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• (1835)

[English]

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

[Translation]

Welcome to the ninth meeting of the Standing Committee on Science and Research.

[English]

The Board of Internal Economy requires that committees adhere to the following health protocols, which are in effect until June 23, 2022. All individuals wishing to enter the parliamentary precinct must be fully vaccinated against COVID-19. All those attending in person must wear a mask, except for members who are at their place during proceedings. Please contact the clerk of the committee for further information on preventative measures for health and safety.

As the chair, I will enforce these measures. As always, colleagues, I thank you for your co-operation.

[Translation]

Today's meeting is taking place in a hybrid format pursuant to the House Order of November 25, 2021.

[English]

I would like to outline a few rules to follow. Interpretation services are available for this meeting. You may speak in the official language of your choice. At the bottom of your screen, you may choose to hear floor audio, English or French. The “raise hand” feature is on the main toolbar should you wish to speak. When you are not speaking, your microphone should be muted. The committee clerk and I will maintain a speaking list for all members.

Colleagues, I am delighted that we have wonderful witnesses joining us tonight.

From BioCanRx, we have Dr. Stéphanie Michaud, president and chief executive officer, and Dr. John Bell, scientific director; from STEMCELL Technologies Inc., Dr. Allen Eaves, president and chief executive officer; and from Université du Québec à Rimouski, François Deschênes, rector, and Dr. Étienne Carbonneau, director, support for internationalization and government relations senior adviser.

We will now hear from our witnesses. Each group will have five minutes.

We will begin tonight with BioCanRx for five minutes, please.

Dr. Stéphanie Michaud (President and Chief Executive Officer, BioCanRx): Thank you very much.

[Translation]

Madam Chair, committee members, first, we would like to thank you for this invitation. We hope that our testimony will provide a unique perspective and data for your important study on successes, challenges and opportunities for science in Canada.

[English]

My name is Stéphanie Michaud. I am president and CEO of BioCanRx, a not-for-profit launched in 2015 that is uniquely focused on accelerating the development of cancer immunotherapies for the benefit of patients. I am extremely pleased to be joined here today by Dr. John Bell, our scientific director and architect of the BioCanRx network.

BioCanRx works by connecting the dots around a technology and building out the connective tissue between sectors invested in and aligned with our mission to do what's needed to advance a technology towards a clinical trial. The result is a highly productive Canadian translational ecosystem in the area of oncology.

To provide the committee with an example of our dedication to our mission and ensuing productivity, from 2005 to 2015 less than one per cent of oncology clinical trials in Canada were based upon discoveries made in our own labs. As of 2020, BioCanRx had doubled this number.

I would now like to turn it over to Dr. Bell.

Dr. John Bell (Scientific Director, BioCanRx): Thanks, Stéphanie.

My name is John Bell. I'm a senior scientist with the Ottawa Hospital Research Institute and a professor of medicine at the University of Ottawa. I currently serve as the scientific director of BioCanRx.

Cancer remains the emperor of all maladies. It's causing over 85,000 Canadian deaths this year, and that number is rising. It's also leaving tremendous economic and sociological carnage in its wake.

The good news on the horizon, however, has been the development of a whole new strategy for treating cancer that involves training a patient's immune system to be able to recognize, attack and eliminate their own cancer. Canadian scientists have made key contributions to the development of this new field of cancer immunotherapy; however, what has been particularly frustrating for me is to see these Canadian discoveries being turned into products outside our borders and, even worse, seeing Canadian cancer patients having delayed, limited or no access to breakthrough drugs that were built upon Canadian-funded science.

It was apparent to me both as an academic scientist and an entrepreneur that there has been a major strategic funding and coordination gap in Canada, making it very difficult, if not impossible, for laboratory and biomedical discoveries to be developed into therapeutic molecules within our own country. This inspired me to apply to the Networks of Centres of Excellence program to form BioCanRx and to create what has become, by all measures, a very successful and effective translational ecosystem. Since we build on the existing excellence in science and clinical care in Canada, we are able to cost-effectively expedite discoveries out of the lab and into trials.

Now let me give you just two examples of how we've been able to rapidly respond to cancer patient needs in Canada.

First, in response to the pandemic, our ecosystem rapidly mobilized its engine of expertise in immunology in clinical trials for cancer patients undergoing treatment, to help them stave off a COVID-19 infection. The trial sought to recruit 1,500 Canadians, and from the ideation to the launch of the trial, it all happened in six weeks. This is really lightspeed for this kind of activity in the biotech sector. It could only happen because we have a very highly coordinated network of motivated scientists, clinicians and industry partners, supported by a nimble government system.

A second example is CAR T-cell therapy. This is a type of immune therapy that harnesses the power of a patient's own immune cells to treat their own cancer. Between 2016 and 2018, there were 63 clinical studies where U.S. patients had access to this life-saving therapy. In that same time frame, only two CAR T-cell clinical studies sponsored by pharma were conducted in Canada. These were in major urban centres and thus provided very limited access to the vast majority of Canadian patients who might have benefited.

BioCanRx scientists and clinicians felt compelled to use our skills, our know-how and our collective infrastructure to reverse the situation, and I can tell you that we are now manufacturing our own made-in-Canada CAR T-cell therapeutics for the treatment of Canadian patients in a very cost-effective fashion. Through this program, we pioneered the delivery of personalized point-of-care manufactured products for patients with refractory leukemia and lymphoma, with the goal of making these kinds of treatments accessible to Canadians wherever they live in our country.

It's our hope that our network will be able to continue enabling science innovators from all sectors to capitalize on existing Canadian infrastructure and expertise while developing their technologies on Canadian soil.

With the sunset of the NCE program, however, we are concerned that we'll no longer be able to sustain our support for pre-

clinical to clinical development for those who need it most—the Canadian patient—and we strongly urge the government to consider this and to keep funding organizations with a demonstrated track record in addressing an unmet need in Canada, such as BioCanRx.

We really appreciate the chance to come and meet with you here today.

Thank you.

● (1840)

The Chair: Thanks to both of you for presenting.

I just want to welcome all our witnesses again. As a committee, we are very grateful.

I'd also like to welcome Mr. Lawrence and Mr. Waugh and thank them for joining us.

Thank you so much.

We're still waiting for Dr. Eaves, so I think we will go to the Université du Québec.

We welcome you. The floor is yours for five minutes.

[*Translation*]

Mr. François Deschênes (Rector, Université du Québec à Rimouski, Université du Québec): Thank you, Madam Chair.

I would like to thank the committee members for inviting us here today.

My name is François Deschênes and I am the rector at UQAR, the Université du Québec à Rimouski. With me is Étienne Carbonneau, from the head office of the Université du Québec.

UQAR is a university located in the region of Est-du-Québec, in Rimouski, but in reality it covers a very large region that takes in Chaudière-Appalaches, Bas-Saint-Laurent, Gaspésie, Îles-de-la-Madeleine and Côte-Nord. In other words, it is an area about the size of Iceland.

The university has about 6,700 students spread across this very large area, which is distinguished by its low population density and the number of rural communities. This means that about two thirds of the students at our institution are first-generation students whose parents did not attend university and do not hold university diplomas. We therefore hope that we are making an enormous contribution to the regions in terms of educating the next generation, but also of attracting and retaining people, so that organizations are able to expand, offer services of equivalent quality, and stay there. Our role is therefore an important one.

As was pointed out earlier, and as Étienne Carbonneau's presence here indicates, we are members of the big Université du Québec network, which consists of ten universities and has just over 97,000 students. This makes it a large network on the Canadian scene.

I want to note one important thing at the outset: I am here before you to talk to you about the research being done in the smaller and mid-sized universities that are often located outside the major centres, in what Quebec calls the regions.

Second, there is a myth I would like to dispel: there are not two categories of universities—research universities and others. Every university has professors whose jobs include doing training and research and offering services to the community. In order for these researchers to make progress, it is important that they have access to research funding.

For example, despite UQAR's relatively small size, it has ranked among the three best universities in its category in Canada for the last ten years in terms of research, intensity, productivity and funding dollars held, but also of quality. In terms of research funding growth, our university has ranked third in Canada, counting all categories, in the last 20 years, with 407% growth. That shows that there are not two categories of universities.

Obviously, we do research for training purposes, but also to develop leading edge knowledge. Our professors live in the community and are therefore well aware of the issues that are specific to the regions where they live, as well. Quite often, that research reflects the circumstances in the community, which means that we are developing knowledge that is transferrable within those regions, and that is important.

For example, we have studies on the organization of health care in remote and rural regions. We also do a lot of research on maritime issues, since we are located along the St. Lawrence River and its estuary. That is also reflected in our research, and as a result we were able to take a leadership role and create the Quebec Maritime Network.

What we have to recall is how difficult it is for small and mid-sized universities to access research funds. At our university, about one third or one quarter of our professors have no research funding. It is more difficult to access. Imagine that: post-docs in Canada do not have the resources to do research.

That illustrates the situation of the Université du Québec à Rimouski, but a number of other universities in Canada experience the same thing, and this deprives us of brains that might come up with new ideas. No one can predict where good ideas will come from. It is therefore important to have programs that are made to match our situations. The situation of a small university is that professors teach numerous, sometimes very different courses, rather than just one or two courses. They therefore have less time to devote to research. That must be adequately taken into consideration in developing programs, but also in evaluating projects, to support the diversity that exists.

In addition, the Canada-wide quotas established for the CFI, the Canada Foundation for Innovation, and for the Canada Research Chairs Program are often based on previous funding. There is

therefore a built-in bias that encourages the concentration of funding.

Studies show that the first dollars invested in research and the return on investments are significant. So let's give researchers everywhere the resources to do research.

That is the main message I want to send.

• (1845)

[English]

The Chair: Thank you so much, Rector. We appreciate your being here and your comments.

Now we will go to Dr. Allen Eaves, the president and chief executive officer of STEMCELL Technologies.

Welcome, Dr. Eaves. We will give you the floor for five minutes. When you see the yellow card, you have 30 seconds left.

Sir, the floor is yours.

Dr. Allen Eaves (President and Chief Executive Officer, STEMCELL Technologies Inc.): Thank you, dear members of the Standing Committee of Science and Research.

Thank you, Madam Chair.

I will begin by acknowledging that I am speaking to you from the traditional, ancestral and unceded territories of the Musqueam, Squamish, and Tsleil-Waututh nations.

As president and CEO of STEMCELL Technologies, I welcome the opportunity to speak with members about the contributions STEMCELL is making for the Canadian science and research ecosystem.

STEMCELL Technologies is Canada's largest biotechnology company, with over 1,700 employees globally, of whom 1,200 are located in British Columbia. Research-focused, we make products that support the life sciences, including some of the ingredients that go into COVID tests and vaccines.

Since its founding in 1993, the company has always been profitable, with an average annual growth rate of 20%. This year, sales revenues will exceed \$400 million. Export-oriented, 97% of our sales are outside of Canada, bringing in those export dollars that are two to three times more valuable than dollars generated within an economy.

At our present growth rate, sales will be \$2 billion in 10 years. To manage this growth, we need to hire and train 4,000 new employees. Most require further on-job training, and they will have to take some of the 500 educational courses we offer internally in our company. This helps mitigate the shortage of people with biomanufacturing training in Canada. That said, STEMCELL benefits from countries like Ireland, which has a national biopharma training program. Presently, STEMCELL has over 80 Irish graduates, most of whom have that training and have worked in biopharma in Ireland.

STEMCELL is known globally for the novelty and quality of its products, which we research, design and make in Vancouver. In addition, we market products made by other companies. With thousands of customers globally, over 3,000 products are used for research in cell therapy, regenerative medicine, tissue engineering, immunotherapy and gene therapy.

Initially, our products were for research use only. Now, many of our products are in clinical trials with the expectation that they will be used in patients. To make clinical products, STEMCELL sought federal support to build the required facilities. Thus, in 2017, we had a loan of \$22.5 million from the federal scientific innovation fund, which was matched by the Province of British Columbia. This \$45 million was then matched 2:1 by STEMCELL with a \$90 million loan from a bank consortium. This \$138 million project, called “project railway”, is nearing a successful completion, with the creation of 675 biomanufacturing jobs.

Unfortunately, the COVID-19 pandemic has again highlighted Canada's dependence on foreign suppliers, this time for making the ingredients for viral testing and vaccines. STEMCELL has made a SIF proposal called “project bedrock” to make these ingredients. This has been submitted with the understanding that matching funding will come from British Columbia. Committee members present are asked to remind our colleagues in government that this investment is aligned with Canada's biomanufacturing and life sciences strategy to improve Canada's long-term pandemic resilience.

In conclusion, we are grateful that the federal government has made supporting biomanufacturing a priority. However, it should be noted that the leading G7 nations—the United States, Germany and Japan—each spend over 3% of their GDP on research. Canada spends half of this at 1.7% of GDP. STEMCELL suggests that it is imperative that Canada spends more on Canadian research-oriented businesses if we are to remain competitive with our G7 colleagues, as well as with China.

I thank members for this opportunity to address the committee today, and I look forward to answering any questions you may have.

• (1850)

The Chair: Thank you, Dr. Eaves.

Once again, I would like to thank all our witnesses for your time, your effort and your expertise today. I would like you to know you have a really excited committee here. They are very interested in what you have to say.

With that, we will now go to hearing from our members. We will go to the six-minute round.

We will begin with Ms. Gladu, for six minutes. The floor is yours.

Ms. Marilyn Gladu (Sarnia—Lambton, CPC): Very good. Thank you, Chair.

Thank you to all the witnesses who have joined us today. We appreciate your testimony.

I'm going to start with Dr. Bell.

I note that you are excellent at getting preclinical trials to become clinical trials and become successful. I know there was discussion when the government decided it was going to implement the PMPRB rules to change the drug approval process in Canada to make it longer and more costly. At the time, they had suggested that would have a negative impact on clinical trials, in which Canada actually punches above its weight. I wonder if that will have an influence on your situation.

Dr. John Bell: Stéphanie may have some thoughts about that, but I don't think I can really comment. I don't know enough about the PMPRB program to actually weigh in on that, to be honest.

Stéphanie, do you have any thoughts on it?

Dr. Stéphanie Michaud: Certainly.

With respect to the PMPRB regulations for the type of work we're currently carrying out, they are very much dedicated to early-stage clinical trials—phase one or phase one/two—at which point we wouldn't be approaching that territory of the PMPRB regulations. It's a long answer to say, in short, that it would not impact the clinical trials that we are bringing forward through the research.

Ms. Marilyn Gladu: For either one of you, you mentioned that your funding is ending despite all the success you've had in getting preclinical trials to clinical trials. Why is it ending?

Dr. John Bell: Go ahead, Stéphanie.

Dr. Stéphanie Michaud: Sure.

We are funded under the networks of centres of excellence program. This program has run for 30 years, but it was sunsetted in December of 2018. We were allowed to apply for a three-year extension, and that will take us to March 31 of 2023, at this time.

Ms. Marilyn Gladu: You would recommend that the government extend that funding, especially for people as successful as you?

Dr. Stéphanie Michaud: We certainly would.

Ms. Marilyn Gladu: Okay, very good.

I want to ask a question of Dr. Eaves.

You're in a position of showing Canada's leadership in stem cells. What should we be doing to help support you, to keep that leadership position for Canada?

Dr. Allen Eaves: We need more funding to support the growth of the industry and to create the jobs. We have a very good educational system. It isn't focused necessarily on this area of biomanufacturing yet. As I mentioned, in Ireland they have a really good system to do that, and they have all this biotechnology and pharma industry in Ireland. We'd like to get some of that in Canada to absorb our graduates. We have a good educational system, but it needs to be a little more focused. Then you need the industry to take up those jobs.

It's sad to say that STEMCELL is the biggest biotech company in Canada. No, we need many more [*Technical difficulty—Editor*] bringing in those export dollars. That's really what we need. We need funding to build the companies and some support for training.

• (1855)

Ms. Marilyn Gladu: Excellent.

[*Translation*]

Mr. Deschênes, you said it was hard for smaller universities to get the funds they need in order to compete with the other universities in terms of funding applications.

Can you explain that further?

Mr. François Deschênes: Yes, of course.

There are a number of examples. First, we need only think of access to funding for the Canada Research Chairs and the funding offered by the Canada Foundation for Innovation. Quotas are imposed based on the number of federal grants received in the past. So this necessarily puts an upper limit on access to funding in that field.

Second, when the committees evaluate research projects submitted by researchers, they don't always take into account the circumstances in which they conduct their research activities. There are researchers who have only one course to teach a year, and others who have four, but that doesn't mean that the ones who teach fewer courses are less productive when it comes to research. What is important is to evaluate potential, not past excellence, because there may be a lot of potential. That has to be taken into account in the evaluation criteria.

There is another unfavourable factor. Increasingly, a matching contribution is required. The university is asked what its commitment is, whether financial or in kind, for a particular project. The smaller institutions necessarily have fewer financial and human resources, so they are not on a level playing field for the evaluation. That doesn't mean at all that the project is less important. No correlation can be drawn between the two things.

We therefore have to be careful when it comes to the indicators used for doing a good assessment of potential and clearly identifying excellence, regardless of the form it takes. That goes well with the capacity to support diversity. We do see diversity within under-represented groups, but it also exists among the researchers at the different institutions, and it has to be recognized.

[*English*]

Ms. Marilyn Gladu: I have a last, quick question for anybody.

I see that you're all successful. What are the barriers—

The Chair: You have 10 seconds, Ms. Gladu. I'm sorry.

Thank you for your very thoughtful, important questions.

With that, we'll go to Mr. Collins for six minutes.

Mr. Chad Collins (Hamilton East—Stoney Creek, Lib.): Thank you, Madam Chair.

As you noted earlier, we have an incredible list of witnesses this evening. I'd like to start with BioCanRx and Dr. Michaud.

I assume that when the original funding was provided by the government for BioCanRx, there was an expectation that it would be able to leverage private funds.

Could you elaborate on your success in that area? What amount of funding have you leveraged with the original investment the government made?

Dr. Stéphanie Michaud: Thank you very much for the question, Madam Chair.

The original investment made in BioCanRx in 2015 was for \$25 million. As I had mentioned, we were allowed to apply for reduced funding and we received another \$15 million in 2020.

Currently, our spend is close to \$30 million. We still have monies to put out in this upcoming year. With respect to attracting funding, the NCE program under which we were funded has an expectation of reaching a 1:1 funding match. Because of the space in which we operate and the ability to shepherd technologies and continue to add value as we bring them through the pre-clinical to clinical phase, we've been able to turn that \$30-million spend into close to \$96 million of leveraged funding going all the way back to 2015.

It's really because the type of engine we have built has been able to attract significant funding from a multitude of different sector partners.

Mr. Chad Collins: Congratulations. That's an incredible number that you delivered versus what the expectations were.

I would ask then about the sunset of the program and some of the questions that Madam Gladu brought up about your current funding.

When does it expire? Is there a funding gap between the funds that you have now and the timeline that you have to reapply for additional funding?

Dr. Stéphanie Michaud: The \$15 million of NCE funding that we currently hold runs until March 31, 2023. We have been allowed to operate as a network of centres of excellence until March 31, 2024, but this is self-funded.

We are very fortunate to have been given the opportunity to apply to the strategic science fund. We're waiting to hear whether or not we will be able to continue in the competitive process. If we are funded under this program, the funding would begin in April of 2024, which means there's a one-year gap between when our NCE funding ends and when the strategic science funding would begin, if we are successful.

• (1900)

Mr. Chad Collins: Thank you.

Your recommendation would be to fill that gap with funding to give you that bridge financing, so to speak, which would allow you to get to the next application process.

Dr. Stéphanie Michaud: It would allow us to be able to continue to carry out our activities and not lose the momentum we have built up since being funded in 2015. We could continue to execute on life-saving clinical trials and deliver value for the private sector, the academic sector and patients across the country.

Mr. Chad Collins: Thank you, Dr. Michaud and Dr. Bell.

Madam Chair, I will move on to Mr. Deschênes.

It must be incredibly difficult to attract top talent in terms of professors, as well as students, to a rural area. I look back to my own university days and I think most of the people I attended university with were more inclined to apply to large urban centres.

How have you overcome that issue? What can the government do to support enrolment numbers in small or mid-sized universities, specifically in those in rural areas?

[*Translation*]

Mr. François Deschênes: Thank you for your question.

Certainly, getting enough research grants is an important factor in terms of attracting and retaining students. Ultimately, it makes it possible to pay those grants back in the form of scholarships to students. Scholarships are an important factor in financing an education. Using these...

[*English*]

Mr. Gerald Soroka (Yellowhead, CPC): I have a point of order.

The Chair: Thank you.

Yes, Mr. Lawrence, there's a lack of interpretation.

We will go back and give our rector an extra minute to be fair.

Can we check that the interpretation is there now, please?

[*Translation*]

Mr. François Deschênes: Testing. Can you hear me?

[*English*]

The Chair: We do, thank you very much

Thank you, Mr. Lawrence.

Go ahead, Mr. Deschênes.

[*Translation*]

Mr. François Deschênes: As I was just saying, the funding provided by the federal government through grants and scholarships is

one of the important factors. When universities in the regions receive these scholarships and grants, they return them in large part to students in the form of funding, as is well known. So these are additional resources that enable us to attract students to the regions, because this means we can offer scholarships that are competitive on the same footing as the other universities. That is a key factor in terms of attraction.

We know that often, when students enrol at universities in a region, they come to like the region and decide to settle there to make their careers and contribute to the region. On that point, I would say that about two thirds of our students, perhaps even three quarters, work in the region after graduation.

It is a very important vector for attraction and retention, and so it is essential to support it.

[*English*]

Mr. Chad Collins: Thank you for that answer, Rector.

I have one last question.

The Chair: Please keep it very short, Mr. Collins.

Mr. Chad Collins: Thank you.

To Dr. Eaves, I'm thinking about the incredible export numbers you talked about earlier. Could you elaborate on "project bedrock"? You talked about matching government funding from the provinces.

What can the federal government do to support that initiative, from a funding or policy perspective?

Dr. Allen Eaves: It's to help support the facilities that we need to go with clinical products. Our focus has traditionally been on the research-use-only products, but we're now moving into clinical grade products. Our media are in 40 different clinical trials.

We want to be able to do the same for the components that go into vaccines, and testing reagents for the pandemic. We have the capability to do this.

• (1905)

The Chair: Dr. Eaves, I'm sorry to interrupt. I hope someone else will pick up this train of thought.

[*Translation*]

Mr. Blanchette-Joncas now has the floor for six minutes.

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Thank you, Madam Chair.

I would like to welcome the witnesses who are with us this evening.

My questions will be mainly for Mr. Deschênes and Mr. Carbonneau.

Thank you for being with us this evening, gentlemen.

Mr. Deschênes, I quite liked your opening presentation. You highlighted a number of problems faced by small and mid-sized regional universities. I would like to carry on from what you were saying, when you mentioned that Quebec's university network was an extensive one. I would say that Quebec's university network is the biggest university network in Canada. I'm proud of it and I'm a proud representative of the Université du Québec à Rimouski, from which I graduated.

Mr. Deschênes, you made clear the inequality between universities in the regions and those located in the big urban centres. Could you propose concrete solutions to combat this phenomenon?

Mr. François Deschênes: In terms of concrete solutions, I spoke earlier about the challenges that arise in the evaluation process, in terms of how the circumstances of researchers in smaller institutions in the regions are taken into account. That is an important factor. We have to make sure that the evaluation committees are representative and that there is vigilance in this regard.

I would propose another possibility: include a section in the forms that could be used to draw attention to those circumstances so they can be better described and better understood. That would mean that when achievements are evaluated, we would be able to draw attention to those circumstances. That is an important factor.

As well, I spoke earlier about how quotas are established when funding is granted in certain programs. That is another important factor.

I also addressed the issue of matching funds and the contribution by the institutions. Here again, the playing field is not level, so we need to be able to draw attention to that. Ideally, in fact, there should be no match in the grants. We are not funding bodies and the money we receive is used to train students. When a match is requested, that means we are diverting money to provide it. This is particularly the case in small institutions where there is little financial leeway. These evaluation criteria should be changed.

With respect to establishing programs, to start with, there has to be a desire to establish programs and criteria that fit our circumstances. With that said, there should not be a race to the bottom. There is excellence everywhere, and the important thing is to give them the ability to prove themselves. Even if the smaller institutions don't have a critical mass when it comes to the number of researchers, that doesn't mean at all that those researchers are not as good. It simply means that they may be on their own and they have probably developed an instinct for greater collaboration with other researchers. We have to determine how to clearly draw attention to that in the evaluations. I think that is a large part of the key to success at that stage.

Mr. Maxime Blanchette-Joncas: Thank you for that explanation, Mr. Deschênes.

You also spoke earlier about measuring excellence, which could be a good way of reducing that inequality.

Could you tell us more about that approach?

Mr. François Deschênes: In fact, I am a strong advocate of measuring potential from different angles. We often evaluate excellence using a certain number of indicators: for example, how many scien-

tific articles a person has produced and how much funding was associated with them. We look at the person's history and full of admiration, we say this person is excellent. Another person, however, one in less optimal conditions than the first person, may have somewhat lower production. How would we be able to evaluate that excellence and put it in perspective in order to convert it into potential—that is, evaluate whether that person has potential?

So it comes back to what I was saying earlier: I think we need to have appropriate criteria and committees that are aware of these situations.

Mr. Maxime Blanchette-Joncas: Thank you.

You also said that over 25% of researchers with doctorates are denied funding, and that this boils down to a loss of expertise, of brains that can't put their talents to work.

What concrete solutions could you propose so, ideally, that doesn't happen?

Mr. François Deschênes: Studies show that, all things being equal, grants, even small ones, are important. That is, productivity doesn't increase tenfold when the grant is ten times higher. So what is important is to be able to provide post-docs who have been trained for research, everywhere in Canada and in the institutions in major centres, with the minimum resources for doing research. That means that we will be able to put a majority, if not all, of our post-docs whose brains are trained for research to work.

I think that programs in the various granting agencies that will reach out to these researchers to put them into action, this will be a factor that will change the future when it comes to potential.

There is also another important factor: the smallest institutions are often less focused on health, since they don't have faculties of medicine. We have to be able to recognize that health research takes various forms and also support it in all its forms, even if an institution doesn't have a faculty of medicine.

That is another way of doing things differently, of innovating, all over, and finding solutions tailored to the various regions of Canada.

• (1910)

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

What do you think that we, collectively, lose by not funding the brains that have been specially trained to do research?

Mr. François Deschênes: We are depriving ourselves of an unbelievable capacity to develop solutions that are tailored to the situations in our communities.

In fact, the analogy I often offer is of a person who has lots of money and buys a lot of cars, but can't use them because they have no money left to put gas in them.

At present, there are brains that are asleep that Canada could be gaining more from. This is an enormous loss. As I said, we don't know where the next revolutionary idea will come from.

As decision-makers, let's try to create fertile ground for all these researchers.

The Chair: I'm sorry, but time is up.

Thank you for your questions, Mr. Blanchette-Joncas.

[*English*]

We will now go to Mr. Cannings, and if you allow me, it is Mr. Cannings' birthday, so we wish him wonderful returns today and for the year.

Mr. Cannings, you have six minutes.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you, Madam Chair. It's unnecessary, but thank you.

As Mr. Collins said, this is a very interesting panel.

I'm going to begin with BioCanRx. I met with Ms. Michaud of BioCanRx a couple of weeks ago, so I got a bit of a taste of what you've been doing. It sounds very innovative and exciting, a sort of distributed network of science, and applying that science to do very exciting and important things, like changing things for cancer patients.

I have so many questions. I'll begin with Dr. Bell. When we're considering the government investment into this network that includes universities, investigators and private investors, where does the IP from this rest? If we are going to export this, how can Canadian companies benefit from your work?

I'll leave it there.

Dr. John Bell: It's a great question. Sure, I'm happy to answer that. I think it is an important question. What BioCanRx is concerned about is that our IP will go outside the country and be developed elsewhere.

Right now if an academic scientist should develop an invention, it belongs to that scientist and his research institute. They have to support the patents and they can try to find a way to develop them, but of course if they don't have any resources to do that, the scientist is often obligated to go outside the country to try to find a way to protect that intellectual property and develop it elsewhere. Therefore, what we're trying to do is to say is this: We're already investing in Canada in many ways. We're making great science, we're making lots of infrastructure and great clinical care. Let's just bring it all together and make sure that our IP is actually cultivated, maintained and actually established and produced in Canada as opposed to giving it away.

We all know the story of insulin. Insulin was developed in Canada many years ago and it's never been manufactured here. So to Allen's point, I think we need to start investing in our own biomanufacturing and our own science that we're already paying for to make things happen here.

Mr. Richard Cannings: You mentioned the CAR-T program, which you're very heavily involved with. I believe from my previous meeting that techniques like that for treating a patient in the

United States cost more than \$450,000. You've developed innovative ways to bring that down to say, \$100,000. It's still a lot of money. I'm just wondering, again, if you see an end point where it's far cheaper? This is exciting, as I say, life-changing, life-saving science for patients. How will patients be able to afford that? Are governments covering the cost of that when you're treating them?

I'll stop there because I'll just take up your time and I'd rather listen to you.

● (1915)

Dr. John Bell: It's again the right question to ask because these are incredible new therapies and, in many cases, are providing people a very long or extended lifespan, if not a cure. As you point out, right now in the case of CAR-T, for instance, when we send a patient to Pennsylvania or to Seattle to be treated, it can cost upwards of a million dollars for the patient—often covered by the government. By creating it in our own infrastructure here in Canada, we'll be able to control those costs.

Stéph and I talk all the time about the concept of creating B corps, for instance, things that actually care more about Canadians and their patients than we do about investors essentially. I think there are ways to be creative, get inventions developed here and maintained here and priced for the way the Canadian system can stand. I think it's soluble. I just think we've gotten ourselves into a mindset that we have to do it the big pharma way, and I think there are many ways to get around that. As you point out, we already have the cost down to about \$100,000 per patient. I know we can do way better than that, because we've only treated a small number of patients so far. If we build our own infrastructure, I think the cost can be controlled and brought down.

You also have to weigh into that the cost of having a curative therapy versus therapies we currently give that are not curative, and that costs a lot of money too. I think there's a rationale for investing in these new technologies.

Mr. Richard Cannings: I have another question on the timeline here. I think Ms. Michaud was talking about stage 1 and stage 2 trials. Is your network going to continue down the path through all those trials so that we will complete all that work in Canada and the patients in those trials can benefit here in Canada?

Dr. John Bell: That's our dream, of course, and the way we do that is to work with companies in Canada like Allen's company—that kind of company that's here in Canada—so that we can help facilitate those phase 1, phase 2, phase 3 studies here, and get it approved in Canada. Also during that whole process, as you point out, Mr. Cannings, we're actually being able to treat Canadian patients right now with therapies that are proving to be curative. So I think it's a good strategy.

Mr. Richard Cannings: Okay. I have a couple of seconds left and I have one quick question. .

I'll just stay with you, Dr. Bell. Would having a single national formulary for pharmaceuticals be beneficial for BioCanRx?

Dr. John Bell: We've talked about that. I think there is certainly value in that from the kinds of things we're doing to make sure that we have a pricing system that will work for Canadians and the Canadian health care system.

And congratulations on your 40th birthday too.

Mr. Richard Cannings: Thank you. You must have forgotten your glasses.

The Chair: Thank you, Mr. Cannings. Thank you to all of our witnesses.

We are now going into the second round. This will be a five-minute round. We'll begin with Mr. Soroka.

Mr. Gerald Soroka: Thank you, Madam Chair.

Thank you to all of the witnesses tonight for coming.

Dr. Bell, you wanted to finish off, I think, a bit more, or at least I wanted to know a bit more. You talked about building a network or an infrastructure and how we could make that more cost-effective in Canada.

I'm intrigued as to what kind of ideas you would have about setting that up and how it would be more cost-effective.

Dr. John Bell: Let me just give you an example.

This actually already exists to some extent in our hospitals. We do bone marrow transplants, which I assume everybody has heard about. In fact Allen's company does a lot of products to support that kind of activity. Bone marrow transplants are done across the country. They're a point-of-care type of treatment, and they're quite affordable. They do great things for patients, and the kinds of therapies we're talking about are very similar to them.

We can leverage what we already have. We already have infrastructure in place. It's really about being very Canadian and working together, and that's what our network does. It really brings the best minds together and the best thought leaders, clinicians and scientists to really build here what we know that we need.

Mr. Gerald Soroka: Okay. Thank you for that. I didn't realize that. You're right: We can back on to a lot of things that already exist. That's a very good point.

Mr. Deschênes, you spoke about how rural universities or colleges are not getting adequate funding. Are you also having a bigger problem with things being in the French language, or even with researchers producing position papers or getting funding in that regard because of the French language?

• (1920)

[*Translation*]

Mr. François Deschênes: Thank you for your question.

For some researchers in the natural sciences and engineering, we do sometimes get the feeling that the applications are being evaluated differently when they are written in French rather than English.

It is easier to find English-speaking evaluators anywhere in the world than to find French-speaking evaluators.

There is probably an evaluation that needs to be done. I know that in the past, it was done at the SSHRC, the Social Sciences and Humanities Research Council. We may need to put together a picture of the situation now in order to determine whether that bias still exists.

Apart from that, I think the composition of the committees is very important. We have to make sure that the evaluators are bilingual, or systematically make sure that the number of francophones is equivalent to the number of anglophones when evaluations are done.

This is important because, sometimes, the aspect that is highlighted is different in terms of interpretation. When publications are in French, the number of journals and recognition of the journals can also be difficult to assess. It is important to consider all these variables when evaluations are done.

[*English*]

Mr. Gerald Soroka: Okay. Thank you for that.

I'm not certain if this is for Dr. Michaud or Dr. Bell.

When it comes to funding, you said that you're going into a sunset clause in one of the agreements, but you talked about a lot of funding coming from the private sector for different organizations. How much of that private funding actually assists in any type of research or development? Is that about a 5% or 10% or is it still higher?

Could you give me a breakdown of how much money is actually coming in from government versus from the private sector?

Dr. Stéphanie Michaud: Certainly. Currently the amount of funding we've been able to attract as a result of our financial outlay—currently of approximately \$30 million—is close to \$96 million. The exact figure is \$95.78 million. This is as a result of being able to connect all of the dots that are necessary in order to advance a preclinical asset all the way through to a clinical trial.

When you build these types of engines that work, that are producing results, that are filled with experts and the right clinicians who are developing some very exciting assets, the private sector takes notice and wishes to invest.

Another key point to recall is that when we work at BioCanRx, we utilize a pipeline approach, and because we're a mission-oriented organization we are very much looking to increase the number of clinical trials, so that a greater number of patients in Canada can benefit from domestic clinical trials. We invest in the technology keeping in mind what the clinical trial for this is going to look like, and as we progress down that pipeline, the amount of monies that we're able to attract from the private sector, of course, increases.

Therefore, in terms of leverage ratios in our clinical trial program, we're approaching ratios of 8:1 on the dollar, and that's because greater value has been introduced into the assets under development.

Mr. Gerald Soroka: Okay. Thank you for that.

I'm pretty certain the chair is going to tell me my time is up.

The Chair: I regret it, my colleague and friend, but yes. Thank you, Mr. Soroka, for those questions.

[Translation]

Mr. Lauzon, you have the floor for five minutes.

[English]

Mr. Stéphane Lauzon (Argenteuil—La Petite-Nation, Lib.): Thank you, Madam Chair.

[Translation]

First and foremost, I would like to thank all the witnesses who are here this evening. It is Thursday evening, for everyone. Thank you very much for being here.

My first question is for Mr. Bell from BioCanRx.

Mr. Bell, you piqued my curiosity about biomanufacturing when you gave the example of insulin. You suggested that insulin could be produced in Canada.

Would be the benefits for Canada of producing our medicines instead of importing them? Would that have an impact on supply?

[English]

Dr. John Bell: That's a great question, and great points, actually. The reality is that when you manufacture in a particular country, you don't want to move your manufacturing plant. You want to keep it there for the duration of the product's lifetime because it costs a lot of money to move it around. [*Technical difficulty—Editor*], it stays in our country.

For instance, Dr. Eaves's company, which is trying to manufacture in Canada, is not going to go anywhere else because he has the infrastructure here and the personnel here. By building that kind of biomanufacturing infrastructure in Canada, we're going to anchor companies in Canada. They're going to stay here, people are going to be trained to work in those companies and we're going to generate for the economy. I think that's really important.

What we often do is have our stuff manufactured offshore, and as you suggest, that can have an impact on supply chains as well. There are so many reasons why it makes a lot of sense to build in Canada, and build biomanufacturing in particular, so we can provide products for our own patients.

• (1925)

[Translation]

Mr. Stéphane Lauzon: Thank you very much for that answer.

Ms. Michaud, you also piqued my curiosity concerning funding sources, which are divided by periods.

What would the impact be if funding were to be stopped in 2024, on all aspects: researcher retention, product development, and the connections we have with all research mechanisms?

Can you give us some examples?

Dr. Stéphanie Michaud: Yes, absolutely, Mr. Lauzon.

Thank you for that question.

The main impact would be that we would no longer be able to continue working on our projects, the clinical trials projects. We would no longer be able to fund new projects and we would no longer be able to attract others. For example, when our budget was cut by 40%, in 2020, we had to completely cut out the first stage of our product development pipeline, because we unfortunately didn't have enough money to sustain it. What did we do? We continued to invest in the products we had already invested in, to try to get them to clinical trials.

If there were to be a period in which there was no funding, that would result not only in departures from the BioCanRx team itself, but also in a loss of continuity in the projects. It would jeopardize the engine we have built, which is working really very well, for evaluating the technologies and moving them toward clinical trials.

So it would cause a total stoppage of these types of activities. That would have a major impact, sir.

Mr. Stéphane Lauzon: Thank you very much for that answer.

Mr. Deschênes, my next question is for you.

Gilles Patry, the president of the U15 Group of Canadian Research Universities, told this committee that many Canadian students don't go on to get higher diplomas. We see students in Canada end their education before the master's or doctorate level, as compared to other western countries.

Have you experienced this situation? What would be the best way of remedying it?

Mr. François Deschênes: Yes, it is absolutely a situation we are experiencing in all the universities, and particularly in the regions. The pull of the labour market is very strong, with full employment and the labour shortage in our regions at present.

One of the important factors is certainly increasing the scholarships offered for master's degrees and doctorates. At present, students prefer to work and earn a decent salary rather than getting an annual scholarship of \$15,000 or \$20,000 or \$25,000. At present, we are seeing that an increase would change things in terms of the capacity to attract and retain these students, who will make up the researchers of tomorrow.

It is therefore important to think about this now in order to make sure we have the next generation.

Mr. Stéphane Lauzon: Thank you.

[English]

Thanks, Madam Chair. That was five minutes and 10 seconds.

The Chair: Yes, thank you, Monsieur Lauzon.

With that, dear colleagues, we've reached the end our time. I know that the entire committee has really enjoyed this good discussion, and we're very grateful to all of you for taking your time to do that. If you're interested, we hope you'll come back.

With that, dear colleagues, we will suspend while we get ready for our next panel. Thank you again, everyone.

• (1925) _____ (Pause) _____

• (1930)

The Chair: I call this meeting to order.

We welcome our guests to the second panel of our ninth meeting. As you know, this is the inaugural science and research committee and the inaugural study on the successes, challenges and opportunities for science in Canada.

For this panel, our committee is really pleased to welcome, as an individual, Dr. Jessie-Lee McIsaac, an assistant professor and Canada research chair in diversity and transitions of early childhood, from Mount Saint Vincent University. We are pleased to welcome Dr. Victor Rafuse, director and professor at Dalhousie University with the Brain Repair Centre; and from TRIUMF, we have Dr. Nigel Smith, the executive director.

We will now go to testimony. You will each have five minutes. When you see me give the yellow card, that means we're at the four-and-a-half-minute mark. I do my best to be fair to everyone.

We will begin with Dr. McIsaac for five minutes.

The floor is yours.

• (1935)

Dr. Jessie-Lee McIsaac (Assistant Professor, Canada Research Chair in Early Childhood: Diversity and Transitions, Mount Saint Vincent University, As an Individual): Thank you, Madam Chair, and to the committee, for the invitation to share my thoughts on the successes, challenges and opportunities for science in Canada. It's really an honour to have the opportunity to speak with the committee this evening.

Before I begin, I do want to start by acknowledging that I'm joining from my home in Halifax, which is in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq nation. I also would like to pay respects to the histories, contributions and legacies of the African Nova Scotian communities, which have been here for over 400 years.

I'm an assistant professor within the Faculty of Education and the department of Child and Youth Study at Mount Saint Vincent University. At the Mount, I'm a tier-2 Canada research chair in early childhood, as was mentioned.

Tier-2 positions are awarded to exceptional emerging researchers who have been acknowledged to be leaders in their field. During my tenure, I have established the Early Childhood Collaborative Research Centre, which engages families, as well as partners in policy and practice, in research to enhance early childhood well being.

I receive tri-agency funding from the Social Sciences and Humanities Research Council and the Canadian Institutes of Health Research, along with funding from non-profit organizations, provincial government sources and the Public Health Agency of Canada.

In my remarks, I'm going to focus on three key points. I'll get right to it.

First, we're facing complex population health and social issues in Canada. The pandemic has had different impacts on us all. It has certainly highlighted the inequity that exists in our communities. As we look toward an equitable pandemic recovery, applying an engaged scholarship approach to science in Canada would mean bridging the gap between theory and practice by integrating scientific and practical knowledge. This means ensuring that our research questions are relevant and meaningful to Canadians. In my work, this means leveraging family voices by considering how the social determinants of health influence families and a child's well being.

Knowledge mobilization is a central part of our work. We do this by engaging partners in the co-production of research, as well as extending our traditional research outputs to support research to have an impact on policy and practice.

One brief example is a recently completed photo voice project with newcomer families in Halifax, where we learned more about how they navigated programs and services for young children. Families took pictures of their daily lives and talked to us about the challenges they faced related to employment and language, and also how they relied on their social networks to support them in their settlement journey.

The results of this research were shared through an outdoor photo exhibit and in other public spaces such as libraries and museums. It is helping to inform adjustments to the implementation of programs for families in communities alongside new research that we're conducting with our settlement agency partners.

Second, I provide my remarks today as an early career researcher. Other witnesses have shared their advice for increased investment in funding for research. As you consider these investments, I'd like to highlight the importance of incorporating an equity lens in research funding.

While the pandemic has resulted in some new opportunities for funding, it has also highlighted the disparities that have emerged within the scientific community, particularly those that relate to gender, race and caregiving. While there have been a few studies that have identified these early experiences, the long-term impacts on the career progression for many of these individuals, including our trainees, will take some time to emerge. We need to be proactive and develop supports for those scientists most affected by the pandemic to avoid a further depending of the inequities.

Finally, a topic brought up in the first part of this session was the need to be thinking about enabling research across the country and recognizing institutional and regional assets. As a smaller institution on the east coast, there are perceived barriers to our capacity for large-scale research, which we often see through the peer review process. Often missed are the unique strengths that come from working at a small institution like Mount Saint Vincent University, which is strongly committed to fostering equity, diversity, inclusion and accessibility.

An example of this is that our institution was established for the advancement of women, with social responsibility and social justice at its core. We are one of 17 universities and colleges from across Canada, and the only Nova Scotia institution, selected to work with the tri-agency Dimensions team to foster increased excellence, innovation and creativity within the post-secondary sector across all disciplines through a focus on equity, diversity and inclusion.

My research program is also greatly enabled in our small province through the ability to foster strong partnerships with policy-makers and communities. This is something that can be different in larger regions.

● (1940)

Thank you again for the invitation to share my remarks. I look forward to your questions and further discussion about the successes and opportunities for science in Canada.

The Chair: Thank you so much, Dr. McIsaac. We appreciate hearing from an early-career researcher, and we thank you for being here.

We will now go to Dr. Victor Rafuse for five minutes. The floor is yours.

Dr. Victor Rafuse (Director and Professor, Dalhousie University, Brain Repair Centre): Thank you, Madam Chair.

First of all, I'd like to also thank the committee for this opportunity to give my presentation today. I'd also like to thank the government and previous governments for their support of research in Canada. Without that support, we would not be where we are today. Is there room for more? I guess that's why we're here. Thank you for your support. I think that's something that's often missed in these opportunities.

I'm going to focus on three things. Many of them you've probably heard several times. They're fairly broad. They're not specific.

The number one issue is the importance of hypothesis-driven research. Hypothesis-driven research is the foundation of all innovation across Canada and the world, across every field. It doesn't matter which field you're looking at, because it all goes back to hypothesis-driven research.

In our field, the sciences and medical sciences field, it's basically coming from the tri-council. The tri-council, whether it's NSERC, SSHRC or CIHR, is not just the foundation for hypothesis-driven research for the most part. It's also the engine of research across Canada. That really is what drives the research in individual labs. Without that research in individual labs, there is no greater research in Canada. If you have initiatives, and for people to be able to participate in them, they have to have an active lab. To have an active lab, they have to have, in our field, tri-council funding.

It's critical, it's important and it's at a moment of stability. We've adjusted the stability, but it needs to grow, so that the health of the research community in Canada can grow with it.

The second thing that I think is critically important—and it was already touched on even this evening—is geographical diversity. Geographical diversity is critical in research. Canada prides itself

on being a diverse country, from St. John's to Vancouver, from Windsor to Iqaluit and beyond. This is what makes Canada Canada, and this is what makes Canada great. It's not only what makes Canada great, it drives the economy. It's what's healthy for Canada. It's also what's healthy for research. You need research from across Canada to challenge and then build on the ideas of all research around the world. Without that, it creates a level of non-equity, and the health of research in Canada suffers dramatically from that.

A point on that is equity of research in federal funding is not as equitable as it could be, in my opinion. Every time there's a federal grant that adds a match to the federal grant, you knock out a large number of small universities. You add that match and we can match.... There are ways that we can match some of the smaller initiatives, like the smaller, individual CFIs, but once they come to a larger CFI or any of the larger grants where there's a match, it's gone.

Therefore, it's not a federal program. It's not available to everyone. It's critically dire for the really small provinces. In Atlantic Canada, it would be P.E.I., where CFIs for individuals is almost zero because they can't access funding. To say the CFI is true federal funding, in my opinion, is not accurate. It advantages the wealthier provinces over others.

● (1945)

The third issue is a bit more vague, but it's an issue that we've been working on as neuroscientists across Canada. It's to try to come across a neuroscience or a brain policy. I'll leave it with the point that the aging brain is increasing the need for this at a rate that we've never seen before in mankind.

It's particularly dire in Canada, where our aging population actually outpaces the rest of the world's.

Thank you.

The Chair: Thank you so much, Dr. Rafuse. We appreciate your being here, and we're grateful for your expertise.

We will now go to Dr. Nigel Smith from TRIUMF, please, for five minutes.

Dr. Nigel Smith (Executive Director, TRIUMF): Good evening, Madam Chair and committee members.

Thank you so much for inviting TRIUMF to appear before you on this important study. My name is Nigel Smith and I am the executive director of TRIUMF, Canada's particle accelerator centre.

I would like to first acknowledge that TRIUMF is located on the traditional, ancestral and unceded territory of the Musqueam people, who for millennia have passed on their culture, history and traditions from one generation to the next on this site. This land has always been a seat of learning.

Located on the campus of the University of British Columbia, TRIUMF is a world-class subatomic physics and accelerator facility that, using world-unique infrastructure, carries out fundamental science and applied research that is changing the world. Founded more than 50 years ago, TRIUMF plays a significant role in Canada's science and innovation ecosystem as one of the largest major research facilities colloquially known as “big science” facilities.

These enterprises—SNOLAB and the Canadian Light Source being other examples—provide infrastructure that no single university can support and, by bringing together a critical mass of researchers and engineers, can develop new ways of addressing problems and enable Canada to compete at scale in the global science and innovation enterprise.

TRIUMF is owned and operated by a consortium of Canadian universities, with operations primarily supported by federal investment over the last 50 years, for which we are highly grateful. Over the last five decades, well over a billion dollars of capital has been invested into TRIUMF, including the largest conventional cyclotron in the world and a new \$100-million accelerator complex in final construction.

Collectively, the massive investment in TRIUMF has created the opportunity for many successes in Canadian science. From advancing our understanding of the origins of the universe to developing next-generation materials and cures for cancer, we are at the forefront of research domestically and act as the portal to other world-class international facilities like CERN in Geneva. We have enabled Nobel Prize-winning research, addressed emergent crises and played a leading role in Canada's effort to establish itself as a global innovator for medical isotopes. We are currently developing radioisotopes for both diagnostics and therapy, with a new \$60-million facility coming online later this year, supporting both federal and provincial needs around isotope security and innovation.

The pandemic has also highlighted the requirements of having resilience within the national research and development ecosystem. Major research facilities play a critical role in this regard, sitting at the interface between academia, industry and government, with the ability to be agile in addressing these emergent issues. As an example, in the face of the COVID pandemic, several Canadian major research labs joined forces, led by Nobel laureate Art McDonald, to rapidly design, prototype and move to market a new type of ventilator to assist in the pandemic response. This also demonstrates the benefit of having that strong network of major research facilities within Canada.

There are challenges in delivering these successes, however. Canada has a globally unique approach to major research facilities, and the associated challenge of managing the full life cycle of these labs has been identified for many years. Much work has been done on this topic over several decades—and we understand ISED has taken up the matter again recently—but it does remain pressing. From the perspective of the major research facilities, we are national assets, here to help, but we require established frameworks and champions to plan and execute effectively over the long time scales required to develop these types of infrastructure.

This challenge is also an opportunity. By optimizing the support mechanisms for the major research facilities, Canada can extract maximum value from the major investments already made, provide a multidisciplinary environment to train highly qualified personnel, attract leading talent to Canada and continue the legacy of world-leading research and benefits for our society.

In summary, TRIUMF and Canada's other major research facilities have a demonstrable track record for delivering world-class science, enabling the success of the research community in Canada, translating this research into societal benefits and providing valuable training to highly qualified personnel. There are challenges in optimizing the investment being made in these facilities, but these national assets can and do deliver for Canadians.

Finally, it would be remiss of me not to invite the committee to tour TRIUMF should such a visit be possible as part of your deliberations or simply during the next time you find yourself in Vancouver. The scale of our infrastructure really should be seen in person to be appreciated.

• (1950)

Thank you very much for your time and the opportunity to speak to this committee.

The Chair: Thank you, Dr. Smith.

I'd like to thank Dr. McIsaac, Dr. Rafuse, and Dr. Smith for coming tonight and for your important perspectives. You have this brand new committee that really cares about what you have to say.

With that, we're going to go to our first six-minute round with our members.

Mr. Soroka, you have the floor.

Mr. Gerald Soroka: Thank you, Madam Chair, and to all the witnesses for coming tonight. I appreciate that some have been with us for a few hours longer than others, depending on which part of the country you're from.

Dr. McIsaac, I was quite intrigued by early childhood learning assisting with different types of ways to improve our society. I've always looked at the fact that we should really be starting before the child is even born.

Are we actually getting enough funding to assist, even before childhood, or are we just more focused on the child that's already alive, and not even with the parents before they become parents?

Dr. Jessie-Lee McIsaac: Thanks. That's a really important question.

There's been a lot more attention paid to the area of early childhood, and certainly as we understand more and more about how critical those early years are for a child's trajectory, and for a family as well.

In terms of the split of funding between different areas and facets that influence early childhood, that's a great question, and I'm not sure, but there could be more.

We also know so much about how the social determinants of health of a family in a community can really impact the child, and that certainly starts before the child is born. It's a really important area and one that needs more attention.

Mr. Gerald Soroka: Thank you for that.

I was more intrigued if you had any more information. If you did want to share that in the future and if you think of something later, you could write us to supply that as well.

Dr. Jessie-Lee McIsaac: Okay, I will do that.

Mr. Gerald Soroka: I would like to now go to Dr. Smith. You had spoken a lot about the different types of funding opportunities, where universities are partnering to create these new research facilities. I was just curious when you talked about the new facility for isotopes.

How was that funded and how did that become such a world-leading facility?

Dr. Nigel Smith: The funding for that was a combination of federal, provincial, and additional research funds from other organizations. The \$60 million that was required to build the facility came from a variety of those sources. It demonstrated one of the challenges of building the research portfolio in having to draw across all of these various sources of funding to make sure that you were able to actually execute on these sorts of programs.

It was an extended period of developing research proposals, developing research threads, and pulling together the overall portfolio. We are at the moment just about to complete the first outfitting. We're working with some provincial partners to complete the internal outfitting of some of the labs that will remain open.

• (1955)

Mr. Gerald Soroka: Thank you for that, Dr. Smith.

You said that we're able to compete with other countries around the world with the funding that we currently have, and yet other countries have twice our GDP.

Could you explain how we're able to compete, even though we're not being funded as highly as other countries?

Dr. Nigel Smith: It's a matter of choice in the areas in which we work. One of the benefits the Canadian system does have is the way that people will collaborate together and actually make decisions and focus on particular areas.

I'll give you an example with the particle physics community in Canada. We work in the accelerator lab in Geneva, called CERN, which is the global facility for particle physics. There are a variety of detectors that are looking for things like the Higgs particle, and so on. The Canadian community came together, and rather than deciding to work on all four of the detectors, we decided to work on a single detector. By doing so, by working solely on ATLAS, we've basically been able to focus all of our efforts onto that single detector and had a real impact within the ATLAS collaboration.

It's basically a question of the choices that are made and the collaborative ability of Canadians and Canadian researchers to focus and pull together on a variety of different areas.

Mr. Gerald Soroka: Thank you for that as well, Dr. Smith.

I still want to question you on another part. You said there are also challenges when you're collaborating, and you just mentioned how there was a focus dealing in one area. Does that mean that two or three other researchers didn't get to have their projects completed? Are these some of the challenges? How do you get around those challenges?

Dr. Nigel Smith: I think one of the key aspects here is the scale of the projects that we have to deal with in areas like particle physics, nuclear physics and even moving into medical isotopes. These are large-scale platforms that one needs to develop. The way that you have to build those platforms is to make sure that you have a consistent strategy across the community.

I think this is one of the areas where particle physics and nuclear physics, in particular, do well. There is an extended discussion within the academic research community pulling together a long-term strategy, a long-term program, that is then put towards funding within federal and provincial structures.

By ensuring that you have focus from the community, that then allows you to basically capitalize on that focus when one goes for funding.

Mr. Gerald Soroka: Thank you for that, Dr. Smith.

I'll move on to Dr. Rafuse. You mentioned—

The Chair: Mr. Soroka, I'm sorry. Your six minutes is up.

Thank you for those questions; they're important questions.

Now we will go to Ms. Diab for six minutes.

The floor is yours.

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

Welcome to all our witnesses here this evening.

As the chair said, this is the inaugural science and research committee of Parliament, the first of its kind.

Welcome to all of you from one coast to the other coast. Although, I have to say, being a member who represents Halifax West, that I'm extremely pleased and privileged to be able to ask both Dr. McIsaac and Dr. Rafuse a couple of questions tonight in the very few minutes that I have.

First, I want to thank both of you. There have been other witnesses in the past who have made similar points, but I really want to thank both of you for shining a light on some of the inequities in research and funding when it comes to smaller jurisdictions, particularly like Nova Scotia, and, quite frankly, like Atlantic Canada.

I've visited both Mount Saint Vincent and the repair centre at Dalhousie. The Mount has great work happening on early childhood and also on aging with the centre that you have. I know we punch above our weight.

Dr. Rafuse, let me just start by asking you directly about the research that you and your team are doing at the Brain Repair Centre. Just tell me a bit about that and what you're doing provincially, nationally and internationally—as much as you can in a short few minutes.

How does that help the research patients practically? I'm going to let you explain some of that because I know you didn't have a chance to do that.

• (2000)

Dr. Victor Rafuse: Thank you for the opportunity to address that question.

The Brain Repair Centre is a medical neuroscience institute, as you well know. By using the word “medical”, that basically means the patient outcome is really the final outcome. In all of the research we're doing, we're actually thinking about the outcome for the individuals who are facing the disorders they have.

We've developed a system at the Brain Repair Centre to focus on three main areas. They're very inclusive. One is neurodegeneration. You can break it down that most neurological disorders that occur in aging have to do with neurodegeneration. There's a neurodegeneration research group. There's a neurodevelopment group.

Neurodevelopment starts as early as in the fetus, but it also continues throughout life, and certainly in adolescence, where there are a lot of developmental issues that we don't think are development issues, such as autism, schizophrenia and the emergence of things like bipolar disorders. Those are really developmental disorders, and that's another main focus.

The third main focus, because we have a localized strength in that area, is on mobility issues, and particularly mobility issues that pertain to mobility from spinal cord disorders. That would be spinal cord injuries and diseases of the spinal cord, predominantly things like ALS and spinal muscular atrophy.

Those are our strengths in what we do. We're very collaborative. I think what we've done successfully is that we've connected with all institutes across Canada. This is a recurring theme. There's collaboration right across Canada. We've set up a network of institute directors across Canada to make sure we're talking together frequently. That's part of a brain strategy that we're working on right now.

More locally, I think it's important that we're working outside of Halifax and including the strengths of New Brunswick and P.E.I. We haven't reached out to Newfoundland yet, just because of time at this point. We would like it to be a maritime or Atlantic Canada initiative.

With regard to how we are addressing the patient, again, it's benched to a bedside approach. I think that's always important. It's terminology that's used very often, but I think it's often...I wouldn't say misused, but not taken as seriously as it should be.

A lot of our scientists are actually clinical scientists who come into the lab because they're faced with problems. For example, Dr. Adrienne Weeks is a neurosurgeon who specializes in brain tumours. She takes the problems she's faced with in the OR with her patients and she brings them into the lab.

Ms. Lena Metlege Diab: Dr. Rafuse, I want to ask Dr. McIsaac a question.

Before I do that, because I'm worried my time is going to run out—

The Chair: You have 35 seconds, so make it really short

Ms. Lena Metlege Diab: —I just want to remind you that the committee would love to take written comments from anyone who wishes to make them.

Dr. McIsaac, I don't know if I have any points, but with early childhood education, I know you've advocated for an affordable child care policy based on research and school-based health promotion and social determinants.

Can you tell us the value of that social science and health promotion research for Canadians, and that type of research on public policy?

• (2005)

The Chair: You have 15 seconds to do social determination.

Dr. Jessie-Lee McIsaac: I'll just maybe mention its relevance.

I think with the early learning and children care agreement, one really important connection to science is the opportunity it provides for early career researchers. It addresses a really important barrier that a lot of early career researchers are experiencing during life transitions that many of them are having at that time.

I'm really happy to see that happening, and that relates to enabling researchers to do science, to have access to—

The Chair: Thank you, Dr. McIsaac. That was really—

Ms. Lena Metlege Diab: I'm hoping some of my other colleagues will get back to you both on those....

The Chair: Thank you, Ms. Diab.

[Translation]

Mr. Blanchette-Joncas will now take his turn for six minutes.

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

I first want to welcome the witnesses who are with us today.

My first questions are for Mr. Smith.

Mr. Smith, in the Chief Science Advisor's annual report, she cited a rather major problem concerning Canada's megascience infrastructure. She referred to "considerable complexity and heterogeneity in the government's approach to support these major research facilities." She also talked about a lack of "formal coordination among the multiple organizations who fund and operate them."

Based on your experience, do you observe the same things?

[English]

Dr. Nigel Smith: I think the coordination has certainly proved that this is one of the areas where additional improvement could be made in thinking about a national strategy for some of the major research facilities, and thinking about the priorities we are trying to address as a country, the tools we need and the way we develop those tools.

I think one of the areas this touches on is that the length of time required to develop and build the sorts of infrastructures that TRIUMF represents is measured in many years. We have been operating, for 50 years, a variety of different accelerators, and if we upgrade those accelerators and bring in new technologies, these can be decadal programs. Having the ability to sustain a strategy and program over the length of time required for the full lifespan of a facility like TRIUMF is extremely critical.

Of course, there are new committees looking at coordination between the councils and CFI, and although that coordination is certainly improving, I think this is an area where additional improvement would really benefit Canada.

[Translation]

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

You talked about strategy. What improvements do you think could be made to achieve better strategic management of these big megascience facilities?

[English]

Dr. Nigel Smith: I think it revolves around thinking about the priorities the country has, the sorts of tools and techniques that will be required to deliver on those questions and the ability to tie together, and work collaboratively on, the infrastructures that we need to develop. As you build a new large-scale accelerator, for instance, it will take many years and hundreds of millions of dollars. The ability to understand the sort of science it will address, making sure that you are bringing in the [Technical difficulty—Editor] through building that strategy, is collaborative and about making sure that you are talking from a bottom-up perspective. What are the researchers in universities and researchers within the country trying to address? There are also some elements of the top-down perspective that we have grand challenges we know we will need to address in the future. What are the tools and techniques we will

need to address those grand challenges and make sure that coordination occurs across a time scale commensurate with building these facilities?

As an example, in looking towards climate change and understanding how we can address climate change, we will need to bring in a whole host of different tools, including the ability to understand, for instance, advance materials. If we're looking to develop battery technology, we need to understand how batteries work, how the surfaces and interfaces work. That's the sort of area that a facility like TRIUMF excels at by using particle probes to understand how surfaces and materials operate.

We need to make sure that we're looking as a country at the sorts of questions that we [Technical difficulty—Editor] how we bring all of these things together from both the bottom up and top down.

• (2010)

[Translation]

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

You talked about several problems that involve coordination and the need for a vision, among other things. Can you also tell us what the main challenges are that Canada will have to meet in terms of megascience?

[English]

Dr. Nigel Smith: That's a great question. I think it touches on many of the grand challenges that people will be aware of in terms of climate change, which is an obvious one, and looking at how we can bring our tools to bear. TRIUMF is a fundamental research facility. It's based in particle physics. It's based in nuclear physics. We need to make sure that we're also able to address many of the challenges that our community is looking to explore over the next few years.

That fundamental research, as has already been mentioned tonight, is the inspirational angle that will bring people into research. One might think that discovering the Higgs particle was extremely esoteric, but it was a fantastic opportunity to really inspire the next generation of researchers or next generation of engineers. Hence, although it's a very specific particle physics question, the highly qualified personnel, the students and the post-docs who get inspired by those sorts of questions, then go on to lead other opportunities and other options that will address these grand challenges.

[Translation]

Mr. Maxime Blanchette-Joncas: Thank you very much for presenting this information, Mr. Smith.

The Chair: Thank you, Mr. Blanchette-Joncas.

[English]

We really appreciate the discussion.

Now we will go to Mr. Cannings for six minutes

Mr. Richard Cannings: Thank you.

I'll continue with you, Dr. Smith. Thank you for the invitation to tour TRIUMF. I had the wonderful opportunity many years ago to tour TRIUMF when it was still pretty young—and I was obviously a lot younger too. It would be interesting to see how TRIUMF has changed. I also had the random luck to be put in a cabin on a train across Canada with one of the scientists from TRIUMF who worked on the CERN particle detector team in the Higgs particle project. Don't test me on how all of that works, but it was all very interesting.

All of this is to say that it was very exciting to be working at UBC, as I was back in the late seventies and early eighties, when TRIUMF was just starting. It was very much a point of pride there. At that time, I think three universities had teamed up—hence the name—and it was a really big example of co-operation in big science.

How does that work nowadays between TRIUMF and Canadian universities, or universities from wherever, who actually have a say in and are part of that team that runs TRIUMF?

Dr. Nigel Smith: We have expanded the number of Canadian universities who are effectively members of TRIUMF. We're just going through an incorporation process at the moment, but we hope that by the end of the year we will actually have 21 Canadian universities as members of TRIUMF. That goes all the way from Vancouver through to Halifax. That demonstrates the interest that the university researchers have in being part of an endeavour like TRIUMF. It allows their researchers to engage in the research that interests and drives and inspires them.

We have expanded from the "TRI" in TRIUMF, which stood for TRI-University Meson Facility. We no longer use that acronym. I don't know what the word would be for 21, but it keeps changing. We are certainly a demonstration of that ability within Canada to collaborate between the universities. It also demonstrates the need for these major research facilities because an operation like TRIUMF is too large for any one or even three universities to sustain. We are constantly looking to bring in other researchers and other universities to support the work we're doing.

• (2015)

Mr. Richard Cannings: Just to expand on that, how does this work when your scientists are working at CERN? Are you connected with CERN in a real way, or is it just people applying to work at CERN and getting time on the accelerators?

Dr. Nigel Smith: We have two aspects there. One is the detectors that the researchers are interested in, and also the accelerator at CERN, the Large Hadron Collider. One of the aspects that TRIUMF is engaged in at the moment... We secured \$10 million to build components of the next generation of the LHC. It's what's called the high-luminosity upgrade to the accelerator itself. TRIUMF is ideally suited to provide those components, because we are world experts in what's called superconducting RF technology, which is used in these accelerators.

The contribution that we make to CERN as the accelerator is, in some sense, a gateway that we use to allow our researchers to engage in the science there as well. Canada is not a member of

CERN, but it's associated with the research there, so by having this in-kind contribution to the accelerator, we make sure that Canadian scientists are more than welcome to utilize the facilities.

For the projects involving the detectors, we also act as a springboard, if you like, so that we are doing coordination work, but also using things like our detector technology team here in developing some of the techniques that might be used at CERN. That then becomes very collaborative with the university researchers.

There are two angles there. One is the detector and one is the accelerator itself.

Mr. Richard Cannings: I'll switch quickly to what you mentioned about isotope analysis and medical isotopes that you produce at TRIUMF and are produced in other parts of Canada. There was a crisis situation a few years ago, I think, around Chalk River, where suddenly there was a gap in isotope production.

Where is that right now and how do you fit in? What about the other isotope producers in Canada? How does that work? Do you work with CNL? How is that all organized?

Dr. Nigel Smith: This is an area where there is a lot of collaboration between the players within Canada, and this is to do with the development of technetium 99 as a radioisotope for medical imaging. There are several players. The Canadian Light Source has an approach. TRIUMF is heavily engaged in the production of these isotopes, as well, so we developed a new process to allow us to create those isotopes.

We work with Chalk River. We work with CNL. That's part of that collaborative aspect of ensuring that we're working across the major research facilities generally, but this is an area that is growing, and TRIUMF is aiming to be one of the—

The Chair: I'm sorry, Dr. Smith. It's the worst part of this, when all of you are sharing such important information in your research. Please forgive me.

We are now going to go to the five-minute rounds. We're going to hear from Ms. Gladu for five minutes, please.

Ms. Marilyn Gladu: Thank you, Chair.

Thank you to all the witnesses for being here today. I'm going to start with Dr. Rafuse.

I've had the pleasure of touring Dalhousie and the Brain Repair Centre, and I know that we are leaders in brain research in Canada. The question for you is how we maintain that leadership and strengthen our position in the world.

Dr. Victor Rafuse: The maintenance of leadership depends on our ability to continue to attract young researchers. I think it was mentioned earlier that young researchers are really the future of research in Canada, and we have to find better ways across Canada to make sure that we attract young people across different cultures and disciplines to do research. That's one of the biggest challenges that we're faced with.

We are definitely working more closely now with our fellow institutes across Canada, and I think that's a recurring theme. Dr. Smith was alluding to it as well. Collaboration in Canada is one of the key things that keeps Canada strong.

We have our local strengths and we're challenged to maintain them, but as a nation, something that we're faced with daily is how to continue to attract young researchers and keep them in science. It's a big challenge and it's a national issue that we all have to address.

• (2020)

Ms. Marilyn Gladu: Thank you.

Dr. Smith, I have had the pleasure of touring TRIUMF as well. That's a very impressive facility.

I have the same question for you. We're leading there. How do we strengthen our position to make sure we don't fall behind?

Dr. Nigel Smith: This touches on the question of building an ecosystem across the major research facilities and making sure we are able to support that ecosystem in a way that optimizes the investment that is being made.

This is where I would go back to ensuring that we are building a strategy across the major research facilities and then providing sufficient support across the entire life cycle of those facilities, not just for the capital investment, but also for the operational aspects of a facility, which are generally about 10%, year on year, of the capital cost.

It is about ensuring that we can build, maintain and operate that world-class, top of the game facility through continued investment across the lifespan of the lab.

Ms. Marilyn Gladu: All of you know that the Naylor report recommended that the government increase the spending for research and that the funding has not yet been realized.

A quick question for each of you is, would you agree that we should implement that recommendation from the Naylor report?

I'll start with you, Dr. McIsaac.

Dr. Jessie-Lee McIsaac: More funding is certainly a common thread, probably from all of the witnesses who have been brought forward. I think—

Ms. Marilyn Gladu: Good, I want to get you all on the record.

Dr. Rafuse.

Dr. Victor Rafuse: I'm on the record as saying yes.

Ms. Marilyn Gladu: Dr. Smith.

Dr. Nigel Smith: I have to agree with the previous two speakers. Yes, more funding is always good.

Ms. Marilyn Gladu: Excellent.

The next one is for Dr. McIsaac.

I'm very interested in your research on newcomers. What can we leverage from your research for the Ukrainian immigrants who we're now bringing to the country?

Dr. Jessie-Lee McIsaac: What an important question.

In our research, we've really tried to leverage the first-hand voices of families. I think it's listening to experiences, understanding their needs and building supports that are relevant and meaningful.

Science can help us do that. Science can be social sciences. It can be building programs and policies that support Canadians. That's a really important part of the work that I do.

Ms. Marilyn Gladu: If you want to submit any other recommendations or leverage your work through the committee, I would invite you to do that. That would be great.

I have a final question on the aging brain. One in six are seniors in the country. It's going to be one in four in less than five years.

Dr. Rafuse, what do we need to do there?

The Chair: Give a short answer, please.

Dr. Victor Rafuse: Thank you for the question.

If I had another hour, I could probably adequately address it. In the short term, we need to develop a strategy.

The strategy should be based on the aging brain, not based on specific diseases. One of the failures of neuroscience research is that it's all based on Alzheimer's versus Parkinson's versus ALS—

The Chair: Dr. Rafuse, I'm sorry to do this. You were just getting wound up to talk about this really important area.

Thank you, Ms. Gladu.

With that, we will go to Mr. McKinnon for five minutes.

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

I'm going to pick on Dr. Smith because my riding is Coquitlam—Port Coquitlam. We're kind of neighbours.

As was the case with Ms. Gladu, I've toured TRIUMF in recent years as well. I would underscore your recommendation that the committee take the opportunity, if it can, to have that tour.

As Mr. Cannings mentioned, you've picked up a great deal of the slack that came from shutting down the NRU reactor in Chalk River.

I'm wondering what kind of commercialization is available. From all the research and technologies you guys have developed, are you able to leverage that into support for your organization for the ongoing maintenance, development and evolution of research?

• (2025)

Dr. Nigel Smith: Thank you for the question.

For commercialization, we actually have a separate arm of TRIUMF called TRIUMF Innovations. The intent of TRIUMF Innovations is to look into TRIUMF and identify any IP that can be spun out or commercialized in work with both our researchers and external groups to try to develop new approaches or techniques that can be put to market.

Medical isotopes are certainly one area in which that's very active at the moment. We are beginning to develop commercialization links with several groups, but we do have a group actually located in TRIUMF, called BWXT, which runs a suite of cyclotrons that are used for isotope development. We are basically generating income either from royalties or from some of the operational aspects as BWXT creates these isotopes and they go as far abroad as UBC and Australia, so there's a very broad set of destinations for those products.

I would note that somewhere between 10% and 15% of the commercialization income—we have about a \$90-million to \$100-million operational cost per year—is derived from those commercial operations. But we would certainly note that commercialization is just one of the benefits that we can create. The societal benefit from being able to create these isotopes and hopefully cure cancers and certainly use them for diagnostics is one of the big societal benefits that we can introduce. So there is not just the commercialization and the income creation but also the impact of the technologies and the techniques that are being developed here.

Mr. Ron McKinnon: Thank you.

I know that you, as a major big science institution, attract a great number of highly qualified people from all over the world. I am wondering if you could speak to us a bit about what brings them, what keeps them here, and what attracts them.

Dr. Nigel Smith: That's a great question for somebody who came from the U.K. to Canada in 2009. I actually came here to run SNOLAB, which is a deep underground facility in northern Ontario. I was so enamoured with the Canadian system, the opportunities here, that I am now a joint Canadian-U.K. citizen.

As an illustration that the Canadian research ecosystem is really attractive, there are areas in which Canada excels, and by doing that it certainly does attract people from all over the world.

I would note, as another example of the benefits of the major research facilities and the ability to use them as training opportunities, that when people leave TRIUMF they are often going to very top positions in other labs around the world. By attracting people to Canada and training them, we are not only able to keep them here but also to ensure that we are adding value to the ecosystem.

Mr. Ron McKinnon: Thank you.

I think that's my time.

The Chair: Thank you, Mr. McKinnon. That's very gracious of you.

Dear colleagues, we've come to the end and I want to thank all of you. We thank you for coming, and we thank you for your work.

Mr. Ron McKinnon: Madam Chair, on a point of order, I'd just note that our Bloc and NDP colleagues tend to get a little bit short-

changed. Given that it's Mr. Cannings' birthday, I wonder if we can give them a couple of minutes.

The Chair: Thank you.

At the will of the committee, I think we could do two and a half minutes to each, but it would be at the will of the committee and since it's Mr. Cannings' birthday.

• (2030)

Mr. Richard Cannings: Did you say that I should go first because it's my birthday?

The Chair: Was there agreement, Mr. Clerk?

Mr. Richard Cannings: I don't know. People are nodding.

Mr. Chad Collins: There is agreement.

The Chair: Okay. That's wonderful.

The Clerk of the Committee (Mr. Leif-Erik Aune): Yes.

Some hon. members: Agreed.

Mr. Richard Cannings: I'm wasting my two and a half minutes, so I'd better get going.

The Chair: No.

Mr. Cannings, we have to let Mr. Blanchette-Joncas go ahead for two and a half minutes, and then go to you.

[*Translation*]

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

I would like to thank my colleague Mr. McKinnon for this present. I would have accepted it in the first round, but I will take it in the second.

My question is for Mr. Rafuse.

Mr. Rafuse, my question is somewhat broad: what are your priorities in terms of what you expect from the federal government?

[*English*]

Dr. Victor Rafuse: That's a very good question.

I think the expectation is to broaden or increase the funding for discovery research. I think that's fundamental even for the megaprojects like Dr. Smith has been talking about. You actually have to have individuals across Canada who can participate in such a phenomenal facility.

I think we need to make sure that we keep them funded and increase the funding of all Canadians who deserve funding.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you.

I'm going to continue quickly with a question for Ms. McIsaac.

Ms. McIsaac, I was really intrigued by your research chair in early childhood. In Quebec, we put the early childhood system in place over 20 years ago. It takes ingenuity, but also a lot of courage to implement a social project like that, and I think it is now inspiring the rest of Canada.

Have you had a chance to collaborate with the scientific community in Quebec concerning your research chair's studies?

[English]

Dr. Jessie-Lee McIsaac: Yes, that's a really great question.

I think we certainly do have a lot to learn from those in Quebec with respect to where we're going in our early learning and child care system in Canada. It's really an exciting time to be doing research and science in this field.

Yes, I have had the opportunity to connect a bit with scientists in Quebec. I think more cross-Canadian collaboration would be so important as we move forward with this really fundamental shift in the way that our early learning and child care system is being built and supported and implemented for our families, for early childhood educators, and for Canadians.

So, yes, I have, and I look forward to more opportunities.

[Translation]

Mr. Maxime Blanchette-Joncas: Thank you.

Ms. McIsaac, quickly, can you tell me what your priorities are in terms of what you expect from the federal government?

The Chair: There are 20 seconds left.

[English]

Dr. Jessie-Lee McIsaac: In addition to discovery research, I think bringing the voices of Canadians to science and research is really important. Leveraging and making sure that the research that we do has an impact on additional research, on policy, on practice, and that Canadians can access that information and that information is being [Inaudible—Editor].

The Chair: Thank you, Dr. McIsaac. You are always very succinct and we appreciate that.

Mr. Cannings, for two and a half minutes, please.

Mr. Richard Cannings: Thank you, Madam Chair.

I'm going to direct my questions to Dr. Rafuse.

With regards to Canada's funding things that we're good at, it seems there are certain areas where Canadian research has excelled and has attracted good researchers from around the world.

I'm wondering about your own field, the Brain Repair Centre. I know when I worked at UBC in the department of zoology, we had ICORD working on the repair of neural systems.

Is that one of the areas that you think Canada excels at? How should we be nourishing these areas of excellence?

Dr. Victor Rafuse: Yes, I would agree 100%. Canada hits well above its weight in neuroscience research, and I think [Technical Difficulty—Editor] maintain it to this day. I think we were successful in attracting people from all over the world to come here to make Canada a place to establish their career.

What do we have to do to maintain that and increase that? We need—and we're doing it—to develop systems to collaborate better across Canada. Trying to find funding opportunities to enable us to do that more efficiently would be outstanding.

All across Canada in pretty much every university that I can think of there's some expertise, if not outstanding expertise, in neuroscience. The idea is how do we communicate together? We do it because it's the nature of science, but to make it really grow and to become something bigger than what it is today really requires an ability—

• (2035)

Mr. Richard Cannings: I have a quick question. I'm sorry, the yellow card is up.

I'd like to get some quick final thoughts on smaller universities. You mentioned the University of Prince Edward Island. You said I think something like CFI is not a national program.

How can we make sure that we provide the funding for those smaller places?

The Chair: You have eight seconds.

Dr. Victor Rafuse: In one sentence: Get rid of the match.

The Chair: That was succinct. I want to say thank you, Mr. Cannings, and also to all of our witnesses.

We thank you for your research. We thank you for sharing your research with us, and we all wish you continued success. We'll say good night to you.

To our colleagues, if we could log off, we have to come back for committee business. We have quite a bit of work to do.

Thank you again to the witnesses.

[Proceedings continue in camera]

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