Policy

"Why Are We Funding This?"

Long-standing myths about "silly science" have contributed to the reckless slashing of government-supported research.

David Shiffman

For the first time since the modern federal research system was established after World War II, scientific funding in the United States is facing harsh cuts. These cuts undermine the core of American public health, safety, and environmental protection, but so far they have provoked only limited backlash beyond the scientific community. One likely reason much of the public seems to be shrugging off this act of self-sabotage is that the cuts have been misrepresented as a fix for waste and fraud, playing off a false but remarkably durable criticism: "A lot of the research we're funding sounds silly! Why are we funding it? Who cares about this stuff?"

Scientists hate this line of attack, for many reasons. At a personal level, no one likes to have work that they are passionate about be misunderstood and mocked. More importantly, scientists know how much thought and careful consideration goes into every funded research project. It requires tremendous time and effort simply to write a grant application, and only a tiny fraction of applications (those that get the highest ratings from independent expert peers) are selected for funding. Long before a public dollar goes to a research project, a whole team of experts in this kind of work must pass judgment and decide that it is important and worth funding. "Silly" science reliably springs from a serious motivation, with serious goals.

Still, the value of scientific research is not always evident to people outside of the relevant field. Some of the criticisms of science funding are certainly made in bad faith, but often the wider public is genuinely confused about what they are funding, and why. There's value in scientists sharing clear and compelling answers to this question, now more than ever.

Silly-sounding science is what happens when researchers do exactly what they are supposed to do, which is thinking freely and exploring new ideas with wide-open curiosity. Enabling dedicated experts to study everything and to push the boundaries of human knowledge in every direction is how vital, and unexpected, discoveries are made. The more we learn, the more we know.

Why should taxpayers in particular pay for that kind of research? Because nobody else has the capacity to fund these studies, and because such basic science has traditionally led to countless transformative discoveries that benefit us all. The attacks on "silly research" are nothing less than an attack on the academic freedom and innovative thinking that turned the United States into the world's leader in science and technology. It is imperative for those of us in the scientific community to defend that leadership.

You Never Know What We'll Discover

One major point that scientists need to communicate more effectively is that we can never anticipate what the future benefits of knowledge will be. It therefore benefits us to learn as much as we can about as many things as we can.

People often wrongly believe that scientific progress is made by a few "great geniuses" working on a few "big questions," and that those geniuses have some sense in advance of what the answers are going to be. In reality, knowledge is advanced by many independent teams of people working on chipping away at the boundaries of knowledge a little bit at a time. Sometimes doing so leads to a world-changing discovery. Other times it just tells us one more thing that doesn't work, a vital step toward eventually learning what does work.

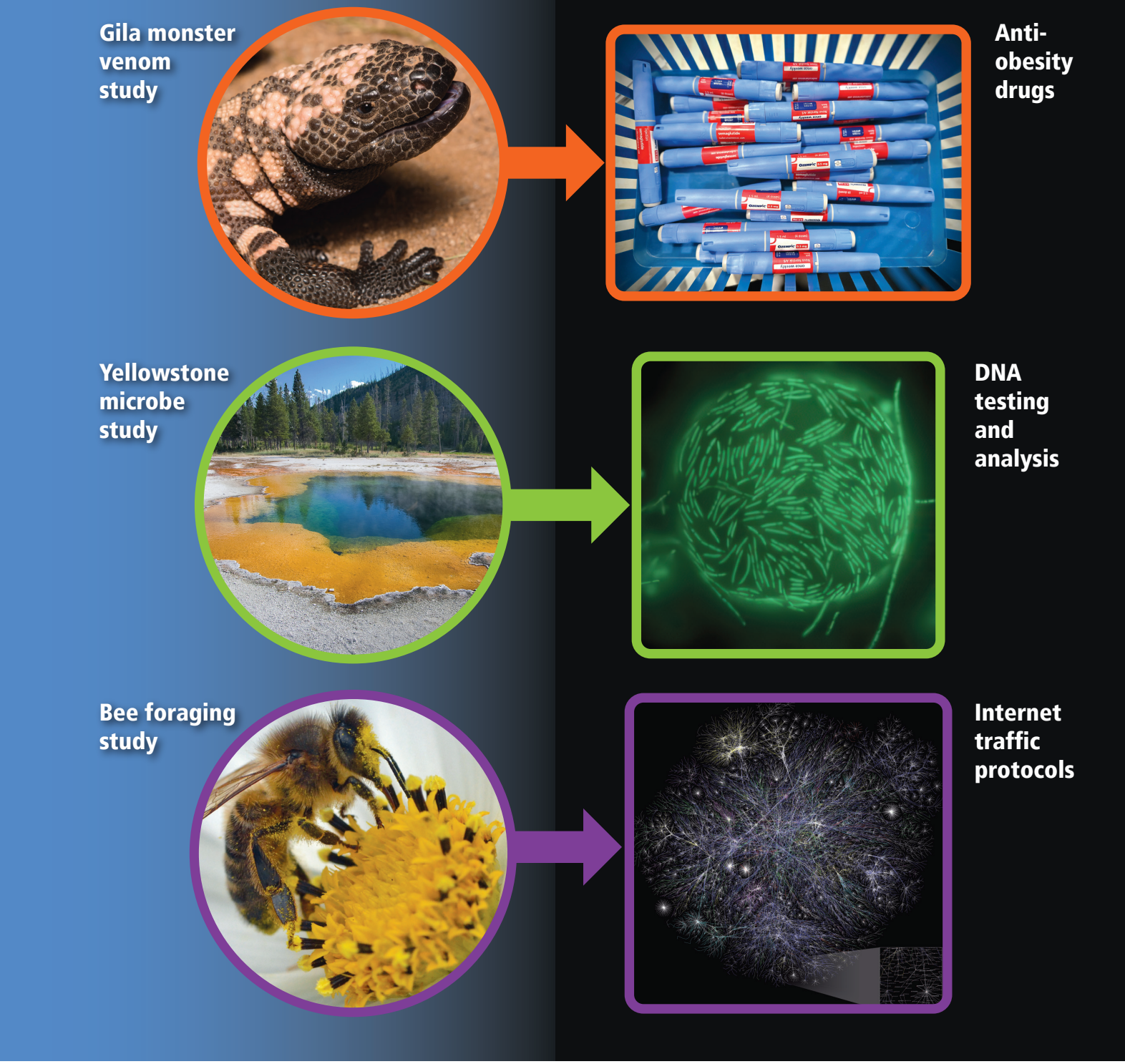
A lot of the time, those world-changing discoveries are utterly unexpected. If someone had said, "Who cares how desert lizard venom works? Let's not fund that research," we never would have discovered semaglutide, a key component of drugs such as Wegovy and Ozempic, which have helped millions of Americans lose weight. If we had decided not to study how bees optimize nectar foraging and distribution among a colony because it sounds silly, we never would have developed an algorithm that allocates internet traffic among computer servers—a technology that powers the $50 billion web-hosting industry. If we hadn't funded research into how bizarre microorganisms thrive in boiling

QUICK TAKE

Public funding of science in the United States has long been criticized for supporting studies that seem "silly" or irrelevant to the public good. Such critiques are especially intense now.

Wide-ranging, curiosity-driven research has led to enormous theoretical and practical benefits over the decades, ranging from anti-obesity drugs to the internet.

Scientists need to speak out on the value of government-supported basic research, so the public understands how much damage will result if we continue the current funding cuts.

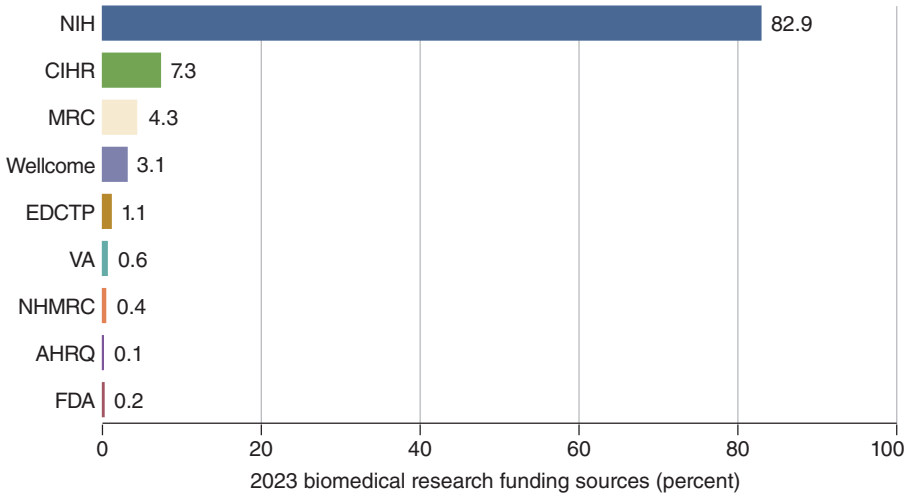


Seemingly obscure research often leads to important results, in unpredictable ways. Research on Gila monster venom led to the development of GLP-1 drugs for diabetes and obesity (*top row*). While studying the *Thermus aquaticus* bacterium, scientists discovered the Taq polymerase enzyme widely used in genetic analysis (*middle row*). Investigations of honeybee foraging patterns inspired one of the computer algorithms used to route data efficiently on the internet (*bottom row*).

Yellowstone geysers, we never would have discovered the bacterium *Thermus aquaticus*, whose Taq polymerase enzymes now enable medical tests for countless genetic diseases.

The American Association for the Advancement of Science (AAAS) honored several of these discoveries with the Golden Goose Award. "The Golden Goose Award honors federally funded research that had an unexpected impact on society, and the idea came from a former member of Congress who had seen narratives about wasteful government spending and wanted to showcase why investing in research is the opposite of that, by highlighting life-changing scientific discoveries," says Erin Heath, the director of federal relations for AAAS. "Our lives are better because of government support of scientific research, which helps the economy, drives discoveries, and creates jobs."

The Golden Goose Award was devised in response to the Golden Fleece Award, created by former senator Wil-



NIH–National Institutes of Health; **CIHR**–Canadian Institutes of Health Research; **MRC**–Medical Research Council; Wellcome; **EDCTP**–European and Developing Countries Clinical Trials Partnership; **VA**–Department of Veterans Affairs; **NHMRC**–National Health and Medical Research Council; **AHRQ**–Agency for Healthcare Research and Quality; **FDA**–Food and Drug Administration

World RePORT/Barbara Aulicino

Public funding is crucial for sustaining a vigorous science ecosystem that leads to intellectual leaps and major new applications. Private industry and philanthropies will not, and cannot, fill the gap if we slash public support. In biomedical research the U.S. National Institutes of Health dominates overall public funding for the entire world—at least, it does so for now.

liam Proxmire in the 1970s to mock what he saw as useless science being funded by taxpayer dollars. He focused on studies with odd or obscure-sounding titles, paying little regard to their actual purpose. Proxmire's highly publicized campaign seriously damaged the public perception of federally funded scientific research and fostered the myth that researchers often get paid to engage in frivolous work for their own amusement.

What is striking about the numerous Golden Goose examples listed on the AAAS website (along with countless more that were considered) is that nobody knew at the time of funding which of the research projects were going to change the world and improve our lives. Undoubtedly there were many funded projects that didn't lead to these breakthroughs. That is the nature of problem-solving: Some possible approaches work, some do not. We therefore need to attack problems from many different angles, knowing that some approaches will fail, and some will sound silly when presented out of context.

Research Benefits Local Economies

Another important point that does not receive enough emphasis is that research grants are economic powerhouses for the communities surrounding universities. Federal research grants are vital economic pipelines, paying the salaries of people who then spend money in the region. Every $1 spent by grants from the National Institutes of Health (NIH) generates nearly $2 in economic activity, for example. Every $1 spent by the National Oceanic and Atmospheric Administration (NOAA) generates at least $2.40 in economic activity, while creating thousands of jobs in rural coastal communities. At the same time, these investments also keep our food supplies safe and guard us from major storms. If you had the opportunity to invest with a guarantee that you'd double your investment, wouldn't you take it?

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It's important to remember that not all universities are in big cities; many major research universities are in very rural areas, and in many counties a university is the largest employer. Academic research supports surrounding small businesses—many a sandwich shop is kept in business by lunchtime foot traffic from a NOAA lab, not to mention grocery stores and housing.

And scientific research grants are not just great investments in terms of creating jobs. They are great investments in terms of producing concrete benefits for the public. The "silly" grants are a crucial part of the process of creative inquiry that has helped generate lifesaving medical treatments, led to cleaner water and air, safeguarded our food, bolstered our national defenses, and enhanced our understanding of the beauty and majesty of nature.

Research Trains the Next Generation

Research grants that cover a wide range of ideas also pay for the training of graduate students, the scientists of the future. Although undergraduate students pay tuition, often graduate students in the sciences get paid for their work (not much, but something)—which is vital, because they are essentially full-time employees of their university and lab with little time for a side job. The main source of these research assistantship funds is research grants, which means that cutting those grants will lead to fewer future scientists in training.

"It's smart to leverage as much brainpower in our citizenry as we can, because that's a really efficient way to increase productivity and innovation," says Brandon Jones, the president of the American Geophysical Union. "One of the best ways you can do that is for science to train as many students across as many broad demographics as possible, because then you increase the future yield in new ideas."

A large, intellectually diverse, well-trained scientific workforce will lead to countless future innovations. We may never know what won't be discovered because of the current, short-sighted budget cuts. It's important to stress that we aren't just training graduate students on how to use a microscope or a centrifuge. We are training them how to think like a scientist, which means supporting wide-ranging scientific curiosity—exactly the kind of free thinking and problem-solving that often gets dismissed as "silly science" by those who are not themselves contributing to any solutions.

"Now is the time to build, not to retreat," Heath says. "Other nations are stepping up their games when it comes to investment in scientific discovery and innovation."

Research Is a Public Good

We can't rely on private industry and charities to take over the funding of creative, basic research, because they cannot or will not fill the gap. They don't have the resources, and they fund different types of work.

The Wellcome Trust, the largest charitable funder of biomedical research, spent about $1.3 billion on research grants in 2022, whereas the NIH spent nearly $33 billion. A 2023 study that examined all of the new pharmaceuticals approved by the U.S. Food and Drug Administration (FDA) in the 2010s found that the research that led to 99.4 percent of them was funded by NIH grants. The National Science Foundation (NSF) spent $7.2 billion on nonmedical science research in 2024. "All of the philanthropy in the United States is just a drop in the bucket compared to the total federal research budget, so you just have a scale issue," says Brenda Mallory, a former head of the White House Office of Science and Technology Policy.

It's also important to note that private industry funds different kinds of research: mostly applied questions with precise goals, rather than open-ended basic foundational science with many possible future uses. "How do you fund things that might not have any kind of immediate profit?" Mallory asks. "Maybe it's not quite clear what the market incentive is, but it's still very important for basic knowledge that supports other research, and maybe even future commercialization. NIH and NSF grants support the research and support the ecosystem that keeps knowledge and information flowing freely."

Applied science has value, too, but it usually involves optimizing an application of something we already know about rather than making new discoveries. Research into basic principles, even if it sometimes sounds "silly," is fundamental to future conceptual breakthroughs, applications, and commercial payoffs. It rarely produces immediate applications, though, which is why it almost never receives investment from private industry.

A further obstacle is that private industry keeps much of its research private as trade secrets, rather than publishing it where anyone anywhere can use it. It's a very different model, one that simply is not sufficient for us to rely entirely on it. A world with research funded wholly by private industry is a world with dramatically fewer innovations.

This idea that private industry could replace the wide-ranging research supported by government funding is not just an idle theory. Elon Musk, representing the Department of Government Efficiency, has stated that he wants to put that idea into action. It's worth noting that the system proposed by opponents of federally funded research—which they term "running the government like a business"—has never worked for science, ever, anywhere in the world. Every single country with a strong research community relies very heavily on government-funded grants.

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How to Make the Case

Scientists understand the value of publicly funded research, but their arguments always run the risk of seeming self-serving. So how do we convince the public that they should support a healthy science ecosystem, even if it includes some silly-sounding research?

Some people who personally oppose government institutions, or who reject the very concept of scientific authority, are probably never going to change their minds. But there are a lot of persuadable people out there, many of whom have little or no idea what researchers actually do, and may have only heard criticisms about wasteful research without ever having heard from a scientist. Convincing those people to support and protect science funding, even if it seems "silly" when presented out of context, requires scientists to get better at explaining to the public not only what we do, but why.

The field of science communication, and the skill set of persuasive narrative argument, have much to offer here. "Finding out where people are and meeting them there with arguments about scientific innovation, societal benefit, and economics, and having discussions at those levels is good," Jones says. "It would benefit scientists to be able to collaborate with folks in other disciplines who know about marketing and can repackage our stories, because speaking technically is not enough."

It's also important to act like a person—not like a walking, talking textbook—in your interactions with the public. In my career as a public science educator focusing on marine biology and conservation, I've persuaded people as much through *how* I present myself as through the lists of facts I present. For instance, in a recent op-ed about the removal of protections from a marine protected area, I stressed not just the science of ocean conservation, but my personal experience as a SCUBA diver who loves seeing healthy coral reefs.

"For those of us who are researchers, science is more than a job," Mallory says. "It gives you meaning. There are other jobs that we might do to make more money, but there's a sense of purpose associated with discovery work."

"Think about how to describe your work at the dinner table so it's understandable," Heath adds. "And remember why you care about the work you do, and let your passion for it come out when you talk about it. Passion for your work is infectious and lets other people know why it's important and why they should care."

Scientific research is in danger. Scientists need to be vocal, visible, and direct in its defense. It is easy to get overwhelmed by the magnitude of the funding changes happening. Finding places to speak to a wider audience, holding open discussion sessions with your community, and sharing the purpose behind your work can help protect research and all the good that comes from it.

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David Shiffman is a faculty research associate at Arizona State University. His career focuses on interdisciplinary marine conservation biology and science communication. Bluesky: @whysharksmatter.bsky.social