



# Canadian Society for Molecular Biosciences Société Canadienne pour les Biosciences Moléculaires

## Board of the Canadian Society for Molecular Biosciences Submission for Pre-Budget Consultation to the House of Commons Standing Committee on Finance August 7th, 2015

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### **Executive summary:**

Science, technology and innovation (STI) are crucial for the economic and societal health of Canada. For example, foundational discovery-based molecular bioscience research has led to Canadian development of innovative cures and diagnostics for diseases, genetic engineering of microbes and plants to produce drugs and high-value chemicals such as biofuels. Innovations stemming from curiosity driven science are the bed-rock of STI that will improve Canadian's health, create businesses and jobs and allow Canada to become a leader in the knowledge economy. Canada's future will depend on support for STI including long-term oriented discovery research.

Canada's past investments have considerably strengthened our nation's capacity for scientific research, for innovation, for training of highly qualified personnel and for the applications of results in biotechnology and medicine. In a very challenging budgetary environment the government has maintained support for science by continuing investments in federal funding agencies that provide crucial support for research institutions in all parts of the country. Whereas we applaud these investments we cannot ignore the fact that despite largely maintaining the budgets of the funding agencies, the available resources are not sufficient to leverage the increased capacity for research and innovation in our nation. Further, **increased targeting** of research investments towards short-term application and commercialization programs has led to a significant deterioration of funding for discovery-based research in Canada. Curiosity-driven discovery science generates both the ideas that fuel innovation and trains the next generation of leaders in research and its application. If Canada is to play an increasing role in the global STI economy it is essential that it increases its support of non-targeted curiosity-driven discovery research. [\*\*The Canadian Society for Molecular Bioscience \(CSMB\) recommends:\*\*](#)

- **Increased investment in open operating grant competitions at CIHR and NSERC to drive innovation and discovery.** This recommendation addresses the 2015 pre-budget consultation theme of productivity, infrastructure and communities, and jobs.
- **Continued investment in research infrastructure.** This recommendation addresses the 2015 pre-budget consultation theme of productivity, infrastructure and communities, and jobs.

## ***Introduction:***

The Canadian Society for Molecular Biosciences (CSMB) represents the interests of thousands of faculty members and research personnel who are training thousands of students in bioscience and biomedical research departments at Universities and other research institutions across Canada. Our members' research programs are largely dependent on operating funding from the **Canadian Institutes of Health Research (CIHR)** and the **Natural Sciences and Engineering Research Council of Canada (NSERC)**. Changes in the research funding priorities by these federal agencies have placed the foundation of innovation and discovery science in Canada at great risk. In this document we make recommendations to help end the crisis that is presently threatening bioscience and biomedical researchers in Canada.

Successive Canadian governments have increased and largely sustained investments in basic discovery-driven and applied research supporting world-class innovation in academic institutions across our country. Investments in the **Canada Foundation for Innovation (CFI)** have provided world-class equipment making our institutions competitive with the best in the world. The **Canada Research Chairs** program has allowed Canada to recruit and retain outstanding academics and contributed to unprecedented growth of our research institutions. These programs have greatly increased the science research capacity of the nation, but realization of the full potential of these investments is currently limited by the availability of operating funds, which are the resources required from year to year to carry out the actual research, and to do so at an internationally competitive level. Operating funds support the salaries of the creative minds that drive Canadian discovery and innovation, most notably the young and highly-qualified technicians, research assistants, graduate students, and post-doctoral fellows who represent the next generation of high-tech employees. Operating funds also provide the supplies and services required to perform the fundamental and applied research that will shape Canada's future. Operating funds can be likened to the 'gas' that fuels the 'car.' Government funding has provided splendid new vehicles (equipment and other infrastructure) and exceptional drivers (research personnel) for the global race in which Canada must compete. However, without adequate fuel (operating funds), we won't be able to get to the finish line.

The granting councils CIHR and NSERC have provided the operating funds to make world-class discoveries and to provide training to highly qualified personnel who will continue to innovate in academic as well as in industrial environments. Indeed, as Canadians we can all be proud of these achievements. The past investments have greatly broadened our capacity for innovation and knowledge creation, for training of highly qualified personnel who create companies and jobs and there has also been a net migration of excellent researchers to our country. Modern technology used in hospitals to improve the health of Canadians and innovative approaches used in the biotechnology sector now were developed in basic discovery research laboratories 10-20 years ago. It is therefore critical that operating fund investments at CIHR and NSERC into early stage discovery research be increased to match the research infrastructure of our nation, which will be crucial in order to reap the benefits of future discoveries.

**Canadian bioscience research is in a crisis.** Research funding was largely maintained in recent years and even increased in some targeted areas, but the granting councils CIHR and NSERC simply cannot keep up with the increased research capacity we have built over the last decade. Further, changes to the open operating grant programs at both NSERC and CIHR that put increased emphasis on immediately translatable research have resulted in an unprecedented decrease of both success rates and funding level for basic researchers. While industry and disease-focused charities support more directed research, basic science has largely no other place to turn to access operating funding other than NSERC and CIHR. This is why basic science needs unbiased and fundamental support through the Tri-Councils. If the trend towards increasing funding of applied over basic research continues, it will result in the closure or contraction of hundreds of laboratories across the country

In the case of NSERC, Discovery Grants support basic discovery research in science and engineering. Since 1978, despite an expansion of the number of researchers and an increased percentage of the Canadian population that pursue a university education, even with a steady increase of funding for the Discovery Grant program there has been a decline of the proportion of the NSERC budget committed to Discovery Grants. Instead NSERC funds have increasingly been directed towards applied and industry partnership programs, with resultant fewer dollars directed towards Discovery Grants. These applied programs are important, but they should not come at the detriment of basic discovery research. For example, in 2014 the average Discovery Grant awarded was \$33,612, an amount that is largely insufficient to support modern bioscience research that is at the cutting edge internationally.

The impact on health research funded by CIHR is even more alarming. Just as an example, the success rate at the CIHR open operating grant competition was about 25% just a few years ago, reflecting a healthy competition for the best ideas ensuring that only excellent and very promising work is being funded. However, this has steadily eroded and dropped to 14% in the last competition. In addition, even the funded grants were all cut by more than 25%, meaning that jobs for hundreds of researchers disappeared. The reforms of the CIHR open operating grant funding and peer review system further aggravate this situation and in the 2015 competition, hundreds of fewer grants have been awarded than in previous years. Also, the mechanism of implementation of these reforms has resulted in funding gaps due to the limited number of competitions. In our current environment many labs are operating on only one operating grant, and as a consequence of all these factors, hundreds of our best biomedical research laboratories across the country have already contracted or will begin to close down over the next few years. This is already leading to a loss of jobs and of economic activity as well as of innovation and training capacity across the country so that costly CFI-funded equipment cannot be used due to lack of operating funds.

Support of discovery research environment in Canada is essential to drive innovation. **While we applaud the government's efforts to support applied and translational research, to foster research between industry and academia, and to drive commercialization, it cannot be at the expense of supporting discovery research as a key component of the**

**STI system.** Further, [OECD data](#) for 2013 indicate that Canada only spends 1.6% of its GDP on Research and Development (R&D), compared to the average OECD nations at 2.4% of GDP. We strongly encourage the Government of Canada to work towards increased spending on R&D to 3.5% of the GDP as in the most aspiring nations such as Japan, Korea, Sweden, Finland and Israel as recommended by the [Scientific Advisory Board of the Secretary General of the United Nations](#). Increased funding for R&D in Canada will enable our country a complete and competitive innovation pipeline – from foundational discovery research to commercialization.

***Recommendation:***

The board of the CSMB proposes two concrete and feasible measures to address the immediate crisis that is occurring for basic discovery research in Canada:

- **Increases to open operating grant budgets of CIHR and NSERC.** The upcoming Federal budgets will be crucial for the Canadian research enterprise. **Annual increases for the granting councils CIHR and NSERC by 5% each year for a minimum of 3 years and that these increases be directed to the most competitive and innovative research funded by the open operating grant competitions (NSERC Discovery Grants and CIHR Foundation and Project Grants).** This infusion of funding would stop the downwards trend that we have experienced for fundamental basic research in Canada. Ensuring that discovery research is maintained in Canada will **a)** generate innovations leading to increased productivity, **b)** train the next generation of scientists necessary for a robust STI-inspired economy and **c)** maintain the employment of highly trained research staff (technicians, research associates) in Canada.
- **Continued investment in research infrastructure.** CFI should continue to play an important role to finance world-class infrastructure. Similar to operational funding, through the CFI Innovation program there has been an increased emphasis on funding large collaborative projects of targeted research projects that can demonstrate the potential of short-term economic or societal benefits. Though this funding is both welcomed and necessary to keep Canada a global leader in research, unfortunately most basic researchers have limited success at accessing CFI Innovation funds. However as infrastructure age, access to more modest equipment funding programs is essential. We recommend increased funding of the CFI John R. Evans Leaders Fund which funds infrastructure for individual researchers. Further increased funding of NSERC Research Tools and Instruments Grants Program and the reinstatement of a modest equipment funding program at CIHR would be equally important. These programs finance urgently needed renewal of ageing infrastructure on a much broader scale that is not eligible for the CFI. In addition to keeping Canada's research laboratories competitive, equipment renewal drives Canada's biotechnology equipment sector and directly leads to job creation. The additional cost needed for this is about 10 million \$ per granting council, for a total of 30 million per year (2016-2018).

To conclude, we applaud the continued commitment of the Canadian government to world-class discovery-based research and its applications for improved health, training and economic development. We hope that the government will agree that Canada must now prioritize STI by increasing investments into the CIHR and NSERC, and sustained support for the CFI. This will ensure that our researchers can reach their full potential continuing to do world-class research and innovation that will stimulate economic development and job creation across our nation and improve the health of Canadians.

On behalf of the board, I would like to thank the committee for the opportunity to provide our input and we would be happy to provide further information and insights in person if requested.

Sincerely,

A handwritten signature in black ink, appearing to read 'K Baetz', with a stylized, cursive script.

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