U.S. Scientists Warn That Trump's Cuts Will Set Off a Brain Drain

As the United States cuts budgets and restricts immigration, China and Europe are offering researchers money and stability.

By Kate Zernike

June 3, 2025

Ardem Patapoutian's story is not just the American dream, it is the dream of American science.

He arrived in Los Angeles in 1986 at age 18 after fleeing war-torn Lebanon. He spent a year writing for an Armenian newspaper and delivering Domino's at night to become eligible for the University of California, where he earned his undergraduate degree and a postdoctoral fellowship in neuroscience.

He started a lab at Scripps Research in San Diego with a grant from the National Institutes of Health, discovered the way humans sense touch, and in 2021 won the Nobel Prize.

But with the Trump administration slashing spending on science, Dr. Patapoutian's federal grant to develop new approaches to treating pain has been frozen. In late February, he posted on Bluesky that such cuts would damage biomedical research and prompt an exodus of talent from the United States. Within hours, he had an email from China, offering to move his lab to "any city, any university I want," he said, with a guarantee of funding for the next 20 years.

Dr. Patapoutian declined, because he loves his adopted country. Many scientists just setting out on their careers, however, fear there is no other option but to leave.

Scientific leaders say that's risking the way American science has been done for years, and the pre-eminence of the United States in their fields.

China and Europe are on hiring sprees. An analysis by the journal Nature captured the reversal: Applications from China and Europe for graduate student or postdoctoral positions in the United States have dropped sharply or dried up entirely since President Trump took office. The number of postdocs and graduate students in the United States applying for jobs abroad has spiked.

A university in France that created new positions for scientists with canceled federal grants capped applications after overwhelming interest. A scientific institute in Portugal said job inquiries from junior faculty members in the United States are up tenfold over the last two months.

“We are embarking on a major experiment in restructuring the innovative engine in America, and China is the control,” said Marcia McNutt, a geophysicist and the president of the National Academy of Sciences, which was established by President Abraham Lincoln to advise the government on science policy. “China is not going to cut its research budget in half.”

Since the 1950s, when the federal government expanded the National Institutes of Health and created the National Science Foundation as public-private research partnerships, the United States has become the international mecca for science. It was the uniquely American system that President Franklin D. Roosevelt’s science adviser, Vannevar Bush, envisioned in his landmark report, “Science, The Endless Frontier”: Federal money enabled scientific discoveries that made American research institutions the envy of the world, and they in turn fueled the rise of the United States as the leader in technology and biotechnology.

As that system attracted international talent, it came to depend on the aspiring scientists who come to the United States to work in university labs at low wages for the privilege of proximity to the world’s best researchers. They often stay: In the American defense industry and fields like engineering and computer and life sciences, at least half the workers with doctorates are foreign-born.

Ardem Patapoutian, a Nobel laureate, received an offer from China to move his lab to "any city, any university I want." Jessica Gow/EPA, via Shutterstock

Now, American science finds itself fighting on several fronts as the Trump administration seeks to cut budgets and seal borders, to punish universities for their liberalism and federal health agencies for their responses to Covid.

Federal science budgets have been slashed. Stricter immigration policies have spread fear among international scientists working in the United States, and those who had hoped to. Graduate and postdoctoral students have had their visas canceled, or worry they will. The administration cut off funding for international students at Harvard — a judge blocked the move, but other universities worry about being next.

Secretary of State Marco Rubio pledged to "aggressively revoke" the visas of Chinese students in what he called "critical fields," which almost certainly includes science, where labs often have more Chinese than American-born graduate students and postdocs.

President Trump has worried about the nation losing its scientific edge to “rivals abroad,” as he wrote in a letter in March to his science adviser, Michael Kratsios. He urged Mr. Kratsios to continue Vannevar Bush’s vision, “recapturing the urgency which propelled us so far in the last century.” Yet Mr. Kratsios argues that philanthropies and industry should pick up more of the cost, and that too much federal science spending goes to bureaucracy.

“Spending more money on the wrong things is far worse than spending less money on the right things,” he said in a speech at the National Academy in May.

But even at Johns Hopkins, which has benefited from the philanthropy of former New York Mayor Michael R. Bloomberg, those dollars can’t make up the shortfall. Industry doesn’t typically fund basic research, and it costs more to do research in industry in part because companies, unlike university labs, have to pay competitive wages.

Dr. Patapoutian calls all of these challenges “a gift” to China.

After World War II, “we brought the rocket scientists here,” said Dr. Marcia McNutt, president of the National Academy of Sciences. “That’s what got us to the moon.” Allison Robbert/Agence France-Presse — Getty Images

“It’s not just the international students, the whole system is on hold because the uncertainty does not allow you to plan,” Dr. Patapoutian said. “With all these grants frozen or cut, it creates this massive chaos.”

Just under half of the graduate students and postdocs in his lab hail from other countries. Now he is seeing less interest from abroad, but like many other lab heads he is not hiring new postdocs anyway: “Everybody’s kind of bolted down making sure we have the funds to keep the people we have.”

In the first half of the 20th century, American scientists joined European universities to make fundamental discoveries: the structure of molecules (J. Robert Oppenheimer), the structure of DNA (James Watson). The rise of fascism in Europe drove many Jewish scientists to the United States.

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While the logistics and expense of moving entire labs is likely to daunt more established researchers from moving, for postdocs and others just starting their labs, other countries offer the promise of greater stability.

“They are going to be able to recruit the best and brightest, proven people,” Dr. McNutt said. “They are going to give them labs. They’re going to give them equipment and funds, no questions asked.”

Richard Huganir, of Johns Hopkins University. KT Kanazawich for The New York Times

At Johns Hopkins, which has long received more N.I.H. funding than any other university, Richard Huganir, the chairman of neuroscience, said he is “terrified” of being unable to enroll international students. His department has 36 labs with 100 graduate students and postdocs, about 30 percent are international.

“For us, it would be losing 30 percent of our work force,” he said. “They are integral to the whole fabric of American science, and losing that population would be devastating.”

Graduate students and postdocs are going home to China and Korea for jobs, he said.

Beyond losing talent, Dr. Huganir worries about the increasing isolation of American science. He canceled plans to host an international meeting at Hopkins because foreign scientists did not want to come to the United States; organizers considered moving it to Oxford, in England, but realized international students in the United States would not go because they fear not being allowed back in. Robert F. Kennedy Jr., the nation's top federal health official, this week said he wanted to bar scientists at the N.I.H. and other federal agencies from publishing in leading scientific journals, which he called "corrupt."

Mathias Unberath, a computer scientist who studies computer-assisted medicine, came to Hopkins from Germany eight years ago. He has 13 doctoral students and two postdocs, all but five from abroad. "My whole team, including those who were eager to apply for more permanent positions in the U.S., have no more interest," he said. Those looking for jobs are applying in Europe, "including some of my superstars," he said. One American citizen, the recipient of a prestigious Siebel scholarship and an award for best paper, has taken a postdoc in Germany.

Dr. Unberath himself was in the hospital with his wife, who had just given birth to their second son, when the first Trump administration suspended H-1B visas — Dr. Unberath had one. Now, he said, even if his students can get visas, they see the cuts to the N.S.F. and N.I.H. and worry they will not be able to get the early career grants they need to earn tenure. "And if you don't make tenure," he said, "well, then what?"

Daphne Koller came from Israel to do her Ph.D. in computer science at Stanford, became a professor there and was awarded a MacArthur Fellowship before founding two tech companies, Coursera, which puts university courses online, and Insitro, which uses artificial intelligence to drive drug discovery. Most of the first employees at both companies, she said, were hired right out of universities, and most were foreign-born.

Daphne Koller, a computer scientist, in her office at Stanford, where she was formerly a professor. She has since founded two companies. Jim Wilson/The New York Times

“I would like nothing better than for the U.S. education system to really have the same emphasis on rigor and science and STEM so that we can train great scientists and engineers here,” Dr. Koller said. “That would be incredible, but it doesn’t happen magically. Even if that were ultimately the case, it’s wonderful for a country to be in the unique position where it is the beacon, the magnet for the best and brightest from all over the world.”

No institution has been more affected than Harvard, as the administration has made it an example of what it sees as the woke excesses of higher education.

Rudolf Pisa, in a cell biology lab there, lost the N.I.H. grant that helps postdoctoral researchers transition to running their own labs. He came from the Czech Republic to do his Ph.D. at Rockefeller University in New York because he believed the American approach to science was “brave.” His wife, a neuroscientist at Boston University, is American, but fears it is only a matter of time before her grant is canceled, too. They are looking for jobs in Europe.

“Two months ago I would not have thought of any of this,” Dr. Pisa said. He had considered himself a good investment for the United States. His work at Rockefeller helped lead to a patent and then a company to design cancer drugs that would be less likely to develop resistance over time. “We created jobs,” he said. “There’s more out of it than just the papers.”

The head of Dr. Pisa’s lab, Tom Rapoport, said five of his students had their visas revoked before a judge temporarily restored them. He also lost the federal grant that funds his lab — despite a perfect score from N.I.H reviewers. He may have to reduce his lab from 14 people to eight, only one of them is American.

Dr. Rapoport knows well how political turbulence affects science. His parents fled Nazism in Germany and Austria to train and work in the United States: His mother was a pediatrician, his father a biochemist who discovered how to prolong the shelf life of blood, which the U.S. military used to save countless service members. They left after being blacklisted as members of the Communist Party, ending up in East Germany.

Dr. Rapoport was a professor there until the fall of the Berlin Wall; after, he had trouble getting a position, he said, because universities were suspicious of those from the East. He joined Harvard in 1995 because he admired the innovation and rigor of American science. “This is scientific heaven,” he said. “Or it used to be.”

He worries that Americans don’t appreciate how the system has worked for so long. “Many people look at us as just parasites,” he said. “All the medicines that people take, they were all developed in the U.S. There’s essentially nothing developed by anyone else. We are on the top of the whole thing, and we’re really risking it all.”

Audio produced by Patricia Sulbarán.

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A version of this article appears in print on , Section A, Page 16 of the New York edition with the headline: America Is Losing Its Pull For Best Minds in Science