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Chair

Mr. Dan Ruimy

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● (0845)

[*English*]

The Chair (Mr. Dan Ruimy (Pitt Meadows—Maple Ridge, Lib.)): Welcome, everybody. It's a fun-packed morning we have. This is meeting number 67 of the Standing Committee on Industry, Science and Technology, and we are continuing our study on intellectual property and tech transfer. We have quite a few witnesses with us today.

We have Karin Hinzer, associate professor and Canada research chair in photonic—that's *Star Trek*, I should have known that—nanostructures and integrated devices, University of Ottawa, School of Electrical Engineering and Computer Science.

We have, from the Association of University Research Parks Canada, Laura O'Blenis. She is co-founder and managing director, all the way from New Brunswick.

We have, from Desire2Learn Incorporated, Jeremy Auger.

We have, from Polytechnics Canada, Dawn Davidson, associate vice-president, research and innovation, George Brown College.

We have, from U15 Group of Canadian Research Universities, George Dixon, vice-president, university research, University of Waterloo.

From EION Inc. we have Anand Srinivasan, technology lead.

We are going to start with Karin Hinzer.

You have seven minutes, please.

[*Translation*]

Dr. Karin Hinzer (Associate Professor and Canada Research Chair in Photonic Nanostructures and Integrated Devices, University of Ottawa, School of Electrical Engineering and Computer Science, As an Individual): Thank you, Mr. Chair, and thank you for inviting me to speak to the committee this morning.

As well as being an associate professor at the University of Ottawa, I am also the director of SUNLAB.

[*English*]

I appear in my personal capacity, representing only my own views.

In my career I've been involved in all three spheres that generate most intellectual property and technology creation. I performed research at the National Research Council of Canada for five years, until 2001. I then worked in the private sector from 2001 to 2006 for large Canadian, and then American, multinationals. And in the past 10 years I have been in academia. Most of my research activities have been focused on the information and communication technologies sphere and clean technologies.

At the University of Ottawa, I direct more than 15 researchers dedicated to developing new systems and services to further our transition to clean energy generation and bring the unification of power and data networks. Our research group has interacted with more than 30 companies, as well as 20 academic and government laboratories, and has spun off three companies.

In Canada, my experience is that when graduate students start with you, you can have confidence that they will become experts in their technical field after five years, as we have universities of international stature, with world-class researchers. They will most likely create valuable intellectual property during their studies. The largest intellectual property and technology transfers from academia to Canadian companies occur when one of these innovative companies hires these technically well-trained graduating students.

Students have access to a number of resources within their universities to learn about intellectual property creation and management, and to be linked to ecosystems in their sector of study. This must usually be initiated by the students, and is usually not required to obtain their degree. Therefore, they often have low incentives to avail themselves of these extremely useful tools. Motivated students must receive adequate compensation while they are performing their research and pursuing knowledge transfer activities. This is mainly provided in Canada by the tri-agency research councils, which are NSERC, CIHR, and SSHRC. Students must have access to world-class equipment, as provided by the Canadian Foundation for Innovation, and prototyping such as provided by our fourth pillar, CMC Microsystems, in Canada.

Canada does this fairly well, although research stipends are lower than those provided by innovative countries such as Germany and Japan. Countries that experience higher rates of technology know-how transfer between academia, government labs, and industry support projects that must include the three pillars of innovation, which are academia, government labs, and industry.

To increase the rate of creation of innovative new companies and to have existing ones grow, new graduates and other members of academia must be networked into the broader innovation ecosystem. In order to do so, research groups must be well funded to attend regional, national, and international events that link collaborators, possible customers, and suppliers, and not just other academics. They must be linked with standards groups, as well as industry and professional associations.

They must be able to get funding from various sources to do design work, proof of concept, client networking, and prototyping. Often these steps can take years, especially when hardware is involved. Therefore funding and support for these ideas must be maintained over this time. This has been a constant in Europe, Japan, and the United States. Student researchers must be incorporated in large-scale research projects in order to dream big and be brought to the next level. In the United States, star students are often involved in Department of Defense or Department of Energy large-scale projects that include the three pillars. This is also observed in European framework projects, and now more and more in China as well.

Within these projects and at their university, they must learn to be comfortable discussing topics of mutual interest with their fellow researchers, evidently, but also with lawyers and business persons in their field. This cost is usually assumed internally by universities and, therefore, may not be optimal to assist a bright mind with a commercialization effort. These bright minds have access to early funding from the industrial research assistance program, IRAP, of the National Research Council. These early-stage companies often must show early local customers, and this is where the Canadian government can help, while they pursue their international customers, to be able to show early success as well as to bankroll their initial efforts.

● (0850)

One funding in clean tech that has worked well over the years is Sustainable Development Technology Canada, SDTC, which provides one-third of all the funds for prototypes, although this comes short of the U.S. projects funded by the small business innovation research, SBIR, and small business technology transfer, STTR, programs that fund early-stage, high-risk technologies for small companies. SBIRs carry the burden of most of the costs of early-stage projects, allowing more technological risk on the company's part.

According to the Naylor report, the amount per capita spent on research and development in Canada has been steadily decreasing for the last 20 years. At the same time, we are a society that is more and more dependent on the advanced economy, and other countries have stepped up to the plate and significantly increased their amount per capita.

[*Translation*]

In conclusion, Canada has all the basic elements to increase its generation of intellectual property and to transfer it to industry and other intersted organizations. We only have to bring them together, recognizing that resources must be allocated for the purpose.

Thank you for your attention.

The Chair: Thank you very much.

[*English*]

We'll move now to Laura O'Blenis from the Association of University Research Parks Canada.

You have seven minutes.

Ms. Laura O'Blenis (Co-Founder and Managing Director, Association of University Research Parks Canada): Good morning, everyone. Thanks for the opportunity to present to you.

It's my pleasure to be here. I'm a co-founder of the Canadian Association of University Research Parks, which we founded 10 years ago. I currently act as the managing director.

Today I want to speak about the opportunity to consider an IP matchmaking program, because we believe that part of the issue with intellectual property and technology transfer is a lack of understanding and awareness of what intellectual property actually exists across the country. I'll run through a few things on this.

The Association of University Research Parks is the national not-for-profit association that advocates on behalf of the 26 research and technology parks and innovation districts across the country. The parks are locally driven communities of innovation that link industry with government and academia. Our park network has an estimated 1,400 companies and 65,000 knowledge-based workers. Over one third of our employees have advanced degrees, at master's or Ph.D. levels. Our network generates over $4.1 billion in annual GDP to the Canadian economy. This is expected to grow to $6.2 billion over the next five years. Approximately half of our companies in the parks are currently exporting to the United States, and about a third of the companies export to Europe. As well, 49% of our companies are planning to expand over the next five years.

We believe we can do more to connect industry with opportunities for technology transfer through our academic institutions, which can result in an increase in commercially viable opportunities and growth in the Canadian economy. We would like to propose an intellectual property matchmatching system. Intellectual property fuels the creation of knowledge-based economies, as we all know, by providing a legal infrastructure through which ideas can become products. Robust IP systems foster innovation, leading to economic growth, job creation, and sustained competitiveness in global markets. Intellectual property, as empirical analysis demonstrates, provides a critical infrastructure that moves innovations from great ideas to tangible, real-world solutions, and makes them broadly available to others.

Commercial intellectual property is commonly an invisible asset, but it is critical infrastructure for the long-term growth and profitability of companies. Business owners worldwide fail to appreciate the value of their intellectual assets. A survey by the London *Financial Times* found that 84% of company owners value their IP at zero, and only 6% value it as anything more than 10% of their company's worth. Nevertheless, the World Bank calculated that royalty and licensing fees generated 5.2 billion pounds in the U.K. in 2010, showing the scale of potential revenue available to those who do recognize the value of IP. There's also an indirect positive relationship between IP and profitability. It's exemplified by Google's acquisition of Motorola Mobility, as an example, including its 24,500 patents and patent applications, some of which Google is using to defend its Android operating system in a global patent war against Microsoft, Apple, and Oracle.

On average, a strong IP environment is associated with an increase in the level of spending on R and D by firms within that particular economy. In turn, there is a significant positive relationship between R and D and gross profit margins. Companies with higher R and D intensity are expected to have higher gross profit margins, something that we seriously need to build in the Canadian economy. Companies that are profitable can therefore reinvest in their businesses and continue to scale their operations. Just as every country needs a system of roads or, as is often the case, a digital network to bring goods and people to market, so does every country at every level of development need an intellectual property system to bring ideas to market as products.

We propose an IP inventory mapping that would help identify opportunities and challenges for Canada, practically and a policy level. By mapping the IP assets in Canada and identifying IP customers abroad, a more targeted matchmaking between Canadian IP holders and customers, including researchers and businesses who can actually transfer this IP into commercial application, can be achieved. Meanwhile, policy-makers could learn how Canada's IP approach is perceived inside and outside of Canada, allowing them to identify areas for improvement and better alignment of Canada's IP policy with its economic development agendas.

AURP Canada proposes the IP landscape matchmaking project where we can leverage our network of 1,400 companies in the 26 parks across Canada, as well as a number of government departments that are currently undertaking intellectual property development and looking for partners to commercialize this IP. We can also leverage our global network of clients and partners through our Silicon Valley office and relationships in other regions, specifically in the United States and Europe, to identify and map out companies globally who may be interested in growing their businesses within the Canadian economy with access to this new IP or knowledge of such IP.

● (0855)

A national matchmaking program could yield many benefits, including a better understanding of what intellectual property exists in Canada, identification of potential opportunities for an increase in technology transfer, better alignment with applied research in priority areas for our federal government, an increase in industry-academia collaboration, an increase in industry adoption and application of research conducted through our academic institutions, an increase in the number of patents executed in Canada, and an increase in the potential global advantage for Canada.

Thank you so much for your time. I'm looking forward to the discussion.

● (0900)

The Chair: Thank you very much.

We're going to move directly to Desire2Learn Incorporated, Jeremy Auger, chief strategy officer. You have seven minutes, sir.

Mr. Jeremy Auger (Chief Strategy Officer, Desire2Learn Incorporated): Good morning, distinguished members of the committee. My name is Jeremy Auger. I'm the chief strategy officer of D2L, a world-leading learning technology company based in Kitchener, Ontario. Founded in 1999, D2L has evolved from a small start-up of just five people to one that now employs over 750 staff around the world, with offices in Canada, the United States, Europe, Australia, Brazil, and Singapore. As a company we're committed to breaking down the barriers to education and transforming the way the world learns. Our learning management system, Brightspace, is a cloud-based platform that looks to improve learning through data-driven technology that helps to deliver a personalized experience to every learner, regardless of geography or abilities. Today millions of learners all around the world in K to 12, higher education, and the enterprise sector use our products as their digital learning environment. Our mission to transform the way the world learns has been the same since we founded the company, and it continues to drive everything we do.

Growing to our current size has taken perseverance and a fundamental belief in our mission, and it hasn't always been easy. As a young company seeking to export to new markets, we learned of the predatory and litigious U.S. IP environment the hard way. As we entered the U.S. market, we were sued by a much larger U.S. competitor and fought a fierce, three-year IP lawsuit all the way to the U.S. federal circuit appeals court. Our experience taught us the importance of IP and that IP is, or will be, central to every business in the future if it isn't already. I believe that as technology proliferates every industry, how one leverages IP will be critical to one's success in the marketplace. For us, as a scale-up, software as a service company, our strategy is likely somewhat different from what you might find in other industries such as pharmaceutical or biotech, but it is critical nonetheless.

For Canada, our challenge is not one of having enough innovation; our challenge is to ensure that Canada retains some of the economic and social benefits from our innovation activities—to ensure that inventions are commercialized and leveraged to support the scaling of Canadian firms. Getting technology transfer practices and policies right is a critical piece of this puzzle, and I'm happy to be here today to share some of our experiences.

In the fast-changing space of software, research is an integrated and applied process. We have a different value proposition for IP than do the other industries I've mentioned. And unlike the fundamental research that occurs in some other sectors, say pharmaceuticals, which can result in breakthrough discoveries, software research tends to be continuous and incremental. For D2L, patents are rarely used for direct monetization to accrue royalties or generate a direct revenue stream; they are mainly used for defensive purposes. The patents that D2L holds primarily act as an insurance policy against competitors attempting to restrict D2L's ability to commercialize its innovations. There are two areas of focus I want to raise in my opening statement, which I'd be pleased to further elaborate on during questions.

The first relates to our experience with university-generated IP and tech transfer offices. I'll start by making it clear that academic institutions are our partners, our customers, and in my opinion Canada should be very proud of them. However, D2L has struggled to find value in university-held IP that's generated in isolation of the private sector. In cases where this has happened, many times we've found the technologies already commonplace in the private sector or not in a state where they would provide commercialization value.

The second relates to partnerships between colleges, universities, governments, and the private sector. A strong partnership between academia and business has the potential to bolster the innovation occurring in Canada, but despite participating in several government-funded research partnerships with academic institutions, D2L has struggled to find value in these projects.

When we partner with universities on research, typically funded in part through grant programs, the grant funding is generally allowed to flow only to the non-profit organization. Usually there's also a requirement on the university to have a commercialization partner, such as D2L, for them to qualify for the funding. As that partner we're required to invest with our own cash towards the university and further spend time and effort to undertake research alongside the academics. Most of the time, any resultant IP from the research will be jointly owned between the parties, and then begins the process of D2L's needing to license or buy back the IP from the university. The result of this process is that we find ourselves doubly investing in research if we have commercial interest in the output.

It's a process that pays for universities to do research with both company and government funds, yet we are beholden to the university for the free and clear use of the IP at the end of the project. D2L and other scale-up companies need relevant IP developed for the marketplace that will facilitate growth and commercial success, but paying for IP twice is a disincentive for companies like ours.

As a scale-up company, D2L needs IP for two reasons: first for defence, namely in the form of a defensive patent portfolio; and second to further our business by driving innovation into our products.

● (0905)

More transparency into ongoing university research would increase the accessibility for companies like D2L to understand current research areas, availability of patents for sale, and financial expectations. Any support in this area, as we just heard, would reduce efforts and costs and would transfer success between universities and the commercial sector. Additionally, upfront transparent IP ownership favouring free and clear commercial exploitation for government-funded joint research would help catalyze more joint research.

Lastly, de-risking the collaboration between academia and business has the capacity to unleash new and innovative ideas onto the world. Research, by its nature, is not certain to produce viable commercial outcomes, so engaging in research can be risky and cost-prohibitive. Smaller-scale grants like those of the engage grants program can reduce the risk of research, which may result in IP that can't be commercialized, but this program is very small in scale, and as such is more appropriate for start-ups than for scale-ups.

The pool of grants available for scale-up companies like D2L is much smaller than that for SMEs, so we are stuck between a rock and a hard place. It can be cheaper for us to hire away researchers from universities rather than having to go through the costs and efforts of dealing with universities through larger grant programs. Grants that de-risk working with universities, such as the engage grants, but that are responsive to the needs of a growth company would benefit both parties. There is huge potential in solidifying the partnership among the three levels of government, academia, and business, but we need to do a better job of de-risking technology transfers for scale-up companies like D2L.

I'll leave it at that. Thanks for the opportunity to speak to you today.

The Chair: Thank you very much.

We're going to go to Polytechnics Canada, Dawn Davidson, associate vice-president, research and innovation, George Brown College.

Ms. Dawn Davidson (Associate Vice-President, Research and Innovation, George Brown College, and Polytechnics Canada): Good morning, everyone. I'm Dawn Davidson, the associate vice-president of research and innovation at George Brown College. It's my pleasure to represent Polytechnics Canada this morning, of which George Brown is a founding member. Thank you for inviting Polytechnics Canada and me to present.

Polytechnics Canada is an association of 13 of Canada's large, research-intensive, and leading colleges, polytechnics, and institutes of technology. Polytechnics offer a wide range of advanced educational credentials including bachelor's degrees, advanced diplomas, certificates, and apprenticeship programs. We provide career-focused and community-responsive education developed in partnership with employers. Our commitment to building resilient regional economies is a key driver of our research initiatives, which commonly involve public-private research partnerships.

Polytechnics focus on collaborative applied research with our private sector partners. We typically work with Canadian companies ranging from small to large, as well as multinationals. We have an industry pull rather than researcher push model, so industry comes to the polytechnic with a real-world innovation challenge and the polytechnic provides access to the talent in the college, including our researchers, technologists, faculty, and students, state-of-the-art facilities, and our extended networks to help deliver an innovation solution.

I'll use a previous partnership at George Brown to illustrate a typical tech transfer scenario at a polytechnic. In 2011 the Colleges Ontario Network for Industry Innovation, which is now part of the Ontario Centres of Excellence, introduced Clear Blue Technologies to George Brown as they needed assistance to develop their smart, off-grid, solar/wind controller for community infrastructure. Clear Blue was a start-up company at the time with a small team, and they lacked all of the in-house expertise and infrastructure necessary to develop their product. We provided complementary expertise to that which was already on their team, and worked alongside them to develop components of their system with our prototyping facilities. In this way, technology transfer was completed to the Clear Blue team, both informally through working alongside one another, and formally via the delivery of technical reports, specifications, and their prototypes.

Over the last 10 years George Brown has transferred technology and knowledge to private sector partners on over 500 applied research projects in a similar manner. Technology and knowledge is also disseminated via workshops, symposia, and conferences to the broader community. This facilitates technology diffusion, the adoption and adaptation of technology, which contributes to innovation gain for our country's homegrown firms. An example of this is that at George Brown we have strong capacity in building information modelling, or BIM. In addition to collaborating with companies on applied research, we disseminate the latest information on BIM via workshops, which helps our partners fill skills gaps on their teams to ensure that they're able to adopt the results of applied research.

Polytechnics adhere to a working principle that intellectual property is best exploited by the private sector, and we have similar industry-friendly IP policies and practices in place across all of our membership. I'll go back to the collaboration with Clear Blue to illustrate this. Clear Blue signed George Brown's standard one-and-a-half page memorandum of understanding, which outlines the ownership of IP arising from a project with the polytechnic. With this agreement all forward IP was assigned to Clear Blue and they were responsible for exploiting and protecting the IP. George Brown retained the right to use the research results for academic purposes, and our students were able to acknowledge their participation on the project on their resumés. With unencumbered IP, Clear Blue Technologies has rapidly commercialized their product. They're selling it in 29 countries, 19 U.S. states, and 7 Canadian provinces. They've generated revenues and created new jobs for Canadians.

I understand that the committee is also interested in how we work with other academic partners and industries, so I'll provide one example of this. I'm happy to take further questions later. RZR Skate Blades is a Hamilton-based company that designs and manufactures custom advanced-performance hockey skate blade runners. RZR's product follows a classic hockey skate blade design, but combines high-quality aerospace-grade stainless steels with the latest technology and custom precision manufacturing processes to yield a product with superior performance, strength, and durability.

● (0910)

The project involved collaboration among RZR, Brock University, and George Brown in order to assess the performance of the runners from two complementary perspectives, the first at Brock University, where they did an on-ice performance testing, and the second at George Brown, where we characterized the materials and did testing on the materials themselves. The results provided RZR with empirical support and validation of the value-add of their proprietary process and will enable them to accelerate market adoption of their product.

These examples exemplify the advantages of polytechnic IP policy and practice commonalities for industry, including the following: industry exploits IP unencumbered by the partnership; industry, in working with multiple polytechnics, finds that we have similar IP policies, which simplifies things; there's clarity with respect to the ownership of IP right up front; the time to negotiate project agreements is minimized; and IP is not an impediment to industry-academic research collaborations.

To close, I want to urge the committee to ensure your study of IP policies and technology transfer issues accurately differentiates the kinds of responses that Canada's post-secondary institutions have to a company's intellectual property needs. With polytechnics, the emphasis is clear and simple: we're not motivated by generating revenue from IP. We're motivated by having access to real-world innovation challenges that can become part of the applied learning that we offer to our students. This IP-friendly approach explains why so many firms turn to applied research offices for support as they work through the commercialization process. To date, federal policy has not adequately captured this differentiated logic.

I welcome your questions.

Thank you very much.

The Chair: Thank you.

We're going to move to the U15 Group of Canadian Research Universities and George Dixon, vice-president.

You have seven minutes, sir.

Dr. D. George Dixon (Vice-President, University Research, University of Waterloo, and U15 Group of Canadian Research Universities): Good morning.

As a point of clarification so that it's essentially perfectly clear, I'm here speaking on behalf of the U15 Group of Universities, but I'm also the VP of research for the University of Waterloo. The brief I'm presenting today is a U15 brief.

The U15 welcomes the committee's efforts to increase the benefits that flow from partnerships, technology transfer, and intellectual property in Canadian post-secondary institutions. Disseminating new knowledge and research results is a core part of the university's research mandate. U15 universities have a strong track record of turning our world-class research into commercial successes, from insulin and Plexiglas to vaccines and, more recently, breakthroughs in artificial intelligence.

Canadian investments in investigator-led research generate three major outputs for the private sector, and I'll speak specifically to each of these. The first is a highly skilled workforce, the second is research partnerships, and the third is commercialized discoveries.

First, an innovative economy requires a highly skilled workforce. Investigators use a significant portion of the research funds that support their research to hire graduate students as research assistants. In fact, about 80% of the non-capital investment in research in universities goes to support graduate student education. The experience those students gain through their cutting-edge research provides them with the skills they share with future employers.

Second is partnerships. Our investments in investigator-led research build expertise in exciting and emerging fields that businesses can then access through research partnerships. Recent investments by Google, Microsoft, the five big banks, and others in the Canadian artificial intelligence research space are in fact the results of two decades of fundamental research in AI within the university system. This is an area where Canada performs better than most people believe. Canada is second in the G7 in terms of the percentage of higher education research that businesses fund. The U15 group undertakes more than $700 million per year in business-funded university research, or more than 80% of the Canadian total.

The last item, and the one I want to spend the most time on, is commercialization. Investigator-led research can lead to discoveries that have significant commercial potential. University technology transfer offices work to protect these discoveries with respect to IP and then commercialize those by either licensing the IP or creating a spin-out company.

Often, people focus on trying to find the perfect IP ownership model. The reality is that models differ, based on a variety of factors and local conditions. Institutions that are highly successful at commercialization use the same policies as institutions that are not as successful. The key determinants of success are not which IP ownership model or practices an institution adopts, but rather how well those practices align with the local market and within what context the university executes those activities—to be more straightforward, how well the universities execute their policies.

We have some extremely successful stories and examples of execution. U15 universities currently hold 2,900 active licences. Interestingly, of the new licence agreements the U15 executed in 2015, about 60% were with small and medium-sized businesses. In addition, over the years, the U15 has created an estimated 600 spin-out companies that remain active. It's also worth noting that 89% of the spin-outs our universities created in 2015 were founded in the institutions' home provinces, creating a significant potential local economic impact.

Although these are good numbers, we almost certainly can do better. Almost by definition, groundbreaking discoveries with significant commercial potential occur at a very early stage and need significant work to make them market ready. Effectively, what you need to do is de-risk the associated business development potential for that IP. This gap between commercial potential and market-ready products or services is one that the U15 thinks the government could help us close.

● (0915)

To do so, we recommend that the government introduce two complementary programs.

The first is a program modelled on the United States small business technology transfer program, to help fund R and D that turns early-stage discoveries into market-ready products and services. NSERC runs an I2I program on innovation to industry. These are effectively early-stage programs that allow you to take IP and develop it into a commercializable product.

The second is a program modelled on the United States innovation corps program, which provides robust entrepreneurship training to researchers, including helping them develop a better understanding of customer needs. This is a strategy that we adopted at the University of Waterloo about 10 years ago, in terms of educating researchers about the potential of the IP they own.

To conclude, I'd like to remind individuals about the importance of investing in investigator-led research so that we can deliver these benefits for all Canadians. There are worrying signs that Canada's strength in these areas is slipping. Although lagging investments are unlikely to undermine our economy in the short and medium term, if Canada is to excel as an innovative nation over the long term, investment in research must be sustained. Given the lag time associated with research and with training top university researchers, stagnant or declining investment in research excellence poses a pressing threat.

The recently released fundamental science review report, commonly known as the Naylor report, provides important recommendations about how to reinvest in and reinvigorate Canada's research ecosystem.

I urge the committee members to consider the importance of ensuring that Canada continues to have both a strong research capacity and the ability to maximize the impact of that research.

Thank you for your time.

● (0920)

The Chair: Thank you very much.

Finally, we're going to move to Mr. Srinivasan, from EION Inc. You have seven minutes, sir.

Dr. Anand Srinivasan (Technology Lead, EION Inc.): Good morning, all. Thank you for inviting me.

I'm going to share my insights regarding the problems that SMEs face in obtaining IP from research institutions. I'm going to suggest two or three solutions because it's only a six-minute speech, and hopefully it's useful.

The intellectual property created by university research teams is important for SMEs—no doubt about it. The researchers are generally ahead of the curve. They cross-pollinate between departments, which we cannot do, and they know what is happening in the field and the latest technology. Secondly, the investment required to build a larger intellectual property portfolio, when supported by government funds, helps both researchers and the SMEs.

My take on this now is not to lessen the investment that the government is putting in. Obviously, the government is putting in a lot of money. What I'm trying to pitch here in the next six minutes is how to make that money work better. Where is the bang for the buck? It's very easy to throw more money...and to see the problem go away, but this is not going to happen.

When SMEs contribute cash and in-kind, it shows commitment from SMEs towards research. They already do not have much funds. There is a reason why they are asking for money from government and universities in order to do it.

There are a few things we can do in order to help SMEs. However, getting IP agreements done with the universities and research institutions and others is not as easy as it seems.

I am going to make my next six minutes into three parts: before the project begins, during the project, and after the project; one problem that we face in each; and what we can do—one solution each. That's all I'm going to do here. If there is more, we can always talk about it.

Before the project starts, personally having been involved in negotiating with various universities and research institutions, and from the company's point of view, I see there is a lack of consistent process across the country in application of IP rules within the research institutions. That leads to delays and overhead in spending time with multiple universities and research institutions, and dealing with different teams every time. If you put in $50,000 to deal with one particular external research institution, another one, and then another one, right across the board there is no consistency in terms of rules.

Secondly, every college and university has its own external research department. Sometimes the external research department is bigger than the number of active researchers producing commercialization with the results. You have to deal with this middleman over here who does not understand technology in order to move forward to do the real work. This leads to an overhead of almost one-third of the money in many cases. You put in $100,000, but it's only $66,000 worth that you're starting to use. The other $33,000 goes purely on overhead.

To give you an example, there are three institutions in Ottawa, all doing research. The three have three different external research divisions, and all three have totally different rules and regulations. When I'm dealing with one particular university, the same thing cannot be transplanted. Their overhead is different from the college's overhead, which is different from the other university's overhead.

What am I suggesting here? I really feel the need, right across the board in Canada, that since intellectual property is important, some department or ministry of innovation should come up with a guideline that dictates 80% of what should be there, so that universities take care of the rest of the 20% for locally managing things. However, 80% seems to be the same thing that we are hashing over again and again. If you could help me with that, then it will be easier for me to concentrate on research rather than this mumbo-jumbo.

During the project execution, the IP ownership itself has to be defined properly. The university research tends to hold onto IP, unable to commercialize, leading to the executable IPs that no one uses, or they go into this mode of agreements after agreements for a particular research result or a patent. If you see the number of patents that are coming for the amount of money that is put in, I don't think it is really very large.

● (0925)

The money is in billions, and the patents are not even in thousands.

So I'll give you an example from my personal experience that would relate to you. I worked in BNR and then we became Nortel. I signed an agreement with BNR that the work I do in BNR goes to BNR. I created patents in BNR and Nortel. Those two patents went to Nortel. That went to Motorola or went to Google. God knows where it went. But Nortel had the complete control of using the patents. I can go and say this is my idea, I did it all, but even if you have the idea when you're taking a shower, it still belongs to Nortel.

Similarly, it's the same thing with Tropic when I worked there, which then became Alcatel-Lucent. I created patents, and they belong to the institution. My name is there in the patent and I'm very satisfied with it. Ultimately it was created. The government puts in money for research and the research is done by the university professors or researchers. They didn't put in the money from their pocket. Why shouldn't the results belong to the Canadian people? It is the government's money so the results belong to the Canadian people. Where is the IP agreement here? The IP is the Canadian people's agreement. Why is somebody else holding the particular results?

If an SME puts in the money, then partially that particular intellectual property is held by the SME and the SME should continue developing the product. But if there's an IP created purely based on the government money that IP should be given to the budding entrepreneurs and innovators in Canada, including the SMEs, to take it up, make more jobs, and create more wealth for the country. That is not being realized at all. Instead what we are doing is saying, “my professor did this or this is mine so I'm going to hold on to it” and there is a big department in the middle that comes and starts negotiating with you.

At the end of the day, SMEs just don't have the money, time, or resources to handle this. They say, to hell with it, I'm going to hire two guys and go and do it myself. This is what is happening. Ultimately what happens is there are non-executable patents in the universities that nobody uses but their list is long. They can make claims about it. Very few of them—and maybe you can even count them on your fingertips—are saying, on big data I did this one and in the smart grid I did that one. But for the billion and a half dollars' investment, do you think that even makes sense? I don't know. If I ran my company like that, I would get fired within the first month.

For example, if you're taking the Far East—I don't want to name the countries—every research institution always has a numbered company associated with it and those numbered companies—which kind of mimic NRC—go around, find those who are synergized and then they evangelize that particular patent, and it allows them to build companies based on that and ultimately the country grows. The Canada stagnation, as many of my colleagues put it, is not due to investment. It is because there is no streamlining of processes to make use of it.

I have just a final point, on after the project. After the project, there is really a lack of proper metrics for SME impact and the intellectual property impact within the country. We need to really measure the IP creation, which is the number of patents that are created in the country. It's a very clear number. If we can compare it with the rest of the world for the amount of money that you make, the total number of patents divided by the total amount of money that you've put in gives you your efficiency. It's not rocket science. If we go and check this one, we will see where we are in the world. Once you measure you can always improve, because you know where you are. That needs to be done.

A specific budget needs to be created, and not an addition. Even within what you have, you can segregate for patent creation. Any money that the government puts in for research to a research institution has to end with a patent and that patent belongs to the Canadian people. If an SME puts in money for that particular research along with the government, that patent belongs to the SME also and there should be no agreements of any sort, because we put the money in we have the right to use it.

Of course, the researchers can write their name on the patents. We can write their name on the patents. We can feel good about it, but ultimately who paid for that research? They own the patent. This is the common norm in the private industry. I don't know why it should not be the norm in the government industry.

Those are the three ideas I have.

Thank you.

● (0930)

The Chair: Thank you very much.

We're tight on time. We're going to jump right into questions.

Mr. Longfield, you have seven minutes.

Mr. Lloyd Longfield (Guelph, Lib.): Thanks so much, and thanks to all the witnesses. My goodness, there are a lot of us this morning.

I want to look at, first of all, the tech transfer offices with Laura.

Thank you for joining us from New Brunswick. We had a good conversation last week when you were in Ottawa about the IP matchmaking service.

Could you maybe outline where there's success in that, what the challenges are, and how we get IP from universities to the small businesses.

Ms. Laura O'Blenis: Right now, as it stands, the academic institutions and the technology transfer offices work on a localized level with the companies that are interested in using or applying that technology and that research. What we're proposing is a system that would allow different areas. It would take it from a localized approach to a national and regional approach, whereby if there is an academic researcher in Edmonton, for example, and there is an intellectual property opportunity in Fredericton, then they would see and be able to sort by discipline or area of focus to be able to help that organization get to market faster with potentially a new innovation. There would certainly be some challenges with this type of program.

We have seen some success with a similar type of concept that is based in Europe through the International Association of Science Parks. It is based in Spain. It has a very high-touch cataloguing system that it uses. It reaches out to a network of about 250,000 researchers, businesses, and others that are interested in intellectual property, when it has a company that is interested in building out a certain platform, maybe around IT. A number of our parks are focused in advanced manufacturing, IT, oceans technology, nanotechnology, and green technology. It really is across the board.

This program is quite interesting. It's called the POINT program, through IASP. The network includes organizations and groups both in Europe and some in Canada as well that are members of IASP. It's very high touch, and it's actually not a database; it's actually done by reaching out to various organizations.

Mr. Lloyd Longfield: So the importance of people doing that... I'm going to have to cut us a little short, if we can.

Ms. Laura O'Blenis: You definitely need access to resources. The other challenge would be from an academic institution perspective. Many of the universities have different IP policies and may or may not have all of the disclosures available to them. Fundamentally, you wouldn't be able to get 100% participation, but if you put the resources behind first mapping out what IP is actually available and then building out the database, we do believe it could be quite interesting for acceleration of company scaling, as was discussed in some of the conversation.

Mr. Lloyd Longfield: Thank you very much.

I want to pivot over to the business discussion, and there are very interesting concepts, so far, from business.

D2L, looking at IP as a defensive mechanism, I know you've had a history with the States on that. Having business driving IP versus having universities drive IP has come up before in our previous meetings. Can you expand on the importance of businesses owning IPs verses universities owning IPs? We have two streams at work here, one from peer research and one from problem solving.

● (0935)

Mr. Jeremy Auger: Especially in the tech field, we talk about R and D. Especially in application development, generally speaking, you're much closer to the D than you are the R. That being said, there is still research that happens within companies.

In terms of investment and return on that investment and research, if you can find the right talent, that is largely the cheapest way to do that research. Then there's no question about resulting ownership and ability to exploit it.

While we love working with universities, we also do a lot of applied research, in software especially. Largely, that takes the form of prototyping, experimentation, and testing new technologies and things like that, more so than fundamental research that is going to yield some sort of breakthrough like you'd find in the medical field, battery technology, or something like that.

Mr. Lloyd Longfield: You also mentioned, in terms of knowledge transfer versus technology transfer, actually just hiring people who have the knowledge and getting them into your business, which ultimately creates jobs and creates value within the Canadian market.

Mr. Jeremy Auger: Right.

If we think about just the simple cost of investing in research in a partnership, we have to weigh that against the cost of just bringing researchers on board as part of the team and doing that research in-house. When we think about emergent fields like AI and machine learning, there are a lot of collaborations forming and efforts under way to build partnerships, which we of course want to be part of. We also have to think about our own commercial interests and bringing on staff with those skills. Many of those might come out of either other AI companies or universities and colleges where they're doing research in that area.

Mr. Lloyd Longfield: I know that one of my colleagues is going to be investigating that further, so I'd like to go to Polytechnics Canada, to Dawn Davidson.

I'm very interested in using colleges as a gateway to IP and looking at businesses owning the IP, using polytechnics as a prototyping service that then connects into the university networks.

Can you expand on that for our study, please?

Ms. Dawn Davidson: We typically don't have offices of technology transfer like they do in university settings; instead we have offices of research and innovation that are oriented towards facilitating applied research within the institution with industry. It really is that industry pull model rather than push model.

We'll work with all of the different players within the regional innovation system. We'll work with other universities, community colleges, polytechnic—

Mr. Lloyd Longfield: I'm sorry, I have to get one quick question in with 15 seconds. Do you encourage businesses to develop or to register IP. Is that part of your process?

Ms. Dawn Davidson: Yes, we require that they either register it or exploit it, that they do something with the intellectual property.

Mr. Lloyd Longfield: Terrific. Thank you very much.

The Chair: Excellent. Thank you.

We're going to move to Mr. Dreeshen. You have seven minutes.

Mr. Earl Dreeshen (Red Deer—Mountain View, CPC): Thank you, Mr. Chair.

Thanks to all of our witnesses for being here this morning. There is certainly a lot to take in. We've had discussions about how our research dollars are second in the G7 and the different responses that we have there.

Of course, there still seems to be a disconnect as to the investment dollars that we have and perhaps some of the results that we're getting. I think that's what is critical for us at this point in time.

I think Mr. Srinivasan had pointed out that there are some gaps, and maybe this is great to have the different groups here so we can talk about some of those. Of course, part of it is the way universities are structured, and U15 would understand; and we have the different provinces that have their own way of doing things. If you're going to have the same type of thing happening, even within one city, you'll find it's going to be frustrating for people to work through that.

My question is for Ms. Hinzer. When we're talking about the challenges for researchers when it comes to intellectual property filing, is it the application process? Is it the costs associated with the process itself? If that's the case, what can legislators do to get rid of some of the inefficiencies? Are there updates to regulations that could perhaps be put in, and could they tie into some of the concerns that Anand had mentioned?

● (0940)

Dr. Karin Hinzer: I'm aware of the different rules in the Ottawa area with intellectual property and the different institutions. On the filing of patents, universities have a finite amount of funds that are available to patents.

If there is a company that has a long-standing relationship and that shows interest and has been collaborating with that research group for a long time, they will say, “Okay, we have a good chance of a licence, so let's patent.”

But they have finite resources. They have to take this out of their general budget in order to protect intellectual property and so they have to make choices. Often the choices are quite limited. It depends on the university, but they will say, “If we don't licence very quickly, we do not have a financial incentive, so instead we'll just try to have the know-how and go with new hires to a company.”

That's fine for the D, as Desire2Learn was expressing. Often that will go more in the form of hires, but if we have new, more groundbreaking...or if there's no industry, or nascent industry.... We can talk about AI. I wanted to go into AI when I was a student and all my professors said, “Don't go into AI. There are no jobs in Ottawa. There are no jobs in Canada. Yes, go to Boston.” That was it.

I didn't want to go to Boston at that time, and so I didn't go into AI. Now AI is big. It was really just R and D. Maybe there would have been a lot of patents. I could have started a company. If I had said no, this is really what I want to do.... I went into another field, but this is where universities cannot provide a lot of support at this point. The way the funding agencies are done, for these more long-term, building portfolios, unless you're in a very rich university.... The University of Toronto, the University of Waterloo, the University of British Columbia do that, but if you're not in one of those three universities. it can be very hard for you to create a portfolio to start a company in new emerging fields. High technologies are all about emerging fields.

Mr. Earl Dreeshen: I would like to comment on what you have mentioned, because if the universities are saying, “We have to set aside a certain amount of money so that we can do this”, then wouldn't it be better to find some ways that companies, small SMEs or whatever, could engage at that stage? You keep your money and deal with the things that you're good at and stay out of that part of it and find ways of having others find venture capital or whatever they need in order to move things forward that look as though they could well be commercialized.

I'm wondering about that, and perhaps maybe Anand could tie in on that as well.

Dr. Karin Hinzer: Can I say something on that?

There are companies out there that the university can go to and ask them to be responsible for the licensing, and usually they will, but there's no guarantee that it's going to be licensed in Canada, and you have to remember this is taxpayers' money. So I'm a little bit against that model, personally.

Mr. Earl Dreeshen: Anand.

Dr. Anand Srinivasan: Let me think through this clearly. The person who created this particular intellectual property is the researcher, along with the SME. In general, researchers are either professors or students. Looking at the 80:20 rule, I can confidently say that university professors and researchers are not entrepreneurs. So either we train them to become entrepreneurs so that they can see from an entrepreneurial angle that something has commercialization potential, or we give it to an SME where an entrepreneur can take it up.

The university professors in general do not have—and rightly so—an interest in making a company. That's again the 80:20 rule. There are exceptions like Dr. Praveen Jain at Queen's University, who has formed three companies, but those people are very rare.

There are two things that can be done. First, we can inculcate in the researcher, preferably a young researcher, the importance of creating a patent. In general he or she is a master's or a Ph.D. student, and you can at least create a bit of an entrepreneurial spirit in these researchers so that they see from a patent angle rather than a paper angle. Second, we can give a bit more control to the other side, which means investing money to show they are really serious about it.

● (0945)

Mr. Earl Dreeshen: From that perspective, how do you satisfy Ms. Hinzer's and everyone's concern about the taxpayer investment? Is there something that could be done so that this isn't just going to be tagged and taken someplace else where the investment will be lost?

The Chair: Please be brief.

Dr. Anand Srinivasan: Yes. There are only two funding options that are possible. One is the fully government-funded option, and the other has an SME involved. If an SME is involved, and the SME makes the decisions, then it becomes easy for them to say no. If it's government-funded, then there has to be a body that decides what needs to be commercialized and how it has to be done.

Mr. Earl Dreeshen: Thank you.

The Chair: We're going to move to Mr. Masse.

Mr. Brian Masse (Windsor West, NDP): Thank you, Mr. Chair, and my thanks to our witnesses.

One of the things that has become evident during the testimony we've received is that there's lots of money going out the door for research and partnerships, but there doesn't seem to be any coordination. In fact, one of the biggest questions I ask is, what is it we want from our results? We don't seem to have an answer for that. We're seeking out something, a final result, that we don't even know yet.

For myself and the constituency I represent—tool and die, mould-making, automotive—it's patents that lead to manufacturing and good jobs. What has become frustrating is that you develop some of these patents and then they go to the United States or some other country. These companies in other places end up putting Canadian companies out of work. Canadian companies have had patents developed by their own workers who go to work every single day just trying to get by. It doesn't seem to be much of a strategy.

Mr. Dixon, you've clustered 15 universities here. Who gets in and out of the cluster of 15 universities? From an organizational perspective, why wouldn't we do that with all universities and all colleges and create some type of a base expectation and an exit program, a pooling of resources? Or are we all just continually replicating things, with people left out of it? Why is it not U10, U20, or along that line? Why is it U15?

Dr. D. George Dixon: This is not an easy question to answer. It was U10, then it became U13, and now it's U15. It is effectively developed on two bases. There is an attempt to be pan-Canadian in the representation of universities, and it also represents the universities that are most research-intensive. Take a look at those U15 universities. They effectively receive something on the order of 75% of all of the research funding in Canada, and they produce about 75% of the Ph.D. students. That's the simple basis. The fact is that U15 has mainly come together to try to share best practices between the universities in the research space.

Mr. Brian Masse: I have a question for Ms. Hinzer, and then go across to include everybody here.

Is there a way for research...or is there a common bond in terms of a final exit, what you want for the investment? Is it for Ph.D. students, or is to get products to market? Is there some type of capability at the end of the day for a national strategy related to this? We're getting into competition with a lot of other countries. Is there any common bond in all of this to produce a national strategy, or is it just too diverse to bring it together?

Dr. Karin Hinzer: A quick answer is that it's what people want. As a taxpayer, what I want is good jobs in Canada. The innovation economy creates a lot of good jobs. We're a rich country, but if we want to stay rich we have to keep investing in innovation.

Automotive is booming around the world. I have collaborations with international companies—not Canadian—that do automotive manufacturing in Canada, but most of the automotive companies do not do their big R and D in Canada. That's one thing that the people here want the Canadian government to do. As an academic, I don't want to see my students going to California, to Tesla, or to Ann Arbor, Michigan, but that's where they're going.

● (0950)

Mr. Brian Masse: You're a hundred per cent correct. We've had some things here, but this is almost the platinum age of automotive innovation, and we're getting our clock cleaned like there's no tomorrow. It's unreal.

Maybe I can ask our guests to quickly go.

Mr. Chair, how much time do I have?

The Chair: You have two and a half minutes.

Laura.

Ms. Laura O'Blenis: I have a couple of comments on that. Certainly, you mentioned a coordination effort, and we do believe that is part of the issue. There's also the issue of the programs that fund early-stage research and commercialization activities. They do not account for “go to market”. There are not allocations. They fund only the research and development component. There is not the component to educate people on getting it to market and on new market access. Innovation is only innovation when you have clients and intellectual property.

So...consideration of reviewing some of the programs or having parameters within the programs, for example the NSERC engage grant or other granting councils that exist. There are fantastic programs across Canada already, but perhaps if we really want to see the effort and the focus on the technology transfer, we need to have a component of allowing companies to access that. Otherwise, we're really not going to get away from companies going to the United States, because they're going to go where their investors are. And if they can get investors to get it to market in the United States, and we can't control that patent or that intellectual property, then inevitably it's going to continue to happen. Until we have a solution on that, it may prove to be something we won't be able to overcome.

We believe having a coordinated effort is very important—we do not think that is insurmountable—and having some type of IP strategy that does protect...D2L, for example, talking about issues in the States. There are things we can do within Canada. Also, when there are IP lawsuits that occur, many countries fight the battle in the country of origin. We don't have protection areas like that, for example.

There are a number of things we can do from a Canadian perspective in terms of collaboration, education, and “go to market” that could solve a number of the issues we're currently having and drive the outcomes that we anticipate you want to see as a result of this exercise.

The Chair: You have about 30 seconds.

Mr. Brian Masse: Does anybody else want to respond to that?

Mr. Jeremy Auger: I'm happy to take 20 seconds, if I can.

I'd reiterate all that's been said. When we look across Canada at the importance of IP, especially speaking with the tech field, we see that almost 70% of tech companies in Canada have fewer than five employees. When we then think about how we keep IP in Canada.... Largely, IP developed in Canada today is assigned to the parent company of U.S. multinationals—something like 40% of it. Then, as we see our start-up economy blossom, many of those companies end up selling themselves—again, largely to U.S. acquirers—so that IP is being drained to the benefit primarily of U.S. multinationals. We need to help support Canadian scale-ups to keep that IP in Canada.

Ms. Laura O'Blenis: Exactly.

Mr. Brian Masse: We've become a branch plant.

Ms. Laura O'Blenis: Exactly.

The Chair: Thank you.

We're going to move on over to Mr. Baylis.

You have seven minutes.

Mr. Frank Baylis (Pierrefonds—Dollard, Lib.): Thank you.

I would like to start with Dr. Anand Srinivasan.

You had talked about the lack of consistency and the challenges that small companies have in starting to negotiate a contract with one university and then starting the whole process over.

What if there were a template? What if we asked or pushed universities to use a standard template so that you knew when you came to do a licence or purchase what you were dealing with? Say 80% plus was standardized. How would that help?

Dr. Anand Srinivasan: Well, it would definitely reduce the overhead for them. At the moment, overhead can shoot up to 30% or 40%. They are going through the same thing everywhere. Most of the people who are negotiating are not even subject matter experts, so a lot of time is being wasted. That would definitely bring it down.

Mr. Frank Baylis: Yes, it would alleviate the weight on a small company by having these set templates that they would use.

Dr. Anand Srinivasan: Yes, I agree with you. It should not be an imposition, because then there would be a retaliation. Insert a template or a guideline, things like that, definitely. There should be fields set out beforehand, so that they know what they are getting into.

Mr. Frank Baylis: Such as they have in the United Kingdom, for example.

Dr. Anand Srinivasan: Oh, okay. I did not know they did that.

Mr. Frank Baylis: Yes.

I'm going to move my question to Mr. Jeremy Auger, but in a slightly different way.

You had mentioned that you have to negotiate twice. You come to a university; you fund the technology; something good comes out of it; and then you find that you jointly own it, but you have the same difficulty of having to renegotiate.

What if they had that template, and you knew going in, because you're partially funding it, that they had to use such a template. What if you knew exactly what you would have to do if something good came out of that research? You would know ahead of time. You would not be stuck thinking that something's great, and then having a greedy person, or some challenges that you have to renegotiate.

How would that help your industry?

● (0955)

Mr. Jeremy Auger: I think anything you do to drive upfront transparency of any IP ownership as output is critical. What that lets you do is decide whether you want to do it in the first place. If the IP outcome is not favourable, you'll know that and may decide not to participate. If it is, then you will participate.

We've actually had situations where we've done joint R and D projects, multi-year R and D projects, with grant funding from the NRC and Canadian universities together, where we had those upfront agreements. In the end, because we did jointly implement some products that went to market, they wanted to renegotiate those agreements as well.

I think transparency is great up front. Sticking to it is even better.

Mr. Frank Baylis: Were they able to renegotiate, or were you able to hold them to what you had?

Mr. Jeremy Auger: In part.

We're tough negotiators, but at the end of the day, when you jointly own something, you need to come to a resolution, especially on something like IP.

We see this more so in the U.S. than in Canada, but it's something to look at not doing in Canada. Developing an environment that supports....

Many times, U.S. universities act as patent trolls. Effectively, they are non-practising entities holding large patent portfolios. They will send companies letters saying things like, “Hey, we noticed that you have a product that likely practices one or more of our patents. We are curious if you would like to purchase or license them.”

Mr. Frank Baylis: I understand. We don't want to be setting up for patent trolls, for sure.

Coming back to the specifics, more clarity right at the beginning about what you're working with would be beneficial.

Mr. Jeremy Auger: It definitely would be, yes. I think it's fair.

Mr. Frank Baylis: Fair enough.

I'm going to move on now to Dr. Karin Hinzer and Mr. George Dixon.

You both touched on the U.S. model of SBIR. I would like you to elaborate a bit on that. How could you see that helping in tech transfer, specifically?

I'll start with Karin.

Dr. Karin Hinzer: When I worked for an American multinational, it also had a plant in.... I'm going to start with Europe.

George talked about it in his testimony, but really, when I worked for this company, people in my company were paid to do R and D on these large, what were usually multi-country, long-term projects, for which the company was getting support. This was explained by Desire2Learn. This is not our model in Canada. We do not fund R and D employees within companies for any project that is funded by the tri-agency research councils.

SBIRs in the Department of Defense and the Department of Energy, large projects—this is not exactly your question Mr. Baylis, but I just want to allude to it now— allow for the paying of employees in companies. This is what allows companies to grow their R and D departments, or to keep them going while they're developing new products that they can then bring out to the market.

With SBIRs and the ASBTT—

Mr. Frank Baylis: The STTRs, yes.

Dr. Karin Hinzer: Yes, the STTRs. What it does is that a company that is either a spin-off from academia or just a spin-off can go out and get funding that pays for all of their R and D.

Mr. Frank Baylis: It's a facilitator to move the technology out.

Dr. Karin Hinzer: Yes, exactly.

It's different from what we have. I gave the example of the SDTC, which pays only 30%, so you need to have your investors lined up and already have the proof of concept done, but this allows you.... It's a stage that is a bit earlier, and it doesn't necessarily have to be linked to universities.

Mr. Frank Baylis: It allows you to get that proof of concept done. It's a funding mechanism that the Americans use to help pull the technology out of the universities and to make it a very easy move, if I could say that.

Dr. Karin Hinzer: It's an easy route, and it's a way to really build your patent portfolio as well, in a certain time frame. We were talking about not having a lot of resources in universities. This is one way to do it.

Dr. D. George Dixon: I don't have a lot to add to what Karin has said, but I'm going to speak from the University of Waterloo experience now, because I frankly don't know what goes on in the other institutions.

One of the major issues we arise at is this POP funding. Effectively, one of the roles of a tech transfer office is to take some IP, de-risk it, put a package around it in order to be able to commercialize it and move it out of the university, and to actually do prototyping and proof of concept associated with that IP. The small business technology transfer program in the States has an outstanding track record and ability to effectively achieve that early-stage activity of moving the IP out of the university.

● (1000)

Mr. Frank Baylis: They're packaging it so that it can be easily moved out.

Dr. D. George Dixon: Package it, de-risk it—

Mr. Frank Baylis: By making prototypes of these....

Dr. D. George Dixon: Yes. Really, what you're trying to do is look at attracting early-stage investors if you're doing a start-up in that space.

On the other area that no one really has alluded to here yet, I'll say just very briefly that if you're starting to look at licensing technologies to large companies, it's a different game. I always say that there's licensing over here and then there's doing spin-off companies and start-ups. For a lot of technologies, especially when you look at drug discoveries or some of these areas where there's a huge amount of capital required up front for an idea, licensing is often a better way to go. Really, this type of activity that I'm talking about here is targeted to start-ups, not to licensing.

The Chair: Thank you.

We're going to move to you, Mr. Lobb, for five minutes.

Mr. Ben Lobb (Huron—Bruce, CPC): Thanks to all of you for your comments.

I've also noticed that there's some committee business here at 10:30. I don't know if we're sticking with that or not, but I have an outstanding motion, and if the intent is to discuss my motion in camera, then I won't be doing that today.

The Chair: No. We will be discussing committee business regarding—

Mr. Ben Lobb: Okay.

I'd also like to point out for the Liberals across the way that my motion deals with the Investment Canada Act. Since we last discussed it, there have been numerous news articles and transactions that have taken place that prove we should be discussing the Investment Canada Act for the benefit of all Canadians. We'll see if they have the courage to do so.

I want to ask Ms. Hinzer a question first. It has to do with comments that Mr. Auger and Mr. Srinivasan made on standardization.

We're not critiquing universities and we're not criticizing universities. We're talking about making improvements or suggestions. Is there any valid point that there should be some streamlining and standardization taking place so that when businesses go to initiate, they don't have to deal with three different processes in one city, such as Ottawa? What do you think?

Dr. Karin Hinzer: It would be great if that were the reality, but the minute you put in lawyers and you have companies, they all want to negotiate. Everybody wants to negotiate.

I'll give an example. In the U.S., the overhead is 52.3%. In Canada, it's usually around 20% to 40%. You have to remember that this overhead is not just for the legal fees, but to be able to do research and labs, and for the security of the university, your Internet connection, your heating and your plumbing in your labs, and just getting desks for your students. These overhead costs are the costs of doing research. It's like overhead in a company. Every company runs with an overhead. When we're talking about fees, these are fees in order to be able to run your university and to deliver on the projects with those companies.

Mr. Ben Lobb: Fair enough, but if we're having a negotiation, shouldn't they be pretty close, the overhead costs from universities...? Is it impossible? For us sitting here today in a small country like Canada—relative to the rest of the world—when we're looking at this study right here, do we start off saying that one of the things we can't do is streamline the negotiation process?

Dr. Karin Hinzer: I'll just give you an idea of the part that is standard. The funding agencies give overhead to the academic institutions, and those are standardized. It's more on the negotiation per se between an R and D company and a university.

Yes, I agree with that statement. It would be better if it were standardized.

Mr. Ben Lobb: Okay.

Mr. Auger, thank you for taking the time today. One of the comments you made about paying for IP twice goes back to what Anand said that in a lot of ways the federal government's money goes into universities through transfer to the provinces, etc., and the Canadian taxpayers' dollars go in, yet professors in universities want the IP.

Maybe you don't want to go into specifics, but I want you to talk about the negotiations from the beginning, the struggle to find value, which you made in your comments, and also the frustration from having to pay twice for IP.

● (1005)

Mr. Jeremy Auger: Typically, when we're working with universities, it will be under some sort of grant program. Those grant programs have requirements, usually to fund research within a university. A good part of the requirements is they require a commercialization partner, like a tech company like ours. Ultimately, the goal is to find commercial value out of research outcomes.

The problems arise in the funding models. Usually it's some sort of matching program. It might be dollar-for-dollar matching, based on the funds raised against government funds. Those funds typically come from companies like ours. When we are paying for half the cost of the program, we are investing our people time additionally to jointly do that research with the university.

At the end of the day, if we then have to pay the university for either a licence or the purchase of IP, since it's jointly arising IP, then to a large degree we feel we have already paid for that IP, either through our own dollars or through Canadian government dollars. Technically, we're paying for a licence or a purchase: it seems as if we're paying twice.

The Chair: Sorry, we're out of time.

We're going to move to Mr. Sheehan. You have five minutes.

Mr. Terry Sheehan (Sault Ste. Marie, Lib.): Thank you very much to all our presenters.

A couple of presenters mentioned the importance of involving young Canadians in research and development, and the asset they can become in tech transfer, not-for-profits, or in SMEs. The federal program has internship programs of up to about a year, 90% for non-profit and about 50% for SMEs.

Perhaps if the people who were commenting about the value of those internship programs could comment on that, that would be great. I think Karin mentioned something about the youth.

Dr. Karin Hinzer: Thank you, Mr. Sheehan.

Internships are extremely important. Yes, the Government of Canada has always had internships. I did internships for the Government of Canada in the early 1990s. In my opinion, there are not enough. I know we have a lot, but we don't have enough.

Students come knocking on my door almost every day. I try to work at the university, and my door is open. I try to direct them toward the funding scheme that can help them the most, but there are not enough of them. Young people looking for opportunities need experience.

Mr. Terry Sheehan: That's excellent.

Does anybody else wish to comment? I don't know if someone online mentioned internships.

Go ahead, George.

Dr. D. George Dixon: If you take a look at the program run by Mitacs, which is specifically directed toward graduate education—I won't declare a conflict, but I was on the board of Mitacs at one point—it aspires to do 10,000 placements a year of master's and Ph.D. students working in the private sector for experience.

At the University of Waterloo, we do 20,000 undergraduate co-op placements a year in our co-op program. It's paid employment by the private sector. It's a vastly transformational opportunity for students when they go out on these work terms.

In this IP space and with respect to graduate education, master's and Ph.D.s., I think the trick to a lot of commercialization activity is those internships or those periods of time. Remember, the first comment I made in my presentation had to do with highly skilled employees. We produce them, but we have to have an effective way to get them into the private sector. Those internships achieve that goal.

● (1010)

Mr. Terry Sheehan: Agreed. One thing too is that in northern Ontario, where I'm from, in rural Canada, there are programs in place where some of those internships can be extended 24 months in an exceptional case, but to small cities and first nations. In your opinion, if we broadened it especially for rural Canada, with a lot of the good research that's going in forestry and mining and out on the oceans and whatnot, and we extended that to the private sector for 24 months and made it more generous—I like the fact that you said "more", and it's on record—how would that be as a recommendation? Do you think that would help out in rural Canada?

Dr. Karin Hinzer: Yes. The companies that I work with like internships. The basic internship is four to six months. Mitacs is six months. Companies like one-year internships more. This is more the model from Germany, where you're doing an apprenticeship. It doesn't feel like a burden. People want to have you there. In the first few months you're there, you're learning the ropes. If you're only there for four months, you're pretty much learning the ropes and not contributing that much. The longer you are there, the more you contribute. The more you integrate in that community, the more you want to want to stay there and work there. For regions that is extremely important.

Mr. Terry Sheehan: Does someone else want to chime in?

Ms. Laura O'Blenis: Dawn can go first, and then I'd like to talk.

Ms. Dawn Davidson: Thank you.

The Mitacs program has been open to only university students so far. There is a fantastic opportunity, with the 10,000 new internships, to open that up to college and polytechnic students as well. As I mentioned, we worked on over 500 projects in the last 10 years with mostly small businesses. Many of those small businesses would love to work with a polytechnic intern on R and D after they have worked on an applied research project with us.

There is a huge opportunity there for the Mitacs program. There was some opening up in the federal budget language around it being open to colleges and polytechnics.

Mr. Terry Sheehan: Thank you.

The Chair: Thank you. That's about all the time we have for that.

We'll move to Mr. Nuttall.

You have five minutes.

Mr. Alexander Nuttall (Barrie—Springwater—Oro-Medonte, CPC): Thank you, Mr. Chair.

I'd like to thank all of our presenters for being here today and for answering our questions.

I'd like to take this in a bit of a different direction. One of the interesting things we're able to do as parliamentarians is to travel to other countries, learn what they're doing and what they're doing differently, identify the successes and failures, and perhaps bring those lessons back. One of the trips I was able to go on that I found the most intriguing was a trip to Israel. On that trip to Israel, I learned a few things that I'd had no idea about. Number one was that in terms of start-up tech companies...the most densely populated in the world, Tel Aviv is blowing up. We had about a five-hour presentation during which they explained how this was all started and how they managed to keep their IP and grow it into businesses, etc. It was really about the alignment of government priorities with the private sector.

Now, we don't have all the things that they have going on. Security is a major export for them. We have the U.S. beside us, not countries that believe we shouldn't exist, so there are some definite differences.

I'm wondering if you could give me any examples of where you have seen the prioritization, or the government has demonstrated the prioritization, of what we already have as our major assets in Canada in terms of leveraging them. We have huge natural resources, whether it's oil...northern Ontario, or northern Quebec. How can we use the assets we have to develop better policy for IP and to develop better synchronization between those natural resource sectors and IP entrepreneurs as they grow and take those things to market?

Dr. D. George Dixon: Perhaps I could make a comment with respect to Israel. It's true that Israel has a very integrated chain. The University of Waterloo has partnerships with three universities in Israel. We have partnerships around accelerators and incubators, both to get some opportunity for Canadian companies from Waterloo and Israel and to bring some Israeli companies over here to look at opportunities.

One thing you have to remember about Israel is that the level of funding that is put into each of those new start-ups is, frankly, amazing. You form a company, and the chain of resources that you can rely on, all the way from early stage through venture all the way up, is quite consistent.

In some ways they have the same problem that we have. They lack large multinationals. You can get a company up to $300 million U. S., but then trying to grow it above that is a very similar type of problem in Israel to what it is here.

I think it's fair to say that, in terms of natural resources and activity in Canada, the area where I see most of the opportunity is in clean tech. It has to do with effectively developing processes and commodities that are marketable worldwide in terms of industrial cleanup. The other one has to do with the forest industry and areas of nanocellulose activity in that space, where we probably have a pretty good opportunity now and have an opportunity to move forward.

I don't know if that answers your question.

● (1015)

Mr. Alexander Nuttall: Yes, certainly. I was able to visit a place, I believe, where the University of Waterloo had a partnership and see that.

I'll move over to Karin.

Sorry, I saw you were able to answer the question.

Dr. Karin Hinzer: With natural resources, if we look at the model of Europe, they have natural resources, fewer than us, but they have a lot. What they've done is they've gone up the food chain. To the example of nanocellulose, it's used a lot in cosmetics, and we have some R and D on that, but we haven't moved up the food chain where we do very sophisticated products for very international, sophisticated consumers. Consumers now, since you can buy everything on the Internet, want very sophisticated post-processed products. We have not stepped up to that.

In the U.S. they have done that, but not as much as in Europe. It's really funded a lot by the Department of Agriculture and the Department of Energy. We have NRCan. We have other research institutions that do that, but we haven't made the effort of bringing them in on large-scale projects as much as the U.S. has done, again, for sophisticated post-processed products.

The Chair: Thank you very much.

We're going to now go to Mr. Arya.

You have five minutes.

Mr. Chandra Arya (Nepean, Lib.): Thank you, Mr. Chair.

Mr. Dixon, you mentioned about how good Israel is, etc., but there are also other issues. The difference is the Israeli defence and the Israeli military. The universities do a lot of research and development that lead to innovation, but they don't hold onto the IP rights. They allow their personnel to take the entire IP with them to the technology sector. That's where it allows them to prosper, but I'll come back to you on that if I have time.

Dr. Hinzer, what about this idea that a lot of research done by the universities is done with taxpayers' dollars? Also, sometimes some SMEs join hands, along with taxpayers' dollars, to fund innovation. Why should the IP rights be limited to universities? Why doesn't it have to go to the SMEs?

Dr. Karin Hinzer: Well, the standard agreement from the tri-agency councils, which is a template that's used by universities, is that the SME that's the partner in a grant, that has put either cash, in-kind contributions, or a combination of both, has right of first refusal on that intellectual property.

Mr. Chandra Arya: Why don't they automatically get the entire rights to use that innovation?

Dr. Karin Hinzer: Because usually for a research group, I get funds from at least 15 different sources for my group.

Mr. Chandra Arya: Then why don't all the 15 sources get the right to use that IP?

Dr. Karin Hinzer: They're from different countries and they're from different provinces.

Mr. Chandra Arya: It doesn't matter. I'm talking about Canadian tax dollars investing in universities, and if the benefit doesn't flow back to Canadians, why should it be there?

Dr. Karin Hinzer: It's a good question, and I can't answer that. I'm on—

Mr. Chandra Arya: Thank you.

I'm going to ask Ms. Davidson. Can you answer that, please?

● (1020)

Ms. Dawn Davidson: Yes. We do give the intellectual property to the partners we work with. We don't retain any of it ourselves.

Mr. Chandra Arya: That's good.

Ms. Dawn Davidson: It's very simple for us. We have a standard template. We sign the same template with every partner. We have no problems partnering with industries; they like to sign our template. It's very simple.

Mr. Chandra Arya: Now, your standard template, how does that match with those of other institutions, say, other universities? I know yours is polytechnic, but other universities, how does it match?

Ms. Dawn Davidson: It doesn't match with the university templates. The universities all have different templates. It does match with other polytechnics across the country or with many colleges across the country.

The reason we're doing applied research is very different from why the universities do it. We're primarily doing it to benefit our regional economies, to get more jobs for our industry partners, so that our students can get great jobs, and also so that we can give our students experiential learning opportunities.

We're not driven by generating revenue from intellectual property. Patenting and publications are not our key metrics. Our key drivers are the number of students and the number of partners and the economic benefits we can have for our partners.

Mr. Chandra Arya: Thank you.

Anand, you mentioned in your speech about a Far East country where the patents are held by a numbered company and it allows the industry to access them.

Dr. Anand Srinivasan: Yes.

Mr. Chandra Arya: Can you slightly expand on that?

Dr. Anand Srinivasan: For example, the university itself does not do the research in a shell. They already partner with a numbered company, which may be a military organization or it could be any of the others. They work in tandem with the university to find where the intellectual properties can be harnessed, and that is useful for spinoffs into a company to produce jobs.

Instead of the universities going around doing this, because they're not the right resource to do it, these people have the resources in order to go and evangelize the particular value of the patent and then find like-minded ones and give this patent so that new start-ups can —

Mr. Chandra Arya: I have about 30 seconds left.

You mentioned the 80:20 ratio where 80% of the professors and researchers don't have the knowledge or the ability to commercialize the innovation they do.

Dr. Anand Srinivasan: Entrepreneurship.

Mr. Chandra Arya: That has led to a lot of IP being held within the universities without ever seeing the light of day.

Dr. Anand Srinivasan: Non-executable patents.

Mr. Chandra Arya: Then what do you think we should do?

Dr. Anand Srinivasan: That should at least be opened up. I completely agree with you that it should be opened up.

The Chair: Thank you very much.

Mr. Masse, you have the final two minutes.

Mr. Brian Masse: Thank you, Mr. Chair.

Thank you to our witnesses today. It's been very good. A lot of thought has gone into what we have, and I would add that, if you have further evidence, the committee will still be accepting it over the summer.

I would be so bold as to say that, if you have students who have seen some of this testimony through the academic institutions, it would be interesting to see their perspective in terms of going through the classrooms.

Mr. Anand, I'm going to finish with what you mentioned with regard to other countries and us, where we are at the end of the day. I think everybody here wants the results to be tangible for us as Canadians. Where do you see our country? I'm worried that we seem to be adrift on this.

The evidence seems to be more and more that a lot of countries—we've been in the United States, and I've been researching other countries.... It kind of seemed as if the argument of the old days as we went through it in Windsor was innovation and high tech. We had to get out of the nuts and bolts of the auto industry, and everybody had to go to high tech, but it turned out everybody was doing that without a plan.

What do you think Canada can do differently from other countries that could actually lead to a very successful model of turning innovation into a job manufacturing strategy and an export strategy versus the opposite, where it seems we export the ideas and we import the products?

Dr. Anand Srinivasan: We are progressing but other people are doing it much faster than us. It's not because we are going in reverse gear; we are also going forward.

The thing we could do better is to not hold the intellectual property and ideas too close to our chest for a long period of time. In the 1920s it worked because it took other people a long time to understand ideas but nowadays it's instantaneous. What needs to be done is like what happened in Android and with the Internet; you open it to Canadian citizens. Anybody who takes it up uses intellectual property that came from a Canadian institution and creates jobs; they should be given incentives. There has to be a centre of excellence created for various silos. For example, smart cars are a clear centre of excellence. They should hold portfolio patents from all institutions, and they should be opening it up to a select group of people to go forward and build companies.

● (1025)

Mr. Brian Masse: Very quickly, would it be more dangerous for us to not share versus share with regard to innovation?

Dr. Anand Srinivasan: There is nothing that other people cannot create. It is just that we did it first. If we wait then we lose, and if we don't wait we still lose if we hold it.

The Chair: Thank you very much.

On that note, I want to thank all our witnesses for taking the time and sharing their knowledge and their information with us, our own kind of knowledge transfer, if you will.

We're going to suspend for two or three minutes, and then we'll come back in camera to discuss committee business.

Thank you.

[*Proceedings continue in camera*]