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The importance of sharing

State still wrestling with how to turn university research into new business

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by Tania Anderson
Contributor

Maryland has long had to confront a complicated question: With more than $2 billion spent a year on research at its university, why aren't more discoveries being licensed to businesses or used to create new ones?

While state officials, researchers and technology experts had few answers for many years, the tide is turning. More attention and funding for technology transfer, which is the commercialization of innovations and discoveries born in research labs, is generating momentum.

The Maryland Technology Development Corp., known as Tedco, and the Maryland Industrial Partnerships Program, two state organizations that help fund tech transfer initiatives, have both had their budgets increased for the first time in several years. Schools like Johns Hopkins University are responding by adding to their tech transfer budgets and staff.

The state also is now armed with success stories. Its examples of fruitful tech commercialization efforts include innovations like drill bits developed at the University of Maryland, Baltimore in the late 1990s that are now sold by Towson-based Black & Decker.

More recently, the state's technology insiders talk about companies like Trophogen as the next MedImmune. The Rockville biotech, which has received funding from the state and Bethesda venture firm Toucan Capital, has developed two different cancer-fighting drugs that are close to the clinical trial phase.

Industry experts also tout Reactive NanoTechnologies Inc. of Hunt Valley as another recent tech transfer success. The company, which developed a joining compound in a Johns Hopkins University lab, has raised two rounds of venture capital.

Tech transfer and university officials list various reasons why the state is now capitalizing on tech transfer efforts.

For starters, they say Maryland has realized the economic benefit of investing in startup companies. The Maryland Industrial Partnerships Program has helped companies generate sales of $9.8 billion in the past 20 years. Universities also see companies founded on their

innovations as future employers for their graduates and in turn long-term Maryland residents.

Larger budgets at the National Institutes of Health and the National Science Foundation, where many grants come from for university research at state universities, also are adding to the momentum.

"That, in turn, leads to more inventions and more ideas," said Steven Fritz, director of technology transfer at Tedco.

While people acknowledge that all of this is progress, more can be done, critics say.

One missing piece, they say, is more venture capitalists willing to sink millions of dollars into a scientist and his or her finding. The state also lacks more angel investors -- like Steve Walker of Walker Ventures -- who have the funds and courage to invest in the next generation of business ideas. Walker, who launched Trusted Information Systems in 1983 and sold it to Network Associates for $350 million, has been investing in startups since launching Walker Ventures in the late 1990s.

"The amount of terrific technology in this area relative to the amount of tech transfer, even with the new surge, is still way, way out of kilter," said Linda Powers, co-founder and managing director of Toucan Capital, a Bethesda-based venture firm that invests in seed-stage and early-stage companies in the Baltimore-Washington region. "There's way more good research that could be getting commercialized."

Investing in science

Most of that research goes on at Johns Hopkins University, the University of Maryland, Baltimore and the University of Maryland, College Park, which are among the top 50 universities in terms of dollars spent on research.

The three institutions spent more than $2.2 billion in 2004, the most recent figures compiled by the Association of University Technology Managers. They also reported creating 11 startup companies and forming 166 license agreements with companies in 2004.

Commercializing that innovation is helped by groups like Tedco, whose budget has gone from just less than $5 million last year to about $6 million this year. The funding will allow the organization to invest in more tech transfer initiatives, namely its Working Capital Loan Fund, which provides loans to early-stage tech companies in certain areas of Maryland. Now the program will be expanded throughout the state.

But Tedco is still considered an underfunded organization when compared with comparable tech advocacy groups. Pennsylvania's counterpart to Tedco, Ben Franklin Technology Partners, has an annual budget of $12 million to $13 million.

"Although Pennsylvania is much larger, they spend more per capita than we do," Fritz said.

The Maryland Industrial Partnerships Program, a 19-year-old state program that funds technology product development between Maryland-based universities and Maryland-based entrepreneurs, saw its first ever budget increase this year. The program's budget has gone from $1.3 million to $2.35 million, allowing MIPS to fund 20 more projects per year from the 32 that it typically does annually.

"Now there's an appreciation for things we've been talking about for years," said Martha Connolly, the program's director.

Since Jill Tarzian Sorensen took over the tech transfer office at Johns Hopkins a little more than a year ago, the budget has increased and the office has gone from seven licensing agents to 10 -- and it's still growing. Sorensen would not say how much the budget has increased, but she plans to add more licensing staff in the next few months.

The payoff for Johns Hopkins, which has worked to shed its reputation of being closed off from the entrepreneurial world, is that revenue coming from royalties of commercialized technology and licenses of university innovations has jumped 75 percent from the previous year, to $14 million in 2005.

Sorensen said Hopkins leaders made a decision to put more resources into partnerships with the local business community and economic developers.

"We're refining our understanding of what's the best way to engage in a way that fortifies the scholar and positions opportunities for industry at the same time," said Sorensen, who ran the tech transfer office at the University of Illinois, Chicago before landing at Johns Hopkins.

Identifying the bottlenecks

Still, some critics of the state's technology transfer initiatives say university officials sometimes stand in the way of greater advances.

Powers said some universities make the process of transferring technology to the private sector unappealing to entrepreneurs by charging large royalties and licensing fees. Those charges -- some of them reaching a tenth of sales -- can limit an entrepreneur's return on his or her investment.

Meanwhile, discoveries that come out of a university lab usually require more research and development. That process could be too costly and time-consuming for businesses searching for a quicker hit, said Stephen Auvil, director of UMBC's office of technology development.

But bumps along the road to commercializing a university invention aren't limited to the lab. Critics say the state desperately needs more investors -- venture capitalists and angel investors -- willing to make those risky early- and seed-stage investments.

Startup and seed-stage venture financing deals made up a slim portion of the state's overall venture deals in 2005, according to the MoneyTree Survey by PricewaterhouseCoopers,

Thomson Venture Economics and the National Venture Capital Association. The state saw $9 million in seed and startup venture deals in 2005, making up 2 percent of the $438 million in venture deals done in the state that year.

The report also showed that Tedco and the Maryland Department of Business and Economic Development were among the most active investors in the country last year. DBED closed 29 deals in 2005, which Tedco closed 24 deals last year.

The price of success

If tech transfer is to continue growing in Maryland, players on all sides of the issue suggest that university researchers and tech development leaders may have to accept the fact that it will take money to eventually make money.

The truth is most university tech transfer offices don't make money -- including those at the UMBC and the University of Maryland. Maryland expects to turn a profit by the end of this year.

University tech transfer offices shell out tens of thousands of dollars to get a single patent on an innovation. Once the patent application is filed, the school can seek out a licensee, a company wanting to use the innovation in their own business.

As part of the agreement the university will get royalties based on certain milestones that the company reaches. The university will also get reimbursed by the company for the patent application.

But tech transfer people say it's virtually impossible to make a profit off commercialization because so much of the money goes back to the researcher and his or her department. A small portion goes back to the tech transfer office for its operations.

"For many offices, the patent expenses are often larger than the operating expenses," Auvil said. "Some universities look to tech transfer offices as revenue generators. We're really here to provide a service."

Auvil's office is a small player in the tech transfer world. With a $250,000 budget this year, the office has brought in $250,000 in licensing revenue so far this year. An average year will see eight to 10 patent applications and five licensing agreements coming out of UMBC.

One of those was with Scientific Products & Systems, a Baltimore company that put together a license agreement with UMBC in 2003. The company, led by CEO David T. Bach, is now selling a liquid dispensing system to the pharmaceutical industry that was developed by UMBC researchers.

Auvil said he doesn't know how much the university will get in royalties from the product. And he's not worried about it.

Tania Anderson is a contributing writer in Arlington, Va.