



The Terry Fox Research Institute
L'Institut de recherche Terry Fox

PROPOSAL FOR
THE MARATHON OF HOPE CANCER CENTRES NETWORK
A TERRY FOX RESEARCH NETWORK

SUBMISSION TO THE HOUSE OF COMMONS FINANCE COMMITTEE
2018

THE MARATHON OF HOPE CANCER CENTRES NETWORK

- BUILDING A CANADIAN NETWORK OF LEADING CANCER CENTRES TO IMPLEMENT PRECISION MEDICINE
- EMBEDDING RESEARCH & INNOVATION INTO THE CANCER CLINIC
- USING BIG DATA AND GENOMICS TO IMPROVE THE HEALTH OUTCOMES FOR CANCER PATIENTS

SUMMARY

Disruptive technologies such as genomics, high power computing, big data analytics, and advanced imaging hold promise to transform the Canadian cancer control system. In order to bring such innovations to the clinical front lines to benefit cancer patients, the Terry Fox Research Institute (TFRI) is establishing a network of leading cancer centres (Marathon of Hope Cancer Centres Network) to position Canada as a global leader in precision medicine in cancer diagnosis and treatment.

To address the challenges of ‘data fragmentation’ the Network and its Big Data initiative will consolidate Canada’s leadership in genomics, clinical trials, artificial intelligence and big data analytics and create a Data Commons with aligned governance designed to facilitate sharing, and secondary use of data, to maximize the benefits of clinical research in precision oncology for both public and private sectors. The Network will unlock a collaborative ecosystem with a culture promoting innovation and entrepreneurship through mentorship and skills training, with access to emergent technologies and capital. This will be undertaken through a new co-ordinated approach to partner and share clinical, genomic, imaging, treatment, outcomes and other complex patient data that will accelerate improvement in outcomes for all Canadian cancer patients, and contribute to innovation and commercialization.

Accurate methods to target the right treatment to the right patient are becoming vital in order to spend Canadian healthcare dollars wisely. The initial focus will be precision medicine but other innovative technologies will also be tested as the Network’s vision is to accelerate the implementation of innovation into the health system, and to improve Canada’s attractiveness for investment by entrepreneurs and by the biotech/pharma industry.

Designation of Marathon of Hope Cancer Centres

TFRI is looking to designate Marathon of Hope Cancer Centres in each region of Canada. A designated centre can be a single organization or it can be made up of a consortium of institutions. TFRI proposes to use the concept of designating a cancer centre as “comprehensive” based upon the centre’s activities in laboratory, clinical, and population health research, and demonstrated excellence and productivity as compared to specified designation criteria. Designated centres will be validated by a panel of international experts. The designated regional centres will form the backbone of the network.

Progress to Date: Establishing Pilot Programs

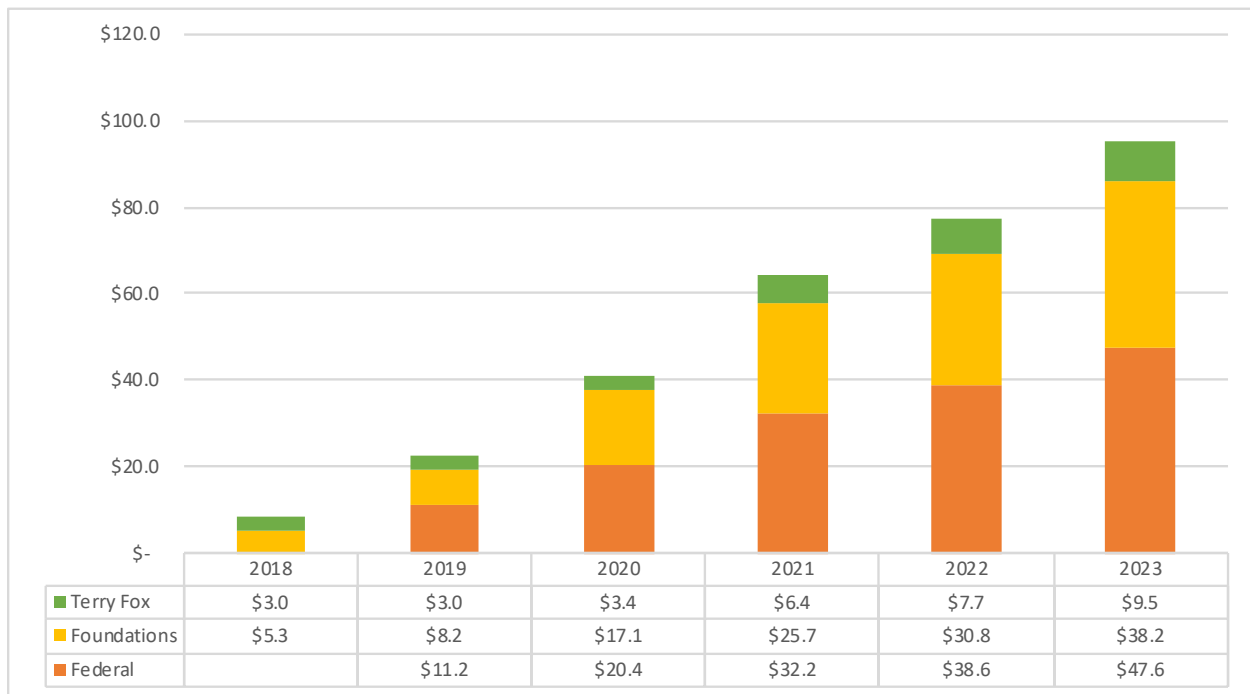
TFRI is partnering, and co-investing with cancer hospitals and research centres across Canada to establish pilot projects to learn what is necessary to align the centres to build a national network:

- 1) TFRI / BC Cancer (Vancouver) / Princess Margaret Hospital (Toronto) are developing infrastructure to share genomic profiling of colorectal cancer patients, harmonizing methods to deliver immunotherapy and molecular imaging probes to improve prostate cancer detection in a two year \$12 million dollar pilot
- 2) TFRI / McGill University Health Centre/ Jewish General Hospital / Centre Hospitalier de l'Université de Montréal / Hôpital Maisonneuve-Rosemont and three cancer research centres in Montreal are developing common infrastructure to share cancer samples and data to understand the responses of melanoma and leukemia patients to immunotherapies in a two-year \$6.5 million dollar pilot.

In addition, centres in Manitoba, Saskatchewan and Alberta, and in Atlantic Canada are working on pilot proposals for review by TFRI this fall.

Funding Request

To create the Network TFRI proposes a matched co-investment by the federal government of \$150 million over five years. This request has the support of Terry's family members and of the Terry Fox Foundation. Funds to match the Federal contributions will come from TFRI and regional organizations such as hospital foundations and research funders. For 2019 the request is \$11.2 million from the federal government.



A Bold Vision for Canada

'Even if I don't finish the Marathon of Hope, we need others to continue. It's got to keep going without me.' –
Terry Fox

Canadians demand that we work together to address the scourge of cancer. We need to ensure that innovations make their way into the cancer clinic as rapidly as possible, and that those innovations can be shared across the country. We need to demonstrate the clinical utility of innovations through demonstration projects in a cost-effective manner, before they are adopted by the cancer control system.

TFRI and its partners are ensuring the success of the **Marathon of Hope Cancer Centres Network** by building the Network centre by centre with pilot projects. At the same time we are working to define detailed criteria for the operation of the Network.

Our **program is unique** because: (i) it builds a platform to implement the vision of the Economic Strategy Table for Health and Biosciences, (ii) it will be led by a philanthropic funder (Terry Fox) in partnership with regional cancer centres and their foundations, (iii) it will unite cancer centres by embedding research and innovation into the cancer clinic, (iv) it will share knowledge and resources to impact the health outcomes of patients, and (v) it will align foundations' investments to match the proposed federal investment to steer activities that will be co-ordinated across Canada to have the opportunity to benefit all Canadians.

Big data will help the program build upon the strength of our diverse population and dispersed centres to learn from each other and to test innovations at cancer's clinical frontlines. Our goal is to have at least one centre in each region of Canada, and work with the leaders in digital health industries to build and share advanced platforms that will drive the practical applications of precision medicine. We will maintain the quality of this program through regular peer review to international standards, and continuing co-investment by regional foundations and agencies and the Terry Fox Foundation.

The Network will contribute significantly to the following:

- (1) To create high quality big data on over 15,000 Canadian cancer patients within the first five years, with a goal of 100,000 patients over ten years with interoperable standards between the centres and with other international efforts such as Genomics England and Australian Genomics programs,
- (2) To answer questions in precision oncology that are relevant to the Canadian population,
- (3) to combine evidence from different parts of Canada to be clinically useful, especially for rare or hard to treat cancers,
- (4) to share information about what works and what does not work to help improve the care for individual patients, as well as prioritize and catalyze questions for research,
- (5) to provide a controlled environment in which to test pre-clinical and clinical innovations in ways that build upon Canada's service-driven model of healthcare,
- (6) to create an innovative and entrepreneurial culture through skills training and mentorship,
- (7) to build a platform facilitating academic-industry collaborations to accelerate Canadian innovation and entrepreneurship to grow Canada's Health and Biosciences industries,
- (8) to build a Network to strengthen **all** its members: by enabling critical mass, access to advanced technologies, sharing knowledge and empowering smaller centres to implement precision medicine,
- (9) to make Canadian precision oncology and digital health leadership more competitive globally, and
- (10) to support improved access to novel therapeutics for more Canadian cancer patients, for pharmaceutical company co-investment and for enhanced home-grown entrepreneurial biotech company development.

Why Precision Medicine for Cancer?

The facts are that two out of five Canadians will get cancer during their lifetime, and one out of four will die of their disease. In spite of improvements in treatment over the past decade, this statement obscures the variability between cancers – survival rates, expressed as five-year relative survival rates, are 8% for pancreatic, 17% for lung, and 20% for liver cancer patients, rising to 64% for colorectal cancer and above for other cancer patients. Thus, there is an urgent need to focus on the poor outcome cancer patients for whom treatment is not successful.

Precision Medicine

The promise of precision medicine is starting to transform the practice of medicine worldwide. Molecular tests are being used more often to detect cancer earlier, to identify the sub-types of cancer in order to target treatment more precisely, and also to monitor the effectiveness of treatment. However, each of the estimated 19,700 Canadians who will die of their cancer this year need better therapeutic options. Better options will come through realizing the promise of cancer precision medicine, in training and re-training personnel to use these new disruptive technologies, and in the evidence that they work in the Canadian context.

Designating Centres

TFRI's goal is to designate Marathon of Hope cancer centres in each region of Canada through two program cycles. These centres are the building blocks for the Marathon of Hope Cancer Centres Network.

The Centres will be encouraged to develop in strategic areas of importance to the individual Centre at the same time as developing and linking shared resources that contribute to the Network. The Network's learning model makes it an attractive grass-roots contributor to modernize Canada's regulatory agility.

Building on the experience of the US NCI-designated cancer centers program whereby philanthropy has been significantly enhanced by the NCI designation, participating Centres will be expected to provide up to 40% of the contribution of the Terry Fox Research Institute and the Federal Government (an approximate ratio of 40:10:50 respectively).

Why Link Centres?

We propose to build upon Canada's experience of building networks like the Networks of Centres of Excellence (NCE) program which address our vast geography, and small population (35 million) compared to much more compact metropolitan areas (Tokyo at 37 million and Shanghai at 34 million). Linkage is vital to share knowledge and gain access to the latest technologies more rapidly and economically.

To build shared platforms, each centre will need to demonstrate sharing and interoperability of its processes. In this way expertise and advanced technologies can be accessed from all regions of Canada. The Network will build the critical mass and leadership to enhance Canada's global impact in precision cancer medicine. The Network will facilitate Canada's collaboration with the efforts of other countries in cancer precision medicine (in which significant investments by government and philanthropic sources have been made) such as the US, UK, France and Germany.

Program Management

TFRI was created eleven years ago with the mandate to support translational cancer research. It manages all the cancer research investments of the Terry Fox Foundation. With the agreement of its partners, TFRI provides leadership in the Marathon of Hope Cancer Centres program. It will lead the international peer review of the designation program for centres.

Impacts

The Network will contribute to build critical mass across the cancer control system, integrate a path to translate knowledge into better patient outcomes, enable greater sharing of resources, and train future leaders in cancer research and care. The Network will transform Canada's cancer control system. It will profoundly alter the current service-driven model of cancer care to include an innovation-driven, patient-centred model, which integrates resources and expertise across the nation.

Why the Federal Government should Invest?

The Prime Minister has clearly indicated that his government will support innovation and science to support the creation of the high-skilled, sustainable jobs for Canada's future.

- The disruptive technologies of precision medicine are being implemented in a haphazard and unequal fashion across Canada
- Terry Fox proposes to align these efforts and share the knowledge from coast to coast
 - To build upon our public health care system which provides high quality big data
 - Our diverse population, from First Nations to new immigrants provides us with a rich global gene pool
 - Our collaboration aligns us to compete against cancer and not each other, and
- Federal leadership and investment will be essential for Canada to
 - build on its leadership in cancer research and medicine,
 - invest in innovation projects like this to make a difference in healthcare, and
 - manage the transformation of the healthcare systems to benefit future patients.