transfer, Maria Freire. They signed the papers in August.

Their agreement says that NIH scientists are free to share cre-lox mice with other nonprofit research labs, provided they sign a simple transfer agreement indicating the recipient won't give the material to anyone else and that DuPont keeps commercial rights. DuPont is not asking to preview publications, nor does it claim extensive "reach-through" property rights on second generation discoveries, as in the past. However, the company does insist that commercial uses of the technology must be covered by a license. DuPont also plans to retain strict control of the use of cre-lox genetic modifications in agricultural research and in the production of mouse embryonic and stem cells. The most significant aspect of the agreement, according to a Jackson Lab staffer, may be its universality: DuPont has said that all researchers who receive federal funding—not just those who work at NIH—will be covered by the liberal rules, effectively freeing up the nonprofit world.

–ELIOT MARSHALL

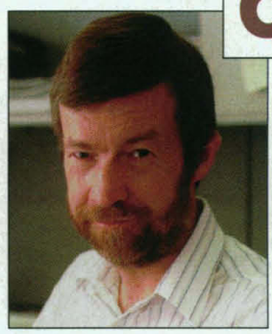
TECHNOLOGY TRANSFER

Small Businesses Get Extra Boost From NSF

Twenty years ago, the National Science Foundation (NSF) had the then-radical idea of providing federal funds to help budding scientist-entrepreneurs turn research findings into products. The idea grew into the government-wide Small Business Innovation Research (SBIR) program, now a billion-dollar operation spread across 10 agencies, that provides small companies with two rounds of federal support before they must stand or fall on their own. This month, NSF gave its portion of the program a new twist, adding a third round of funding for companies that aren't quite ready to cut the federal cord. The move is likely to rekindle debate over just how well the program is working in generating an economic payoff from federally funded research.

Congress created SBIR in 1982 and modeled it after the original NSF experiment. The program—which is funded by a controversial 2.5% "tax" on the R&D budgets of all major research agencies (*Science*, 17 May 1996, p. 942)—awards up to $100,000 for a feasibility study of a potential product, called Phase 1, and up to $750,000 for additional research on a prototype, called Phase 2. The law stipulates that Phase 3, the company's entry into the marketplace, must occur without the help of government funding. Now, NSF has tinkered with those rules by adding a component, dubbed Phase 2b, that allocates an additional $100,000 for 12 more months to companies that have lined up investors willing to put up at least $200,000. NSF, which currently limits Phase 2 awards to $400,000, is testing the idea with four companies this year and plans to expand it to more than 100 next year using money from its existing SBIR pot.

The rationale, say NSF officials, comes from a survey that found most fledgling companies aren't ready for the free market after only 2 years of federal support, and that a small percentage of the companies aided by SBIR generate most of the jobs and revenue. "SBIR is not working as well as it should," says Kesh Narayanan, head of NSF's industrial innovation division, who conceived the extended funding idea. "We wanted to find ways to encourage more companies to take the next step [toward commercialization]."



Green for green. New award helps Alan Kinnersley run field tests of Auxein's plant metabolite.

SBIR's supporters generally regard NSF's new twist as fine-tuning an already worthy activity. "Our commercialization rate is much higher than most university technology transfer programs," says Dan Hill of the Small Business Administration, which coordinates the government-wide program and approved NSF's experiment. "I don't see the additional federal support as a crutch, but rather as a way for a company to do more R&D while it lines up investors. And since NSF is buying more research, it's a win-win situation for both parties," adds Hill.

However, others say that NSF may be giving the companies a little too much nurturing. "It's extremely tricky to find the right balance between federal incentives and the commercial sector," says Tom Moss, head of the Government-Industry-University Research Roundtable at the National Academy of Sciences. And Harvard University economist Josh Lerner says that successful companies tend to use SBIR as seed money to attract private investors and that "it's not healthy for companies to avoid the need to go out into the market."

One company participating in NSF's pilot program, Polatomic Inc. of Richardson, Texas, is also looking at the government as a primary customer. The company received $100,000 from NSF based on money it has lined up from NASA's Jet Propulsion Laboratory in Pasadena, California, to help it develop an instrument called a vector/scalar laser magnetometer, which can measure a planet's magnetic field from orbit. "We didn't want to restrict the source of their outside funding," says Narayanan. "As long as it's for the benefit of the federal consumer, what does it matter who's putting up the money?"

Polatomic's chairman, industrial physicist Bob Slocum, says that the company hopes someday to have customers besides NASA and the Navy, which is interested in using it on submarines. Slocum adds that a modified version of the device should also appeal to private companies, who could use it to identify mineral and oil deposits, locate toxic waste sites, and detect buried explosives. But geophysicist John Connerney of NASA's Goddard Space Flight Center in suburban Maryland, which builds a different type of magnetometer for space observations, sees the new injection of federal funding as a sign that the company hasn't really built a better mousetrap. "If Polatomic was truly a commercial business, I would think they would have identified paying customers by the end of Phase 2," says Connerney, who in the past has reviewed SBIR proposals for NSF.

AUXEIN CORP.

Another grantee, Auxein Corp. of Lansing, Michigan, says it needs the additional funding to conduct more field trials of a plant growth stimulant based on the natural hormone gamma aminobutyric acid, which acts as a neurotransmitter in animals. Chief scientist Alan Kinnersley says the company has lined up $2 million from three investors and found another company interested in becoming the exclusive distributor for its use in horticulture. But sales have fallen short of projected levels. "We have faced an uphill battle educating people about what AuxiGro can do," he explains, "including a 30-year history of biostimulants that have failed to live up to their promise."

Narayanan says he doesn't expect dramatic results from Phase 2b. But he says the SBIR program needed a boost. "We had two choices," he says. "We could sit back and hope for the best. Or we could try something new."

–JEFFREY MERVIS

MAGNETIC RESEARCH

Los Alamos Magnet Leads the Field

It shrieks like Godzilla, harnesses the power of 80 diesel locomotives, exerts a force strong enough to crumple the strongest reinforced steel beams, and now it's open for business. Today, officials at the Los Alamos National Laboratory in New Mexico are scheduled to cut the ribbon on a new magnet