



Building Canada's Innovation Ecosystem & Bringing Canadian Research to the Marketplace

2018 Pre-Budget Consultation Submission
By: The Centre for Drug Research and Development (CDRD)
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Introduction

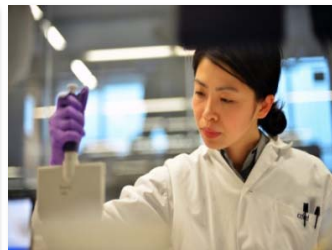
On behalf of the team at The Centre for Drug Research and Development as well as our extended network of partners across Canada, we want to express our sincere appreciation for the Government of Canada's strong commitment to our organization and the national research and innovation endeavour.

As an organization that has long been supported through several federal programs, we appreciate the importance of a strong relationship with the federal government, and how critical your ongoing support is to the life sciences sector, and to our organization.

Since its inception, CDRD has strived to be a global bridge that translates discoveries into new therapeutic products, and to uniquely train the next generation of highly-qualified personnel to drive the development of innovations. We have partnered extensively with academia, industry, government and foundations to identify and advance promising discoveries, and successfully transform them into viable investment opportunities for the private sector.

At CDRD, we continue to deliver on this mandate, serving Canadians, making a direct and strong impact on Canadian life sciences, and realizing significant related societal and economic benefits – surpassing any vision that the founders and funders originally held for CDRD. Our team remains committed to further building on achievements already realized, and further building the scale and sustainability of the life sciences industry in Canada.

CDRD looks forward to continuing to advance Canada's Innovation and Skills Agenda, and specifically help Canadian life sciences businesses to be more productive and competitive. We thank you again for your support, and we look forward to continuing to work in partnership with the Government of Canada to claim our nation's rightful place amongst global innovation leaders.





About CDRD

Headquartered in Vancouver, The Centre for Drug Research and Development (CDRD) is Canada's drug development and commercialization engine. We bring together partners from across the country and around the world to turn cutting-edge health research in academia, and nascent technologies in Small- and Medium-Sized Enterprises (SMEs), into innovative new products and ultimately a sustainable Canadian life sciences industry. CDRD was founded in 2007, enabled by the support of the federal government (most notably through the Centres of Excellence for Commercialization and Research (CECR) program), the BC provincial government, and the private sector. Now with a proven track record of results, CDRD is firmly positioned as a central leader in Canada's innovation ecosystem.

CDRD has strategic partnerships with over 50 affiliated universities and research institutes, 26 Canadian health sciences SMEs/entrepreneurs, 6 top global pharmaceutical companies, 8 of the world's leading translational research centres, and 3 patient-focused foundations. Through this extensive network, and relationships with the most influential Key Opinion Leaders, decision makers, and supporters shaping Canadian and global innovation, CDRD brings together the complementary expertise and resources required to proactively find, collaboratively develop, and commercialize disruptive, game-changing technologies certainly for patients, but also for the commercial success of strong new Canadian health sciences anchor companies that will result.

This model works. CDRD's success to date demonstrates that we have effectively leveraged and networked Canada's regional and technological strengths. By working with strong primary regional clusters, networking those together, and strategically focusing on areas where Canada has the most significant technological strengths and/or opportunities for growth, we have begun to catalyze a globally competitive national "super cluster".

This involves the following key (inter-dependent) activity areas on which CDRD focuses:

1. Identification & Evaluation

CDRD proactively identifies and evaluates therapeutically promising early-stage technologies within academia and Canadian life sciences companies from both a scientific and commercial view.

Outcomes to date:

- 1,700+ researchers engaged
- 1,455 discoveries reviewed

2. Validation & Incubation

CDRD independently replicates data and builds interdisciplinary teams of experts to collaboratively define and execute critical experiments that will maximize a technology's probability of future clinical success and substantiate for further investment.

Outcomes to date:

- 269 individual projects undertaken.



3. Acceleration & Commercialization

CDRD adds significant value to a technology, builds a comprehensive intellectual property package and compelling business case; and secure the private sector investors / partners to take the technology to patients.

Outcomes to date:

- 58 technologies advanced toward commercialization
- 72 new patents generated
- 14 commercial transactions executed
- 7 new spin-offs created.

4. Skills Training

CDRD offers a well-established, highly-regarded and unique Training Program that combines the best elements of industry and academia, and cultivates Canada's top talent, producing highly qualified and industry-ready personnel, management and entrepreneurial leaders.

Outcomes to date:

- 192 new HQP trained
- 96% of post-doc alumni have secured full-time employment in their chosen field
- 84% remain in Canada.

Toward Canadian Life Sciences Leading the World Enhancing Productivity and Competitiveness of our Businesses

In looking at the broader landscape in which CDRD operates, we see an economic truism of Canada that we have been the proverbial hewers of wood and drawers of water. For 150 years, we have largely relied on the extraordinary abundance of our natural resources to build our economy, but only to the extent that we export those resources in a raw form for others to extract further value. We are at serious risk of doing exactly the same thing with another natural resource: our incredible scientific research enterprise.

Case in point: Canada has a proud history of health research to support innovation, and punches far above its weight on the credibility, competitiveness and impact of that research. With less than 0.5 per cent of the world's population, we produce 5% of the world's research publicationsⁱ, with a citation rate that is among the top six nations globally and 43% higher than the global averageⁱⁱ. But what do we do with this competitive advantage, with this raw material? Far too often, we export it as is – before we have an opportunity to fully exploit its value. Classically, we develop products to proof-of-concept or even commercial validation, and then sell. Such a pattern is evident in Canada's subsequent metrics around private-sector investment in research and development and business innovation performance which persistently lag behind global competitors. We have not yet successfully translated our considerable investment in health research into a fully sustainable life sciences sector. Canada is in fact the only advanced pharmaceutical market without a global anchor company.



If being hewers of wood and drawers of water is in our DNA, it's time for a little gene editing.

The good news is that significant effort is being made throughout Canada's health sciences ecosystem to do things differently. At CDRD for example, we are firmly and singularly focused on translating discovery into commercial reality and revenues coming back into our economy. The organization is unique in North America, and one of only a very small number of similar centres in the world. CDRD encompasses both the drug development infrastructure necessary to drive programs forward, and the scientific, business, and intellectual property expertise necessary to support academic researchers and life sciences companies across the country in navigating the complex life sciences ecosystem and developing viable technologies that attract commercial partners to carry them through to market.

This is how we are working to build a life sciences sector commensurate with Canada's research leadership; representing a critical strand of the new economic DNA Canada needs.

Recently, we saw a terrific example of a leading Canadian life sciences company built from academia on forward taking a significant step towards becoming that elusive global anchor company – and coupled with it is compelling evidence of the type of impact the CDRD model can have along the way. In April, Zymeworks Inc. raised almost \$60M USD through an Initial Public Offering (IPO) on the Toronto and New York Stock Exchanges – and notably, is the first Canadian venture-backed IPO in the life sciences sector since 2014. Zymeworks' business today is a combination of their own proprietary work in bi-specific antibodies for cancer – work led by CEO, Ali Tehrani since his PhD days spent in the labs at the University of British Columbia, and an antibody-drug conjugate (ADC) platform spun-out of CDRD under Kairos Therapeutics. The story of Kairos and that platform is the CDRD story. Recognizing the commercial opportunity of ADCs, our team joined forces with John Babcook, a defiantly Canadian serial entrepreneur-scientist to conceive, develop and validate the platform. As Zymeworks was looking for scale-up growth to make their pipeline more robust and their business more sustainable, combining forces with Babcook, Kairos, and the CDRD-built platform made tons of sense.

The Zymeworks example is one of adding greater economic value to Canada's most precious – and mobile – natural resource: our people. Instead of seeing the high-skill, high-pay jobs exported to another marketplace they remain here, striving to build a Canadian life sciences anchor.

So how do we further prime Canada's ecosystem to produce more Zymeworks? How will we be able to realize the full economic and health outcomes from research funded today, and become a leading generator of world-class innovation of that research led by greater private sector investment?

The federal government can ensure the viability of this research, development and commercialization pathway through a comprehensive and well-aligned public policy environment that supports basic research, champions organizations like CDRD, and stimulates, attracts, and catalyzes further venture capital investment in Canada such that there are in fact pools of capital to take the discoveries forward to the market, and ultimately to patients. We are starting to see a rebound of both venture capital in general, and Canadian life sciences venture capital firms in particular. We are also seeing more international venture capital drawn to Canada by high quality research. But if we are going to scale-up that work here – add further economic value to the natural resources – it is imperative that we further strengthen Canadian life sciences venture capital. The federal government has initiated some important steps in this regard that should be acknowledged, supported and encouraged.

The "miracle drug" of tomorrow starts with the hard work of today. Canadian academic researchers and life sciences companies alike are doing this work. Reaping the full benefits here in Canada though, requires a commitment to a long-term, strategic, and comprehensive approach to the support of research and its translation into innovation. That is the Canadian economic DNA for the future.



The Future of CDRD

CDRD has evolved to become a central and unique leader in Canada's innovation ecosystem, bringing together partners from across the country and around the world to turn cutting-edge health research in academia, and nascent technologies in Small- and Medium-Sized Enterprises (SMEs), into innovative new products and ultimately a sustainable Canadian life sciences industry. It is therefore primed to be a nexus for the advancement of the Federal Government's Innovation and Skills Agenda.

CDRD has successfully established a strong national and international reputation and solid track record which we now look to build upon to maximize our ultimate long-term impact on Canadian life sciences and realize our Vision of Canadian life sciences leading the world. To date however, the funding environment in which CDRD has had to operate (piecemeal and unpredictable funding with varying and often poorly aligned processes, timelines, and expectations) has significantly hampered each of these areas. CDRD is therefore seeking a renewed financial commitment from the federal government that will not only sustain the positive impact CDRD is currently making, but will also allow us to effectively meet the above challenges, attract additional funding leverage, and realize the full commercial potential of Canada's life sciences sector.

For CDRD, ongoing federal support will further enhance our ability to maximize the return from publicly-funded research by validating, advancing, and adding value to a greater number of novel technologies to make them appropriate for risk capital investment; help early-stage companies stay and scale-up in Canada; and ultimately, bring new life-changing therapies to patients and new jobs to Canadians in a robust national bio-economy. We look forward to working with your Government to make this Vision a reality.

i. NSERC
ii. Council of Canadian Academies

For further information, please contact:

Gordon McCauley
President and CEO
CDRD
Direct: 604-827-1132
Email: gmccauley@cdrd.ca

Barry Gee
Director, Communications & External Affairs
CDRD
Direct: 604-827-1223
Email: bgee@cdrd.ca

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