

Reduced funding and sequestration impact young biomedical researchers

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Constraints on funding for research are currently a major topic of conversation among young and established investigators alike. With this in mind, the first article in Young Investigator Perspectives series of editorials provides a thoughtful student perspective on the impact of the current funding situation on graduate students and postdoctoral scholars. I thank Alexis Carulli for her excellent and timely contribution. I hope this will stimulate discussion, as well as directly highlight concerns shared by many young scientists and some possible strategies to address them.

—P. Kay Lund

DAYS BEFORE FEDERAL SEQUESTRATION commenced, a student in my graduate program publicly voiced anxiety about how budget cutbacks might affect trainees. Our graduate director instructed us not to worry; we should focus on our research and leave the funding concerns to the faculty. In the ensuing months since the sequester prompted a \$1.6 billion cut from an already tight NIH budget (1, 5), it has become clear that the funding crisis is having real consequences on trainee progress and career outlook. Investigators are leaving academia, some are leaving science altogether, and trainees everywhere are in doubt about the future of science and whether there will be a place in it for them.

These concerns have hit young researchers at all levels of training. When the time came to pick labs this year, many new graduate students found that the previously well-funded labs they rotated in were experiencing reductions in or uncertainties about funding and were hesitant to take on new trainees. For first-year students who had little forewarning that their intended career field was so fiscally challenged, the sequester cuts came as an unexpected blow. One new student commented, “When I entered grad school, I was relieved to be taking steps to secure my future; however, in this current financial state I feel like my future is more unsure than ever. I feel like I got on board a sinking ship.”

Later-stage PhD students, typically better informed about the realities of research funding, felt that the sequester merely intensified an already bad situation. One student explained how the low funding rates are shaping his future career plans: “I would be less likely to take a soft-money position at a large research institution and more likely to go to a smaller school where I can still do research but also teach. Reducing the amount of my salary that is paid off of grant money will definitely be more of an emphasis when I hit the job market than it would have been previously.”

The fact that all researchers with federally funded grants are working on “soft money” is well illustrated by the cold reality that, as grants remain unfunded, a common cost reduction

strategy is termination of higher salaried employees, despite the impact on technical support and intellectual contribution. One student commented: “The lab has shrunk from 3 grad students, 1 postdoc, and 2 technicians to just 3 grad students. This not only decreases the day-to-day interactions and discussions with peers but also makes research much more difficult. The number of rote tasks that I do has increased exponentially and I am forced to spend less time doing actual experiments and increased time doing general lab upkeep.”

Aside from more time spent on nonexperimental activities, trainees in labs with tight funding are also facing increased scrutiny on purchases. Labs often delay ordering critical reagents for key experiments until the next grant decision is returned. Such delays can increase time to graduation or decrease the caliber of student publications. Furthermore, graduate students who have not secured their own funding via training grants or fellowships feel that they are a financial burden. These students have concerns that they might feel pressure to publish in lower-quality journals because the lab simply cannot afford to keep them long enough to complete more rigorous studies.

Postdoctoral fellows have additional insight on the budget crisis because they have personally witnessed how funding cuts are changing the type of science being performed today. There is a sense that basic science research is becoming less fundable and the pressure is very high to pursue translational studies. Although translation is a crucial component of biomedical research, it is still essential to preserve research into the very fundamentals of biological processes, which may have high risk but also yields high rewards when unexpected, transformative discoveries emerge. Additionally, trainees see their mentors spending more time grant writing, desperately packaging their story so that it sells in a climate with as little or lower than a 10% chance of success. As the job market becomes smaller and even more competitive, some are finding themselves wondering if they will have or even want the career they’ve worked so hard for.

Current evidence suggests that these concerns are shared widely across multiple institutions. A new survey conducted by the American Society for Biochemistry and Molecular Biology confirms the widespread consequences of the budget cutbacks (6). Of the more than 3,700 researchers surveyed, 46% had laid off a researcher due to budget cuts, and 53% were unable to take on promising new trainees. Additionally, 80% of the respondents reported spending more of their time writing grants although 65% are still struggling to attain funding and 67% received less funding than in 2010.

Although some determined young researchers intend to pursue academia regardless of the funding situation, the grim reality is that more trainees are considering leaving science completely, which has potentially long-term negative consequences for science in the US. Two objectives must be put in place to counteract this: First, we must increase the value and marketability of graduate and postdoctoral training to fields outside of the tradi-

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tional tenure-track academic route. Trainees need to have confidence that their time invested will lead to a satisfying career. Dr. Victor DiRita, Associate Dean of Graduate and Postdoctoral Studies at the University of Michigan Medical School, outlined a "Career Agility Plan" that empowers graduate students to define career goals early and offers support to diversify skillsets to achieve these goals. The recent NIH sponsored "Broadening Experiences in Scientific Training" initiative (RFA-RM-12-022) also seems like a step in the right direction (2). With expanded skills and career options, more students can complete their degrees with optimism, likely increasing the amount of students who stay in science, academic or otherwise. The second objective is investment. With less funding available, young researchers feel like they have no way to compete with established investigators. The NIDDK has a great track-record of funding trainees (3, 4), and continued commitment to training awards, pilot grants, young investigator, and career transition awards is required to ensure that new investigators can get started in our increasingly competitive environment.

Everyone is struggling with reduced funding. Resolution may require a redesign of the way science is conducted in our country. As we continue forward, it is imperative to keep trainee interests and excellence at the forefront and to find a secure place for these talented young minds to flourish and contribute. Our success truly is the future of biomedical science.

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AUTHOR CONTRIBUTIONS

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