Discussion of reading 5: Peer review

Schultz, Eloquent science

Chapter 19: Editors and peer review
Chapter 20: Writing a review
Chapter 21: Responding to reviews
Funding landscape and the NSF
Research and development funding is shifting “east”?

National R&D Investment
Gross R&D as a percent of GDP

- S. Korea
- Japan
- Finland
- Taiwan
- Germany
- U.S.
- OECD
- China
- EU-28

Source: OECD Main Science and Technology Indicators 2016. © 2016 AAAS
Basic research is increasing rapidly in OECD area

Research Trends in OECD Area, 1985-2013
Based on data in USD 2010 constant prices

Index 1985 = 100


Organisation for Economic Cooperation and Development
Higher funding leads to increase in number of published papers?
But not much change in fraction of highly-cited papers by country.
Corporate and philanthropy increasingly important for basic research in United States (includes pharmaceutical basic research)
Federal R&D spending is mostly through Dept. of Defense.
Federal R&D spending is mostly through Dept. of Defense.
Federal funding of science is mostly of life science

Funding by Science (2009, research only, across departments and agencies)

- Total: $54,800 (million)
- LIFE: $29,299
- ENGINEERING: $8,907
- ENVIRONMENTAL: $3,352
- PSYCHOLOGY: $1,852
- OTHER: $1,341
- PHYSICAL: $5,593
- MATH & COMPUTER: $3,333
- SOCIAL: $1,123
NIH funding grew dramatically in 1990s
Federal funding still the dominant source of funding for university R&D
Federal government funds majority of research at MIT

Source MIT website
Federal government funds majority of research at MIT

Expected to be more important over time (e.g., Simons foundation)
National Science Foundation (NSF)
Mission of the National Science Foundation (NSF)

Mission:
• To promote the progress in science
• To advance the national health, prosperity, and welfare
• To secure the national defense
• Maintain facilities in Antarctica
• Promote equal opportunities in science and engineering
• Support computer methodologies
  *(NSF act 1950 + later additions)*

Directed to:
• Initiate and support basic scientific research
• Award scholarships and graduate fellowships
etc.

See Grant Application Writer’s Handbook, Chapter 1
### Success rate of proposals to NSF

<table>
<thead>
<tr>
<th>Year</th>
<th>Proposals</th>
<th>Awards</th>
<th>Success Rate</th>
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</thead>
<tbody>
<tr>
<td>2006</td>
<td>42,352</td>
<td>10,425</td>
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<td>2007</td>
<td>44,577</td>
<td>11,463</td>
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<td>2008</td>
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<td>2009</td>
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<td>2010</td>
<td>55,542</td>
<td>12,996</td>
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<td>2011</td>
<td>51,562</td>
<td>11,192</td>
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<td>2012</td>
<td>48,613</td>
<td>11,524</td>
<td>24%</td>
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<tr>
<td>2013</td>
<td>48,999</td>
<td>10,829</td>
<td>22%</td>
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<td>2014</td>
<td>48,051</td>
<td>10,958</td>
<td>23%</td>
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<td>2015</td>
<td>49,620</td>
<td>12,007</td>
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<tr>
<td>2016</td>
<td>49,285</td>
<td>11,877</td>
<td>24%</td>
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Source: NSF Enterprise Information System, 10/01/16.
### Success rate of proposals to NSF

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<td>22%</td>
<td>23%</td>
<td>24%</td>
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Source: NSF Enterprise Information System, 10/01/16.

### Success rate of proposals from new principal investigators (PIs)

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<td>19%</td>
<td>19%</td>
<td>25%</td>
<td>17%</td>
<td>15%</td>
<td>17%</td>
<td>17%</td>
<td>18%</td>
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Report of NSF on merit review to NSB
Gender

In general, while fewer proposals are received from women than men, the success rate for female PIs is slightly higher than that for male PIs. The proportion of proposals from female PIs was 26.9% in FY 2016 and the proportion of awards to women was 28.8%.

Figure 1. Percentage of Proposals from and Awards to Women

Source: NSF Enterprise Information System, 10/01/16.
# Directorate for Geosciences

Overall FY 2017 GEO funding rate: 30%

<table>
<thead>
<tr>
<th>Division</th>
<th>Funding Rate</th>
<th>Actions</th>
<th>Awards</th>
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<tbody>
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<td>44%</td>
<td>675</td>
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<td>EAR</td>
<td>26%</td>
<td>1483</td>
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<tr>
<td>ICER</td>
<td>25%</td>
<td>378</td>
<td>96</td>
</tr>
<tr>
<td>OCE</td>
<td>29%</td>
<td>1226</td>
<td>354</td>
</tr>
<tr>
<td>OPP</td>
<td>29%</td>
<td>673</td>
<td>196</td>
</tr>
</tbody>
</table>

AGS = Atmospheric and Geospace sciences  
EAR = Earth Sciences  
ICER = Integrative and Collaborative Education and Research  
OCE = Ocean Sciences  
OPP = Office of Polar programs

Source: NSF website
Detailed rules for NSF proposals are given in chapter 2 of PAPPG
Next reading: Proposal basics

- The grant application writer's workbook NSF Fastlane Version
  Chapter 6: Merit review and common mistakes

- PAPPG: Chapter II, Section 2d "Project description"