



Pre-Budget Consultation Submission

August 6, 2014

Executive Summary

An Opportunity for Canada

As a result of Canada's strong support of health research through the Networks of Centres of Excellence (NCEs), the Centres of Excellence for Commercialization and Research (CECRs), the Canadian Institutes of Health Research (CIHR), Genome Canada and others, we have the foundation for a vibrant Canadian health sciences industry. There remains however, a key gap in our ability to translate this world-class research into its commercial potential, and realize the full extent of resulting economic and societal benefits. Maximizing the return from publicly-funded research is the primary objective of The CDRD/CVI Enterprise.

Headquartered in British Columbia, The Centre for Drug Research and Development (CDRD) together with its commercialization vehicle, CDRD Ventures Inc. (CVI) (collectively "The CDRD/CVI Enterprise") is the only national drug development and commercialization engine providing the expertise and infrastructure to *transform basic health research into commercialized therapeutics* improving human health – while, growing our national health sciences industry into a wholly-optimized generator of economic prosperity. It represents an effective means to advance innovative technologies forward along the innovation continuum, adding value throughout that process. These value-added technologies can then form the foundation of a critical mass of new health sciences companies, thus *creating long-lasting, high-paying jobs*, and supporting continued Canadian "*brain gain*" by providing biomedical researchers with attractive opportunities in Canada. We must also offer training opportunities that generate new *industry-ready Highly-Qualified Personnel* to lead the industry into the future.

We can achieve this and compete globally by working in partnership with government, industry, academia, and foundations to build on and leverage the established capabilities and strengths of the CDRD/CVI Enterprise. Our path toward the realization of this vision is captured in three phases of organizational development:

- Phase I (2007-2014): Building Capacity
- Phase II (2015-2022): Achieving Critical Mass
- Phase III (2023 onward): Reaching Self-Sustainability.

As an Enterprise supported through Phase I by the British Columbia Provincial Government and industry, and by the Federal Government (primarily through successful competition in the NCE-CECR program, the Canada Foundation for Innovation (CFI), and most recently the Canada Accelerator and Incubator Program (CAIP)), CDRD/CVI has received robust validation of its model and the best practices we have developed, as well as broad recognition that we have successfully achieved or exceeded our original objectives. However, due to the high risk and associated cost of drug development and long development timelines, and as CDRD/CVI is a large-scale national endeavour (at the crossroads of becoming a leading global organization), we are now operating at a stage and scale far beyond the means of existing federal programs. Furthermore, there remains a significant gap between CDRD/CVI's capacity and those of our global competitors. The ongoing success of The CDRD/CVI Enterprise therefore relies upon a greater level of support from all our partners going forward.

CDRD/CVI is therefore requesting a significant federal investment to support the first five years of Phase II, and bring the federal contribution to a comparable level to that of the BC Government. This will then enable CDRD/CVI's evolution into one of the top centres of its kind in the world, and allow for and result in:





- Securing new partnerships to leverage/establish complementary national infrastructure in other provinces with key health sciences clusters;
- Increased capacity to support a more investigators and Canadian SMEs (validating and developing another 250+ commercially and therapeutically valuable innovations);
- The ability to drive technology development further down the innovation continuum, creating and retaining more value in and for Canada; and the opportunity to capitalize on new strategic areas of high commercial potential (e.g. immunotherapy, biomarkers and diagnostics);
- Specialized training for 300+ graduates, providing the industry-ready personnel key to the life sciences economy;
- Attraction of over \$200M in foreign direct investment including follow-on support for spin-offs;
- 6,929 direct and indirect jobs supported;
- \$381M contributed back to GDP.

Through this investment, the Government of Canada's priority areas for Budget 2015 will be directly met:

- Increasing the competitiveness of Canadian businesses through research, development, innovation and commercialization;
- Maximizing the number and types of jobs for Canadians;
- Supporting families and helping vulnerable Canadians by focusing on health, education and training.

Ultimately, we can compete globally by building on and leveraging the established capabilities and strengths of the CDRD/CVI Enterprise. In doing so, Canada will then not only be the generator of world-class health research it is today, but also the generator of world-class *innovation* from the translation of that research.

The CDRD/CVI Enterprise

A Unique Canadian Asset to Leverage

CDRD/CVI is Canada's fully-integrated national, not-for-profit drug development and commercialization centre providing the infrastructure and expertise to enable investigators from leading health research institutions to advance promising early-stage drug candidates. CDRD/CVI validates and de-risks discoveries stemming from publicly-funded health research, and transforms them into investment opportunities for the private sector, maximizing and capturing the related economic and societal benefits from these public investments here in Canada.

As Canada's national centre, CDRD/CVI is the only organization in the country — and one of just a handful in the world — with the fully-integrated expertise, infrastructure and partnerships to source, evaluate, incubate, accelerate and commercialize innovative health technologies from any institution and in virtually any therapeutic area.



In order to successfully meet its mandate and achieve (or in many cases, exceed) its objectives, CDRD established state-of-the-art drug development infrastructure, and scientific and business expertise. This has all been supported by a foundation of unique partnerships with global industry leaders (Pfizer, Roche, GlaxoSmithKline, Johnson & Johnson, and MERCK), academia, foundations, and government at both the provincial and federal level. These partnerships provide a diverse funding base, opportunities to leverage investments, and early industry participation and commercial pull for technologies.

With a first right to negotiate for the technologies developed at CDRD, its commercialization vehicle, CVI has a continuous and unparalleled pipeline of the most innovative and commercially-promising pre-validated (thus de-risked) technologies in Canada. CVI licenses select promising technologies to advance them to a stage where they can attract licensing partners or form the foundation for new companies. CVI then returns its profits to CDRD to support long-term self-sustainability of the Enterprise.

Figure I: The CDRD/CVI Model: A Critical Piece of Canada’s Innovation Continuum

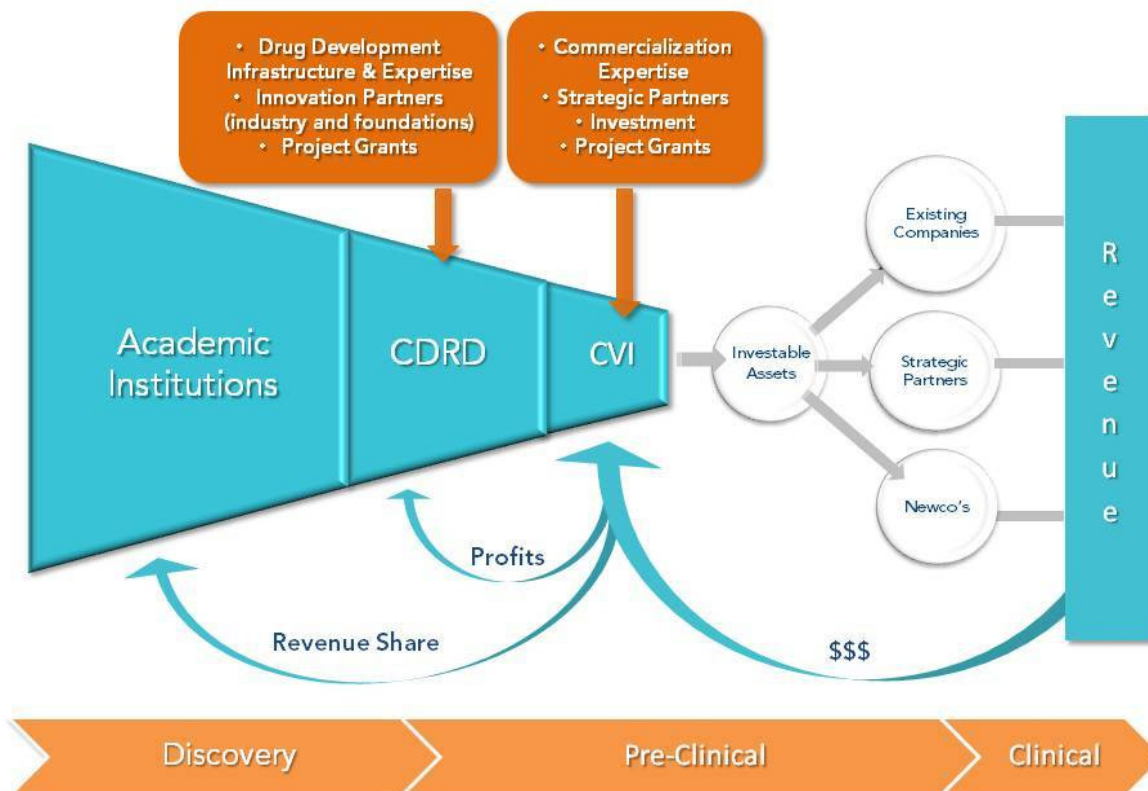
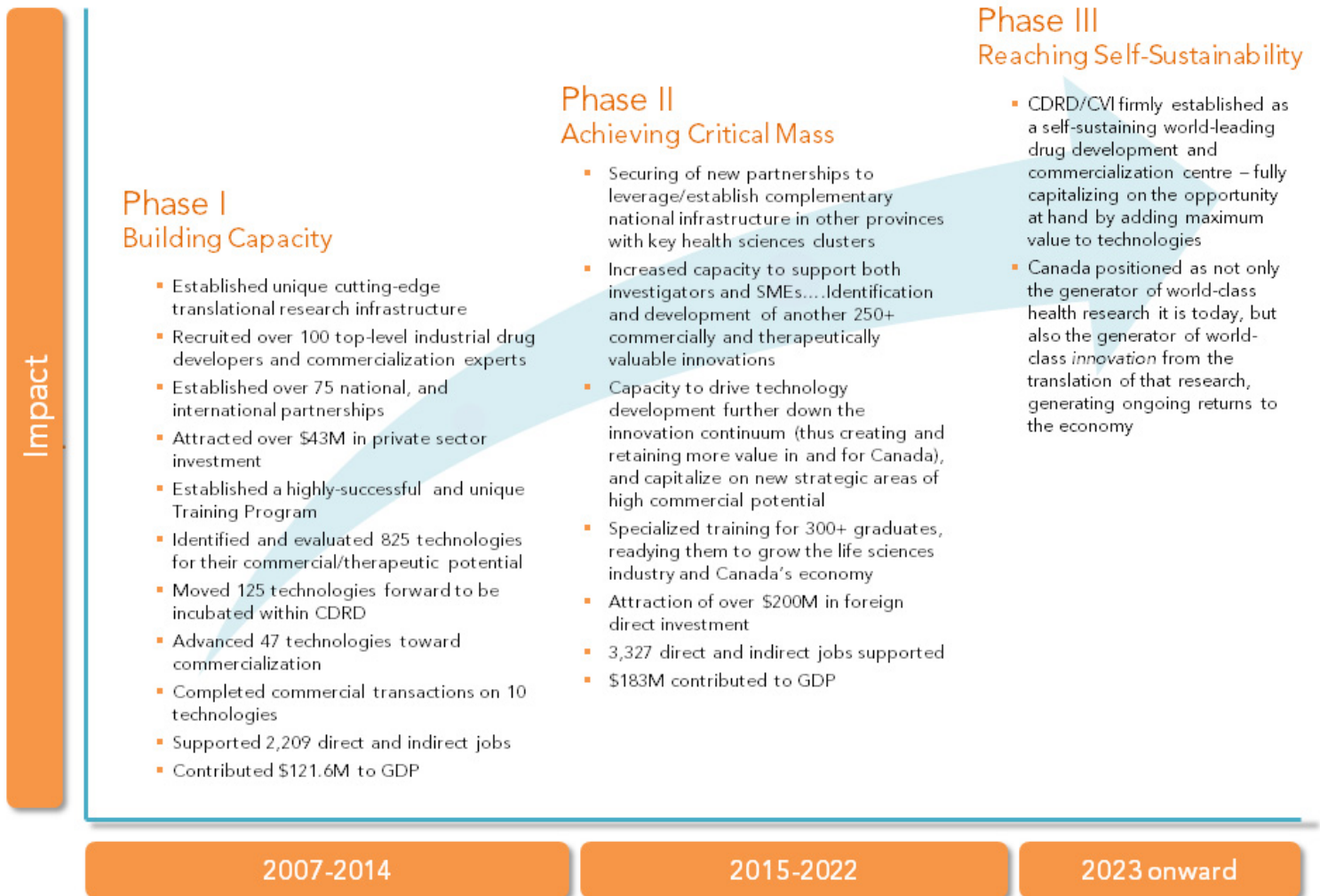




Figure II: CDRD/CVI Phases of Development and Outcomes





A Proven Track Record and Significant Outcomes

CDRD/CVI Phase I (2007-2014): Building Capacity

With CDRD having been operational for six years, and CVI fully launched just last year, the Enterprise has already demonstrated significant outcomes:

- **Establishing unique cutting-edge translational research infrastructure:** CDRD/CVI has comprehensive drug development infrastructure to develop both small molecules and biologics across therapeutic areas. CDRD/CVI partnered with UBC to construct a new \$134M building with 40,000 feet² of translational research space where CDRD/CVI is headquartered.
- **Recruiting talent:** CDRD/CVI employs 110 full-time drug development and business (commercialization) professionals. During the recent downturn in the industry nationally, many highly-educated and experienced professionals faced having to leave Canada for employment. CDRD/CVI retained many of these people, as well as recruited new talent to Canada.
- **Establishing and expanding provincial, national, and international academic collaborations:** CDRD has affiliation agreements with ~50 academic institutions, including universities in 8/10 provinces, and top international institutions such as Oxford, the University of Tokyo, the Max Planck Institutes, the University of California, San Francisco, and Karolinska.
- **Attracting private sector investment and generating leverage:** CDRD/CVI has become a magnet for international investment, successfully leveraging the public investments to attract \$43M from the private sector, including global partners Pfizer, Roche, GlaxoSmithKline, Johnson & Johnson, and MERCK.
- **Developed Highly-Qualified Personnel:** CDRD has established a very successful Training Program that has readied 115 Post-Doctoral Fellows, Graduate Student Interns, Business Interns, and Co-op Students for jobs in industry (94% employment rate).

As a result of its Phase I-II activities, CDRD/CVI will generate significant economic benefits for Canada including:

- Supporting 6,929 direct and indirect jobs*
- Contributing \$381M to GDP*

** Based on BC Stats Economic Multipliers*



Advancing Technology Development and Commercialization – CDRD/CVI's Impact to Date

- More than 1,100 Principal Investigators have been engaged – thereby increasing their commercial focus
- 825 technologies from leading national and international institutions have been evaluated for their commercial/therapeutic potential
- 125 technologies have moved forward to be incubated within CDRD in partnership with the Principal Investigator at the originating academic institution
- 47 met their scientific milestones (with another 42 projects currently ongoing), thereby adding greater value to the technologies and further advancing them towards commercialization
- 5 technologies have now graduated to CVI for acceleration
- 3 technologies have been out-licensed to private sector biotech/pharma companies, with 1 of these therapeutics now having advanced into clinical trials to treat patients
- 4 new companies have been spun-out to further develop promising innovative technologies, and capture the related economic and societal benefits including the creation of new jobs.

Important to add is the fact that CDRD/CVI employs a 'kill it quickly' mantra. As such, it has discontinued work on 94 additional technologies after conducting one or more critical experiments, and then deeming them not commercially and/or scientifically viable. This ensures that resources are spent on only the most promising technologies, and that the potential returns for investors are maximized.

The Challenge in Front of Us

CDRD/CVI Phase II (2015-2022): Achieving Critical Mass

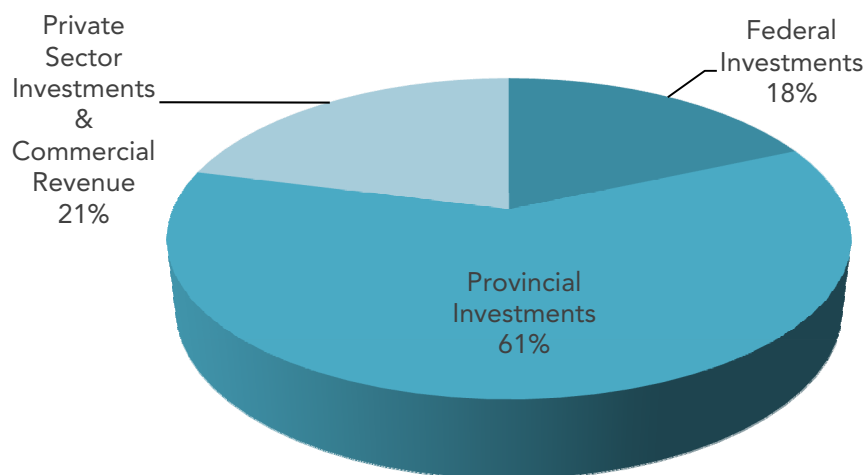
The CDRD/CVI Enterprise received excellent reviews during CECR renewal and other external evaluations, confirming that we have successfully achieved our mandate and realized significant outcomes and impact to date. But because of the high cost and long development timelines of drug development, and the fact that CDRD/CVI is a large-scale national centre working across all therapeutic areas, our ongoing success requires enhanced levels of support from all our partners through our next Phase.



Moreover, there is a significant gap between CDRD/CVI’s capacity and those of our competitors around the world. CDRD/CVI leads a global alliance of five international leading drug discovery and development centers that has come together to share resources, collaborate on projects and capitalize on international opportunities; but CDRD/CVI is funded at a significantly lower level than its alliance partners, thus limiting its opportunities.

In Phase II: Achieving Critical Mass, CDRD/CVI will need to further transform to maximize the full potential of Canadian innovation, and become an internationally-renowned commercialization centre. As such, we are seeking an investment from the Federal Government (to support the first five years of this next Phase) to bring its contribution to a level comparable to that of the British Columbia Government’s \$153M to date (\$87M capital; \$76M operational). This will then represent the predictable funding that is needed to attract an even greater level of private sector investment, and execute on CDRD/CVI’s vision for the future.

Figure III: CDRD/CVI Sources of Revenue, Phase I (2007-2014)



CDRD/CVI Phase III (2023 onward): Reaching Self-Sustainability

For drug development, the time required to reach commercialization outcomes is significant, ranging from three to five years for early-stage pre-clinical commercialization (i.e. out-licensing to the private sector or establishing a new spin-out company), to as much as 10-12+ years for products to reach the marketplace. Given these timeline, CDRD/CVI has already achieved significant commercialization milestones through Phase I, but will require several more years to advance projects to the point where significant profits can flow back to fully sustain operations (Phase III).

The requested funding support combined with private sector and provincial funding will take CDRD/CVI a point of self-sustainability through commercialization revenues from the technologies it has incubated and the companies it has accelerated.



Conclusion

Advancing Canada's Priorities & Competing at a Global Level

By supporting CDRD/CVI, the Federal Government will effectively meet the following priorities for Budget 2015:

- **Increasing the competitiveness of Canadian businesses through research, development, innovation and commercialization:** The global health sciences industry is one of virtually unparalleled market potential. CDRD/CVI proactively identifies the most commercially-promising discoveries in academia across Canada, and develops them to attract private sector investment, supporting Canadian innovation and commercialization while also attracting new international technologies to be developed and commercialized here in Canada.
- **Maximizing the number and types of jobs for Canadians:** CDRD/CVI ensures researchers, entrepreneurs and Canadian start-up companies (SMEs) have the resources they need to enable them to stay and grow in Canada, maximize the commercialization of health technologies and the creation of new health sciences companies – and thereby fully capitalize on the vast job-creation potential of the industry.
- **Supporting families and helping vulnerable Canadians by focusing on health, education and training:** CDRD/CVI represents a new way to bring innovative therapeutics to patients – a model that fosters collaboration, the sharing of resources, leveraging of investment, and mitigation of risk. CDRD/CVI's successful Training Program provides new opportunities for the next generation of drug developers and bio-entrepreneurs.

The goal of CDRD/CVI is to translate discovery into value-added innovation, and therefore be transformative for the health sciences industry, and make Canada an international hub for health sciences innovation and investment. The federal government has a tremendous opportunity to build on CDRD/CVI's success, and further optimize what it has helped seed. We have established an international competitive advantage for Canada, and now have an opportunity to leverage this advantage to realize the full potential of Canada's health sciences industry.

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