GRANT WRITING AND GRANTSMANSHIP

Geoffrey C. Gurtner, MD, FACS

Johnson and Johnson Professor of Surgery
Professor of Bioengineering and Materials Science and Engineering (by courtesy)
Stanford University
SURGICAL RESEARCH TRENDS

- Surgeons are submitting fewer applications
- Success rates are going down for everyone
- Surgeons have less overall funding than 15 years ago

Figure 2 Trends in award success rate (A) and application volume (B) within surgery and 5 top-funded nonsurgical departments between years 2004 and 2013.
“When you start your lab, work on the most audacious project that you can imagine.

If you chose right, you will still be working on it at the end of your career.”

Judah Folkman (1933-2008)
IN GENERAL

Work on something you are PASSIONATE about…

…and good things will follow
• Start Early!
• Over 3 months for your first grant
• Manage your schedule
• Last three weeks are critical – do not be distracted
**GRANT PREPARATION**

- Understand the process
- Submission Deadlines: February 5\textsuperscript{th}, June 5\textsuperscript{th}, October 5\textsuperscript{th}
- Revisions: March 5\textsuperscript{th}, July 5\textsuperscript{th}, November 5\textsuperscript{th}
- RFA’s
- “Study Section” review approximately 3 months later
• Clearly need a *central hypothesis*
• Need 2-4 specific aims to explore your central hypothesis
• Demonstrate that you can perform or are capable of doing the experiments proposed
• If you can’t perform them, get a collaborator or mentor who can
Specific Aims (1 page)
Research Plan (12 pages total)
  A. Background and Significance (2-3 pages)
  B. Innovation (1-2 pages)
  C. Approach (7-9 pages)
    - Include Preliminary Data
    - Organize by Specific Aims
• The first and most important page in an RO1
• Keep them simple in concept and short
• Discuss with others and often
• Can be “organic” as you prepare the application
• State your central hypothesis clearly and refer to it often, should be stated on specific aims page
Introductory paragraph to “set the table”
Finish with “central hypothesis”
  – Specific and testable
Aims are designed to test hypothesis
Avoid descriptive jargon
  – I use “To determine...”
Must be logical and make sense
• Avoid “too much” ambition
• Avoid fishing expeditions
• Avoid descriptive approaches
• Avoid “domino aims”
• Balance between too conservative or predictable results and “overly ambitious”
• You or your collaborator must have preliminary data to support each Aim
• Like a manuscript introduction
• Review the areas explored by each Aim
• Point out the “hole” in the literature that your Aim explains
• Reviewer should understand why you have proposed your Aims
• Reviewer should predict your Aims
Global Integration or Translational Strategy and Overall Integration of Aims with a Graphic
• How is what you are doing different from other researchers in your area?
• Why would it be a mistake not to fund you?
• Novel tools and technology?
• Will you develop new reagents that can be shared?
Preliminary Studies

- Very important
- Keep figures clean and easy to read
- Transition between studies – tell a story
- State what you’ve done and what remains to be explored in Specific Aim X
- State why these data are important for the related Aim
• Easiest part of the grant to write
• State why these experiments are important for the related Aim
• Elucidate specific techniques only once and then refer to them
• Keep figures sparse and easy to read
• Transition between sections – tell a story
• State what you’ve done and what remains to be explored in Specific Aim X
• Reference your key papers
OTHER FORMS

• Human Subjects
  – Exempt or not ( Expedited )
  – Women and minorities / children
  – Enrollment table

• Animal Justification
  – Answer the five questions
  – Put in table for animal #
  – Refer to this table in your Research Design & Methods

• Discussed after scores at study section
BUDGET

Forms

• Budget
  – Modular < $250,000
  – Non-Modular > $250,000
• Justification
  – Ask collaborators about % effort
• Personnel – rule of thumb (assumption of $250,000/yr)
  – 2 People + PI on an R01
• Break out supplies vs. animals on budget
• Congruence between budget, justification, and section F
Letters of Support

- **Start Early**
  - Detailed discussion ahead of time
  - % effort or “effort as needed”

- **Send a draft**

- **Great way to add expertise where you need it**

- **Be specific about what they will help you with**
• Need for all key personnel
• Four Pages
• Honors & Publications: two page max!
• Review format with RMG personnel. Form is CONSTANTLY CHANGING
• Research Support: ongoing and completed
• Important
• Can guide your grant to a “favorable” study sections
• Can suggest funding institutes
• Keep it short (one page max)
Rate Limiting Steps

- Request letters of support early
- Request updated biosketches early
- Budget: modular or detailed
- Justification of personnel, supplies, animals (per diem and purchase)
- Resources- incorporate the “strengths” of your institution
Supplemental Data

• Approximately 3 months after grant is submitted
• E-mail SRA of Study Section to ask when the last day you can submit
• 1 page PDF format
• PDF of manuscripts accepted for publication during interim no longer accepted
• Demonstrate that you are actively working on the grant
Peer Review

- Understand the process
- Study Section members receive package of grants to review
- Post-review and preliminary score (approximately 50% “triaged”)
- Primary, secondary, tertiary reviews given orally at study section
- Discussion of application
- Grants scored by all members (1.0 – 5.0 scale)
- Score posted 1-2 days later on NIH Commons
- Do not contact SRA for score
NIH GRANTS

R01 Summary Statement

• Significance
  – Usually what you tell them

• Approach
  – Research design & methods

• Innovation

• Investigator

• Environment

• Overall evaluation
NIH GRANTS

Summary Statement ("Pink Sheet")

• 6-8 weeks following study section
• “Summary and discussion” section at the beginning reflects discussion
• Critiques from each reviewer
• Speak with program officer whose name is listed on pink sheet
  – They often sit in on Study Section and can provide valuable information not in critiques
  – Ask what the most recent Institute pay line was
Revision

- One page introduction to revised application
  - Follows resources and prior to Specific Aims
- Think manuscript revision
- Global concerns
- Address critiques point-by-point
- Make changes obvious
- Do **NOT** argue with reviewers
• A₀, A₁ Applications
• Very few A₀ applications funded
• ? When to re-submit ?
• My opinion: When you can address the concerns of the reviewers
• Balancing Act: Waiting to acquire new data versus roster changing
• Achilles heel of NIH peer review
  – New Reviewers with New Concerns
  – Increasing frequency with ↑ number of revised grants submitted
Big Picture

• Funding is difficult, don’t get discouraged
• Expect failure
• Stay with it and resubmit
• Pick a mentor or collaborator in your area of interest
• Ask people to review your grant—EARLY!
• Collaborate with anyone who has a different skill set than you do
• Leverage your translational advantage as a surgeon