How to Write a Compelling Grant Abstract

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The Challenge of Obtaining Funding

Agenda

❑ Market your work

❑ Before you start writing

❑ Structure of abstracts

❑ Types of abstracts

❑ Review your abstract

Reviewers' Remarks*

"If I don't get interested by the first page, the proposal is lost."

*NIH study section reviewers' comments;
from Robert Porter, 2005. "What Do Grant Reviewers Really Want, Anyway?"

Grant Reviewing is a Subjective Process

Reviewers are never wrong;
Reviewers are never right

They simply provide an assessment of material that you provide in your application.

The Reality of the Grant Review Process

NIH Reviewers:

➤10 – 15 proposals as primary reviewers

➤Up to 100 proposals for reading

"A grant application is not science; it is the marketing of science."

A.H. Schmaier

Grant Writing as a Genre of Academic Writing

Type: Persuasive writing

Purpose: to persuade reviewers to fund the proposed research

BUT

In grant proposals, you must persuade without seeming to persuade

Project Description/Abstract/Summary

➢Describes the project;

➢Shows the importance and relevance of your research;

➢Is used as a guide to the document;

➢Is used to decide where to assign your application.

Marketing Your Research

Think how you can explain your project in one sentence.

Introduce your project to your partner.

Getting Prepared For Abstract Writing

Choose a Sponsoring Agency

Federal/State Agencies

National Institute of Health

National Science Foundation

Department of Engineering

CT Dept. of Public Health

Private Agencies

American Lung Association

American Chemical Society

Kidney Disease Foundation

Bill&Melinda Gates Foundation

www.grants.com

http://grants.nih.gov/grants/oer.htm

http://foundationcenter.org

https://yale.communityforce.com/Funds/Search.aspx

Main Types of NIH Grants

❑Research Grants (R01, R21)

❑Career Development Awards (K99, K01)

❑Research Training and Fellowships (F31, T32)

❑Program Project/Center Grants (P01)

❑Resource Grants (R24, R25)

❑Small Business Grants (SBIR/STTR)

Strictly Follow the Guidelines

➢ Learn everything about the sponsoring agency.

➢ Find funded grant applications.

➢ Examine them closely for the format and structure.

NIH RePORTER database.

Sections of an NIH Application
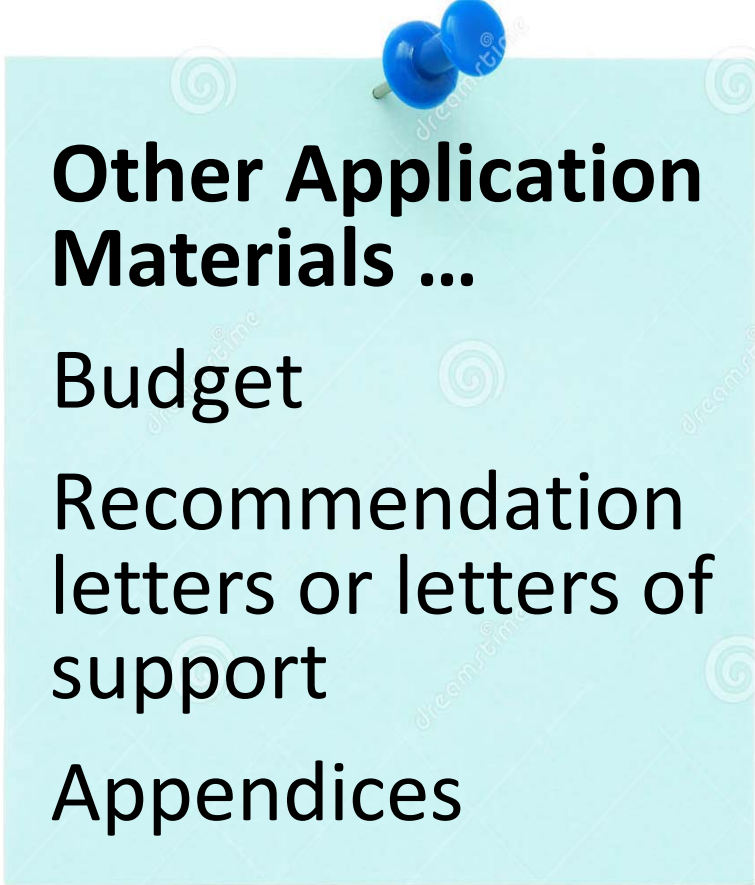
Project Description/Abstract

Specific Aims

Research Strategy
- o Significance
- o Innovation
- o Approach

Literature Cited

Biographical Sketches

Other Application Materials ...

Budget

Recommendation letters or letters of support

Appendices

Learn From Samples

Share with your groupmates what sponsoring agency you would like to submit your grant to. What type of grant is this going to be?

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Content and Structure of Abstracts

Grant Abstracts Provide Answers to These Questions:

➢ What do you intend to do?

➢ Why is the work important?

➢ What has already been done?

➢ How are you going to do the work?

Content of Grant Abstracts

From the general application guide for NIH

- State the broad, long-term objectives and specific aims, making relevance to the mission of the agency.

- Describe the research design and methods for achieving the stated goals.

- Be sure that the project summary reflects the key focus of the proposed project so that the application can be appropriately categorized.

Grant Abstracts Provide Answers to These Questions:

What do you intend to do?

Why is the work important?

What has already been done?

How are you going to do the work?

Background

Problem

Objectives

Prelim. Results

Strategy

Significance

Example 1

Global warming is arguably one of the most pressing concerns of our time. However, we lack an effective model to predict precisely by how much the temperature will rise as a consequence of the increased levels of CO_2 and other factors. The width of this range is due to several uncertainties in different elements of the climate models, including the variability in the Sun's rate of energy output. To gain greater insight into the relationship between solar energy output and global temperature, we propose to launch the internationally led ABC satellite in April 2018. Our aim is to collect for 2 years data on the solar diameter and shape, oscillations, and photospheric temperature variation. We will assess these data to model solar variability. Our findings will dramatically advance our understanding of solar activity and its climate effects.

Background

Problem

Objectives

Strategy

Significance

Example 2

X is a major human pathogen, which infects over 100 million people per year, leading to high morbidity and mortality. Current therapies for X are expensive, poorly tolerated, and only partially effective in controlling the pathogens and in limiting disease. Recently, we and other succeeded in establishing a system to grow X in cell culture. These systems will allow us to completely dissect the life cycle of X. Our initial characterization of cell culture-produced X indicates unusual physical properties. Understanding of X's life cycle will aid in the development of improved pharmaceuticals.

⬅ Problem statement is missing

⬅ Objective is missing

Signals of the Structure

Problem

… has not been determined

… is unclear

X is limited by …

The questions remains if…

Objectives

Our objective is …

We propose to …

We will examine the hypothesis that …

Strategy

We will achieve this goal by …

Specifically, we will … by …

Our general strategy is to …

Significance

… is important for …

These results may play a role in …

Y can be used to …

… will provide insights into…

When and How to Start Writing:

Write a four-page description of your project:

By adding details, you can turn this description into your research plan.

By stripping it of details you can create an abstract.

Consider writing your application as "walking your dog."

Outline Your Abstract

Using the list of the components, write one sentence for each section of your abstract.

Read your abstract to your team-mates.

Signals of the Structure

Problem

… has not been determined

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Objectives

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We propose to …

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Types of Abstracts

Types of Abstracts

Technical Abstracts

Lay Abstracts

The same content

Written for federal agencies

Written for private foundations and corporations;

➢ Contain shorter background sections;

➢ Elaborate on preliminary results, research strategies and specific aims.

➢ Should be widely understandable;

➢ Contain longer background and significance sections.

Type Differences

Technical Abstracts

- ❑ Assume background knowledge;

- ❑ Few justifications;

- ❑ Extensive use of terminology;

- ❑ Few definitions and examples.

Lay Abstracts

- ❑ Require background;

- ❑ Frequent initial purpose clauses;

- ❑ Terminology is used with caution;

- ❑ More definitions and examples.

Technical vs. Lay Abstracts

Using the features of technical vs. lay abstracts, determine which is which in the following examples.

Background Section

Lay Abstract

Emphysema is a major subset of chronic obstructive lung disease, predicted to reach epidemic proportions by 2020. The condition develops in most people over the age of 35 and can lead to the loss of oxygen exchange, lung enlargement, and, if severe, complete respiratory failure. Cigarette smoke, pollutants, and gender are thought to be important determinants of the severity of the disorder.

Technical Abstract

Most people over the age of 35 years exhibit emphysema, a major manifestation of chronic obstructive pulmonary disease (COPD). Cigarette smoke, pollutants, and gender are thought to be important determinants of the severity of the disorder.

Problem Section

Technical Abstract

Curative therapies or reliable diagnostic biomarkers do not exist for emphysema/ COPD.

Lay Abstract

Disease-altering treatment or reliable diagnostic features that can be used to measure the progress of the disease have not yet been determined.

Strategy Section

Technical Abstract

This proposal will directly build on and expand our pilot findings. Specifically, we will first confirm the role of Z, X, and Y in the pathogenesis of age-induced and cigarette smoke-induced emphysema and validate their roles as therapeutic targets. Subsequently, we will analyze molecular interactions of these molecules in young and aged people in relation to cigarette exposure, gender, and emphysema/COPD.

Lay Abstract

We believe that the synergistic or additive effects of age and cigarette smoke on Z's function may explain disease development and characteristics.

Technical vs. Lay Abstracts

Break into teams of 4 people.

Take a sentence form one of your abstracts (one per team) and re-write it for technical and lay audiences.

Share your sentences with us.

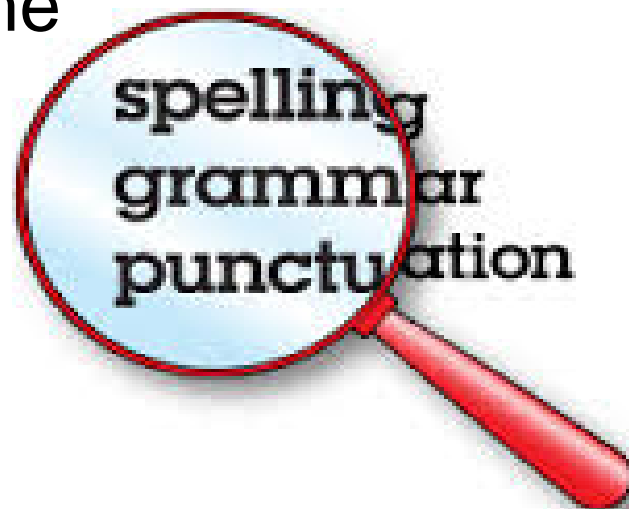# Review Your Application

Grant Abstracts Should

➢present an accurate description of the proposed work;

➢be able to stand on its own (separate from the application);

➢be informative to other people working in the same or related fields;

➢be succinct and concise and limited to 30 lines of text.

Avoid in Grant Abstracts

➢ descriptions of past accomplishments;

➢ the use of the first person;

➢ any information not covered in your proposal;

➢ any confidential information;

➢ graphs or images;

➢ citations.

Carefully Review Your Application

➢ Allow sufficient time to put the completed application aside.

➢ Edit for different problems separately.

➢ Proofread by reading the application aloud, backwards, and from a printed copy.

spelling
grammar
punctuation

Excessive Length

Revise: Omit Less Important Information:

1. Definitions;
2. Experimental preparations;
3. Details on methods;
4. Exact data;
5. Confirmatory results;
6. Comparisons with previous studies.

Edit: Trim Your Sentences

1. Avoid redundancies;

2. Delete useless intensifies;

3. Use simpler vocabulary;

4. Put action into your words;

5. Trim your clauses or phrases;

6. Write shorter sentences.

1. Avoid Redundancies

- final outcome;
- new innovations;
- particular interest;
- summarize briefly;
- shorter/longer in length;
- puzzling in nature;

- already existing;
- completely eliminate;
- basic fundamentals;
- estimates roughly at;
- period of time;
- true facts.

Avoid Abbreviated Redundancies:

HIV virus = Human Immunodeficiency Virus;

AIDS syndrome = Acquired Immunodeficiency Syndrome

2. Avoid Useless and Emotional Intensifiers

Really, very, quite, extremely, severely, clearly, certainly, essentially, actually:

The preliminary results ==clearly== show that the protein was absent in the fraction.

… siRNA duplex ==quite possibly== caused an RNA interference effect.

3. Use Simpler Vocabulary

A large number of = many;

Along the lines = like;

As a general rule = generally;

Exhibits the ability = can;

On the occasion of = when;

Is equipped with = contains;

In the light of the fact = because.

4. Put Action into the Verb

Avoid weak and phrasal verbs:
be, have, do, make, get, seem, find out, set up…

The subjects are under intense pressure of X…

The subjects face intense pressure of X…

Researchers have found out that drug X has side effects of Y and Z.

Researchers have discovered that drug X has side effects of Y and Z.

4. Put Action into the Verb

Avoid expletive constructions:
there is/ there are/it is

==There is== fellowship training in Allergy and Clinical Immunology and Pulmonary Medicine at Yale University.

Yale University ==provides== fellowship training in Allergy and Clinical immunology and Pulmonary Medicine.

4. Put Action into the Verb

Avoid nominalizations, i.e. nouns derived from verbs and adjectives

Nominalizations		Verbs:
discovery	-	discover
resistance	-	resist
reaction	-	react
Nominalizations		Adjectives:
difference	-	different
proficiency	-	proficient
importance	-	important

Sentences with action verbs are natural, direct, and easy to understand

Make a decision   **- decide**

Cause a decrease **- decreased**

Be a failure   **- fail**

Have a tendency   **- tend**

These studies ==contributed to the identification== of the cellular progenitors of memory CD8 T cells.

These studies ==helped to identify== the cellular progenitors of memory CD8 T cells.

5. Trim Your Clauses or Phrases

Omit "Overview" Phrases

Recent studies reported that intracellular calcium is released when adipocytes are stimulated with insulin. (14 words)

Intracellular calcium is released when adipocytes are stimulated with insulin. (10 words)

6. Write Shorter Sentences

❑ **Easy to understand** (≈ 15-20 words);

❑ **Emphasize one idea**;

❑ **Weigh more.**

Developing effective vaccines to prevent infection and to treat chronic infection or cancer remains a formidable challenge primarily because we do not fully understand how memory T and B cells develop during immune responses. (34 words)

We do not fully understand how memory T and B cells develop during immune responses. This knowledge gap creates a formidable challenge to develop effective vaccines to prevent infection and treat chronic infection or cancer. (15 + 20 words)

Receive Feedback

❑ All collaborators (ethical issue!)

❑ Anyone who is writing a letter for you

❑ Outside readers (at least 3!)

- An expert in the field

- A person in a closely related field

- An intelligent non-expert

❑ Good proofreader with excellent English skills

Review Your Abstract

Go back to your abstract in exercise 3 and trim your sentences

Good luck with your proposal!

References

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