Introduction to NIH

Alan J. Snyder, Ph.D.
VP and Associate Provost for Research & Graduate Studies
November, 2012
Scale, organization and character
### Organization: Institutes & Centers

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

Quality of science
sound excellent outstanding

Potential clinical impact

major, tangible
logical but intangible or remote

Yes
No

LEHIGH UNIVERSITY
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/
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

- Rock Talk
  nexus.od.nih.gov/all/rock-talk/

- Cover letters