Grant Writing for Success
Part 2

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Objective: Help You Secure Funding for Research

What is available? How to get some?

Important Things to Know:
1. The handout material is a reference resource
2. The handout contains more information than I will discuss
3. Information that is important is repeated to remind you that it is important
Anthony M. Coelho, Jr., Ph.D.

Grant Success Associates 1 year
Health Research Associates 1 year
NIH Review Policy Officer 8 years
Scientific Review Administrator and Chief - Clinical Studies and Training Review Section - NHLBI 7 years
Peer Reviewer 12 years
NIH Funded Investigator 18 years
DOE Funded Investigator 8 years
Other Agencies and Private Sector Funding

My Research Experience:

- Role of Diet, Exercise and Stress on Blood Pressure Regulation, Atherosclerosis and Cardiovascular Disease.
- Effects of Exposure to Electric and Magnetic Fields on the Central Nervous System

Collaborators and Co-Investigators

- 2 Biological Anthropologists
- 2 Biostatisticians (and support staff)
- 2 Experimental Psychologists
- 3 Cardiovascular Physiologists (and labs)
- 3 Pathologists (and labs)
- 3 Lipid Biochemists (and labs)
- 1 Nutritionists
- 1 Exercise Physiologist (and lab)
- 2 Electrical Engineers (and support staff)
- 3 Veterinarians (and support staff)
- Lots of technicians, Post-docs, Consultants
Good Grantsmanship
Principles for Success:

- Understand the Agency Mission
- Understand Peer Review
- Secure collaborators for areas in which you lack experience and training
- There are no competitors in science, there are only potential collaborators.
- Grant writing is a learned skill
- Grantsmanship is a full time job
- You are in control of your life

Understanding the Agency Mission

• **NIH Mission** is science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burdens of illness and disability.
NIH supports research:
• in causes, diagnosis, prevention, and cure of human diseases;
• in processes of human growth and development;
• in biological effects of environmental contaminants;
• in understanding of mental, addictive and physical disorders; and
• in directing programs for the collection, dissemination, and exchange of information in medicine and health, including development and support of medical libraries and training of medical librarians and other health information specialists.

Understanding the Agency Mission:
• NIH mission is based and defined in law
• Appropriations bills define expectations
• NIH must report to Congress that it has complied with the legislative expectations
• NIH reports to congress on success
• NIH funding dependent on success and compliance with the legislative mandate
• NIH success based on the success of the scientists it supports
• NIH wants you to be a successful scientist

NIH INSTITUTES AND CENTERS
- AA National Institute on Alcohol Abuse and Alcoholism NIAAA
- AG National Institute on Aging NIA
- AI National Institute of Allergy and Infectious Diseases NIAID
- AR National Institute of Arthritis and Musculoskeletal and Skin Diseases NIAMS
- AT National Center for Complementary and Alternative Medicine NCCAM
- CA National Cancer Institute NCIC
- DA National Institute on Drug Abuse NIDA
- DC National Institute on Deafness and Other Communicative Disorders NIDCD
- DE National Institute of Dental and Craniofacial Research NIDCR
- DK National Institute of Diabetes and Digestive and Kidney Diseases NIDDK
- EB National Institute of Biomedical Imaging and Bioengineering NIBIB
- ES National Institute of Environmental Health Sciences NIEHS
- EY National Eye Institute NEI
- GM National Institute of General Medical Sciences NIGMS
- HD National Institute of Child Health and Human Development NICHD
- HG National Human Genome Research Institute NHGRI
- HL National Heart, Lung, and Blood Institute NHLBI
- LM National Library of Medicine NLM
- MD National Center on Minority Health and Health Disparities NCMBH
- MH National Institute of Mental Health NIMH
- RR NIH Roadmap Initiative, Office of the Director NROD
- NR National Institute of Nursing Research NINR
- NS National Institute of Neurological Disorders and Stroke NINDS
- RR National Center for Research Resources NCRR
- TW John E. Fogarty International Center FTC
Requests for Applications

- BARDA/NIAD Medical Countermeasures to Mitigate and/or Treat Ionizing Radiation-Induced Cutaneous Injury: Project Blueprint (R01) (RFA-AI-07-037)
  National Institute of Allergy and Infectious Diseases
  Application Receipt Date(s): February 21, 2008

- The Interaction of HIV, Drug Use, and the Criminal Justice System (R01) (RFA-DH-08-027)
  National Institute on Drug Abuse
  National Institute of Mental Health
  Application Receipt Date(s): February 27, 2008

- Human Microbe Demonstration Projects (UH2/UH3) (RFA-MB-08-012)
  NIH Roadmap Initiatives
  National Center for Complementary and Alternative Medicine
  National Cancer Institute

Program Announcements

- Thyroid in Aging (R01) (PA-08-037)
  National Institute on Aging
  National Cancer Institute
  National Institute of Diabetes and Digestive and Kidney Diseases
  Application Receipt Date(s): Multiple dates, see announcement.

- Thyroid in Aging (R21) (PA-08-038)
  National Institute on Aging
  National Cancer Institute
  Application Receipt Date(s): Multiple dates, see announcement.

- Thyroid in Aging (R03) (PA-08-039)
  National Institute on Aging
  National Cancer Institute
1. Research Objectives

Purpose

The purpose of this funding opportunity announcement (FOA) is to encourage submission of investigator-initiated research applications on the thyroid in aging. This FOA is intended to promote basic, translational, and clinical studies leading to increased understanding of the physiology of the aging thyroid and improved diagnosis and management of thyroid diseases in the elderly.

Background

Thyroid disorders are common in the United States. Thyroid disease affects an estimated 10.4 million Americans between 1988 and 1994 (NHANES III survey). An additional 8.7 million Americans had biochemical evidence of "subclinical" thyroid disease, and it is estimated that 50% of individuals with subclinical hyperthyroidism and 50% of individuals with subclinical hypothyroidism may be unaware of their thyroid status. Therefore, thyroid disease represents a significant medical and public health challenge in the United States.

When compared to younger adults, prevalence of thyroid disease appears to increase with age.
1. Scientific/Research Contacts:

David A. Fishman, M.D., Ph.D.
National Institute on Aging
35 US 1, SC-302
3701 Observatory Road
Baltimore, MD 21224-2690
Phone: 410-535-7505
Fax: 410-535-6920
Email: David.Fishman@nih.gov

2. NIH Home

Section VII: Agency Contacts

Identify NIH Staff who can help you
Grant Success Associates

NIH GRANT$ Formula for Grant Success

http://deainfo.nci.nih.gov/concepts/recentcleared.htm

Division of Extramural Activities

Concepts Cleared at the NCI Board of Scientific Advisors Meeting

June 29, 2006
- Pediatric Phase II Pilot Consortium (PA-04-07-302 published)
- Advanced Technology Radiation Therapy Clinical Trials Support (ATC) (PA-04-07-083 published)
- Cooperative Minority Institutional Cancer Center Partnership (CMICCCP) (PA-04-01-016 published)
- Cooperative Trials in Diagnostic Imaging (The American College of Radiology Imaging Network (ACRIN)) (PA-04-01-005 published)
- Early Clinical Trials of New Anti-Cancer Agents with Phase I Emphasis (PA-04-01-021 published)

November 14, 2006
- Cancer Genome Characterization Centers (CGCC) (PA-04-01-027 published)
Elements of Grant Success

- Good Ideas
- Good Timing
- Good Presentations
- Good Reviewers
- Good Luck
- Good Grantsmanship

Good Idea

SIGNIFICANT?
- Does it address an important problem?
- How will scientific knowledge be advanced?

INNOVATIVE?
- Builds upon or expands knowledge base
- Capable of making a difference

UNDERSTANDABLE?

Are These Good Ideas?
- Develop a vaccine to prevent HIV infection
- Develop a method to prevent HIV from replicating or mutating
- Produce a drug that will raise HDL and lower LDL without any toxic side effects
- Produce a drug that will lower blood pressure without any side effects
- Study the human genome
Are These Ideas Understandable?

What if you thought of these ideas in 1952? 1962? 1972? Are they still Good Ideas?

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- Develop a method to prevent HIV from replicating or mutating
- Produce a drug that will raise HDL and lower LDL without any toxic side effects
- Produce a drug that will lower blood pressure without any side effects
- Study the human genome

Good Timing

- Will the idea be understood by others?
- Does it build upon existing knowledge?
- Does it build upon similar ideas?
- Do you have preliminary data?
- How will the idea be received?

Good Timing is NOT

“I plan on submitting a grant application in two weeks can you tell me who might be a good program person for me to speak with before I send my application in?”
Good Presentation

Organize the Application

• What do you want to do?
• Why do you want to do it?
• How are you going to do it?
• What is the expected outcome?
• Why is it a good thing?

Good Presentation: Organize the Application

• Develop a logical outline (presentation sequence)
• Use Section Heading - help reviewers "find things"
• Heading must reflect the contents of the paragraphs
• Use both major and minor section headings
• Make it easy for reviewers - Don't make them work
• Use a detailed table of contents
• Do everything to help reviewers:
  Understand your idea,
  Why it is important and
  Why it is reasonable and feasible

Good Presentation

Address Review Criteria:

  Significance
  Approach
  Innovation
  Investigator
  Environment
Good Presentation: Address Review Criteria

(1) SIGNIFICANCE:
• Does this study address an important problem?
• If the aims of the application are achieved, how will scientific knowledge or clinical practice be advanced?
• What will be the effect of these studies on the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field?

(2) APPROACH:
• Are the conceptual or clinical framework, design, methods, and analyses adequately developed, well integrated, well reasoned, and appropriate to the aims of the project?
• Does the applicant acknowledge potential problem areas and consider alternative tactics?

(3) Innovation:
• Is the project original and innovative? For example: Does the project challenge existing paradigms or clinical practice; address an innovative hypothesis or critical barrier to progress in the field?
• Does the project develop or employ novel concepts, approaches, methodologies, tools, or technologies for this area?
(4) Investigator:
• Are the investigators appropriately trained and well suited to carry out this work?
• Is the work proposed appropriate to the experience level of the principal investigator and other researchers?
• Does the investigative team bring complementary and integrated expertise to the project (if applicable)?

(5) Environment:
• Does the scientific environment in which the work will be done contribute to the probability of success?
• Do the proposed studies benefit from unique features of the scientific environment, or subject populations, or employ useful collaborative arrangements?
• Is there evidence of institutional support?

Good Reviewers

Reviewer ➔ Good Reviewer
• Organize and make reviewers “Happy”
• Make it easy for them to understand things
• Make it easy for them to find things
• Make it easy for them to be your advocate
• Don’t make them “work hard”
**Factors Involved in Reviewer Assignment**

- Abstract
- Specific Aims
- Methods Section
- Self Referral Letter - request specific study section
- Research the background of the review committee
- Letter to SRA recommending types of reviewers

***TYPES OF REVIEWERS NOT NAMES OF REVIEWERS***

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**Know who the potential reviewers are and do what you can to control the selection process.**

- Self Referral Letter - request specific study section
  - Research the background of the review committee
    - CRISP Database
    - Rosters of Committees
  - Letter to SRA recommending types of reviewers

***TYPES OF REVIEWERS NOT NAMES OF REVIEWERS***

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**The consequence of:**

- Good Ideas
- Good Presentation
- Good Timing
- Good Reviewers
- Good Grantsmanship
COMMUNICATE WITH NIH

• Program Staff
• Review Staff
• Grants Management Staff

Improve your luck by preventing problems before they happen

COMMUNICATING WITH NIH

Before Submitting, Call Institute Program Staff
• Assess scientific interest and match
• What do they want to fund?

Submit Your Application With a Cover Letter
• Institute interest
• Study Section Interest - Charter

COVER LETTER

• Suggest Key Areas of Expertise Required
• Do Not Suggest Specific Reviewer Names
• Suggest Institute(s) For Potential Funding
• Suggest Study Section(s) For Review
COMMUNICATING WITH NIH

CONTACTS WITH REVIEW STAFF

Scientific Review Administrator answers
• Questions about the review process
• Format and structure of application
• “Oops” missing material or late material

COMMUNICATING WITH NIH

AFTER REVIEW, CONTACT PROGRAM STAFF

Institute Program Administrator
• Questions about the discussion of your application (after you have summary statement)
• Scores and percentiles
• Questions about the fundability of application

REVISE & RESUBMIT

Do Not Appeal Review Outcome

NIH Appeal Outcomes:
1. Council Denies Appeal (bad outcome)
2. Council Accepts Appeal: Original Application and Letter of Appeal is sent to the Same Study Section for a second examination and evaluation (bad outcome)
3. Council Accepts Appeal: Original Application be sent to a new Study Section but without the Letter of Appeal (bad outcome)
REVISION COVER LETTER

• For Revisions, Indicate Review History
• Request Same Or Different Study Section
• Provide Justification for your request
• Don’t be Argumentative ! Never!
• Don’t be Abrasive ! Never!

What if you know that you are “Right” and the reviewers are “Wrong”, is it appropriate to argue your position in your resubmission

A NO! NO! NO! NO! NO! NO! NO!

Remember
• An application for funding is not about the facts of your completed research.
• It is about ideas and potential research
• Never be Argumentative !
• Never be Abrasive !
• Do not do longterm damage to yourself

REVISING & RESUBMITTING

• Write A Clear Introduction Section
• Address All Criticisms Thoroughly
• Respond Constructively

• Accept the Help of Reviewer Comments
• Don’t Be Argumentative !
• Don’t be Abrasive !
**REVISING & RESUBMITTING**

- Update Preliminary Results
- Remember that Properly Revised applications can receive fundable scores and subsequent $$
- Maintain communications with Scientific Review Administrator and Program Administrator

**DO’S AND DON’TS**

- Do Pursue original science. This is an area that study sections are most concerned about.
- Do Provide a well focused research plan.
- Do not let your ideas wander from the main theme.

“This application is characterized by ideas that are both original and scientifically important.

Unfortunately the ideas that are scientifically important are not original and the ideas that are original are not scientifically important.”
“In addition to proposing a research design that is a fishing expedition, the applicant also proposes to use every type of bait and piece of tackle known to mankind.”

DO’S AND DON’TS (2)

- Provide a critical approach to project.
- Discuss potential problem areas and alternative approaches.
- Never assume that the reviewers will know what you mean.
- Always be explicit about what you want the reviewers to know and what they need to know.

DO’S AND DON’TS (3)

- Read the application instructions carefully.
- Read the application instructions carefully.
- Read the application instructions carefully.
DO’S AND DON’TS (4)

• Read the application instructions carefully.
• They may seem overwhelming but the effort is worth it and could spell the difference between success and failure.
• Supply sufficient detail.
• Stay within the page limitations.
• If you don’t understand something in the instructions ask for help.
• Call the SRA call the PA.

DO’S AND DON’TS (5)

• Do Secure collaborators for areas of research in which you lack experience and training.

Point of View

• There are no competitors in science,
• There are only potential collaborators.
DO’S AND DON’TS (6)

- Secure collaborations for areas of research in which you lack experience and training.
- "Independent Researcher" does not mean that you working in isolation.
- "Independent Researcher" does mean that you set the direction of the research.
- Don’t give the impression of being intellectually “Isolated”.

DO’S AND DON’TS (7)

- Prepare a reviewer friendly application.
- It should be well organized and clear.
- Tables and figures should be easily viewed.
- Do not hand-draw structures.
- Do not photoreduce your application to an unreasonable size.
- Remember that Reviewers work late at night.

DO’S AND DON’TS (8)

- Do not be overly ambitious.
- Project a realistic amount of work.
- Provide a thorough literature search.
- Be sure you have found key references.
- Know your Reviewers - do literature searches of committee members.
- Minimize typographical errors.
DO’S AND DON'TS (9)
- If you are a new investigator, ask for 5 years.
- The sentiment at NIH is to award sufficient time and funds for new investigators to establish their programs.
- Make sure that you have collaborators who can compensate for your deficiencies and who and add credibility to your innovative ideas.
- Don’t appear intellectually isolated.

DO’S AND DON'TS (10)
- If your application is a renewal or supplement request, be aware that study section members will not have the benefit of your previous application but rather only the previous summary statement.
- Be sure to explain your progress carefully in the current application.
- Publish, Publish, Publish - be productive.

BEFORE YOU SUBMIT AN APPLICATION
- Show your application to a colleague
- Show your application to a colleague who knows little to nothing about your area of research and ask them if they understand
  – What you are proposing to do?
  – How you are proposing to do it?
  – Why you are proposing to do it?
If they do not understand Revise until they do
- Get feedback on clarity
- Get feedback on scientific merit
AFTER REVIEW IS OVER

- The Program Administrator at the Institute to which your proposal was assigned is the new contact point. Wait for the Summary Statement.
- Address any concerns on review to them.
- Appeal letters are appropriate only if review was flawed (legal and procedural).
- More constructive use of your energy is amending and resubmitting the application and incorporating reviewer comments.
- Do not take the review comments personally.

IF YOU RESUBMIT

- Answer previous critiques completely.
- Supply an introduction section which explains the changes you have made.
- Leave your irritations with the review out of your resubmission.
- Don’t argue or be hostile.
- You will not be help yourself if you force the study section into a defensive posture.
- Accept Reviewers comments and suggestions as helpful and incorporate them in your revision.

IF YOU RESUBMIT

- Remember that the study section will have the previous summary statement, but not the previous application.
- Do not refer to the previous application for details.
- Remember that reviewers are generally trying to help you become a better research scientist.
Top 10 errors in grant proposals

1. Proposing to do too much
   • Common problem of new PIs
   • Giving reviewers too many targets to throw darts at
   • Assuming that the reviewers will be impressed with your ability to do everything
   • Demonstrates a lack of focus

2. Not Amending proposals properly
   – Hasty response
   – Giving reviewers new targets to throw darts at (change in the wrong places)
   – Failing to take advice
   – Failing to take advice of reviewers
   – Failing to respond to reviewer comments
   – Revising only what the reviewers point out and not using the opportunity to create a better application.

3. No Hypotheses or Predictions
   – Methods in search of reasons
   – Create animal models
   – Descriptive ‘bean counting’ or ‘fishing’
   [If you must do any of these, explain why.]
4. Silly Hypotheses

We propose to test the hypothesis that our methods of measurement are better than your methods of measurement.

5. Disconnect between Specific Aims and Research Design & Methods

- Methods without Designs
- Incomplete details of methods

6. Expertise missing

- Failure to demonstrate capability in preliminary studies
- Capability not demonstrated in publications
- Lack of appropriate collaborators and consultants
- Reliance on cameo appearances as backup
Top 10 errors in grant proposals

7. Non-Modular Budget
   – Inflated budget
   – Naïve low budget without explanation

8. Tilting at other people’s windmills
   – There are no “kid’s grants”
   – R03 and R21 grants are NOT first steps towards getting R01 grants
   – R03 and R21 grants are NOT easier to get than R01 grants
   – Present your best science and use the right mechanism = R01

9. Sloppiness
   – Dense text pages
   – Inconsistent information
   – Typographical errors, poor grammar
   – Logical failure
   – Poor organization
   – Failure to read instructions
   – Failure to follow instructions

Top 10 errors in grant proposals
10. Unexplained hiatus in productivity
   – Explain to the reviewers what happened - do not make them guess or assume an answer

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**Resources**

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**Funding Opportunities**

**Sites with important information:**

- http://grants.nih.gov/grants/welcome.htm#introduction
- http://deainfo.nci.nih.gov/funding.htm
Grant Success Associates

http://deainfo.nci.nih.gov/consumer.htm

How to Write a Grant Application

http://grants2.nih.gov/grants/grant_tips.htm
http://www.niaid.nih.gov/ncn/grants/
http://www.nigms.nih.gov/funding/tips.html
http://www.nigms.nih.gov/funding/moregrant_tips.html
http://deainfo.nci.nih.gov/EXTRA/EXTDOCS/gntapp.htm
http://12.46.245.173/cfda/cfda.html
http://cpmcnet.columbia.edu/research/writing.htm
Rule #1

**DO NOT** write the application for Yourself unless you are going to fund it yourself

You **MUST** convince the **entire** review committee and the funding agency

Rule #2

**STUDY SECTIONS**

**DO NOT FUND!**

**INSTITUTES FUND!**
Rule #3
You must satisfy the needs of reviewers and the needs of the funding agency.

Rule #4
Reviewers are never wrong. Reviewers are never right; they simply provide an assessment of material that you provided in your application.

Rule #5
Comments in the summary statements are never about you as a person. The comments are about the material that you provided in your application and the way in which you provided the information.
Rule #6
The comments in the summary statements only list some of the weaknesses not all of the weaknesses. When you revise your application use the time as an opportunity to improve the entire application.

Rule #7
Always contact NIH staff before you submit an application and preferably when you are in the planning stages.

Make sure that you give yourself and the NIH staffer enough time to work with together.

Q. Do I really have to contact NIH before I submit an application?

A. Only if you want to get funded!
• Always contact program staff during application development
• Must contact & IC staff prior to a submission if you want them to agree to accept the application for any investigator-initiated competitive applications with $500,000 direct cost for any single year
• Request must be at least six weeks before deadline
Rule #8
DO NOT write the application for the “Specialist”
You MUST convince the entire review committee

Rule #9
Secure Collaborators for areas of research in which you lack experience and training and who can complement you. Let them help you prepare the best possible application

Rule #10
Secure a mentor or mentors who can help you succeed
Who is a good Mentor?
EXAM Question
What are the Elements of the Formula Grant Success?

Grantsmanship
*Knowing + Understanding
  - What to do
  - How to do it
  - When to do it
  - What to do when things don’t go as planned
*Being willing to do what is needed
*Doing it- doing what is needed
Understanding Peer Review

NIH GRANT$
Thank You

See the Videos
http://ora.stanford.edu/ora/ratd/nih_04.asp

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