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## Biotechnology scientific activities in federal government departments and agencies, 2003-2004

Data on science and technology (S&T) expenditures and full-time equivalent allocated to biotechnology for the fiscal year 2003-2004 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 S&T expenditures on biotechnology increased from \$678 million in 2002-03 to \$746 million in 2003-04 (10.1%). Most of the increase comes from augmented expenditures in two granting councils: the Canadian Institutes of Health Research and Genome Canada, with respectively \$40 million and \$30 million increase in spending.
- ▶ When comparing biotechnology as a percentage of total federal government S&T expenditures, the 2003-04 value represents 8%. The value of S&T expenditures in biotechnology have more than doubled since 1998-99, when they represented 5.5% of the federal government's total S&T expenditures.
- ▶ In 2003-2004, \$717 million or 96% of identified biotechnology expenditures were devoted to R&D. The National Research Council continues to be the largest performer with \$113 million and the Canadian Institutes of Health Research (CIHR) is the largest funder (\$251 million) of biotechnology R&D expenditures.
- ▶ The largest recipient of S&T biotechnology funds was the higher education sector, receiving \$379 million an increase of 11% over the 2002-2003 funds. Of this amount, CIHR contributed \$243 million, followed by the Canada Foundation for Innovation with \$76 million.
- ▶ In 2003-2004, a total of 1,708 full-time equivalent were devoted to biotechnology activities, representing 5% of the total federal S&T full-time equivalent. Eighty-seven percent of the full-time equivalent involved in biotechnology activities were engaged in R&D.
- ▶ The National Research Council has the largest number of full-time equivalent (748) devoted to biotechnology activities. Agriculture and Agri-Food Canada follows second with 400 full-time equivalent engaged in biotechnology activities. Overall, the scientific and professional category accounted for 43%, technical personnel for 37% and other support staff the remaining 20%.

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<b>Table 1 Federal government S&amp;T expenditures on biotechnology by activity and performer</b>						
Activity / Performer	Intramural	Business enterprise	Higher education	Other <sup>1</sup> Performers	Foreign performers	Total
thousands of dollars						
<b>2003-2004</b>						
Research and experimental development (R&D)	226,513	28,098	370,359	87,412	4,591	716,973
Related scientific activities (RSA)	17,218	1,323	8,757	1,244	519	29,061
<b>Total expenditures</b>	<b>243,731</b>	<b>29,421</b>	<b>379,116</b>	<b>88,656</b>	<b>5,110</b>	<b>746,034</b>
<b>2002-2003<sup>r</sup></b>						
Research and experimental development (R&D)	219,583	39,017	332,745	56,819	4,294	652,458
Related scientific activities (RSA)	15,077	1,296	7,351	979	516	25,219
<b>Total expenditures</b>	<b>234,660</b>	<b>40,313</b>	<b>340,096</b>	<b>57,798</b>	<b>4,810</b>	<b>677,677</b>
<b>2001-2002</b>						
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
<b>Total expenditures</b>	<b>232,764</b>	<b>33,457</b>	<b>206,345</b>	<b>79,887</b>	<b>4,366</b>	<b>556,819</b>
<b>2000-2001</b>						
Research and experimental development (R&D)	185,027	25,957	197,859	528	2,693	412,063
Related scientific activities (RSA)	8,682	6,628	4,528	323	88	20,249
<b>Total expenditures</b>	<b>193,709</b>	<b>32,585</b>	<b>202,387</b>	<b>851</b>	<b>2,781</b>	<b>432,312</b>
<b>1999-2000</b>						
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
<b>Total expenditures</b>	<b>184,551</b>	<b>34,499</b>	<b>169,159</b>	<b>878</b>	<b>1,922</b>	<b>392,009</b>
<b>1998-1999</b>						
Research and experimental development (R&D)	137,997	15,141	152,468	533	2,916	309,055
Related scientific activities (RSA)	4,967	1,041	4,081	233	100	10,423
<b>Total expenditures</b>	<b>142,964</b>	<b>16,182</b>	<b>156,549</b>	<b>766</b>	<b>3,016</b>	<b>319,477</b>

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

**Table 2 Federal government full-time equivalent engaged in biotechnology S&T activities by category**

Category	Activity				Total
	R&D	RSA	Administration of R&D	Administration of RSA	
full-time equivalent					
<b>2003-2004</b>					
Scientific and professional (includes executive)	512	131	77	9	729
Technical	581	40	4	0	625
Others <sup>1</sup>	212	30	106	6	354
<b>Total full-time equivalent</b>	<b>1,305</b>	<b>201</b>	<b>187</b>	<b>15</b>	<b>1,708</b>
<b>2002-2003<sup>f</sup></b>					
Scientific and professional (includes executive)	556	128	30	3	717
Technical	624	38	4	0	666
Others <sup>1</sup>	224	24	107	2	357
<b>Total full-time equivalent</b>	<b>1,404</b>	<b>190</b>	<b>141</b>	<b>5</b>	<b>1,740</b>
<b>2001-2002</b>					
Scientific and professional (includes executive)	525	42	33	1	601
Technical	592	19	9	0	620
Others <sup>1</sup>	207	4	72	1	284
<b>Total full-time equivalent</b>	<b>1,324</b>	<b>65</b>	<b>114</b>	<b>2</b>	<b>1,505</b>
<b>2000-2001</b>					
Scientific and professional (includes executive)	531	43	21	2	597
Technical	443	20	1	0	464
Others <sup>1</sup>	191	7	44	2	244
<b>Total full-time equivalent</b>	<b>1,165</b>	<b>70</b>	<b>66</b>	<b>4</b>	<b>1,305</b>
<b>1999-2000</b>					
Scientific and professional (includes executive)	509	49	19	1	578
Technical	417	21	0	0	438
Others <sup>1</sup>	166	5	43	2	217
<b>Total full-time equivalent</b>	<b>1,092</b>	<b>75</b>	<b>63</b>	<b>3</b>	<b>1,234</b>
<b>1998-1999</b>					
Scientific and professional (includes executive)	462	29	21	1	513
Technical	413	22	0	0	435
Others <sup>1</sup>	152	0	39	1	193
<b>Total full-time equivalent</b>	<b>1,027</b>	<b>51</b>	<b>61</b>	<b>2</b>	<b>1,141</b>

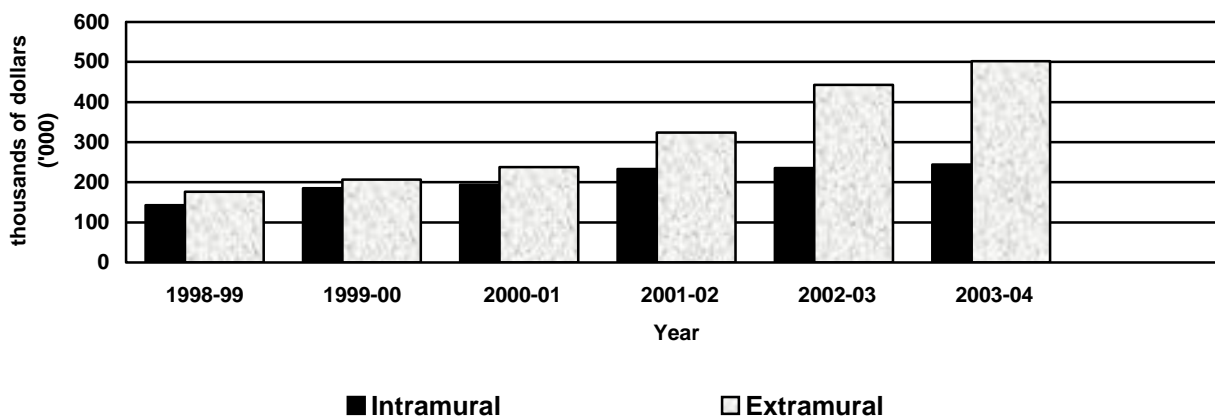
1. Includes administrative and foreign service, administrative support, operational and military personnel.

**Table 3 Federal government S&T expenditures on biotechnology activities by department or agency and by performer, 2003-2004**

Department /Agency	Intramural	Business enterprise	Higher education	Other <sup>1</sup> performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	63,936	0	0	0	0	63,936
Canada Foundation for Innovation	2,128	0	76,133	0	0	78,261
Canadian Institutes of Health Research	17,984	0	242,608	6,674	3,869	271,135
Environment Canada	934	524	216	55	18	1,747
Fisheries and Oceans Canada	2,896	0	10	10	0	2,916
Genome Canada	2,465	0	0	78,236	0	80,701
Health Canada	12,598	548	971	370	105	14,592
Industry Canada	6,325	19,365	0	0	0	25,690
National Defence	8,582	2,638	607	2,023	0	13,850
National Research Council Canada	114,710	5,589	0	1,090	0	121,389
Natural Resources Canada	7,901	125	434	53	24	8,537
Natural Sciences and Engineering Research Council of Canada	2,958	632	54,631	0	983	59,204
Social Sciences and Humanities Research Council of Canada	314	0	3,506	145	111	4,076
<b>Total Expenditures</b>	<b>243,731</b>	<b>29,421</b>	<b>379,116</b>	<b>88,656</b>	<b>5,110</b>	<b>746,034</b>

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

**Federal government S&T expenditures on biotechnology by performer, 1998-99 to 2003-04**



**Table 3A Federal government expenditures on biotechnology S&T activities by department or agency 1998-1999 to 2003-2004**

Department /Agency	S&T					
	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003 <sup>f</sup>	2003-2004
	thousands of dollars					
Agriculture and Agri-Food Canada	46,543	55,479	57,227	63,936	63,936	63,936
Canada Foundation for Innovation	...	...	33,517	43,915	82,700	78,261
Canadian Institutes of Health Research	...	...	133,652	176,406	232,291	271,135
Environment Canada	1,793	1,389	4,938	1,576	1,748	1,747
Fisheries and Oceans Canada	600	2,600	2,251	3,663	3,663	2,916
Genome Canada	...	...	...	34,268	50,013	80,701
Health Canada	3,898	4,798	4,765	7,552	14,369	14,592
Industry Canada	11,517	32,914	30,425	34,683	36,208	25,690
Medical Research Council	125,206	133,637	...	...	...	...
National Defence	...	...	...	0	8,612	13,850
National Research Council Canada	83,742	108,630	110,285	130,592	124,772	121,389
Natural Resources Canada	6,357	7,485	7,914	9,110	6,110	8,537
Natural Sciences and Engineering Research Council of Canada	38,900	44,000	44,605	48,588	50,339	59,204
Social Sciences and Humanities Research Council of Canada	921	1,078	2,733	2,530	2,916	4,076
<b>Total expenditures</b>	<b>319,477</b>	<b>392,009</b>	<b>432,312</b>	<b>556,819</b>	<b>677,677</b>	<b>746,034</b>

**Table 3B Federal government expenditures on biotechnology R&D activities by department or agency 1998-1999 to 2003-2004**

Department /Agency	R&D					
	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003 <sup>f</sup>	2003-2004
	thousands of dollars					
Agriculture and Agri-Food Canada	46,543	55,479	57,227	63,936	63,936	63,936
Canada Foundation for Innovation	...	...	33,517	43,915	82,700	78,261
Canadian Institutes of Health Research	...	...	133,652	172,912	229,448	268,290
Environment Canada	1,555	1,222	3,593	1,322	1,223	962
Fisheries and Oceans Canada	580	2,600	2,251	2,924	2,924	2,320
Genome Canada	...	...	...	34,268	50,013	80,701
Health Canada	2,556	3,049	3,049	4,988	6,711	7,462
Industry Canada	8,966	29,008	20,360	29,840	30,619	19,365
Medical Research Council	125,206	133,637	...	...	...	...
National Defence	...	...	...	0	8,150	13,780
National Research Council Canada	83,027	107,822	108,772	129,177	124,072	118,819
Natural Resources Canada	5,402	6,779	7,666	8,983	5,181	7,238
Natural Sciences and Engineering Research Council of Canada	34,600	39,200	39,805	43,359	44,922	52,277
Social Sciences and Humanities Research Council of Canada	620	707	2,171	2,233	2,559	3,562
<b>Total expenditures</b>	<b>309,055</b>	<b>379,503</b>	<b>412,063</b>	<b>537,857</b>	<b>652,458</b>	<b>716,973</b>

**Table 4 Federal government R&D expenditures on biotechnology activities by department or agency and by performer, 2003-2004**

Department /Agency	Intramural	Business enterprise	Higher education	Other <sup>1</sup> performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	63,936	0	0	0	0	63,936
Canada Foundation for Innovation	2,128	0	76,133	0	0	78,261
Canadian Institutes of Health Research	17,410	0	240,431	6,615	3,834	268,290
Environment Canada	691	56	166	31	18	962
Fisheries and Oceans Canada	2,300	0	10	10	0	2,320
Genome Canada	2,465	0	0	78,236	0	80,701
Health Canada	6,274	0	731	352	105	7,462
Industry Canada	0	19,365	0	0	0	19,365
National Defence	8,512	2,638	607	2,023	0	13,780
National Research Council Canada	113,230	5,589	0	0	0	118,819
Natural Resources Canada	6,702	88	434	0	14	7,238
Natural Sciences and Engineering Research Council of Canada	2,615	362	48,715	0	585	52,277
Social Sciences and Humanities Research Council of Canada	250	0	3,132	145	35	3,562
<b>Total Expenditures</b>	<b>226,513</b>	<b>28,098</b>	<b>370,359</b>	<b>87,412</b>	<b>4,591</b>	<b>716,973</b>

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

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**Table 5 Federal government full-time equivalent engaged in biotechnology S&T activities by department or agency and by category, 2003-2004**

Department /Agency	Scientific and professional	Technical	Other <sup>1</sup>	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	17	0	94	111
Environment Canada	11	2	0	13
Fisheries and Oceans Canada	5	13	2	20
Genome Canada	30	0	0	30
Health Canada	115	57	25	197
Industry Canada	35	0	17	52
National Defence	21	11	0	32
National Research Council Canada	227	351	120	748
Natural Resources Canada	39	27	3	69
Natural Sciences and Engineering Research Council of Canada	15	0	9	24
Social Sciences and Humanities Research Council of Canada	0	0	2	2
<b>Total full-time equivalent</b>	<b>729</b>	<b>625</b>	<b>354</b>	<b>1,708</b>

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

**Table 6 Federal government R&D full-time equivalent engaged in biotechnology activities by department or agency and by category, 2003-2004**

Department /Agency	Scientific and professional	Technical	Other <sup>1</sup>	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	17	0	92	109
Environment Canada	6	2	0	8
Fisheries and Oceans Canada	5	5	2	12
Genome Canada	30	0	0	30
Health Canada	41	39	11	91
Industry Canada	1	0	0	1
National Defence	19	11	0	30
National Research Council Canada	260	342	120	722
Natural Resources Canada	33	22	1	56
Natural Sciences and Engineering Research Council of Canada	13	0	8	21
Social Sciences and Humanities Research Council of Canada	0	0	2	2
<b>Total full-time equivalent</b>	<b>589</b>	<b>585</b>	<b>318</b>	<b>1,492</b>

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



**Table 7 Comparison of federal government S&T<sup>1</sup> expenditures and biotechnology S&T expenditures by department or agency, 2003-2004**

Department /Agency	Total S&T expenditures <sup>1</sup>	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	322,767	63,936	20
Canada Foundation for Innovation	383,427	78,261	20
Canadian Institutes of Health Research	697,513	271,135	39
Environment Canada	798,920	1,747	0
Fisheries and Oceans Canada	327,274	2,916	1
Genome Canada	80,701	80,701	100
Health Canada	382,262	14,592	4
Industry Canada	445,071	25,690	6
National Defence	439,126	13,850	3
National Research Council Canada	804,142	121,389	15
Natural Resources Canada	492,832	8,537	2
Natural Sciences and Engineering Research Council of Canada	762,065	59,204	8
Social Sciences and Humanities Research Council of Canada	463,152	4,076	1
Others	2,589,218	..	..
<b>Total Expenditures</b>	<b>8,988,470</b>	<b>746,034</b>	<b>8</b>

1. Source: Federal science expenditures and personnel 2004-2005 survey.

**Table 8 Comparison of federal government R&D<sup>1</sup> expenditures and biotechnology R&D expenditures by department or agency, 2003-2004**

Department /Agency	Total R&D 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	235,508	63,936	27
Canada Foundation for Innovation	383,427	78,261	20
Canadian Institutes of Health Research	690,141	268,290	39
Environment Canada	400,570	962	0
Fisheries and Oceans Canada	126,291	2,320	2
Genome Canada	80,701	80,701	100
Health Canada	123,912	7,462	6
Industry Canada	383,312	19,365	5
National Defence	314,890	13,780	4
National Research Council Canada	728,808	118,819	16
Natural Resources Canada	274,275	7,238	3
Natural Sciences and Engineering Research Council of Canada	673,242	52,277	8
Social Sciences and Humanities Research Council of Canada	407,953	3,562	1
Others	866,224	..	..
<b>Total Expenditures</b>	<b>5,689,254</b>	<b>716,973</b>	<b>13</b>

1. Source: Federal science expenditures and personnel 2004-2005 survey.

**Table 9 Comparison of federal government S&T<sup>1</sup> full-time equivalent and biotechnology S&T full-time equivalent by department or agency, 2003-2004**

Department /Agency	Total S&T full-time equivalent	Biotechnology S&T full-time equivalent	Biotechnology full-time equivalent in S&T as a percentage of total S&T full-time equivalent
	full-time equivalent		percentage
Agriculture and Agri-Food Canada	2,296	400	17
Canada Foundation for Innovation	43	10	23
Canadian Institutes of Health Research	282	111	39
Environment Canada	3,263	13	0
Fisheries and Oceans Canada	2,234	20	1
Genome Canada	30	30	100
Health Canada	2,630	197	7
Industry Canada	1,141	52	5
National Defence	1,933	32	2
National Research Council Canada	3,838	748	19
Natural Resources Canada	3,448	69	2
Natural Sciences and Engineering Research Council of Canada	295	24	8
Social Sciences and Humanities Research Council of Canada	172	2	1
Others	12,911	..	..
<b>Total full-time equivalent</b>	<b>34,516</b>	<b>1,708</b>	<b>5</b>

1. Source: Federal science expenditures and personnel 2004-2005 survey.

**Table 10 Comparison of federal government R&D<sup>1</sup> full-time equivalent and biotechnology R&D full-time equivalent by department or agency, 2003-2004**

Department /Agency	Total R&D full-time equivalent	Biotechnology R&D full-time equivalent	Biotechnology full-time equivalent in R&D as a percentage of total R&D full-time equivalent
	full-time equivalent		percentage
Agriculture and Agri-Food Canada	1,795	400	22
Canada Foundation for Innovation	43	10	23
Canadian Institutes of Health Research	275	109	40
Environment Canada	914	8	1
Fisheries and Oceans Canada	834	12	1
Genome Canada	30	30	100
Health Canada	616	91	15
Industry Canada	510	1	0
National Defence	1,475	30	2
National Research Council Canada	2,795	722	26
Natural Resources Canada	1,889	56	3
Natural Sciences and Engineering Research Council of Canada	261	21	8
Social Sciences and Humanities Research Council of Canada	97	2	2
Others	2,390	..	..
<b>Total full-time equivalent</b>	<b>13,924</b>	<b>1,492</b>	<b>11</b>

1. Source: Federal science expenditures and personnel 2004-2005 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<sup>s</sup> value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- <sup>p</sup> preliminary
- <sup>r</sup> revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- <sup>E</sup> 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 Innovation Surveys section, Science, Innovation and Electronic Information Division.

<http://www.statcan.ca/english/IPS/Data/88-001XIE.htm>

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<http://www.statcan.ca/english/IPS/Data/88-202XIE.htm>

***Federal Science Activities, 2003-2004***, 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.

<http://www.statcan.ca/english/IPS/Data/88-204XIE.htm>

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