

# FROM DISCOVERY TO MARKET

**UIC's Office of Technology Management helps  
faculty commercialize their innovations**

**By Steve Hendershot**

**F**ive years ago, renowned orthopedic surgeon and UIC Professor Dr. Maria Siemionow hit on a revolutionary approach to developing patient-specific therapies for Duchenne muscular dystrophy, a rare but fatal genetic disease.

Since then, Siemionow's company, Dystrogen Therapeutics, has raised more than \$3 million in investment capital. Yet the combination of an immediately recognizable clinical discovery, a clear path to market and an acclaimed researcher (Siemionow performed the world's first near-total face transplant surgery in 2008) didn't fast-track Dystrogen's inaugural product: its first clinical trial will begin this year.

It's a reminder that in medicine and the life sciences, startups don't advance as quickly as software companies.



## Researcher-entrepreneurs must often settle in for a long, winding journey before they're able to bring their discoveries to market.

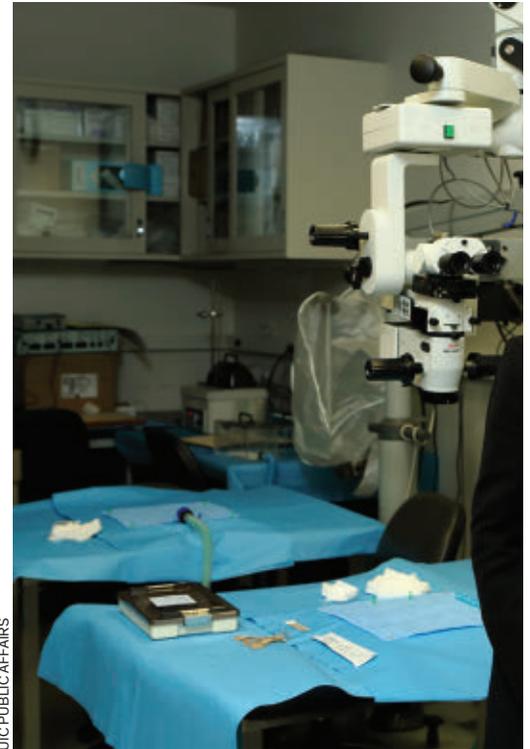
"If we were a typical Silicon Valley software startup, we'd have had [three stock offerings] by now," observes Dr. Kris Siemionow, who is Maria Siemionow's son, Dystrogen's co-founder and CEO, and chief of spine surgery at UIC.

But the researcher-entrepreneurs behind those breakthroughs often must settle in for a long, winding journey before they're able to bring their discoveries to market.

Dystrogen, for example, has slogged through extensive lab testing, fundraising and submissions to regulatory authorities. It's not a process for the impatient or easily discouraged.

"The only way [forward] is to go through the hoops because there are certain things we have control over and can plan for, and others we can't," says Maria Siemionow.

Dystrogen is among a growing stable of successful startups and licensed technologies at UIC, most of which are in research-intensive, highly regulated industries such as the life sciences. Others include Actuate Therapeutics, which has raised \$30 million to bring its cancer drugs to market, and Enzyme by Design, which raised \$1 million last year to develop a less-toxic form of chemotherapy. In all, UIC holds 436 patents and has launched 34 active startups.



UIC PUBLIC AFFAIRS

### EXPERT GUIDANCE

Helping faculty move their innovations from lab to market is the UIC Office of Technology Management (OTM), which provides guidance on everything from preparing a business plan to raising capital to securing patents.

One faculty member who's benefited from OTM's expertise is Sushant Anand, UIC assistant professor of mechanical and industrial engineering. He's developed a material that can alter the conditions under which fluids change into solids and vice versa. It has commercial potential, perhaps as a de-icer. But the precise path to market isn't clear, and Anand isn't an entrepreneur.

To date, OTM has helped Anand secure intellectual-property protections. After he published his de-icing research in an influential academic journal, OTM introduced him to potential clients. It also showed him how to prepare a pitch to investors. "That's when I really saw how helpful OTM could be," Anand says. "I hadn't done any market research, thought about valuation or

**UIC researchers Maria and Kris Seimionow have launched Dystrogen Therapeutics to market a drug that will help people with Duchenne muscular dystrophy, a rare but fatal genetic disease. The mother-and-son team has raised more than \$3 million in investment capital.**



thought about how much money companies could save if they used our coating [rather than] the current products on the market.”

Traditionally, the function of university technology-transfer departments has been to license technologies developed on campus to ensure that the appropriate contracts, patents and intellectual property protections are in place—and that the school gets its fair share of the resulting revenue.

But over the past decade, that mission has broadened at UIC and elsewhere, with universities taking a more active role in helping faculty find outlets for their discoveries, whether it's a licensing deal with a multinational conglomerate or an introduction to a venture capitalist that can bring a startup to life.

“It's evolved from managing patents to guiding the efforts toward translational research and commercialization,” says Steven Gould, CEO of MATTER, a Chicago-based health care-tech incubator, and a consultant to companies and universities bringing

life-science products to market.

That shift may be driven in part by the potential for a financial windfall, but UIC's leaders also see deeper meaning in the opportunity to turn laboratory insights into real-world solutions.

“In order to really impact people's daily lives, we have to take the research that we're doing—whether it's to develop a new drug, or a piece of software or a social intervention—and find a mechanism to take it from the university into the private sector. It's absolutely critical to do that work if we're going to have the impact that we want to have as a university,” says TJ Augustine, UIC Vice Chancellor for Innovation.

In practice, that means when faculty bring promising innovations to OTM, its staff members do more than cover the legal bases. They also analyze the new technology and make recommendations on possible paths to market based on factors such as regulatory hurdles or the competitive landscape.

“Often, there's a technology that could go into all sorts of different things, and our job is to help [faculty] figure out what will make that first killer application,” says Suseelan Pookote, OTM director.

One critical determination for any startup is its leadership. Just because someone is a genius in the laboratory doesn't mean he or she will be, or want to be, a whiz in the boardroom. Pookote works with faculty members to determine whether the smartest path forward means running the company themselves (in which case, OTM may connect them with mentors or prospective investors), hiring an outside CEO, or skipping the startup route altogether and licensing the technology to an existing company.

“Some faculty are entrepreneurial in nature and show interest in taking their own technology to market,” Pookote says. “They're the experts, and they have the passion, so if they also have the right skill sets, that can be ideal for taking the company forward.”

But in some cases, it's not the right call, and hiring an outside CEO works best. That was true for Actuate Therapeutics, which commercialized technology based on the research of Alan Kozikowski, a professor emeritus in UIC's Department of Medicinal Chemistry and

**UIC's Office of Technology Management provides expert advice to the University's researchers-entrepreneurs, including analyzing their discovery's potential, says Suseelan Pookote, OTM director (left). UIC also has a partnership with investment firm Deerfield Management, which provides additional guidance on whether UIC faculty startups have the right business plan or are making the most of their opportunities, says Melissa Maderia, OTM senior technology director.**





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**—Suseelan Pookote**

Pharmacognosy. The company has thrived since hiring veteran executive Dan Schmitt in 2015.

Anand isn’t sure which path he’ll choose—he likes the idea of retaining control, but also knows that the time required to run a business means less time in the lab. “It depends on your bandwidth,” he says.

**SOCIAL IMPACT BEYOND LIFE SCIENCES**

However, OTM staff also is interested in innovations that have the potential to positively impact society, regardless of their likelihood to generate revenue.

OTM staff is also working with UIC psychology professor Geri Donenberg to help her scale a program she designed to promote sexual health among young people who are on probation in the juvenile justice system. Donenberg has spent years developing her program, compiling an evi-

dence-based track record of demonstrable success, as well as incorporating a series of refinements such as new training materials that will allow community members to lead programming, rather than graduate-student instructors.

However, the flip side of the program’s lengthy gestation is that it now needs to be rebranded. Initially, it was called “PHAT Life: Preventing HIV/AIDS Among Teens.” Not only has the slang word “phat” fallen out of vogue, but Donenberg also wants to expand the program’s focus beyond HIV prevention. (She says that’s always been her intention, but when she began applying for grants in 2004, HIV prevention was where the money was.) Now, OTM is connecting Donenberg with marketing experts to assist with the rebrand, as well as helping her determine whether to form a stand-alone company, or a nonprofit, or remain embedded within the University.

“It’s been a long road, and we’re still experimenting with different [formats for] optimization,” Donenberg says. “But if we had gone faster, we wouldn’t have gotten this level of refinement or buy-in.”

That refinement—and research base—is vital for UIC-incubated programs to grow.

“These things [are the result of] evidence-based research. The work has been conducted over a five- to 10-year period to



Services and products developed at UIC range from new drug therapies and de-icers to a program designed to prevent AIDS transmission among teens to Fit and Strong!, an evidence-based, physical-activity program designed for older adults.

validate that this isn't just a good idea, but good science—and that it actually works,” says Mark Krivchenia, OTM senior technology manager.

For example, Fit and Strong!, a physical-activity program designed for older adults to combat osteoarthritis, was developed in the UIC Center for Research and Aging. Empirical evidence has shown that it produces better outcomes than standard physical therapy, resulting in winning endorsements from the National Council on Aging and the Centers for Disease Control and Prevention.

### CRITICAL PARTNERSHIPS

In the medical field, by the time a new drug or therapy's creators begin to think about commercialization, the discovery has already hit several research milestones, from its initial discovery to countless rounds of experimentation and testing. But the next step, when it shifts from lab experiment to product-in-development, is especially critical.

“It's where you move from saying—‘This is a really interesting discovery’—to where you're thinking about the implications and how it might become something that's clinically relevant to the world,” Gould says.

It's also a perilous step because the necessary changes in funding and focus can derail a project unless they're handled well. Federal and nonprofit research grants tend to

cover the discovery phase, but the commercialization process requires private capital. Making introductions to investors, therefore, is one of OTM's core functions.

To facilitate that step, UIC forged a partnership last year with health care investment firm Deerfield Management and created a new company, West Loop Innovations. West Loop helps fund the process of translating drug research into specific applications with commercial appeal.

Several emerging technologies at UIC are vying to reach that point, including two drugs that have been shown in animal testing to improve survival rates and cognitive outcomes after cardiac arrest. Another treatment in development uses engineered exosomes (cellular message carriers) to aid in bone and tissue regeneration.

The Deerfield Management partnership also is paying dividends for still-developing technologies and earlier-stage startups because it's able to build on the OTM team's expertise in identifying hidden potential—and hidden obstacles—in emerging innovations. In turn, West Loop Innovations offers an outside perspective that OTM values.

“We're able to put all of these startups in front of [Deerfield] ... and [get] their input into whether these companies have the right business plan or whether there are opportunities that they're not aware of,” says Melissa

Maderia, OTM senior technology manager.

These are precisely the issues that Dystrogen Therapeutics have been working through. Although its mother-and-son leadership team have decided to focus on Duchenne muscular dystrophy for its first clinical trial, both believe the gene therapy will ultimately have broader applications. That belief comes from their backgrounds as clinicians and investigators.

“It hasn't been a case of, ‘We have this hammer, so now let's find some nails we can hit with it;’” Kris Siemionow says. “We've been driven by what we've found to be possible with science, as well as our sense of an unmet clinical need. And this is a natural fit.”

But even the most natural fit can mean a years-long lead time before an emerging therapy is ready for a clinical trial, followed by more years before the treatment receives full regulatory approval. It's a long road, and one that can test the patience of UIC innovators who are waiting to see their discoveries brought to life. The key to endurance, Maria Siemionow says, is to enjoy the process.

“Once you first see the effect, it's very encouraging; then to move it to the production line—from the bench to the clinic—is a very unique opportunity,” she says. “Now, finally, it's really happening. To see that is to fulfill the dream of every physician and scientist.” 