Resource "Buffet" for Writing Effective Scientific Grant Proposals

FIRST COURSE: THE FUNDAMENTALS OF SUCCESSFUL GRANTSMANSHIP

A successfully funded proposal is far more than a piece of writing. It's often the culmination of months of preparation. There's a great deal to know *before* you even focus on what you plan to do scientifically. To know what you are getting into, spend a few hours getting the overview (and more) via the resources listed here.

Start by viewing these videos from grant writing workshops at the University of Wisconsin's School of Medicine:
http://videos.med.wisc.edu/events/91. The link takes you to a video library that lists topics by date. I haven't viewed all of these yet, but I specifically recommend the following didactic presentations with the caveat that you usually won't be able to hear audience questions at the end and the slides aren't always legible:

- Grant Overview (Chen on 3/5/10)
- Writing a K Award (Cox on 3/5/10)
- Specific Aims (Rabago on 3/5/10 and Sesto on 3/27/09)
- Background and Significance (Jajour on 3/5/10).

Read these excellent articles for understanding the grant process from beginning to end:

- Devine, EB. The art of obtaining grants. *Am J Health-Syst Pharm 2009; 66:580-587.*

- Chung, KC and Shauver MJ. Fundamental principles of writing a successful scientific grant proposal. *JHS* 2008; 33A, 566-572.

- Berger, DH. An introduction to obtaining extramural funding. *J Surgical Research* 2005;128: 226–231.

Familiarize yourself with these sites:

From the American Association for the Advancement of Science:

Tips on how to find grants, and "work the process".
http://sciencecareers.sciencemag.org/career_development/tools_resources/how_to_guides/how_to_get_funding

Excellent series of short articles entitled "How not to kill a grant application".
http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/0210/grants_and_grant_writing_index

From the Burroughs Wellcome Fund/ Howard Hughes Medical Institute:

This downloadable book is a collection of practical advice, experiences, and opinions from seasoned biomedical investigators and other professionals.
http://www.hhmi.org/resources/labmanagement/moves.html

SECOND COURSE. SPECIFIC INFORMATION ABOUT NIH GRANTS

◆ For Junior Faculty Seeking an NIH Mentored Career Development ("K") Award

A terrific guide for that is useful for everyone, not just surgeons:
Brock MV and Bouvet M. Writing a successful NIH mentored Career Development Grant (K Award).   *Annals of Surgery*, 2010; 251: 1013-1017.

Don't miss UCSF's course on writing K grants, taught by Tom Mitchell: powerpoints and examples, or take the course
(click "schedule" to find the next offering of the course.)

Watch the video **"Writing a K Award" (click on the presentation by Cox on 3/5/10):**
http://videos.med.wisc.edu/events/91.

Very helpful article (again, not just for surgeons!): Brock MV and Bouvet M. Writing a successful NIH mentored Career Development Grant (K Award). Hints for the junior faculty surgeon. *Annals of Surgery*, 2010; 251: 1013-1017.

◆ **For Everyone**
Essential articles about the NIH process, from choosing an institute, understanding the various funding mechanisms, K series vs R series, building a team, and preparing the proposal: Berg KM *et al.* Demystifying the NIH Grant Application Process. J Gen Intern Med 22(11):1587–95. Horner RD. Demystifying the NIH Grant Application Process: The Rest of the Story. J Gen Intern Med 22(11):1628–9

I also highly recommend this site: http://writedit.wordpress.com/grantsmanship-downloads/
Once you link to it, you'll find a wealth of great resources, including the following:

New NIH Application-Review Processes – PDF of Powerpoint slides and corresponding notes reviewing shorter application format and enhanced peer review and scoring processes (2010).

> *Note:* NIH grant applications submitted after January 25, 2010 (i.e., for funding in FY11 and beyond) now have shorter page limits a restructured format, with changes to the research plan, biosketch, resources, and select agent components. In addition to checking the "writedit.wordpress.com" site, be sure to check the NIH's NIAID website (more about that below), which tends to have the best information and has already put out a call to scientists willing to "share" their successful proposals.

Early Career Grantsmanship – PDF of Powerpoint slides and corresponding notes providing a broad introduction to all things NIH and reviewing early career funding mechanisms (2010)

NIH Regional Grants Seminar Presentations Here, you'll find tremendously useful presentation material—downloadable PDF and PPT files—from NIH on everything from overviews of how the NIH works, to administrative processes, budgeting, career development, research integrity, and, of course, how to prepare an effective grant proposal! ***Presentations from the most recent regional NIH seminar are here:*** http://www.ohsu.edu/xd/research/nih-regional-seminar.cfm

The "Writeedit.wordpress.com" site is also a terrific place to follow NIH funding trends, as well as to post questions and get answers from other investigators. For example, a recent posting … http://writedit.wordpress.com/2010/06/ contained this key item:

> Writedit is in Portland for the NIH Regional Grants Seminar (& I recommend everyone attend one of these or at least view the online presentations… At one talk, an SRO shared a good rule of thumb for differentiating Impact from Significance: Significance is the hypothetical benefit to science/technology/clinical practice *if* the aims are achieved … Impact is the real-world impact, taking into account why the investigators & environment will really make this cool study work & shift a paradigm or two…

You can also go directly to the NIH website to learn about the new review criteria:
http://enhancing-peer-review.nih.gov/docs/application_changes.pdf
http://enhancing-peer-review.nih.gov/page_limits.html

Within the NIH itself, the best materials come from one institute—the NIAID—<u>but these materials are useful for all researchers</u>, regardless of whether the NIAID is where you'll be sending your proposal: For writing tips "in sync" with the new NIH Format, scroll down the page to the "in sync" section:
http://funding.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx#titlabs

Great advice linked to samples of successfully funded RO1 applications written under the shorter format, with the 12 page Research Strategy:

http://blog.citizen.apps.gov/NIAIDFunding/2011/01/writing-the-research-strategy/

http://funding.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx

NIH podcasts! "Designed for investigators, fellows, students, research administrators, and others, we provide insights on grant topics from those who live and breathe the information":
http://grants.nih.gov/podcasts/All_About_Grants/index.htm

Get an overview of the review process and how to improve your chances of being funded (NIH-specific but much will be true for other agencies): ora.stanford.edu/ora/ratd/nih_04.asp
This is a video link to a workshop on *NIH Funding Opportunities, Peer Review and Grant Writing*, which was presented by Anthony Coelho, Ph.D. Review Policy Officer, NIH National Institutes of Health on December 14, 2004, at Stanford University.

More from NIH:
   http://www.niaid.nih.gov/ncn/grants/cycle/part00.htm. The NIH grant cycle. It's worth the time it takes to go through it—you'll save all kinds of time and spare yourself many woes if you do.

   http://www.drg.nih.gov/Video/Video.asp. The Center for Scientific Review (the portal for NIH grant applications and their review for scientific merit) has produced a video of a mock study section meeting to provide an inside look at how NIH grant applications are reviewed for scientific and technical merit. The video shows how outside experts assess applications and how review meetings are conducted to ensure fairness. The video also includes information on what applicants can do to improve the chances their applications will receive a positive review.

   www.training.nih.gov/careers/careercenter/grants.html#prop Provides links to useful resources available on proposal writing. Many links will be useful for non-NIH proposals as well.

UCSF's Office of Career and Professional Development— http://career.ucsf.edu/events.html— hosts a workshop series on grant writing every Spring and a "Preparing Future Faculty" series throughout the year. Sign up on their listserv to receive announcements: http://career.ucsf.edu/pff/listservs.html.
   - Presentation that gives an overview of the NIH plus great advice about writing each section of the research plan, from Keith Yamamoto PhD, UCSF's Executive Vice Dean for Research: view as PDF .
   - Examples of K08, K23 and K24 grant applications: http://ctsi.ucsf.edu/training/grants-library
   - Additional resources: http://career.ucsf.edu/lifesci/samples.grants.html

A good resource that has detailed tips and examples for preparing a new NIH proposal, and may well be worth the $65 price tag—<u>use with caution though</u>, because it's too early in the process to know what a successful "new format" grant looks like:
The Grant Application Writer's Workbook: Guide to A Successful Proposal, National Institutes of Health.
http://www.grantcentral.com/workbook_nih_sf424_shortened.html

Essential Article for Writing Clinical Proposals: (includes several real examples):
Inouye SK and Fiellin F. An evidence-based guide to writing grant proposals for clinical research. *Ann Intern Med 2005;142:274-282.*