



Memorandum

Office of the Vice-Principal
(Research and International Relations)
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TO: Senate

FROM: Dr. Rose Goldstein, Vice-Principal (Research and International Relations)

SUBJECT: Report on Research Performance and Innovation

DATE: September 22, 2011

DOCUMENT #: D11-01

ACTION REQUIRED: INFORMATION APPROVAL/DECISION

ISSUE: Dr. Rose Goldstein, Vice-Principal (Research and International Relations), will present its annual report to Senate on key indicators of McGill research and innovation performance.

BACKGROUND & RATIONALE: The Report on Research Performance and Innovation is an annual review of McGill's success in major funding programs, its progress in areas related to innovation, and other major achievements of University researchers.

The objective of the Report on Research Performance and Innovation is to provide Senate with a comprehensive portrait, based on concrete data, of McGill's competitiveness in major funding programs, as well as the University's effectiveness in moving discoveries and inventions from the lab to the commercial market. Finally, Dr. Goldstein will share her vision for how McGill can build on its strengths while fundamentally transforming our approach to partnerships with industry and other external stakeholders.

More specifically, this year's Report will examine a wide range of performance indicators, including how McGill compares to its G5 and U15 peers in terms of market share and research intensity over the last five years. The emphasis will be on identifying significant trends in funding while outlining how the University's research enterprise can become better suited to compete in the future. The presentation will also look ahead to upcoming opportunities in the research community that are particularly noteworthy and which could have a major impact on the University this year and in the future.

A detailed outline of the Report is attached as Appendix A.

**MOTION OR
RESOLUTION
FOR APPROVAL:**

N/A

**PRIOR
CONSULTATION:**

Principal, Provost and Vice-Principals

NEXT STEPS:

N/A

APPENDICES:

Appendix A: Report on Research Performance and Innovation Outline

Report on Research Performance and Innovation Outline

Objective: To provide the Senate with a comprehensive portrait, based on concrete data, of McGill's competitiveness in major funding programs; to review the University's effectiveness in moving discoveries and inventions from the lab to the commercial market; and to outline the Office of the Vice-Principal (Research and International Relations)'s vision for how McGill can transform its research enterprise to become more competitive in the future.

I. Introduction and Report Objectives

This section will briefly outline the Report's goals and provide a roadmap for the four main sections of the presentation. It will:

- Highlight McGill's research and innovation strengths
- Identify areas for improvement
- Celebrate achievements
- Look ahead to priorities for FY2011-12 and beyond

II. Research Performance

This section will focus on McGill's research performance compared to other members of the G5 and U15. It will compare market share and research intensity over the last five years, with an emphasis on identifying major trends and where we can transform our performance.

Topics

- a. Federal programs (CIHR, NSERC, SSHRC, Tri-Council, CFI)
- b. Quebec programs (FRSQ, FQSRC, FQRNT)
- c. International programs (IDRC, MDEIE, NIH, etc.)
- d. Large-scale and team grants from all sources
- e. Areas affected by research performance, particularly in federal programs

III. Innovation and Business Engagement

This section will review major indicators of the success and challenges facing McGill's innovation enterprises. It will focus on comparative metrics between McGill and its G5 and U15 peers, as well as Association of University Technology Managers (AUTM) benchmarks.

Topics

- a. Overview of results

- b. Innovation outcomes, including patents, licensing outcomes, and new companies
- c. Corporate engagement, including contracts and partnerships with private sector

IV. Major Wins and Achievements

This section will recognize a few of the many outstanding accomplishments in McGill's research community over the past year. Particular attention will be paid to achievements in influential federal and provincial competitions, key awards and prizes presented to McGill faculty, and noteworthy success rates for applications to various programs.

Proposed Topics

- a. Federal awards
- b. Provincial awards
- c. Recap of BRAVO

V. Upcoming Opportunities

This section will identify a number of major competitions, initiatives and areas of improvement that the Office of the Vice-Principal (Research and International Relations) will focus on in the coming year.

Topics

- a. Networks for Centres for Excellence (NCE) finalists (biofuels and orthopedic trauma)
- b. Canada-India Centre for Research Excellence
- c. Canada Excellence Research Chair (CERC) competition
- d. CFI Round VII for large projects
- e. Quebec Research priority projects
- f. Other upcoming competitions of note
- g. Strategic Reframing Initiative and increasing research performance

The background of the slide features a red-tinted image of a flag on a pole and a building with a dome, likely a university building. The text is overlaid on a white circular graphic.

Report on Research Performance and Innovation

Presentation to Senate
September 2011

Dr. Rose Goldstein
Vice-Principal (Research and International Relations)



McGill



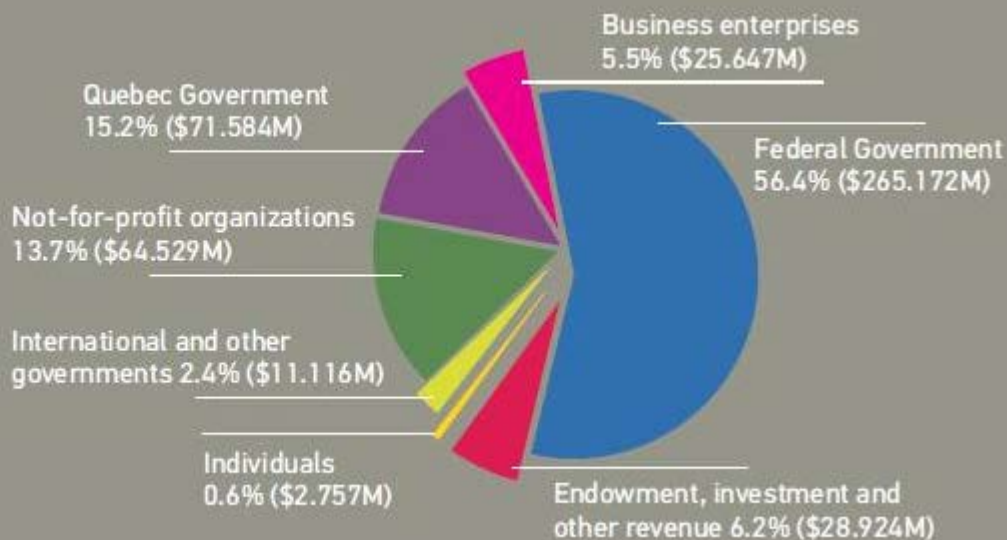
Overview

Objectives for this presentation

- Highlight McGill's research and innovation strengths
- Identify areas for improvement
- Celebrate achievements
- Look ahead to priorities

Report on Research Performance and Innovation

McGill's research funding sources 2009-2010: \$469.729 million*



*McGill and affiliated hospitals

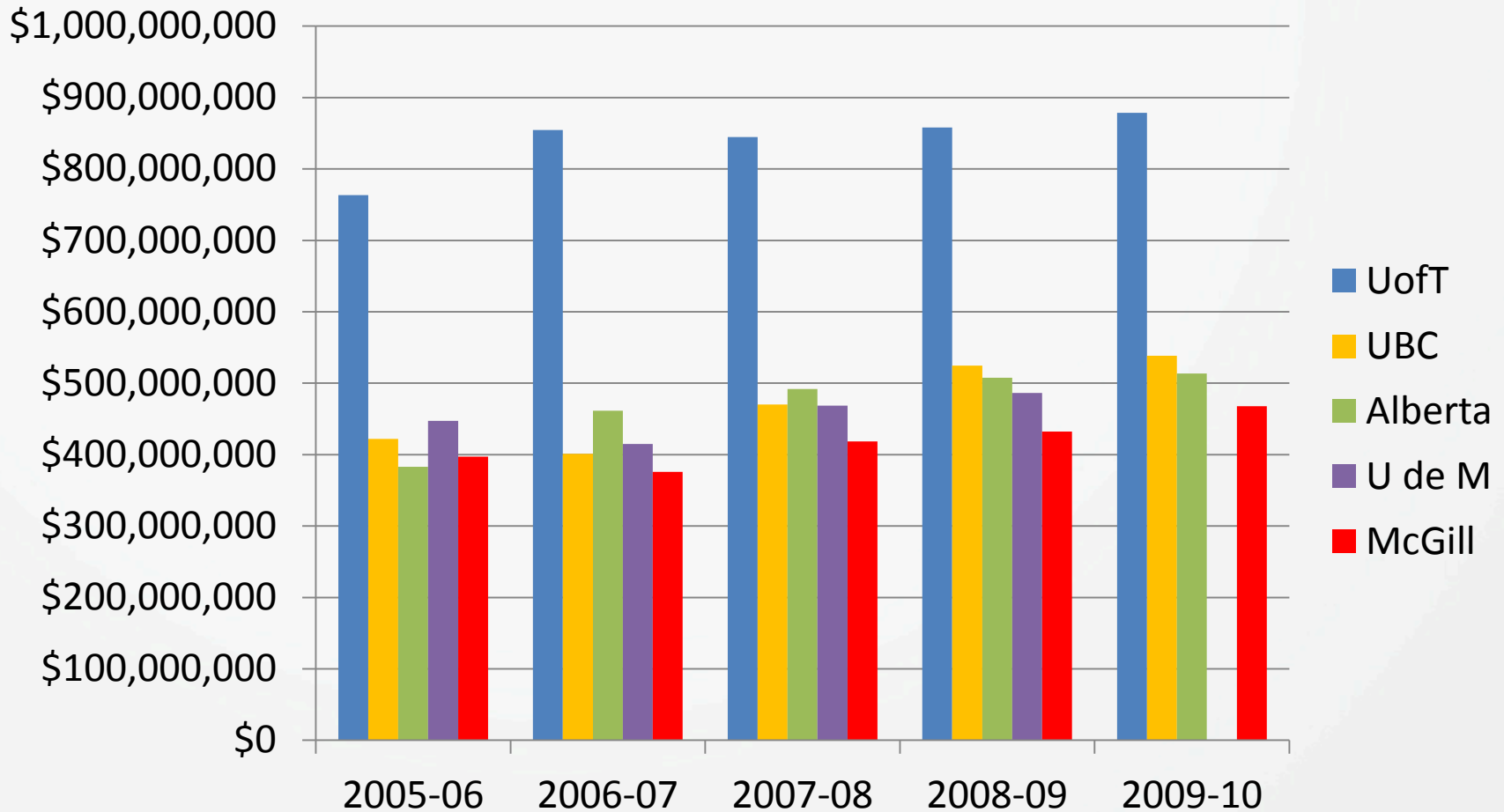


Impact of Research Performance

These are all affected by our research performance:

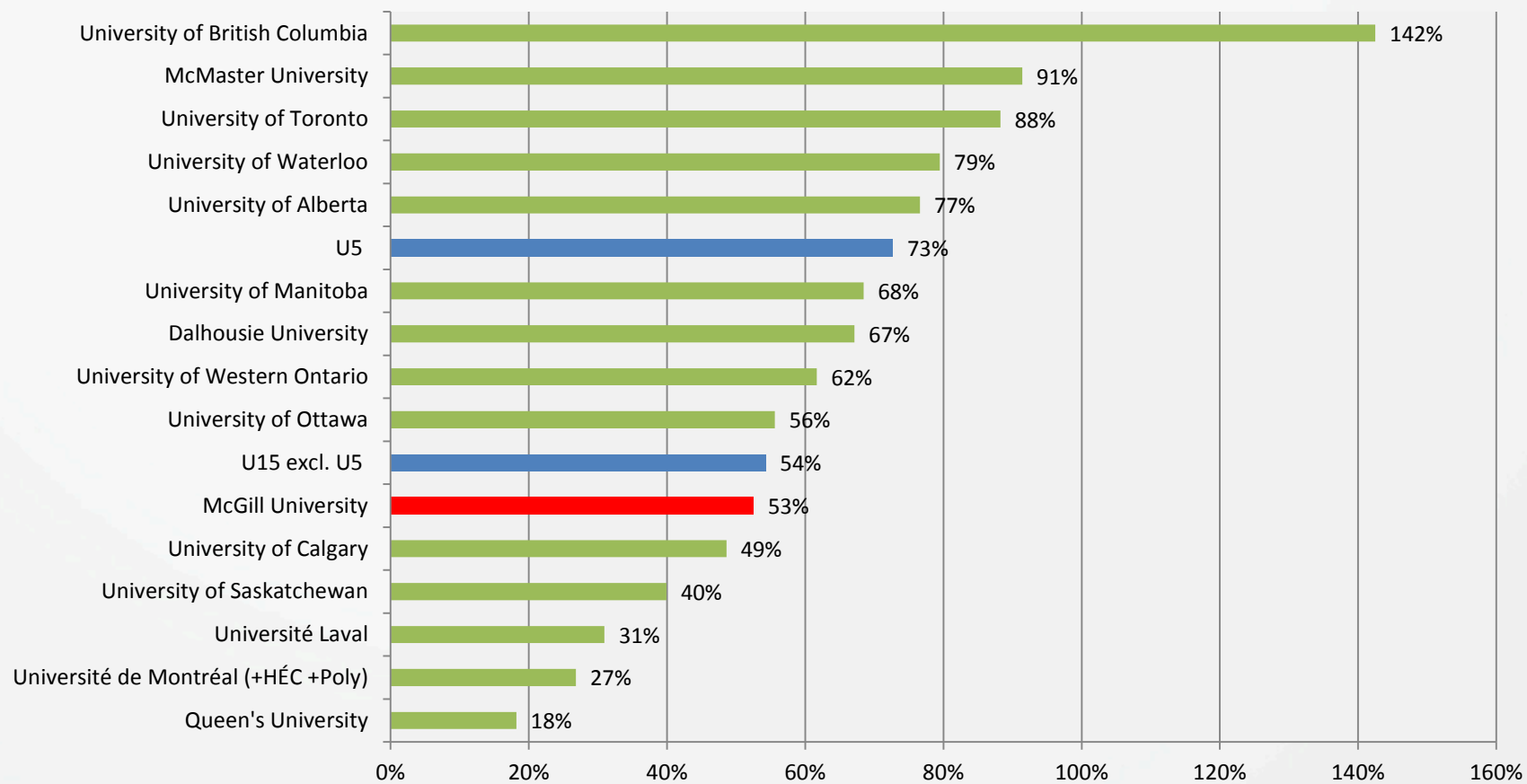
- University Rankings
- Canada Research Chairs (CRC)
- Canada Excellence Research Chairs
- Graduate Fellowships
- Undergraduate Awards
- Canada Foundation for Innovation (CFI) Awards
- Indirect Costs of Research

G5 Sponsored Research Income



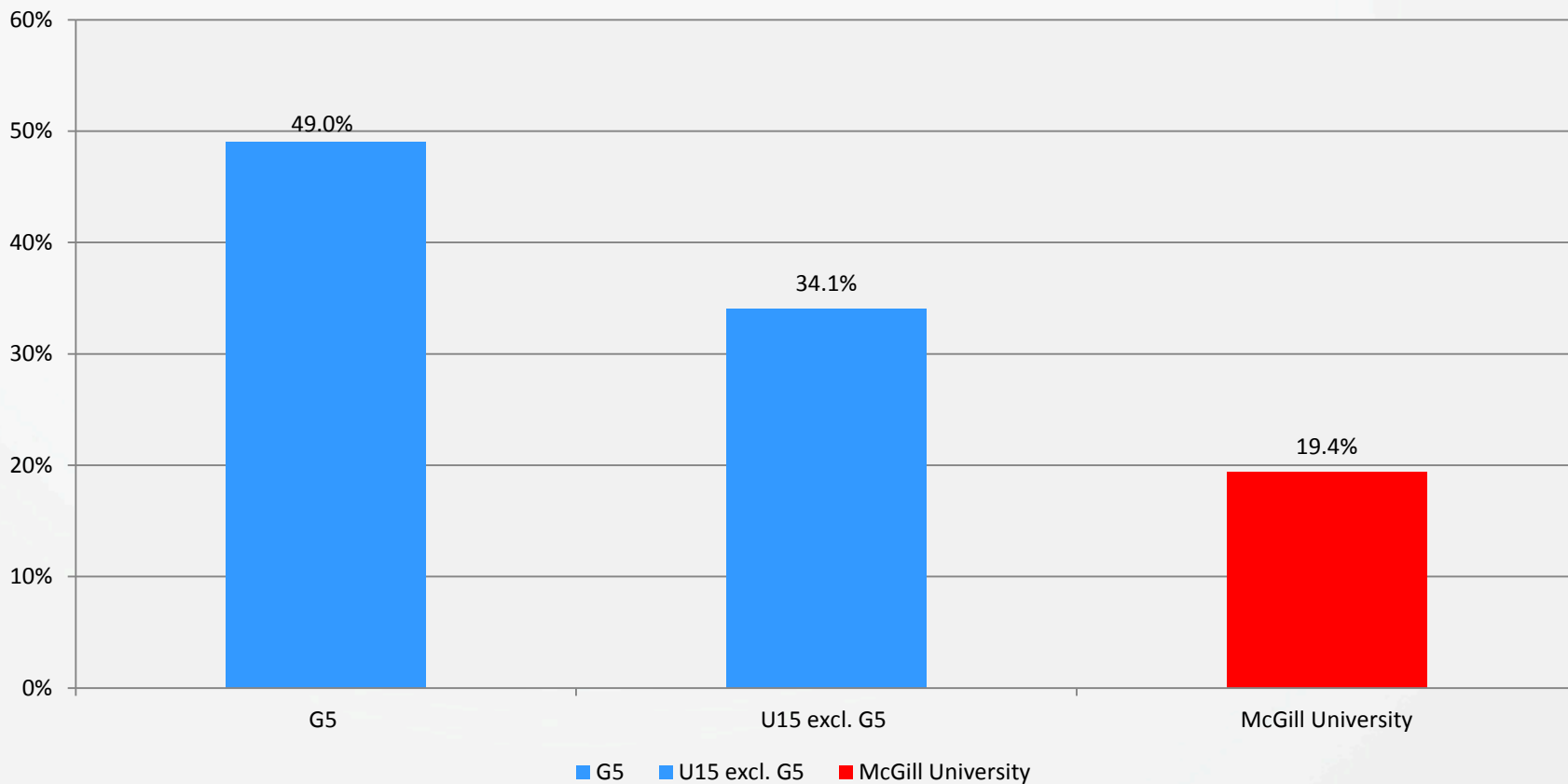
U15 Sponsored Research Income

2001-2009 change (%) in total sponsored research revenue



Research Intensity

2001-2009 change (%) in research intensity

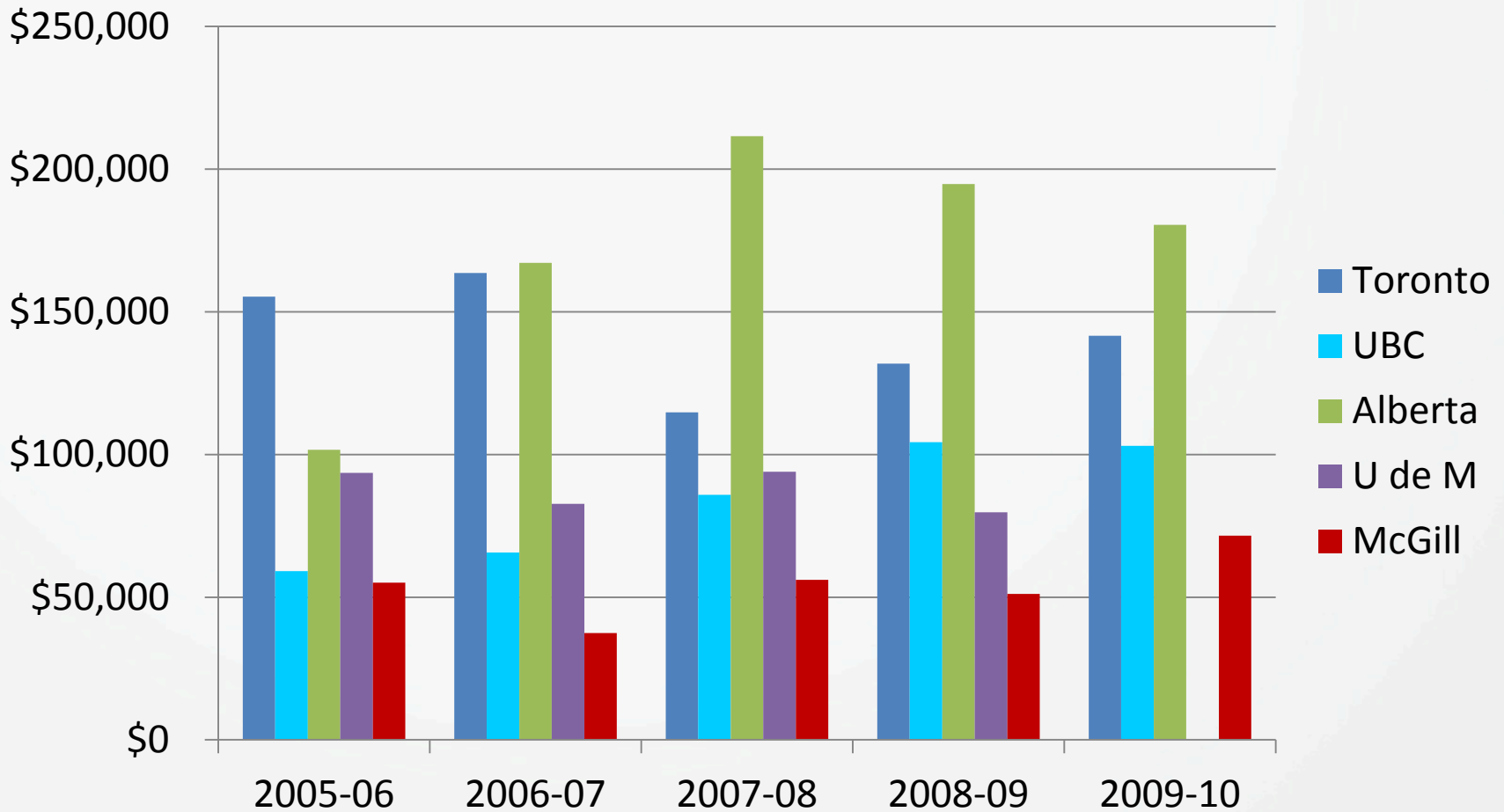




Provincial Comparison of Operating Funding per Student

Rank	Province	2007-08
1	Newfoundland-Labrador	\$24,322
2	British Columbia	\$23,060
3	Saskatchewan	\$22,249
4	Alberta	\$21,301
5	Prince Edward Island	\$19,993
-	Rest of Canada Average	\$17,948
6	Nova Scotia	\$16,479
7	New Brunswick	\$16,240
8	Ontario	\$16,162
9	Manitoba	\$15,206
10	Quebec	\$15,189

G5 Comparison: Provincial \$ per FTE





Origins of Funding Dollars

Federal Programs

- Canadian Institutes of Health Research (CIHR)
- Natural Sciences of Engineering Research Council of Canada (NSERC)
- Social Sciences and Humanities Research Council of Canada (SSHRC)
- Canada Foundation for Innovation (CFI)

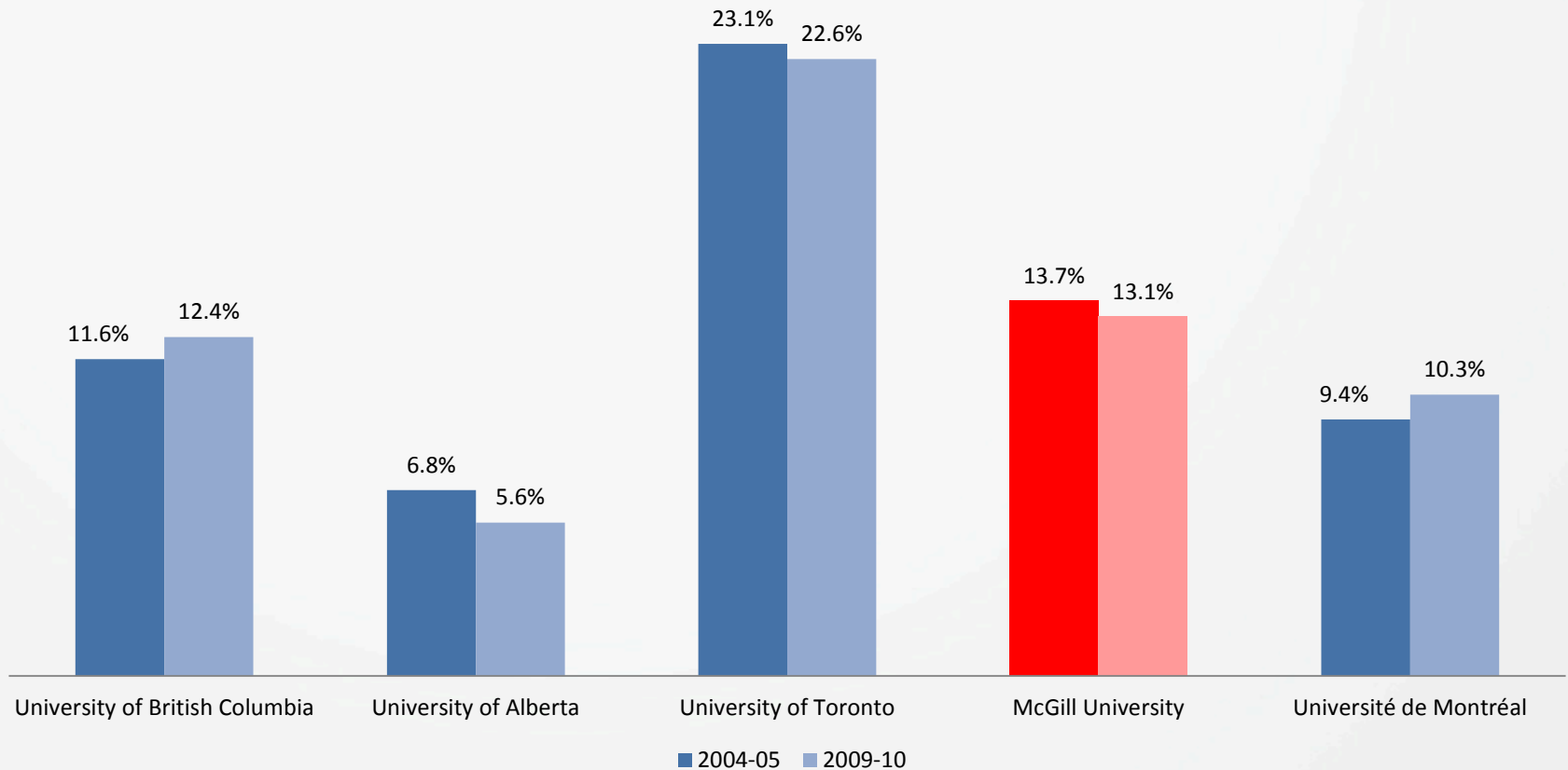
CIHR Funding Evolution

CIHR award dollars for G5

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	5-year change	2-year change
UBC	\$ 63,935	\$ 68,912	\$ 69,902	\$ 78,221	\$ 85,538	\$ 89,586	40.1%	14.5%
Alberta	\$ 37,466	\$ 37,441	\$ 38,307	\$ 40,961	\$ 44,022	\$ 40,532	8.2%	-1.0%
Toronto	\$ 127,522	\$ 137,603	\$ 155,326	\$ 164,641	\$ 174,701	\$ 163,137	27.9%	-0.9%
McGill	\$ 75,655	\$ 79,532	\$ 81,877	\$ 91,482	\$ 95,711	\$ 94,977	25.5%	3.8%
U de M	\$ 51,770	\$ 55,397	\$ 61,879	\$ 63,522	\$ 75,352	\$ 74,383	43.7%	17.1%
U5 Total	\$ 356,349	\$ 378,885	\$ 407,290	\$ 438,827	\$ 475,324	\$ 462,616	29.8%	5.4%
U15 excl. U5	\$ 195,536	\$ 208,418	\$ 207,652	\$ 222,914	\$ 237,744	\$ 260,652	33.3%	16.9%
U15 Total	\$ 551,885	\$ 587,304	\$ 614,942	\$ 661,742	\$ 713,069	\$ 723,267	31.1%	9.3%
CIHR Total	\$ 618,936	\$ 657,746	\$ 689,941	\$ 739,222	\$ 796,914	\$ 808,246	30.6%	9.3%

Market Share: CIHR

Market Share of G5 CIHR award dollars (grants, career awards and scholarships)



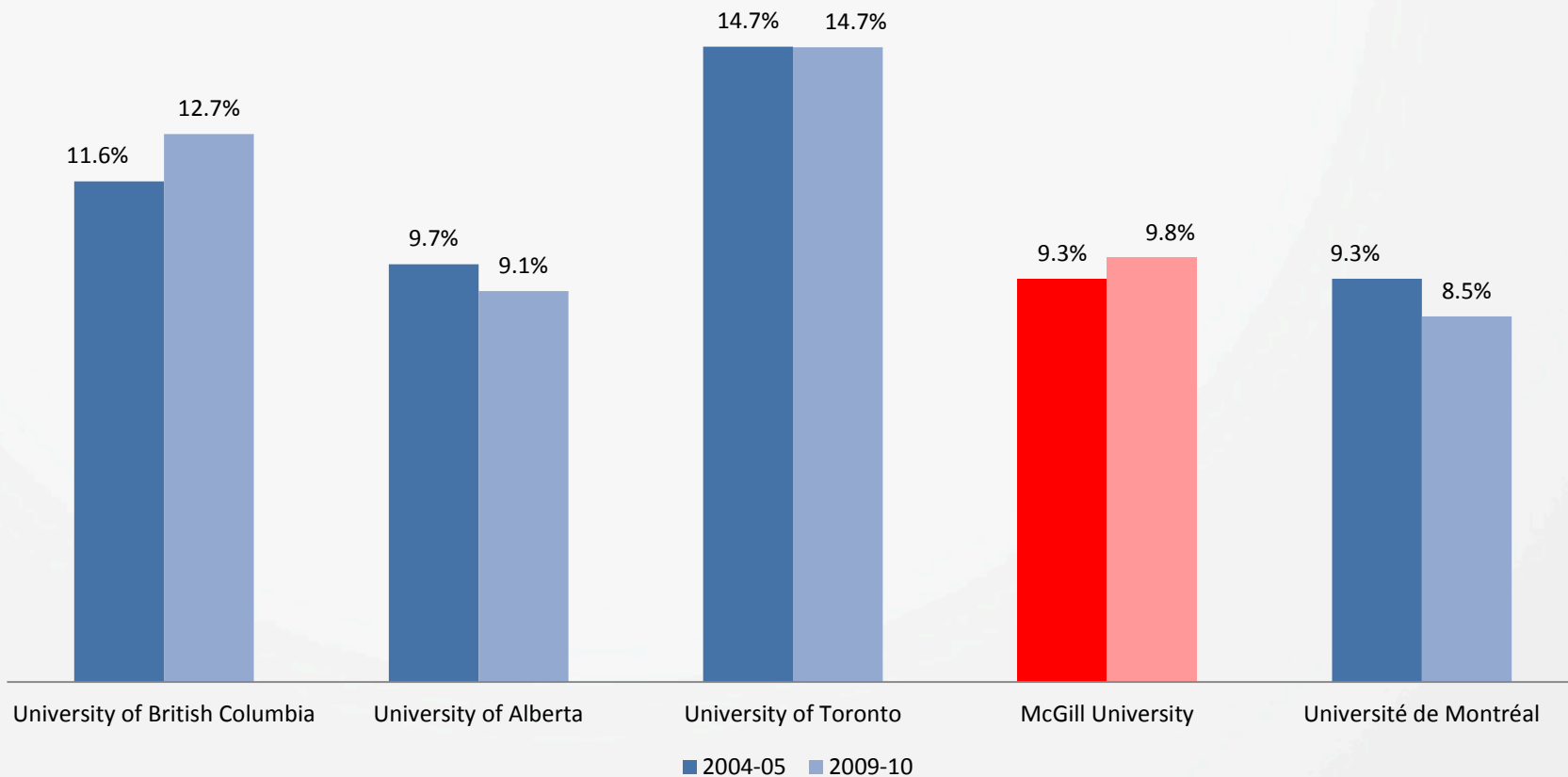
NSERC

NSERC award dollars for G5 institutions (thousands of dollars)

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	5-year change	2-year change
UBC	\$ 46,525	\$ 51,449	\$ 51,140	\$ 60,444	\$ 64,707	\$ 62,230	33.8%	3.0%
Alberta	\$ 38,809	\$ 39,225	\$ 39,313	\$ 42,774	\$ 45,298	\$ 44,390	14.4%	3.8%
U of T	\$ 59,021	\$ 61,441	\$ 63,940	\$ 66,778	\$ 67,530	\$ 72,112	22.2%	8.0%
McGill	\$ 37,430	\$ 40,137	\$ 40,116	\$ 41,044	\$ 44,825	\$ 48,151	28.6%	17.3%
U de M	\$ 37,468	\$ 38,189	\$ 38,010	\$ 40,690	\$ 41,651	\$ 41,516	10.8%	2.0%
U5 Total	\$ 219,253	\$ 230,442	\$ 232,521	\$ 251,730	\$ 264,011	\$ 268,400	22.4%	6.6%
U15 excl. U5	\$ 219,214	\$ 234,637	\$ 245,852	\$ 261,948	\$ 272,065	\$ 273,400	24.7%	4.4%
U15 Total	\$ 438,468	\$ 465,079	\$ 478,373	\$ 513,678	\$ 536,076	\$ 541,799	23.6%	5.5%
NSERC Total	\$ 641,016	\$ 680,668	\$ 703,314	\$ 755,450	\$ 796,508	\$ 819,122	27.8%	8.4%

Market Share: NSERC

Share of G13 NSERC award dollars (grants, career awards and scholarships)



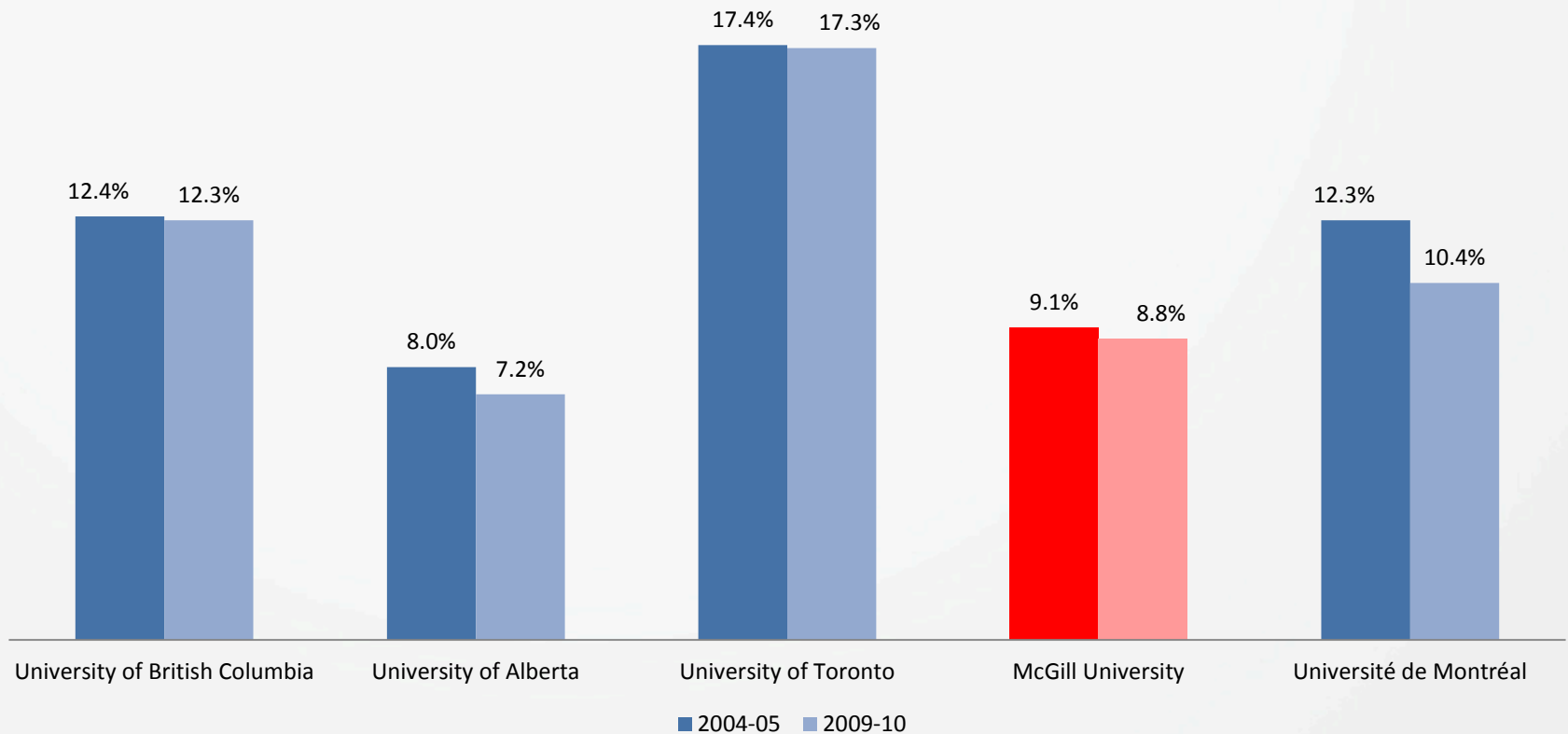
SSHRC

SSHRC award for G5 institutions (thousands of dollars)

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	5-year change	2-year change
UBC	\$ 14,313	\$ 16,347	\$ 16,603	\$ 17,249	\$ 16,332	\$ 18,448	28.9%	7.0%
Alberta	\$ 9,217	\$ 9,418	\$ 9,841	\$ 9,349	\$ 9,572	\$ 10,794	17.1%	15.4%
U of T	\$ 20,097	\$ 24,937	\$ 23,542	\$ 22,706	\$ 24,794	\$ 26,028	29.5%	14.6%
McGill	\$ 10,550	\$ 12,061	\$ 13,561	\$ 13,135	\$ 13,034	\$ 13,238	25.5%	0.8%
U de M	\$ 14,176	\$ 15,998	\$ 16,124	\$ 15,116	\$ 14,883	\$ 15,689	10.7%	3.8%
U5 Total	\$ 68,352	\$ 78,761	\$ 79,671	\$ 77,556	\$ 78,616	\$ 84,196	23.2%	8.6%
U15 excl. U5	\$ 47,239	\$ 55,121	\$ 59,176	\$ 61,607	\$ 63,933	\$ 66,202	40.1%	7.5%
U15 Total	\$ 115,592	\$ 133,882	\$ 138,847	\$ 139,163	\$ 142,548	\$ 150,398	30.1%	8.1%
SSHRC Total	\$ 200,202	\$ 230,019	\$ 239,509	\$ 243,742	\$ 252,890	\$ 264,083	31.9%	8.3%

Market Share: SSHRC

Market Share of U15 SSHRC award dollars (grants, career awards and scholarships)



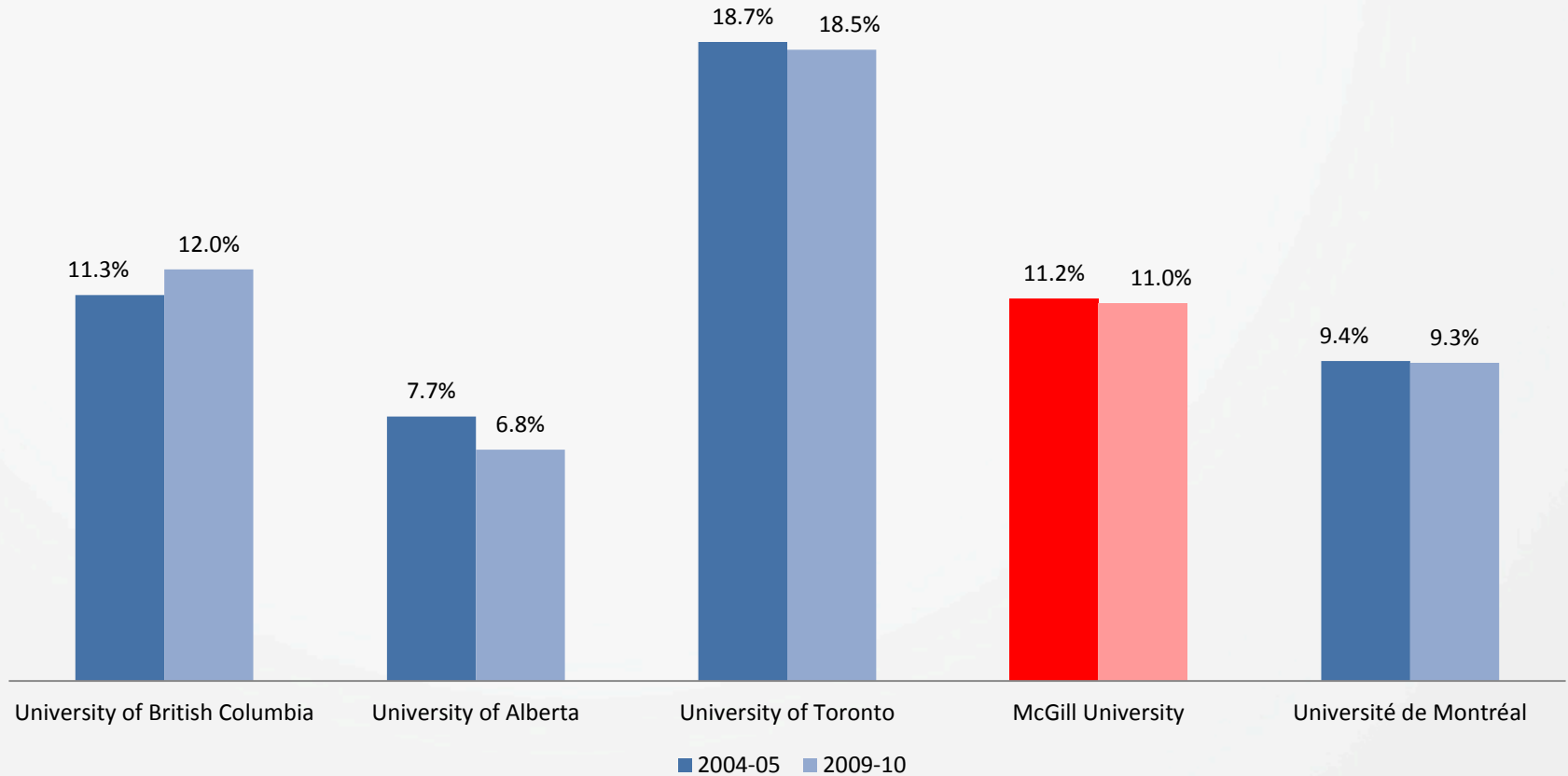
Tri-Council

Federal Tricouncil award dollars for U5 institutions (thousands of dollars)

	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	5-year change	2-year change
UBC	\$ 124,773	\$ 136,708	\$ 137,645	\$ 155,914	\$ 166,577	\$ 170,265	36.5%	9.2%
Alberta	\$ 85,493	\$ 86,085	\$ 87,462	\$ 93,085	\$ 98,892	\$ 95,716	12.0%	2.8%
U of T	\$ 206,640	\$ 223,981	\$ 242,808	\$ 254,125	\$ 267,026	\$ 261,277	26.4%	2.8%
McGill	\$ 123,635	\$ 131,730	\$ 135,554	\$ 145,662	\$ 153,570	\$ 156,366	26.5%	7.3%
U de M	\$ 103,413	\$ 109,584	\$ 116,014	\$ 119,328	\$ 131,886	\$ 131,588	27.2%	10.3%
U5 Total	\$ 643,955	\$ 688,088	\$ 719,482	\$ 768,113	\$ 817,950	\$ 815,211	26.6%	6.1%
U15 excl. U5	\$ 461,990	\$ 498,177	\$ 512,680	\$ 546,470	\$ 573,742	\$ 600,254	29.9%	9.8%
U15 Total	\$1,105,945	\$1,186,265	\$1,232,162	\$1,314,582	\$1,391,693	\$1,415,465	28.0%	7.7%
Tri-Council Total	\$1,105,945	\$1,186,265	\$1,232,162	\$1,311,451	\$1,388,544	\$1,414,237	27.9%	7.8%

Market Share: Tri-Council

Market Share of U15 Federal Tri-Council award dollars (grants, career awards and scholarships)



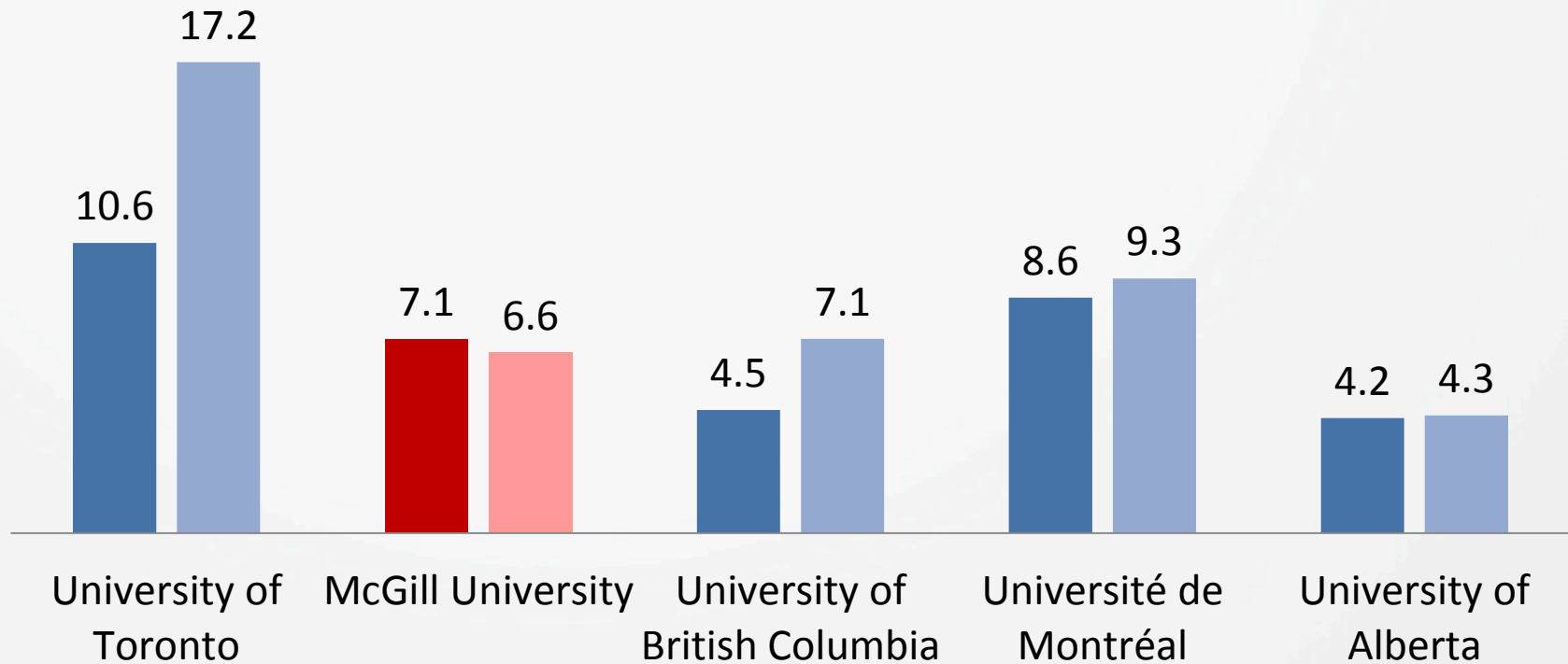
CFI Awards 2005-2010

University (including affiliates)	Total CFI Dollars	2005-06	2006-07	2007-08	2008-09	2009-10
University of Toronto	\$768,303,173	\$9,811,241	\$56,248,785	\$13,463,600	\$263,402,938	\$102,326,253
McGill University	\$347,776,602	\$6,521,774	\$14,243,707	\$9,498,273	\$103,290,887	\$39,512,270
University of British Columbia	\$320,977,105	\$4,145,824	\$28,475,881	\$9,703,488	\$7,699,844	\$42,584,194
Université de Montréal	\$317,848,050	\$7,997,565	\$47,412,567	\$4,558,320	\$5,587,549	\$55,230,181
University of Alberta	\$224,769,068	\$3,879,643	\$25,284,715	\$3,997,378	\$3,333,461	\$25,706,127

CFI Awards Market Share

Comparison of Market Share of CFI Awards among the G5

■ 2005-06 ■ 2009-10





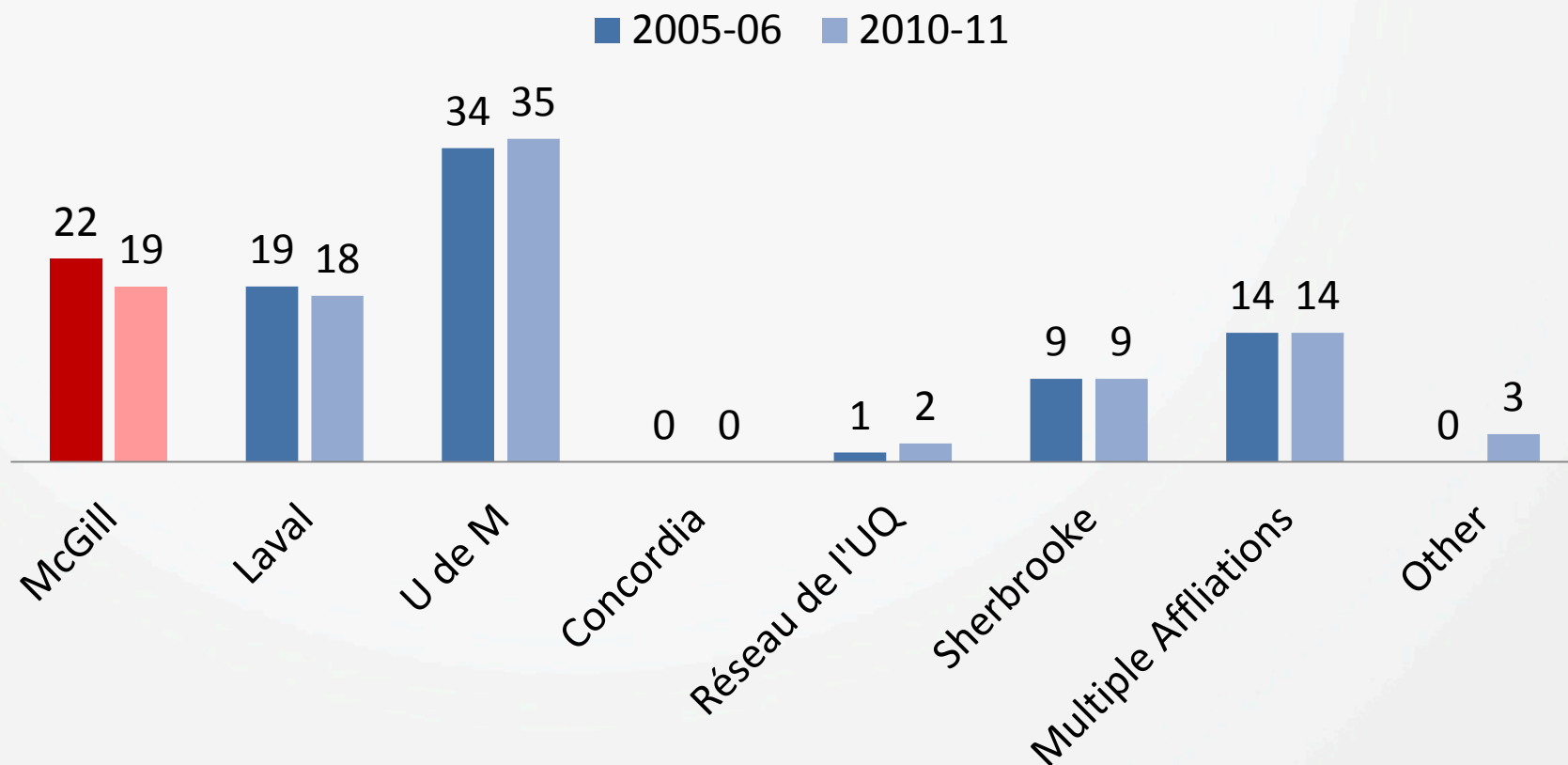
Provincial Funding Sources

Quebec Programs

- Fonds de la recherche en santé (FRSQ)
- Fonds québécois de la recherche sur la nature et les technologies (FQRNT)
- Fonds de la recherche sur la société et la culture (FQRSC)

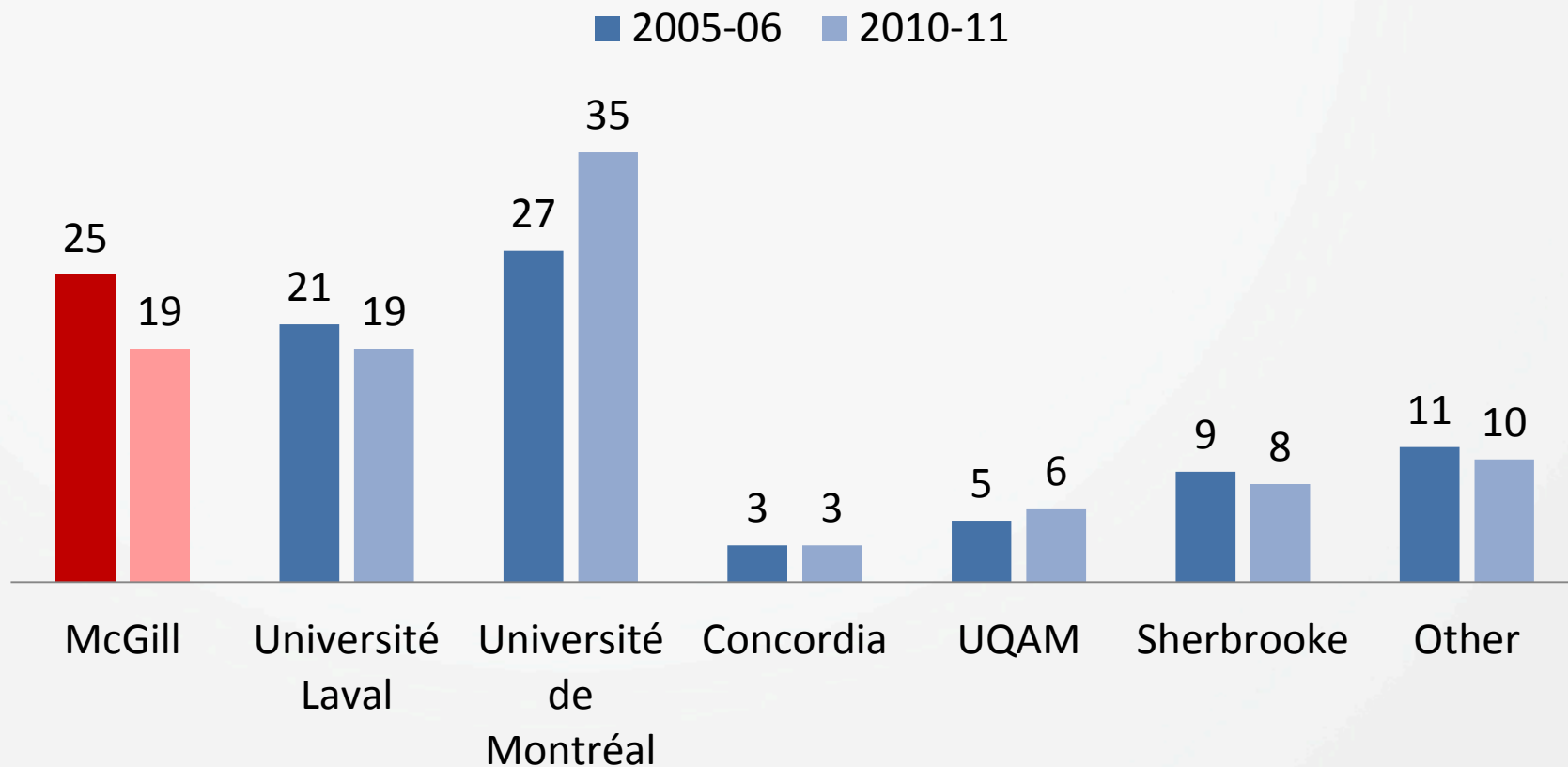
Fonds de la recherche en santé du Québec (FRSQ)

Market Share of Total FRSQ Funding



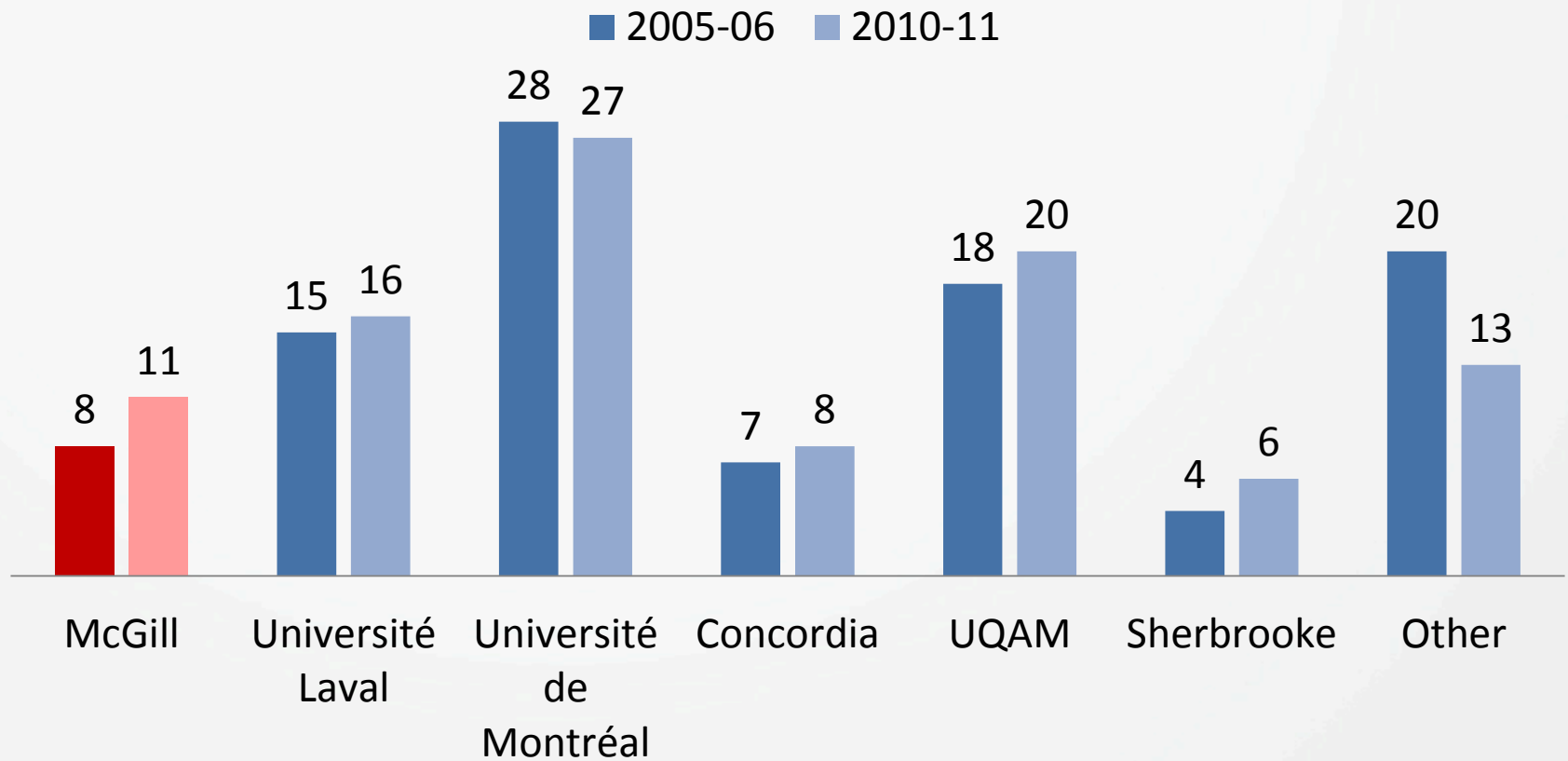
Fonds de la recherche sur la nature et les technologies (FQRNT)

Market Share of Total FQRNT Funding

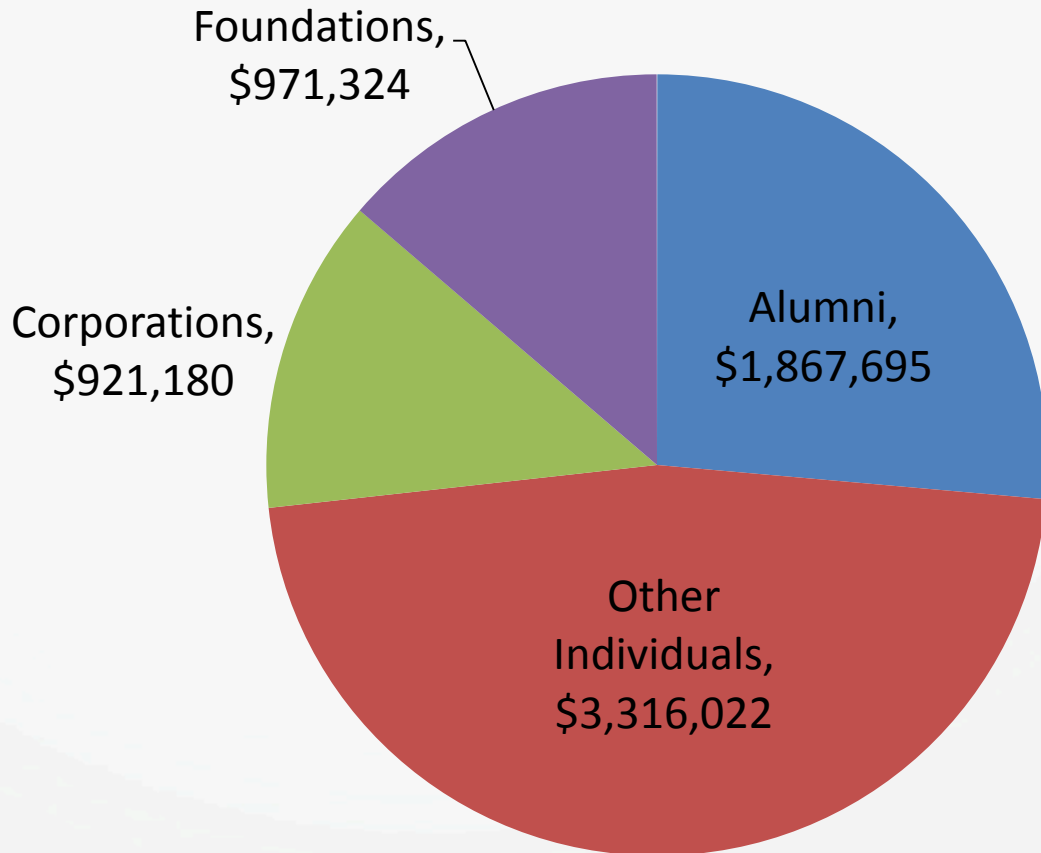


Fonds québécois de la recherche sur la société et la culture (FQRSC)

Market Share of Total FQRSC Funding



Philanthropy



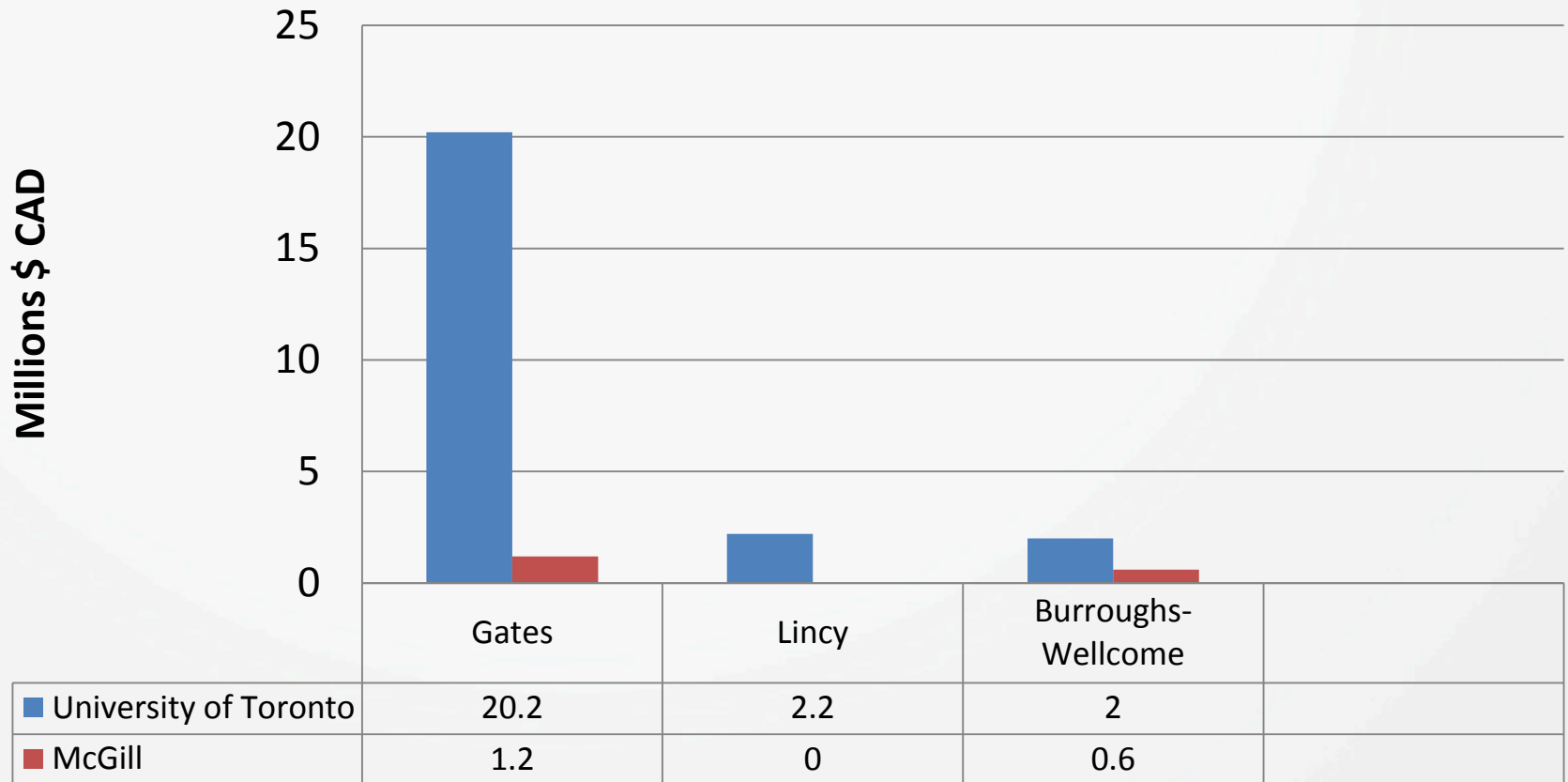
Private Support of McGill Research 2010-11

Donations to Research: **\$7.1-million**

Total Donations: **\$65.1-million**

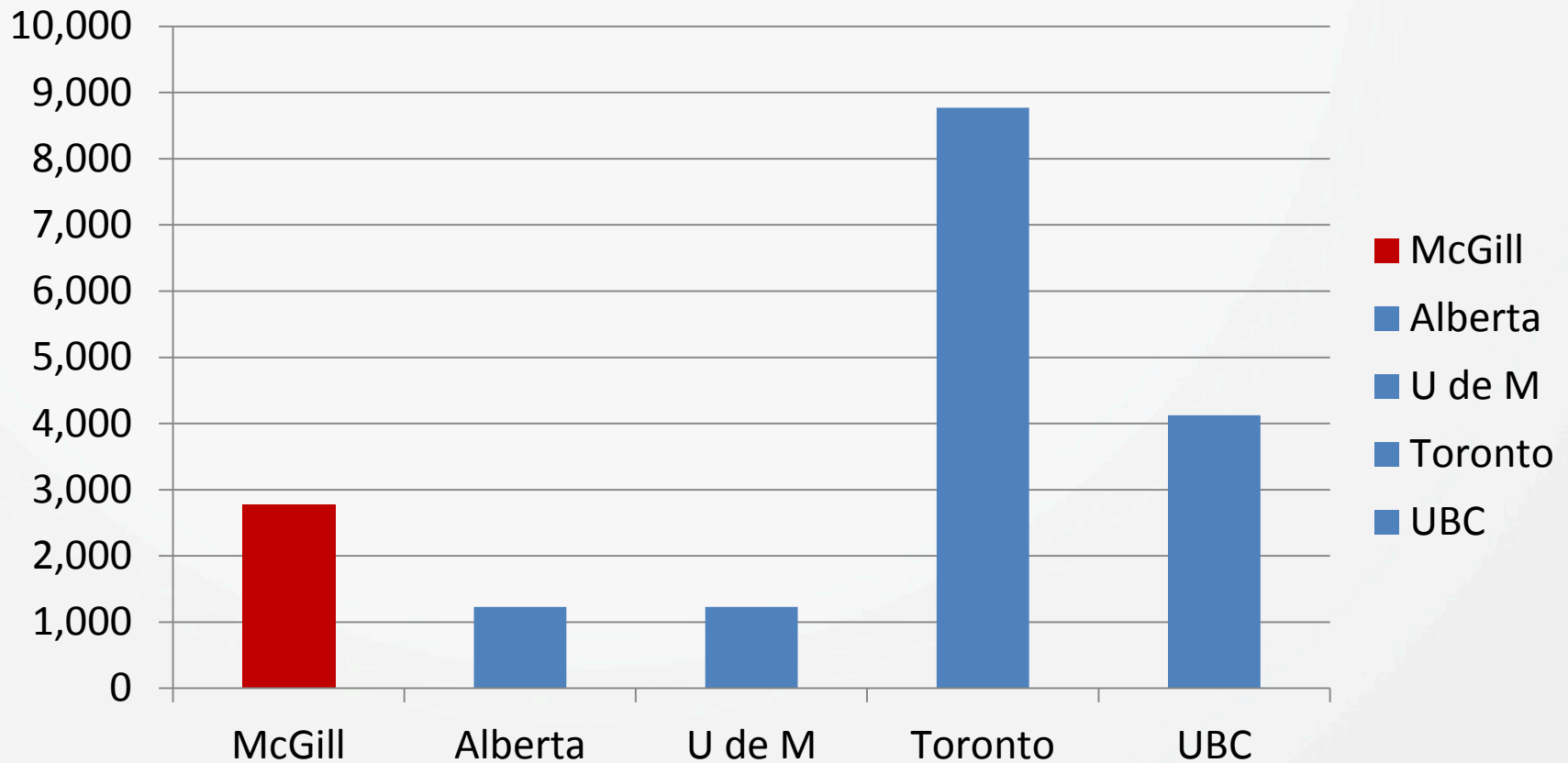
U.S. Grants

Not-for-Profit Funding (2005-2010)



U.S. Grants: National Institutes of Health (NIH)

Dollars Awarded by NIH per Tenure-Track Researcher 2009-10





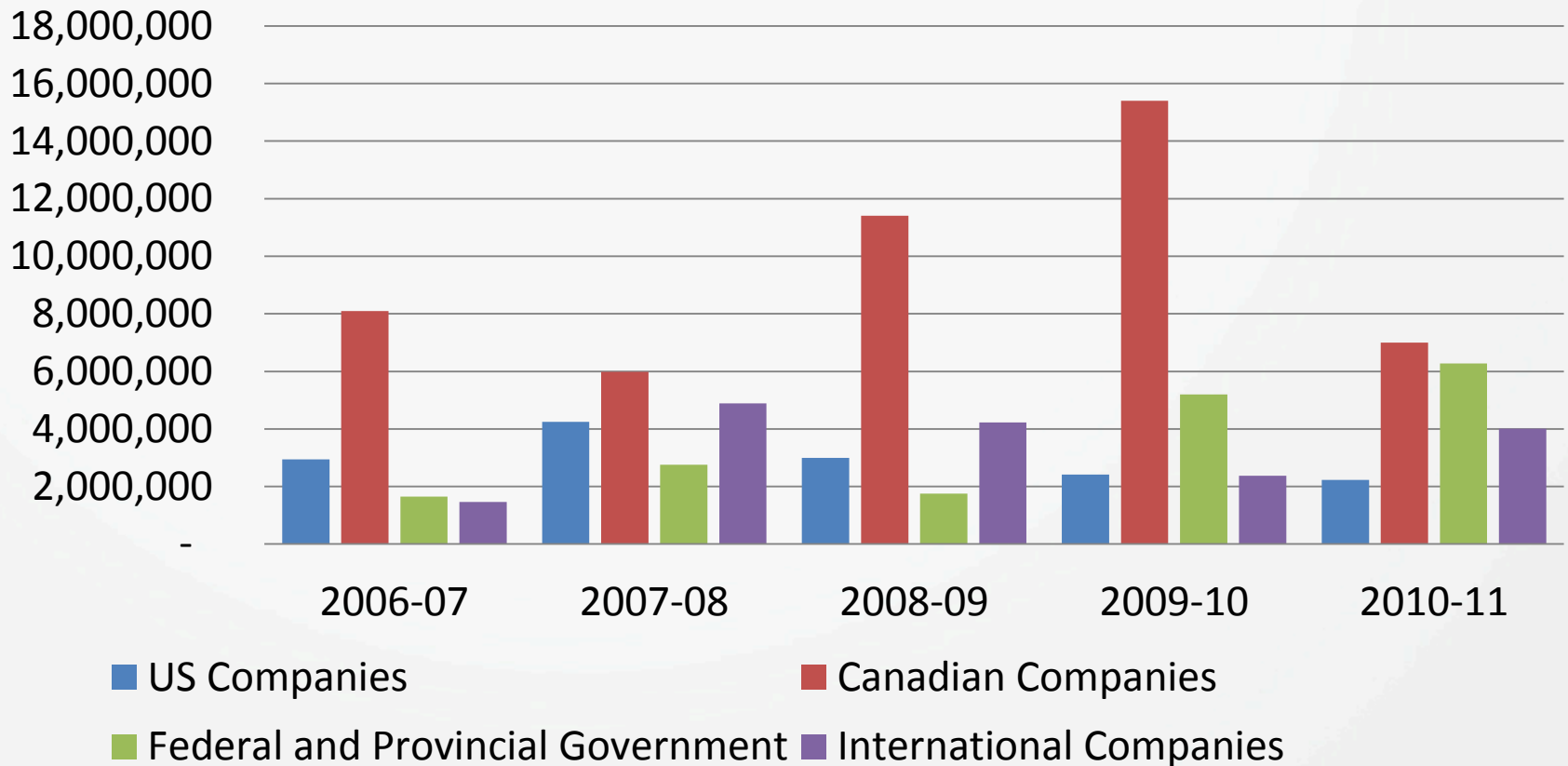
Report on Research Performance and Innovation

Part 2: Innovation and Business Engagement

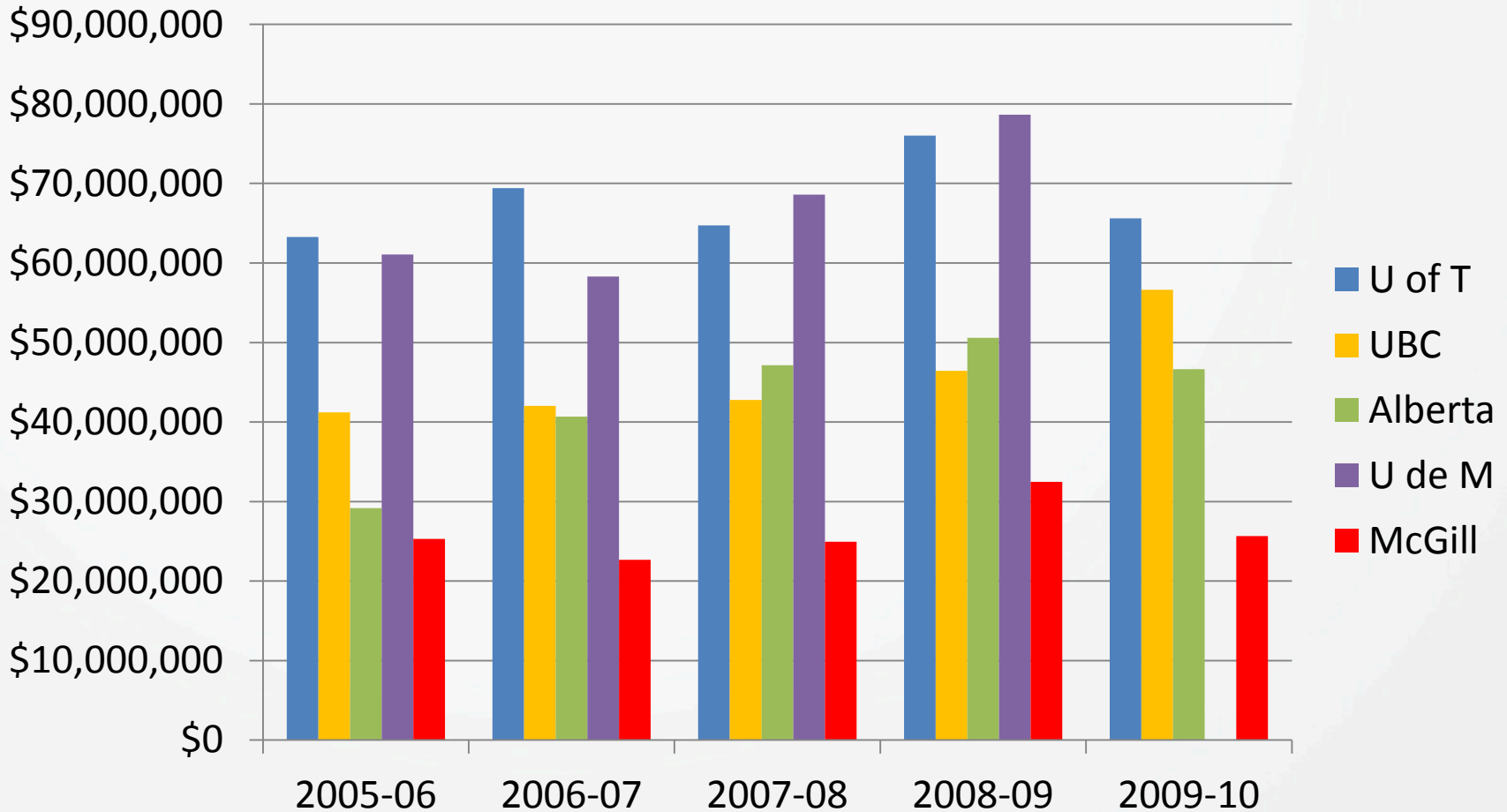
- G5 comparison of business enterprises
- Evolution of income from research contracts
- Trends in patents and licenses
- Partnership Metrics

Innovation: Research Contracts

Revenue from Research Contracts

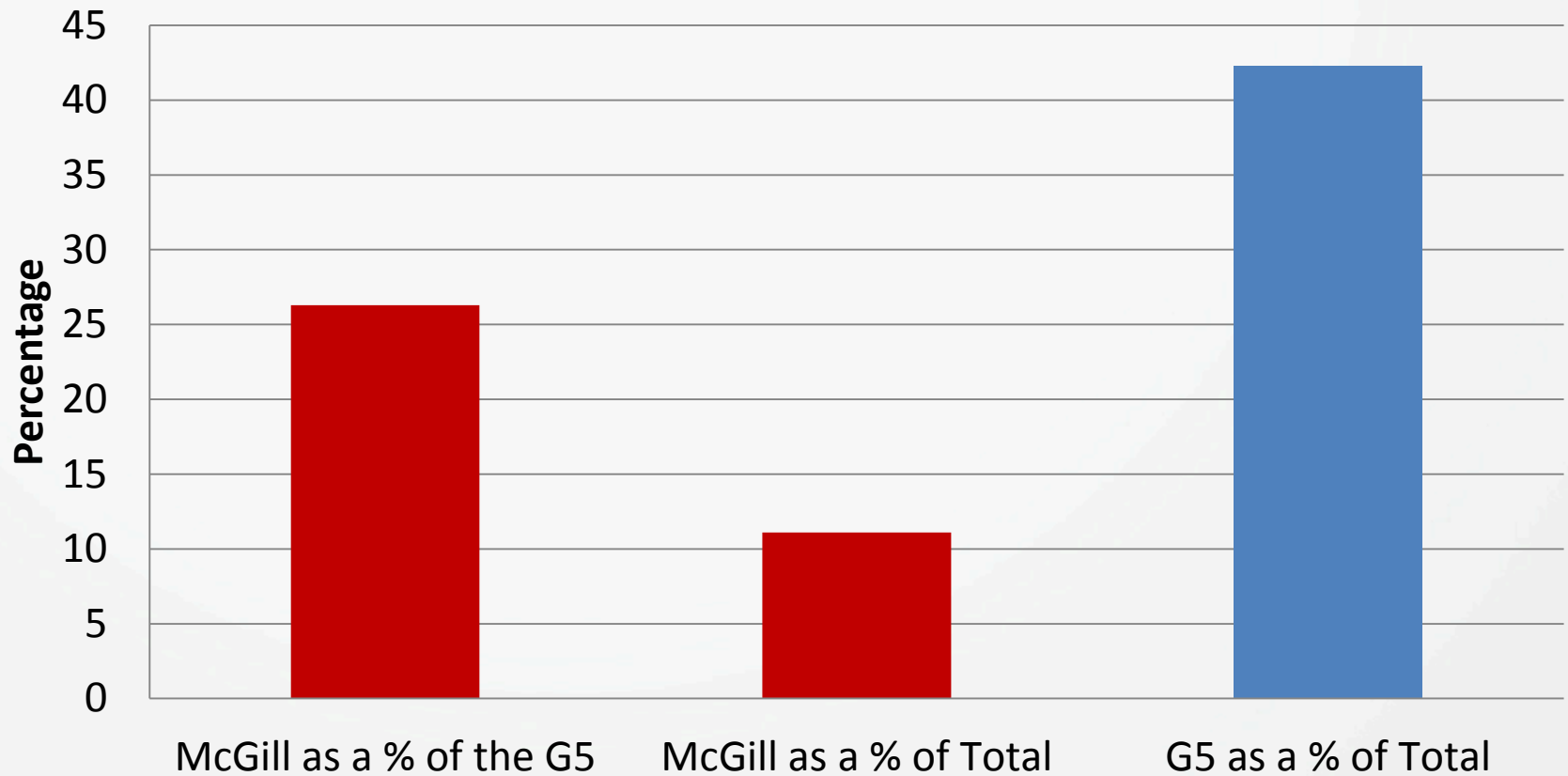


G5 Business Enterprise Income



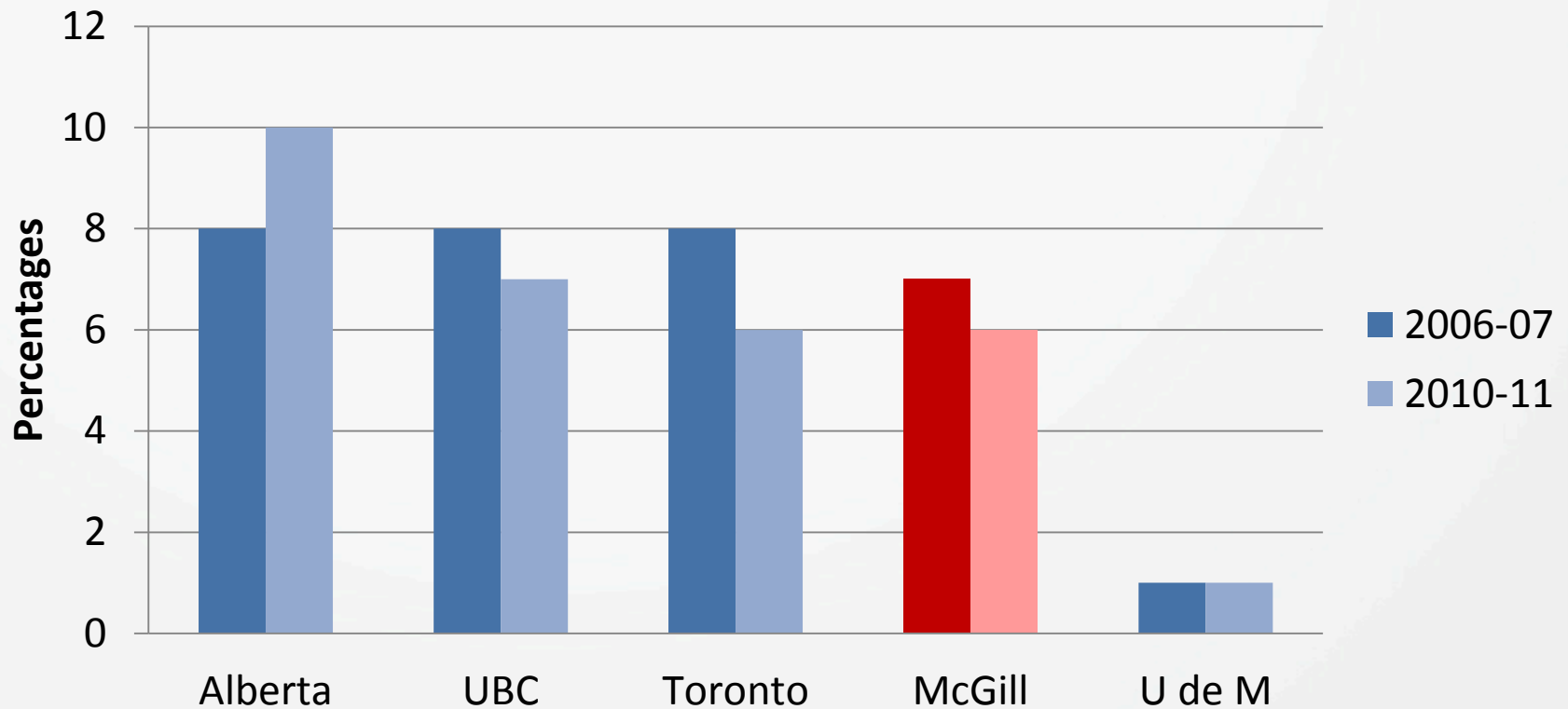
I2Is and POPs Market Share

Total Gap Funding \$ Awarded since 2005



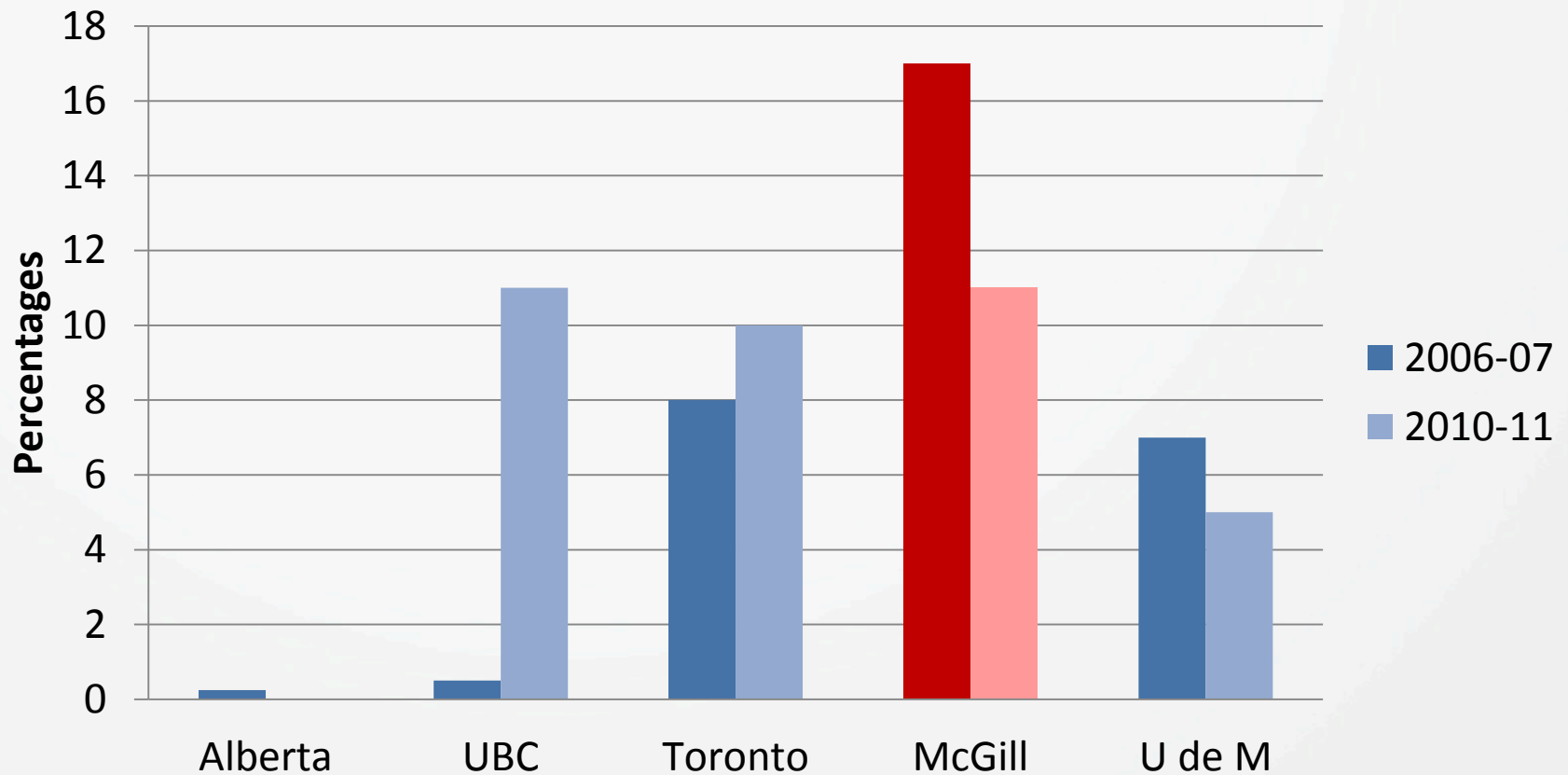
CRD Market Share

G5 Market Share of NSERC Collaborative Research and Development Program



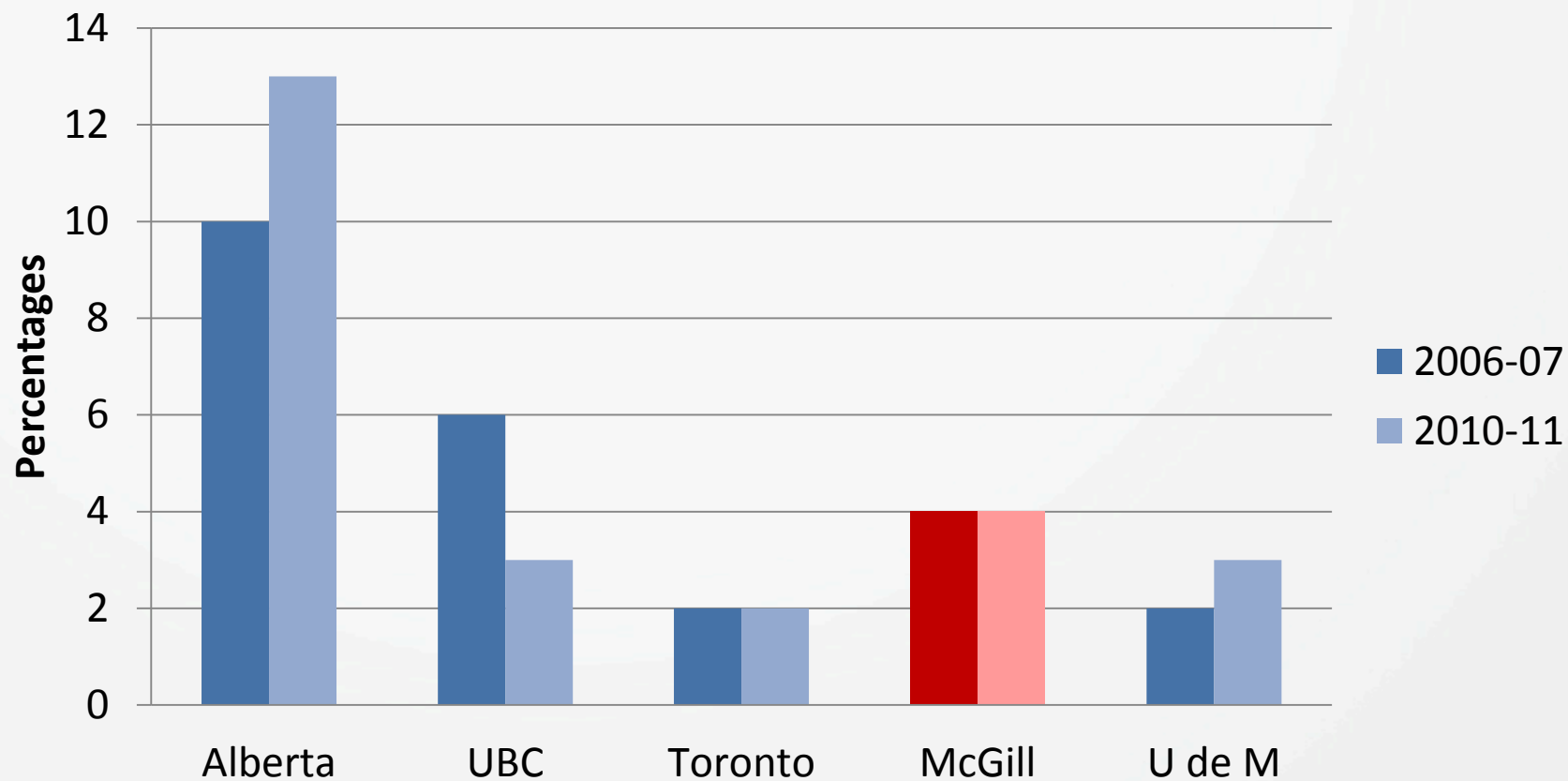
NSERC Strategic Networks Market Share

G5 Market Share of NSERC Strategic Networks



NSERC-Industry Chairs

G5 Market Share of NSERC-Industry Chairs



Partnership Metrics

University	Private Sector			Government			Publications
	N	%	Rank	N	%	Rank	N
University of Ottawa	157	4.0	2	382	9.6	2	3,962
Université de Montréal	404	4.5	1	529	5.9	4	8,906
University of Alberta	425	3.8	4	858	7.8	3	11,047
Université Laval	231	3.6	7	750	11.6	1	6,438
McMaster University	282	3.9	3	308	4.2	9	7,280
University of Waterloo	186	3.8	5	226	4.6	7	4,874
Queen's University	168	3.2	8	312	5.9	5	5,310
University of Calgary	214	3.7	6	252	4.4	8	5,781
McGill University	370	2.7	10	729	5.4	6	13,603
University of Western Ontario	166	3.0	9	214	3.8	10	5,616
G13	2,319	3.4		4,105	6.1%		

Protecting Intellectual Property

Institution	2009 Invention Disclosures	US Patents Issued	New Patent Applications	IP Index
UdM	123	9	156	288
McGill	124	12	121	257
UBC	157	13	76	246
Toronto (non-UHN)	148	7	34	189
Alberta	98	8	43	149
Toronto - UHN	87	0	29	116
Calgary	55	3	55	113
Laval	37	6	64	107
Queen's	79	9	18	106
McMaster	60	10	31	101
Waterloo	32	1	11	44
Sherbrooke	20	0	3	23

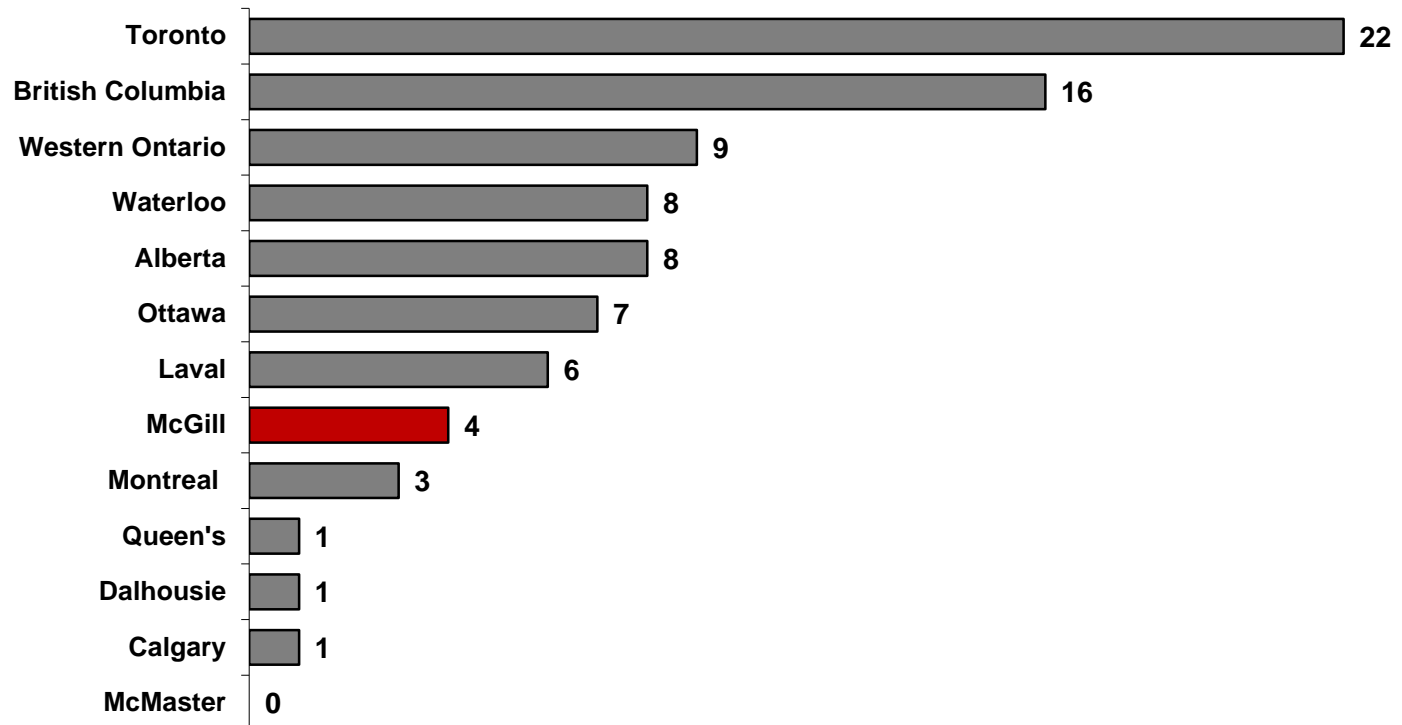
Commercial Activity and Income

Name	2009 Startups	2009 Licenses and Options Executed	Cumulative Active Licenses
McMaster	0	220	358
UBC	7	63	302
Waterloo	5	4	264
Sherbrooke	0	48	235
Alberta	2	31	198
Toronto (non-UHN)	7	23	180
Calgary	0	19	173
McGill	1	20	132
Laval	4	18	105
Queen's	0	15	75
Toronto - UHN	0	22	68
UdM	1	30	66

Institution	2009 Total Research Expenditures	2009 Adjusted Gross Income	2009 Gross Income Per Total Research Expenditures
Sherbrooke	\$116,117,520	\$8,612,493	\$0.0742
Toronto (non-UHN)	\$431,654,532	\$8,270,948	\$0.0192
Queen's	\$163,732,000	\$2,426,712	\$0.0148
UBC	\$475,285,174	\$5,605,835	\$0.0118
Calgary	\$524,539,669	\$5,700,016	\$0.0109
Laval	\$224,523,655	\$2,040,742	\$0.0091
Toronto - UHN	\$251,524,236	\$1,352,740	\$0.0054
McMaster	\$311,974,377	\$1,330,964	\$0.0043
Waterloo	\$144,089,362	\$427,368	\$0.0030
McGill	\$412,433,000	\$879,153	\$0.0021
Alberta	\$507,600,000	\$877,070	\$0.0017
UdM	\$376,745,930	\$495,688	\$0.0013

Start-Ups

Start-Up Companies Formed, Three-year Total
FY 2007 to FY 2009





Innovation Challenges

- Partnerships
- Commercial activity
- Income from commercialization

In summary

Funding	Ranking by Research Intensity in G5	Ranking by Market Share in G5
Sponsored Research Income	3	4
CIHR	3	2
NSERC	3	3
SSHRC	1	4
Tri-Council	2	3
Business Enterprise Income	5	5



Report on Research Performance and Innovation

Part 3: Major Wins and Achievements

- International Awards
- Federal Awards
- Provincial Awards
- Recap of BRAVO



Highlights: International

Key International Results 2010-11

- Africa: \$1-million to Professor Timothy Geary for new anti-parasitic drugs
- India, Kenya and the Caribbean: \$10.2-million to three interdisciplinary food security projects
- China: \$230,000 to Grace Fong for her study of Ming-Qing women's writing



Highlights: Federal Awards

- CIHR: Two Open Operating Grants at a total of \$6.46-million over five years
- SSHRC: Professor Gwyn Campbell awarded \$2.5-million over seven years through SSHRC Major Collaborative Research Initiatives.
- NSERC Strategic Network with FP Innovations awarded \$5.3-million over five years to Professor Theo van de Ven



Highlights: Provincial Awards

MDEIE-PSR-SIIRI

- This program brought in over \$2.5 million in 2010 (15 projects)
- Professor John Dalton awarded \$820,000, largest amount ever approved under MDEIE-PSR-SIIRI

Genome Québec

- Professor Mark Lathrop received \$5-million over five years through the Recruitment Program in Health Research.



Highlights: BRAVO Honorees

McGill researchers received the following awards:

- 13 Royal Society of Canada Fellowships (9 in 2011)
- 9 Orders of Canada
- 2 Prix du Québec (Prix Léon-Gérin and Prix Wilder Penfield)

Plus:

- Prix ACFAS – J.-Armand-Bombardier
- Steacie Fellowship
- NSERC 2010 Synergy Award for Innovation, Leo Derikx Category
- Killam Fellowship
- NSERC John C. Polanyi Award
- Induction into the Canadian Medical Hall of Fame



Report on Research Performance and Innovation

Part 4: Upcoming Opportunities

- Networks of Centres of Excellence (NCE) finalists for two \$25-million grants
- New India-Canada Centre of Excellence
- Canada Excellence Research Chairs (CERCs)
- CFI Round VII
- Strategic Reframing Initiative and increasing performance



Summary

McGill's research enterprise is:

- Stable or making small gains in research funding, and need to transform to recapture market share
- Doing well in early innovation and discoveries, but punching below our weight in outcomes and commercialization
- Enacting our vision for the future by strengthening the foundations of individual disciplines while building partnerships



Report on Research Performance and Innovation

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And thank you to Senate...

Questions?

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