

FEDERAL OBLIGATIONS FOR R&D AND R&D PLANT EXPECTED TO REACH OVER \$105 BILLION IN FY 2004

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Federal obligations for research and development (R&D) and R&D plant in fiscal year 2004 will increase an estimated 4 percent (3 percent in inflation-adjusted 2000 dollars) over the FY 2003 level, reaching \$105.2 billion (table 1). In this *InfoBrief*, “research” includes both basic and applied research. See Data Notes, below, for more detailed definitions of research, development, and R&D plant.

Federal Funding for Research

With agencies projecting a rise of 3 percent (2 percent in constant 2000 dollars) in total research funding, to \$54.1 billion, research will account for 51 percent of total R&D and R&D plant dollars in FY 2004. The Departments of Health and Human Services (HHS), Defense (DoD), Energy (DOE), and Agriculture, and two independent agencies, the National Aeronautics and Space Administration (NASA) and the National Science Foundation (NSF), have consistently been the top research-funding agencies. Combined, these six agencies are expected to account for 93 percent of research dollars in FY 2004 (table 2). HHS is expected to provide the largest share (52 percent) of agency-funded research, followed by DoD (11 percent) and DOE and NASA (10 percent each).

Basic Research

Since FY 1990 Federal obligations for basic research have grown annually an average of 6 percent (4 percent in constant 2000 dollars). The basic-research share of Federal obligations for R&D and R&D plant

has also increased, growing from 17 percent in FY 1990 to 25 percent in FY 2000. Since FY 2000 that share has remained at 25 or 26 percent (table 1). In FY 2004 agency support for the life sciences, an estimated \$15.4 billion, will account for 58 percent of the total for basic research (table 3).

Applied Research

Federal obligations for applied research during the period FY 1990 to FY 2004 have grown at an average annual rate of 7 percent (5 percent in constant 2000 dollars) (table 1). Applied research accounted for 16 percent of Federal R&D and R&D plant obligations in FY 1990 and had reached 27 percent by FY 2001. That share has since remained steady. Applied research funding is concentrated in the life sciences (\$13.9 billion, or 51 percent) and engineering (\$6.8 billion, or 25 percent).

Science and Engineering Fields

According to preliminary estimates, engineering (\$9.1 billion), physical sciences (\$5.4 billion), and environmental sciences (\$3.8 billion) will receive substantial support for research in FY 2004 (table 3); however, the life sciences will receive more research funding (an estimated \$29.3 billion) in FY 2004 than will any other field. The life sciences (agricultural sciences, biological sciences, environmental biology, medical sciences, and other life sciences) will account for more than half of total research funding. HHS (mostly from NIH) will provide 85 percent (\$24.8 billion) of life sciences research funding.



TABLE 1. Federal obligations for research, development, and R&D plant, by character of work: FY 1990–2004

Fiscal year	Total R&D and R&D plant	Research			Development	R&D plant
		Total	Basic	Applied		
Millions of current dollars						
1990	65,831	21,622	11,286	10,337	41,937	2,272
1991	64,148	23,968	12,171	11,798	37,327	2,853
1992	68,577	24,491	12,490	12,001	41,102	2,985
1993	70,415	26,890	13,399	13,491	40,424	3,101
1994	69,451	27,411	13,523	13,888	39,824	2,215
1995	70,443	28,434	13,877	14,557	39,752	2,256
1996	69,399	28,260	14,464	13,796	39,393	1,746
1997	71,753	29,365	14,942	14,423	40,461	1,927
1998	73,914	30,922	15,613	15,309	41,178	1,813
1999	77,386	33,528	17,444	16,084	41,813	2,046
2000	77,356	38,471	19,570	18,901	34,393	4,493
2001	84,003	44,714	21,958	22,756	35,219	4,070
2002	90,158	48,007	23,668	24,338	37,846	4,305
2003 preliminary	101,008	52,569	25,600	26,969	43,187	5,252
2004 preliminary	105,220	54,072	26,643	27,429	46,983	4,165
Millions of constant 2000 dollars						
1990	81,023	26,612	13,890	12,722	51,615	2,796
1991	76,095	28,432	14,437	13,995	44,278	3,384
1992	79,353	28,339	14,453	13,887	47,561	3,454
1993	79,673	30,426	15,161	15,265	45,738	3,508
1994	76,928	30,362	14,979	15,383	44,112	2,454
1995	76,419	30,847	15,054	15,792	43,125	2,448
1996	73,868	30,080	15,395	14,684	41,930	1,858
1997	75,064	30,720	15,631	15,089	42,328	2,016
1998	76,397	31,961	16,137	15,824	42,562	1,874
1999	78,950	34,205	17,796	16,409	42,658	2,087
2000	77,356	38,471	19,570	18,901	34,393	4,493
2001	82,082	43,691	21,456	22,235	34,414	3,977
2002	86,565	46,094	22,725	23,369	36,338	4,133
2003 preliminary	95,426	49,663	24,185	25,478	40,801	4,962
2004 preliminary	98,117	50,421	24,844	25,577	43,811	3,884

NOTE: Gross domestic product implicit price deflators were used to convert current dollars to constant FY 2000 dollars.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2002–2004.

Federal Funding for Development

Until FY 2004 the development share of total obligations for R&D and R&D plant had been decreasing, falling from 64 percent in FY 1990 to an estimated 43 percent in FY 2003 (table 1). In FY 2004, however, agencies project an increase in development funding of 9 percent (7 percent in constant 2000 dollars) over the FY 2003 level, to \$47.0 billion, or 45 percent of total R&D and R&D plant obligations. DoD will provide 39.9 billion of these development dollars (85 percent), up 11 percent from FY 2003.

Federal Funding for R&D Plant

R&D plant is slated to decrease 21 percent (22 percent in constant 2000 dollars) from FY 2003 levels, to \$4.2 billion (table 1). R&D plant dollars will account for 4 percent of the R&D and R&D plant total. NASA will pro-

vide the largest share of R&D plant dollars (\$2.2 billion), followed by DOE (\$1.0 billion) and NSF (\$0.3 billion).

Data Notes

All percentages in this report have been rounded to whole numbers. Preliminary estimates presented here are being released in advance of the NSF detailed statistical tables report *Federal Funds for Research and Development: Fiscal Years 2002, 2003, and 2004*. The full report will be available at <http://www.nsf.gov/sbe/srs/dst.htm>.

Research, development, and R&D plant, collectively, includes all costs for performance of R&D plus the costs of R&D plant. R&D plant includes costs related to structures, works, equipment, facilities, or land for use in R&D activities.

TABLE 2. Federal obligations for research, by selected agency: FY 1990–2004

Fiscal year	Total	HHS ¹	DoD	DOE	NASA ²	NSF	USDA	All other agencies
Millions of current dollars								
1990	21,622	7,467	3,529	2,571	3,061	1,690	1,061	2,244
1991	23,968	8,163	3,718	3,274	3,371	1,785	1,176	2,483
1992	24,491	7,946	4,073	3,413	3,229	1,868	1,261	2,701
1993	26,891	9,193	4,784	3,440	3,549	1,882	1,252	2,792
1994	27,411	9,736	4,241	3,283	3,841	2,040	1,323	2,948
1995	28,434	10,076	4,198	3,460	4,046	2,149	1,299	3,206
1996	28,260	10,546	3,996	3,362	3,878	2,188	1,220	3,070
1997	29,365	11,228	3,810	3,568	4,185	2,249	1,290	3,036
1998	30,922	12,019	3,970	3,788	4,414	2,289	1,334	3,110
1999	33,528	13,715	4,142	3,920	4,358	2,506	1,488	3,399
2000	38,471	17,913	4,920	4,101	3,964	2,726	1,612	3,235
2001	44,714	20,649	6,806	4,593	4,472	3,044	1,804	3,347
2002	48,007	23,231	6,265	5,062	4,839	3,260	1,810	3,539
2003 preliminary	52,569	26,318	6,514	5,321	5,333	3,404	1,922	3,757
2004 preliminary	54,072	27,907	5,890	5,519	5,487	3,690	1,779	3,800
Millions of constant 2000 dollars								
1990	26,612	9,190	4,344	3,164	3,767	2,079	1,306	2,762
1991	28,432	9,683	4,410	3,883	3,999	2,118	1,394	2,945
1992	28,339	9,194	4,713	3,949	3,737	2,162	1,459	3,125
1993	30,426	10,401	5,412	3,893	4,015	2,129	1,416	3,159
1994	30,362	10,785	4,697	3,636	4,254	2,260	1,465	3,266
1995	30,847	10,931	4,555	3,753	4,389	2,332	1,409	3,478
1996	30,080	11,225	4,253	3,579	4,128	2,329	1,299	3,268
1997	30,720	11,746	3,986	3,732	4,378	2,352	1,350	3,176
1998	31,961	12,422	4,103	3,915	4,562	2,366	1,379	3,214
1999	34,205	13,992	4,226	3,999	4,446	2,557	1,518	3,467
2000	38,471	17,913	4,920	4,101	3,964	2,726	1,612	3,235
2001	43,691	20,177	6,651	4,488	4,370	2,974	1,762	3,270
2002	46,094	22,305	6,016	4,861	4,646	3,130	1,738	3,398
2003 preliminary	49,663	24,863	6,154	5,027	5,038	3,216	1,816	3,549
2004 preliminary	50,421	26,023	5,493	5,146	5,117	3,441	1,659	3,543

DoD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = Department of Agriculture.

¹ Beginning in FY 2000, the National Institutes of Health classified all of its development activities as research.

² Beginning in FY 2000, NASA reclassified and transferred funding for the space station and space station research from R&D to R&D plant.

NOTE: Gross domestic product implicit price deflators were used to convert current dollars to constant FY 2000 dollars.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2002–2004.

Research is systematic study directed toward fuller scientific knowledge or understanding of the subject studied and is classified as either basic or applied. Basic research is performed without specific applications in mind; applied research is performed to meet a recognized, specific need.

Development includes costs related to the production of materials, devices, and systems or methods and comprises design, development, and improvement of prototypes and new processes to meet specific requirements.

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TABLE 3. Federal obligations for research, by field of science and engineering: FY 2002–2004

Field	FY 2002	FY 2003	FY 2004	FY 2004
	Millions of current dollars			Percent
		preliminary	preliminary	
Total research, all fields	48,007	52,569	54,072	100.0
Life sciences	25,477	28,442	29,340	54.3
Engineering	8,275	9,074	9,127	16.9
Physical sciences	4,983	5,105	5,417	10.0
Environmental sciences	3,418	3,690	3,762	7.0
Mathematics and computer sciences	2,631	2,738	2,829	5.2
Mathematics	402	NA	NA	NA
Computer sciences	2,043	NA	NA	NA
Mathematics and computer sciences, nec	185	NA	NA	NA
Social sciences	1,039	1,176	1,203	2.2
Psychology	906	1,009	1,050	1.9
Other sciences, nec	1,278	1,334	1,344	2.5
Basic research, all fields	23,668	25,600	26,643	100.0
Life sciences	14,024	15,190	15,428	57.9
Engineering	1,865	2,053	2,334	8.8
Physical sciences	3,406	3,662	3,937	14.8
Environmental sciences	1,833	1,964	2,093	7.9
Mathematics and computer sciences	999	1,066	1,124	4.2
Mathematics	326	NA	NA	NA
Computer sciences	637	NA	NA	NA
Mathematics and computer sciences, nec	36	NA	NA	NA
Social sciences	362	402	399	1.5
Psychology	465	511	526	2.0
Other sciences, nec	715	751	801	3.0
Applied research, all fields	24,338	26,969	27,429	100.0
Life sciences	11,453	13,252	13,912	50.7
Engineering	6,410	7,021	6,793	24.8
Physical sciences	1,577	1,443	1,480	5.4
Environmental sciences	1,585	1,725	1,668	6.1
Mathematics and computer sciences	1,632	1,672	1,705	6.2
Mathematics	76	NA	NA	NA
Computer sciences	1,406	NA	NA	NA
Mathematics and computer sciences, nec	149	NA	NA	NA
Social sciences	677	774	804	2.9
Psychology	441	498	524	1.9
Other sciences, nec	563	582	542	2.0

NA = not available (preliminary data on subfields are not collected).
nec = not elsewhere classified.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2002–2004.

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