# Improving Peer Review

## CSR Initiatives

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center for scientific review

Advisory Committee to the Director
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National Institutes of Health
U.S. Department of Health and Human Services

# Why Has U.S. Biomedical and Behavioral Research Been So Successful?

- Evolution of unique dynamic partnerships -- through NIH -- between Government and academic/medical schools

- 100% of NIH funds to universities and medical centers awarded through peer review (Only 4-10% in Europe)

# The Fundamental Tenets for NIH

1. Federal government  and the politicians must assure complete freedom for the individual scientists in developing and conducting their research work.

2. Reviews should be conducted by outside experts essentially without compensation.

3. Program management and review functions should be separated.

# Peer Review at CSR

# CSR Peer Review Statistics

- 80,000 applications received and reviewed a year
- 18,000 reviewers a year
- 236 Scientific Review Administrators
- 2,000 review meetings a year

# CSR: 4 Review Divisions & 23 IRGs

## Division of Biologic Basis of Disease

- AIDS and Related Research (AARR)
- Endoc, Metabolism, Nutrition, Reproductive Sciences (EMNR)
- Immunological Sciences (IMM)
- Infectious Diseases and Microbiology (IDM)
- Oncological Sciences (ONC)

## Division of Molecular & Cellular Mechanisms

- Bioengineering Sciences and Technologies (BST)
- Biology of Development and Aging (BDA)
- Biological Chemistry and Macromolecular Biophysics (BCMB)
- Cell Biology (CB)
- Genes, Genomes, and Genetics (GGG)
- Molecular, Cellular Develop Neuroscience (MDCN)

## Division of Physiology and Pathology

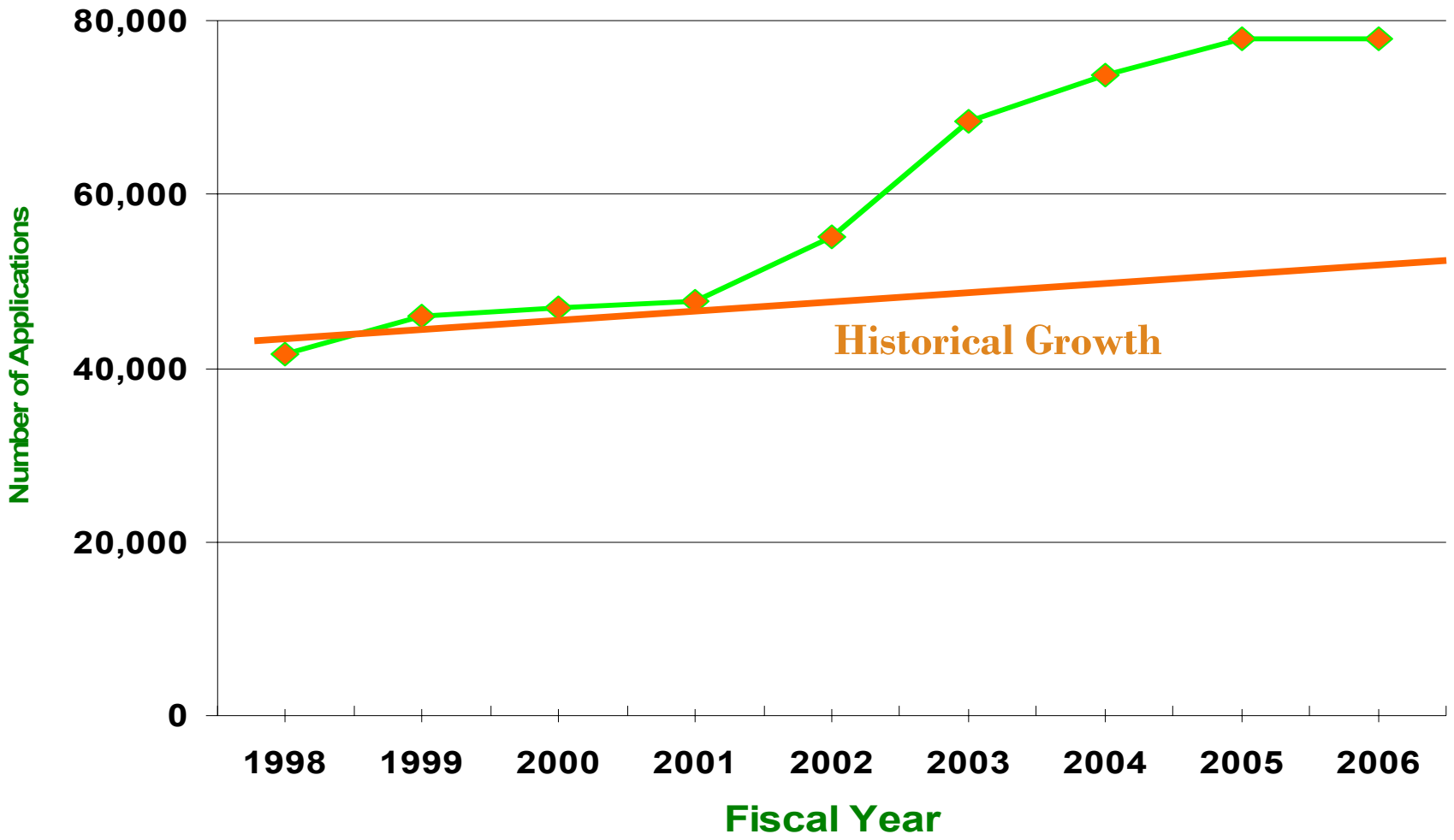
- Cardiovascular Sciences (CVS)
- Digestive Sciences IRG (DIG)
- Hematology (HEME)
- Integrative, Functional Cognitive Neuroscience (IFCN)
- Musculoskeletal, Oral, Skin Sciences (MOSS)
- Renal and Urological Sciences (RUS)
- Respiratory Sciences (RES)

## Division of Clinical and Population-Based Studies

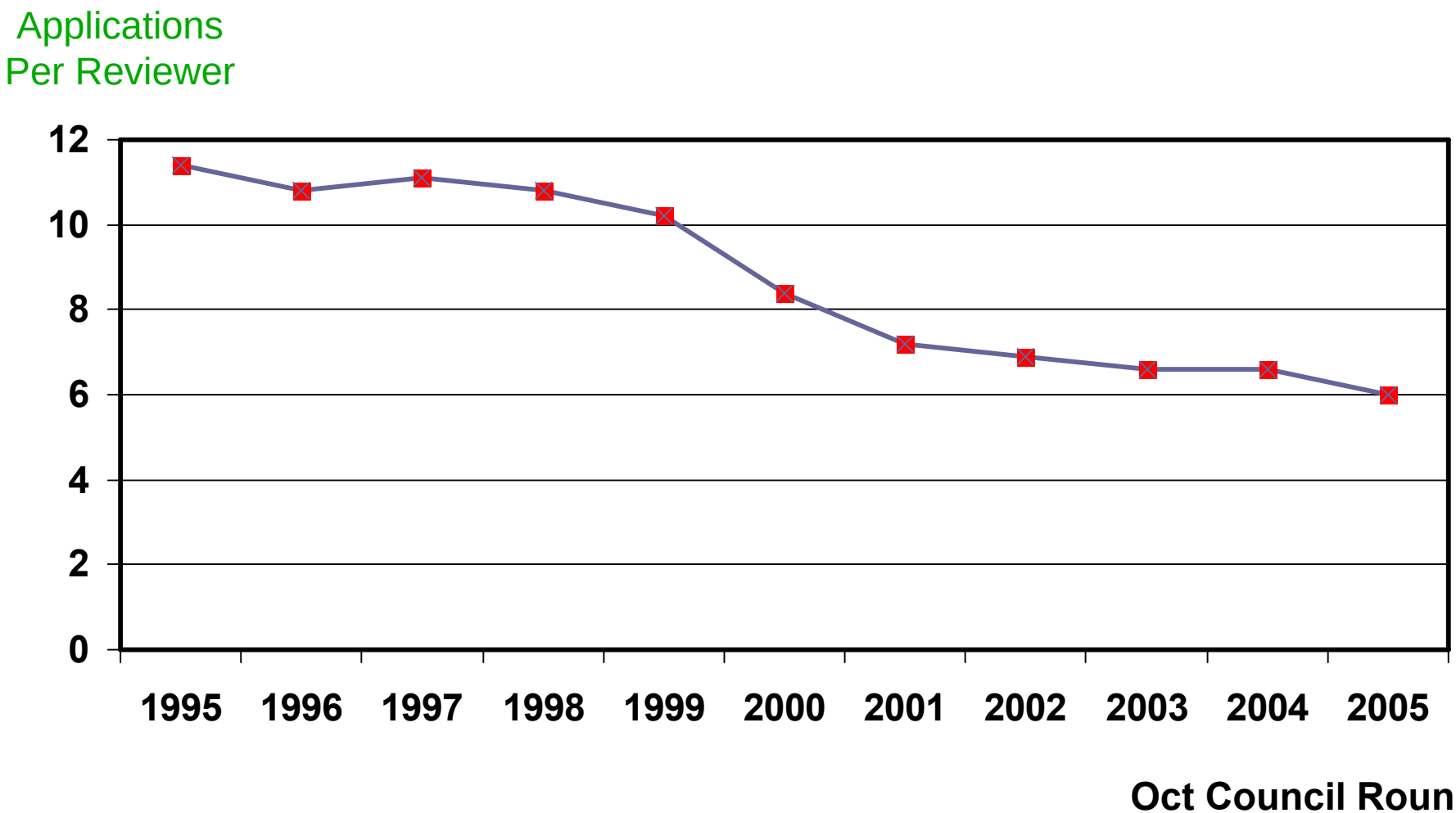
- Behavioral & Biobehavioral Processes (BBBP)
- Brain Disorders and Clinical Neuroscience (BDCN)
- Health of the Population (HOP)
- Risk, Prevention, and Health Behavior (RPHB)
- Surgery, Radiology, and Bioengineering (SRB)

# The Drivers for Change

# 1st Driver: Number of Applications Submitted



# 2nd Driver: Reviewer's Load



# 3rd Driver: CSR Budget for 2007

- CSR Budget $ 60 M
- SREA Budget $ 40 M

# 4rd Driver: One Review Platform for 60 years

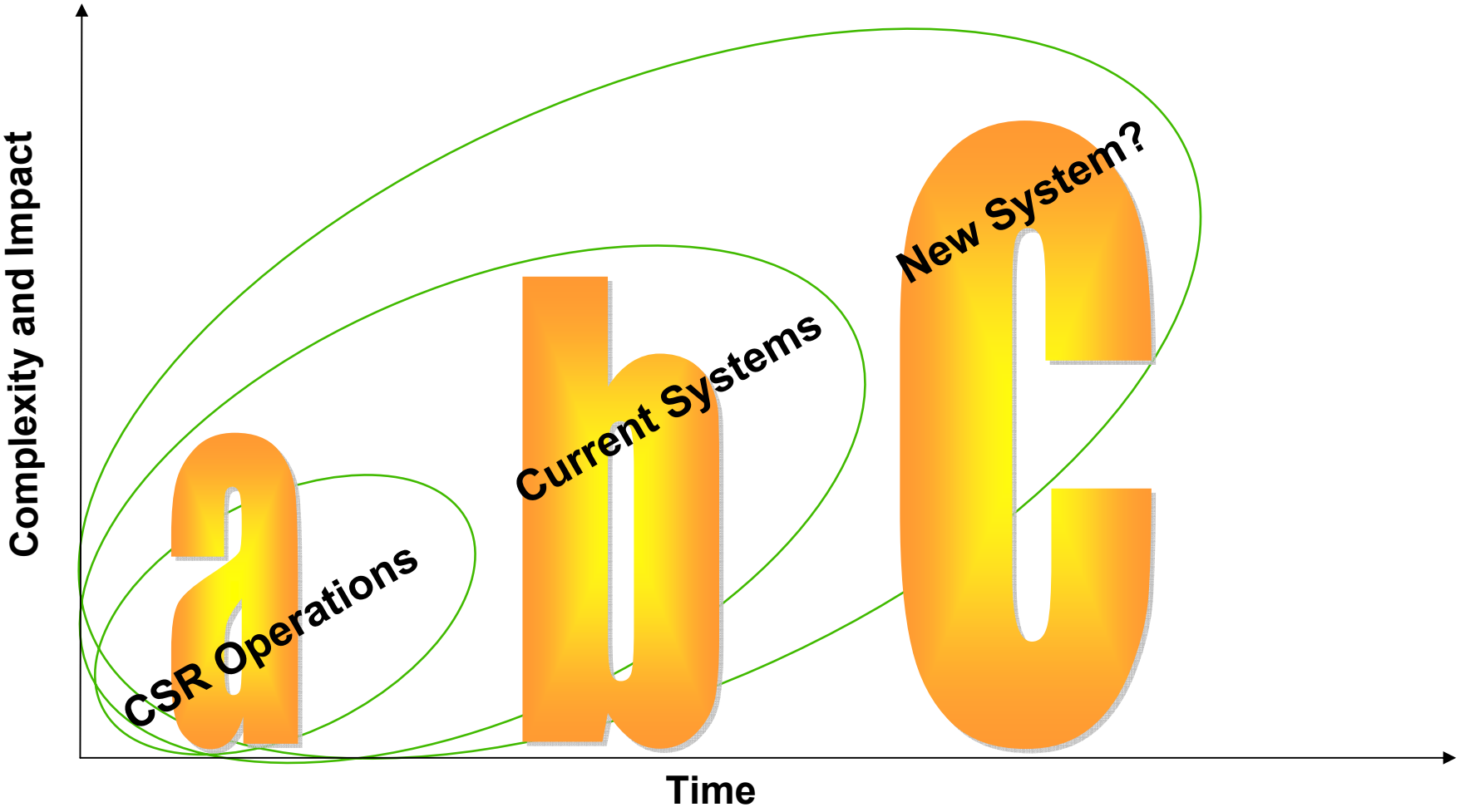
**The First NIH Study Section**
**1946**

**The Last NIH Study Section**
**2007**

# Major Complaints About NIH Peer Review

- The process is too slow
- There are not enough senior/experienced reviewers
- The process favors predictable research instead of significant, innovative, or transformative research
- The time and effort required to write and review are a heavy burden on applicants and reviewers

# Reengineering Peer Review


Complexity and Impact
Time
a
CSR Operations
b
Current Systems
c
New System?

# Changes in CSR Operations

1. Increase Communication and Transparency

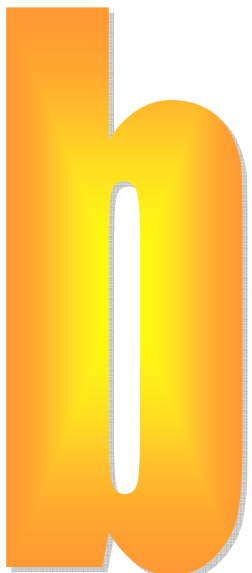
2. Increase Efficiency and Effectiveness

# A Vision for Peer Review

1. Improve study section alignment and performance
2. Shorten the review cycle
3. Do more to recruit and retain more high-quality reviewers and decrease the burden on applicants and reviewers
4. Improve the identification of significant, innovative and high-impact research

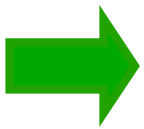
# A Vision for Peer Review

1. **Improve study section alignment and performance**
   - **Internal IRG Reviews**
   - **External Reviews**



# Biannual IRG Review Schedule

| Scheduled 2006 --14 IRGs |
| --- |
| Biological Chemistry and Macromolecular Biophysics (BCMB) |
| Cardiovascular Science (CVS) |
| Bioengineering Sciences and Technologies (BST) |
| AIDS and Related Research (AARR) |
| Risk, Prevention, and Health Behavior (RPHB) |
| Genes, Genomes and Genetics (GGG) |
| Digestive Sciences (DIG) |
| Endocrinology, Metabolism, Nutrition and Reproductive Sciences (EMNR) |
| Brain Disorders and Clinical Neuroscience (BDCN) |
| Integrative, Functional and Cognitive Neuroscience (IFCN) |
| Molecular, Cellular and Developmental Neuroscience (MDCN) |
| Hematology (HEME) |
| Immunology (IMM) |
| Health of the Population (HOP) |



| Scheduled 2007 -- 9 IRGs |
| --- |
| Biology of Development and Aging (BDA) |
| Infectious Diseases and Microbiology (IDM) |
| Biobehavioral and Behavioral Processes (BBBP) |
| Cell Biology (CB) |
| Musculoskeletal, Oral and Skin Sciences (MOSS) |
| Oncological Sciences (ONC) |
| Surgical Sciences, Biomedical Imaging and Bioengineering (SBIB) |
| Respiratory Sciences (RES) |
| Renal and Urological Sciences (RUS) |

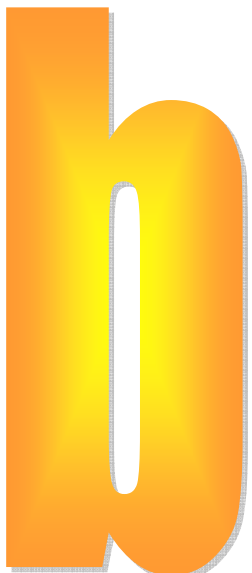
# Six Open House Workshops in 2007

| | |
|---|---|
| **Mar. 2** | **Neurological (3): Brain Disorders and Clinical Neuroscience (BDCN); Integrative, Functional and Cognitive Neuroscience (IFCN); Molecular, Cellular and Developmental Neuroscience (MDCN)** |
| **April 25** | **Behavioral/Social (3): Biobehavioral and Behavioral Processes (BBBP); Health of the Population (HOP); Risk Prevention and Health Behavior (RPHB)** |
| **Jun. 29** | **Disease-based (4): AIDS and Related Research (AARR); Infectious Diseases and Microbiology (IDM); Oncological Sciences (ONC); Surgical Sciences, Biomedical Imaging and Bioengineering (SBIB)** |
| **Aug. 24** | **Integrated Biological (4): Digestive Sciences (DIG); Musculoskeletal, Oral and Skin Sciences (MOSS); Renal and Urological Sciences (RUS) Endocrinology, Metabolism, Nutrition and Reproductive Sciences (EMNR)** |
| **Nov. 9** | **Integrated Biological (5): Immunology (IMM); Hematology (HEME); Cardiovascular Sciences (CVS); Respiratory Sciences (RES); Biology of Development and Aging (BDA)** |
| **Dec. 18** | **Biomolecular (4): Biological Chemistry and Macromolecular Biophysics (BCMB); Bioengineering Sciences and Technologies (BST); Cell Biology (CB); Genes, Genomes and Genetics (GGG)** |

# A Vision for Peer Review

1. Improve study section alignment and performance

2. **Shorten the review cycle**



# Shortening the Review Cycle

## The Goal

- To provide applicants a review and score within 3 months of application submission. This will permit resubmission of applications (when doable and desirable) 4 months earlier than in the past.
- To permit 3 reviews within one year

## Shortening the Review Cycle

## First Step: Posting Summary Statements Earlier

- Post all within 1 month of meeting
- Post new investigator summary statements within 10 days

# Shortening the Review Cycle

## Second Step: Advances in Electronic Systems

**How we distribute 80,000 applications?**

**Retooled for electronic submission**

- **Applications are now submitted electronically**

**Assign applications using text fingerprinting, artificial intelligence software**

**Full Implementation by November 2007**

# Shortening the Review Cycle

## Third Step: Shortening Review Cycle Pilot for New Investigators

### Shorter Review Cycles for New Investigators

Last year: About 2,000 new investigators in pilot

Feb 2007: 3,000

June 2007: 6,000 new investigators

Nov 2007: All New Investigators (>12,000)

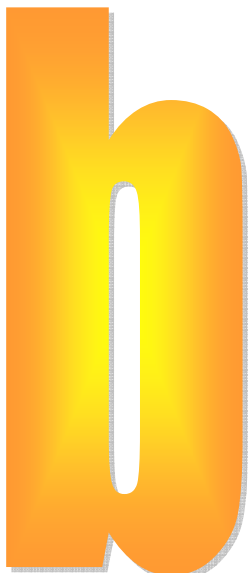
# Short Review Cycle Pilot of New Investigator R01 Applications

| New Investigator R01 Applications | Applications Submitted for July 2006 Round | | *Applications Submitted for Nov. 2006 Round | | Total | |
|---|---|---|---|---|---|---|
| Reviewed in Pilot | 628 | 100 % | 579 | 100% | 1,207 | 100% |
| Amended/Submitted for the Next Round | 83 | 13.2% | 79 | 13.6% | 162 | 13.4% |

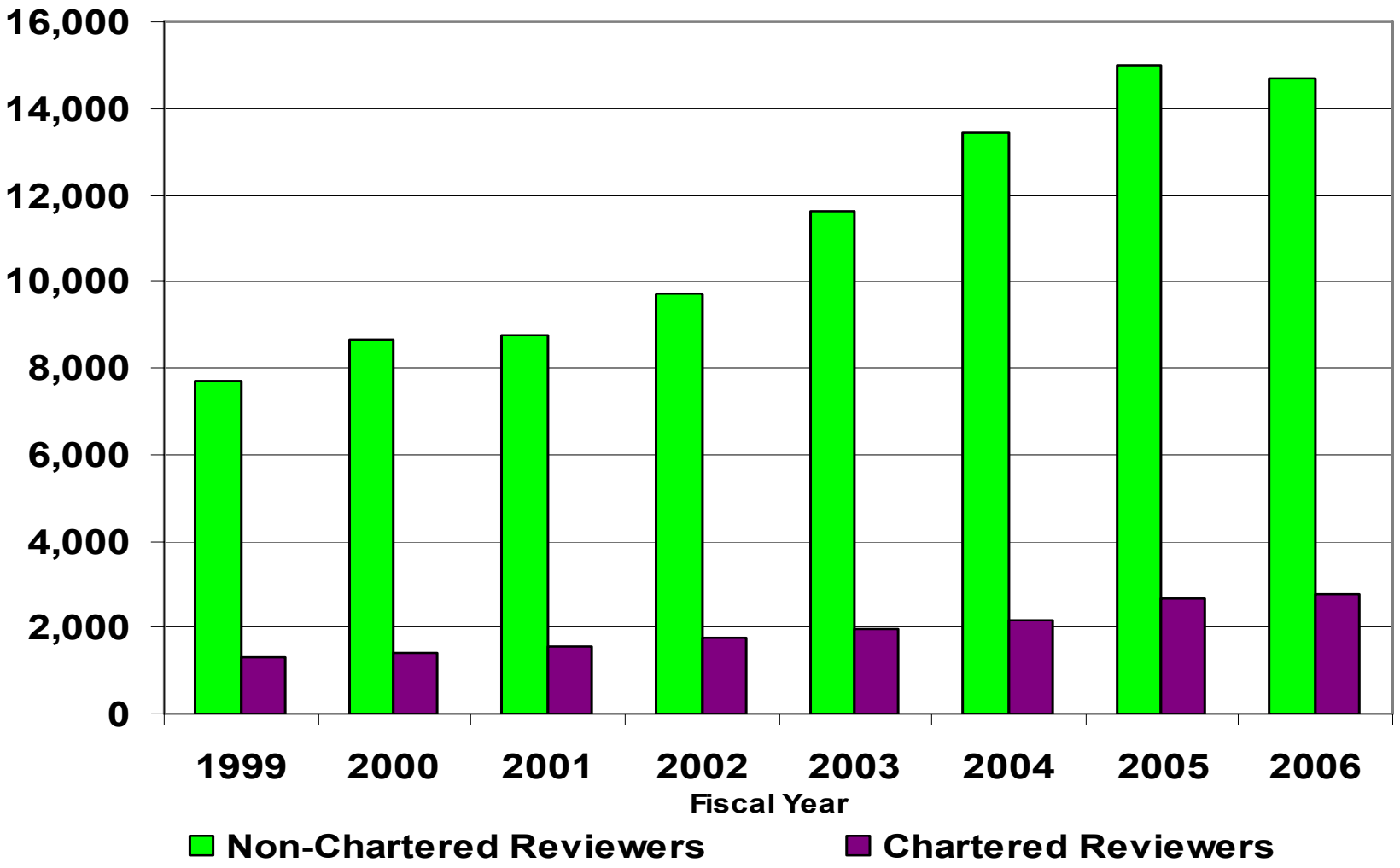
* Not counting resubmissions from one Study Section (Due. Nov. 30.)

# A Vision for Peer Review

1. Improve study section alignment and performance
2. Shorten the review cycle
3. **Do more to recruit and retain more high-quality reviewers and decrease the burden on applicants and reviewers**



# CSR's Growing Need for Reviewers



# Reviewers – Current Situation

- Far too many reviewers on study sections
  - Broader science
  - Decrease in reviewer load
  - Unnecessary
- Too many ad hoc reviewers

# Near-Term Solutions for Recruiting and Retaining the Best Reviewers

- Require less travel by using electronic review modes
- Have Shorter Meetings
- Shorten Applications

# Expanding Peer Review's Platforms

| Study Sections | Electronic Reviews |
| --- | --- |
| | • Telephone Enhanced Discussions<br>• Video Enhanced Discussions<br>• Asynchronous Electronic Discussions |
| Necessity | • Clinical reviewers |
| Preference | • Physicists, computational biologists |
| New Opportunities | • Fogarty, International Reviewers |

**Our Goal: 10% of all reviews to be electronic in 2007**

## A Study Section Chair Talks About Asynchronous Electronic Discussions

**"Finally, in spite of my initial skepticism regarding this "blog-like" review mechanism, all . . . [reviewers] produced comments, critiques, posed questions in a fashion that I would judge to be the BEST I've seen in ~30 years of chairing various review groups."**

**Craig M. Jackson, Ph.D.**
**President and Principal Scientist**
**Hemosaga Diagnostics Corp.**

# Shorter Applications

- Trans NIH Committee
- Communication and Support from Societies, Diseases Groups, Scientific Leadership
- 2 Retreats of NIH Directors
- Approval and Support of our Advisory Committee
- Survey of Scientists

# The Advantages of Shorter Applications

## Operational

- Each reviewer can read more applications
- Study sections can be smaller
- More experienced reviewers can be recruited

## Cultural

- Reviews can be more focused on impact and innovation and less on approach and preliminary results

# NIH Guide Survey on Shorter R01 Applications

| Responses | Number | Percent |
|---|---|---|
| For Shorter Applications | 3,827 | 73% |
| Against Shorter Applications | 1,251 | 27% |
| Total | 5,078 | 100% |

Survey ended on January 8, 2007

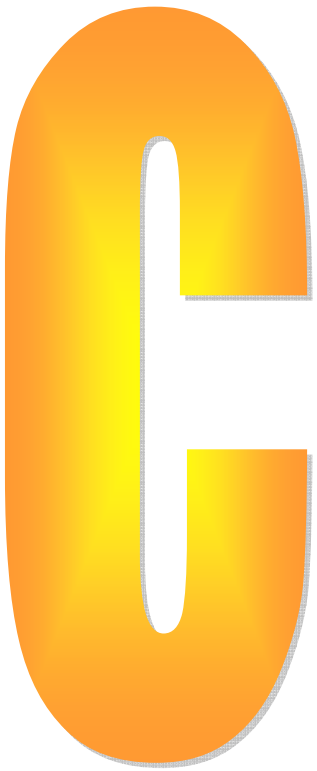
# Initiatives Under Early Planning

# Initiatives Under Early Planning/Consideration

- **Abolishing deadlines for applicants**
  - Design a Pilot for members of standing study sections
  - Fellowships?
  - Small Business?
- **Reviewer rewards**
  - Focus more on intellectually stimulating experience
  - No deadlines for applications
  - Increase grant support to cover time doing reviews?
- **Editorial Board Reviews**
  - Fellowships
  - Translational, multidisciplinary research

# A New System?

- If we didn't have any peer-review system and we had to design one from scratch, what would it look like?



# This is CSR