

FEDERAL AGENCIES SUPPORTED R&D GROWTH OVER THE PERIOD FY 1994–2004

by Ronald L. Meeks

Federal agencies provided \$105.4 billion for R&D and R&D-plant-related activities in FY 2004 (table 1).¹ Over the decade ending FY 2004, federal obligations for R&D and R&D plant grew at an average annual rate of 4.3% (2.3% in inflation-adjusted 2000 dollars), but average growth rates for the first and second halves of the period differed substantially both for total R&D and R&D plant and for each component. Growth rates are calculated for the period FY 2000 to FY 2004 because changes in National Institutes of Health (NIH) and National Aeronautics and Space Administration (NASA) classifications of R&D component activities resulted in large differences in obligations reported between FY 1999 and FY 2000 (see, for example, R&D plant for 1999 and 2000 in table 1).² Total R&D and R&D plant averaged an annual growth rate of 2.2% between FY 1994 and FY 1999 and 8.0% between FY 2000 and FY 2004 (0.5% and 5.7%, respectively, in constant 2000 dollars).

Agencies' Funding for Research

Research accounted for 50.6% (\$53.4 billion) of total federal R&D and R&D plant money in FY 2004 (table 1).

¹ This *InfoBrief* is revised. Initially, the Department of Defense (DOD) reported \$40.130 billion in major systems development obligations for FY 2004. DOD has since revised that FY 2004 total to \$35.783 billion. The current *InfoBrief* incorporates these revisions into the federal R&D obligation totals.

FY 2004 data presented here are from the National Science Foundation (NSF) Survey of Federal Funds for Research and Development FY 2004–06, which collected actual data for FY 2004 and preliminary data for FY 2005 and FY 2006.

² Beginning with FY 2000, NIH classified all of its development activities as research. Also in FY 2000, NASA reclassified Space Station as a physical asset, reclassified Space Station Research as equipment, and transferred funding for the program from R&D to R&D plant.

Federal agencies provided 42.5% (\$22.7 billion) of their total research dollars to universities and colleges, 22.6% (\$12.1 billion) to intramural performers (i.e., in-house or other federal agencies), and 12.7% (\$6.8 billion) to industry (figure 1). The remainder was divided among federally funded research and development centers, nonprofit organizations, state governments, and foreign performers. Federal obligations for research grew at an average annual rate of 6.9% (4.9% in inflation-adjusted 2000 dollars) between FY 1994 and FY 2004. Within this period, obligations grew at an average annual rate of 4.1% between FY 1994 and FY 1999 and 8.5% between FY 2000 and FY 2004 (2.4% and 6.2%, respectively, adjusted for inflation).

Research in the life sciences accounted for 52.0% (\$27.7 billion) of total federal research dollars in FY 2004 (figure 2). Engineering was a distant second, accounting for 16.6% (\$8.9 billion).

Basic Research

Basic research accounted for 24.8% (\$26.1 billion) of total R&D and R&D plant funding in FY 2004. The Department of Health and Human Services (HHS) provided 56.5% (\$14.8 billion) of basic research support, mainly from NIH (figure 3). NSF provided the next largest proportion (13.4%, or \$3.5 billion), followed by the Department of Energy (DOE) at 10.2% (\$2.7 billion). Federal obligations for basic research increased 6.8% annually between FY 1994 and FY 2004 (4.8% in inflation-adjusted 2000 dollars). Between FY 1994 and FY 1999, federal obligations for basic research grew at an average annual rate of 5.2%, and between FY 2000 and FY 2004 at an average annual rate of 7.5% (3.5% and 5.2%, respectively, adjusted for inflation).



TABLE 1. Federal obligations for research and development, by character of work and R&D plant: FY 1994–2004

Fiscal year	Total	Total R&D	Total research	Basic research	Applied research	Development	R&D plant
Current \$millions							
1994	69,451	67,235	27,411	13,523	13,888	39,824	2,215
1995	70,443	68,187	28,434	13,877	14,557	39,752	2,256
1996	69,399	67,653	28,260	14,464	13,796	39,393	1,746
1997	71,753	69,827	29,365	14,942	14,423	40,461	1,927
1998	73,914	72,101	30,922	15,613	15,309	41,178	1,813
1999	77,386	75,341	33,528	17,444	16,084	41,813	2,046
2000	77,356	72,863	38,471	19,570	18,901	34,393	4,493
2001	84,003	79,933	44,714	21,958	22,756	35,219	4,070
2002	90,158	85,853	48,007	23,668	24,338	37,846	4,305
2003	97,928	93,661	51,072	24,751	26,320	42,589	4,267
2004	105,371	101,377	53,358	26,121	27,237	48,019	3,994
Constant 2000 \$millions							
1994	76,928	74,474	30,362	14,979	15,383	44,112	2,454
1995	76,419	73,971	30,847	15,054	15,792	43,125	2,448
1996	73,868	72,010	30,080	15,395	14,684	41,930	1,859
1997	75,064	73,048	30,720	15,631	15,089	42,328	2,016
1998	76,397	74,523	31,961	16,137	15,824	42,562	1,874
1999	78,950	76,862	34,205	17,796	16,409	42,658	2,087
2000	77,356	72,863	38,471	19,570	18,901	34,393	4,493
2001	82,066	78,090	43,683	21,452	22,231	34,407	3,976
2002	86,424	82,298	46,019	22,688	23,330	36,279	4,126
2003	92,055	88,044	48,009	23,267	24,742	40,035	4,011
2004	96,731	93,066	48,984	23,979	25,004	44,081	3,667

NOTES: In FY 2000, National Institutes of Health classified all its development activities as research. In FY 2000 National Aeronautics and Space Administration (NASA) reclassified Space Station as a physical asset, reclassified Space Station Research as equipment, and transferred funding for the program from R&D to R&D plant. NASA data for FY 2004 and later may not be directly comparable to data for FY 2003 and earlier. 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 2004, 2005, and 2006.

Applied Research

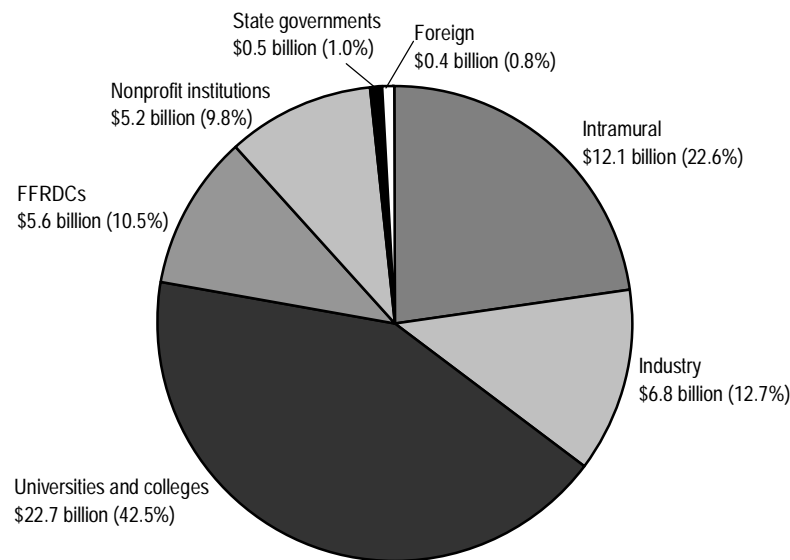
Applied research accounted for 25.8% (\$27.2 billion) of total R&D and R&D plant funding in FY 2004. The three top funding agencies were HHS (48.6%, or \$13.2 billion), Department of Defense (DOD) (15.7%, or \$4.3 billion), and DOE (10.4%, or \$2.8 billion) (figure 4). Federal obligations for applied research increased 7.0% annually between FY 1994 and FY 2004 (5.0% in inflation-adjusted 2000 dollars). Within this period, average annual growth was 3.0% between FY 1994 and FY 1999 and 9.6% between FY 2000 and FY 2004 (1.3% and 7.2%, respectively, in inflation-adjusted 2000 dollars).

Agencies' Funding for Development

Development accounted for 45.6% (\$48.0 billion) of total R&D and R&D plant obligations in FY 2004 (table 1).

DOD accounted for most of the total federal development funding (86.2%, or \$41.4 billion), due mostly to DOD's major systems development projects (table 2). Subtracting those dollars, DOD's share of development was 45.9%; NASA was the second largest supporter, with 21.9% (\$2.7 billion); and DOE was the third largest, accounting for 16.8% (\$2.1 billion) of total development, excluding major systems. Like research obligations, federal obligations for development also increased between FY 1994 and FY 2004 but at a lower rate, 1.9% (no change in inflation-adjusted 2000 dollars). Obligations for development grew at an average annual rate of 1.0% (down 0.7% in inflation-adjusted 2000 dollars) between FY 1994 and FY 1999 and at 8.7% (6.4% adjusted for inflation) between FY 2000 and FY 2004.

FIGURE 1. Federal obligations for total research, by performer: FY 2004

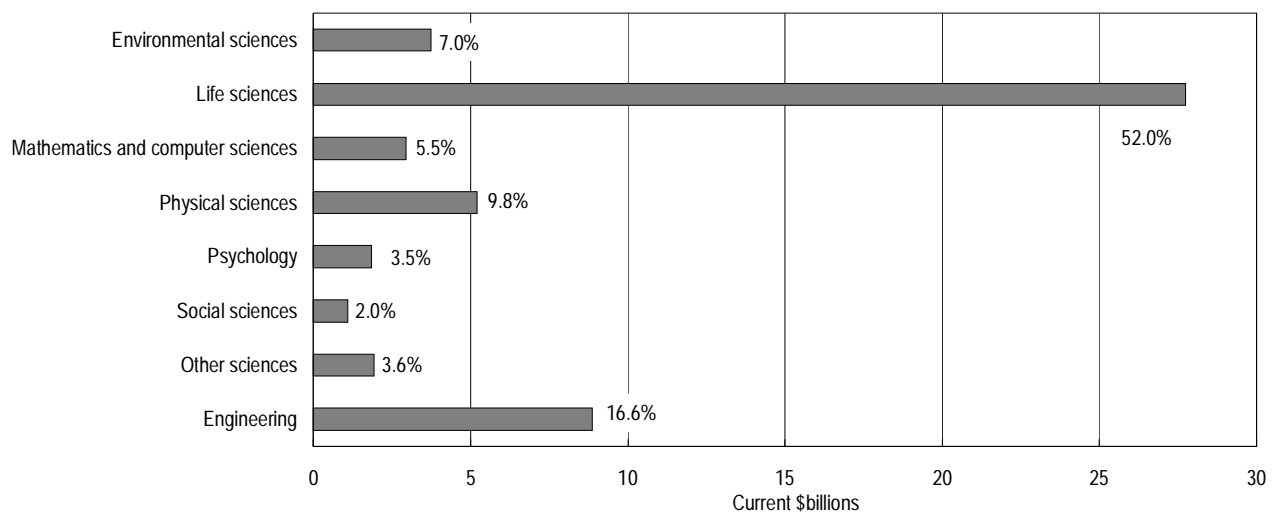


FFRDCs = federally funded research and development centers.

NOTES: Because of rounding, detail may not add to total. Percentage of total research (\$53.4 billion) was computed using dollars in thousands. Intramural includes costs associated with administration of intramural and extramural programs by federal personnel and actual intramural performance.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2004, 2005, and 2006.

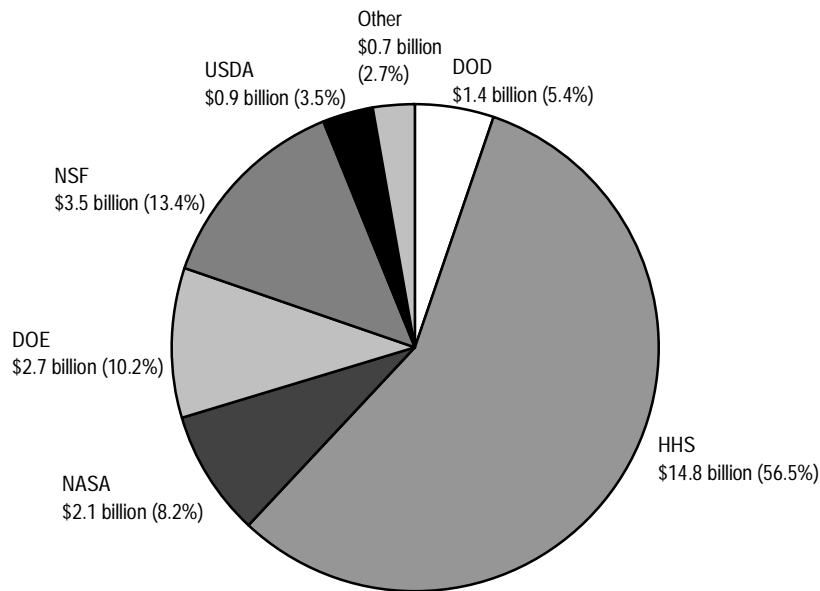
FIGURE 2. Federal obligations for total research, by field of science and engineering: FY 2004



NOTES: Because of rounding, detail may not add to total. Percentage of total research (\$53.4 billion) was computed using dollars in thousands.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2004, 2005, and 2006.

FIGURE 3. Federal obligations for basic research, by major funding agency: FY 2004



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; Other = all other agencies.

NOTE: Percentage of basic research (\$26.1 billion) was computed using dollars in thousands.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2004, 2005, and 2006.

Agencies' Funding for R&D Plant

The R&D plant share of federal R&D and R&D plant obligations over the period FY 1994 to FY 2004 ranged between 2.5% (FY 1996 and FY 1998) and 5.8% (FY 2000). Since FY 2000 the R&D plant share has slowly decreased, dropping to 3.8% (\$4.0 billion) in FY 2004 (table 1). Federal agencies reported a 6.1% average annual growth rate in R&D plant (4.1% in inflation-adjusted 2000 dollars) between FY 1994 and FY 2004. Obligations decreased at an average annual rate of 1.6% between FY 1994 and FY 1999 and 2.9% between FY 2000 and FY 2004 (down 3.2% and 5.0%, respectively, in inflation-adjusted 2000 dollars).

Five agencies provided 89.6% of total federal R&D plant funding in FY 2004: NASA (36.8%, or \$1.5 billion), DOE (25.2%, or \$1.0 billion), HHS (10.8%, or

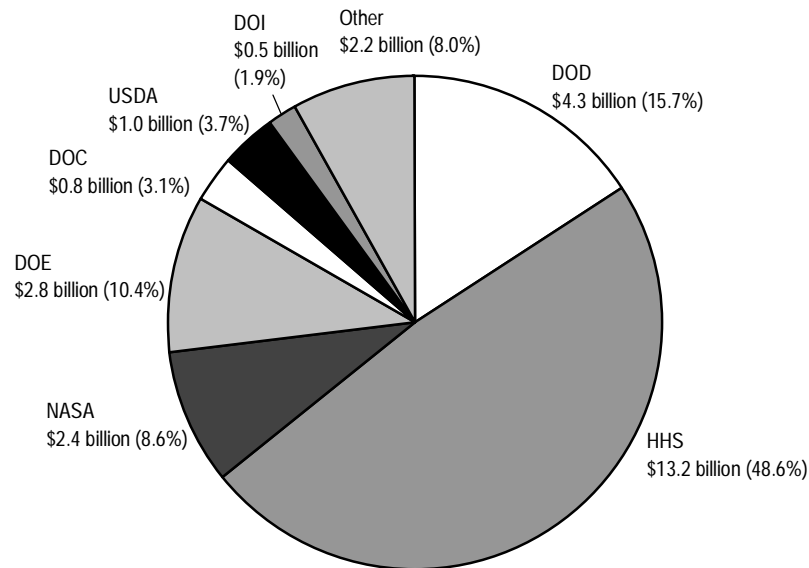
\$0.4 billion), NSF (9.9%, or \$0.4 billion), and DOD (6.9%, or \$0.3 billion).

Data Collection Notes

Definitions of *research*, *development*, and *R&D plant* as used in this *InfoBrief* are provided in the technical notes section of the detailed statistical tables reports for this survey. For the prior-year report, see <http://www.nsf.gov/statistics/nsf06313/>.

The 30 federal agencies that report R&D obligations to the NSF Survey of Federal Funds for Research and Development submitted actual obligations for FY 2004 and preliminary data for FY 2005 and FY 2006. Data were requested from agencies beginning in February 2005. Agencies later revise the preliminary data on the basis of actual changes in the funding levels of R&D programs.

FIGURE 4. Federal obligations for applied research, by major funding agency: FY 2004



DOC = Department of Commerce; DOD = Department of Defense; DOE = Department of Energy; DOI = Department of the Interior; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; NSF = National Science Foundation; USDA = U.S. Department of Agriculture; Other = all other agencies.

NOTE: Percentage of applied research (\$27.2 billion) was computed using dollars in thousands.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2004, 2005, and 2006.

Further, agencies may provide changes in prior-year data to reflect program reclassifications or other data corrections.

In FY 2004 NASA implemented a full cost budget approach, which includes all of the direct and indirect costs for procurement, personnel, travel, and other infrastructure-related expenses relative to a particular program and project. NASA's data for FY 2004 and later years may not be directly comparable to its data for FY 2003 and earlier years.

Transition to the new system has delayed NASA's reporting of R&D data to NSF. Revisions in their methods of reporting R&D dollars have also delayed NIH and DOD responses to the survey. NIH has revised its financial database, and new records no longer contain information regarding field of science and engineering. The research required to ascertain this information has slowed NIH's response to the survey.

Beginning in FY 2004, DOD started requiring its reporting agencies to adhere to a new set of DOD standards when providing data to the survey. This new reporting method has slowed DOD's response time.

The full set of detailed tables from this survey will be available in the report *Federal Funds for Research and Development: Fiscal Years 2004, 2005, and 2006* at <http://www.nsf.gov/statistics/fedfunds/>. Individual detailed tables from the 2004–06 survey may be available in advance of the full report. For further information, contact

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TABLE 2. Federal obligations for development, by selected agency: FY 2004
(Current dollars in millions)

Agency	Total	% distribution	% distribution, excluding DOD major systems
All agencies	48,018.7	100.0	100.0
Department of Agriculture	183.4	0.4	1.5
Department of Commerce	171.0	0.4	1.4
Department of Defense	41,397.0	86.2	na
Advanced technology ^a	5,613.8	11.7	45.9
Major systems ^b	35,783.2	74.5	na
Department of Energy	2,055.7	4.3	16.8
Department of Health and Human Services	142.0	0.3	1.2
Department of Homeland Security	532.6	1.1	4.4
Department of Labor	161.9	0.3	1.3
Department of Transportation	269.1	0.6	2.2
Environmental Protection Agency	125.1	0.3	1.0
National Aeronautics and Space Administration	2,683.1	5.6	21.9
All other agencies	297.8	0.6	2.4

DOD = Department of Defense; na = not applicable.

^a Advanced technology development includes development of subsystems and components and efforts to integrate subsystems and components into system prototypes for field experiments and/or tests in a simulated environment.

^b Major systems development includes integrating technologies; developing prototypes; and testing them in realistic operating environments; conducting engineering and manufacturing development requirements prior to full-rate production; and upgrading systems that have been fielded or received approval for full-rate production.

NOTE: Because of rounding, detail may not add to total.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2004, 2005, and 2006.

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