Enhancing Peer Review

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Council of Councils  
Bethesda, MD  
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National Institutes of Health  
U.S. Department of Health and Human Services
NIH Peer Review

- Analysis of TR01 Review
- Enhancing Peer Review
- Review of ARRA Applications
Review Highly Transformative Research

- **OD Transformative RO1 (T-RO1)**
  - Awards once a year, funding for 5 years
  - 8-page application
  - 740 submitted, 720 reviewed
  - 42 funded ($ 32 million)

- **Editorial Board Review**
  - Initial scoring based on innovation and potential science transformation by a small study section of distinguished, broad-science reviewers (the editors)
  - Specific science reviewed by appropriate reviewers (subject experts-the editorial board)
  - Final ranking by the editors
Scoring

720 TR01 Applications, 1-9 Scale
John Bowers
The Editors
Percentage of Stage One reviewers who thought it reasonable to review about 300 applications for Stage One of three stage review process

- 43% for No
- 57% for Yes
The Editors

Of applications reviewed, what percentage understood the goals of the Transformative R01 RFA?
The Editors

Percentage of applications capable of transforming science - Did we get what we hoped for?
The Editors

How often did Stage 2 reviewer comments dramatically change reviewer initial assessments?

- Never
- Rarely
- Sometimes
- Often
- Always

Number of respondents
The Editors

How often did Stage 2 reviewers appear to have the appropriate expertise to evaluate technical aspects of the applications?

- Always
- Often
- Sometimes
- Rarely
- Never

Number of respondents
The Editors

Should future announcements have specific areas of science highlighted?

- Strongly disagree: 4 respondents
- Disagree: 3 respondents
- Somewhat agree: 0 respondents
- Agree: 0 respondents
- Strongly agree: 0 respondents

Number of respondents
Applicants
Transformative R01 Applicants by Gender

- Males: 79%
- Females: 21%
Applicants
Age Distribution of T-R01 Applicants

Number of respondents

- Under 25
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80+
Applicants: Race and Ethnicity

Race
- White: 71%
- African American/Black: 21%
- Asian: 6%
- Other/Unknown: 2%

Ethnicity
- Hispanic: 5%
- Non-Hisp: 95%
Applicants
Percentage of NIH Experienced TR01 Applicants

- Yes: 89%
- No: 9%
- No answer: 2%
Applicants
Percentage of Applicants with ≥ 50% of their Funding (past 5 years) by Source

- NIH
- Foundations
- ..Hospitals,
- ..Other US
- For-profits
- Other

Number of respondents
Applicants
Percentage of Applicants Claiming Proposed Project is Significant Departure from Previous Research Direction

- **Yes**: 82%
- **No**: 18%
## Applicants

<table>
<thead>
<tr>
<th>Research Area</th>
<th>% of Applicants</th>
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<tbody>
<tr>
<td>Behavioral and/or Social Science</td>
<td>10.2%</td>
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<tr>
<td>Clinical and/or Translational Research</td>
<td>28.1%</td>
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<tr>
<td>Instrumentation and/or Engineering</td>
<td>5.8%</td>
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<tr>
<td>Molecular, Cellular, and/or Chemical Biology</td>
<td>38.1%</td>
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<tr>
<td>Pathogenesis and/or epidemiology</td>
<td>3.7%</td>
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<tr>
<td>Physiological and/or Integrative Systems</td>
<td>9.1%</td>
</tr>
<tr>
<td>Quantitative and/or Mathematical Biology</td>
<td>3.7%</td>
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</table>
Applicants
Possibility of Receiving Funding From other Sources

- Very unlikely: 210
- Somewhat unlikely: 84
- Somewhat likely: 24
- Very likely: 110
Enhancing Peer Review
Corporate NIH: Enhancing Peer Review

• The Charge from Dr. Zerhouni:

  “Fund the best science, by the best scientists, with the least administrative burden…”

Two advisory committees to the NIH Director

http://enhancing-peer-review.nih.gov
The Process

1. Diagnostic
   - June 2007 – Feb. 2008

2. Design Implementation Plan
   - March 2008 – June 2008

3. Begin Phased Implementation of Selected Actions
   - September 2008
Improve Quality and Transparency of the Peer Review Process

Changes occurred at the last meetings (July 2009):
• Scores 1-9
• Assigned reviewers score each criterion
• Shorter summary statement, with boxes for each criterion
• Clustering new investigators
• Scores of individual criteria given to all applicants
• Discussed applications receive additional overall impact score

Changes occurring in 2010:
• Shorter application (12 pages for R01) designed to match scoring criteria
A. Enhanced Review Criteria

• Overall Impact:
  - Assessment of the likelihood for the project to exert a sustained, powerful influence on the research field(s)

  - New Core Criteria Order:
    - Significance
    - Investigator(s)
    - Innovation
    - Approach
    - Environment
B. Template-Based Critiques

- The objective is to write evaluative statements and to avoid summarizing the application.
- Comments should be in the form of bullet points or if necessary short narratives.

<table>
<thead>
<tr>
<th>1. Significance</th>
<th>Please limit text to ¼ page</th>
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<tbody>
<tr>
<td>Strengths</td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Weaknesses</td>
<td></td>
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# C. Scoring

<table>
<thead>
<tr>
<th>Impact</th>
<th>Score</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Impact</td>
<td>1</td>
<td>Exceptional</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Outstanding</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Excellent</td>
</tr>
<tr>
<td>Moderate Impact</td>
<td>4</td>
<td>Very Good</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Low Impact</td>
<td>7</td>
<td>Fair</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Marginal</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>Poor</td>
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C. Scoring
Priority Scores of R01 and R21 Reviewed by CSR

June 2008

June 2009
D. Order of Review

Why?

• Concern of variation of scores during different times of the meeting.
  • The original plan was to recalibrate scores at the end of the meeting.

Solution:

• Recalibrate dynamically by discussing in order of average preliminary scores from assigned reviewers.

Requirement:

• Reviewers must participate in entire meeting.
E. Enhancing Peer Review Training

- **CSR and NIH Review Staff**
  - 6 face to face training sessions, January 2009
  - 6 face to face training sessions, April 2009
  - Continuous updating

- **Chairs**
  - 27 half a day sections for 400 chairs in 11 cities

- **Reviewers**
  - Training material (Power Point, interactive training, frequently asked questions, mock study section video, etc, in April-May 2009)
  - Senior CSR staff at the first two meeting using the new system
American Recovery and Reinvestment Act
CSR Peer Review: 2008

- 77,000 applications received
- 16,000 reviewers
- 1,600 review meetings
- 240 Scientific Review Officers
CSR Peer Review: 2009

- 115,000 applications received
- 38,000 reviewers
- 1,800 review meetings
- 240 Scientific Review Officers
Applications Received for Review by CSR
(May-July 2009)

- Non ARRA Applications (Normal)  18,200
- Challenge Applications            21,000
- Competitive Revisions             1,200
- GO Grants                          180
- High End Instrumentation           130
- Small Business                     1,500

- TOTAL                              42,000
Applications Reviewed and Reviewers Used by CSR in May-July 2008 and 2009
Applications Reviewed and Reviewers Used by CSR in June 2008 and 2009
The Way We Did It

To achieve great things, three things are needed: a plan, great people and not quite enough time

adapted from Leonard Bernstein
This is CSR

September 2009
Looking at the Future

- **R01**
- **R21**