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# Enhancing Peer Review

**A Self-Study by the NIH  
in Partnership with the Scientific Community  
to Strengthen Peer Review in  
Changing Times**

**<http://enhancing-peer-review.nih.gov/>**

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# Enhancing Peer Review

## The Charge:

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

<http://enhancing-peer-review.nih.gov/>

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# Overall Approach

- **The Goal: To identify the most significant challenges to the system used by NIH to support science and propose recommendations that would enhance this system in the most transformative manner**
- **The fine details of implementation were purposefully not considered during this phase of the project and it would be premature to consider issues of this type today**

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# Guiding Principles

- **Peer review is the foundation of the system used by NIH to support biomedical and behavioral research**
- **Peer Review must be continually optimized to adapt to the dynamic changes in biomedical and behavioral research**
- **We must assure the core values of peer review including:**
  - i. **Scientific competence of reviewers and the review**
  - ii. **Fairness, timeliness and integrity of the review process**
  - iii. **Support for the “best” science ... recognizing that “best” is dependent on many factors including scientific quality, public health impact, mission of an Institute or Center and the current NIH portfolio**

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# Challenges & Recommended Actions

- 1. Reducing Administrative Burden of Applicants, Reviewers and NIH Staff**
- 2. Enhancing the Rating System**
- 3. Enhancing Review & Reviewer Quality**
- 4. Optimizing Support at Different Career Stages & Types**
- 5. Optimizing Support for Different Types and Approaches of Science**
- 6. Reducing the Stress on the Support System of Science**
- 7. The Need for Continuous Review of Peer Review**

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# 1. Reducing Administrative Burden of Applicants, Reviewers and NIH Staff

**Challenge: *There are too many applications in the system leading to a high burden for both applicants and reviewers***

- Since 2002 the number of applications submitted has exceeded the historical growth rate
- In 2008, CSR estimates 80,000 total applications will be submitted

**Goal: Reduce the number of applications that need to be submitted by helping applicants make faster, more informed decisions whether to refine an existing application or develop a new idea**

## **Recommended Actions**

- Provide unambiguous feedback to all applicants
  - Establish an NRR (not recommended for resubmission) decision option
  - Provide ratings for all applications
  - Pilot use of short “prebuttals” to correct factual errors in review

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# 1. Reducing Administrative Burden of Applicants, Reviewers and NIH Staff (cont.)

***Challenge: Increasingly, three submission rounds are necessary before an application is funded***

- Support for meritorious science may be delayed when initial submissions are often placed at the end of the queue
- Reviewers may favor “last chance” applications which may lead to support of less meritorious science

**Goal: Focus on the merit of the science as presented in the application and not the potential improvements that may be realized following additional rounds of review**

## **Recommended Action**

- Eliminate the “special status” of amended applications - consider all applications as being NEW

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# 1. Reducing Administrative Burden of Applicants, Reviewers and NIH Staff (cont.)

**Consequences to eliminating the “special status” of amended applications by considering all applications as being NEW:**

- **Applicants**

- May resubmit application, with or without revisions, if desired
- Will no longer respond to reviewer comments as part of application

- **Reviewers**

- Will no longer see previous reviewers' comments
- Will be able to write a more concise review

- **NIH**

- Will no longer provide previous reviewers' comments and summary statements to reviewers
  - Will yield greater flexibility in study section makeup
  - Will still distinguish between type 1 and type 2 (competing continuation) applications
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## 2. Enhancing the Rating System

**Challenge: Improve the usefulness of the rating system to inform decision making for both applicants and NIH**

**Goal: To focus and elevate the level of discourse at the study section, rate multiple explicit criteria individually**

### **Recommended Actions**

- **Modify the rating system for all RPGs (Scores + Rank)**
    - **Impact**
    - **Investigator(s)**
    - **Innovation**
    - **Plan**
    - **Environment (including information on institutional support for the applicant)**
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## 2. Enhancing the Rating System (cont.)

### Recommended Actions (cont.)

- **Restructure the application to reflect the new emphasis on the rating criteria**
  - **Shorten application to focus on impact and innovation of the work proposed**
  - **Lessen emphasis on standard methodological details and preliminary data that is not essential to supporting the novel aspects of the application**
  
- **Restructure and shorten the reviews and summary statements to reflect the new rating criteria**

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## 2. Enhancing the Rating System (cont.)

**Goal: To enhance consistency of rating and to engage all Charter members in the review of each application**

### **Recommended Action**

- Charter members will rank applications explicitly at conclusion of the meeting (see section 3)

**Goal: To provide unambiguous feedback**

### **Recommended Action**

- Create an unambiguous category: Not Recommended for Resubmission (NRR) (see section 1)

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## 3. Enhancing Review and Reviewer Quality

### Challenges:

- ***Need to increase review focus on potential impact and innovation of application and reduce emphasis on routine methodology (see section 2)***
- ***An insufficient number of expert reviewers assess applications***
- ***Reviewer time and expertise are not being used effectively***
- ***Factual errors in summary statements detract from the credibility of the review***
- ***Need to enhance and standardize reviewer, study section chair and SRO training***
- ***Knowledge of the identity of the applicant/applicant's institution might bias reviewers***

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## 3. Enhancing Review and Reviewer Quality (cont.)

**Goal: To enhance quality of review**

### **Recommended Actions**

- **Engage more persons to review each application (optimally 4 or more)**
  - **Have additional reviewers review for “impact”**
  - **Expand pilots of Editorial Board models (for large, complex applications)**
  - **Electronic assisted reviews**
  
- **Pilot the use of “prebuttals” to allow applicants to correct factual errors in review**
- **Establish or enhance reviewer, study section chair and SRO training**
- **Pilot anonymous review in the context of a two-level review system such as the editorial board model**

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## 3. Enhancing Review and Reviewer Quality (cont.)

**Goal:** To enhance quality of reviewers

### **Recommended Actions**

- **Create incentives for reviewers**
  - **More flexible service (twice per year)**
  - **Provide more flexible deadlines for grant submission for all reviewers**
- **Link potential service to study section to the most prestigious NIH awards**
  - **e.g. Future MERIT/Javits/Pioneer/EUREKA Awardees - will agree to serve as reviewers if asked**

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## 3. Enhancing Review and Reviewer Quality (cont.)

**Goal: To ensure best use of Charter member's time and expertise**

### **Recommended Actions**

- **Lessen burden on reviewers by shortening the length of the application and the summary statement**
  - **Reviews should focus solely on the merit of the application as presented (section 2)**
  - **Restructure the application to reflect the rating criteria (section 3)**
- **Have Charter members explicitly rank applications at conclusion of study section meeting**

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## 4. Support for Different Career Stages and Types

***Challenge:*** *There are lower success rates for New Investigators at every stage of type 1 R01 application*

**Goal:** Continue to enhance support for new investigators

### **Recommended Actions**

- Continue to fund more R01's for early career investigators
- Consider the merits of reviewing early career investigators separately, by generalists, to enhance innovation and risk-taking by applicants
- Consider the merits of ranking early career investigators against each other
- “Environment” criterion should take into account institutional commitment

## 4. Support for Different Career Stages and Types (cont.)

***Challenge:*** *There is a need to enable greater productivity of highly accomplished NIH investigators with less administrative burden to applicants and reviewers*

**Goal:** Enable greater productivity of highly accomplished NIH investigators with less administrative burden to applicants and reviewers

### **Recommended Action**

- **Refine the NIH MERIT/Javits Award mechanism**
  - **Permit investigators, who have met threshold criteria, to apply for this award**
  - **Must commit to minimum of 51% effort**
  - **A greater emphasis will be paid to past accomplishment**
  - **Award will be made for seven - ten years (4 + 3 + 3)**
  - **Add commitment to serve on study section if asked**

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## 5. Support for Different Types and Approaches of Science

***Challenge: Need to seek out and support the most transformative research ideas***

**Goal: To provide clear opportunities for applications proposing transformative research**

### **Recommended Actions**

- **Expand use of Pioneer, Innovator, and EUREKA Awards to increase support for Transformative research**
  - **The goal: at least 1% of R01-like awards would use this transformative path**
  - **Acknowledge that extremely transformative ideas will have inherently high-failure rate**

## 5. Support for Different Types and Approaches of Science (cont.)

***Challenge:*** *There are differences in success rates for applications proposing clinical research than applications not proposing clinical research. Success rates for applications proposing clinical research, in aggregate, are higher when reviewed in ICs*

**Goal:** To ensure optimal review of clinical research

### **Recommended Actions**

- Determine underlying causes of submission patterns and different results observed to CSR and IC panels and consider corrective actions if needed
- Determine if greater attention to “impact” criteria will increase success rate for clinical research
- Ensure participation of adequate numbers of clinician scientists by providing more flexible options for service
- Continue to pilot the use of patients and/or their advocates on reviews of clinical research

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## 5. Support for Different Types and Approaches of Science (cont.)

***Challenge: Interdisciplinary work needs a space to be reviewed and supported***

**Goal: To ensure optimal review and support of interdisciplinary research**

### **Recommended Actions**

- NIH should analyze applications that are IR in nature with respect to:
  - Referral patterns for review
  - Assignment for secondary review and funding consideration
  - Success rates
- Employ editorial board model for review of IR
  - Content experts; “big picture” thinkers and “interpreters”
- Enhance trans-NIH approaches to provide support space for highly meritorious IR work

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## 6. Reducing the Stress on the Support System of Science

**Challenge: *There are finite resources***

- ~ 8% of NIH grants are awarded to < 2.5% of the investigators
- Two-thirds of NIH principal investigators are  $\leq 50\%$  total percent effort

**Goal: To ensure optimal use of NIH resources**

### **Recommended Actions**

- Require a minimum percent effort on RPGs
  - PIs must devote at least 20 % effort, unless they can provide an explicit justification to the relevant IC for a lower percent effort
  - All remaining participants must devote a minimum of 5% effort unless they can provide explicit justification to the relevant IC for a lower percent effort

## 6. Reducing the Stress on the Support System of Science (cont.)

### **Challenge: *There are finite resources***

- **The number of tenure-track positions in academia and scientist positions in all sectors is straining to keep up with the number of postdoctoral fellows being trained**
- **There are an insufficient number of tenure track positions for the current pool of biomedical researchers - industry has been the fastest growing employment section but this is now in a down-turn**
- **Universities continue to build additional research facilities, populated increasingly by person on “soft money”, non-tenure track, positions**

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## 6. Reducing the Stress on the Support System of Science (cont.)

**Goal:** To optimize system used by NIH to support PI's and other research personnel

### **Recommended Actions**

- Investigate the issue of salary support for PIs recognizing the diversity of business models employed by applicant organizations
- Analyze the NIH contribution to the optimal biomedical work-force needs
  - Evaluate total number of graduate students and postdoctoral fellows being supported
  - Develop a census of research associates/staff scientists as an initial step towards exploring approaches to providing more stable support for these individuals

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# 7. The Need for Continuous Review of Peer Review

**Goal: To assure the core values of peer review**

## **Recommended Actions**

- **Mandate a periodic data-driven assessment of the peer review process NIH-wide**
- **Ensure that any proposed changes to the peer review process:**
  - **Address a specific challenge or problem**
  - **Be testable in some format such as pilot in scope or time**
- **Capture appropriate current baseline data and develop new metrics to track key elements of the peer review system**