Scoring Criteria:
What (NIH) Grant Reviewers Look For in a Proposal

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NIH Funding Decisions

The NIH utilizes 2 stages of review when making funding decisions

1. **Evaluation of scientific merit in study sections**
   - Determine overall **impact scores** used to rank applications (and percentiles)
   - Articulate factors driving scores in critiques and discussion

2. **Funding decisions by Institutes and advisory councils based on**
   - **Percentiles** and input from study section
   - Program priorities, budget, and other administrative factors

Main Review Criteria

- **Core Review Criteria**

  - Significance
  - Investigator(s)
  - Innovation (NOT a specific criterion for NRSAs)
  - Approach
  - Environment

- **Overall Impact**

  - Assessment of the likelihood for the project to *exert a sustained, powerful influence on the research field(s) involved*
  - <u>Should</u> the studies be done (Significance and Innovation) and <u>can</u> the studies be done (Investigator, Approach and Environment)?

9-Point Scoring Scale

Impact	Score	Descriptor
High Impact	1	Exceptional
	2	Outstanding
	3	Excellent
Medium Impact	4	Very Good
	5	Good
	6	Satisfactory
Low Impact	7	Fair
	8	Marginal
	9	Poor

At the Study Section Meeting
Application Discussion

- Only ~50% of applications with top preliminary impact scores get discussed. Rest triaged (not discussed).

- Any member in conflict with an application leaves the room

- Three assigned reviewers state their preliminary scores

- Reviewer 1 introduces the application and presents critique (noting strengths and weaknesses)

- Reviewers 2 and 3 highlight new issues and areas that significantly impact scores

- All eligible members are invited to join the discussion.

Range of Scores

- After discussion, Chair provides a summary and assigned reviewers state final **Overall Impact Scores**, defining the score range. Final scores may differ from preliminary scores based on discussion.

- Each panel member provides an overall impact score (online or on paper).

- Panel members may vote outside this range, although a reason must be stated to the section.

5 Scored Review Criteria

- **Significance**

    Is there a strong scientific foundation for the studies and will the studies/findings be impactful to the field?

- **Investigators**

    Do the Investigators have the appropriate expertise and are they capable of completing the project?

- **Innovation**

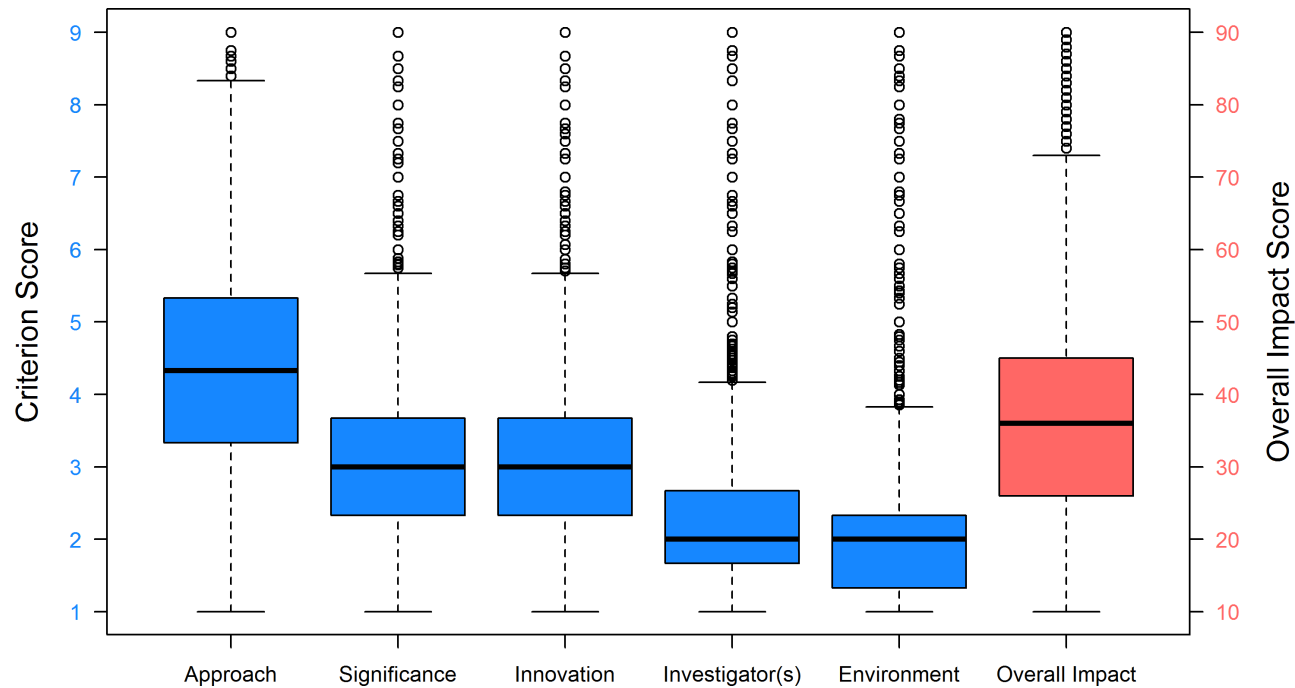   Is there Innovation in the application?

- **Approach**

    Is the Research Design rigorous and appropriate for the Aims?

- **Environment**

    Will the Environment contribute to the project's success?

Approach is the most important criteria driving overall impact score

	Overall Impact	Approach	Significance	Innovation	Investigator	Environment
Variable						
Overall Impact	1	-	-	-	-	-
Approach	0.84	1	-	-	-	-
Significance	0.68	0.72	1	-	-	-
Innovation	0.61	0.68	0.72	1	-	-
Investigator(s)	0.53	0.66	0.6	0.6	1	-
Environment	0.44	0.57	0.55	0.56	0.75	1

doi:10.1371/journal.pone.0155060.t002

Eblen MK et al. (2016) How Criterion Scores Predict the Overall Impact Score and Funding Outcomes for National Institutes of Health Peer-Reviewed Applications. PLoS ONE 11(6): e0155060. https://doi.org/10.1371/journal.pone.0155060

Overall Impact

The overall impact score is not an average of the 5 criterion scores. It reflects the likelihood that the project will significantly advance the field, _if all of the Aims are achieved._

Top scored applications (1-2) are potentially **transformative**.

Does not have to be strong in all Criteria to have major impact.

However, a low score in any of the individual criteria typically reduces the overall impact score of an otherwise highly significant application, because the likelihood of success is reduced.

Criterion 1: Significance

- Should focus on how the work will move the field.

- Prospective evaluation of **future impact** and retrospective evaluation of the foundation for the studies.

- Use this section to:

  (i) State the overarching and specific goals of the proposed studies

  (ii) Broadly describe current knowledge (big picture of what is known)

  (iii) What is impeding advancement of the field (e.g. technological or conceptual limitations)

  (iv) How you are going to overcome these limitations

  (e.g. technological advancement, new conceptual framework, etc.)

  (v) How your new approach is going to advance the field (**IMPACT**).

*__Advice:__ Conclude the significance section with a paragraph entitled "**Outcomes and Impact**".*

Criterion 2: Investigators

- Is the Investigator qualified to conduct the project? Do they have the expertise and experience to conduct the proposed studies? Highlight training, publication records and roles in the project.

Criterion 2: Investigators

Use the biosketch to tell reviewers how your technical and intellectual background, and your experiences are relevant to the proposal (**Personal Statement**). Tell the reviewers how you are uniquely qualified for the project.

- You can also use the **Biosketch** and other sections (e.g. **Resources**) to briefly reinforce the strength and availability of any collaborations and cores that are especially important to the proposed work.

  - This can affect scoring of both 'Investigator(s)' and 'Environment'.

Criterion 3: Innovation

Technical Innovation is not crucial but the methods used should be **current**.

Use this section to:

(i) List the technical innovations of your study (If any)

(ii) Note *conceptual* innovation(s)

(ii) If no technical innovations, try to emphasize how well - established technologies will be used to address an important question or lead to conceptual innovation and discovery

Do you have a unique way of viewing a longstanding problem or system? Has the problem you will address been overlooked? Might you be able to provide fresh insight that will change how we think about a system?

Criterion 4: Approach

- Experiments should be well designed to test the specific hypotheses and achieve the specific aims.

- What Reviewers are looking for in this section:

(i) Use of **current methodological approaches** is always a plus. Regardless of how fancy the techniques, the methods should be current and adequate to achieve the goals.

(ii) Demonstration of Feasibility. **The importance of Preliminary Data.** Two goals of preliminary data: a) To demonstrate feasibility but too early for significant results b) To show some preliminary results that support your hypothesis.

No matter how significant and well designed a proposal is, it will not get a high score if you do not, at a minimum, provide preliminary data to demonstrate feasibility (demonstrate that you can do it).

What else are Reviewers looking for in the Approach section?

Independence of the Aims: related but not dependent on each other's outcome.

e.g. If all aims depend on the outcome of Aim 1, should Aim 1 fail the entire proposal is doomed.

Potential Problems and Alternative Strategies. Identify what could go wrong and if that happens what you would do instead.

Note: If you do not address this, the Reviewer will do it for you, and penalize you for not having thought of potential problems with your experimental design.

Provide **just enough experimental detail** for reviewers to understand what you plan to do. A grant is not a paper's Methods section.

Realistic aims and timelines. Don't be overly ambitious.

Criterion 5: Environment

Does the PI have access to the appropriate resources in their existing environment?

Does PI have access to necessary equipment, colleagues, facilities (animals, core, etc). This needs to be addressed in the **Facilities and Equipment.**

Make things EASY for the review!

The most important thing to know about the reviewer is that he/she has a pile of 8-12 grants to read (reviewer has a lot of work to do) and that only a few that are ranked at the top of the pile (scored 1-3) have a chance of reaching the payline (**competition is fierce**).

You loose points if:
- you **make the Reviewer work too hard**
- appear to be **hiding issues**
- your proposal is **irritating**:
  - dense margin-to-margin text
  - too small figures
  - endless typos, poor grammar
  - missing or mis-numbered figures, missing figure legends
  - cut and pasted text from another unrelated application without modification
  - incorrect references

How to make the job easy for the NIH Reviewer

- Be concise, avoid too much jargon and excessive abbreviations.

- Make sure your grant is not too dense (leave white spaces)

- Avoid too much technical details or extensive review of the literature