

# Education in a Research Context



---

Peter Bruns

Howard Hughes Medical Institute



# HHMI Support for

---

- People: HHMI Professors
- Report: *Bio2010*
- Program: EXROP



# HHMI Professors

---

- 20 chosen
- Leading scientists
- Engaged educators
- \$1M over four years
- Will meet as a group



# To Find the Professors and What They are Doing

---

- Go to: [www.hhmi.org](http://www.hhmi.org)
- Search for: hhmi professors



# The List

---

- Manuel Ares, Jr. UC Santa Cruz
- Utpal Banerjee UCLA
- Sarah C.R. Elgin Wash U
- Ellen Fanning Vanderbilt
- Hilary Godwin Northwestern
- Bob Goldberg UCLA
- Jo Handelsman Wisconsin



# The List

---

- Graham Hatfull      Pittsburgh
- Ronald Hoy          Cornell
- Elizabeth Jones      Carnegie Mellon
- Darcy Kelley        Columbia
- Mary Lidstrom        U of Washington
- Richard Losick        Harvard
- Yi Lu                  Illinois



# The List

---

- David Lynn                      Emory
- Rebecca Richards-Kortum      Texas
- Alanna Schepartz              Yale
- Tim Stearns                      Stanford
- Graham Walker                  MIT
- Isiah Warner                      LSU



# *Bio2010*

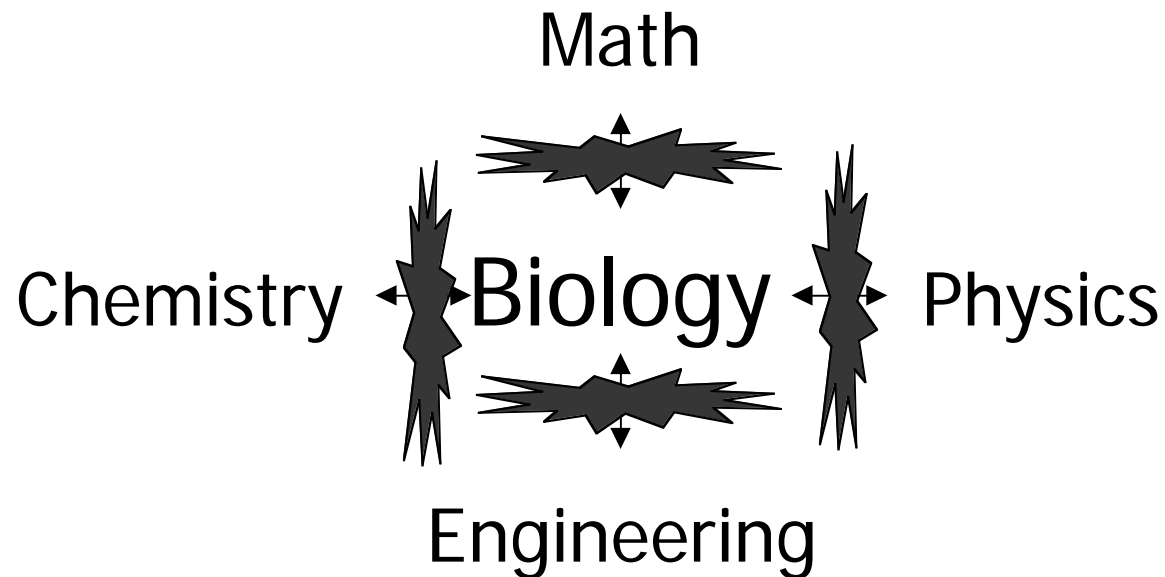
---

- “Undergraduate Education to Prepare Biomedical Research Scientists”
- HHMI/NIH
- Lubert Stryer, Chair
- Prepublication copy at [www.nas.edu](http://www.nas.edu), search for bio 2010

# *Bio2010* Findings

---

- The nature of contemporary bio





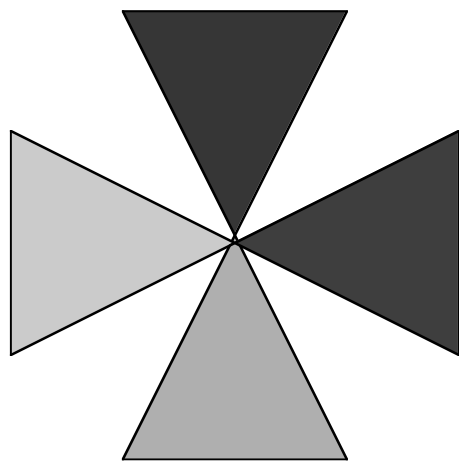
# *Bio2010* Findings

---

- The nature of the academy
  - Dynamic research
  - Static teaching

# *Bio2010* Multiple Solutions

---



Institutions



Faculty



External



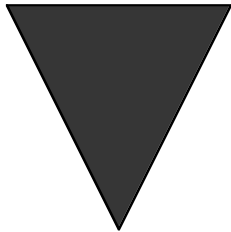
External



# Top Down: Institutional

---

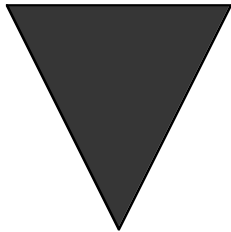
- University
- College
- Department





# Top Down: Institutional

---



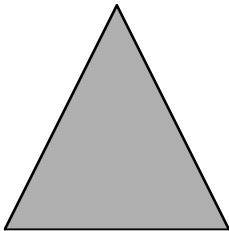
- Reward teaching
- Credit faculty efforts in
  - interdisciplinary teaching
  - student research
- Rework bio-major requirements
- Encourage mutual inclusions (bio, chem, math physics, engineering)



# Bottom Up: Faculty

---

- Add quantitative material to bio courses.
- Add modules to courses
  - Case studies
  - Current examples
  - Research experiences
- Learn from the science of teaching



# EXROP: Exceptional Research Opportunities



---

An example that might be useful  
for Center program planning



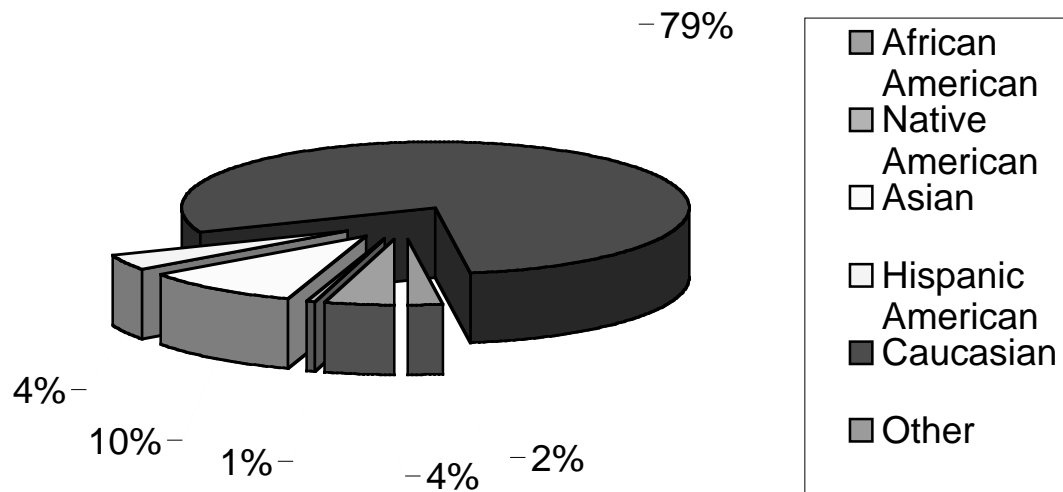
# The Problem and a Solution

---

Data from Mike Summers at  
UMBC with the Meyerhoff  
Program

# The Problem

## SEM PhD Production in 2000



Source: NSF WebCASPAR database



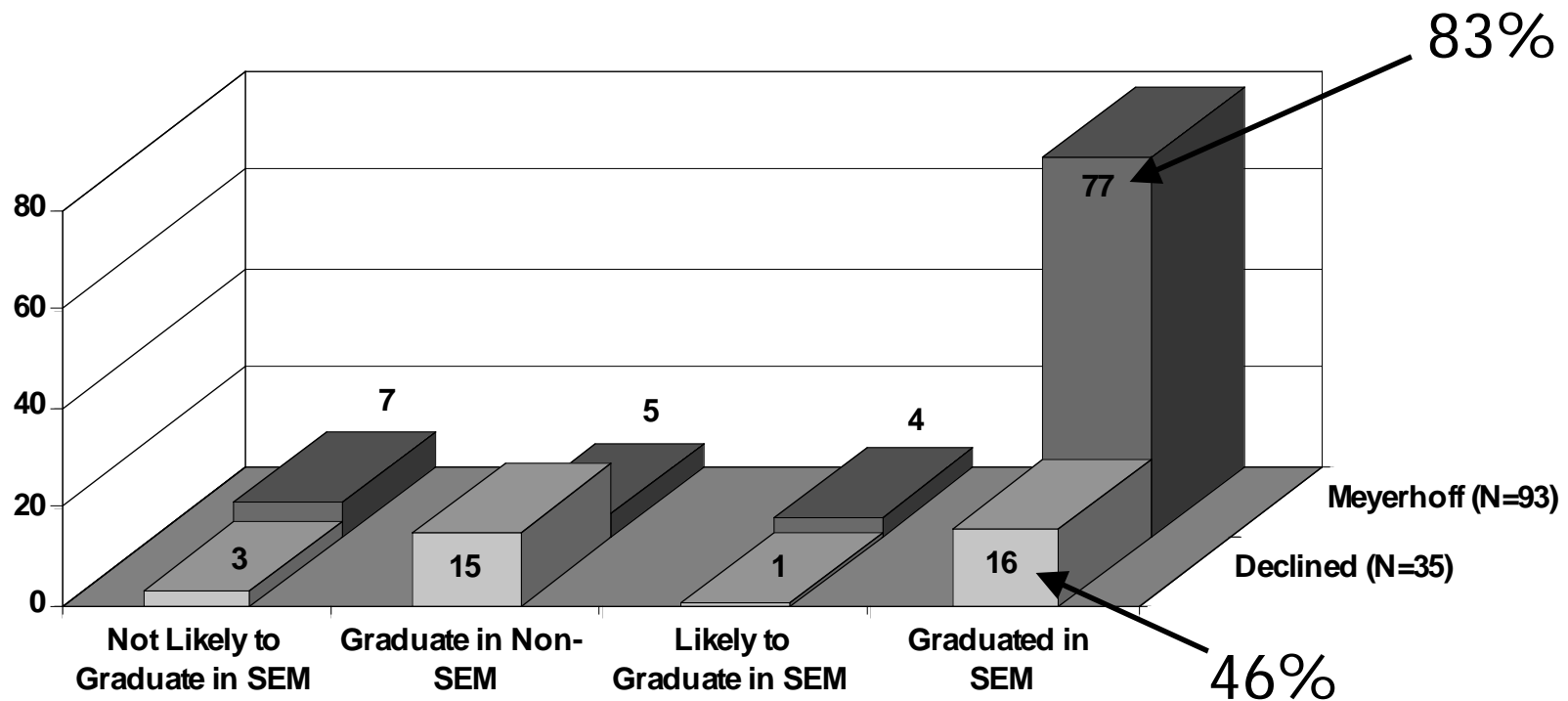
# The Meyerhoff Solution

---

- Find highly talented, high achieving students
  - (i.e. start with strong students)
- Active research from early on
- Mentor, mentor, mentor

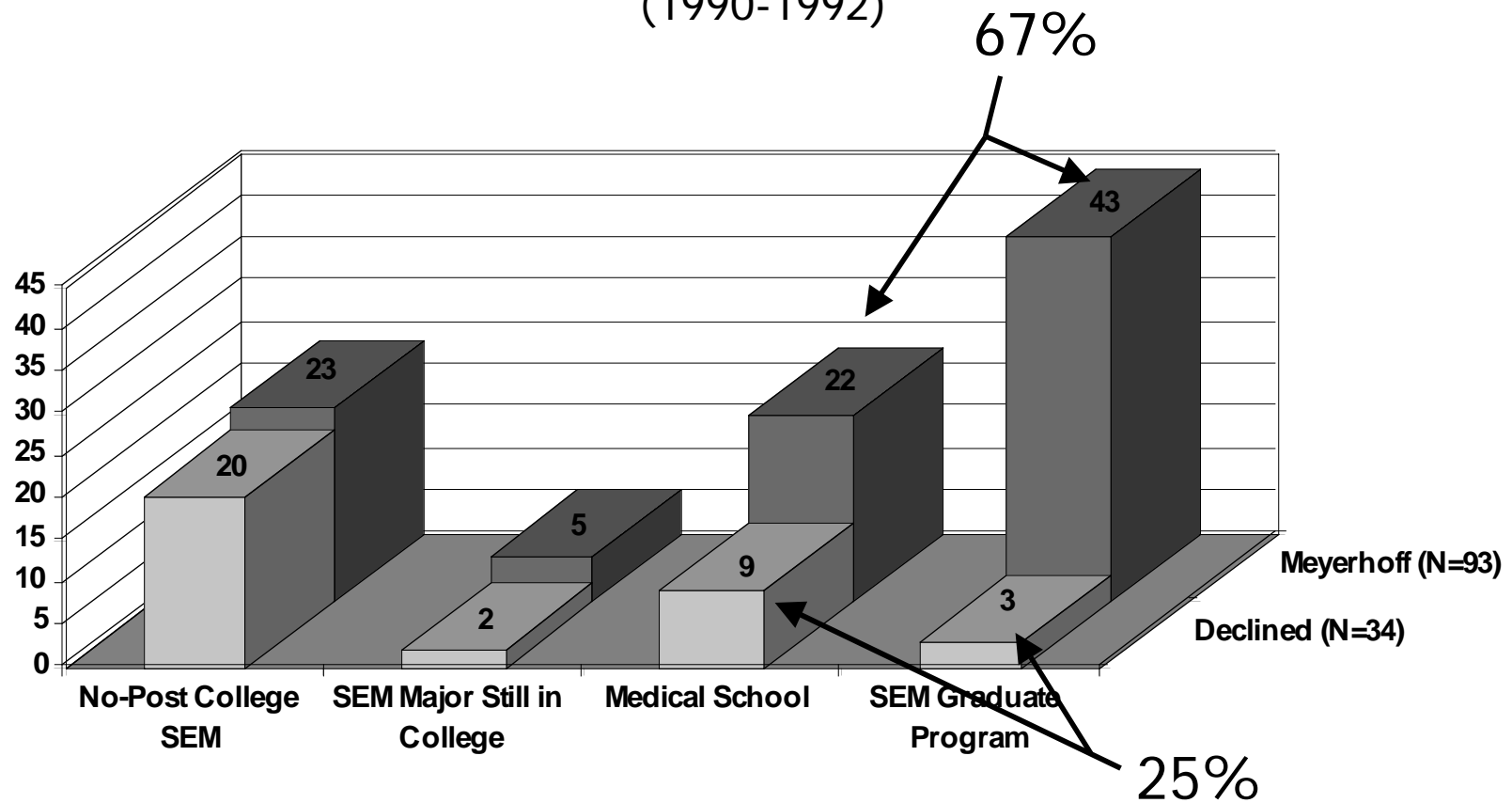
# Retention in SEM Major

Meyerhoff students versus those who declined offer  
(1990-1992)

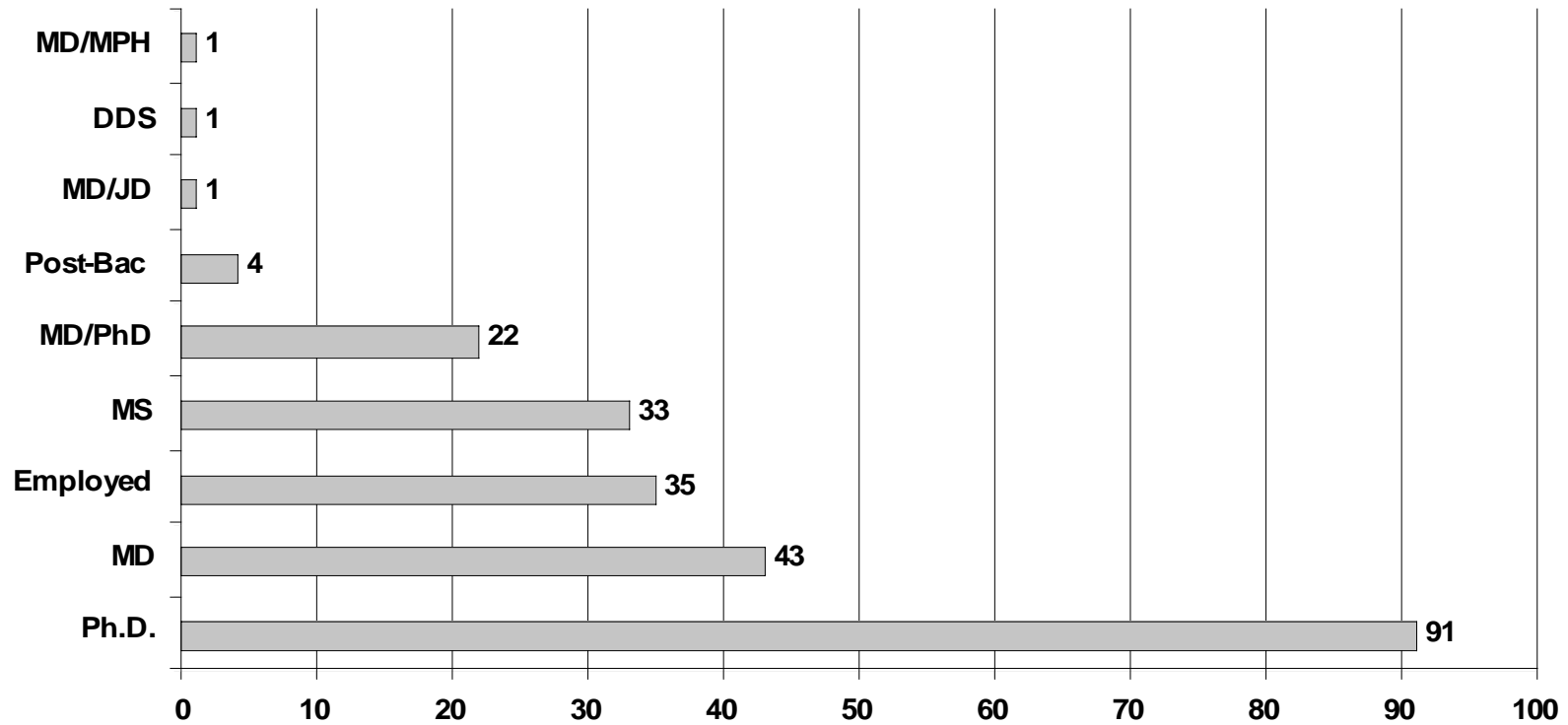


# SEM Majors Post-College

Students who accepted Meyerhoff offer versus those who declined  
(1990-1992)



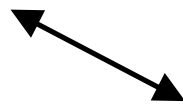
# Outcomes, as of '02



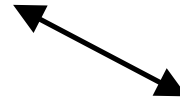
# EXROP Strategy

---

Undergraduate  
Programs



Investigators

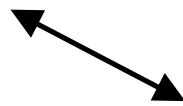


Graduate  
study

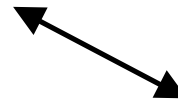
# Research Center Strategy?

---

Undergraduate  
Programs



Center Scientists



Graduate  
study



# The Summer Elements

---

Source → Site → Lab

University or college with a record of being a source of minority undergraduates who go on to graduate work in science.

Institution with a summer housing and social program with minority students

HHMI

Investigator



# URL's for Further Reference

---

- [www.nas.edu](http://www.nas.edu)
  - search for bio2010
- [www.hhmi.org](http://www.hhmi.org)
  - search for hhmi professors
- [www.umbc.edu](http://www.umbc.edu)
  - search for meyerhoff