

Event

Scientific and technological discoveries leave the laboratory as intellectual property (including patents, copyright and trade secrets), but the changing roles of institutions, firms and individuals with respect to intellectual property management and technology transfer (both nationally and internationally) are often unclear.

Significance

Statistics Canada (2005) surveyed 87 universities and 34 hospitals (80% response rate) conducting research in Canada. The total amount of sponsored research funds invested in research at the 121 institutions was C\$4.3B. The report identified that there were then about 3,000 items of IP held that precipitated 876 spin-off companies. The survey found that the 2003 revenue received by the 121 organizations from commercialized IP was C\$55.5M, and the operational expense of those organizations was C\$36.4M. The net return on the C\$4.3B investment was only about 0.4%.

Analysis

The Council of Canadian Academies (2006) report on science and technology in Canada asserted that while Canada is a world leader in many research areas and is increasing research strength in emerging fields, it does not do an effective job in converting strength in basic R&D to commercial activity. The report states that the lack of commercialization success from public sector innovative research is "... a long-standing deficiency in Canada's innovation system....(p. 25)" The findings of this report were reiterated one year later when Industry Canada (2007) released *Mobilizing Science and Technology to Canada's Advantage*, Canada's science and technology strategy, which acknowledges that Canada is internationally recognized as having a strong research base, but has considerable opportunity to improve commercialization of innovative research.

Researchers face the daunting challenge of first understanding and then identifying the means of maximizing the economic contribution of public sector innovation. This task is especially complex in the areas of agriculture, food and bioproducts, where innovations may have both commercial and social value. At issue are the roles of public and private sector actors in both innovation and translating that innovation into important agricultural processes and products.

While there is a plethora of theory on the interactions between innovators and private sector commercialization of innovation, there is little theory addressing the intersection of public institutions and commercial interests. Three frameworks have been proposed that attempt to conceptualize the innovation systems that are used, or have been used, to enable the transfer of public sector innovations. These models focus, in turn, on the actors (academia, government and industry and possibly the public),¹ the agendas of the various actors involved in technology transfer² and on the motivators and incentives within university technology transfer offices.³

Beyond theory, practice is mounting. Many universities in North America established technology transfer offices within a decade of the US Bayh-Dole Act of 1980. The vast majority of these offices were established with a 'diamonds in the sky' attitude, thinking substantial revenue streams for universities would result. With the exception of a handful of universities in North America, revenue streams are but a mere trickle of what was hoped (Siegel and Wright, 2007).

Conclusion

There are numerous indicators that existing IP strategies utilized by public institutions have fallen short of early expectations. It is an open question whether universities obtaining patents increases or limits knowledge mobilization and product development.

¹ Etzkowitz, H. and L. Leydesdorff. 2000. The dynamics of innovation: From national systems and "Mode 2" to a triple helix of university-industry-government relations. *Research Policy* 29:109-23.

² Bozeman, B. 2000. Technology transfer and public policy: A review of research and theory. *Research Policy* 29:627-55.

³ Bercovitz J. and M. Feldmann. 2006. Entrepreneurial universities and technology transfer: A conceptual framework for understanding knowledge based economic development. *Journal of Technology Transfer* 31:175-88.