

Management Action Plan

Response to the Evaluation of the Discovery Research Program

The Natural Sciences and Engineering Research Council (NSERC) Discovery Research Program is designed to enhance the capacity of Canadian researchers to further our shared understanding of natural sciences and engineering through the production and dissemination of high-quality research while providing a stimulating environment for research training. It is important to emphasize that the reference to “Canadian researchers” is inclusive, covering both emerging and established researchers, as well as the diversity of the Canadian population in terms of its identity factors and regional distribution. This research is meant to be undertaken collaboratively, including joint efforts with international partners. As with all fundamental research, the body of knowledge generated with the support of the program is expected to ultimately find applications in both private and public sectors, for the benefit of all Canadians. To achieve this, the Discovery Research Program supports a suite of grants and supplements, including the following components, which were included in this evaluation: Discovery Grants (DG), Discovery Accelerator Supplements (DAS), Northern Research Supplements (NRS), Ship Time (ST) supplements, Subatomic Physics (SAP) program, Research Tools and Instruments (RTI), Collaborative and Thematic Resources Support in Mathematics and Statistics (CTRMS) and Canadian Institute for Theoretical Astrophysics (CITA).

The review covered the five-year period following the last evaluation, from the 2013-14 fiscal year to the end of the 2017-18 fiscal year.

Overall Comments

Management agrees with the overall findings of the evaluation, which confirm that the NSERC Discovery Research Program is a central part of the federal government’s strategy for support of fundamental research in the natural sciences and engineering in Canada.

Since its creation over 40 years ago, NSERC has played a pivotal role in the growth of the natural sciences and engineering in Canada to develop talent, generate discoveries and support innovation in pursuit of economic, environmental and social outcomes. With the historic investments in support of science and research announced in Budget 2018, the Discovery Research Program will continue to make enhancements to deliver on the Government of Canada’s objectives in advancing knowledge, skills and innovation for the benefit of all Canadians. Discovery Research funding will help Canada’s natural sciences and engineering research community remain internationally competitive and provide Canada with a diverse pool of highly skilled people that will meet the future needs of an increasingly global and knowledge-based economy.

In the coming years, NSERC will work to address the recommendations (as outlined below) and further improve the efficiency and effectiveness of the Discovery Research Program funding.

Management would like to thank the research community for providing invaluable feedback throughout the course of the evaluation. Thousands of Discovery Research Program participants, review committee members and institute administrators participated in the overall design of the evaluation, evaluation survey, key informant interviews and institute case studies.

Recommendations and Management Response

Recommendation 1:

The Discovery Research Program is a fundamental building block of the Canadian research funding environment.

Considering its fundamental role and positioning in the ecosystem of research funding in Canada, NSERC should maintain the Discovery Research Program, with the goal of ensuring its sustainability and its continued adaptability to emerging dynamics in the fields of natural sciences and engineering.

Management Response: Agreed.

Management is pleased that the Discovery Research Program and its funding elements are deemed to be highly relevant and continue to be the central component of funding for fundamental research in the natural sciences and engineering in Canada. The evaluation provides strong rationale for the continued support of the program.

Federal Budget 2018 announced new funding for discovery research, ramping up from \$44 million per year in 2018-19 to \$90 million in 2021-22. NSERC has invested these funds into the Discovery Research Program, while taking into account Budget 2018 priorities for equity, diversity and inclusion (EDI) and support for early career researchers (ECRs). The ramped-up funding commitments have allowed NSERC to increase the funds available for Discovery Grants competitions, to provide additional support for ECRs when they receive their first Discovery Grant, to increase the number of DAS awards, to provide additional support to CTRMS funded institutes, as well as to SAP projects, equipment and facilities, and to maintain a stable level of funding to RTI. We will continue to manage the budget and the additional investment funds in an efficient manner in order to support sustainable and stable grant sizes in the Discovery Research Program.

As indicated in the evaluation findings, NSERC has a demonstrated track record of responding to feedback from the research community by adapting and improving the effectiveness of the Discovery Research Programs. NSERC will continue to be responsive to the community, while taking into account government priorities such as EDI as well as support for ECRs.

Recommendation 2:

It is generally recognized that the costs of research can vary by discipline and that this may result in variations in the funding levels among different disciplines. However, at the time of the evaluation there was no publicly available information that could explain and justify the extent of these differences, and how this translates into Discovery Grant Evaluation Group budgets and the range of average grant sizes across disciplines. This has led to speculation among those consulted and questions about the fairness of the current model.

NSERC should explain the rationale for funding differences across disciplines, providing a clear description of the Discovery Grant funding levels and how they are established. This would reflect NSERC's commitment to ensuring a transparent management of the program, it would allow researchers to be adequately informed at the time of their application, and it would provide them with an opportunity to plan accordingly.

Management Response: Agreed.

Management recognizes the value of better communicating information on the funding levels and the processes used to establish them. NSERC staff will explore ways to better communicate with the community using various avenues.

Recommendation 3:

The RTI funding provides critical support needed for the successful implementation of research funded by the Discovery Research Program and other NSERC programs. This funding is complementary to other infrastructure funding, notably that provided by the Canada Foundation for Innovation (CFI). However, with its current level of funding, RTI only supports one fifth of the applications submitted by the community. Moreover, only half of the funded researchers perceive that they have the equipment required to conduct cutting-edge research. As a result, RTI is not in a position to respond to the needs of those it is intended to serve.

NSERC should clarify its objectives with respect to the nature and level of support it provides for research tools and instruments that enable researchers to carry out leading edge research funded by the Discovery Research Program and other NSERC programs. NSERC should revisit the RTI budget in order to enable the program to meet the needs of the community.

Management Response: Agreed.

Management accepts the findings of the evaluation with regard to the critical nature of the RTI funding and recognizes that the current funding level is not meeting the needs of the natural sciences and engineering research community. While RTI is not the only mechanism that provides funding for research equipment (CFI is also a significant player), the evaluation has highlighted that NSERC remains the main player for the support of what can be referred to as "small" equipment (that is, equipment valued at \$250,000 or less), whether it is the replacement of existing equipment or the acquisition of entirely new equipment. NSERC will

analyze alternatives to the current RTI program structure, including alternate approaches at other funding agencies, in order to develop future funding options for RTI. To further inform this activity, we will conduct a gender-based analysis plus (GBA+) of RTI to ensure fair and equitable access to program resources for all applicants. While management commits to undertake the assessment of RTI funding options, in the current context of a fixed NSERC budget and multiple funding pressures, any significant budgetary increase to RTI would require new federal funding.

Recommendation 4:

The funding mechanisms for subatomic physics (SAP) and mathematics and statistics have emerged incrementally over time. The SAP funding mechanism is long-standing and reflects the nature of the research undertaken; evidence from the evaluation has demonstrated that it is serving the specific needs of this community. In contrast, the funding mechanism for mathematics and statistics was implemented more recently. Since 2014 it has had a fixed proportional relationship between the funding for Collaborative and Thematic Resources Support in Mathematics and Statistics (CTRMS) and the funding to individual Discovery Grants. This approach to funding isn't serving the community's needs.

NSERC should consider separating the management of the funding for individual mathematics and statistics Discovery Grants from the management of the funding for institutes provided by CTRMS.

Management Response: Agreed.

Management accepts the findings of the evaluation with regard to the inherent challenges of the current funding mechanism for the mathematical and statistical sciences. NSERC will separate the management of the funding for individual Discovery Grants from the management of the funding for institutes provided by CTRMS.

Recommendation 5:

The currently funded research institutes in the fields of astrophysics, subatomic physics, and mathematics and statistics fulfill an important role that is highly complementary to the Discovery Grants provided by the program. However, NSERC funding is fragmented and has been implemented incrementally. The most significant gap that NSERC now faces results from a lack of a coherent vision and strategy on how to support research institutes, and to provide this funding in a manner that is consistent with the principles governing all its granting activities.

NSERC should clarify its vision and develop a comprehensive framework and guidelines that communicate how NSERC intends to provide ongoing support to research institutes in Canada, including the potential of expanding to other fields of research. Moreover, in order to improve accountability and assess impacts, NSERC should implement a more rigorous monitoring and reporting framework for the institutes that it supports.

Management Response: Agreed.

Management recognizes that the currently funded institutes play an important role for certain research communities. However, with three different components through which the institutes are supported, which have been introduced as discipline-based needs emerged over time, the coherence and alignment of institute funding can be improved. NSERC is reviewing the funding components for institutes and intends to build on the most promising and relevant aspects when defining its vision and developing a strategy for research institute funding based on a revised peer review framework. As part of this activity, NSERC plans to harmonize and improve the reporting requirements to ensure more effective performance monitoring. Future expansion of the institute program to other fields of research would be contingent on the receipt of new federal funding and prioritization of funding pressures.

Recommendation 6:

Ensuring that all qualified Canadians have access to and benefit from its programs is a longstanding goal for NSERC, and are the basis for the tri-agency EDI action plan. The Discovery Research Program is in the process of implementing changes to ensure fair access and support for underrepresented groups in all fields of NSE in the research ecosystem. Comprehensive data on a number of identity dimensions of program participants is currently lacking.

NSERC should pursue the implementation of its EDI principles as they apply to activities funded through the Discovery Research Program. This includes, among other things: 1) continuing to collect and analyze new, broader data to better understand the participation of all underrepresented groups; 2) continuing to provide the required support to both grant applicants and reviewers to ensure that the activities they undertake with the support of the Discovery Research Program reflect these principles.

Management Response: Agreed.

Management recognizes the importance of EDI in attaining research excellence and continues to build on existing EDI initiatives to further support the implementation of the tri-agency EDI action plan. We agree that the collection of accurate and relevant information will inform our ongoing commitment to strengthening EDI in research, and we understand that the current evaluation could not be informed by the latest initiatives at NSERC and the tri-agencies in this regard. Inter-agency efforts are currently being undertaken to enhance data collection and reporting for all programs, including the Discovery Research Programs. This data will support the identification and reduction of barriers for under-represented groups and also allow for full and transparent reporting of competition outcomes. NSERC continues to enhance the EDI content in all aspects of the Discovery Research Program, including program literature for applicants, peer review guidelines and processes for reviewers, and training materials available for applicants and reviewers. Furthermore, all NSERC program staff must take mandatory EDI

training not only to improve EDI content in our programs and recognize bias in peer review, but also to better equip staff to provide guidance to the research community and respond to its needs.

Management Action Plan

Recommendation	Agree, Partially Agree, Disagree	Proposed Action	Responsibility	Target Date for Completing Proposed Action
<p>1. Considering its fundamental role and positioning in the ecosystem of research funding in Canada, NSERC should maintain the Discovery Research Program, with the goal of ensuring its sustainability and its continued adaptability to emerging dynamics in the fields of natural sciences and engineering.</p>	Agreed	<p>NSERC will continue to implement Federal Budget 2018 and manage the Discovery Research Program budget in an efficient manner in order to support sustainable grant sizes in the future. We will continue to be responsive to the community, while taking into account government priorities such as EDI as well as ECRs.</p>	Director, Engineering and Life Sciences	Ongoing
<p>2. NSERC should explain the rationale for funding differences across disciplines, providing a clear description of the Discovery Grant funding levels and how they are established. This would reflect NSERC's commitment to ensuring a</p>	Agreed	<p>NSERC commits to exploring ways to better communicate information on Discovery Grant funding levels and the processes used to establish them.</p>	Director, Engineering and Life Sciences	November 2020

transparent management of the program, it would allow researchers to be adequately informed at the time of their application, and it would provide them with an opportunity to plan accordingly.				
3. NSERC should clarify its objectives with respect to the nature and level of support it provides for research tools and instruments that enable researchers to carry out leading edge research funded by the Discovery Research Program and other NSERC programs. NSERC should revisit the RTI budget in order to enable the program to meet the needs of the community.	Agreed	NSERC commits to undertake the assessment of RTI funding options in order to better meet the needs of the community. In the current context of a fixed NSERC budget and multiple funding pressures, any significant budgetary increase to RTI would require new federal funding.	Director, Mathematical, Environmental and Physical Sciences	March 2021 (RTI Competition Year 2021)
4. NSERC should consider separating the management of the funding for individual mathematics and statistics Discovery Grants from the management of the funding for institutes provided by CTRMS.	Agreed	NSERC will separate the management of the funding for individual mathematics and statistics Discovery Grants from the management of the funding for CTRMS.	Director, Mathematical, Environmental and Physical Sciences	July 2020 (DG Competition Year 2020)
5. NSERC should clarify its vision	Agreed	NSERC will build on the	Director,	June 2020

<p>and develop a comprehensive framework and guidelines that communicate how NSERC intends to provide ongoing support to research institutes in Canada, including the potential of expanding to other fields of research. Moreover, in order to improve accountability and assess impacts, NSERC should implement a more rigorous monitoring and reporting framework for the institutes that it supports.</p>		<p>most promising and relevant aspects as it defines its vision and develops a strategy for research institute funding based on a revised peer review framework.</p> <p>NSERC plans to modernize and consolidate the reporting requirements to ensure more rigorous performance monitoring.</p>	<p>Mathematical, Environmental and Physical Sciences</p>	<p>June 2022</p>
<p>6. NSERC should pursue the implementation of its EDI principles as they apply to activities funded through the Discovery Research Program. This includes, among other things: 1) continuing to collect and analyze new, broader data to better understand the participation of all underrepresented groups; 2) continuing to provide the required support to both grant</p>	<p>Agreed</p>	<p>NSERC recognizes the importance of EDI in attaining research excellence and continues to build on existing EDI initiatives to further support the implementation of the tri-agency EDI action plan in the Discovery Research Program. This includes but is not limited to the collection of EDI self-identification data from</p>	<p>Director, Engineering and Life Sciences, Director, Mathematical, Environmental and Physical Sciences</p>	<p>Ongoing</p>

<p>applicants and reviewers to ensure that the activities they undertake with the support of the Discovery Research Program reflect these principles.</p>		<p>applicants and reviewers, as well as continued enhancement of EDI in all aspects of program literature, peer review process and training materials for applicants, reviewers and staff.</p>		
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