SURVIVING THE SHORTFALL

Decreased research funding from traditional sources has led some investigators to get creative.

BY JEANNE METTNER

Fifteen years ago, Daniel Saltzman, M.D., chief of pediatric surgery at the University of Minnesota Amplatz Children's Hospital, conceived a novel—and self-admittedly “crazy”—way to kill solid cancer tumors: inject them with modified strains of salmonella, a bacteria that has the ability to penetrate solid masses and deliver cancer-fighting immune-modulating genes. When tested in a clinical trial involving dogs with metastatic osteosarcoma, Saltzman’s investigational therapy had a 38 percent success rate (six of 16 dogs with bone cancer who were treated with it survived).

Even though subsequent research in Saltzman’s lab revealed ways that the salmonella can disarm what he calls the “force field” of tumor immunosuppression, he knew the chance of getting funding for his work from traditional sources was slim.

“You can go to a funding agency like the NIH and say, ‘Look, I want to treat cancer with a bacteria that would normally give you horrible diarrhea and belly pain’—and they’d laugh you out of the room simply because of the idea of it,” Saltzman says. “Here we are 15 years later and we find that it really works; but a granting agency is still not going to be the one to take a chance and give money for it.”

Frustrated with his inability to clinch federal grant money, Saltzman took his pleas to cyberspace. With the help of two Minneapolis agencies, he created ProjectStealth.org, a crowdsourcing website that provides information about his research and allows individuals to contribute dollars to support his research. Saltzman also has done a TEDx talk and created Twitter and Facebook accounts for ProjectStealth to generate interest in his work. Thus far, he has raised about $175,000. When he reaches $500,000, Saltzman says he will have the funds needed to complete the research required to file an Investigational New Drug application with the Food and Drug Administration. In the meantime, his lab has stayed open with the help of smaller philanthropic grants and proceeds from fundraisers. “We’ve had crowdsourcing donations ranging from $5 to $35,000,” he says.

A crisis of inflationary proportions

Although Saltzman’s approach to securing funding is decidedly unconventional, it illustrates the hoops researchers must now jump through to ensure their investigations survive in a time when federal funding for research has faced repeated cuts. Perhaps
and pathology and vice dean for research at the University of Minnesota Medical School. Although he is unaware of any lab closures that have resulted from the NIH cuts, he knows many that were forced to downsize. “A lot of these labs are like small businesses. If you have five or six employees and you lose one, it has a tremendous impact,” he explains. “You end up having to narrow the scope of your activities.”

The decade of incremental decreases in NIH dollars has also prompted a climate change in the biomedical research world. Stephen Riederer, Ph.D., chairman of research finance and professor of radiology at Mayo Clinic, says the erosion of support has been particularly challenging for young investigators. In 1980, the average age at which an M.D./Ph.D. received his or her first R01 grant was 36. Today, it’s 44. “I am concerned about this because it’s causing some young investigators to question whether they want to stay in academic research at all.” He adds that researchers who are completing their hardest hit has been the National Institutes of Health, which funds 40 percent of the biomedical research in this country. In 2013, when sequestration forced a 5 percent cut to the NIH budget, the agency had, in effect, $4.7 billion (22 percent) less in inflation-adjusted dollars than it had a decade earlier. In 2013, the NIH funded 20 percent fewer research grants than it did in 2003; the number of R01 grants (large, multi-year grants) funded during that same period fell by almost 30 percent.

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The cuts have proved challenging for researchers in Minnesota and throughout the United States. For example, the University of Minnesota Medical School’s NIH funding went from $152 million in 2012 to $145 million in 2013. Mayo Clinic’s NIH budget fell from $223 million to $211 million during that same period.

“As far as disciplines being impacted—whether it’s cancer, neuroscience, genetics, cardiovascular, infectious disease, everybody has felt it,” says Tucker LeBien, Ph.D., a professor of laboratory medicine.

PHOTO COURTESY OF DANIEL SALTZMAN

Daniel Saltzman, M.D., with Buddy, a 6-year-old golden retriever who lost his front leg to bone cancer and is now cancer-free as a result of the treatment strategy developed in Saltzman’s lab.
advanced training are instead taking jobs in the biotechnology or pharmaceutical industries.

Making up (part of) the difference
To compensate for the lost federal dollars, both Mayo and the University of Minnesota rely on philanthropic donations and provide financial support to researchers through internal funding programs. The university’s Wallin Neuroscience Discovery Fund, which was established by the family of former Medtronic and Pillsbury executive Winston Wallin, for example, commits $500,000 a year for novel neuroscience research. And a Mayo Clinic-funded source called NIH Relief allocates money for projects that receive a high rating but do not receive NIH funding. Riederer says the hope is that this short-term funding will allow investigators to address some of the issues identified in their NIH summary statements and improve their studies, so they can reapply for multi-year grants.

Although helpful, philanthropic funding offers little or no support for indirect expenses such as utility costs, space rental, and IT and human resources support. For each NIH grant awarded, an academic institution is given an additional amount of funding—over and above the grant award—to cover those expenses. The amount received is based on a set percentage that the institution and the federal government have negotiated based on actual expenses. At the University of Minnesota, the rate amounts to 52 percent of every federal grant dollar awarded. At Mayo, it is 59 percent. That amount is significant money for research institutions. “Only the federal government pays full indirect costs, so making up that difference becomes a serious challenge,” LeBien says.

An uncertain future
Although the mandated 5 percent cut from the 2013 sequestration was returned to the NIH budget in 2014, the overall funding available remains less than what it was in 2012 (see box). In short, 10 years of uncertainty in the area of biomedical research funding has resulted in scientists having to get creative in the way they raise research dollars. “I think we are going to have to find some innovative ways to address this fiscal crisis, if it ends up being permanent,” Riederer says. “Even today, we are encouraging investigators to be entrepreneurial. We’re trying to foster an environment where they can work with their colleagues for funding or partner with other organizations or industries to accomplish their research goals.” For example, Mayo gastroenterologist David Ahlquist, M.D., creator of the Cologuard stool testing system (a DNA test), worked with Exact Sciences, a Madison, Wisconsin, company to develop the test kit, which is awaiting FDA approval.

Whether crowdsourcing becomes a viable way to raise dollars for biomedical research remains to be seen. Neither LeBien nor Riederer are aware of any other investigators who are using the method to raise funds. And Saltzman has not been approached by others who want to learn more. “If crowdsourcing emerged a few years from now as a major source of revenue, we’d have to take a hard look at whether we can do business that way,” LeBien says. “From an institutional standpoint, pursuing research funding should be done through the right channels because you are representing the university. … You can have enthusiasm for your project, but on the other hand, the language has to be vetted to make sure you get it right.”

Saltzman admits his approach has raised eyebrows among university officials but says he wouldn’t do things differently. “Are my ways of raising my research dollars unconventional? Absolutely. But it’s either go this route or close my lab. Desperate times call for desperate measures.”

Jeanne Mettner is a frequent contributor to Minnesota Medicine.