



**Ensuring Canada's Competitiveness through an
Investment in Ovarian Cancer Research**

Submitted by

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Recommendation:

That the government provide an immediate and specific investment of at least \$10 Million in ovarian cancer research to advance action on the Canadian Ovarian Cancer Research Consortium's three research priorities and enable the Personalized Medicine Platform for Ovarian Cancer.

The Issue

Ovarian cancer is the most fatal women's cancer in Canada and significantly underfunded when compared to other, less fatal cancers. For every two women diagnosed with ovarian cancer, only one will survive five years. Diseases like breast and prostate cancer have seen great advances in prognosis and treatments, which can be largely attributed to significant investment in research. This funding has allowed for the development of better screening methods, early diagnosis, and a wider range of more effective treatment options.

Overall cancer survival rates are the highest they have ever been, with 63% of patients surviving at least five years after treatment. Survival rates for ovarian cancer, however, have not improved in five decades and available treatments have not changed significantly since the 1990s. The 5-year mortality rate for ovarian cancer is 56%, while for breast cancer it is 13% and for prostate cancer it is 5%. Yet from 2005-2015, the federal government invested \$249.3M in breast cancer research, \$102.7M in prostate cancer research, and \$38.6M in ovarian cancer research. A similar funding discrepancy exists when looking at CIHR funding. During the same period, 2005-2015, \$162M was invested in breast cancer research, \$70.6M in prostate cancer research and \$31.2M in ovarian cancer researchⁱ.

Canadian women are being left behind; it is time to address this gap. Canada needs to invest in scientific progress against the most fatal women's cancer. The diagnosis of ovarian cancer is highest in women aged 55-64, when they are at the most productive time of their working lives and when they are filling the instrumental role of caregiver to an aging parent populationⁱⁱ. When women at the prime of their lives die, the detrimental consequences are felt at many levels – their families, jobs, volunteer work, and in the Canadian economy.

To ensure that Canadian women remain healthy and as productive as they can be, Ovarian Cancer Canada is calling for a focused and increased investment of at least \$10 million by the federal government in ovarian cancer research. With this research investment, women diagnosed with ovarian cancer can live longer, better lives, and remain contributing members of Canadian society.

What is needed to advance ovarian cancer?

Insufficient research dollars are being directed to ovarian cancer research and as a result, we simply do not know enough about the disease to effectively prevent, screen, and treat ovarian cancer. Ovarian Cancer Canada is the only national organization dedicated to ovarian cancer awareness, patient support and research. In consultation with communities of patients, clinicians and researchers, Ovarian Cancer Canada has created a three-pronged approach to address lagging research progress with a clear single aim: to improve the outcomes of women diagnosed with ovarian cancer over the next five years.

Large-scale team projects

The Canadian Ovarian Cancer Research Consortium (COCRC), facilitated by Ovarian Cancer Canada and comprised of world-class, leading-edge oncologists and scientists has developed "*The Personalized Medicine Platform for Ovarian Cancer*" that will position Canada as the leader in making needed breakthroughs in this disease. The COCRC has determined that in order to improve survival rates a coordinated team-based approach to research is needed so that there can be an integrated focus on key priority areas. The projects must also be large in scale to ensure that there are enough patients and/or samples to result in meaningful findings in order to lead to the identification of new and more effective treatments. Funding individual projects concentrated on distinct and unique areas will not lead to a significant impact on outcomes.

Priorities for investment

Two recent international assessments^{iii/iv} of the current challenges in ovarian cancer identified key research areas that offer the most promise in tackling this disease. These priorities for investment in ovarian cancer research are:

- 1) **developing new research models**
- 2) **developing novel treatments**
- 3) **advancing clinical trials**

Together, these three priorities highlight the research phases needed to advance a personalized medicine platform for ovarian cancer. This patient-oriented approach to care (or "personalized medicine") has been advocated by several leading national and provincial agencies, including the Canadian Institutes of Health Research.^v

1) Develop better experimental models **\$2.25 million**

Testing of new treatment strategies requires the development of models of ovarian cancer that closely emulate the disease in patients. This disease lacks these "high fidelity" models which has limited the development of effective new drugs. Simply put, the better the experimental model, the more clinically applicable the outcome. The past decade has seen intense activity around developing and validating preclinical models for ovarian cancer, which demonstrated the many strengths and some limitations of the models currently available. Canadian researchers are well-positioned to create and improve these models to learn more about how ovarian cancer starts, how it progresses and, most importantly, how it can be stopped. These models are needed to bridge the gap between discovery and validation of new treatments, and the testing of those treatments in women with ovarian cancer.

2) Identify and prioritize development of novel treatment strategies **\$2.25 million**

Most ovarian cancer patients are diagnosed with advanced disease. Although they initially respond well to treatment, relapse occurs in 85% of these patients and few effective treatment options exist. Research teams across Canada have been at the forefront of designing new treatment strategies. These include developing drugs that target factors critical to cancer cell survival, developing strategies that engage the immune system to defeat the tumor and that manipulate the tumour microenvironment that supports cancer growth. A number of these treatment approaches are poised for clinical testing, with more being at the important stages of validation and preclinical testing. With an investment of approximately \$2.25 million, we can advance the study of up to five of the most promising strategies each year to achieve more effective treatments, which will result in lives enhanced, extended, and potentially, saved.

3) Stratify patients in clinical trials **\$5.5 million**

In women with ovarian cancer, the initial response to chemotherapy is highly variable. This is because there are several subtypes of ovarian cancer that differ in many aspects, including histology, molecular pathology and response to treatment. Identifying women who are not likely to respond to standard treatment, and offering these individuals alternative treatments, remains one of the most important goals in the clinical management of ovarian cancer patients. There are several experimental treatments currently in development some of which have had little to no opportunity to be tested in women with ovarian cancer. These trials have the potential to introduce personalized medicine in ovarian cancer within five years, by supporting a network of sites able to do clinical research, banking tissue longitudinally through the established tissue banks, and supporting assay development. The scope and intensity of this plan requires recruitment of dedicated personnel to coordinate activities, infrastructure support, an outcomes registry, and a specific focus on evaluative research and knowledge translation.

Ovarian Cancer Canada's Commitment to Research

Since its inception, Ovarian Cancer Canada has invested more than \$6M in ovarian cancer research and built strategic partnerships with organizations such as the Canadian Institutes of Health Research, the Cancer Research Society, BioCanRx (a NCE initiative), and the Terry Fox Research Institute to advance ovarian cancer research. The organization created Canada's only ovarian cancer research conference, partnered with CIHR and the Cancer Research Society to increase the number of grants funded annually, established a national ovarian cancer tissue bank, funded capacity grants to train new scientists, and supported a large-scale biomarker project. As a result of Ovarian Cancer Canada's efforts, there are now over 200 ovarian cancer clinicians and scientists in Canada. Together these researchers are coordinated and connected through the Canadian Ovarian Cancer Research Consortium (COCRC) led by Ovarian Cancer Canada's Chair in Ovarian Cancer Research.

In the past decade, the COCRC has built a research capacity that is now primed and capable of supporting the large-scale projects described in this submission. This research community has contributed to many major advances, including the identification of strategies to reduce the risk of ovarian cancer (McAlpine, BC Cancer), the accurate subtyping of ovarian cancers (Kobel, University of Calgary), the identification of the mutations associated with those subtypes (Huntsman, BC Cancer), the development of a resource to discover biomarkers that better predict prognosis and response to chemotherapy (Mes-Masson, Université de Montréal), and the discovery of the importance of the immune system in controlling response to treatment (Nelson, University of Victoria).

Canadian scientists have become international leaders in ovarian cancer research, well known for their high-caliber research and for making innovative and important advances in our understanding of ovarian cancer over the past decade. Several major partners provide valuable resources, such as the TFRI-COEUR national tissue bank, or have the capacity to run ovarian cancer clinical trials (OVCARE, Canadian Clinical Trials Group and the Princess Margaret Consortium). As world leaders in ovarian cancer research, Canadian researchers are best positioned to lead this research through the next important phase – identification of new and more effective treatments.

Current Challenges in the Canadian Research System

While the Federal Government does fund health research through CIHR, the reality is that, in its current form, CIHR would not be able to support this three-pronged approach at once, and the key to success for results in the next 5 years is the implementation of all aspects of this program.

CIHR funding opportunities primarily include:

- 1) "Team Grants" on specific topics/diseases that do not include ovarian cancer. In cases where a team grant includes cancer, ovarian cancer is often excluded as the disease falls outside of the parameters of the grant. For example, with a 1.4 per cent incidence, ovarian cancer is too common to be considered rare, and though the five-year mortality rate is 56 per cent the disease is not quite fatal enough to be considered a high fatality cancer.
- 2) "Project Grants" that support individual or small group research projects that do not encompass collaborative initiatives that are key to the large-scale projects needed for significant advances in ovarian cancer treatment. The project grants provide researchers with focused project funding but they do not connect multiple projects across the country. Enabling multi-center coordination is the only way to lead to the advances that are desperately needed. It should also be understood that the unique features of ovarian cancer do not allow it to fit into more generic funding opportunities or to benefit from research learnings in other cancers.

Therefore, Ovarian Cancer Canada is seeking a partnership with the Terry Fox Research Institute (TFRI) to deliver “The Personalized Medicine Platform for Ovarian Cancer”. The TFRI has experience organizing competitive funding opportunities to support large-scale, multi-institutional, multi-disciplinary projects. Preliminary discussions with other potential partners, including the Cancer Research Society, 3CTN, BioCanRX and the Canadian Cancer Society are also underway. Ovarian Cancer Canada will establish a Governance Committee to provide guidance and oversight to ensure the highest possible impact of the collective efforts.

Budget Request

An immediate and specific investment of at least \$10M towards ovarian cancer research to advance action on the Canadian Ovarian Cancer Research Consortium’s three research priorities and enable the Personalized Medicine Platform for Ovarian Cancer.

ⁱ Cancer Research Investment in Canada, 2015. Canadian Cancer Research Alliance. (CIHR funding calculations were based on grants for projects with at least 50% relevance to a particular disease site).

ⁱⁱ Portrait of caregivers. Published by Statistics Canada, 2012. <https://www150.statcan.gc.ca/n1/pub/89-652-x/89-652-x2013001-eng.htm#a9>

ⁱⁱⁱ Ovarian Cancers: Evolving Paradigms in Research and Care. Published by the National Academy of Sciences, March 2016: nas.edu/OvarianCancers.

^{iv} Rethinking ovarian cancer II: reducing mortality from high-grade serous ovarian cancer. *Nat. Rev. Cancer* 2015, 15: 668-679.

^v Canada’s Strategy for Patient-Oriented Research. Improving health outcomes through evidence-informed care. Published August 2011. <http://www.cihr-irsc.gc.ca/e/44000.html>