

Anatomy of a Grant Application

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Overview

- 1) Common elements in research grant applications (and fellowship as applicable)
 - Content
 - Forms
- 2) How to make sure you are meeting funder expectation
- 3) Grant application terminology

Grant

Definition: An exercise in persuasive writing that conveys your ideas to a funder to get money to do something.

Different types of grant:

Research

Clinical practice or service delivery

Training grants, **Fellowships, Career Development**

Education, curriculum development

Buildings and Equipment

**The goal of a grant proposal for RESEARCH:
Obtain financial sponsorship for your project**



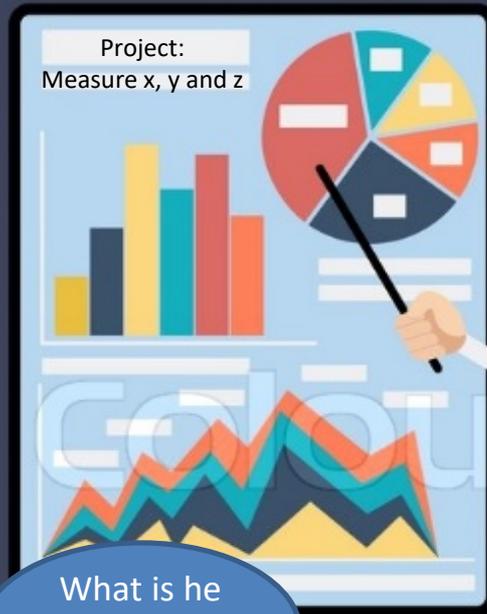
What do you need
to know before you
go in?





What do you need
to convey to them?





I want to measure x, and y and z....

And then I'll know x, y, z.

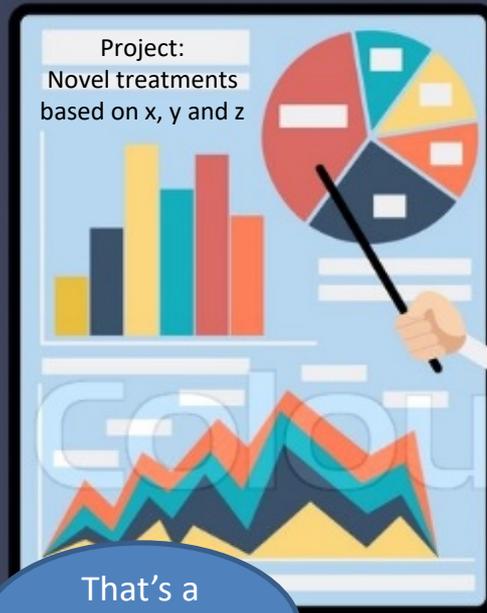
Who is this person?

What is he talking about?

Why should I care about this?

How would he even do that?





Its critical...
Striking finding...
We will measure
x, y and z

And then we
will be able to
develop novel
treatments..

I think he
could do
this!

That's a
novel
approach!

That would
move the field
forward!

I want to
hear more!



The goal of a grant proposal for **RESEARCH**: Obtain financial sponsorship for your project

Research grants have certain elements in common

Element	Implications for You
Must be responsive to the mission of the funder	Know the funders mission and goals
Communication is organized according to specific rules	Get the directions, read the directions, follow the directions
Presentation must be logical	Provide information (what, why, how) where and how reviewers expect to see it
Work must be feasible	Demonstrate that it is possible to complete the project within given timeframe, budget, available resources, and personnel
Reflect state-of-the-art and best practices in the field	Up to date and cutting edge
Must have an impact	Must move the field forward in some way or meet the need of the funder

Key Sections of Grants:

- **Research – Approach**
- **Personnel**
- **Resources – Institution**
- **Budget and Time**
- **Training (if applicable, eg F or K)**

Key Steps:

- **Understand the funder**
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- **Find a successful example, experienced reader/editor**

Research – Strategy – Approach

- **Obviously a key component of any research grant**
- **Structure and key elements to include are fundamentally the same**
 - **Logical**
 - **Modify to meet specific requests of funder**
 - **Modify to meet space constraints**

Structure and key elements to include are fundamentally the same:

- **May be described in several different sections:**
 - **Abstract/Summary**
 - **Aims page**
 - **Strategy (significance, innovation, preliminary data, aims/goals, approach/design/methods, outcomes, impact, analysis)**
- **Length will vary**
- **Documents will vary**
- **Content will be similar but with emphasis based on funder instructions**

A good structure to start with is something like a specific aims page

- **Specific Aims Page – a requested document in an NIH grant proposal**
- **However,**
 - **Universal means of presenting a problem and potential solution**
 - **All grants should have the info requested in the specific aims page, although it might be spread throughout the grant**
 - **Outlining in this way is a useful way of formulating/organizing your research plans**

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Ask for slides

Why start with an 'Aims Page' - Purpose

- Centerpiece/Blueprint/Road Map/Master plan for the rest of grant
- Should include everything about the proposal that is important and exciting - without the detail
- Point the reader in the right direction and set the tone for the rest of the grant
- Engage the reviewer, win them over, provide them with a conceptual framework
- 'Sell' your proposal (persuasive writing)

The Universe

You Are Here ●

Everything
critical: Why,
What, How

Outcomes

Impact



Structure of the Research Strategy

Orient the Reviewer

Should get the reader's attention
Typical to address the mission of the funder (eg. NIH = health, NIMH = mental health)



Current Knowledge

State what is known about issue (*It is well known that...*)

Gap or unmet need

State what is unknown (*However, it is unknown/unclear/undetermined ...*)

Why it's important to address gap or unmet need

Addressing this issue will...

The lack of understanding of this issue prevents...

Structure of the Research Strategy

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Reviewer Impression:

- I understand
- This is interesting
- This is important
- I want to advocate



Structure of the Research Strategy

What, Why

Long-term Goal Should clearly encompass the gap (*Our long-term goal is to....*)

Overall objective This is the next step to achieve the long-term goal (*The overall object of this application is to ...*)

Central hypothesis understandable, testable, adequately supported, provides focus, directional, testing the central hypothesis will achieve the objective

Rationale that underlies the proposed research, should convey what will be possible after completion of the proposal, and is not possible now

Structure of the Research Strategy

Do you need a hypothesis?

Maybe not, if:

- **Generating a product or resource (biorepository, database, tool, model, etc)**
- **Setting up or improving a process (eg increasing efficiency in assay or clinical process, establishing a clinic)**
- **Research is hypothesis generating**

Otherwise, YES

What is a hypothesis?

“A tentative explanation for an observation, phenomenon, or scientific problem that can be tested by further investigation.”

Hypotheses are tested, not proven

Characteristics of a good hypothesis

- Important
- Focused, precise
- For an NIH grant:

Hypothesis that increases understanding of biologic processes, diseases, treatments, or prevention

Structure of the Research Strategy

Aims/Goals/Objectives

- Number varies – dependent on timeframe for funding and budget
- If its an aim designed to test the hypothesis - Should be written in such a way that regardless of outcome, aim is achieved
- Link back to the central hypothesis
- For each aim:
 - Convey why research is being done
 - What you hypothesize
 - How you will determine (methods)
 - How you will analyze
 - Alternative outcomes and approach
 - Interpretation
 - Impact

Structure of the Research Strategy

Overall “Big Picture”

Known data

Gap

Reason to fill gap

Long-term goal

Rationale

Overall hypothesis

Aims

- **Why**
- **Specific hypotheses**
- **How**
- **What**
- **Impact**

Alternatives/Interpretation

Impact

Future Directions



Outline this information

Shorter for abstract and aims

Modify based on content and length requirements of the funder

Longer with more detail for strategy

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Personnel

- **Who you are**
- **Where you have been**
 - **Education**
 - **Positions**
- **Metrics of your success**
 - **Positions**
 - **Awards**
 - **Publications**
 - **Grants**
 - **Grades (fellowship grants)**
- **What you have contributed**
 - **Publications**
 - **Description**
- **Qualifications to complete the project**
- **What you will do on the project**

Documents that contain info about Personnel

- **Biosketch**
 - Generally used for PI and other key personnel
- **Budget Justification**
 - For people receiving salary on a grant – describes their role on the project and what they are responsible for
- **Letters of support**
 - Generally provided by people named in the proposal, but who are not receiving salary from the grant. EG providing a service or expertise (advisors, consultants, heads of cores, collaborators providing a resource, etc)
- **Research approach**
 - Generally in preliminary data or methods

Biographical Sketch

=

Biosketch

≠

Curriculum Vitae (CV)

Biosketch

≠

Curriculum Vitae (CV)

CV

- University specific format
- Contains all of your career information
 - Training
 - Teaching
 - Service
 - Scholarship
 - Etc
- Used for job applications, introductions, promotion
- Start now and keep up to date!

Link to Emory CV format

(http://med.emory.edu/administration/faculty_affairs_dev/templates.html)

Biosketch

≠

Curriculum Vitae (CV)

Biosketch

- NIH form
- Highly structured
- Specific to each grant and type of grant
- Enables reviewers to evaluate the qualifications of the team (you) – specifically for that project
- Used by many different funders (not just NIH)

Biosketch

≠

Curriculum Vitae (CV)

Biosketch

- NIH form
- Highly structured
- Specific to each grant and type of grant
- Enables reviewers to evaluate the qualifications of the team (you) – specifically for that project
- Used for grant applications (not just NIH) and introducing yourself to funders

Sections of the Biosketch

A. Personal Statement

A. Specific to the grant

B. Emphasize your strengths relative to the project

B. Positions and Honors

C. Contribution to Science

D. Additional Information: Research Support and/or Scholastic Performance

Sections of the Biosketch

- A. Personal Statement**
- B. Positions and Honors**
- C. Contribution to Science**
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Resources - Institution

Key issue for reviewers - Do you have the resources necessary to complete the project?

- **Equipment**
- **Space (Lab, office, desk)**
- **IT resources**
- **Cores**
- **Animal facilities**
- **Access to patients**
- **Clinical space**
- **Does your environment support academic success?**
 - **Record of university, school, department, group**
 - **Seminars, CTSA, collaborative atmosphere, etc**

Resources - Institution

Documents

- **Resources and Institutional Environment**
- **Equipment**
- **Approach**

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Budget and Time

Key issue for reviewers is whether they think you can complete the project within budget and on time?

- **The time and the budget are generally set for you**
- **Match the number of aims/goals to the number of years**
- **Use a timeline or milestones table**
- **If there is any question, give an example of completing something similar with time and budget**
 - **Eg Enrollment of subjects into a study**
- **Know the funder rules (no computers, no travel, no PI salary, no indirect costs, etc)**

Budget and Time

Documents:

- Budget
- Budget Justification
 - Personnel Effort
 - Travel
 - Other expenses (supplies, cores, animals, etc)
- Approach
- Timeline/Milestones

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Fellowship or Training Grants

- Almost all ask for a research component
- The goal is to move you closer to independence in your field
- Elements that are added on to the research grant:
 - Evaluation of you as a trainee
 - Evaluation of your sponsor/s
 - Evaluation of your training plan
 - Does it build on your strengths?
 - Does it address your weaknesses?
 - Does it move you closer to your goal?

Fellowship or Training Grants

- **Documents**
 - **Applicant - Your Training**
 - **History (your trainability)**
 - **Goals (where/what do you want be)**
 - **Sponsor**
 - **History (successful researcher)**
 - **Mentoring (successful mentor)**
 - **Funds (sufficient to support you)**
 - **Commitment (knows you and your goals)**
 - **Training Plan**
 - **Does the plan move you closer to your goals**
 - **Letters of Reference**

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Understand the funder

- **What is their mission?**
- **What are their priorities?**
- **What projects have they funded in the past?**
- **Contact them**
 - **Many funders want you to contact**
 - **NIH always wants you to contact**



Follow the directions

- **Find the directions**
- **Study the directions**
- **If there are any questions, ask the funder**
- **Follow the directions**

Find a successful example

- **Some directions can be vague**
 - **Example – The specific aims page**
- **If you can't find an example, find a reviewer**
 - **someone who has looked at a lot of grants**
 - **Someone with experience with that type of funder**
- **Find a reviewers**
 - **Peer**
 - **Mentor**
 - **Someone not in your lab**



Don't reinvent the
wheel

What has to happen in order for someone to fund your project?

- They have to be able to tell what you're going to do
- They have to think it's worth the money
 - Compelling reason to do the project
 - Moves field towards a goal/has an impact
 - Helps funder achieve their mission
- They have to believe that you can do it
 - You (and your team have the expertise)
 - You have the resources
 - You can complete the project in the specified amount of time for the money requested

Vocabulary/Terminology

- OSP – Office of Sponsored Programs (Emory)
- Cayuse – Emory system for compiling an NIH grant (accessible through OSP website).
- NIH – National Institutes of Health
- NIH Intramural grant – A research grant project that is completed by the NIH
- NIH Extramural grant – An NIH funded grant that is performed outside the NIH
- NIH Institute or Center – The NIH is divided into Institutes and Centers, each of which has its own mission, own priorities and own funding
- NIH OER - Office of Extramural Research
- PA – Program Announcement – a funding opportunity
- PAR - A PA with special **receipt, referral and/or review** considerations, as described in the PAR announcement
- RFA – Request for Application, Identifies a more narrowly defined area for which one or more NIH institutes have set aside funds for awarding grants
- Parent Announcement – Parent announcements are broad funding opportunity announcements allowing applicants to submit investigator-initiated applications
- PI – Principle Investigator

Resources

- <https://grantrainingcenter.com/blog/10-common-elements-winning-proposals/>
- <http://grantproposals.com/article/elements-of-a-grant-proposal/>

Resources

Editing:

- Coursera ([coursera.org](https://www.coursera.org)) – lots of free courses through Emory
 - **Writing in the Sciences**
 - Conjunctions, connections and adverb clauses
 - Learn English
 - Adjectives and adjective clauses
 - Business English communication skills
 - Presentations: Speaking so that people listen

Resources

Editing:

- <http://www.law.cuny.edu/legal-writing/students/grammar/editing/editing-self.html>
- **References: www.germann.edu/tutor/documents/PaperSelf-EditingJuly2012.pdf**
- <http://owl.english.purdue.edu/owl/resource/561/01/> Copyright ©1995-2013 by The Writing Lab & The OWL at Purdue and Purdue University.
- <http://www.oxbridgeediting.co.uk/blog/top-proofreading-tips-speed-proofreading-61/>
- <http://lifehacker.com/5968996/how-to-edit-your-own-writing>

Writing:

- <http://www.quickanddirtytips.com/education/grammar/grammar-girls-editing-checklist>
- <http://cybertext.com.au/10490.htm>
- <https://writingcenter.unc.edu/tips-and-tools/editing-and-proofreading/>