Growing the Cancer Research Pipeline by Expanding Opportunities

Supporting work in all components of higher education is essential to the future of cancer research.

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In his senior year at Oakland University in Michigan, Tyler Parsons started working on a research project led by Gerard Madlambayan, Ph.D.

Tyler was able to be part of the NCI-funded project—investigating how certain types of stem cells affect tumors' ability to grow in the aftermath of radiation therapy—because of the type of NCI grant Dr. Madlambayan had received, called a Research Enhancement Award, or an R15.

Tyler flourished in the lab and decided to remain at Oakland, working on the R15-funded project, to get his Ph.D. However, while he was in the home stretch of getting his doctoral degree, Tyler's life took an extremely worrisome turn: After a series of health problems caused by blood clots, he was finally diagnosed with a type of blood cancer called polycythemia vera.

Thankfully, his disease responded well to an immunotherapy treatment (and continues to do so), and he was able to complete his Ph.D. and is now finishing his postdoctoral work at Washington University in St. Louis. The research he's doing now is not only scientifically important but deeply personal: another NCI-funded project that's investigating his own disease.

Tyler may never have ended up at Washington University studying his own cancer type had not Dr. Madlambayan applied for and been awarded that R15 grant. That's because of two unique features of R15 grants.

First, these grants are available only to researchers at smaller institutions like Oakland where there are many talented researchers but, overall, the schools themselves have not been major recipients of National Institutes of Health (NIH) funding. Of course, those applying for the grant must have a scientifically strong and relevant research proposal.

And second, applicants must also include a detailed plan in their application for bringing in undergraduate and graduate students at their institutions to do meaningful work on the research project and offering the mentorship support those students need to pursue careers in scientific research.

This past June, we heard Dr. Madlambayan share Tyler's inspiring story at a workshop sponsored by NCI's Division of Cancer Biology, which administers NCI R15 grants focusing on fundamental cancer research.

The workshop brought together R15-funded investigators from across the country to share findings from their research projects as well as their experiences and insights from being part of this innovative NIH program.

All in all, the workshop was an excellent demonstration of how the R15 program is helping to foster the next generation of cancer scientists. And given the consequential science and inspirational training stories we heard, we both agree it's time this program got a little more attention.

Focusing on impactful science at training-focused institutions

Many cancer researchers choose to work at smaller institutions where they can do high-quality, impactful work while also having plentiful opportunities for face-to-face teaching and training the next generation of scientists.

It's precisely for these researchers and the students at these schools that NIH established the R15 grant program about 40 years ago. By supporting smaller-scale research projects at institutions that have not been major recipients of NIH funding, the program is strengthening the basic and clinical research infrastructure and environment at these vital places of higher learning.

The workshop highlighted the secret to success for this program. By requiring the inclusion of undergraduate and graduate students as active participants in these research projects, the program opens up a critical avenue for bringing people from a diverse array of backgrounds and experiences into the cancer workforce.

Expanding the pool of people who are exposed to high-quality biomedical research during this transformative period in their lives is foundational to establishing a community of researchers who see things from different angles and perspectives. If we're going to make the kind of rapid progress against cancer and many other diseases that we all desire and expect, a workforce of people who can look at the same problems and devise entirely different strategies for overcoming them is absolutely paramount.

For example, at the workshop, Juan Andres Melendez, Ph.D., of SUNY Polytechnic Institute in New York, recounted the story of the first Ph.D. student who worked on his R15-funded project investigating the underlying biology of the cellular damage caused by free radicals, with an eye toward using that information to prevent cancer and other age-related diseases.

On her first day in the lab, the student, whose first language is Spanish, told him that she wanted to study an enzyme called "superoxido dismutasa." As Dr. Melendez explained, he had never heard somebody say superoxide dismutase in Spanish! That student excelled at the work,

including creating a series of cell lines so that she could indeed study this antioxidant enzyme in intricate detail.

And Maria Diakanova, Ph.D., described the vital role her first R15 grant played (she has received several) in not only advancing her own research career at the University of Toledo but also allowing her to bring in a wonderful group of undergraduates to work on the project.

Four of those undergrads stayed on at Toledo to complete their graduate studies. “They had already created a lot of data” as part of the research project, Dr. Diakanova said, and by the time they finished their Ph.D. degrees, each had their names on four or five published studies. All four have gone on to be “very successful in their scientific lives,” she said.

Taking advantage of a proven program

In the wake of these and the other inspiring stories we heard at the June 2024 workshop, it became clear that for a program with so much potential to have an even greater impact, we at NCI need to do more to promote it.

Consider this: In fiscal year 2023, nearly 800 R01 grants—the primary NCI program for funding investigator-initiated research projects—were awarded. By comparison, during the same period only 20 new R15 grants were awarded. Even though the number of faculty and students at qualifying institutions is large, the success rate for investigators who applied for an R15 was much greater than that for those who applied for an R01.

Although smaller in scale than the R01 program, the R15 program is creating important opportunities for investigators at less-resourced institutions to pursue impactful and important research and for motivated, talented students to start down a path toward a career in cancer research.

In fact, this program is precisely in line with one of the core goals of the National Cancer Plan: optimizing the cancer research workforce. Because our workforce needs entry from the widest range of talent. We need students from all walks of life to recognize the potential of a career dedicated to research, as well as careers in patient-facing positions, education and teaching, and the private sector.

The future of delivering on the promise of cancer research depends on success in all these arenas, which is why supporting work in all components of higher education is essential.

We encourage researchers from eligible universities across the country to investigate this exciting program and consider applying for an R15 grant. As the workshop demonstrated, the potential benefits for these researchers and students at their schools are truly awesome.

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