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"Fiscal cliff" threatens to impede biomedical discoveries

Scientists fear that automatic cuts in funding for the National Institutes of Health, set to kick in at the start of 2013, will harm research and patients.

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Brianna Commerford felt a lump. After a few months of feeling mildly ill, she was diagnosed with stage IV Hodgkin's lymphoma. She was devastated, she was scared, and she was only 9 years old.

Five years later, Brianna is still alive thanks to an experimental treatment she received from the Children's Oncology Group. Devoted to curing childhood and adolescent cancer, the COG is a clinical trials group that is primarily supported by the U.S. National Institutes of Health (NIH), the largest sponsor of biomedical research in the world.

This month scientists nationwide are petitioning to protect lifesaving research programs like this one before January, when the federal government will automatically slash—or "sequester"—8.2 percent ($2.5 billion) of the NIH budget for 2013 unless Congress stops the move. The money will be withheld because of provisions in the Budget Control Act of 2011 that aimed to cut spending. Combined with the scheduled finale of the Bush-era tax cuts, the provisions are expected to push the country over the now proverbial fiscal cliff.

Separate from the scheduled downsizing of Medicare (2 percent or $14 billion), the NIH cuts threaten to corrode the foundations of biomedical education and research in the U.S. Agencies including the National Science Foundation, NASA and the Department of Defense would also be saddled with lighter coffers. The prospect of deep cuts is particularly alarming to biomedical researchers because the cutbacks would come at a time of already strained budgets.

From 1999 to 2003 the federal allocation for the NIH doubled, which triggered a tremendous boom in the biomedical workforce, according to a 2008 report from an NIH advisory committee. In the years following, though, federal support has failed to keep pace with this expansion in labor; rising inflation and three cuts to the NIH budget in the last seven years have meant that budgeted funds largely go to maintaining the status quo rather than to fresh initiatives.

With fewer awards available, this shortfall has incited fierce competition for federal grants, and consequently the success rate for winning an NIH grant is now at its lowest level in American history. The global financial meltdown of 2008 strained matters further when several private foundations were forced to shut down.

"The sequester could affect both existing and future grants," says Christy Gullion, an advocate for the University of Washington, which would potentially lose $83 million next year. She has been lobbying in Washington, D.C., since the summer of 2011, when lawmakers resolved the debt-ceiling crisis by passing the Budget Control Act. "We are in uncharted territory if the sequester takes effect."

Far from the nation's capital in the birch forests of Maine, many aspiring biologists opt to spend their free hours in the laboratory of Richmond Thompson, a neuroscientist at Bowdoin College. His studies on how different chemicals in the brain—such as vasopressin, vasotocin and testosterone—affect social behavior offer the perfect research opportunity for intrepid minds.

Thompson's mentorship program receives part of its support from the NSF through its Broader Impacts initiative, which emphasizes undergraduate education and provides monies for students to perform research during the summer.

"At small schools like Bowdoin, we use undergraduates to do a lot of our research," says Thompson. "If the money starts to disappear, not only does our research start to slow down, but it also means far fewer experiences for undergraduates."

Another scientist fearing the aftermath of the sequestration is Puneet Opal, a neurologist at Northwestern University who has published an editorial opposing the cuts in The Atlantic. He studies spinocerebellar ataxia type 1 (SCA1), a genetic brain disorder that strikes in adulthood, causing the progressive loss of balance and of muscle control in the face.

Opal's lab recently discovered a connection between motor dysfunction in mouse models of SCA1 and VEGF, a protein that promotes the growth of blood vessels. His lab wants to study this link in patients, but whether clinical studies can begin will ultimately depend on receiving grants from the NIH next year.

This doomsday scenario has some wondering: is U.S. biological research too dependent on the NIH? At many universities, the NIH pays for almost everything: grad students, professor salaries and equipment. Nature published an analysis on December 6 week that suggests this relationship can actually stifle scientific ingenuity. But even the study's author, John Ioannidis, believes research funding "should be dramatically increased overall, and even more so for investigators with bold ideas."

Last week the Associated Medical Schools of New York held a press conference urging Congress to find a resolution. One in 10 doctors in the U.S. is trained in New York, and medical centers are among the state's biggest employers. The New York economy stands to lose approximately $1.25 billion in 2013 if the NIH budget cuts are made.

"It would imperil thousands of people," said Jerrold Nadler (D-NY), who was joined at the meeting by fellow U.S. House representatives Charlie Rangel (D-NY) and Carolyn Maloney (D-NY), academic deans from NYC-based medical centers and patient advocates, including 14-year-old cancer survivor Brianna Commerford.

Fighting back tears during her testimony, Brianna expressed her gratitude for the scientists who discovered the drug that saved her life. "No kid should have to endure the pain and suffering that comes with a cancer diagnosis," she says. "Research is a sign of hope for these kids and their families. Taking funds away will certainly take the hope away…from everybody."

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