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Biotechnology scientific activities in federal government departments and agencies, 2004/2005

Data on science and technology (S&T) expenditures and full-time equivalent allocated to biotechnology for the fiscal year 2004/2005 were collected from selected federal departments and agencies. Survey results contribute to the work of the Canadian Biotechnology Strategy.

The S&T data collected for biotechnology are composed of expenditures on research and development (R&D) and related scientific activities (RSA) for both intramural and extramural performers and also the full-time equivalent associated with these activities.

Highlights

- ▶ The federal government's science and technology expenditures on biotechnology continued to climb from \$744 million in 2003/2004 to \$791 million in 2004/2005 representing 9% of total federal science and technology expenditures (Table 1).
- ▶ In 2004/2005, a total of 1,656 person-years were devoted to biotechnology science and technology activities, representing 5% of the total federal science and technology person-years. Since 2002/2003, the number of government personnel engaged in biotechnology science and technology activities has been declining (Table 2).
- ▶ The largest recipient of science and technology biotechnology funds was the higher education sector, receiving \$403 million, an increase of 6% over the 2003/2004 expenditures. Of this amount, Canadian Institutes of Health Research continued to be the largest contributor with \$270 million followed by Canada Foundation for Innovation with \$69 million (Table 3A).
- ▶ The second largest performer is the federal government with \$262 million. The National Research Council of Canada accounted for 47% of all intramural government science and technology expenditures on biotechnology (Table 3A).

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- ▶ In 1999 and 2000, the federal government's intramural and extramural science and technology expenditures on biotechnology were approximately equal (roughly 50%). However, beginning in 2001/2002, the proportion of extramural expenditures increased. In 2004/2005, extramural expenditures amounted to twice as much as intramural expenditures. This is due mainly to increased federal funding to the higher education sector.
- ▶ The National Research Council of Canada reported 733 full time equivalents (44%) devoted to biotechnology science and technology activities. Agriculture and Agri-Food Canada followed with 400 person-years (24%) engaged in biotechnology activities (Table 4).
- ▶ In 2004/2005, \$760 million or 96% of identified biotechnology science and technology expenditures were devoted to research and development. This is an increase of 6% over 2003/2004 (Table 5).
- ▶ The National Research Council of Canada continued to be the largest performer with \$122 million. This amount represents 50% of the federal government's intramural research and development in biotechnology (Table 5).
- ▶ The largest funder was the Canadian Institutes of Health Research with \$277 million spent on biotechnology research and development. Of the \$277 million, \$267 million was funded to the higher education sector.
- ▶ The federal government's research and development personnel engaged in biotechnology has decreased slightly from 1,491 in 2003/2004 to 1,462 full-time equivalents in 2004/2005 (Table 2, 10).
- ▶ The National Research Council of Canada had the most research and development personnel engaged in biotechnology research and development activities (Table 6).
- ▶ When examining the biotechnology research and development personnel, technicians constituted 38%, scientific and professional was 36% and the other category had the remaining 26%.
- ▶ Genome Canada continued to lead with 93% of their total R&D budget spent on biotechnology research and development. Genome Canada's primary responsibility is to fund research programs for genomics and proteomics which are components of biotechnology. Canadian Institutes of Health Research followed second with 42% of their research and development budget allocated to biotechnology (Table 8).

Table 1 Federal government S&T expenditures on biotechnology by activity and performer, 1999/2000 to 2004/2005

Activity / Performer	Intramural	Business enterprise	Higher education	Other ¹ performers	Foreign performers	Total
thousands of dollars						
2004/2005						
Research and experimental development (R&D)	242,391	33,467	393,321	86,837	4,123	760,139
Related scientific activities (RSA)	19,468	576	9,300	1,155	514	31,013
Total expenditures	261,859	34,043	402,621	87,992	4,637	791,152
2003/2004^f						
Research and experimental development (R&D)	226,513	26,038	370,359	87,412	4,591	714,913
Related scientific activities (RSA)	17,218	1,323	8,757	1,244	519	29,061
Total expenditures	243,731	27,361	379,116	88,656	5,110	743,974
2002/2003^f						
Research and experimental development (R&D)	219,583	30,056	332,745	56,819	4,294	643,497
Related scientific activities (RSA)	15,077	1,296	7,351	979	516	25,219
Total expenditures	234,660	31,352	340,096	57,798	4,810	668,716
2001/2002						
Research and experimental development (R&D)	223,036	32,881	199,034	79,121	3,785	537,857
Related scientific activities (RSA)	9,728	576	7,311	766	581	18,962
Total expenditures	232,764	33,457	206,345	79,887	4,366	556,819
2000/2001						
Research and experimental development (R&D)	185,027	25,956	197,859	528	2,693	412,063
Related scientific activities (RSA)	8,682	6,628	4,528	323	88	20,249
Total expenditures	193,709	32,584	202,387	851	2,781	432,312
1999/2000						
Research and experimental development (R&D)	177,855	34,577	164,521	628	1,922	379,503
Related scientific activities (RSA)	6,696	922	4,638	250	0	12,506
Total expenditures	184,551	35,499	169,159	878	1,922	392,009

1. "Other" includes Canadian non-profit institutions and provincial and municipal governments.

Table 2 Federal government personnel engaged in biotechnology S&T activities by category, 1999/2000 to 2004/2005

Category	Activity				Total
	R&D	RSA	Administration of R&D	Administration of RSA	
full-time equivalent					
2004/2005					
Scientific and professional (includes executive)	483	131	38	4	656
Technical	544	25	12	0	581
Others ¹	230	29	155	5	419
Total full-time equivalent	1,257	185	205	9	1,656
2003/2004^r					
Scientific and professional (includes executive)	512	147	46	9	714
Technical	581	41	4	0	626
Others ¹	212	33	136	6	387
Total full-time equivalent	1,305	221	186	15	1,727
2002/2003^r					
Scientific and professional (includes executive)	556	129	30	3	718
Technical	624	38	4	0	666
Others ¹	224	24	107	2	357
Total full-time equivalent	1,404	191	141	5	1,741
2001/2002					
Scientific and professional (includes executive)	525	42	33	1	601
Technical	592	19	9	0	620
Others ¹	207	4	72	1	284
Total full-time equivalent	1,324	65	114	2	1,505
2000/2001					
Scientific and professional (includes executive)	531	43	21	2	597
Technical	443	20	1	0	464
Others ¹	191	7	44	2	244
Total full-time equivalent	1,165	70	66	4	1,305
1999/2000^r					
Scientific and professional (includes executive)	509	49	19	1	578
Technical	417	21	0	0	438
Others ¹	166	5	43	2	216
Total full-time equivalent	1,092	75	62	3	1,232

1. Includes administrative and foreign service, administrative support, operational and military personnel.

Table 3A Federal government S&T expenditures on biotechnology activities by department or agency and by performer, 2004/2005

Department /Agency	Intramural	Business enterprise	Higher education	Other ¹ performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	67,073	0	0	0	0	67,073
Canada Foundation for Innovation	2,005	0	69,000	0	0	71,005
Canadian Institutes of Health Research	19,466	0	269,533	6,844	3,387	299,230
Environment Canada	1,364	447	122	0	0	1,933
Fisheries and Oceans Canada	3,800	0	50	10	0	3,860
Genome Canada	2,660	0	0	80,003	0	82,663
Health Canada	10,535	0	25	0	105	10,665
Industry Canada	9,812	22,001	0	0	0	31,813
National Defence	10,177	1,537	1,734	5	0	13,453
National Research Council of Canada	123,864	9,365	0	1,090	0	134,319
Natural Resources Canada	7,699	19	450	5	0	8,173
Natural Sciences and Engineering Research Council of Canada	3,155	674	58,266	0	1,048	63,143
Social Sciences and Humanities Research Council of Canada	249	0	3,441	35	97	3,822
Total Expenditures	261,859	34,043	402,621	87,992	4,637	791,152

1. "Other" includes Canadian non-profit institutions and provincial and municipal governments.

Federal government S&T expenditures on biotechnology by performer, 1999/00 to 2004/05

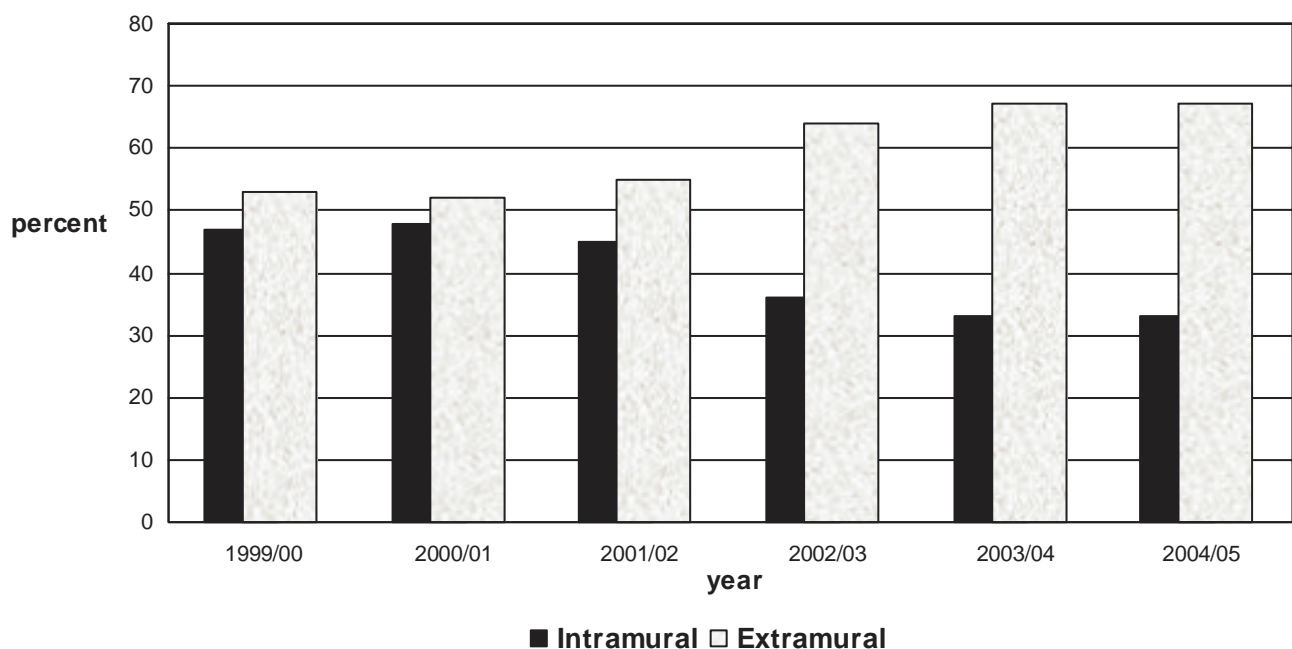


Table 3B Federal government expenditures on biotechnology S&T activities by department or agency 1999/2000 to 2004/2005

Department /Agency	S&T					
	1999/2000	2000/2001	2001/2002	2002/2003 ^f	2003/2004 ^f	2004/2005
	thousands of dollars					
Agriculture and Agri-Food Canada	55,479	57,227	63,936	63,936	63,936	67,073
Canada Foundation for Innovation	...	33,517	43,915	82,700	78,261	71,005
Canadian Institutes of Health Research	...	133,652	176,406	232,291	271,135	299,230
Environment Canada	1,389	4,938	1,576	1,748	1,747	1,933
Fisheries and Oceans Canada	2,600	2,251	3,663	3,663	2,916	3,860
Genome Canada	...	...	34,268	50,013	80,701	82,663
Health Canada	4,798	4,765	7,552	14,369	14,592	10,665
Industry Canada	32,913	30,425	34,683	27,247	23,630	31,813
Medical Research Council	133,637	...	...	...	...	...
National Defence	...	...	0	8,612	13,850	13,453
National Research Council of Canada	108,630	110,285	130,592	124,772	121,389	134,319
Natural Resources Canada	7,485	7,914	9,110	6,110	8,537	8,173
Natural Sciences and Engineering Research Council of Canada	44,000	44,605	48,588	50,339	59,204	63,143
Social Sciences and Humanities Research Council of Canada	1,078	2,733	2,530	2,916	4,076	3,822
Total expenditures	392,009	432,312	556,819	668,716	743,974	791,152

Table 3C Federal government expenditures on biotechnology R&D activities by department or agency 1999/2000 to 2004/2005

Department /Agency	R&D					
	1999/2000	2000/2001	2001/2002	2002/2003 ^f	2003/2004 ^f	2004/2005
	thousands of dollars					
Agriculture and Agri-Food Canada	55,479	57,227	63,936	63,936	63,936	67,073
Canada Foundation for Innovation	...	33,517	43,915	82,700	78,261	71,005
Canadian Institutes of Health Research	...	133,652	172,912	229,448	268,290	296,378
Environment Canada	1,222	3,593	1,322	1,223	962	1,357
Fisheries and Oceans Canada	2,600	2,251	2,924	2,924	2,320	3,360
Genome Canada	...	...	34,268	50,013	80,701	82,663
Health Canada	3,049	3,049	4,988	6,711	7,462	5,557
Industry Canada	29,008	20,360	29,840	21,658	17,305	22,001
Medical Research Council	133,637	...	...	...	...	...
National Defence	...	...	0	8,150	13,780	13,316
National Research Council of Canada	107,822	108,772	129,177	124,072	118,819	131,183
Natural Resources Canada	6,779	7,666	8,983	5,181	7,238	7,210
Natural Sciences and Engineering Research Council of Canada	39,200	39,805	43,359	44,922	52,277	55,755
Social Sciences and Humanities Research Council of Canada	707	2,171	2,233	2,559	3,562	3,281
Total expenditures	379,503	412,063	537,857	643,497	714,913	760,139

Table 4 Federal government personnel engaged in biotechnology S&T activities by department or agency and by category, 2004/2005

Department /Agency	Scientific and professional	Technical	Other ¹	Total
full-time equivalent				
Agriculture and Agri-Food Canada	160	160	80	400
Canada Foundation for Innovation	4	4	2	10
Canadian Institutes of Health Research	20	0	112	132
Environment Canada	11	4	0	15
Fisheries and Oceans Canada	15	18	2	35
Genome Canada	0	0	33	33
Health Canada	65	27	9	101
Industry Canada	61	1	23	85
National Defence	9	10	2	21
National Research Council of Canada	257	332	144	733
Natural Resources Canada	39	25	1	65
Natural Sciences and Engineering Research Council of Canada	15	0	9	24
Social Sciences and Humanities Research Council of Canada	0	0	2	2
Total full-time equivalent	656	581	419	1,656

1. Includes administrative and foreign service, administrative support, operational and military personnel.

Table 5 Federal government R&D expenditures on biotechnology activities by department or agency and by performer, 2004/2005

Department /Agency	Intramural	Business enterprise	Higher education	Other ¹ performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	67,073	0	0	0	0	67,073
Canada Foundation for Innovation	2,005	0	69,000	0	0	71,005
Canadian Institutes of Health Research	19,290	0	266,955	6,779	3,354	296,378
Environment Canada	1,006	229	122	0	0	1,357
Fisheries and Oceans Canada	3,300	0	50	10	0	3,360
Genome Canada	2,660	0	0	80,003	0	82,663
Health Canada	5,427	0	25	0	105	5,557
Industry Canada	0	22,001	0	0	0	22,001
National Defence	10,110	1,467	1,734	5	0	13,316
National Research Council of Canada	121,818	9,365	0	0	0	131,183
Natural Resources Canada	6,736	19	450	5	0	7,210
Natural Sciences and Engineering Research Council of Canada	2,789	386	51,956	0	624	55,755
Social Sciences and Humanities Research Council of Canada	177	0	3,029	35	40	3,281
Total Expenditures	242,391	33,467	393,321	86,837	4,123	760,139

1. "Other" includes Canadian non-profit institutions and provincial and municipal governments.

Table 6 Federal government R&D personnel engaged in biotechnology R&D activities by department or agency and by category, 2004/2005

Department /Agency	Scientific and professional	Technical	Other ¹	Total
	full-time equivalent			
Agriculture and Agri-Food Canada	160	160	80	400
Canada Foundation for Innovation	4	4	2	10
Canadian Institutes of Health Research	20	0	109	129
Environment Canada	6	4	0	10
Fisheries and Oceans Canada	15	18	2	35
Genome Canada	0	0	33	33
Health Canada	24	22	3	49
Industry Canada	0	0	0	0
National Defence	8	10	2	20
National Research Council of Canada	238	319	144	701
Natural Resources Canada	33	19	1	53
Natural Sciences and Engineering Research Council of Canada	13	0	8	21
Social Sciences and Humanities Research Council of Canada	0	0	1	1
Total full-time equivalent	521	556	385	1,462

1. Includes administrative and foreign service, administrative support, operational and military personnel.

Table 7 Comparison of federal government S&T¹ expenditures and biotechnology S&T expenditures by department or agency, 2004/2005

Department /Agency	Total S&T ¹ expenditures	Biotechnology S&T expenditures	Biotechnology S&T expenditures as a percentage of total S&T expenditures
	thousands of dollars		percentage
Agriculture and Agri-Food Canada	352,298	67,073	19
Canada Foundation for Innovation	308,719	71,005	23
Canadian Institutes of Health Research	718,861	299,230	42
Environment Canada	749,641	1,933	0
Fisheries and Oceans Canada	273,755	3,860	1
Genome Canada	88,769	82,663	93
Health Canada	284,490	10,665	4
Industry Canada	419,122	31,813	8
National Defence	479,885	13,453	3
National Research Council of Canada	789,702	134,319	17
Natural Resources Canada	519,732	8,173	2
Natural Sciences and Engineering Research Council of Canada	814,427	63,143	8
Social Sciences and Humanities Research Council of Canada	529,046	3,822	1
Others	2,785,111	..	..
Total Expenditures	9,113,558	791,152	9

1. Source: Federal science expenditures and personnel 2005/2006 survey.

Table 8 Comparison of federal government R&D¹ expenditures and biotechnology R&D expenditures by department or agency, 2004/2005

Department /Agency	Total R&D ¹ expenditures	Biotechnology R&D expenditures	Biotechnology R&D expenditures as a percentage of total R&D expenditures
	thousands of dollars		percentage
Agriculture and Agri-Food Canada	264,950	67,073	25
Canada Foundation for Innovation	308,719	71,005	23
Canadian Institutes of Health Research	712,010	296,378	42
Environment Canada	231,128	1,357	1
Fisheries and Oceans Canada	69,845	3,360	5
Genome Canada	88,769	82,663	93
Health Canada	62,117	5,557	9
Industry Canada	351,908	22,001	6
National Defence	356,974	13,316	4
National Research Council of Canada	706,452	131,183	19
Natural Resources Canada	335,726	7,210	2
Natural Sciences and Engineering Research Council of Canada	712,683	55,755	8
Social Sciences and Humanities Research Council of Canada	465,690	3,281	1
Others	964,049	..	..
Total Expenditures	5,631,020	760,139	13

1. Source: Federal science expenditures and personnel 2005/2006 survey.

Table 9 Comparison of federal government S&T¹ personnel and biotechnology S&T personnel by department or agency, 2004/2005

Department /Agency	Total S&T ¹ personnel	Biotechnology S&T personnel	Biotechnology personnel in S&T as a percentage of total S&T personnel
	full-time equivalent		percentage
Agriculture and Agri-Food Canada	2,325	400	17
Canada Foundation for Innovation	46	10	22
Canadian Institutes of Health Research	288	132	46
Environment Canada	3,238	15	0
Fisheries and Oceans Canada	1,845	35	2
Genome Canada	34	33	97
Health Canada	2,452	101	4
Industry Canada	967	85	9
National Defence	2,016	21	1
National Research Council of Canada	4,178	733	18
Natural Resources Canada	3,606	65	2
Natural Sciences and Engineering Research Council of Canada	311	24	8
Social Sciences and Humanities Research Council of Canada	178	2	1
Others	13,052	..	..
Total full-time equivalent	34,536	1,656	5

1. Source: Federal science expenditures and personnel 2005/2006 survey.

Table 10 Comparison of federal government R&D¹ personnel and biotechnology R&D personnel by department or agency, 2004/2005

Department /Agency	Total R&D ¹ personnel	Biotechnology R&D personnel	Biotechnology personnel in R&D as a percentage of total R&D personnel
	full-time equivalent		percentage
Agriculture and Agri-Food Canada	1,674	400	24
Canada Foundation for Innovation	46	10	22
Canadian Institutes of Health Research	282	129	46
Environment Canada	906	10	1
Fisheries and Oceans Canada	506	35	7
Genome Canada	34	33	97
Health Canada	426	49	12
Industry Canada	346	0	0
National Defence	1,583	20	1
National Research Council of Canada	3,000	701	23
Natural Resources Canada	1,966	53	3
Natural Sciences and Engineering Research Council of Canada	272	21	8
Social Sciences and Humanities Research Council of Canada	101	1	1
Others	2,682	..	..
Total full-time equivalent	13,824	1,462	11

1. Source: Federal science expenditures and personnel 2005/2006 survey.

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^p preliminary
- ^r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- F too unreliable to be published

Note

Due to rounding, components may not add to totals.

This publication was prepared by **Christine Delorey** under the direction of **Lloyd Lizotte**, Subject Matter Manager, Science and Technology Surveys section, Science, Innovation and Electronic Information Division.

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<http://www.statcan.ca:8096/bsolc/english/bsolc?catno=88-202-X>

Federal Science Activities, 2004-2005, Catalogue No. 88-204-XIE, annual. It presents statistics on the federal government's activities in science and technology (S&T). It covers expenditures and full-time equivalent by type of science, performing sectors, provinces, federal departments and agencies.

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