

# Writing Successful Grant Proposals: KTR

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# Grant Writing Fundamentals

- To enhance ability to get fundable score
  - Clearly defined problem
  - Ability of project to extend scientific knowledge
    - Interesting, important, testable hypotheses that build on previous research in the field
  - Propose a scope of work that is appropriate

# Developing a Hypothesis

- Review the past and current literature
- Choose a problem that is *Important*, that is *Feasible* with your expertise
- State the hypothesis *clearly*
- Make sure that the *hypothesis can be tested* with current approaches
- Make sure your results can be *interpreted*

# Address the W's

- **Who:** is your audience? Understand the focus of the granting agency
- **What :**
  - Is the question you are addressing?
  - Is the importance of the biological question?
  - Tools will you use to address the question?
  - What will society have at the end of the research?
- **Where:** will the research take us?
- **Why:**
  - Is the time now to address the question?
  - Are you the person to perform the research?

# Know your Agency

- Go to the web site of various funding agencies
- Read their “how to submit a grant” pages
- Learn their system
- Talk to a program officer about questions you have about the appropriate study section
- Follow the program announcement carefully (format, page limit, font size, typos, grammar etc)
- Follow up with program officer to get advice on resubmitting an application

# Career Development Awards

- K01: mentored 3-5 yrs new faculty awards
- KO2: new faculty awards, intense research focus
- KO5: senior scientist to protect for mentoring
- K07: protected time to develop curricula
- K08: mentored clinical scientist (K12 to institution)
- K22: transition to faculty award
- K23: clinical scientist in patient oriented research
- K24: midcareer award in patient oriented research
- K25: quantitative research development
- K26: mouse pathobiology
- K99/R00: transition award mentored then compete for R01 transition

# Types of NIH Grants

- **R series**
  - **RO1**: 3-5 yrs 250K (rarely to 500K)
  - **RO3**: 2 yrs at 50K/yr pilot feasibility, subset analysis, new technique or model
  - R13: for scientific meetings; R15 for nontraditional academic group funding
  - **R21**: 2yrs 150/125K novel idea, pilot feasibility
  - R34: 1 yr 100K planning clinical trial
  - R41-43: STTR: 1-2yr, 100-750K small business tech transfer
  - R56: 1-2 yrs for R01s that just miss to get more data

# *Scope of the Project*

- Do not try to do too much
- Avoid the “overambitious” or “innovative but risky” labels
- Keep the project *Focused and Feasible*
- Reviewers react negatively to multiple unrelated projects written as one grant

# Start Early

- Review the literature on your topic
- Outline potential specific aims then weed out the weak ones
- *Write for the reviewers, not for yourself*
- Make sure you allow time for trusted colleagues to review the application: for both content and format
- *Listen to others' advice*

# Abstract

- The first impression
- A focused statement of the state of the field “where we are”
- List the Specific Aims
- End with interpretation and relevance
- Should be readable by the public

# Background and Significance

- Focused literature review
- Why is the study needed
- What are the unsolved issues
- How these studies will be important to human health

# Specific Aims

- How many (2-4?)
- Concise and clear outcomes to be obtained
- Be careful of “descriptive” aims
- Stand back and review the order

# Preliminary Data

- Show that the planned studies are feasible
- You have the model, reagents, the techniques, the skills, the ability to recruit patients etc (with your collaborators)
- Excellent Pilot data: **CLEAR FIGURES** and legends

# Research Plan

- Follow the outline of your specific aims (use diagrams and/or figures to illustrate the experimental design)
- Respect page limits but give enough detail of the experimental design
- Justify outcome measures, patient recruitment, doses, time points etc
- Include the appropriate controls
- Don't forget STATISTICS (get help!)

# Special Issues

- *Use of Animals*
  - Follow instructions, detail answers to all questions
  - Justify number and type, minimize risk
- *Human Subjects*
  - Follow instructions carefully and appropriate format
  - Address gender, minority and children
  - Justify all procedures and risk/benefit
  - Minimize risk

# Always Include...

- *Interpretation* sections
- *Pitfalls, alternative approaches*
- Appropriate statistical analysis
- *Timeline*
- Implications for the field
- Future directions

# Budget

- Justify personnel and what they contribute to the project
- Even in a modular budget use words to describe any costly reagents or animals etc
- Don't excessively overinflate a budget
- Know the study section (some rarely fund above the modular budget cap)

# Important Features in a New Applicant Application

- In Background, give credit to prior workers in the field
- *Preliminary data are critical*
- Give *details for any method* you have not published yourself
- Make sure to include potential limitations of method and alternative approaches
- Include *letters from collaborators on any challenging new technique*
- Be sure that *independence is outlined* (in resources, space, letters from chairmen etc)

# Review Criteria

- **Overall impact**
- Significance
- Investigator
- **Approach**
- Innovation
- Environment
  
- Does your finished project defend each of these areas?

# Keys to the Successful Researcher: Resubmission

- *Listen* to criticisms (take them seriously)
- Respond to reviewers critique with a *positive and not defensive attitude*
- Respectively disagree where you are justified
- Add *new preliminary data* to support the revised application
- STAY POSITIVE
- BE PERSEVERANT

# Successful Grant Writing: Take Home Bullets

- **Read and follow instructions**
- Write clearly and concisely
- Clearly explain what you propose (methods, approach, controls etc)
- Keep your eye on the BIG PICTURE
- Start early so colleagues have time to read and offer advice
- Don't ever write with an "attitude"
- Be neat, do not use small font size, check grammar and spelling
- BE PERSEVERANT

# Tips on Grant Writing

- Currently funded projects
- Funding trends
- Success rates, average award amounts by locale or topic
- <http://report.nih.gov>
- <http://projectreporter.nih.gov/reporter.cfm>



