THE HILL TIMES
THIRTY-THIRD YEAR CANADA'S POLITICS AND GOVERNMENT NEWSPAPER MONDAY, SEPTEMBER 12, 2022 $5.00

Opinion

Turning crisis into opportunity: a Canadian-made bio-revolution

Canada has a second chance to build a comprehensive biotech ecosystem as new domestic investment funds and foreign investors take notice of our industry.

Bettina Hamelin

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A well-supported Canadian life sciences and biotechnology industry requires thoughtful partnerships, much more investment and a transparent regulatory path for novel technologies, says Bettina Hamelin, president and CEO of Ontario Genomics. *Photograph courtesy of Pixabay*

Twenty years after the Human Genome Project, we have made significant strides in understanding what "genomics" can do to transform health care. Today, genomics pave the way for a bio-revolution that reaches far beyond human health into crop optimization, food production, and the sustainable manufacturing of products using yeasts and microbes as 'mini-factories.'

A life-threatening and economically challenging pandemic put these genomics advances to the test. Within weeks of the COVID-19 outbreak, the world had a diagnostic test and a vaccine ready for clinical trials.

These breakthroughs thrived outside Canada. Unlike what came to be known as "Operation Warp Speed" south of the border, Canada did not have a life sciences industry at the tipping point for these technologies, nor the apparent ability to mobilize the kind of interagency strategy and funding needed for a similar response.

In the 1990s, Canada's biotech industry flourished with success stories like BioChem Pharma, the inventor of still-used lifesaving AIDS medication 3-TC. Before the pandemic, investment in Canada's biotech start-up industry had all but dried up. Instead, the Canadian government focused on our strong natural resources sector and tech opportunities such as AI and quantum technologies. The pandemic, however, reminded us of the vulnerabilities of supply chains and how important it can be for a country to produce its own, including vaccines, antibodies, personal protective equipment and genomic sequences.

Fortunately, our existing capacities and communities rallied together. Genome Canada, together with a network of six provincially funded Genome Centres and funded by the federal government, rapidly set up a national viral and human genome sequencing initiative to track the evolution of the virus and disease susceptibility.

Even beyond this initiative, the government has become increasingly attuned to the opportunities and needs in this space. An aggregate commitment of more than $2.2 billion over the next five to seven years into the life sciences, bio-manufacturing and the bourgeoning genomics strategy are great gateways; investments into talent development through organizations like MITACs are steps in the right direction. However, we cannot rest there.

We need to futureproof our country.

While we brace for the next inevitable pandemic or global health emergency, we are witnessing a climate crisis raging at home and around the world with unpredictable weather patterns, famines, and disease. According to the World Health Organization, a quarter of a million people will die annually from climate change between 2030 and 2050. Urgent action must address the massive gap between trends and necessary carbon dioxide reduction to limit global warming to below 2°C by 2030.

Canada needs to do its part in providing solutions – in life sciences, agriculture and food production, and sustainable bioproduction of materials. A well-supported Canadian life sciences and biotechnology industry requires thoughtful partnerships, much more investment and a transparent regulatory path for novel technologies. Canada has lagged many jurisdictions when it comes to investing in transformational technology discovery, development and commercialization.

While we are fortunate to have brilliant Canadians who created successful companies like Deep Genomics, AbCellera, Notch, and Noblegen, the pull to move headquarters south of the border continues to be strong—both for investment and talent.

Today, Canada has a second chance to build a comprehensive biotech ecosystem. New domestic investment funds and foreign investors have taken notice of our industry with a 70 per cent year-over-year increase in venture funding in 2021 for a total of over $2-billion. Proving Canadian companies can commercialize when the appropriate support is available.

Canada has a budding biotech industry built on engineering or synthetic biology, an innovation engine that uses biomass rather than petroleum-based inputs and bioengineering to create products we need every day. This transformative and sustainable approach has the power to offset some of the $2-4-billion/per year cost of global climate change as predicted by 2030. This will put Canada in a strong export position for innovative products while creating jobs and prosperity right here at home.

We need to rally more together across academia, federal and provincial governments, and commercialization-focused not-for-profits with the kind of congeniality that attracts Canadian philanthropists, pension funds and big industry players who currently invest elsewhere.

The global bio-revolution makes it feasible to imagine a world where up to 60 per cent of all inputs into our economy could be made biologically. This would herald a global market worth $2-trilliong to $4-trillion annually. If we commit to being a proactive part of this, our economy and jobs will shift towards an innovation-based economy. It will either happen to Canada or in Canada. I hope we opt for the latter.

Bettina Hamelin, PharmD, EMBA, is the president and CEO of Ontario Genomics, an Ontario-based not-for-profit organization that catalyzes and supports the development of genomics-based technologies across multiple economic sectors for a genomics and engineering biology-driven bioeconomy. Dr. Hamelin has over 30 years of experience in academia, industry, and not-for-profit organizations across Canada, the U.S. and Europe.

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