

Genome Canada Five Year Evaluation Report: Management Response

June 2014

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Introduction

This report outlines Genome Canada's Management's response to the findings, conclusions and recommendations resulting from the second, five-year evaluation of Genome Canada. As per the funding agreements with Industry Canada, Genome Canada is required to submit an independent third-party evaluation of its activities and projects every five years. The last evaluation was completed in 2009 and this current evaluation was completed in March 2014.

The Five Year Evaluation assessed Genome Canada's relevance and past performance over the period from 2009-10 to 2013-14. Its findings help inform management and other stakeholders on progress; it is an important accountability tool; it provides the opportunity for reflection on how Genome Canada is executing its Strategic Plan (2012-2017) and how to best implement the organization's strategic direction going forward.

Genome Canada found the evaluation undertaken by Science Metrix to be comprehensive and of high quality. Management felt that the evaluation demonstrated Genome Canada's value and alignment to Canada's Science and Technology strategy and made it clear that Genome Canada is progressing in the right direction for achieving its own strategic plan.

A number of strengths were highlighted in the report particularly around the quality of the research that is undertaken. The report noted that Genome Canada has directly contributed to enhancing support and capacity for genomics research through its funding programs, and through the development and implementation of a coordinated national strategy. Genome Canada has made a positive contribution to enhancing Canada's international profile and visibility in genomics, and to attracting additional investments to support genomic research. The output of peer-reviewed papers produced by principal investigators increased significantly with Genome Canada funding, furthermore, so did the scientific impact (i.e., paper citations, proportion of papers in the 10% most cited category). These positive indictments of the scientific research speak to the rigour of the peer review process that ensures that Genome Canada funds at the highest standard of research.

Notwithstanding the positive advancements made by Genome Canada between 2009 and 2014, there were areas highlighted in the report that warranted further consideration as we forge ahead with delivering on our strategic plan.

Six recommendations arose from the evaluation and these have been considered by the Management and Board of Directors of Genome Canada in terms of the contextual considerations, the strategic implications and the action items that will be addressed. The implementation plan for these action items will be incorporated into Genome Canada's annual corporate planning cycles. While some can be easily achieved with distinct projects and short timeframes others are more long term initiatives embedded into ways of working. The resource implications and Genome Canada's ability to deliver on these action items will be considered during corporate planning.

Recommendation One: Joint Initiatives

Genome Canada, working with the Genome Centres, should seek out and/or create joint initiatives with a broader range of public and private organizations aiming to achieve similar objectives (e.g., R&D funding programs, partnership programs, business innovation, etc.).

Contextual Considerations

The evaluation correctly noted that delivering on Genome Canada's strategic plan objectives will require earlier and robust engagement with partners and end-users. Genome Canada has been aware that partnerships and long-term relationships are the cornerstone to maintaining momentum in achieving our objectives. The sustainability of funding for transformational research, translation and application will be paramount. This will require not only continued federal support and the attraction of greater funding from other sources, but also enhanced engagement with key stakeholders, including end-users and other funding agencies, to ensure the results of the research are translated into benefits for Canadians. This approach was articulated in Genome Canada's 2012-2017 Strategic Plan, which recognizes the potential transformative role of genomics in delivering benefits for Canadians as a key enabler for driving the Canadian bio-economy. The Strategic Plan re-defined Genome Canada's Mission: To lead the Canadian Genomics Enterprise by:

- Connecting ideas and people across public and private sectors to find new uses and applications for genomics;
- Investing in large-scale science and technology to fuel innovation; and
- Translating discoveries into applications to maximize impact across all sectors.

In its Strategic Plan Genome Canada committed to placing greater emphasis on the translational aspects of innovation by applying the knowledge gained from research to grow the Canadian bio-economy and address real-world challenges. In other words, to become more focused on the endpoint of the research process with the development of applications that lead to economic and social benefits for Canadians. Genome Canada continues to fund research and fuel discovery but this will become more "purpose-driven," reflecting our emphasis on the application of research. This shift in focus shapes virtually all that we do, for example, from setting strategic priorities to influencing the nature of partnerships we form, from how we design programs, to setting the criteria used to select areas for investment.

Genome Canada also committed to attracting a greater investment from others to support genomics research and has proactively been pursuing this greater investment since the implementation of the 2012 Strategic Plan. Historically Genome Canada has been required to secure 1:1 co-funding for investments from the Federal Government. For funds received in Budget 2013, Genome Canada is required to secure co-funding at a ratio closer to 1:2. This has necessitated a significant strategic change in the way the organisation secures co-funding and engages with organisations with similar objectives to create joint initiatives.

Prior to Budget 2013, the majority of co-funding was secured at the "Project" level, primarily through the efforts of the Genome Centres and Project Teams. The strategy going forward is for the 1:2 co-funding requirement to be met through both "Project" co-funding and "Programmatic" co-funding, i.e., funding secured up-front for specific programs. During the period reviewed by the evaluation (2009-2014) the majority of the project co-funding has come from provincial sources (51%) and foreign partners (30%), while industry accounted for 7% of total external funding. The new emphasis on also securing programmatic

funding offers the opportunity to leverage greater funding from private sources as well as other non-traditional sources.

Genome Canada has already initiated a number of activities that endorse this new approach of engaging with a broader range of stakeholders and potential funders. Not only does this increase the potential sources of funding, but enhances the relevance of the research through alignment with the needs of the end-user and thereby ensuring, where appropriate, a greater potential for uptake into use. Genome Canada has therefore addressed the recommendation in the evaluation through initiatives that include:

- The development of Sector Strategies: There has been significant engagement with key stakeholders – industry, government agencies (science-based departments, regulators, and policy makers), etc. – to define together the potential role of genomics to meet the needs of the end-users, ensuring uptake into practical applications.
- The establishment of strategic partnerships with other funding agencies: For example:
 - on genomics and human health, with the Canadian Institutes of Health Research (CIHR) for Large-Scale Applied Research Project (LSARP) Competition 2012 ;
 - on bioinformatics and computational biology (B/CB), with CIHR for the B/CB 2012 Competition and with CIHR, the Natural Sciences and Engineering Research Council (NSERC) and the Canada Foundation for Innovation in NSERC's Discovery Frontier Program; and
 - on *Listeria* and food safety with the Canadian Food Inspection Agency and Alberta Innovates Bio-Solutions;
 - on *E.coli* and food safety with Genome Alberta/Alberta Livestock and Meat Agency, Ontario Ministry of Agriculture, Food and Rural Affairs;
 - on agriculture and agri-food with Western Grain Research Foundation for LSARP 2014 – Genomics and Feeding the Future
- Engagement activities with federal (e.g., AAFC, NRCan, Health Canada, DFO), and provincial organizations (e.g., Alberta Innovates, Ontario Ministry of Innovation, Alberta Livestock and Meat Agency) allow us access to other research communities and bring us closer to the end-users, which when combined with genomics technologies and expertise expand our ability to address larger, more important questions facing us today.
- Developing funding programs which require participation by end-users (those who will translate the research into use) at various levels – co-applicants, co-funders, collaborators, etc., e.g., LSARP competitions and even more so in the GAPP (Genomic Applications Partnership Program).
- Exploring the development of public-private partnerships (PPPs), such as the Structural Genomics Consortium, in a number of sectors (e.g., agriculture, energy, health) as a mechanism to advance partnerships between academia and industry, increase the likelihood of translation of the research results into use and attracting industry investments into Canada.

Strategic Implications

The strategic shift in focus for Genome Canada to connect ideas and people across public and private sectors to find new uses and applications for genomics has brought with it significant new activities for both Genome Canada and the regional Centres. The objectives and activities that were laid out in the strategic plan to accomplish this include:

Objective 1) Respond to societal needs by generating discoveries and accelerating their translation into applications

- Involve downstream experts and end-users in priority setting and program design

- Coordinate the development of programs to support the end-to-end integration of research and its application
- Develop innovative models of public-private partnerships
- Foster an entrepreneurial spirit in the scientific community
- Support internationally competitive large-scale science
- Provide leading-edge technologies to Canadian scientists

Objective 2) Attract greater investment in genomics research from a broad range of stakeholders, in particular the private sector

- Establish strategic partnerships
- Create programs focused on regional priorities

These objectives have required additional and differing skill sets within the organisation, some of which had to be acquired by recruitment of new staff. At both Genome Canada and the Centres there is an increased business development function and engagement with a broader range of organizations. Consideration of the organisational changes; how we develop the capacity to deliver on this approach; what implications it has on Genome Canada and the Centres; and the anticipated resource implications are on-going through the annual corporate planning process.

Action Items

To support development of joint initiatives with a broader range of public and private organizations aiming to achieve similar objectives, the following action items are proposed:

- **Continual refresh of the Sector Strategies and engagement with sector experts** to ensure we are aligned with the needs of the end-users and well-positioned to deliver on the transformative power of genomics in those sectors as they advance.
- **Exploration of new partnership and program models more closely aligned with the needs of the partner, the end-user and the research community.**
- **Increase the focus on strategic partnerships with federal agencies and departments and provincial governments and agencies** to promote collective thinking on genomics and increase their buy in and participation in Genome Canada's Strategic Plan.
- **Be proactive in understanding receptor capacity and engaging with the private sector in the translation of genomics research** by encouraging industry players to invest in specific projects through GAPP and the development of large Public Private Partnerships (PPP's) in sectors other than health and internationally
- **Increase engagement with the international community**, in particular international funding agencies to investigate opportunities for strategic partnerships and take advantage of Canadian leadership in driving international projects with clear benefit to Canada.
- **An assessment of the current and future state of human and financial resources** for undertaking joint initiatives to ensure that there is the appropriate support to achieve this objective.
- **Ongoing monitoring of the effectiveness of the strategies** to secure co-funding and the impact of the 1:2 requirement on the ability of GC and the Centres to support world-class genomics research in Canada, that has impact and contributes to the bio-economy.

Recommendation Two: Communications and Engagement

Genome Canada should coordinate with the Genome Centres to develop a communications and engagement plan that identifies strategies for specific audiences/sectors and facilitates the sharing of communications tools and resources.

Contextual Considerations

The evaluation concluded that Genome Canada’s performance was modest with regard to raising awareness among policy-makers, industry and the general public on the risks and benefits of genomic research, and that communication activities represent the main area where duplication is occurring among the Genome Centres and Genome Canada, resulting from a lack of coordinated efforts (e.g., messaging, sharing of tools and expertise). A number of contributing factors have played a role in this modest engagement including:

- Lack of senior communications leadership during the evaluation period. Genome Canada experienced a President/CEO transition and high level of turnover of communications staff during this period.
- Major shifts in the media/communications landscape have occurred during the period with the rapid growth of social media and a high level of media/message saturation in the public domain, making it more complex and challenging to compete for share of attention in a “noisy” communications environment, particularly with scientific content.
- Lack of human and financial resources dedicated to major national communications and outreach initiatives in partnership with the regional Genome Centres.

Genome Canada has been aware of these challenges and has initiated a number of activities towards developing a communications and engagement plan:

- Development of a multiyear collective communications plan to be used across the enterprise (Genome Canada and Centres) with agreed upon joint audiences, messaging and tactics;
- Development of specialized communications plans for the Genome Canada and Centres – e.g., Issues and Crises Management Plan;
- Involvement of Centres’ communication representatives on major national events (e.g., Genomics: The Power and The Promise) and initiatives (e.g., Celebrating genomics as part of Canada’s sesquicentennial);
- Initiation of an exercise to refresh the Genome Canada brand platform and rebuild the Genome Canada website, which will serve as a primary digital marketing and communications tool; and
- Undertaking a recruitment process for the new VP responsible for orchestrating Genome Canada’s external relations function (including government relations, communications, sponsorships and events and Genomics in Society).

Strategic Implications

Genome Canada recognizes the importance of communications and is committed to enhancing the recognition of the value of genomics by increasing stakeholder appreciation of genome science, its applications and its implications (Objective 4 of the Strategic Plan 2012-2017). Strategic implications in working towards this objective include:

- **Strategic focus on target audiences** –Genome Canada’s Board-approved communications plan primarily targets policy-makers, partners and potential “end-users”, with a secondary focus on the general public. With limited financial and human resources dedicated to communications, the program must remain tightly focused on reaching the primary audience groups, while playing a supporting role to the Centres in regard to broader general public outreach.
- **Resource capacity** – A new Director of Communications was hired in 2013, and as noted above a new VP is currently being recruited. Further resources implications for communications and external relations function will be considered as part of corporate planning.
- **Collaboration with Centres** – Greater emphasis must be placed on communications collaboration and coordination among Genome Canada and Centres to avoid duplication and maximize synergies. The Communication Seven group (C7) can be an effective forum for this and Genome Canada must play a leadership role in facilitating joint-planning and implementation of select national initiatives.

Action Items

To support the execution of an integrated communication strategy the following action items are proposed:

- **Continue regular C7 meetings** to discuss enterprise-wide communications activities
- **Develop a multi-faceted strategy to raise the profile of Genome Canada.** The strategy will address (i) communicating to our major stakeholders (ii) organizing major national and international events in genomics, and (iii) addressing issues critical to the smooth introduction of genomics based technologies into society. It will also consider FTEs and operational budget.
- **Take a leadership role in convening organisations with common goals and objectives** in advancing Canada’s bio-economy to harness the energy and communicative power of these groups.

Recommendation Three: GE³LS

Genome Canada should address current information gaps on the effectiveness and weaknesses of integrated GE³LS to confirm its value in facilitating translation of genomics research and to develop criteria and guidelines to help adjust practices for the integration of GE³LS.

Contextual Considerations

The evaluation noted that there is broad recognition of the value of GE³LS research and the evaluation identified Genome Canada's role in making Canada a "world leader in GE³LS". However, it was noted that there are mixed views on the value of embedding GE³LS research into every project. In addition, there is presently not enough evidence to make a direct link between integrated GE³LS and facilitated translation. This is an issue that Genome Canada has been aware of and a number of initiatives are currently planned, or have been initiated, that begin to address these issues, for example:

- A new approach to supporting GE³LS research (the Third Modality) is being piloted through the Genomics and Personalized Health Program.
- Efforts towards collaboration and partnerships are ongoing (e.g., Canadian Science Policy Conference, the Federation for the Humanities and Social Sciences; the Social Sciences and Humanities Research Council)
- The "Genomics, Public Policy and Society" series is being leveraged by presenting it to broader audiences.

Strategic Implications

Beyond the above mentioned initiatives, Genome Canada has been reviewing its approach to GE³LS research. To date, GE³LS research has been focused on providing evidence based research on the ethical, environmental, economic, legal and social aspects of genomics research to identify the challenges and opportunities that exist and the evaluation correctly focused on how Genome Canada has been achieving that over the last five years. However, moving forward, to fulfil Genome Canada's objective in the new strategic plan of '*enhancing the impact of genomics by transforming knowledge of the ethical, environmental, economic, legal and social challenges and opportunities into sound policies and practices*' (Objective 3, Strategic Plan 2012-2017), there needs to be a shift in approach that places more emphasis on its transformative potential and understanding the role of genomics in society. To support this, efforts have been undertaken to reposition Genome Canada's approach with the following three strategic pathways:

- **Developing innovative models of collaborative research:** New approaches to investing in GE³LS research continue to be explored, including with potential external partners. It follows that, as included in the current Genome Canada Strategic Plan (2012-2017), efforts must continue to develop new models of collaborative research that assist in the translation of genomics research.
- **Shaping the innovation continuum:** Translation should be considered in the broader context and not be limited to commercialization of genomics research. Moreover, demonstrating that translation – broadly defined – has been facilitated is challenging. It may be insufficient to rely on surveys of researchers who are likely in a position to only assess whether GE³LS in their projects facilitates the

translation of their genomics research, a time frame that is much too short for new knowledge to be applied effectively. Rather, to measure the impact of GE³LS research, new methodologies need to be explored and supported. It may be more valuable to ask the following questions, some of which can only be answered by parties other than the genomics or GE³LS researchers:

- Were integrated GE³LS research questions well informed by the project's genomics research / the current state of genomics research?
- Did integrated GE³LS research influence future genomics research projects that a genomics scientist undertook subsequently? (i.e., results of GE³LS research were transferred within the genomics research community)
- Did integrated GE³LS research subsequently influence end-users who were involved in projects?
- Did integrated GE³LS research influence policies or practices? (i.e., results of GE³LS research transferred to policy-makers, decision-makers or other end-users)
- Did integrated GE³LS research facilitate the translation of the genomics research into use?

Action Items

To support initiatives to address current information gaps on the effectiveness of integrated GE³LS to confirm its value in facilitating translation of genomics research and to develop criteria and guidelines to help adjust practices for the integration of GE³LS, the following action items are proposed:

- A project to undertake further **research on the effectiveness of integrated GE³LS** and the service versus research role of GE³LS in our projects is set for the third quarter of fiscal year 2014-2015; a budget has been submitted by the Director, Evaluation, to undertake this research in collaboration with the Director, National GE³LS Program. The project will look at the benefits and effectiveness of integrated GE³LS (e.g., how effective has it been, whether its absence impedes uptake of genomic applications; how it facilitates translation—and over what timeline; other indirect or non-translational benefits of GE³LS).
- The development of collaborations and partnerships with organisations that can help **expand the capacity to undertake GE³LS research**.
- The development of collaborations and partnerships with organisations that can **help translate results of GE³LS research** and transfer them.
- **Engagement with end-users**, through efforts of regional Genome Centres and Genome Canada, to identify gaps in knowledge that can be filled by GE³LS research

Recommendation Four: Collaborative and Sector Driven Research

Genome Canada should further improve working relationships with Genome Centres and collaboratively develop focused and customized funding programs that address the needs of specific sectors, including both large-and small-scale projects, as appropriate.

Contextual Considerations

One of Genome Canada's unique aspects and part of its mandate is to support LSARPs that allow interdisciplinary teams to come together to address sector-specific and multi-sector issues with genomic based research solutions. LSARPs can range in total size from \$2 million to \$10 million over 4 years.

To complement the program of large-scale projects Genome Canada has developed a suite of customised programs over the last few years that have addressed the needs of specific research areas or points in the value chain that could be useful in any of the seven sectors. This has provided opportunities for the funding of projects of different size and addressing funding gaps along a continuum of innovation from basic science to translation and application. For example:

- The Bioinformatics and Computational Biology Competition (B/CB) ranged in size from large projects of up to \$1 million to small projects of \$125K-\$250K total budget.
- The Genomic Applications Partnership Program (GAPP) provides support for small-scale proof-of-concept or pilot projects through to large-scale projects, ranging in size from \$300,000 to \$6 million in total project budget and requiring users to be fully integrated into the project plans as co-project leaders and to provide at least half of the co-funding.
- Genome Canada's emerging issues program provides up to a maximum investment of \$250K from Genome Canada for a period of 18 months to address opportunities or issues which are either newly arisen or whose importance have increased due to an increased incidence of the problem. Projects funded to date include: *C. difficile*, *Listeria* and *E. Coli*. Projects funded in this program are usually in response to an issue brought to our attention by a Genome Centre and sometimes the initiative is led by the Genome Centre, e.g., *E. coli* programs was led by Genome Alberta.
- Genome Canada has also looked at a flexible funding model for the disruptive innovation program.

Genome Canada has long recognised that collaboration with the Genome Centres is an important aspect of every element of the work we do and this is recognised in the evaluation. These relationships will be ever more important as we move forward with both our large scale initiatives and efforts towards more translational programs. Genome Canada's diffuse governance model is both a strength and a weakness. As there are seven unique and separate organisations making up the Genomics Enterprise, consensus and truly integrated working will always be a work in progress. However, the model is successful because of the unique regional and sectoral perspectives and expertise the Centres provide and the dynamic tensions that fuel true innovation in the way genomics research is funded in Canada. Mechanisms are in place to maximise engagement with the Centres whether that is through frequent meetings at all functional levels or through Centre leadership on initiatives such as the recent development of the sector strategies. Genome Canada will continue to be proactive in enhancing these relationships as it implements its strategic plan.

Strategic Implications

Genome Canada recognises that achieving its strategic objectives will require not only large-scale projects, but also smaller scale and/or more flexible and/or user focused (e.g., industry) projects that help build both research and end-user capacity to support greater translation and application. The current approach to program development has already started to tackle this and Genome Canada's initiatives such as the Genomic Applications Partnership Program, the Bioinformatics and Computational Biology Competition and others are initial and effective steps in this direction.

Action Items

To support initiatives to improve working relationships with Genome Centres and collaboratively develop focused and customized funding programs that address the needs of specific sectors, including both large-and small-scale projects, the following action items are proposed.

- Use the Emerging Issue Program (for small-scale projects) to collaborate with Genome Centres to respond to urgent issues of importance in their regions and where appropriate give them the lead on managing the program
- Collaborate with the Centres on Enterprise-wide large-scale strategic partnership initiatives that can be led by a Centre, e.g., DivSeek
- Consult the Centres extensively as programs are developed

Recommendation Five: STICS

Genome Canada should encourage the five Science and Technology Innovation Centres (STICs) to build on their unique strengths (e.g., providing analytical expertise, developing training programs and providing leading-edge technologies at an affordable cost) and to develop clearer policies and guidelines regarding data sharing and intellectual property, with a view to promote more open access to data.

Contextual Considerations

Genome Canada's mission includes a commitment to provide researchers across Canada access to leading edge technology in all genomics related fields. Genome Canada accomplishes this through Science and Technology Innovation Centres (STICs) that have been funded through competitive international peer review. These STICs provide researchers access to high throughput genomic technologies, such as DNA sequencing, RNA expression, protein identification and quantitation, as well as new methods and data analysis. The STICs also assist researchers in the development of research proposals by providing advice on appropriate technologies, study design, data analysis and bioinformatics that improve the quality of the research. Since 2001, GC has invested over \$160M in STICs.

Strategic Implications

It is generally recognized that the various STICs over the years have been leading edge centres because of their ability to advance, develop and take up new technologies and that this has been facilitated by them also being world leading research centres that are always advancing, developing and taking up the latest technologies, and have made major contributions to advancing the field of genomics.

In the 2013 federal budget, GC was provided \$165 million beginning in 2014-15 to support its multi-year strategic plan. GC has allocated \$45 million of this funding towards access to leading edge technologies, including \$30 million for STICs over two years. As such, it is an appropriate time for GC to evaluate the best model to support STICs beyond March 2015 and ensure that GC is fulfilling its mandate to make leading edge genomic technologies accessible to Canadian researchers.

The review undertaken found that the present model of funding for STICs poses certain challenges. The future model that the Board of Directors approved at their March 20, 2014 meeting addresses these challenges as follows:

1. To address the challenge of lack of synchronization between Genome Canada's LSARP competitions and STIC funding competitions based on estimated demand from projects, and to ensure that all projects come to the STICs with all the funds required to pay the full costs of services, implementation of a full cost recovery model for technology services provided to Genome Canada projects by the STICs.
2. To ensure that the STICs remain at the cutting-edge in providing access to genomics technologies to the research community, continuation of funds to support technology development. This will also give the STICs the ability to create a value proposition that will enable them to cope with increasing

pressure from external genomics technology service providers.

3. To facilitate an environment that allows the STICs to collaborate and to harness the collective power of the STICs, Genome Canada will provide problem driven and incentive based networking opportunities to the STICs.
4. To address the challenge of funding indirect core operating costs for infrastructure and personnel, Genome Canada will provide core operating support to help ensure that support is provided for activities that are fundamental to the basic day-to-day operations of STICs but difficult to fund through direct costs to the projects.

Also, it is imperative that Canada be positioned appropriately in dealing with future challenges arising from the era of high-throughput science in a period of considerable flux regarding future technology choices.

Action Items

It is important to recognize that there has been a different number and mix of STICs over the years and that the five current STICs may not apply or be approved for funding in the next open competition for STIC funding. Therefore, the following action items are intended to apply to whichever STICs are approved for funding in future. To support the Science and Technology Innovation Centres (STICs) in building on their unique strengths the following actions items are proposed:

- **Establishment of the Genomics Innovation Network:** To achieve its strategic goal to build on the unique strengths of individual STICs, and to address the challenges and begin to implement the future model mentioned above, Genome Canada plans to establish a network of genomic technologies innovation centres across Canada. The aim of this network, to be known as the Genomics Innovation Network (GIN), will be to facilitate an environment that allows innovation centres across Canada to collaborate and harness their collective power for the advancement of genomics research in Canada. It will also aid in providing the highest quality genomic technologies and advice to the research community.
- **Review existing data sharing and intellectual property policies:** It is important to make sure that the general principles governing data sharing and ownership of intellectual property, created or acquired as part of projects in which Genome Canada is directly or indirectly involved, are up-to-date and aligned with the current international practice. Genome Canada should consider undertaking an in depth re-evaluation of its current data sharing and intellectual property policies.

Recommendation Six: Performance Measurement and Reporting

Genome Canada should continue to improve its performance measurement and reporting structures, as well as seek to better integrate its different databases.

Contextual Considerations

Genome Canada has recognised there is a need for performance measurement and evaluation practices and tools that better capture, measure and articulate the value of Genome Canada and of genomics research. In the last two years it has undertaken a considerable amount of work to develop a foundation for this function including:

- Employing a Director of Evaluation;
- Establishing a performance measurement framework and logic model to guide its approach to measuring performance;
- Developing a national database to collect metrics on funded projects from across the Centres. This database is currently being populated with retrospective data on previously funded projects as well as being expanded to collect data on internal activities;
- Developing a draft four-year strategy for evaluation research that aligns with the term of the current strategic plan and meets the organisations needs to better inform decision making on key strategic initiatives;
- Undertaking an information management and IT review in Genome Canada (currently underway) to assess the various tool and databases used with the organisation to better integrate data collection and sharing across functional areas and to the Centres.

While the above initiatives have started the process of embedding evaluation within the culture of the organisation it is acknowledged that there is a lot of work still to be done. The five year evaluation rightly identified the need to better define concepts and measures of transformative, translational, and social and economic impacts, which may include targeted studies and/or socio-economic impact analysis—in order to better tell the story of Genome Canada’s potential impact.

Strategic Implications

Performance measurement and evaluation is a key component of Genome Canada’s strategic objective to *‘enhance the recognition of the value of genomics by increasing stakeholder appreciation of genome science, its applications and its implications’* (Objective 4, Strategic Plan 2012-2017). However, it also goes beyond this objective in that it has a dual function to provide robust evidence to the organisation for decision making on programs and governance development in the future.

There are a number of strategic implications that should be considered such as:

- **Working more closely with the Centres:** Integrated performance measurement and evaluation requires working more closely with the Centres. While the national database is one step towards that goal it provides metrics on a narrow set of indicators that are mainly focused on the outputs of the research rather than the outcomes and impact. As the Centres develop more evaluation capacity there has to be

mechanisms to ensure a reciprocal flow of best practice/data/evidence and shared resources that meets everybody's needs in a coordinated manner where appropriate.

- **Developing a program of Evaluation Research:** Good performance measurement goes beyond collecting metrics on key performance indicators. It involves building a compelling performance narrative that involves undertaking strategic evaluative research of value to the organisation.
- **Measuring longitudinally.** The outcomes and impacts from Genome Canada's funded programs take a considerable number of years to materialise and currently no systematic longitudinal tracking is undertaken beyond end of funding.
- **Resource constraints:** Genome Canada and the Centres have limited resources to dedicate to PM and evaluation activities. Resource limitations necessitate that a program of evaluation has to prioritise issues and information needs that enable the organisation to make evidenced based decisions and inform how it is performing against its strategic objectives.

Potential Action Items

To support the continued improvement in Genome Canada's performance measurement and reporting structures the following action items are proposed:

- **Four-year evaluation strategy:** Consult with the Centres and the BOD on a draft four year evaluation strategy to ensure it meets the needs of the different stakeholders and planned initiatives in the coming years; provides outcome and impact data arising from research programs (including GE³LS) and provides Genome Canada with good quality information to review the success of its Strategic Plan 2012-2017. Planning will have to occur within an envelope of limited resources but consideration includes undertaking evaluation projects:
 - driven by Genome Canada in collaboration with the Centres that provide value to the Enterprise with both a regional and a national perspective.
 - driven by Genome Canada in collaboration with other funding bodies that partner on major competitions such as CIHR, CFI and CIFAR.
 - that measure Genome Canada's success against its strategic plan to inform the development of the next five year plan from 2018-2023
- **Integrate evaluation considerations into the planning process for each program Genome Canada launches:** Ensure a close alignment between program objectives, and the expected outcomes of the program and how these will be measured
- **Commit to a funding envelope for performance measurement and evaluation** to fulfil the evaluation strategy over the next few years. Considerations include agreeing on the degree to which Genome Canada outsources research work, or build in-house capacity or adopts a hybrid model.
- **Develop a program of 'evaluation research'** within the funding portfolio that run concurrently with and complement funded competition programs. The evaluation program would undertake a meta analysis of funded projects and look specifically at the social and economic impacts of the program.
- **Develop a resource plan** to implement the evaluation and performance measurement strategy.

Appendix 1: Action Items

Current status:  No progress  In progress  Completed

Recommendation	Action Items	Status	Actions taken	Date completed
1) Genome Canada, working with the Genome Centres, should seek out and/or create joint initiatives with a broader range of public and private organizations aiming to achieve similar objectives (e.g., R&D funding programs, partnership programs, business innovation, etc.).	Continual refresh of the Sector Strategies and engagement with sector experts to ensure we are aligned with the needs of the end-users and well-positioned to deliver on the transformative power of genomics in those sectors as they advance.			
	Exploration of new partnership and program models more closely aligned with the needs of the partner, the end-user and the research community.			
	Increase the focus on strategic partnerships with federal agencies and departments and provincial governments and agencies to promote collective thinking on genomics and increase their buy in and participation in Genome Canada's Strategic Plan.			
	Be proactive in understanding receptor capacity and engaging with the private sector in the translation of genomics research by encouraging industry players to invest in specific projects through the GAPP and the development of large Public Private Partnerships (PPP's) in sectors other than health and internationally			

	Increase engagement with the international community, in particular international funding agencies to investigate opportunities for strategic partnerships and take advantage of Canadian leadership in driving international projects with clear benefit to Canada.			
	An assessment of the current and future state of human and financial resources for undertaking joint initiatives to ensure that there is the appropriate support to achieve this objective.			
	Ongoing monitoring of the effectiveness of the strategies to secure co-funding and the impact of the 1:2 requirement on the ability of GC and the Centres to support world-class genomics research in Canada, that has impact and contributes to the bio-economy.			
2) Genome Canada should coordinate with the Genome Centres to develop a communications and engagement plan that identifies strategies for specific audiences/sectors and facilitates the sharing of communications tools and resources.	Continued regular C7 meetings to discuss enterprise-wide communications activities			
	Develop a multi-faceted strategy to raise the profile of Genome Canada. The strategy will address (i) communicating to our major stakeholders (ii) organizing major national and international events in genomics, and (iii) addressing issues critical to the smooth introduction of genomics based technologies into society. It will also consider FTE's and operational budget.			
	Take a leadership role in convening organisations with common goals and objectives in advancing Canada's bio-economy to harness the energy and communicative power of these groups.			
3) Genome Canada should address current information	A project to undertake further research on the effectiveness of integrated GE3LS. The project			

gaps on the effectiveness and weaknesses of integrated GE3LS to confirm its value in facilitating translation of genomics research and to develop criteria and guidelines to help adjust practices for the integration of GE3LS.	will look at the benefits and effectiveness of integrated GE3LS (e.g., how effective has it been, whether its absence impedes uptake of genomic applications; how it facilitates translation—and over what timeline; other indirect or non-translational benefits of GE3LS).			
	The development of collaborations and partnerships with organisations that can help expand the capacity to undertake GE3LS research.			
	The development of collaborations and partnerships with organisations that can help translate results of GE3LS research and transfer them.			
	Engagement with end-users, through efforts of regional Genome Centres and Genome Canada, to identify gaps in knowledge that can be filled by GE3LS research			
4) Genome Canada should further improve working relationships with Genome Centres and collaboratively develop focused and customized funding programs that address the needs of specific sectors, including both large-and small-scale projects, as appropriate.	Continue to use the Emerging Issue Program (for small-scale projects) to collaborate with Genome Centres to respond to urgent issues of importance in their regions and where appropriate give them the lead on managing the program			
	Continue to collaborate with the Centres on Enterprise-wide large-scale strategic partnership initiatives that can be led by a Centre, e.g., DivSeek			
	Continue to consult the Centres extensively as programs are developed			
Genome Canada should encourage the five Science and	Establishment of the Genomics Innovation Network:			

<p>Technology Innovation Centres (STICs) to build on their unique strengths (e.g., providing analytical expertise, developing training programs and providing leading-edge technologies at an affordable cost) and to develop clearer policies and guidelines regarding data sharing and intellectual property, with a view to promote more open access to data.</p>	<p>Review existing data sharing and intellectual property policies</p>			
<p>Genome Canada should continue to improve its performance measurement and reporting structures, as well as seek to better integrate its different databases.</p>	<p>Develop a four year evaluation strategy to undertake evaluation projects:</p> <ul style="list-style-type: none"> • driven by Genome Canada in collaboration with the Centres that provide value to the Enterprise with both a regional and a national perspective. • driven by Genome Canada in collaboration with other funding bodies that partner on major competitions such as CIHR, CFI and CIFAR. • that measure Genome Canada’s success against its strategic plan to inform the development of the next five year plan from 2018-2023 			
	<p>Integrate evaluation considerations into the planning process for each program Genome Canada launches: Ensure a close alignment between program objectives, and the expected outcomes of the program and how these will be measured</p>			

	Commit to a funding envelope for performance measurement and evaluation to fulfil the strategic evaluation plan. Considerations include agreeing on the degree to which GC outsources research work, build in-house capacity or adopts a hybrid model.			
	Develop a program of ‘evaluation research’ within the funding portfolio that run concurrently with and complement funded competition programs. The evaluation program would undertake a meta analysis of funded projects and look specifically at the social and economic impacts of the program.			
	Develop a resource plan to implement the evaluation and performance measurement strategy.			