NIH in the Post Doubling Era:
Realities and Strategies for the Future

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Competition for funds from the NIH and other sponsors, intensifying year by year, now stands at an unprecedented level, and shows no sign of abating. Never before have so many established investigators faced so much uncertainty about their longevity as active scientists. Never before have so many novices faced so many disincentives to entering or continuing a research career.

Dr. William F. Raub, Former Deputy Director NIH

1982
The Apparent Paradox:

The budget of NIH has doubled

- but -

Success rates have dropped by a third

*What is happening?*
National Research Capacity and Demand for Grants Surges at End of Doubling Period, Success Rates Fall

- % Success Rate of Grants Funded
  - 1998: 31%
  - 2001: 22%
  - Projected 2007: 19%

- Number of Applications/Applicants (in thousands)
  - 1998: 24,154
  - 2001: 43,069
  - 2006: 49,656
  - Increase: +8,359

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June 29, 2006
National Research Capacity and Demand for Grants Surges at End of Doubling Period, Success Rates Fall

% Success Rate of Grants Funded

Number of Applications/Applicants (in thousands)

- Success Rates
- Applications

+5,334
+5,208

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Investment in Research Facilities at U.S. Medical Schools

Dollars (in billions)

Year

1990-1997 3.2B
1998-2002 5.4B
2003-2007 9.5B

AAMC – Survey of Research Facility Investments (99 of 125 AAMC Member Schools)
* Data Based on AAMC Faculty Roster

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Common Misperceptions
Common Misperception 1: 
*NIH is Over-emphasizing Applied Research*
Common Misperception 2: "NIH is Shifting Towards Solicited Research"

- Unsolicited grants: 90% in 1994, 91% in 2006
- Solicited grants: 10% in 1994, 9% in 2006

Fiscal Year: 1994 to 2006
Common Misperception 3:
NIH Roadmap is Shifting Funds Away from Grant Pool

- Developed to increase synergy across NIH
- Not a single initiative but over 345 individual awards in FY 2005, 133 institutions, 33 states
- Estimated FY04-09
  - 40% basic
  - 40% translational
  - 20% high risk

FY2006 Budget = $28.6 B
The Bottom Line:

Demand for Grants “Took Off” Just as NIH Budget Was “Landing”!

- Post doubling “surge” in applications has led to a supply/demand imbalance
- Success rate drop is due to
  - Near 100% increased demand for grants
  - 80% increase in number of applicants
  - Near 40% increased costs of grants since 1998
  - 5% Decrease in inflation adjusted budget since 2003
NIH’s Challenge: Maintain Research Enterprise Vitality in Light of Reduced Purchasing Power and Increased Demand

Note: BRDPI is the Biomedical Research and Development Price Index

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Where Do We Go From Here?

Adaptive Strategies Based on Key Principles
Principle 1: Protect Core Values and Mission

Discovery and Generation of New Knowledge
Maintain a Balanced National Biomedical Research Portfolio

NIH - $28B
Private Sector - $59B

Basic Research
Translational Research
Clinical Research

Private Sector - $59B
Translational Research
Basic Research
Clinical Research
The Greatest Risk to Science is to Stop Taking Risk!
11/35 Pioneer Awards to Neuroscience

- Math modeling of neural networks (Larry Abbott)
- Architecture/plasticity of brain circuits (Hollis Cline)
- Evolutionary/computational approaches to motivation (Leda Cosmides)
- Large-scale, systematic mapping of neural circuit dynamics (Karl Deisseroth)
- Glycobiology of neural stem cells (Rosalind Segal)
- Vocal learning (Erich Jarvis)
- Sleep/synaptic homeostasis (Giulio Tononi)
- Detection/removal of neurotoxic proteins (Junying Yuan)
- “Neurogrid” hardware cortical simulation platform (Kwabena Boahen)
- Atomic-level study of neurodegeneration proteins (Gary Pielak)
- Nanotechnological detection of Alzheimer’s biomarker in CSF (Chad Mirkin)
Responding to the Changing Needs of the Scientific Community

- Catalyze change – Facilitate interdisciplinary research
- Stimulate the transformation of clinical and translational science into a new intellectual discipline
- Integrate resources and training and **early independence** for a new generation of scientists
- Promote maximum flexibility for science and reduce artificial barriers to research
Today, A Fundamental Scientific Barrier is our Limited Ability to Study Complex and Dynamic Biological Systems in Health or Disease!
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<th>Current</th>
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NIH Blueprint: Resources for Neuroscientists

- GENSAT
- Mouse Archiving and Central Distribution
- NIH Neuroscience Microarray Consortium
- Neuroimaging Informatics Tools
Hodgkin-Huxley ... Computational Neuroscience

“... collaboration between experimentalists and theoreticians is thriving.” – Floyd Bloom, Oct. 6 Science

Neuroscience Database Gateway
http://ndg.sfn.org/
The Genetic Association Information Network (GAIN)

- The first six studies were selected out of nearly three dozen applications:
  - Psoriasis  
    - University of Michigan
  - ADHD  
    - State University of New York-Upstate Medical University
  - Schizophrenia  
    - Evanston Northwestern Healthcare Research Institute
  - Bipolar Disorder  
    - University of California San Diego
  - Major Depression  
    - University of North Carolina
  - Diabetic Nephropathy  
    - Joslin Diabetes Center
Promote the Value of Ethical Animal Research for the Benefit of Humans and Animals.

*Stand by our Scientists*
**Principle 2:**

*Protect the Future: New Investigators!*

Pathway to Independence Award

- Five years of support consisting of two phases
- Phase I provides 1-2 years of mentored support for advanced post doctoral fellows - 90k per year
- Phase II provides up to 3 years of independent RO1 equivalent research support - 250k per year
- NIH aiming for 150-200 awards per year
  - Received ~700 applications so far
  - First award announcements this Fall

Principle 3
Focus on Balancing Supply/Demand and Scientific Priorities

- Actively manage supply/demand imbalance by adjusting programs
- Prioritize projects to maintain reasonable investigator-initiated success rates
- Maximize research and development over non core activities across all portfolios
- Facilitate peer-review processes to reduce need for multiple applications
Some Good News: Budget Recycling Phenomenon Will Provide Some Relief

What Funds are Available in any One Year?

- Budget Increase
- Uncommitted Funds
- Committed Funds

- From current year to previous year
- From ending grants started 4-5 years ago
- Continuing grants

NIH Appropriations

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October 2006
NIH Congressional Appropriations

Billions of Dollars

FY 1998: $13.7
FY 1999: $15.6
FY 2000: $17.8
FY 2001: $20.5
FY 2002: $23.3
FY 2003: $27.1
FY 2004: $28.0
FY 2005: $28.6
FY 2006: $28.6
FY 2007: $28.6

2007: + 3% New and Competing grants

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What are My Chances of Being Funded?

**Success Rate per Application Understates Funding Rate per Applicant**

Success Rate files as of May 3, 2006. Program srf_indiv_060103_rfm Individuals are determined using the pi_profile_person_id in IMPAC-II
Principle 4: *Proactive Communication about Investment in NIH*

*We need your help to:*

- Increase awareness of the benefits every American receives from public investment in biomedical research
- Convey to all audiences the role research will play in transforming medicine in the 21st century
- Educate the public and private sectors of the importance of sustaining momentum in advancing knowledge and discovery
NIH Homepage

- More than 40 Fact Sheets
- State-by-state Funding Data
- Newsletter from NIH Director
- Percent of public that knows about NIH’s role doubled from 6% to 12% since 2003
- Less than a third know role of federal govt in medical research
- NOT ENOUGH!

http://www.nih.gov/about/researchresultsforthepublic/index.htm
Principle 5:
Promote NIH’s Vision for the Future

Predictive  Personalized  Preemptive

Participatory
A Final Tribute to a True Neuroscience Humanist

“All one has to do is walk through a downtown area to appreciate that the availability of adequate treatment for patients with schizophrenia and other mental illnesses is a serious problem in this country.

We wouldn't let our 80-year-old mother with Alzheimer's live on a grate. Why is it all right for a 30-year-old daughter with schizophrenia?”

— Dr. Wayne Fenton, 1953-2006
NIH
Transforming medicine and health through discovery