

Québec in North America / Le Québec en Amérique du Nord

Québec and the Biotech Industry in North America

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What is the current state of the biotech industry in North America and how can we best understand Québec's place as one of the major clusters in this continental picture? These are the central questions addressed by this note, along with an evaluation of the industry's sources of funding, the costs of its operations, and its prospects for a sustainable future.

Current State of the Biotech Industry in North America

The biotech industry is defined as any technological application that uses biological systems, living organisms, or derivatives thereof to make or modify products or processes for specific use.¹ The biotech industry as we know it today began in the United States in the early 1970s with the formation of the first company Genentech created by Stanford and University of California scientists, owned today by Hoffman LaRoche.² Canada also developed a biotech

Le Québec et le secteur de la biotechnologie en Amérique du Nord

Français : <http://cepea.cerium.ca/article350.html>

Résumé

Quelle est la situation actuelle de l'industrie des biotechnologies en Amérique du Nord et comment pouvons-nous mieux comprendre la place qu'y occupe le Québec, qui représente l'une des plus importantes « grappes » dans ce tableau continental? Voilà les questions auxquelles cette note tente de répondre, qui présente en outre une évaluation des sources de financement de l'industrie, de ses coûts d'opération et de ses perspectives de développement pour l'avenir. Le Québec possède des avantages distincts pour permettre à cette industrie de prospérer, notamment de faibles coûts d'opération et des programmes gouvernementaux d'appui à l'industrie très concurrentiels. Ces avantages ne sont pas une garantie absolue de croissance durable, toutefois, car d'autres provinces et États offrent des programmes comparables et, surtout, parce que la plus grande disponibilité de capital de risque aux États-Unis donne un avantage substantiel aux firmes de ce pays face à leurs concurrents canadiens.

industry which started its development in the 1990s.³

The United States is the largest nest for biotech companies with a total of 1444 companies, both public and private. Canada is the second largest player in the world with

¹ "The Cartagena Protocol on Biosafety – Terms / Definitions." Belgian Biosafety Clearing House, 30 May 2005; www.biosafetyprotocol.be/Definitions.html.

² "About Biotech. 1953 - 1976: Expanding the Boundaries of DNA Research." Access Excellence @ the National Health Museum; www.accessexcellence.org/RC/AB/BC/1953-1976.html.

³ "Scan of Canadian Strengths in Biotechnology." Science Metrix, January 2005; www.science-metrix.com.

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<http://cepea.cerium.ca/article340.html>

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472 companies. The U.S. holds 33% of the biotech companies in the world and Canada 11%.⁴

The Canadian biotech industry is some years behind in its overall stage than the industry in the United States. In Canada more companies are in Phase I and Phase II or not yet in clinical trials. The aggregate of the Biotech industry in Canada is characterized by having a very large number of biotech companies in early stages. In the United States the biotech industry is expected to become profitable by 2008 if the current trends are sustained.⁵ To be able to compare the biotech industry between the US and Canada, we should take in consideration that the total Canadian economy is one tenth of that of the U.S.'s in GDP terms (Canada \$ 1.02 trillion dollars, US 11.75 trillion dollars GDP), meaning that in the United States there are 123 companies for every trillion dollars of GDP, while in Canada

there are 472 companies for every trillion dollars of GDP.

North American Biotech Clusters

The industry is highly clustered in regions throughout North America and the important factors shaping these clusters are their relation with access to venture capital, the quality of local research institutes, and the strategic linkages between biotech firms, government, and academia.⁶

In the United States, California has the largest cluster with more than 400 biotech companies. Within California two sub-clusters are easily identified: The San Francisco Bay Area, where 230 companies are located benefiting from the presence of the University of California at San Francisco and Stanford University; and San Diego. This city represents the second most important cluster in California with around 105 biotech companies.⁷ San Diego is the most “clustered” biotech region in the United States where many companies are simply across the street from one another, and the fact that all these companies are generally under one municipal government facilitates bureaucratic processes such as getting permits. Recently, big pharmaceutical companies such as Novartis, Pfizer, Johnson & Johnson have moved to the area increasing the cross fertilization of ideas, resources, and talent.⁸ San Diego has an important organization designed to foster the creation of high-tech industries; UCSD Connect assists companies in their spin off process, helps them write business plans, attract venture capital, and talent.⁹ Finally, Los Angeles is the smallest cluster in California with about 75 companies.¹⁰

Massachusetts is an important cluster with more than 200 biotech companies and is

⁶ “[The U.S. Biotechnology Industry](#)” International Access Corporation, Center for International Science and Technology Policy, George Washington University; www.gwu.edu/~cistp/PAGES/biotech2.pdf.

⁷ Ernst & Young, “[Global Biotechnology Report 2005](#).”

⁸ “Cluster analysis” *The Economist*, March 27, 2003.

⁹ “[The U.S. Biotechnology Industry](#).”

¹⁰ Ernst & Young, “[Global Biotechnology Report 2005](#).”

⁴ Ernst & Young, “[Global Biotechnology Report 2005](#).” June 2005; www.ey.com/beyondborders.

⁵ Id.

distinguished by the number and proximity of research institutes, among them The Massachusetts General Hospital, Harvard University, Massachusetts Institute of Technology, Boston University, Beth-Israel Deaconess Medical Center, and the New England Medical Center.¹¹

Boston receives more grants than any other city in the U.S. Two key players in the industry are the Massachusetts Biotechnology Council and the MIT Enterprise Forum, the latter supporting companies in early stages. According to a Brookings Institution report by Cortwright and Mayer, Boston and San Francisco are the strongest biotech clusters in the United States, both were the pioneers of biotech firms back in the 1970's and have continued to grow since then. Boston and San Francisco have about five times as much research activity as the United States mean, yet ten times the biotech commercialization. They have each three of the top ranked medical research institutions, and each region has more than 3000 biotech related patents from the last ten years, also receiving the majority of venture capital in biotech.¹²

Following California and Massachusetts, the two most important clusters are Ontario and Québec. Ontario became a leader in the biotech industry in 2004, increasing its number of biotech companies from 137 to 148. This represents 31% of Canada's biotech companies and 3.4% of the world biotech industry. The Greater Toronto Area has seven teaching hospitals and over 30 specialized medical and related research centers and institutes.¹³ The University of Toronto and its affiliated research institutions help make Toronto one of the most important medical and R&D communities in North America and one of the largest concentrations of medical

research.¹⁴ The Toronto Biotechnology Initiative (TBI) serves the region's infrastructure of universities and research institutions.¹⁵ TBI's central role is to build bridges to bring together all the biotech stakeholders.¹⁶

Québec in 2004 came down from being the third to become the fourth most important hub for biotech in North America. It lost its leadership in the Canadian biotech industry to Ontario due to the loss of 15 biotech companies having a final total of 143, with 30% of the Canadian biotech industry and 3.2% of the world biotech industry. This is due to changes in Québec government policies limiting the seed funds available from quasi-government and government venture fund organizations. Also venture capitalists have encouraged small and undercapitalized companies to merge. Québec was more effective than Ontario at raising venture capital, raising a total of 284 million dollars, 170 million by public companies and the balance by private companies. Companies in Ontario raised 242 million dollars 180 million by public companies and the balance by private companies.¹⁷

Funding for Biotech Companies in North America

After the biotech bubble burst in 2001, biotech companies reduced costs and opted for different exit methods. The number of Initial Public Offerings (IPOs) remained low until 2004, with companies waiting for the right moment to issue their IPOs; in 2004 there were 28 IPOs in the United States and 4 in Canada, while in 2003 there were only 7 IPOs in the US and none in Canada¹⁸. Most of these companies did not get the valuations they were expecting and because of the low valuations, it is expected that in the coming years companies will try to be acquired by big

¹¹ "The U.S. Biotechnology Industry."

¹² Joseph Cortwright and Heike Mayer, *Signs of Life: The Growth of Biotechnology Centers in the U.S.* (Washington, D.C., The Brookings Institution Center on Urban and Metropolitan Policy, 2002). www.brookings.edu.

¹³ Morris S. Berrie, "Canadian Biotech: A Tale of (more than) Two Cities." *Biotechnology Investment Today*. May 2004; www.investinbiotech.com.

¹⁴ Ravi Seethapathy and David Johnston "Canada-India S&T Mapping Study," www.iccc.org/doc/s&treport.pdf.

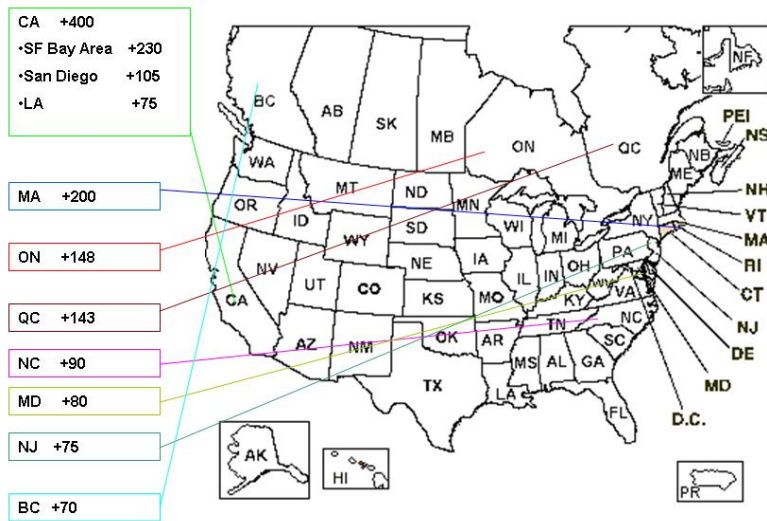
¹⁵ Morris S. Berrie, "Canadian Biotech: A Tale of (more than) Two Cities."

¹⁶ "About TBI - Nature of TBI." Toronto Biotechnology Initiative; www.torontobiotech.org/about_nature.html.

¹⁷ Ernst & Young, "Global Biotechnology Report 2005."

¹⁸ Id.

Main North American Biotech Hubs



Source: Ernst & Young, “Global Biotechnology Report 2005.”

pharmaceutical companies or other biotech companies, since big pharma can give higher valuations because it often has the know-how and the lobbying apparatus to get a drug approved, also has world wide presence and strong marketing departments. It is very expensive and difficult for a biotech company to become fully integrated without having to license some of the products. Out of the four companies that went public in Canada in 2004 two were Québec companies.¹⁹

On average, U.S. biotech companies received in 2004 almost ten times as much financing as their counterparts in Canada, this holds true for all the different stages of financing except when companies go public; companies in the U.S. almost received three times as much money as companies in Canada.²⁰ The reason why companies in Canada receive less financing than companies in the United States is partially explained by the fact that Canadian biotech companies are less mature and are at much earlier stages than companies in the United States when they go public.

An additionally important factor is the amount of venture capital under management in

Canada in comparison to the United States. The total capital under management in the United States is 16 times that of Canada, this is much more than what would be expected in relation to the size of the economies in GDP terms (10x). Also in Canada more than 60% of the venture capital is managed by quasi-public and public institutions, while in the United States only 1% of venture capital is managed by non-private investors.²¹ These semi-public and public funds usually have different constraints as to where they can invest (e.g.; *Fond de Solidarité* can only invest in Québec regardless if there are good opportunities in other regions). 20% of all the

venture capital associations are Labor Sponsored Venture Capital Corporations who represent thousands of small investors that do not have an ownership interest in the investments these companies make contrary to the case of a single large investor.²² For these small investors the tax benefits they receive for placing their money within these corporations are good enough to keep their money there regardless of the returns. Another problem that venture capitalists face in Canada is the low yearly returns these companies have had in comparison to the United States, as shown in Table 1.

Table 1: Rates of Return for Venture Capital in the U.S. and Canada (2004)

	1 Yr	3Yr	5Yr	10Yr
US VC (USD)	19.3%	-2.9%	-1.3%	26%
CA VC (CND)	0.3%	-6.8%	-2.4%	3.6%

Sources:
 NVCA (www.nvca.org/pdf/performanceQ404final.pdf)
 and CVCA ([May 20 Press Release](#))

²¹ The Boston Consulting Group, “FAST FORWARD: Accelerating Canada’s Leadership in the Internet Economy,” January 2000; <http://e-com.ic.gc.ca>.

²² Marla Levy, “Venturing to take the risk,” University of British Columbia. Fall 2003. www.sauder.ubc.ca.

¹⁹ Id.

²⁰ Id.

Also, returns are generally lower in Canada than in the United States. One reason for this difference in the rates of return is the lack of an efficient exit mechanism for investors in Canada; companies that went public in the last five years on the Toronto Stock Exchange received between ¼ and ½ of the funds that companies that went public in the United States received.²³ According to Douglas J. Cumming and Jeffrey G. Macintosh, the main exit method in Canada is the buyback (30.6% in 2002) and the Write-Off (20.1% in 2002), these two are the less profitable exit methods for investments and account for almost 50% of the deals. In the United States the main exit methods are the Write-off (30%), followed by IPO (26.8%) and Acquisition (26.8%). Finally, Québec received 36% of the total financing for biotech in Canada followed by Ontario with 30%.²⁴

Cost of Operations

Canada ranks as the most competitive country to operate a biotech company according to a 2004 KPMG study, with an over all total cost advantage of 22.4% over the United States. The main cost advantages in Canada results from savings in labor and benefits, which are 73% of the cost of labor and benefits in the United States. Canada's public health-care system enables employers to pay health benefits of only 2.1% of the workers gross pay compared to 9.6% in the US. Total R&D annual costs are 16.6% lower in Canada than in the U.S. Canada also ranks first in the world for the lowest cost of clinical trials, with costs 23% lower than they are in the U.S.²⁵ The Boyd Company, in a study published in 2003, outlined that a variation of 50% in operating costs can be expected across different

North American Biotechnology hubs. Montréal ranked as the most economic place to operate a biotech firm in North America and Toronto occupied the 6th place in the ranking.

Table 2:
The Ten Least Expensive Biotech Hubs...

1-Montréal, QC	\$7,955,000
2.-Sioux Falls, SD	\$7,963,262
3. Athens, GA	\$8,121,568
4. Shreveport, LA	\$8,202,453
5. Tulsa, OK	\$8,237,917
6. Toronto, ON	\$8,452,187
7. Colorado Springs, CO	\$8,500,337
8. Charlottesville, VA	\$8,517,371
9. Rochester, MN	\$8,547,240
10. Salt Lake City, UT	\$8,614,914
... and the Ten Most Expensive	
1. San Jose, CA	\$12,106,100
2. San Francisco, CA	\$11,935,032
3. Fairfield County, CT	\$10,748,891
4. Boston, MA	\$10,632,657
5. Nassau/Suffolk, NY	\$10,290,838
6. Princeton, NJ	\$10,186,943
7. Chicago, IL	\$10,172,623
8. Philadelphia, PA	\$10,073,441
9. San Diego, CA	\$10,041,176
10. Middlesex/Somerset/ Hunterdon, NJ	\$10,035,825

Source: Investissement Québec: "[Site Selection by the Numbers for Biotechnology Facilities](http://www.investquebec.com)," www.investquebec.com.

Another important consideration is that empirical evidence suggests that operating costs have not been a major decision on the location for biotech companies, instead the locations seem to be correlated to where these companies spin-off and where top management prefers to reside. Tax benefits granted by the federal government are an important factor in the economic equation for biotech companies and are a significant part of the Canadian biotechnology development strategy. The most important tax incentive is the Federal Scientific Research and

²³ Macdonald, Mary, and Gemma Postlethwaite, "[State of the PE Market](http://www.canadavc.com)" Thomson Financial, 14 March 2004; www.canadavc.com.

²⁴ Douglas J. Cumming and Jeffrey G. Macintosh, "[Venture Capital Exits In Canada And The United States](http://www.jama.ca/pubs/2004/kpmg_study/kpmg2004.pdf)" *University of Toronto Law Journal*, Vol. 53, 2003, pp. 101-200.

²⁵ "CEO's Guide to World Business Costs - Biotech R&D" KPMG Business, March 14, 2004; www.jama.ca/pubs/2004/kpmg_study/kpmg2004.pdf.

Experimental Development program (SR&ED), permitting a 100% deduction of all eligible SR&ED costs, a 20% investment tax credit on SR&ED expenditures. The investment tax credit can offset 100% of the federal tax payable in the year, or carried back 3 years or forward 10 years. For small Canadian Controlled Private Corporations (CCPCs), the investment tax credit increases to 35% (up to the first \$2 million in SR&ED expenditures). This credit is refundable in cash even if the company does not have enough tax payables to cover the credit.

This refundable investment tax credit is a significant incentive to stay in Canada. Tax credits in Canada cover a very large scope of activities compared to Federal R&D credits in the U.S. Table 3 compares Canadian qualifying expenditures versus U.S. expenditures:

Table 3 : Canadian and U.S. Qualifying Expenditures		
	Canada	U.S.
Wages & Salaries	√	√
Capital Equipment	√	
Materials	√	√
Overhead	√	
Contract Expenses	√	

The SR&ED 20% tax in Canada also covers all R&D dollars as oppose to the incremental R&D dollars in the United States. Furthermore, Canadian R&D tax incentives can also be carried forward indefinitely compared with U.S. tax incentives, although the latter law is under review as of June 2005, because it is considered to harm the development of biotech companies in the U.S. In Canada tax credits are only transferable from biotech company to a life sciences company within Canada. A company that goes public loses the eligibility to receive the 35 % cash credit and only has the tax credit option available; it must wait for commercial profits before it can use its tax credits, often losing

them altogether because of the time needed to become profitable.²⁶

Many Canadian companies that receive funding often invest the money not needed for the current year expenses; this money earns interest that is taxed as income, and if the taxable amount is over \$200,000 then the company loses its tax credit status for that year.²⁷

Furthermore, three major biotech provinces in Canada also have their own R&D tax incentives to encourage the development of their biotechnology industries. British Columbia supports the least developed tax incentive program offering only a 10% non-refundable BC income tax credit for eligible expenditures on qualified R&D.²⁸ Ontario offers a similar 10% tax credit for R&D within SMEs. It also offers a 20% tax credit (OBRI) for research performed within a qualified research institution such as a University.²⁹

Québec has a much more complex and generous tax incentive program which includes salaries of employees who worked directly on the project, one-half of the fees paid to a subcontractor who performed R&D on behalf of the corporation, 80% of the total eligible R&D expenditures incurred in connection with a research contract with a research centre, contributions to a research consortium, and expenditures made in connection with a pre-competitive research project. The basic Québec tax credit is 17.5% of R&D expenditures. This rate is increased to 35% for contracts with a research centre, contributions paid to a research consortium and expenditures incurred in connection with a pre-competitive research project, regardless of the size of the corporation. The tax credit is refundable, e.g. a corporation can receive its tax credit even if it did not pay any income

²⁶ BIOTECCanada, "[Mighty Maples from Little Saplings Grow](http://www.biotech.ca)," July 2004 (www.biotech.ca).

²⁷Id.

²⁸ "[Provincial Business Incentives](http://www.penticton.ca)," Economic Development Services (www.penticton.ca).

²⁹ Ontario Investment Service, "[Incentives for Innovation](http://www.2ontario.com)," (www.2ontario.com).

tax.³⁰ Québec also offers specialized tax incentives for biotech firms that establish themselves within a Biotechnology Development Center. The goal is to encourage the formation of clusters in Biotechnology as well as to foster more cooperation in this industry. Finally, certain qualified specialists may also benefit from a personal tax holiday design to encourage foreign migration to Québec.³¹

The generous tax incentives provide a strong reason for biotechnology to continue to flourish within Canada. However, tax incentives are being developed in the United States and competition is increasing. For example 33 States now offer some form of tax credit for R&D activity, while 30 States offer net operation loss carryover programs. As such, it is becoming more and more difficult for provinces in Canada to set themselves apart from the United States. Furthermore, budget pressures on local and provincial governments are also making it more difficult to maintain these generous incentives. Recently, Québec cut back on some generous initiatives as a result of a new liberal government.³²

Competition exists to attract biotech companies or to foster their development. Forty-one states in the U.S. have set up some type of program to support bioscience development. Though most have focused on tax credits and private sector support, such as venture capital, 30 states have also used public efforts and funds to drive bioscience initiatives.³³ Universities count with more than 21 billion USD on grants provided by the National Institutes of Health³⁴ (the Canadian institutes of Health Research provides only 700 million CND³⁵). Also other sources play an

important role, the tobacco industry signed a landmark \$300 billion settlement to reimburse U.S. states for medical care. Big Tobacco agreed to pay each state sums ranging from \$200 million to \$28 billion over 25 years starting in 1998 to cover smoker health-care costs. The only condition was that this money should be spent in health care or related industries. Already, 16 states have designed schemes to foster the development of biotech with this money, Michigan being the leader of these initiatives.³⁶

The Long-Term Picture: Is the Biotech Industry Sustainable?

The key elements for the sustainability of the industry are continuing private-sector investment in product development, the ability to perform clinical research and the access to the market. Massachusetts and California count on an older industry with several success stories, with certain biotech companies getting closer to big pharmaceuticals in revenues and market value and the capacity of acquiring other companies. Higher liquidity of the U.S. market means an easier access to funds for biotech companies and venture capital firms that, unlike in Canada, are mostly private and have much experience in financing biotech firms. Also the universities and medical centers in the area are great resources for medical research. Companies in the United States have portfolios in a later stage of development than those of Canadian Companies which generally have very few products in their portfolio and usually are in the first or second phase of development.

The investment needed for a product in phase III is almost ten times that of a product in phase II or Phase I as depicted in graphic 1, most Canadian biotech firms are struggling for funds as they are in phase I or Phase II.³⁷

³⁰ ["Taxation in Québec 2005,"](#) Raymond Chabot Grant Thornton & Investissement Québec. 1st quarter 2005 (www.investquebec.com).

³¹ ["2004 Québec budget highlights"](#) Deloitte. March 30, 2004 (www.deloitte.com).

³² Ernst & Young, ["Global Biotechnology Report 2005."](#)

³³ ["Tobacco Windfall Spurs Biotech Investment,"](#) Bio-IT World.com, March 7, 2002 (www.bio-itworld.com).

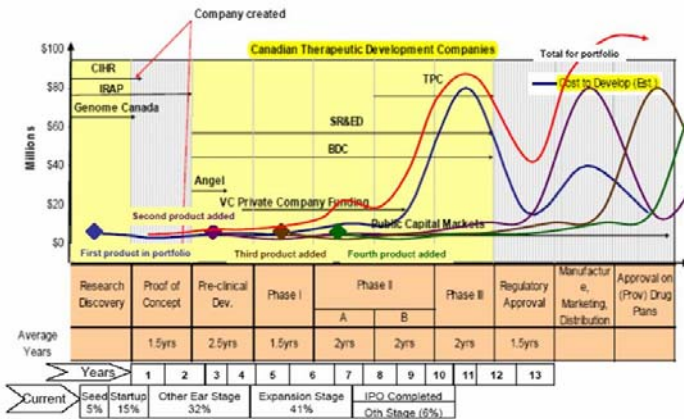
³⁴ ["Summary of the FY 2006 President's Budget,"](#) National Institutes of Health, February 7, 2005 (www.nih.gov).

³⁵ ["Government Support"](#) Government of Canada June 17, 2005 (www.investincanada.gc.ca).

³⁶ ["Tobacco Windfall Spurs Biotech Investment,"](#) Bio-IT World.com.

³⁷ Rick Norland, ["First Principles: Background to Financing Canada's Biotech Companies,"](#) Thorington Corporation, August 2004 (www.bionorth.ca).

Graphic 1: Biotech Development Phases³⁸



According to Ernst and Young, almost 45% of the public biotech companies in Canada have less than two years' worth of cash on hand. In the United States the proportion is 40%. Companies in Canada usually go public at an earlier stage than do their American counterparts, going public often during Phase II or I. On the other hand 42% of companies in Canada seem to be financially sound with more than three years of cash. In the United States these companies represent 45% of the total, with these amounts of cash often a result of the biotech bubble in 2001. In Canada 36% of the companies had less than one year of cash and in the US 20%.⁴¹

As argued earlier, venture capital available for financing in Canada is 1/16 of that in the U.S. and there are 1/3 the number of biotech companies. In order to support the industry and avoid the downfall of hundreds of companies further investment will be needed. Also, because Canada does not have the home-grown capital to support the industry, foreign investment will be needed; currently only about 20% of the venture capital in Canada is foreign.³⁹ Tax savings from the government, low wages and skilled labor will not be enough for the industry to prosper.

There are a number of important considerations for Biotech companies. First, there is a concern that companies that go public either in Canada or the United States are not getting the valuations they expect. Second, Although people in developed countries are aging considerably and this will represent an important market for illnesses common to the latest stages of life, governments and insurance firms are becoming wary about which products to reimburse, limiting the listing and reimbursement to breakthrough products that prove to create a real and remarkable benefit for patients.

Finally, the 10% global yearly growth in the pharmaceutical industry from 2003⁴² might prove unsustainable as it is much higher than global GDP growth, and generics and pricing

Graphic 2: Biotech Firms Survival Index⁴⁰

Ernst & Young Survival Index: U.S., Europe, and Canada												
	U.S.				Europe				Canada			
	2004		2003		2004		2003		2004		2003	
	Number of companies	% of total	Number of companies	% of total	Number of companies	% of total	Number of companies	% of total	Number of companies	% of total	Number of companies	% of total
More than 5 years cash	103	31%	120	38%	10	10%	11	11%	31	38%	27	33%
3-5 years cash	54	16%	53	17%	24	24%	21	22%	3	4%	1	1%
2-3 years cash	42	13%	43	14%	26	27%	23	24%	2	3%	0	0%
1-2 years cash	67	20%	50	16%	16	16%	22	23%	16	20%	15	19%
Less than 1 year cash	64	20%	48	15%	22	22%	19	20%	30	36%	38	47%
Total public companies	330		314		98		96		82		81	

Source: Ernst & Young and company financial statement data
Numbers may appear inconsistent because of rounding

³⁸ Source of Graphic 1: Rick Norland, "First Principles: Background to Financing Canada's Biotech Companies."

³⁹ "2004 Review of venture capital investment activity in Canada" AltAssets, June 1, 2005 (www.altassets.com).

⁴⁰ Ernst & Young, "Global Biotechnology Report 2005."

⁴¹ Id.

⁴² Phil Taylor "World pharma markets still slowing down," October 3, 2005 (www.drugresearcher.com).

policy are becoming more and more commonplace.

Conclusions

In Canada, there is an important disproportion between the number of biotech companies and the funds available to foster their growth. As companies move to later stages where much larger financing is needed, biotech companies might face serious financial distress. Capital could be attracted from abroad but the low historic returns in the Canadian market and the lack of effective and profitable exit methods make the country's industry not as attractive as the industry in the U.S for investment.

Canada is very competitive in its operating cost structure; advantages based on low labor costs, a low Canadian dollar and very generous tax exemptions granted by the federal and provincial governments provide advantages to the industry. Nevertheless, most states in the U.S. are developing programs to foster the creation and growth of a biotech industry with tax exemptions as generous as those available in Canada. Furthermore, the increasing value of the Canadian dollar is diminishing the cost advantages that companies previously enjoyed.

The young Canadian biotech industry may become vulnerable if proper ways to finance it are not developed. The lack of reliable sources of private funds and the absence of a large Canadian pharmaceutical company suggest that acquisitions or partnerships will come mainly from the American or European firms.

To succeed, the biotech industry in Canada will have to convince Canadian and foreign investors that it has what it takes to advance its companies to a late stage of development and become one of the dominant players on global markets. A higher profile of Canadian companies in the US and in Europe will be needed, to attract experienced management in getting products approved by the European Medicine Agency and the Federal Drug Administration and at the same time this new

Québec and the Biotech Industry in North America

Abstract

What is the current state of the biotech industry in North America and how can we best understand Québec's place as one of the major clusters in this continental picture? These are the central questions addressed by this note, along with an evaluation of the industry's sources of funding, the costs of its operations, and its prospects for a sustainable future. Québec has distinct advantages for this industry, including lower operating costs and a generous incentive programs. These advantages are not an absolute guarantee of sustainability, however, as other states or provinces offer increasingly competitive incentives and the greater availability of home-grown venture capital in the United States compared to Canada puts U.S.-located biotech firms at a competitive advantage.

generation of late-stage biotech managers should be more oriented to the commercialization of the products and able to sell the story to all the stakeholders.

Canada and Québec have proven very keen at fostering the birth of Biotech companies, the issue now is how to make them develop into global corporations.



Québec in North America 
A project co-chaired by Stephen Blank and Guy Stanley, with the assistance of Pasquale Salvaggio



The *Québec in North America* project emerged from the presence of Professor Stephen Blank as a Fulbright Visiting Scholar at the Université de Montréal in 2004-2005. He co-chaired the project with Guy Stanley, with the assistance of Pasquale Salvaggio in the summer and fall of 2005. Project advisors were Michael Hawes, Executive Director of the Canada-U.S. Fulbright Program, Jean-François Lisée, Executive Director of the Université de Montréal's Center for International Studies (CÉRIUM), and Pierre Martin, Director of the Université de Montréal's Chair in American Political and Economic Studies. The financial contribution of the Canada-U.S. Fulbright Program and of the CÉRIUM (through a generous grant from the ministère des Relations internationales du Québec) is gratefully acknowledged.

Twelve students from HEC-Montréal, Université de Montréal, and Université du Québec à Montréal attended the project's seminars and prepared research papers. Guests at the seminar meetings included Albert Juneau (Québec Chamber of Commerce), Diane Wilhelmy (former Québec deputy minister of International Relations) and Konrad Yakabuski (Globe and Mail).

The picture of Québec in North America that emerges from these studies is that of a vibrant source of economic and cultural activity with an important presence throughout the continent. Québec is a major source and destination along trade corridors with New York and New England, and by far the largest Canadian supplier in an integrated North American electricity market. In 2004, Québec ranked sixth among countries of the world in terms of exports to the U.S. and fourth in the world as a destination for U.S. exports. Mexico is Québec's most important trading partner in Latin America. Québec is the fourth largest center of film production in North America, as well as the fourth largest biotechnology hub in North America.

The papers also illustrate hurdles that must be overcome as Québec pursues its integration within the continent. More generous provincial programs for biotech—especially Ontario—are eroding some of Québec's luster. The challenge of managing cross-border enterprises is also significant, as shown by the example of Quebecor World. Exporting presents additional issues since the tragic events of September 11, 2001. Some of these are illustrated in the paper on CLIC Import-Export. Taken together, these papers shed light on how North America is evolving as an economic zone. Although trade amongst companies

continues between Québec and the rest of North America, trade increasingly is occurring within shared networks, or within firms. In this context, the barriers to trade between Québec and the rest of North America are becoming barriers to common economic growth.

The bottom line is that North America is rapidly reaching the point where many economic problems are shared no matter where they emerge. This has obvious implications for public policy and for policy capacity, or the ability of North American governments to recognize and solve common problems.

“Québec in North America” Project Home Page:
<http://cepea.cerium.ca/article340.html>

Alain-Michel Ayache, [*Exporter aux États-Unis dans le nouveau contexte de sécurité: l'expérience de CLIC Import-Export / Exporting to the United States in the New Security Context : The Case of CLIC Import-Export*](#), Notes & Analyses # 8.

David Descôteaux, [*Quebecor World et les atouts d'une plateforme nord-américaine / Quebecor World and the benefits of a North American Platform*](#), Notes & Analyses # 9.

Lauris Apse, [*Hollywood Nord-Est? La production de films nord-américains au Québec / Hollywood Northeast? North American Film Production in Québec*](#), Notes & Analyses # 10.

Rolando Gonzalez, [*Le Québec et le secteur de la biotechnologie en Amérique du Nord / Québec and the Biotech Industry in North America*](#), Notes & Analyses # 13.

Minea Valle Fajer, [*Le corridor Québec-New York / The Québec-New York Corridor*](#), Notes & Analyses (forthcoming).

Anne-Elisabeth Piché, [*Un partenariat en pleine expansion : les relations économiques entre le Québec et le Mexique depuis 1994 / An Expanding Partnership : Economic Relations between Québec and Mexico Since 1994*](#), Notes & Analyses (forthcoming).

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Sandra D'Sylva, [*Le Corridor Québec-Nouvelle-Angleterre / The Québec-New England Corridor*](#), Notes & Analyses (forthcoming).

Notes & Analyses sur les États-Unis/on the USA

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12. Stephen Blank, [North American Trade Corridors : An Initial Exploration](#) (Analysis/analyse), March/mars 2006.
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10. Lauris Apse, [Hollywood Nord-Est? La production de films nord-américains au Québec / Hollywood Northeast? North American Film Production in Québec](#), (Note), « Le Québec en Amérique du Nord / Québec in North America », mars 2006.
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