

# Welcome Back!

Proposal Structure and Strategy

Bioengineering 6061 Proposals

## The Plan

#	Date	Inst.	Topic	Due Date
<b>Bioengineering/Physiology 6061 Schedule, 2014</b>				
1	Tue, Jan 7, 2014	RM	Proposal strategy and structure/Specific Aims	
2	Tue, Jan 14, 2014	RM	Mechanics of text preparation	
3	Tue, Jan 21, 2014	RM	Proposal presentation	Mon, Jan 20, 2014
4	Tue, Jan 28, 2014	RM/VD	Presentations 1 + Review of Specific Aims drafts	
5	Tue, Feb 4, 2014	RM/VD	Presentations 2 + Reviewing	
6	Tue, Feb 11, 2014	RM/VD	Presentations 3 + Editing strategies	
7	Tue, Feb 18, 2014	RM	Presentations 4 + Significance/Background/Innovation	Mon, Feb 17, 2014
8	Tue, Feb 25, 2014	RM	Presentations 5 + Biosketch preparation	
9	Tue, Mar 4, 2014	RM	Workshopping session	Mon, Mar 3, 2014
	March 10-15		Spring Break	
0	Tue, Mar 18, 2014	RM	Presentations 6 + Presentation reviews	Mon, Mar 17, 2014
1	Tue, Mar 25, 2014	RM	Presentations 7 + Approach	Mon, Mar 17, 2014
2	Tue, Apr 1, 2014	RM	Presentations 8 + The Process of Review	
3	Tue, Apr 8, 2014	RM/VD	Presentations 9 + IRB/IACUC	Mon, Apr 7, 2014
4	Tue, Apr 15, 2014	RM/VD	Presentation 10 + Full Proposal Presentation	
5	Tue, Apr 22, 2014	RM/VD	The Real Thing: Grant Proposal Writing	Mon, Apr 21, 2014

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# The Web Site

## Bioengineering 6061: Proposal Writing and Presenting II



**Course Goals:** To be effective in science and engineering, graduate students must have well developed communication skills in all forms of scientific exchange. The pursuit of those skills is a long term task that continues throughout a professional career. The general goal of this class is to improve those skills and to create a framework for ongoing improvement well beyond the class.

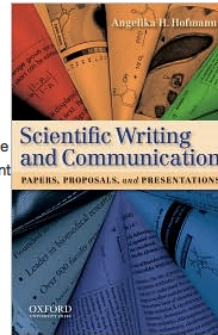
**Specific Aims:** A major component of the PhD program is the preparation of a research proposal, which includes both a written document and an oral presentation. The specific aims of this course support achieving these requirements through

- 1) Developing general presentation and writing skills for scientific communication.
- 2) Learning the specific features, components, and style of a written research proposal
- 3) Creating oral presentations that support the presentation of the research proposal and the ability to defend it in a public setting.
- 4) Develop constructive criticism skills in order to evaluate communication and suggest approaches to improvement.

**Course Components:** We will use a spectrum of learning approaches to achieve the specific aims including didactic lectures, homework assignments, and in-class presentations, supported by discussion and a high degree of interaction in and out of class. The use of constant feedback from instructors and fellow students will be a key element of the learning process so that students learn not only to improve their own communication skills but also to provide constructive critique to written and oral communications they view.

### Course Materials

- Syllabus is always a little dynamic but current version is: [syllabus.pdf](#)
- The schedule is even more dynamic and the latest version is: [schedule.pdf](#)



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# The Presentation Schedule

## Course Materials

- Syllabus is always a little dynamic but current version is: [syllabus.pdf](#)
- The schedule is even more dynamic and the latest version is: [schedule.pdf](#)



- The [Doodle poll](#) for signing up to carry out your 5-minute presentation.
- College of Engineering [academic guidelines](#) .

## Course Texts:

- **Required text:** Scientific Writing and Communication by Angelika Hofmann. Oxford University Press. Available from Amazon.com and other fine book suppliers in paperback for under \$25.
- **Supplemental text:** Presentation Zen by Garr Reynolds, New Riders, Peachpit Press. 2008. Also available from Amazon.com and others for as low as \$10.

# The Presentation Schedule

## BIOEN 6061 Presentation Schedule 2014

Poll initiated by Rob MacLeod | 👤 0 | 💬 0 | ⌚ 4 days ago

The day and time for your five-minute oral presentation.

Table view | **Calendar view** | 🗓️

Time zone: Mountain Time [change](#)

**This is a limited poll**  
Every option can be chosen by maximum 1 participant(s).

[Show all 20 options](#)

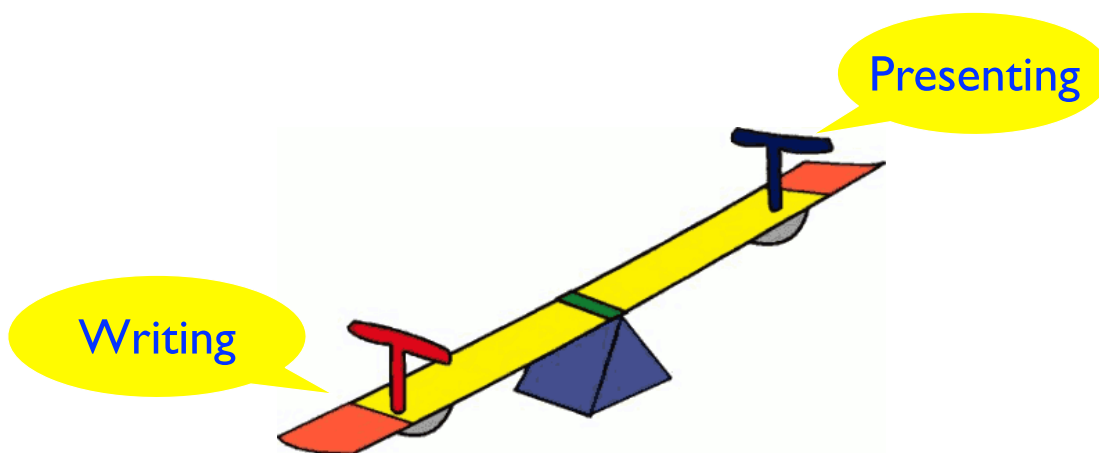
	January 2014 Tue 28		February 2014 Tue 4		Tue 11		April 2014 Tue 15
<b>0 participants</b>	12:25 PM	12:40 PM	12:25 PM	12:40 PM	12:25 PM	12:40 PM	12:40 PM
<input type="text" value="Your name"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

[Cannot make it](#) [Save](#)

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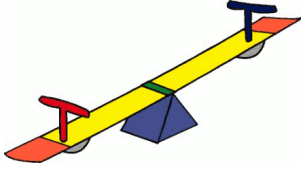
# Content and Approach



Proposal Structure and Strategy

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# Content and Approach



Proposal Structure and Strategy

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# Proposal Strategy/ Structure

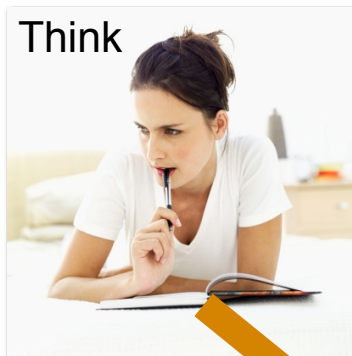
Proposal Structure and Strategy

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# Why Proposal?



# Goals of Proposal Writing



**You Must Complete  
the Plan**

# Department Requirements

## Year 2

- Meet with research supervisory committee to report progress (fall)
- If admitted as Ph.D. student, prepare 'Plan of Study in Bioengineering' (fall)
- If admitted as M.S. student:
  - Apply for admission to Ph.D. program (fall)
  - Form 5 member Ph.D. research supervisory committee (fall)
  - Prepare 'Plan of Study in Bioengineering' (fall)
- Prepare for Ph.D. qualifying examination
- Take advanced courses in area of specialization

## Year 3

- Take written Ph.D. qualifying examination (early fall)
- Meet with research supervisory committee to report progress and prepare for written research proposal (fall)
- Submit written research proposal (deadline: end of Fall Semester) (please see NOTE below)
- Take oral qualifying exam (deadline: end of Spring Semester) (please see NOTE below)
- Take advanced courses
- Report research at scientific meeting / submit manuscript

- **\*IMPORTANT NOTE: failure to submit the research proposal in Fall Semester and take oral qualifying exam by the end of Spring Semester of Year 3 will result in a loss of RA support and associated loss of the tuition waiver.**

# Format

# Proposal Format



**U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
PUBLIC HEALTH SERVICE**

**Grant Application  
PHS 398 (Revised 6/2009)**

*See the 11/23/2009 NIH Guide Notice NOT-OD-10-016 for important changes to this version.*

*All notable changes made to PHS 398 instructions and form pages are listed at the [bottom of this page](#) (updated 3/25/2011).*

<http://grants.nih.gov/grants/funding/phs398/phs398.html>

## Formatting

- **Font**

- Use an Arial, Helvetica, Palatino Linotype or Georgia typeface, a black font color, and a font size of 11 points or larger. A symbol font may be used to insert Greek letters or special characters; the font size requirement still applies.
- Type density, including characters and spaces, must be no more than 15 characters per inch.
- Type may be no more than six lines per inch.
- Use black ink that can be clearly copied.
- Print must be clear and legible.



# Formatting

- Paper Size and Page Margins
  - Use standard size (8 1/2" x 11") sheets of paper.
  - Use at least **one-half inch margins (top, bottom, left, and right)** for all pages, including continuation pages.
  - For electronic submission, no information should appear in the margins
  - For paper submissions, include the PD/PI's name in header and and page numbers in footer.

# Formatting

- Page Formatting
  - Because a number of reviewers will be reviewing applications as electronic documents and not paper versions, applicants are strongly encouraged to use only a standard, single-column format for the text. Avoid using a two-column format since it can cause difficulties when reviewing the document electronically.
  - The application must be single-sided and single-spaced.
  - Consecutively number pages throughout the application. Do not use suffixes (e.g., 5a, 5b).
  - Do not include additional pages between the face page and page 2.
  - Do not include unnumbered pages.



# Formatting

- Figures, Graphs, Diagrams, Charts, Tables, Figure Legends, and Footnotes
  - A smaller type size is acceptable, but it must be in black ink, readily legible, and follow the font typeface requirement.

# Page Limits

Section of Application	Section of Application
<b>Introduction to Revision or Resubmission Applications</b>	1 page
<b>Introduction to Revision or Resubmission Applications</b> For each project and core of multi-component applications	1 page
<b>Specific Aims</b>	1 page
<b>Research Strategy (Item 5.5.3 of Research Plan)</b> For Activity Codes R03, R13/U13, R21, R36, R41, R43, Fellowships (F), SC2, SC3	6 pages
<b>Research Strategy (Item 5.5.3 of Research Plan)</b> For Activity Codes R01, single project U01, R10, R15, R18, U18, R21/R33, R24, R33, R34, U34, R42, R44, DP3, G08, G11, UH2, UH3, SC1, X01	12 pages
<b>Research Strategy (Item 5.5.3 of Research Plan)</b> For all other Activity Codes, including Cs, Ps, Ss, Ts, Us, etc.	follow FOA instructions *
<b>Biosketch (per person)</b> For all Activity Codes except DP1 and DP2	4 pages
<b>Biosketch (per person)</b> For DP1 and DP2	2 pages
<b>Appendix **</b>	No page limits, but content limitations. See relevant section of instructions and FOA

# Use Templates

## Fillable Individual PHS 398 Forms

(These forms are to be used only with paper submissions using the PHS 398. Do **not** use the PDF samples provided below in an SF424 (R&R) application. These are fillable PDF forms which will cause an error in the electronic submission of an SF424 (R&R) application. See the [SF424 \(R&R\) application page](#) for appropriate formats to be used for electronic submission.)

Form Page 1: Face Page	<a href="#">MS Word</a> (88 KB)	<a href="#">PDF</a> (310 KB)
Form Page 1-continued: Additional form for use <b>only</b> if Multiple PD/Pis are proposed. Do <b>not</b> include if submitting a single-PD/PI application.	<a href="#">MS Word</a> (76 KB)	<a href="#">PDF</a> (254 KB)
Form Page 2: Summary, Relevance, Project/Performance Sites, Senior/Key Personnel, Other Significant Contributors, and Human Embryonic Stem Cells	<a href="#">MS Word</a> (117 KB)	<a href="#">PDF</a> (369 KB)
Project/Performance Site Format Page - use only if additional space is needed.	<a href="#">MS Word</a> (92 KB)	<a href="#">PDF</a> (269 KB)
Form Page 3: Research Grant Table of Contents	<a href="#">MS Word</a> (79 KB)	<a href="#">PDF</a> (701 KB)
Form Page 4: Detailed Budget for Initial Budget Period	<a href="#">MS Word</a> (89 KB)	<a href="#">PDF</a> (309 KB)
Form Page 5: Budget for Entire Proposed Project Period	<a href="#">MS Word</a> (86 KB)	<a href="#">PDF</a> (573 KB)
Biographical Sketch Format Page	<a href="#">MS Word</a> (38 KB)	<a href="#">PDF</a> (599 KB)
Biographical Sketch Sample	<a href="#">MS Word</a> (72 KB)	<a href="#">PDF</a> (63 KB)
Resources Format Page	<a href="#">MS Word</a> (39 KB)	<a href="#">PDF</a> (240 KB)
Checklist Form Page	<a href="#">MS Word</a> (84 KB)	<a href="#">PDF</a> (506 KB)
Continuation Format Page	<a href="#">MS Word</a> (36 KB)	<a href="#">PDF</a> (202 KB)

# Templates (on Canvas)

## NIH Templates



## LaTeX Templates

### My Fabulous Research

Your Name <sup>1,2</sup>, PI <sup>2,2</sup>, and PI <sup>3,1,2</sup>

<sup>1</sup>Department of Bioengineering  
University of Utah  
Salt Lake City, UT 84112

<sup>5</sup>Department of Outstanding Science  
University of Utah  
Salt Lake City, UT 84112

Email: your.name@utah.edu, your.collaborator@utah.edu, and your.mentor@utah.edu

October 24, 2012

```

%*-latex-*
% Document name: proposal.tex, a template for the PhD Proposal
%
% Authors: Rob MacLeod
%
% Last update: Mon Jan 30 07:10:25 2012 by Rob MacLeod
% - created
%
%*****
\documentclass[11pt]{report}
\usepackage{nih-proposal}

%***** New commands

% Change the footnotes from numbers to a series of symbols
\renewcommand{\thefootnote}{\fnsymbol{footnote}}
\newcommand{\etal}{\em et al.}
\newcommand{\etc}{\em etc.}
\newcommand{\eg}{\em e.g.}
\newcommand{\ie}{\em i.e.}
\newcommand{\vpp}{\C{\raisebox{0.5ex}{\tiny++}}}
\newcommand{\degrees}{\text{\textcircled{#1}}\text{\textcircled{#2}}}
\newcommand{\splitline}{\begin{center}\hrule{\columnwidth}{.7mm}\end{center}}
\newcommand{\nuu}{\mathcal{N}u}
\newcommand{\vohm}{\mathcal{V}\Omega}
\newcommand{\sft}{\mathcal{S}f}

%*****
\begin{document}

%***** The text
\setcounter{secnumdepth}{3}

%***** 1) Title
\thispagestyle{empty}
\input{title}
\newpage

%***** 2) Table of Contents
\tableofcontents
\newpage

%***** 3) Budget, Bios, Other Support, Resources *****
\chapter{Biosketches}

```

# Structure

## NIH Standard Structure

Budget and **Biosketches**

1 page

Specific Aims

- Significance
- Innovation
- Approach

12 pages

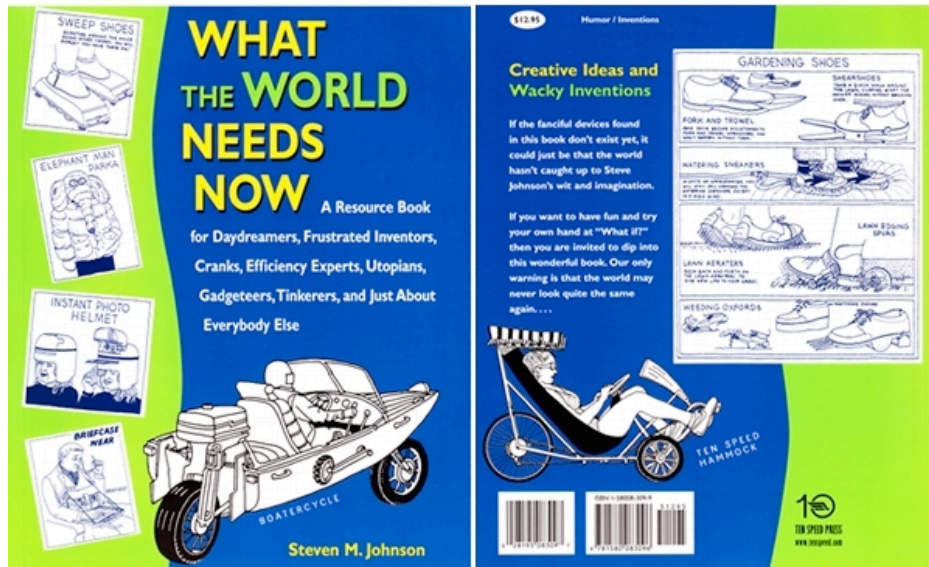
“Research Strategy”

**Cited References**

Regulatory Requirements

Contracts, Plans, Letters

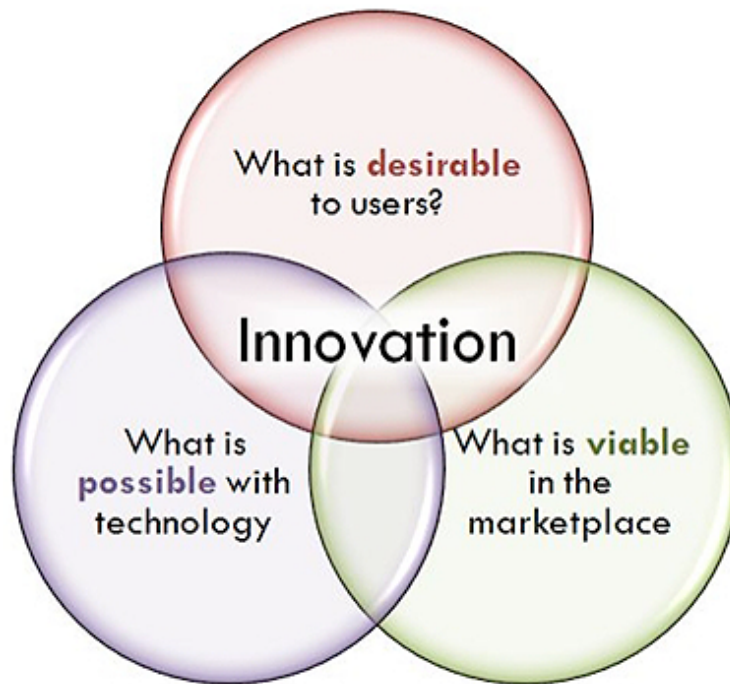
# Significance



# Significance

- Explain the importance of the problem or critical barrier to progress in the field that the proposed project addresses.
- Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
- Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

# Innovation



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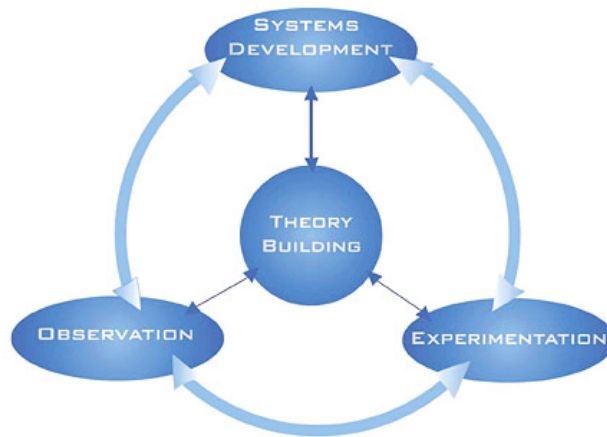
# Innovation

- Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
- Describe any novel theoretical concepts, approaches or methodologies, instrumentation or intervention(s) to be developed or used, and any advantage over existing methodologies, instrumentation or intervention(s).
- Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation or interventions.
- Not all proposals need to be innovative (at least, this is the NIH official policy)

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# Approach



<http://www.nsf.gov/pubs/2002/nsf01168>

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# Approach

- Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project.
- Unless addressed separately in a *Resource Sharing Plan*, include how the data will be collected, analyzed, and interpreted as well as any resource sharing plans as appropriate.
- Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.

Proposal Structure and Strategy

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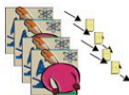
# Approach

- Describe previous or preliminary results that indicate the feasibility of the proposed approach.
- If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high risk aspects of the proposed work.
- Point out any procedures, situations, or materials that may be hazardous to personnel and precautions to be exercised. A full discussion on the use of Select Agents should appear in a *Select Agent Research* section.

# Explain the Impact

- Describe how the research will exert a sustained, powerful influence on the research field.

## Research Impact



- I. measures the size of a research contribution to further research
- II. generates further research funding
- III. contributes to the research productivity and financial support of the researcher's institution
- IV. advances the researcher's career
- V. promotes research progress

Tim Brody - Eprints -  
Southampton U.

Definitions vary

So you can define it!

<http://www.ariadne.ac.uk/issue35/harnad/>



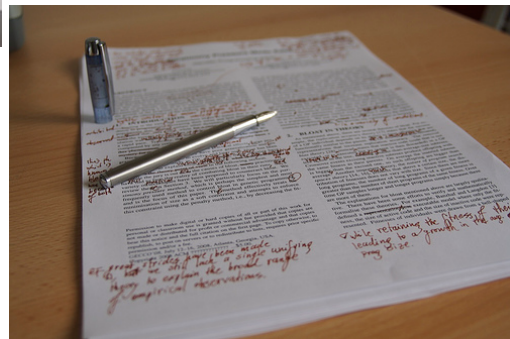
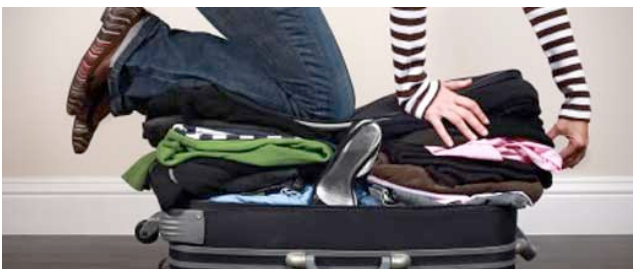
# Tips and Tricks

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## Writing Tips

Don't cram your application like a suitcase



Proofread your application.

<http://www.sci.utah.edu/~macleod/grants/insiderguide.pdf>

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# Pitfalls of Proposals

Overambitious

Unfocused

Naive

Incoherent

Low impact

Lacks  
Innovation

Proposal Structure and Strategy

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# Tips for Proposal Writing

Propose something significant

Good ideas don't always sell themselves

Make it exciting

Be brief with stuff everyone knows

Probe for mechanisms and seek new models

Avoid proposing to "collect more data."

Be very clear and concise

Pull it together

<http://www.sci.utah.edu/~macleod/grants/insiderguide.pdf>

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# Who is the Audience?



?

?



Don't assume too much!!

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## Recent Change in NIH Review

- Old Practice
  - Too much focus on how to “do” the research
  - Significant mentoring on how to revise
  - Long, detailed application/too much to read
- New Focus
  - **Impact: Is research worth doing?**
  - Clear signal via criteria scores whether or not to resubmit
  - Streamlined applications (easier to validate, less to read)

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# Information

## Rob's Grant Information Page

A list of granting sources and links to grant applications. The choices reflect my biomedical bias and is in no way comprehensive.

### Granting Agency Policy and Program Information

#### Other good grants sites

- [University of Utah Health Science Resources for Basic Scientists including Research grant information](#)
- [College of Engineering grant information](#)

#### NIH General Information

<http://www.sci.utah.edu/~macleod/grants/>

## Grant Writing Tips

Some of these are specific to grants, others simply useful for any writing project.

- [Rob's Writing page](#)
- [Rob's Latex Page.](#)
- [NIH Insider Guide.](#) A set of tips from former NIH study section chairs.
- [Proposal Writing: The Business of Science \(pdf\)](#) by Wendy Sanders. Great advice for any grant writer.
- [NIH Guidelines \(also for review\)](#)
  - [Grant writing tips from NIH](#)
  - [General reviewer guidelines](#)
  - [Reviewer guidance on the shortened applications](#)
  - [FAQ for review of short grants.](#)
- [RO1 Grant writing tips](#)
- [AHA Grant Writing Tips](#)
- [Proposal Writer's Guide by Don Thackrey](#)
- [The SCI text markup scheme](#)