

A Lost Generation of young scientists? U-M grad student voices concern about research funding crunch

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This is Alexis Carulli, an M.D./Ph.D. student in the University of Michigan Medical School's Medical Scientist Training Program. Credit: Courtesy Alexis Carulli

Alexis Carulli wants to make a difference in fighting human disease. So do the thousands of bright graduate students like her, and recent Ph.D. graduates, working in medical research laboratories around the country.

But with federal scientific research [funding](#) flat, eroded by inflation and cut by budget sequestration, Carulli worries for her generation of aspiring biomedical scientists.

In a new article published in the *American Journal of Physiology: Gastrointestinal and Liver Physiology*, she speaks up about it, to make sure the voice of the young scientist is heard. She describes the potential effect of ongoing instability in research funding—and highlights the very real impact that today's [science funding](#) climate is having on the daily lives and career plans of young researchers-in-[training](#).

"This is an issue that's pervasive, across the country," she says, based on conversations with peers at U-M and at conferences. "The decreased funding levels for science aren't just affecting research right now. If this situation lasts longer, it will have very long-term consequences, because the scientists won't be there."

More of them may head for careers in industry that will use their scientific skills, but won't necessarily focus on discovering entirely new knowledge, she says. Those born overseas and trained here may leave the U.S. to go back to home countries that are pouring money into science funding – a sort of reverse "brain drain." And some may decide that the long road of training for a scientific career isn't worth the investment of time and effort, due to uncertainty about funding.

Carulli herself plans to be both a doctor and a scientist – a long journey of earning both a medical degree and a Ph.D. through U-M's Medical Scientist Training Program, plus advanced training in a medical residency and fellowship after that.

She's six years in, and hoping that her chosen path—and full funding for her graduate studies—will help her weather the storm in science funding. But she can't know for sure.

She also notes that what she heard from her peers is not all doom and gloom. "It was uplifting to see that not everyone had given up," she says. "But the fact that the path to academia is filled with so many obstacles is troubling." As she writes in the paper, "Our success truly is the future of biomedical science."

Supporting students and recent Ph.D.s

Victor DiRita, Ph.D., the associate dean for graduate and postdoctoral studies at the U-M Medical School, says Carulli's concerns resonate with him and his team.

That's why they have created new programs to help graduate [students](#) and recent Ph.D.s (called postdoctoral fellows or postdocs) understand the many career paths that biomedical graduates can go down, and the marketable skills that earning a Ph.D. gives them. They work with the Office of Student Success in U-M's Rackham Graduate School, through which Ph.D.'s are awarded.

The U-M Medical School has more than 570 graduate students pursuing masters and Ph.D. degrees, and more than 550 postdocs, training and performing research in its labs. About 30 percent of U-M Medical School Ph.D. graduates go on to academic research careers, while the rest choose to go to teach at small colleges, to industry, or to government and the nonprofit sector.

"Academic positions that are dependent on government funding are limited, so we need to help students understand that their training as a scientist gives them enormous transferrable skills," says DiRita—first and foremost, their ability to do a "deep dive" on a scientific problem and come up with answers through research. It is essential for each student to develop a "career agility plan" to guide themselves, he says.

"Students need to come in with their eyes wide open," he notes.

"Students who are focused on becoming academics really have to work their tails off, because those positions are hard to get. But that level of effort and the expertise that develops from it will contribute to success in many other [career](#) paths."

U-M and other schools have increasingly found themselves having to offer "bridge" funding, to help research faculty whose grants are running out and who haven't yet gotten more funding – even though their latest grant applications were judged highly worthy. As federal science funds shrink due to cuts and inflation, a smaller percentage of grant applications are getting funded.

Daily impact of funding cuts

With such a high level of uncertainty, Carulli notes in her article, graduate students and postdocs may find themselves unable to pursue a certain experiment right away because their advisor doesn't want to spend their remaining money on expensive supplies that they don't have on hand.

Those who are finishing their initial graduate coursework and looking for a faculty member's laboratory to work in may find that many aren't able to take on new students, due to lack of funding, she says. And those who are finishing Ph.D.s are finding fewer labs can take them on as postdocs.

Carulli studies adult stem cells in the digestive tract as a student in the lab of Linda Samuelson, Ph.D., who is the John A. Williams Professor of Gastrointestinal Physiology in the Department of Molecular and Integrative Physiology, and Associate Director of U-M's Center for Organogenesis.

Samuelson says she's proud of Carulli for gathering and reflecting the concerns that students have, and shares those concerns given the current funding climate. While U-M has weathered the current funding crunch better than other schools, it isn't immune.

"We bring in the brightest young people interested in science, help them define research problems, and support them through the process of discovery and training," she says. "That support depends on our funding for our labs. We make a 4 to 6 year commitment to these students, and we want them to have state-of-the-art technology and important [research](#) problems to address. To support that we need sustained funding. It would be a tragedy to lose them."

More information: *Am. J. of Physiology: Gastrointestinal and Liver Physiology*, [DOI: 10.1152/ajpgi.00297.2013](https://doi.org/10.1152/ajpgi.00297.2013)
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