

Technology Transfer at Canadian Universities: 2007 Update

A Report for the University Presidents' Council
of
British Columbia

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Technology Transfer at Canadian Universities: 2007 Update

Page 2 of 23

Summary

This report is an update and extension of the author's previous studies of the transfer of technology from Canadian universities to the private sector, *Technology Transfer at Canadian Universities*, and its updates. As such, it may be read in conjunction with the previous studies.

It incorporates and analyzes new quantitative data from the Fiscal Year (FY) 2003, 2004 and 2005 Licensing Surveys by the Association of University Technology Managers (AUTM) of performance indicators of technology transfer. Virtually all North American universities with high levels of research funding respond to the AUTM Survey. Included herein are updated individual, quantitative results for responding Canadian and U.S. institutions in these periods and for the entire 15-year history of the AUTM Surveys. There are also comparisons with two international studies.

The five specific performance indicators from the AUTM report used for further analysis herein are:

- Invention Disclosures Received,
- Licenses and Options Executed,
- U.S. Patents Issued,
- License Income Received, and
- Start-Up Companies Formed,

all on a per annum basis. The aspects of “commercialization productivity” are calculated by normalizing these measures by research expenditures.

The analysis is incomplete due to lack of response to the AUTM Surveys by a small number of Canadian universities with significant research funding and others that do report to AUTM but do not permit their data to be reported in disaggregated, identifiable form. These factors and changes to the composition of the groups used in the comparisons make it impossible to perform precise year-to-year comparisons for all the responding universities; however, a core group of nine universities that responded in all or most years permit some long-term longitudinal comparisons.

The key findings are:

1. The amount of technology that is transferred from universities to the private sector, as measured by Invention Disclosures Received and by Licenses and Options Executed, is a linear function of research expenditures. This is the case cumulatively for responding Canadian universities and for responding U.S. universities, with roughly the same constants of proportionality applicable in both countries.
2. Data over the 15-year period of the AUTM Surveys support the conclusion cited above, both for the (varying) sets of annual respondent institutions and for the nine Canadian institutions that responded consistently to the AUTM Surveys over the years. Historically there were some consistent differences between Canadian and U.S. institutions, with less License In-

Technology Transfer at Canadian Universities: 2007 Update

Page 3 of 23

come Received and more Start-Up Companies Formed per dollar of research expenditures in Canada than in the U.S.; the difference in start-up formation rate has diminished over time and is absent in the FY 2005 report

3. Regional differences in Canada are quite pronounced, both in the FY 2005 data and over the longer-term. Institutions in Ontario lag noticeably behind the rest of Canada in most measures. Data on Quebec institutions are incomplete, but responding Quebec institutions, overwhelmingly dominated by the Université de Sherbrooke, lead Canada in License Income Received per dollar of Research Expenditures.
4. The effectiveness of technology transfer (measured in terms of the full range of outputs, per research dollar) at the top group (ranked in terms of Research Expenditures) of responding Canadian universities collectively in FY 2005 is lower than it is collectively at the universities ranked below them in terms of Research Expenditures. Separation of Canadian universities into “G-10” and “non-G-10” groups reveals that the G-10 group has lower performance per dollar of Research Expenditure in three of the five subject categories; this is consistent with what was found in reports on most years previously.
5. There is a need for more complete, publicly available information on the performance of Canadian universities in technology transfer, upon which informed, evidence-based decisions about public policy can be made. In addition, methods of assessing the effectiveness of non-traditional modes of technology transfer, i.e. other than licensing and start-up formation, should be developed and applied.

One concludes from point 1 above, as confirmed in this update, that increases to the direct funding of university research via the three federal granting agencies (NSERC, CIHR and SSHRC), the Canada Foundation for Innovation and other funding agencies, accompanied by payment of the full indirect costs of university research – including the costs of technology transfer itself – would benefit the Canadian economy through increased production of transferable technologies and the enhanced capacity to commercialize them.

Technology Transfer at Canadian Universities: 2007 Update

Page 4 of 23

Introduction

This report is an update and extension of the author's original November 19, 2000 study of the transfer of technology from Canadian universities to the private sector, *Technology Transfer at Canadian Universities*, and its two previous updates dated January 11, 2002 and May 29, 2003. The original study was based primarily on the FY 1999 Licensing Survey conducted by the Association of University Technology Managers (AUTM) and previous AUTM Licensing Surveys; the updates are based on subsequent AUTM Surveys. The present report focuses primarily on presentation, analysis and interpretation of new quantitative data from the FY 2003, 2004 and 2005 AUTM Surveys. It also comprises an extension and update of parts of the *Addendum* to the 2002 update, dated July 31, 2003, in which performance measures were traced over time and compared between regions of Canada. All of the author's prior reports can be obtained at:

<http://www.sfu.ca/vpresearch/vprreports.htm>

The AUTM Survey

AUTM carries out its Licensing Survey each year, consistent with its mission to collect information on its members' programs. The Survey results provide objective information, usually in consistent format, related to technology transfer from the academic sector.

The full data set referenced from the AUTM Licensing Surveys comprise individual entries for Canadian post-secondary educational institutions, the Canadian particle and nuclear physics national laboratory TRIUMF, Canadian hospitals and health institutes, plus universities, colleges, hospitals and other research institutions in the United States. Due to the voluntary nature of the survey, the number and composition of responding institutions differs somewhat year-to-year. In addition, individual data are not shown for institutions wishing to remain anonymous, but their data are included in totals.

Attention in this report is focused on the Canadian universities which are significant participants in research and technology transfer. Therefore, hospitals and health institutes, TRIUMF and a few small post-secondary institutions are removed from the AUTM dataset leaving the numbers shown in the accompanying table of **AUTM Respondents**. Canadian post-secondary institutions that were omitted from further consideration in FY 2005 are: École de technologie supérieure, Lakehead

University, University of Northern British Columbia, Mount Allison University, University of Prince Edward Island, Saint Mary's University, Nova Scotia Agricultural College, Bishop's University, and Trent University. Collectively, their research expenditures in FY 2005 were less than

AUTM Respondents		
	Canadian Respondents*	U.S. Respondents
FY		
1991	8	98
1992	8	98
1993	10	117
1994	10	120
1995	15	127
1996	13	131
1997	14	132
1998	16	128
1999	15	139
2000	15	169
2001	19	168
2002	20	174
2003	21	181
2004	19	164
2005	21	191*

*Excludes small institutions, hospitals, TRIUMF
**U.S. FY 2005 data include all responding institutions

Technology Transfer at Canadian Universities: 2007 Update

Page 5 of 23

\$65 million and total License Income less than \$10,000, with other commercialization measures similarly below those at the institutions that were included in the analysis.

The cited Canadian respondents that are included for FY 2003, 2004 and 2005 are listed in Tables 1, 2, and 3 respectively; Tables follow Appendix A. Also listed in these tables are the comparable number of U.S. respondents with the highest levels of research expenditures for FY 2003 and 2004. Fully detailed FY 2005 U.S. data are not yet available from AUTM; included in Table 3 is the information available at the time of writing.

The five specific performance indicators from the AUTM report used for further analysis herein are

- Invention Disclosures Received,
- Licenses and Options Executed,
- U.S. Patents Issued,
- License Income Received, and
- Start-Up Companies Formed,

all on a per annum basis.

Some points/cautions must be considered when interpreting the data:

- The inclusion of research expenditures and commercialization of intellectual property generated at research hospitals affiliated with universities is not treated in a consistent manner across the responding institutions.
- Entries for University of Calgary / UTI, Inc. include commercialization of non-University IP as well as that flowing from the University of Calgary; in their most recent report, one-quarter of their disclosures and one-third of the companies assisted were non-University of Calgary.
- The AUTM definition of "Start-Up Company" is interpreted differently at different universities.

Results and Analysis

The data shown in Tables 1, 2 and 3 show tremendous variability among institutions. As in previous reports, we can reduce or eliminate the effects of some of the variability among institutions by normalizing the data. One can normalize for size of the institution in a number of ways – for example, by number of faculty members or students, by operating budget or by Research Expenditures. The most common and most useful normalization is by Total Research Expenditures. This involves dividing the output indicator – for example, number of Invention Disclosures Received at a particular institution – by that institution's Total Research Expenditures for that period to arrive at Invention Disclosures Received per dollar of Total Research Expenditure.

Technology Transfer at Canadian Universities: 2007 Update

Page 6 of 23

We apply this approach to the AUTM data for FY 2003, FY 2004 and FY 2005 and find the ratios given in Tables 1, 2 and 3 for the groups of Canadian post-secondary institutions in each year with the greatest Research Expenditures; as noted above, we omit reference to the smallest institutions since their Research Expenditures are much less than the others (by more than a factor of 2), as are their output measures. Tables 1 of the author's prior reports contain the same data and ratios for the fiscal years 1999, 2000, 2001 and 2002 data in the same format. The composition of responding universities differs for each of these years.

On page 2 of Tables 1, 2 and 3 are the AUTM results for the top U.S. universities individually and total results for all U.S. respondents in each year, including normalizations by Research Expenditures. Note again that, at the time of writing, some of the individual institutional data are not available for the U.S. institutions in FY 2005, so these data points are omitted from Table 3 and in the corresponding figures. Cumulative data are available for all parameters except License Income Received and Start-Up Companies Formed, so these plots of U.S. results could be completed for FY 2005; However, the FY 2005 cumulative data are for all responding U.S. institutions, including independent hospitals and research institutes, so are not strictly comparable to previous years; it should be noted that these non-university institutions reported less than 10% of the universities' research expenditures and commercialization outputs so their inclusion in these results are at most a minor perturbation..

For the top Canadian and the top U.S. universities in Tables 1, 2, and 3 statistical information about the distributions follows the individual institutional listings. In the first row below the individual listings (Rows labeled A and I for Canada and the U.S. respectively) are shown in **bold type** the **totals** of institutional values of the directly measured data (Research Expenditures, Disclosures, etc.) that are presented in the columns directly above them. Shown in those same Rows (A and I), in *italics*, are the derived, *cumulative* results - that is, the results of dividing, for example, the **total** number of Invention Disclosures by the **total** Research Expenditures for those institutions. In the next three Rows (B, C and D for the Canadian universities and J, K and L for the U.S.) are shown basic statistical attributes (average, median and standard deviation) of the distributions of the individual institutional data themselves. In addition, we compile in Row N on page 2 of each Table 1, the **total** and *cumulative* figures for all responding U.S. universities.

Canadian Results

On the first page of Tables 1, 2 and 3 the comparison of the *cumulative* Canadian data from AUTM between the top group in terms of Research Expenditures (in Row E) and the larger group (in Row A - which of course includes the top group) is informative. We note that all the *cumulative* measures (in *italics*) agree fairly closely. This shows the dominance of the sums by the ten institutions with the highest Research Expenditures.

Comparison of the *cumulative* data from AUTM between the top Canadian group in terms of Research Expenditures (in Row E) with the *cumulative* data from the remaining institutions (in Row F) shows that this latter group typically had better results in all categories of productivity in all fiscal years considered.

Technology Transfer at Canadian Universities: 2007 Update

Page 7 of 23

The above observations also prompt a separate analysis of the outputs from the universities from the "G-10" group of large Canadian universities, most of which have medical schools. As in previous years, all ten are represented in the AUTM Survey for FY 2003 and 2004 - they are marked with asterisks in the tables. The results for these ten - labeled "G-10" - are shown in Row G of Tables 1, 2 and 3, along with the results for the remaining respondents, in Row H. Université de Montréal did not report in FY 2005; so Page 1 of Table 3 contains results for the other nine only. Three of the five measures are higher for the non-G-10 group of twelve institutions.

Our results may also be compared with the results reported recently by Statistics Canada ("StatsCan") in an article "*Size Counts: Outcomes of IP Commercialization.*" They surveyed 86 unspecified Canadian universities in 2004 and examined the relationships between commercialization outcomes and university "size," as measured by research expenditures. Of interest here are their 18 "large" universities (\$80 million or more in research expenditures) and 10 "medium" universities (\$25 – \$19 million) – none of our AUTM sample falls into their "small" category which contains 58 institutions. The following table presents their results in a form that facilitates comparison with our results.

StatsCan results:

Size	Research Expenditures	Invention Disclosures	Licenses Executed	License Income	Patents Issued	Start-Ups to Date
Large	84%	85%	92%	96%	89%	78%
Medium	11%	12%	6%	3%	9%	20%
Small	5%	3%	2%	1%	2%	2%

We can recast our FY 2004 AUTM Results in the StatsCan format, using their categories. Only three of the 19 AUTM respondents fall in the StatsCan "medium" category.

AUTM results:

Size	Research Expenditures	Invention Disclosures	Licenses Executed	License Income	Patents Issued	Start-Ups to Date
Large	96%	93%	97%	99%	94%	93%
Medium	4%	7%	3%	1%	6%	7%

There is a fair degree of consistency between these two sets of results, despite the differences in sample size and composition. In both sets, medium-sized institutions recorded more than their proportionate share (by research expenditure) of disclosures and start-ups and less than their proportionate share of licenses and license income.

In the tables, the distributions of individual, unnormalized Canadian results for Research Expenditures and License Income Received are strongly skewed, as evidenced by medians (Row C) displaced below the averages (Row B) and by large (in some cases statistically meaningless) standard deviations (Row D) in relation to the averages. Upward skewing of Research Expenditures is due mostly to the very large Research Expenditures at the largest universities, and the

Technology Transfer at Canadian Universities: 2007 Update

Page 8 of 23

normalized License Income Received is skewed significantly by the very high License Income Received by the Université de Sherbrooke.

It is worth digressing to point out that the lion's share of the licensing income (almost \$10 million USD in FY 2005) at the Université de Sherbrooke is derived from one core technology - speech compression within wireless and internet applications - which has been adopted into hundreds of millions of devices world-wide. Other universities have had similar experiences with one "big hit" producing prodigious amounts of continuing royalty revenue. McGill enjoyed another type of "big hit" in FY 2001 in the (one-time) sale of equity in a start-up; then, in FY 2002, their reported License Income dropped by over 80%! U.B.C. has enjoyed substantial income in recent years from its licenses to QLT.

Returning to the tables, we note that the distributions of the normalized results are slightly better behaved. There are still large variations in the normalized measures, but the normalized results for Licenses and Options Executed and for Invention Disclosures Received are somewhat closer to normal distributions, with standard deviation smaller than the average and with the median fairly close to the average. However the other three measures display wide variations, even after normalization by Research Expenditures. This is also readily apparent from inspection of the normalized results for the individual institutions.

The variability of these results is fully consistent with that seen in the previous reports. It also vividly points out the difficulty of using averages of these types of measures – normalized or unnormalized – to draw clear conclusions from aggregated data.

U.S. Results and Comparison with Canadian Results

We turn now to a comparison between the Canadian and U.S. data in Table 2 for FY 2004 – the last year for which full data on US institutions is available. We note initially that, for both the top 19 universities (Row I) and the overall data set (Row N), the *cumulative* results for output measures at the U.S. universities are of the same order of magnitude as the Canadian results (Row A), with some higher and some lower. Specifically, U.S. Patents Issued and License Income Received are cumulatively greater (per \$1M) in the U.S., while there are more disclosures, more licenses executed and more start-ups formed (per \$1M) in Canada.

However, these data should be adjusted to take into account one very significant difference between the two countries: U.S. Research Expenditures include explicit recognition of the indirect costs of research whereas Canadian data do not. The rates charged by universities in the U.S. for indirect costs range from 15% to 115%, with an average value of 52.3% of total direct costs (reference: *Indirect Costs Reimbursement in the U.S.A.: Facts and Fiction*, AUCC Research File, June 2000).

Although imprecise, since it is an average taken over a different set of universities than reported here and because some, relatively minor, sponsors of Canadian research did make contributions toward indirect costs, applying an adjustment to the U.S. figure for Research Expenditures based

Technology Transfer at Canadian Universities: 2007 Update

on this average value is a reasonable approximation. The results are shown in Rows M and O in Table 2) We now note that, on this basis, the U.S. results are still of the same order of magnitude as Canadian, but results for U.S. Patents Issued and License Income Received (per \$1M) exceed the Canadian results by more substantial margins. The recent introduction of partial payment of indirect costs by the three principal Canadian granting agencies would not affect results here, since those payments are not included in the totals reported to AUTM.

Multi-Year Trends

AUTM Surveys began in FY 1991 and Canadian universities have participated from the start. Eight responded for FY 1991, with increasing numbers of participants since then, as shown in the above table entitled **AUTM Respondents**, along with the numbers of responding U.S. institutions. As mentioned above and as is the case in the rest of this report, reference is not made to those Canadian universities whose Research Expenditures are significantly less than those of the other responding Canadian universities.

The five output measures considered here have been used continuously, in most cases, from the beginning and thus provide the opportunity for analysis of long-term trends. The changes in composition of the responding group can limit the usefulness of the results. In order to eliminate the variability caused by changes to the composition of the sample, the nine Canadian institutions that responded most consistently over the 15-year period were identified. The nine recurrent respondents are listed in the table entitled **Recurrent Respondents**.

With the exception of the University of Manitoba and Simon Fraser University, each reported all or nearly all of the performance measures in all eleven years; these two started reporting in 1993. We present results graphically for the whole data set each year, as well as for these recurrent respondents. Unfortunately, no institutions in the Province of Quebec are among the recurrent respondents.

Recurrent Respondents
Queen's University*
Simon Fraser University
University of Alberta*
University of British Columbia*
University of Calgary/UTI, Inc.
University of Manitoba
University of Toronto*
University of Waterloo*
University of Western Ontario*
* "G-10" University

The first set of results shown in Figures 1 a– f (all figures are in the companion document to this one) comprise the non-normalized totals of the five output measures considered herein, as well as total annual Research Expenditures for all Canadian, all U.S. (where available) and the nine recurrent Canadian respondents over the entire period. Note that the vertical scales for the U.S. are a factor of 10 larger than for Canada, except for License Income Received which is a factor of 100 larger for the U.S. institutions. Because collection of data on Patents Issued and Start-Up Companies formed were collected and reported consistently first in 1993 and 1994 respectively, data start at those years in Figures 1d and 1e and subsequent plots.

Technology Transfer at Canadian Universities: 2007 Update

The next set of results in Figures 2 a – e show the five normalized output measures for all Canadian respondents and for the recurrent Canadian respondents, compared with those from all U.S. available respondents over the entire period. The *cumulative* results for each country – that is the national total output measure divided by national total research expenditures – are shown. The U.S. results are corrected for the provision of overhead payments in the U.S., as described above. U.S. and Canadian vertical scales are the same. Where available, results from the United Kingdom and Australia are also included.

Forming multi-year averages will reduce the effects of the high inter-year variability of the plotted results. It is also attractive in the Canadian context since institutional allocations of Canada Research Chairs, payments toward the Indirect Costs of Research and CFI New Opportunities awards are all based on such a rolling average – specifically, a three-year rolling average. In Figures 3 a – f are shown the results of applying this approach to the data on totals presented in Figures 1 a – f on the recurrent Canadian respondents, with rolling averages of the results for total Canadian respondents and (where available) total U.S. respondents shown for comparison. All plots are equally weighted averages of the data for the indicated year with the data for the two preceding years. Because collection of data on U.S. Patents Issued and Start-Up Companies Formed were collected over shorter periods, data shown in Figures 3d and 3e begin in 1995 and 1996 respectively. Again note the difference in scale for Canadian and U.S. measures.

Finally, we present in Figures 4 a – e the 3-year rolling averages of the annual normalized output measures that were presented in Figures 2 a – e. Again, plots are averages of the data for the indicated year with the data for the two preceding years. U.S. and Canadian vertical scales are the same as in Figures 2 a – e.

Regional Differences

An examination of performance by universities in Canada’s regions was initiated in the author’s *Addendum* to his 2003 report on the FY 2001 AUTM Survey results. This was done both for all five indicators based on the FY 2001 results. In the present study, these analyses were updated and extended to include historical results.

Figure 5 Region	Figure 5 Institutions
BC	Simon Fraser University University of British Columbia
Alberta	University of Alberta University of Calgary
Prairie	University of Manitoba
Ontario	Queen's University University of Toronto University of Waterloo University of Western Ontario

Figures 5a – 5e show the results for the nine institutions listed in the table of Recurrent Respondents, which were respondents over the full period of the AUTM Surveys FY 1991 – FY 2005. These are listed in the table. Shown are the averages of the productivity measures, weighting each institution equally. Unfortunately, no institutions in the Province of Quebec are among the recurrent respondents cited in Figure 5.

Technology Transfer at Canadian Universities: 2007 Update

Figure 6 Region	Figure 6 Institutions
West	Simon Fraser University University of Alberta University of British Columbia University of Calgary / UTI, Inc. University of Manitoba University of Saskatchewan University of Victoria
Ontario	McMaster University Queen's University University of Guelph University of Ottawa University of Toronto University of Waterloo University of Western Ontario York University
Quebec	McGill University Université de Montréal Université de Sherbrooke Université Laval
Atlantic	Dalhousie University Memorial University University of New Brunswick

The FY 2005 results shown in Figures 6a – 6e and 7a – 7e are much more inclusive, as shown in the table below.

In Figure 7, the “West” region institutions are subdivided into “B.C.” and “Prairie.” In all cases, the cumulative values of the productivity measures, in each region are shown. It is clear that there are continue to be regional differences, although they are somewhat less pronounced than seen previously. In a few cases, average results are dominated by the activities at one institution; the most notable example is the almost \$10 million USD in License Income Received in FY 2005 by the Université de Sherbrooke that was cited above.

Discussion

High Variability

Among the Canadian results, there is no apparent correlation between institutional size, type (“Medical/Doctoral” versus “Comprehensive,” to use the categories used by Maclean’s magazine), or age and an individual institution’s performance on any one of the measures, whether normalized by Research Expenditures or not. This points to the highly idiosyncratic nature of the process of technology transfer, with relatively small numbers of outputs (Disclosures, Patents, Licenses, Start-Ups Formed) emerging in a given time period, wide variations in the degree of commercial success of the technologies transferred and large variations from one FY to another. There are a number of instances in which the commercialization of one or two technologies is responsible for the large variations. This may occur in one of two modes:

- A technology is successfully commercialized via license(s) to one or more established firms and the technology is widely adopted, generating large royalty streams. Two examples are the licensing of a particular pharmaceutical by UBC to QLT Inc. and the licensing of ACELP Speech Compression Technology by the Université de Sherbrooke to over 72 companies worldwide. In each case, the commercial success of the technology led to multimillion dollar increases in revenue from FY 2000 to FY 2005, with further funding from the same sources anticipated in future years.

Technology Transfer at Canadian Universities: 2007 Update

Page 12 of 23

- A technology is successfully commercialized via a start-up company in which the university holds an equity position. When the university “cashes in” its equity holding, a major one-time rise in revenue can occur. For example, at SFU, the sale of NCompass Labs to Microsoft was responsible for most of a 12-fold increase in revenue between FY 1998 and FY 1999, with another similar (but smaller) event between FY 2001 and 2002. At McGill, a similar (but much larger) sale of equity in a spin-off was responsible for the almost 10-fold increase in their revenue between FY 2000 and FY 2001. As noted above, the absence of such a large infusion of income in FY 2002 resulted in a dramatic decrease to a much lower level.

Another contributor to the inter-institutional variation seen in these data must be variation in institutional commitment to technology transfer and variation in support for these activities from internal and external sources – especially when an institution is seen to “under-perform” consistently over a number of years.

It is important to note here the similarity of the normalized Canadian and U.S. results for Invention Disclosures Received and Licenses and Options Executed over the long term in contrast to the consistent differences in the other measures, especially License Income Received and Start-Up Companies Formed, the latter until recent AUTM surveys. Equally striking is the similarity of normalized results from the Recurrent Canadian and All Canadian respondents, especially in view of fact that in recent years, the recurrent group comprised only about one-half the cited Canadian respondents.

Start-Up Formation

We suggested in the past that the higher rate of start-up formation in Canada, until recently, compared with the U.S. can be linked to Canada's lower receptor capacity. This lack of capacity has been documented in previous studies by the Conference Board of Canada and by the ACST. In Canada, especially as compared with the U.S., there are few pre-existing firms that can use their own existing R&D structures to take intellectual property generated in the universities to the next steps in the process of commercialization. In addition to the well-documented difficulties in attracting venture capital, especially since the “dot.com” crash, start-ups are well known to have endemic cash-flow and managerial problems, which threaten the successful exploitation of IP that they own or acquire. Venture capital may be becoming somewhat more accessible again, but at nowhere near the levels of seven or eight years ago.

The trend shown in Figures 1e, 3e, 2e and 4e is a striking reduction both in the absolute number of start-up formation and in the rate of start-up formation per \$1M research expenditure in Canada, toward the rate seen in the U.S. It is not clear whether this is a reflection of increasing maturity of Canadian industrial receptor capacity, shortage of venture capital for start-ups, a shorter-term result of the dot.com crash, a result of the lag time between the large infusion of research funding in Canada in the last few years (e.g. the 150% increase from FY 1999 to FY 2005 at the nine recurrent respondent institutions) and the production of commercializable IP, or some other

Technology Transfer at Canadian Universities: 2007 Update

Page 13 of 23

cause. There is an interesting discussion of the phenomenon of substantial time lag between research expenditure and output measures such as invention disclosures and patent applications on pages 26 – 28 of AUTM's Canadian Licensing Survey: FY 2005 Survey Summary.

It remains clear that start-ups based on university research IP are a significant factor in Canada. A study by Clayman and Holbrook (2003) found that, in the sample studied, the "survival rate" was 73% overall and is similar at both Medical/Doctoral institutions (72%) and Comprehensive institutions (76%). Overall, 80% of the surviving companies operate in the same region as the university from which they originated and thus are significant drivers of economic activity in those regions. However, further study is needed to assess their impact, since "survival" does not necessarily connote "success."

License Income

Recalling that License Income Received includes the proceeds of liquidation of equity, the lower normalized License Income Received in Canada versus the U.S. is a significant factor and likely stems mainly from two factors:

- the increasingly prevalent taking of equity holdings in start-up companies by Canadian universities, as an alternative to licensing income available to U.S. universities from larger, better established U.S. firms. Gains take longer to realize through this route than via license income and do not show up in these reports until they do occur. It is worth noting that this sort of delay makes difficult the assessment of the effects of increases in research funding and of increases in commercialization efforts, since cause and effect can be widely separated in time.
- several huge "hits" (financial successes) by some U.S. universities that result in license incomes in the range of \$30M - \$70M per annum. The most striking example is the \$62M received by Florida State University in FY 2001 almost exclusively from a licensing agreement for a semi-synthetic process for the production of the cancer-fighting drug taxol. Taxol licensing revenue dropped after that and was \$2.5 million in FY 2005. Florida State earned a total of \$351 million by the time that its license expired. There has not been such a "hit" in Canada, although the \$10M earned in FY 2005 by the Université de Sherbrooke is of the same order of magnitude.

Taking all these factors into account, we conclude that Canadian university researchers appear to be every bit as creative and inventive as their U.S. counterparts (citing equivalent rates of Invention Disclosures Received) and that Canadian universities are every bit as aggressive in licensing IP generated in the institutions (citing equivalent Licenses and Options Executed). Differences in patenting rates are less significant since much IP is protected via other means, especially recently and especially in areas other than biotechnology. In addition, we have no disaggregated data - only some aggregated data from Statistics Canada - on total patents issued to Canadian university inventors. As noted above, the missing ingredients in Canada are larger-scale core research funding and a large domestic industrial base to exploit the IP efficiently and effectively.

Technology Transfer at Canadian Universities: 2007 Update

Page 14 of 23

Despite these shortcomings, it appears that some long-term commitments to technology transfer in Canada are beginning to bear fruit. Even with the time lag between investment in research and successful technology transfer – noted above – the over 200% increase in License Income Received by all institutions from FY 1999 to 2005 in Canada is very impressive, as is the contrast with the smaller (75%) increase in the U.S (see Figure 1c); the nine recurrent respondent institutions in Canada registered an absolute increase of 156%. Over the same period, the Licensing Income Received per \$1M Research Expenditures remained roughly constant in Canada as it did also in the U.S. over that period (see Figure 2c).

Other Output Measures

It is unfortunate that there are no readily quantifiable performance measures related to means of technology transfer other than Patents Issued, License Income Received and Start-Ups Formed. Especially in the rapidly moving area of information technology and multimedia, much of the technology transferred is in the form of trade secrets and other types of “know-how.” Reports such as this tell only part of the story since they omit any direct reference to these forms of technology transfer, although Start-Ups Formed is loosely correlated to them. Development of means of quantitatively assessing such modes of technology transfer is highly desirable and it is hoped that AUTM and/or Statistics Canada will devote effort in this direction.

Conclusions

A number of conclusions can be drawn from the results. Most have been touched on in the discussion sections above; they are presented here with some elaboration of the rationale behind them.

1. The amount of technology that is measurably transferred from universities appears to be roughly a linear function of Research Expenditures. This is the case cumulatively for Canadian universities and for U.S. universities. It is evidenced clearly by the essentially constant rates of Invention Disclosures per \$1M and Licenses and Options Executed per \$1M presented in Figures 4a and 4b. The output rate - that is technology outputs (as exemplified by Disclosures and Licenses) per Research Expenditure input - is approximately the same in both countries and has been over the last decade, once indirect costs are factored out of the U.S. Research Expenditures. This applies over the very wide range of institutional settings and over a very wide range of performance by the individual institutions. It is noted again that there are very significant year-to-year fluctuations in both the actual and the normalized measures. Whether there are underlying longer-term trends remains to be seen. Calculation of three-year rolling averages helps in determining trends since the averages tend to damp out short-term perturbations.
2. The effectiveness of technology transfer (measured in terms of the range of outputs per Research Expenditure dollar) at the top Canadian universities collectively is

Technology Transfer at Canadian Universities: 2007 Update

Page 15 of 23

typically noticeably lower than it is collectively at the universities ranked below them, although there are very wide variations in performance. This result is consistent from findings in the author's previous reports. It is worth noting that rates of technology transfer in the U.S. have been consistently similar across the full range of universities over the life of the AUTM Surveys – i.e. no disparity between large and small institutions as appears to be the case in Canada, appears to exist in the U.S. It is a reasonable conjecture that the passage in 1980 of the Bayh-Dole act, which gave all U.S. universities the responsibility for commercializing IP generated in federally funded research, stimulated broadly based activity in universities of all sizes and types.

3. It is important to note here the similarity of the normalized Canadian and U.S. results for Invention Disclosures Received and Licenses and Options Executed over the long-term and the consistent differences in the other normalized measures, especially License Income Received per \$1M (where the U.S. is ahead) and Start-Up Companies Formed per \$1M (where Canada has led). Equally striking is the similarity of normalized results from the Recurrent Canadian and All Canadian respondents, especially in view of the fact that in recent years, the recurrent group comprises only one-half the Canadian respondents.
4. There is opportunity for further analysis of the AUTM data sets and the StatsCan results. Longitudinal studies of the effectiveness of technology transfer at those institutions which have reported in all of AUTM's fifteen Surveys have produced valuable, interesting results. A more detailed analysis of the impacts of long-term, well-staffed technology transfer offices, involving direct contact with the offices themselves and access to their records would add to these purely statistical results.
5. There is a need for more publicly available (unlike the StatsCan data), comprehensive information on the performance of Canadian universities in technology transfer, upon which informed decisions on public policy can be made. Although the AUTM Surveys captured most of the universities that attract most (approximately 90%) of the research funding in Canada, the post-secondary respondents comprised well fewer than one-half of the universities in the country and omit some significant players, including the institutions in the Université du Québec system.

Acknowledgements

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Appendix A

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Technology Transfer at Canadian Universities: 2007 Update

Page 17 of 23

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Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

FY2003 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	License & Options per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of British Columbia*	\$ 268,962,957	141	0.524	37	0.138	\$ 9,756,996	\$ 36,276	19	0.071	4	0.015
2 McGill University*	\$ 228,902,134	99	0.432	38	0.166	\$ 1,460,601	\$ 6,381	45	0.197	5	0.022
3 Université de Montréal*	\$ 223,144,484	80	0.359	29	0.130	\$ 604,474	\$ 2,709	11	0.049	3	0.013
4 University of Toronto*	\$ 219,401,967	138	0.629	40	0.182	\$ 2,109,400	\$ 9,614	3	0.014	7	0.032
5 University of Alberta*	\$ 186,048,255	61	0.328	18	0.097	\$ 1,068,384	\$ 5,743	11	0.059	4	0.021
6 Université Laval*	\$ 126,129,631	34	0.270	10	0.079	\$ 127,752	\$ 1,013	8	0.063	3	0.024
7 University of Calgary / UTI, Inc.	\$ 120,831,629	124	1.026	20	0.166	\$ 2,935,162	\$ 24,291	13	0.108	3	0.025
8 University of Western Ontario*	\$ 100,435,434	29	0.289	18	0.179	\$ 281,514	\$ 2,803	4	0.040	0	0.000
9 Queen's University*	\$ 94,978,228	57	0.600	6	0.063	\$ 3,479,052	\$ 36,630	14	0.147	0	0.000
10 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
11 McMaster University*	\$ 86,290,242	47	0.545	48	0.556	\$ 633,198	\$ 7,338	3	0.035	0	0.000
12 University of Guelph	\$ 76,247,150	155	2.033	41	0.538	\$ 576,803	\$ 7,565	5	0.066	0	0.000
13 University of Ottawa	\$ 72,810,336	15	0.206	6	0.082	\$ 42,608	\$ 585	4	0.055	1	0.014
14 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
15 University of Manitoba	\$ 60,324,127	35	0.580	6	0.099	\$ 1,682,750	\$ 27,895	5	0.083	0	0.000
16 Université de Sherbrooke	\$ 58,079,340	14	0.241	23	0.396	\$ 10,182,867	\$ 175,327	1	0.017	1	0.017
17 Dalhousie University	\$ 53,679,777	8	0.149	2	0.037	\$ 17,667	\$ 329	7	0.130	0	0.000
18 Memorial University	\$ 36,405,168	18	0.494	3	0.082	\$ 126,347	\$ 3,471	0	0.000	0	0.000
19 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
20 University of New Brunswick	\$ 22,042,227	15	0.681	8	0.363	\$ 80,478	\$ 3,651	1	0.045	1	0.045
21 University of Victoria	\$ 17,885,020	33	1.845	6	0.335	\$ 92,797	\$ 5,189	0	0.000	0	0.000
A Can. Totals & Cumulative: Top 21	\$ 2,240,719,179	1,178	0.526	401	0.179	\$ 36,864,815	\$ 16,452	166	0.074	52	0.023
B Can. Average: Top 21	\$ 106,700,913	56.1	0.602	19.1	0.202	\$ 1,755,467	\$ 18,009	7.9	0.068	2.5	0.028
C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 1,658,247,276	803	0.484	242	0.146	\$ 22,777,944	\$ 13,736	130	0.078	32	0.019
F Can. Totals & Cumulative: Last 11	\$ 582,471,903	375	0.644	159	0.273	\$ 14,086,871	\$ 24,185	36	0.062	20	0.034
G "G-10" (*) Totals & Cumulative	\$ 1,601,821,351	924	0.577	273	0.170	\$ 23,226,995	\$ 14,500	127	0.079	29	0.018
H Non-G-10 Totals & Cumulative	\$ 638,897,829	483	0.756	142	0.222	\$ 16,753,324	\$ 26,222	42	0.066	13	0.020

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 2 of 2

FY2003 AUTM Survey Results for Responding U.S. Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

U.S. University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of California System	\$ 2,623,300,000	1,027	0.391	208	0.079	\$ 67,019,000	\$ 25,548	323	0.123	22	0.008
2 Johns Hopkins University	\$ 1,461,554,527	330	0.226	159	0.109	\$ 6,712,152	\$ 4,592	95	0.065	5	0.003
3 Massachusetts Inst. of Technology	\$ 994,354,000	452	0.455	114	0.115	\$ 26,824,897	\$ 26,977	152	0.153	15	0.015
4 University of Illinois	\$ 785,088,000	229	0.292	86	0.110	\$ 7,700,876	\$ 9,809	39	0.050	6	0.008
5 University of Washington	\$ 784,411,974	199	0.254	67	0.085	\$ 29,282,203	\$ 37,330	46	0.059	3	0.004
6 University of Michigan	\$ 749,344,497	257	0.343	76	0.101	\$ 9,100,000	\$ 12,144	64	0.085	9	0.012
7 University. of Wisconsin-Madison	\$ 721,248,000	406	0.563	177	0.245	\$ 37,765,393	\$ 52,361	87	0.121	0	0.000
8 University of Pennsylvania	\$ 649,700,000	321	0.494	83	0.128	\$ 11,653,155	\$ 17,936	50	0.077	12	0.018
9 Stanford University	\$ 639,895,454	362	0.566	128	0.200	\$ 45,383,189	\$ 70,923	117	0.183	12	0.019
10 SUNY System	\$ 629,261,894	235	0.373	34	0.054	\$ 13,726,454	\$ 21,814	51	0.081	4	0.006
11 Penn State University	\$ 545,031,000	156	0.286	20	0.037	\$ 1,643,635	\$ 3,016	58	0.106	2	0.004
12 Harvard University	\$ 538,946,600	119	0.221	69	0.128	\$ 24,282,171	\$ 45,055	59	0.109	4	0.007
13 University of Colorado	\$ 531,800,000	124	0.233	34	0.064	\$ 3,083,185	\$ 5,798	23	0.043	6	0.011
14 University of Pittsburgh	\$ 513,064,000	74	0.144	44	0.086	\$ 3,006,015	\$ 5,859	22	0.043	8	0.016
15 University of Minnesota	\$ 508,557,000	218	0.429	56	0.110	\$ 38,083,275	\$ 74,885	54	0.106	4	0.008
16 Cornell University	\$ 504,600,000	186	0.369	50	0.099	\$ 3,293,000	\$ 6,526	53	0.105	13	0.026
17 Duke University	\$ 474,953,669	125	0.263	39	0.082	\$ 2,793,574	\$ 5,882	50	0.105	1	0.002
18 Washington University St. Louis	\$ 474,328,000	91	0.192	41	0.086	\$ 12,815,429	\$ 27,018	54	0.114	3	0.006
19 Texas A&M University System	\$ 456,235,000	117	0.256	81	0.178	\$ 7,311,571	\$ 16,026	27	0.059	5	0.011
20 University of Arizona	\$ 454,941,000	111	0.244	23	0.051	\$ 1,076,870	\$ 2,367	12	0.026	2	0.004
21 Ohio State University	\$ 416,000,000	130	0.313	42	0.101	\$ 565,877	\$ 1,360	21	0.050	4	0.010
I U.S. Totals & Cumulative: Top 21	\$ 15,456,614,615	5,269	<i>0.341</i>	1,631	<i>0.106</i>	\$ 353,121,921	\$ 22,846	1,457	<i>0.094</i>	140	<i>0.009</i>
J U.S. Average: Top 21	\$ 736,029,267	250.9	0.329	77.7	0.107	\$ 16,815,330	\$ 22,535	69.4	0.089	6.7	0.009
K U.S. Median: Top 21	\$ 545,031,000	199	0.292	67	0.101	\$ 9,100,000	\$ 16,026	53	0.085	5	0.008
L U.S. Standard Deviation: Top 21	\$ 492,775,654	208.1	0.119	52.1	0.050	\$ 17,926,195	\$ 22,057	67.0	0.039	5.4	0.006
M U.S. Totals & Cumulative: Top 21 adjusted for indirect costs @52.3%	\$ 10,089,174,031	5,269	<i>0.522</i>	1,631	<i>0.162</i>	\$ 353,121,921	\$ 35,000	1,457	<i>0.144</i>	140	<i>0.014</i>
FY2003 AUTM Survey Results for <u>All</u> Responding U.S. Institutions (N = 181)											
N U.S. Totals & Cumulative: N=181	\$ 37,175,077,087	14,431	<i>0.388</i>	4,132	<i>0.111</i>	\$ 1,133,105,742	\$ 30,480	3,673	<i>0.099</i>	348	<i>0.009</i>
O U.S. Totals & Cumulative: N=181 adjusted for indirect costs @52.3%	\$ 24,265,716,114	14,431	<i>0.595</i>	4,132	<i>0.170</i>	\$ 1,133,105,742	\$ 46,696	3,673	<i>0.151</i>	348	<i>0.014</i>

Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

FY2004 AUTM Survey Results for Responding Canadian Universities (Top 19)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 Université de Montréal*	\$ 379,886,279	70	0.184	68	0.179	\$ 1,326,870	\$ 3,493	4	0.011	2	0.005
2 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
3 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
4 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
5 University of British Columbia*	\$ 268,904,440	145	0.539	53	0.197	\$ 10,565,156	\$ 39,290	18	0.067	2	0.007
6 University of Calgary / UTI, Inc.	\$ 190,073,430	108	0.568	24	0.126	\$ 2,544,562	\$ 13,387	6	0.032	0	0.000
7 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
8 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
9 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
10 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
11 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
12 University of Saskatchewan	\$ 93,842,243	43	0.458	20	0.213	\$ 906,317	\$ 9,658	4	0.043	3	0.032
13 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
14 University of Waterloo*	\$ 75,236,154	11	0.146	37	0.492	\$ 623,782	\$ 8,291	0	0.000	7	0.093
15 Université de Sherbrooke	\$ 72,548,815	18	0.248	23	0.317	\$ 8,232,337	\$ 113,473	3	0.041	2	0.028
16 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
17 University of Victoria	\$ 35,998,462	33	0.917	4	0.111	\$ 113,538	\$ 3,154	4	0.111	0	0.000
18 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
19 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
A Can. Totals & Cumulative: Top 19	\$ 2,772,835,637	1,168	0.421	502	0.181	\$ 37,936,292	\$ 13,681	137	0.049	41	0.015
B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 2,172,494,815	868	0.400	297	0.137	\$ 24,679,233	\$ 11,360	105	0.048	24	0.011
F Can. Totals & Cumulative: Last 9	\$ 600,340,822	300	0.500	205	0.341	\$ 13,257,059	\$ 22,083	32	0.053	17	0.028
G "G-10" (*) Totals & Cumulative	\$ 2,007,992,155	777	0.387	368	0.183	\$ 23,313,331	\$ 11,610	101	0.050	31	0.015
H Non-G-10 Totals & Cumulative	\$ 764,843,482	391	0.511	134	0.175	\$ 14,622,962	\$ 19,119	36	0.047	10	0.013

*"G-10" Institution

**Dalhousie and Memorial did not provide data for publication in 2004

*** \$CDN = 1.30*\$US

Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 2 of 2

FY2004 AUTM Survey Results for Responding U.S. Universities (Top 19)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

U.S. University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of California System	\$ 2,623,300,000	1027	0.391	208	0.079	\$ 67,019,000	\$ 25,548	323	0.123	22	0.008
2 Johns Hopkins University	\$ 1,461,554,527	330	0.226	159	0.109	\$ 6,712,152	\$ 4,592	95	0.065	5	0.003
3 Massachusetts Inst. of Technology	\$ 994,354,000	452	0.455	114	0.115	\$ 26,824,897	\$ 26,977	152	0.153	15	0.015
4 University of Washington	\$ 784,411,974	199	0.254	67	0.085	\$ 29,282,203	\$ 37,330	46	0.059	3	0.004
5 University of Illinois	\$ 785,088,000	229	0.292	86	0.110	\$ 7,700,876	\$ 9,809	39	0.050	6	0.008
6 University of Wisconsin-Madison	\$ 721,248,000	406	0.563	177	0.245	\$ 37,765,393	\$ 52,361	87	0.121	0	0.000
7 University of Michigan	\$ 749,344,497	257	0.343	76	0.101	\$ 9,100,000	\$ 12,144	64	0.085	9	0.012
8 SUNY System	\$ 710,175,177	257	0.362	50	0.070	\$ 13,363,714	\$ 18,817	43	0.061	7	0.010
9 Stanford University	\$ 693,529,925	350	0.505	89	0.128	\$ 47,272,397	\$ 68,162	87	0.125	9	0.013
10 University of Pennsylvania	\$ 654,457,805	392	0.599	87	0.133	\$ 8,653,042	\$ 13,222	45	0.069	6	0.009
11 Penn State University	\$ 606,521,000	167	0.275	23	0.038	\$ 1,916,613	\$ 3,160	46	0.076	4	0.007
12 Harvard University	\$ 590,592,500	160	0.271	50	0.085	\$ 16,654,975	\$ 28,200	35	0.059	4	0.007
13 University of Colorado	\$ 571,342,900	147	0.257	41	0.072	\$ 34,128,958	\$ 59,735	18	0.032	9	0.016
14 University of Pittsburgh	\$ 558,878,000	140	0.251	53	0.095	\$ 3,805,082	\$ 6,808	39	0.070	10	0.018
15 Cornell University	\$ 537,700,000	225	0.418	80	0.149	\$ 7,233,500	\$ 13,453	53	0.099	6	0.011
16 University of Minnesota	\$ 515,061,000	224	0.435	100	0.194	\$ 45,550,764	\$ 88,438	38	0.074	3	0.006
17 Duke University	\$ 492,040,666	127	0.258	51	0.104	\$ 3,794,523	\$ 7,712	32	0.065	10	0.020
18 University of Arizona	\$ 478,680,000	94	0.196	24	0.050	\$ 962,762	\$ 2,011	18	0.038	4	0.008
19 Ohio State University	\$ 447,000,000	161	0.360	30	0.067	\$ 629,033	\$ 1,407	26	0.058	6	0.013
I U.S. Totals & Cumulative: Top 19	\$ 14,975,279,971	5,344	<i>0.357</i>	1,565	<i>0.105</i>	\$ 368,369,884	\$ 24,599	1,286	<i>0.086</i>	138	<i>0.009</i>
J U.S. Average: Top 19	\$ 788,172,630	281.3	0.353	82.4	0.107	\$ 19,387,889	\$ 25,257	67.7	0.078	7.3	0.010
K U.S. Median: Top 19	\$ 654,457,805	225	0.343	76	0.101	\$ 9,100,000	\$ 13,453	45	0.069	6	0.009
L U.S. Standard Deviation: Top 19	\$ 500,633,408	207.7	0.117	51.4	0.049	\$ 19,194,085	\$ 25,080	69.8	0.032	4.9	0.005
M U.S. Totals & Cumulative: Top 19 adjusted for indirect costs @52.3%	\$ 9,774,986,926	5,344	<i>0.547</i>	1,565	<i>0.160</i>	\$ 368,369,884	\$ 37,685	1,286	<i>0.132</i>	138	<i>0.014</i>
FY2004 AUTM Survey Results for <u>All</u> Responding U.S. Universities (N = 164)											
N U.S. Totals & Cumulative: N=164	\$ 37,162,153,394	15,002	<i>0.404</i>	4,087	<i>0.110</i>	\$ 1,034,055,106	\$ 27,825	3,268	<i>0.088</i>	425	<i>0.011</i>
O U.S. Totals & Cumulative: N=164 adjusted for indirect costs @52.3%	\$ 24,257,280,283	15,002	<i>0.618</i>	4,087	<i>0.168</i>	\$ 1,034,055,106	\$ 42,629	3,268	<i>0.135</i>	425	<i>0.018</i>

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received***	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Alberta*	\$ 323,349,167	59	0.182	13	0.040	\$ 877,931	\$ 2,715	10	0.031	2	0.006
2 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.031	1	0.003
3 University of Toronto*	\$ 321,035,738	224	0.698	34	0.106	\$ 1,413,729	\$ 4,404	8	0.025	3	0.009
4 University of British Columbia*	\$ 303,335,806	143	0.471	50	0.165	\$ 13,321,844	\$ 43,918	25	0.077	2	0.006
5 McMaster University*	\$ 240,490,833	46	0.191	192	0.798	\$ 1,272,778	\$ 5,292	2	0.006	2	0.006
6 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.031	0	0.000
7 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.009	1	0.003
8 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.009	0	0.000
9 University of Western Ontario*	\$ 168,954,530	81	0.479	35	0.207	\$ 3,635,863	\$ 21,520	8	0.025	5	0.015
10 Queen's University*	\$ 113,710,000	52	0.457	10	0.088	\$ 745,637	\$ 6,557	8	0.025	3	0.009
11 University of Guelph	\$ 103,328,886	106	1.026	40	0.387	\$ 1,114,285	\$ 10,784	7	0.022	0	0.000
12 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.037	0	0.000
13 University of Waterloo*	\$ 87,293,333	8	0.092	34	0.389	\$ 648,308	\$ 7,427	0	0.000	2	0.006
14 University of Manitoba	\$ 81,701,633	46	0.563	5	0.061	\$ 1,397,147	\$ 17,101	8	0.025	0	0.000
15 Université de Sherbrooke	\$ 79,189,178	24	0.303	31	0.391	\$ 9,726,183	\$ 122,822	3	0.009	0	0.000
16 Dalhousie University	\$ 77,080,833	16	0.208	1	0.013	\$ 123,716	\$ 1,605	1	0.003	0	0.000
17 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.003	0	0.000
18 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.031	1	0.003
19 York University	\$ 40,666,667	12	0.295	6	0.148	\$ -	\$ -	0	0.000	0	0.000
20 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.009	2	0.006
21 University of New Brunswick	\$ 27,694,642	16	0.578	3	0.108	\$ 43,762	\$ 1,580	2	0.006	2	0.006
A Can. Totals & Cumulative: Top 21	\$ 3,171,794,632	1,339	0.422	544	0.172	\$ 40,267,813	\$ 12,696	134	0.042	26	0.008
B Can. Average: Top 21	\$ 151,037,840	63.8	0.513	25.9	0.177	\$ 1,917,515	\$ 14,585	6.4	0.019	1.2	0.004
C Can. Median: Top 21	\$ 103,328,886	52	0.471	13	0.106	\$ 877,931	\$ 6,480	7	0.009	1	0.003
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.370	41.0	0.198	\$ 3,373,474	\$ 28,173	5.8	0.018	1.4	0.004
E Can. Totals & Cumulative: Top 10	\$ 2,417,061,353	921	0.381	394	0.163	\$ 25,833,539	\$ 10,688	87	0.036	19	0.008
F Can. Totals & Cumulative: Last 11	\$ 754,733,278	418	0.554	150	0.199	\$ 14,434,274	\$ 19,125	47	0.062	7	0.009
G "G-10" (*) Totals & Cumulative	\$ 2,071,183,428	760	0.367	408	0.197	\$ 23,525,503	\$ 11,358	74	0.036	20	0.010
H Non-G-10 Totals & Cumulative	\$ 1,100,611,204	579	0.526	136	0.124	\$ 16,742,311	\$ 15,212	60	0.055	6	0.005

**U Montréal did not provide data in 2005

*** \$US = 1.20*\$Cdn

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 2 of 2

FY2005 AUTM Survey Results for Responding U.S. Universities (Top 21) Dummy data where AUTM data are missing

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

U.S. University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of California System	\$ 2,916,534,000	1	0.000	265	0.091	\$ 92,902,000	\$ 31,854	310	0.106	19	0.007
2 Johns Hopkins University	\$ 1,674,228,321	1	0.001	94	0.056	\$ 12,369,870	\$ 7,388	81	0.048	5	0.003
3 Massachusetts Inst. of Technology	\$ 1,133,000,000	1	0.001	93	0.082	\$ 39,824,482	\$ 35,150	133	0.117	20	0.018
4 University of Washington	\$ 895,349,071	1	0.001	109	0.122	\$ 29,317,473	\$ 32,744	40	0.045	4	0.004
5 University of Illinois	\$ 817,990,000	1	0.001	63	0.077	\$ 7,115,689	\$ 8,699	65	0.079	7	0.009
6 University. of Wisconsin-Madison	\$ 798,099,000	1	0.001	216	0.271	\$ 49,052,238	\$ 61,461	89	0.112	4	0.005
7 University of Michigan	\$ 778,061,728	1	0.001	86	0.111	\$ 16,721,791	\$ 21,492	80	0.103	7	0.009
8 SUNY System	\$ 735,792,126	1	0.001	84	0.114	\$ 13,592,373	\$ 18,473	35	0.048	6	0.008
9 University of Pennsylvania	\$ 672,736,678	1	0.001	83	0.123	\$ 7,495,118	\$ 11,141	37	0.055	9	0.013
10 Penn State University	\$ 637,911,000	1	0.002	21	0.033	\$ 2,266,479	\$ 3,553	37	0.058	3	0.005
11 Harvard University	\$ 623,339,500	1	0.002	58	0.093	\$ 27,987,375	\$ 44,899	44	0.071	7	0.011
12 University of Pittsburgh	\$ 602,664,000	1	0.002	58	0.096	\$ 4,246,193	\$ 7,046	20	0.033	8	0.013
13 Cornell University	\$ 561,320,000	1	0.002	79	0.141	\$ 3,952,000	\$ 7,041	51	0.091	5	0.009
14 University of Minnesota	\$ 548,873,000	1	0.002	82	0.149	\$ 47,051,520	\$ 85,724	51	0.093	1	0.002
15 University of Arizona	\$ 530,233,000	1	0.002	28	0.053	\$ 1,175,915	\$ 2,218	10	0.019	5	0.009
16 Ohio State University	\$ 511,500,000	1	0.002	19	0.037	\$ 696,000	\$ 1,361	38	0.074	2	0.004
17 Duke University	\$ 510,372,000	1	0.002	28	0.055	\$ 3,712,252	\$ 7,274	25	0.049	3	0.006
18 University of Colorado	\$ 497,762,300	1	0.002	60	0.121	\$ 27,352,470	\$ 54,951	13	0.026	9	0.018
19 University of Florida	\$ 478,000,000	1	0.002	66	0.138	\$ 40,300,000	\$ 84,310	54	0.113	13	0.027
20 University of Southern California	\$ 431,800,000	1	0.002	65	0.151	\$ 2,891,273	\$ 6,696	35	0.081	7	0.016
21 Georgia Institute of Technology	\$ 420,317,170	1	0.002	37	0.088	\$ 4,478,516	\$ 10,655	43	0.102	9	0.021
I U.S. Totals & Cumulative: Top 21	\$ 16,775,882,894	21	<i>0.001</i>	1,694	<i>0.101</i>	\$ 434,501,027	\$ 25,900	1,291	<i>0.077</i>	153	<i>0.009</i>
J U.S. Average: Top 21	\$ 798,851,566	1.0	0.002	80.7	0.105	\$ 20,690,525	\$ 25,911	61.5	0.073	7.3	0.010
K U.S. Median: Top 21	\$ 623,339,500	1	0.002	66	0.096	\$ 12,369,870	\$ 11,141	43	0.074	7	0.009
L U.S. Standard Deviation: Top 21	\$ 561,968,869	0.0	0.001	59.4	0.052	\$ 23,096,302	\$ 26,344	63.6	0.031	4.9	0.007
M U.S. Totals & Cumulative: Top 21 adjusted for indirect costs @52.3%	\$ 10,950,315,205	21	<i>0.002</i>	1,694	<i>0.155</i>	\$ 434,501,027	\$ 39,679	1,291	<i>0.118</i>	153	<i>0.014</i>
FY2005 AUTM Survey Results for All Responding U.S. Institutions (N = 191)											
N U.S. Totals & Cumulative: N=191	\$ 42,300,000,000	17,382	<i>0.411</i>	4,932	<i>0.117</i>	\$ 1	\$ 0	3,278	<i>0.077</i>	1	<i>0.000</i>
O U.S. Totals & Cumulative: N=191 adjusted for indirect costs @52.3%	\$ 27,610,966,057	17,382	<i>0.630</i>	4,932	<i>0.179</i>	\$ 1	\$ 0	3,278	<i>0.119</i>	1	<i>0.000</i>

Sorted Tables for Technology Transfer at Canadian Universities: 2007 Update

A Report for the University Presidents' Council
of
British Columbia

June 2007

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Sorted Tables for Technology Transfer at Canadian Universities: Fiscal Year 2007 Update

Page 2 of 32

This document contains sorted versions of Tables 1, 2 and 3 of the report “Technology Transfer at Canadian Universities: 2007 Update.”

For each of FY 2003, FY 2004 and FY 2005, the results on Canadian institutions, derived from analysis of the AUTM survey reports, are sorted according to each of the five specific quantitative measures of commercialization from the AUTM survey reports:

- Invention Disclosures Received
- Licenses and Options Executed
- U.S. Patents Issued
- License Income Received
- Start-Up Companies Formed,

all on a per annum basis. Commercialization productivity is calculated by dividing each of these measures by total research expenditures at the institution. The results for each measure are presented in order of descending productivity.

The field upon which the results are sorted and the results for the three BC institutions are highlighted on Page 1 of each Table. For comparison, the results for U.S. institutions are included on Page 2 of each Table (but are not re-sorted).

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

FY2003 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Guelph	\$ 76,247,150	155	2.033	41	0.538	\$ 576,803	\$ 7,565	5	0.066	0	0.000
2 University of Victoria	\$ 17,885,020	33	1.845	6	0.335	\$ 92,797	\$ 5,189	0	0.000	0	0.000
3 University of Calgary / UTI, Inc.	\$ 120,831,629	124	1.026	20	0.166	\$ 2,935,162	\$ 24,291	13	0.108	3	0.025
4 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
5 University of New Brunswick	\$ 22,042,227	15	0.681	8	0.363	\$ 80,478	\$ 3,651	1	0.045	1	0.045
6 University of Toronto*	\$ 219,401,967	138	0.629	40	0.182	\$ 2,109,400	\$ 9,614	3	0.014	7	0.032
7 Queen's University*	\$ 94,978,228	57	0.600	6	0.063	\$ 3,479,052	\$ 36,630	14	0.147	0	0.000
8 University of Manitoba	\$ 60,324,127	35	0.580	6	0.099	\$ 1,682,750	\$ 27,895	5	0.083	0	0.000
9 McMaster University*	\$ 86,290,242	47	0.545	48	0.556	\$ 633,198	\$ 7,338	3	0.035	0	0.000
10 University of British Columbia*	\$ 268,962,957	141	0.524	37	0.138	\$ 9,756,996	\$ 36,276	19	0.071	4	0.015
11 Memorial University	\$ 36,405,168	18	0.494	3	0.082	\$ 126,347	\$ 3,471	0	0.000	0	0.000
12 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
13 McGill University*	\$ 228,902,134	99	0.432	38	0.166	\$ 1,460,601	\$ 6,381	45	0.197	5	0.022
14 Université de Montréal*	\$ 223,144,484	80	0.359	29	0.130	\$ 604,474	\$ 2,709	11	0.049	3	0.013
15 University of Alberta*	\$ 186,048,255	61	0.328	18	0.097	\$ 1,068,384	\$ 5,743	11	0.059	4	0.021
16 University of Western Ontario*	\$ 100,435,434	29	0.289	18	0.179	\$ 281,514	\$ 2,803	4	0.040	0	0.000
17 Université Laval*	\$ 126,129,631	34	0.270	10	0.079	\$ 127,752	\$ 1,013	8	0.063	3	0.024
18 Université de Sherbrooke	\$ 58,079,340	14	0.241	23	0.396	\$ 10,182,867	\$ 175,327	1	0.017	1	0.017
19 University of Ottawa	\$ 72,810,336	15	0.206	6	0.082	\$ 42,608	\$ 585	4	0.055	1	0.014
20 Dalhousie University	\$ 53,679,777	8	0.149	2	0.037	\$ 17,667	\$ 329	7	0.130	0	0.000
21 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
A Can. Totals & Cumulative: Top 21	\$ 2,240,719,179	1,178	0.526	401	0.179	\$ 36,864,815	\$ 16,452	166	0.074	52	0.023
B Can. Average: Top 21	\$ 106,700,913	56.1	0.602	19.1	0.202	\$ 1,755,467	\$ 18,009	7.9	0.068	2.5	0.028
C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 998,144,046	771	0.772	213	0.213	\$ 21,407,872	\$ 21,448	67	0.067	19	0.019
F Can. Totals & Cumulative: Last 11	\$ 1,242,575,133	407	0.328	188	0.151	\$ 15,456,943	\$ 12,439	99	0.080	33	0.027

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 2 of 2

FY2003 AUTM Survey Results for Responding U.S. Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

U.S. University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of California System	\$ 2,623,300,000	1,027	0.391	208	0.079	\$ 67,019,000	\$ 25,548	323	0.123	22	0.008
2 Johns Hopkins University	\$ 1,461,554,527	330	0.226	159	0.109	\$ 6,712,152	\$ 4,592	95	0.065	5	0.003
3 Massachusetts Inst. of Technology	\$ 994,354,000	452	0.455	114	0.115	\$ 26,824,897	\$ 26,977	152	0.153	15	0.015
4 University of Illinois	\$ 785,088,000	229	0.292	86	0.110	\$ 7,700,876	\$ 9,809	39	0.050	6	0.008
5 University of Washington	\$ 784,411,974	199	0.254	67	0.085	\$ 29,282,203	\$ 37,330	46	0.059	3	0.004
6 University of Michigan	\$ 749,344,497	257	0.343	76	0.101	\$ 9,100,000	\$ 12,144	64	0.085	9	0.012
7 University. of Wisconsin-Madison	\$ 721,248,000	406	0.563	177	0.245	\$ 37,765,393	\$ 52,361	87	0.121	0	0.000
8 University of Pennsylvania	\$ 649,700,000	321	0.494	83	0.128	\$ 11,653,155	\$ 17,936	50	0.077	12	0.018
9 Stanford University	\$ 639,895,454	362	0.566	128	0.200	\$ 45,383,189	\$ 70,923	117	0.183	12	0.019
10 SUNY System	\$ 629,261,894	235	0.373	34	0.054	\$ 13,726,454	\$ 21,814	51	0.081	4	0.006
11 Penn State University	\$ 545,031,000	156	0.286	20	0.037	\$ 1,643,635	\$ 3,016	58	0.106	2	0.004
12 Harvard University	\$ 538,946,600	119	0.221	69	0.128	\$ 24,282,171	\$ 45,055	59	0.109	4	0.007
13 University of Colorado	\$ 531,800,000	124	0.233	34	0.064	\$ 3,083,185	\$ 5,798	23	0.043	6	0.011
14 University of Pittsburgh	\$ 513,064,000	74	0.144	44	0.086	\$ 3,006,015	\$ 5,859	22	0.043	8	0.016
15 University of Minnesota	\$ 508,557,000	218	0.429	56	0.110	\$ 38,083,275	\$ 74,885	54	0.106	4	0.008
16 Cornell University	\$ 504,600,000	186	0.369	50	0.099	\$ 3,293,000	\$ 6,526	53	0.105	13	0.026
17 Duke University	\$ 474,953,669	125	0.263	39	0.082	\$ 2,793,574	\$ 5,882	50	0.105	1	0.002
18 Washington University St. Louis	\$ 474,328,000	91	0.192	41	0.086	\$ 12,815,429	\$ 27,018	54	0.114	3	0.006
19 Texas A&M University System	\$ 456,235,000	117	0.256	81	0.178	\$ 7,311,571	\$ 16,026	27	0.059	5	0.011
20 University of Arizona	\$ 454,941,000	111	0.244	23	0.051	\$ 1,076,870	\$ 2,367	12	0.026	2	0.004
21 Ohio State University	\$ 416,000,000	130	0.313	42	0.101	\$ 565,877	\$ 1,360	21	0.050	4	0.010
I U.S. Totals & Cumulative: Top 21	\$ 15,456,614,615	5,269	<i>0.341</i>	1,631	<i>0.106</i>	\$ 353,121,921	\$ 22,846	1,457	<i>0.094</i>	140	<i>0.009</i>
J U.S. Average: Top 21	\$ 736,029,267	250.9	0.329	77.7	0.107	\$ 16,815,330	\$ 22,535	69.4	0.089	6.7	0.009
K U.S. Median: Top 21	\$ 545,031,000	199	0.292	67	0.101	\$ 9,100,000	\$ 16,026	53	0.085	5	0.008
L U.S. Standard Deviation: Top 21	\$ 492,775,654	208.1	0.119	52.1	0.050	\$ 17,926,195	\$ 22,057	67.0	0.039	5.4	0.006
M U.S. Totals & Cumulative: Top 21 adjusted for indirect costs @52.3%	\$ 10,089,174,031	5,269	<i>0.522</i>	1,631	<i>0.162</i>	\$ 353,121,921	\$ 35,000	1,457	<i>0.144</i>	140	<i>0.014</i>
FY2003 AUTM Survey Results for <u>All</u> Responding U.S. Institutions (N = 181)											
N U.S. Totals & Cumulative: N=181	\$ 37,175,077,087	14,431	<i>0.388</i>	4,132	<i>0.111</i>	\$ 1,133,105,742	\$ 30,480	3,673	<i>0.099</i>	348	<i>0.009</i>
O U.S. Totals & Cumulative: N=181 adjusted for indirect costs @52.3%	\$ 24,265,716,114	14,431	<i>0.595</i>	4,132	<i>0.170</i>	\$ 1,133,105,742	\$ 46,696	3,673	<i>0.151</i>	348	<i>0.014</i>

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

FY2003 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 McMaster University*	\$ 86,290,242	47	0.545	48	0.556	\$ 633,198	\$ 7,338	3	0.035	0	0.000
2 University of Guelph	\$ 76,247,150	155	2.033	41	0.538	\$ 576,803	\$ 7,565	5	0.066	0	0.000
3 Université de Sherbrooke	\$ 58,079,340	14	0.241	23	0.396	\$ 10,182,867	\$ 175,327	1	0.017	1	0.017
4 University of New Brunswick	\$ 22,042,227	15	0.681	8	0.363	\$ 80,478	\$ 3,651	1	0.045	1	0.045
5 University of Victoria	\$ 17,885,020	33	1.845	6	0.335	\$ 92,797	\$ 5,189	0	0.000	0	0.000
6 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
7 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
8 University of Toronto*	\$ 219,401,967	138	0.629	40	0.182	\$ 2,109,400	\$ 9,614	3	0.014	7	0.032
9 University of Western Ontario*	\$ 100,435,434	29	0.289	18	0.179	\$ 281,514	\$ 2,803	4	0.040	0	0.000
10 McGill University*	\$ 228,902,134	99	0.432	38	0.166	\$ 1,460,601	\$ 6,381	45	0.197	5	0.022
11 University of Calgary / UTI, Inc.	\$ 120,831,629	124	1.026	20	0.166	\$ 2,935,162	\$ 24,291	13	0.108	3	0.025
12 University of British Columbia*	\$ 268,962,957	141	0.524	37	0.138	\$ 9,756,996	\$ 36,276	19	0.071	4	0.015
13 Université de Montréal*	\$ 223,144,484	80	0.359	29	0.130	\$ 604,474	\$ 2,709	11	0.049	3	0.013
14 University of Manitoba	\$ 60,324,127	35	0.580	6	0.099	\$ 1,682,750	\$ 27,895	5	0.083	0	0.000
15 University of Alberta*	\$ 186,048,255	61	0.328	18	0.097	\$ 1,068,384	\$ 5,743	11	0.059	4	0.021
16 Memorial University	\$ 36,405,168	18	0.494	3	0.082	\$ 126,347	\$ 3,471	0	0.000	0	0.000
17 University of Ottawa	\$ 72,810,336	15	0.206	6	0.082	\$ 42,608	\$ 585	4	0.055	1	0.014
18 Université Laval*	\$ 126,129,631	34	0.270	10	0.079	\$ 127,752	\$ 1,013	8	0.063	3	0.024
19 Queen's University*	\$ 94,978,228	57	0.600	6	0.063	\$ 3,479,052	\$ 36,630	14	0.147	0	0.000
20 Dalhousie University	\$ 53,679,777	8	0.149	2	0.037	\$ 17,667	\$ 329	7	0.130	0	0.000
21 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
A Can. Totals & Cumulative: Top 21	\$ 2,240,719,179	1,178	<i>0.526</i>	401	<i>0.179</i>	\$ 36,864,815	<i>\$ 16,452</i>	166	<i>0.074</i>	52	<i>0.023</i>
B Can. Average: Top 21	\$ 106,700,913	56.1	0.602	19.1	0.202	\$ 1,755,467	\$ 18,009	7.9	0.068	2.5	0.028
C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 966,224,089	579	<i>0.599</i>	263	<i>0.272</i>	\$ 16,962,388	<i>\$ 17,555</i>	70	<i>0.072</i>	30	<i>0.031</i>
F Can. Totals & Cumulative: Last 11	\$ 1,274,495,090	599	<i>0.470</i>	138	<i>0.108</i>	\$ 19,902,427	<i>\$ 15,616</i>	96	<i>0.075</i>	22	<i>0.017</i>

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

FY2003 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University	Total Sponsored Research Expenditures	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	License & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 Université de Sherbrooke	\$ 58,079,340	14	0.241	23	0.396	\$ 10,182,867	\$ 175,327	1	0.017	1	0.017
2 Queen's University*	\$ 94,978,228	57	0.600	6	0.063	\$ 3,479,052	\$ 36,630	14	0.147	0	0.000
3 University of British Columbia*	\$ 268,962,957	141	0.524	37	0.138	\$ 9,756,996	\$ 36,276	19	0.071	4	0.015
4 University of Manitoba	\$ 60,324,127	35	0.580	6	0.099	\$ 1,682,750	\$ 27,895	5	0.083	0	0.000
5 University of Calgary / UTI, Inc.	\$ 120,831,629	124	1.026	20	0.166	\$ 2,935,162	\$ 24,291	13	0.108	3	0.025
6 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
7 University of Toronto*	\$ 219,401,967	138	0.629	40	0.182	\$ 2,109,400	\$ 9,614	3	0.014	7	0.032
8 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
9 University of Guelph	\$ 76,247,150	155	2.033	41	0.538	\$ 576,803	\$ 7,565	5	0.066	0	0.000
10 McMaster University*	\$ 86,290,242	47	0.545	48	0.556	\$ 633,198	\$ 7,338	3	0.035	0	0.000
11 McGill University*	\$ 228,902,134	99	0.432	38	0.166	\$ 1,460,601	\$ 6,381	45	0.197	5	0.022
12 University of Alberta*	\$ 186,048,255	61	0.328	18	0.097	\$ 1,068,384	\$ 5,743	11	0.059	4	0.021
13 University of Victoria	\$ 17,885,020	33	1.845	6	0.335	\$ 92,797	\$ 5,189	0	0.000	0	0.000
14 University of New Brunswick	\$ 22,042,227	15	0.681	8	0.363	\$ 80,478	\$ 3,651	1	0.045	1	0.045
15 Memorial University	\$ 36,405,168	18	0.494	3	0.082	\$ 126,347	\$ 3,471	0	0.000	0	0.000
16 University of Western Ontario*	\$ 100,435,434	29	0.289	18	0.179	\$ 281,514	\$ 2,803	4	0.040	0	0.000
17 Université de Montréal*	\$ 223,144,484	80	0.359	29	0.130	\$ 604,474	\$ 2,709	11	0.049	3	0.013
18 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
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A Can. Totals & Cumulative: Top 21	\$ 2,240,719,179	1,178	0.526	401	0.179	\$ 36,864,815	\$ 16,452	166	0.074	52	0.023
B Can. Average: Top 21	\$ 106,700,913	56.1	0.602	19.1	0.202	\$ 1,755,467	\$ 18,009	7.9	0.068	2.5	0.028
C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 1,142,056,215	760	0.665	262	0.229	\$ 32,900,958	\$ 28,809	71	0.062	31	0.027
F Can. Totals & Cumulative: Last 11	\$ 1,098,662,965	418	0.380	139	0.127	\$ 3,963,858	\$ 3,608	95	0.086	21	0.019

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

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2 Queen's University*	\$ 94,978,228	57	0.600	6	0.063	\$ 3,479,052	\$ 36,630	14	0.147	0	0.000
3 Dalhousie University	\$ 53,679,777	8	0.149	2	0.037	\$ 17,667	\$ 329	7	0.130	0	0.000
4 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
5 University of Calgary / UTI, Inc.	\$ 120,831,629	124	1.026	20	0.166	\$ 2,935,162	\$ 24,291	13	0.108	3	0.025
6 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
7 University of Manitoba	\$ 60,324,127	35	0.580	6	0.099	\$ 1,682,750	\$ 27,895	5	0.083	0	0.000
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11 University of Alberta*	\$ 186,048,255	61	0.328	18	0.097	\$ 1,068,384	\$ 5,743	11	0.059	4	0.021
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17 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
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A Can. Totals & Cumulative: Top 21	\$ 2,240,719,179	1,178	<i>0.526</i>	401	<i>0.179</i>	\$ 36,864,815	\$ <i>16,452</i>	166	<i>0.074</i>	52	<i>0.023</i>
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C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 1,128,764,150	688	<i>0.610</i>	176	<i>0.156</i>	\$ 20,688,139	\$ <i>18,328</i>	126	<i>0.112</i>	32	<i>0.028</i>
F Can. Totals & Cumulative: Last 11	\$ 1,111,955,029	490	<i>0.441</i>	225	<i>0.202</i>	\$ 16,176,676	\$ <i>14,548</i>	40	<i>0.036</i>	20	<i>0.018</i>

Technology Transfer at Canadian Universities: 2007 Update

Table 1 - Page 1 of 2

FY2003 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

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1 University of Waterloo*	\$ 67,528,018	9	0.133	15	0.222	\$ 590,121	\$ 8,739	6	0.089	13	0.193
2 Simon Fraser University	\$ 31,180,498	26	0.834	1	0.032	\$ 61,235	\$ 1,964	4	0.128	4	0.128
3 University of New Brunswick	\$ 22,042,227	15	0.681	8	0.363	\$ 80,478	\$ 3,651	1	0.045	1	0.045
4 University of Saskatchewan	\$ 89,412,556	40	0.447	26	0.291	\$ 954,608	\$ 10,676	2	0.022	3	0.034
5 University of Toronto*	\$ 219,401,967	138	0.629	40	0.182	\$ 2,109,400	\$ 9,614	3	0.014	7	0.032
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7 Université Laval*	\$ 126,129,631	34	0.270	10	0.079	\$ 127,752	\$ 1,013	8	0.063	3	0.024
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15 Dalhousie University	\$ 53,679,777	8	0.149	2	0.037	\$ 17,667	\$ 329	7	0.130	0	0.000
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B Can. Average: Top 21	\$ 106,700,913	56.1	0.602	19.1	0.202	\$ 1,755,467	\$ 18,009	7.9	0.068	2.5	0.028
C Can. Median: Top 21	\$ 86,290,242	35	0.494	18	0.166	\$ 604,474	\$ 6,381	5	0.059	1	0.015
D Can. Standard Deviation: Top 21	\$ 74,808,041	47.6	0.498	14.8	0.155	\$ 2,897,765	\$ 37,746	9.9	0.051	3.2	0.047
E Can. Totals & Cumulative: Top 10	\$ 1,149,556,255	560	0.487	199	0.173	\$ 19,570,610	\$ 17,024	94	0.082	44	0.038
F Can. Totals & Cumulative: Last 11	\$ 1,091,162,924	618	0.566	202	0.185	\$ 17,294,206	\$ 15,849	72	0.066	8	0.007

Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

FY2004 AUTM Survey Results for Responding Canadian Universities (Top 19)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Victoria	\$ 35,998,462	33	0.917	4	0.111	\$ 113,538	\$ 3,154	4	0.111	0	0.000
2 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
3 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
4 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
5 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
6 University of Calgary / UTI, Inc.	\$ 190,073,430	108	0.568	24	0.126	\$ 2,544,562	\$ 13,387	6	0.032	0	0.000
7 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
8 University of British Columbia*	\$ 268,904,440	145	0.539	53	0.197	\$ 10,565,156	\$ 39,290	18	0.067	2	0.007
9 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
10 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
11 University of Saskatchewan	\$ 93,842,243	43	0.458	20	0.213	\$ 906,317	\$ 9,658	4	0.043	3	0.032
12 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
13 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
14 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
15 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
16 Université de Sherbrooke	\$ 72,548,815	18	0.248	23	0.317	\$ 8,232,337	\$ 113,473	3	0.041	2	0.028
17 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
18 Université de Montréal*	\$ 379,886,279	70	0.184	68	0.179	\$ 1,326,870	\$ 3,493	4	0.011	2	0.005
19 University of Waterloo*	\$ 75,236,154	11	0.146	37	0.492	\$ 623,782	\$ 8,291	0	0.000	7	0.093
A Can. Totals & Cumulative: Top 19	\$ 2,772,835,637	1,168	0.421	502	0.181	\$ 37,936,292	\$ 13,681	137	0.049	41	0.015
B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 1,213,053,392	706	0.582	248	0.204	\$ 23,600,265	\$ 19,455	60	0.049	18	0.015
F Can. Totals & Cumulative: Last 9	\$ 1,559,782,245	462	0.296	254	0.163	\$ 14,336,028	\$ 9,191	77	0.049	23	0.015

*"G-10" Institution

**Dalhousie and Memorial did not provide data for publication in 2004

*** \$CDN = 1.30*\$US

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Table 2 - Page 2 of 2

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1 University of California System	\$ 2,623,300,000	1027	0.391	208	0.079	\$ 67,019,000	\$ 25,548	323	0.123	22	0.008
2 Johns Hopkins University	\$ 1,461,554,527	330	0.226	159	0.109	\$ 6,712,152	\$ 4,592	95	0.065	5	0.003
3 Massachusetts Inst. of Technology	\$ 994,354,000	452	0.455	114	0.115	\$ 26,824,897	\$ 26,977	152	0.153	15	0.015
4 University of Washington	\$ 784,411,974	199	0.254	67	0.085	\$ 29,282,203	\$ 37,330	46	0.059	3	0.004
5 University of Illinois	\$ 785,088,000	229	0.292	86	0.110	\$ 7,700,876	\$ 9,809	39	0.050	6	0.008
6 University of Wisconsin-Madison	\$ 721,248,000	406	0.563	177	0.245	\$ 37,765,393	\$ 52,361	87	0.121	0	0.000
7 University of Michigan	\$ 749,344,497	257	0.343	76	0.101	\$ 9,100,000	\$ 12,144	64	0.085	9	0.012
8 SUNY System	\$ 710,175,177	257	0.362	50	0.070	\$ 13,363,714	\$ 18,817	43	0.061	7	0.010
9 Stanford University	\$ 693,529,925	350	0.505	89	0.128	\$ 47,272,397	\$ 68,162	87	0.125	9	0.013
10 University of Pennsylvania	\$ 654,457,805	392	0.599	87	0.133	\$ 8,653,042	\$ 13,222	45	0.069	6	0.009
11 Penn State University	\$ 606,521,000	167	0.275	23	0.038	\$ 1,916,613	\$ 3,160	46	0.076	4	0.007
12 Harvard University	\$ 590,592,500	160	0.271	50	0.085	\$ 16,654,975	\$ 28,200	35	0.059	4	0.007
13 University of Colorado	\$ 571,342,900	147	0.257	41	0.072	\$ 34,128,958	\$ 59,735	18	0.032	9	0.016
14 University of Pittsburgh	\$ 558,878,000	140	0.251	53	0.095	\$ 3,805,082	\$ 6,808	39	0.070	10	0.018
15 Cornell University	\$ 537,700,000	225	0.418	80	0.149	\$ 7,233,500	\$ 13,453	53	0.099	6	0.011
16 University of Minnesota	\$ 515,061,000	224	0.435	100	0.194	\$ 45,550,764	\$ 88,438	38	0.074	3	0.006
17 Duke University	\$ 492,040,666	127	0.258	51	0.104	\$ 3,794,523	\$ 7,712	32	0.065	10	0.020
18 University of Arizona	\$ 478,680,000	94	0.196	24	0.050	\$ 962,762	\$ 2,011	18	0.038	4	0.008
19 Ohio State University	\$ 447,000,000	161	0.360	30	0.067	\$ 629,033	\$ 1,407	26	0.058	6	0.013
I U.S. Totals & Cumulative: Top 19	\$ 14,975,279,971	5,344	<i>0.357</i>	1,565	<i>0.105</i>	\$ 368,369,884	\$ 24,599	1,286	<i>0.086</i>	138	<i>0.009</i>
J U.S. Average: Top 19	\$ 788,172,630	281.3	0.353	82.4	0.107	\$ 19,387,889	\$ 25,257	67.7	0.078	7.3	0.010
K U.S. Median: Top 19	\$ 654,457,805	225	0.343	76	0.101	\$ 9,100,000	\$ 13,453	45	0.069	6	0.009
L U.S. Standard Deviation: Top 19	\$ 500,633,408	207.7	0.117	51.4	0.049	\$ 19,194,085	\$ 25,080	69.8	0.032	4.9	0.005
M U.S. Totals & Cumulative: Top 19 adjusted for indirect costs @52.3%	\$ 9,774,986,926	5,344	<i>0.547</i>	1,565	<i>0.160</i>	\$ 368,369,884	\$ 37,685	1,286	<i>0.132</i>	138	<i>0.014</i>
FY2004 AUTM Survey Results for <u>All</u> Responding U.S. Universities (N = 164)											
N U.S. Totals & Cumulative: N=164	\$ 37,162,153,394	15,002	<i>0.404</i>	4,087	<i>0.110</i>	\$ 1,034,055,106	\$ 27,825	3,268	<i>0.088</i>	425	<i>0.011</i>
O U.S. Totals & Cumulative: N=164 adjusted for indirect costs @52.3%	\$ 24,257,280,283	15,002	<i>0.618</i>	4,087	<i>0.168</i>	\$ 1,034,055,106	\$ 42,629	3,268	<i>0.135</i>	425	<i>0.018</i>

Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

FY2004 AUTM Survey Results for Responding Canadian Universities (Top 19)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
2 University of Waterloo*	\$ 75,236,154	11	0.146	37	0.492	\$ 623,782	\$ 8,291	0	0.000	7	0.093
3 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
4 Université de Sherbrooke	\$ 72,548,815	18	0.248	23	0.317	\$ 8,232,337	\$ 113,473	3	0.041	2	0.028
5 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
6 University of Saskatchewan	\$ 93,842,243	43	0.458	20	0.213	\$ 906,317	\$ 9,658	4	0.043	3	0.032
7 University of British Columbia*	\$ 268,904,440	145	0.539	53	0.197	\$ 10,565,156	\$ 39,290	18	0.067	2	0.007
8 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
9 Université de Montréal*	\$ 379,886,279	70	0.184	68	0.179	\$ 1,326,870	\$ 3,493	4	0.011	2	0.005
10 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
11 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
12 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
13 University of Calgary / UTI, Inc.	\$ 190,073,430	108	0.568	24	0.126	\$ 2,544,562	\$ 13,387	6	0.032	0	0.000
14 University of Victoria	\$ 35,998,462	33	0.917	4	0.111	\$ 113,538	\$ 3,154	4	0.111	0	0.000
15 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
16 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
17 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
18 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
19 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
A Can. Totals & Cumulative: Top 19	\$ 2,772,835,637	1,168	<i>0.421</i>	502	<i>0.181</i>	\$ 37,936,292	\$ <i>13,681</i>	137	<i>0.049</i>	41	<i>0.015</i>
B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 1,507,235,531	565	<i>0.375</i>	380	<i>0.252</i>	\$ 25,240,633	\$ <i>16,746</i>	78	<i>0.052</i>	23	<i>0.015</i>
F Can. Totals & Cumulative: Last 9	\$ 1,265,600,106	603	<i>0.476</i>	122	<i>0.096</i>	\$ 12,695,659	\$ <i>10,031</i>	59	<i>0.047</i>	18	<i>0.014</i>

*"G-10" Institution

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*** \$CDN = 1.30*\$US

Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

FY2004 AUTM Survey Results for Responding Canadian Universities (Top 19)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures per \$1M	License & Options Executed	License & Options per \$1M	License Income Received	License Income per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 Université de Sherbrooke	\$ 72,548,815	18	0.248	23	0.317	\$ 8,232,337	\$ 113,473	3	0.041	2	0.028
2 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
3 University of British Columbia*	\$ 268,904,440	145	0.539	53	0.197	\$ 10,565,156	\$ 39,290	18	0.067	2	0.007
4 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
5 University of Calgary / UTI, Inc.	\$ 190,073,430	108	0.568	24	0.126	\$ 2,544,562	\$ 13,387	6	0.032	0	0.000
6 University of Saskatchewan	\$ 93,842,243	43	0.458	20	0.213	\$ 906,317	\$ 9,658	4	0.043	3	0.032
7 University of Waterloo*	\$ 75,236,154	11	0.146	37	0.492	\$ 623,782	\$ 8,291	0	0.000	7	0.093
8 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
9 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
10 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
11 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
12 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
13 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
14 Université de Montréal*	\$ 379,886,279	70	0.184	68	0.179	\$ 1,326,870	\$ 3,493	4	0.011	2	0.005
15 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
16 University of Victoria	\$ 35,998,462	33	0.917	4	0.111	\$ 113,538	\$ 3,154	4	0.111	0	0.000
17 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
18 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
19 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
A Can. Totals & Cumulative: Top 19	\$ 2,772,835,637	1,168	0.421	502	0.181	\$ 37,936,292	\$ 13,681	137	0.049	41	0.015
B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 1,290,153,668	674	0.522	280	0.217	\$ 32,491,508	\$ 25,184	56	0.043	26	0.020
F Can. Totals & Cumulative: Last 9	\$ 1,482,681,969	494	0.333	222	0.150	\$ 5,444,785	\$ 3,672	81	0.055	15	0.010

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Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

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Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Victoria	\$ 35,998,462	33	0.917	4	0.111	\$ 113,538	\$ 3,154	4	0.111	0	0.000
2 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
3 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
4 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
5 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
6 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
7 University of British Columbia*	\$ 268,904,440	145	0.539	53	0.197	\$ 10,565,156	\$ 39,290	18	0.067	2	0.007
8 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
9 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
10 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
11 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
12 University of Saskatchewan	\$ 93,842,243	43	0.458	20	0.213	\$ 906,317	\$ 9,658	4	0.043	3	0.032
13 Université de Sherbrooke	\$ 72,548,815	18	0.248	23	0.317	\$ 8,232,337	\$ 113,473	3	0.041	2	0.028
14 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
15 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
16 University of Calgary / UTI, Inc.	\$ 190,073,430	108	0.568	24	0.126	\$ 2,544,562	\$ 13,387	6	0.032	0	0.000
17 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
18 Université de Montréal*	\$ 379,886,279	70	0.184	68	0.179	\$ 1,326,870	\$ 3,493	4	0.011	2	0.005
19 University of Waterloo*	\$ 75,236,154	11	0.146	37	0.492	\$ 623,782	\$ 8,291	0	0.000	7	0.093
A Can. Totals & Cumulative: Top 19	\$ 2,772,835,637	1,168	<i>0.421</i>	502	<i>0.181</i>	\$ 37,936,292	\$ <i>13,681</i>	137	<i>0.049</i>	41	<i>0.015</i>
B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 1,413,712,281	632	<i>0.447</i>	241	<i>0.170</i>	\$ 21,016,612	\$ <i>14,866</i>	106	<i>0.075</i>	21	<i>0.015</i>
F Can. Totals & Cumulative: Last 9	\$ 1,359,123,356	536	<i>0.394</i>	261	<i>0.192</i>	\$ 16,919,681	\$ <i>12,449</i>	31	<i>0.023</i>	20	<i>0.015</i>

*"G-10" Institution

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Technology Transfer at Canadian Universities: 2007 Update

Table 2 - Page 1 of 2

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2 Simon Fraser University	\$ 35,995,589	27	0.750	5	0.139	\$ 116,984	\$ 3,250	3	0.083	3	0.083
3 Queen's University*	\$ 113,436,154	61	0.538	8	0.071	\$ 4,744,421	\$ 41,825	7	0.062	6	0.053
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6 University of Toronto*	\$ 281,925,758	164	0.582	38	0.135	\$ 2,251,502	\$ 7,986	4	0.014	5	0.018
7 McGill University*	\$ 286,487,692	103	0.360	40	0.140	\$ 1,159,268	\$ 4,046	30	0.105	5	0.017
8 University of Manitoba	\$ 70,774,267	40	0.565	7	0.099	\$ 1,674,913	\$ 23,666	6	0.085	1	0.014
9 University of Alberta*	\$ 268,965,385	65	0.242	16	0.059	\$ 838,821	\$ 3,119	13	0.048	3	0.011
10 University of Guelph	\$ 92,532,885	44	0.476	39	0.421	\$ 640,671	\$ 6,924	4	0.043	1	0.011
11 University of Western Ontario*	\$ 114,384,615	47	0.411	30	0.262	\$ 837,715	\$ 7,324	7	0.061	1	0.009
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15 Université Laval*	\$ 122,123,369	44	0.360	13	0.106	\$ 215,028	\$ 1,761	11	0.090	0	0.000
16 McMaster University*	\$ 96,642,308	67	0.693	65	0.673	\$ 750,768	\$ 7,769	7	0.072	0	0.000
17 University of New Brunswick	\$ 26,770,099	17	0.635	5	0.187	\$ 197,749	\$ 7,387	1	0.037	0	0.000
18 University of Ottawa	\$ 146,307,692	61	0.417	7	0.048	\$ 195,890	\$ 1,339	5	0.034	0	0.000
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B Can. Average: Top 19	\$ 145,938,718	61.5	0.478	26.4	0.209	\$ 1,996,647	\$ 16,165	7.2	0.055	2.2	0.020
C Can. Median: Top 19	\$ 113,436,154	47	0.476	23	0.140	\$ 838,821	\$ 7,387	5	0.048	2	0.011
D Can. Standard Deviation: Top 19	\$ 102,796,411	41.9	0.199	20.3	0.163	\$ 2,861,160	\$ 26,299	6.9	0.031	2.2	0.028
E Can. Totals & Cumulative: Top 10	\$ 1,391,744,942	576	<i>0.414</i>	233	<i>0.167</i>	\$ 21,189,015	\$ <i>15,225</i>	74	<i>0.053</i>	36	<i>0.026</i>
F Can. Totals & Cumulative: Last 9	\$ 1,381,090,695	592	<i>0.429</i>	269	<i>0.195</i>	\$ 16,747,277	\$ <i>12,126</i>	63	<i>0.046</i>	5	<i>0.004</i>

*"G-10" Institution

**Dalhousie and Memorial did not provide data for publication in 2004

*** \$CDN = 1.30*\$US

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received***	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.075	2	0.050
2 University of Guelph	\$ 103,328,886	106	1.026	40	0.387	\$ 1,114,285	\$ 10,784	7	0.175	0	0.000
3 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.301	0	0.000
4 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.251	1	0.025
5 University of Toronto*	\$ 321,035,738	224	0.698	34	0.106	\$ 1,413,729	\$ 4,404	8	0.201	3	0.075
6 University of New Brunswick	\$ 27,694,642	16	0.578	3	0.108	\$ 43,762	\$ 1,580	2	0.050	2	0.050
7 University of Manitoba	\$ 81,701,633	46	0.563	5	0.061	\$ 1,397,147	\$ 17,101	8	0.201	0	0.000
8 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.251	0	0.000
9 University of Western Ontario*	\$ 168,954,530	81	0.479	35	0.207	\$ 3,635,863	\$ 21,520	8	0.201	5	0.125
10 University of British Columbia*	\$ 303,335,806	143	0.471	50	0.165	\$ 13,321,844	\$ 43,918	25	0.627	2	0.050
11 Queen's University*	\$ 113,710,000	52	0.457	10	0.088	\$ 745,637	\$ 6,557	8	0.201	3	0.075
12 Université de Sherbrooke	\$ 79,189,178	24	0.303	31	0.391	\$ 9,726,183	\$ 122,822	3	0.075	0	0.000
13 York University	\$ 40,666,667	12	0.295	6	0.148	\$ -	\$ -	0	0.000	0	0.000
14 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.251	1	0.025
15 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.075	0	0.000
16 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.075	1	0.025
17 Dalhousie University	\$ 77,080,833	16	0.208	1	0.013	\$ 123,716	\$ 1,605	1	0.025	0	0.000
18 McMaster University*	\$ 240,490,833	46	0.191	192	0.798	\$ 1,272,778	\$ 5,292	2	0.050	2	0.050
19 University of Alberta*	\$ 323,349,167	59	0.182	13	0.326	\$ 877,931	\$ 2,715	10	0.251	2	0.050
20 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.025	0	0.000
21 University of Waterloo*	\$ 87,293,333	8	0.092	34	0.389	\$ 648,308	\$ 7,427	0	0.000	2	0.050
A Can. Totals & Cumulative: Top 21	\$ 3,171,794,632	1,339	0.422	544	0.172	\$ 40,267,813	\$ 12,696	134	0.042	26	0.008
B Can. Average: Top 21	\$ 151,037,840	63.8	0.399	25.9	0.176	\$ 1,917,515	\$ 14,180	6.4	0.164	1.2	0.032
C Can. Median: Top 21	\$ 103,328,886	52	0.303	13	0.106	\$ 877,931	\$ 5,292	7	0.201	1	0.025
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.226	41.0	0.194	\$ 3,373,474	\$ 28,287	5.8	0.151	1.4	0.035
E Can. Totals & Cumulative: Top 10	\$ 1,423,609,281	923	0.648	211	0.148	\$ 25,132,858	\$ 17,654	93	0.065	15	0.011
F Can. Totals & Cumulative: Last 11	\$ 1,748,185,351	416	0.238	333	0.190	\$ 15,134,956	\$ 8,658	41	0.023	11	0.006

**U Montréal did not provide data in 2005

*** \$US = 1.20*\$Cdn

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 2 of 2

FY2005 AUTM Survey Results for Responding U.S. Universities (Top 21) Dummy data where AUTM data are missing

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

U.S. University	Total Sponsored Research Expenditures	Invention Disclosures Received dummy	Invention Disclosures Received per \$1M dummy	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of California System	\$ 2,916,534,000	1	0.000	265	0.091	\$ 92,902,000	\$ 31,854	310	0.106	19	0.007
2 Johns Hopkins University	\$ 1,674,228,321	1	0.001	94	0.056	\$ 12,369,870	\$ 7,388	81	0.048	5	0.003
3 Massachusetts Inst. of Technology	\$ 1,133,000,000	1	0.001	93	0.082	\$ 39,824,482	\$ 35,150	133	0.117	20	0.018
4 University of Washington	\$ 895,349,071	1	0.001	109	0.122	\$ 29,317,473	\$ 32,744	40	0.045	4	0.004
5 University of Illinois	\$ 817,990,000	1	0.001	63	0.077	\$ 7,115,689	\$ 8,699	65	0.079	7	0.009
6 University. of Wisconsin-Madison	\$ 798,099,000	1	0.001	216	0.271	\$ 49,052,238	\$ 61,461	89	0.112	4	0.005
7 University of Michigan	\$ 778,061,728	1	0.001	86	0.111	\$ 16,721,791	\$ 21,492	80	0.103	7	0.009
8 SUNY System	\$ 735,792,126	1	0.001	84	0.114	\$ 13,592,373	\$ 18,473	35	0.048	6	0.008
9 University of Pennsylvania	\$ 672,736,678	1	0.001	83	0.123	\$ 7,495,118	\$ 11,141	37	0.055	9	0.013
10 Penn State University	\$ 637,911,000	1	0.002	21	0.033	\$ 2,266,479	\$ 3,553	37	0.058	3	0.005
11 Harvard University	\$ 623,339,500	1	0.002	58	0.093	\$ 27,987,375	\$ 44,899	44	0.071	7	0.011
12 University of Pittsburgh	\$ 602,664,000	1	0.002	58	0.096	\$ 4,246,193	\$ 7,046	20	0.033	8	0.013
13 Cornell University	\$ 561,320,000	1	0.002	79	0.141	\$ 3,952,000	\$ 7,041	51	0.091	5	0.009
14 University of Minnesota	\$ 548,873,000	1	0.002	82	0.149	\$ 47,051,520	\$ 85,724	51	0.093	1	0.002
15 University of Arizona	\$ 530,233,000	1	0.002	28	0.053	\$ 1,175,915	\$ 2,218	10	0.019	5	0.009
16 Ohio State University	\$ 511,500,000	1	0.002	19	0.037	\$ 696,000	\$ 1,361	38	0.074	2	0.004
17 Duke University	\$ 510,372,000	1	0.002	28	0.055	\$ 3,712,252	\$ 7,274	25	0.049	3	0.006
18 University of Colorado	\$ 497,762,300	1	0.002	60	0.121	\$ 27,352,470	\$ 54,951	13	0.026	9	0.018
19 University of Florida	\$ 478,000,000	1	0.002	66	0.138	\$ 40,300,000	\$ 84,310	54	0.113	13	0.027
20 University of Southern California	\$ 431,800,000	1	0.002	65	0.151	\$ 2,891,273	\$ 6,696	35	0.081	7	0.016
21 Georgia Institute of Technology	\$ 420,317,170	1	0.002	37	0.088	\$ 4,478,516	\$ 10,655	43	0.102	9	0.021
I U.S. Totals & Cumulative: Top 21	\$ 16,775,882,894	21	<i>0.001</i>	1,694	<i>0.101</i>	\$ 434,501,027	\$ 25,900	1,291	<i>0.077</i>	153	<i>0.009</i>
J U.S. Average: Top 21	\$ 798,851,566	1.0	0.002	80.7	0.105	\$ 20,690,525	\$ 25,911	61.5	0.073	7.3	0.010
K U.S. Median: Top 21	\$ 623,339,500	1	0.002	66	0.096	\$ 12,369,870	\$ 11,141	43	0.074	7	0.009
L U.S. Standard Deviation: Top 21	\$ 561,968,869	0.0	0.001	59.4	0.052	\$ 23,096,302	\$ 26,344	63.6	0.031	4.9	0.007
M U.S. Totals & Cumulative: Top 21 adjusted for indirect costs @52.3%	\$ 10,950,315,205	21	<i>0.002</i>	1,694	<i>0.155</i>	\$ 434,501,027	\$ 39,679	1,291	<i>0.118</i>	153	<i>0.014</i>
FY2005 AUTM Survey Results for All Responding U.S. Institutions (N = 191)											
N U.S. Totals & Cumulative: N=191	\$ 42,300,000,000	17,382	<i>0.411</i>	4,932	<i>0.117</i>	\$ 1	\$ 0	3,278	<i>0.077</i>	1	<i>0.000</i>
O U.S. Totals & Cumulative: N=191 adjusted for indirect costs @52.3%	\$ 27,610,966,057	17,382	<i>0.630</i>	4,932	<i>0.179</i>	\$ 1	\$ 0	3,278	<i>0.119</i>	1	<i>0.000</i>

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received***	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 McMaster University*	\$ 240,490,833	46	0.191	192	0.798	\$ 1,272,778	\$ 5,292	2	0.008	2	0.008
2 Université de Sherbrooke	\$ 79,189,178	24	0.303	31	0.391	\$ 9,726,183	\$ 122,822	3	0.012	0	0.000
3 University of Waterloo*	\$ 87,293,333	8	0.092	34	0.389	\$ 648,308	\$ 7,427	0	0.000	2	0.008
4 University of Guelph	\$ 103,328,886	106	1.026	40	0.387	\$ 1,114,285	\$ 10,784	7	0.029	0	0.000
5 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.050	0	0.000
6 University of Western Ontario*	\$ 168,954,530	81	0.479	35	0.207	\$ 3,635,863	\$ 21,520	8	0.033	5	0.021
7 University of Alberta*	\$ 323,349,167	59	0.182	13	0.054	\$ 877,931	\$ 2,715	10	0.042	2	0.008
8 University of British Columbia*	\$ 303,335,806	143	0.471	50	0.165	\$ 13,321,844	\$ 43,918	25	0.104	2	0.008
9 York University	\$ 40,666,667	12	0.295	6	0.148	\$ -	\$ -	0	0.000	0	0.000
10 University of New Brunswick	\$ 27,694,642	16	0.578	3	0.108	\$ 43,762	\$ 1,580	2	0.008	2	0.008
11 University of Toronto*	\$ 321,035,738	224	0.698	34	0.106	\$ 1,413,729	\$ 4,404	8	0.033	3	0.012
12 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.042	1	0.004
13 Queen's University*	\$ 113,710,000	52	0.457	10	0.088	\$ 745,637	\$ 6,557	8	0.033	3	0.012
14 University of Manitoba	\$ 81,701,633	46	0.563	5	0.061	\$ 1,397,147	\$ 17,101	8	0.033	0	0.000
15 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.042	0	0.000
16 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.012	2	0.008
17 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.012	0	0.000
18 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.042	1	0.004
19 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.012	1	0.004
20 Dalhousie University	\$ 77,080,833	16	0.208	1	0.013	\$ 123,716	\$ 1,605	1	0.004	0	0.000
21 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.004	0	0.000
A Can. Totals & Cumulative: Top 21	\$ 3,171,794,632	1,339	0.422	544	0.172	\$ 40,267,813	\$ 12,696	134	0.042	26	0.008
B Can. Average: Top 21	\$ 151,037,840	63.8	0.511	25.9	0.122	\$ 1,917,515	\$ 8,200	6.4	0.028	1.2	0.005
C Can. Median: Top 21	\$ 103,328,886	52	0.471	13	0.088	\$ 877,931	\$ 4,404	7	0.033	1	0.004
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.370	41.0	0.115	\$ 3,373,474	\$ 10,440	5.8	0.025	1.4	0.006
E Can. Totals & Cumulative: Top 10	\$ 1,473,030,619	578	0.392	430	0.292	\$ 31,550,173	\$ 21,419	69	0.047	15	0.010
F Can. Totals & Cumulative: Last 11	\$ 1,698,764,013	761	0.448	114	0.067	\$ 8,717,640	\$ 5,132	65	0.038	11	0.006

**U Montréal did not provide data in 2005

*** \$US = 1.20*\$Cdn

Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received***	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 Université de Sherbrooke	\$ 79,189,178	24	0.303	31	0.391	\$ 9,726,183	\$ 122,822	3	0.038	0	0.000
2 University of British Columbia*	\$ 303,335,806	143	0.471	50	0.165	\$ 13,321,844	\$ 43,918	25	0.316	2	0.025
3 University of Western Ontario*	\$ 168,954,530	81	0.479	35	0.207	\$ 3,635,863	\$ 21,520	8	0.101	5	0.063
4 University of Manitoba	\$ 81,701,633	46	0.563	5	0.061	\$ 1,397,147	\$ 17,101	8	0.101	0	0.000
5 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.126	0	0.000
6 University of Guelph	\$ 103,328,886	106	1.026	40	0.387	\$ 1,114,285	\$ 10,784	7	0.088	0	0.000
7 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.152	0	0.000
8 University of Waterloo*	\$ 87,293,333	8	0.092	34	0.389	\$ 648,308	\$ 7,427	0	0.000	2	0.025
9 Queen's University*	\$ 113,710,000	52	0.457	10	0.088	\$ 745,637	\$ 6,557	8	0.101	3	0.038
10 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.126	1	0.013
11 McMaster University*	\$ 240,490,833	46	0.191	192	0.798	\$ 1,272,778	\$ 5,292	2	0.025	2	0.025
12 University of Toronto*	\$ 321,035,738	224	0.698	34	0.106	\$ 1,413,729	\$ 4,404	8	0.101	3	0.038
13 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.126	1	0.013
14 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.038	2	0.025
15 University of Alberta*	\$ 323,349,167	59	0.182	13	0.164	\$ 877,931	\$ 2,715	10	0.126	2	0.025
16 Dalhousie University	\$ 77,080,833	16	0.208	1	0.013	\$ 123,716	\$ 1,605	1	0.013	0	0.000
17 University of New Brunswick	\$ 27,694,642	16	0.578	3	0.108	\$ 43,762	\$ 1,580	2	0.025	2	0.025
18 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.038	0	0.000
19 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.013	0	0.000
20 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.038	1	0.013
21 York University	\$ 40,666,667	12	0.295	6	0.148	\$ -	\$ -	0	0.000	0	0.000
A Can. Totals & Cumulative: Top 21	\$ 3,171,794,632	1,339	0.422	544	0.172	\$ 40,267,813	\$ 12,696	134	0.042	26	0.008
B Can. Average: Top 21	\$ 151,037,840	63.8	0.497	25.9	0.161	\$ 1,917,515	\$ 6,167	6.4	0.070	1.2	0.016
C Can. Median: Top 21	\$ 103,328,886	52	0.457	13	0.096	\$ 877,931	\$ 4,404	7	0.088	1	0.013
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.378	41.0	0.192	\$ 3,373,474	\$ 5,850	5.8	0.051	1.4	0.018
E Can. Totals & Cumulative: Top 10	\$ 1,315,183,913	703	0.535	247	0.188	\$ 34,647,161	\$ 26,344	91	0.069	13	0.010
F Can. Totals & Cumulative: Last 11	\$ 1,856,610,719	636	0.343	297	0.160	\$ 5,620,653	\$ 3,027	43	0.023	13	0.007

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Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

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2 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.040	0	0.000
3 University of Alberta*	\$ 323,349,167	59	0.182	13	0.043	\$ 877,931	\$ 2,715	10	0.033	2	0.007
4 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.033	1	0.003
5 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.033	1	0.003
6 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.033	0	0.000
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12 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.010	1	0.003
13 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.010	0	0.000
14 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.010	2	0.007
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18 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.003	0	0.000
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C Can. Median: Top 21	\$ 103,328,886	52	0.303	13	0.088	\$ 877,931	\$ 4,404	7	0.010	1	0.003
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.370	41.0	0.200	\$ 3,373,474	\$ 27,422	5.8	0.012	1.4	0.005
E Can. Totals & Cumulative: Top 10	\$ 2,012,277,420	942	0.468	220	0.109	\$ 26,766,111	\$ 13,301	109	0.054	17	0.008
F Can. Totals & Cumulative: Last 11	\$ 1,159,517,212	397	0.342	324	0.279	\$ 13,501,703	\$ 11,644	25	0.022	9	0.008

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Technology Transfer at Canadian Universities 2007 Update

Table 3 - Page 1 of 2

FY2005 AUTM Survey Results for Responding Canadian Universities (Top 21)

Survey Results Normalized by Sponsored Research Expenditures (All figures in US\$)

Canadian University**	Total Sponsored Research Expenditures***	Invention Disclosures Received	Invention Disclosures Received per \$1M	License & Options Executed	Licenses & Options Executed per \$1M	License Income Received***	License Income Received per \$1M	U.S. Patents Issued	U.S. Patents Issued per \$1M	Start-up Companies Formed	Start-up Companies Formed per \$1M
1 University of Western Ontario*	\$ 168,954,530	81	0.479	35	0.207	\$ 3,635,863	\$ 21,520	8	0.047	5	0.030
2 University of Toronto*	\$ 321,035,738	224	0.698	34	0.106	\$ 1,413,729	\$ 4,404	8	0.047	3	0.018
3 Queen's University*	\$ 113,710,000	52	0.457	10	0.088	\$ 745,637	\$ 6,557	8	0.047	3	0.018
4 University of Waterloo*	\$ 87,293,333	8	0.092	34	0.389	\$ 648,308	\$ 7,427	0	0.000	2	0.012
5 University of New Brunswick	\$ 27,694,642	16	0.578	3	0.108	\$ 43,762	\$ 1,580	2	0.012	2	0.012
6 McMaster University*	\$ 240,490,833	46	0.191	192	0.798	\$ 1,272,778	\$ 5,292	2	0.012	2	0.012
7 University of Victoria	\$ 39,887,500	64	1.605	2	0.050	\$ 148,333	\$ 3,719	3	0.018	2	0.012
8 University of Alberta*	\$ 323,349,167	59	0.182	13	0.077	\$ 877,931	\$ 2,715	10	0.059	2	0.012
9 University of British Columbia*	\$ 303,335,806	143	0.471	50	0.165	\$ 13,321,844	\$ 43,918	25	0.148	2	0.012
10 University of Ottawa	\$ 198,333,333	44	0.222	6	0.030	\$ 93,490	\$ 471	3	0.018	1	0.006
11 McGill University*	\$ 322,520,000	94	0.291	31	0.096	\$ 1,316,066	\$ 4,081	10	0.059	1	0.006
12 Simon Fraser University	\$ 44,105,043	35	0.794	2	0.045	\$ 285,820	\$ 6,480	10	0.059	1	0.006
13 York University	\$ 40,666,667	12	0.295	6	0.148	\$ -	\$ -	0	0.000	0	0.000
14 Memorial University	\$ 75,057,986	8	0.107	0	0.000	\$ 37,500	\$ 500	1	0.006	0	0.000
15 Dalhousie University	\$ 77,080,833	16	0.208	1	0.013	\$ 123,716	\$ 1,605	1	0.006	0	0.000
16 Université Laval*	\$ 190,494,021	53	0.278	9	0.047	\$ 293,348	\$ 1,540	3	0.018	0	0.000
17 Université de Sherbrooke	\$ 79,189,178	24	0.303	31	0.391	\$ 9,726,183	\$ 122,822	3	0.018	0	0.000
18 University of Guelph	\$ 103,328,886	106	1.026	40	0.387	\$ 1,114,285	\$ 10,784	7	0.041	0	0.000
19 University of Manitoba	\$ 81,701,633	46	0.563	5	0.061	\$ 1,397,147	\$ 17,101	8	0.047	0	0.000
20 University of Calgary / UTI, Inc.	\$ 234,837,926	125	0.532	14	0.060	\$ 2,862,854	\$ 12,191	10	0.059	0	0.000
21 University of Saskatchewan	\$ 98,727,578	83	0.841	26	0.263	\$ 909,221	\$ 9,209	12	0.071	0	0.000
A Can. Totals & Cumulative: Top 21	\$ 3,171,794,632	1,339	<i>0.422</i>	544	<i>0.172</i>	\$ 40,267,813	\$ <i>12,696</i>	134	<i>0.042</i>	26	<i>0.008</i>
B Can. Average: Top 21	\$ 151,037,840	63.8	0.476	25.9	0.169	\$ 1,917,515	\$ 13,579	6.4	0.037	1.2	0.006
C Can. Median: Top 21	\$ 103,328,886	52	0.303	13	0.088	\$ 877,931	\$ 5,292	7	0.018	1	0.006
D Can. Standard Deviation: Top 21	\$ 103,246,344	53.0	0.377	41.0	0.199	\$ 3,373,474	\$ 28,252	5.8	0.036	1.4	0.006
E Can. Totals & Cumulative: Top 10	\$ 1,824,084,882	737	<i>0.404</i>	379	<i>0.208</i>	\$ 22,201,673	\$ <i>12,171</i>	69	<i>0.038</i>	24	<i>0.013</i>
F Can. Totals & Cumulative: Last 11	\$ 1,347,709,750	602	<i>0.447</i>	165	<i>0.122</i>	\$ 18,066,140	\$ <i>13,405</i>	65	<i>0.048</i>	2	<i>0.001</i>

**U Montréal did not provide data in 2005

*** \$US = 1.20*\$Cdn