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Biotech research boosted by new patent

By TODD ETSHMAN
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As University of Rochester Medical Center faculty member Dr. Spencer Rosero pointed out, Rochester isn't Palo Alto when it comes to funding and development of biotechnology products. That may be changing, however, thanks to Rosero, URMC and a Fairport-based company called Raland Therapeutics Inc.

URMC announced on Friday that it received patent approval from the U.S. Patent and Trademark Office for an implantable chip consisting of human cells that can potentially identify and detect physiologic and chemical changes in the body faster and more accurately than ever before.

"A lot of patients say they don't feel good but everything looks OK to us," Rosero said. "Some patients know ahead of time that they're going to have a heart attack even though our data says there is nothing wrong."

By using actual cells implanted in a small chamber made of biocompatible polymers and wireless sensors, cardiologists like Rosero can receive more accurate information than the electronic information they currently receive. And the chip could be used to command devices such as a pacemaker, defibrillator or insulin pump.

The cells, implanted in the body in a chamber the size of a small watch, integrate biology with electronics and provide a better advance warning system for doctors and patients.

"They're like sentries that can tell you what's going on," Rosero said. "The cells can't leave but continually receive biochemistry signals."

Rosero has been working on the patent utilizing mouse cells for over six years, but the human cells could come from anywhere in the body. For example, liver cells could be used to determine the effects of chemotherapy and living cell signals could be used to tweak the amount of medication a patient receives.

"Biotechnology for patients is a long haul and it's growing so fast, I think the patent office gets overwhelmed," Rosero said. "Fortunately, the patent office found it innovative enough to issue."

Rosero utilized a diverse team of local scientific and engineering talent and whatever funds he could muster — even if that meant buying used equipment from eBay. The patent is the first development to use actual living cells.

"First it'll be a research tool for scientists and pharmaceutical companies but we're hoping for a human application in a few years," Rosero explained.

Rosero created the first generation prototype, but moving the patent forward will be the job of Raland Therapeutics, which will guide the patent through animal testing, human testing, the Food and Drug Administration and finally to the market.

"It will definiteay make patients' lives better," said Bill Rader, Raland's president and CEO, who was asked to help by URMC officials. "Lives will be altered or saved because of what we're doing today. What they were thinking about 30 years ago is coming to fruition today."

Rader said he has big plans for the company utilizing local brainpower.

COURTESY URMC

Dr. Spencer Rosero with the implantable chip that received patent approval recently.

"The idea in the long run is to do the actual manufacturing and distribution here," he said. "We feel confident that we'll be able to stay local and utilize the ideas and technology created from the great minds here as we build out this company."

Raland is currently working with the University of Rochester's Office of Technology Transfers on five patents in various stages of development and approval. The University of Rochester currently holds 273 U.S. patents — 115 (42 percent) are under license — and 106 foreign patents.

On average, the university files 67 U.S. provisional and 65 non-provisional patent applications per year, said URMC spokeswoman Leslie White.

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