SESSION I: Examples of Best Practices

“Institution Building”

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CANADA

OECD Workshop - Management of Intellectual Property Generated from Publicly Funded Research
December 11, 2000
I. Should national governments provide general guidelines that will help research institutions build the types of support necessary for the protection and exploitation of their knowledge base?

X Yes  □ No
• Thought provoking question for many years in Canada.


• Group spent 1999/00 academic year researching new ways to develop more effective system of innovation in Canada.

• Report was produced - paper is a synthesis of the activities over the past three years.

  Expert Panel on the Commercialization of University Research - “Public Investments in University Research: Reaping the Benefits” (http://acst-ccst.gc.ca)
II. What kind of support should national governments provide to public research institutions that are commercializing their knowledge base?

- Canadian context examples will be provided in:
  
  A.) Issues Pertaining to Standardized Intellectual Property (IP) Ownership
  B.) Model Contracts and Conflict of Interest (COI) Guidelines
  C.) Estimates of Costs Associated with Exploiting / Defending IP Rights
  D.) Funding or Loans for Start Up of Technology Transfer Office’s (TTO’s)
  E.) Studies of Costs and Benefits of Various Models of Technology Transfer and Development Activities
  F.) Skills Training and Recruitment of the Managers of Public Sector IP Portfolios
  G.) Regional Alliances
A.) Issues Pertaining to Standardized Intellectual Property (IP) Ownership

1.) The cases:

- Lost commercialization opportunities
- Leaked commercial opportunities
  a) Consulting contracts assigning away IP rights
  b) Post Doctoral Fellows leaving country and taking IP with them
- Limiting innovative capacity of National Governments
- Litigation
**Comparison of proposed Canadian IP Policy and U.S. Bayh-Doyle Act**

<table>
<thead>
<tr>
<th>Provisions of the Bayh-Dole Act</th>
<th>Proposed Canadian Policy Principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Universities are required to determine in a reasonable time period whether they will take title of federally funded inventions. If they choose not to, title may revert to the Fed’l Gov’t. Universities are restricted in their ability to assign to any other party.</td>
<td>- Universities are required to determine in a reasonable time period whether they will take title to federally funded IP. May elect to assign the title back to the inventor.</td>
</tr>
<tr>
<td>- University must disclose inventions to the Fed’l Gov’t in a reasonable time period. Failure to do so entitles the government to take ownership of the undisclosed invention.</td>
<td>- The University must disclose the IP to the Fed’l Gov’t annually, provided such information is not subject to the <em>Access to Information Act</em>.</td>
</tr>
<tr>
<td>Provisions of the Bayh-Dole Act cont’d</td>
<td>Proposed Canadian Policy Principles cont’d</td>
</tr>
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<td>----------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>- Once a University takes a title to a Fed'l funded invention, it must file patent applications in a reasonable time period, or title reverts to Fed’l Gov’t.</td>
<td>- Once University (or affiliated org) take title to IP arising from Federal funding, it must make reasonable efforts to commercialize IP in a manner that benefits Canada.</td>
</tr>
<tr>
<td>- Gov’t retains a non-exclusive right to utilize any innovations that it needs.</td>
<td>- Gov’t retains a non-exclusive right to utilize any IP that it needs.</td>
</tr>
<tr>
<td>- Fed’l Gov’t required periodic reporting by Universities on commercialization efforts.</td>
<td>- Federal Gov’t requires annual reporting by universities on commercialization efforts.</td>
</tr>
</tbody>
</table>
B. Model Contracts and Conflict of Interest (COI) Guidelines

1.) Model Contracts

– Best source of Model Agreements in North America - the Association of University Technology Managers (AUTM)

– *Technology Transfer Practice Manual* Vol. II, Part VIII: Pertinent Agreements, includes samples:
  – Confidential Disclosures Agreement (CDA’s)
  – Option Agreements
  – Exclusive License Agreements
  – Biological Materials Transfer Agreements
  – Non-exclusive License Agreements
  – Software License Agreements
1.) Model Contracts cont’d

- New, updated model agreements are currently being prepared by AUTM; web site address for future reference: http://www.autm.net

2.) Conflict of Interest (COI)

- COI policy guidelines are necessary and integral part of the knowledge commercialization business.
- In Canada, almost all major public sector research institutions have COI policies of varying degrees.
2.) Conflict of Interest cont’d

- I would like to offer the following principles:
  - Conflict of Interest cannot be avoided and must be managed
  - Full and complete disclosure is necessary
  - Common sense must prevail
  - Protection of the rights of the innocent is essential (i.e.: Graduate Students, Post Doctoral Fellows, Hospitalized Patients, etc.)
  - Establish oversight committee to deal with the COI issues as they arise, not after they occur
C.) Estimates of Costs Associated with Exploiting and Defending Intellectual Property Rights

– Example (for comparison):

• Assume that a commercialization office requires one commercialization specialist for every 75 Faculty Members
• Annual expenses per specialist is approximately $100,000/year to cover operating and capital costs
• Each major research institution requires a minimum of $1 million/year to protect IP
• Canadian Case Study: Natural Sciences and Engineering Research Council (NSERC)
  – NSERC’s research budget is ~ $500 million
  – NSERC supports 7500 Faculty scientists
  – NSERC Canada requires approximately 100 commercialization specialists to deal with one NSERC project
    Total cost of specialists = $10 million
    Other Costs for patenting, etc. = $15 million*

*estimated total in Canadian Institutions
• Canadian Case Study: NSERC cont’d
  – Total estimated cost for NSERC supported research = $25 million.
  – This is equal to 5% of the NSERC budget

• Since the Canadian Federal Government support of all University research amounts to $1 billion / year, it was recommended that $50 million / year be allocated for the commercialization of knowledge-based activities at Universities.*

D.) Funding or Loans for Start Up of Technology Transfer Office’s (TTO)

Benefits of Increased Funding to University TTO’s

- Forecasts prepared in Canadian Expert Panel study show that an additional $50 million per year over 10 years in support of University TTO’s would result in the following benefits:
  - Estimated Increase in Royalties to Universities $120,000,000
  - Estimated Increase in Number and Value of University Spin Off Companies $2,345,000,000
  - Estimated Increase in Federal Tax Revenue from Increased Economic Activity by Licensees and Spin-Off Companies $2,000,000,000

Over 10 Years $500 Million

Investment Yields Economic Gain of Over $4.4 Billion
### Benefits of Increased Funding to University TTO’s - Increased Royalties to Universities

<table>
<thead>
<tr>
<th>Year</th>
<th>Status Quo</th>
<th>With Increased Funding</th>
<th>Total Royalties Received With Additional Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Royalties Received With No New Funding</td>
<td>Incremental Increase in Royalties</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>$18,000,000</td>
<td>$0</td>
<td>$18,000,000</td>
</tr>
<tr>
<td>2000</td>
<td>$18,000,000</td>
<td>$360,000</td>
<td>$18,360,000</td>
</tr>
<tr>
<td>2001</td>
<td>$18,000,000</td>
<td>$900,000</td>
<td>$18,900,000</td>
</tr>
<tr>
<td>2002</td>
<td>$18,000,000</td>
<td>$3,600,000</td>
<td>$21,600,000</td>
</tr>
<tr>
<td>2003</td>
<td>$18,000,000</td>
<td>$6,300,000</td>
<td>$24,300,000</td>
</tr>
<tr>
<td>2004</td>
<td>$18,000,000</td>
<td>$10,800,000</td>
<td>$28,800,000</td>
</tr>
<tr>
<td>2005</td>
<td>$18,000,000</td>
<td>$15,300,000</td>
<td>$33,300,000</td>
</tr>
<tr>
<td>2006</td>
<td>$18,000,000</td>
<td>$19,800,000</td>
<td>$37,800,000</td>
</tr>
<tr>
<td>2007</td>
<td>$18,000,000</td>
<td>$20,700,000</td>
<td>$38,700,000</td>
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<tr>
<td>2008</td>
<td>$18,000,000</td>
<td>$20,700,000</td>
<td>$38,700,000</td>
</tr>
<tr>
<td>2009</td>
<td>$18,000,000</td>
<td>$21,600,000</td>
<td>$39,600,000</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$198,000,000</strong></td>
<td><strong>$120,060,000</strong></td>
<td><strong>$318,060,000</strong></td>
</tr>
</tbody>
</table>

*Forecast of cumulative increase in royalties paid to all Canadian Universities resulting from increased commercialization effort by University TTO’s enabled by $50M additional federal support per year, 1999-2009. Forecast prepared for Expert Panel Study - J. Murray / G. Tertzakian (1999).*
• Benefits of Increased Funding to University TTO’s - Increased Royalties to Universities

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**Benefits of Increased Funding to University TTO’s - Increased Value of University Spin-Off Companies**

<table>
<thead>
<tr>
<th>Year</th>
<th>Status Quo</th>
<th>With Increased Funding</th>
<th>Total Value of Spin-Offs With Increased Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Value of Spin-Offs</td>
<td>Number</td>
</tr>
<tr>
<td>1999</td>
<td>55</td>
<td>$13,750,000</td>
<td>0</td>
</tr>
<tr>
<td>2000</td>
<td>55</td>
<td>$41,000,000</td>
<td>5</td>
</tr>
<tr>
<td>2001</td>
<td>55</td>
<td>$154,250,000</td>
<td>15</td>
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<tr>
<td>2002</td>
<td>55</td>
<td>$263,500,000</td>
<td>25</td>
</tr>
<tr>
<td>2003</td>
<td>55</td>
<td>$370,750,000</td>
<td>30</td>
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<tr>
<td>2004</td>
<td>55</td>
<td>$491,000,000</td>
<td>30</td>
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<td>2005</td>
<td>55</td>
<td>$609,500,000</td>
<td>30</td>
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<tr>
<td>2006</td>
<td>55</td>
<td>$730,500,000</td>
<td>30</td>
</tr>
<tr>
<td>2007</td>
<td>55</td>
<td>$866,500,000</td>
<td>30</td>
</tr>
<tr>
<td>2008</td>
<td>55</td>
<td>$1,024,500,000</td>
<td>25</td>
</tr>
<tr>
<td>2009</td>
<td>55</td>
<td>$1,142,500,000</td>
<td>25</td>
</tr>
<tr>
<td>Totals</td>
<td>605</td>
<td>$5,707,750,000</td>
<td>245</td>
</tr>
</tbody>
</table>

* Forecast of cumulative increase in the number and value of Canadian University Spin-Off Companies resulting from increased commercialization effort by University TTO’s enabled by $50M additional federal support per year, 1999-2009. *Forecast prepared for Expert Panel Study - J. Murray / G. Tertzakian (1999).*
Benefits of Increased Funding to University TTO’s - Increased Value of University Spin-Off Companies

* Forecast of cumulative increase in the number and value of Canadian University Spin-Off Companies resulting from increased commercialization effort by University TTO’s enabled by $50M additional federal support per year, 1999-2009. *Forecast prepared for Expert Panel Study - J. Murray / G. Tertzakian (1999).*
E.) Studies of Costs and Benefits of Various Models of Technology Transfer and Development Activities

• In Canada, there are two main models of University Technology Transfer Organizations:
  – Office / Department of the University (usually VP Research portfolio)
  – Arms-Length Wholly Owned Company (for profit, one shareholder - the founding University)

• Summary of key points:
  – The cost / benefit of either model is relatively equal, providing that the following are in place:
    i.) Clear Policies on IP ownership, Revenue Sharing, and Conflict of Interest
    ii.) Structure and Attitude to nurture and assist early stage inventions to the point that they are ready to commercialize (see diagram)
Commercialization Pathways

Publication of Results

Research
Research Grants, Collaborative Research, Contract Research

Results from Collaborative and Contract Research Transferred to Company

Invention Disclosure
From Faculty, Staff & Students

Initial Technology Assessment
Patent & Literature Search
Technology & Market Assessments
TTO IP Committee Decision

Technology Returned for Further Research

Technology Returned to Inventor

3rd Party Commercialization Process
Technology & Market Evaluations
IP Protection
Technology Marketing

TTO Prototype Development Program
Technology Scaling-Up / Proof-of-Concept
In-Depth Technology & Market R&D
IP Protection
Technology Marketing

Spin-Off Company Formation

TTO Commercialization Process
Technology & Market Evaluations
IP Protection
Technology Marketing

Direct License to an Existing Company*

LICENSING OPTIONS

TTO = Technology Transfer (Commercialization) Office

*May lead to the assignment of the IP to the company in exchange for equity, once agreed-upon corporate milestones are achieved.

Adapted from University-Industry Liaison Office Technology Transfer Process at University of British Columbia, Livingstone (1998)
F.) Skills Training, Retooling, and Recruitment of the Managers of Public Sector IP Portfolios

- Example: WestLink Innovation Network - Technology Commercialization Internship Program
  - 2 Year “Graduate” Program
    - Interns hosted at each of University - Industry Liaison Office, High-tech company / Spin-off company, and a Venture Capital firm at 8 month intervals
    - Intern hosts pay half of intern salaries, the other half of salary and the administration of program is provided through Federal / Provincial support
• WestLink Technology Commercialization Internship Program cont’d
  
  – **Qualifications of Internship Candidates**: science / technical background plus MBA (or equivalent in business experience / demonstrated aptitude)

  – **Potential Employers**: All 16 WestLink Innovation Network Members (14 Universities and 2 Networks of Centres of Excellence); High Technology Spin-Off Companies; Venture Capital Groups; Research Parks / Economic Development Departments; Law Firms with Intellectual Property specialization; National Research Council and other Federal Research Institutions; and Provincial Research Institutions.
### WestLink Tech. Comm. Internship Program cont’d

Three 8 - Month Intern Placements

<table>
<thead>
<tr>
<th>Technology Transfer Office</th>
<th>Venture Capital Firm</th>
<th>High Technology Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics covered include:</td>
<td>Topics covered include:</td>
<td>Topics covered include:</td>
</tr>
<tr>
<td>• Overview of academic research enterprise</td>
<td>• Overview of a venture capital enterprise</td>
<td>• Overview of management responsibilities to its investors, board, customers and employees</td>
</tr>
<tr>
<td>• Overview of technology transfer operations including sponsored research, technology evaluation, protection and licensing, and spin-off company formation</td>
<td>• Business opportunity evaluation including management capabilities, technology assessment, market opportunity, and business models.</td>
<td>• Business planning</td>
</tr>
<tr>
<td>• Technology evaluation including patentability, technical feasibility, market research, background IP rights, IP protection strategy, and licensing basics</td>
<td>• Structuring venture investments including developing term sheets, due diligence, closing a transaction, and monitoring company performance</td>
<td>• Financing operations</td>
</tr>
<tr>
<td>• Courses: AUTM basic licensing or equivalent</td>
<td></td>
<td>• Stock option plans</td>
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<td></td>
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<td>• Product development</td>
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<td></td>
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<td>• Operational issues</td>
</tr>
</tbody>
</table>
G. Regional Alliances

- Two examples of Canadian regional initiatives

1.) Bureau de Liaison Enterprise - Universities (BLEUs) in Eastern Canada

- U de M
- École Polytechnique
- École HEC
- McGill
- Laval
- Sherbrooke
- Concordia
- UQAM
- ETS
- INRS
- TELUQ
- U du Québec
- UQTR
- UQAT
- UQAR
- UQH
- UQAC
- ENAP
• Services rendered by the BLEU:
  – *Research Projects*: Preparation, negotiation, administration, budget, billing, etc.
  – *Intellectual Property*: Policy administration, protection, disclosures, BMTA’s, etc.; Training and informing researchers
  – *Technology Transfer*: Management of portfolios that have been commercialized, evaluation of innovations, research partnerships, license negotiations, administration of agreements
  – *Spin-Off’s*: Training and educating research and supporting spin-off company creation
  – *Statistics*: Information, liaison, and networking.
• Benefits of the BLEU’s:
  – Sharing of experience and information
  – Giving strength to their negotiations
  – Improving their efficiency
  – Enhancing their lobbying position
  – Allowing the power of the “group” for a unified voice versus on an individual basis
2.) WestLink Innovation Network Ltd.

- Not-for-Profit organization.
- Formed to **facilitate** communication, collaboration, training, and technology bundling and commercialization.
- WestLink’s Membership consists of the Western Canadian Universities and their affiliated research organizations located in Western Canada (western Ontario, Manitoba, Saskatchewan, Alberta, and British Columbia).
• WestLink’s Members include:

• University of Alberta, ILO
• Brandon University
• University of British Columbia, UILO
• Canadian Bacterial Diseases Network of Centres of Excellence (CBDN)
• UTI Inc. / University of Calgary
• University of Manitoba, ILO
• University of Northern British Columbia
• University of Regina
• UST Inc. / University of Saskatchewan
• Simon Fraser University, U/ILO
• IDC / University of Victoria
• University of Winnipeg
• Protein Engineering Networks of Centres of Excellence Inc. (PENCE)
• TechBC Corp.
• Lakehead University
• University of Lethbridge
• WestLink’s Menu of Program and Services
  • Networking and Communication
  • Building Technology Transfer Skills and Awareness
  • Technology Bundling and Commercialization Facilitation
  • Contract Services
• WestLink works as a facilitator and catalyst to provide resources for Western technology transfer, organizing events and courses to develop technology transfer skills for both the research and business community, and encourage collaboration on commercialization issues among its Members.
III. How can national initiatives maintain flexibility so that individual institutions can customize them to their particular needs?

- National governments set the policies and guidelines.
- Individual institutions be given the authority to customize their activities within these policies and guidelines.
- Reporting annually - assist in evaluating the performance of policies and guidelines being implemented and their effectiveness.
Questions?

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