



Opinion

There are no overnight successes in science: medical research needs more stable funding

Canada needs to adjust its approach to funding in order to support moonshot ideas that could make a major difference.

BY MICHAEL SEFTON

The rollout of the first bivalent COVID shots is a reminder that the development of these vaccines ranks among the greatest public health achievements of our lifetimes. But they also showcase the gap that exists between perception and reality when it comes to scientific advances—and how we fund them.

The vaccines are frequently said to have been developed in a 10-month scientific sprint, but the truth is most of the key research stretches back 30 years. Hungarian biochemist Katalin Kariko began working on the mRNA technology on which the vaccines depend in the late 1980s. Though she faced her fair share of scientific setbacks, her biggest challenge was finding stable institutional support and funding for an idea that was ahead of its time.

Kariko's experience will be a familiar one to many research scientists, whose labs are constantly chasing their next grant. Major bodies like the Canadian Institutes of Health Research are charged with directing scarce public money to support scientific work that's most likely to yield impactful results. To land their next two- or three-year grant, scientists must continually show progress in their work, usually through publishing their

findings in reputable journals. This system has been designed to ensure public money is spent wisely, but the unintended consequence is that it is biased towards incrementalism.

Michael Sefton is the executive director of Medicine by Design. Photograph courtesy of Medicine by Design

This kind of funding is important, but we also have to ensure we make space for the big ideas that might take years or even decades to reach their potential. Take stem cells, for instance. They were discovered by researchers at Toronto's Uni-

versity Health Network and the University of Toronto back in the 1960s, but scientists are still only beginning to unlock their ability to treat conditions as diverse as liver disease, heart problems, and Alzheimer's. With questions once again swirling around how we will pay for Canada's health system, these are the kinds of advances that could help us meet the needs of an aging population. But Canada needs to adjust its approach to funding in order to support moonshot ideas that could make a major difference.

Major bodies like the Canadian Institutes of Health Research are charged with directing scarce public money to support scientific work that's most likely to yield impactful results. The CIHR is an independent agency established in 2000 and is accountable to Parliament through the Health Minister Jean-Yves Duclos. *The Hill Times* photograph by Andrew Meade



Take Medicine by Design, where I work. Launched in 2015 by the University of Toronto and its affiliated hospitals, it

is a multidisciplinary medical research initiative targeting regenerative medicine advances. We secured a \$114-million grant over seven years from the federal government's Canada First Research Excellence Fund (CFREF). That grant has helped us attract the best scientists and researchers to Canada. These researchers are working on a stem cell therapy that enables people with diabetes to produce insulin. That could potentially put an end to regular insulin injections to regulate blood sugar. There are also projects that promise transformative methods to pre-

vent heart disease and regenerate the brain after a stroke. Each of these projects aims to achieve a once-in-a-generation scientific transformation to benefit humanity. But we are up against the CFREF grant's seven-year deadline in 2023. If we are to continue achieving our goal to transform human health, our projects will require ongoing, sustained funding.

Like mRNA research, space exploration, artificial intelligence, and renewable energy, advances in regenerative medicine take persistence, time, and money. Long-term funding can help retain the next generation of leading biomedical researchers and

entrepreneurs so their careers can grow in Canada. It can also protect the made-in-Canada intellectual property under development: biomedical technology, therapies, medicines, and applications. Once fully tested, these assets can drive enormous economic impact in Canada, such as high-paying jobs, long-term research, and commercial-scale manufacturing on a similar scale to hubs in the United States and Europe.

Our obstacle is not the science, the expertise, or the technology; it's stable support over an extended period to see these projects through clinical trials and regulatory review and into the clinic.

Instead of rigid deadlines, Canada needs a funding system that can support research with a 10- to 15-year horizon, and which can adapt and pivot to support success. To ensure public funds are spent wisely we need rigorous checks and balances, but if projects are progressing and showing promise, there should be mechanisms for continued funding.

The other side of this coin is that sometimes things won't work out. Both scientists and governments have to get more comfortable with the idea that some—maybe most—moonshots will not work and be upfront in explaining to the public why it was worth trying anyway. Even “failed” experiments teach us something.

Canada already has some of the world's best institutions and scientific minds. Rethinking how we fund our most ambitious research projects is the final piece of the puzzle. It's not easy to put dollars on big, bold ideas. But it's worth doing because the ones that succeed—like the COVID vaccines, insulin, and stem cells—will change lives for decades to come.

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