Significant and Innovative Proposals: Convincing Your Reviewers

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Acknowledgement:
Generous wisdom from many collaborators
IMPACT

• Convince funder to add your study to the research portfolio
• Return on investment
• Why should the funder invest in your research?

• Impact, Impact, Impact!!!
Overall Impact:

- The likelihood for a project to exert a **sustained, powerful** influence on research field(s) involved
- To arrive at overall impact, five core criteria are evaluated:

<table>
<thead>
<tr>
<th>Importance:</th>
<th>Significance</th>
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<tbody>
<tr>
<td></td>
<td>Innovation</td>
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<table>
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<tr>
<th>Feasibility:</th>
<th>Investigator</th>
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<td>Approach</td>
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<td>Environment</td>
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Overall Impact:
The likelihood for a project to exert a sustained, powerful influence on research field(s) involved.

### Evaluating Overall Impact:
Consider the 5 criteria: significance, investigator, innovation, approach, environment (weighted based on reviewer’s judgment) and other score influences, e.g. human subjects, animal welfare, inclusion plans, and biohazards.

<table>
<thead>
<tr>
<th>Overall Impact</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
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<tbody>
<tr>
<td>Score</td>
<td>1 2 3</td>
<td>4 5 6</td>
<td>7 8 9</td>
</tr>
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</table>

e.g. Applications are addressing a problem of high importance/interest in the field. May have some or no weaknesses.
e.g. Applications may be addressing a problem of high importance in the field, but weaknesses in the criteria bring down the overall impact to medium.
e.g. Applications may be addressing a problem of moderate/high importance in the field, with some or no weaknesses.
e.g. Applications may be addressing a problem of low or no importance in the field, with some or no weaknesses.
High Impact (scored 1-3)

- High importance in the field addressed. May have no or minor weaknesses.

Medium Impact (scored 4-6)

- High importance in the field addressed BUT weaknesses in the criteria reduce its impact.
- Moderate importance topic addressed. May have no or minor weaknesses.

Low Impact (scored 7-9)

- Moderate importance but weakness reduces impact.
## Overall Impact

### What drives the overall impact score?

- The importance of the research

### What drives the importance of the research?

- **Significance** and **Innovation**

### Feasibility:

- Investigator
- Approach
- Environment

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Research Strategy

- Significance
- Innovation
- Approach
  - Preliminary Studies
  - Methodology

• Note: Research Strategy allocated 12 pages, but NIH gives no criteria how to divide them
• Suggestion: ~ 1-1½ page for Significance
  ~ ½ page for Innovation
  ~ 10 pages for Approach
SIGNIFICANCE
Significance Assumes Success

If your aims succeed, will your research exert a powerful influence on its field?

• Move science forward
• Translational
• Paradigm-shifting
Significance

Moves science forward
• Research will address an issue or critical barrier to progress in the field

Translational
• Research will improve scientific knowledge, technical capability, and/or clinical practice, which will ultimately improve the health of the public

Paradigm-shifting
• Research will develop concepts, methods, technologies, treatments, services or preventative interventions that drive this field.
A strong significance section will answer these key questions.

- What is the gap this research will address between what we need to know and what we currently know?
- Why will this research succeed?
- Why does this research matter?

Note: Tailor the flow of this section to most powerfully present your case. The order these questions are addressed will vary with your story.
Constructing Significance Section: Defining the gap

What do we need to know?

Paragraph 1 Introduce the problem

• Present the problem you plan to solve
• State the magnitude of the problem
• Tie your problem to research priorities
  o NIH has identified reducing burden of XX as a major priority
  o Responsive to program announcement PAR-XX
• Present a gap and the importance of filling the gap
What do we currently know?

Paragraph 2 Premise

• Short critical analysis of salient, most important, relevant primary literature
• Highlight what your prior research contributes to the literature. Refer to your preliminary study section
• Clearly state the gap your research will address
• Give a one sentence summary of the PREMISE for pursuing this gap
Constructing Significance Section

Why will this research will succeed?

Paragraph 3 How your approach will overcome challenges

• Restate the PREMISE supporting your idea
• Describe the approach succinctly emphasizing the RIGOR of your approach
• Explain why this approach will remove barriers or overcome challenges to solve the problem
Constructing Significance Section

Why does this research matter?

Paragraph 4 How results will advance science

• Explain how your research will move science forward or change practice

• State your expected contributions:
  o If Aim 1 is successful then XXX
  o If Hypothesis 1 is confirmed then XXX

• Explain who will benefit and how
  o Will lives be saved or quality of life improved?
  o Will this work provide a new treatment rationale or less costly way to deliver care?
INNOVATION

What is new?
Innovation: What is new?

Innovation section should explain

- How application challenges and or shifts current research or clinical practice paradigms.
- New theoretical concepts, approaches or methodologies, instrumentation or intervention(s) to be developed or used.
- Advantages over existing methodologies, instrumentation or intervention(s).
- Refinements, improvements, new applications of theoretical concepts, approaches or methodologies, instrumentation or interventions.
Innovation: Confirm your idea is new

Good Place to Begin:
Make Sure Your Research Question is Unique

Search research databases to see if anyone else has been funded to carry out similar research

- NIH Research Portfolio Online Reporting Tool Expenditures and Results (RePORTER)
- Community of Science
Innovation: Think Broadly

Think broadly about what constitutes innovation

• Is your hypothesis innovative?
• Does your research approach a question from fresh perspective?
• Do you have novel outcomes or a new study design?
• Does your research employ Novel method/technique?
  New combination of technologies?
  New application of technologies?
Innovation: Be creative

What is new about your study?

- **Conceptually**, are you looking at the problem in a different way?
- Is the **resource** you are using unique? Does it provide insights that other resources do not provide?
- Does your research bring together **novel expertise**?
Innovation: What is distinctive?

State why your study will be distinctive

This work is innovative because

• First study to investigate XX
• Characterizes XX in a rigorous way that will lead to XX
• Changes the XX paradigm OR extends the XX paradigm to XX
• First to use XX applied to XX
• Produces novel information to uniquely address the question of XX
How to Write about Innovation?
Be Straightforward!

In 1 or 2 paragraphs

• Clearly state what is novel.
  o Bullet what is innovative
  o Do not be afraid to use the word *innovative*
• State the value from taking this approach
• Explain why you are positioned to succeed
  o Building on prior work or pilot study
  o Evidence from preliminary data
  o Track record
Litmus Test

Interesting that journalists often investigate scientific news using 5 questions:

♦ What do we need to know?
♦ What don’t we know?
♦ What is new?
♦ Why does it matter?
♦ Who cares?

Convincing Significance and Innovation sections will clearly answer these questions.