




Submission to the Expert Review Panel on Research and Development

February 18, 2011

By Canada's Fifteen Leading Research Universities

University of Alberta
The University of British Columbia
University of Calgary
Dalhousie University
Université Laval
University of Manitoba
McGill University
McMaster University
Université de Montreal
University of Ottawa
Queen's University
University of Saskatchewan
University of Waterloo
University of Western Ontario

**Though a member of the U15, the University of Toronto is not a signatory to this document.*



As Canada's fifteen leading research universities, the U15 undertake more than 90 percent of contracted research between the private sector and post-secondary institutions. The U15 are ranked among the world's premier research institutions and represent a research enterprise that is valued at \$5 billion in annual research income. Collectively, we produce more than 60 percent of all graduate students in Canada – the talent that drives our national innovation enterprise. As key partners in fostering the innovation enterprise we welcome the government's decision to assess government programs that support R&D, specifically as they relate to encouraging private sector investment in R&D. We also recognize that this review is not an opportunity to secure additional funding but to identify how government can secure the maximum returns on its investments.

The purpose of this submission is to discuss how the U15 can continue to build on our partnership with government, private sector partners and indeed all Canadians, in overcoming our nation's productivity challenges and secure a vibrant, sustainable and internationally-enviable innovation ecosystem.

Thanks to our abundant natural resources, human talent, government policy and a welcoming society, Canadians have fostered what has been seen by many as an enviably stable and prosperous economy. As the Expert Panel's Consultation Paper notes, however, a rapidly changing global context requires Canadians to become more economically competitive by improving our productivity and our innovation ecosystem.

Innovation encompasses a vast spectrum of activity and is much more than the act of creating new products. The Consultation Paper properly acknowledges the concept of innovation as a continuum and stresses the need to consider the various factors that contribute to fostering innovation, from talent to ideas, from networks to capital. Innovation cannot be seen or stimulated in isolation. Though beyond the scope of this review, a successful national innovation strategy will require decision-makers to contemplate the varied contributions to the full innovation continuum. That continuum touches on many aspects of government policy, including all levels of education, immigration policy, taxation, the interaction between innovators and government services, jurisdictional alignment and cooperation, and direct and indirect incentives.

Canada's research universities are uniquely placed to stimulate and engage the full breadth of the innovation continuum and, in fact, are doing just that. Of the four inputs articulated in Figure 2 of the Consultation Paper, research universities are leading contributors to three.

Through our research and teaching enterprise, research universities:

- Foster new ideas and knowledge;
- Educate, recruit and retain talented, educated and entrepreneurial people; and
- Cultivate and leverage networks, collaborations and linkages.

And while our institutions may not be the primary sources for capital, many of our institutions are exploring innovative ways to provide early stage pre-seed investments in early start-ups by students, young researchers and recent alumni. Based on these contributions, some have even suggested that in the absence of a research-minded industry base, universities will play a critical role in driving commercialization in the foreseeable future.

Of these various inputs we consider talent – highly skilled individuals – the key contributor to advancing the innovation continuum, with knowledge production at research universities a close second. Talent initiates new ideas/processes, talent is ready to receive new ideas and take them to the marketplace, and talent in the marketplace adapts and adopts these ideas/processes to real life problems and opportunities. Importantly, talent encourages, instructs and attracts more talent.

As researchers, instructors, professionals or skilled graduates, the talent cultivated at leading research universities represents a broad spectrum of expertise that touches the lives of all Canadians and engages every industry sector. As alumni of our institutions, this talent goes out into businesses, communities and government to become the needed knowledge generators, idea receptors and innovation adopters.

Importantly, this talent also cultivates the strategic linkages and partnerships needed to succeed. Increasingly, successful research endeavours are those that are linked not only across disciplines but across borders. Researchers are increasingly collaborating with partners in jurisdictions around the world, leveraging knowledge, funding and markets. Research university campuses are themselves becoming more internationally focussed. With an ever growing influx of international students and ambitious targets to increase international student numbers, our campuses provide early opportunities for young Canada-based talent to learn and appreciate the opportunities and benefits of being globally engaged. In his recent op-ed, "Innovate or Perish", Kevin Lynch underscores this globalization:

The internationalization of science and technology means OECD countries are losing their monopoly on creating new products and developing innovative technologies. In this global, knowledge-based economy, the Internet is reshaping how we work, how we communicate, how we socialize, and how we learn. The "national" university is going global, with online learning, virtual campuses, transborder research networks, and international student bodies and faculties.

Thanks to competitive government programs and institutional ambition, Canadian research universities are producing and attracting some of the best international talent to Canada. And yet, as a nation, we trail many of our OECD competitors in this regard, particularly in the production of individuals with advanced degrees, such as PhD and Masters' level students. The 2009 Council of Canadian Academies report, "Innovation & Business Strategy: Why Canada Falls Short", correlates Canada's low proportion of workers with advanced degrees to Canadian business's poor innovation performance.

In our view, addressing the shortage of talent, particularly talent with advanced degrees, is fundamental to advancing the innovation continuum. Doing so necessitates the holistic conceptualization of the innovation continuum – research universities, government and the private sector need to come together to train and attract more individuals with advanced degrees and to communicate their value to the private sector and the broader community.

Governments can provide increasingly competitive support for graduate scholarships and post-doctoral fellowships, and universities can provide the needed environment in which to learn and research. However, if this talent cannot find appropriate employment opportunities following study, we risk underutilizing or losing the talent we so desperately need. The lost opportunity costs are great, particularly if the talent is home-grown. As one professor has pointed out, "Every time one of my graduate students leaves with a PhD and goes to Microsoft (in the United States) we're essentially handing Microsoft half-a-million dollars."

Exposing students to industry and industry to students is an important step. Research universities are developing entrepreneurship programs to instil entrepreneurialism across disciplines and to foster greater interaction with industry partners. Promoting entrepreneurialism and exposing both students and industry to the benefits of closer cooperation through experiential learning opportunities like internships and co-op programs is producing results, but more can be done.

SMEs and Innovation

Small and medium-sized enterprises (SMEs) are a core part of the Canadian economy, comprising almost 97 percent of all firms. It is a mistake to suggest that the dominance of Canadian business by SMEs inhibits innovation. Rather, this reality calls on all innovation partners to adjust programs to the unique needs and concerns of SMEs and, increasingly, consider the role of local jurisdictions in which these SMEs are situated.

Some observers have suggested that, in fact, SMEs are at the forefront of innovation with a disproportionately high number of new firms coming on line, replacing older or failed SMEs. As less productive companies leave the marketplace they are replaced with more productive and/or innovative start-ups – demonstrating in real terms the conceptualization of innovation as “creative destruction”.

Of the SMEs that succeed and grow, those who strategically position themselves within the innovation continuum thrive. Per the October 2010 TD Bank report, “Secret to Success: An Economic Perspective for Small Business”:

The most successful SMEs are those that pursue increased R&D, strive to innovate and invest in new technologies. And the data show that many Canadian small and medium-sized businesses do exactly that.

The report goes on to suggest that,

The most positive dimension to this story is that if SMEs were to boost their innovative capacity and capital stock, it would help boost Canada’s ailing productivity performance.

The U15 have consulted broadly with industry partners and have heard repeatedly about the Small Business Innovation Research (SBIR) program established in the United States. There may be features of this uniquely tailored SME program that could be replicated in Canada to better support SMEs wanting to pursue increased R&D.

A Word about SR&EDs

In our consultations, we have also heard a wide range of views on the Scientific Research and Experimental Development (SR&ED) program. We also recognize that a considerable portion of the contract research with private sector partners undertaken at the research universities is a result of the program. From this consultation it does appear as though the SR&ED program is not achieving its policy objective. However there does not seem to be sufficient data to fully understand the problems associated with the program and the current Review may be limited in time and capacity to undertake a comprehensive analysis of the program. Before proceeding with any fundamental changes to the SR&ED, government should be mindful of unintended consequences. We encourage government to consider undertaking a more in-depth analysis of the SR&EDs following the conclusion of the current review.

Notwithstanding this caveat, we do encourage government to review the process associated with SR&ED approval and auditing. As Canada’s leading research universities, our common advocacy theme has been for government to instill the value of excellence when allocating strategic funding. The rigour associated with identifying that excellence has produced results, as exemplified by the Centres of Excellence for Commercialization and Research (CECR) program and the Networks of Centres of Excellence (NCE) program. Unfortunately, the SR&ED approval process lacks similar rigour. As well, the quality of the auditing associated with the program has been questioned. Better oversight of the SR&ED program is long overdue.

Lastly, industry partners have noted that, particularly for small and medium sized companies, the SR&ED program rewards conduct of research but not the continuum that converts that research into sales.

What Works?

Talent Programs

Some of the most successful Canadian “innovation” programs are those that support the movement of talent between industry and universities. Should government contemplate redirecting funding that now supports the SR&ED program, we suggest this funding go towards funding talent programs such as the NSERC Industrial Postgraduate scholarships, the NRC’s Industrial Research Assistance Program (IRAP) and MITACS.

MITACS

MITACS Accelerate program is actively facilitating graduate and post-doctoral internships in a full spectrum of industry sectors and across a broad field of disciplines. The establishment of its Globalink program now connects international talent to Canadian businesses and universities, creating a pipeline of talent and building invaluable networks. In addition to redirecting funding from the SR&ED program, the U15 encourage government to:

- Consider expanding MITACS to include government departments to foster greater innovation in the public service;
- Consider partially funding longer term placements immediately upon graduation; and
- Encourage industry partners to demonstrate greater buy-in to the program by supporting the program at levels comparable to similar programs in other jurisdictions.

IRAP

IRAP is specifically tailored to Canada's SME-dominated business landscape. By supporting almost 10,000 SMEs on an annual basis, the program provides access to innovative ideas and approaches in real time. Based on a 2009 report on a survey of participating SMEs, IRAP was responsible for 35% of all IP, 16% of revenues generated by patents and 23% of revenues generated by trademark, copyrights and confidentiality agreements. While largely successful, we encourage government to consider reallocating SR&ED funding to the program. As well, there are a number of programmatic considerations which may enhance IRAP's overall efficacy. We suggest that government:

- Streamline delivery of services;
- Move to a model with multiple calls for proposals throughout the year and a peer review process for selection;
- Open the door for direct regional participation in sectors of interest; and
- Encourage a broader use of the funding to include access to research universities, fourth pillar facilities, faculty consulting, HQP exchanges, and services.

Centres of Excellence for Commercialization and Research

As most CECRs are only into year 3 of a 5 year program and many have taken 1 to 1.5 years to get up and running, it may be too early to speak about their overall success. However, the feedback from participating researchers, private sector advisors, and partners has largely been positive. Many centres are becoming hubs for industry, government and other universities and, in a number of cases, becoming nodes of international collaboration with similar entities abroad.

The main concern with the CECR program is timelines. The CECR program expects CECRs to be self-sufficient in 5 years. While we appreciate the need for timelines to ensure accountability, the relatively short timelines are insufficient to fully transition out. This is not realistic in any sector and particularly not in health and medicine-related fields. The possibility to extend CECRs, through a competitive process, is highly desirable.

NCEs

The Networks of Centres of Excellence is a made-in-Canada approach to overcoming our vast geography and encouraging the collaboration of experts across the country. In essence, they help to cluster a critical mass of innovators from sea to sea to sea. NCEs have funded more than \$1.5 billion in strategic networks and centres, contributing to the innovation ecosystem through research, commercialization and knowledge translation. We encourage government to continue supporting these lucrative hubs of innovation.

How Can Innovation Partners Better Support the Continuum?

Collaboration and Communication

In his 2008 report, “Compete to Win”, Red Wilson emphasized:

One of our key findings is that Canada needs to get its act together as a nation. As governments, as businesses and as individuals we need to work better together and collaborate more effectively in the service of our national competitiveness. Competition is global, and the pace of economic activity will continue to accelerate. We must ensure that our policies and our mindset reflect global realities, and our national interest.

One of the recurring themes from sector and industry partners is the lack of awareness of Canada’s competitive advantage (talent pool, universities, tax incentives). We need to communicate and market ourselves better to Canadian partners and much better to existing and potential international partners.

If contemplating new programs, government should consider those that foster greater collaboration and interdisciplinarity across industry, universities, colleges, professional associations, and federal laboratories – we need to forge strategic partnerships. In delivering programs, government should promote simplicity and accessibility in order to maximize the ability of industry and their partners to participate productively.

Universities can change and are changing to be more open to bridging academia and industry. For example, they are recognizing industry experience for credit and bringing private sector individuals to campus to impart knowledge; however, more can and will be done.

International

As noted above, globally significant research is the result of strategic international partnerships – globally significant business leverages international partnerships. As government contemplates new incentive programs and/or fine-tunes existing programs, allowance should be made for a degree of international or internationally-related expenditures. Canadian industry and universities need to start participating in the global market and we only hamper our success if we are unable to cooperate with partners because of an accounting principle.

In fact, we suggest government actively encourage the private sector, including SMEs, to undertake greater international trade. Research universities are in many ways well ahead of Canadian businesses in having established international networks. Any new programs should promote university-industry partnerships that extend their reach beyond Canada.

Measuring our success

Accountability is important, we recommend adding rigour to programs and, as the U15, we expect equal rigour of ourselves. As government considers how to further develop innovation programs, we commit to working with government to establish robust metrics that genuinely capture the richness of university – industry collaboration and university contribution to the innovation ecosystem. Some early metrics may include reporting on the increase to the number of graduates being produced or the increased engagement between graduates with advanced degrees and industry partners.

We owe it to all Canadians to demonstrate how, together, we are advancing our country.

Conclusion

The U15 are actively supporting Canada’s innovation ecosystem and are committed to working with government, industry and sector partners to cultivate our national innovation ecosystem. To us, talent is the key element to cultivate and attract, greater collaboration and mobility between industry and our universities the key relationship to foster, and achieving excellence the ultimate goal to pursue. Doing so, we feel, will significantly increase Canada’s economic competitiveness, sustain our prosperity and ensure a brighter future for all Canadians.