

2011
INTERNATIONAL REVIEW
OF THE
CANADIAN INSTITUTES OF HEALTH RESEARCH

**Expert Review Team Report
for
Institute of Cancer Research**

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Chair, Expert Review Team
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Summary

1. The Canadian cancer research community has maintained its traditional excellence in biomedical and clinical research. Excellence in CIHR funded investigators through the open competition mechanism is clearly evident. These include John Dick, Peter Dirk, Tony Pawson, Nahum Sonnenberg, Tak Mak, Marco Marra, David Huntsman, Sam Aparicio and many others. With the leadership of the Institute of Cancer Research (ICR), pillars 3 and 4 research activities have been stimulated with significant success and acknowledged international excellence. The Palliative End-of-Life Care (PEOLC) initiative is such an example and a potential role model. Survivorship research might be something similar in the future. Investments in establishing a national tumour repository network (CTRnet) and in interdisciplinary training programs (Strategic Training Initiative in Health Research (STIHR)) are also success stories with impact. ICR has been responsive to national needs such as the medical isotope crisis and the access to quality care (wait times) program.
2. The proposed ICR-led Personalized Medicine Initiative has the potential to become a large, successful, cross-cutting institute initiative. CIHR needs to be prepared for the societal changes of personalized medicine.
3. Since the last CIHR international review, the funding landscape in cancer research in Canada has changed dramatically. A number of organizations with new money have been created, (e.g. Canadian Partnership Against Cancer (CPAC), the Terry Fox Research Institute (TFRI), the Ontario Institute for Cancer Research (OICR)) while the National Cancer Institute of Canada (NCIC) has been phased out as an independent funder. This has resulted in models for cancer research funding that are complicated and fragmented. This has put significant stress on the cancer research community. There is also a concern that basic research across all four pillars will be compromised as overall funding for investigator initiated 'open competition' projects is likely to decrease as non-government organizations (NGOs) move toward more targeted (strategic) team funding mechanisms. Some coordination amongst funders will be required to maintain essential capacity across the spectrum of cancer research at the national level and at the same time, be nimble to take advantage of new opportunities.
4. In this context, ICR has done a tremendous job in bringing the cancer research community together through its effort in establishing a cooperative of cancer funders (i.e. Canadian Cancer Research Alliance (CCRA)). Being the single largest funder of cancer research in the country, ICR has the opportunity to become the voice of cancer research in Canada working within the context of CCRA. Researchers and stakeholders see ICR as the best qualified for such a national leadership. However, this is not without challenge as ICR will need to build increased branding awareness with the public. There are many competing voices. There is a need for more public outreach and professional communication about the mandate, activities and successes of ICR/CIHR. An appropriate strategy will need to be developed and additional resources may need to be made available to the Scientific Director of ICR to fully develop this opportunity.
5. Some areas where ICR can have significant impact include:
 - a. Bioinformatics/computational biology. This must be enhanced to keep pace with competitive research communities around the world.

- b. Development of a coherent national strategy for international collaboration. This is a stated focus of the ICR Scientific Director.
 - c. More strategic partnerships with industry can facilitate knowledge transfers and provide new funding opportunities.
 - d. Closer strategic programming with the Natural Sciences and Engineering Research Council of Canada (NSERC), Genome Canada, the Canadian Foundation for Innovation, and CPAC would leverage research.
 - e. A long term strategic vision for cancer research in Canada would strengthen the mission and allow for prioritization of resources. ICR working with CCRA members have already produced a framework. The next step is for ICR to focus on its areas of priority in coordination with other funders.
6. Within CIHR there are some issues that may need to be addressed
- a. Resources that the Scientific Director has available appear to be limited for the strategic development of the potential of ICR as the leader in the large and complex cancer research community. Mechanisms for insuring sustainability of successful initiatives such as those noted in point #1 above will need to be put in place.
 - b. The peer review system is under strain. Although the creation of the Scientific Council and the College of Reviewers appears to help, it may be useful for Scientific Directors to be even more actively involved in the structuring of grants panels in the Open Operating Grant Program. This may be another mechanism to help the Scientific Director build community and sustain strategic initiatives.
 - c. Establishment of longer term alliances with complementary CIHR institutes need to be further encouraged e.g. obesity, inflammation, aging, and gender research would seem ideal for partnering with ICR activities.
 - d. Transition from one Scientific Director to the next is a delicate process where the organizational, administrative support system can easily become disrupted. This need to be looked into. A possible 4 plus 4 year term may be appropriate.
7. The directional focus of the Scientific Director is strongly endorsed. This includes:
- a. building the cancer research community in partnership with others and giving it a home with ICR providing the national leadership.
 - b. leading in interdisciplinary and team training for the next generation of cancer researchers.
 - c. catalyzing the discussions around personalized medicine.
 - d. bringing the Canadian cancer research community to become a more effective player in the international arena.

Section 1 – Institute mandate

Created in 2000 as one of the 13 institutes of the Canadian Institutes of Health Research (CIHR), the Institute of Cancer Research (ICR) has a mandate to support research that reduces the burden of cancer on individuals and families through prevention strategies, screening, diagnosis, effective treatments, psychosocial support systems and palliation. The ICR mandate transcends disciplines and encompasses all four health research themes: biomedical; clinical; health systems and services; and social, cultural and environmental factors that affect the health of populations. ICR's mission is to foster research based on internationally accepted standards of excellence that bear on preventing and treating cancer, and improving the health and quality of life of cancer patients and survivors.

CIHR Institute of Cancer Research – Internal Assessment for 2011 International Review, pg 1

Section 2 - Status of this area of research in Canada

- Canada has maintained world class cancer research across a wide spectrum of activities. For example, in stem cell (normal and cancer biology), cancer imaging, PEOLC, CTRnet and in clinical trials research.
- Since the last CIHR international review, the cancer research funding environment and community in Canada have experienced significant and dramatic changes. New organizations have been formed with new money and some established organizations have closed down.
- Notably, the NCIC which had been in existence for more than 60 years and a major funder of cancer research ceased to exist as an independent funding organization in December 2008. The major funding partners of NCIC were the Canadian Cancer Society (CCS) and the Terry Fox Foundation (TFF).
- New initiatives at the national level include the CCRA involving the major cancer funders in the country was formally established late in 2006. Dr. Phil Branton, the first Scientific Director of ICR, was instrumental in bringing cancer funders together. The current Scientific Director, Dr. Morag Park, is co-chair of the CCRA. In the past year, the CCRA has undertaken a strategic planning exercise and a pan-Canadian cancer research strategy has been produced as a framework for cancer research for the next 5 years. CCRA membership stands at about 30.
- CPAC was created by the Federal government in November 2006 to undertake the Canadian Strategy for Cancer Control with a budget of \$260M new money over 5 years. One of its mandates is to create national standards and guidelines for cancer treatments. CPAC also supports a 300,000 population cohort study and partners with the TFRI on translational cancer research.
- The TFRI (involving more than 45 MOU partners), was launched in October of 2007 to focus on pan-Canadian 'translational cancer research' projects with an investment of \$50 M of new money by the TFF.

- CCS created the Canadian Cancer Society Research Institute (CCSRI) in late 2008 to bring into better alignment its research funding with its mission. Currently CCSRI is undergoing a visioning and strategic direction exercise.
- Changes in cancer research funding have also occurred at the Provincial level. Most significant is OICR founded in December of 2005 by the Ontario Ministry of Research and Innovation to undertake all aspects of cancer research with a budget of greater than \$70 M per annum (mostly new money).
- Cancer research foundations at the local levels have been very active.
- CCRA reports that current cancer research funding in Canada is about \$400M per annum excluding funds generated by hospital foundations.
- CIHR/ICR is the single major funder investing ~\$125 M per annum mainly through the open grant competition mechanism. ICR has been effective in using its allocation of \$8.5 M per annum to fund its role as a neutral broker to bring partners together, to build a community that is somewhat fragmented due to organizational changes, in playing a leading role in CCRA, and in focusing on training of young people (STIHR program) and in promoting health services and policy research.

Overall impression of the Canadian research landscape in this area

1. Canada appears to have maintained first rate cancer research across a wide spectrum of activities. The creation of CIHR/ICR has allowed for the emergence of outstanding cancer research in pillars 3 and 4. For example, the PEOLC research program is world class.
2. The major challenge for cancer research in Canada is that the funding landscape has become more heterogeneous with the demise of NCIC and the creation of a number of national and provincial initiatives with significant new money, notably CPAC, TFRI, and OICR. Moreover, the International reviewers learned that there is a lack of coordination between Provincial and Federal funding agencies.
3. In the face of such a challenging landscape, ICR has played a leadership role in bringing the community together through the formation of CCRA. Recent activities of CCRA include the development of a pan-Canadian strategic framework for cancer research which should help to coordinate the activities of CCRA members.
4. One issue for ICR will need to address is the concern that outstanding basic research across all four pillars may suffer as funding for investigator initiated 'open competition' is likely to decrease as NGOs focus on more targeted research in keeping with their mission.
5. Certain infrastructure will need strengthening – particularly in bioinformatics to support large, data intensive initiatives such as personalized medicine – need to create infrastructure and sustain it.
6. There is consensus that ICR is the right body to help bring coherence to cancer research in Canada by its leadership and working through CCRA.

Section 3 - Transformative Impacts of the Institute

- Building pillars 3 & 4 cancer research capacity has been impactful. A highly successful example is the PEOLC initiative. This initiative was identified as the top priority for ICR after a Delphi process through which the cancer research community was widely consulted. This initiative transformed an underserved community and built research capacity with aligned grants panels and request for applications. This community has flourished and is recognized internationally transformative. This initiative has impacted policy changes and how end-of-life care is been handled across the country.
- Catalyzed and funded the formation of CTRnet, a national tumour banking network. Members of CTRnet agree to adhere to standard operating procedures (SOPs) for banking, processing tissues, quality control, data collection etc, developed in collaboration with international tissue bankers. CTRnet is an essential infrastructure that supports the pan-Canadian translational research of projects of TFRI and clinical trials.
- Other potentially transformative initiatives are at earlier stages of development. These include:
 - Survivorship Initiative has broad (multi-pillar) outcomes
 - Laid the groundwork for an imaging network
 - Childhood cancer—survivorship initiative to look at late effects in childhood cancers—involved in creating a C17 network of centres involved in pediatric cancer
 - Leadership in a personalized medicine initiative
- Creation of the CCRA. ICR took the lead with key partners to create the CCRA which in hindsight allowed a community to be built in the face of significant upheavals and organizational changes in the funding landscape. The CCRA generated reports (funding statistics) which allowed cancer funders to come to a common understanding of funding trends for research, to act cooperatively, to steer resources to underfunded areas, and to collaborate on large initiatives. This is still early days for the CCRA and ICR leadership can help the CCRA be more effective. The CCRA reports that about \$ 400M per year is invested in cancer research in Canada (excluding the investments of industry and hospital foundations) of which ICR/CIHR is the single largest funder at ~\$ 125M per annum.

Overall impression – to what extent has this Institute been transformative?

1. ICR has been transformative in a number of fronts some of which are beginning to have real impact e.g. in the development of research capacity in pillars 3 and 4 (PEOLC), in helping to build a useful national tumour banking network, CTRnet, and in its leadership in creating the CCRA. These are notable and substantive accomplishments.
2. A challenge is to continue to find resources and a viable mechanism to sustain successful initiatives while still allowing for resources to invest in more capacity building in underserved areas.

Section 4 - Outcomes

- While many of the initiatives are too new or in early stages to be able to evaluate e.g. imaging network and personalized medicine, ICR has demonstrated ability to respond to public concerns
 - When the Chalk River reactors closed, resulting in a medical isotope shortage crisis, ICR took the lead with NSERC – to discover alternative methods of creating medical isotopes.
 - ICR worked to address concerns about access to quality care/ wait times – institutions began working with this benchmark.
- PEOLC initiative has impacted end-of-life care practice.
- Building capacity with the STIHR grants.
- ICR is becoming an scientific interface for reaching the public (Café Scientifiques).

Overall impression – to what extent has this Institute been successful in achieving outcomes?

1. Improved health outcomes from cancer research will require significant time. ICR has been putting the fundamentals into place such as building the community, by being an exemplary partner and by its emphasis on interdisciplinary training programs.
2. The PEOLC initiative has been transformative.
3. ICR has capitalized on some early wins by its leadership in the medical isotope crisis and in the access to quality care mandate.

Section 5 - Achieving the Institute mandate

- ICR has been responsive in exercising its mandate.
- Success includes its efforts to integrate the 4 pillars – ICR community building efforts have included a focus on health services and policy research communities to bring them into the cancer research arena.
- Technological advances have allowed for interdisciplinary team research integrating diverse approaches with the powerful potential to deliver a different kind of healthcare. ICR has been encouraging and working with universities and institutions to recognize and reward team work.
- One of the real accomplishments of ICR is its support of the STIHR grants (22 teams in this area) – a valuable tool to integrate and train the next generation of cancer researchers. Most have a curriculum tied to it.

Overall impression – to what extent has this Institute achieved its mandate?

1. ICR has achieved its mandate with a great deal of success. It has built a broad spectrum cancer research community.
2. ICR has recognized gaps in research capacity and built communities in those areas.
3. ICR represents Canadian cancer research and brings it to the international arena for productive interaction.
4. ICR's emphasis on interdisciplinary training and team research is timely.

Section 6 - ERT Observations & Recommendations

- The Scientific Director is very passionate about building the community, capacity building/mentorship role and creating a home for cancer research in Canada. Building the community with young investigators, continue to sustain their programs.
- Continue to exercise ICR leadership within CCRA.
- ICR can leverage its resources by increased cross-institute partnering. Other areas that could be tapped into include obesity, inflammation, gender, aging etc.
- Have identified and initiated personalized medicine as a priority and have taken a leadership role. This is an opportunity to work synergistically with other CIHR institutes and other organizations in this cross-cutting initiative. It would be strategic to harmonize bioinformatics to support personalized medicine and sustain it. This includes standardization of electronic records (health records, info processing, trial repository, SOPs, access, centralized data bank).
- Prudent for ICR to develop and articulate a long term vision to partners and the scientific community since cancer is a chronic disease, one can predict the numbers coming and this should be reflected in ICR's mandate (e.g. what will be the priorities in cancer research 10 years from now).
- Relationship and opportunity to work more closely with Genome Canada and NSERC.
- Continue to explore international strategic partnerships.
- Increase partnership with industry (development of diagnostics and predictive biomarkers).
- ICR is not visible to the public, the policy makers nor to the scientists. They have the potential to promote their activities. CIHR could do more in creating a stronger brand. ICR should create a corporate identity to be more politically successful. Should utilize popular communications tools such as facebook, twitter to reach a broad and young audience.
- Smooth seamless and successive transition from one Scientific Director without loss of corporate memory, staff, different vision – a longer term and/or overlap of Scientific Director could be considered.

Overall impression of the performance of this Institute

Recommendations

1. ICR has done a great job of building community, but needs resources to continue. The cancer research community is high profiled, large, and complex. It is challenging for the Scientific Director to be appointed to a nominal 50% time for such a task. Resources and a strategy need to be developed to increase the “branding” of ICR/CIHR to increase awareness by the public and policy makers.
2. Transition from one Scientific Director to the next is a delicate process where the organizational, administrative support system can easily become disrupted
3. The stated focus of the Scientific Director is strongly endorsed:
 - a. building the cancer research community in partnership with others and giving it a home with ICR providing the national leadership
 - b. leading in interdisciplinary and team training for the next generation of cancer researchers
 - c. catalyzing the discussions around personalized medicine;
 - d. bringing the Canadian cancer research community to become a more effective player in the international arena.

Appendix 1 - Expert Review Team

Chair - Dr. Victor Ling

Scientific Director, Terry Fox Research Institute

Distinguished Scientist, BC Cancer Agency

Professor, Departments of Biochemistry and Molecular Biology, and Pathology and Laboratory Medicine

University of British Columbia

Expert Reviewer - Dr. Margaret Tempero

Deputy Director and Director of Research Programs at the UCSF Helen Diller Family

Comprehensive Cancer Center, Department of Medicine

University of California San Francisco, USA

International Review Panel – Professor Rudi Balling

Director, Luxembourg Centre for Systems Biomedicine

University of Luxembourg

Appendix 2 - Key Informants

Session 1 – Review of Institute

- 1. Dr. Morag Park, ICR Scientific Director**
- 2. Dr. William Mackillop, Chair – Institute Advisory Board**
Head, Division of Cancer Care and Epidemiology, Queen's University Cancer Research Institute
Professor and Chair, Community Health and Epidemiology
Queen's University
- 3. Dr. Heather Bryant**
Vice-President, Cancer Control, Canadian Partnership Against Cancer
Clinical Professor, Departments of Community Health Sciences and Oncology
University of Calgary
- 4. Dr. Gerry Johnston**
Associate Dean, Research, Faculty of Medicine
Professor, Department of Microbiology and Immunology
Dalhousie University

Session 2 – Consultation with researchers

- 1. Dr. Richard Doll**
Director of the Sociobehavioural Research Centre and the Provincial Leader for Cancer Rehabilitation, British Columbia Cancer Agency
Adjunct Professor, Faculty of Health Sciences
Simon Fraser University
- 2. Prof. Alexander McEwan**
Director, Oncologic Imaging, Cross Cancer Institute
Professor and Chair, Department of Oncology
University of Alberta
- 3. Dr. Fei Fei Liu**
Head, Division of Applied Molecular Oncology, Ontario Cancer Institute
Professor, Faculty of Medicine, Departments of Medical Biophysics, Radiation Oncology and Otolaryngology
University of Toronto

Session 3 – Roundtable with stakeholders

1. Dr. Neil Hagen

Head, Division of Palliative Medicine,
Professor, Departments of Oncology, Medicine and Clinical Neurosciences
University of Calgary

2. Dr. Simon Sutcliffe

Chair, Canadian Partnership Against Cancer

3. Dr. Michael Wosnick

Vice-President of Research, Canadian Cancer Society
Scientific Director, Canadian Cancer Society Research Institute