

April 2006

# SMALL BUSINESS INNOVATION RESEARCH

## Information on Awards Made by NIH and DoD in Fiscal Years 2001 through 2004

The electronic version of this report was reposted April 21, 2006, to correct the report cover title displayed in the previous version. The time period “Fiscal Years 2002 through 2004” has now been corrected to read “Fiscal Years 2001 through 2004.”





Highlights of [GAO-06-565](#), a report to congressional requesters

## Why GAO Did This Study

The Small Business Innovation Research (SBIR) program is a three phase program that increases the use of small businesses to meet federal research needs and encourages commercialization of this research. Venture capital is one source of funding to help commercialize SBIR projects. To receive an award firms must meet ownership and other criteria and awards may exceed dollar guidelines. In 2002, the Small Business Administration (SBA) clarified that majority owners of firms that receive awards must be individuals rather than corporations.

Since 2002, controversy has arisen over the extent to which venture capital firms may own SBIR firms. GAO was asked to provide information on SBIR for fiscal years 2001 - 2004. For NIH and DoD, we determined the (1) number and characteristics of awards, (2) number and characteristics of awards above the guidelines, (3) changes in award characteristics after 2002, and (4) factors agencies consider, and data they collect on, SBIR awards.

NIH, DoD, and SBA provided technical comments that were incorporated, as appropriate. DoD said our findings were not surprising in light of differences in the markets for SBIR projects. SBA said our findings, though useful, may be misconstrued as suggesting a link between venture capital investment and SBIR eligibility, when no such link exists.

[www.gao.gov/cgi-bin/getrpt?GAO-06-565](http://www.gao.gov/cgi-bin/getrpt?GAO-06-565).

To view the full product, including the scope and methodology, click on the link above. For more information, contact Anu Mittal at (202) 512-3841 or [mittala@gao.gov](mailto:mittala@gao.gov).

# SMALL BUSINESS INNOVATION RESEARCH

## Information on Awards Made by NIH and DoD in Fiscal Years 2001 through 2004

### What GAO Found

During fiscal years 2001-2004, the National Institutes of Health (NIH) and Department of Defense (DoD) made 16,019 SBIR awards valued at \$5.3 billion. GAO identified the following characteristics of these awards: (1) most were concentrated in a few states; (2) a few agency component made most of the awards; (3) award amounts ranged from well below the guidelines to significantly above; (4) few awards were made to firms that had received venture capital investment, NIH made more than DoD; and (5) firms that received DoD SBIR awards were relatively small-sized.

Overall, from fiscal year 2001 through 2004, about half of NIH awards and 12 percent of DoD awards exceeded the guidelines, and most went to firms that had not received venture capital investment. Awards above the guidelines accounted for 70 percent of NIH's SBIR dollars and 23 percent of DoD's. Agency officials said NIH and DoD made such awards generally to fund relatively expensive research or to ensure high-quality results. Awards above the guidelines to firms that had received venture capital investment accounted for 18 percent of NIH's awards above the guidelines, and about 8 percent of DoD's. At NIH, firms that had received venture capital investment were more likely to receive the largest awards than firms that had not. A similar relationship existed for DoD's phase I awards but not for its phase II awards.

Since 2002, when SBA clarified SBIR ownership eligibility criteria, an increasing number of awards have been made to small business firms that had received venture capital investment; such firms have generally received larger awards at NIH and, in the aggregate, a larger share of NIH's and DoD's available SBIR funds. In addition, the average phase II award amount to firms that had received venture capital investment increased by over 70 percent, from about \$860,000 in fiscal year 2001 to about \$1.5 million in fiscal year 2004. As a result, such firms attracted a greater percentage of NIH's total SBIR dollars each year—about 21 percent on average in fiscal years 2003 and 2004, compared to an average of about 14 percent in fiscal years 2001 and 2002. At DoD we found similar trends, but to a somewhat lesser extent.

NIH, DoD, and SBA focus mainly on SBIR eligibility criteria relating to ownership, for-profit status, and the number of employees when reviewing applications. Although applicants self-certify that they meet these criteria, both NIH and DoD make efforts to verify the accuracy of the information prior to making an award. When agency officials are unable to verify the accuracy of an applicant's information, they refer the matter to SBA. Both agencies limit their data collection efforts largely to information about the SBIR award itself, such as award size. Agencies are not required to gather data on characteristics of the firms receiving the awards, such as the presence of venture capital investment; as a result, this information is currently not being collected.

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**Abbreviations**

DoD	Department of Defense
IDI	Innovation Development Institute
NIH	National Institutes of Health
R&D	research and development
SBA	Small Business Administration
SBIR	Small Business Innovation Research

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April 14, 2006

### Congressional Requesters

As a competitor in the global economy, the United States relies heavily on innovation through research and development (R&D). The potential of small businesses to be sources of significant innovation led the Congress to increase government funding for R&D projects and establish the Small Business Innovation Research (SBIR) program. The Small Business Innovation Development Act of 1982<sup>1</sup> established the SBIR program to, among other things, stimulate technological innovation related to each participating federal agency's goals and mission, use small businesses to meet federal R&D needs, and increase private sector commercialization of innovations derived from federal R&D. From its inception in fiscal year 1983, through fiscal year 2004, the SBIR program has awarded over \$17 billion to more than 82,000 projects.

Every federal agency with an R&D budget of \$100 million or more is required to establish and operate a SBIR program funded by 2.5 percent of that agency's budget for research conducted by others, called extramural research. Participating agencies make awards and manage their own programs, while the Small Business Administration (SBA) plays a central administrative and oversight role. Of the federal agencies with SBIR programs, two—the National Institutes of Health (NIH) in the Department of Health and Human Services and the Department of Defense (DoD)—account for the largest share of awards. NIH and DoD generally rely on the various components within the agency, such as the institutes and centers within NIH or the military and defense components within DoD, to help implement the SBIR program and make funding decisions. The extent of participation by awarding components differs in relation to their size, with larger components issuing more awards than smaller ones.

SBIR is a three-phased program. During phase I, participating agencies fund a proposed idea that appears to have commercial potential to more fully investigate its scientific and technical merit and feasibility. In phase II, participating agencies fund projects to further develop the idea, again taking into account its commercial potential. Generally, phase I and II awards may not exceed \$100,000 and \$750,000, respectively. However, SBA has interpreted its statutory authority as providing it the discretion to allow

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<sup>1</sup>Pub. L. No. 97-219 (1982).

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participating agencies to make larger awards above these guidelines when appropriate. Funds for all SBIR awards are dispersed contingent upon the awardee firm successfully achieving planned milestones. In phase III, SBIR firms are expected to commercialize the resulting product or process, but with no further SBIR funding. Funding for commercialization may come from the private sector or from non-SBIR federal dollars. One source of private sector funding available to SBIR firms to help commercialize SBIR-supported projects is funding from venture capital firms. In return for their investment in SBIR awardee firms, venture capital firms often receive a share in the ownership of the firm and, ultimately, any profits that may result when the project is commercialized.

To qualify for SBIR awards, small business firms must meet certain SBIR ownership and other eligibility criteria, such as being 51 percent or more owned by individuals who are U.S. citizens or permanent resident aliens.<sup>2</sup> Over the last several years, some controversy has arisen over whether SBIR awards can be made to small businesses whose majority owners are venture capital firms. In the fall of 2002, SBA provided additional clarification of the ownership criteria but did not specifically address the role of venture capital firms.<sup>3</sup> In 2003, an SBA administrative law judge issued a decision stating that venture capital firms could not be considered “individuals” for the purpose of satisfying the ownership criteria for the program. However, these events have raised concerns that small businesses that are majority-owned by venture capital firms are being unfairly excluded from participating in the SBIR program, and as a result, important research is not being funded and conducted. Others contend that small business firms that had not received venture capital investment are being excluded from the program because they are unable to compete against firms with venture capital investment that may, as a result of the venture capital investment, have access to greater management expertise and resources.

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<sup>2</sup>Effective early 2005, the 51 percent ownership requirement was revised to allow for majority ownership and control by another business concern or joint venture which itself meets the 51 percent requirement. 13 C.F.R. § 121.702(a).

<sup>3</sup>SBA's clarification took two forms: one was an updated Policy Directive promulgated through the Federal Register and the second was additional informal interpretive guidance provided by SBA's Office of General Counsel in October of 2002. 67 Fed. Reg. 60072 (Sep. 24, 2002).



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In this context, you asked us to review the SBIR awards NIH and DoD made from fiscal year 2001 through 2004, including those made to firms whose majority owners were venture capital firms, and the agencies' processes for determining eligibility. Because information on the degree of venture capital ownership is confidential and proprietary, and not available from the public or private sources we contacted, we could not directly respond to your inquiry. Instead, as agreed with your offices, this report provides information on those small business firms that had received venture capital investment at any time through fiscal year 2004, and also received an SBIR award in fiscal year 2001 through fiscal year 2004.<sup>4</sup> Specifically, we determined (1) the total number and key characteristics of NIH's and DoD's phase I and phase II awards, including the geographic location of awardee firms, agency component making the award, amount of the award, presence of venture capital investment in the awardee firm, and number of employees working for the SBIR firm and its affiliates; (2) the number and key characteristics of NIH's and DoD's phase I and phase II awards that were above the guidelines, including the reasons the awards exceeded the guidelines; (3) changes, if any, in award characteristics, for awards above and below the guidelines, that occurred following SBA's clarification of—and ruling on—the ownership criteria regarding venture capital ownership; and (4) the factors NIH, DoD, and SBA consider when determining eligibility for SBIR awards, and the data these agencies collect about SBIR awardees and applicants.

To conduct our work, we interviewed NIH, DoD, and SBA officials about their procedures and any changes that occurred from fiscal years 2001 through 2004. We reviewed agency documentation on awards, award selection and funding, eligibility determinations, and the data elements that are collected during the eligibility process. We also interviewed officials from organizations that represent venture capital investors and biotechnology firms to obtain their views on the SBIR program and venture capital investment.

To determine the total number of phase I and phase II awards and the key characteristics of these awards, we obtained data from NIH and DoD for all SBIR awards made during fiscal years 2001 through 2004. These data

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<sup>4</sup>Ninety-three percent of the firms in our study that had received an SBIR award and venture capital investment first received venture capital investment between 1990 and 2004. The remaining 7 percent first received venture capital investment before 1990. The data also do not indicate the length of time venture capital investment remained in the awardee firm.

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included award amounts projected at the time the award was made as well as additional funding and supplemental amounts issued subsequent to the award, which allowed us to provide information on awards that originated in fiscal years 2003 and 2004 but which may not be completed until 2005 or later. As a result, our data differ from information provided in agency reports on the amounts distributed in any specific fiscal year. We also obtained data from two private sector firms, Innovation Development Institute (IDI) and Dow Jones-Venture One, to determine which awardee firms received venture capital investment before receiving an SBIR award between fiscal years 2001 and 2004. Initially, we selected IDI because its database included information that supplemented agency data on SBIR awardee firms. IDI's database included information on venture capital investments in SBIR awardee firms that was compiled from published information such as company press releases. Subsequently, we obtained data from Dow Jones-Venture One to help corroborate, and supplement as necessary, the IDI data. We selected Dow Jones-Venture One because its database on venture capital investment is compiled and updated with information from both venture capital investors and the firms that receive the investment. These data do not indicate the length of time venture capital investment remained in the awardee firm. We interviewed key officials at IDI and Dow Jones-Venture One about their databases. We assessed the reliability of relevant fields in the databases and found them sufficient for our review.

To assess any differences that occurred following SBA's October 2002 clarification of ownership criteria and its May 2003 decision related to venture capital ownership in SBIR firms, we compared NIH and DoD data on awards made from October 1, 2000, through September 30, 2002, with data on awards made from October 1, 2002, through September 30, 2004. We used the combined data set to compare NIH and DoD awards from the two time periods in terms of the key characteristics described above. See appendix I for more details about our scope and methodology. We conducted our work in accordance with generally accepted government auditing standards.

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## Results in Brief

During fiscal years 2001-2004, NIH and DoD made a total of 16,019 SBIR awards valued at \$5.3 billion. We identified the following key characteristics of these awards:

- Most of the awards were concentrated in a few states. Firms in California and Massachusetts submitted about a third of all the

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applications and received about a third of all SBIR awards, totaling about a third of all dollars awarded.

- A small number of awarding components in NIH and DoD made most of the awards. At NIH, four awarding components issued about half of the awards, while the other 19 participating institutes and centers issued the remainder. Similarly, at DoD, four awarding components issued over 80 percent of the SBIR awards, while the other six participating components issued the remainder.
- Award amounts ranged from well below the guidelines to significantly above the guidelines. At NIH, phase I awards averaged \$162,537 and ranged from \$61,750 to \$1.7 million; phase II awards averaged \$934,643 and ranged from \$150,593 to about \$6.5 million. At DoD, phase I awards averaged \$89,504 and ranged from \$36,595 to \$449,000; phase II awards averaged \$771,362 and ranged from \$69,997 to about \$4.4 million.
- The percentage of awards to firms that had received venture capital investment was relatively small at both agencies, but was larger at NIH than at DoD. Specifically, about 17 percent of the NIH awards—accounting for 18 percent of the dollars NIH awarded to SBIR firms—and 7 percent of the DoD awards—accounting for 7 percent of the dollars DoD awarded—went to firms that had received venture capital investment. Awards to firms that had received venture capital investment were generally concentrated in the same states and in the same award-making agency components as for all of the awards.
- The firms that received DoD SBIR awards were, on average, relatively small-sized firms. Specifically, half of the firms had 20 employees or fewer. SBIR awardee firms that had also received venture capital investment were, on average, about 30 percent larger than firms that had not. Comparable information on firm size was not available for NIH.

Overall, about 50 percent of NIH awards and 12 percent of DoD awards exceeded SBIR guidelines, and most went to firms that had not received venture capital investment. Awards above the guidelines accounted for 70 percent of the dollars NIH awarded to SBIR firms and 23 percent of DoD's. At NIH, phase I awards above the guidelines ranged from just over \$100,000 to \$1.7 million, although most awards were \$595,000 or less. Similarly, NIH's phase II awards above the guidelines ranged from slightly above \$750,000 to \$6.5 million, but most were \$2.1 million or less. According to NIH officials responsible for the SBIR program, awards above the

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guidelines generally are made for projects in selected technology areas (such as biotechnology) that may be relatively more expensive to complete. At DoD, phase I awards above the guidelines ranged from just over \$100,000 to about \$448,796, although most of the awards were \$142,000 or less. Similarly, DoD's phase II awards above the guidelines ranged from about \$750,000 to \$4.4 million, although most were \$2.0 million or less. At DoD, the two main reasons awards exceeded the guidelines were because (1) the agency had determined that additional funds were needed to ensure a high-quality investigation of the proposed idea, or (2) the amount exceeding the guidelines included non-SBIR funds. With regard to the number of awards that exceeded the guidelines and were made to firms that had received venture capital investment, we determined that 18 percent of awards above the guidelines at NIH and about 8 percent of awards above the guidelines at DoD went to such firms. However, at NIH we found that firms that had received venture capital investment were more likely than firms that had not received such investment to receive the largest awards. For example, firms that had received venture capital investment were about six times more likely to receive phase II awards greater than \$2.5 million, which accounted for about 7 percent of NIH's phase II dollars. A similar relationship existed for DoD's phase I awards but not for its phase II awards. While the data, overall, indicate a relationship between firms that had received venture capital investment and high award amounts, by themselves they do not indicate whether the presence of venture capital was the reason these firms received such large awards.

Since 2002, when SBA clarified SBIR ownership eligibility criteria, an increasing number of awards have been made to small business firms that received venture capital investment; such firms have generally received larger awards at NIH and, in the aggregate, a larger share of NIH's and DoD's available SBIR funds. For example, the number of firms that received venture capital investment and also received SBIR awards from NIH steadily increased from 106 in fiscal year 2001 to 150 in fiscal year 2004. The number of awards these firms received also increased from 155 to 249. Moreover, the average phase II award amount to firms that had received venture capital investment increased by over 70 percent, from \$861,488 in fiscal year 2001 to about \$1.5 million in fiscal year 2004. Consequently, such firms attracted a greater percentage of NIH's total SBIR dollars each year—about 21 percent on average in fiscal years 2003 and 2004, compared to an average of about 14 percent in fiscal years 2001 and 2002. At DoD we found similar trends, but to a somewhat lesser extent.

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NIH, DoD, and SBA focus primarily on criteria relating to ownership, for-profit status, and number of employees to determine a firm's eligibility for the SBIR program. Although applicants self-certify that they meet these criteria, both NIH and DoD perform certain actions to try and verify the accuracy of the information submitted by applicants prior to making an award. For example, both agencies frequently contact potentially successful applicants and may require additional documentation. When agency officials are unable to ensure the accuracy of an applicant's information, they refer the matter to SBA. After SBA makes an eligibility determination, it makes information about the firms it finds ineligible publicly available on its Web site, but does not always indicate that the determination was for SBIR purposes. We also found that NIH and DoD take different approaches to retaining and sharing information on firms found ineligible. In 2003, NIH began to retain information centrally on firms it found ineligible and made the information available to all of its agency components that make SBIR awards. In contrast, DoD retains information on firms it finds ineligible in individual contract files and shares the information electronically with awarding components but does not retain the data in a centralized resource. With regard to data collected by the agencies, we determined that each agency limits its data collection efforts largely to information about the SBIR award itself, such as award size and location of the principal investigator. Agencies do not gather data on characteristics of the firms receiving the awards, such as the presence of venture capital investment or the extent of venture capital ownership. Nor do the agencies systematically gather data on the industry represented by the applicant.

In commenting on our report, NIH, DoD, and SBA provided technical comments that we incorporated, as appropriate. DoD agreed that because data on ownership are not publicly available, it is not possible to determine the extent to which venture capital firms own SBIR awardee firms. Moreover, DoD did not find the results of our analysis surprising in light of differences in markets for research supported by NIH and DoD. SBA noted that while the information may be useful, it could be misconstrued as suggesting a link between the presence of venture capital investment and SBIR ownership criteria when such a link does not exist. While we understand SBA's concern, we believe the report clearly states that we used venture capital investment as a proxy for venture capital ownership because ownership data are proprietary and confidential. We also explicitly note in the report that no causal link can be inferred from the data.

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## Background

Of the eleven agencies that currently have SBIR programs, two—NIH and DoD—account for the largest share of awards.<sup>5</sup> Large agencies, such as NIH and DoD, generally rely on the various components within the agency such as the 23 participating institutes and centers within NIH and the 10 participating military and defense components within DoD, to help implement the SBIR program and make funding decisions.<sup>6</sup> Agencies decide what type of research to fund, solicit and review applications for technical and scientific merit, verify that the applicant meets eligibility criteria, select which projects to fund, and decide the size of the award. Awards can be made to successful applicants in the form of grants, contracts, or cooperative agreements.<sup>7</sup> SBA plays a key administrative and oversight role, such as issuing policy directives and annual reports for the program and monitoring agencies' annual funding allocations. Once an award has been issued, awarding agency staff monitor the progress of work on the project.

The Small Business Innovation Development Act of 1982 established a three-phased structure for the SBIR program. During phase I, participating agencies fund a proposed idea that appears to have commercial potential to more fully investigate its scientific and technical merit and feasibility. Work on the phase I project is generally not to exceed 6 months. During phase II, participating agencies fund projects to further develop the idea, generally over a 2-year period, again taking into account its commercial potential. During phase III, firms are expected to commercialize the resulting product or process using other federal or private sector funds, but with no further SBIR funding. Unlike phases I and II, phase III has no general limits in time or dollar amounts. In addition to phase I and II awards, NIH and DoD also make awards through a streamlined process—known as fast track—for

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<sup>5</sup>The nine other participating agencies are the Departments of Agriculture, Commerce, Education, Energy, Homeland Security, and Transportation; the Environmental Protection Agency, the National Aeronautics and Space Administration, and the National Science Foundation.

<sup>6</sup>The names of two DoD components changed during the period of our review—fiscal years 2001 through 2004. Specifically, the Ballistic Missile Defense Organization became the Missile Defense Agency in 2002, the National Imagery and Mapping Agency became the National Geospatial-Intelligence Agency in 2003.

<sup>7</sup>At DoD, which almost exclusively uses contracts to make awards, contracting officials are responsible for ensuring that evaluations are based solely on the factors specified in the solicitation and that all requirements of law, executive orders, regulations, and all other applicable procedures—including clearances and approvals—have been met.

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projects with high commercial potential.<sup>8</sup> Both agencies use an expedited review process for fast track applications. However each agency operates its program differently. For example, to qualify for DoD's fast track awards, firms that have received phase I awards must obtain commitments for outside funding that DoD will match while NIH's program considers information on phases I and II simultaneously and does not involve matching funds. In addition, the two agencies account for their fast track awards differently. NIH maintains data on fast track awards separately from its data on phase I and II awards. At DoD, fast track awards are included in the phase I and phase II awards data. Funding for fast track awards, which comprise a small portion of each agency's SBIR awards, are not subject to specific dollar limits. Funds for all awards are dispersed contingent upon the awarded firm successfully achieving planned milestones.

Receipt of a phase II award is contingent upon successful completion of a phase I award. Firms may receive phase II awards from the same agency that funded their phase I award or from a different participating agency. Successful commercialization during phase III may immediately follow completion of the phase II project, or may not occur for several years, or much later; drug development and medical products and processes that require extensive testing and federal regulatory approval before marketing fall into this final category.

Funding for commercialization may come from the private sector or from non-SBIR federal sources. Venture capital firms that typically invest in new or existing firms with the potential for above-average growth are one source of private sector funding available to small businesses that would like to commercialize their SBIR-supported projects. Venture capital firms may seek to invest in small businesses that have received SBIR awards because, in exchange for their venture capital, they receive an ownership stake in the business and, ultimately, a share of any potential profits that result when the SBIR-supported project is commercialized.

Generally, phase I and phase II awards may not exceed \$100,000 and \$750,000, respectively. SBA has interpreted its statutory authority as providing it with discretion to allow agencies to make awards above these

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<sup>8</sup>While the fast track process is not explicitly provided for in the SBIR statute or Policy Directive, NIH and DoD have developed the process as one way to help ensure seamless funding between phase I and phase II.

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guidelines, when appropriate, if they provide written justification to SBA after doing so. For example, in 2001, SBA granted NIH a waiver that allowed it to routinely make awards above the guidelines for unusually expensive research, such as medical treatment and drug research. Similarly, DoD makes awards above the guidelines on a case-by-case basis according to certain criteria, such as whether the cost was determined to be reasonable and necessary to ensure a high-quality product.

To compete for SBIR awards, firms must meet size, ownership, and other eligibility criteria.<sup>9</sup> For example, eligible firms must (1) be organized as for-profit firms that operate primarily within, or contribute significantly to, the U.S. economy; (2) be 51 percent or more owned by individuals who are U.S. citizens or permanent resident aliens; and (3) have, with their affiliates, no more than 500 employees.<sup>10</sup> Under current law, applicants self-certify their eligibility and face potential criminal and civil penalties for misrepresenting the status of their firm in order to obtain an SBIR award. Although firms may receive multiple phase I and II SBIR awards for different projects—either from the same or from different participating agencies—firms may not receive multiple awards for work that is essentially the same.

NIH and DoD follow similar procedures to select applicants and determine their eligibility for an SBIR award. (See fig. 1.) Specifically, each agency consults its various awarding components to develop research topics that further the agency’s mission, and periodically announces SBIR project opportunities through a solicitation to seek funding for research on those topics. Before the date applications are due, both agencies encourage potential applicants to contact agency staff to discuss any questions they may have, including questions about their eligibility. As of December 2005, both agencies require applicants to file electronically, and to register with the Central Contractor Register database. Submitted applications are

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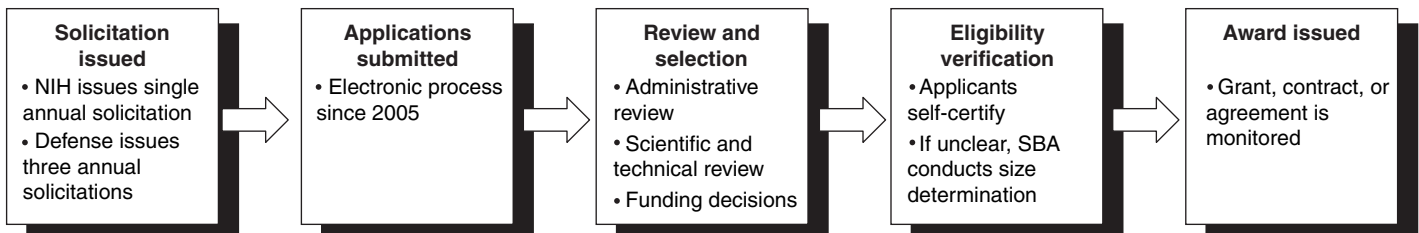
<sup>9</sup>The Small Business Act states that a small business must be “independently owned and operated,” must not be “dominant in its field,” and that the definition of small business can vary by industry. Over the years, SBA has established and revised numerical definitions, called size standards, which are almost always stated in terms of either the number of employees or average annual receipts of a firm. For SBIR, SBA established a size standard all participating agencies must use that is stated in terms of the number of employees in the firm.

<sup>10</sup>Effective early 2005, the 51 percent ownership requirement was revised to allow for majority ownership and control by another business concern or joint venture which itself meets the 51 percent requirement. 13 C.F.R. § 121.702(a).



reviewed internally for administrative completeness, and those that do not comply with the requirements may be rejected or take longer to review.

**Figure 1: General Selection Process for SBIR Awards at NIH and DoD**



Source: GAO.

Note: This chart reflects the general process at NIH and DoD. Because agencies and their awarding components' processes differ to some extent, not all awarding components execute each step in the same manner.

At NIH, appropriately completed applications are assigned to a scientific review group and a potential funding component to undergo a two-step external peer review. The scientific review groups evaluate each application for scientific and technical merit, and commercial potential; assign scores; and subject meritorious applications to a second review. The National Advisory Council or the board of the awarding component then evaluates the applications for scientific merit, factoring in the scientific review groups' scores and relevance to the awarding component's mission and goals, and recommends applications to be funded. The members of the scientific review groups and the National Advisory Council or the board of the awarding component are nonfederal scientists, physicians, and engineers who are recognized authorities in their field. In contrast, at DoD, after an application has been forwarded to the appropriate awarding component, internal agency staff review the scientific and technical merit and the commercial potential of the application, and make decisions about which ones to fund.

Once officials at each awarding component decide which of the meritorious applications to fund, both NIH and DoD largely rely on information that the applicant provides and certifies as accurate to determine eligibility, although each agency makes some effort to independently corroborate the self-certified information. To help conserve limited staff resources and provide a more timely determination, both NIH

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and DoD verify the eligibility of only those firms that submit applications deemed meritorious by their review process.

In recent years, the ownership criteria have come under increased scrutiny, particularly with regard to majority ownership of SBIR awardee firms by venture capital firms. Specifically, in 2001, an SBA administrative law judge issued a decision clarifying that the terms “individuals” and “citizens” in the SBIR criteria meant only natural persons, not entities such as corporations. Subsequently, in the fall of 2002, SBA both revised its SBIR policy directive and provided additional informal clarification to participating agencies regarding the ownership criteria, but did not specifically address the role of venture capital firms or other corporations. Then in 2003, the same SBA administrative law judge issued a decision stating that venture capital firms could not be considered individuals for the purpose of satisfying the ownership criteria for the program.

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## Key Characteristics of NIH’s and DoD’s SBIR Awards for Fiscal Years 2001 through 2004

During fiscal years 2001 - 2004, NIH and DoD made a total of 16,019 SBIR awards valued at \$5.3 billion. This section discusses the following key characteristics that we identified for these awards: (1) total number and value of the awards made, (2) geographical distribution of the awards made, (3) agency components making the awards, and (4) size of firms receiving the awards. In addition, this section provides detailed information on the key characteristics of those awards that were made to firms that had received venture capital investment.

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## Total Number and Value of NIH’s and DoD’s SBIR Awards for Fiscal Years 2001 through 2004

From fiscal year 2001 through 2004, NIH and DoD issued a combined total of 11,146 phase I awards, totaling about \$1.3 billion, and 4,675 phase II awards, totaling about \$3.8 billion. As shown in table 1, during fiscal years 2001 - 2004, DoD made twice as many awards as NIH totaling over \$3.2 billion.

**Table 1: Total Number and Dollar Value of SBIR Awards Made by NIH and DoD During Fiscal Years 2001 - 2004**

(Dollars in millions)

Agency	Phase I awards		Phase II awards		Fast track awards		Dollar value of all awards
	Number	Dollar value	Number	Dollar value	Number	Dollar value	
NIH	3,580	\$582	1,283	\$1,199	198	\$211	\$1,992
DoD	7,566	\$677	3,392	\$2,616	<sup>a</sup>	<sup>a</sup>	\$3,294
<b>Total</b>	<b>11,146</b>	<b>\$1,259</b>	<b>4,675</b>	<b>\$3,816</b>	<b>198</b>	<b>\$211</b>	<b>\$5,286</b>

Source: GAO analysis of NIH and DoD data.

<sup>a</sup>DoD includes the number and full anticipated dollar value of its fast track awards in its data on phase I and phase II awards.

Notes:

(1) The dollar value of NIH's phase I and II awards includes anticipated funding throughout the life of the project. The dollar value of fast track awards includes total dollars allotted to the projects through the end of fiscal year 2005 and does not include anticipated funding for projects that will continue after fiscal year 2005.

(2) DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

However, NIH awards were, on average, larger than the DoD awards. We found the following at NIH:

- Phase I awards averaged \$162,537, with a median of \$100,658, and ranged from \$61,750 to \$1.7 million, with about 90 percent falling between \$96,000 and \$489,000.
- Phase II awards averaged \$934,643, with a median of \$763,719, and ranged from \$150,593 to about \$6.5 million, with about 90 percent falling between \$542,000 and \$1.8 million.
- Fast track awards averaged \$1.1 million, with a median of \$850,000, and ranged from \$96,514 to \$9.6 million, with about 90 percent falling between \$173,000 and \$2.5 million.

In contrast, at DoD, we found the following:

- Phase I awards averaged \$89,504, with a median of \$99,000, and ranged from \$36,595 to \$449,000, with about 90 percent falling between \$68,000 and \$120,000.

- Phase II awards averaged \$771,362, with a median of \$747,622, and ranged from \$69,997 to about \$4.4 million, with about 90 percent falling between \$450,000 and \$1.2 million.

**Geographical Distribution of NIH's and DoD's SBIR Awards for Fiscal Years 2001 through 2004**

While a firm in every state received at least one SBIR award from both NIH and DoD, a small number of states accounted for most of the awards. Specifically, about 70 percent of all SBIR awards and dollars awarded went to firms in 10 states, although the states differed between NIH and DoD. Moreover, firms in these states also submitted about 70 percent of the phase I and II applications at NIH, and phase I applications at DoD. DoD does not maintain comparable information on phase II applications by state. For example, at NIH and DoD, small businesses from California and Massachusetts submitted about a third of the applications and received about a third of the awards and a third of the dollars awarded. Tables 2 and 3 provide information on the geographical distribution of NIH's and DoD's total SBIR applications and awards for the top 10 states for fiscal years 2001 through 2004; detailed information on the distribution of applications, awards, and awarded dollars among all states is presented in appendix II for NIH and appendix III for DoD.

**Table 2: Geographical Distribution of NIH's Total SBIR Applications, Awards, and Dollars Awarded for the Top 10 States During Fiscal Years 2001 - 2004**

(Dollars in millions)

State	Total applications - number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage
California	3,918 (21%)	988 (20%)	\$395 (20%)
Massachusetts	2,364 (12%)	707 (14%)	\$285 (14%)
Maryland	1,224 (6%)	327 (6%)	\$142 (7%)
New York	830 (4%)	216 (4%)	\$118 (6%)
Texas	906 (5%)	213 (4%)	\$81 (4%)
Pennsylvania	725 (4%)	212 (4%)	\$81 (4%)

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(Dollars in millions)

State	Total applications - number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage
Washington	646 (3%)	195 (4%)	\$80 (4%)
Virginia	728 (4%)	167 (3%)	\$66 (3%)
Ohio	584 (3%)	181 (4%)	\$59 (3%)
New Jersey	507 (3%)	136 (3%)	\$57 (3%)
<b>Subtotal</b>	<b>12,432 (66%)</b>	<b>3,342 (66%)</b>	<b>\$1,364 (68%)</b>
Other states	6,516 (34%)	1,719 (34%)	\$629 (32%)
<b>Total</b>	<b>18,948<sup>a</sup> (100%)</b>	<b>5,061 (100%)</b>	<b>\$1,992 (100%)</b>

Source: GAO analysis of NIH data.

<sup>a</sup>Also included in this total are three applications submitted by firms in Puerto Rico, none of which were funded.

**Table 3: Geographical Distribution of DoD's Phase I SBIR Applications and Total Awards and Dollars Awarded for the Top 10 States During Fiscal Years 2001 - 2004**

(Dollars in millions)

State	Phase I applications - number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage
California	10,584 (21%)	2,433 (22%)	\$741 (23%)
Massachusetts	6,173 (12%)	1,568 (14%)	\$483 (15%)
Virginia	3,787 (7%)	825 (8%)	\$245 (7%)
Ohio	2,022 (4%)	485 (4%)	\$163 (5%)
Colorado	1,956 (4%)	543 (5%)	\$160 (5%)
Maryland	2,594 (5%)	543 (5%)	\$152 (5%)
Pennsylvania	1,840 (4%)	440 (4%)	\$132 (4%)

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(Dollars in millions)

State	Phase I applications - number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage
New York	1,946 (4%)	423 (4%)	\$126 (4%)
Texas	2,619 (5%)	447 (4%)	\$125 (4%)
New Jersey	1,644 (3%)	305 (3%)	\$88 (3%)
<b>Subtotal</b>	<b>35,165 (69%)</b>	<b>8,012 (73%)</b>	<b>\$2,414 (73%)</b>
Other states	15,610 (31%)	2,946 (27%)	\$880 (27%)
<b>Total</b>	<b>50,775<sup>a</sup> (100%)</b>	<b>10,958 (100%)</b>	<b>\$3,294 (100%)</b>

Source: GAO analysis of DoD data.

<sup>a</sup>Also included in this total are six phase I applications submitted by firms in Puerto Rico to DoD, none of which were funded.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

## NIH and DoD Agency Components Making SBIR Awards for Fiscal Years 2001 through 2004

At both NIH and DoD a small number of awarding components accounted for most of the SBIR awards and dollars awarded. Specifically, 4 of NIH's 23 participating institutes and centers accounted for about half of the SBIR awards and dollars. The National Cancer Institute had the largest share at NIH, accounting for almost 20 percent of the SBIR awards and dollars. Table 4 shows the total SBIR awards and dollars associated with these four NIH awarding components. For information on the distribution of SBIR awards and dollars among all participating NIH components, see appendix II.

**Table 4: Total SBIR Awards and Dollars Awarded for Four Primary NIH Awarding Components During Fiscal Years 2001 - 2004**

(Dollars in millions)

Awarding component	Total awards - number and percentage	Total dollars awarded - number and percentage
National Cancer Institute	945 (19%)	\$347 (17%)
National Institute of Allergy and Infectious Diseases	618 (12%)	\$276 (14%)
National Heart, Lung, and Blood Institute	597 (12%)	\$236 (12%)
National Institute of General Medical Sciences	390 (8%)	\$151 (8%)
<b>Subtotal</b>	<b>2,550 (50%)</b>	<b>\$1,011 (51%)</b>
Remaining 19 institutes and centers	2,511 (50%)	\$982 (49%)
<b>Total</b>	<b>5,061 (100%)</b>	<b>\$1,992 (100%)</b>

Source: GAO analysis of NIH data.

Similarly, four of DoD's ten awarding components accounted for more than 80 percent of the SBIR awards and dollars awarded, with the Air Force and the Army together accounting for 43 percent of awards and just over half of the dollars. Table 5 shows the total SBIR awards and dollars awarded associated with these four DoD awarding components. For more information on the distribution of SBIR awards and awarded dollars among all participating DoD components, see appendix III.

**Table 5: Total SBIR Awards and Dollars Awarded for Four Primary DoD Awarding Components During Fiscal Years 2001 - 2004**

(Dollars in millions)

Awarding component	Total awards - number and percentage	Total dollars awarded - number and percentage
Air Force	2,783 (25%)	\$1,018 (31%)
Army	2,003 (18%)	\$683 (21%)
Navy	2,548 (23%)	\$619 (19%)
Missile Defense Agency	1,912 (17%)	\$483 (15%)
<b>Subtotal</b>	<b>9,246 (84%)</b>	<b>\$2,803 (85%)</b>
Remaining six awarding components	1,712 (16%)	\$490 (15%)
<b>Total</b>	<b>10,958 (100%)</b>	<b>\$3,294 (100%)</b>

Source: GAO analysis of DoD data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

### Characteristics of NIH and DoD SBIR Awards Made to Firms that Had Received Venture Capital Investment

Firms that had received venture capital investment received a relatively small percentage of the NIH and DoD SBIR awards, although they received a somewhat larger percentage of awards from NIH than DoD.<sup>11</sup> As shown in table 6, at NIH, firms that had received venture capital investment received about 18 and 14 percent of the phase I and II awards, respectively, accounting for about 18 percent of the agency's total SBIR dollars.

<sup>11</sup>Ninety-three percent of the firms in our study that had received an SBIR award and venture capital investment first received venture capital investment between 1990 and 2004, while the remaining 7 percent first received venture capital investment before 1990. The data do not indicate the length of time the venture capital investment remained in the awardee firm.



**Table 6: Total NIH SBIR Awards and Dollars Awarded to Firms That Had and Had Not Received Venture Capital Investment During Fiscal Year 2001 - 2004**

(Dollars in millions)

	Phase I awards		Phase II awards		Fast track awards		Total awards	
	Number and percentage	Dollars awarded and percentage	Number and percentage	Dollars awarded and percentage	Number and percentage	Dollars awarded and percentage	Number and percentage	Dollars awarded and percentage
Firms that had received venture capital investment	627 (18%)	\$112 (19%)	183 (14%)	\$212 (18%)	34 (17%)	\$32 (15%)	844 (17%)	\$356 (18%)
Firms that had not received venture capital investment	2,953 (82%)	\$470 (81%)	1,100 (86%)	\$988 (82%)	164 (83%)	\$179 (85%)	4,217 (83%)	\$1,637 (82%)
<b>Total</b>	<b>3,580 (100%)</b>	<b>\$582 (100%)</b>	<b>1,283 (100%)</b>	<b>\$1,199 (100%)</b>	<b>198 (100%)</b>	<b>\$211 (100%)</b>	<b>5,061 (100%)</b>	<b>\$1,992 (100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

As shown in table 7, at DoD about 7 percent of phase I and II awards were made to firms that had received venture capital investment. These awards accounted for about 7 percent of the dollars DoD awarded to SBIR firms.

**Table 7: Total DoD SBIR Awards and Dollars Awarded to Firms That Had and Had Not Received Venture Capital Investment During Fiscal Years 2001 - 2004**

(Dollars in millions)

	Phase I awards		Phase II awards		Total awards	
	Number and percentage	Dollars awarded and percentage	Number and percentage	Dollars awarded and percentage	Number and percentage	Dollars awarded and percentage
Firms that had received venture capital investment	517 (7%)	\$47 (7%)	230 (7%)	\$172 (7%)	747 (7%)	\$218 (7%)
Firms that had not received venture capital investment	7,049 (93%)	\$630 (93%)	3,162 (93%)	\$2,445 (93%)	10,211 (93%)	\$3,075 (93%)
<b>Total</b>	<b>7,566 (100%)</b>	<b>\$677 (100%)</b>	<b>3,392 (100%)</b>	<b>\$2,616 (100%)</b>	<b>10,958 (100%)</b>	<b>\$3,294 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

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Awards to firms that had received venture capital investment were generally concentrated in the same states and in the same agency components as for all SBIR awards. At NIH, the 10 states that accounted for close to 70 percent of the total SBIR dollars also accounted for about 77 percent of the dollars to firms that had received venture capital investment. Likewise, at NIH, the four awarding components that issued about half of the SBIR dollars also accounted for 73 percent of the dollars to firms that had received venture capital investment. At DoD, the 10 states that accounted for 73 percent of the total dollars awarded to SBIR firms also accounted for about 70 percent of the dollars to firms that had received venture capital investment. In addition, the four awarding components that issued 85 percent of the dollars also issued 82 percent of the dollars to firms that had received venture capital investment.

In contrast, awards to firms that had not received venture capital investment were more widely distributed, although small businesses in every state received at least one SBIR award from NIH and DoD. Specifically, we found that in 17 states, none of the firms that had received SBIR awards from NIH had received venture capital investment. For example, awardee firms in Nebraska, Vermont, and Delaware each accounted for less than 1 percent of NIH's SBIR dollars, and none of the firms in these states had received venture capital investment. For DoD, we found that in 21 states, none of the firms that had received SBIR awards had received venture capital investment. For example, awardee firms in Nevada, Tennessee, and Rhode Island each accounted for about 1 percent or less of the dollars DoD awarded, and none of the firms in these states had received venture capital investment. Detailed information on the geographical distribution of applications, awards, and dollars awarded to firms that had received venture capital investment is presented in appendix II for NIH and appendix III for DoD.

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### Size of SBIR Firms That Received Awards from DoD

The firms that received DoD SBIR awards were, on average, relatively small-sized firms. Half of the firms had 20 or fewer employees, as reported by awardees at the time they applied for SBIR awards. DoD SBIR awardee firms that had received venture capital investment were also small-sized, on average, but about 30 percent larger than firms that had not received such investment. We could not determine the size of SBIR awardee firms for NIH, because the agency does not maintain comparable information on the number of employees at awardee firms.

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## Few Awards above the Guidelines Were Made to Firms That Had Received Venture Capital Investment Although These Firms Tend to Receive Larger Awards

While about half of NIH awards and 12 percent of DoD awards were above the guidelines, less than 20 percent of such awards at NIH and about 8 percent at DoD went to firms that had received venture capital investment. However, at NIH, we found that firms that had received venture capital investment were more likely than firms that had not received such investment to receive the largest awards. A similar relationship existed for DoD's phase I awards but not for its phase II awards. While the data, overall, indicate a relationship between firms that had received venture capital investment and high award amounts, they do not indicate whether the presence of venture capital investment was the reason the firms received an SBIR award. Awards above the guidelines were generally concentrated in the same states and made by the same awarding agency components as were awards that were within the guidelines.

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## Number and Value of NIH and DoD SBIR Awards That Were above the Guidelines

From fiscal years 2001 through 2004, 2,674 of the 5,061 SBIR awards made by NIH exceeded the guidelines. These awards totaled about \$1.4 billion and accounted for 70 percent of NIH's SBIR dollars. During the same time period, 1,302 of the 10,958 SBIR awards made by DoD exceeded the guidelines. These awards totaled \$743 million and accounted for 23 percent of the dollars DoD awarded. Table 8 shows the total number and dollar value of the SBIR awards made by NIH and DoD during fiscal years 2001 - 2004 that were both within and above the guidelines.<sup>12</sup>

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<sup>12</sup>The percentage of DoD awards that exceeded SBA's guidelines due to SBIR funds alone may be lower than 12 percent because awarding components may add non-SBIR program funds to individual awards. DoD does not account for these funds in a way that allowed us to separate program from SBIR dollars.

**Table 8: Total Number and Dollar Value of NIH and DoD SBIR Awards within and above the Guidelines Made During the Period Fiscal Years 2001 - 2004**

(Dollars in millions)

	NIH		DoD	
	Within the guidelines – number and percentage	Above the guidelines – number and percentage	Within the guidelines – number and percentage	Above the guidelines – number and percentage
<b>Phase I</b>				
Number of awards	1,738 (49%)	1,842 (51%)	6,826 (90%)	740 (10%)
Dollar value of awards	\$171 (29%)	\$411 (71%)	\$587 (87%)	\$91 (13%)
<b>Phase II</b>				
Number of awards	549 (43%)	734 (57%)	2,830 (83%)	562 (17%)
Dollar value of awards	\$376 (31%)	\$823 (69%)	\$1,964 (75%)	\$653 (25%)
<b>Fast track</b>				
Number of awards	100 (51%)	98 (49%)	a	a
Dollar value of awards	\$59 (28%)	\$152 (72%)	a	a
<b>Total</b>				
Number of awards	2,387 (47%)	2,674 (53%)	9,656 (88%)	1,302 (12%)
Dollar value of awards	\$606 (30%)	\$1,386 (70%)	\$2,550 (77%)	\$743 (23%)

Source: GAO analysis of NIH and DoD data.

<sup>a</sup>All DoD fast track awards are included with DoD's phase I and phase II awards.

Note: Almost all of DoD's phase I awards above the guidelines are attributable to the Army's effort to provide funding for the transition from phase I to phase II. However, the amount above the guidelines generally reduces subsequent phase II award amounts.

At NIH we found the following:

- Phase I awards that exceeded the guidelines averaged \$223,106, with a median of \$153,138, and ranged from just over \$100,000 to \$1.7 million, but about 90 percent were \$595,000 or less.
- Phase II awards above the guidelines averaged \$1.1 million, with a median of \$924,914, and ranged from just over \$750,000 to \$6.5 million, but about 90 percent were \$2.1 million or less.

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- Fast track awards above the guidelines averaged \$1.5 million, with a median of \$1,151,979, and ranged from just over \$850,000 to \$9.6 million, but about 90 percent were \$3.4 million or less.

Although NIH does not retain data centrally on the reason individual projects exceeded the SBA guidelines, it generally makes such awards for research in specific fields, such as biotechnology, that is relatively costly to conduct. In 2001, SBA granted NIH a waiver that allows the agency to issue awards that exceed the guidelines without reporting data on individual projects. In the waiver, SBA recognized that NIH routinely issues awards for particularly expensive technologies. During the review process, external peer reviewers also assess the reasonableness of cost estimates before agency officials make awards above the guidelines.

At DoD, we found the following:

- Phase I awards that exceeded the guidelines averaged \$122,312, with a median of \$119,911, and ranged from just over \$100,000 to \$448,796, but about 90 percent were \$142,000 or less.
- Phase II awards above the guidelines averaged \$1.2 million, with a median of \$1 million, and ranged from just over \$750,000 to \$4.4 million, but about 90 percent were \$2.0 million or less.

At DoD, the two main reasons awards exceeded the guidelines were that (1) extra funds were needed to ensure a high-quality investigation of a proposed idea and (2) the amount above the guidelines included non-SBIR program funds. These non-SBIR funds, called mission funds, are not included in DoD's calculation of its 2.5 percent obligation to fund the SBIR program. For example, a DoD component, such as the Army, Navy, or Air Force, may add mission funds to a SBIR project if it decides that the project may help support its programmatic goals. Moreover, it is DoD's policy to encourage its awarding components to match these and other non-SBIR dollars with SBIR dollars. At DoD, about half of phase II awards above the guidelines have received mission funds from awarding components.

## Extent to Which NIH and DoD SBIR Awards above the Guidelines Were Made to Firms That Had Received Venture Capital Investment

At both NIH and DoD, most of the awards that exceeded the guidelines went to firms that had not received venture capital investment. As shown in table 9, only 18 percent of awards above the guidelines at NIH and only about 8 percent of awards above the guidelines at DoD went to firms that had received venture capital investment.

**Table 9: Percentage of NIH and DoD SBIR Awards within and above the Guidelines to Firms that Had Received Venture Capital Investment During Fiscal Years 2001 - 2004**

	NIH		DoD	
	Awards within the guidelines - percentage to firms that had received venture capital investment	Awards above the guidelines – percentage to firms that had received venture capital investment	Awards within the guidelines - percentage to firms that had received venture capital investment	Awards above the guidelines – percentage to firms that had received venture capital investment
Phase I	16	19	7	9
Phase II	12	16	7	6
Fast track	18	16	<sup>a</sup>	<sup>a</sup>
<b>Total</b>	<b>15</b>	<b>18</b>	<b>7</b>	<b>8</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

<sup>a</sup>All DoD fast track awards are included with DoD's phase I and phase II awards.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

While firms that had received venture capital investment received a small share of the total SBIR awards, these firms were generally more likely than firms that had not received such investment to receive the largest awards from NIH. Specifically, firms that had received venture capital were twice as likely as firms that had not received such investment to receive phase II awards from NIH greater than \$1 million, which accounted for about 37 percent of NIH's phase II dollars; these firms were about six times more likely to receive phase II awards greater than \$2.5 million, which accounted for about 7 percent of the phase II dollars.

Similarly, for DoD phase I awards, we found that firms that had received venture capital investment were more likely to receive awards above the guidelines than firms that had not received such investment. However, this relationship did not hold true for DoD's phase II awards. We found that phase II awardee firms that had received venture capital were less likely to receive large awards than firms that had not received such investment.

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While the data, overall, indicate a relationship between firms that received venture capital investment and high award amounts, by themselves the data do not indicate whether the presence of venture capital was the reason these firms received such large awards. Many factors can influence the willingness of venture capital firms to invest funds in small businesses.

NIH and DoD awards that exceeded SBA's guidelines were generally concentrated in the same states and in the same agency components as were all SBIR awards. At NIH, the 10 states that received close to 70 percent of the total SBIR dollars also received 72 percent of the dollars for awards above the guidelines. Likewise, at NIH, the four components that awarded about half of the SBIR program dollars accounted for 54 percent of the awards above the guidelines. At DoD, the 10 states that received 73 percent of the total dollars awarded also received about 74 percent of the awards above the guidelines. In addition, the four DoD agency components that awarded 85 percent of the dollars also awarded about 89 percent of the awards above the guidelines. Detailed information on the geographical and agency component distribution for awards that were above the guidelines, as well as awards that were within the guidelines, and their associated dollars is presented in appendix II for NIH and appendix III for DoD.

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## SBA's Ownership Clarification Does Not Appear to Have Reduced Program Participation by Firms That Had and Had Not Received Venture Capital Investment

During fiscal years 2001 - 2004, participation in NIH's and DoD's SBIR programs substantially increased for both types of firms—those that had, and those that had not, received venture capital investment. However, we did observe the following differences in the awards made by NIH and DoD over the 4-year period including the 2 years before and the 2 years after SBA provided additional clarification of the ownership criteria in October 2002:

- Overall participation in the SBIR program by firms that had received, and that had not received, venture capital investment increased. However, firms that had received venture capital investment were added to the program at a significantly higher rate than those that had not. For example, at NIH, over the 4-year period, we noted that participation by firms that had received venture capital investment grew at a rate of 42 percent, compared to 19 percent for those that had not received this type of investment.
- The total number of awards made by NIH and DoD to both types of firms in the 2 years after the clarification was greater than the number of awards made before the clarification. However, the rate at which

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awards were made to firms that had received venture capital investment was significantly greater than the rate at which awards were made to firms that had not received venture capital investment. For example, over the 4-year period, the number of awards that DoD made to firms that had received venture capital investment increased by 167 percent, compared to a 65 percent increase in awards to firms that had not. More specifically, the number of awards to firms that had received venture capital increased from 270 in the 2 years before the clarification to 477 in the 2 years after. Whereas, awards to firms that had not received venture capital increased from 4,154 in the 2 years before the clarification to 6,057 in the 2 years after.

- For firms that had and had not received venture capital investment, the average dollar value of awards generally increased at NIH, but decreased or remained about the same at DoD over this 4-year period. For example, at NIH, although both types of firms received increasingly larger phase II awards between fiscal years 2001 and 2004, the awards to firms that had received venture capital investment were substantially larger than those to firms that had not received this kind of investment. Specifically, in the 2 years before the clarification, phase II awards to firms that had received venture capital investment averaged about \$885,000 compared to over \$1.3 million in the 2 years following, while awards to firms that had not received venture capital averaged less than \$860,000 before the clarification compared to less than \$950,000 after the clarification.
- The number of awards that were above the guidelines increased significantly at NIH after the clarification but decreased at DoD. For example, from 2001 to 2004, the number of awards above the guidelines increased by 45 percent at NIH from about 600, on average, in the 2 years before the clarification to about 730, on average, in the 2 years after. In contrast, at DoD, these awards decreased by 26 percent, from about 351 on average, in the 2 years before the clarification to about 300, on average, in the 2 years after the clarification.
- Firms that had received venture capital investment received an increasing share of total dollars awarded at both NIH and DoD although the change at DoD was significantly less. For example, at NIH, in the 2 years prior to the clarification, firms that had received venture capital investment were awarded about 14 percent of total SBIR program funds, and in the 2 years following the clarification this share had increased to about 22 percent. At DoD, firms that had received venture capital



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investment received 6 percent, on average, of the dollars awarded in the 2 years before the clarification and 7 percent, on average, in the 2 years following the clarification.

- At both NIH and DoD, 10 states accounted for the majority of dollars awarded both before and after the clarification. However, the concentration of NIH's dollars awarded to firms that had received venture capital investment increased somewhat in the 10 states following the clarification, while the concentration of DoD's dollars awarded to such firms in the 10 states decreased somewhat.
- Four agency components generally accounted for the majority of dollars awarded and dollars awarded to firms that had received venture capital investment both before and after the clarification. At both NIH and DoD, the concentration of the dollars awarded by the four agency components to firms that had received venture capital investment increased following the clarification but to a lesser extent at DoD.
- Finally, the number of applications received by both NIH and DoD continued to increase following the SBA clarification. Both agencies experienced a significant growth in the number of applications received in the 2 years after the clarification compared to the 2 years preceding the clarification. For example, at DoD, the total number of applications in fiscal years 2001 and 2002 was 22,139 and the total number of applications received in fiscal years 2003 and 2004 was 33,922. According to officials responsible for the SBIR program at NIH and DoD, the quality of the applications for SBIR awards increased or remained the same during the 4-year period. However, because the number of applications received increased at a faster rate than the agencies' SBIR budgets, the percentage of the applications funded by NIH and DoD has generally decreased.

Tables 10 through 22 provide detailed data for NIH's and DoD's SBIR awards broken out by fiscal year from 2001 to 2004.

**Table 10: Number of Awardee Firms by Agency, and Venture Capital Investment Status for Fiscal Years 2001 through 2004**

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage increase from 2001
<b>NIH</b>					
Number of firms that had received venture capital and an SBIR award	106	145	146	150	42
Number of firms that had not received venture capital but had received an SBIR award	668	715	675	797	19
<b>NIH total</b>	<b>773</b>	<b>859</b>	<b>820</b>	<b>946</b>	<b>22</b>
<b>DoD</b>					
Number of firms that had received venture capital and a SBIR award	42	69	95	100	138
Number of firms that had not received venture capital but had received a SBIR award	932	1,151	1,407	1,377	48
<b>DoD total</b>	<b>972</b>	<b>1,220</b>	<b>1,500</b>	<b>1,476</b>	<b>52</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

Note: Subtotals do not add to totals because a small number of firms received SBIR awards in the same fiscal year, both before and after they received venture capital investment.

**Table 11: Number of SBIR Awards by Agency, and Venture Capital Investment Status of Awardee Firms for Fiscal Years 2001 through 2004**

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage increase from 2001
<b>NIH</b>					
Awards to firms that had received venture capital investment	155	219	221	249	61
Awards to firms that had not received venture capital investment	1,009	1,060	980	1,168	16
<b>NIH total</b>	<b>1,164</b>	<b>1,279</b>	<b>1,201</b>	<b>1,417</b>	<b>22</b>
<b>DoD</b>					
Awards to firms that had received venture capital investment	98	172	215	262	167
Awards to firms that had not received venture capital investment	1,830	2,324	3,042	3,015	65
<b>DoD total</b>	<b>1,928</b>	<b>2,496</b>	<b>3,257</b>	<b>3,277</b>	<b>70</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

**Table 12: Average Award Amount by Agency, Venture Capital Investment Status of Awardee Firm, and Award Phase for Fiscal Years 2001 through 2004**

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage change
NIH SBIR awards to firms that had received venture capital investment					
Phase I	168,190	159,548	169,038	212,241	26
Phase II	861,488	907,879	1,262,073	1,475,188	71
Fast track	783,884	977,551	1,064,922	833,293	6
NIH awards to firms that had not received venture capital investment					
Phase I	136,463	147,481	166,400	181,051	33
Phase II	837,487	871,835	908,577	985,544	18
Fast track	1,051,212	1,456,464	1,168,800	766,553	-27
DoD SBIR awards to firms that had received venture capital investment					
Phase I	91,032	90,192	89,814	91,520	1
Phase II	795,780	855,745	739,721	679,724	-15
DoD awards to firms that had not received venture capital investment					

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	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage change
Phase I	90,278	88,907	87,891	91,143	1
Phase II	831,144	809,933	764,919	725,277	-13

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 13: Number of SBIR Awards above and within the Guidelines by Agency and Venture Capital Investment Status of Awardee Firm for Fiscal Years 2001 through 2004**

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage change
NIH awards above the guidelines					
Awards to firms that had received venture capital investment	79	119	125	162	105
Awards to firms that had not received venture capital investment	484	531	518	656	36
<b>Subtotal – awards above the guidelines</b>	<b>563</b>	<b>650</b>	<b>643</b>	<b>818</b>	<b>45</b>
NIH awards within the guidelines					
Awards to firms that had received venture capital investment	76	100	96	87	14
Awards to firms that had not received venture capital investment	525	529	462	512	-2
<b>Subtotal – awards within the guidelines</b>	<b>601</b>	<b>629</b>	<b>558</b>	<b>599</b>	<b>Less than -1</b>
<b>NIH total</b>	<b>1,164</b>	<b>1,279</b>	<b>1,201</b>	<b>1,417</b>	<b>22</b>
DoD awards above the guidelines					
Awards to firms that had received venture capital investment	22	34	25	19	-14
Awards to firms that had not received venture capital investment	320	326	323	233	-27
<b>Subtotal – awards above the guidelines</b>	<b>342</b>	<b>360</b>	<b>348</b>	<b>252</b>	<b>-26</b>
DoD awards within the guidelines					
Awards to firms that had received venture capital investment	76	138	190	243	220
Awards to firms that had not received venture capital investment	1,510	1,998	2,719	2,782	84
<b>Subtotal – awards within the guidelines</b>	<b>1,586</b>	<b>2,136</b>	<b>2,909</b>	<b>3,025</b>	<b>91</b>
<b>DoD total</b>	<b>1,928</b>	<b>2,496</b>	<b>3,257</b>	<b>3,277</b>	<b>70</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 14: Average Amount of SBIR Awards, above and within the Guidelines, by Agency and Venture Capital Investment Status of Awardee Firm for Fiscal Years 2001 through 2004**

Agency, investment status, and award phase	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage change
NIH SBIR awards to firms that had received venture capital investment					
Awards above the guidelines					
Phase I	227,867	214,623	234,256	275,301	21
Phase II	1,061,762	1,034,901	1,503,443	1,830,112	72
Fast track	858,545	2,098,561	1,360,918	1,234,942	44
Awards within the guidelines					
Phase I	99,151	99,033	98,803	98,542	-1
Phase II	680,288	653,835	693,131	632,244	-7
Fast track	765,218	529,147	472,932	431,644	-44
NIH SBIR awards to firms that had not received venture capital investment					
Awards above the guidelines					
Phase I	181,217	200,314	230,007	248,623	37
Phase II	976,319	1,040,435	1,076,773	1,148,833	18
Fast track	1,147,764	2,068,788	1,781,892	1,195,005	4
Awards within the guidelines					
Phase I	98,640	98,267	98,167	97,899	-1
Phase II	694,630	681,442	682,759	693,059	Less than 1
Fast track	729,372	555,988	683,436	546,206	-25
DoD SBIR awards to firms that had received venture capital investment					
Awards above the guidelines					
Phase I	123,356	126,304	144,474	120,128	-3
Phase II	1,090,605	1,186,847	993,327	1,349,711	24
Awards within the guidelines					
Phase I	82,628	82,767	83,080	88,548	7
Phase II	693,726	727,577	700,705	657,140	-5
DoD SBIR awards to firms that had not received venture capital investment					
Awards above the guidelines					
Phase I	119,844	123,022	123,061	119,903	Less than 1

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Agency, investment status, and award phase	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004	Percentage change
Phase II	1,182,723	1,131,501	1,168,355	1,175,187	-1
Awards within the guidelines					
Phase I	86,446	85,005	84,403	88,551	2
Phase II	689,116	706,179	693,342	692,485	Less than 1

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 15: Share of Dollars Awarded by Agency and Venture Capital Investment Status of Awardee Firm for Fiscal Years 2001 through 2004**

(Dollars in millions)

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004
<b>NIH</b>				
Awards to firms that had received venture capital				
<b>Total dollars awarded</b>	<b>\$57</b>	<b>\$72</b>	<b>\$99</b>	<b>\$127</b>
Percentage of dollars	14	14	20	22
Awards to firms that had not received venture capital				
<b>Total dollars awarded</b>	<b>\$358</b>	<b>\$438</b>	<b>\$394</b>	<b>\$447</b>
Percentage of dollars	86	86	80	78
<b>Total dollars awarded by NIH</b>	<b>\$415</b>	<b>\$510</b>	<b>\$493</b>	<b>\$574</b>
<b>DoD</b>				
Awards to firms that had received venture capital				
<b>Total dollars awarded</b>	<b>\$34</b>	<b>\$48</b>	<b>\$58</b>	<b>\$78</b>
Percent of dollars	5	7	7	7
Awards to firms that had not received venture capital				
<b>Total dollars awarded</b>	<b>\$636</b>	<b>\$653</b>	<b>\$811</b>	<b>\$975</b>
Percent of dollars	95	93	93	93
<b>Total dollars awarded by DoD</b>	<b>\$670</b>	<b>\$701</b>	<b>\$869</b>	<b>\$1,053</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

**Table 16: Share of Dollars Awarded above and within the Guidelines by Agency and Venture Capital Investment Status of Awardee Firm for Fiscal Years 2001 through 2004**

(Dollars in millions)

	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004
NIH SBIR awards to firms that had received venture capital				
Awards above the guidelines				
<b>Total dollars awarded</b>	<b>\$34</b>	<b>\$52</b>	<b>\$80</b>	<b>\$108</b>
Percentage of total dollars awarded	8	10	16	19
Awards within the guidelines				
<b>Total dollars awarded</b>	<b>\$22</b>	<b>\$20</b>	<b>\$19</b>	<b>\$19</b>
Percentage of total dollars awarded	5	4	4	3
NIH SBIR awards to firms that had not received venture capital				
Awards above the guidelines				
<b>Total dollars awarded</b>	<b>\$220</b>	<b>\$293</b>	<b>\$271</b>	<b>\$327</b>
Percentage of total dollars awarded	53	57	55	57
Awards within the guidelines				
<b>Total dollars awarded</b>	<b>\$138</b>	<b>\$145</b>	<b>\$123</b>	<b>\$120</b>
Percentage of total dollars awarded	33	29	25	21
<b>Total dollars awarded by NIH</b>	<b>\$415</b>	<b>\$510</b>	<b>\$493</b>	<b>\$574</b>
DoD SBIR awards to firms that had received venture capital				
Awards above the guidelines				
<b>Total dollars awarded</b>	<b>\$11</b>	<b>\$17</b>	<b>\$10</b>	<b>\$6</b>
Percentage of total dollars awarded	2	2	1	1
Awards within the guidelines				
<b>Total dollars awarded</b>	<b>\$22</b>	<b>\$31</b>	<b>\$48</b>	<b>\$72</b>
Percentage of total dollars awarded	3	4	6	7
DoD SBIR awards to firms that had not received venture capital				
Awards above the guidelines				
<b>Total dollars awarded</b>	<b>\$233</b>	<b>\$192</b>	<b>\$166</b>	<b>\$107</b>
Percentage of total dollars awarded	35	27	19	10
Awards within the guidelines				
<b>Total dollars awarded</b>	<b>\$404</b>	<b>\$461</b>	<b>\$645</b>	<b>\$868</b>
Percentage of total dollars awarded	60	66	74	82
<b>Total dollars awarded by DoD</b>	<b>\$670</b>	<b>\$701</b>	<b>\$869</b>	<b>\$1,053</b>

Source: GAO analysis of NIH, DoD, Dow Jones, and IDI data.

Note: DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 17: Geographical Distribution of NIH Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage
California	\$176 (19%)	\$52 (41%)	\$219 (21%)	\$80 (35%)
Massachusetts	\$142 (15%)	\$9 (7%)	\$142 (13%)	\$20 (9%)
Maryland	\$65 (7%)	\$3 (2%)	\$77 (7%)	\$20 (9%)
New York	\$47 (5%)	\$10 (8%)	\$71 (7%)	\$28 (12%)
Texas	\$26 (3%)	\$5 (4%)	\$55 (5%)	\$6 (3%)
Pennsylvania	\$38 (4%)	\$5 (4%)	\$43 (4%)	\$6 (3%)
Washington	\$40 (4%)	\$7 (6%)	\$39 (4%)	\$10 (4%)
Virginia	\$28 (3%)	\$2 (1%)	\$38 (4%)	\$2 (1%)
Ohio	\$32 (3%)	\$2 (2%)	\$27 (3%)	\$1 (1%)
New Jersey	\$31 (3%)	\$2 (1%)	\$26 (2%)	\$3 (1%)
Subtotal	\$626 (68%)	\$97 (76%)	\$737 (69%)	\$176 (78%)
Other states	\$299 (32%)	\$32 (24%)	\$330 (31)	\$51 (22%)
<b>Total</b>	<b>\$925 (100%)</b>	<b>\$129 (100%)</b>	<b>\$1,068 (100%)</b>	<b>\$227 (100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

Note: Totals and percentages may not add because of rounding.



**Table 18: Geographical Distribution of DoD Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage
California	\$320 (23%)	\$28 (34%)	\$421 (22%)	\$40 (29%)
Massachusetts	\$204 (15%)	\$2 (2%)	\$279 (15%)	\$15 (11%)
Virginia	\$115 (8%)	\$7 (9%)	\$130 (7%)	\$5 (4%)
Ohio	\$72 (5%)	\$0 (0)	\$90 (5%)	\$1 (1%)
Colorado	\$68 (5%)	\$8 (9%)	\$92 (5%)	\$6 (4%)
Maryland	\$57 (4%)	\$2 (3%)	\$94 (5%)	\$5 (3%)
Pennsylvania	\$54 (4%)	\$1 (1%)	\$78 (4%)	\$1 (Less than 1)
New York	\$47 (3%)	\$3 (4%)	\$80 (4%)	\$10 (8%)
Texas	\$47 (3%)	\$3 (3%)	\$78 (4%)	\$3 (2%)
New Jersey	\$40 (3%)	\$5 (6%)	\$48 (2%)	\$7 (5%)
Subtotal	\$1,025 (75%)	\$58 (71%)	\$1,389 (72%)	\$93 (68%)
Other states	\$347 (25%)	\$24 (29%)	\$533 (28%)	\$43 (32%)
<b>Total</b>	<b>\$1,371 (100%)</b>	<b>\$82 (100%)</b>	<b>\$1,922 (100%)</b>	<b>\$136 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Notes:

(1) Totals and percentages may not add because of rounding.

(2) DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 19: Dollars Awarded by Four Primary NIH Awarding Components, Overall and to Firms that Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage
National Cancer Institute	\$156 (17%)	\$27 (21%)	\$192 (18%)	\$53 (23%)
National Institute of Allergy and Infectious Diseases	\$103 (11%)	\$38 (29%)	\$173 (16%)	\$82 (36%)
National Heart, Lung, and Blood Institute	\$115 (12%)	\$10 (8%)	\$121 (11%)	\$18 (8%)
National Institute of General Medical Sciences	\$75 (8%)	\$14 (11%)	\$76 (7%)	\$19 (8%)
<b>Subtotal</b>	<b>\$449 (49%)</b>	<b>\$89 (69%)</b>	<b>\$562 (53%)</b>	<b>\$172 (76%)</b>
Remaining 19 institutes and centers	\$476 (51%)	\$40 (31%)	\$506 (47%)	\$55 (24%)
<b>Total</b>	<b>\$925 (100%)</b>	<b>\$129 (100%)</b>	<b>\$1,068 (100%)</b>	<b>\$227 (100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

Note: Totals and percentages may not add because of rounding.

**Table 20: Dollars Awarded by Four Primary DoD Awarding Components, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage	Dollars awarded - total and percentage	Dollars awarded to firms that had received venture capital investment – total and percentage
Air Force	\$479 (35%)	\$22 (27%)	\$539 (28%)	\$31 (22%)
Army	\$286 (21%)	\$20 (24%)	\$398 (21%)	\$41 (30%)
Navy	\$267 (19%)	\$12 (14%)	\$352 (18%)	\$21 (15%)
Missile Defense Agency	\$144 (10%)	\$12 (14%)	\$339 (18%)	\$20 (14%)
<b>Subtotal</b>	<b>\$1,176 (86%)</b>	<b>\$66 (80%)</b>	<b>\$1,628 (85%)</b>	<b>\$112 (82%)</b>
Remaining six awarding components	\$196 (14%)	\$16 (20%)	\$295 (15%)	\$24 (18%)
<b>Total</b>	<b>\$1,371 (100%)</b>	<b>\$82 (100%)</b>	<b>\$1,922 (100%)</b>	<b>\$136 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Notes:

- (1) Totals and percentages may not add because of rounding.
- (2) DoD's award amounts include both SBIR dollars and additional non-SBIR dollars from awarding components.

**Table 21: SBIR Budgets and Number of Applications Submitted by Agency for Fiscal Years 2001 through 2004**

(Dollars in millions)

Agency	Fiscal year 2001	Fiscal year 2002	Fiscal years 2001-2002	Fiscal year 2003	Fiscal year 2004	Fiscal years 2003-2004	Percentage increase – fiscal years 2001-2002 compared to fiscal years 2003-2004
NIH – total SBIR budget	\$402	\$471	\$873	\$525	\$566	\$1,091	25
NIH – total applications submitted	3,601	4,049	7,650	5,176	6,122	11,298	48
DoD – total SBIR budget	\$638	\$779	\$1,417	\$895	\$1,016	\$1,911	35
DoD – total applications submitted	8,225	13,914	22,139	16,520	17,402	33,922	53

Source: GAO analysis of NIH and DoD data.

Note: Data for DoD are from the agency's fiscal year reports, which coincide more closely with the calendar year.

**Table 22: Percentage of Applications Funded by Agency for Fiscal Years 2001 through 2004**

Agency	Fiscal year 2001	Fiscal year 2002	Fiscal year 2003	Fiscal year 2004
NIH total	34%	32%	27%	22%
NIH phase I	30%	28%	24%	20%
NIH phase II	53%	49%	44%	38%
NIH fast track	30%	29%	22%	18%
DoD total	24%	20%	19%	19%
DoD phase I	18%	17%	14%	13%
DoD phase II	75%	63%	73%	68%

Source: GAO analysis of NIH and DoD data.

## NIH, DoD, and SBA Focus Largely on Select Eligibility Criteria and Collect Limited Data on SBIR Awardees

NIH, DoD and SBA focus primarily on criteria relating to ownership, for-profit status, and the number of employees to determine a firm's eligibility for the SBIR program and take steps to verify eligibility information provided by applicants. When NIH or DoD officials are unable to ensure the accuracy of an applicant's information, they refer the matter to SBA. After SBA makes an eligibility determination, it makes information about the firms it finds ineligible available on its Web site, but does not always indicate that the determination was for SBIR purposes. NIH makes information on ineligible firms centrally available to participating agency

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components while DoD does not. Each agency limits its data collection efforts largely to information about the SBIR award itself, such as award size and location of the principal investigator, and does not collect information on certain characteristics of the firms receiving the awards, such as the presence of venture capital investment.

Officials at NIH, DoD, and SBA told us that they focus largely on three SBIR criteria in their eligibility reviews—ownership, size in terms of the number of employees, and for-profit status of SBIR applicants. However, they also stated that they consider information on the full range of criteria, such as whether the principal investigator is employed primarily by the applying firm, and the extent to which work on the project will be performed by others.<sup>13</sup> Both NIH and DoD rely on applicants to self-certify that they meet all of the SBIR program’s eligibility requirements as part of their SBIR applications. At NIH, applicants certify they meet the eligibility criteria by completing a verification statement when NIH notifies them that their application has been selected for funding but prior to NIH making the award. The verification statement requires applicants to respond to a series of questions to certify they meet SBA’s eligibility criteria relating to for-profit status, ownership, number of employees, where the work will be performed, and the primary employment of the principal investigator, among others. NIH also refers applicants to its notice of SBIR funding opportunities, known as a solicitation, for more detail on SBA’s eligibility requirements. NIH will not issue an award until it receives and accepts the applicant’s responses to the verification statement. At DoD, the cover sheet for each SBIR application requires applicants to certify they meet SBA’s eligibility criteria. The cover sheet also refers applicants to DoD’s solicitation that details the requirements. As with NIH, DoD will not fund applications if the questions on the cover sheet are not answered. Both NIH and DoD warn applicants of the civil and criminal penalties for making false, fictitious, or fraudulent statements. In addition to the eligibility criteria provided in the agency’s solicitations, NIH and DoD support periodic conferences during which potential applicants can learn about SBIR eligibility criteria, and both agencies post eligibility requirements on their Web sites.

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<sup>13</sup>SBA guidance states that awardees must perform at least two-thirds of the research and analysis effort on phase I projects and half of the work on phase II projects, although the agency may approve deviations from this guidance.

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Although agencies rely largely on applicants to self-certify that they meet the SBIR program's eligibility criteria, both NIH and DoD make additional efforts to ensure the accuracy of the information provided by applicants prior to making an award. At NIH, officials in participating institutes and centers conduct Web searches, check press releases, and may request documentation from applicants to verify information on their eligibility status, including, but not limited to, information on ownership, size, principal investigators, board members, location, e-mail addresses, and affiliations with other firms. In addition, NIH officials search published information on such features as venture capital investments, and whether the applicant has been purchased by another company or changed its name, as well as internal information on whether NIH has received other grant applications from the applicant. NIH officials review this information, among other things, to identify potential concerns regarding the applicant's eligibility status. For example, an ".edu" e-mail extension could indicate that the principal investigator is primarily employed by a university rather than by the applicant, as required by SBIR criteria. If no concerns arise, NIH deems the company eligible. However, when concerns cannot be resolved, NIH officials contact the applicant to ask a standard list of questions. Currently, the list of questions varies by institute and center, but according to NIH officials, the agency is in the process of creating a uniform list of eligibility questions to be used throughout NIH. NIH officials also told us that it has incorporated eligibility training into the curriculum for its SBIR staff.

At DoD, prior to making an award, officials check the information applicants provided in the application cover sheet for consistency with the eligibility information applicants entered into the Central Contractor Registration database that is required for all applications, and the Online Representations and Certifications Application system that is required for phase II applications. According to DoD officials, most discrepancies between information on the cover sheets and in the databases occur because the applicant was purchased by another company, the e-mail addresses have changed, or the principal investigator appears to be a full-time employee of an educational institution. To resolve discrepancies, DoD officials may choose to contact the applicant, or search on the Web for information. Typically, officials told us, DoD awarding components work with firms to answer their eligibility questions and help ensure that they prepare the necessary documentation properly. In addition, DoD encourages self-policing by applicants by posting the names of recent SBIR awardees on its Web site so that competitors can raise any eligibility concerns they may have. However, Office of Naval Research officials said

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competing firms seldom raise concerns, usually only one per year, and that typically the concern is related to whether the awardee firm has been purchased by another company.

When officials at either NIH or DoD have unresolved concerns about the accuracy of an applicant's eligibility information, they refer the matter to SBA to make an eligibility determination.<sup>14</sup> Upon receipt of a letter from the agency detailing its concerns, SBA officials contact the applicant, ask them to re-certify their eligibility status, and may request additional documentation on the criteria of concern. For example, SBA officials may request articles of incorporation and information on the distribution of ownership to determine whether the applicant was at least 51 percent owned by qualified individuals. Upon making a determination of eligibility, SBA then notifies the official at the inquiring agency, and the applicant, of its decision. Further, SBA makes the information about firms it finds ineligible publicly available on its Web site so that all participating agencies and the public can access the information. However, SBA does not currently require its eligibility officials to include information on the Web site identifying whether or not the determination was for SBIR purposes. An SBA official told us the agency plans to include such information on its Web site more systematically before the end of fiscal year 2006.

NIH and DoD take different approaches to retaining and sharing information on firms found ineligible by SBA. At NIH, when SBA notifies the referring agency official that it has deemed an SBIR applicant as ineligible, the official notes the determination in the applicant's file. However, according to NIH officials, in response to the May 2003 SBA decision, NIH also began centrally tracking firms SBA found ineligible, as well as firms that self-selected themselves as ineligible and withdrew their applications at some point in the review process. The agency makes this information available to all of its institutes and centers that make SBIR awards. In addition, agency officials told us that, if during the eligibility review process, a firm was determined to be ineligible for an SBIR award, NIH advises the applicant to be recertified by SBA before applying for additional awards. In contrast, DoD retains information on firms determined to be ineligible in the applicants' files and does not have a centralized process to share the information across DoD awarding components. However, DoD officials said it is common practice for awarding components to share such information electronically.

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<sup>14</sup>SBA refers to these eligibility determinations as "size determinations."

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For the most part, NIH and DoD limit their data collection efforts largely to information about the SBIR awards they make. Key information the agencies track includes the phase, date, and amount of the award; the geographic location of the awardee firm and principal investigator; and contact information. Currently, the agencies do not maintain detailed data on (1) applicants that the agencies decided not to select for funding, (2) the reasons applicants were not selected for funding, and (3) characteristics of the firms receiving the awards, such as the presence of venture capital investment or the extent of ownership by venture capital firms or other entities.<sup>15</sup> Moreover, neither NIH nor DoD systematically categorizes SBIR projects by the industry represented or by the specific type of research, such as whether the research is for a process or product or whether the research is for software or therapeutic devices. However, both agencies categorize projects by the general research topics listed in each agency's solicitation.

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## Agency Comments and Our Evaluations

We provided NIH, DoD, and SBA with a draft of this report for their review and comment. NIH only provided technical comments that we have incorporated, as appropriate. DoD agreed that because data on ownership are not publicly available, it is not possible to determine the extent to which venture capital firms own SBIR awardee firms. Moreover, DoD did not find the results of our analysis surprising in light of differences in markets for SBIR projects supported by NIH and DoD. SBA noted in its comments that while the information in the report may be useful, it could be misconstrued as suggesting a link between the presence of venture capital investment and SBIR ownership criteria when such a link does not exist. While we understand SBA's concern, we believe that our report clearly states that we used venture capital investment as a proxy for venture capital ownership because ownership data are proprietary and confidential or not readily available. We also explicitly note in the report that no causal link can be inferred from the data. Both DoD and SBA also provided technical comments that we incorporated, as appropriate. The comments from DoD and SBA are included in this report as appendixes IV and V, respectively.

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<sup>15</sup>Awardee firms will be asked to provide information on venture capital investment associated with specific SBIR projects as part of efforts to build a government database that includes information on commercialization of SBIR projects, among other things.



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We are sending copies of this report to the Director of the National Institutes of Health, the Secretary of Defense, the Administrator of the Small Business Administration, and other interested parties. We will make copies available to others upon request. In addition, this report will be available, at no charge, on GAO's Web site at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-3841 or [mittala@gao.gov](mailto:mittala@gao.gov). Contact points for our Offices of Congressional Relations and Public affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VI.

A handwritten signature in black ink that reads "Anu K. Mittal". The signature is written in a cursive, flowing style.

Anu K. Mittal  
Director, Natural Resources and Environment

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*List of Requesters*

The Honorable John F. Kerry  
Ranking Member  
Committee on Small Business and Entrepreneurship  
United States Senate

The Honorable Edward M. Kennedy  
Ranking Minority Member  
Committee on Health, Education, Labor and Pensions  
United States Senate

The Honorable Michael B. Enzi  
Chairman  
Committee on Health, Education, Labor and Pensions  
United States Senate

The Honorable Olympia J. Snowe  
Chair  
Committee on Small Business and Entrepreneurship  
United States Senate

The Honorable Donald A. Manzullo  
Chairman  
Committee on Small Business  
House of Representatives

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# Scope and Methodology

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In conducting our work, we interviewed officials at the National Institutes of Health (NIH), the Department of Defense (DoD), and the Small Business Administration (SBA) about their procedures in place, and any changes that occurred during the time period of our review—fiscal years 2001 through 2004. We reviewed agency documentation on awards, award selection and funding, eligibility determinations, and the data elements that are collected during the eligibility process. We also interviewed officials from organizations that represent venture capital investors and biotechnology firms to obtain their views on the Small Business Innovation Research (SBIR) program and venture capital investment.

To determine the total number and key characteristics of SBIR awards, we obtained data from NIH and DoD for all awards made during fiscal years 2001 - 2004. Specifically, we asked for funding data on all SBIR awards that originated in fiscal years 2001 through 2004 and excluded data on funding to awards that originated before and after our time frame. These data included award amounts projected at the time the award was made and supplemental amounts issued subsequent to the award. We compared these data to data on funds actually issued to awardee firms to ensure that the projections were reasonable. We based our analysis on the projected amounts combined with supplemental funds, which allowed us to provide information on awards that originated in fiscal years 2003 and 2004 but which may not be completed until 2005 or later. However, for NIH fast track awards, we based our analysis on the actual dollars NIH spent on the award as of September 30, 2005. We did not analyze awards NIH made as contracts, which were a small portion of NIH's awards, because certain data elements essential for our analysis were not available. We interviewed key officials at NIH and DoD about their databases. We assessed the reliability of relevant fields in the agencies' databases and found them sufficient for our review. Our assessment included tests of the data itself as well as reviews of internal quality control procedures. We used analytic software to identify the following key characteristics of awards made by NIH and DoD: the number of firms receiving these awards; geographic location of these firms; agency components making the awards; the amounts of the awards; and for DoD, the number of employees working for the SBIR firms and their affiliates.

We also obtained data from two private sector firms, the Innovation Development Institute (IDI) and Dow Jones-Venture One. Initially, we selected IDI because its database included information that supplemented

agency data on SBIR awardee firms. IDI's database included information on venture capital investments in SBIR awardee firms that was compiled from published information such as company press releases. Subsequently, we obtained data from Dow Jones-Venture One to help corroborate, and supplement as necessary, the IDI data. We selected Dow Jones-Venture One because its database on venture capital investment is compiled and updated with information from both venture capital investors and the firms that receive the investment. We interviewed key officials at IDI and Dow Jones-Venture One about their databases. We assessed the reliability of relevant fields in the databases and found them sufficient for our review. Our assessment included tests of the data itself as well as reviews of internal quality control procedures.

We combined data from NIH and DoD with data from the private sector sources to identify firms that had received venture capital investment at any time before they received an SBIR award in our time frame. In a small number of cases, the venture capital investment occurred as early as 1980, although most occurred in or after 1990. Specifically, at both agencies combined, 93 percent of SBIR firms first received venture capital investment between 1990 and 2004, 6 percent first received investment between 1985 and 1989, and 1 percent first received investment earlier than 1985. The private sector data did not include information on whether the venture capital investment was still present in the firm at the time of the SBIR award, or whether the venture capital firms were majority owners. We used analytic software to determine the number of awards made, the amounts of the awards, the percentage of applications receiving awards, and how the awards were distributed geographically. Similarly, to identify the number of phase I and phase II awards that were above the guidelines and their key characteristics, we used analytic software on the agency data and the combined data to identify firms that had received venture capital investment by the time they received an SBIR award above the guidelines in our time frame.

In our analyses, we express differences in the likelihoods of receiving awards that exceeded SBA's guidelines by using odds ratios. An odds ratio is generally defined as the ratio of odds of an event occurring in one group

compared to the odds of it occurring in another group.<sup>1</sup> In our analyses, the event of interest was receiving an award that exceeded SBA's guidelines versus one that did not. We computed odds ratios to indicate the difference between firms that had and firms that had not received venture capital investment in the likelihood of receiving awards that (1) exceeded SBA's guidelines at all, and (2) exceeded the guidelines by large amounts. For example, the odds that a firm that had received venture capital investment received an NIH phase II award above \$1 million were .499 while the odds that a firm that had not received venture capital investment received such an award were .244. Therefore, the ratio of those two odds was 2.045 (.499 / .244), indicating that firms that had received venture capital investment were 2.045 times (about 2 times) more likely to receive phase II awards over \$1 million than firms that had not received such investment.

To assess any differences that occurred to awards both above and below the guidelines following SBA's October 2002 additional clarification of the SBIR ownership criteria and its May 2003 decision that addressed ownership of SBIR firms by venture capital firms, we compared NIH and DoD data on awards made from October 1, 2000, through September 30, 2002, with data on awards made from October 1, 2002, through September 30, 2004. We used the combined data set to compare NIH and DoD awards from the two time periods in terms of the key characteristics described above. We conducted our work in accordance with generally accepted government auditing standards.

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<sup>1</sup>Odds are generally defined as the probability of being in one group divided by the probability of not being in the group. For example, 33.3 percent of the NIH phase II awards that went to firms that had received venture capital investment exceeded \$1 million. So, the probability that firms that had received venture capital investment received phase II awards that exceeded \$1 million was .333, and the odds that such firms received these large awards were .499 (.333/.667).

# Detailed Information on SBIR Awards Made by NIH During Fiscal Years 2001 through 2004

**Table 23: Geographical Distribution of NIH's Total SBIR Applications, Awards, Dollars Awarded, Dollars to Firms That Had and Had Not Received Venture Capital Investment, and Dollars to Awards within and above SBA's Guidelines, Fiscal Years 2001 through 2004**

(Dollars in millions)

State	Total applications – number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA's guidelines – number and percentage	Dollars to awards above SBA's guidelines – number and percentage
California	3,918 (21%)	988 (20%)	\$395 (20%)	\$132 (37%)	\$263 (16%)	\$93 (15%)	\$302 (22%)
Massachusetts	2,364 (12%)	707 (14%)	\$285 (14%)	\$30 (8%)	\$255 (16%)	\$83 (14%)	\$202 (15%)
Maryland	1,224 (6%)	327 (6%)	\$142 (7%)	\$23 (7%)	\$119 (7%)	\$30 (5%)	\$111 (8%)
New York	830 (4%)	216 (4%)	\$118 (6%)	\$37 (11%)	\$81 (5%)	\$27 (4%)	\$92 (7%)
Texas	906 (5%)	213 (4%)	\$81 (4%)	\$11 (3%)	\$70 (4%)	\$23 (4%)	\$58 (4%)
Pennsylvania	725 (4%)	212 (4%)	\$81 (4%)	\$11 (3%)	\$70 (4%)	\$24 (4%)	\$57 (4%)
Washington	646 (3%)	195 (4%)	\$80 (4%)	\$17 (5%)	\$63 (4%)	\$37 (6%)	\$43 (3%)
Virginia	728 (4%)	167 (3%)	\$66 (3%)	\$3 (1%)	\$63 (4%)	\$21 (3%)	\$45 (3%)
Ohio	584 (3%)	181 (4%)	\$59 (3%)	\$3 (1%)	\$55 (3%)	\$19 (3%)	\$40 (3%)
New Jersey	507 (3%)	136 (3%)	\$57 (3%)	\$5 (1%)	\$52 (3%)	\$16 (3%)	\$41 (3%)
North Carolina	484 (3%)	127 (3%)	\$56 (3%)	\$4 (1%)	\$53 (3%)	\$15 (2%)	\$42 (3%)
Wisconsin	295 (2%)	103 (2%)	\$45 (2%)	\$11 (3%)	\$35 (2%)	\$10 (2%)	\$35 (3%)
Oregon	297 (2%)	112 (2%)	\$43 (2%)	\$3 (1%)	\$40 (2%)	\$17 (3%)	\$26 (2%)
Michigan	450 (2%)	110 (2%)	\$41 (2%)	\$3 (1%)	\$38 (2%)	\$15 (3%)	\$25 (2%)
Colorado	430 (2%)	127 (3%)	\$39 (2%)	\$4 (1%)	\$35 (2%)	\$20 (3%)	\$19 (1%)
Illinois	528 (3%)	109 (2%)	\$38 (2%)	\$6 (2%)	\$31 (2%)	\$12 (2%)	\$25 (2%)

**Appendix II**  
**Detailed Information on SBIR Awards Made**  
**by NIH During Fiscal Years 2001 through**  
**2004**

(Continued From Previous Page)

(Dollars in millions)

State	Total applications – number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA’s guidelines – number and percentage	Dollars to awards above SBA’s guidelines – number and percentage
Minnesota	336 (2%)	90 (2%)	\$31 (2%)	\$1 (Less than 1%)	\$31 (2%)	\$13 (2%)	\$19 (1%)
Connecticut	256 (1%)	77 (2%)	\$26 (1%)	\$4 (1%)	\$22 (1%)	\$8 (1%)	\$18 (1%)
Arizona	219 (1%)	60 (1%)	\$26 (1%)	\$3 (1%)	\$23 (1%)	\$12 (2%)	\$14 (1%)
Florida	393 (2%)	81 (2%)	\$23 (1%)	\$1 (Less than 1%)	\$23 (1%)	\$11 (2%)	\$13 (1%)
Utah	267 (1%)	72 (1%)	\$21 (1%)	\$1 (Less than 1%)	\$19 (1%)	\$13 (2%)	\$8 (1%)
New Hampshire	168 (1%)	58 (1%)	\$20 (1%)	\$1 (Less than 1%)	\$19 (1%)	\$11 (2%)	\$9 (1%)
Georgia	209 (1%)	51 (1%)	\$20 (1%)	\$6 (2%)	\$14 (1%)	\$5 (1%)	\$15 (1%)
Indiana	170 (1%)	44 (1%)	\$18 (1%)	\$4 (1%)	\$13 (1%)	\$4 (1%)	\$13 (1%)
District of Columbia	123 (1%)	42 (1%)	\$16 (1%)	\$0 (0%)	\$16 (1%)	\$5 (1%)	\$12 (1%)
Rhode Island	115 (1%)	37 (1%)	\$16 (1%)	\$1 (Less than 1%)	\$14 (1%)	\$3 (1%)	\$12 (1%)
Hawaii	45 (Less than 1%)	13 (Less than 1%)	\$14 (1%)	\$13 (4%)	\$1 (Less than 1%)	Less than \$1 (Less than 1%)	\$14 (1%)
Missouri	188 (1%)	43 (1%)	\$13 (1%)	\$2 (1%)	\$11 (1%)	\$9 (2%)	\$4 (Less than 1%)
Alabama	127 (1%)	36 (1%)	\$12 (1%)	\$2 (1%)	\$10 (1%)	\$5 (1%)	\$7 (1%)
South Carolina	110 (1%)	33 (1%)	\$12 (1%)	\$4 (1%)	\$7 (Less than 1%)	\$3 (1%)	\$8 (1%)
New Mexico	137 (1%)	37 (1%)	\$11 (1%)	\$1 (Less than 1%)	\$10 (1%)	\$5 (1%)	\$6 (Less than 1%)
Iowa	81 (Less than 1%)	20 (Less than 1%)	\$9 (Less than 1%)	\$1 (Less than 1%)	\$8 (Less than 1%)	\$2 (Less than 1%)	\$7 (1%)
Oklahoma	78 (Less than 1%)	19 (Less than 1%)	\$9 (Less than 1%)	\$3 (1%)	\$6 (Less than 1%)	\$3 (Less than 1%)	\$6 (Less than 1%)

**Appendix II**  
**Detailed Information on SBIR Awards Made**  
**by NIH During Fiscal Years 2001 through**  
**2004**

(Continued From Previous Page)

(Dollars in millions)

State	Total applications – number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA’s guidelines – number and percentage	Dollars to awards above SBA’s guidelines – number and percentage
Tennessee	151 (1%)	28 (1%)	\$9 (Less than 1%)	Less than \$1 (Less than 1%)	\$8 (1%)	\$3 (1%)	\$5 (Less than 1%)
Kentucky	120 (1%)	21 (Less than 1%)	\$8 (Less than 1%)	\$2 (Less than 1%)	\$7 (Less than 1%)	\$3 (1%)	\$5 (Less than 1%)
Nebraska	44 (Less than 1%)	16 (Less than 1%)	\$8 (Less than 1%)	\$0 (0%)	\$8 (Less than 1%)	\$2 (Less than 1%)	\$6 (Less than 1%)
Vermont	64 (Less than 1%)	20 (Less than 1%)	\$7 (Less than 1%)	\$0 (0%)	\$7 (Less than 1%)	\$3 (Less than 1%)	\$5 (Less than 1%)
Delaware	115 (1%)	22 (Less than 1%)	\$6 (Less than 1%)	\$0 (0%)	\$6 (Less than 1%)	\$3 (1%)	\$3 (Less than 1%)
Kansas	66 (Less than 1%)	19 (Less than 1%)	\$5 (Less than 1%)	\$0 (0%)	\$5 (Less than 1%)	\$3 (1%)	\$2 (Less than 1%)
Montana	66 (Less than 1%)	12 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$1 (Less than 1%)	\$3 (Less than 1%)
Nevada	49 (Less than 1%)	12 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$4 (1%)	Less than \$1 (Less than 1%)
Maine	55 (Less than 1%)	13 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$2 (Less than 1%)	\$2 (Less than 1%)
Wyoming	19 (Less than 1%)	8 (Less than 1%)	\$3 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$2 (Less than 1%)	\$1 (Less than 1%)
Arkansas	47 (Less than 1%)	10 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$1 (Less than 1%)	\$1 (Less than 1%)
North Dakota	27 (Less than 1%)	7 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$1 (Less than 1%)	\$1 (Less than 1%)
Louisiana	75 (Less than 1%)	9 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$1 (Less than 1%)	\$1 (Less than 1%)
South Dakota	35 (Less than 1%)	4 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$1 (Less than 1%)	\$1 (Less than 1%)
Idaho	28 (Less than 1%)	8 (Less than 1%)	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$1 (Less than 1%)	Less than \$1 (Less than 1%)
Mississippi	18 (Less than 1%)	6 (Less than 1%)	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	Less than \$1 (Less than 1%)	\$1 (Less than 1%)
Alaska	11 (Less than 1%)	2 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)
West Virginia	17 (Less than 1%)	1 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)



**Appendix II**  
**Detailed Information on SBIR Awards Made**  
**by NIH During Fiscal Years 2001 through**  
**2004**

(Continued From Previous Page)

(Dollars in millions)

State	Total applications – number and percentage	Total awards - number and percentage	Total dollars awarded - number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA’s guidelines – number and percentage	Dollars to awards above SBA’s guidelines – number and percentage
<b>Total</b>	<b>18,948<sup>a</sup></b> <b>(100%)</b>	<b>5,061</b> <b>(100%)</b>	<b>\$1,992</b> <b>(100%)</b>	<b>\$356</b> <b>(100%)</b>	<b>\$1,637</b> <b>(100%)</b>	<b>\$606</b> <b>(100%)</b>	<b>\$1,386</b> <b>(100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

<sup>a</sup>Also included in this total are three applications submitted to NIH by firms in Puerto Rico, none of which were funded.

Note: Percentages and totals may not add because of rounding.

**Table 24: Component Distribution of NIH Awards, Dollars Awarded, Dollars to Firms That Had and Had Not Received Venture Capital, and Dollars to Awards within and above SBA’s Guidelines, Fiscal Years 2001 through 2004**

(Dollars in millions)

Awarding component	Total awards – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA’s guidelines – number and percentage	Dollars to awards above SBA’s guidelines – number and percentage
National Cancer Institute	945 (19%)	\$347 (17%)	\$80 (23%)	\$267 (16%)	\$83 (14%)	\$264 (19%)
National Institute of Allergy and Infectious Diseases	618 (12%)	\$276 (14%)	\$120 (34%)	\$156 (10%)	\$52 (9%)	\$224 (16%)
National Heart, Lung, and Blood Institute	597 (12%)	\$236 (12%)	\$28 (8%)	\$209 (13%)	\$78 (13%)	\$159 (11%)
National Institute of General Medical Sciences	390 (8%)	\$151 (8%)	\$33 (9%)	\$118 (7%)	\$51 (8%)	\$100 (7%)
National Institute of Diabetes and Digestive and Kidney Diseases	335 (7%)	\$142 (7%)	\$18 (5%)	\$123 (8%)	\$36 (6%)	\$106 (8%)
National Institute of Neurological Disorders and Stroke	289 (6%)	\$111 (6%)	\$21 (6%)	\$90 (5%)	\$36 (6%)	\$75 (5%)
National Center for Research Resources	212 (4%)	\$106 (5%)	\$8 (2%)	\$98 (6%)	\$33 (5%)	\$73 (5%)

**Appendix II**  
**Detailed Information on SBIR Awards Made**  
**by NIH During Fiscal Years 2001 through**  
**2004**

(Continued From Previous Page)

(Dollars in millions)

<b>Awarding component</b>	<b>Total awards – number and percentage</b>	<b>Total dollars awarded – number and percentage</b>	<b>Dollars to firms that had received venture capital investment – number and percentage</b>	<b>Dollars to firms that had not received venture capital investment – number and percentage</b>	<b>Dollars to awards within SBA’s guidelines – number and percentage</b>	<b>Dollars to awards above SBA’s guidelines – number and percentage</b>
National Institute of Child Health and Human Development	240 (5%)	\$91 (5%)	\$6 (2%)	\$85 (5%)	\$60 (10%)	\$30 (2%)
National Institute of Mental Health	201 (4%)	\$80 (4%)	\$3 (1%)	\$77 (5%)	\$26 (4%)	\$55 (4%)
National Institute on Aging	197 (4%)	\$78 (4%)	\$4 (1%)	\$74 (5%)	\$23 (4%)	\$55 (4%)
National Institute on Drug Abuse	132 (3%)	\$56 (3%)	\$3 (1%)	\$53 (3%)	\$18 (3%)	\$39 (3%)
National Eye Institute	159 (3%)	\$50 (3%)	\$5 (1%)	\$46 (3%)	\$15 (3%)	\$35 (3%)
National Institute of Environmental Health Sciences	125 (2%)	\$47 (2%)	\$3 (1%)	\$44 (3%)	\$21 (3%)	\$26 (2%)
National Institute of Arthritis and Musculoskeletal and Skin Diseases	120 (2%)	\$38 (2%)	\$5 (1%)	\$33 (2%)	\$12 (2%)	\$26 (2%)
National Human Genome Research Institute	92 (2%)	\$36 (2%)	\$12 (3%)	\$25 (2%)	\$7 (1%)	\$29 (2%)
National Institute on Deafness and Other Communication Disorders	98 (2%)	\$35 (2%)	Less than \$1 (Less than 1%)	\$35 (2%)	\$15 (2%)	\$21 (2%)
National Institute of Biomedical Imaging and Bioengineering	99 (2%)	\$32 (2%)	\$2 (1%)	\$30 (2%)	\$10 (2%)	\$23 (2%)
National Institute of Dental and Craniofacial Research	90 (2%)	\$28 (1%)	\$1 (Less than 1%)	\$27 (2%)	\$13 (2%)	\$15 (1%)
National Institute on Alcohol Abuse and Alcoholism	58 (1%)	\$25 (1%)	\$0 (0%)	\$25 (2%)	\$7 (1%)	\$18 (1%)
National Institute of Nursing Research	25 (Less than 1%)	\$11 (1%)	Less than \$1 (Less than 1%)	\$11 (1%)	\$6 (1%)	\$5 (Less than 1%)
National Center for Complementary and Alternative Medicine	28 (1%)	\$9 (Less than 1%)	\$2 (Less than 1%)	\$8 (Less than 1%)	\$2 (Less than 1%)	\$8 (1%)

**Appendix II**  
**Detailed Information on SBIR Awards Made**  
**by NIH During Fiscal Years 2001 through**  
**2004**

(Continued From Previous Page)

(Dollars in millions)

Awarding component	Total awards – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA’s guidelines – number and percentage	Dollars to awards above SBA’s guidelines – number and percentage
National Library of Medicine	9 (Less than 1%)	\$4 (Less than 1%)	\$1 (Less than 1%)	\$3 (Less than 1%)	\$2 (Less than 1%)	\$2 (Less than 1%)
National Center on Minority Health and Health Disparities	2 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)
<b>Total</b>	<b>5,061 (100%)</b>	<b>\$1,992 (100%)</b>	<b>\$356 (100%)</b>	<b>\$1,637 (100%)</b>	<b>\$606 (100%)</b>	<b>\$1,386 (100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

Note: Percentages and totals may not add because of rounding.

**Table 25: Geographical Distribution of NIH Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
California	\$176 (19%)	\$52 (41%)	\$219 (21%)	\$80 (35%)
Massachusetts	\$142 (15%)	\$9 (7%)	\$142 (13%)	\$20 (9%)
Maryland	\$65 (7%)	\$3 (2%)	\$77 (7%)	\$20 (9%)
New York	\$47 (5%)	\$10 (8%)	\$71 (7%)	\$28 (12%)
Texas	\$26 (3%)	\$5 (4%)	\$55 (5%)	\$6 (3%)
Pennsylvania	\$38 (4%)	\$5 (4%)	\$43 (4%)	\$6 (3%)
Washington	\$40 (4%)	\$7 (6%)	\$39 (4%)	\$10 (4%)
Virginia	\$28 (3%)	\$2 (1%)	\$38 (4%)	\$2 (1%)

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(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
Ohio	\$32 (3%)	\$2 (2%)	\$27 (3%)	\$1 (1%)
New Jersey	\$31 (3%)	\$2 (1%)	\$26 (2%)	\$3 (1%)
North Carolina	\$32 (3%)	\$1 (1%)	\$24 (2%)	\$3 (1%)
Wisconsin	\$20 (2%)	\$6 (5%)	\$25 (2%)	\$5 (2%)
Oregon	\$22 (2%)	\$1 (1%)	\$21 (2%)	\$2 (1%)
Michigan	\$17 (2%)	\$1 (1%)	\$24 (2%)	\$1 (1%)
Colorado	\$18 (2%)	\$2 (1%)	\$21 (2%)	\$2 (1%)
Illinois	\$20 (2%)	\$3 (2%)	\$17 (2%)	\$3 (2%)
Minnesota	\$14 (2%)	\$0 (0%)	\$17 (2%)	\$1 (Less than 1%)
Connecticut	\$8 (1%)	\$1 (Less than 1%)	\$18 (2%)	\$4 (2%)
Arizona	\$16 (2%)	\$1 (1%)	\$11 (1%)	\$2 (1%)
Florida	\$9 (1%)	Less than \$1 (Less than 1%)	\$14 (1%)	Less than \$1 (Less than 1%)
Utah	\$14 (2%)	\$1 (1%)	\$6 (1%)	Less than \$1 (Less than 1%)
New Hampshire	\$9 (1%)	Less than \$1 (Less than 1%)	\$11 (1%)	\$1 (Less than 1%)
Georgia	\$9 (1%)	\$2 (1%)	\$11 (1%)	\$4 (2%)
Indiana	\$7 (1%)	\$1 (1%)	\$11 (1%)	\$3 (1%)
District of Columbia	\$9 (1%)	\$0 (0%)	\$7 (1%)	\$0 (0%)
Rhode Island	\$7 (1%)	Less than \$1 (Less than 1%)	\$8 (1%)	\$1 (1%)
Hawaii	\$3 (Less than 1%)	\$2 (2%)	\$11 (1%)	\$11 (5%)

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(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
Missouri	\$7 (1%)	\$2 (1%)	\$6 (1%)	Less than \$1 (Less than 1%)
Alabama	\$8 (1%)	\$2 (1%)	\$4 (Less than 1%)	\$1 (Less than 1%)
South Carolina	\$6 (1%)	\$2 (2%)	\$6 (1%)	\$2 (1%)
New Mexico	\$5 (1%)	\$1 (1%)	\$6 (1%)	Less than \$1 (Less than 1%)
Iowa	\$6 (1%)	\$0 (0%)	\$3 (Less than 1%)	\$1 (1%)
Oklahoma	\$3 (Less than 1%)	\$1 (1%)	\$6 (1%)	\$2 (1%)
Tennessee	\$2 (Less than 1%)	Less than \$1 (Less than 1%)	\$6 (1%)	\$0 (0%)
Kentucky	\$3 (Less than 1%)	\$1 (1%)	\$5 (Less than 1%)	\$1 (Less than 1%)
Nebraska	\$2 (Less than 1%)	\$0 (0%)	\$6 (1%)	\$0 (0%)
Vermont	\$2 (Less than 1%)	\$0 (0%)	\$6 (1%)	\$0 (0%)
Delaware	\$2 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$0 (0%)
Kansas	\$3 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$0 (0%)
Montana	\$2 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$0 (0%)
Nevada	\$3 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Maine	\$3 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Wyoming	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Arkansas	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
North Dakota	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Louisiana	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)

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**2004**

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(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
South Dakota	\$2 (Less than 1%)	\$0 (0%)	\$0 (0%)	\$0 (0%)
Idaho	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Mississippi	Less than \$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Alaska	\$0 (0%)	\$0 (0%)	Less than \$1 (Less than 1%)	\$0 (0%)
West Virginia	Less than \$1 (Less than 1%)	\$0 (0%)	\$0 (0%)	\$0 (0%)
<b>Total</b>	<b>\$925</b> <b>(100%)</b>	<b>\$129</b> <b>(100%)</b>	<b>\$1,068</b> <b>(100%)</b>	<b>\$227</b> <b>(100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

Note: Percentages and totals may not add because of rounding.

**Table 26: Component Distribution of NIH Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
National Cancer Institute	\$156 (17%)	\$27 (21%)	\$192 (18%)	\$53 (23%)
National Institute of Allergy and Infectious Diseases	\$103 (11%)	\$38 (29%)	\$173 (16%)	\$82 (36%)
National Heart, Lung, and Blood Institute	\$115 (12%)	\$10 (8%)	\$121 (11%)	\$18 (8%)
National Institute of General Medical Sciences	\$75 (8%)	\$14 (11%)	\$76 (7%)	\$19 (8%)
National Institute of Diabetes and Digestive and Kidney Diseases	\$63 (7%)	\$7 (6%)	\$79 (7%)	\$11 (5%)

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(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
National Institute of Neurological Disorders and Stroke	\$54 (6%)	\$8 (6%)	\$57 (5%)	\$14 (6%)
National Center for Research Resources	\$61 (7%)	\$2 (2%)	\$45 (4%)	\$6 (3%)
National Institute of Child Health and Human Development	\$44 (5%)	\$3 (2%)	\$47 (4%)	\$3 (1%)
National Institute of Mental Health	\$39 (4%)	\$1 (1%)	\$41 (4%)	\$2 (1%)
National Institute on Aging	\$40 (4%)	Less than \$1 (Less than 1%)	\$38 (4%)	\$3 (1%)
National Institute on Drug Abuse	\$29 (3%)	\$3 (2%)	\$28 (3%)	Less than \$1 (Less than 1%)
National Eye Institute	\$22 (2%)	\$2 (2%)	\$28 (3%)	\$3 (1%)
National Institute of Environmental Health Sciences	\$22 (2%)	\$1 (1%)	\$25 (2%)	\$2 (1%)
National Institute of Arthritis and Musculoskeletal and Skin Diseases	\$20 (2%)	\$3 (2%)	\$18 (2%)	\$2 (1%)
National Human Genome Research Institute	\$19 (2%)	\$7 (5%)	\$17 (2%)	\$5 (2%)
National Institute on Deafness and Other Communication Disorders	\$19 (2%)	\$0 (0%)	\$16 (2%)	Less than \$1 (Less than 1%)
National Institute of Biomedical Imaging and Bioengineering	\$8 (1%)	\$0 (0%)	\$25 (2%)	\$2 (1%)
National Institute of Dental and Craniofacial Research	\$15 (2%)	\$1 (1%)	\$13 (1%)	Less than \$1 (Less than 1%)
National Institute on Alcohol Abuse and Alcoholism	\$8 (1%)	\$0 (0%)	\$17 (2%)	\$0 (0%)

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**Detailed Information on SBIR Awards Made**  
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(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
National Institute of Nursing Research	\$5 (1%)	\$0 (0%)	\$6 (1%)	Less than \$1 (Less than 1%)
National Center for Complementary and Alternative Medicine	\$6 (1%)	\$1 (1%)	\$3 (Less than 1%)	\$1 (Less than 1%)
National Library of Medicine	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$1 (Less than 1%)
National Center on Minority Health and Health Disparities	\$0 (0%)	\$0 (0%)	Less than \$1 (Less than 1%)	\$0 (0%)
<b>Total</b>	<b>\$925 (100%)</b>	<b>\$129 (100%)</b>	<b>\$1,068 (100%)</b>	<b>\$227 (100%)</b>

Source: GAO analysis of NIH, Dow Jones, and IDI data.

Note: Percentages and totals may not add because of rounding.



# Detailed Information on SBIR Awards Made by DoD During Fiscal Years 2001 through 2004

**Table 27: Geographical Distribution of DoD's Phase I Applications, Total Awards, Total Dollars Awarded, Dollars to Firms That Had and Had Not Received Venture Capital Investment, and Dollars to Awards within and above SBA's Guidelines, Fiscal Years 2001 through 2004**

(Dollars in millions)

State	Phase I applications – number and percentage	Total phase I and phase II awards – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA's guidelines – number and percentage	Dollars to awards above SBA's guidelines – number and percentage
California	10,584 (21%)	2,433 (22%)	\$741 (23%)	\$68 (31%)	\$673 (22%)	\$567 (22%)	\$175 (24%)
Massachusetts	6,173 (12%)	1,568 (14%)	\$483 (15%)	\$17 (8%)	\$465 (15%)	\$363 (14%)	\$120 (16%)
Virginia	3,787 (7%)	825 (8%)	\$245 (7%)	\$12 (6%)	\$232 (8%)	\$185 (7%)	\$60 (8%)
Ohio	2,022 (4%)	485 (4%)	\$163 (5%)	\$1 (1%)	\$161 (5%)	\$130 (5%)	\$33 (4%)
Colorado	1,956 (4%)	543 (5%)	\$160 (5%)	\$14 (6%)	\$146 (5%)	\$128 (5%)	\$32 (4%)
Maryland	2,594 (5%)	543 (5%)	\$152 (5%)	\$7 (3%)	\$145 (5%)	\$121 (5%)	\$31 (4%)
Pennsylvania	1,840 (4%)	440 (4%)	\$132 (4%)	\$2 (1%)	\$131 (4%)	\$103 (4%)	\$29 (4%)
New York	1,946 (4%)	423 (4%)	\$126 (4%)	\$14 (6%)	\$113 (4%)	\$97 (4%)	\$29 (4%)
Texas	2,619 (5%)	447 (4%)	\$125 (4%)	\$6 (3%)	\$119 (4%)	\$101 (4%)	\$23 (3%)
New Jersey	1,644 (3%)	305 (3%)	\$88 (3%)	\$12 (5%)	\$76 (2%)	\$68 (3%)	\$20 (3%)
Florida	1,662 (3%)	280 (3%)	\$83 (3%)	\$2 (1%)	\$81 (3%)	\$66 (3%)	\$17 (2%)
Alabama	1,139 (2%)	280 (3%)	\$81 (2%)	\$6 (3%)	\$75 (2%)	\$67 (3%)	\$14 (2%)
Michigan	1,400 (3%)	224 (2%)	\$69 (2%)	\$14 (7%)	\$55 (2%)	\$52 (2%)	\$17 (2%)
Washington	828 (2%)	179 (2%)	\$63 (2%)	\$3 (2%)	\$60 (2%)	\$47 (2%)	\$17 (2%)
Arizona	1,291 (3%)	226 (2%)	\$60 (2%)	\$3 (1%)	\$56 (2%)	\$51 (2%)	\$9 (1%)
New Mexico	801 (2%)	179 (2%)	\$50 (2%)	\$1 (1%)	\$48 (2%)	\$37 (1%)	\$13 (2%)

**Appendix III  
Detailed Information on SBIR Awards Made  
by DoD During Fiscal Years 2001 through  
2004**

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(Dollars in millions)

<b>State</b>	<b>Phase I applications – number and percentage</b>	<b>Total phase I and phase II awards - number and percentage</b>	<b>Total dollars awarded - number and percentage</b>	<b>Dollars to firms that had received venture capital investment – number and percentage</b>	<b>Dollars to firms that had not received venture capital investment – number and percentage</b>	<b>Dollars to awards within SBA's guidelines – number and percentage</b>	<b>Dollars to awards above SBA's guidelines – number and percentage</b>
Connecticut	705 (1%)	151 (1%)	\$46 (1%)	\$3 (1%)	\$43 (1%)	\$39 (2%)	\$8 (1%)
New Hampshire	541 (1%)	142 (1%)	\$44 (1%)	Less than \$1 (Less than 1%)	\$43 (1%)	\$31 (1%)	\$13 (2%)
Minnesota	645 (1%)	134 (1%)	\$41 (1%)	\$11 (5%)	\$31 (1%)	\$35 (1%)	\$6 (1%)
Georgia	673 (1%)	101 (1%)	\$34 (1%)	\$8 (4%)	\$27 (1%)	\$23 (1%)	\$11 (2%)
Illinois	788 (2%)	112 (1%)	\$31 (1%)	Less than \$1 (Less than 1%)	\$31 (1%)	\$27 (1%)	\$5 (1%)
Nevada	189 (Less than 1%)	62 (1%)	\$25 (1%)	\$0 (0%)	\$25 (1%)	\$17 (1%)	\$8 (1%)
North Carolina	478 (1%)	92 (1%)	\$23 (1%)	\$6 (3%)	\$16 (1%)	\$21 (1%)	\$1 (Less than 1%)
Oregon	350 (1%)	73 (1%)	\$21 (1%)	\$1 (1%)	\$19 (1%)	\$17 (1%)	\$4 (1%)
Utah	352 (1%)	63 (1%)	\$21 (1%)	\$1 (Less than 1%)	\$20 (1%)	\$16 (1%)	\$4 (1%)
Tennessee	383 (1%)	57 (1%)	\$17 (1%)	\$0 (0%)	\$17 (1%)	\$15 (1%)	\$2 (Less than 1%)
Rhode Island	151 (Less than 1%)	35 (Less than 1%)	\$15 (Less than 1%)	\$0 (0%)	\$15 (Less than 1%)	\$11 (Less than 1%)	\$4 (1%)
West Virginia	201 (Less than 1%)	45 (Less than 1%)	\$15 (Less than 1%)	\$0 (0%)	\$15 (Less than 1%)	\$8 (Less than 1%)	\$7 (1%)
Indiana	287 (1%)	49 (Less than 1%)	\$14 (Less than 1%)	\$1 (1%)	\$12 (Less than 1%)	\$11 (Less than 1%)	\$3 (Less than 1%)
Maine	154 (Less than 1%)	40 (Less than 1%)	\$13 (Less than 1%)	\$1 (Less than 1%)	\$13 (Less than 1%)	\$8 (Less than 1%)	\$5 (1%)

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Detailed Information on SBIR Awards Made  
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(Dollars in millions)

<b>State</b>	<b>Phase I applications – number and percentage</b>	<b>Total phase I and phase II awards - number and percentage</b>	<b>Total dollars awarded - number and percentage</b>	<b>Dollars to firms that received venture capital investment – number and percentage</b>	<b>Dollars to firms that not received venture capital investment – number and percentage</b>	<b>Dollars to awards within SBA's guidelines – number and percentage</b>	<b>Dollars to awards above SBA's guidelines – number and percentage</b>
South Carolina	190 (Less than 1%)	42 (Less than 1%)	\$11 (Less than 1%)	\$0 (0%)	\$11 (Less than 1%)	\$8 (Less than 1%)	\$3 (Less than 1%)
Wisconsin	173 (Less than 1%)	29 (Less than 1%)	\$11 (Less than 1%)	\$1 (Less than 1%)	\$10 (Less than 1%)	\$9 (Less than 1%)	\$1 (Less than 1%)
Oklahoma	226 (Less than 1%)	46 (Less than 1%)	\$10 (Less than 1%)	\$3 (1%)	\$7 (Less than 1%)	\$8 (Less than 1%)	\$2 (Less than 1%)
Idaho	178 (Less than 1%)	27 (Less than 1%)	\$9 (Less than 1%)	\$0 (0%)	\$9 (Less than 1%)	\$4 (Less than 1%)	\$5 (1%)
Missouri	248 (Less than 1%)	36 (Less than 1%)	\$8 (Less than 1%)	\$0 (0%)	\$8 (Less than 1%)	\$8 (Less than 1%)	Less than \$1 (Less than 1%)
Montana	173 (Less than 1%)	30 (Less than 1%)	\$8 (Less than 1%)	\$0 (0%)	\$8 (Less than 1%)	\$7 (Less than 1%)	\$1 (Less than 1%)
Vermont	120 (Less than 1%)	19 (Less than 1%)	\$7 (Less than 1%)	\$0 (0%)	\$7 (Less than 1%)	\$5 (Less than 1%)	\$1 (Less than 1%)
Kansas	108 (Less than 1%)	20 (Less than 1%)	\$7 (Less than 1%)	\$0 (0%)	\$7 (Less than 1%)	\$6 (Less than 1%)	Less than \$1 (Less than 1%)
Louisiana	166 (Less than 1%)	29 (Less than 1%)	\$6 (Less than 1%)	Less than \$1 (Less than 1%)	\$6 (Less than 1%)	\$5 (Less than 1%)	\$1 (Less than 1%)
District of Columbia	129 (Less than 1%)	20 (Less than 1%)	\$6 (Less than 1%)	\$0 (0%)	\$6 (Less than 1%)	\$5 (Less than 1%)	\$1 (Less than 1%)
Hawaii	158 (Less than 1%)	22 (Less than 1%)	\$6 (Less than 1%)	\$0 (0%)	\$6 (Less than 1%)	\$4 (Less than 1%)	\$2 (Less than 1%)
Iowa	143 (Less than 1%)	17 (Less than 1%)	\$5 (Less than 1%)	\$0 (0%)	\$5 (Less than 1%)	\$4 (Less than 1%)	\$2 (Less than 1%)
Delaware	153 (Less than 1%)	21 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$3 (Less than 1%)	\$1 (Less than 1%)

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Detailed Information on SBIR Awards Made  
by DoD During Fiscal Years 2001 through  
2004**

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(Dollars in millions)

State	Phase I applications – number and percentage	Total phase I and phase II awards - number and percentage	Total dollars awarded - number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Dollars to firms that had not received venture capital investment – number and percentage	Dollars to awards within SBA's guidelines – number and percentage	Dollars to awards above SBA's guidelines – number and percentage
Arkansas	81 (Less than 1%)	12 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)
Mississippi	95 (Less than 1%)	19 (Less than 1%)	\$3 (Less than 1%)	\$1 (1%)	\$2 (Less than 1%)	\$3 (Less than 1%)	\$0 (0%)
Nebraska	49 (Less than 1%)	10 (Less than 1%)	\$3 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$2 (Less than 1%)	\$1 (Less than 1%)
Kentucky	64 (Less than 1%)	6 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	Less than \$1 (Less than 1%)	\$2 (Less than 1%)
Wyoming	42 (Less than 1%)	5 (Less than 1%)	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$2 (Less than 1%)	Less than \$1 (Less than 1%)
Alaska	36 (Less than 1%)	4 (Less than 1%)	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$1 (Less than 1%)	\$0 (0%)
North Dakota	25 (Less than 1%)	3 (Less than 1%)	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$1 (Less than 1%)	Less than \$1 (Less than 1%)
South Dakota	29 (Less than 1%)	5 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	Less than \$1 (Less than 1%)	\$0 (0%)
<b>Total</b>	<b>50,775<sup>a</sup> (100%)</b>	<b>10,958 (100%)</b>	<b>\$3,294 (100%)</b>	<b>\$218 (100%)</b>	<b>\$3,075 (100%)</b>	<b>\$2,550 (100%)</b>	<b>\$743 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

<sup>a</sup>Also included in this total are six phase I applications submitted to DoD by firms in Puerto Rico, none of which were funded.

Notes:

(1) Dollar totals include SBIR dollars and non-SBIR funds from DoD awarding components.

(2) Percentages and totals may not add because of rounding.

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Detailed Information on SBIR Awards Made  
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**Table 28: Component Distribution of DoD Awards, Dollars Awarded, Dollars to Firms That Had and Had Not Received Venture Capital, and Dollars to Awards within and above SBA's Guidelines, Fiscal Years 2001 through 2004**

(Dollars in millions)

<b>Awarding component</b>	<b>Total awards – number and percentage</b>	<b>Total dollars awarded – number and percentage</b>	<b>Dollars to firms that had received venture capital investment – number and percentage</b>	<b>Dollars to firms that had not received venture capital investment – number and percentage</b>	<b>Dollars to awards within SBA's guidelines – number and percentage</b>	<b>Dollars to awards above SBA's guidelines – number and percentage</b>
Air Force	2,783 (25%)	\$1,018 (31%)	\$53 (24%)	\$965 (31%)	\$756 (30%)	\$263 (35%)
Army	2,003 (18%)	\$683 (21%)	\$61 (28%)	\$622 (20%)	\$499 (20%)	\$185 (25%)
Navy	2,548 (23%)	\$619 (19%)	\$32 (15%)	\$587 (19%)	\$508 (20%)	\$111 (15%)
Missile Defense Agency	1,912 (17%)	\$483 (15%)	\$32 (14%)	\$451 (15%)	\$382 (15%)	\$101 (14%)
Defense Advanced Research Projects Agency	680 (6%)	\$235 (7%)	\$23 (11%)	\$212 (7%)	\$168 (7%)	\$67 (9%)
Office of Secretary of Defense	653 (6%)	\$163 (5%)	\$8 (4%)	\$155 (5%)	\$159 (6%)	\$4 (1%)
Chemical Biological Defense	141 (1%)	\$35 (1%)	\$6 (3%)	\$30 (1%)	\$32 (1%)	\$4 (Less than 1%)
Special Operations Command	149 (1%)	\$35 (1%)	\$2 (1%)	\$33 (1%)	\$27 (1%)	\$8 (1%)
Defense Threat Reduction Agency	72 (1%)	\$18 (1%)	\$1 (Less than 1%)	\$17 (1%)	\$17 (1%)	\$1 (Less than 1%)
National Geospatial- Intelligence Agency	17 (Less than 1%)	\$4 (Less than 1%)	\$1 (Less than 1 %)	\$3 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)
<b>Total</b>	<b>10,958 (100%)</b>	<b>\$3,294 (100%)</b>	<b>\$218 (100%)</b>	<b>\$3,075 (100%)</b>	<b>\$2,550 (100%)</b>	<b>\$743 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Notes:

(1) DoD's dollar totals include SBIR dollars and additional non-SBIR funds from DoD awarding components.

(2) Percentages and totals may not add because of rounding.

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by DoD During Fiscal Years 2001 through  
2004**

**Table 29: Geographical Distribution of DoD Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
California	\$320 (23%)	\$28 (34%)	\$421 (22%)	\$40 (29%)
Massachusetts	\$204 (15%)	\$2 (2%)	\$279 (15%)	\$15 (11%)
Virginia	\$115 (8%)	\$7 (9%)	\$130 (7%)	\$5 (4%)
Ohio	\$72 (5%)	\$0 (0%)	\$90 (5%)	\$1 (1%)
Colorado	\$68 (5%)	\$8 (9%)	\$92 (5%)	\$6 (4%)
Maryland	\$57 (4%)	\$2 (3%)	\$94 (5%)	\$5 (3%)
Pennsylvania	\$54 (4%)	\$1 (1%)	\$78 (4%)	\$1 (Less than 1%)
New York	\$47 (3%)	\$3 (4%)	\$80 (4%)	\$10 (8%)
Texas	\$47 (3%)	\$3 (3%)	\$78 (4%)	\$3 (2%)
New Jersey	\$40 (3%)	\$5 (6%)	\$48 (2%)	\$7 (5%)
Florida	\$34 (2%)	\$1 (1%)	\$50 (3%)	\$1 (1%)
Alabama	\$23 (2%)	\$1 (2%)	\$58 (3%)	\$4 (3%)
Michigan	\$25 (2%)	\$4 (5%)	\$44 (2%)	\$10 (7%)
Washington	\$24 (2%)	\$1 (1%)	\$40 (2%)	\$3 (2%)
Arizona	\$31 (2%)	\$2 (3%)	\$29 (2%)	\$1 (1%)
New Mexico	\$24 (2%)	\$0 (0%)	\$25 (1%)	\$1 (1%)
Connecticut	\$19 (1%)	Less than \$1 (Less than 1%)	\$28 (1%)	\$3 (2%)

**Appendix III  
Detailed Information on SBIR Awards Made  
by DoD During Fiscal Years 2001 through  
2004**

(Continued From Previous Page)

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
New Hampshire	\$16 (1%)	Less than \$1 (Less than 1%)	\$28 (1%)	\$0 (0%)
Minnesota	\$20 (1%)	\$6 (7%)	\$21 (1%)	\$5 (4%)
Georgia	\$19 (1%)	\$5 (6%)	\$16 (1%)	\$3 (2%)
Illinois	\$11 (1%)	Less than \$1 (Less than 1%)	\$21 (1%)	Less than \$1 (Less than 1%)
Nevada	\$9 (1%)	\$0 (0%)	\$16 (1%)	\$0 (0%)
North Carolina	\$8 (1%)	\$2 (2%)	\$14 (1%)	\$5 (3%)
Oregon	\$8 (1%)	Less than \$1 (Less than 1%)	\$13 (1%)	\$1 (1%)
Utah	\$7 (1%)	Less than \$1 (Less than 1%)	\$14 (1%)	\$1 (1%)
Tennessee	\$8 (1%)	\$0 (0%)	\$9 (Less than 1%)	\$0 (0%)
Rhode Island	\$8 (1%)	\$0 (0%)	\$7 (Less than 1%)	\$0 (0%)
West Virginia	\$2 (Less than 1%)	\$0 (0%)	\$14 (1%)	\$0 (0%)
Indiana	\$4 (Less than 1%)	Less than \$1 (Less than 1%)	\$10 (1%)	\$1 (1%)
Maine	\$5 (Less than 1%)	\$0 (0%)	\$9 (Less than 1%)	\$1 (1%)
South Carolina	\$4 (Less than 1%)	\$0 (0%)	\$7 (Less than 1%)	\$0 (0%)
Wisconsin	\$3 (Less than 1%)	Less than \$1 (Less than 1%)	\$8 (Less than 1%)	\$1 (1%)
Oklahoma	\$2 (Less than 1%)	\$0 (0%)	\$7 (Less than 1%)	\$3 (2%)
Idaho	\$5 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$0 (0%)
Missouri	\$3 (Less than 1%)	\$0 (0%)	\$6 (Less than 1%)	\$0 (0%)
Montana	\$4 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$0 (0%)

**Appendix III  
Detailed Information on SBIR Awards Made  
by DoD During Fiscal Years 2001 through  
2004**

(Continued From Previous Page)

(Dollars in millions)

State	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
Vermont	Less than \$1 (Less than 1%)	\$0 (0%)	\$6 (Less than 1%)	\$0 (0%)
Kansas	\$3 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$0 (0%)
Louisiana	\$2 (Less than 1%)	Less than \$1 (Less than 1%)	\$4 (Less than 1%)	\$0 (0%)
District of Columbia	\$2 (Less than 1%)	\$0 (0%)	\$4 (Less than 1%)	\$0 (0%)
Hawaii	\$1 (Less than 1%)	\$0 (0%)	\$5 (Less than 1%)	\$0 (0%)
Iowa	\$3 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$0 (0%)
Delaware	\$2 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$0 (0%)
Arkansas	\$1 (Less than 1%)	\$0 (0%)	\$3 (Less than 1%)	\$0 (0%)
Mississippi	\$2 (Less than 1%)	\$1 (1%)	\$2 (Less than 1%)	Less than \$1 (Less than 1%)
Nebraska	\$3 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	\$0 (0%)
Kentucky	Less than \$1 (Less than 1%)	\$0 (0%)	\$2 (Less than 1%)	\$0 (0%)
Wyoming	\$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
Alaska	Less than \$1 (Less than 1%)	\$0 (0%)	\$1 (Less than 1%)	\$0 (0%)
North Dakota	\$1 (Less than 1%)	\$0 (0%)	\$0 (0%)	\$0 (0%)
South Dakota	Less than \$1 (Less than 1%)	\$0 (0%)	Less than \$1 (Less than 1%)	\$0 (0%)
<b>Total</b>	<b>\$1,371 (100%)</b>	<b>\$82 (100%)</b>	<b>\$1,922 (100%)</b>	<b>\$136 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Notes:

(1) DoD's dollar totals include SBIR dollars and additional non-SBIR funds from DoD awarding components.

(2) Percentages and totals may not add because of rounding.



**Appendix III  
Detailed Information on SBIR Awards Made  
by DoD During Fiscal Years 2001 through  
2004**

**Table 30: Component Distribution of DoD Dollars Awarded, Overall and to Firms That Had Received Venture Capital Investment, Fiscal Years 2001-2002 Compared to Fiscal Years 2003-2004**

(Dollars in millions)

Awarding component	Fiscal years 2001-2002		Fiscal years 2003-2004	
	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage	Total dollars awarded – number and percentage	Dollars to firms that had received venture capital investment – number and percentage
Air Force	\$479 (35%)	\$22 (27%)	\$539 (28%)	\$31 (22%)
Army	\$286 (21%)	\$20 (24%)	\$398 (21%)	\$41 (30%)
Navy	\$267 (19%)	\$12 (14%)	\$352 (18%)	\$21 (15%)
Missile Defense Agency	\$144 (10%)	\$12 (14%)	\$339 (18%)	\$20 (14%)
Defense Advanced Research Projects Agency	\$95 (7%)	\$10 (12%)	\$140 (7%)	\$14 (10%)
Office of Secretary of Defense	\$54 (4%)	\$3 (4%)	\$109 (6%)	\$5 (4%)
Chemical Biological Defense	\$18 (1%)	\$3 (4%)	\$17 (1%)	\$3 (2%)
Special Operations Command	\$11 (1%)	Less than \$1 (Less than 1%)	\$24 (1%)	\$1 (1%)
Defense Threat Reduction Agency	\$15 (1%)	Less than \$1 (Less than 1%)	\$3 (Less than 1%)	\$1 (Less than 1%)
National Geospatial-Intelligence Agency	\$2 (Less than 1%)	Less than \$1 (Less than 1%)	\$1 (Less than 1%)	\$1 (Less than 1%)
<b>Total</b>	<b>\$1,371 (100%)</b>	<b>\$82 (100%)</b>	<b>\$1,922 (100%)</b>	<b>\$136 (100%)</b>

Source: GAO analysis of DoD, Dow Jones, and IDI data.

Notes:

- (1) DoD's dollar totals include SBIR dollars and additional non-SBIR funds from DoD awarding components.
- (2) Percentages and totals may not add because of rounding.

# Comments from the Department of Defense



ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

OFFICE OF THE UNDER SECRETARY OF DEFENSE  
3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

APR 06 2006

Anu K. Mittal  
Director, Natural Resources and Environment  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

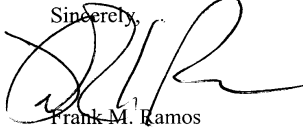
Dear Ms. Mittal:

This is the Department of Defense (DoD) response to GAO draft report, "SMALL BUSINESS INNOVATION RESEARCH: Information on Awards Made by NIH and DoD in Fiscal Years 2001 through 2004," dated April 2006 (GAO Code 360617).

The GAO offers no recommendations and concedes that the initial congressional question regarding SBIR awards to firms whose majority owners were venture capital firms could not be answered. The Department concurs with GAO's finding stated early in the report that information on the degree of venture capital ownership is confidential and proprietary, and not available from public sources. Thus, it is generally impossible to verify whether or not a firm is majority owned by venture capital corporations beyond documents provided by the firm.

Additionally, the relatively small degree of venture capital interest in DoD SBIR awardees, particularly relative to NIH awardees, is not surprising based on the characteristics of the respective markets. Likewise, absence of higher award rates or different geographic distribution of awards to firms with venture capital support versus firms without such support is not a surprise. Presence of venture capital investment is not an evaluation criteria in the selection of SBIR awardees from among qualifying firms.

The Department appreciates the opportunity to comment on the draft report and would like to provide technical corrections and additional information (enclosure).

Sincerely,  
  
Frank M. Ramos  
Director, Small Business Programs

Enclosure:  
As stated



# Comments from the Small Business Administration



U.S. SMALL BUSINESS ADMINISTRATION  
WASHINGTON, D.C. 20416

April 6, 2006

Ms. Anu K. Mittal  
Director, Natural Resources and Environment  
Government Accountability Office  
441 G Street, NW  
Washington, DC 20548

**Re:** SBA comments on the Government Accountability Office (GAO) draft report, "Small Business Innovation Research: Information on Awards Made by National Institute of Health (NIH) and the Department of Defense (DoD) in Fiscal Years 2001 through 2004" (GAO-06-565)

Dear Ms. Mittal:

On March 22, 2006, GAO submitted to the U.S. Small Business Administration (SBA) for comment a draft report titled "Small Business Innovation Research (SBIR): Information on Awards Made by NIH and DoD in Fiscal Years 2001 through 2004" (GAO-06-565). The report presents selected tabulations of publicly-available data on SBIR program awards for two of the eleven participating agencies. While the report presents information that can be useful for program evaluation, SBA finds much of the discussion of data unclear. We welcome the opportunity to provide some clarification.

One of the topics of the report is the involvement of venture capital in small businesses receiving SBIR awards. Data is presented in the report on the number of awardee firms that have received venture capital investment, tabulated by state and by agency. While these data are useful, the presentation of the data and the discussion in the report may be misconstrued as suggesting a link between this information and issues regarding the eligibility requirements for the program.

The report contains a considerable number of references to the program's ownership requirements for eligibility, which state that an awardee must be a for-profit business concern that is (a) at least 51 percent owned and controlled by one or more individuals who are U.S. citizens, or (b) at least 51 percent owned and controlled by another for-profit business concern that is itself eligible for the program (i.e., is itself at least 51 percent owned and controlled by one or more individuals who are U.S. citizens). Further, the awardee firm, together with all of its affiliates, may employ no more than 500 employees in total. The report also contains references to an SBA size determination ruling that clarified certain features of the program's eligibility requirements.

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**Appendix V  
Comments from the Small Business  
Administration**

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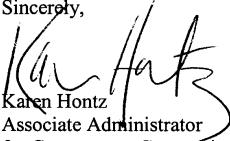
Ms. Anu K. Mittal

2

However, as noted in the report, the data presented indicate only the presence of venture capital investment in awardee firms and do not contain information on the degree or actual percentage of ownership by venture capital firms. Venture capital firms may own up to 49 percent of an SBIR awardee, and this has been the case throughout the history of the program (so long as all other eligibility requirements are met). Thus, the data presented in the report has no bearing on program eligibility. For this reason, SBA finds the general discussion of SBIR eligibility to be unclear and potentially misleading. Attachment A contains additional comments on the report.

Thank you for the opportunity to comment on the draft report.

Sincerely,



Karen Hontz  
Associate Administrator  
for Government Contracting

# GAO Contact and Staff Acknowledgments

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## GAO Contact

Anu K. Mittal (202) 512-3841

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## Staff Acknowledgments

In addition to the individual named above, Cheryl Williams (Assistant Director), Stephen Cleary, Curtis Groves, Annamarie Warman Lopata, Gregory Marchand, Marcus Oliver, Alison O'Neill, G. Gregory Peterson, and Anne Rhodes-Kline made key contributions to this report.

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