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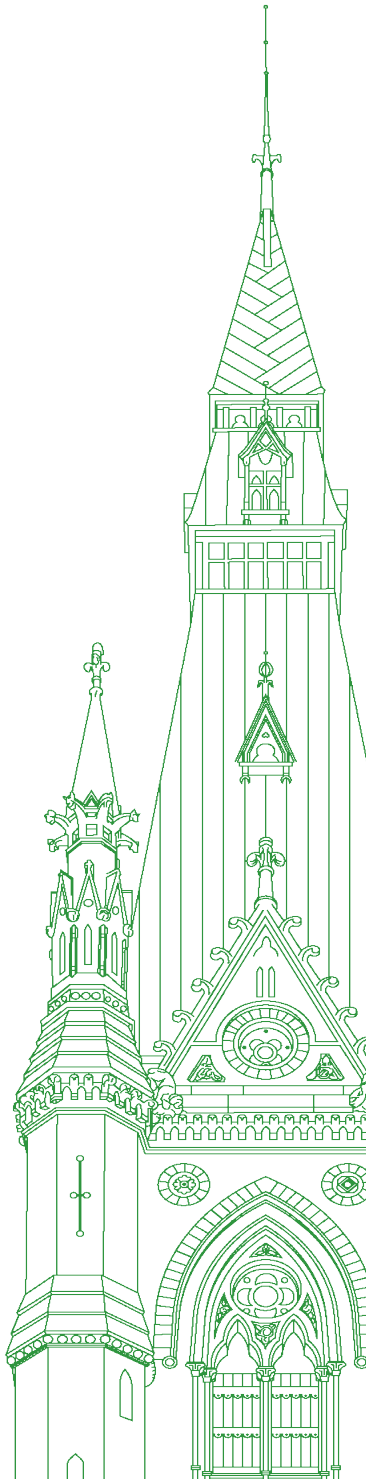

Chair: The Honourable Kirsty Duncan

Standing Committee on Science and Research

Tuesday, February 15, 2022

● (1830)

[*English*]

The Chair (Hon. Kirsty Duncan (Etobicoke North, Lib.)): Good evening, colleagues. I call this meeting to order.

Before we start, I want to recognize Corey Tochor and thank him for the work he has done these last few weeks. Could we take a moment to recognize Corey?

Some hon. members: Hear, hear!

The Chair: I'd like to welcome you all to meeting number five of the House of Commons Standing Committee on Science and Research.

As you know, the Board of Internal Economy requires that the committee adhere to health protocols, which are in effect until March 11, 2022. As the chair, I will enforce these measures and I thank you all for your co-operation.

Today's meeting is taking place in a hybrid format pursuant to the House order of November 24, 2021. There are a few rules. Interpretation services are available for this meeting. You may speak in the official language of your choice. At the bottom of your screen is the toolbar and you may choose to hear floor audio, English or French. The “raise hand” feature is on the main toolbar should you wish to speak. I would remind you that all comments should be addressed through the chair.

When you are not speaking, your microphone should be muted. The committee clerk and I will maintain a speaking list for all members.

We're delighted tonight to have from the Canadian Institutes of Health Research, Dr. Michael Strong, president. From the Natural Sciences and Engineering Research Council, we have Dr. Alejandro Adem, president. From the Social Sciences and Humanities Research Council, we have Dr. Ted Hewitt, president, and Dr. Dominique Bérubé, vice-president of research.

We will begin with our witness testimony, and we'll begin with Dr. Michael Strong for five minutes.

Dr. Michael Strong (President, Canadian Institutes of Health Research): [*Technical difficulty—Editor*]

[*Translation*]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Excuse me, Madam Chair, [*Technical difficulty—Editor*] currently no interpretation. [*Technical difficulty—Editor*] Dr. Strong [*Technical difficulty—Editor*] French interpretation.

[*English*]

The Chair: I'm sorry, Dr. Strong.

We will suspend for a minute to make sure that we have translation.

Monsieur Blanchette-Joncas, are you on the French channel?

[*Translation*]

Mr. Maxime Blanchette-Joncas: Yes, I am.

[*English*]

The Chair: Are we good to go now? How is the interpretation now?

[*Translation*]

Mr. Maxime Blanchette-Joncas: No interpretation is coming through.

All right. I'm being told that the problem is fixed. We can resume.

[*English*]

The Chair: Dr. Strong, could you try again please?

Dr. Michael Strong: Thank you, Madam Chair.

I wish to thank the committee for the invitation to appear here today. It is a great privilege, both as CIHR's president and as a scientist, to join my colleagues in addressing the inaugural members of Canada's parliamentary committee dedicated to science and research.

In the preamble to the act, which established CIHR in 2000, Parliament recognized that excellence in health research is fundamental to improving the health of Canadians. CIHR has since endeavoured to deliver on its mandate by investing in high-calibre, peer-reviewed research, and its translation into better health for Canadians.

As we strive to build on our successes, we see an opportunity to modernize the concept of research excellence, and address many of the challenges currently facing the research community and Canadians. It's an opportunity to firmly position Canada as a global leader in inclusive and collaborative science focused on real world impact.

The challenges of emerging health threats and a rapidly evolving world only underscore these imperatives. The current state of science and public investment in science is a subject that merits full attention. This committee's study is timely and extremely important in this regard.

During the pandemic, [*Technical difficulty—Editor*] remarkable drive to develop vaccines against COVID-19. In fact, we know this achievement was built upon decades of research involving hundreds of people worldwide, including crucial contributions by Canadian scientists.

What may have been less evident to many Canadians was how our research community truly rallied at the very onset of the pandemic, despite its disruptions in our lives. They initiated urgent research, guided public health responses and supported peer-review as CIHR mobilized its rapid funding, becoming the first national agency in the world to launch an open call for COVID-19 research.

CIHR has since invested over [*Technical difficulty—Editor*] continues to fund studies on gaps and emerging priorities. I am also proud to say that, in parallel, CIHR has continued to deliver its investigator-initiated research programs at full funding levels. This was critical.

It is important to realize that there is no overnight success in science, but rather incremental steps forward, driven by hard work, collaboration and sustained investment in both fundamental and applied research. This means supporting excellence across what we call the four pillars of health research: biomedical, clinical, [*Technical difficulty—Editor*] and population health. It's targeting research to help governments and health care partners address a broad range of priorities, such as the opioids crisis, mental health, climate change and reduced health costs.

As we emerge from the pandemic, CIHR is poised and uniquely positioned to contribute to building a healthier, more prosperous Canada.

In January, we established the Centre for Research on Pandemic Preparedness and Health Emergencies to support ongoing research for emergency preparedness, prevention, [*Technical difficulty—Editor*] biomanufacturing and life sciences strategy. CIHR will soon launch a new clinical trials fund to strengthen Canada's bioinnovation pipeline.

During the pandemic, CIHR also introduced [*Technical difficulty—Editor*] in our history. This plan outlines an ambitious vision for a healthier society built on research excellence.

Our engagement with the community identified key challenges. For instance, how do we strengthen fundamental research while continuing to support strategic priorities? How do we define research excellence, and how do we ensure that research excellence is adequately supported in Canada? How do we ensure that the best scientific evidence is quickly put into the hands of those who can use it? How do we bridge the so-called valley of death in innovation, so that discoveries in Canada lead to successful commercialization and to new solutions for Canadians?

Our strategic plan looks to address these themes and others, for instance, by better integrating evidence into health decisions, through knowledge mobilization and learning health systems, where patients, health professionals, managers and scientists, embedded in the health system, work together to determine where the problems lie, and what the solutions should be.

[*Technical difficulty—Editor*] while strengthening investigator initiated research, the cornerstone of medical science.

Moving this vision forward will require a vibrant, globally competitive research community—

● (1835)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Pardon me, Dr. Strong.

Madam Chair, there's a problem with the connection. The interpretation has cut out four times since Dr. Strong began speaking. Can you tell me whether Dr. Strong's connection was checked before the meeting began?

Dr. Michael Strong: Sorry.

[*English*]

The Chair: Thank you, Monsieur Blanchette-Joncas. We have validated it. We're not sure where the connection issue is happening, and we apologize.

I think it's best to allow Dr. Strong to finish his last 30 seconds. Is that agreeable to the committee? All right.

Dr. Strong, it's over to you for 30 seconds.

● (1840)

[*Translation*]

Dr. Michael Strong: Thank you.

[*English*]

Moving this vision forward will require a vibrant, globally competitive research community. It will require us to continue to work hand in hand with our partners. With our tri-agency colleagues, we will continue to enhance collaboration and harmonization. We will work in collaboration with organizations in the private, charitable and public sectors, and we will continue to advance cutting-edge research and support innovation.

The Chair: Thank you so much, Dr. Strong.

With that, we will go to Dr. Alejandro Adem from the Natural Sciences and Engineering Research Council.

We hope the interpretation is back.

Dr. Alejandro Adem (President, Natural Sciences and Engineering Research Council): Thank you very much.

[*Translation*]

Good evening.

Thank you for inviting me to appear before your committee.

I’m pleased to join my fellow granting council presidents to exchange with you on the successes, challenges and opportunities for science in Canada.

[*English*]

My name is Alejandro Adem. I am the president of the Natural Sciences and Engineering Research Council of Canada, NSERC.

I'm a mathematician currently on leave from a faculty position at the University of British Columbia. Before joining NSERC, I was CEO of Mitacs, a non-profit organization that builds bridges between academia and the private sector through student internships.

I am currently also serving as the chair of the Canada Research Coordinating Committee. I would be glad to discuss with you today or at a later date the important work that the CRCC is doing to collaboratively advance federal research priorities.

[*Translation*]

First, however, allow me to introduce NSERC and share with you some of the exciting work that we are doing for Canadians.

For more than 40 years, NSERC has played a critical role in supporting natural sciences and engineering research in Canada.

[*English*]

The Chair: I'm sorry, Dr. Adem, but we're going to suspend. I think we have to sort out the interpretation problems.

Can we suspend for a few minutes?

Dr. Alejandro Adem: Okay, stop the clock.

The Chair: Yes, thank you.

● (1840)

_____(Pause)_____

● (1845)

The Chair: Colleagues, I'll resume the meeting.

Dr. Adem, we'll begin with you again, for five minutes.

[*Translation*]

Dr. Alejandro Adem: Good evening.

Thank you for inviting me to appear before your committee.

I’m pleased to join my fellow granting council presidents to exchange with you on the successes, challenges and opportunities for science in Canada.

[*English*]

My name is Alejandro Adem. I am the president of the Natural Sciences and Engineering Research Council of Canada or NSERC. I'm a mathematician currently on leave from a faculty position at the University of British Columbia. Before joining NSERC, I was CEO of Mitacs, a non-profit organization that builds bridges between academia and the private sector through student internships.

I'm also currently serving as the chair of the Canada Research Coordinating Committee. I would be glad to discuss with you today or at a later date the important work the CRCC is doing to collaboratively advance federal research priorities.

[*Translation*]

First, however, allow me to introduce NSERC and share with you some of the exciting work that we are doing for Canadians.

For more than 40 years, NSERC has played a critical role in supporting natural sciences and engineering research in Canada.

[*English*]

In addition to being Canada's largest funder of discovery, research and innovation, we also support creative public outreach activities, promoting the value of science and engineering and increasing science literacy among young Canadians.

NSERC has two flagship programs. One is discovery grants to support fundamental research and training. The other is alliance grants for university researchers partnering with private sector, public sector or not-for-profit organizations.

We also provide support to students and research trainees from undergraduates all the way through to post-doctoral fellowships.

In addition, NSERC partners with the other councils on important joint programs, such as the Canada research chairs, the Canada first research excellence fund and the highly interdisciplinary new frontiers in research fund.

During the past year, NSERC has invested $1.4 billion to support over 12,000 researchers and over 33,000 trainees at universities and colleges across Canada. NSERC supports 75% of all natural science and engineering researchers in Canada.

Our partnership programs have connected academics to thousands of partners in industry, government and the non-profit sector. We support research at institutions of all sizes across Canada as research excellence occurs in every corner of our country. Our trainees go on to positions in academia, government and the private sector, where a STEM background provides them with critical skills for today's technologically advanced society.

Over the years, the support that NSERC has provided for fundamental research has yielded important technologies and solutions that have benefited Canadians. Areas such as artificial intelligence, quantum science, clean technology, biomedical engineering, etc., have been incubated and then mobilized thanks to the steady support of our discovery and applied research programs, which support ideas and innovation in all the areas of natural sciences and engineering.

[*Translation*]

In addition to working very closely with the other granting councils, NSERC is proud to collaborate with other government-based departments and agencies in the advancement of science.

● (1850)

[*English*]

In recent years, NSERC has partnered with departments like Environment and Climate Change Canada, Fisheries and Oceans, and Agriculture Canada to fund collaborative efforts between federal scientists and the academic community. Examples include research on forest fires, plastic pollution and food security.

NSERC plays a critical role in understanding and developing solutions to climate change, spending over $200 million annually to support research in environmental sciences, renewable energy, sustainable electric vehicle batteries, carbon capture and storage, and much more.

We're also helping Canadian researchers push the boundaries of knowledge through international partnerships. For example, NSERC and the U.S. National Science Foundation recently announced a joint initiative on quantum science and artificial intelligence.

[*Translation*]

As we now turn our attention to Canada’s postpandemic economic recovery, NSERC is keen to contribute to that effort in a meaningful way.

[*English*]

For example, last October we launched the NSERC alliance missions grants to address critical science and technology challenges to create benefits for our economy. The college and community innovation program, which supports applied research partnerships between colleges in all regions of the country and SMEs, is generating innovative solutions to local and regional business challenges.

Our agency is committed to the principles of equity, diversity and inclusion, seeking to address the under-representation of many groups in STEM fields, so that all Canadians can benefit from science and innovation.

[*Translation*]

Madam Chair, these are just some examples of how NSERC is supporting natural sciences research and researchers.

Thank you.

[*English*]

The Chair: Thank you very much, Dr. Adem.

Now we will go to Dr. Ted Hewitt, president of the Social Sciences and Humanities Research Council.

Dr. Ted Hewitt (President, Social Sciences and Humanities Research Council): *Bonsoir*, Madam Chair.

Thank you for your invitation to appear before this committee and also for your long-standing leadership in science and research.

I'm very proud to appear before you today as president of the Social Sciences and Humanities Research Council since 2015. I'm also a career academic, working in Canada and internationally, including for many years as the senior university administrator, principally in the research field.

In these various roles, I've had the privilege to observe from different perspectives the many changes in the Canadian research system that have occurred over the past three decades.

[*Translation*]

At the beginning of the century, the major investments that were made in key national research programs created a solid foundation to attract talent to Canada and retain it.

This made it possible to build research expertise in Canada and gave the country's research councils the momentum to endure, grow and prosper.

Research spending by subsequent governments helped sustain that healthy growth.

[*English*]

I believe that Canada's academic research system today is robust. It's a system that rests on three key pillars, which are critical to its stability and success. First, of course, is the research itself, the projects, the formulation, the execution of research plans. Second are the people, not just the researchers but the new talent that's being developed at all levels in the system. Third are the research tools, the buildings, the infrastructure, and the equipment. Thanks to investments and a good balance of fundamental and strategic research over the past several decades and enhanced coordination within the research enterprise in recent years within the Canada Research Coordinating Committee, I believe that Canada is increasingly well served in all three of these pillars.

Could the system be strengthened? It could absolutely. The research enterprise and society have awakened to the critical need to break down the real barriers that exist to equity, diversity and inclusion and to advancing reconciliation with indigenous peoples through strengthening indigenous research capacity and research training. We must continue to advance multidisciplinary as well as international collaboration and effective channels to mobilize research knowledge, because we need the contribution of all Canadians to generate, deliver and share research if we're going to avoid jeopardizing innovation, technologies, commercial products and sound public policy.

[*Translation*]

As president of the Social Sciences and Humanities Research Council, or SSHRC, I want to underscore the essential role social sciences and humanities research plays in maximizing the benefits of science. The social sciences and humanities encompass a wide range of research fields, all of which are human-centred.

Innovation is about more than just technology and patents. The development, implementation, commercialization and adoption of new technologies are human factors that are greatly affected by humanities and social sciences elements. Science and technology don't happen on their own. They do not determine the merits of exploring a given technological path. People do, and that's where the crucial role of social sciences and humanities research comes into play, broadening our understanding of other humans and societies.

● (1855)

[*English*]

Canadians' social science and social sciences and humanities research are helping to address some of the most critical challenges we as a society face domestically and globally, be those pandemic recovery, economic growth, environmental sustainability, affordable housing or reconciliation. Fundamentally it's about building and sustaining a just and prosperous society. People are at the heart of what drives our future. We are well positioned to build and capitalize on Canada's strength across the disciplinary array in the social sciences, and in humanities in particular, and to build the Canada we want and need for today and tomorrow.

Thank you.

The Chair: Thank you, Dr. Hewitt.

Thank you, to all of our witnesses, for your time, your expertise and your effort.

We will now go to questions from members. This is a six-minute round, and we will begin with Ryan Williams for the Conservative Party for six minutes.

Mr. Ryan Williams (Bay of Quinte, CPC): Thank you very much, Madam Chair.

Through you I'm going to go to our first scientist, Dr. Strong.

Thank you very much for your opening statement. In your opening statement, you talked about funding research to reduce health care costs. Canada right now has the fifth-highest per capita spending on health care in the OECD, yet we're not getting anywhere near a good bang for our buck. We have the longest wait times in the OECD and we're dead last in doctors and ICU beds per capita in the G7. Could you expand a bit on the results from the research that actually reduced our health care costs?

Dr. Michael Strong: Yes, in fact, CIHR does conduct research, and one of its pillars specifically supports health outcomes and investments, to look at how the health care system has improved, not just during the period of the pandemic but also prior to that. It's a matter of looking at the best ways to ensure that the procedures that are put in place need to be done, can be done efficiently and are done well within the facilities that are available for them.

An example of that would be research that's been recently released looking at the types of processes that need to move forward for surgical intervention—which ones require in-hospital work, and which ones can be done in a lower-acuity setting—and that's helping to drive reduced costs. We do conduct research in that area and are helping to influence those costs.

Mr. Ryan Williams: Thank you very much.

Through you, Madam Chair, to Dr. Strong again, with publicly funded research institutions accounting for 80%—I think it may be closer to 90%—of the intellectual property created in Canada, how can we drive innovation and downstream commercialization if the players are so heavily dependent on federal funding?

Dr. Michael Strong: Madam Chair, I thank the member for that question. It's a crucial one at this moment in time.

It actually speaks to the biomanufacturing and life sciences initiative that's being built coming out of the pandemic to strengthen our ability to create that pipeline and then sustain it in the long term so that ideas and research that find their initial formulation within the laboratory are well supported, are moved through the clinical trials networks and are scaled up appropriately. Then the IP would be maintained within Canada so that the trials are done here and the answers are used to benefit Canadians.

It is a fundamental investment that has been done to address exactly that question of ensuring that we maintain IP in Canada for innovation's purpose.

Mr. Ryan Williams: Thank you, Doctor.

My next question is again to Dr. Strong.

In your 10-year strategic plan, what were your solutions to bridging the commercialization valley of death, as you called it?

● (1900)

Dr. Michael Strong: The valley of death is actually populated by a number of different issues that need to be addressed. The first is to ensure that the funding is in place to ensure that the development of the research ideas are there to begin with.

Also, there is a need to ensure that there is a deeper association with industry so that, as we're training our next set of graduates, as we're conducting the research experiments to look at this, we have a vision or an eye on getting across that valley. What is needed by industry to ensure that the ideas that are brought forward can be operationalized and moved forward? To do that, you need to have industry involved at the very early stages as well.

Again, returning to the biomanufacturing initiative as an example of that, this is something that is being tightly interwoven at the very beginning of research to try and understand how we support this better. It's incremental change, but it's at multiple different steps.

Mr. Ryan Williams: Thank you, sir.

I'm sorry for ganging up on you, but I have one more question for you, Dr. Strong.

You mentioned funding to strengthen Canada's bioinitiative pipeline. I assume that is funding for both university and private sector research; maybe you can confirm that for me. What is expected from a public and private sector split between applicants?

Dr. Michael Strong: Again, I will return to the biomanufacturing strategy and life sciences strategy that's embedded with that because it's a good example of knitting together across multiple different departments and agencies the capacity to actually see something carried all the way through, and the engagement of corporate entities.

As the CIHR, we are part of that, but so are my colleagues here at the table, as well as ISED, in terms of helping with commercialization, and NRC. For us, the role of CIHR is to ensure that the investment is there in several different layers. The first is the early discovery component. We want to encourage working with my colleagues here through the tri-agency fund so that industry is brought in as a partner very early on, as well as the private sector. Then, moving into the clinical trials component to support that and to do the evaluative component, that needs to be done with industry as well.

The final piece is a rigorous training program to ensure that the next generation of researchers that we develop understand this pipeline in the context of working with public partners to make it successful.

Again, it's a very broad strategy, and each of us owns a piece of it.

Mr. Ryan Williams: Thank you, sir.

The Chair: We will go to Ms. Diab for six minutes.

Ms. Lena Metlege Diab (Halifax West, Lib.): Thank you very much, Madam Chair.

Welcome to all of our witnesses to this historic committee. I'm glad to have you here.

I'm going to direct my first question to Dr. Adem.

You are the current chair of the Canada Research Coordinating Committee. I think you mentioned in your remarks that you'd like to expand a bit on that. Can you let us know the importance of increased coordination for improving research ecosystems in Canada and whether you think there's progress made on that front? What else would you like to see happen and what else we can do to have more of that going on?

We've heard from past witnesses before how crucial it is to have coordination and partnerships among the government and the different sectors.

Dr. Alejandro Adem: Thank you.

Madam Chair, let me say that I started in this job in 2019, and the first day I started, three of us had dinner with the president of CFI. It's been a remarkable journey, especially given the pandemic. The councils and CFI work very closely; we have meetings every week and we work on issues of substance through the Canada Research Coordinating Committee.

It's extremely important that the different councils and funding agencies work together. In fact, I think there are significant areas where we collaborate almost freely and practically as one unit. For example, with SSHRC, we share the administrative backbone—it's the same one for both agencies—and the tri-agency programs deliver a whole slew of programs for the three agencies at the same time.

The Canada Research Coordinating Committee has had the really wonderful effect of bringing us even closer together and harmonizing our activities. We have the three agencies plus CFI, NRC, the chief science adviser, the deputy minister of ISED and the deputy minister of health there.

Among our accomplishments, we developed an innovative new interdisciplinary program called the new frontiers in research fund, and you will have seen the rollout of some of the recent transformation grants. There is fantastic work, work on spinal cords, creative new materials, environmentrics and all sorts of different things and amazing programs.

We have action plans that provide a foundation for ongoing interagency collaborations supporting early career researchers. Greater equity, diversity and inclusion in the research community are key interests of the science and innovation communities. We implemented Canada's first strategic plan co-developed with first nations, Inuit and Métis peoples to guide new models for supporting indigenous research and research streams.

If I may say so, we also developed the Canada research continuity emergency fund, which helped sustain 32,000 people ineligible for CERB, ensuring the continuity of 22,000 vital research projects. We also have a number of international initiatives, particularly one on climate change, which are going to be truly interdisciplinary.

It's not perfect, but there is huge progress being made and harmonious collaboration between the agencies.

● (1905)

Ms. Lena Metlege Diab: Thank you.

I don't know how much time we have left, but I'll hone in on the question, which you mentioned. On support for early careers and graduate students, would you say they're getting their proportion of the overall research funding in Canada? What can we do to better support them? Do you think it's different depending on the discipline or field they're in? Please shed some light on that.

Dr. Alejandro Adem: People ask me about where the funding for research goes, and primarily it goes to people, to students and trainees. I think around three quarters of the funding for NSERC goes to people, so it's important that they be adequately supported.

Obviously, areas such as computer science and electrical engineering, which are competitive areas where the market has a lot of demand, require competitive offers. As a professor at UBC, we struggle to make offers that are competitive when competing with universities in the U.K., Europe and the U.S. I think it's important for us to maintain competitive stipends and support for students. We certainly all agree on that, and Canada has so much to offer as a country, and our universities are wonderful institutions, centres of knowledge and innovation, so it is important for us to support these young people as best as we can.

Ms. Lena Metlege Diab: Perfect. Thank you.

Dr. Hewitt, I will ask you a quick question. I know you were the inaugural chair of the Canada Research Coordinating Committee. Do you see differences in terms of particularly from when you started until now, given COVID? What else can we do to support our researchers?

Dr. Ted Hewitt: It was an honour and a privilege to take on that role. Based upon where we started, the measures we have taken and put into place over these past few years have been remarkable.

We do have a report we published just this year that we can certainly pass along to the committee and it lists some of those accomplishments.

In terms of the work we did in equity, diversity and inclusion, for example, across the agencies, the changes that were made to the Canada research chairs that went through the CRCC who were involved all the way, programming we put in place—

The Chair: Dr. Hewitt.

Dr. Ted Hewitt: —to harmonize support for early career researchers. I could go on and on.

The Chair: Dr. Hewitt, thank you. Sorry to interrupt.

We will now go to—

Ms. Lena Metlege Diab: Madam Chair, can we ask that those reports be sent to the committee. Thank you.

● (1910)

The Chair: Thank you, Ms. Diab. Absolutely.

Now we will go to Monsieur Maxime Blanchette-Joncas, for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I want to begin by thanking the witnesses for joining us this evening to participate in the committee's study.

My first question flows from something my fellow member just talked about, the creation of the Canada Research Coordinating Committee in 2017.

I'll start with you, Dr. Strong.

In 2011, Quebec combined its three research funding agencies under the umbrella of the Fonds de recherche du Québec. That was more than 10 years ago.

Have you consulted your Quebec counterparts to learn about the benefits of bringing research funding agencies together under a single umbrella?

[*English*]

Dr. Michael Strong: Yes, indeed, we are very close with Rémi Quirion, a colleague who chairs the FRQ, the funding agency that's in place. We have had a number of conversations over the course of the last several years with regard to the successes he has seen by bringing those entities together under one roof. It has allowed a number of advantages that he sees in place with regard to the ability to bring more broadly based policies in, with regard to open science and so on.

In direct answer to your question, yes, we have had conversations with him and work very closely in a number of our program developments.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you.

I'd like the other witnesses to answer that question, if possible.

Mr. Adem, would you like to go next?

[*English*]

Dr. Alejandro Adem: Yes. Of course.

I think the model of Quebec is certainly a very interesting one. Coordination I think had some very positive aspects.

On the other hand, the range that our agencies have is quite enormous. I, myself, as a mathematician and physical scientist would not feel qualified to make judgements about humanities much less about medical sciences.

I know that in the day I have to make decisions where my knowledge of the field, the fact that I am an academic with a certain background, allows me to have that view. Also, I may say, Canada is a very broad country and there are different points of view across all the provinces in the country. We tend to always go towards a confederation model where we put together the diverse points of view and work together.

What I see emerging is the close collaboration that we have among the agencies creating that sort of role that Dr. Hewitt has in the sense that we are constantly in touch, we're working together, and we have a number of joint initiatives, but we also have that diversity when it comes to issues, for example, of technology in the case of what we talk about in the natural sciences, or these deep health issues that Dr. Strong talks about, or the social sciences and humanities. I think we need to have that expertise, and some differentiation I personally think is valuable.

[*Translation*]

Thank you for your question.

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Adem.

Mr. Hewitt, do you see any benefit in bringing federal research funding agencies together under a single umbrella?

Dr. Ted Hewitt: Thank you for your question, Mr. Blanchette-Joncas.

The Fonds de recherche du Québec's structure isn't all that different from the federal structure. The three agencies were combined into a single agency. In Quebec, the conditions are a bit different from those in the rest of Canada in terms of community, regional and language differences. The three disciplinary communities are different, so their needs and expectations have to be met through the three agencies. As Mr. Adem mentioned, the model works well.

In addition, the three agencies' programs work quite well and are administered by SSHRC. I'm referring to the Canada research chairs program, programming related to the indirect costs of research and the Canada first research excellence fund, for instance. Spending on those programs is a lot higher than it is for individual programming, in order to support the three disciplines here, in Canada, across all fields.

When all is said and done, our model isn't much different from Quebec's, but it does have other benefits to better support Canada's various communities.

● (1915)

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Hewitt.

My next question is for Dr. Strong and has to do with something else.

Dr. Strong, you brought up the equity, diversity and inclusion criteria. I realize that they apply at the individual level, meaning they are used for individuals.

However, do you have similar criteria or a similar mechanism for institutions?

I'm referring to inequities having to do with geography—so universities or research chairs in urban centres versus regions.

Can you talk more about that? Do you have criteria to ensure universities are treated equitably, whether they are located in regions or urban centres?

[*English*]

The Chair: Keep it a short answer, please.

Dr. Michael Strong: The core of the question is, in fact, a very good one. As we've begun to look more carefully at bringing forward EDI—equity, diversity and inclusiveness—anti-racism principles into all of our granting processes, we are very much aware that there are regional differences, urban versus non-urban, that are at play with all of that.

We are in the process right now of actually reaching out to those communities, through a very deep consultation process, for those with lived experiences to help guide us into what our policies should look like, to guide our grants even further along those lines.

That's actually happening as we speak, through national committees, people raising their voices, through webinars to give us that information.

The Chair: Dr. Strong, it's so interesting. I'm sorry to move on. Thank you for that answer.

Now we will go to Richard Cannings, for six minutes.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you all for being here.

As usual, I have enough questions to spend the entire night here, but we don't have that time.

I'm going to start by trying to pick up on a point that Ms. Diab mentioned a few minutes ago. We've heard a lot about how, at the core of all this, there are people, especially the “new talent”, they call it. These are students, basically, grad students who are entering the research field. We really want to help them grow in their knowledge and we want to keep them here in Canada.

However, what I've been hearing whenever I've talked to researchers and students is that one of the programs that has fallen behind over the last few years is the student scholarships program that the tri-councils administer.

Completely coincidentally, I just came from a meeting with the Canadian Alliance of Student Associations and they had this ask as well. They've looked at what that scholarship program provided at its peak and they said we really should get back to that. They pointed out that it would cost about an additional $120 million each year to get it back to where it was.

Perhaps I can start with Dr. Adem to comment on that. All the councils administer it, but could we start with NSERC and just say where we are with supporting these students? Support for these students is really the basis of all this.

Dr. Alejandro Adem: Indeed, the people are at the core of what we do, and it's very important to provide adequate support for the trainees. We're talking about undergraduates, graduates and postdocs. Keeping the stipends and the rates competitive is certainly something that is important for us to do. Canada has to invest in its young people. In keeping track of how things develop over time, the erosion through cost-of-living increases is something which indeed has been brought to our attention by groups of students, and some researchers too.

It's an issue that we face, but I think every country faces that, because there's a worldwide competition for talent. It's not enough to say that Canada is a great country to live in. We have to put resources on the table to attract the best students, from India, Pakistan and Africa. It's very important that we offer competitive stipends to adequately support our students.

Now, usually it's a combination of resources that are used. It could be funding from the agencies. There can be teaching assistantships and other sources. However, I think all of us recognize that this is a stress point for our system.

● (1920)

Mr. Richard Cannings: Thank you. As long as the tri-councils see this as a problem and something that has to be renewed, to get back to where it was at least....

I want to switch this up and turn to Dr. Strong again.

You touched on IP and innovation and keeping that within Canada. One big issue we've been hearing about for the last two years is vaccines. We used to have the government lab that produced vaccines in Canada. I think we would have been well served if we'd had that at the start of this pandemic. However, keeping that IP in Canada and keeping it preferably within government....

I have a friend, Dr. Tony Holler. He had a company called ID Biomedical. They developed a flu vaccine, and it was sold to a multinational, GlaxoSmithKline. I don't know the details of what that company is doing. I know they used to have labs in Quebec.

That seems to be the path of Canadian companies and Canadian IP, and I'm wondering if you could provide a bit more detail on what we can do to keep that valuable and essential IP and production within Canada.

Dr. Michael Strong: The answer to that really stems from what we've learned in the course of the pandemic about the need to ensure we have the infrastructure in Canada to be able to fully synthesize and be self-sufficient with respect to vaccine production, and, in reality, a number of other agents that would be required for other therapeutic interventions over time.

The investments that are in the process of being made at this time—and, again, I refer back to the biomanufacturing initiative but also specifically to the CIHR and the tri-agency's role in this—have been very much to begin to design the programs that will start at the very early part of this to ensure that, for the actual ideas that are synthesized here in Canada, the research is done within Canada, the IT is protected and the partnerships with industry are in place. However, when it comes to the point of scaling up and being able to do the actual synthesis, this is an area where our colleagues at ISED have been doing massive investments in order to ensure we have the capacity for fill and finish.

The lesson learned from the pandemic has been that Canada needs to have a steady state of capacity that will allow us to ensure we can produce vaccines or other therapeutics without having to rely on other countries to do so. It is the pipeline that needs to be constructed, and the resources have been provided to us to start the foundations of that.

Mr. Richard Cannings: Thank you.

The Chair: Thank you so much, Mr. Cannings and Dr. Strong.

This is excellent testimony. The questions are really good from our members, and we have experts here.

Might I suggest that we do an extra five minutes to make up for the five minutes we lost and, to be fair, do two and a half minutes for each party.

Some hon. members: Agreed.

The Chair: With that, I will go to Mr. Soroka for two and a half minutes.

Mr. Gerald Soroka (Yellowhead, CPC): Thank you, Madam Chair.

Mr. Strong, I guess Mr. Cannings and I are sitting too close to each other, because we have the same kind of question.

I wanted to talk about the research being done on COVID to create a vaccine, and yet it seemed like this government decided not to fund universities any further and went for the big pharmaceutical companies.

My question is this: Is it purely because we didn't have the manufacturing capabilities, or do you feel that they didn't value our research, or is it because we wouldn't be recognized across the world by making our own vaccine at home?

Dr. Michael Strong: It actually is a broader combination of issues than what you've delineated.

In the early days of the pandemic it was important to really quickly be able to scale up and get vaccines into the arms of Canadians, and that capacity did not reside within Canada to do that, hence the partnering with pharmaceuticals to be able to bring that to the table for Canadians rapidly.

We made a massive investment—at CIHR alone, over $300 million. If you look across all of our agencies, you see there was close to almost $800 million of funding into research for very basic...right from therapies, best interventions, to new nucleotide therapies, and so on. We made the investments really rapidly into the basic research to try to pay the dividends, but we needed to bridge that, and that's where the pharmaceuticals came in.

It was a strong vote of confidence in our academic centres and the ability for them to turn on a dime to produce that.

● (1925)

Mr. Gerald Soroka: As a follow-up question, it seems like everyone wants to say they've had a Pfizer or a Moderna, or whatever company you want to put in there. Do you think there's still going to be the same recognition worldwide if it's made in Canada, or not?

Dr. Michael Strong: This is a worldwide effort to deal with COVID, SARS-CoV-2, and the next coronavirus that will come along, and so all countries are working very hard to develop vaccines to understand new ways of therapies to block the receptors.

I would say that irrespective of what country, and that includes Canada, it will be celebrated worldwide as we develop these. I think we're in a very strong position with very good research in Canada to be amongst that group, and I see it every day through the results coming across our desks.

The Chair: Thank you.

Now we will go to Mr. McKinnon for two and a half minutes.

Mr. Ron McKinnon (Coquitlam—Port Coquitlam, Lib.): Thank you, Chair.

I want to switch away from talking about downstream innovation and commercialization, and turn to the headwaters of research, which I believe are fundamental research and pure research.

I think one of the characteristics of pure research is that we don't necessarily know what's going to pan out, whether an idea is a good one or not until way down the road.

How do we make sure that we adequately support fundamental research, and how do we decide what off-the-cuff, off-the-wall research is worth supporting?

I would direct that to start with Dr. Adem, please.

Dr. Alejandro Adem: Indeed, blue skies research is essential to the health of science and innovation. Everything comes from an idea, and the ideas are the ones that are then mobilized to produce well-being for society.

I myself am a mathematician. Everything we do is about ideas, and very abstract ideas, so the whole point I think about fundamental research is that we do not choose the winners. It is the scientific method that is developed and the participation of peer review, the scientific community evaluating proposals in an open, intellectual discussion, that then results in appropriate funding for these projects.

I'm very proud of the discovery grants program that we have at NSERC, where we fund thousands of researchers working on blue skies research. We're really investing in people and their ideas. Afterwards these ideas might be mobilized into an application, into interdisciplinary activities, but it really is, I think, at the core.

I moved to Canada because of the strength of its funding system and the discovery grants program, because in an area such as mine it really is unique in the world.

That point is well taken, and in our consultations with the community invariably we hear that that is the bedrock of science and research in Canada.

Mr. Ron McKinnon: I guess I'm still kind of concerned about what sort of—

The Chair: Mr. McKinnon, that's two and a half minutes.

Thank you, and thank you to Dr. Adem.

We'll now go to Monsieur Maxime Blanchette-Joncas, for two and a half minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

My question is for Mr. Hewitt.

I'd like to get a better sense of why the funding for the three granting agencies is broken down on a 40-40-20 basis. SSHRC has been receiving 15% less for the past 30 years.

Can you explain what the basis for the 40-40-20 breakdown is? Why does SSHRC receive 15% less when it comes to total available research funding?

● (1930)

Dr. Ted Hewitt: That's a very good question. I spoke to the previous minister about that very issue.

Currently, I think the split is 22-38, so we're doing a bit better.

We are also active in tri-agency programming to increase the share of funding available to researchers in the social sciences and humanities field. That, too, is very important.

I completely agree that what we contribute is worth more than what we receive under the current breakdown for the three areas. I will continue engaging the government on the issue in an effort to increase our share, as well as the amount of funding available for all three research areas.

Thank you for asking.

Mr. Maxime Blanchette-Joncas: It's my pleasure, Mr. Hewitt. We agree that total available funding needs to increase as well.

You said your agency's share of the funding had gone up. Do you have more recent data on the proportion of research funding allocated by agency?

Dr. Ted Hewitt: Yes, absolutely.

Mr. Maxime Blanchette-Joncas: How recent are the data, Mr. Hewitt?

Dr. Ted Hewitt: Those data are available, and we can share them with the committee.

Mr. Maxime Blanchette-Joncas: I would like a written answer, please, Madam Chair.

Thank you, Mr. Hewitt.

[*English*]

The Chair: Duly noted, Monsieur Blanchette-Joncas, and thank you for the questions.

You can really see the interest in the committee in this subject area, and we're so grateful to our witnesses.

We'll go to Mr. Cannings, for two and a half minutes.

Mr. Richard Cannings: Thank you again, and I'll try to be quick.

We heard a lot about the co-operation and collaboration between the granting councils. How does that work? If I were a researcher trying to decide which of the councils to apply to...I think of my friend, Dr. Pieter Cullis, who developed the lipid nanoparticles that are an essential part of the mRNA vaccines, working at UBC. That's very basic research, but has some medical applications. I don't know whether Dr. Cullis applied to CIHR or NSERC, but are there some issues there, and how do you deal with them in the tri-councils?

I suppose anybody can answer. Dr. Hewitt has his hand up.

Dr. Ted Hewitt: It's an excellent question. For most researchers, they already know the answer. They know where they work. They know where their colleagues are, and they know with which agency they need to work.

We have developed a couple of mechanisms to assist those folks whose work tends to fall across the agencies. One is through the new frontiers in research fund, which has a strong interdisciplinary bent, and allows for projects to span across the research agencies. There are also other interdisciplinary and multidisciplinary funds that people can apply to, and there are programs within those funds.

One important thing I have to mention, though, is an initiative that was developed by the three agencies just recently to allow for researchers to apply to their normal agency where they would normally apply with highly interdisciplinary and multidisciplinary projects. These are now managed through a system called TAPER, which is the tri-agency initiative for merit review or peer review, where the projects can be assessed with reviewers from across the three agencies, and we've already received dozens of applications.

We're working hard to make this easier for folks to work across boundaries and across the three councils in a number of ways.

Mr. Richard Cannings: Thank you very much.

The Chair: Thank you, Mr. Cannings.

I'd like to thank all our witnesses. This was tremendous testimony. We thank you for your time and your expertise.

I'd also like to thank our members for their work tonight.

We will suspend to move to our second panel. We thank you all.

● (1935)

_____(Pause)_____

● (1935)

The Chair: Good evening, everyone. We'd like to welcome you to this fifth meeting of the inaugural Standing Committee on Science and Research. We are looking forward to your testimony. We are grateful for your time, your effort and your expertise.

Tonight, we're pleased to have with us Dr. David Naylor, professor at the University of Toronto, who is appearing as an individual; from Brock University, Dr. Tim Kenyon, vice-president, research; and, from McMaster University, Dr. Karen Mossman, vice-president, research, and Dr. Gerry Wright, director of the Michael G. DeGroote Institute for Infectious Disease Research.

With that, we will go to Dr. Naylor.

You will have five minutes, Dr. Naylor.

Mr. Chad Collins (Hamilton East—Stoney Creek, Lib.): Madam Chair, just procedurally, I know that we have a vote later. I just wanted to find out whether we have unanimous consent to go through to 8:20 and then adjourn at that point in time.

The Chair: Thank you, Mr. Collins. I will ask the committee.

Do we have unanimous consent to go through to 8:20?

The Clerk of the Committee (Mr. Leif-Erik Aune): Yes, Madam Chair. You have unanimous consent in Zoom and on the floor.

The Chair: That's terrific.

Thank you so much, Mr. Collins and committee.

We'll go over to Dr. Naylor for five minutes.

Dr. David Naylor (Professor, University of Toronto, As an Individual): Thank you very much, Madam Chair.

I want to start by acknowledging your steadfast support for science and research over the last number of years. The leadership role you have played is greatly appreciated by the research community, I know.

I also want to thank all the members present for their public service.

Thank you for giving up yet another evening to the cause of your work. I feel privileged to be here with you. I hope to contribute usefully.

One of the points I'd like to make off the top, highlighted as well by my colleagues who are presidents of the granting agencies, is that science and research, where we focus on discoveries and downstream patents and the use of the ideas in civil society, is ultimately about people. It's about the next generation of talent and equipping subsequent generations of Canadians to lead and to make a difference in our country and in the world. What they get from advanced training in research, the discipline of science and scholarship, is a way of dealing with the world and understanding and shaping the world. It makes a massive difference to how this country unfolds in the decades ahead. It's an investment in the future.

It's also an investment in excellence and equity. It's not a cost centre. It bears enormous fruit, not just in terms of, if we think about it, commercialization or application, but because those individuals who are shaped by their participation in the research enterprise, whether they stay in the academy or move elsewhere into a whole variety of roles, make a huge difference to this country. The blend of competition and collaboration that characterizes cutting-edge research is I think so important, and in some ways very Canadian—that confluence of goals, of working together in common cause, but also seeking to excel, which I think is very important.

There is a great deal more I could say about where we are in terms of our funding situation. The competition is simply intense in ways that it's never been. I simply want to wrap up by sharing some benchmarks.

We have the huge COMPETES act happening in the great United States of America to our south. Germany is another peer nation. It's had 3% annual increases in research funding for a decade, and has now started a second decade of similar increases. That's 20 years at 3%, compounding at 60%, a roughly 80% increase over that period. Obviously, the U.K. has also been investing and has provided excellent coordination to an oversight mechanism that looks more like Quebec's current granting council mechanism.

So everyone is in this game. Canada has done extremely well. We've had great leadership in so many ways, but the bar has been raised. I think we have to meet it, and ideally surpass it, in the years ahead.

That's all, Madam Chair. Thank you for your time.

● (1940)

The Chair: Thank you so much, Dr. Naylor, for your testimony and for being here.

We will now go to Dr. Tim Kenyon, vice-president of research at Brock University.

You have five minutes, please.

Dr. Tim Kenyon (Vice-President, Research, Brock University): Thank you, Madam Chair.

Thanks for the opportunity to share some thoughts on science and research in Canada, from my perspective and my role, and on some successes, challenges and opportunities, all at a very high thematic level.

[*Technical difficulty—Editor*] Of course, there are many things that could be mentioned here, but research in Canada under its granting councils—

The Chair: I'm sorry, Dr. Kenyon—

Dr. Tim Kenyon: —and we've heard from three of them, I think, just tonight, from SSHRC, NSERC and CIHR....

Yes?

The Chair: Dr. Kenyon, I'm going to stop you for a second and ask that you begin again. You were frozen and we missed what you had to say.

Please start again.

Dr. Tim Kenyon: Thank you. That wasn't a technical glitch. I just personally freeze sometimes. I'll try to keep that from happening.

Thank you for allowing me to be here. I'm going to speak about some successes, challenges and opportunities for Canada in science and research, but all at a very high, thematic level.

There are many things that could be mentioned here, but I'll begin by noting something that we do quite well in Canada. Research in Canada is well served by the four main federal granting councils. They are SSHRC, NSERC, and CIHR, which I believe you've heard from tonight, as well as the Canada Foundation for Innovation, which supports research and innovation infrastructure across all disciplines.

In my experience, these agencies are well managed. They're based on sound principles for supporting excellent in inquiry, with clear mandates and a close engagement with the research community. While historically, no element of the research and science ecosystem in Canada has done enough to address the exclusion of researchers who are indigenous, Black or otherwise of under-represented groups, these federal granting agencies are now helping to coordinate and facilitate a more deliberate and outcomes-based approach to diversity and research. Their roles and resources can be expanded with confidence. This is not because the agencies are perfect—I'm going to talk about something they could probably do a bit better—but because for agencies of their size, they are responsive to changing research needs and imperatives.

Of the many opportunities that exist for science and research in Canada, I would mention both big science and small science.

By “big science”, I simply note a key recommendation of the 2017 Fundamental Science Review. It's as compelling today as when it was written. Some infrastructure of critical importance to Canadian research is achievable only through committed federal support over its entire life cycle. Canada boasts a few such major research facilities that are represented directly in the federal budget, but we have not capitalized—at least not yet—on the opportunity to create a strategic system and long-term planning process for determining how major research initiatives are selected for that status. The Fundamental Science Review in recommendation 4.7 proposed a way of doing so. Whether it's that way or some other way, the opportunity for Canada is to have a carefully considered implementation of national science and research facilities that enable extraordinary discovery and might address some of the generational challenges that face humanity.

What about small science? At least half of the publicly funded university researchers in Canada work at universities that are considered medium-sized or smaller. Those outside of the very few largest cities in Canada tend to be medium-sized or smaller. These institutions are the sites of research excellence by any measure. They make good on a mandate that includes contributing to science and inquiry of universal value and interest. They also play an irreplaceable role in enhancing the economic, social and cultural vitality of the regions in which they exist. Their partnerships are more likely to be local, critical to the aspirations of regional industry and business, and informed by an expert understanding of their community partners. They are also very efficient at generating one of the most important and reliable forms of research impact, namely the impact of teaching when conducted by experts actively engaged in research. As one study's authors put it, “the 'many small' approach increases the teaching research interface, and it increases total productivity.”

Another opportunity for research in Canada is to find ways to leverage the capacity of small- to medium-sized research universities, at least in part by ensuring that their virtues are counted as virtues, and that they are appropriately resourced for that work.

Thanks again. My job is literally better than a dream job, because I get to facilitate the work of researchers doing things that I could not have dreamed of as a child. I see Canada delivering on its ambitions to support great research and scholarship. I think we can dream bigger still, and we may need to.

● (1945)

The Chair: Thank you so much, Dr. Kenyon.

We will now go to McMaster University.

I don't know if it's Dr. Mossman or Dr. Wright, or if you are splitting the time, but you will have five minutes. It's over to you, please.

Dr. Karen Mossman (Vice-President, Research, McMaster University): Thank you, Madam Chair, and good evening and thank you, all, so much for the invitation.

My colleague, Dr. Gerry Wright, a renowned infectious disease expert and lead of Canada's Global Nexus for Pandemics and Biological Threats, and I are so very pleased to be here and to talk about one of our passions, science and research in Canada.

The pandemic has given us pause, a forced opportunity, if you will, to reassess the science and research ecosystem in Canada. I'm saying this not only as the head of McMaster's research enterprise but as a researcher whose lab has never been busier since March 2020.

Canada is home to some of the brightest researchers in the world and we have the capacity to achieve scientific breakthroughs to positively impact the world. From medicine to nuclear research, from combatting climate change to pioneering the next generation of mobility, Canada has incredible and untapped potential. We need to ensure we seize and maximize this potential for the benefit of Canadians and citizens around the world.

You've heard from previous witnesses about the challenges—and there are many—but we'd like to focus on the solutions and opportunities. In particular, we would like to offer a new model of research and development as a solution to overcome some of the barriers that we face. As one of Canada's most research-intensive universities, McMaster has long been at the forefront of innovation. Problem-based learning was developed at McMaster's medical school before being exported around the world. We are home to Canada's only major nuclear research reactor, opened more than six decades ago by Prime Minister Diefenbaker in 1959. We were ahead of our time then and we continue to be forward thinking.

Now we are leading the way with Canada's Global Nexus for Pandemics and Biological Threats, an ecosystem of its own of pandemic preparedness. We see the nexus model as a path forward for research in Canada that can unlock our potential across the country. Canada's global nexus will be transformative for the advancement of Canada's science and research ecosystem. The research being undertaken goes beyond the science of vaccines and pandemics. It brings together the best minds from across the country, from public health, government departments and relevant industries, and connects them with our research expertise. This ensures business, academia and government are aligned and connected, understand each other's needs, support one another's work, and collectively mobilize the knowledge needed to benefit Canadians.

Our model removes the barriers and boundaries, co-locating experts from all sectors to capitalize on the benefits of collaboration and coordination.

Canada's global nexus is already yielding results for Canadians but there is so much more we can do. Previously, this committee had asked witnesses why Canada was the only G7 country unable to rapidly produce a vaccine. The simple answer is that Canada was not prepared at the beginning of the pandemic. Over the last two years, through partnerships, government support and our vast reservoir of talent, Canadian-based organizations, including Canada's global nexus, have pivoted their research to begin clinical trials for COVID vaccines. Not only has Canada been able to catch up to our allies, but we are poised to surpass them. Indeed, our own inhaled vaccine, effective against COVID and other variants of concern, is currently in clinical trials.

While we may indeed have lost the short game, we're by no means out. It's just the opposite, in fact. We know that with the right combination of funding and our ability to leverage Canada's existing expertise, we can win the long game. Through research, we can keep Canada competitive. As a country, we need to embrace the kinds of research that are the hallmark of McMaster: interdisciplinary, connected and collaborative. We need to be creative to ensure we attract and retain the brightest thinkers. We have already been able to repatriate three top researchers back to Canada from the United States, improve IP development and keep Canadians safe with made-in-Canada solutions. This will require not only federal investment, but new solutions and approaches, such as the nexus model.

Future federal investments need to be made with a view to leveraging expertise and partnerships. With that in mind, we are asking the federal government to partner with us to accelerate this new and unique platform. Advancing Canada's global nexus now will not only advance the rapid development of vaccines and other therapeutics, but will allow us to train the much-needed highly qualified personnel and create numerous jobs and business opportunities for Canadians.

● (1950)

Importantly, it will provide the evidence upon which our government leaders and agencies can develop policies and informed decisions. This is a model that Canadians should champion.

The Chair: Dr. Mossman, I'm sorry to interrupt. There's a group of very eager members of Parliament who I know will want to ask further questions.

Thank you.

Dr. Karen Mossman: Thank you for your time.

The Chair: With that, we will now go to our round of questioning. This is a six-minute round and we will begin with Tony Baldinelli.

Mr. Tony Baldinelli (Niagara Falls, CPC): Thank you, Madam Chair. It is good to have you back in the chair.

To all the witnesses, thank you for being here this evening.

Over the previous meetings, we've heard a number of witnesses talking about the importance of the ecosystem foundation as being critical to science, research and innovation. In fact, we've heard from them of the need for discussions on the greater need for harmonization, collaboration and coordination.

Mr. Naylor, in the fall of 2017, the Canada Research Coordinating Committee was established with a mandate of greater harmonization, integration and coordination of research-related programs and policies to address issues of common concern. At the same time, in the spring of 2017, there was also the Naylor report, and one of its recommendations was the creation of a national advisory council on research and innovation.

I just want to get your opinion. Do you believe the creation of that CRCC is essentially what you or the Naylor report had been recommending?

● (1955)

Dr. David Naylor: We did recommend the creation of such a coordinating committee, and I think we're very grateful that the minister, now in the chair, moved quickly to get that established.

The question that really needs some sounding across the country in the research community is whether the current structure is coordinating as well as might be hoped. I fully acknowledge that my colleagues have made progress. Things such as TAIPR, the streamlined peer review for transdisciplinary research, are impressive.

I would note, however, referring to the new frontiers fund, it was actually part of the budget that the minister and others brought down that anticipated that fund. It's very important to understand that some of this is simply executing on that which was put in place at the transdisciplinary level. That's that side of it.

I would think the coordination function needs a close look, but part of the reason we recommended a second body, an oversight body, was for just that reason, to provide that court of sober second opinion on how things were evolving but also, from the standpoint of an ecosystem, to make sure that innovation was linked to the science and research.

Mr. Tony Baldinelli: Thank you.

Dr. David Naylor: This was to be a committee focused on research and innovation, not on research alone. We see a need for both.

Thank you very much.

Mr. Tony Baldinelli: Thank you.

I have one quick question to you. I also keyed in on your recommendation 4.11 about the government undertaking a comprehensive review to modernize, and where possible, harmonize the legislation of the four agencies.

Are we aware, maybe even our chair as well, whether that was ever done?

Dr. David Naylor: I don't think it was ever done, and I think you'll find that it might be something to be thought about if there were to be a review of how the coordination has gone.

Obviously the colleagues are collaborating very well. You don't want structure to supersede just good collaboration and common sense. However, I still believe that review is appropriate.

Mr. Tony Baldinelli: Thank you for that. I just find that it has been five years and we continue to hear this notion of the ecosystem and needs for collaboration and harmonization, so I wonder if we're failing in some area. We've heard from certain witnesses that the systems can be cumbersome and bureaucratic. In fact, one witness talked about the whole notion of a “one-stop shop” idea.

I'll go to Dr. Mossman now, because unfortunately she didn't have a chance to finish on that whole notion about the ecosystems. You talked about new solutions and approaches, and you talked about the nexus model. Could you quickly expand on that a bit?

After that, I'd like to get to Mr. Kenyon, of Brock University, as well for one question.

Dr. Karen Mossman: The question is on the Nexus ecosystem.

The idea is to pull together, not just multidisciplinary across multiple universities, but across sectors within public health to have that coordination, so we understand what....

Something like a pandemic is a very complex problem and it requires complex solutions. It requires coordination not just amongst academics, but with our industry partners, government partners, and policy-makers, so we can quickly understand what all the issues are and rapidly mobilize all of the expertise that we have in all these sectors across the country.

Mr. Tony Baldinelli: Thank you.

I'd like to go to Mr. Kenyon now.

I latched on to your comments about medium and smaller research taking place at some of these universities such as Brock. I really enjoyed your line about enhancing the cultural and economic vitality of our communities and the impact it has.

I'll use Niagara as an example. I am wondering if you could expand on the establishment of the Cool Climate Oenology and Viticulture Institute and what it has meant to our grape and wine sector.

● (2000)

The Chair: Give a short answer, please.

Dr. Tim Kenyon: Through you, Madam Chair, the Cool Climate Oenology and Viticulture Institute is a great example of what we're talking about. A program like Vine Alert, which uses sophisticated meteorological and real-time monitoring of grapevine bud conditions, enables grapevine farmers to know when to turn on their wind machines in the winter. Right now is a great example to reduce losses of grapevine to cold weather. This enables them to save, on a conservative estimate, a million dollars a year collectively in propane costs alone by not having to turn the machines on needlessly.

To put something like that in place you have to be brilliant, you have to be creative, but you also have to be here.

If you're not here, you don't do it.

The Chair: Dr. Kenyon, that was a short answer.

Mr. Baldinelli, thank you for your questions and thank you to the witnesses who answered.

We will now go to Mr. Chad Collins for six minutes.

Mr. Chad Collins: Thank you, Madam Chair.

I would like to direct my questions to Dr. Mossman and Dr. Wright from a parochial perspective.

Through the pandemic, I think we've all learned about the importance of making strategic investments in science and research. It's these past investments that have been made in the field that have helped us get through the pandemic and get us to where we are today.

I listened with interest about the nexus project. I thought I heard the reference to an inhalable vaccine for COVID.

Through you, Madam Chair, could either Dr. Mossman or Dr. Wright further elaborate on the nexus model and the reference to the inhalable vaccine?

Dr. Karen Mossman: Sure. I can certainly take that.

The inhaled vaccine really builds on the expertise that we have at McMaster in adenovirus-based technology. The adenovirus-based technology is actually McMaster's solution from many years ago. We also have deep expertise in mucosal immunity. This stems from past research in tuberculosis.

Putting all that expertise together, we came up with a new inhaled type of vaccine that gets directly into the lungs and the mucosal surfaces where we know it is more efficacious. It also is different in that it has three different proteins—not just against spike, but also against two other conserved proteins. This will allow it to provide immunity against variants of concern or even new coronaviruses. Because of the nature of it being an inhaled vaccine, it only requires about 1/100th of the dose. From a manufacturing perspective, this gives a great advantage.

This is all from past investment in our GNP facility and from the research within our group that we were able to develop this really new type of technology.

Mr. Chad Collins: Thanks, Dr. Mossman.

You emphasized, Dr. Mossman, about how the nexus project differs from the existing research ecosystem in Canada. You reference—I specifically wrote it down—that the right amount of funding will get us to the next stage with nexus.

Can you elaborate and further explain how nexus differs from the existing research ecosystem? What amount of funding were you referencing in your opening statement in that regard?

Dr. Karen Mossman: Our entire nexus project is around $400 million, but I'm actually going to let Gerry, who is the lead of nexus, talk about the unique ecosystem.

Dr. Gerry Wright (Director, Michael G. DeGroote Institute for Infectious Disease Research, and Lead, Canada's Global Nexus for Pandemics and Biological Threats, McMaster University): Thank you very much.

Thank you for the question. I'm really happy to tell you a bit more about it.

First, the nexus initiative is really built on our experience in the Institute for Infectious Disease Research over the last almost 20 years, where the emphasis really has been on interdisciplinary teamwork and bringing people together across disciplines that don't normally work together and providing rewards for doing so.

Some of those are obviously financial rewards that are enabled, frankly, by very generous philanthropic gifts that have pioneered our ability to do this cross-disciplinary work. As you've heard, it is very challenging in the Canadian system to foster that, frankly, and it is in fact very challenging to foster that in the university system, because the rewards are primarily individual.

The nexus initiative is really built to be able to bridge all of those gaps through the development of teams and through the development of pre-existing collaborations and, as Dr. Mossman said, both within the university and with our partners in industry, government and not-for-profit agencies across the globe. That really provides us an opportunity to do truly agile interdisciplinary work that is directly focused on impacts.

● (2005)

Mr. Chad Collins: My final question, through you, Madam Chair, would be about this. In my time as a councillor in Hamilton, I had the honour and the privilege of working with McMaster University and other partners to bring the David Braley Health Sciences Centre to downtown Hamilton. I believe there were 400 positions that came with that new building and with the investment that the city and the province supported. I believe we had a philanthropic donation from Mr. Braley on that one as well.

That brought many funding sources together. I think one of the goals and objectives was to retain some of the talent that is making its way through McMaster and some of our other institutions, not just in Ontario but across the country.

Dr. Wright, can you expand upon how nexus will help us retain Canada's top talent, not just with your project here, but maybe in the city and beyond its borders?

Dr. Gerry Wright: Yes, I'd be delighted to.

We're very excited about the initiative, and we're purposely locating it at McMaster Innovation Park, where it is surrounded by opportunities to develop start-up companies and what have you.

Part of our goal is to provide a seamless opportunity to translate research from the laboratory into application by co-locating it in such an area. That will be a pretty significant issue. As Dr. Mossman indicated, the idea is picking up steam, and we actually have been able not only to retain but to repatriate three outstanding Canadian researchers from the United States, who are coming back to Canada, back to McMaster, to set up their laboratories to contribute to our Canadian research—

The Chair: Dr. Wright, I hate to interrupt.

Mr. Chad Collins: Thank you, Dr. Wright.

The Chair: It's so interesting.

Thank you, Mr. Collins.

We will now go to Monsieur Blanchette-Joncas for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Madam Chair.

I want to start by welcoming our second panel of witnesses this evening.

My first questions are for Dr. Naylor.

Dr. Naylor, thank you for being here.

In less than two months, it will have been five years since you chaired the Advisory Panel for the Review of Federal Support for Fundamental Science. The panel's report, commonly referred to as the Naylor report, laid the groundwork for a strategy aimed at increasing research investment, achieving better coordination across the four granting agencies, and creating a national advisory council on research and innovation.

The report contained numerous recommendations. Do you think the measures the government has taken since the report came out are enough? Will Canada be able to make up for decades of lost ground in the research and innovation sector?

[*English*]

Dr. David Naylor: I've had the privilege through the years of doing a few reports for government. I learned a long time ago that your batting average is never 100%. There will be some recommendations that stick and others that don't. I would say that, by the measure of past experience, I thought that many of the recommendations were acted on. The funding that flowed was hugely appreciated by the community. It did not rise to the level we had hoped, but it was certainly generous, and I think it made a real difference.

I do wish that an oversight body like a council of science and innovation or a national advisory committee on research and innovation had been created. I think that is a missing piece, a vehicle or system to knit things together. I also think that, now that we're past that five-year mark, it really is time for us to reconsider what investments we need to make, remembering that the budget that followed that report had a limited lifespan for further investments.

We had a very generous budget in 2021, but it was also very focused on specific areas. Now we need to get back to basics and think about how to support the broad range of disciplines and institutions of all types and sizes to lift all boats as best we can.

● (2010)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Dr. Naylor.

Do you have any recommendations that weren't in the report but that you feel are urgently needed?

[*English*]

Dr. David Naylor: There are elements such as the review of governance and harmonization that I think are not as urgent but would be nice to have. That's one thing that's worthy of consideration.

I take the point raised earlier about the need for a big science oversight mechanism. We really need to have outstanding facilities at scale to compete internationally. We need to know how to pick them and how to invest in them, but we also need to know how to decommission them and wind them down, if they have to be wound down. I thought that was a very good point made by my colleague, and I think that's another one that needs fairly urgent attention, given how important big science is to the success of this country on the international stage.

By and large, as I said, there was a wide-ranging response that we appreciated on the panel and a few things that I think merit urgent attention. The biggest issue is that we need to reinvest now to keep up with our peer nations, to lift all those boats to help the next generation of bright, young Canadians across all backgrounds. It really is about equity and excellence together so we can succeed in the years ahead.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Dr. Naylor.

One of the report's main recommendations sought a major reinvestment of federal research dollars. The panel recommended that the reinvestment be undertaken over four years, equivalent to an additional 0.4% of the government's annual budget. Spending would have gone from $3.5 billion to $4.8 billion.

This is 2022, nearly five years later. How would you assess the federal government's investment in research and innovation?

[*English*]

Dr. David Naylor: I think that we made up a lot of lost ground. I want to emphasize that. It was very important, but I think we didn't catch up as far as we needed to. The most recent budget was completely understandable; it was a pandemic budget. It was highly focused, and it made a lot of important investments.

I think that it would be inappropriate to be critical of a very strategic set of decisions. Generous investments were made, mostly on a one-time-only basis. We do, however, need a multi-year plan to reinvest now, to build on a steady basis and to provide a stable platform for the next generation of scientists and scholars. I think that's what's necessary now.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Dr. Naylor.

You referred to a plan or vision. Besides the recommendations in the panel's report, what would you recommend to the federal government in the short term? Specifically, I'm talking about a vision for the future when it comes to science, innovation and research, so that Canada can compete on the world stage and, of course, make up for the ground it lost in recent decades.

[*English*]

The Chair: Dr. Naylor, give a short answer, if you can.

Dr. David Naylor: First, there are many areas of exciting opportunity. We're back to that challenge of picking winners. I think the whole point of having a broad-ranging investment in fundamental science and scholarship is to let the winners emerge, not only through the process of peer review but in the broader marketplace of ideas, inventions and discoveries that determines the flow of science.

I am very optimistic that, if we make broad-ranging support and the granting council is a priority, those areas will find themselves. We've picked a few areas already. They're obvious: artificial intelligence, quantum and so on. We made a big bet on building pandemic and infectious disease capacity. I think this will unfold well in the years ahead if we make a sustained, broad investment.

The Chair: Thank you, Dr. Naylor.

Thank you, Monsieur Blanchette-Joncas.

You can see the interest in the committee in this subject area.

We will go now to Mr. Cannings for six minutes, please.

● (2015)

Mr. Richard Cannings: Thank you.

Thank you, all, for being here before us.

I'm going to continue with Dr. Naylor.

It has been brought up a couple of times, so I don't want to hammer on too much about this business of your recommendations of a national advisory council on research and innovation. The Council on Science and Innovation, CSI, was announced a couple of years ago. That seemed to have that same role. There was a secretariat created, but it doesn't seem to exist.

I wonder if you have any insights on where that initiative is, or if it is off the table now completely.

Dr. David Naylor: No. I have no special insights.

Mr. Richard Cannings: Okay, thanks. We'll move on, then.

I wanted to maybe give you some more time. There was a big question that Monsieur Blanchette-Joncas asked about where we stand compared with different countries in the rest of the world. You mentioned Germany's big, annual increases over the past decade or more.

Where are those countries putting that money? Is it pure research money, like NSERC, CIHR or SSHRC, or do those funds include private investment?

What should the government should be doing? Maybe we are doing the right thing, but not at the level you think we should. I'm looking for some international insights.

Dr. David Naylor: Thanks very much.

There has been an interesting mix in how countries have approached their reinvestment over the last number of years. The 3% refers, really, to the core and Germany, but remember that they structure their research on institute lines, as well as having granting councils analogous to ours, so it's a blend.

In like fashion, if we were to look at Canada, I think we always need a blend. We need to support open-ended, discovery-oriented, blue sky research—however you want to describe it. The free flow of imagination in all disciplines is so essential to create a better future for the world and for Canada, and also to allow young minds to flourish. However, some targeted areas are important and you'll understand that Canada has to make some bets in particular areas. We've done that effectively in a few places already. It has to be a blend.

The last thing I would say is that we have NRC reinventing itself. There's money that's been set aside for the new CARPA. I think that is the acronym for it. We have to figure out how to link entities like NRC and CARPA to the upstream ecosystem to create a positive flow and interchange between research and development and innovation. Again, oversight through some type of body would help, but we need a plan, we need a vision, we need stable, long-term support and we need to make sense of how that works together in the broad public interest.

Mr. Richard Cannings: Thank you.

Madam Chair, I'll cede the rest of my time. The bells are ringing here and I think our minds are turned elsewhere, but I want to thank the witnesses for their testimony here.

The Chair: Thank you, Mr. Cannings.

The bells are ringing, and I'm sorry for that.

All of us on the committee would really like to thank our witnesses. This was tremendous. We're very grateful for your testimony tonight.

To our outstanding colleagues, thank you for being so excited and part of this inaugural committee.

With that, I'm afraid we will have to finish for the evening.

The meeting is adjourned.