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FEDERAL SUPPORT FOR R&D AND R&D PLANT PROJECTED AT $110 BILLION FOR FY 2005

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A National Science Foundation survey of federal agencies shows federal obligations for research and development and R&D plant at an estimated $110.2 billion in FY 2005, an increase of 3.5 percent (1.4 percent in inflation-adjusted 2000 dollars) over FY 2004 (table 1). Obligations for research are expected to account for nearly half of that amount. FY 2005 figures in this report are projections based on obligations provided by the agencies surveyed; FY 2004 figures are preliminary.

Federal Funding for Research

Federal research obligations for all agencies in FY 2005 show a slim 0.5 percent current-dollar increase over FY 2004 (a 1.5 percent decrease in constant 2000 dollars). Research accounts for 49.6 percent ($54.7 billion) of total R&D and R&D plant dollars.

The Departments of Health and Human Services (HHS), Defense (DOD), Energy (DOE), and Agriculture (USDA), 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 account for 93.5 percent of FY 2005 federal research dollars (table 2). Of all FY 2005 federal research funding, HHS provides the largest share, 52.6 percent ($28.8 billion), followed by DOE (10.6 percent), DOD (10.5 percent), NASA (9.5 percent), NSF (7.0 percent), and USDA (3.3 percent).

Basic Research

From FY 1990 to FY 2005 federal obligations for basic research grew at an average annual rate of 6.0 percent (3.8 percent in constant 2000 dollars). As a share of total R&D and R&D plant, obligations for basic research increased from 17.1 percent in 1990 to 26.3 percent in FY 2002 (table 1). According to estimates, that share drops to 24.4 percent ($26.9 billion) in FY 2005.

Applied Research

Federal obligations for applied research in FY 1990–2005 grew at an average annual rate of 6.8 percent (4.7 percent in constant 2000 dollars). The applied research share of the R&D and R&D plant total increased from 15.7 percent in FY 1990 to 27.1 percent in FY 2001, its highest level. That share is estimated to drop to 25.3 percent ($27.8 billion) in FY 2005.

HHS Funding for Research

HHS obligations for research in FY 1990–2005 grew at an average annual rate of 9.4 percent (7.2 percent in constant 2000 dollars) and doubled between FY 1999 and FY 2005. The HHS share of agency-funded research has increased each year since FY 2001. Estimates for FY 2005 show an increase of 2.4 percent (0.3 percent in constant 2000 dollars), or $0.7 billion, over FY 2004. Nearly all (96.2 percent) of the HHS research total is slated for the National Institutes of Health (table 3); 88.6 percent ($25.5 billion) of FY 2005 HHS research funding is planned in support of the life sciences (table 4).

DOE Funding for Research

DOE obligations for research in FY 1990–2005 grew at an average annual rate of 5.6 percent (3.4 percent in constant 2000 dollars). DOE obligations account for $5.8 billion of all FY 2005 federally funded research,

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TABLE 1. Federal obligations for research and development and R&D plant, by character of work: FY 1990–2005

Fiscal year	All 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	97,928	51,072	24,751	26,320	42,589	4,267
2004 preliminary	106,488	54,450	26,436	28,013	48,271	3,768
2005 projected	110,193	54,698	26,860	27,838	51,789	3,706
	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	1,859
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	82,066	43,683	21,452	22,231	34,407	3,976
2002	86,474	46,045	22,701	23,344	36,300	4,129
2003	92,263	48,117	23,320	24,798	40,126	4,020
2004 preliminary	98,373	50,300	24,422	25,878	44,592	3,481
2005 projected	99,767	49,523	24,319	25,204	46,889	3,356

NOTES: Gross domestic product implicit price deflators for 2000 were used to convert current to constant dollars. Agencies reported preliminary obligations for FY 2004 and projected obligations for FY 2005 during FY 2004.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2003–05.

down $18 million from FY 2004 (table 2). Two components of DOE, Office of Science at $2.6 billion (45.3 percent) and defense programs at $2.4 billion (41.1 percent), account for most of the department's FY 2005 research dollars (table 3). Of total FY 2005 DOE research funding, 73.5 percent is planned in support of the physical sciences ($2.3 billion) and engineering ($2.0 billion) (table 4).

DOD Funding for Research

DOD obligations for research in FY 1990–2005 grew at an average annual rate of 3.3 percent (1.2 percent in constant 2000 dollars), even though the DOD share of agency-funded research has been declining since FY 2001. DOD accounts for $5.7 billion of FY 2005 agency-funded research, down 3.9 percent (5.8 percent in constant 2000 dollars) from FY 2004 (table 2). The Departments of the Air Force, Army, and Navy and the Defense Advanced Research Projects Agency account for most (88.6 percent) of the DOD research dollars (table 3). Of total FY 2005 DOD research funding, 52.9 percent ($3.0 billion) is planned in support of engineering (table 4).

Defense research in FY 2005 (defense research funding from DOD plus DOE defense programs) accounts for $8.1 billion (14.8 percent) of the federally funded research total, down 1.1 percent (3.1 percent in constant 2000 dollars) from FY 2004 estimates.

TABLE 2. Federal obligations for research, by agency: FY 1990–2005

Fiscal year	All agencies	HHS[a]	DOE	DOD	NASA[b]	NSF	USDA	Other
	Millions of current dollars							
1990	21,739	7,467	2,570	3,529	3,061	1,690	1,069	2,353
1991	23,968	8,162	3,274	3,718	3,371	1,785	1,175	2,483
1992	24,491	7,946	3,413	4,073	3,229	1,868	1,261	2,701
1993	26,891	9,193	3,440	4,784	3,549	1,882	1,252	2,792
1994	27,411	9,736	3,283	4,241	3,841	2,040	1,323	2,948
1995	28,434	10,076	3,460	4,198	4,046	2,149	1,299	3,206
1996	28,260	10,546	3,362	3,996	3,878	2,188	1,220	3,070
1997	29,365	11,228	3,568	3,810	4,185	2,249	1,290	3,036
1998	30,922	12,019	3,788	3,970	4,414	2,289	1,334	3,110
1999	33,528	13,715	3,920	4,142	4,358	2,506	1,488	3,399
2000	38,471	17,913	4,101	4,920	3,964	2,726	1,612	3,235
2001	44,714	20,649	4,593	6,806	4,472	3,044	1,804	3,347
2002	48,007	23,231	5,062	6,265	4,839	3,260	1,810	3,539
2003	51,072	26,288	5,261	5,816	4,553	3,609	1,869	3,677
2004 preliminary	54,450	28,106	5,812	5,958	5,171	3,730	1,985	3,688
2005 projected	54,698	28,770	5,794	5,724	5,217	3,844	1,800	3,549
	Millions of constant 2000 dollars							
1990	26,756	9,190	3,164	4,344	3,767	2,079	1,316	2,895
1991	28,432	9,683	3,883	4,410	3,999	2,118	1,394	2,945
1992	28,339	9,194	3,949	4,713	3,737	2,162	1,459	3,125
1993	30,426	10,401	3,893	5,412	4,015	2,129	1,416	3,159
1994	30,362	10,785	3,636	4,697	4,254	2,260	1,465	3,266
1995	30,847	10,931	3,753	4,555	4,389	2,332	1,409	3,478
1996	30,080	11,225	3,579	4,253	4,128	2,329	1,299	3,268
1997	30,720	11,746	3,732	3,986	4,378	2,352	1,350	3,176
1998	31,961	12,422	3,915	4,103	4,562	2,366	1,379	3,214
1999	34,205	13,992	3,999	4,226	4,446	2,557	1,518	3,467
2000	38,471	17,913	4,101	4,920	3,964	2,726	1,612	3,235
2001	43,683	20,173	4,487	6,649	4,369	2,973	1,762	3,269
2002	46,045	22,282	4,856	6,009	4,641	3,127	1,736	3,394
2003	48,117	24,767	4,956	5,479	4,290	3,400	1,761	3,464
2004 preliminary	50,300	25,964	5,369	5,504	4,777	3,446	1,834	3,407
2005 projected	49,523	26,048	5,246	5,183	4,723	3,480	1,630	3,213

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.

[a] In FY 2000 the National Institutes of Health, part of HHS, classified all of its development activities as research.

[b] In FY 2000 NASA reclassified and transferred funding for space station and space station research from R&D to R&D plant.

NOTES: Gross domestic product implicit price deflators for 2000 were used to convert current to constant dollars. Agencies reported preliminary obligations for FY 2004 and projected obligations for FY 2005 during FY 2004.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2003–05.

NASA Funding for Research

NASA obligations for research in FY 1990–2005 grew at an average annual rate of 3.6 percent (1.5 percent in constant 2000 dollars). In FY 2005 NASA's portion of agency-funded research dollars is $5.2 billion, a slight current-dollar increase of 0.9 percent over FY 2004 but a 1.1 percent decrease in constant 2000 dollars (table 2). NASA plans to provide 88.0 percent of its total FY 2005 research funding in support of engineering ($2.4 billion), environmental sciences ($1.2 billion), and physical sciences ($1.1 billion) (table 4).

NSF Funding for Research

NSF obligations for research in FY 1990–2005 grew at an average annual rate of 5.6 percent (3.5 percent in constant 2000 dollars). NSF is providing $3.8 billion of the agency-funded research total in FY 2005, an increase of 3.1 percent (1.0 percent in constant 2000 dollars) over FY 2004 (table 2). Of total FY 2005 NSF research funding, 75.0 percent is planned in support of mathematics and computer sciences ($0.8 billion), physical sciences ($0.7 billion), environmental sciences ($0.7 billion), and engineering ($0.7 billion) (table 4).

TABLE 3. Federal obligations for research, by top agency funders: FY 2003–05
(Millions of current dollars)

Agency	FY 2003	FY 2004 preliminary	FY 2005 projected	FY 2005 % distribution
All agencies	51,072	54,450	54,698	-
Department of Agriculture	1,869	1,985	1,800	100.0
Agricultural Research Service	966	985	899	49.9
Cooperative State Research, Education, and Extension Service	568	654	549	30.5
Forest Service	251	256	258	14.3
Other	83	89	95	5.3
Department of Defense	5,816	5,958	5,724	100.0
Defense Advanced Research Projects Agency	1,268	1,369	1,413	24.7
Department of the Air Force	1,329	1,470	1,559	27.2
Department of the Army	1,118	1,363	1,048	18.3
Department of the Navy	1,157	1,207	1,053	18.4
Other	944	549	651	11.4
Department of Energy	5,261	5,812	5,794	100.0
Energy Efficiency and Renewable Energy	310	335	299	5.2
Fossil Energy	256	231	222	3.8
National Nuclear Security Administration	2,158	2,314	2,453	42.3
Defense Programs	2,010	2,242	2,381	41.1
Nonproliferaton and Verification	148	72	72	1.2
Office of Science	2,395	2,718	2,624	45.3
Other	141	214	196	3.4
Department of Health and Human Services	26,288	28,106	28,770	100.0
National Institutes of Health	25,156	27,004	27,665	96.2
Other	1,131	1,102	1,104	3.8
National Aeronautics and Space Administration	4,553	5,171	5,217	-
National Science Foundation	3,609	3,730	3,844	-

NOTE: Agencies reported preliminary obligations for FY 2004 and projected obligations for FY 2005 during FY 2004.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2003–05

TABLE 4. Federal obligations for research, by field of science and engineering and agency: FY 2005 projected
(Millions of current dollars)

Field	All agencies	HHS	DOE	DOD	NASA	NSF	USDA	Other
All fields	54,698	28,770	5,794	5,724	5,217	3,844	1,800	3,549
Environmental sciences	3,916	488	298	312	1,164	691	15	948
Life sciences	29,791	25,498	289	695	334	578	1,443	953
Mathematics and computer sciences	2,841	72	941	834	94	793	19	88
Physical sciences	5,373	522	2,260	467	1,064	741	94	225
Psychology	1,157	990	0	88	25	4	1	50
Social sciences	1,081	318	0	46	0	133	151	434
Other sciences, nec	1,391	596	7	254	171	247	4	112
Engineering	9,147	284	2,000	3,029	2,364	657	74	740

DOD = Department of Defense; DOE = Department of Energy; HHS = Department of Health and Human Services; NASA = National Aeronautics and Space Administration; nec = not elsewhere classified; NSF = National Science Foundation; USDA = Department of Agriculture.

NOTE: Agencies reported projected obligations for FY 2005 during FY 2004.

SOURCE: National Science Foundation/Division of Science Resources Statistics, Survey of Federal Funds for Research and Development: FY 2003–05

USDA Funding for Research

USDA obligations for research in FY 1990–2005 grew at an average annual rate of 3.5 percent (1.4 percent in constant 2000 dollars). Obligations are slated to drop to $1.8 billion in FY 2005, a decrease of 9.3 percent (11.1 percent in constant 2000 dollars) from FY 2004 (table 2). The Agricultural Research Service; Cooperative State Research, Education, and Extension Service; and Forest Service account for most (94.7 percent) of the USDA research dollars (table 3). Of total FY 2005 USDA research funding, 80.2 percent ($1.4 billion) is planned in support of the life sciences (table 4).

Federal Funding for Development

From FY 1990 to FY 2005, total federal funding for development grew at an average annual rate of 1.4 percent (down 0.6 percent in constant 2000 dollars). Until FY 2002 the development share of total obligations for R&D and R&D plant had been decreasing, falling from 63.7 percent in FY 1990 to 41.9 percent in FY 2001 (table 1). Development shares have since risen from 42.0 percent in FY 2002 to 47.0 percent in FY 2005 (table 1). Growth in the development share of the total reflects the Bush administration's relative emphasis on defense-related R&D, which is dominated by development.

Defense development funding (development funding from DOD plus DOE defense programs) for FY 2005 is $46.2 billion, or 89.2 percent of total obligations for development funding, and is up 7.9 percent (5.7 percent in constant 2000 dollars) from FY 2004.

Federal Funding for R&D Plant

From FY 1990 to FY 2005 federal funding for R&D plant has grown at an average annual rate of 3.3 percent (1.2 percent in constant 2000 dollars). Since FY 1990 obligations have fluctuated, reaching a low of $1.7 billion in FY 1996 and a high of $4.5 billion in FY 2000. R&D plant is slated to decrease 1.6 percent (3.6 percent in constant 2000 dollars) from FY 2004 levels, to $3.7 billion in FY 2005 (table 1). R&D plant accounts for 3.4 percent of all R&D and R&D plant obligations in FY 2005.

Data Notes

Preliminary estimates presented here are being released in advance of the NSF detailed statistical tables report *Federal Funds for Research and Development: Fiscal Years 2003, 2004, and 2005,* which will be available at http://www.nsf.gov/statistics/fedfunds/. Amounts agencies reported for 2004 reflect congressional appropriation actions as of that period, as well as apportionment and reprogramming decisions as of that time. Data for 2005 represent administration budget proposals that had not been acted on at the time agencies were surveyed.

Research is defined as 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.

R&D plant includes costs related to structures, works, equipment, facilities, or land for use in R&D activities.

For 2003, federal agencies reported obligations of $93.7 billion in total R&D to all performers of R&D, compared with $85.3 billion in federal funding reported by the performers. Although NSF has not found a definitive explanation for this divergence, in 2005 the National Research Council noted that comparing federal R&D outlays (as opposed to obligations) with performer expenditures results in a smaller discrepancy.[1] For 2003, federal agencies reported R&D outlays of $89.8 billion to all performers of R&D.

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[1]National Research Council. 2005. *Measuring Research and Development Expenditures in the U.S. Economy*. Panel on Research and Development Statistics at the National Science Foundation, Committee on National Statistics, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.

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