

the team, says, “[We] provide rebuttal, response, and clarification” to misleading reports in the media.

This past September, rapid response team cofounder Scott Mandia and others launched the Climate Science Legal Defense Fund. The nonprofit group raises money for climate scientists embroiled in legal battles. As of Decem-

ber, it had raised more than \$20 000 for Mann, who is fighting Freedom of Information Act demands by the American Tradition Institute think tank for 5000 pages of his email correspondence. The fund also offers informal counseling to harassed climate scientists and plans to hire a staff attorney to offer quick and experienced help. “Many sci-

entists think they can win by blocking punches. You have to throw them,” says Mandia, who teaches physical sciences at New York’s Suffolk County Community College. “The main thing is that the world understands there is a group that will defend climate scientists who are being harassed.”

Toni Feder

Small business technology program gains new lease on life

Six-year extension of grants act will give small companies a leg up in the scramble for increasingly scarce federal research dollars.

Although the federal science and technology budget is expected to shrink in the coming years, one of the largest federal R&D programs should continue to thrive: Congress took action last month to extend the \$2.3 billion Small Business Innovation Research program for six years. The SBIR’s reauthorization will increase from 2.5% to 3.2% the amount of money that goes to small businesses from the so-called extramural—that is, externally performed—R&D budgets of 11 federal agencies. But it will also shrink the amount of money available for universities, the major external performers of federal basic research.

The agencies participating in the SBIR program range in size from the Department of Defense and the National Institutes of Health, which handed out SBIR grants totaling \$1.2 billion and \$616 million, respectively, in fiscal year 2010, to the Environmental Protection Agency, which issued \$4.8 million in grants that year. Taken together, the SBIR programs are larger than the R&D budgets of all but six departments—DOD, NIH, NSF, NASA, and the US Departments of Agriculture and Energy.

Eligible small businesses, with 500 or fewer employees, compete for funds by responding to annual solicitations.

Program gets high marks

Charles Wessner of the National Research Council, who has headed exhaustive reviews of the SBIR projects of the five largest agencies, says they are generally fulfilling agency missions. An NRC assessment of the DOD program, for example, concluded that it was “contributing directly to enhanced capabilities . . . and the needs of those charged with defending the country.”

Equally important, he notes, the SBIR program also provides a direct route for small businesses to compete for federal technology dollars. Practically, the only other option for a small company to get federal development funding is to subcontract for a large corporation.

All SBIR awardees must begin with a phase-one feasibility study, for which a maximum of \$150 000 over six months is available. Only then are they eligible for a phase-two grant. The program is highly competitive, says Wessner. Only 20% of applicants receive a phase-one

award, and just half of those succeed in getting a phase two. Although guidelines call for those grants to be limited to \$1 million over two years, NIH, in particular, has awarded some multimillion-dollar grants; the reauthorized program caps them at \$2 million.

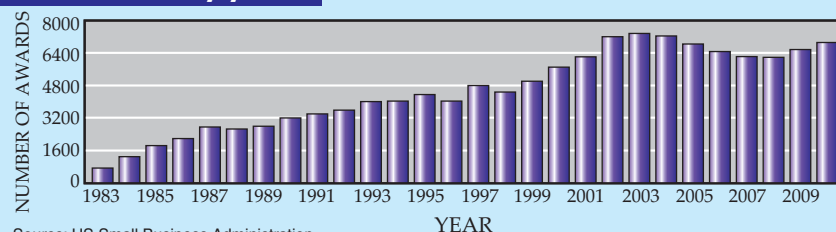
A new feature of the reauthorized program makes companies that are majority owned by US venture capital firms eligible to receive SBIR awards. But as before, no limit is placed on the number of awards a company may receive. A few companies have amassed hundreds over the years. For example, Physical Optics in Torrance, California, got its start in 1985 with an SBIR grant; through FY 2010 it had been awarded 1243 grants from seven different agencies. The company has introduced more than 100 products and created six spinoff companies. Its products are in use at dozens of military and DOE installations.

Some large companies, such as cell-phone manufacturer Qualcomm and internet security provider Symantec, originated from SBIR grants. More recently, A123 Systems, an MIT spinoff, had help from at least four SBIR grants in developing lithium-ion battery technology now being manufactured in the US for electric vehicles. ViewPlus, a company founded by Oregon State University physics professor John Gardner, developed a line of Braille printers and expanded the applications for its products with the help of 15 SBIR grants from NSF and NIH. The company has collaborated with the American Physical Society to make APS journals more accessible to visually impaired users.

Room for improvement

The NRC reviews have found that SBIRs have stimulated patents, publications, and technology transfer at universities and have encouraged the formation of new businesses. The review

SBIR awards by year



Source: US Small Business Administration

Through fiscal year 2010, the Small Business Innovation Research program has awarded more than \$29 billion in 118 000 grants to help small companies develop new technologies.

of DOE programs found that 41% of SBIR phase-two projects had either reached the marketplace or were in the process of being commercialized. And of the DOD projects, 46% reported some sales or licensing revenues, and another 18% expected to yield future revenues.

The reviews also found room for improvements. The DOE program, for example, hasn't done enough to bring the national laboratories into partnerships with award recipients, one critique said. And the department could do more to foster applications from minority- and women-owned companies.

Although SBIR grants produce higher rates of patenting than does academic research, Wessner discounts the value of such comparisons. "We need both basic research and someone to bring it to the market," he says, adding that universities could further facilitate commercialization of their research by helping their faculty with SBIR applications.

Before the reauthorization, more than two dozen universities joined scientific societies and higher-education associations to unsuccessfully argue against raising the SBIR set-aside. Any increase "will result in funding cuts for investigator-initiated peer-reviewed grants that are the cornerstone of the nation's research enterprise," they maintained in a letter to lawmakers; they were especially concerned that the increase to 3.2% would occur "as the budgets of the federal science agencies are likely to shrink or at best remain flat."

Jere Glover, executive director of the Small Business Technology Council, a trade association for SBIR awardees and hopefuls, says universities have always been unhappy with SBIR. Of concern to academia at the program's inception was the possible brain drain as faculty members, fueled by SBIR grants, fled campuses to commercialize their research, he says. Today, however, universities boast of the number of spinoff companies they create.

Overstated achievements?

Some lawmakers voiced concerns during the protracted, three-year reauthorization debate. Cases of waste, fraud, and abuse have been documented, although Wessner says the numbers have been small relative to the size of the program. Fraudulent activities have included double- and triple-billing multiple agencies for the same research and failing to conduct research altogether. Senator Jay Rockefeller (D-WV), who held a hearing in August 2009 on SBIR fraud, said his staff had identified 29 cases of fraud occurring between 1990 and 2009, involving more than 300 SBIR contracts totaling more than \$100 million.

The Government Accountability Office warned in a September 2011 report that some SBIR awardees might overstate their commercial achievements in hopes of improving their prospects for obtaining further SBIRs. Lacking a common set of metrics, agencies have gathered commercialization data that are incompatible, the GAO report stated. Among the largest SBIR agencies, only DOD routinely takes steps to verify the commercialization data provided by grant recipients. Officials with the DOE and NIH SBIR programs told the GAO that they lacked the necessary resources to authenticate the information.

Glover thinks the GAO's concern is unwarranted. He says recipients are more likely to err on the side of caution and to understate their commercial successes. The NRC assessments, which the new law orders to be continued, will provide the necessary verification, he says.

The reauthorization statute contains fraud-fighting provisions, including stiffer oversight requirements for agencies and a mandate that awardees certify their compliance with all SBIR program provisions.

David Kramer

From cells to limbs, UK center studies war injuries

More people are surviving with worse injuries than ever before.

A new center at Imperial College London works to understand injuries from explosions and to mitigate their damage. On 7 December the Royal British Legion announced it would put £5 million (\$7.8 million) over

five years into the new Centre for Blast Injury Studies; it is the first time that the charity, which looks after the interests of veterans, is investing in basic research. Imperial College is providing an additional £3 million, and the UK defense ministry is paying the salaries of participating military surgeons.

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