Practical Research Advice: NIH Navigation and Grantsmanship

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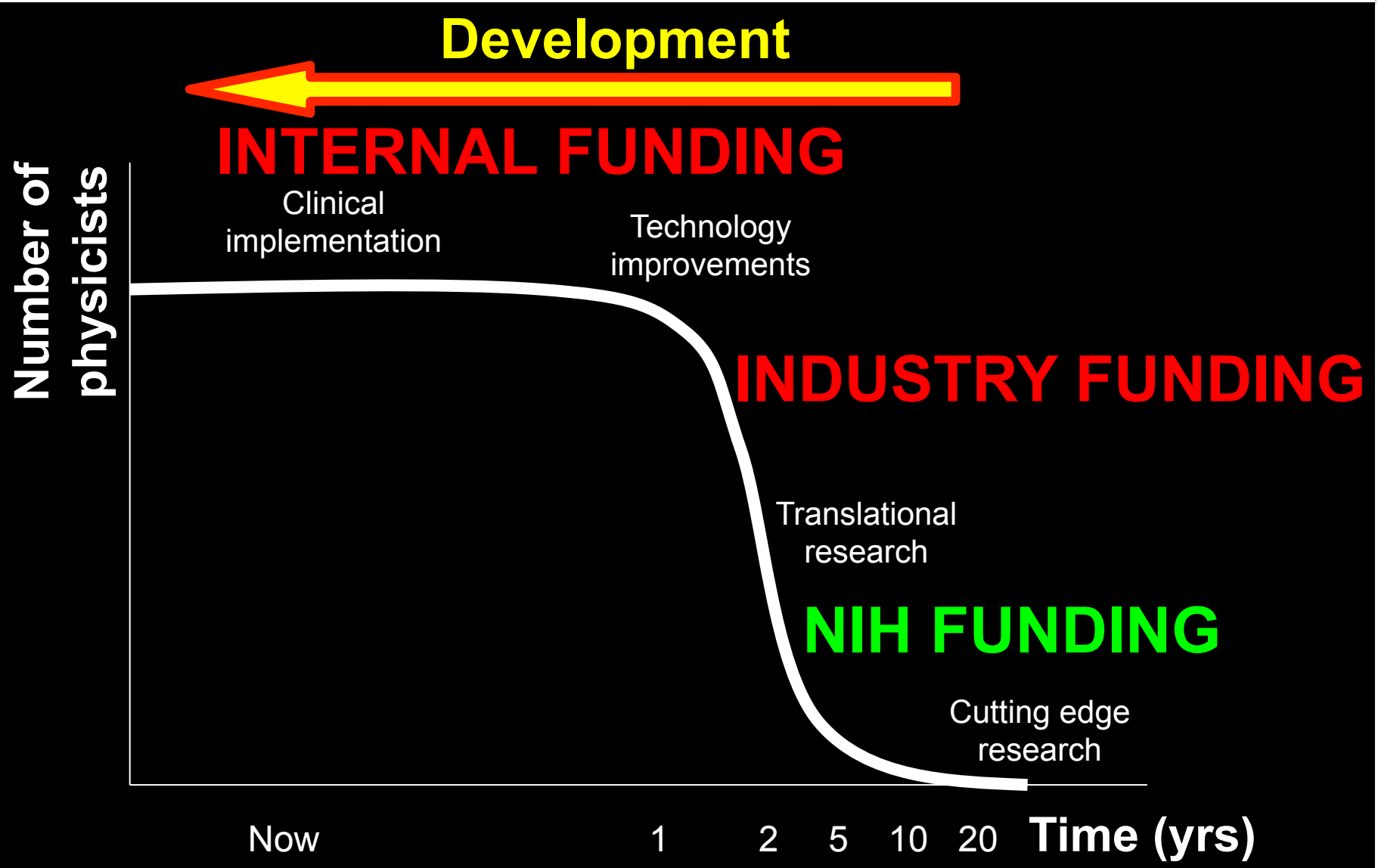
Outline

- Introduction
- NIH grant mechanisms
- Information and important websites
- NIH grant submission workflow

- NIH peer review process
- Review criteria, scoring
- How to write a successful grant
- Conclusions

Spectrum of medical physics



Bortfeld and Jeraj 2011, Br J Rad 84: 485

Most popular NIH funding mechanisms

- **R01** – Research Projects
- **R21** – Exploratory/Developmental Awards
- **R41/R44** – Small Business Awards
- **K/F** – Training Awards
- **P01** – Research Program Project Awards
- **R&D Contracts** - NIH's direct involvement

Research awards

- **R01 Research Project Grant**
  - Support a discrete, specified, circumscribed project (3-5 years)
  - Institutional sponsorship assures the NIH that the institution will provide facilities necessary to conduct the research and will be accountable for the grant funds
- **R21 Exploratory/Developmental Grants**
  - Encourage the development of new research activities (2 years)
  - No pilot data required

Application types

- **Unsolicited/Investigator initiated** applications http://grants.nih.gov/grants/guide/parent_announcements.htm

- **Initiated** applications: http://grants.nih.gov/grants/guide/weeklyindex.cfm
  - **Program Announcements (PAs)**
    - Statement of new or ongoing NIH interest in a certain research area
  - **Requests for Applications (RFAs)**
    - Statement soliciting applications in a well-defined scientific area to accomplish specific program objectives
    - Set-aside of money
    - Might need Letter of Intent (LOI)
    - Might have special review panel

Writing a grant

- Register as a user of NIH eRA Commons: commons.era.nih.gov/commons/
- Check for RFAs and Pas: www.grants.gov
- Check for deadlines: grants.nih.gov/grants/funding/submissionschedule.htm
  - New R01 applications: Feb 5, Jun 5, Oct 5
  - R01 renewals: Mar 5, Jul 5, Nov 5
  - Deadlines for applications in response to RFAs and PAs may differ
- Consult your local (University/Hospital) grant office for specific instructions how to go through the submission process

Scientific Review Groups (SRGs)

- Each study section has 12-24 members who are primarily from academia (roster is public)
- Study sections (typically) convene face-to-face meetings
- As many as 60-100 applications are reviewed by each study section in one or two days
- Reviewers receive grants about 1 month in advance

Reviewer Assignments

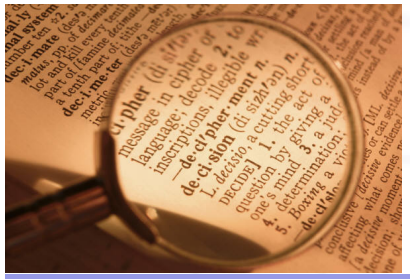
- ≥ 3 qualified reviewers (2 + 1)
- based on scientific content
- based on expertise of reviewer
- conflicts of interest
- reviewer workload

  ~ 8-12 as reviewer 1, 2, or 3

New investigator

A PD/PI who has not yet competed successfully for a substantial, competing NIH research grant, e.g. R01

- The NIH will support applications from NIs at success rates comparable to those for new applications submitted by established investigators
- The NIH encourages NI and ESIs to apply for R01 grants when seeking first-time funding from NIH (initiative is limited to R01)



eRA Commons Post Review

- Priority Score
  - ✓ Three days after conclusion of SRG meeting
- Summary statement
  - ✓ 4 – 8 weeks after conclusion of SRG meeting

After the Review

- Consult Program Officer
- Consider resubmission (once!)
  - ✓Consider critiques in summary statement
  - ✓Address critiques in introduction and text

Scoring system

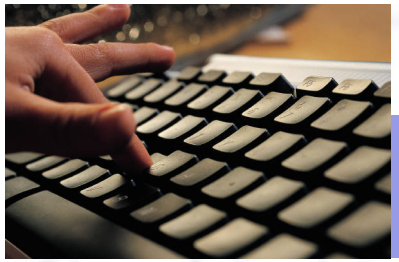
Score	Descriptor	Additional Guidance on Strengths/ Weaknesses
1	Exceptional	Exceptionally strong with essentially no weaknesses
2	Outstanding	Extremely strong with negligible weaknesses
3	Excellent	Very strong with only some minor weaknesses
4	Very Good	Strong but with numerous minor weaknesses
5	Good	Strong but with at least one moderate weakness
6	Satisfactory	Some strengths but also some moderate weaknesses
7	Fair	Some strengths but with at least one major weakness
8	Marginal	A few strengths and a few major weaknesses
9	Poor	Very few strengths and numerous major weaknesses

Minor Weakness: An easily addressable weakness that does not substantially lessen impact
Moderate Weakness: A weakness that lessens impact
Major Weakness: A weakness that severely limits impact

Review Criteria (individually scored)

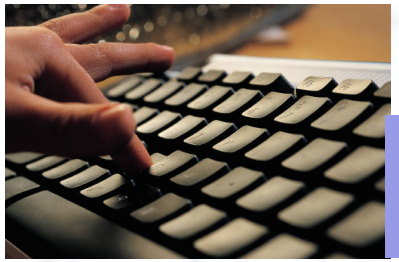
- **Significance**: Does the study address an important problem? How will scientific knowledge be advanced?
- **Innovation**: Are there novel concepts or approaches? Are the aims original and innovative?
- **Approach**: Are design and methods well-developed and appropriate? Are problem areas addressed?
- **Investigator**: Is the investigator appropriately trained?
- **Environment**: Does the scientific environment contribute to the probability of success? Are there unique features of the scientific environment?

There is also an overall score ("overall impact")



Outline

- Introduction to Application (if resubmission)
- Specific Aims
- Research Strategy
  - Significance
  - Innovation
  - Approach
  - Preliminary Studies/Progress Report (if renewal)
- References



Research Strategy

Approach

- Sections corresponding to the number of specific aims
- Describe specific methods to be employed
- Convince reviewers that this methodology will work
- Discuss the way in which the results will be analyzed and interpreted
- Discuss potential difficulties and limitations and how these will be overcome or mitigated
- State expected results