Developing a More Productive, Efficient and Sustainable Biomedical Research Enterprise

Jon Lorsch
NIGMS Mission

• Promote fundamental research on living systems to lay the foundation for advances in disease diagnosis, treatment and prevention.

• Enable the development of the best trained, most innovative and productive biomedical research workforce possible.
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2015 NIGMS budget is $2.37 Billion

- Extramural Research: 89%
- Training & Workforce Development: 8%
- Intramural Research: <1%
- Administrative: 3%
Our job is to ensure that the taxpayers’ money is invested in fundamental biomedical research in the most efficient and effective way possible
National Institute of General Medical Sciences
5-Year Strategic Plan

March 2015
A Major Strategic Goal for NIGMS Is to Refocus Our Portfolio on Investigator-Initiated Research

Jim Deatherage, NIGMS
Portfolio Rebalancing Contributed to a Jump in Success Rate in FY 2014

Predicted 2014 success rate without rebalancing
Project-based Funding

- Early career investigators
- Distribution of funding
- Efficiency
- Academic business model
- Optimizing education
- Maximizing chances for discoveries
- Reproducibility
- Peer review
- Diversifying Research
- Size of workforce
- Promoting creativity and innovation
- Are trainees students or workforce?
- Post-doc. holding tank
- Stability and sustainability
- Scientific rewards system
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Distribution of NIGMS Grantees’ Total NIH Direct Costs

- Top 5% have 24%
- Top 20% have 50%

$398 Million
NIGMS D.C.

Data: Deatherage & Nie
Maximizing the Return on Our Investment of Taxpayer Dollars

Another R01 to someone who already has $400K d.c. buys the taxpayers 1 extra paper

An R01 to a new PI or someone who will otherwise have nothing buys the taxpayers 5 papers

4 paper difference in yield
What should our metric for funding be?

# of Grants Awarded
What should our metric for funding be?

- # of Grants Awarded *X*
- # of Investigators Supported
Funding Research *Programs* instead of Individual *Projects*

- Increase the **stability of funding** to enhance investigators’ willingness to take on ambitious scientific projects and to approach problems creatively.

- Increase **flexibility** for investigators to follow important new research directions as opportunities arise.

- Improve the **distribution of funding** among investigators to increase overall scientific productivity and the chances for important breakthroughs.

- Reduce the time spent by researchers **writing grant applications**, allowing them to spend more time conducting research.

- Reduce the time spent on **reviewing grant applications**.
Maximizing Investigators’ Research Award (MIRA)

- One NIGMS research grant per PI – R35
- Bigger and longer (5 years) than current R01 averages
- Direct cost range up to $750K
- Not tied to specific aims
- Review based on track record and overall research ideas
- Budget could be modulated based on competing review in order to avoid abrupt termination of research groups
- Separate panels and modified review considerations for early-stage investigators
What MIRA Is Not

• Not targeted specifically at high-risk, high-potential-reward research

• Not targeted specifically at a perceived highly elite group of investigators

If it works, MIRA could support any investigator studying questions related to NIGMS’ mission
Initial Implementation Plan

• Need to generate a moderate number of applications to test the MIRA application and review concepts.

• Applications from NIGMS established PIs with either ≥2 NIGMS R01s or 1 NIGMS R01 for ≥$400K d.c.

• Applications from New Investigators.

• Separate FOAs, review panels, and review criteria for established PIs and New Investigators.

• If pilot phase is successful, expand the program to include all PIs working on questions relevant to NIGMS’ mission.
The NIGMS ESI success rate (R01, DP2, R37 and RF1 mechanisms) has remained higher than the success rate of NIGMS experienced investigators.

*ESI (Early Stage Investigator) – A new investigator who is within 10 years of completing their terminal research degree or within 10 years of completing their medical residency at the time they apply for R01 grants.*
Grants to New Investigators are Renewed More Frequently than New Grants to Established Investigators

New NIGMS R01s awarded FY 2004-2007

Data: Stefan Maas
"Reaching" to Fund Grants for New Investigators Seems to Be Justified

New NIGMS R01s awarded FY 2004-2007

Percent of Projects

Percentile ranking of initial (new) grant

Data: Stefan Maas
Some Important Issues in Workforce Development

• Developing the Optimal Workforce
  o Building diversity: from research questions to regions to people

• PhD Education
  o Promoting innovation to improve outcomes
  o Evaluation and outcomes assessment
  o Career development

• Physician-Scientist Education
  o Complementary models to the Medical Scientist Training Program?
  o Retention in research

• Postdoctoral Training
  o What is postdoctoral training for and who should do it?
  o Improving postdoctoral training
A Shared Responsibility

Sure glad the hole isn’t at our end.
Questions or Comments?