

Too Early to Tell

Grade Incomplete for 21st Century Fund

When Indiana created the 21st Century Research and Technology Fund in 1999, it was hailed as an overdue step but one that lacked adequate funding compared to other state initiatives.

In the four years since, the fund has endured a roller-coaster ride. State budget problems prompted Gov. O'Bannon to freeze the \$25 million a year fund in November 2001. The 2002 special session featured the release of \$15 million a year to fund some projects that had already been selected for awards. Despite continuing budget difficulties, the 2003 General Assembly revived the fund at an unexpected \$75 million over two years.

(The economic woes and state budget challenges also impacted other states. Michigan has greatly reduced its highly heralded \$1 billion life sciences investment over 20 years. Others, however, continue to be proactive with passage of funding programs/proposals at far higher levels than what Indiana has in place).

Has the 21st Century Fund been a success? What criteria should be used to judge its performance? Where is the fund headed in the future?

The answers: It may still be too early to tell, it depends on whom you ask and we're not sure.

James Eifert, Ph.D., president of Rose-Hulman Ventures in Terre Haute and a 21st Century Fund board member, cautions against early judgments. "The fact that we started and stopped is a real hiccup, but we still need to think of ourselves as very early in this game."

How it works

The page 18 chart reveals highlights of the first four rounds of funding. Among the key points:


- The larger number of Round 1 entries stems from a six-month period between creation of the fund and the initial review. Tony Armstrong, director of the fund, expects a similar occurrence for the fifth round this fall due to the two-year lapse between awards
- Requests far exceeded actual awards, with a general consensus that a number of worthy projects have gone unfunded
- Fund officials point to the more than \$125 million in additional money leveraged due to the 21st Century awards

Grants are awarded in three broad categories – science and technology commercialization, centers of excellence and entrepreneurial activities. While some states have allocated specific funding levels to various categories, Indiana maintains an open approach.

"This allows us to fund the projects they feel rise to the top," Armstrong explains. "They" are a peer review panel of national experts that evaluates the applications. The 21st Century board reviews the panel's suggestions and submits its recommendations to the State Budget Committee, which allocates the funds.

Most of the 58 awards thus far have fallen into life sciences, advanced manufacturing and information technology. The growing Central Indiana Life Sciences Initiative leads Armstrong to anticipate increased activity in that area during the current fifth round.

Awards are for a period of two years. The official cap is \$5 million, although awards above \$2 million are uncommon. Each application must feature a partnership between higher education and the commercial sector. Universities dominated the early submissions, but by the third round



The Indiana University Emerging Technologies Center is expected to be a major player in assisting life sciences companies.

By Tom Schuman

nearly 50% of the applications came from the business community.

Forming new bonds

Armstrong strongly believes that the intangible value of partnerships will have long-lasting impacts.

"I think the legacy of the fund going forward will be the partnerships. There are collaborations that will last 20, 30 years," he contends, adding that it's not only forging ties between universities and companies. "There is a link also between university and university, which probably hadn't worked as well together before."

Fund leaders point to the example of a collaboration between Notre Dame and Warsaw-based Zimmer, Inc. researchers to develop "minimally invasive solutions" for orthopaedic conditions. The result could reduce rehabilitation times of weeks or months to a few days.

Zimmer has hired several Notre Dame graduates as part of the association, and some company employees are taking part in a doctorate level program at the university. The project also involves researchers at both Indiana and Purdue universities.

"You need a team," to move forward on such projects,



New partnerships will deliver long-lasting benefits, says 21st Century Fund director Tony Armstrong.

Armstrong notes. "At the federal level, that's becoming the model as well. Universities can also play the role of facilitator, allowing companies (that likely wouldn't have joined forces on a project) to work together."

For example, the fourth round of awards included a Center for Wireless Communication and Networking. Teaming with Purdue and Notre Dame researchers are representatives of Delphi Delco Electronics in Kokomo, Thomson Multimedia in Indianapolis and ITT Industries in Fort Wayne.


Measuring tools

There are countless other "feel good" stories. The bottom line, however, would seem to include commercialization of technology and creation of the high-wage, high-skill jobs that the state is lacking. A direct link, though, between the fund and commercialization may be a significant stretch at this point.

"We're trying to seed this effort, to bring together these collaborations to get to the next step," Armstrong analyzes. "Maybe we should say we're pre-seed, to get them to the seed stage. We have to make sure we continue to have a pipeline (of funding). It's a challenge everywhere, not just in Indiana."

Bioinformatics
Chemical Informatics
Health Informatics
Human-Computer Interaction
Laboratory Informatics
Media Arts and Science (New Media)
Music Informatics

Indiana University School of
informatics



**the knowledge and skills you need
for the information age are here**

Bloomington
www.informatics.indiana.edu

Indianapolis
www.informatics.iupui.edu

INDIANA UNIVERSITY
Indiana University is an Affirmative
Action/Equal Opportunity Institution

21st Century Research & Technology Fund (\$ in millions)

	Round 1 (12/99)	Round 2 (3/00)	Round 3 (11/00)	Round 4 (11/01)	Total
Total project submissions	170	100	101	109	480
Number of awarded projects	12	21	13	12	58
Total amount of requests for 21st Century Funds	\$168.0	\$109.1	\$137.4	\$144.7	\$559.3
21st Century Fund award amount	\$13.8	\$23.3	\$14.7	\$15.6	\$67.5
Total project budget amounts for 21st Century Fund awardees	\$25.0	\$78.1	\$56.7	\$54.2	\$214.2
Total number of start-up companies					15
Total federal, industrial and venture capital follow-on funds					\$125.5

Source: 21st Century Research & Technology Fund

Eifert says it's much too early to measure the success of the 21st Century program by jobs created, sales or profits.

"Persistence in the marketplace should be one measure. You have to consider the number of ventures funded that are still moving forward a year after the grant expires," he declares. "Leverage on investment is a second factor."

Rose-Hulman Ventures faces a similar situation in analyzing its partnerships. Of 35 companies invested in during the past three years, Eifert says one has been acquired, with several more profitable and a number of others

generating revenue. The bottom line is that it's too early for a complete grade.

Both Eifert and Armstrong emphasize the lengthy time frame involved in product commercialization.

"You have to think about the whole technology development spectrum, from idea to conception to research ... to going into the marketplace," Eifert says. "There's a real critical area between research and commercialization, and it's hard for private money to play in that capacity. That's where the 21st Century Fund is so important."

Armstrong adds, "The challenge in life sciences is that it takes so long, through the regulatory process and clinical trials, from concept to product. It's going to be a few years before we see some of the results."

Case study

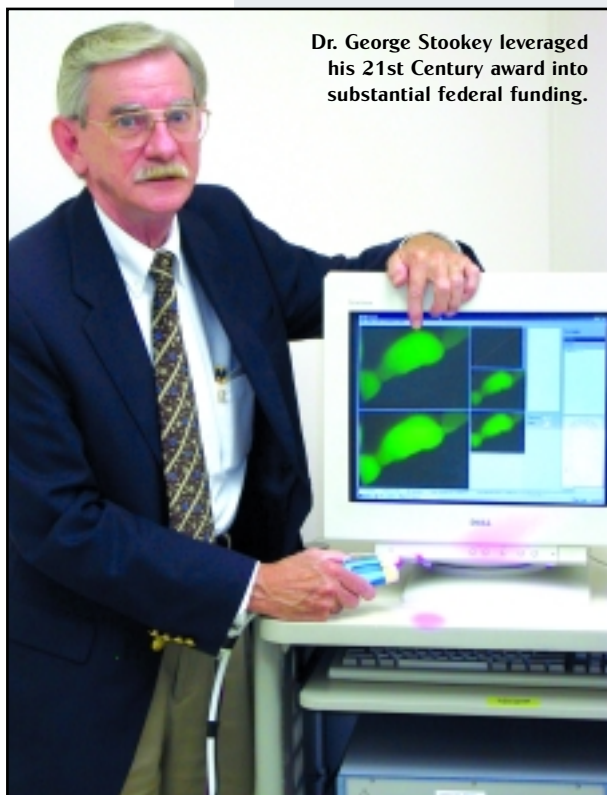
A Round 1 awardee reports that the 21st Century Fund is just what was needed to get the ball rolling on a technology that could dramatically change the field of dentistry and the treatment of tooth decay. The \$1.6 million award to Dr. George Stookey, distinguished professor emeritus at the Indiana University School of Dentistry, was only an initial step to additional funding and research.

Work under way in Sweden, and later picked up by a group in Amsterdam, was focusing on the early detection of tooth decay. Stookey says it is possible to detect such problems up to two years before the current predominant method of an x-ray in the dentist's office.

The 21st Century Fund grant was used to help obtain \$6 million from the National Institutes of Health (NIH). Stookey purchased a company – Therametric Technologies, Inc. – started by two IU dentistry faculty to assist in the R&D process. One SBIR (Small Business Innovation Research) grant has been received, a second is pending and a third will be submitted in an effort to "perfect the procedures needed to put this into practice."

In August, Stookey moved his company into newly created space in the Indiana University Emerging Technologies Center. Two members of his team – Ph.D's from Japan and India – will do most of the work at the facility, along with several consultants. The product should be in a test market by the end of the year (with additional funding helping bring full-time employment to six), with a fully improved system in place a year after that.

"The 21st Century money was critical. It allowed us to make a number of improvements in the system, which had only been used on



Dr. George Stookey leveraged his 21st Century award into substantial federal funding.

an experimental basis,” Stookey declares. “We did pilot studies and showed it could work in a clinical environment. We used it to leverage support from NIH and to get additional funding (from the private sector).”

Stookey, involved in dentistry research since 1957 and a member of the team that developed Crest toothpaste, says that tooth decay is reversible and this technology could have a “revolutionary impact.”

The research jobs created by the 21st Century funds may not be as large in number as a new manufacturing or sales operation. The cumulative effect, though, is not something to be taken lightly.

“At the end, you’ve created a company and they’re on their way. Technology is not an overnight thing. It takes time for people to see that. If we had not pushed this system, somebody else would have.”

Going forward

Observers of the 21st Century Fund process say internal discussions have been taking place on the future direction of the fund. Armstrong cites the attempted creation of the Indiana Venture Fund (part of the Energize Indiana package that did not pass the General Assembly) as a vehicle for later funding for what he calls 21st Century graduates.

“The board has been thinking about ways we might do that. We also work to try to get folks connected with companies, to get people introduced to capital partners,” he offers.

Eifert notes that it is important to continue to generate high quality proposals from the commercial sector. While those in the academic world often possess grant writing experience and have other avenues for funding, “for businesses, at this stage, there are not a lot of other places to go.”

Another area of debate is the involvement of larger companies. Is the fund intended for industry leaders like Eli Lilly or Zimmer, or for start-ups trying to make their mark? Eifert says both, although the rules may be different.

“If a proposal is associated with a large company, there needs to be a large amount of leverage there. As companies get larger, they’re able to support their own R&D. If we put in

half a million dollars, maybe \$5 million should come from outside (federal or institutional resources).”

INFORMATION LINK

Resources: Tony Armstrong, 21st Century Research and Technology Fund, at (317) 233-4332 or www.21fund.org

James Eifert, Rose-Hulman Ventures, at (812) 244-4001

Dr. George Stookey, Therametric Technologies, Inc., at (317) 278-7876

Need space for your great business idea? Start here.

actual products or businesses. Just ask Sunas, Powerway, and Nalnk. Today, they are vibrant, growing companies because they came to us for incubator space, financial assistance or technology expertise. Call us as you can be next.

812-244-4000 www.rose-hulman.edu

ROSE-HULMAN
Ventures