my time to the research activities. In the summer we work full time for 10 weeks accomplishing as much as we can. It should be no surprise that the total number of publications resulting from the grant is lower than for similar funding at an institution where the primary focus is research rather than teaching. At Ithaca College the research enterprise itself is an important part of the undergraduate educational process.”
Comparison of AREA grants and RUI grants

• There is no dollar limit on RUI grants. AREA grants are restricted to $150,000 in direct costs.
• AREA funding is in modules of $25,000, RUIs are not
• No specific funds are set aside for RUI proposals
• Both have specific limits on the type of institutions eligible
• RUI grants must be submitted electronically through Fastlane
Proposal Preparation

• Project Summary: one page
• Project Description
  – Background and significance
  – Results from prior support
  – Preliminary results
  – Specific objectives
  – Overall significance and broader impacts
• References
• CV
• RUI impact statement
Project description from my 2002 proposal

- Background and significance: 3 ½ pages
- Results from previous support: 3 ½ pages including research results, publications, and present activities of the students funded by the previous grant.
- Preliminary results: slightly more than 3 pages
- Specific objectives including experimental details: about 4 pages
- Significance: 1 page including both scientific significance and broader impacts.
Results from Prior support

- Scientific results including publications
- Infrastructure results:
  - Total number of students who worked on the project
  - Number who have graduated
  - Number enrolled in MS, MD and PhD programs and where enrolled
  - Special awards and fellowships won by these students
  - Number of student presentations and the venues, number of student publications
Significance: part I

• Should address the scientific significance of your work and where it fits into the broader picture.

Significance: part II

• Should address infrastructure impacts: students trained, how they were involved in the project, what they learned
From my 2002 proposal

- In addition to increasing our understanding of this important enzyme complex, the research described in this proposal will provide significant opportunities for undergraduate students to acquire critical thinking skills, to learn about experimental design, to participate in scientific inquiry, to contribute in a meaningful way to our store of scientific knowledge, and to develop their interests in pursuing a career in scientific research. Undergraduate students will be involved in all aspects of the project and will be expected to participate as presenters at scientific meetings and as co-authors on manuscripts describing the work.
Other documents

• Two page CV. Even here, be sure to highlight publications and presentations by your students.
• RUI Impact Statement: what NSF is looking for
  – Increase in faculty research at PUIs
  – Increase in opportunities for direct student involvement in research
  – Improvement in instrumentation available to students
  – Enhancement of student preparation for careers in science
Your impact statement should include:

- Brief Background on your institution
- Description of the current research environment
  - Facilities
  - Number of stds supported during recent summers
  - Number of std presentations/publications
  - Number of stds enrolled in graduate/medical school
- Achievements of your students specifically
- How the funds will help continue/improve opportunities for std/fac research at your institution
Common mistakes

#1: Not explaining clearly what you wish to do and why it is important
- Proposal is poorly organized
- Insufficient background knowledge
- Lack of clear specific objectives
- Difficult to read, full of jargon
- Being too ambitious
- Not providing a time line and alternative approaches
- Not addressing broader impacts

#2: Not reminding the reader about PUI issues
- How will students be involved
- What have students done in the past
- What will they learn from this experience
- How will you choose students

#3: Not following the grant proposal guidelines
- Assuming no one will notice if you’re over the page limit
- Using a font so small no one can read it
- If you can’t fit everything in 15 pages you’re probably including too much
Common mistakes

#4: not including results from prior support and preliminary results

#5: inflating the budget
  - For the most part reviewers don’t pay much attention to the budget unless it is grossly out of whack
  - Be sure funds for all personnel are justified

#6: failure to address broader impacts

#7: failure to proof
  - Misspelled words
  - Poor grammar
Proposal review

• By the study section. If the news is good, you may hear fairly quickly. Program administrators like to give good news.
• In 2003, I still had not heard by Jan 2003 (panel met in Oct 2002) so I called my PA
• She gave me the bad news that I would not be funded.
• Later I called her back and asked how many RUIs were funded and where mine ranked among RUIs
• Two weeks later she called me back and told me I was funded for the full amount.
Final points

• Communicate with your program administrator
• Follow the directions
• Get a colleague out of your area to review your proposal
• Get a colleague in your area to review your proposal
• Prepare a strong RUI impact statement.
• **Proofread very carefully.**
## Proposals, Awards and Funding Rates by Directorate & Office

<table>
<thead>
<tr>
<th></th>
<th>Fiscal Year</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSF</strong></td>
<td>Proposals</td>
<td>31,942</td>
<td>35,165</td>
<td>40,075</td>
<td>43,851</td>
<td>41,722</td>
<td>42,352</td>
<td>44,577</td>
<td>44,428</td>
</tr>
<tr>
<td></td>
<td>Awards</td>
<td>9,925</td>
<td>10,406</td>
<td>10,844</td>
<td>10,380</td>
<td>9,757</td>
<td>10,425</td>
<td>11,463</td>
<td>11,149</td>
</tr>
<tr>
<td></td>
<td>Funding Rate</td>
<td>31%</td>
<td>30%</td>
<td>27%</td>
<td>24%</td>
<td>23%</td>
<td>25%</td>
<td>26%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>BIO</strong></td>
<td>Proposals</td>
<td>5,131</td>
<td>5,143</td>
<td>5,591</td>
<td>6,063</td>
<td>6,475</td>
<td>6,617</td>
<td>6,728</td>
<td>6,598</td>
</tr>
<tr>
<td></td>
<td>Awards</td>
<td>1,431</td>
<td>1,400</td>
<td>1,448</td>
<td>1,432</td>
<td>1,355</td>
<td>1,202</td>
<td>1,303</td>
<td>1,291</td>
</tr>
<tr>
<td></td>
<td>Funding Rate</td>
<td>28%</td>
<td>27%</td>
<td>26%</td>
<td>24%</td>
<td>21%</td>
<td>18%</td>
<td>19%</td>
<td>20%</td>
</tr>
</tbody>
</table>

### RUI Program Funding Rates

![Bar chart showing the number of awards from 2004 to 2008](chart.png)

- **Number of Awards:**
  - **2004:** 103
  - **2005:** 100
  - **2006:** 110
  - **2007:** 113
  - **2008:** 100