

# Innovation: Curiosity, Collaboration and Creativity



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RESEARCH AND DEVELOPMENT AT universities looks very different from what we witnessed at the turn of the millennium.

The 1990s model was all about intellectual property, spinoff companies and a focus on blockbuster technologies that would float the next Google. Today, dramatic spikes from techno dreams have been smoothed down with approaches that are more open, sustainable, collaborative,

entrepreneurial, and potentially more effective. This is an exciting time to be involved in R&D in our country.

The University of British Columbia, like Canada's other research-intensive universities, has done well by the old model: UBC research discoveries have generated more than \$5 billion from the sale of products. But if we measure success only in the rarified atmosphere of commercial IP, we're cutting ourselves off from the oxygen it takes to breathe life into Canada's R&D future. While transformative technologies like Google make for transfixing social narratives, the vast majority of advances in human knowledge are incremental.

If we accept that premise, the obvious next question must be: how can we accelerate the increments? The IP-spinoff approach has been one such spur, and it still has an important role to play in the rapid deployment of new ideas. But there are other less proprietary ways to get there, such as open source, and they are transforming the global landscape in which Canada must

find ways to flourish as an innovation leader.

Advances in human knowledge aren't simply incremental, they are frequently just happy accidents on the road to somewhere else. There are payoffs from enjoying the scenery and the people we encounter even as we keep our eyes on the road. Here are some examples from my own university.

Don Mavinic, a professor of Civil Engineering, started work on the problem of phosphorus buildup in wastewater treatment pipes. It turned out he also found a way to avoid polluting our waterways while providing a sustainable source of phosphorus. The result is a technology that not only prevents phosphorus from clogging wastewater pipes but also converts it into valuable environmentally friendly fertilizer. Municipalities in Canada, the US and the UK are already benefitting from this revolutionary technology.

Prof. Kishor Wasan was working on fundamental research in drug delivery using lipids (the body's fat)

as a conveyance mechanism. He discovered that a drug previously delivered only by very expensive injection means could now be taken orally. This promises to dramatically lower the cost of treating a fatal developing world disease, visceral leishmaniasis, affecting 200 million people.

What accelerants propelled these ideas from the university into the world community? They are exactly the kind of things that I believe we need to extend Canada's R&D innovation leadership.

Collaboration is a key element in these stories, Prof. Mavinic with government and business leaders to bring the technology to a global market scale, and in Prof. Wasan's case the foresight to connect to an existing partnership between UBC's University Industry Liaison Office and the international student group Universities Allied for Essential Medicines. The resulting Global Access Initiative allowed UBC to play a leading role with Harvard, Yale and other US institutions to promote access to essential health innova-

tions in the developing world.

Direct collaboration with industry is very important. For example, UBC has embarked on an exciting clean energy project that shows how universities can make living laboratories of their campuses and lead social change. Faculty in several UBC units are working on a pilot project with Canadian biomass gasification leader Nexterra and global giant GE that will use waste wood on our Vancouver campus to generate enough clean electricity to power 1,500 homes, reduce the university's natural gas consumption by up to 12 per cent and eliminate up to 4,500 tonnes of greenhouse gas emissions per year – the equivalent of taking 1,100 cars off the road.

What are the other accelerants that will drive Canada's R&D success in the 21st century? Clearly, increasing the number of highly qualified and innovative people is at the heart of what universities do. The federal and provincial governments must promote policies to support and promote this badly needed increase.

Canada lags well behind other OECD countries, especially the United States, in the production of Masters and PhD graduates.

University graduates become even more qualified when they are given opportunities beyond the standard classroom experience. It is UBC's goal, for example, to offer every undergraduate student – not just every Science or Engineering student – a meaningful research experience. When we couple this approach with programs like work coops or international exchanges, the opportunities multiply. When we recognize the value of alliances with organizations like the BC Innovation Council, we signal institutional support for entrepreneurship across our community of students, faculty and alumni.

We can't be certain which R&D model will most advantage Canada in the next 10 years, but any system that aligns intellectual curiosity with creative collaborations and an increase in the number of qualified and innovative graduates will surely have the best chance of success.