ENG-CAREER
PROPOSAL WORKSHOP

Research Plan, IM and BI

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What is the Research Plan?

It is the ”meat” of your application

- It describes what you are planning to do
- It describes why you want to do it
- It describes how you will do it
- It describes why you are the one to do it

What is the Research Plan?

Research plans can take many forms

- You can choose your organization
- You can choose what you emphasize
- You can choose how much background you provide or not
- How many figures you include
- How many references you include
- …
- There is a lot of freedom

This means, you can and will develop your own style

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What is the Research Plan?

What ever you do, it should clearly and concisely…

- Describe what you are planning to do
- Describe why you want to do it
- Describe how you will do it
- Describe why you are the one to do it

Remember not only who your audience is, but also the circumstances under which they will read your proposal

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What is the Research Plan?

Some things MUST be included

- You need to include Broader Impacts
- You must include Intellectual Merit

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What is Intellectual Merit?

- The Intellectual Merit criterion encompasses the potential to advance knowledge

What Does That Practically Mean?

- This is where you want to describe how your work will benefit the small circle of experts in your (and adjacent) fields

These are the Official Criteria

- What is the potential for the proposed activity **to advance knowledge and understanding within its own field or across different fields?**
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

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What are Broader Impacts?

- The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

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What Does That Practically Mean?

- This is where you want to describe how your work, if funded, will impact those outside of the small circle of experts

These are the Official Criteria

- What is the potential for the proposed activity **to benefit society or advance desired societal outcomes?**
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- How well qualified is the individual, team, or organization to conduct the proposed activities?
- Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

These are the Official Criteria

Broader impacts may be accomplished **through the research itself**, through the activities that are directly related to specific research projects, or through activities that are supported by, but **are complementary** to, the project. NSF values the advancement of scientific knowledge and activities that contribute to achievement of **societally relevant outcomes**. Such outcomes include, but are not limited to: full participation of women, persons with disabilities, and other underrepresented groups in science, technology, engineering, and mathematics (STEM); improved STEM education and educator development at any level; increased public scientific literacy and public engagement with science and technology; improved well-being of individuals in society; development of a diverse, globally competitive STEM workforce; increased partnerships between academia, industry, and others; improved national security; increased economic competitiveness of the United States; and enhanced infrastructure for research and education.

This is what I do

I begin with a 1-page complete overview (1 page)

- 1 paragraph on the general topic
- 1 paragraph on the specific knowledge gap or problem I want to address
- 1 paragraph describing my research goals and/or hypothesis
- A brief description of my research objectives
- 1 paragraph outlining what the NSF can expect once I am done

This is what I do

Next, I provide Background Information (1-2 pages)

- Here I focus ONLY on the knowledge that is relevant to answer the what, why, how, and why me questions
- This is not the time to show off unrelated knowledge
- Here you can integrate your own previous work
- At the conclusion, the reader should know enough to be able to evaluate the rest of my proposal
- You must strike a balance between the expert reader and they non-expert reader of which your panel will be comprised

This is what I do

Next, I provide an overview of my IM (0.5 pages)

- In a bulleted list, I focus on the most important intellectual deliverables of my work
- Often these bullets align with the expected outcomes of my research objectives
- Others don’t do this. Instead, they use the intellectual merit section as their “research strategy” section

This is what I do

Next, I describe my research strategy (~6 pages)

- This is a traditional strategy section
- I organize it by the research objectives
- Under each objective I explain my rationale or motivation, methods (including statics if applicable), alternative strategies, validation strategy, expected outcomes
- Note, this may be very program dependent

This is what I do

Next, I describe my broader impacts (2-3 pages)

- I divide them into categories which each has their own section
- There are many ways to have a broad impact
- Pick those that you believe are most impactful
- For example, “Societal impact” or “Medical impact,” “Open Science,” or “Educational”
- Keep in mind broader impacts can come from research and/or educational objectives
- I love this section. Here you get to be creative.

This is what I do

Things I evaluate when reading broader impacts

- Are they taken seriously?
- Are they creative but realistic?
- Have the PIs a serious plan with sufficient detail to evaluate its likelihood or success?
- Do the PIs have previous examples/experience?
- Are they integrated into existing infrastructure?
- Are these efforts scalable? Are the resources available?
- Is there an evaluation plan?

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Take aways

- Solicit successful proposals and learn from them
- Develop your own style that complies with the NSF requirements
- Write a proposal that is easy to read, easy to understand, and excites
- You don't write for yourself; you write for others!
- Differentiate between broader impacts and intellectual merit
- Identify research gaps that excite your peers
- Device a creative but realistic broader impact strategy
- Enjoy this process: here, you actually get to dream!