NIH Budget Facing a “Perfect Storm” in 2006

- Federal & Trade Deficits
- Defense and Homeland Security needs
- Katrina
- Pandemic flu
- Post- Doubling effects
- Physical Sciences focus
- Biomedical research inflation- 3 to 5%
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, NIH Associate Director for Research and Training, strategy paper, 1982
What Is Really Happening?
3 Fundamental Drivers

- Large capacity building throughout U.S. research institutions and increase in number of new faculty

- Appropriations below inflation after 2003
  - Increases of 3% in ‘04, 2% in ‘05 and 0% in 06
  - Biomedical Inflation in 2004 was ~ 5%

- Budget cycling phenomenon
New Grant Applications, Applicants and Success Rates

During and After Doubling Period

<table>
<thead>
<tr>
<th>Year</th>
<th>Success Rates</th>
<th>Applications</th>
<th>Applicants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Projected:
- 2005: 43,069
- 2007: 49,656

Number of Applications/Applicants

% Success Rate of Grants Funded

- 1998: 0%
- 1999: 0%
- 2000: 0%
- 2001: 0%
- 2002: 0%
- 2003: 0%
- 2004: 0%
- 2005: 0%
- 2006: 0%
- 2007: 0%
New Grant Applications, Applicants and Success Rates

*During and After Doubling Period*

## Success Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>Applications/Applicants</th>
<th>% Success Rate of Grants Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>49,656</td>
<td>5%</td>
</tr>
<tr>
<td>1999</td>
<td>43,069</td>
<td>5%</td>
</tr>
<tr>
<td>2000</td>
<td>37,069</td>
<td>5%</td>
</tr>
<tr>
<td>2001</td>
<td>31,069</td>
<td>5%</td>
</tr>
<tr>
<td>2002</td>
<td>25,069</td>
<td>5%</td>
</tr>
<tr>
<td>2003</td>
<td>20,069</td>
<td>5%</td>
</tr>
<tr>
<td>2004</td>
<td>15,069</td>
<td>5%</td>
</tr>
<tr>
<td>2005</td>
<td>10,069</td>
<td>5%</td>
</tr>
<tr>
<td>2006</td>
<td>5,069</td>
<td>5%</td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

## New Grant Applications, Applicants and Success Rates During and After Doubling Period

- **Applications**
  - 1998: 49,656
  - 1999: 43,069
  - 2000: 37,069
  - 2001: 31,069
  - 2002: 25,069
  - 2003: 20,069
  - 2004: 15,069
  - 2005: 10,069
  - 2006: 5,069
  - 2007: 0

- **Applicants**
  - 1998: 49,656
  - 1999: 43,069
  - 2000: 37,069
  - 2001: 31,069
  - 2002: 25,069
  - 2003: 20,069
  - 2004: 15,069
  - 2005: 10,069
  - 2006: 5,069
  - 2007: 0

- **Success Rates**
  - 1998: 5%
  - 1999: 5%
  - 2000: 5%
  - 2001: 5%
  - 2002: 5%
  - 2003: 5%
  - 2004: 5%
  - 2005: 5%
  - 2006: 5%
  - 2007: 0%
Inflation Eroded Gains in NIH Funding

Real and Nominal NIH Funding Levels Since 2003

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Nominal Funding</th>
<th>Adjusted by BRDPI</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2003</td>
<td>26.7</td>
<td>26.7</td>
<td></td>
</tr>
<tr>
<td>FY 2004</td>
<td>28.2</td>
<td>25.2</td>
<td>-7.3%</td>
</tr>
<tr>
<td>FY 2005</td>
<td>28.9</td>
<td>24.8</td>
<td>-14.1%</td>
</tr>
<tr>
<td>FY 2006</td>
<td>28.2</td>
<td>24.8</td>
<td>-15.2%</td>
</tr>
<tr>
<td>FY 2007</td>
<td>28.2</td>
<td>24.8</td>
<td>-15.2%</td>
</tr>
</tbody>
</table>

Note: BRDPI is the Biomedical Research and Development Price Index

7.3% loss in purchasing power since 2003
The Budget Cycling Phenomenon:

What Funds are Available in any One Year?

- Committed Funds
- Uncommitted Funds
- Budget Increase
  - From current year to previous year
  - From ending grants started 4-5 years ago
  - Continuing grants

NIH Appropriations
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

Doubling
The Bottom Line:
Demand for Grants “Took Off” Just as NIH Budget Was “Landing!”

- Post doubling “boom” in applications has led to demand/supply imbalance
- NIH managed well despite small increases in 2004 (2.9%) and 2005 (2%) but flat 2006 made it difficult to adjust
- ~80% of success rate drop is due to increased demand for grants
- ~20% of drop is due to increased costs of grant and inflation effects.
- Budget cycling effect will improve demand vs supply of proposed

Applications
Budget
Common Misperceptions
Common Misperception: NIH is Over-Emphasizing Applied Research
Common Misperception: NIH Shifting Towards Solicited Research with too many RFAs

- Unsolicited: 91%
- Solicited: 93%

Percentage of Grants by Fiscal Year:
- Unsolicited: Steady at 91%
- Solicited: Steady at 93%

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

FY2005 Request = $28.757B

- Developed to increase synergy across NIH
- Not a single initiative but over 345 individual awards in FY 2005, 133 institutions, 33 states:
  - 40% basic
  - 40% translational
  - 20% high risk
NIAAA and Trans-NIH Initiatives

- NIH Roadmap:
  - Metabolomics Technology Development
  - Standards in Proteomics
- NIH Neuroscience Blueprint
- Center for Inherited Disease Research
- Genes and Environment Initiative
The Question on Everyone’s Mind: What are MY chances of being funded?
>99% of grants under the payline are funded

Success Rate per application
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
Where Do We Go From Here?
NIH Must Develop Adaptive Strategies:
Key Principles

- Protect core values and mission: *Discovery and New Knowledge*

- Protect the future: New Investigators
  - Pathway to Independence Program
  - Institutes and Centers efforts to assist new investigators

- Manage the key drivers
  - Supply/demand of grants

- Proactive communications
  - A unified message about value of NIH’s investment and need for sustainability

- Promote NIH’s vision for the future
Impact of NIAAA Research

- **Prevention Research:**
  - NIAAA research established the effectiveness of underage drinking laws.
  - These laws led to a reduction in drinking and alcohol-related crashes among people under 21.

- **Identified Environmental Risk Factors**

- **Identified Genes Involved in Protection and Risk**
  - Genes Confirmed for Alcoholism, a Common Complex Disorder (replicated)
  - Alcohol Dehydrogenase (ADH2; adh4)
  - Aldehyde Dehydrogenase (ALDH2)
  - Protection
    - NPY
    - OPMR1
    - CHRM2
    - SERT
    - OPRM1
    - NPY
  - Risk
    - GABRA2: AD/eeg-beta
    - SERT: AD/withdrawal type II, depression, anxiety, binge drinking, suicidality, OCD
    - CHRM2: AD/Bipolar
    - OPMR1: naltrexone responsiveness/reinforcement response
    - NPY: AD/stress response, withdrawal, heavy drinking, depression

- Average NIAAA investment per American:
  - ~$1.07 per year

- 14-year NIAAA investment per American:
  - ~$14.95 Total
Protecting the Future: Pathway to Independence Award

Enhanced Support for 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
Central Themes in NIH Communications:

A Vision for the Future
The Future Paradigm:
Transform Medicine from Curative to Preemptive

Predictive ↔ Personalized ↔ Preemptive

Participatory
NIH  Transforming medicine and health through discovery