Research Strategies when Paradigms Change: Right Sizing the Research Enterprise

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We are not the only ones having this discussion...

How Long Can the U.S. Stay on Top?

Government funding has powered U.S. research universities to global prominence. With that support now

DBS HOPKINS UNIVERSITY BEARS THE NAME OF THE MARYLAND
moniker who in 1873 made what was then the largest bequest in U.S.

The Bloomberg Center for Physics and Astronomy, the

Bloomberg School of Public Health, and the Bloomberg Children’s

Center hospitals are prominent reminders of the $1.1 billion donated

over the past 30 years by Michael Bloomberg, the billionaire me-

mogul and outgoing New York City mayor. And his generosity

well beyond bricks and mortar. In January, Bloomberg (7

class of 1964) announced that he was donating $250-

dow 50 new faculty chairs and $300 million to pro-

sheds to needy undergraduates.

Such gifts aren’t just eye-catching: In an era of st

eminent support for academic science, officials top research universities in the United States

more and more. "The name of the game is keeping your place at the table," said

popular ranking of the world’s best universities,

University, U.S. institutions now hold

But many of those top universities

if the largest single slice of

federal government, starts to

weakening over the

...
Right sizing the research enterprise

- Scope of cuts
- Impact
- Potential strategies & tactics
- Discussion
Federal Research Funding Falling
Non-Defense Research Funding
Note, space, health & general science

Source: AAAS, based on OMB Historical Tables in Budget of the United States Government FY 2013. FY 2013 is the President’s request.
Note: Some Energy programs shifted to General Science beginning in FY 1998. © 2012 AAAS
National Institutes of Health Funding

National Institutes of Health Budget, 1998-2013
budget authority in billions of constant FY 2012 dollars

Source: AAAS Report: Research and Development series and agency budget documents. FY 2012 and FY 2013 figures are latest estimates. © 2012 AAAS
NIH Funding FY 2000-13

Sources: NIH Budget Office; House and Senate Appropriations Committees

$M
35
30
25
20
15
10
5
0

NIH Budget in Current and Constant Dollars

Source: NIH Office of the Director, Office of Budget: http://officeofbudget.od.nih.gov/
Pressures on NIH budget:
Less $, more applications

Since 1998:

• Applications: ↑100% (25K to ~ 50K)
• Applicants: ↑68% (19K to 32K)
Success Rates (excluding ARRA)

Funding rates @ 6%-8% (competing renewals)

“We doubled the NIH budget and the funding rate went down. Can’t you guys practice birth control”
What Happened?
## Impact on New England by fiscal year: peak grant funding in red (millions)

<table>
<thead>
<tr>
<th>Funding</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>loss</th>
<th>%</th>
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<tr>
<td>MA</td>
<td>2,458</td>
<td>2,543</td>
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<td>CT</td>
<td>466</td>
<td>484</td>
<td>480</td>
<td>473</td>
<td>445</td>
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<tr>
<td>RI</td>
<td>155</td>
<td>154</td>
<td>153</td>
<td>147</td>
<td>144</td>
<td>11</td>
<td>7.1</td>
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<tr>
<td>ME</td>
<td>68</td>
<td>73</td>
<td>75</td>
<td>73</td>
<td>72</td>
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<td>VT</td>
<td>61</td>
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<td>53</td>
<td>51</td>
<td>55</td>
<td>6</td>
<td>9.8</td>
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<tr>
<td>Total</td>
<td>3,208</td>
<td>3,315</td>
<td>3,268</td>
<td>3,215</td>
<td>3,100</td>
<td>217</td>
<td>6.3</td>
</tr>
</tbody>
</table>

Source: Fredric Majnoun
New England Grant Funding Trends by fiscal year in millions

Numbers in millions

CT

MA

ME

RI

VT

Total

Source: Fredric Majnoun
Sequestration cuts

• 5% of NIH funding cut
• Also a 2% Medicare cut.

Grand Bargain in comparison:
• larger Medicare, Medicaid cuts
• probably NIH cut as well.
• Further cut in salary cap?
Analysis by Dr. Jeremy Berg

American Society for Biochemistry & Molecular Biology, reviewed in Science

In 2013, NIH funded investigators dropped by 500 to 1,000 (5% sequestration cut).
How are faculty salaries & facilities cuts paid for?

- Faculty have contracts or tenure
- Space (rent, mortgages) fixed costs
- Where is the $$$ coming from?
- Medical schools reporting operating losses.
How is your institution handling these cuts?
Public universities still have a mission of access and quality, but the means are changing. As states have continuously reduced their funding as shown in the chart, universities have turned to philanthropy, research, and raising tuition as different revenue streams. Source: National Science Foundation, Academic R&D Expenditures: FY 1953–2008.

http://www.nsf.gov/statistics/seind14/index.cfm/chapter-5/c5s1.htm#s1
University R&D Funding by Source
expenditures in billions, FY 2012 dollars

Where is the money coming from?
Medical School Revenue LCME Part 1-A: 126 Fully Accredited Medical Schools, FY2010

- Clinical & hospital
- Grants
- State funding
- Endowment & Philanthropy
- Tuition
Patient Care as a % of operating medical school revenues

Patient care revenue is an important revenue stream for most universities with medical schools (patient care as a % of total operating revenue, FY 2011)

Source: Moody's MFRA, AAMC
Challenges for Research Funding

- Health Care Reform: Clinical income to fund research disappearing
- NIH budget flat (or worse) for 10 years
- ARRA funds x 2 years, then sequestration.
- State institutions: budget cuts
- Endowments: unreliable
- Industry research funds falling
- Can’t raise tuition much: student debt already high
US Academic Medical Centers: Complex, Successful Organizations Driven by Integrated University-Hospital Strategies

New Challenges on the Horizon
Moody’s on AMCs

Following a decade of integration, competitive positioning and improved operating results, AMCs face heightened credit risks...

Governments are pressuring hospitals to become more cost effective -- challenging for AMCs due to their high operating cost structures.

The weak outlook for funding for hospital reimbursements and research grants increases pressure on AMCs as they deal with ebbing revenue growth.
AMCs with their high operating cost structures are under pressure to become cost effective clinically and educationally.

NIH research & medical cuts as well as pressure to minimize MD student debt further limit options.

Technology promises to decrease educational costs but medical education requires significant faculty supervision.
Yin-Yang of the Funding Climate

Faculty
- Spending more time writing grants
- “No time to think”, much less do science

Need:
- new funding sources
- new types of collaborations
- pilot grants
- bridge funding

Dean
- F&A to offset research cost declining
- Increasing % of faculty salaries centrally funded
- Increased regulations (cost)
- Dean’s office becomes “ask central”
Right sizing the research enterprise

- Scope of cuts
- Impact
- Potential strategies & tactics
- Discussion
Never waste a good crisis!
Rahm Emanuel

best time to make changes!
Add to the current model?
Adopting a Strategy

Current issues facing AMC’s

- **Clinical**: Healthcare reform - drive system costs down - how does this influence clinical, educational and research programs?
- **Education**: cost of medical education - price sensitivity
- **Research**: Reduction in research funding - NIH isn’t expected to grow, how do we sustain infrastructure, repurpose facilities? New partnerships?

Source: Mike White, CFO, BUSM
We all know the steps

• Develop an enterprise level framework for what can be reasonably accomplished
• Maintain a focused, disciplined approach
• Identify opportunities and pitfalls
• Be realistic about new initiatives as well as sun-downing operations that have exceeded their useful life
• Build something - look across the organization to leverage resources - you can’t do it by yourself

Source: Mike White, CFO, BUSM
Reducing costs

- shared service model
- consolidate basic science departments
- administrative staff reductions
- exit rental space
- decrease payments to University
- decrease # of PhDs and MD-PhDs.
- Do more with less. (Do less with less?)
Increase revenue

• increase faculty % salary on grant
• Space metric expectations (F&A/sq. ft.)
• post bac, MAs, certificate programs
• hospital support
• IP Licensing & Marketing
• Philanthropy
• Centralization management
Research Strategies when Paradigms Change

• Broaden the scope of research
• Enhance efficiency: new collaborators
• Develop new funding sources for research faculty—a “Practice plan”
Expand the scope of research...

**Big data:** Study large databases (Medicare, Kaiser, etc), to study preferences, behaviors and outcomes:
- now feasible: electronic medical records
- results often surprising: prostate cancer
- colon cancer pts don't get indicated rx

**Dry bench research:** better F&A per square foot of research space.
Global Health & Development

- Foundation funding: Gates, USAID, etc.
- Implementation research (Fogarty theme)
- Emerging infectious diseases, trauma, genetics
- Chronic diseases (obesity, hypertension, cancer & cardiovascular disease).
- International medical education, allied health,
- Students love it!
Other ideas for expanding the scope?
Research Strategies when Paradigms Change

- HHMI med to grad programs
- AHC networks (CTSAs) to form trials consortia (NCI cooperative groups)
- Central IRBs
- Standard national pharma research contracts
- Regional cores
HHMI Grad to Med Pilot Program

- Academia loses MD/PhDs to private practice
- Increasing numbers of PhDs in clinical departments
- HHMI program: Train PhDs in translational research
Work in teams

• Collaborate
• Can’t afford to compete
• NIH: multiple PI grants
Quarterback vs. Basketball Team model

- Faculty don’t have to give up their intellectual contributions to another PI
- Multi-disciplinary research (or patient care)
- Reward teams vs. single leaders
- Workplace diversity provides diverse solutions: e.g. Einstein’s riddle
Tactics

Grow the pie:

• Diversify research portfolio
• Recruit funded faculty
• Invest in centers
• Regional collaborations
Invest in Centers

Scope

Efficiency

Practice Plan

Immunology
- Physiology
- Pharmacology
- Biochemistry
- Medicine
- Psychiatry

Cancer

Scope

Efficiency

Practice Plan
Invest in Centers

• Centers Facilitate Research
• Support Cores (direct & indirect $$)
• Increase intra-departmental cross talk
• *Attract philanthropy to basic research*
Increase Efficiency

Out of the box collaborations
Massachusetts Green High-Performance Computing Center (GHPCC)

Shared high-performance computing center in Holyoke, Massachusetts using hydroelectric power

Partnership of

• Equity: MA Commonwealth, MIT, Harvard, U Massachusetts, Boston U
• Non-Equity: EMC, Cisco, & others
Massachusetts Green High-Performance Computing Center (GHPCC)

- Build facility for research & non-mission critical servers
- Meet computational space needs for 5-10 years
- Condo model for space & operating costs
- Low cost power $0.07/Kw-hr vs. $0.17 Kw-hr from Nstar
- ~50% reduction in annual operating costs, including depreciation
New relationships to leverage research faculty capabilities and talents?

- Netherlands insurance group funded clinical trials!
- CMS has funded a few pilot studies.
- Insurance companies would not have to cover less effective treatments.
Other ideas for increasing efficiency?
Diversify revenue streams
“Practice Plan” for research faculty

Health sciences education

• **Undergraduates**: "staying alive", happiness, STDs, ETOH, recognition of classmates mental health issues, flu

• **Lay audiences**: company or insurance covered
The issue of Post Docs: % of NIH Grants to Young Investigators Has Steadily Declined

Source: NIH
Rescuing US biomedical research from its systemic flaws (PNAS 2014)

Bruce Alberts, Marc Kirschner, Shirley Tilghman, & Harold Varmus (UCSF, HMS, Princeton & NCI)

“severe imbalance between dollars available for research and the still-growing US scientific community…has created a hypercompetitive atmosphere (that reduces) scientific productivity and (threatens) promising careers”
Recommendations

- 5 year research budget
- Reduce the PhD student #s
- Support students only on training grants
- Increase MS and PhD staff scientists
- Increase post doc salaries; limit support years
- More secure grant funding: track record based
- Review funding of >$1M per lab
- Limit fraction of salaries on grants
- Limit F&A for salaries & building costs.
NIH’s Institutional Development Award debate

• Invest in research in rural states
• Coalition advocates for 1% of NIH budget (from current $273 to $310 million).
• Boston: $1.8 billion in 2013 (8% of NIH funding)
• Also increasing scrutiny of researchers who have > $1 million in grants
• Warren “Our focus should be on increasing the investment in scientific research, not on how best to divide up a shrinking pot.”
What do you think of:

- Alpert Recommendations?
- NIH funding for rural states?
Dean’s Expectations for Research Administration

- Know and follow all regulations
- Facilitate grant submissions and administration
- Service, not policing, mentality
- Make suggestions to do this better!
Communicate and reassure: We are in this together.

Never lower your standards: lens through which we evaluate options

Use resources efficiently: share equipment, use space efficiently, accountability for salary on grants

Invest in your people: leadership development, mentorship, grantsmanship courses, mock study sections, etc.

Create an environment of opportunity and success: Recognize mentors in promotions and faculty awards.

Find programmatic synergies: build on institutional strengths. Centers and institutes generate administrative support through center and program grants.
Boston University Medical Center