NIH Center for Scientific Review

peer review notes

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NIH Budget Boost and the Impact on Peer Review

Congress and the President boosted the NIH budget by $2 billion late last year. "After a decade of tight budgets and missed opportunities, this is great news," said CSR Director Dr. Richard Nakamura. "The raise couldn't come soon enough, as application submissions are at historic highs and paylines are at historic lows."

Looking Ahead

"Incoming NIH applications increased about 6% last year to over 86,000," he said. "But applications reviewed by CSR reviewers rose 14%, as CSR absorbed more of the increase than the review units at the other NIH Institutes and Centers. CSR is recruiting more Scientific Review Officers to keep up."

"While it's an exciting time, we look forward with a worried eye," he continued. "A new surge of applications seeking the increased funds could be difficult to bear in the short term." He noted it is already a challenge to recruit reviewers, and asking more scientists to spend days away from their work and families will be more challenging.

Appeal to Applicants and Research Deans

"While $2 billion is a big increase, it is less than a 10 percent increase, and a large portion of it is earmarked for specific areas and initiatives," said Dr. Nakamura. "Competition for funding is still going to be intense, and paylines will not return to

historic averages . . . So make sure you put your best effort into your application before you apply."

Counterproductive Efforts

"We know some research deans have quotas and force their PIs to submit applications regularly," said Dr. Nakamura. "It's important for them to know that university submission rates are not correlated with grant funding. Therefore, PIs should be encouraged to develop and submit applications as their research and ideas justify the effort to write them and have other scientists review them."

Reviewing Peer Review at NIH

"Criticism of NIH peer review has increased over the last decade, as funding stalled and incoming applications surged," said CSR Director Dr. Richard Nakamura. "Since review scores are so critical to getting funding, many PIs have questioned the ability of our peer review system to prioritize high-impact research."

"Peer review certainly doesn't deserve all the blame," he continued. "But our critics deserve credit for raising important questions and for spurring us on to focus more on ways to better assess and improve NIH peer review."

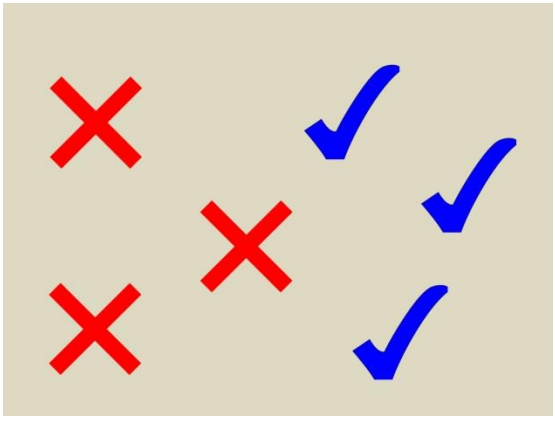
As part of this effort, Dr. Nakamura recently coauthored an essay titled "Reviewing Peer Review at the NIH," which was published in the New England Journal of Medicine. His coauthor, Dr. Michael Lauer, is now the new Director of the NIH Office of Extramural Research.

Three Issues Are Explored in the Article

- Bibliometric tools have a limited value for assessing peer reviewed science
- The imprecision of tools to measure peer review doesn't mean the current system is failing
- Science funding should be subject to evaluation

Drs. Lauer and Nakamura then discussed various ways to assess peer review before inviting the community to join the conversation and work to advance peer review.

Do's and Don'ts for the New NIH Biosketch



Since last May, applicants are required to use a new biosketch format, where they are asked to highlight their scientific contributions instead of simply listing their publications. The goal is to better focus reviews on the magnitude and significance of an applicant's research accomplishments.

So you can make the new format work as well as it can for you, we pulled together the following Do's and Don'ts for applicants and reviewers:

Advice to Applicants

- Read the instructions and use the new biosketch format.
- Be objective -- Don't oversell or undersell yourself.
- Make sure your claims are backed up by your publications.
- Don't stuff your biosketch with data and information that do not belong there.
- Take advantage of the option to provide links to your publications via SciENcv or My lBibliography.
- Relax if you are a new investigator: the new requirement can only help you, since study sections cluster the reviews of new investigator R01 applications.

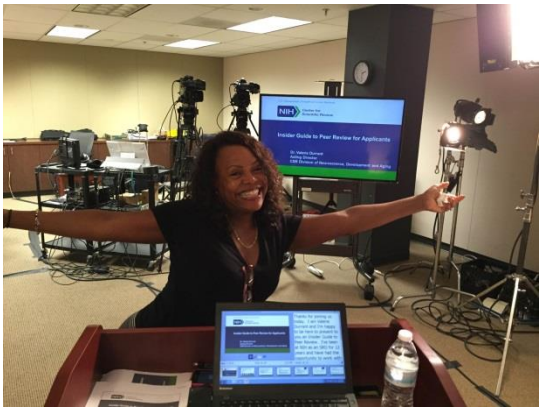
Bottom Line: List only pertinent information in your biosketch, and know your application could be withdrawn if you don't use the new biosketch format.

Advice to Reviewers

- Take the time to read biosketches -- they could save you time in assessing an investigator's contributions.
- You may factor an uninformative biosketch into your scoring if it hinders your ability to assess the investigator.

Learn More: Biosketch Q&As

CSR Posts Webinar Videos for New Applicants and University Research Administrators



New R01 grant applicants and University Research Administrators can now view our fall 2015 "Meet the Experts in NIH Peer Review" webinars online.

These webinars were designed to provide useful insights into our application submission and peer review processes.

You'll See Presentations by Four to Five CSR/NIH Experts

- The Review of Your NIH Grant Application Begins Here
- What You Need to Know about Application Receipt and Referral
- How Your Application Is Reviewed
- Key Things to Know About the NIH Grants Program
- Jumpstart Your Career with CSR's Early Career Reviewer Program (Only in the R01 Webinar)

Each Webinar includes a Q&A session at the end.

Job Jump: Moving from Academia to NIH

Dr. Bruce Reed took the leap last August, and we thought you'd enjoy hearing his reflections on his new life as a federal official. He left the University of California in Davis to become the new Director of CSR's Division of Neuroscience, Development and Aging. He was a professor of neurology and Associate Director of its Alzheimer's Disease Center as well as a neuropsychologist at Veterans Affairs Northern California in Martinez.

Why did you leave academia?

There was a push and a pull. I felt the same pressures so many of our PIs feel: Even if you're successful, there's a continual pressure to not only support yourself but your lab and a lot of people. As for the pull . . . it was new and a chance to contribute to science in a different way and at a higher level. I didn't have illusions

I would change the course of scientific discovery, but having a hand in things on the broad horizon made the job attractive. Then, things came together with my wife and kids that made it really attractive.

What do you like most about working at CSR?

It is a place where I feel my opinion and presence matters and I can have some influence on what gets done. It's very stimulating to be more concerned about bigger trends in science. And it's kind of fun having some glimpse inside the inner workings of NIH.

What were the biggest surprises about working for the government?

In my academic world, I could buy whatever computer I wanted and put whatever I wanted on it. Here, it is a small production to put a new app on your phone. But there are greater risks at NIH if you let folks download anything they want. On the positive side, I've been impressed by the dedication of the people who work at CSR.

Have you learned any new things about peer review?

PIs are always concerned about where their applications ought to be reviewed. After working at CSR, I believe they shouldn't worry as much, because there is a whole group of people who think about assignments all the time, who really know the committees and who is on them. They really want applications to get reviewed in the right place and they do a good job.

Also, I wish I had known how carefully SROs were about picking reviewers. I would have been more flattered when I was asked to serve.

What do you think about the state of NIH peer review now that you've observed a lot of meetings?

I've been impressed by the quality of the reviewers and the discussions. I think applications are being treated fairly. But anybody who is close to the process knows it's not perfect. We always need to try to make it as good as it can be – that's our job.

Would you recommend others follow in your footsteps?

It all depends on what you want. I honestly miss doing science, where there's a premium on innovation and creativity. But on the other hand, it's all problem solving. The job at CSR is just a different kind of problem solving -- trying to make the peer review system work better. There's is a lot of satisfaction in that. So if you're looking for a change and find a good opportunity, you should do it.

Geneticist Advances Schizophrenia Research: the Power of Peer Review

Breast cancer researcher and Lasker Award winner Dr. Mary-Claire King encountered challenges several years ago when she wanted to expand the scope of her research to study schizophrenia, a disease that affects about one in 100 people worldwide.

Dr. King, professor of genomic sciences and medicine at the University of Washington in Seattle, already was known for her work with BRCA1 and related genes that harbor mutations predisposing people to breast and ovarian cancer — mutations that now are detected with standard lab tests.

Dr. King also was known for her human rights work, including the innovative, mitochondrial-DNA-based identification of children stolen as babies under the military government in Argentina in the late 1970s and early 1980s. Many of the children were eventually reunited with surviving family members based on DNA matches, and the approach now is used for forensic and human rights investigations worldwide.

Schizophrenia was a very different challenge. Dr. Thomas Lehner, now director of the Office of Genomics Research Coordination at the National Institute of Mental Health (NIMH), was Dr. King's program officer for her first schizophrenia grant application.

"She had an idea about the genetics of schizophrenia that was not universally accepted at the time," Dr. Lehner said. "Although Dr. King was a very highly regarded genomic scientist, I think it would have been unusual for a scientist outside the field of genetic psychiatry to achieve success with a first proposal."

Dr. Lehner connected Dr. King with others already working in the field, alerted her to key resources funded by the NIMH, and told her about collaborative R01 grants, an option for NIMH-funded scientists to team up for a project proposal, with each receiving an individual grant for their part.

"He shepherded me at every step," Dr. King said. "He was very hands on and very critical, but never tried to dictate to me or tell me what to do."

The first grant proposal submitted by Dr. King and colleagues did not score well at peer review. Dr. King and her colleagues revised the proposal in detail based on the study section criticisms. The resubmitted proposal was funded.

Both the quality of program officers and the quality of peer review are critical to the success of the NIH, in Dr. King's view.

"Reviewers questioned how we could achieve the throughput we aimed for," Dr. King said. "Genomic technology was improving very quickly, and by the second submission we had much more preliminary data that showed that we could do what we proposed."

She has since deepened her genetic studies with additional NIH support, making major contributions to schizophrenia research.

The idea that motivated Dr. King to study schizophrenia and other complex diseases was contrary to the dominant thinking in human genetics at the time. Because large population studies had not revealed common, severely damaging genetic variants that could act individually to greatly elevate risk for complex diseases, many researchers concluded that complex diseases instead arise primarily due to combined effects of common, small-effect, inherited genetic variations.

Dr. King reasoned differently. She hypothesized that although severely high-risk mutations leading to a disease such as schizophrenia would die out quickly in any population — because those afflicted bear fewer offspring — these severe mutations could be continually replaced by new severe mutations. She hypothesized that severe risk variants are continually arising through mutation in every generation. Because they are extremely rare — sometimes affecting just one individual — these mutations would be not be detected by genome-wide association studies.

Dr. King began working with Dr. Michael Wigler, a geneticist at the Cold Spring Harbor Laboratory, and Dr. Jonathan Sebat, a geneticist at University of California, San Diego, both of whom studied autism, another brain disorder with origins early in development. Wigler and Sebat demonstrated that recently arising mutations — in the form of large deletions or additions of DNA — were associated with a significant proportion of cases of autism.

Discoveries

Next, with initial funding from the Brain & Behavior Research Foundation (then NARSAD), and with her new NIH funding, Dr. King at last was able to focus on schizophrenia. Working with Dr. Sebat and other colleagues, particularly Dr. Jon McClellan, professor of psychiatry and Dr. Tom Walsh, associate professor of medical genetics, both at the University of Washington, she discovered that rare, recently arising DNA additions and deletions do indeed play a role in schizophrenia, a discovery reported in Science in 2008.

Dr. King's NIH grant was renewed after a competitive peer review, and she and her colleagues continue to exploit newly developed genomic technologies. They found that among individuals with schizophrenia but no family history of the disease, harmful "de novo" mutations — those that arose in a parent's sperm or egg but that are not found in parents' blood — were much more likely to be associated with a network of genes that are switched on prenatally to guide development of the brain's prefrontal cortex. The discovery was reported in 2013 in Cell.

Dr. King also participates in new NIH-funded collaborations to explore schizophrenia genetics in other populations, including in the Middle East and in South Africa. "It's still early days for our research," she said, "both in the U.S. and elsewhere. Our goal is to define pathways that are altered in schizophrenia, so that our clinical colleagues will have better information to decide the best treatment for each patient. It's the essence of precision medicine."

Dr. King made one strong recommendation for peer review: that every principal investigator of an R01 or other major NIH grant be expected to participate as an ad hoc member of an appropriate study section at least once every two years, and that study section staff be empowered to ask these senior scientists to do so. "But please ask us way in advance," she pleads.

"The peer review system can be messy, like democracy itself, but it's better than any of the alternatives," she said. — *Jeffrey Norris*

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