Deciding Which Science Gets Funded: The Review Process

By Julianna LeMieux — February 9, 2017

In part I of this series, published earlier this week, we discussed the RO1 grant - the bread and butter of academic research funding. Here, in part II, we delve into what happens to a grant after it is submitted and how select grants are awarded the funding.

After submission, a grant is assigned to the most appropriate section, or institute, within the NIH (there are 21 different institutes [1].) The PI requests the most appropriate placement, which is taken into consideration.

Once assigned, the grant goes through peer review - the cornerstone of the scientific process. A group of about 20 scientists working in the same field come together near Bethesda, MD, to discuss the grant proposals, and gauge their enthusiasm for the projects. The scientists who make up these groups, called 'study sections,' have a wealth of research experience, a strong publication record and has obtained RO1s themselves. A study section member will go to two or three meetings each year, where 60–100 applications may be under review per meeting. Generally, scientists serve a four or five year term as a standing member of the a study section and it is this group that sets the tone of the study section.
Each grant is assigned to three or four study section members. These people become the 'experts in the room' for their proposals. Before traveling to Bethesda, the scientists put in hours reading and grading their grants. The grants that have received a low score are triaged and, if all study section members are in agreement, these grants are not discussed at the meeting. If even one person wants to bring a grant to the table for discussion, based on its scientific merit, it is pulled out of the triage and discussed.

The remaining grants are discussed and their scientific merit and the reviewers' level of enthusiasm is scored. In the end, a vote is conducted through a secret ballot.

The review process is supposed to be as objective as possible, although it should be noted that the reviewers know the author of the grant. Therefore, it is hard to imagine that there is no bias in the judging. Especially when we know that well established scientists have an easier time getting their papers published in high impact journals. One check and balance in the system that helps counteract the rich getting richer is that young investigators, submitting their first grant, have a higher funding line than people submitting renewals.

In contrast, although the PI may know the members of the entire study section, they should not know who the three or four members were that represented their grant to the group.

Science can be a small world with many people who work together, publish together, or work at the same institution. During a study section, these people recuse themselves from the discussion of a grant that they cannot be impartial over and, in fact, have to leave the room during the conversation.

After the meeting, the critiques, scores and recommendations are all released to the author of the application.

For the authors, the most important piece of information is the 'percentile ranking' based on the grant's overall score. It is this number that determines life or death for the grant. If the grant is at 11%, and the funding cut off is 12%, the grant is funded. If the cutoff is 10%, it will not make the cut. To add to the stress, scientists usually know their percentile ranking before they know the funding cutoff - a number that changes over time.

For more information on particular grants, you can visit the Research Portfolio Online Reporting Tool (RePORT) allows open access to the project summaries of all of the grants that are funded by the government.

Lastly, It should be noted that scientists perform this service as a professional obligation. They are paid only for their travel and a small per diem ($100-$200/day.) They are not doing this for the money - rather, because this process is at the cornerstone of how science is done in this country, and how scientific progress moves forward. There is no compensation for the time spent reviewing the grants before the study section. It can be a grueling task, to sift through hundreds of grants, knowing that only one in ten will be funded. And, although the process is not perfect, the decades of strong scientific research going on this country are a testament to its efficacy.

NOTE:
The NIH is split into 21 institutes, with a large amount of variation in how much each one is allotted for funding. For example, in 2016, the National Cancer Institute received the largest amount of money at $5.1 billion with the National Institute of Nursing Research receiving just $145 million.