How to Review a Scientific Grant

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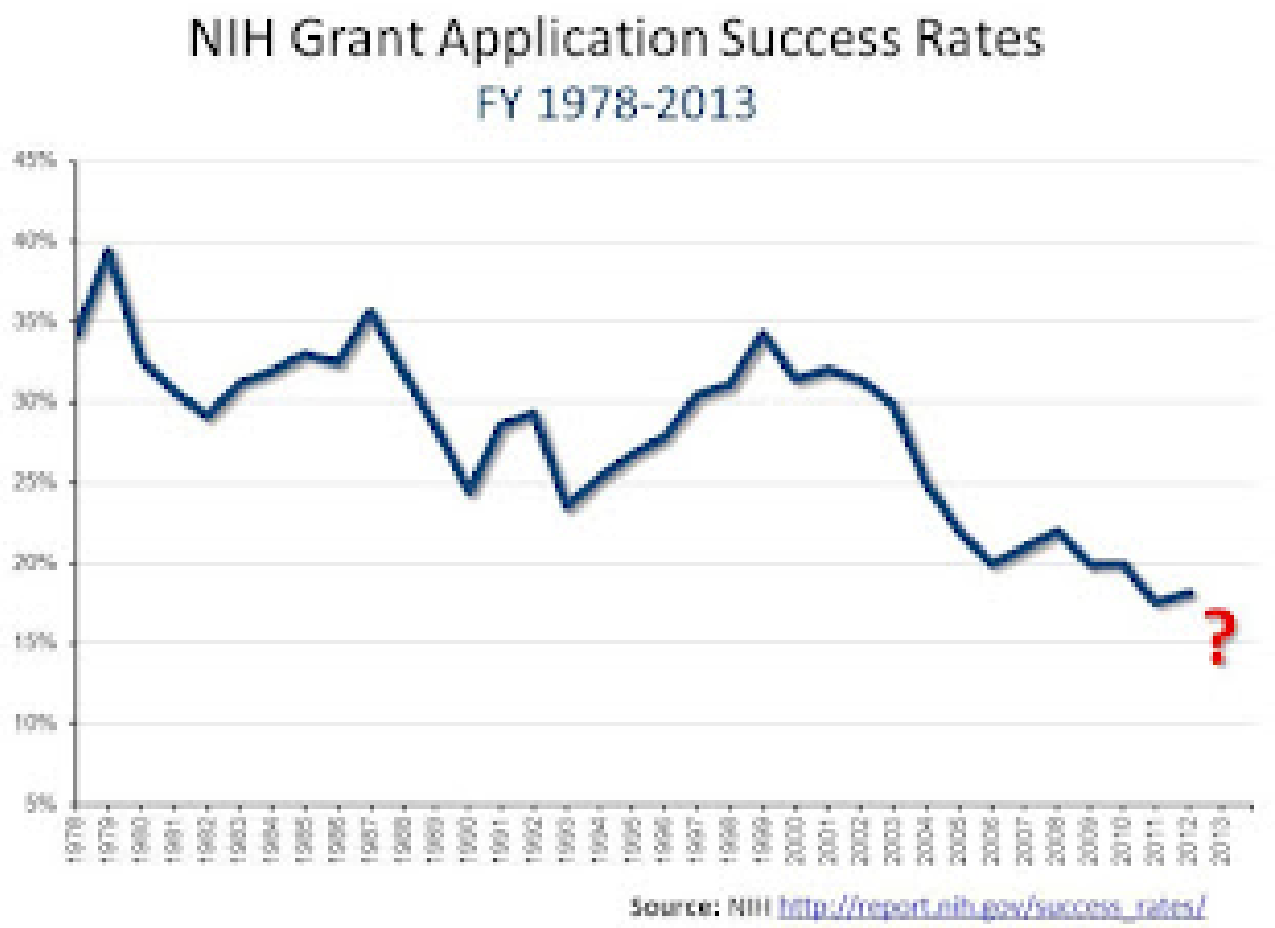
Scientific research is expensive. Discoveries need dollars. The vast majority of academic medical research is supported by funding from charitable Foundations, or national governments (e.g. NIH). The “gold standard” for funding success as a tenure-track faculty member at an academic institute in the USA is obtaining R01’s (or equivalent) from the NIH. But with a relatively stagnant budget over the last decade, and more PIs competing for that pot of money, NIH pay lines have shrunk dramatically (see Figure). There is more pressure than ever on PIs to write good grants to support their research. In turn, this also means there is a tremendous amount of pressure on grant reviewers to thoughtfully evaluate the proposals to ensure the most meritorious applications are selected for funding. As an early-to-mid career PI, I have now had the chance to serve on several study sections for both Foundations and the NIH. I have learned a lot about the process of grant review (which in turn I think has helped me become a better grant writer) which I am hoping to share here to help young investigators really identify what funding bodies are looking for in successful applications, and to help them become better reviewers for other people’s grants. Some of the common themes from the study sections I have been on include considering the following;



- Scope of the work – reviewers want to ensure the project is likely to be completed within the timeframe and budgetary constraints of any given award. One criticism particularly of young investigators is that the the application is too ambitious, proposing what would amount to 5-years of work for a 2-year award. Conversely, if the study appears as an incremental advance over the current work of the investigator, then the application will likely be viewed as not innovative.
- Don't get bogged down in the details – Many applications go into excruciating details about technical procedures. While this may be important if you are proposing to use a novel technique or explain how you have adapted a technology in your lab, other times it takes away valuable page space that can be better used to convince the reviewer of the significance of the study. Remember, not all your reviewers are going to be experts in your field. Your main job is to convince them this is a good problem to solve.
- Does the preliminary data support overall hypothesis – This is a critical question to ask yourself when reviewing a grant. Have the investigators shown enough supporting evidence to justify their study? Are all the preliminary data presented with rigorous approaches, or are they missing key experiments or important controls?

- Big picture – Reviewers want to be convinced that your proposal is this a question worth answering. Have you convinced me of the significance of the study either for basic biology or public health?

For additional insight, I contacted some member of the NIH Molecular and Cellular Hematology (MCH) Study Section for their thoughts on what makes a good grant, and the most important features reviewers look for when reviewing applications;

From Dr. Shannon McKinney-Freeman (St. Jude Children's Research Hospital) …

From Dr. Wei Tong (Children's Hospital of Philadelphia) …

https://public.csr.nih.gov/ForReviewers/BecomeAReviewer/ECR

https://public.csr.nih.gov/sites/default/files/2017-10/InsiderGuidetoPeerReviewApplicants.pdf

https://grants.nih.gov/grants/peer/guidelines_general/scoring_system_and_procedure.pdf

Grant A. Challen, Ph.D.
Associate Professor
Section of Stem Cell Biology
Division of Oncology
Department of Internal Medicine
Washington University in St. Louis

“The most important thing: you need to get your reviewer’s excited about what you are proposing to do!!!! So, make it engaging and the rationale and impact clear from the very beginning and throughout. Reviewer’s will forgive issues with approach and thin preliminary data if they are really excited by the work. Make the grant easy to read, if the reviewer is struggling to force themselves through your grant, you are sunk.”

“I first look at the big picture: is this grant working on an important question? Is it innovative? Is it based on sufficient published and/or preliminary data? Are the aims well-structured and do the proposed experiments sufficiently test the hypothesis? Then I look at the investigator: does the PI consistently publish solid work? An outstanding grant answers all my questions as I am reading it. It is important to write a grant that people outside the designated field can understand.”

There are many resources available to help prepare grant reviewers/writers. Some NIH resources include the Early Career Review (ECR) program which exposes the young PIs to rigor of NIH peer review at the early stage of their career;

More information can be found at Insider’s Guide to Peer Review -

Scoring System and Procedure -

Scientific reviewers have a responsibility to be accountable so that the money awarded to applicants is being used for the very best science with the highest chance of making a difference to society.

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