UWM researcher gets entrepreneurship lessons

By Thomas Content of the Journal Sentinel
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Zhen "Jason" He's eighth-floor lab at the College of Engineering and Applied Science offers a window to the emerging research and business-focused mission at the University of Wisconsin-Milwaukee.

He is among the first wave of researchers Chancellor Michael Lovell hired when he began running the UWM engineering school. In the past two years, He has more than doubled his lab space, and his research team will soon quadruple to 14 people.

Now he's working to build a business around the wastewater treatment technology he's pioneered, launching Hydrotech Innovations this year. The start-up is the third company that has been spawned from UWM research.

To that end, He was sent out of the lab and back to school to learn more about entrepreneurship.

He and graduate civil engineering student Kyle Jacobson recently participated in a course about how to launch a start-up through a $50,000 grant from the National Science Foundation's Innovation Corps.

The lessons from the course, led by innovation and entrepreneurial guru Steve Blank, can be applied to anyone who's thinking about going into business - or anyone who thought they had a great idea but saw nothing come out it.

Although many start-ups derive from university research, academics and entrepreneurs are in different worlds.

"Research is a curiosity-driven process," said He. "Now we have to change our mind-set to a market-driven process."

Congress funded the creation of the Innovation Corps several years ago to ensure that the dollars taxpayers are investing in scientific research get translated into successful start-ups that attract private capital and create jobs.

In short, the Innovation Corps seeks to bridge the gap that leads so many start-ups to fail.

Blazing a trail

For a research university that's trying to build a reputation in R&D, He's launch of Hydrotech Innovations is a milestone. It's the third company to be spawned from UWM research, and the first from a crop of engineers Lovell added as part of his aim to steer research to work alongside local businesses to boost the region's economy.

The UWM entrepreneurial experiment isn't a sure thing, but it's significant for Milwaukee's attempts to forge a reputation in the area of water and energy technology research, development and commercialization.

The UWM team is the only National Science Foundation team from Wisconsin to have gone through the Innovation Corps learning process, traveling to Stanford University in Palo Alto, Calif., to get business development training from Blank, an engineer, professor of entrepreneurship and author of "The Startup Owner's Manual."

"This is a big deal. Not just for scientists and engineers, not just for every science university in the U.S., but in the way we think about bringing discoveries ripe for innovation out of the university lab," Blank wrote on his entrepreneurship blog. "If this program works it will change how we connect basic research to the business world. And it will lead to more start-ups and job creation."

The crash course has helped He and Jacobson as they develop their microbial fuel cell technology and look for ways to bring it to market.

Innovation Corps instructors told them to visit as many customers as possible and find out what they need. Program mentors kept tabs on He to make sure he was following through on those visits.

"In the past I thought our technology was best. We can solve this problem or that problem," He said. "After talking to so many people we realize it's quite different."

He's research helped him develop microbial fuel cells for wastewater treatment that are effective at multitasking: They can produce electricity and treat wastewater simultaneously.

By adding a third element, an algae bioreactor, He believed his team had developed an even better technology. Adding the algae improved the treatment of chemicals in the water while creating a byproduct that could be used to make biodiesel.

It turned out the algae bioreactor, while a great technology, added a layer of complexity the wastewater treatment plant operators and food and beverage plant managers weren't interested in.

"We're not here to deal with algae, we want to make cheese," Jacobson recalls being told during one customer visit. "Dealing with our wastewater problem is a problem enough for us. We don't want to spend more resources on it, we just want to make more cheese."

In response, the Hydrotech researchers simplified the process. The microbial fuel cell can provide cheese or malt plants what they're looking for - a way to treat their wastewater that's less energy-intensive and doesn't produce as much sludge.

The process still needs more work in the lab before Hydrotech can go to market, and gave He another lesson: that he'd prefer to remain in the lab rather than be a businessman.

His research pursuits continue in the area of applying his technology to desalination. And this month, an energy journal published research by He and fellow UWM researcher Junhong Chen to derive a nanorod catalyst technology that could bring down the technology's cost by an order of magnitude.

Meanwhile, the NSF process gave Jacobson, a PhD student, the entrepreneurial bug.

"The NSF project really showed me you really need to put a lot of work in it and go out and talk to people," he said. "That's the best way to get your idea out there and change your idea so it actually fits in someplace."