Looking to cash in on research

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The carbon tubes that Vesselin Shanov and Mark Schulz are building are only one-thousandth the thickness of a human hair, but the University of Cincinnati hopes the profits from those tubes someday get much more substantial.

The researchers in UC's engineering department say they have grown "black cotton" the nanotubes.

They say the tubes eventually could be used in applications from apparel to aerospace, because they are lighter and stronger than any natural fiber.

The researchers have formed a company called General Nano LLC to try to market the technology or license it to other companies.

"We're getting close," Schulz said. "We need to make it both long and strong. It's chemistry, so it's taking a bit of time to optimize."

Shanov and Schulz have just started, but the business of turning inventions born in university laboratories into real revenue already is a high-stakes game.

UC and others patent dozens of inventions a year, hoping they'll find technologies they can license to another company, sell outright or form a company to market - called "technology transfer."

At UC, the program has gone through highs and lows.

The university reaped $30 million in royalties between 1979 and 2002 from licensing a radioactive imaging technology called Cardiolite to big drug companies.

But that revenue faded when the patent expired and UC collected only $582,057 overall for the year ended June 30, 2007, less than $333.5 million in research funding last year, money small companies just can't replicate.

Nationally, there are far many more failures than successes, and the legendary development of the Google software at Stanford or Gatorade at the University of Florida are few and far between.

But that doesn't keep universities from trying. In 2006, nearly 700 new products discovered on campuses were introduced for sale or license, and there were 15,900 total patent applications, according to the Association of University Technology Managers.
The University of California, tops on the list, reaped $193.5 million in licensing income in 2006, the group said.

At Miami University's Oxford campus, nearly all of its $953,000 in licensing revenue last year came from sales of one software system to audit student records. Newer technologies Miami is looking at include a set of blades used to make reeds for oboes, which was licensed to a German company and could produce revenue by the end of the year.

"The game-changers are obvious," said Gil Pacey, associate dean for research at MU. "All the rest are highly speculative."

BUDGETS ARE SMALL, THOUGH

The emphasis on commercializing university research started in 1980, when former U.S. Sens. Bob Dole of Kansas and Birch Bayh of Indiana sponsored a bill to let universities keep revenue generated through federal research funding. Examples at UC are clustered among more than a dozen colleges, with most of the research centered in the colleges of Engineering and Medicine.

With budget cuts implemented all over campus, there isn't a huge budget to spend on new patents or investments.

UC President Nancy Zimpher and Vice President of Research Sandra Degen encourage faculty to find ways to commercialize their ideas and have competed for research grant dollars from the Ohio Board of Regents. They're also considering forming a foundation that would enable UC to buy ownership stakes in private companies.

One example is Aires Pharmaceuticals, the one start-up company formed using UC research last year. It's located in San Diego with the entrepreneur who founded it, but has licensed a technology developed by UC researcher Dan Hassett. Hassett found a mutation that could help doctors eliminate the organism that produces mucus in the lungs of cystic-fibrosis patients.

Aires paid UC an upfront fee of $50,000, but it could take more than a decade and a total investment of hundreds of millions of dollars to get the company to the point where it's producing royalties for UC.

Also, Shanov and Schulz's inventions have not yet begun to produce real revenue. The patent on their nanotubes was published in April, and they still have to bring the cost to produce the nanotubes down from more than $100 per gram.

"People say, 'Call me when it goes to $5 per pound,' " Shanov said.

Those are long odds. But Dan O'Neill, associate director of the intellectual property office at UC, said it's easy to see the commercial possibilities.

"We saw this," O'Neill said, "and we said, 'That's cool.' "

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