

# Survey of Intellectual Property Commercialization in the Higher Education Sector



2007



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# Survey of Intellectual Property Commercialization in the Higher Education Sector

2007

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- ... not applicable
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- 0<sup>s</sup> value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published

## Note

Estimates for reference year 2006 are included for reference purposes only. No revisions have been made to the data since it was published in October, 2008

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## Highlights

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- Total income from intellectual property (IP) at Canadian universities and affiliated teaching hospitals was \$52.5 million (current dollars) in 2007, down 12% from 2006 (\$59.7 million) (Table 18-1).
- The proportion of Canadian universities and affiliated hospitals engaged in intellectual property management (IP) decreased to 71% in 2007 (compared to 82% in 2006) (Table 1-1).
- There were 285 full-time equivalent employees engaged in IP management in 2007, down 12% from 2006 (323 in 2006), while total operational expenditures for IP management decreased by less than 2% between the two years, from \$42.5 million to \$41.9 million (Table 2-1).
- The value of research contracts undertaken at universities and affiliated hospitals was estimated at \$1.2 billion, up by 6% from 2006 (Table 9-1).
- In 2007, the number of new inventions disclosed and reported to universities and affiliated hospitals remained virtually unchanged from previous year at 1,357 (Table 13-1).
- There were 1,634 patent applications filed with universities and affiliated hospitals in 2007, up from 1,442 in 2006 (+13%) (Table 14-1).
- The number of patents issued to Canadian universities and affiliated hospitals increased from 339 to 479 (+41%) between 2006 and 2007 (Table 15-1), while the total number of patents held at the end of 2007 declined from 4,784 to 4,185 (-13%) (Table 16-1).
- A total of 24 spin-off companies launched by universities and affiliated hospitals were reported to have been incorporated in 2007 (Table 20-1). This brings to 1,174 the total number of companies spun off by educational institutions to date (Tables 19-1 and 24-1).



# Analysis

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## Introduction

Intellectual property commercialization is the process of transferring new technologies, in the form of products or knowledge, from the lab to the marketplace. There are various indicators to measure this process, for example: the number of institutions engaged in intellectual property (IP) management (Table 1-1), IP income (Table 18-1), number of inventions, patents and licenses (Tables 13-1, 14-1, 15-1, 16-1 and 17-1), and value of research contracts (Table 9-1).

## IP management infrastructure

In 2007, 71% of responding Canadian universities and affiliated teaching hospitals (educational institutions) (80) were engaged in IP management, compared to 82% in 2006.<sup>1</sup> While 83% of universities (55) reported being engaged in IP management in 2007, only 54% of affiliated hospitals (25) were similarly engaged (Table 1-1).<sup>2</sup>

Almost all universities that reported being engaged in IP management had IP offices (92%) in 2007. The number of universities actually reporting IP offices continued to decline since 2005 (from 62 to 51 in 2007), with the total number of IP offices in universities also decreasing (from 79 in 2005 to 59 in 2007) (Table 1-1).

There were 285 full-time equivalent employees (FTE's) engaged in IP management, a 12% decline between 2006 and 2007 (323 FTE's in 2006), with the 2007 estimate getting more in line with the 2005 number (292) (Table 2-1).

Total operational expenditures for IP management were \$41.9 million compared with \$42.5 million in 2006 (Table 2-1). Almost a third of those expenditures, that is 27%, were funded from IP commercialization revenues (compared to 17% in 2006), while 41% were funded from institutional base funding (8 point drop from 2006) (Table 3-1).

## Income from IP

Total income from IP was \$52.5 million (current dollars) in 2007, down 12% from the previous year (\$59.7 million in 2006). Royalties again accounted for more than two thirds (71%) of all income from IP. The Canadian share of IP income rose from 14% to almost 19%, although income from "unclassified" sources continued to account for 40% of total income (Table 18-1).

## Research contracts

Total value of research contracts was \$1.2 billion in 2007, representing a 6% increase from 2006 (Table 9-1). The federal government sponsored a fifth of that amount while provincial and other levels of government accounted for a quarter of that amount, a significant change from 2006 (13% and 16% respectively of total value). In comparison, "other Canadian sources" (i.e. businesses and non profit organizations) and "foreign sources" (i.e. foreign government, business and non profit organizations) accounted for 25% and 16% of total research contracts value respectively. The "other sponsors" share of research contracts value dropped from 29% to 11% between 2006 and 2007.

1. Detailed information for 2006 are available in last year's Catalogue no. 88-222-X, titled *Survey of Intellectual Property Commercialization in the Higher Education Sector 2006 and 2005, 2008*: <http://www.statcan.gc.ca/pub/88-222-x/88-222-x2008000-eng.htm>.

2. Some of the decline in the proportion of institutions engaged in IP management may be due to lack of response from certain institutions engaged in IP management.

Clinical trials accounted for 20%, or 245.6 million dollars, of the total value of research contracts (Table 10-1).<sup>3</sup>

## Protection of IP

The pool of discoveries and patent applications influence the number of technologies protected. From 2003 to 2007, the number of universities and affiliated hospitals that filed patent applications dropped to 59 (-8%), while the number of educational institutions registering copyrights dropped to 25 (Table 12-1).

In 2007, the number of new inventions disclosed to educational institutions remained stable at 1,357 while the number of new IP disclosures for copyrights increased from 547 to 2,038 (Table 13-1).

Meanwhile, the total number of inventions (past and new disclosures) to be legally protected by universities and affiliated hospitals continued to decline from 707 in 2006 to 668 in 2007 (-6%).<sup>4</sup> The total number of IP disclosures to be protected by copyrights fell by a quarter to 28 between 2006 and 2007 (Table 13-1).

Patent applications at various stages of progress (i.e. initiating and follow-on applications) rose 13% to 1,634 in 2007 (Table 14-1). Health professions and sciences accounted for one third of patent applications in 2007 while engineering and applied sciences accounted for 19% of patent applications.

The number of patents issued to Canadian universities and teaching hospitals increased from 339 to 479 (+41%) between 2006 and 2007 (Table 15-1), while the patent portfolio held by these institutions at the end of 2007 stood at 4,185 (Table 16-1), a 13% reduction compared to the portfolio held at the end of 2006.

## Commercialization of IP

University and hospital technologies are generally commercialized in two ways: they are patented or licensed to established business organizations; or new companies are spun off from educational institutions.<sup>5</sup>

### Patents and licenses

Half (51%) of the patent portfolio held by universities and affiliated hospitals<sup>6</sup> (or 1,143) had been licensed out, assigned or otherwise commercialized at the end of 2007, similar to the situation at the end of 2006 (Table 16-1). Half of those patents were held in countries outside Canada and the U.S. (Table 16-1).

Educational institutions granted 538 new licenses and options in 2007 (+23% from 2006); they executed 2,679 active licenses and options with Canadian and foreign organisations (+31%) (Table 17-1).

### Spinoffs

In 2007 there were 24 newly incorporated companies launched by Canadian universities and affiliated hospitals to commercialize their respective technologies (Table 20-1). This brings to 1,174 the total number of companies spun off by educational institutions to date (Table 19-1).

The regional distribution of spin-off companies remained similar in 2007 compared to 2006 (Table 24-1).

More than a third of all spin-offs created to date are built upon technologies directly related to health sciences (Table 21-1).

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3. However, it is important to note that 61% of total value of research contracts reported in 2007 was assigned to the "other" research type category, illustrating the challenge encountered by educational institutions in having to categorise the type or nature of sponsored research contracts.

4. These are disclosures which, after evaluation, universities and hospitals determined to contain enough novelty to represent an advance over existing technologies and offer economic potential.

5. These spin-off companies are set up to: (a) license the institution's technology; or (b) fund research at the institution in order to develop technology that will be licensed by the company; or (c) provide a service that was originally offered through a department or unit of the institution.

6. The 51% share of patent portfolio refers here to the portfolio of those educational institutions that licensed, assigned or commercialized at least one patent at the end of 2007, not to the full patent portfolio held at end of year.

Among income sources associated with spin-off companies, disposition of equity holdings accounted for \$3.7 million (-23% from 2006) while remaining equity held by institutions accounted for \$34.8 million (-16% from 2006) (Table 22-1).

# Statistical tables

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**Table 1-1**  
**Institutions engaged in intellectual property management — 2007**

	Hospitals	Universities	Responding institutions
	number		
Institutions	46	66	112
Institutions engaged in intellectual property management	25	55	80
Institutions with intellectual property offices	18	51	69
Count of intellectual property offices	31	59	90
	percent		
Institutions engaged in intellectual property management	54	83	71
Institutions with intellectual property offices	72	93	86

**Note(s):** Intellectual property management includes identification, protection, promotion or commercialization of intellectual property. Institutions: Educational institutions. The percentage of institutions with intellectual property offices is calculated as follows: (Institutions with intellectual property offices/ Institutions engaged in intellectual property management)x100.

**Table 1-2**  
**Institutions engaged in intellectual property management — 2006**

	Hospitals	Universities	Responding institutions
	number		
Institutions	33	84	117
Institutions engaged in intellectual property management	24	72	96
Institutions with intellectual property offices	13	55	68
Count of intellectual property offices	13	69	82
	percent		
Institutions engaged in intellectual property management	73	86	82
Institutions with intellectual property offices	54	76	71

**Note(s):** Intellectual property management includes identification, protection, promotion or commercialization of intellectual property. Institutions: Educational institutions. The percentage of institutions with intellectual property offices is calculated as follows: (Institutions with intellectual property offices/ Institutions engaged in intellectual property management)x100. Previously this indicator was calculated: (Institutions with intellectual property offices/ Respondents)x100.

**Table 2-1**  
**Expenditures on intellectual property management — 2007**

	Expenditures
	thousands of dollars
<b>Total operational expenditures for intellectual property management</b>	<b>41,851</b>
Salaries and benefits corresponding to full-time equivalents	22,490
Patent and regular legal expenditures <sup>1</sup>	12,730
Litigation expenditures <sup>2</sup>	x
Other operational expenditures	x
	number
<b>Full-time equivalent employees engaged in intellectual property management</b>	<b>285</b>

1. Patent and regular legal expenditures include those for patent filings, patent searches, registration of copyright, etc.

2. Litigation expenditures are those related to disputes over patents or other intellectual property and include settlements.

**Note(s):** Based on response from 69 institutions with intellectual property offices, engaged in intellectual property management. Full-time equivalent is an estimate of the number of person-years.

**Table 2-2**  
**Expenditures on intellectual property management — 2006**

	Expenditures
	thousands of dollars
<b>Total operational expenditures for intellectual property management</b>	<b>42,492</b>
Salaries and benefits corresponding to full-time equivalents	23,899
Patent and regular legal expenditures <sup>1</sup>	12,434
Litigation expenditures <sup>2</sup>	575
Other operational expenditures	5,585
	number
<b>Full-time equivalent employees engaged in intellectual property management</b>	<b>323</b>

1. Patent and regular legal expenditures include those for patent filings, patent searches, registration of copyright, etc.

2. Litigation expenditures are those related to disputes over patents or other intellectual property and include settlements.

**Note(s):** Based on response from 68 institutions with intellectual property offices, engaged in intellectual property management. Full-time equivalent is an estimate of the number of person-years.

**Table 3-1**  
**Source of operational expenditures for intellectual property management — 2007**

	Canada	Atlantic	Quebec	Ontario	Prairies	British Columbia
	percent					
Institutional base funding	<b>41</b>	x	59	59	21	x
Institutional one-time allocations	<b>5</b>	x	x	1	x	1
Intellectual property commercialization revenues	<b>27</b>	11	x	30	16	x
External sources	<b>27</b>	62	x	11	x	39

**Note(s):** Based on response of 69 institutions with intellectual property offices, engaged in intellectual property management. Components may not add to total due to rounding.

**Table 3-2**  
**Source of operational expenditures for intellectual property management — 2006**

	Canada	Atlantic	Quebec	Ontario	Prairies	British Columbia
	percent					
Institutional base funding	<b>49</b>	27	64	42	82	38
Institutional one-time allocations	<b>8</b>	7	12	9	3	6
Intellectual property commercialization revenues	<b>17</b>	2	10	25	8	32
External sources	<b>26</b>	65	14	24	8	24

**Note(s):** Based on response of 68 institutions with intellectual property offices, engaged in intellectual property management. Components may not add to total due to rounding.

**Table 4-1**  
**Years of experience of technology transfer personnel — 2007**

	Personnel	
	number	percent
<b>Total</b>	<b>283</b>	<b>100</b>
Less than 2 years	72	25
3 to 4 years	58	20
5 to 9 years	78	28
10 to 14 years	30	11
15 to 19 years	23	8
20 years and over	21	7
Not stated	1	0

**Note(s):** Based on response from 69 institutions with intellectual property offices, engaged in intellectual property management.

**Table 4-2**  
**Years of experience of technology transfer personnel — 2006**

	Personnel	
	number	percent
<b>Total</b>	<b>333</b>	<b>100</b>
Less than 2 years	86	26
3 to 4 years	64	19
5 to 9 years	102	31
10 to 14 years	32	10
15 to 19 years	20	6
over 20 years	20	6
Not stated	9	3

**Note(s):** Based on response from 68 institutions with intellectual property offices, engaged in intellectual property management.



**Table 5-1**  
**Highest educational attainment of technology transfer personnel — 2007**

	Personnel
	number
<b>Total technology transfer personnel</b>	<b>283</b>
Bachelor's degree	68
Master's degree	114
Doctorate	82
Other	19

**Note(s):** Based on response from 69 institutions with intellectual property offices, engaged in intellectual property management.

**Table 5-2**  
**Highest educational attainment of technology transfer personnel — 2006**

	Personnel
	number
<b>Total technology transfer personnel</b>	<b>333</b>
Bachelor's degree	87
Master's degree	132
Doctorate	77
Other	37

**Note(s):** Based on response from 68 institutions with intellectual property offices, engaged in intellectual property management.

**Table 6-1**  
**Legal services used for intellectual property matters by institutions with central offices engaged in intellectual property management — 2007**

	Responding institutions
	number
<b>Total institutions with intellectual property offices</b>	<b>64</b>
In-house legal counsel	28
Outside legal counsel	42
In-house patent agent	3
Outside patent agent	40
Not stated	7

**Note(s):** Based on response of 64 institutions reporting having intellectual property offices. Institutions: Educational institutions.

**Table 6-2**  
**Legal services used for intellectual property matters by institutions with central offices engaged in intellectual property management — 2006**

	Responding institutions
	number
<b>Total institutions with intellectual property offices</b>	<b>68</b>
In-house legal counsel	31
Outside legal counsel	47
In-house patent agent	4
Outside patent agent	39
Not stated	6

**Note(s):** Based on response of 68 institutions with intellectual property offices, engaged in intellectual property management. Institutions: Educational institutions.

**Table 7-1**  
**Policy requirements for researcher to report intellectual property created at the institution — 2007**

	Always	Sometimes	Never	No reporting policy	No such intellectual property
	percent				
Inventions	50	17	7	14	13
Intellectual property protected by copyright					
Software or databases	35	29	10	16	10
Educational materials	22	31	18	20	9
Other materials	23	31	13	23	10
Industrial designs	30	17	10	14	30
Trademarks or official marks	28	18	12	16	26
New plant varieties	24	16	8	12	40

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Values do not include research contracts. Due to rounding, components may not add to the total.

**Table 7-2**  
**Policy requirements for researcher to report intellectual property created at the institution — 2006**

	Always	Sometimes	Never	No reporting policy	No such intellectual property
	percent				
Inventions	55	11	5	19	10
Intellectual property protected by copyright					
Software or databases	35	25	9	21	10
Educational materials	25	24	19	24	9
Other materials	27	22	12	23	15
Industrial designs	30	13	11	21	25
Trademarks or official marks	32	14	9	22	24
New plant varieties	24	11	7	19	40

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Values do not include research contracts. Due to rounding, components may not add to the total.

**Table 8-1**  
**Ownership policy of intellectual property created at the institution — 2007**

	Institution owns	Researcher owns	Joint ownership	No policy on ownership	Other ownership policy	No such intellectual property
	percent					
Inventions	20	35	21	10	4	9
Intellectual property protected by copyright						
Software or databases	17	42	16	11	8	6
Educational materials	11	49	14	14	7	5
Other materials	10	41	7	16	7	19
Industrial designs	14	35	7	22	4	18
Trademarks or official marks	23	30	6	22	4	15
New plant varieties	11	32	6	27	7	16

**Note(s):** Based on the questionnaires received representing 112 responding institutions.

**Table 8-2**  
**Ownership policy of intellectual property created at the institution — 2006**

	Institution owns	Researcher owns	Joint ownership	No policy on ownership	Other ownership policy	No such intellectual property
	percent					
Inventions	17	34	23	15	2	9
Intellectual property protected by copyright						
Software or databases	14	39	19	12	4	12
Educational materials	14	52	12	9	4	10
Other materials	11	38	10	14	3	24
Industrial designs	13	30	13	25	3	16
Trademarks or official marks	21	28	9	25	2	15
New plant varieties	6	26	12	28	1	28

**Note(s):** Based on the questionnaires received representing 117 responding institutions.

**Table 9-1**  
**Research contracts by sponsor — 2007**

	Contracts
	thousands of dollars
<b>Total</b>	<b>1,224,897</b>
Federal government	258,351
Provincial and other levels of government	323,234
Other Canadian sources (business enterprises or organizations)	307,759
Foreign sources (government, business enterprises or organizations)	198,572
Other	136,981

**Note(s):** Research contracts do not include research grants (e.g. SSHRC, NSERC, CIHR) and multi-year contracts have been prorated for the reference year. Based on the questionnaires received representing 112 responding institutions.

**Table 9-2**  
**Research contracts by sponsor — 2006**

	Contracts
	thousands of dollars
<b>Total</b>	<b>1,154,268</b>
Federal government	148,157
Provincial and other levels of government	184,839
Other Canadian sources (business enterprises or organizations)	286,667
Foreign sources (government, business enterprises or organizations)	198,507
Other	336,097

**Note(s):** Research contracts do not include research grants (e.g. SSHRC, NSERC, CIHR) and multi-year contracts have been prorated for the reference year. Based on the questionnaires received representing 117 responding institutions.

**Table 10-1**  
**Research contracts by type of research — 2007**

	Contracts
	thousands of dollars
<b>Total value of research contracts</b>	<b>1,224,897</b>
Clinical trials	245,639
Service contracts	32,603
Collaborative research and development	54,831
Sponsored research contracts	145,049
Other	746,775
Unclassified	0

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested.

**Table 10-2**  
**Research contracts by type of research — 2006**

	Contracts
	thousands of dollars
<b>Total value of research contracts</b>	<b>1,154,268</b>
Clinical trials	270,393
Service contracts	22,760
Collaborative research and development	95,175
Sponsored research contracts	193,444
Other	572,496
Unclassified	0

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested.

**Table 11-1**  
**Research contracts by type of intellectual property provision — 2007**

	Contracts
	thousands of dollars
<b>Total response</b>	<b>946,655</b>
The sponsor owns the intellectual property	20,633
The sponsor has a license to the intellectual property	25,567
The sponsor has an option to acquire a license to the intellectual property under commercially reasonable terms	68,492
The intellectual property is unrestricted	21,268
Other/Unknown	810,695

**Note(s):** Based on the questionnaires received representing 112 responding institutions. These values do not include research grants (e.g. SSHRC, NSERC, CIHR), clinical trial and service contracts.

**Table 11-2**  
**Research contracts by type of intellectual property provision — 2006**

	Contracts
	thousands of dollars
<b>Total response</b>	<b>861,115</b>
The sponsor owns the intellectual property	43,906
The sponsor has a license to the intellectual property	51,424
The sponsor has an option to acquire a license to the intellectual property under commercially reasonable terms	42,526
The intellectual property is unrestricted	25,941
Other/Unknown	697,318

**Note(s):** Based on the questionnaires received representing 117 responding institutions. These values do not include research grants (e.g. SSHRC, NSERC, CIHR), clinical trial and service contracts.

**Table 12-1**  
**Types of intellectual property protection engaged in from 2003 to 2007**

	Responding institutions
	number
Filing of patent applications	59
Registration of copyright	25
Registration for industrial designs, trademarks, official marks or integrated circuit topographies	29
Filing of applications for plant breeders' rights	7
Executing non-disclosure or confidentiality agreements	64
Administration of material transferred agreements inbound	48
Administration of material transferred agreements outbound	44
Other	3

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Institutions: Educational institutions.

**Table 12-2**  
**Types of intellectual property protection engaged in from 2002 to 2006**

	Responding institutions
	number
Filing of patent applications	64
Registration of copyright	30
Registration for industrial designs, trademarks, official marks or integrated circuit topographies	31
Filing of applications for plant breeders' rights	9
Executing non-disclosure or confidentiality agreements	69
Administration of material transferred agreements inbound	42
Administration of material transferred agreements outbound	46
Other	8

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Institutions: Educational institutions.



**Table 13-1**  
**Intellectual property resulting in protection activity and new intellectual property disclosed during 2007**

	New intellectual property	Intellectual property protected
	number	
Inventions	1,357	668
Intellectual property protected by copyright	2,038	28
Industrial designs, trademarks, official marks and new plant varieties	x	23
Other	68	1

**Note(s):** Based on the questionnaires received representing 112 responding institutions.

**Table 13-2**  
**Intellectual property resulting in protection activity and new intellectual property disclosed during 2006**

	New intellectual property	Intellectual property protected
	number	
Inventions	1,356	707
Intellectual property protected by copyright	547	38
Industrial designs, trademarks, official marks and new plant varieties	182	76
Other	115	x

**Note(s):** Based on the questionnaires received representing 117 responding institutions.

**Table 14-1**  
**Patents status by field of study — 2007**

	Patent applications			Total
	Initiating	Follow-on	Unclassified	
	number			
<b>Total</b>	<b>807</b>	<b>820</b>	<b>7</b>	<b>1,634</b>
Agriculture and biological sciences	36	71	0	107
Engineering and applied sciences	148	160	4	312
Health professions and sciences	252	253	0	505
Mathematics and physical sciences	34	86	3	123
Unclassified	337	250	0	587

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. For international patent applications the parent Patent Cooperation Treaty (PCT) is counted as one application and each entry into national phase as one application.

**Table 14-2**  
**Patents status by field of study — 2006**

	Patent applications			Total
	Initiating	Follow-on	Unclassified	
	number			
<b>Total</b>	<b>719</b>	<b>715</b>	<b>8</b>	<b>1,442</b>
Agriculture and biological sciences	49	102	0	151
Engineering and applied sciences	144	139	6	289
Health professions and sciences	203	179	0	382
Mathematics and physical sciences	55	46	2	103
Unclassified	268	249	0	517

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. For international patent applications the parent Patent Cooperation Treaty (PCT) is counted as one application and each entry into national phase as one application.

**Table 15-1**  
**Patents issued by field of study and country — 2007**

	Canada	United States	Other	Unclassified	Total
	number				
<b>Total</b>	<b>63</b>	<b>220</b>	<b>196</b>	<b>0</b>	<b>479</b>
Agriculture and biological sciences	3	23	13	0	39
Engineering and applied sciences	25	48	32	0	105
Health professions and sciences	20	79	61	0	160
Mathematics and physical sciences	2	5	2	0	9
Unclassified	13	65	88	0	166

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. For international patent applications the parent Patent Cooperation Treaty (PCT) is counted as one application and each entry into national phase as one application.

**Table 15-2**  
**Patents issued by field of study and country — 2006**

	Canada	United States	Other	Unclassified	Total
	number				
<b>Total</b>	<b>42</b>	<b>133</b>	<b>164</b>	<b>..</b>	<b>339</b>
Agriculture and biological sciences	2	12	36	..	50
Engineering and applied sciences	14	34	18	..	66
Health professions and sciences	6	35	38	..	79
Mathematics and physical sciences	2	11	1	..	14
Unclassified	18	41	71	..	130

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. For international patent applications the parent Patent Cooperation Treaty (PCT) is counted as one application and each entry into national phase as one application.

**Table 16-1**  
**Patents held and commercialized — 2007**

	Canada	United States	Other countries	Unclassified	Total
	number				
<b>Total patents held at the end of 2007, including patents issued that year</b>	<b>415</b>	<b>1,709</b>	<b>2,061</b>	<b>0</b>	<b>4,185</b>
For institutions that licensed, assigned or commercialized at least one patent this year:					
Total patents held, including patents issued at the end of 2007	286	946	1,002	0	<b>2,234</b>
Number of patents licensed, assigned or otherwise commercialized at the end of 2007	124	367	652	0	<b>1,143</b>

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested.

**Table 16-2**  
**Patents held and commercialized — 2006**

	Canada	United States	Other countries	Unclassified	Total
	number				
<b>Total Patents held at the end of 2006, including patents issued that year</b>	<b>594</b>	<b>2,061</b>	<b>2,129</b>	<b>0</b>	<b>4,784</b>
For institutions that licensed, assigned or commercialized at least one patent this year:					
Total patents held, including patents issued at the end of 2006	465	1,360	1,281	0	<b>3,106</b>
Number of patents licensed, assigned or otherwise commercialized at the end of 2006	247	548	857	48	<b>1,700</b>

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested.

**Table 17-1**  
**Licenses and options — 2007**

	Exclusive and sole licenses	Non-exclusive licenses	Unclassified	Total
	number			
<b>Total new licenses</b>	<b>187</b>	<b>351</b>	<b>0</b>	<b>538</b>
Total new licenses executed with Canadian licensees	120	109	0	229
Total new licenses executed with foreign licensees	57	129	0	186
Unclassified new licenses	10	113	0	123
<b>Total active licenses</b>	<b>1,043</b>	<b>1,435</b>	<b>201</b>	<b>2,679</b>
Total active licenses with Canadian licensees	753	250	7	1,010
Total active licenses with foreign licensees	290	803	2	1,095
Unclassified active licenses	0	382	192	574

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. Counts include stand-alone licenses and options only and exclude those embedded in research contracts and non-commercial (royalty free) licenses.

**Table 17-2**  
**Licenses and options — 2006**

	Exclusive and sole licenses	Non-exclusive licenses	Unclassified	Total
	number			
<b>Total new licenses</b>	<b>219</b>	<b>214</b>	<b>4</b>	<b>437</b>
Total new licenses executed with Canadian licensees	169	58	3	230
Total new licenses executed with foreign licensees	50	156	1	207
Unclassified new licenses	..	..	..	..
<b>Total active licenses</b>	<b>897</b>	<b>987</b>	<b>154</b>	<b>2,038</b>
Total active licenses with Canadian licensees	665	204	17	886
Total active licenses with foreign licensees	232	783	11	1,026
Unclassified active licenses	..	..	126	126

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested. Counts include stand-alone licenses and options only and excludes those embedded in research contracts and non-commercial (royalty free) licenses.

**Table 18-1**  
**Income received from intellectual property — 2007**

	Canadian sources	Foreign sources	Unclassified	Total
thousands of dollars				
<b>Total</b>	<b>9,811</b>	<b>21,569</b>	<b>21,097</b>	<b>52,477</b>
Running royalties	3,505	17,928	15,908	37,341
Milestone payments	1,760	x	x	3,423
From one time sales of intellectual property	x	x	x	x
Reimbursement of patent, legal and related costs	1,845	x	x	4,216
License income received from another Canadian institution under a revenue-sharing agreement	x	0	0	x
Other	x	x	1,925	5,181

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Unclassified: Respondents provided totals but were unable to break down components as requested.

**Table 18-2**  
**Income received from intellectual property — 2006**

	Canadian sources	Foreign sources	Unclassified	Total
thousands of dollars				
<b>Total</b>	<b>8,560</b>	<b>25,627</b>	<b>25,501</b>	<b>59,689</b>
Running royalties	3,913	19,679	17,617	41,209
Milestone payments	810	x	x	2,955
From one time sales of intellectual property	1,001	x	x	4,483
Reimbursement of patent, legal and related costs	1,518	621	3,216	5,355
License income received from another Canadian institution under a revenue-sharing agreement	392	x	x	461
Other	926	401	3,898	5,225

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Unclassified is the category used when respondents provided totals but were unable to break down components as requested.

**Table 19-1**  
**Spin-off companies, purpose and link to institution — 2007**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,174</b>	<b>100</b>
License <sup>1</sup>	453	39
Research and development <sup>2</sup>	137	12
Service <sup>3</sup>	39	3
License and research and development	52	4
Other	32	3
Not stated	461	39

1. Obtain a license to utilize the institution's technology.

2. Fund research at the institution in order to develop technology that will be licensed by the company.

3. Provide a service that was originally offered through a department or unit of the institution.

**Note(s):** These estimates represent an inventory of all spin-off companies reported by educational institutions since 1999, regardless of the status of those spin-offs over time (e.g. active, inactive, merged or amalgamated). Components may not add to total due to rounding.

**Table 19-2**  
**Spin-off companies, purpose and link to institution — 2006**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,103</b>	<b>100</b>
License <sup>1</sup>	431	39
Research and development <sup>2</sup>	128	12
Service <sup>3</sup>	38	3
License and research and development	50	5
Other	33	3
Not stated	423	38

1. Obtain a license to utilize the institution's technology.

2. Fund research at the institution in order to develop technology that will be licensed by the company.

3. Provided a service that was originally offered through a department or unit of the institution.

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Components may not add to total due to rounding.

**Table 20-1**  
**Year of incorporation of spin-off companies — 2007**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,174</b>	<b>100</b>
Before 1980	45	4
1980 to 1984	64	5
1985 to 1989	92	8
1990 to 1994	181	15
1995 to 1999	358	30
2000 to 2004	302	26
2005	31	3
2006	29	2
2007	24	2
Not stated	48	4

**Note(s):** These estimates represent an inventory of all spin-off companies reported by educational institutions since 1999, regardless of the status of those spin-offs over time (e.g. active, inactive, merged or amalgamated). Components may not add to total due to rounding.

**Table 20-2**  
**Year of incorporation of spin-off companies — 2006**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,103</b>	<b>100</b>
Before 1980	44	4
1980 to 1984	63	6
1985 to 1989	90	8
1990 to 1994	181	17
1995 to 1999	358	32
2000 to 2004	289	26
2005	29	3
2006	14	1
Not stated	35	3

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Components may not add to total due to rounding.



**Table 21-1**  
**Technology field or sector of spin-off companies — 2007**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,174</b>	<b>100</b>
Agriculture or biology	134	11
Health sciences	390	33
Engineering or applied sciences	206	18
Information	207	18
Mathematics or physical sciences	104	9
Business or management	12	1
Other	115	10
Not stated	6	1

**Note(s):** These estimates represent an inventory of all spin-off companies reported by educational institutions since 1999, regardless of the status of those spin-offs over time (e.g. active, inactive, merged or amalgamated). Components may not add to total due to rounding.

**Table 21-2**  
**Technology field or sector of spin-off companies — 2006**

	Spin-off companies	
	number	percent
<b>Total</b>	<b>1,103</b>	<b>100</b>
Agriculture or biology	132	12
Health sciences	380	34
Engineering or applied sciences	194	18
Information	184	17
Mathematics or physical sciences	99	9
Business or management	12	1
Other	96	9
Not stated	6	1

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Components may not add to total due to rounding.

**Table 22-1**  
**Dividends, equity disposition, remaining equity and venture capital investment of spin-off companies — 2007**

	Spin-off companies
	thousands of dollars
Cash dividends received by institutions	x
Equity holdings, options and warrants disposed of by institutions	x
Remaining equity held by the institutions in publicly traded spin-offs	34,754
Investment in spin-offs raised with the assistance of the institution	5,884

**Note(s):** Based on the questionnaires received representing 112 responding institutions. Institutions: Educational institutions.

**Table 22-2**  
**Dividends, equity disposition, remaining equity and venture capital investment of spin-off companies — 2006**

	Spin-off companies
	thousands of dollars
Cash dividends received by institutions	98
Equity holdings, options and warrants disposed of by institutions	4,824
Remaining equity held by the institutions in publicly traded spin-offs	41,524
Investment in spin-offs raised with the assistance of the institution	x

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Institutions: Educational institutions.

**Table 23-1**  
**Regional differences in intellectual property commercialization, part 1 — 2007**

	Sponsored research <sup>1</sup>	Income from intellectual property	Expenditures on intellectual property management	Research contracts	Responding institutions
	millions of dollars				number
<b>Total Canada</b>	<b>5,012</b>	<b>52</b>	<b>42</b>	<b>1,225</b>	<b>112</b>
Atlantic	267	1	4	109	22
Quebec	992	19	8	130	33
Ontario	2,360	11	15	402	36
Prairies	810	5	6	x	13
British Columbia	584	16	9	x	8
	percent				
<b>Total Canada</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Atlantic	5	2	10	9	20
Quebec	20	37	19	11	29
Ontario	47	21	36	33	32
Prairies	16	10	14	x	12
British Columbia	12	31	21	x	7

1. Values for sponsored research are taken from Report 3.1 on the Canadian Association of University Business Offices (CAUBO) data for the year ended 2007.  
**Note(s):** Based on the questionnaires received representing 112 responding institutions. Institutions: Educational institutions. Atlantic: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick. Prairies: Manitoba, Saskatchewan and Alberta. Components may not add to total due to rounding.

**Table 23-2**  
**Regional differences in intellectual property commercialization, part 1 — 2006**

	Sponsored research <sup>1</sup>	Income from intellectual property	Expenditures on intellectual property management	Research contracts	Responding institutions
	millions of dollars				number
<b>Total Canada</b>	<b>5,449</b>	<b>60</b>	<b>42</b>	<b>1,154</b>	<b>117</b>
Atlantic	286	1	3	90	18
Quebec	1,404	x	9	140	29
Ontario	2,229	15	14	433	36
Prairies	935	7	8	358	20
British Columbia	595	x	8	134	14
	percent				
<b>Total Canada</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Atlantic	5	2	7	8	15
Quebec	26	x	21	12	25
Ontario	41	25	33	37	31
Prairies	17	11	19	31	17
British Columbia	11	x	19	12	12

1. Values for sponsored research are taken from Report 3.1 on the Canadian Association of University Business Offices (CAUBO) data for the year ended 2006.  
**Note(s):** Based on the questionnaires received representing 117 responding institutions. Institutions: Educational institutions. Atlantic: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick. Prairies: Manitoba, Saskatchewan and Alberta. Components may not add to total due to rounding.

**Table 24-1**  
**Regional differences in intellectual property commercialization, part 2 — 2007**

	Inventions disclosed	Inventions protected	Patent applications filed	Total patents issued	Total patents held	Inventions declined	New licenses and options	Active licenses and options	Spin-off <sup>1</sup> companies created to date	Responding institutions
number										
<b>Total Canada</b>	<b>1,357</b>	<b>668</b>	<b>1,634</b>	<b>479</b>	<b>4,185</b>	<b>333</b>	<b>538</b>	<b>2,679</b>	<b>1,174</b>	<b>112</b>
Atlantic	82	47	42	x	x	x	x	31	88	22
Quebec	262	145	503	147	1,304	61	91	766	190	33
Ontario	509	183	494	88	854	97	244	780	445	36
Prairies	207	112	248	175	x	x	44	383	193	13
British Columbia	297	181	347	x	1,274	124	x	719	258	8
percent										
<b>Total Canada</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Atlantic	6	7	3	x	x	x	x	1	7	20
Quebec	19	22	31	31	31	18	17	29	16	29
Ontario	38	27	30	18	20	29	45	29	38	32
Prairies	15	17	15	37	x	x	8	14	16	12
British Columbia	22	27	21	x	30	37	x	27	22	7

1. These estimates represent an inventory of all spin-off companies reported by educational institutions since 1999, regardless of the status of those spin-offs over time (e.g. active, inactive, merged or amalgamated).  
**Note(s):** Based on the questionnaires received representing 112 responding institutions. Institutions: Educational institutions. Atlantic: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick. Prairies: Manitoba, Saskatchewan and Alberta. Components may not add to total due to rounding.

**Table 24-2**  
**Regional differences in intellectual property commercialization, part 2 — 2006**

	Inventions disclosed	Inventions protected	Patent applications filed	Inventions declined	New licenses and options	Total active licenses and options	Spin-off companies created to date	Responding institutions
number								
<b>Total Canada</b>	<b>1,356</b>	<b>707</b>	<b>1,442</b>	<b>353</b>	<b>437</b>	<b>2,038</b>	<b>1,103</b>	<b>117</b>
Atlantic	49	21	59	31	7	23	77	18
Quebec	296	169	366	78	100	616	185	29
Ontario	525	226	518	102	221	716	405	36
Prairies	168	65	184	26	59	321	190	20
British Columbia	318	226	315	116	50	362	246	14
percent								
<b>Total Canada</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
Atlantic	4	3	4	9	2	1	7	15
Quebec	22	24	25	22	23	30	17	25
Ontario	39	32	36	29	51	35	37	31
Prairies	12	9	13	7	14	16	17	17
British Columbia	23	32	22	33	11	18	22	12

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Institutions: Educational institutions. Atlantic: Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick. Prairies: Manitoba, Saskatchewan and Alberta. Components may not add to total due to rounding.

**Table 25-1**  
**Spin-offs companies grouped by North American Industry Classification System (NAICS) — 2007**

Spin-off companies		
	number	percent
<b>Total spin-offs</b>	<b>1,174</b>	<b>100</b>
Service industries	651	55
Manufacturing industries	135	11
Wholesale trade	30	3
Other industries	32	3
Industry information not available	326	28

**Note(s):** These estimates represent an inventory of all spin-off companies reported by educational institutions since 1999, regardless of the status of those spin-offs over time (e.g. active, inactive, merged or amalgamated). Components may not add to total due to rounding.

**Table 25-2**  
**Spin-offs companies grouped by North American Industry Classification System (NAICS) — 2006**

Spin-off companies		
	number	percent
<b>Total spin-offs</b>	<b>1,103</b>	<b>100</b>
Service industries	649	59
Manufacturing industries	126	11
Other industries	9	1
Industry information not available	319	29

**Note(s):** Based on the questionnaires received representing 117 responding institutions. Components may not add to total due to rounding.

## Data quality, concepts and methodology

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The universe is comprised of all members of the Association of Universities and Colleges of Canada (AUCC), as well as the university-affiliated research hospitals. The latter includes some members of the Association of Canadian Teaching Hospitals (ACTH) and some other hospitals reporting R&D activity on the Annual Hospital Survey.

This survey is a census with a cross-sectional design. Data are collected for all units of the target population, therefore no sampling is done.

Surveys are subject to certain types of errors: coverage, non-response, interpretation and processing errors. The methodology of this survey has been designed to minimize errors and to reduce their potential impact.

It is not possible, at this point, to determine the non-response rates (weighted by size measures) and adjust for the non-response or other coverage issues. This release, as in previous years, will only cover the respondent population.

Both micro and macro-editing are done. As questionnaires are returned, the information is captured onto a screen containing the previous response. This forces a comparison of the previous and current responses. As well, internal inconsistencies are noted and followed up by telephone.

The data are also compared against external public sources of information such as university websites, the Association of University Technology Managers (AUTM) survey, the Canadian Association of University Business offices (CAUBO), annual reports, press releases and conference presentations.

No imputation or estimation of missing information is done for this survey except when it is possible to estimate data based on related answers. One of the most common cases is information provided in aggregate form only and not broken down into the categories requested. For these cases, an "unclassified" category is created. If no information whatsoever is available, the field is left blank and no imputation is done.

Response rates for 2007:

- 188 questionnaires mailed out
- 112 responding institutions (this includes combined reports)

Further details on the methodology of the survey can be found at: *Data Sources and Methodology* (Survey record no. 4222).