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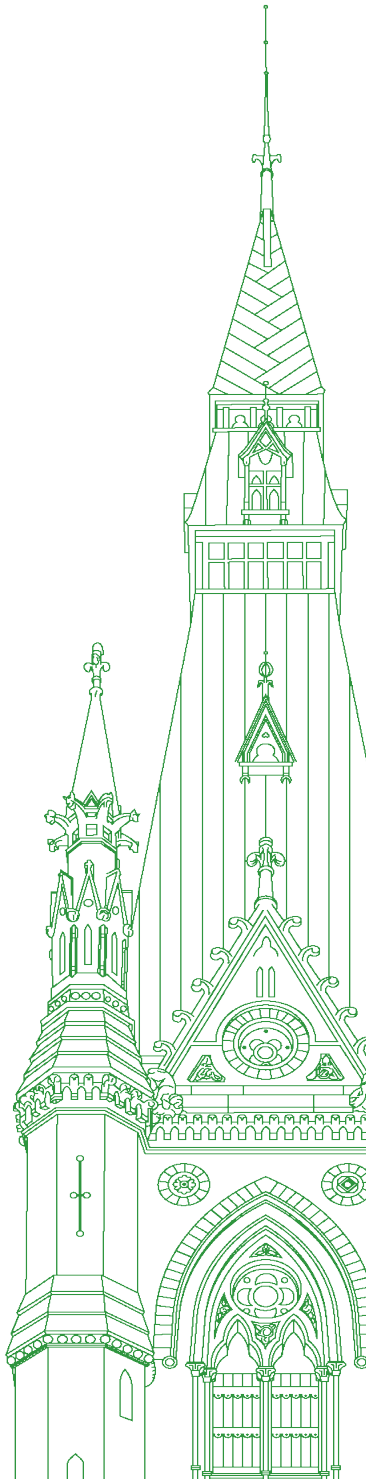

Chair: Mr. Joël Lightbound

Standing Committee on Industry and Technology

Friday, April 8, 2022

● (1305)

[*English*]

The Chair (Mr. Joël Lightbound (Louis-Hébert, Lib.)): Welcome to meeting number 17 of the House of Commons Standing Committee on Industry and Technology.

Pursuant to Standing Order 108(2) and the motion adopted by the committee on Tuesday, March 1, 2022, the committee is meeting to study domestic manufacturing capacity for a COVID-19 vaccine.

Today's meeting is taking place in a hybrid format. For those present in the room in Ottawa, you know the rules in place, so please govern yourselves accordingly.

I want to thank all the witnesses who are with us today. We have many witnesses for the panels in both the first and the second hours.

For the first hour, from the Department of Industry, we have Mr. Eric Costen, senior assistant deputy minister, industry sector.

[*Translation*]

We also have Rodrigo Arancibia, Senior Director, Life Sciences and Biomanufacturing Branch; Darryl C. Patterson, Director General of the Life Sciences and Biomanufacturing Branch; and, lastly, Daniel Quinn, Director, Research Infrastructure and Outreach, Science and Research Sector.

From the National Research Council of Canada, we also have Maria Aubrey, Vice-President, Strategic Initiatives; and Lakshmi Krishnan, Vice-President, Life Sciences.

Thank you, everyone, for being with us today for the first hour.

In the second hour, we will hear from Dr. Alain Lamarre, Full Professor at the Institut national de la recherche scientifique, who is appearing as an individual; John R. Fulton, President of Biolyse Pharma Corporation; Andrew Casey, President of BIOTECanada; Oliver Technow and Marc Sauer from BioVectra; and, lastly, Dr. Volker Gerdts, Director and Chief Executive Officer of the Vaccine and Infectious Disease Organization.

As we have a very full agenda, I would ask everyone to stick to their allotted time. I normally have a small yellow card to signal one minute left and a red card to indicate that time is up.

Without further ado, we will begin the first hour of our meeting with the first witness panel.

Mr. Costen, the floor is yours.

[*English*]

Mr. Eric Costen (Senior Assistant Deputy Minister, Industry Sector, Department of Industry): Thank you, Chair.

Good afternoon, members. On behalf of my colleagues, we're very pleased to be here today to provide you with an update on domestic biomanufacturing capacity in Canada.

It's well established that at the outset of the pandemic, Canada had very little of the biomanufacturing capacity required to produce the relevant vaccines. This reality was the result of a 30- to 40-year decline in the sector, which saw major firms exit the country. It hindered our ability to attract manufacturers of COVID-19 vaccines to Canada.

From the very outset of the pandemic, the government immediately set to the task of addressing these biomanufacturing gaps through a series of strategic investments. This process began with a thorough review of Canada's existing industrial capabilities for biomanufacturing, looking at existing production capacity in particular in order to identify both critical gaps and existing assets where there were opportunities for growth.

Informed by this view and motivated to urgently expand domestic capacities to develop and manufacture vaccines, the government immediately sprung to action. Since the spring of 2020, there have been investments of approximately $1.6 billion in new vaccine, therapeutic and biomanufacturing projects.

The government's long-term plan to ensure an innovative, responsive and resilient sector was articulated in the biomanufacturing and life sciences strategy, which was announced last summer. The strategy has two broad objectives. The first is to grow a strong and competitive domestic life sciences sector with cutting-edge biomanufacturing capabilities. The second is to fundamentally enhance Canada's preparedness in order to respond to future pandemics and other health emergencies.

The strategy has five pillars in pursuit of these objectives. The first is strong, coordinated governance. The second is to strengthen research systems and the talent pipeline. The third is to grow world-leading companies in the sector. The fourth is to build public assets and public capacity. The fifth is to enable innovation through world-class clinical trial systems and the regulatory environment.

Under these five pillars, the strategy aims to build flexible manufacturing facilities across a portfolio of cutting-edge technology platforms to ensure that Canada has the ability and the flexibility to address a wide range of infectious disease threats, while also fostering a sustainable industry that will drive economic growth. One of the first actions was to start construction on the NRC's biologics manufacturing centre in Montreal, which is an end-to-end production facility that will be capable of producing a wide range of vaccines and other biologics.

The government has made several investments across the country, building on areas of strength and where there is a strong base of innovation. For example, it's providing funding and support for the University of Saskatchewan's Vaccine and Infectious Disease Organization, or VIDO, for the clinical trials of its two COVID-19 vaccine candidates as well as an expansion of its facilities.

To support end-to-end vaccine manufacturing capabilities across a range of technology platforms, investments have been made in companies such as Sanofi Pasteur and Resilience Biotechnologies, the latter of which has a multi-year agreement with Moderna to now produce their drug substance for their COVID-19 vaccine at its facility in Mississauga.

To build up capabilities and supply chains in mRNA more broadly, the government has also invested in BioVectra's vaccine manufacturing facilities in Prince Edward Island. Other investments have been made in promising researchers and developers, like Precision NanoSystems in Vancouver.

Recognizing the success of antibody therapies in treating COVID-19, investments have also been made in pioneering developers like AbCellera, who are also located in Vancouver, in order to support their research and production activities.

Since many vaccine manufacturers and developers often use contract manufacturers to fill their vaccines into vials and to package and distribute them, steps are also being taken to ensure an adequate presence of those services in Canada. The lack of this sort of manufacturing capacity was a critical gap identified at the outset of the pandemic. We are making progress to address it.

● (1310)

Investment attraction is critical to ensure the sustainability and growth of this sector. In August 2021, the government signed a memorandum of understanding with Moderna, a leading mRNA vaccine developer, so that they would build a state-of-the-art mRNA vaccine production facility here in Canada. As a result of these investments and others, and ongoing work and negotiations that we expect will lead to new projects and more capacity in the months and years ahead, Canada will have a diversified production capacity for hundreds of millions of doses across a range of vaccine platforms.

A sustainable and thriving biomanufacturing and life sciences ecosystem is not possible without a cutting-edge pipeline of science and research and the talent base to drive it. To this end, two other initiatives have also been launched. The Canada Foundation for Innovation will deliver a bio-innovation research infrastructure fund to support infrastructure needs at post-secondary institutions and research hospitals. As well, federal research funding agencies are delivering a new Canada biomedical research fund, and this is designed to support high-risk applied research, as well as training and talent development.

In addition, colleagues at Health Canada are working to enhance and modernize the relevant regulatory systems, and the Canadian Institutes of Health Research is preparing to launch a new clinical trials fund. This will support clinical studies for new drug candidates.

Taken together, the investments that have been made to advance the strategy will provide Canada with a diverse and strong base of domestic biomanufacturing capabilities that will be needed to fight future pandemics.

At this time, I'd like to turn to my colleague, Maria, who will say a few more words about the NRC's biologics manufacturing centre.

Thank you.

Ms. Maria Aubrey (Vice-President, Strategic Initiatives, National Research Council of Canada): Thank you, Mr. Chair, for the invitation to speak with you today about the National Research Council of Canada, as part of your study on domestic manufacturing capacity for COVID-19 vaccines.

I'd like to begin by acknowledging that the National Research Council facilities are on the traditional unceded territories of many first nations, Inuit and Métis people, and their ancestral footsteps and rights extend beyond the boundaries that exist today. We respectfully honour these peoples' rights, history and relationships with this land.

My name is Maria Aubrey, and I'm the vice-president of strategic initiatives and responsible for the design, build and operationalization of the NRC's new biologics manufacturing centre.

I am joined today by my colleague from the NRC, Dr. Lakshmi Krishnan, vice-president of life sciences. In this capacity, she oversees the human health therapeutics, aquatic and crop resource development and medical devices research centres.

The NRC is Canada's largest federal research and development organization. Throughout the COVID-19 pandemic, the NRC has been an important contributor to Canada's response, including testing PPE and helping develop a made-in-Canada solution for COVID-19 testing.

The NRC also provided support to firms through the new "challenge" programs and our industrial research assistance program, best known as IRAP. Today, IRAP has invested $81 million to support 14 small and medium-sized enterprises developing made-in-Canada vaccines and therapeutics. Through IRAP, the NRC also supported more than 2,200 innovative businesses, helping them weather the pandemic and preserving over 26,000 jobs in Canada.

Early in the pandemic, the Government of Canada asked the NRC to establish the new biologics manufacturing centre for biomanufacturing production at our Royalmount campus in Montreal, Quebec. In June of 2021, we completed the construction of the centre. This new end-to-end biomanufacturing facility is designed to produce cell-based vaccines and other biologics in compliance with good manufacturing practices, GMP. This includes viral vector, protein subunit, virus-like particles and other recombinant proteins.

The biologics manufacturing centre has a production capacity of approximately 4,000 litres, which could translate into approximately two million doses of a vaccine per month. It is important to note, however, that the number of doses will vary widely depending on the specific vaccine and the manufacturing yield.

The biologics manufacturing centre was built to fulfill a public good mandate. This means if another pandemic or health emergency strikes, the biologics manufacturing centre will be made available to produce cell-based vaccines or other drugs to keep Canadians healthy and safe. In non-pandemic emergency times, it will focus on public interest projects such as the production of drugs for rare diseases to support the health of Canadians and protect those at high risk. Collaborating with industry and academic partners, the biologics manufacturing centre will complement and support Canada's domestic capacity and knowledge in biomanufacturing.

In June 2021, through the budget implementation act, the NRC received royal assent for the legislative authority to engage in the production, on any scale, of drugs and devices, as those terms are defined in section 2 of the Food and Drugs Act, for the purpose of protecting or improving public health in Canada or elsewhere. This new authority allows the NRC to produce vaccines and other biologics at the BMC on a commercial scale, once all Health Canada approvals have been secured.

The NRC is now completing the commissioning, qualification and validation process of the centre to demonstrate GMP compliance. This is required for all new biomanufacturing facilities producing drugs for humans in Canada.

In February of 2021, the Government of Canada signed a memorandum of understanding with Novavax to pursue options to produce its COVID-19 vaccine at the biologics manufacturing centre once both the vaccine candidate and the facility receive the required Health Canada approvals. In February of 2022, Health Canada announced the authorization of the Novavax COVID-19 vaccine in adults 18 years of age and older.

● (1315)

The NRC is working with Novavax on the technology transfer. It includes pilots from small to large scale to demonstrate the required quality characteristics through engineering runs and quality production batches. Once that is satisfactorily achieved and Novavax receives approval for production at the centre, production can continue on a commercial scale.

To conclude, as an important part of Canada's broader biomanufacturing and life sciences strategy, the new biologics manufacturing centre will help increase domestic capacity for vaccine innovation and production to bolster Canada's resilience and preparedness. The biologics manufacturing centre is intended to serve as a foundational element for a proposed broader system of federal capabilities and assets to respond to future pandemics or other health priorities, supporting Canada's national biomanufacturing security and sovereignty.

Thank you for your time, and we'd be pleased to answer your questions.

[*Translation*]

The Chair: Thank you very much, Mr. Costen and Ms. Aubrey.

Mr. Généreux, you have six minutes.

Mr. Bernard Généreux (Montmagny—L'Islet—Kamouraska—Rivière-du-Loup, CPC): Thank you, Mr. Chair, and thanks to the witnesses.

Mr. Costen, can you tell us whether Medicago is one of your vaccine development partners in Canada?

[*English*]

Mr. Eric Costen: Absolutely, and thank you very much for the question. Medicago is most certainly one of the vaccine manufacturers in the country that we've invested in over the last number of years.

[*Translation*]

Mr. Bernard Généreux: When the Government of Canada decides to invest in businesses to develop and produce vaccines, what processes are put in place to determine who the owners and partners of those businesses are?

You can probably see my next question coming. Has the Canadian government checked to see who Medicago's co-owners and partners are? Based on what we now know, and barring evidence to the contrary, that business won't be able to sell its drugs or vaccines anywhere else but in Canada.

● (1320)

[*English*]

Mr. Eric Costen: That's a very important question. I'm happy to answer it and to provide as much information as I can regarding the process for making investment decisions and, quite frankly, the situation regarding Canada's investment in Medicago.

The first thing I would say is that there is an extensive process for vetting requests for funding under the strategic innovation fund, a significant due diligence that, of course, includes a significant examination of the financial situation of the applicant, including the ownership structure.

What I would do is go back to the time frame in which the decision for funding Medicago was made. The basis for those decisions was really shaped by the quality of the science and the view from Canada's experts regarding what held the most promise in Canada to quickly bring an effective vaccine to market. Of course, you'll recall that in 2020 there was a very urgent need to invest in a broader range of efforts to develop and bring to market a safe and effective vaccine.

Medicago has long been recognized by experts as being one of the stronger and most scientifically proven vaccine manufacturers operating in Canada. This view is not only the view supported by the Government of Canada. It's also one supported by the U.S. government through their BARDA and DARPA programs that have also invested in the company. I think the decision to fund Medicago and develop their vaccine technology and vaccine candidate has in some ways been confirmed by the recent regulatory decision and approval of their vaccine, which is one of only six made yet to date.

Regarding the ownership structure, we were very well aware at the time that PMI held a minority share in the company. It was examined carefully and not viewed as a contravention of the WHO Framework Convention on Tobacco Control. The focus really was on the quality of their science and the promise that their vaccine candidate brought with it, knowing that, based on their science, their platform technology and the view from experts, there was a high likelihood that this could be a promising vaccine candidate and one that was worthy of investment.

The final point I'll make is regarding the WHO decision. As has been reported publicly by the company—I know Minister Champagne has stated this publicly—we're very aware that the company is looking with some urgency at the question of its ownership structure, and we continue to be in close contact with the company, understanding that they recognize the seriousness of the WHO decision and are moving to make decisions to address the challenges they face.

[*Translation*]

Mr. Bernard Généreux: Thank you, Mr. Costen.

I entirely agree that we want to promote Medicago's products. The question in my mind is more about the federal government's responsibility for those products.

Before investing $173 million in a business, isn't it customary to ensure that the products of that business, regardless of their quality, can be sold both in Canada and around the world?

The WHO's policy hasn't changed as a result of Medicago. It was already in place before the government decided to invest in the company.

● (1325)

[*English*]

Mr. Eric Costen: Again, thank you very much for the question.

At the time of the investment, it really was an investment in their vaccine candidate and looking to get an effective and safe vaccine to market as soon as possible.

The ownership structure and the challenge that it might present to them was not known at the time of the decision. It's probably worth mentioning that the PMI group owns a minority share in the company. It is majority controlled by Mitsubishi. It operates as an independent biomanufacturing company and, really, the focus was on getting a safe and effective vaccine to market as soon as possible.

[*Translation*]

Mr. Bernard Généreux: Mr. Costen, let me repeat my question…

The Chair: Pardon me, Mr. Généreux, that's all the time you had.

I now give the floor to Mr. Dong for six minutes.

[*English*]

Mr. Han Dong (Don Valley North, Lib.): Thank you very much, Chair.

I want to thank the witnesses for coming today and participating in this study.

My first question is for the public servants at ISED. I remember that, from the beginning of COVID, the capacity to produce a potential vaccine in Canada was widely talked about in my riding and among the public. Then we found out that the capacity to produce had been tapering off for decades.

Can you explain to me a little better what we're doing to make sure that this doesn't happen again? It was due to decisions by all governments in the past that we allowed the production of vaccines to leave Canada and land somewhere else. How do we make sure that this doesn't happen again?

That's for the ADM, please.

Mr. Eric Costen: Thank you. It's a pleasure to answer that question.

You're absolutely right. At the outset of the pandemic, when Canada went looking for the capacity that it could rely on to develop and manufacture a COVID vaccine, it found a sector that had been largely diminishing over many years. I could certainly turn to my colleague Darryl Patterson on that. He could describe to you some of the major exits over the last few decades.

Before I do that, I might really emphasize that, having done that survey and having looked for a number of very core capacity attributes.... We were looking for the ability to manufacture vaccines across major different vaccine platforms. As I'm sure most of the members of this committee will know, not all pathogens are the same and not all vaccines are the same. They're not all built on the same platform. In order to have a resilient biomanufacturing and life sciences sector, you need a diversity of capacity that cuts across multiple platforms, because you just don't know what pathogen is going to hit you.

As I mentioned, there are different parts of the value chain, all the way from basic science and R and D through to commercialization and so-called fill and finish. Canada had very little capacity on the back end. We've really prioritized investments now such that, when we look and we do the math on the investments that have been made, we've gone from a position where we had very little capacity at scale to fill and finish vaccines to where we have an ability to fill and finish approximately 300 million to 400 million doses per year across platforms.

Of course, that not only puts us in a position to be able to serve the domestic needs of Canadians, even in situations where you would need multiple vaccines in a given year, but it also puts the sector on a sustainable footing in order to be able to provide much-needed assistance globally.

Mr. Han Dong: That's great. Let me just stop you there for a second. I'm sorry. I have limited time.

You talked about making sure that the sector is on “sustainable footing”. That's very important. I want to go back to my original question. What happened for them to leave Canada? Was it because the profit margin just wasn't there, or was it not sustainable to produce in Canada? Have we addressed the root cause of that problem?

You talked about more than 300 million every year now. Is that sustainable? The demand for vaccines may taper off as we exit COVID.

● (1330)

Mr. Eric Costen: If it's okay, I might turn to my colleague Darryl Patterson to answer that part of the question.

Mr. Darryl C. Patterson (Director General, Life Sciences and Biomanufacturing Branch, Department of Industry): Sure. I'm happy to jump in. Thank you for the question.

Of course, it was for a number of reasons that we witnessed over the last 30 to 40 years a decline in manufacturing capacity in Canada. Essentially, from the early 1970s we went from importing about 20% of our vaccines and therapeutic drugs to over 85% today. We saw a number of factors over the course of these years. One was companies concentrating their manufacturing in large markets where there are cost advantages and other underlying factors.

I think the key thing you're raising here is to make sure that we have an ecosystem that's supported, from discovery to clinical trials to commercialization and end-stage production. By focusing the strategy on all of the value chain, making those investments across the value chain and ensuring that we're developing flexible manufacturing capacity, in non-pandemic times, when those facilities are not focused on a specific vaccine, they can be put to other uses. For example—

Mr. Han Dong: I'm sorry to cut you off, but I want to get one more point in.

How important is it—

The Chair: I'm sorry, Mr. Dong. I'll be the one to cut you off. We're very tight on time.

We'll go to Mr. Lemire for six minutes.

[*Translation*]

Mr. Sébastien Lemire (Abitibi—Témiscamingue, BQ): Thank you, Mr. Chair.

Mr. Costen, allow me to restate Mr. Généreux's question. You gave two quite different answers.

Did you or did you not know who Medicago's financial partners were before giving the company $173 million, knowing the WHO would be setting conditions respecting tobacco companies?

[*English*]

Mr. Eric Costen: As I said in my first answer, we did know. It's part of the due diligence process and looking at the financial situation of the company. Part of that is an examination of the ownership structure. There was an awareness at the outset that PMI had a minority position over Medicago.

[*Translation*]

Mr. Sébastien Lemire: So perhaps there's a lesson to be learned there.

When Minister Champagne appeared before the committee, he committed to ensuring that the National Research Council of Canada's Human Health Therapeutics Research Centre would be ready in the fall of 2021.

It's important to expand vaccine production capacity, as I'm sure you'll agree. Last year, everyone came and told us it was appalling that Quebec's pharmaceutical sector, a jewel in the crown of Quebec's economy, had been abandoned and that more new money would therefore be invested elsewhere in Canada.

Are there still a lot of delays in the process for approving research centre laboratories in Canada?

[*English*]

Mr. Eric Costen: I will turn to my colleague Daniel Quinn, who has oversight over research infrastructure and can probably provide you some information regarding the process for laboratory approvals.

Daniel.

Mr. Daniel Quinn (Director, Research Infrastructure and Outreach, Science and Research Sector, Department of Industry): Thank you for the question.

Absolutely. Supporting downstream biomanufacturing capacity with upstream investments in research and talent in post-secondary institutions and research hospitals is critical. This includes the applied research funding supports and the infrastructure to support it.

Part of the consultations in 2021 found that along with the science [*Technical difficulty—Editor*].

[*Translation*]

Mr. Sébastien Lemire: The interpreter's telling us his remarks are inaudible. I can't hear anything either.

[*English*]

The Chair: I believe you're on mute for some reason, Mr. Quinn. Can you try again?

Mr. Daniel Quinn: Can you hear me now? I'm sorry about that. I'll try to be brief.

Under budget 2021, there were significant investments for science and research, investments in both the talent pipeline infrastructure and applied research. That includes the laboratories themselves. The strategy was released in the summer shortly thereafter. The Canada Foundation for Innovation released the biosciences research infrastructure fund, and that was done quite quickly after the release of the strategy, in September. The containment level three and four laboratories that are funded from that competition are really the critical pieces necessary to support infectious disease research for pandemic readiness under the strategy.

Further to that, there will be a larger investment on the equipment and research side to follow. Just last week, the Canada biomedical research fund and the biosciences research infrastructure fund competition was also launched.

● (1335)

[*Translation*]

Mr. Sébastien Lemire: Under the budget introduced yesterday, only $20 million will be allocated to the Canadian Institutes of Health Research over five years starting in 2022-2023. However, it seems to me we agreed that we need to have bigger ambitions, more particularly, that we need to rebuild the entire vaccine production ecosystem. I don't think that amount is enough to realize our ambitions, particularly those Mr. Quinn just cited.

I'd like to hear what you have to say about that.

[*English*]

Mr. Eric Costen: If we look back to last year's budget and the commitment to $2.2 billion, which is in addition to the $1.6 billion that has been spent to date, that's the marker for funding the strategy. Of the $2.2 billion, approximately $1 billion is dedicated to various research undertakings, whether it's through supporting building out research infrastructure or through the Canada biomedical research fund or the clinical trials support.

Our strategy, executing on the strategy and rebuilding the sector are in many ways fuelled by the funding that was allocated in last spring's budget. We have lots or work ahead of us.

[*Translation*]

Mr. Sébastien Lemire: The NRC's Human Health Therapeutics Research Centre could produce a vaccine developed by the American company Novavax once it has received the necessary regulatory approval.

Would you please tell us a little more about that?

Could you also tell us how the NRC manages its cooperative arrangement with its private-sector partners?

[*English*]

Mr. Eric Costen: Go ahead, Maria.

Ms. Maria Aubrey: There are two portions to that. The first one, with regard to the engagement with Novavax, is progressing very well. As you are aware, the construction of the facility is complete, as I indicated. We're now focusing on the technology transfer through all the different phases and ensuring that it is done in accordance with good manufacturing practices to ensure that there's sustainability of the facility and that we not only end up with the ability to produce the Novavax vaccine but that we have demonstrated the capability of the centre for ongoing support.

In regard to collaboration and managing our partnership, I would like to pass it over to Dr. Krishnan, as the NRC not only has the biologics manufacturing centre but the engagement starts right from research and development through to supporting clinical trials and then on to, now with the biologics manufacturing centre, being able to do the production.

Dr. Lakshmi Krishnan (Vice-President, Life Sciences, National Research Council of Canada): Thank you to my colleague Maria for the opportunity to intervene and present the way NRC collaborates with the industry.

NRC has a long history of collaboration in the area of vaccines and biologics development with Canadian industry and, where appropriate, with others. We continually do this by partnering and identifying opportunities across the continuum of what we need to do to support the pipeline development and movement of R and D from early-stage, preclinical work to the later stages. With the new production facilities we will have in the biologics manufacturing centre and, in the future, the ability to make clinical trial material, we will be able to provide end-to-end support to the Canadian industry for advancing the pipeline.

During the pandemic, we demonstrated that. Very early on in the pandemic, we worked with a number of Canadian industries, for example, supporting the preclinical work necessary to advance to clinical trial for VIDO's COVID-19 vaccine candidate, as well as working with VBI Vaccines Inc., another Canada-based R and D unit and company, to advance its COVID-19 vaccine to clinical trials. As well, our industrial research assistance program has supported many.

● (1340)

The Chair: Thank you, Dr. Krishnan.

We'll have to move now to Mr. Masse for six minutes.

Mr. Brian Masse (Windsor West, NDP): Thank you, Mr. Chair.

Thank you to our witnesses for being here.

There is no doubt that the pandemic has highlighted the decline of Canada's manufacturing sector, not only with regard to vaccines but a number of different industries. The remnants have had to transition to doing everything from medical equipment to hand sanitizer made by breweries, a whole series of things that were identified as weaknesses before, while we have signed serious trade agreements that allowed environmental or labour and working conditions to be be used as subsidies against our own manufacturing base.

This is no different, in many respects, from the promises by the large Rx and D and other pharmaceutical industries to reinvest in Canada with tax reductions and the extension of patents. Those were supposed to bring a panacea of investment, which never took place.

As we try to build our sector back here—and I'd like to ask Mr. Costen this—Canada is one of 182 countries that signed on to the tobacco issues with regard to the WTO. How much has this damaged our reputation? In this process, what is being done to build that back? We're still waiting for a decision. This is not an unknown thing. Philip Morris has a very clear history. Now we're caught in this situation. We're one of 182 signatories. What can we do at this point to bring in an internal process so it doesn't happen again?

Mr. Eric Costen: Thank you so much for the question.

Your question raises a number of really important issues, the first of which is that Medicago is, first and foremost, a vaccine manufacturing firm that is not controlled by PMI. It is completely independent. It operates in and around Quebec City. It has a site in North Carolina. It is a company that has gone from very much a start-up to prerevenue. It has shown exceptional quality in its science. The technology platform for the vaccine it has brought forward is unique insofar as it offers a safe and effective alternative to mRNA vaccines. Views of the promise of the science, the promise of the technology, the quality of the company and the asset it represents to Canada are very widely held amongst experts throughout Canada.

With respect to the issue of its ownership structure and the legacy of PMI, there's no question there. Canada's position on tobacco control and its commitment to the Framework Convention on Tobacco Control, as you indicated in your question, are very long standing. When it came time to review the application for investment by the company, there was very careful consideration given to the implications of PMI having a minority stake in the ownership structure. Those considerations were weighed against the reality that we were a few months into a global pandemic when there was a race to get a vaccine developed and into the arms of people. In that situation and faced with those choices and understanding that there might be challenges associated with that down the road, the unanimous view of experts was that this was a company worth investing in and that this was a base of science that showed promise. In October of 2020, when there wasn't a COVID vaccine to be seen, that was very much the decision that was made.

My final point—not to repeat myself or to be too long-winded, and I apologize for that—is that the ownership questions that are being raised today and the problem that PMI ownership presents to the company and its long-term viability, in answer to the member's first question, are very much on the mind of the company right now. We expect them to take action.

● (1345)

Mr. Brian Masse: I appreciate that. I have to cut you off, and I'm going to leave it at that. I have a little bit of extra time left, and I want to use it for another question. I appreciate your answer. It's a difficult situation we're all involved in here, but we have to fix it really quickly.

Thank you for that.

Really quickly, then, to move to my second question, with the investments we're making in partnerships and the original Bill C-52, which allowed for the generic production of vaccines for malaria, tuberculosis, AIDS/HIV and enterovirus...the Canadian access to medicines regime is what it has actually come to be. Do the products we're actually producing and putting public money into allow for the entrance into that automatically? This is known formally as the Jean Chrétien Pledge to Africa bill. We've only seen it used once because it is such disastrous legislation. However, will all of the medicines we are actually cofunding through the public purse to help the general public be compliant so that we will be allowed to produce them generically if the developer or the country does not do it at a low cost?

Mr. Eric Costen: Thank you for the question.

I will say off the top that you're asking a question that is not really in my area of expertise, nor in my colleagues'.

If we have time, I might turn to my colleague Darryl Patterson, who could offer a few views. You're asking a very big question about IP and patents. We'll certainly do our best, but it may be something we need to return to you on.

Darryl, do you want to try this?

The Chair: I'm afraid, Mr. Costen, we're out of time for that. If you want to submit anything in writing, that's always possible via the clerk of the committee.

Mr. Brian Masse: That would be appreciated. Thank you.

The Chair: Thank you, MP Masse.

We will move to Madam Gray for five minutes.

Mrs. Tracy Gray (Kelowna—Lake Country, CPC): Thank you, Mr. Chair.

Thank you to all of the witnesses for being here today.

Mr. Costen, what are the opportunities to reduce red tape in the domestic vaccine manufacturing space? What easy fix can the government make right now to help manufacturers produce them here in Canada?

Mr. Eric Costen: In terms of red tape reduction, it's an interesting question. I have a few thoughts in response.

I think there are opportunities that probably exist on multiple levels. Some of these have proven themselves over the past 18 months, where you've seen a level of agility and speediness in decision-making that was brought to bear because of the necessity of the crisis that we are in.

In terms of ISED's responsibilities and the industrial program that we operate—the strategic innovation fund—if we look back, we've seen several examples of a streamlined process that allows for decisions to be made efficiently and quickly. Reflecting on the discussion of some of the questions by other members, they don't necessarily sacrifice important questions of the due diligence and scrutiny that are required prior to the decisions associated with investing public money.

There are probably continued opportunities to ensure that we're balancing the need to have thorough due diligence, while at the same time moving quickly and with agility, as you say, reducing red tape, in order to be able to support businesses, especially in times of crisis.

I would also note, if I can, that there's likely a very important question around the regulatory regimes that exist to safeguard the public health of Canadians but also to create the framework in which businesses operate in this space in Canada. We saw lots of very significant efforts made on the part of Health Canada to be agile and quick in a regulatory decision-making process, without sacrificing, ultimately, their responsibility to safeguard health.

These are two areas where there has been a mindful attempt to balance the need for speediness and avoiding unnecessary processes with not sacrificing the integrity of the decision-making process.

Mrs. Tracy Gray: That's great. Thank you very much.

Would you be able to give a couple of examples of what that red tape reduction might have been?

Are there specific recommendations that have now been made to the minister?

Mr. Eric Costen: In terms of examples, I may turn to Rodrigo.

In the early stage of the pandemic, there were a number of significant funding decisions that were made, early on and in a very compressed time frame, that have proven to be highly advantageous.

Rodrigo, could you provide a couple of quick examples?

● (1350)

Mr. Rodrigo Arancibia (Senior Director, Life Sciences and Biomanufacturing Branch, Department of Industry): I would like to highlight that, for the first time, there was a problem with the funding mechanisms to support high-risk, high-potential projects related to the development of vaccines or therapeutics and to support the science and the companies working on those projects for the COVID-19 therapeutics or vaccines. There was a funding mechanism, an instrument, that was needed to de-risk the investment of the private sector or support the research at a university or academia.

At the same time, it was important for the regulator to have an agile mechanism and to very tightly work with other international regulators in the U.S. or Europe to make sure that the standards were maintained, the quality and safety were in place and protected, and that whatever came out in terms of authorization would be safe and effective.

There were some instruments from the regulatory side that Canada led internationally by allowing clinical trial data to be available to the regulator as it became available, as opposed to waiting for the whole phase to end. It was the speediness in regulatory approval and funding.

Mrs. Tracy Gray: Great. Thank you.

We know that there were a number of processes that might have been expedited at some point. What I'm looking for is whether there's some permanent red tape reduction, processes that have been streamlined or different recommendations out of this learning, moving forward.

Mr. Eric Costen: There's a period of reflection that's happening right now. We're still in the pandemic. We're all hopeful that it's in the rear-view mirror soon enough. I think across government, you're going to see many of us reflecting on the experience of what worked and what didn't, or what could have worked better.

I don't know that I have a specific example that I can point to right now, other than to say that the process of reflection, advice.... Where can things be optimized and made more efficient and quicker, without sacrificing quality and safety? Those were guiding principles from the very get-go. I suspect, to your point about how these measures can become part of the permanent landscape, that period of reflection is under way.

The Chair: Thank you, Mr. Costen.

We'll move to Mr. Erskine-Smith for five minutes.

Mr. Nathaniel Erskine-Smith (Beaches—East York, Lib.): Thanks, Joël.

I want to start with the international obligation we have to help peer countries and developing countries that don't have access to the same vaccines we do. It's really important that we have a vaccine manufacturing capacity in this country for future pandemics and future crises. It's nice to see the investments that have been made to ensure that we have a greater degree of preparedness.

You, Mr. Costen, just mentioned the pandemic, that we are still in this pandemic and we hope it's in the rear-view mirror sometime in the near future, but it won't be in the rear-view mirror in the near future for all countries because they don't have the vaccine coverage that we do. I wonder, given the investments we've made today in vaccine manufacturing related to COVID, when we can expect the first shipment of vaccines from a Canadian manufacturer to a country in need, and what the ramp-up of that production looks like going forward.

Mr. Eric Costen: Thank you for the question.

I think maybe there are two dimensions to the answer. One of course would have to do with Canada's donation strategy.

Mr. Nathaniel Erskine-Smith: Let's bracket that off, because donations are vaccines we've procured from elsewhere that we plan to donate. I'm not interested in that at all. I'm interested in what we are producing here at home that we plan to ship elsewhere.

Mr. Eric Costen: I'll look to maybe Maria, who could probably offer a thought on the time-frame element of your question around getting vaccines when the facility is qualified and when they're rolling off the line. Novavax would probably be the first example of that.

Perhaps Maria, you might be able to offer an answer to the question that's better than what I could offer.

Ms. Maria Aubrey: Thank you for the question.

The pandemic brought to bear, as it was originally indicated, the importance of being able to produce vaccines in Canada for our own certainty but also to be able to support others as you have highlighted. We are going as fast as we possibly can without actually jeopardizing or putting at risk the importance of producing vaccines in a safe manner in accordance with good manufacturing practices.

The way the biologics manufacturing centre is intended to work is that we don't own the vaccine. We work with people who are vaccine sponsors, and we take that vaccine, such as the case with Novavax, and produce it either for the need in Canada, if we need it obviously, or for other countries in need, which would have to be where the Canadian approval and the vaccine sponsor have the authority to bring it to them.

Therefore, for us right now, we are, as I indicated, in the commissioning, qualification and validation, we have completed the pilot runs with the Novavax vaccine—

● (1355)

Mr. Nathaniel Erskine-Smith: I apologize. I understand there's great detail to this, but I'm more interested in the timeline, the reasonably expected timeline and the number of doses that we expect as well. Surely we have a trajectory here and a plan in place so that we can say it's between *x* date and *y* date, and this is our expectation.

What's the date we expect and what are the doses we expect?

Ms. Maria Aubrey: The actual date has to be determined, in combination, by the vaccine sponsor and Health Canada, because they will generate the approval. Right now our target is to have our engineering runs and our quality batches completed at the end of this fiscal year, assuming everything goes right. Obviously we—

Mr. Nathaniel Erskine-Smith: Can I pause there?

You said you want to do everything as quickly as you can but not jeopardize safety. We're in a global pandemic. Other countries need vaccines. We have the vaccines we need, and thankfully we do and I'm glad that we do, but other countries desperately need vaccines.

We're going to hear later this afternoon from BioNiagara. They were pushing for amendments to the Patent Act. They were pushing for us, using the Canadian access to medicines regime, to add COVID-19, in addition to tuberculosis, malaria and HIV/AIDS. Wouldn't it have made sense, as we ramp up domestic manufacturing capacity, as we get closer to Novavax being completed, as we get closer to a place where we can produce vaccines with IP in a Canadian context, to say on an interim basis we're going to have BioNiagara produce vaccines, amend the Patent Act and ship vaccines to developing countries that are in desperate need?

Mr. Costen.

The Chair: The answer will have to be very brief, Madam Aubrey or Mr. Costen.

Mr. Nathaniel Erskine-Smith: It would be for Mr. Costen.

Mr. Eric Costen: There are a couple of quick things. I think it's an unavoidable reality that the manufacturing of these vaccines and the fitting up of these facilities takes years. If you look at a typical or even an aggressive schedule for building and qualifying, these are extraordinarily technical and finicky processes that do span years.

The reality is that in Canada, after these investments, the facility that Maria's describing will be the first one rolling vaccines off the line. It has been done, by any reasonable comparison, at light speed compared to what you might have seen 10 years ago. For other facilities where we have made investments—I think of Sanofi as an example—we will be waiting several years before this facility is ready and we see vaccines. That's not because of needless delays. It's just because of the nature of this manufacturing.

On your point about the global demand, you're absolutely—

The Chair: Mr. Costen, I'm afraid I'm going to have to stop you. I'm sorry. I have a terrible role here.

We need to move to Mr. Lemire for two and a half minutes.

[*Translation*]

Mr. Sébastien Lemire: Thanks to the witnesses for their presentations today and for all their work, particularly over the past two years. I remember there was considerable criticism, particularly in this committee, of the fact that Canada was unable to produce Canadian vaccines in response to the pandemic and that it didn't have a strategy.

Mr. Costen, if memory serves me, you confirmed that earlier when you said that we didn't know what to do in October 2020 after staking everything on the Chinese vaccine CanSino.

We had a first phase of $900 million and a second of $1.3 billion, for a total of $2.2 billion, $1.6 billion of which has been spent. If I'm not mistaken, that leaves us with $600 million to spend.

Thus far, how has that government spending tangibly increased Canada's biomanufacturing capacity in the short and medium terms? What will we do with the remaining $600 million?

● (1400)

[*English*]

Mr. Eric Costen: Thank you very much for the question. There are maybe just a couple of quick things. I will try to be very brief.

In my reference to October 2020, the strategy was to identify, following expert scientific advice, which candidate vaccines had the greatest promise to come to market safely and effectively. Canada made a series of investments across a diversity of platforms including Moderna, Pfizer, Medicago and Novavax. Canada invested in a portfolio of vaccines and we're seeing the results of those investments play out today.

In terms of your question about investment priorities going forward, many of those are articulated directly in the strategy. We will continue to see investments made upstream in R and D and in talent. We will see investments made to continue to build out our industrial capacity across protein-based vaccines, mRNA vaccines and viral vector vaccines. You will see investment in development of therapeutics and antibody therapies as well as supply chain investments.

We still have quite a bit of work to do to continue down this path to rebuild the sector, guided by the strategy, and to strategically build out the ecosystem that is described in the document that was published last summer.

[*Translation*]

Mr. Sébastien Lemire: Thank you, and keep up the good work.

The Chair: Thank you, Mr. Costen.

I now give the floor to Mr. Masse for two and a half minutes.

It seems he's not with us. So that concludes our last round for the first hour.

Mr. Bernard Généreux: Mr. Chair, Ms. Zarillo is here replacing Mr. Masse.

The Chair: Ms. Zarillo, would you like to use Mr. Masse's two and a half minutes?

[*English*]

Ms. Bonita Zarrillo (Port Moody—Coquitlam, NDP): I'm going to pass, if you don't mind.

Thank you.

The Chair: That's actually a blessing because we're really short on time and we have a second panel coming in.

Thank you very much to our witnesses for this first hour. It is much appreciated. Thanks for all the hard work you're doing on behalf of Canadians.

We will now suspend briefly until all our witnesses are in place.

Thank you. Have a good day and have a good weekend.

● (1400)

_____(Pause)_____

● (1405)

The Vice-Chair (Mr. Michael Kram): Thank you very much to the witnesses for joining us this afternoon to share their expertise in this field.

Every witness will have a six-minute presentation, and then we'll move to questions. We are starting with John Fulton from BioNiagara.

Mr. Fulton, you have six minutes. Take it away.

Mr. John R. Fulton (Spokesperson and Representative for Biolyse Pharma Corporation, and President, BioNiagara): I'd like to start by thanking the Standing Committee on Industry and Technology for inviting me today. I am the president of BioNiagara in St. Catharines.

I'd like to make a little clarification. In the last meeting, they referred to BioNiagara as the company that wishes to produce a COVID-19 vaccine. It's actually Biolyse Pharma, a GMP and GLP industrial-level sterile fill injectable drug manufacturer based in St. Catharines.

In October 2005, during the bird flu H5N1 pandemic, there was a worldwide shortage of the patented antiviral drug oseltamivir, known as Tamiflu, which at the time was considered the only therapeutic with any effect on this killer virus. Biolyse quickly reverse-engineered Tamiflu and secured access to millions of Christmas trees, which contain the main ingredient necessary to fabricate this drug.

At the time, Roche's Tamiflu was under patent, and for Biolyse to scale production to meet the needs of this global crisis, a compulsory licence would have had to be issued by Industry Canada, now ISED, to protect Biolyse from litigation. After I contacted the director of patent policy in Ottawa, I discovered that there was legislation on the books that allowed generic manufacturers to produce patented medicines for global emergencies. This is currently known as Canada's access to medicines regime, or CAMR.

As of 2005, Biolyse would have been the first company in the world to attempt to have a drug manufactured using this emergency legislation. In 2003, under Prime Minister Jean Chrétien, Canada was the first country in the world to proudly adopt this legislation from the World Trade Organization's TRIPS agreement. In October 2006, seven months after applying to have oseltamivir added to schedule 1 of the Patent Act, which is the necessary first step in applying for a compulsory licence, it was successfully listed, and we were the first to achieve that.

By then, Canada and other countries had sent billions to Roche for their Tamiflu. Fortunately, by then, seven months later, after applying to have us added, the bird flu had ceased to be an immediate threat to Canadians and to the world's population. Unfortunately, now without a country in need, there was no market for our generic version of Tamiflu, and we abandoned the project.

Let's fast forward to March 1, 2021. When the COVID-19 pandemic hit in early 2020, the supply of the essential medicines and personal protective equipment became critical. The lack of domestic production capacity was a reality check for the Canadian government and its provinces. In response to the insecurity of global supply, a federal government COVID-19 vaccine task force was formed to seek out high-potential Canadian candidates for the manufacturing of vaccines.

In May 2020, Deloitte, the contractor, contacted Biolyse Pharma on behalf of the COVID-19 vaccine task force. Deloitte was ecstatic to have discovered one of the few remaining domestic manufacturers of sterile injectables in Canada, which was several years into the construction of a biologics manufacturing centre designed to produce monoclonal antibodies. As a result of Deloitte's inquiry, Biolyse pivoted to repurposing the facility for vaccine production.

Biolyse already had the available expertise and equipment to produce millions of doses of adenovirus vector or mRNA vaccines. At that time, Biolyse was also busy supplying Canadian hospitals and international health ministries with its sterile injectable medicines, while undergoing the major expansion of its 125,000-square-foot, seven-acre, St. Catharines-based manufacturing plant.

At the bequest of Deloitte, Biolyse put forth all the requested information to support its fill and finish capacity for specific vaccine platforms—more specifically, volume capacity at each stage of the production process, formulation, API production, filtration, filling, sealing, labelling, packaging and all types of specialized equipment readily available and on site for vaccine production.

● (1410)

The main advantage of Biolyse's response to the task force was that all the equipment and expertise necessary to fabricate biologics as well as the Health Canada licences to produce vaccines were immediately available and on site. For example, Biolyse has bioreactors up to 2,500 litres, numerous large industrial chromatography systems, multiple high-speed fill lines—it takes three years to get a fill line now if you want to purchase or fabricate it—and all the necessary GLP laboratories, water purification and air filtration systems required.

It's worth noting that such specialized equipment would generally take years to acquire, especially since ordering such equipment was nearly impossible during the pandemic due to global demand and supply chain chaos.

Considering the readiness of Biolyse with the potential of producing a minimum of 20 million and up to 80 million vaccine doses per year, supported by the existing equipment and its level two biosecurity, GMP-GLP facility, Biolyse and Deloitte determined that, with an investment from the federal government of as little as $4 million, which at the time would have been equivalent to a small PPE order, Biolyse could hire the necessary contractors and staff to accelerate the repurposing for vaccine production and, within four to six months, be in a position to attract one of the vaccine candidates that Biolyse had open dialogues with and were seeking to expand their production capacity.

After spending nearly a year trying to get support—

● (1415)

The Vice-Chair (Mr. Michael Kram): As much as I hate to cut you off, you are out of time.

Maybe those comments can come forward during the question and answer period.

Mr. John R. Fulton: Sure.

I just have a lot to say. It's quite the story.

The Vice-Chair (Mr. Michael Kram): Our next witnesses are from BioVectra. We have Mr. Technow and Dr. Sauer.

Feel free to begin your presentation.

Mr. Oliver Technow (Chief Executive Officer, BioVectra Inc.): Good afternoon, Mr. Chair and members of the committee.

My name is Oliver Technow. I am the CEO of BioVectra, a contract development and manufacturing organization headquartered here in Charlottetown, Prince Edward Island. Thank you for the opportunity to speak with you today. Also joining me is Dr. Sauer, BioVectra's chief science officer and a 20-year veteran of the sector, who is leading the charge on our mRNA vaccine and biomanufacturing expansion. I have 30-plus years of global pharmaceutical industry leadership experience, having lived and worked in Europe, the United States and Canada.

My company is a leading Canadian CDMO, with 17 of our clients being among the world's top 20 pharmaceutical companies. Overall, we serve more than 100 clients. We produce active pharmaceutical ingredients, and as a full service CDMO, we support our clients globally to develop and produce pharmaceuticals and therapies, making a huge difference in the lives of patients. We have a 50-year track record, with beginnings as a start-up company that was the brainchild of Dr. Regis Duffy, former dean of science here at UPEI. Today we have 600 employees and five state-of-the-art facilities in both Charlottetown and Windsor, Nova Scotia, certified by Health Canada, U.S. FDA and the Japanese PMDA.

A key to the global competitiveness of our businesses is that we are continuously investing in expanding our capabilities in terms of offering end-to-end services, from clinical development all the way to commercial manufacturing. We announced in November a $79.6-million expansion of our business to produce mRNA vaccines and therapeutics, with the Government of Canada contributing $39.8 million through the strategic innovation fund and a $10-million investment from the Province of Prince Edward Island. This is a natural next step for our company, as we have decades of experience in making very closely related molecules.

Our expansion includes constructing a cutting-edge biomanufacturing facility here in Charlottetown, creating a single-use clinical scale suite in Windsor, Nova Scotia, and opening an R and D facility in Halifax. We just broke ground, and when completed in 2023, BioVectra will be able to produce up to 160 million doses of mRNA vaccine per year, with the capability to commercially package, or fill and finish, 70 million doses. Through this expansion, we will add at least 125 new jobs in the sector, generate research partnerships and development opportunities for life sciences and biomanufacturing professionals, and create 225 co-op terms for students.

CDMOs like ours are ideally positioned to offer the flexibility needed to respond to the next pandemic, because we have developed platforms that can produce many types of products for many biopharmaceutical companies. We have specialized talent in research and development, engineering, business development, quality and manufacturing, which are needed to support the end-to-end life cycle of drug production and manufacturing.

Over the last several years, Canada has made significant investments in the infrastructure and S and T capabilities needed to reinvigorate the country's domestic biomanufacturing. I believe that to truly reinstate Canada as a biomanufacturing leader, we need to be nurturing an ecosystem that can sustain it over the long term, such as staying on par with other countries' investments into new technologies, which will remain crucial in attracting more global pharmaceutical companies to come to Canada. Also, I believe the focus now needs to shift from bricks-and-mortar investments towards building a more robust bioscience talent pipeline. Talent truly is the catalyst for a robust and globally competitive Canadian biomanufacturing sector, and we should be aiming really high to make Canada a prime talent destination.

The economic growth potential for this sector is enormous, and our ability to succeed or fail is contingent upon building, attracting and retaining our human capital. The first step that I see needed is to grow and retain top talent in the country. We need engineers, scientists and technicians who can see an attractive career path in the bioscience sector in Canada. We need to be targeting graduates from all academic levels and make the sector attractive by taking approaches such as offering transition-to-work opportunities and establishing more co-op student placements. This can be best solved through close collaboration and partnership between the private and public sector.

One good example of this is CASTL, the Canadian Alliance for Skills and Training in Life Sciences, headquartered here in Prince Edward Island. CASTL is the result of close collaboration between different levels of government, industry and academia, and it brings a world-class technical training curriculum to Canada as the exclusive partner of Ireland's globally recognized National Institute for Bioprocessing Research and Training. BioVectra was involved in the development and is an early adopter of CASTL, which is a one-stop shop for our industry's training and academic requirements.

I urge our decision-makers to create better conditions to attract talent from around the world so that they choose Canada as the destination to make their careers. I believe governments could play a leading role in adopting policies that streamline and speed up the immigration process to tackle the domestic talent gaps that we know are coming. They can create other options too, as other countries do, with, for example, personal income tax incentives, which have proven to be quite successful.

● (1420)

Our experience has been that to attract international talent, you need to offer an attractive place to live. I would like to see our leaders continue to work swiftly to create conditions that make Canada that place—conditions such as improving immediate access to health care, child care and middle-income home ownership.

A lesson from the pandemic that we need to keep at the forefront is to nurture and sustain Canada's domestic biomanufacturing capability, which will help prepare Canada to pivot and respond quickly to the next global crisis.

Thank you.

The Vice-Chair (Mr. Michael Kram): Thank you very much, Mr. Technow.

Our next witness is Dr. Gerdts from VIDO-InterVac.

Dr. Gerdts, you have six minutes.

Dr. Volker Gerdts (Director and Chief Executive Officer, Vaccine and Infectious Disease Organization - International Vaccine Centre): Thank you very much, Mr. Chair and committee members.

My name is Volker Gerdts. I'm the director of VIDO, which stands for the Vaccine and Infectious Disease Organization, a research institute here at the University of Saskatchewan. We're on Treaty No. 6 territory and the homeland of the Métis.

We operate one of Canada's and the world's largest high-containment research institutes for infectious diseases and vaccine development. We have about 170 researchers from more than 28 countries. More than 50% of them are female, and 40% of our research staff represent visible minorities.

VIDO is funded through an MSI grant from the Canada Foundation for Innovation. That means 60% of our operating funding for parts of our facility—for parts, not for the whole—comes from CFI.

VIDO has been leading Canada's response to COVID. We were the first in the country to isolate the virus and then distribute it to all diagnostic labs in the country. We were the first in Canada to have an animal model established and the first university with a vaccine in clinical trials. It is now in trials in Africa, in Uganda, and is also entering a trial here in Canada for booster studies, using our vaccine as a boost to already authorized vaccines. During the last two years, we worked with almost 100 companies from all around the world to find and test their solutions, whether vaccines, therapeutics or antivirals for this disease.

The organization overall receives support, as I mentioned, from CFI, but also from the Government of Saskatchewan. During the pandemic in particular, we received funding from ISED for our vaccine research but also to develop a manufacturing facility here, in-house. This is, of course, what we are talking about today.

VIDO is currently building an in-house manufacturing facility that will enable us to manufacture both human and animal vaccines. What's very unique about our facility is that it's connected into our containment. It's one of a handful in the whole world that will be able to make vaccines for those pathogens that require higher levels of containment, often referred to as “high consequence” pathogens.

Construction of the facility is almost complete. It will be commissioned by the fall of this year. We're anticipating that we'll be able to start production in Q4 of 2022.

This facility can produce a variety of technologies, including the RNA vaccines. It can also make biovector vaccines, live vaccines, some mammalian cell-based vaccines and subunit vaccines. VIDO's vaccine is a subunit protein vaccine. We envision that, in principle, depending on which technology, our facility can make as many as 40 million doses a year. However, it is a pilot-scale manufacturing facility, which is really driven to quickly drive innovation from the discovery stage and get it quickly into clinical trials.

VIDO is part of and a pillar in Canada's life sciences and biomanufacturing strategy. We are happy to support the strategy as outlined in there. That includes, for example, the training mission. We have a number of graduate students who are being trained not only in the discovery science but now also in manufacturing and the operation of the facility. We think it is critical, as we look forward and prepare for the future, to have the skills, as we just heard from Mr. Technow, and the skilled workers to operate these facilities.

As a side note, during the pandemic we had to recruit over 30 researchers who were able to work in high containment with a virus. It takes usually six months from recruiting a person to getting them to be comfortable working with a potentially lethal virus in the lab.

Lastly, VIDO received funding in last year's budget—not yesterday's budget but the one last year—to take on the role as Canada's centre for pandemic research. As part of that, we have received funding from the Government of Canada, the Government of Saskatchewan, the City of Saskatoon and many private and corporate donors to expand our capacity. We're upgrading our containment space to the highest level, to containment level four, thereby doubling Canada's capacity for high containment. We're building a new animal facility, which will enable us to work all year round with those species from which we see these diseases emerge. As I mentioned, we're also about to open our manufacturing facility.

All of that will allow us to bring the world's best researchers to Canada and attract companies to Canada that will use this infrastructure in the future to make sure that Canada will never find itself in a situation like we did two years ago.

● (1425)

Thank you.

The Vice-Chair (Mr. Michael Kram): Thank you very much, Dr. Gerdts.

Our next witness, appearing as an individual, is Dr. Lamarre.

Dr. Lamarre, you have six minutes.

[*Translation*]

Dr. Alain Lamarre (Full Professor, Institut national de la recherche scientifique, As an Individual): Thank you, Mr. Chair.

First of all, I would like to thank the committee for inviting me to take part in this meeting. The topic you are discussing is essential to ensuring our national security, responding to the COVID-19 pandemic and, above all, preparing to cope with future pandemics.

I am a professor at the Centre Armand-Frappier Santé Biotechnologie of the Institut national de la recherche scientifique, or INRS, in Laval. I have been conducting research on antiviral immune response for more than 30 years, as well as on the development of vaccines and immunotherapies. I am therefore particularly interested in today's subject.

Canada currently doesn't have enough vaccine production capacity to meet its needs. I would include biologics such as monoclonal antibodies and immunotherapies in that category. As a result of this insufficient production capacity, Canadians are at the mercy of a form of protectionism practised by countries that produce vaccines and other biologics. In recent months, Canada has begun to make substantial investments to restore its national production capacity. However, an even greater effort will have to be made in the next few years to rebuild an ecosystem that is rich and diversified at all stages of the vaccine development chain.

I welcome, for example, the investments being made at the NRC's biologics manufacturing centre in Montreal and at the Medicago corporation in Quebec City, which has developed the only vaccine manufactured in Canada and approved by Health Canada. Major investments have also been made in other private companies across the country. In addition, new projects are in development, including construction of the next biologics and vaccine production infrastructure by SmokePond Biologics here in Laval. These investments have already begun to produce results, but they must continue and expand in future.

Note that Canada ranks last among the G-7 countries in research and development spending. On a percentage basis, for example, Canada invests half as much in technology and R&D as the United States. Consequently, the measures the federal government announced in the 2022 budget yesterday for the creation of a Canada growth fund of $15 billion over five years is a step in the right direction. That will help leverage private investors to restructure supply chains, for example, which I think should also include biologics, vaccines and personal protection equipment.

I think it will be important for the federal government to invest substantial sums in three specific sectors to consolidate its investments and maximize the potential impact on vaccine production.

First, it should continue and increase federal investment in basic research in Canada. Basic research is an essential component in developing new technologies pertaining to vaccination and health in general. It will therefore be important to increase research funding. Unfortunately, however, I see that no mention is made in the 2022 budget of any significant increase in the budgets of the federal granting councils. I believe an increase in the order of 10% per year over the next 10 years will be appropriate if we want to return to our role as a global leader.

Second, I think we should continue and increase federal investment in advanced research infrastructure through the Canadian foundation for innovation. As we just saw, it's an essential partner for the Vaccine and Infectious Disease Organization, or VIDO, which invests in highly advanced technology infrastructure. It will be critical in the coming years that we continue and increase investment not only in infrastructure, but also in the funding of long-term operating and maintenance costs in order to maximize the impact of those investments.

Third, we should establish a vaccine development funding structure that would bridge the gap between academic research and the pharmaceutical industry. A rich and diversified public research ecosystem is increasingly important for the development and commercialization of new and innovative treatments and vaccines for patients.

As regards the commercialization of innovations emerging from university labs, government investment should assist in advancing the clinical development of vaccine candidates and promising immunotherapies until they are mature enough to attract global pharmaceutical companies and those companies then invest in their large-scale production and distribution.

● (1430)

To conclude, Canada needs to do more to position itself internationally in the biomanufacturing field, to be able to combat COVID-19 and other future pandemics.

Thank you, and I am ready to answer your questions.

[*English*]

The Vice-Chair (Mr. Michael Kram): Thank you very much, Dr. Lamarre.

Our final witness is Mr. Andrew Casey from BIOTECanada.

Mr. Casey, you have six minutes.

Mr. Andrew Casey (President and Chief Executive Officer, BIOTECanada): Thank you, Mr. Chair.

Thank you to the committee for this opportunity to provide input into the study.

By way of introduction, BIOTECanada is the national association that represents Canada's biotech industry. Our 240 members stretch across the country. They include the large multinational pharmaceutical companies, many of which are in the vaccine development and manufacturing capacity. Also, most of our members are the early-stage biotech companies that have good ideas that are coming out of our university labs or research institutes, but they're trying to commercialize, trying to get out into the marketplace. We have a diverse, robust membership. It includes BioVectra and VIDO, both of which have testified here today.

As I was preparing for this session I reflected that it was exactly a year ago to this day that I had my first vaccine shot. If you think back to the early days of the pandemic, back in March 2020, the earliest predicted time frame for getting vaccines was three to five years out. That we were able to start putting them into arms about a year ago is a remarkable scientific feat. I think that needs to be recognized. That we're even having this discussion today about how to prepare for the next one with vaccines and developing biomanufacturing capacity is truly remarkable. It's a testament to science. It's a testament to this industry and the work it's done, and full credit, as well, to our regulators, including Health Canada and the innovation department at ISED.

Also, there is Canadian biotechnology in one of those vaccines. It's important to recognize that the Pfizer vaccine has the Acuitas technology, which is the lipid envelope within which the mRNA coding is put into the body. The Canadian industry, the biotech industry, has played a really important role in delivering on some of these vaccines.

We're not out of this mess. We still have a lot of work to be done. I think we've heard from some of the companies today of the important role they're going to play in addressing some of these challenges coming up, including Medicago, which was discussed in the earlier session.

I think it's very prudent, though, to start to prepare for the possibility, the very real possibility, that there is going to be a COVID-40 or a COVID-50. You can pick your year and I'll use COVID as an example. It is not necessarily going to be another COVID-like challenge, but we do have to prepare. I think most governments around the world were caught off guard by the pandemic. There's a recognition that they don't want to be doing this on an ad hoc basis going forward. It makes sense to prepare for the next one and invest heavily.

Thankfully, in Canada, as we've seen from the companies that presented today, we have a very robust ecosystem here upon which to build. As you heard from the panel earlier, with the officials from the government, significant investments have come forward from the government to enhance and grow that capacity. We're building on some fantastic companies in this country, including BioVectra, including VIDO, including Medicago and others. There are some great partnerships, as well, between Sanofi Pasteur and the government, and also Moderna. You've seen the growth in the NRC facility. Those are some very significant investments as well. We are in a very good position. We're building on something that's a very strong foundation.

If I had some advice for the committee—and I'll leave it at this—there are a couple of things. One is that we don't know what the next challenge is going to be. It's very hard to predict what the next solution is going to be. If we had this discussion five years ago I'm not so sure we would have chosen mRNA vaccines as the solution. We have to be very careful about what we're putting all of our bets on.

The second thing is that it is imperative that we increase the number of shots on net. The growth of the ecosystem is going to be really important. That ecosystem includes all components, not only the early-stage companies and the ones that are existing but also the multinational companies, which are a very important part of that ecosystem, working closely together.

The other part is that we have to look at this as not just an “in case of an emergency” situation. Let's hope this is not going to happen for another 30 or 40 years, but what do you do with those investments in between? It's like with Olympic athletes. You don't just participate every four years; you train in between. We have to do likewise. Whatever these investments are, they have to be connected into the existing ecosystem to grow it and to leverage those strengths.

The last piece, which I think is really important—and it's been mentioned a couple of times by my colleagues—is talent. We have to grow our talent pool here. This is a global challenge. Every country has its elbows up. They're going to looking to steal our people. We have to attract talent. We have to keep talent. This is going to be absolutely paramount.

We have a really strong foundation upon which to build. The investments are solid. They're going to really support the growth of the industry. I'm encouraged by that, but if we don't work collectively and understand where it's all going, we're going to be in a bit more trouble.

I will leave it there. I look forward to questions from the committee. Thank you.

● (1435)

The Vice-Chair (Mr. Michael Kram): Thank you very much, Mr. Casey and all of our witnesses, for your very informative presentations.

We'll now move on to the question and answer portion.

Our first questioner is Monsieur Deltell from the Conservative Party.

You have six minutes.

Mr. Gérard Deltell (Louis-Saint-Laurent, CPC): Thank you so much, Chair.

[*Translation*]

I'd like to thank the witnesses for their excellent testimony.

My first question is for Dr. Lamarre.

Good afternoon and thank you for being here.

You spoke about the funds invested in recent years, particularly to deal with the COVID-19 pandemic, and about how successful we have been. As a Quebecker and a resident of Quebec City, I was proud that a company in my city made a name for itself by creating a new vaccine.

I was nevertheless surprised and disappointed when the World Health Organization, the WHO, did not recognize the vaccine.

How did you react when you learned that the vaccine developed in Canada wasn't recognized by the WHO?

Dr. Alain Lamarre: It came as a surprise to me, as it did for many others. My understanding of the situation is that neither the efficacy nor the safety of the Medicago vaccine were at issue. It was rather the company's links to a tobacco manufacturer.

The WHO position was known, and is defensible from a world health standpoint.

I believe that Medicago and the government will have to work with their financial partners to find a solution that would be acceptable to the WHO. They will have to ensure that the Medicago vaccine, which has yielded excellent results in clinical studies, obtains the approval of the WHO. The vaccine could then be used within the COVAX mechanism and distributed to countries that still need large supplies of vaccines. In Canada, there is less need, but it's still very important elsewhere on the planet.

● (1440)

Mr. Gérard Deltell: I'm pleased to hear you speak about the quality of the research and the product. That's what we found so disappointing, to put it mildly. We have all kinds of talent and quality products here that could be marketed. Millions of lives could have been saved by inspired Canadian engineering and efforts.

Unfortunately, we can't move forward because of an administrative formality.

You said earlier that the WHO's position was known, and that it was defensible. I don't have any personal position on that, but given the urgency of the situation and the importance of the research and repercussions worldwide, do you, as an experienced researcher and academic, believe that the WHO could have or should have made its rules more flexible?

Dr. Alain Lamarre: I do in fact believe that the WHO's position is defensible.

Would the WHO be willing to change its rules? Perhaps not, but it's not too late to act, knowing that other investors, or even the federal government, could take over the cigarette manufacturer's stake. I don't believe the game is completely lost. There may be room for negotiations with the WHO, which could soften the rule for pandemics. Whether it will do it is another matter.

Mr. Gérard Deltell: I'm going to continue this line of discussion.

In the previous testimony, we learned that the government was aware of the WHO rules from the outset, and about the shared ownership of the company. Everyone knew about it.

I may not be an expert in this field, but I was surprised and terribly disappointed. That's as much as I can say in polite language.

What do you think about the fact that everyone knew, but that no one did anything?

Dr. Alain Lamarre: I think we'll have to go back to the early days of the company. In passing, I'm not involved in any way with this company. I have no shares in the company and no particular axe to grind about what it does.

Based on what I know, in the early start-up phases of any project, you tend to take whatever capital might be on offer.

In this instance, I would imagine that Philip Morris International felt there was an affinity of some kind with the plant being used to manufacture the vaccine. The plant is in the same family as tobacco, and this meant an affinity for the company.

I'm not going to cast the first stone at Medicago, because I'm aware of what it's like to start up a biotechnology company. At the outset, Medicago was a small biotech company that got its start in the university community. It grew and needed capital to develop. I don't think Medicago was wrong to do so. This was the capital that enabled it to develop.

Later on in the vaccine's development, could the actuarial structure of the company have been reviewed, knowing that the WHO would apply this provision? That's an important question that needs to be asked.

● (1445)

[*English*]

The Vice-Chair (Mr. Michael Kram): Thank you very much, Dr. Lamarre and Monsieur Deltell.

Next, from the Liberal Party, we have Mr. Fillmore for six minutes.

Mr. Fillmore, the floor is yours.

Mr. Andy Fillmore (Halifax, Lib.): Thank you, Chair.

Thank you to the witness panel today for sharing your time and experiences with us.

I'd like to direct my questions to the team from Charlottetown today, if I could, the BioVectra team.

I noticed, Mr. Technow, on the website.... I've spent some time on your website today. Back in November, you had an announcement about the development of a new mRNA production facility. There was a beautiful photograph with Minister Champagne and Charlottetown MP Sean Casey.

I wondered if you could tell us about the arc, the journey that you're on with this facility, where you're now and how the federal government has been able to assist along that journey.

Mr. Oliver Technow: Thank you for the question.

As you've said, Mr. Fillmore, the start of this [*Technical difficulty—Editor*].

The Vice-Chair (Mr. Michael Kram): I wonder if Dr. Sauer might want to step in. It appears that Mr. Technow's camera is frozen.

Dr. Marc Sauer (Vice-President, Process Science and Development Services, BioVectra Inc.): Absolutely.

As you mentioned, in November we announced the expansion of our facility into mRNA vaccine manufacturing, as well as the establishment of a state-of-the-art process development facility to go with it. We're currently at the phase where we have.... In early 2022, we started the construction on the development areas and facilities. We will actually break ground this Thursday on the mRNA vaccine facility in Charlottetown.

We're currently foreseeing a time frame of about 12 months to get this to conclusion. At that point, we will go into equipment qualification, and then we'll be ready to transfer first projects into the facility.

Mr. Andy Fillmore: Thanks, Dr. Sauer.

This is going to be an important part of BioVectra's ability to face whatever the next seven-year cycle brings us in terms of a pandemic.

Are you facing any other hurdles in terms of fill and finish, or production capacity? Is there anything else that would stand between you today and being able to address whatever the next pandemic might be?

Dr. Marc Sauer: No, fill-finish is going to be part of the expansion.... I'm sorry. I'm hearing an echo. I hope it's just me.

Fill-finish is going to be a part of the expansion, so the investment into the project, as the project itself, was meant to be a complete end-to-end solution for the development and production of mRNA vaccines and therapies. In this case, we wouldn't see any hurdles that wouldn't allow us to be a complete offer for said vaccines.

I think Mr. Fulton pointed out that the supply chain has been strained over the past two years, but in this case, for us, we were able to secure partnerships with key suppliers of the equipment that would be needed to get the facility up in time.

Mr. Andy Fillmore: Thanks, Dr. Sauer.

In his opening remarks, Mr. Technow mentioned that you have the main facility in Charlottetown. There's now a facility in Windsor, Nova Scotia, and I think he mentioned a new facility in Halifax.

I know this is a complex manufacturing process. I wonder if you could just elucidate on what the role of the three locations are. Of course, I'm particularly happy to hear about the Halifax location, being that I represent Halifax.

Thank you.

Dr. Marc Sauer: Of course.

Charlottetown is our headquarters. We have operated out of this site for the past 50 years. For the mRNA vaccine expansion, it allowed us to act quickly because it is not a greenfield expansion there, so we were able to build it onto the existing facility. We are in a position to use utilities that are already in place, which also cuts down on the total time to get this up and running.

Windsor, Nova Scotia, is our headquarters for biologic therapeutics. We are expanding it to bring on single-use, clinical-scale operational equipment that would allow us to not only produce commercial but also materials that are needed for either smaller patient populations or clinical trials.

Halifax will be our new home for the state-of-the-art process development centre. We will move most of our development teams out of the Windsor facility to Halifax and then establish there a truly remarkable facility for development, discovery and also characterization.

● (1450)

Mr. Andy Fillmore: Bravo. I'm very glad to hear that.

Mr. Chair, is there another minute?

The Vice-Chair (Mr. Michael Kram): You're right at time.

Mr. Andy Fillmore: Dr. Sauer, thank you very much.

Please give my thanks to Mr. Technow as well.

Dr. Marc Sauer: Of course. Thank you very much.

The Vice-Chair (Mr. Michael Kram): Thank you, Dr. Sauer and Mr. Fillmore.

Our next questioner is Monsieur Lemire from the Bloc Québécois.

Monsieur Lemire, you have six minutes.

[*Translation*]

Mr. Sébastien Lemire: Thank you, Mr. Chair.

Dr. Lamarre, I'm very pleased that you are here before the committee. As I mentioned when I was inviting you, you have been a remarkable witness for this committee. What I have learned from your point of view is the idea of funding throughout the vaccine and drug development chain, which needs to provide long-term funding for all the stakeholders in all the sectors, from research to sales, to rebuild a rich, innovative, collaborative, flexible, and diversified ecosystem. You spoke about this briefly earlier.

Since the last time you appeared before this committee a year ago, do you find that the progress made by governments, and the Canadian government in particular, is satisfactory?

Dr. Alain Lamarre: As I said in my presentation, there were major investments, and some of my colleagues here before the committee spoke about their results. There were the projects I mentioned and several others in development. There was recently an announcement about a new cell and gene therapy manufacturing facility in Hamilton. There is also the SmokePond Biologics project here in Laval, about which we are very enthusiastic.

So things are moving in Canada. There have been significant federal government investments, and that's good. This comes later in the vaccine production chain, but I think that the early stages, meaning the innovation and basic research generation process that is being carried out in Canadian research institutes and universities, ought not to be ignored. This research depends almost entirely on federal government research funding, whether through the Canadian Institutes of Health Research, the CIHR, or the Natural Sciences and Engineering Research Council of Canada, NSERC. There is still a lot of work to be done because the budgets of funding research agencies like CIHR and NSERC have not grown very much in recent years, particularly given the growing numbers of researchers in Canada and the constantly-rising costs of research.

Just as the cost of living is increasing, the costs of infrastructure and staff are also rising. So if the CIHR has a budget of $1 billion a year, and it doesn't increase very much from one year to the next, the end result is a much lower success rate year-over-year in CIHR and NSERC competitions. As a result, potential innovations from Canadian universities are not adequately funded.

What I'd like to see in terms of government funding is a 10% per year increase over 10 years in the budgets of the three federal councils, to bring Canada's position closer to the leaders in the field, like the G7 countries, the United States and Europe. There's still a lot of work to do.

● (1455)

Mr. Sébastien Lemire: You probably heard, as I did, particularly during the first hour, all kinds of numbers about the amount of money that the department is going to provide to rebuild the Canadian vaccine and biological products production industry. For the first phase, $900 million is the figure that was mentioned, and $1.3 billion for the second phase, for a total of $2.2 billion. So far, only $1.6 billion have been spent, leaving $600 million unspent.

How can this money be invested in the short term to make conditions attractive once again for the pharmaceutical industry?

Dr. Alain Lamarre: I think, in fact, that what's needed is to create structures, along the lines of what the National Research Council of Canada has done, that are at the junction of university research and the pharmaceutical industry. That would make them independent of the ups and downs of the marketplace, to which the pharmaceutical and contract research companies are subject. These structures would also be publicly funded, with a view to developing technologies based on discoveries at universities or research institutes and moving them to an initial clinical study phase with human subjects.

For the federal government, it would be money well spent.

Mr. Sébastien Lemire: We hope so, because the message that was sent yesterday was rather weak. There was talk of $20 million over five years, beginning in 2021-22, to the Canadian Institutes of Health Research. The message is not as forceful as the one that was sent last year.

What signal is that sending?

To finish up, I'll ask whether you are worried about any shortages in the supply chain?

Dr. Alain Lamarre: As I mentioned earlier, I am worried about that. The success rate in CIHR competitions, for example, is declining. It's below 20% in each competition, meaning that excellent research proposals are not being funded. Furthermore, even when a project is funded, 26% to 27% of the research budget is generally cut from each grant, because there is less money to hire staff.

As several speakers mentioned beforehand, it's important to invest funds not only on infrastructure, but also on highly qualified staff and graduate students, or even postdoctoral fellows. It's important to have significant budgets that can provide grants for educational and research internships, to ensure that Canada has a high-level scientific community available for recruitment in the biomanufacturing and vaccine manufacturing industries.

That troubles me even more than the supply chains. The latter are of course a concern, but I think that matter will be sorted out. We nevertheless need to continue to develop our qualified workers so that they can work in these industries over the coming years.

Mr. Sébastien Lemire: Thank you sincerely, Dr. Lamarre.

Dr. Alain Lamarre: Thank you.

[*English*]

The Vice-Chair (Mr. Michael Kram): Thank you, Dr. Lamarre and Monsieur Lemire.

Finally, from the NDP, we have Ms. Zarrillo for six minutes.

Ms. Zarrillo, the floor is yours.

Ms. Bonita Zarrillo: Thank you, Mr. Chair.

I'll start with a question for Mr. Fulton, and if I have time I'll go to Mr. Technow on labour shortages.

Mr. Fulton, I think I heard correctly that the government did not know of the expertise of Biolyse or other companies able to manufacture vaccines, and only found out by accident.

My question for Mr. Fulton is around expertise and the fact that the government wasn't aware, and only found out by accident when a consulting group made an inquiry. What can the government do to have a comprehensive list of the certified and capacity-ready manufacturers to quickly manufacture critical vaccines and therapeutics when needed in Canada?

● (1500)

Mr. John R. Fulton: To clarify, Deloitte was the contractor hired by the Government of Canada through the vaccine task force to search out companies like Biolyse.

As far as I know, there are a handful in Canada producing injectables. There are Omega, Sandoz and Biolyse Pharma that I know of. They're three industrial-sized facilities. They reached out, I think, on May 1, 2020. We started a dialogue. We were sending all kinds of documentation, so they—the government and the task force—were well aware that Biolyse existed.

I think what we need going forward is a meeting just like this, where there's transparency and there are independent groups that could look at this—not a task force that the public wasn't made aware of until a few months after it was in existence. Just having this kind of discourse and this kind of conversation now is a help.

If we had a time machine to go back two years and try to put together a group like this to have this discussion.... Biolyse is sitting there with all that equipment, all that expertise and Health Canada approvals for producing vaccines, and it's still sitting idle. They only asked for a few million dollars to hire more contractors and more staff. It could have been up and running.

We tried to use CAMR, Canada's access to medicines regime. I've been calling and sending emails. I met with over 40 different individuals, officials within the government, and we can't get a straight answer on how to use the legislation that I used effectively in 2005-06. They won't have a discussion with us regarding that. They won't start talking, because once the government starts talking about the addition of COVID-19 vaccines and therapeutics, it triggers the addition to schedule 1. Once we're on schedule 1, we can ask for a compulsory licence and move forward with the project.

I had a lot to say here today. Unfortunately, I got cut short, but that's really it. It's having these kinds of open discussions with the public, experts and government officials to really figure out how to solve this problem.

Ms. Bonita Zarrillo: I'm just going to pivot now to Mr. Technow on labour shortages. A number of witnesses talked about it today.

I just wanted to ask about your business and also ancillary businesses that support your business. We know that labour shortages can be an issue.

Could you just expand a little bit on labour shortages? What is needed to attract and retain workers in your industry and in ancillary industries that support the work you do?

Mr. Oliver Technow: Thank you for the question. I hope this time I can get through my answer without technical issues.

To provide some context here, during the pandemic we onboarded approximately 150 new employees at BioVectra, despite the challenges of having to do this remotely and with all the protocols in place.

It has also accelerated the realization that if you make up and work towards new technologies—and part of our biomanufacturing strategy in Canada is to make sure that we have new, cutting-edge technologies in the country to respond to future health crises more quickly and more efficiently—you also realize that there's a talent shortage to actually run these processes and fill these new projects and investments with life.

In my industry in particular, we're now talking about all these new technologies. A handful of people in Canada have first-hand experience with these types of technologies. By default, we are actually depending on immigration and attracting talent from abroad. This has been a little bit more of a pronounced situation. Given our company's location in eastern Canada, we have to be creative from the get-go. We have found a lot of really effective ways to attract the right talent from all over the globe.

I would actually predict that this labour shortage we see in our industry will only accelerate. I think studies out there very recently have been talking about a gap of almost 60,000 people—if I got the number correct—to actually just deliver on the current biomanufacturing strategy. That gives a little bit of an idea what's at stake and what's at hand here.

As I said in my presentation, we need to come to the table in private-public partnerships and really tackle this issue from the ground up, making sure that we have the inroads into academia streamlined and have quicker immigration.

As far as the labour shortage on the auxiliary businesses are concerned, I don't think I'm qualified to talk about this a lot. We obviously see some of the challenges in supply chain. As we all are aware, certain parts of a bricks and mortar construction site, like steel, are becoming more difficult to source, but there is also this general topic of the great resignation. That doesn't stop in Canada and it doesn't stop in my industry. It's all over the world. It's in every sector and in every trade, so we have to be a little bit more creative.

My recommendation is, as I said earlier, that we need to aim high. It's not enough to try to make up for other jurisdictions that have some kind of innovative and attractive program in place, because by the time we catch up here in Canada, those guys have already moved ahead.

I really encourage us to have a very ambitious plan and a very ambitious task force in the future that addresses these challenges with sustainability in mind.

● (1505)

The Vice-Chair (Mr. Michael Kram): Thank you very much to all of our witnesses.

Ms. Zarrillo, your time is up.

I will now hand the chair back over to Monsieur Lightbound.

The Chair: Thank you very much, Michael, for chairing this meeting in my absence. I appreciate it.

Thanks to our witnesses for being here with us. It's been very interesting. I've been listening all along.

Members, before we adjourn there is just a small item of business I'd like to get over with.

Witnesses if you want to disconnect, this is committee business at this point, so you may consider yourselves thanked fully by committee members. We appreciate your presence here. Have a great weekend. Stay safe.

For committee members, I believe there have been discussions between the parties and there is consent to adopt Mr. Lemire's motion on competitiveness. I'm just looking for unanimous consent around the room, so that the clerk and the analyst can get to work inviting the witnesses for the study when we come back from the break.

I see a thumbs-up from Mr. Masse. I know Mr. Lemire is on board. I see no objection in the room, so I gather we have unanimous consent for the motion that has been distributed amongst members.

(Motion agreed to [*See Minutes of Proceedings*])

The Chair: Thank you all for your great work.

Have a great weekend. Safe travels and we will see each other in three weeks.

This meeting is adjourned.