

# Introduction to NIH

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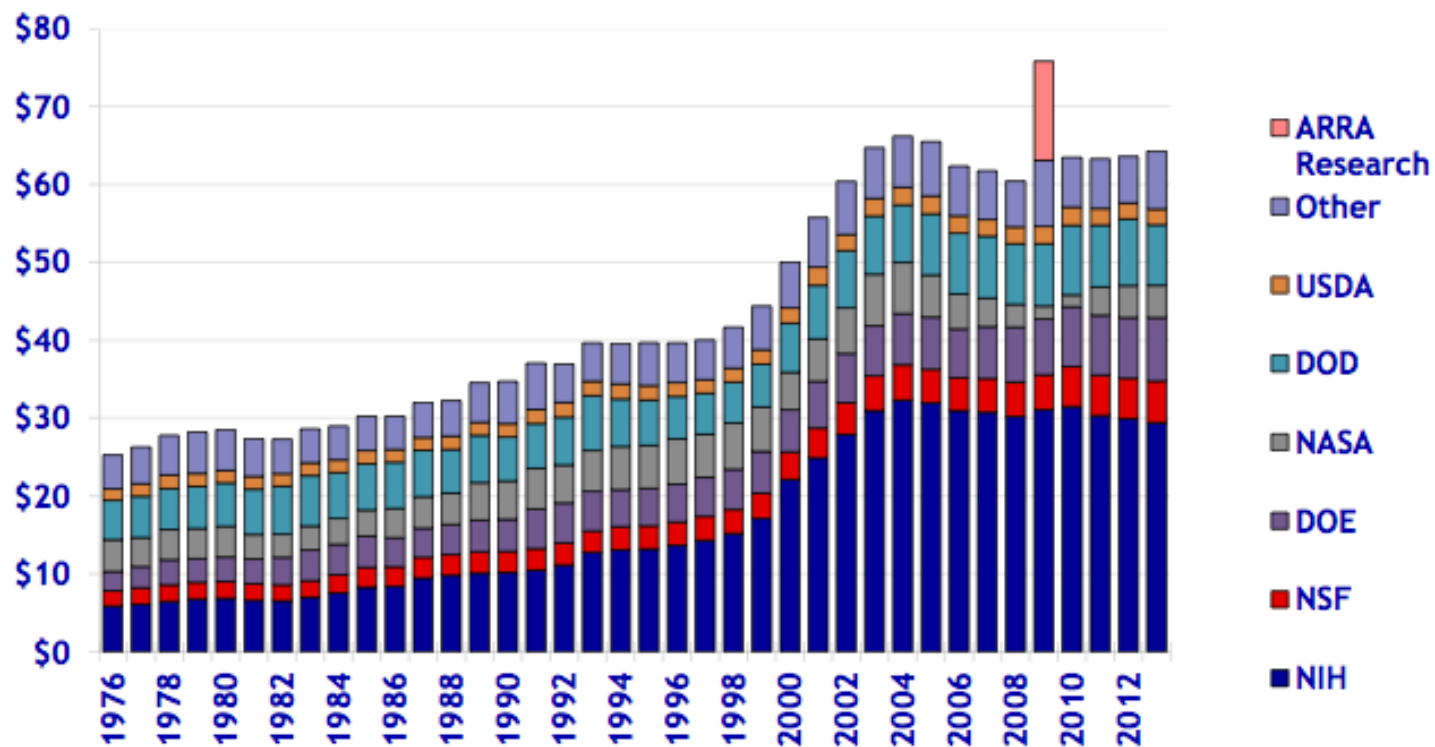
VP and Associate Provost for Research & Graduate Studies

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# Scale, organization and character

## Trends in Research by Agency, FY 1976-2013

Billions of FY 2012 Dollars



Source: 1976-1994 figures are from the NSF federal funds survey; remainder is from AAAS R&D reports. FY 2012 figures are latest estimates, FY 2013 is the President's budget.

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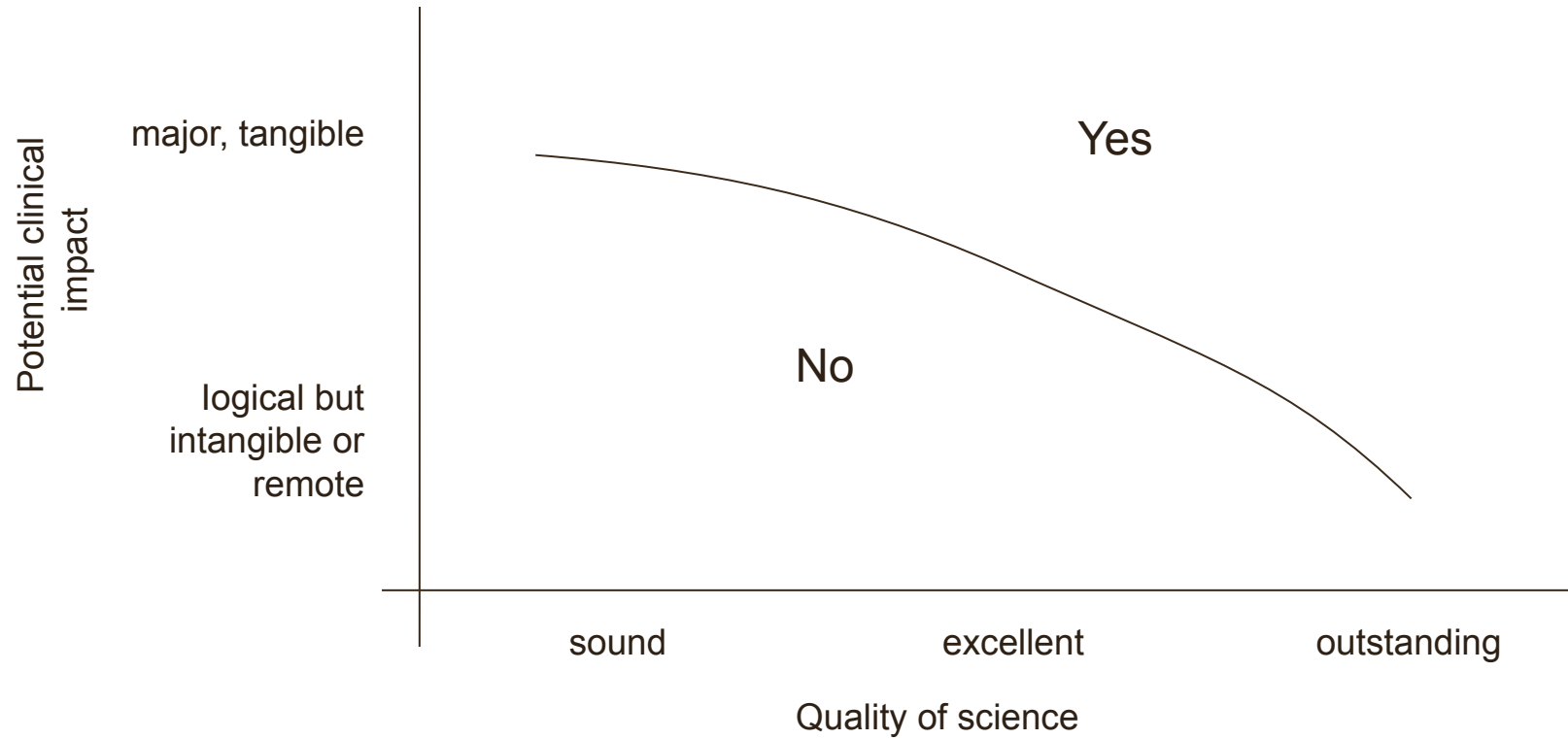
# Organization: Institutes & Centers

- NCI
- NIAMS
- NIEHS
- CIT
- NEI
- NIBIB
- NIGMS
- CSR
- NHLBI
- NICHD
- NIMH
- FIC
- NHGRI
- NIDCD
- NIMHD
- NCCAM
- NIA
- NIDCR
- NINDS
- NCATS
- NIAAAA
- NIDDK
- NINR
- CC
- NIAID
- NIDA
- NLM
- OD

# What gets funded

- Lots of basic science, but with a marked disease focus
- Truly outstanding science with logical but possibly intangible relationship to understanding and treating disease
- Sound science with clear opportunity for impact

# What gets funded



# How things get funded

- Strong separation of program development & funding from the review process
- Institutes and Centers
  - Develop programs
  - Fund grants
- Center for Scientific Review
  - Reviews the majority of grant application

# Your program official

- Works for the Institute or Center
- Interested in having a productive portfolio
- Can be your friend and advisor
- Has exceedingly little discretion in funding



# The Center for Scientific Review

- Employs review staff (SRO's)
  - Assign applications to review groups (*study sections*)
  - Recruit peer reviewers, conduct review sessions, prepare feedback
  - Scientific background, PhD+ training
  - Career position

# The Center for Scientific Review

- Peer reviewers
  - “Just like you and me”
  - Majority nominated to standing study sections:  
3/year x 4 years
  - Standing members R01 or higher PI’s
  - Others “ad hoc”

# Institute/Center Council

- Final approval of all grants
- Most approvals en masse
- Larger grants require specific review

# Grant programs and applications

# Terminology: Grant Mechanisms

- R01 – research project grant – the “flagship”
- R21 – exploratory/developmental grant
- R03 – small research grant
- R15 – AREA grant
- P series – program project and center grants
- U series – cooperative grants

# R01 vs. R21

- R01
  - Usually requires preliminary data (but check PA or PAR)
  - Usually renewable (over and over)
- R21
  - Requires only rationale
  - Not renewable (gateway to R01)
- Both R01 and R21
  - Require a well-constructed and specific plan
  - Require clear and convincing evidence that you can do everything you say you'll do

# Terminology: Solicitations

- Investigator-initiated (unsolicited) - most common
- Request for applications (RFA)
  - Funds set aside
- Program announcement (PA)
  - No funds set aside and no special review
- Program announcement (PAR)
  - No funds set aside but *special emphasis* review panel

# New and Early Stage Investigators

- NI: prior to first R01 or larger grant
- ESI: NI within first 10 years (plus any extensions) of terminal degree
- Individual institutes and centers may give preferences to new and ES investigators
- **Average age, PhD with first R01, is ~42**

See [grants.nih.gov/grants/new\\_investigators/](https://grants.nih.gov/grants/new_investigators/)



# Application structure (PHS398)

- Abstract – your story in a nutshell (write this last)
- Introduction (amended apps only)
- Specific Aims – your goals (write these first)
- Research Strategy – your story
  - Significance – Aims and proposed work in context
  - Innovation – departure from the obvious
  - Approach – your plan
  - Preliminary studies/rationale/progress report  
– your proof
- etc. (not that these things don't matter!)

# The review process

# Review criteria

- **Significance**  
How does the world change if this project is done?
- **Investigators**  
Are these people the best prepared to do it?
- **Innovation**  
Does the work challenge current paradigms?
- **Approach**  
Are studies well designed and poised to succeed?
- **Environment**  
Do the investigators have everything they need?

# Scoring system

- Criterion scoring – by assigned reviewers
  - Integer scores from 1 ... 9  
corresponding to Exceptional...Poor (sort of)
- Impact (“priority”) score – by all panel members, only if discussed
  - Integer score from 1 ... 9
  - Average x 10 → score from 10 ... 90

# Review process

- Each application reviewed in advance by about 3 assigned reviewers
- About half of applications not discussed, per initial “triage.”
- Applications that are discussed
  - Presented by the assigned reviewers, who recommend Impact Scores
  - Scored by all non-conflicted panelists

# Review process

- Reviewers do not recommend funding
- Reviewers may, and do, recommend budget changes, especially to carve out weak portions
- Reviewers may, and do, recommend reduction in years of funding
  - 5-year plan commonly yields 3 years' funding

# Trends in CSR review

- Mail reviews / pre-reviews (two-stage)
- Use of less experienced reviewers

# Funding: from CSR to the IC

- Impact score → percentile
- Applications ranked, across review groups, by percentile
- Funding per available funds in IC or program
  - subject to across-the-board cuts to hit goals for funded projects
  - some discretion at the margins
  - potential for partnering among IC's



Some advice

# Keys to success

- Know your audience
  - What they know, what they don't know
  - Be cognizant of multidisciplinary and disease/system-oriented study sections
  - Remember: most reviews are done by overworked people on nights and weekends

# Keys to success

- Tell a good story.
  - Engaging from the very start
  - Momentum/anticipation/surprise
- A meticulously prepared, well-written, well-referenced, easy to read application
- A clear, specific plan
  - alternatives as appropriate in limited critical areas

# Your goals

1. Make the reader want to know what happens  
(when you get to do the work)
2. Convince the reader that you can do it

# Making them want to know

- A clear problem or possibility important to people other than you
  - patients (but **do not** stretch the argument)
  - caregivers (ditto)
  - scientists (more than those just like you)
- A novel, interesting and promising approach

# Convincing them that you can do it

- A meticulously prepared, well-written application
- No logical gaps
- Demonstrated facility with key techniques
- A sound structure to the overall plan

# Things to avoid

- A wildly ambitious plan, or one of unrealistic scope
- “Specific Aim fatigue”
- Hyperbole
- Getting mired in technical details
- Skipping over key details
- An application that is, in any way, hard to read
- Acronymphillia

# The cover letter

- List expertise needed for review
- Request IC or study section assignment
- Point out RFA or PA
- Requests exclusion of reviewers
  - competitor, long-standing scientific disagreement, conflict of interest



# Work within NIH structure/culture

- Address the right audience, separately and one at a time:
  - Review process – SRO, CSR
  - Advice & counsel, interpreting critique – program office
  - Grant application – peer reviewers
- NEVER quote or characterize a conversation with your program office in an application

# Resources

- Reviewer guidelines  
[grants.nih.gov/grants/peer/reviewer\\_guidelines.htm](https://grants.nih.gov/grants/peer/reviewer_guidelines.htm)
- Rock Talk  
[nexus.od.nih.gov/all/rock-talk/](https://nexus.od.nih.gov/all/rock-talk/)
- Cover letters  
[www.niaid.nih.gov/researchfunding/grant/strategy/pages/4coverletter.aspx](https://www.niaid.nih.gov/researchfunding/grant/strategy/pages/4coverletter.aspx)