Interview: Gary Goodyear, Canadian Minister of State (Science and Technology)

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Gary Goodyear, Minister for Science, shares with us how the Canadian Government has taken a different approach to funding innovation and the benefits it has reaped in the pharma industry as a whole in the country.

You became Minister of State for Science and Technology in 2008, a position that had previously not existed since 1995. What was the reason for resurrecting this position, and some of the primary achievements of the last five years?
The Prime Minister has said that science powers commerce. In 2008, Canada was facing the start of the global economic crisis, and the Prime Minister was convinced that Canada would be negatively impacted. Given that the government had launched a science and technology strategy the year before, he asked me to ensure that science in Canada would not be derailed because of any economic downturn. As a result, while other countries have had some very difficult decisions to make (as did we), the Prime Minister has taken an opposing route and increased our investments in science with every single budget. Since 2006, Canada has invested over CDN $9 billion new dollars into science and technology. It has been a significant turnaround fostered by an attitude that was completely contrary to what many other countries were doing to battle their debts and the economic downturn.

One recent example of this attitude was the announcement to restructure the National Research Council (NRC). Could you elaborate a little more on this?
In its multi-year strategy, the Canadian government has placed billions of dollars into capacity at the countryâ??s universities for basic and advanced research. There are over 500 new projects, brand-new buildings and refurbished laboratories. A significant portion of that investment funded new equipment for those buildings, and today there are more scholarships and fellowships than ever in the history of Canada. According to the OECD, Canada is number one in the G7 in terms of higher education expenditures on research and development as a percentage of its GDP. However, Canada is nowhere near number one in terms of business expenditure on research and development. The Prime Minister has therefore said that the system needs to be balanced. While we continue to fund Canadaâ??s already strong basic research, we need to focus more on the business commercialization aspect of this research capacity. Essentially, our investments in science build and create knowledge and enhance understanding, and then provide commercial, economic or social benefits from that knowledge. Our Governmentâ??s multi-year strategy ensures long-term strength in basic research, but applied commercialization must improve to create higher quality jobs and ensure the quality of life in Canada remains or improves.
So one of our governmentâ??s challenges is how to get more businesses to come to the table and engage in more R&D, as Canadaâ??s private sector invests less than its peers in other countries. These innovation gaps continue despite a high level of federal support for R&D provided both indirectly, through tax credits, and directly, through various programs. A successful innovation system requires a mix of complementary elements. R&D spending is only one of them. In our view, the role of government is to establish policies that strengthen the science, technology and innovation

enterprise from discovery research all the way through to commercialization.
One key commitment from recent federal budgets was to refocus the NRC. We are now delivering on that commitment.
The refocused NRC will return to its historic, legislated role as a provider of research and technology to support industry development and growth. The refocused NRC will share risk with its clients by working with them to identify critical needs and outcomes and provide the expertise and key facilities they require. This will help Canadian industry maintain a competitive edge and deploy new technologies in a timely way through collaborative R&D projects, technology development and pilot and demonstration projects.
The refocused NRC will be outcome based and accountable. It will strengthen and stimulate collaboration with industry and academia as appropriate and necessary to fulfil the new mandate. It will improve business practises to become more business-like and efficient.
The NRC will continue to support small and early stage companies through an expanded Industrial Research Assistance Program, and it will build strategic international partnerships, such as Eureka, with the European Union and our other major economic partners to facilitate access to technology and markets for Canadian-based enterprises.

What might be a concrete example of that dedication to business investment?
Our Government recently announced the creation of the Algal Carbon Conversion Pilot Project (ACC). To provide context, industry in Canada is sometimes unwilling to take the next step on a particular technology because the risks are too high and commercial benefits are not evident up front. In the case of ACC, the benefits to the economy and environment were great enough that partnering with industry was necessary to progress. Under the NRCâ??s new mandate, one of the largest gas companies in Canada, Canadian Natural, has invested CDN $9.5 million in this innovative new technology with another small company called Pond Biofuels. This collaboration with the NRC is building a plant so that, on a large scale, we can absorb carbon dioxide emissions. That carbon capture feeds an algae pond. The algae are then transformed into many different products, including biofuels and livestock feed. This type of technology could be game-changing, especially given its portability. This is an example of knowledge and technology that the NRC is pushing into industry to create jobs. As time goes by, I think that businesses will ask the NRC to acquire new knowledge or demonstrate the usability of knowledge. The NRC will therefore work with all business to help with their research. This is because over 95 percent of businesses in Canada have less than 50 employees and thus do not have research capacity. The refocused NRC will provide an opportunity to protect Canadaâ??s industry strength as well as improving the countryâ??s worldwide ranking in terms of how businesses use research to create new products and jobs.
While the majority of pharmaceutical companies tend to manage their own R&D infrastructure, in what ways can the Ministry be a good partner for that sector?
This pulls the strategy together. All these investments in new buildings, state-of-the art equipment, and scholarships add up to create a â??brain gainâ?•. Canada has incredible capacity for science infrastructure. The country has some of the best students in the world exposed to that equipment. Bright individuals come from around the world to Canada for this infrastructure and those who stay will teach the next generation of scientists, building a critical mass of talent and infrastructure. Add all of that to Canadaâ??s impressive tax regime and environment for business growth, and you are starting to attract some serious R&D capacity for all industries. There is also the element of multiculturalism of Canadian society. Canada has huge international demographics, which makes the country attractive when you are putting together a clinical study. It is the â??perfect stormâ?• if you will, and the industry will continue to grow and grow in the coming years.
As well, Canada is a leader in genomics research. In fact, genomics is a foundational piece of Canadaâ??s growing bio-economy, which is expected to account for about CDN $38 billion of our GDP by 2017. Certainly, history will record our eraâ??s achievements in genomics as game-changing. As we deepen our understanding of the genetic code â?? the language of life â?? our relationship with the world around us is fundamentally changing. And as the science of genomics

advances, so does it power to deliver economic and social benefits to Canadians.
Our Government recently announced the launch of Genome Canadaâ??s Genomics Applications Partnership Program (GAPP). This is a new, CDN $90 million partnerships program designed to engage users (i.e. industry, government, not-for-profits and other organizations) to drive genomics solutions from academia to the marketplace. GAPP marks a significant shift further down the value chain to meet specific, real-world challenges or opportunities identified by the users themselves. The users will be directly involved in developing and driving the projects in order to achieve results for their organizations.
Furthermore, the government has put in place procurement strategies to push innovation, as well as immigration policies to acquire the required skill sets in the necessary areas. We are setting up programs to increase unemployed Canadiansâ?? skill levels. It is a well thought-out and carefully coordinated government effort to really move the country in the right direction.
The Prime Minister is convinced that the quality of life and the economic and financial security for Canadians rests in discovering new products through a robust basic support by developing, building and selling products to the living rooms and hospitals of the world. We are not close to being done but we do appear to be heading in the right direction. A recent report rated Canadaâ??s science sector as â??healthy and growingâ?•, and fourth worldwide in absolute terms. That is impressive for a country the size of Canada, and a robust indicator that our strategy is working.

If we were to return to Canada in another three to four years, what is your vision for that point in time?

There is a general government push to recognize that the jobs of tomorrow are the higher knowledge and economy-based jobs. Even in the manufacturing sector, we are looking at how businesses can adopt the latest technology in additive and advanced manufacturing to help train current employees on how to use that technology to become more competitive and efficient. In three to five years, you will see a continuation of what we are doing. I predict greater strength in R&D, not just in the pharmaceutical sector but many others as well. It is almost palpable in some areas of Canada where technology is advancing so fast that people just get excited talking about it. Companies will talk to each other and suddenly three or four companies turns into 70 companies coming together to focus on one development. For example, Ontario has one of the largest consortia of water technology research in the world. All these little companies have found a way to compete against the larger players and yet be more effective in addressing the needs of the customer.

Given the various attributes that you have cited, can Canada serve as a model to Europe and the emerging markets of the world?

Canada has worked hard to have some of the best metrics policies in the world, which could serves as an example to others. It is easy to talk about how many jobs a program creates; I am more interested in how long that job would last, the salary, and in what sector.
If you invest funds in a business to help develop a new product, whether the business was successful or not is just the beginning. I want to know more than that. At what cost did the business develop the product? Is that cost less than someone elseâ??s product? To whom and where did they sell it? Will the company sell the product to more markets? This is probably a fine point that most overlook, but science is all about objectivity, reproducibility and validity. I believe that the more accurately the success of a government program can be measured, the more decisions can be based on objective measurements and not politics. This would allow every government to do what is in the best interest of the State, not the party.

Would you have a final message on behalf of the Ministry of State to the readers of Pharmaceutical Executive?

You can expect Canada to be a collaborative partner in working with other countries on the common challenges every nation faces. I think that by working together with other countries on certain issues, Canada can get where it needs to go faster and at less cost to the taxpayer. Canada will continue to focus on creating an environment for businesses to succeed here, including opening up new markets through trade agreements, reducing red tape and instituting competitive tax incentives to industry. I also predict a rebirth of the manufacturing sector at an advanced level, which is very important to

any country.
My main message is one of collaboration and partnership. Canada has many assets and resources, and more importantly a passion to continue to grow the economy, and we would be interested in working with other countries to share solutions to challenges we all face.

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