Canadian Society for Molecular Biosciences

Promoting and advancing molecular understanding of biology

Boosting Investment in Scientific Research: An Important Tool for Crisis Preparedness and Keeping Talent in Canada

Submission to the Finance Committee's Pre-Budget Consultations

Prepared by:

The Canadian Society for Molecular Biosciences (CSMB)

RECOMMENDATIONS

Recommendation 1: That the Government of Canada increase tri-council budgets by a minimum of 10% per year over the next 5 years.

Recommendation 2: That the Government of Canada increase the level of support for recipients of the Canada Graduate Scholarship (Masters program) and Postgraduate Scholarship (Doctoral program), bringing funding to an internationally competitive level.

Recommendation 3: That the Government increase investment in training of the next generation of scientists, over 4 years, to an additional $140M per year (increases at $35M per year, via the tri-councils).

Recommendation 4: That the Government increase its investment in the Research Support Fund, over 4 years, to an additional $478M to help institutions across Canada to support their researchers as effectively and efficiently as possible.

Alongside a number of stakeholders within Canada's scientific community, the ***Canadian Society for Molecular Biosciences (CSMB)*** is drawing attention to the need for enhanced and sustained federal investments in science and discovery research. This will ensure Canada is well positioned to attract, retain and support the scientists, and aspiring scientists, who are choosing to pursue their groundbreaking research in Canada, rather than competing jurisdictions internationally , as well as competing professions outside of research. .

Through immense cross-disciplinary collaboration and a spirit of scientific ingenuity, Canada's scientific community, including CSMB, has risen to many significant challenges, most recently through involvement with mRNA vaccine development. This is a testament to Canadian scientific know-how and the dedication of our community to the advancement of science and the betterment of society in Canada.

Aspiring leading scientific researchers in Canada are profoundly motivated by impactful contributions such as these. However, enticing researchers to pursue their studies and careers in Canada has become increasingly challenging. The lack of reliable, transparent and predictable research funding and student support in comparison to related global jurisdictions and in particular professions outside of research has become a significant obstacle that requires urgent attention.

The lack of dependable support for the next generation science talent pipeline, leading to a shortage of skills, is problematic for a sector that is so dependent on highly qualified personnel. Ongoing and sustained increases in the amount of grant funding available for basic science researchers is crucial to ensuring that our best and brightest will enter science and discovery research and that they continue to perform research, rather than to seek more compelling opportunities elsewhere, leading to "brain drain" both from the sector and from Canada.

The Urgent Need to Increase Support for Scientific Research and Training: An Investment in our Long-Term Future

Momentous change has been the biggest constant of the 21st century, from adapting to the changes in climate patterns globally, to meeting the challenges posed by pandemic outbreaks – crisis preparedness is critical. Scientists must be well positioned to deploy innovation and precision medicine quickly and at scale.

Canada's allies and competitors have taken note of these changes, challenges and emerging science policy realities. President Biden's first budget request to Congress, for instance, reflected his administration's bold and ambitious science and research agenda, including funding to expand education and workforce training programs and support next-generation science talent. To illustrate this – in 2022, the budget of the Canadian Institutes of Health Research (CIHR) was a mere 2.38% compared with the budget of the United States National Institutes of Health (NIH) budget. Given that the US population is 8.7 times that of Canada, they invest 5 to 6 times as much in biomedical research per capita, compared to us. The United

States is only one of several countries that has identified science and research as a way to deal with global challenges, and has matched this with adequate funding.

Research funding in Canada is supported via the following structures:

1- Operating grants through tri-councils that fund student stipends and consumables
2- Fellowships awarded through CIHR / NSERC
3- Research Support Fund to offset the costs of overhead

The current level of operational support at the tri-councils is insufficient to support Canadian researchers at internationally competitive rates. The erosion of the funding base has been slowly forcing many promising biomedical research laboratories across the country to reduce their research efforts or close entire research programs, release highly trained personnel, and stop training the next generation of scientists. This fundamentally threatens our preparedness for a future public health crisis, as basic science training is foundational to so many aspects of public health, medicine and biomedical research into therapies.

CSMB's recommendations to address these challenges are outlined below:

Recommendation 1: That the Government of Canada increase tri-council budgets by a minimum of 10% per year over the next 5 years.

This is in alignment with the recommendations presented by the Advisory Panel on the Federal Research Support System, released in March 2023 (The Bouchard Report). This investment would address the steady decline in research funding in Canada thereby positioning Canada to innovate and discover on the global stage, promote greater international collaboration, create interdisciplinary opportunities, and lead to high-risk ventures that will ensure Canada is ready to face the next global challenges ahead, health or otherwise. This investment would also acknowledge that tri-council operating grants fund a wide range of highly qualified personnel and trainees that are not captured by other investments (such as those outlined in subsequent recomendations). These are critical to retain expertise and enable sustained innovation and discovery.

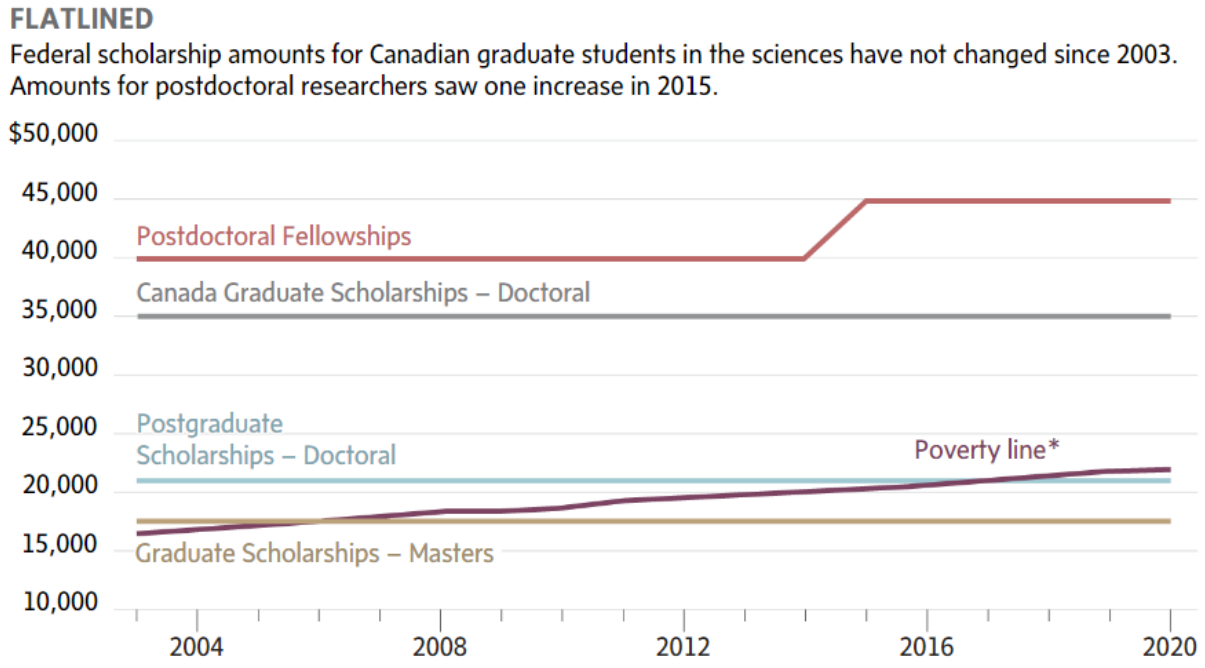
The Need to Increase Support for our Best and Brightest: An Investment in the Talent Needed for Tomorrow

As the pandemic highlighted the need for a highly skilled workforce with a background in biosciences – which feeds into the fields of epidemiology, virology, vaccine development, public health, pharmaceutical innovation, and more – is more important than ever. Hence, government action is needed to ensure that we have enough qualified Canadians to meet the needs of a rapidly growing sector. As Canada looks towards making our economy more innovative and productive, it remains vital that any government strategy retain a strong focus on the significant hurdles faced by our science and research sector: a lack of support for next generation science talent, leading to a skills shortage – which is problematic for a sector that relies on a highly skilled workforce.

It is important that Canada uplifts and supports our next generation of science talent. Unfortunately, stagnant funding in Canada is making it difficult to demonstrate the value and opportunities in science to our young people. As noted, this reality was articulated in the Advisory Panel on the Federal Research Support System. In addition, witnesses that were called to testify at the Standing Committee on Science and Research on the *Government of Canada's Graduate Scholarship and Post-Doctoral Fellowship Programs* study echoed this same concern.

Government financial support for science and research is primarily made through investments in infrastructure, such as for university-based laboratories, in addition to grant funding for researchers through the tri-councils (CIHR, NSERC, SSHRC) which graduate students rely heavily on. Ongoing and sustained increases in the amount of grant funding available for basic science researchers is crucial to ensuring that our best and brightest can continue to perform research, and that they do not seek more compelling opportunities elsewhere.

Today, scholarship amounts are not increasing with inflation – and in fact, amounts have not increased since the early 2000's. For example, during the 2021-2022 fiscal year, Master level students were eligible for a one-time scholarship of $17,500, while the poverty line for a single individual living in an urban area with a population greater than 500,000 was $22,060.To further conceptualize, the median Canadian individual income in 2023 is $61,640 according to statistics Canada.



At the same time, the competition for grants and funding is highly competitive. For example, from the CIHR's Fall 2022 project grant results, of the 511 applications submitted by early career researchers, only 20.2% of applications were funded. Of the 657 mid-career applications submitted by mid-career investigators, only 18.1% of applications were funded. These low

success rates mean that many of Canada's researchers spend hours writing grant applications, in addition to their research output which on average far exceeds 40 hours per week, yet many of their grant applications are unsuccessful.

The science and research sector is, like many other sectors, competing for talent. Faced with low success rates for funding support, as well as a perception that Canadian scientists and researchers do not have access to a livable wage, our current cohort of talent may be leaving the field - not because they don't love it, but because they can't afford to stay in it. At the same time, opportunities within the sector, but abroad, may appear far more attractive than those offered domestically, leading to instances of "brain drain".

The Government of Canada can address these obstacles by adding to base funding to increase success rates for applicants, as recommended by the Advisory Panel on the Federal Research Support System. The Government of Canada can also help by increasing the amount available from operating grants, in alignment with a recommendation outlined in Canada's Fundamental Science Review.

More specifically, the CSMB suggests the following:

Recommendation 2: That the Government of Canada increase the level of support for recipients of the Canada Graduate Scholarship (Masters program) and Postgraduate Scholarship (Doctoral program), bringing funding to an internationally competitive level.

Recommendation 3: *That the Government increase investment in training of the next generation of scientists, over 4 years, to an additional $140M per year (increases at $35M per year, via the tri-councils).*

The Need to Increase Support for Research Enterprise: An Investment in Infrastructure

Cutting-edge discovery research such as the Canadian scientific teams searching for a COVID-19 vaccine, takes place in universities, hospitals and research institutes across the country and their infrastructure is increasingly in need of upgrades. Our scientists require state of the art infrastructure to continue to innovate, discover and create new knowledge.

The Research Support Fund assists Canadian post-secondary institutions with the costs associated with managing their research enterprise, helping them to maintain a world-class research environment. Grants through the Fund can be used to maintain modern labs and equipment, provide access to up-to-date knowledge resources, and more. However, despite its significant impact, the Fund is lacking in the investments needed to ensure that our research infrastructure is operating as efficiently as we need it to. This recommendation is aligned with the Fundamental Science Review.

Recommendation 4: *That the Government increase its investment in the Research Support Fund, over 4 years, to an additional $478M to help institutions across Canada to support their researchers as effectively and efficiently as possible.*

Conclusion

Canada's scientific research community was able to meet the immense challenge posed by the pandemic due to the investments that have been made by governments, provincial, territorial and federal, to support the scientific community thus far, and Canada's scientists were at the forefront. A commitment to basic science helped us to understand and apply knowledge to the problems Canadians faced, such as the novel vaccines developed over the past years. Similarly, a sustained commitment and increased investment in basic science will help us to understand the root causes of many other problems that Canadians face, or might face in the future – diseases like cancer, diabetes, and dementia, and challenges such as climate change, natural disasters, antibiotic resistance and contaminated drinking water, to name a few. Canadian research and researchers who choose to conduct their work in Canada urgently need Federal action and support.

*Conceived in 1957, the **Canadian Society for Molecular Biosciences (CSMB)** is a professional association of scientists involved in Biochemistry, Cell Biology, Molecular Biology and Genetics. Our members are primarily from universities and academic research institutions from across the country and are the scientists responsible for investigator-driven research. Their work generates new knowledge that fuels innovation and discoveries, and trains the next generation of scientists who will continue to innovate and contribute to our knowledge-based economy through academic, industry, and business opportunities.*