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To order Statistics Canada publications, please call our National toll-free line 1-800-267-6677 or internet: infostats@statcan.ca**Biotechnology scientific activities in selected federal government departments and agencies, 2002-2003**

Data on science and technology (S&T) expenditures and person-years allocated to biotechnology for the year 2002-2003 were collected from selected federal departments and agencies. The criterion for selection was significant activity in this field. Survey results contribute to the work of the Canadian Biotechnology Strategy.

The data collected for biotechnology are composed of research and development (R&D) and related scientific activities (RSA) expenditures, for intramural and extramural activities, by performer, and also the person-years associated with these activities.

Biotechnology expenditures do not include any regulatory activities of the Federal Government. They are not included in S&T activities found in international definitions in the OECD's Frascati Manual¹.

Canada Foundation for Innovation and National Defence biotechnology expenditures appear for the first time in this service bulletin.

Highlights

The Federal government S&T expenditures on biotechnology increased to \$695 million in 2002-2003, or about 9% of federal S&T expenditures. This represents an increase of 25% over the 2001-2002 expenditures. This increase is essentially attributed to four departments and agencies: the Canadian Institutes of Health Research added \$56 million, the Canada Foundation for Innovation added \$39 million, Health Canada added \$23 million and Genome Canada added \$16 million. Virtually all (95%) of the federal biotechnology expenditures were devoted to R&D.

In 2002-2003 almost 64% of biotechnology S&T activities funded was performed outside of the Federal Government.

The largest recipient of S&T biotechnology funds was the Higher Education sector, receiving \$340 million (49%).

The full-time equivalent of 1,888 person-years was devoted to biotechnology S&T activities in 2002-2003 in the Federal Government. This represents 6% of the total federal S&T person-years.

1. *Measurement of Scientific and Technical Activities – Frascati Manual, OECD 2002.*

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Definition

The statistical definition of OECD for biotechnology is “the application of science and technology to living organisms, as well as parts, products and models thereof, to alter living and non-living materials for the production of knowledge, goods and services”.

Survey Results

In 2002-2003, as shown in Table 1, the Federal Government’s identified biotechnology expenditures were \$695 million of which \$663 million were devoted to R&D. Of the \$252 million in biotechnology S&T activities performed within the Federal Government, \$230 million were devoted to R&D and the remainder to RSA.

Table 1 Federal government S&T expenditures on biotechnology by activity and performer						
Activity / Performer	Intramural	Business enterprise	Higher education	Other performers	Foreign performers	Total
thousands of dollars						
2002-2003						
I. Research and experimental development (R&D)	229,735	39,017	332,745	56,819	4,294	662,610
II. Related scientific activities (RSA)	22,383	1,296	7,351	979	516	32,525
III. Total expenditures	252,118	40,313	340,096	57,798	4,810	695,135
2001-2002 ^f						
I. Research and experimental development (R&D)	223,036	32,881	199,034	79,121	3,785	537,857
II. Related scientific activities (RSA)	9,728	576	7,311	766	581	18,962
III. Total expenditures	232,764	33,457	206,345	79,887	4,366	556,819
2000-2001 ^f						
I. Research and experimental development (R&D)	185,027	25,957	197,859	2,693	528	412,063
II. Related scientific activities (RSA)	8,682	6,628	4,528	88	323	20,249
III. Total expenditures	193,709	32,585	202,387	2,781	851	432,312

Table 2 Federal government person-years engaged in biotechnology S&T activities by category					
Category	Activity				Total
	R&D	RSA	Administration of R&D	Administration of RSA	
2002-2003					
Scientific and professional (include executive)	609	113	30	3	755
Technical	720	35	4	0	759
Others ¹	240	25	107	2	374
Total person-years	1,569	173	141	5	1,888
2001-2002 ^r					
Scientific and professional (include executive)	525	42	33	1	601
Technical	592	19	9	0	620
Others ¹	207	4	72	1	284
Total person-years	1,324	65	114	2	1,505
2000-2001 ^r					
Scientific and professional (include executive)	530	43	21	2	596
Technical	443	20	1	0	464
Others ¹	191	7	44	2	244
Total person-years	1,164	70	66	4	1,304

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

In 2002-2003, the survey found that a total of 1,888 person-years were devoted to biotechnology activities of which 91% were engaged in R&D. The scientific and professional category accounted for 40%, technical personnel for 40% and other support staff the remaining 20%.

Growth related to biotechnology expenditures went from 1,304 person-years in 2000-2001 to 1,505 in 2001-2002, a 15% increase and it further increases 25% in the next period to 1,888 person-years. These figures are in contrast to the total government person-years, which showed almost a 6% growth between the initial time periods and a decline of just over 2% in the subsequent year to year change.

In 2002-2003 of the \$252 million in biotechnology S&T performed by the Federal Government, the National Research Council is still the largest performer with \$122 million (48%). Agriculture and Agri-Food Canada ranked second performing \$64 million (25%).

The Canadian Institutes of Health Research (CIHR) is the largest supporter of biotechnology expenditures, reaching \$232 million, of which \$210 million went to the higher education sector.

Table 3 Federal government S&T expenditures on biotechnology activities by selected departments or agencies and by performer, 2002-2003

Department /Agency	Intramural	Business enterprise	Higher education	Other ¹ performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	63,936	0	0	0	0	63,936
Canada Foundation for Innovation	1,780	0	80,920	0	0	82,700
Canadian Institutes of Health Research	13,105	0	210,545	5,134	3,507	232,291
Environment Canada	996	487	180	85	0	1,748
Fisheries and Oceans Canada	3,312	40	25	286	0	3,663
Genome Canada	880	0	0	49,133	0	50,013
Health Canada	30,157	505	225	710	230	31,827
Industry Canada	5,070	30,938	0	140	60	36,208
National Defence	2,762	5,850	0	0	0	8,612
National Research Council Canada	121,868	1,800	14	1,090	0	124,772
Natural Resources Canada	5,375	127	500	108	0	6,110
Natural Sciences and Engineering Research Council of Canada	2,685	566	45,351	777	960	50,339
Social Sciences and Humanities Research Council of Canada	192	0	2,336	335	53	2,916
Total Expenditures	252,118	40,313	340,096	57,798	4,810	695,135

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

Table 3A Federal government expenditures on biotechnology S&T activities by selected departments or agencies and by activity 2000-2001 to 2002-2003						
Department /Agency	S&T			R&D		
	2000-2001 ^f	2001-2002 ^f	2002-2003	2000-2001 ^f	2001-2002 ^f	2002-2003
	thousands of dollars					
Agriculture and Agri-Food Canada	57,227	63,936	63,936	57,227	63,936	63,936
Canada Foundation for Innovation	33,517	43,915	82,700	33,517	43,915	82,700
Canadian Institutes of Health Research	133,652	176,406	232,291	133,652	172,912	229,448
Environment Canada	4,938	1,576	1,748	3,593	1,322	1,224
Fisheries and Oceans Canada	2,251	3,663	3,663	2,251	2,924	2,924
Genome Canada	0	34,268	50,013	0	34,268	50,013
Health Canada	4,765	7,552	31,827	3,049	4,988	16,863
Industry Canada	30,425	34,683	36,208	20,360	29,840	30,619
National Defence	0	0	8,612	0	0	8,150
National Research Council Canada	110,285	130,592	124,772	108,772	129,177	124,072
Natural Resources Canada	7,914	9,110	6,110	7,666	8,983	5,181
Natural Sciences and Engineering Research Council of Canada	44,605	48,588	50,339	39,805	43,359	44,922
Social Sciences and Humanities Research Council of Canada	2,733	2,530	2,916	2,171	2,233	2,559
Total Expenditures	432,312	556,819	695,135	412,063	537,857	662,610

Table 3B Federal government intramural expenditures on biotechnology S&T activities by selected departments or agencies and by activity 2000-2001 to 2002-2003						
Department /Agency	S&T			R&D		
	2000-2001 ^f	2001-2002 ^f	2002-2003	2000-2001 ^f	2001-2002 ^f	2002-2003
	thousands of dollars					
Agriculture and Agri-Food Canada	57,227	63,936	63,936	57,227	63,936	63,936
Canada Foundation for Innovation	894	1,399	1,780	894	1,399	1,780
Canadian Institutes of Health Research	6,061	12,040	13,105	6,061	11,635	12,673
Environment Canada	4,404	706	996	3,079	596	864
Fisheries and Oceans Canada	2,251	3,312	3,312	2,251	2,629	2,629
Genome Canada	0	880	880	0	880	880
Health Canada	4,718	7,289	30,157	3,002	4,988	16,383
Industry Canada	3,554	4,434	5,070	0	0	0
National Defence	0	0	2,762	0	0	2,429
National Research Council Canada	104,585	127,561	121,868	103,072	126,146	121,168
Natural Resources Canada	7,406	8,427	5,375	7,196	8,398	4,494
Natural Sciences and Engineering Research Council of Canada	2,379	2,592	2,685	2,094	2,281	2,363
Social Sciences and Humanities Research Council of Canada	229	188	192	151	148	136
Total Expenditures	193,709	232,764	252,118	185,027	223,036	229,735

In 2002-2003 a total of \$433 million in R&D biotechnology expenditures were funded outside of the Federal Government. The largest recipient of research and development biotechnology funds was the higher education sector, receiving \$333 million.

Table 4 Federal government R&D expenditures on biotechnology activities by selected departments or agencies and by performer, 2002-2003						
Department /Agency	Intramural	Business enterprise	Higher education	Other ¹ performers	Foreign performers	Total
thousands of dollars						
Agriculture and Agri-Food Canada	63,936	0	0	0	0	63,936
Canada Foundation for Innovation	1,780	0	80,920	0	0	82,700
Canadian Institutes of Health Research	12,673	0	208,233	5,074	3,468	229,448
Environment Canada	864	124	150	85	0	1,224
Fisheries and Oceans Canada	2,629	40	25	230	0	2,924
Genome Canada	880	0	0	49,133	0	50,013
Health Canada	16,383	215	25	10	230	16,863
Industry Canada	0	30,619	0	0	0	30,619
National Defence	2,429	5,721	0	0	0	8,150
National Research Council Canada	121,168	1,800	14	1,090	0	124,072
Natural Resources Canada	4,494	127	475	85	0	5,181
Natural Sciences and Engineering Research Council of Canada	2,363	371	40,815	777	596	44,922
Social Sciences and Humanities Research Council of Canada	136	0	2,088	335	0	2,559
Total Expenditures	229,735	39,017	332,745	56,819	4,294	662,610

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

Tables 5 and 6 represent person-years engaged in biotechnology activities. Table 5 shows the National Research Council with the largest number of person-years (849) devoted to biotechnology activities. Agriculture and Agri-Food Canada ranks second with 400 person-years devoted entirely to biotechnology. The total number of person-years devoted to biotechnology R&D (Table 6) is 1,710 in 2002-2003.

Table 5 Federal government person-years engaged in biotechnology S&T activities by selected departments or agencies and by category, 2002-2003				
Department /Agency	Scientific and professional	Technical	Other ¹	Total
	person-years			
Agriculture and Agri-Food Canada	160	160	80	400
Canada Foundation for Innovation	4	4	2	10
Canadian Institutes of Health Research	12	0	68	80
Environment Canada	12	1	0	13
Fisheries and Oceans Canada	9	9	2	20
Genome Canada	0	0	27	27
Health Canada	138	152	42	332
Industry Canada	35	0	9	44
National Defence	19	21	0	40
National Research Council Canada	327	389	133	849
Natural Resources Canada	26	23	1	50
Natural Sciences and Engineering Research Council of Canada	13	0	8	21
Social Sciences and Humanities Research Council of Canada	0	0	2	2
Total person-years	755	759	374	1,888

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

Table 6 Federal government R&D person-years engaged in biotechnology activities by selected departments or agencies and by category, 2002-2003				
Department /Agency	Scientific and professional	Technical	Other ¹	Total
	person-years			
Agriculture and Agri-Food Canada	160	160	80	400
Canada Foundation for Innovation	4	4	2	10
Canadian Institutes of Health Research	12	0	68	80
Environment Canada	8	1	0	9
Fisheries and Oceans Canada	5	4	2	11
Genome Canada	0	0	27	27
Health Canada	90	137	26	253
Industry Canada	1	0	0	1
National Defence	16	20	0	36
National Research Council Canada	310	380	133	823
Natural Resources Canada	21	18	1	40
Natural Sciences and Engineering Research Council of Canada	12	0	7	19
Social Sciences and Humanities Research Council of Canada	0	0	1	1
Total person-years	639	724	347	1,710

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

Table 7 shows a comparison by department or agency of total Federal Government expenditures for 2002-2003. Genome Canada had the highest percentage (100%) of biotechnology expenditures to total S&T expenditures. Overall, the Federal Government's identified biotechnology expenditures represented 9% of its S&T expenditures.

Table 7 Comparison of federal government S&T¹ expenditures and biotechnology expenditures by department or agency, 2002-2003			
Department /Agency	Total S&T expenditures ¹	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	384,530	63,936	17
Canada Foundation for Innovation	359,477	82,700	23
Canadian Institutes of Health Research	633,026	232,291	37
Environment Canada	593,617	1,748	0
Fisheries and Oceans Canada	337,822	3,663	1
Genome Canada	50,013	50,013	100
Health Canada	336,827	31,827	9
Industry Canada	422,308	36,208	9
National Defence	306,693	8,612	3
National Research Council Canada	770,303	124,772	16
Natural Resources Canada	479,521	6,110	1
Natural Sciences and Engineering Research Council of Canada	688,900	50,339	7
Social Sciences and Humanities Research Council of Canada	202,188	2,916	1
Others	2,446,485
Total Expenditures	8,011,710	695,135	9

1. Source: Federal science expenditures and personnel 2003-2004 survey.

When comparing total Federal Government R&D expenditures to biotechnology R&D expenditures for 2002-2003 (Table 8), R&D biotechnology expenditures represented 13% of the total R&D expenditures. Genome Canada had the highest percentage of biotechnology R&D to total R&D expenditures (100%), followed by CIHR with 37%.

Table 8 Comparison of federal government R&D¹ expenditures and biotechnology R&D expenditures by department or agency, 2002-2003			
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	373,917	63,936	17
Canada Foundation for Innovation	359,477	82,700	23
Canadian Institutes of Health Research	625,239	229,448	37
Environment Canada	214,709	1,223	1
Fisheries and Oceans Canada	128,292	2,924	2
Genome Canada	50,013	50,013	100
Health Canada	102,173	16,863	17
Industry Canada	352,930	30,619	9
National Defence	272,055	8,150	3
National Research Council Canada	694,892	124,072	18
Natural Resources Canada	272,053	5,181	2
Natural Sciences and Engineering Research Council of Canada	609,761	44,922	7
Social Sciences and Humanities Research Council of Canada	157,328	2,559	2
Others	830,226	..	.
Total Expenditures	5,043,065	662,610	13

1. Source: Federal science expenditures and personnel 2003-2004 survey.

Comparisons of Federal Government S&T and R&D person-years with biotechnology S&T and R&D person-years are presented in tables 9 and 10. Biotechnology S&T person-years represented 6% of S&T person-years (Table 9), while R&D biotechnology person-years represented 13% of the person-years devoted to all federal R&D (Table 10).

Table 9 Comparison of federal government S&T¹ person-years and biotechnology person-years by department or agency, 2002-2003			
Department /Agency	Total S&T person-years	Biotechnology S&T person-years	Biotechnology person-years in S&T as a percentage of total S&T person-years
	person-years		percentage
Agriculture and Agri-Food Canada	2,099	400	19
Canada Foundation for Innovation	39	10	26
Canadian Institutes of Health Research	252	80	32
Environment Canada	3,158	13	0
Fisheries and Oceans Canada	2,368	20	1
Genome Canada	27	27	100
Health Canada	2,582	332	13
Industry Canada	1,065	44	4
National Defence	1,529	40	3
National Research Council Canada	3,568	849	24
Natural Resources Canada	3,234	50	2
Natural Sciences and Engineering Research Council of Canada	280	21	8
Social Sciences and Humanities Research Council of Canada	160	2	1
Others	12,811	..	.
Total person-years	33,172	1,888	6

1. Source: Federal science expenditures and personnel 2003-2004 survey.

Table 10 Comparison of federal government R&D¹ person-years and biotechnology R&D person-years by department or agency, 2002-2003			
Department /Agency	Total R&D person-years	Biotechnology R&D person-years	Biotechnology person-years in R&D as a percentage of total R&D person-years
	person-years		percentage
Agriculture and Agri-Food Canada	2,046	400	20
Canada Foundation for Innovation	39	10	26
Canadian Institutes of Health Research	244	80	33
Environment Canada	884	9	1
Fisheries and Oceans Canada	891	11	1
Genome Canada	27	27	100
Health Canada	684	253	37
Industry Canada	481	1	0
National Defence	1,401	36	3
National Research Council of Canada	2,463	823	33
Natural Resources Canada	1,719	40	2
Natural Sciences and Engineering Research Council of Canada	248	19	8
Social Sciences and Humanities Research Council of Canada	83	1	1
Others	2,342	..	.
Total person-years	13,552	1,710	13

1. Source: Federal science expenditures and personnel 2003-2004 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.

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

Federal Science Activities, 2002-2003, 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 person-years by type of science, performing sectors, provinces, federal departments and agencies.

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

Note of appreciation

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