

DOD Basic Research Rises 13 Percent; Congress Allocates \$9.4 Billion for S&T

(This analysis is part of a series of AAAS R&D Funding Updates on the FY 2001 congressional appropriations process. This analysis includes information on R&D in final FY 2001 DOD appropriations. The complete series of AAAS R&D Funding Updates, including continually updated analyses of R&D by agency in FY 2001 appropriations, is available on the AAAS R&D Web Site (<http://www.aaas.org/spp/R&D>) in the "FY 2001 R&D" or the "What's New" sections.)

President Clinton signed into law a final FY 2001 Defense appropriations bill providing substantial increases for Department of Defense (DOD) R&D on August 9. The final Defense bill adds even more money to the substantial increases contained in the House and Senate bills for most DOD R&D programs, in contrast to the cuts requested by the Pentagon and the Clinton Administration. In December, President Clinton signed into law another bill containing a 0.22 percent across-the-board reduction for most DOD programs; all figures in this analysis have been adjusted to reflect this reduction. **DOD's R&D in FY 2001 totals \$41.9 billion**, \$3.3 billion more than the President's request and \$2.5 billion or 6.4 percent more than FY 2000 (see Tables A and B).

The final Defense bill boosts DOD funding of basic research ("6.1") by \$149 million or 12.8 percent to \$1.3 billion. The final increase is above the House proposed increase of 11.5 percent and the Senate proposal of 10.5 percent. Applied research ("6.2") also increases substantially by 7.7 percent to \$3.7 billion. Including DOD's medical research programs, **DOD S&T** ["6.1" through "6.3" programs, representing DOD's investment in basic and applied research and technology development, plus medical research contained in other accounts] increases by 8.0 percent to \$9.4 billion, considerably more than the requested level of \$7.6 billion.

The final Defense bill contains substantial increases for the overall DOD budget as well as for R&D programs, increases even larger than those proposed by the President in February. The \$288 billion total for the final Defense bill, which funds most but not all of DOD, is \$4 billion more than the request and more than \$20 billion above the FY 2000 funding level. Military health care, procurement, and operations and maintenance accounts are the top priorities for Congress in the Defense bill, and receive even larger increases than the R&D programs.

The final Defense bill provides large increases for most **basic research ("6.1")** accounts. DOD requested a 4.9 percent increase for "6.1" but the Senate responded with a 10.5 percent increase, and the House went even higher with a 11.5 percent increase. The final bill goes higher still with an appropriation of \$1.3 billion, 13.1 percent or \$152 million more than FY 2000, reduced to 12.8 percent in December because of the across-the-board cut (see Table A). (All figures in this analysis are adjusted to reflect rescissions and general reductions of approximately 1 percent across the board in the Defense bill, as well as the additional December reduction. In recent years, the Senate has proposed large increases to "6.1" while the House has appropriated smaller increases or cuts, and final appropriations have generally split the difference. But this year's House-proposed increase was a departure from the recent pattern, and the final Defense bill also breaks from pattern by going above both the House and the Senate.

The **applied research ("6.2")** accounts total \$3.7 billion in the final bill, nearly 8 percent above the FY 2000 funding level. As a result, total DOD support of research (basic plus applied) will be \$5.0 billion (up 9.0 percent), the largest increase in more than a decade, compared to a requested cut.

The “6.1” and “6.2” research accounts provide a significant share of federal support for several **key scientific and engineering disciplines**. DOD provides nearly a third of all federal support for engineering research, and a majority of federal support for some key engineering subfields. DOD also provides more than 40 percent of total federal support for computer sciences research, and plays a strong funding role in other disciplines such as mathematics, oceanography, medical sciences, chemistry, physics, and environmental sciences.

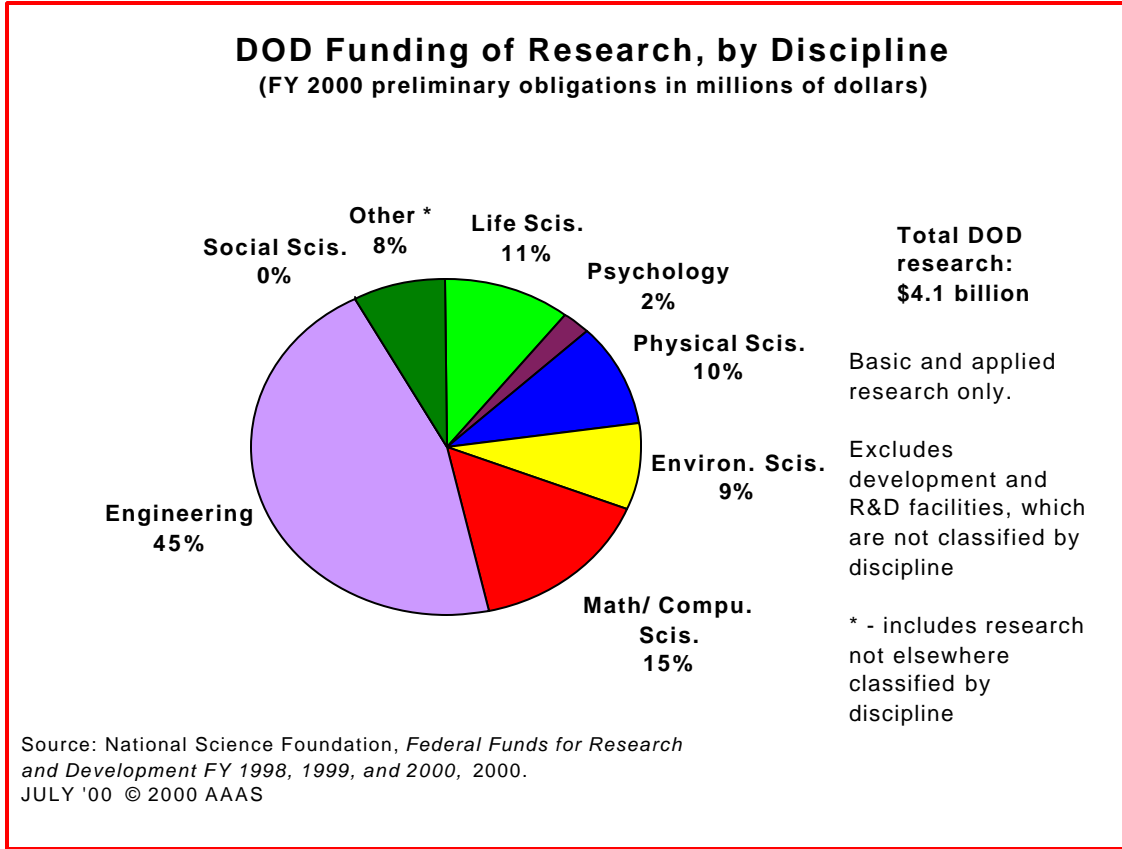


Figure 1.

DOD’s research portfolio by science and engineering discipline is shown in Figure 1. Because of DOD’s national security mission, the portfolio is weighted toward disciplines such as engineering, mathematics, physics, and computer sciences which have relevance to future weapons systems, but DOD also supports research in other fields for national security reasons, including the life sciences to combat bioterrorism threats and to ensure healthy solidiers, and environmental sciences (chiefly oceanography) to assist the Navy in operating its ships.

The “6.1” and “6.2” accounts are especially important for the nation’s **colleges and universities**, which perform more than half of “6.1” research and roughly 20 percent of “6.2” research. DOD is the third largest sponsor of federal R&D at colleges and universities, behind only the National Institutes of Health and the National Science Foundation. DOD’s impact, however, is concentrated in several key fields, shown in Figure 2 below. DOD provides a tenth of federal support for academic R&D, but more than half of all federal support for mechanical engineering and electrical engineering at universities, and nearly half of all federal support for computer sciences and materials engineering. The FY 2001 increases for “6.1” and “6.2” should boost DOD support for academic R&D in FY 2001, which has declined significantly in recent years due to cuts in the mid- to late 1990s in these accounts.

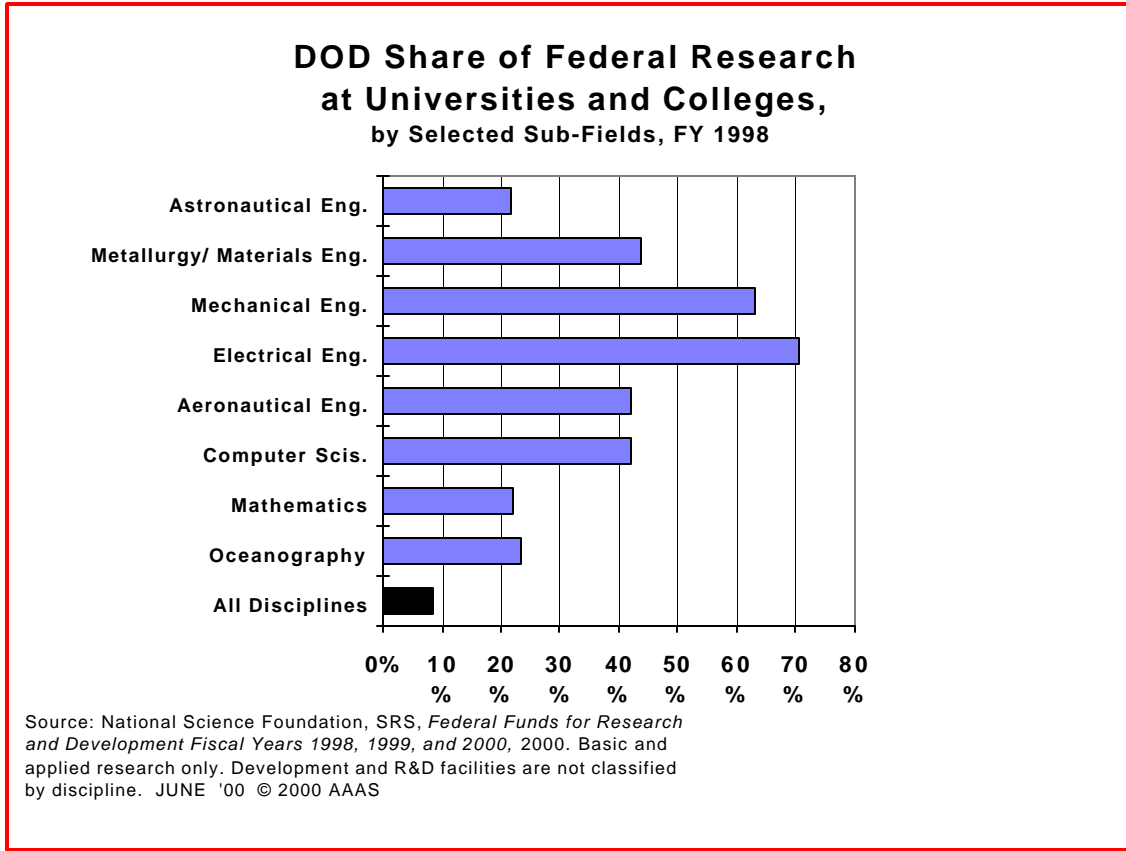


Figure 2.

The final Defense bill contains a separate \$349 million appropriation, outside the regular R&D accounts, for **congressionally designated medical R&D** (see Table A) plus another \$66 million for medical care-related information technology development for a total of \$414 million. This appropriation for peer-reviewed, competitively awarded research grants continues the recent expansion of DOD’s effort in medical research. The final bill divides the \$349 million medical R&D total into \$175 million for breast cancer research (up from \$172 million in FY 2000), \$100 million for prostate cancer research (up from \$74 million), \$12 million for ovarian cancer research, \$6 million for other cancer research, and more than \$50 million for peer reviewed medical research on other topics. The Defense bill also contains numerous congressionally designated medical research in DOD’s regular accounts, mostly in the Army and Navy, including R&D on HIV, alcoholism, neuroscience, bone marrow disease, Gulf War illness, and funding for medical laboratory facilities around the nation. Counting these appropriations, the Defense bill provides nearly \$750 million for congressionally designated medical research projects.

The “6.1,” “6.2,” and “6.3” categories are often grouped together as **“Science and Technology” (S&T)**. This category encompasses basic research, applied research, and advanced technology development, which contribute to a broad knowledge base with potential applications to a wide variety of military as well as civilian uses. S&T is separate from the “6.4” and higher categories, which are focused on the development and testing of specific weapons systems. DOD S&T declined steeply in the 1990s, but in FY 2000 DOD S&T, including the medical research appropriations formerly appropriated within the “6.3” category, exceeded \$8 billion for the first time since FY 1994 thanks to strong congressional support for an appropriation of \$8.7 billion. Many science and technology organizations and defense observers called on DOD to maintain S&T funding at a minimum of \$8 billion in 2000 dollars, but the Pentagon requested only \$7.6 billion for S&T in FY 2001. **The final Defense bill far exceeds the request to bring S&T to \$9.4 billion**, up 8.0 percent from FY 2000. [This total includes medical research outside the regular “6.1” through “6.3” categories.]

Among the Defense Agencies, **the Defense Advanced Research Projects Agency (DARPA) receives \$2.0 billion in FY 2001 (up 6.4 percent; see Table B).** Most DARPA programs that are high priorities for the Administration will receive increases, although not as large as requested. Extensible Information Systems, a key program in the Administration's Information Technology initiative on fundamental IT research, will see its funding rise from \$30 million to \$53 million, though this falls short of the request for \$69 million. Computing Systems and Communications Technology, another IT initiative component, falls short of the \$377 million request but will still rise from \$321 million in FY 2000 to \$334 million in FY 2001. Congress added to the request for Biological Warfare Defense, a program that funds R&D aimed at countering bioterrorism threats, and FY 2001 funding will be \$168 million, up from \$132 million.

The **Ballistic Missile Defense Organization's (BMDO)** budget will also increase substantially, by 22.4 percent to \$4.2 billion. The BMDO appropriation funds continued development and testing of national and theater missile defense systems, including \$1.9 billion for development of a national missile defense. Although recent, widely publicized failures of missile defense tests and slower-than-expected development of key systems led President Clinton to defer a decision on whether to deploy a national defense system to President-elect Bush, BMDO will continue its extensive development and testing efforts.

The House approved the Defense bill conference report on July 19, and the Senate on July 27. President Clinton signed the bill into law on August 9, making the Defense bill only the second of the 13 FY 2001 appropriations bills to be signed into law (the first, the Military Construction bill, also funds DOD programs). The substantial increases for DOD result from a bipartisan consensus that the defense budget needs to be increased substantially, and this consensus has made passage of the defense-related appropriations relatively easy and non-controversial. The remaining 11 bills covering domestic programs, however, were harder to enact and were not complete until December 21. As part of the final FY 2001 appropriations bill, President Clinton signed into law a provision reducing most discretionary programs by an across-the-board 0.22 percent, including most programs in DOD.

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**Table A. Department of Defense by Program
R&D in the FY 2001 Budget (FINAL)
(budget authority in millions of dollars)**

	FY 2000 Estimate	FY 2001 Request	Final FY 2001 Appropriations				
			FY 2001 FINAL	Chg. from Request Amount	Percent	Chg. from FY 2000 Amount	Percent
Research, Development, Test, and Evaluation:							
Basic Research ("6.1")	1,161	1,217	1,310	93	8.0%	149	12.8%
Applied Research ("6.2")	3,410	3,144	3,673	528	15.5%	262	7.7%
Total Research, or Tech. Base	4,571	4,362	4,983	621	13.6%	411	9.0%
Advanced Tech. Dev. ("6.3")	3,826	3,182	3,967	785	20.5%	141	3.7%
Total Science and Technology	8,397	7,543	8,949	1,406	16.7%	552	6.6%
Demonstration/Validation ("6.4")	6,524	6,810	7,800	991	15.2%	1,276	19.6%
Engineering and Manuf. Dev. ("6.5")	8,689	8,661	8,641	-20	-0.2%	-48	-0.6%
RDT&E Management Support ("6.6")	2,552	2,434	2,614	180	7.1%	62	2.4%
Operational Systems Dev. ("6.7")	12,188	12,415	12,780	366	3.0%	593	4.9%
BA Adjustment	68	1	0	-1	-0.9%	--	--
TOTAL RDT&E	38,419	37,863	40,785	2,922	7.6%	2,366	6.2%
Other appropriations ¹	655	647	647	0	0.0%	-8	-1.3%
Medical research ²	270	66	414	348	128.9%	144	53.4%
Total DOD R&D	39,344	38,576	41,846	3,270	8.3%	2,502	6.4%

AAAS estimates based on FY 2001 appropriations bills. Includes conduct of R&D and R&D facilities.

FY 2000 and FY 2001 request figures based on OMB R&D data and supplemental agency budget data.

Figures are rounded to the nearest million. Changes calculated from unrounded figures.

FY 2000 figures adjusted to reflect rescissions and supplementals enacted in Public Law 106-246.

FY 2001 FINAL figures are adjusted to reflect rescissions and supplementals, and are also reduced to reflect general reductions and a 0.22 percent across-the-board cut.

¹ R&D support in military personnel, military construction, and other DOD appropriations.

Includes chemical agents and munitions destruction R&D funded outside RDT&E.

² Medical research appropriated in Defense Health Programs, not RDT&E. These funds are not included in "6.2."

December 20, 2000 - FINAL FY 2001 funding levels.

**Table B. Department of Defense by Agency
R&D in the FY 2001 Budget (FINAL)
(budget authority in millions of dollars)**

	FY 2000 Estimate	FY 2001 Request	Final FY 2001 Appropriations				
			FY 2001 FINAL	Chg. from Request Amount	Percent	Chg. from FY 2000 Amount	Percent
Research, development, test, and evaluation:							
Army	5,204	5,260	6,242	981	18.7%	1,038	19.9%
Navy	9,001	8,477	9,372	895	10.6%	371	4.1%
Air Force	14,487	13,686	13,926	241	1.8%	-561	-3.9%
Defense Agencies	9,431	10,238	11,019	780	7.6%	1,588	16.8%
<i>Defense Adv. Res. Projects Agcy.</i>	1,876	1,951	1,997	46	2.4%	121	6.4%
<i>Ballistic Missile Defense Org.</i>	3,428	3,943	4,195	252	6.4%	768	22.4%
<i>Other</i>	4,127	4,344	4,826	482	11.1%	699	16.9%
Director of Test and Evaluation	265	0	0	0	- -	-265	-100.0%
Director of Operational Test & Eval.	31	202	227	25	12.4%	196	630.8%
TOTAL RDT&E	38,419	37,863	40,785	2,922	7.7%	2,366	6.2%
Other appropriations ¹	655	647	647	0	0.0%	-8	-1.3%
Medical research ²	270	66	414	348	527.4%	144	53.4%
Total DOD R&D	39,344	38,576	41,846	3,270	8.5%	2,502	6.4%

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