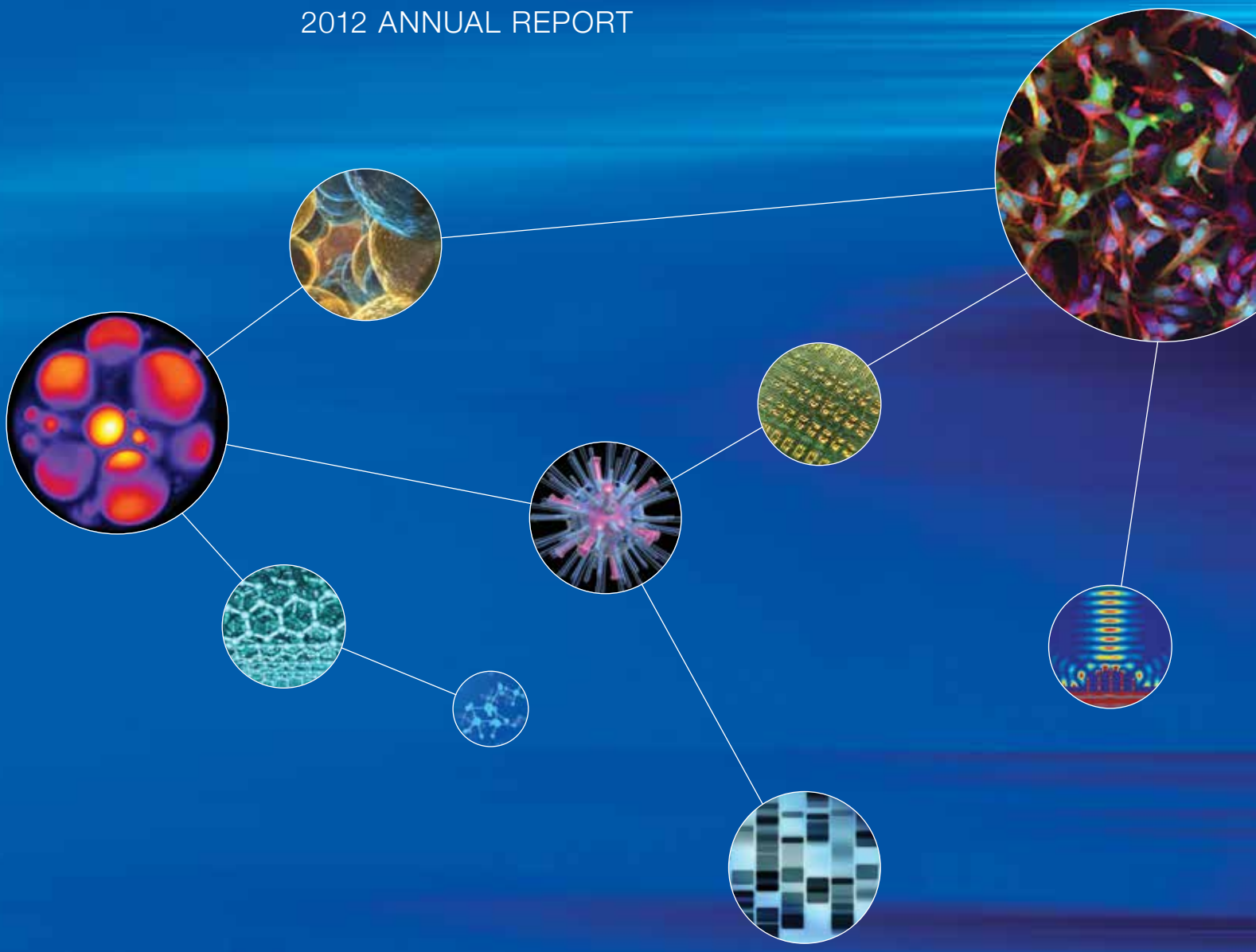
OTM

UNIVERSITY OF PITTSBURGH
OFFICE OF TECHNOLOGY MANAGEMENT
2012 ANNUAL REPORT



Connecting Momentum

How We Are Ensuring Success as a Catalyst of Commercial Collaboration

Certainly, our role in innovation commercialization at the University of Pittsburgh dictates an assertive pursuit of invention disclosures and innovation licensing transactions. I am happy to report that we have achieved record highs in both pursuits this past year thanks to Pitt Innovators, our staff, and our commercial partners.

But that's only part of our story of success in fiscal year 2012. As a strategic catalyst in transforming the University's innovation development and entrepreneurial culture, we have become more than assertive. When it comes to changing the culture here, we are lighting even more fires. We are connecting even more dots. Momentum continues to build as we put even more new ideas and strategies into motion and develop strong partnerships to cultivate new initiatives that have the potential to take on a life of their own. When it comes to innovation commercialization and entrepreneurship, we are helping, indeed, to change the academic culture at Pitt.

As our latest annual report showcases, we not only experienced a sizable jump in invention disclosure submissions, innovation licenses, and the launching of new companies, we also contributed significantly to the development of new initiatives and commercial partnerships that helped to attract millions of dollars in grants and sponsored research in fiscal year 2012 as well as many new partners and supporters, both internally and externally.

It's important to note that all of these initiatives take a multifaceted approach to commercialization, bringing together entrepreneurial education; multi-disciplinary collaboration; Office of Technology Management's commercialization process; and partnerships that include industry, entrepreneurs, investors, and the community. I believe that the broader scope of such initiatives will pay exponential dividends down the road in enhancing the overall academic experience here as well as boosting the region's economic impact and quality of life.

Take the University's recent Wallace H. Coulter Foundation partnership award, for example. This structured collaboration (see page 16) brings together clinicians, bioengineers, commercial partners, and new staff with extensive industry and entrepreneurial experience in a systematic effort to identify problems and solve

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them collaboratively. The goals are the development of new ideas that can be transformed into useful, life-improving products and new companies and the fostering of a culture that promotes innovation commercialization and supports the University's growing community of Pitt Innovators. I expect great new things to emerge from this five-year program and other new initiatives.

Of course, we now face exciting new challenges as we continue to ramp up the University's commercialization activities and strengthen its entrepreneurial culture. That's why, for instance, we're continuing to build our Executive in Residence program, and we're working on a new initiative to develop an even stronger start-up endeavor.

As you can imagine, vetting more than 300 innovations in a year can prove daunting, but we are able to leverage our resources and continue to engage many invaluable new partners in effectively commercializing as many Pitt innovations as possible for the benefit of the community and humankind. As such, I would like to thank our senior administrators, staff, and commercial partners for contributing so significantly to the University's commercialization success. I am grateful for your continued support of both our long-term vision for innovation commercialization and entrepreneurship at Pitt and our role as facilitator and catalyst.

I also extend my deepest appreciation to our Pitt Innovators, who continue to demonstrate such vast imagination and ingenuity in transforming their research into commercial products and services. Their willingness to dream, explore, and invent continues to inspire us all.

Respectfully,

Marc S. Malandro
Associate Vice Chancellor for Technology Management
and Commercialization
University of Pittsburgh

OTM Impact at a Glance

310

INVENTION DISCLOSURES

This record participation brings the cumulative total to 2,632 invention disclosures submitted for commercial consideration since 1996.

49

U.S. PATENTS ISSUED

The University's total patent portfolio of innovations since 1996 now stands at 490 U.S. patents.

132

LICENSES/OPTIONS EXECUTED

OTM's licensing managers experienced their busiest year ever, pushing the cumulative total to 817 licenses/options to commercial partners.

$6.8

MILLION IN TOTAL REVENUE IN 2012

This includes $4.2 million in licensing income for the year.

9 → 89

IN 2012 — SINCE 1996

NEW START-UP COMPANIES FORMED

Since 1996, OTM has facilitated the launch of 89 start-up companies around Pitt innovations—a great success in perhaps the most challenging aspect of Pitt's commercialization endeavors.

$780

MILLION IN TOTAL RESEARCH EXPENDITURES IN 2012

OTM's goal is to strive to identify and effectively facilitate the development of more commercially viable innovations emerging from Pitt's collective research endeavor.

Year in Review

Partner with Pitt. It's a simple message, really, but one we have been conveying aggressively to industry, investors, entrepreneurs, economic development organizations, and even the University of Pittsburgh's own innovators in recent years to foster innovation development and commercialization collaboration across campus and around the world.

It's also a proactive initiative that has led to new opportunities this past year, resulting in substantial increases in innovator participation, technology licenses, start-up companies, translational research grants, and sponsored research partnerships.

By partners, we mean University leaders and researchers, large pharmaceutical companies, serial entrepreneurs, local economic development agencies, alumni, foundations, venture capitalists, and successful business leaders who give back as mentors, among others who support Pitt's commercialization. It's a team effort—a shared commitment of expertise, time, money, and vision aimed at transforming world-class research into products and processes that will benefit humankind.

And it's working well at Pitt as more and more faculty, staff, and students embrace this activity as an important part of their academic research endeavor. Here's how the Office of Technology Management (OTM), in conjunction with the Office of Enterprise Development (OED) and literally hundreds of Pitt Innovators who participated in the process, fared in fiscal year 2012.

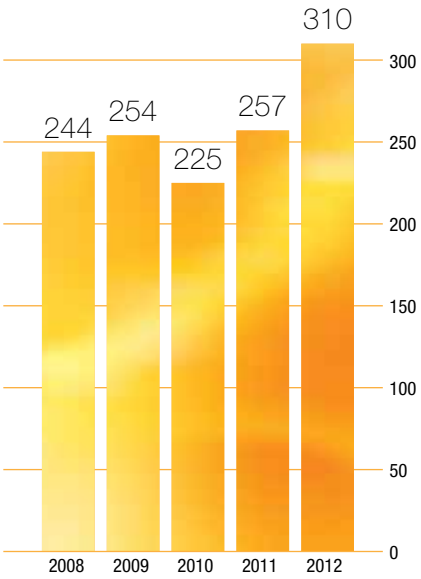
Invention Disclosures

Innovation development activities surged across campus in FY 2012, leading to the submission of a record 310 invention disclosures to OTM for commercial consideration. That's an almost 21 percent increase from the previous year's record number. Invention disclosures represent the first step for Pitt Innovators in the commercialization process, as they alert the University to innovations with commercial potential that emerge from innovators' research activities.

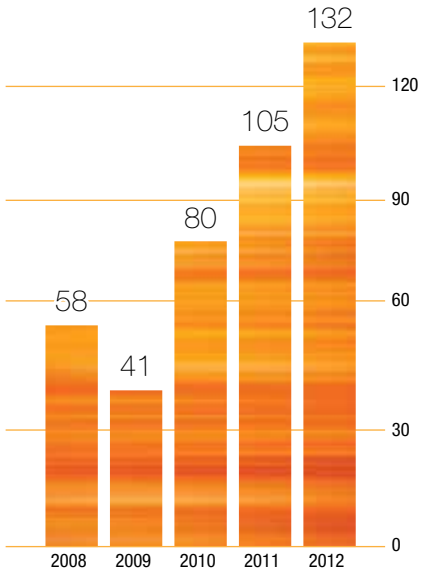
This past year's performance also marks a 319 percent increase over invention disclosure submissions in 2003, a year that became a significant turning point for Pitt's commercialization activities. Back in 2003, Pitt researchers submitted only 74 invention disclosures to OTM, which sparked a strategic shift at OTM aimed at attracting more innovators to—and actively engaging them in—the innovation commercialization process at Pitt. Since then, the University has enjoyed a steady climb in participation, culminating in this past year's milestone increase.

Invention disclosure submissions over the past five years have totaled 1,290. Overall, Pitt Innovators have submitted 2,632 invention disclosures to OTM since the inception of the office in 1996.

Driving the recent momentum is a combination of factors. Outreach efforts to bring education and awareness to Pitt faculty, staff, and students continue to play an active role in the activities of OTM and OED. Staff members also continue to meet and work with researchers individually even before innovations begin to emerge from their activities, setting the stage for commercialization. And more departments, centers, and institutes are working with OTM and OED to promote

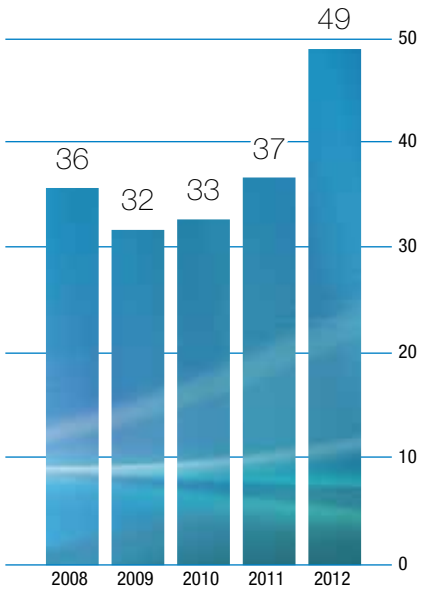


INVENTION DISCLOSURES

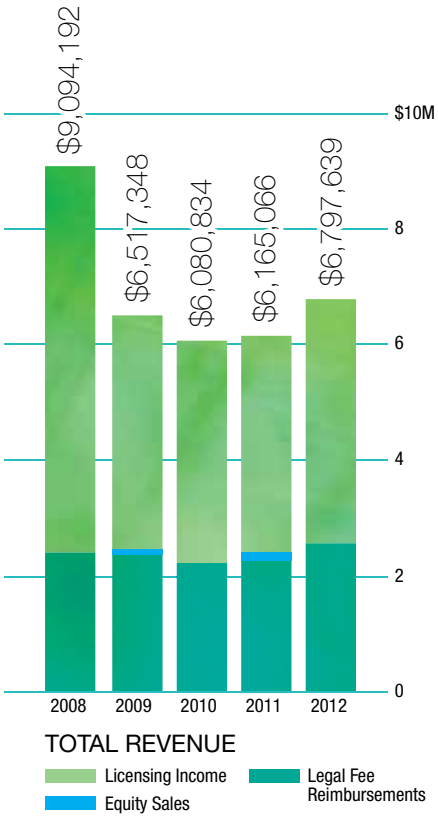


LICENSES/OPTIONS

Year in Review continued



U.S. PATENTS ISSUED



TOTAL REVENUE

collaborative research programs with translational components that lead to greater innovation.

Licenses/Options

Ultimately, OTM's goal is to disseminate as many Pitt innovations as possible into the commercial marketplace, where they will benefit humankind. As such, OTM's licensing managers have experienced their busiest and best year ever in securing commercial partners to accomplish OTM's goal.

Their efforts in 2012 led to the execution of 132 technology licenses or options to commercial partners—an increase of almost 26 percent from the previous year's licensing activity. This year's performance also demonstrates a higher level of collaborative commercialization activities with other universities with which Pitt shares in the ownership of the intellectual property. Of the total number of licenses/options, 57 fell under interinstitutional agreements in which Pitt was not the lead institution in the deal. That's a 39 percent increase from the previous year.

Another 68 represent regular licenses/options, up from last year's 59, and four were sublicenses. Since 1996, OTM has executed 817 technology licenses/options with commercial partners. (Prior to 2010, sublicenses and interinstitutional licenses led by other institutions weren't counted in the official totals.)

U.S. Patents Issued

The University's patent portfolio continued to grow substantially this past year. The U.S. Patent and Trademark Office awarded Pitt and its innovators 49 new U.S. patents in FY 2012, up 32.4 percent from the previous year. That brings the five-year total to 187 and the total since 1996 to 490 patents for innovations developed at the University. This was achieved amidst a continued backlog of pending patent applications and recent patent law reforms.

Meanwhile, OTM continues to forge ahead in facilitating the patent or copyright protection of its growing portfolio of Pitt innovations. Working with a stable of specialized patent attorneys, OTM in FY 2012 facilitated the filing of 123 new U.S. patent applications, marking a jump of 41.4 percent over the previous year's new filings. Since 1996, OTM has filed 1,084 new applications for U.S. patent consideration.

Total Revenue

OTM's general increase in commercialization activity also has had a positive effect on the generation of revenue from this activity. Total revenue for FY 2012 rose to nearly $6.8 million, up more than 10.2 percent from FY 2011. Cumulative revenue for the past five years increased to $34.6 million. Total revenue includes licensing revenue, equity sales, and legal fee reimbursement from licensees.

Of the 2012 total, licensing revenue totaled more than $4.2 million, and the University received nearly $2.6 million in legal fee reimbursement.

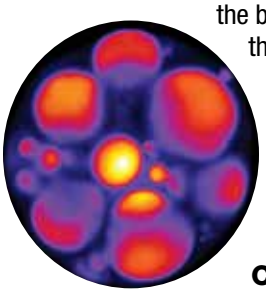
Start-up Activity

Due in part to an increase in the number of "platform" innovations developed at Pitt and a more concerted effort by OTM and OED to promote and facilitate start-up activities, start-up activity this past year more than quadrupled over the previous year. Success was driven, in part, by a combination that included OTM licensing managers and executives in residence, OED's development and implementation of the new Pitt Ventures initiative and start-up process, and a growing number of innovations with more than one potentially profitable commercial application.

This past year, the University spun out nine new start-up companies based on Pitt innovations, up from the previous year's two start-ups. They are as follows:

Qrono Inc.

Sam Rothstein, a graduate student in The Department of Chemical and Petroleum Engineering, and a team led by department chair Steven Little developed novel microparticles that serve as a controlled-release drug delivery system. That system is the basis for this new start-up company.



Cellular Research Laboratories, LLC

This new company is based on a unique antioxidant compound designed by Distinguished University Professor of chemistry Peter Wipf (shown below) and his research team to slow the aging process and extend the quality of life. The company plans to develop a topical application with the compound.

First Principles Engineering, Inc.

Mechanical engineering and materials science professor Lisa Weiland has taken an entrepreneurial leave of absence to start this local company. She has developed a new hydrokinetic energy-harvesting device that can adapt to inconsistent water flow (see related feature in this report on page 11).

Windhoek Healthcare LLC

Pediatrics professor Alejandro Hoberman's new antibiotic formula for infants that reduces diaper rash and other unpleasant side effects serves as the basis for this recent University spin-off.

SAVD Solar, Inc.

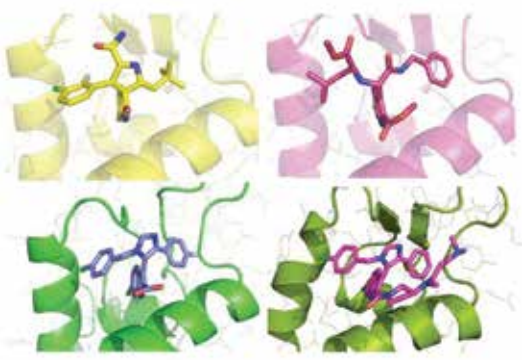
Hong Koo Kim, a professor of electrical and computer engineering, has invented a new class of nano-optic-based refractive thin-film materials and devices aimed at capturing a significantly greater amount of solar energy than existing bulk metamaterials. Potential applications for this new company include devices for optical beam shaping, imaging, lithography, optical data storage, information processing, and photovoltaics, among other considerations.

Complexa, Inc.

This start-up has licensed several Pitt technologies developed by Bruce Freeman, a professor of pharmacology and chemical biology. Among the innovations are a therapeutic treatment for type 2 diabetes and cardiovascular disease using nitrated fatty acids and keto fatty acids as anti-inflammatory agents.

Carmolex Inc.

Based on a novel computer software system developed by computational and systems biology professor Carlos Camacho, this Pittsburgh-based start-up offers enabling technologies for the large-scale design, synthesis, and validation of small-molecule protein antagonists for drug discovery. The software uses unique algorithms that optimize and significantly speed up the screening of molecular drug candidates against protein-protein targets.

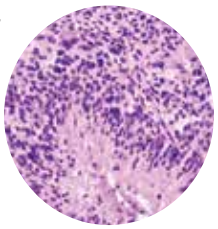


Enercode Inc.

Chemical and petroleum engineering professor Di Gao has developed a new coating that is designed to prevent ice from accumulating on the coated substrate. The coating includes silicone resins and silicone oils that slowly leach out of the coating and prevent the adhesion of ice. This start-up will pursue the wind turbine industry and others in which ice is a problem.

Paradigm Oncology, Inc.

This new company is developing a diagnostic service to predict patient outcomes associated with alkylator chemotherapy. Enabling the diagnostics is a set of biomarkers licensed by the start-up that was developed by Robert Sobol Jr., a professor of pharmacology and chemical biology at Pitt.



Innovating at Pitt

A RASH SOLUTION

If Alejandro Hoberman, the Jack L. Paradise MD Endowed Professor of Pediatric Research, gets his way, fewer children with acute otitis media, or middle ear infection, will wind up with side effects like diaper rash or diarrhea after taking an antibiotic.

He has come up with a new antibiotic formulation, which will reduce such side effects while still effectively eradicating the infection.

ORTHO-SENSORS

Associate Professor of Chemistry Alexander Star has found yet another novel use for carbon nanotubes. He has developed a tiny pH sensor that configures oxidized single-walled nanotubes and a conducting polymer into chemiresistors.

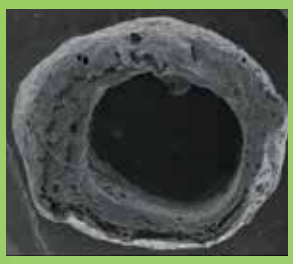
His technology recently attracted the attention of start-up Ortho-tag, Inc., a company based on RFID tags developed by Department of Electrical and Computer Engineering professor Marlin Mickle for monitoring the performance of hip and other bone prosthetics. The company has licensed the technology from Pitt for use in detecting infection.

A BREATH OF FRESH … CAPITAL

Another $10 million round of capital for Pitt-based spin-off ALung Technologies Inc. has given this local medical device start-up some breathing room as it prepares for its first commercial sales in Germany. That raises the funding total so far to $40 million from investors. ALung has been developing a portable artificial lung device based on technologies originally developed by William Federspiel—William Kepler Whiteford Professor in the Departments of Chemical and Petroleum Engineering, Surgery, and Bioengineering and director of the Medical Devices Laboratory at the McGowan Institute for Regenerative Medicine at Pitt—and his team of researchers and licensed from Pitt. The device, which works much like a kidney dialysis machine, pumps a patient's blood through a cleaning process that removes carbon dioxide and adds oxygen.

PATENT PATIENCE

Medical device start-up company Cohera Medical, Inc., has been celebrating its first European sales and its continued fundraising success this past year. Now it can celebrate perhaps one of its greatest achievements to date: a new patent. The U.S. Patent and Trademark Office has awarded Cohera Medical a patent for Hydrophilic Biodegradable Adhesives, the basis of a product now called TissuGlu. The patent application originally was filed in 2008. The medical adhesive, developed by Eric Beckman, the George M. Bevier Professor of Engineering in the Swanson School of Engineering, and Michael Buckley, a former associate professor of oral and maxillofacial surgery at the University of Pittsburgh School of Dental Medicine, is being used in lipoplasty surgery. The adhesive serves as the platform on which the Pittsburgh company is being built. Meanwhile, the company continues to build sales in Europe after launching the product in Germany in the fall of 2011. And this past June, it succeeded in raising another $8.4 million in capital through a Series D round of financing as it continued to conduct clinical tests in the United States.



BRIDGING THE (NERVE) GAP

When serious nerve damage occurs, trying to reconnect and repair the nerve can prove, well, unnerving. Not so for Department of Plastic Surgery professor Kacey Marra, though, who has found a novel solution that more effectively bridges long gaps in damage and encourages faster nerve regeneration. She has developed a biodegradable polymer-based nerve guide that provides not only scaffolding between damaged nerves but also a double-walled microsphere delivery system for bioactive neurotrophic factors aimed at enhancing the regeneration process until the damage is repaired. Her technology is designed for use with another guide that already is on the market.

TRUTH IN EATING, EXERCISE, AND PUBLIC SAFETY

When it comes to eating too much of the wrong foods or exercising too little, your eButton won't cover for you. That's because this small wearable computer—developed by Mingui Sun, professor of neurological surgery, bioengineering, and electrical engineering, and his students—contains an intelligent computer software system that automatically will track and analyze your daily food intake and physical activity. The device, worn on the front of your chest and containing numerous miniature sensors, is designed to help people stay healthy, especially those with diabetes, heart disease, obesity, and other conditions. The software system of this personal electronic assistant segments video, identifies foods, estimates food volume, and recognizes physical activities. Interestingly, the eButton recently has been adapted for use by police officers in what one day may become an intelligent police badge designed to enhance public safety. Sun and his team currently are working with the Pittsburgh Bureau of Police to test and develop such a device.

COPD VS. FDA-APPROVED ANTICONVULSANTS

David Perlmutter, the Vira I. Heinz Professor and chair of the Department of Pediatrics, and his research team have discovered a targeted new treatment for liver disease and chronic obstructive pulmonary disease (COPD) using anticonvulsant drugs already approved by the U.S. Food and Drug Administration. Tests by his team have shown therapeutic efficacy in treating the two diseases in animal models. The treatment has been shown to alleviate signs and symptoms of alpha 1-antitrypsin (AT) deficiency, an inherited disorder that results in the formation of insoluble protein aggregates in cells. Such aggregates can damage the liver, lungs, and other organs, which can lead to COPD, liver disease, and other disorders. In fact, AT deficiency is the leading genetic cause of the need for liver transplantation in children.

NEW ARTERIES: GRAFTS AND GROWTH

Ninety days. That's roughly all it may take for a heart bypass surgery patient to grow a fully regenerated artery, thanks to a new biodegradable artery graft innovation developed by Yadong Wang, associate professor of bioengineering, and his research team. Wang's vascular grafts are cell free, porous, and made of an elastic polymer that also is suturable. Their porous nature allows cells to penetrate the graft walls immediately, fostering the growth of new blood vessels within a few days. Tests have shown that, within three months, the new vessels are complete and the grafted polymer has disappeared, resorbing into the body.

BETTER SHOT ON THE FIELD

Health and rehabilitation sciences professor Rory Cooper, always the advocate for athletes with disabilities, has developed a highly adjustable chair for novice contenders pursuing shot put, discus, and javelin throwing.

Cooper, the FISA/ Paralyzed Veterans of America Chair and Distinguished Professor in the Department of Rehabilitation Science and Technology, and his research team created the chair to allow budding athletes to adjust their chairs as they develop their styles, techniques, and skills. The team worked in collaboration with the U.S. Department of Veterans Affairs. Existing chairs tend to be less adjustable and custom made for individual experienced athletes, and they can lead to poor performance, fear of falling, and injury for newer athletes. The new chair design has been licensed to Accessible Designs, Inc.

INNOVATION SHOPPING

If you're looking for a cutting-edge innovation to license from the University, you now can find it posted on the new Innovation Commercialization Web site launched recently by the Offices of Technology Management and Enterprise Development.

The new site not only gives you searchable access to all available technologies by keywords on the home page but also lets you know about the latest computer software being developed on campus as well as new research tools that are emerging from Pitt research.

In addition, Pitt Innovators now can go to the Web site's new Pitt Innovator Library for information and articles on everything from commercialization basics and intellectual property issues to raising angel investment and living the entrepreneur's life.

www.innovation.pitt.edu

Kinetic Energy and Entrepreneurship

Mechanical engineering professor Lisa Weiland and her colleagues are giving Pitt's energy research endeavor a big boost

Mechanical engineering professor Lisa Weiland would be the first to tell you that she learned a lot from her days of studying the air flow dynamics of morphing aircraft—so much so, in fact, that she has taken the principles that emerged from her research and applied them to a new company and a novel device that captures energy from unevenly flowing streams … of water.

Indeed, this inventive and admittedly restless academic with an entrepreneurial disposition has transformed her knowledge of aerodynamics into a sort of "aquadynamics" and, ultimately, into a hydrokinetic system that can generate electricity from shallow, turbulently flowing rivers and streams. And she's so excited about the potential for her device that she has taken an entrepreneurial leave of absence from the University to launch her own company.

"I think you can reinvent yourself intellectually time and time again—I personally think you should," says Weiland, an associate professor of mechanical engineering and materials science, of her move in research focus from air to water and from aircraft to energy.

Weiland is not alone in using her own kinetic energy this past year to give Pitt's fast-growing energy research endeavor a serious commercial boost. Electrical and computer engineering professor Hong Koo Kim, whose previous work in electro-optics has led to numerous devices and at least one start-up company, recently developed a whole new class of nano-optic-based refractive thin-film materials that this past year became the basis of a start-up company called SAVD Solar, Inc.

Kim's new materials—and new devices to accommodate those materials—are designed to greatly improve the ability of solar panels to capture energy over more traditional bulk metamaterials. The new company is expected to develop products from the licensed technology for optical beam shaping, lithography, optical data storage, imaging, information processing, and photovoltaics.

Chemical and petroleum engineering professor Di Gao, meanwhile, has set his sights on the wind energy industry. He has developed a new deicing coating that has been licensed to start-up Enercode Inc., whose initial commercial application targets giant windmills. His coating basically is a unique silicone resin that also contains silicone oils designed to slowly leach out of the coating. The surface oils then prevent snow and ice from adhering to surfaces such as the turbine blades of windmills.

And electrical and computer engineering professors Kevin Chen and Joel Falk, in partnership with the National Energy Technology Laboratory and former Pitt student Michael Bursic, have developed a laser device for measuring and fine-tuning the composition of gases being fed into power plant turbines used to generate electricity. This technology was licensed this past year by Kaiser Optical Systems, Inc.

Weiland is taking an entrepreneurial leave of absence to build a company, called First Principles Engineering, Inc., based on her new invention. The innovation, while still in the development stage, uniquely captures energy from the uneven, sometimes turbulent flow of shallow water to rotate a small turbine that, in turn, generates electricity. Most existing hydroelectric systems require a strong, steady flow of water to drive the turbines. Potential applications, she says, could include municipalities and the military.

"Some rivers and streams have a lot of kinetic energy, but they're very shallow, making the water unsteady and turbulent," says Weiland, who studied the issue with engineering colleagues William Clark and Daniel Cole, among others. "So, when you put something into an unsteady flow, how do you get a steady, repeating motion," which is needed to steadily turn a turbine?

Hence, the principles of aerodynamics. "It came from an adaptive aircraft strategy," she says of her innovation concept, which works with a "repeating bouncing motion." She explains it like this: Her device works in a similar way as when a person puts his or her hand out a car window horizontally and then moves it up and down slightly against the wind, making it "surf" on the wind. Her device works similarly against the water's current, creating a repeating motion that turns the turbine.

Her device did get the attention of the U.S. Navy, which awarded her start-up a Phase I Small Business Innovation Research grant. She also has attracted the interest of Pittsburgh-based Innovation Works, a state-funded economic development agency that promotes innovation. So why does she feel compelled to jump into the entrepreneurial fray herself with her concept? "I don't know; it's a character flaw," Weiland jokes. "I've always had ants in my pants. I need new mountains to climb."

But she also believes in the potential for her innovation. "I more than believe," she corrects. "There is compelling evidence to believe that it can get out there and be useful. I feel a certain obligation to get it out there.

"I also feel a certain societal obligation," she adds. "People are paying for research, and they deserve a return. I can't let it die on the vine."

Academic Entrepreneur

D. Lansing Taylor takes a collaborative, entrepreneurial, systems approach to drug discovery

D. Lansing Taylor

If ever an "academic entrepreneur" existed, D. Lansing Taylor, without question, is what one might call the quintessential "academic entrepreneur."

During the span of Taylor's long and noteworthy research career, his research and teaching interests have taken him to three renowned research universities and to at least four start-up ventures built upon his work. So he understands not only the importance of cutting-edge translational research and how to take new ideas to market but also how to transform ideas into companies, raise capital, and foster strategic collaborations and partnerships.

Such academic entrepreneurial qualities and experiences are serving Taylor well today as the Allegheny Foundation Professor of Computational and Systems Biology in the University of Pittsburgh School of Medicine and director of the University's Drug Discovery Institute (DDI).

Today, thanks to Taylor's leadership and commercial foresight, drug discovery research at Pitt epitomizes both the University's multidisciplinary, collaborative translational research philosophy and its evolution into a life sciences research powerhouse that acknowledges and embraces the individualized

"We're really dealing with the complexity of life rather than simplifying it."

complexities—biological systems—of the body and how it holistically interacts with potential new drugs.

"We're really dealing with the complexity of life rather than simplifying it," Taylor says of the institute's focus today. "When you take a drug, it's usually designed to hit a particular protein. The reality is that it interacts with a range of molecules, which can cause side effects or an improved benefit. A safe drug is [one which] the side effects are minimal.

"We are applying both molecular and phenotypic discovery, with complex measurements over time and space," he continues. "We now are more fully integrating computational methods with experimental methods. … Our goal is to shorten the time and decrease the cost of discovering new drugs. We are changing the paradigm."

The University first launched the collaborative DDI in 2006. At the center of the institute's endeavor, at least initially, was its state-of-the-art high-throughput screening facility, with a repository capable of holding nearly 5 million chemical compounds. The facility also is equipped with at least 10 robots that can conduct automated assay plating and, ultimately, provide researchers with countless drug screening tests.

Today, however, the institute combines such capabilities with more predictive quantitative systems pharmacology, which combines computational and experimental methods with chemistry and medicinal chemistry to better address the complexities of drug discovery. Its primary therapeutic target areas are cancer, neurological diseases, infectious diseases, and other areas with strong scientific rationales.

Organizationally, DDI is structured around those targeted areas as a "distributed network of solutions," Taylor says. "One of our mantras is success through collaboration. Our collaborators become our intellectual drivers. So what DDI has to offer is [that] we have the facilities and people here—and a process to evaluate" potential research collaborations and drug candidates.

Taylor accepted the role of director of DDI in November 2010 after spending almost 20 years starting and growing four different life sciences companies in the Pittsburgh region. Taylor is known as an entrepreneurial pioneer in high-content analysis and screening. He began his academic career at Harvard University, where he developed novel fluorescence-based reagents and imaging technologies along with fluorescent analog cytochemistry. In 1982, he became director of Carnegie Mellon University's Center for Fluorescence Research in the Biomedical Sciences. From there, he launched his entrepreneurial career in the early 1990s.

One of his companies, Cellomics, Inc., developed screening methods aimed at automating cell and experimental animal drug discovery. The company eventually was sold to Thermo Fisher Scientific Inc. He also applied cellular and tissue systems biology to diagnostics and drug safety via Cellumen and Cernostics, Inc. He sold Cellumen in the summer of 2010 and today is applying both his scientific knowledge and entrepreneurial acumen to his leadership at DDI.

Says Taylor of his decision to join Pitt, "I wanted to spend the last part of my career in academia."

Innovating Regeneration

Led by Professor William Wagner, the McGowan Institute for Regenerative Medicine and its research teams are developing breakthrough innovations that promote healing and tissue growth

Graft-on patches that enable damaged organs to heal. Powders that promote new tissue growth. Scaffolding that provides a bio-framework to regrow arteries or an esophagus ravaged by cancer. Such visionary innovations are par for the course for researchers at the McGowan Institute for Regenerative Medicine, which is gaining international prominence in the field. Leading the way is Pitt Innovator William Wagner, professor of surgery, bioengineering, and chemical engineering and the new director of the institute. While serving as the institute's leader, he continues to drive his own breakthrough research endeavor as well.

Researchers in Wagner's laboratory continue to develop promising new applications for biocomposites—synthetic engineered materials that combine extracellular materials with man-made polymers to create substances that can duplicate the properties and behaviors of different tissues and promote new growth. Biocomposites, Wagner notes, offer a number of potential advantages over current alternatives such as GORE-TEX and other materials now used in medical applications.

"Our objective is always to spin out new technologies to advance medicine."

"The [biocomposite] material sutures better, and you can engineer it so [that] surrounding cells will interact with it more naturally," Wagner says. "You want it to be natural from both the biochemical and mechanical perspectives, and a biohybrid composite gives you both components."

An example of biocomposites' potential benefits is a biocomposite patch developed by Wagner's lab to address a long-standing medical challenge: helping organs weakened by disease to gain the time needed to heal. So far, his team has applied the material to abdominal walls and has developed a heart patch from synthetic materials that are designed with elasticity and the ability to break down eventually in the body. A heart weakened by cardiac disease typically balloons outward as it beats and attempts to compensate for its loss of strength. Wagner's heart patch, which is sutured to the exterior of the damaged area, is engineered to mimic the natural flexing and stretching of healthy heart tissue, creating a supporting scaffold to help the heart heal more effectively.

Animal trials show that the patch can support tissue healing and may encourage regeneration. In a related research program, Wagner's team is developing an injectable material for the heart that provides support similar to that of the patch. This NIH-funded research continues toward eventual human trials, he says.

Wagner says that regenerating live tissue is the ultimate goal of McGowan Institute researchers, but the ability to mimic tissue behavior with synthetics provides a solid bridge or foundation to help move toward that eventuality. Because the material can be engineered to exhibit a variety of physical characteristics, it can be matched to a variety of body tissues and used for a variety of medical applications, such as abdominal wall repair, breast reconstruction, and pelvic floor support.

One McGowan Institute spin-off company leveraging the synthetic technology is Neograft Technologies, Inc., which developed the Angioshield polymer sleeve and an electro-spinning technique for creating the sleeves. Those sleeves are designed to support veins used for coronary bypass grafts and protect them from overdilation. The Office of Technology Management (OTM) facilitated the commercialization process and start-up launch, providing expertise that Wagner calls vital to the institute's ongoing success.

"Our objective is always to spin out new technologies to advance medicine," Wagner says of the institute. "We need to make that handoff so that commercialization happens. But to bring the technology to the point of the handoff requires us to understand regulatory pathways and current standards of care as well as business planning and issues like reimbursement. That's where OTM's help is essential."

Says Wagner of the material used in the vein graft technology, "This is a classic platform technology. Polymer chemistry enables us to continually adapt the mechanics of these substances to create new ones that meet specific medical requirements.

"We're trying to take advances in molecular biology and cell biology and our understanding of stem cells, materials science, and chemical engineering and apply that knowledge to create solutions to real-world problems," Wagner says. "[The McGowan Institute] doesn't depend on any single technology, so our researchers focus on the problem instead of the tool, and we can adapt and improve the tools to meet our ultimate goal: regenerative medicine that addresses tissue or organ failure."

Coulter Culture

This national foundation grant program elevates bioengineer/clinician collaboration, community partnership, commercialization, and entrepreneurship

When bioengineering professor Pratap Khanwilkar left Utah last year after 28 years, you could say that he came to the University of Pittsburgh simply to pursue yet another entrepreneurial dream. After all, he left behind a commendable legacy of cofounding six biotechnology/medical device start-up companies while also teaching at the University of Utah.

In fact, though, this academic entrepreneur has joined a leadership team that is setting the stage for the potential development of many biotech/medical device start-ups over the next five years while also giving Pitt's culture of innovation commercialization and entrepreneurship an enormous boost. Khanwilkar is the program director of Pitt's new Coulter Translational Research Partners II Program, which was launched in fall 2011 in the Swanson School of Engineering Department of Bioengineering with a $3.54 million five-year grant from the Wallace H. Coulter Foundation. Pitt was one of only six universities nationally to receive the award. Khanwilkar also is serving as a professor of bioengineering and an executive in residence in the Office of Technology Management (OTM), one of several key partners in the new program.

"It's really a start-up," Khanwilkar says of the new program and the entrepreneurial acumen needed to develop it into maturity. "It's a completely new program that Pitt has never done before. There's a huge need, though. That's why I'm here. I believe I can make a difference."

The program, first established by the Coulter Foundation, encourages innovation development collaboration between clinicians and bioengineering researchers. It also employs a highly structured solicitation and vetting process that includes internal and external advisors, mentors from the local business community, and extensive entrepreneurial education for participating researchers. The goal is to develop health care improvements that address unmet clinical needs and to accelerate their development and commercialization into patient care.

"This provides a structured process for investigators to follow along with funding," Khanwilkar says. "It provides a little bit of money and a whole lot of mentoring and brings the business ecosystem to the table."

Harvey Borovetz, Distinguished Professor, chair of the Department of Bioengineering, and principal investigator of the program, adds, "[Khanwilkar] brings an entirely new expertise in translational research to the offices of faculty who are interested."

Other members of the leadership team include Stephen Badylak, a surgery professor and deputy director of the McGowan Institute for Regenerative Medicine, and Marc Malandro, director of OTM and associate vice chancellor for technology management and commercialization at Pitt.

Borovetz continues, "You certainly need exciting technical and clinical opportunities, but you also need business and marketing strategies. Many faculty [members] aren't very knowledgeable about these things. Now we have an attentive audience."

During the start-up phase of the program this past year, Khanwilkar and the leadership team put together a team of 35 advisors, including seven people from the University of Pittsburgh Medical Center (UPMC) and UPMC Health Plan and others from Pittsburgh's business and venture investment communities. They also met with dozens of clinicians and engineering faculty members to promote the program's goals and solicit project applications.

As a result of those efforts, the Coulter program attracted 33 initial innovation development applications from bioengineering/clinical research teams. The advisors then vetted those applications, considering factors such as commercial potential (market size and clinical need), time to market, and identifiable commercialization gaps, among others. The group then culled from those applications 14 projects whose innovators were invited to submit more-detailed applications. Those 14 also were asked as part of the process to attend the Office of Enterprise Development's From Benchtop to Bedside: What Every Scientist Needs to Know educational course this past spring.

Of those 14, the program awarded funding to four innovation development teams:

- **Hand-held Force Magnifier:** This microsurgical instrument magnifies the sense of touch for surgeons conducting eye and other sensitive surgeries and improves the control of small movements. The team includes bioengineering professor George Stetten and ophthalmology professor and department chair Joel Schuman.
- **Resorbable Calcium Phosphate Putty:** This regenerative bone filler is designed to stimulate new bone growth in craniofacial bones and dental implants. Leading this team are bioengineering professor Prashant Kumta and dental medicine professor Charles Sfeir.

- **Anti-inflammatory Gum Disease Treatment Using Protein Microparticles:** This controlled-release treatment uses the protein CCL22 to attack inflammation and induce periodontal regeneration using the body's immune system. Key researchers are chemical and petroleum engineering professor and chair Steven Little and Sfeir.
- **Infection-reducing Regenerative Treatment for Patients with Cardiac Device Implants:** Bioengineering professor Yadong Wang and School of Medicine professor David Schwartzman have developed a treatment using biodegradable spherical droplets to deliver fibroblast growth factor, rifampin, and minocycline into implant sites over several weeks to promote healing.

For those whose projects were not accepted for the Coulter program, Khanwilkar says he still met with each group and offered constructive feedback as to how to move forward in their commercialization efforts. Some also were referred to another new Swanson School program, the Center for Medical Innovation (CMI), which is aimed at providing proof-of-concept funding and guidance for earlier-stage innovations and their innovators. The Coulter program also is providing funding for the CMI projects.

"Our vision for the Coulter program is more start-up companies and [technology] licenses and building a culture of translation at Pitt through awareness and education that develops serial innovators," Khanwilkar says.

Adds Borovetz, "We now have this array of people across multiple disciplines who want to make this translation successful."

A Universal Vaccine Platform

Microbiology and molecular genetics professor Ted Ross and his team at the Center for Vaccine Research have developed a unique flu vaccine that has attracted the support of one of the world's largest vaccine manufacturers

If Ted Ross and his research team have their way, people one day soon will have access to a universal flu vaccine that protects them regardless of the disease strain and may require only one shot every 10 years or longer.

That proposition, backed by extensive research and intellectual property developed by Ross and his team at the University of Pittsburgh Center for Vaccine Research (CVR) and even extended into other global health concerns, has not been lost on the international pharmaceutical industry. In fact, Pitt and CVR recently entered into a significant long-term licensing and sponsored research partnership with Sanofi Pasteur, one of the world's largest vaccine manufacturers.

The partnership's goal is to develop a single-platform vaccine that protects people against multiple strains of influenza, which

Ted Ross

kills about 36,000 people each year in the United States alone. If successful, this approach could streamline vaccine development and help to ensure that more people than ever are protected against common infectious diseases.

"Our goal is a vaccine that stimulates an immune response that recognizes all strains of influenza but also has durability so we do not have to reformulate it and inoculate people every year," says Ross, associate professor of microbiology and molecular genetics and a CVR founder.

Ross and his research team developed the vaccine by using algorithms and computer modeling to identify epitopes, portions of antigens capable of stimulating an immune response, of various flu viruses. Once they identified the similarities across several flu strains, they captured them and combined the molecules within a single vaccine. This vaccine approach, called computationally optimized broadly reactive antigen, or COBRA, addresses three common flu viruses—H1N1, H3N2, and influenza B—and is being tested successfully in mice, ferrets, and nonhuman primates—necessary precursors to eventual human trials.

> "This partnership means a steady income for the lab, and that frees us to think about the science, to read more, and explore—the things that enable us to be more innovative, better scientists."

According to the Centers for Disease Control and Prevention, a flu vaccine's effectiveness is largely the result of two factors: the age and health of the person being vaccinated and the similarities between the viruses in the vaccine and the flu strains circulating in the community. Ross' single-platform approach helps to ensure that the right strains are targeted and can be manufactured in less time than current versions.

"A vaccine that works this way benefits the manufacturer by driving down its development and manufacturing costs," says Ross, who compares his vaccine to a tetanus shot that's administered once every 10 years, "but it also drives down health care costs. Because it lasts longer and can eliminate the need for an annual flu shot, there's a greater likelihood of compliance in high-risk groups like the elderly."

Ross notes that his lab's COBRA approach also can be applied to other pathogens such as HIV and dengue fever, which causes an estimated 50 million infections each year in Asia, Africa, and South America.

"Like influenza, these diseases have multiple strains that make it a challenge to generate an effective vaccine," he says. "Our approach can find the commonalities and enables us to develop a gene sequence that is amenable to killed virus, live virus, or emerging technology delivery platforms."

CVR's partnership with Sanofi Pasteur, engineered with the assistance of OTM, benefits both parties. CVR receives ongoing financial support from a company capable of commercializing the labs' work. Sanofi Pasteur, in turn, gains access to a breakthrough vaccine platform.

"This partnership means a steady income for the lab," Ross says, "and that frees us to think about the science, to read more, and explore—the things that enable us to be more innovative, better scientists."

Little Lab's Big Ideas

Engineering professor Steven Little and his team are developing novel drug delivery systems with better precision and timing

Visit www.littlelab.pitt.edu and you're immediately advised to "Think little." Of course, it's a play on the name of the lab's driving force, Steven Little, associate professor and chair of the Department of Chemical and Petroleum Engineering at the University of Pittsburgh Swanson School of Engineering. It's also the mantra that guides his lab's research into synthetic materials that interact with cells and mimic their behavior to deliver drugs or other substances with greater precision and timing.

Take, for example, the lab's novel treatment for periodontal disease, a leading cause of tooth loss that also is linked to increased heart disease, strokes, and premature births. Using a polymer contained in dissolvable sutures, Little's group developed a microscopic capsule filled with a certain protein, or chemokine. When they are placed in the pockets between gums and teeth, where bacteria breed and trigger damaging inflammation, the capsules break down over time and release the protein. The protein then acts like a homing signal to draw regulatory T cells to ward off destructive inflammation caused by the infection.

Early animal studies show that the treatment can foster healing, can create more ideal conditions for new bone and gum tissue growth, and may help to strengthen the immune system to better handle future bacterial attacks.

"Cells communicate on multiple levels, and there are nuances to that communication," Little explains. "If we can design a delivery system that interacts in the same ways, then theoretically we can exert greater control over the interaction by mimicking and influencing cell behavior."

Little equates current drug therapies, which he says bombard cells indiscriminately, to broadcasting repeatedly over a loudspeaker. Improving the delivery system will create a more intimate, one-to-one cellular "conversation."

"As we gain understanding about the way these delivery systems behave, we increase our ability to guide that behavior," he says.

Little's technology offers broad commercialization opportunities—not only in medicine but also in areas such as agriculture. To tap that potential, Little and Sam Rothstein, one of the lab's chemical engineering doctoral candidates, recently founded Qrono Inc., which offers pharmaceutical, agricultural, and other potential customers design and product development services.

Steven Little

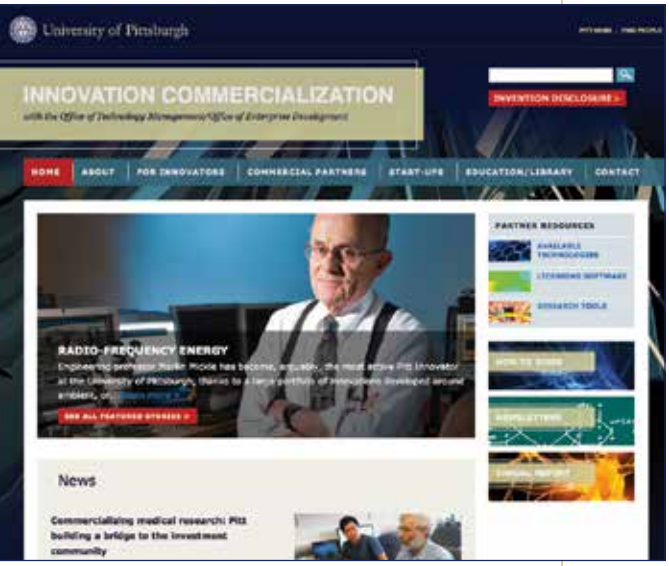
The desire to develop a pipeline of big ideas comes naturally to Little, who arrived at Pitt in 2006. He received his doctorate from the Massachusetts Institute of Technology, where he studied under Robert Langer, a prolific, world-renowned inventor whose innovations have been licensed to more than 250 companies.

"We have to be both educators and innovators, so there are good people to chase the ideas we generate," Little explains. "There's nothing like seeing students develop confidence, followed by ideas, and then championing those ideas through the process of creating a company and producing a real product. The experience is very rewarding."

Chemical engineering rests at the heart of Little's work, but he stresses that widespread interaction among academic disciplines drives his lab's successes. "Delivery systems behavior is based on fundamental chemical engineering concepts that we understand," he says. "But we also need collaborators to provide critical know-how about the potential applications. Our group includes people with backgrounds in chemistry, medicine, immunology, pharmaceutical sciences, and even physics. It's that diversity that keeps us looking at things from a range of perspectives.

"We want to change the way people think about delivery systems and their role in medicine," he adds. "One day, instead of prescribing pills, a diagnosis will be recognized as a cellular communication problem, and we'll be able to design and 'program' a drug formulation to interact with the body and address that problem in a very targeted, specific way."

Engaging Pitt Innovators and Partners



Certainly record numbers of invention disclosures and technology licenses/options this past fiscal year would not have occurred without the momentum of a cultural shift here, driven largely by collaboration and important long-term partnerships. Translational research, innovation commercialization, and entrepreneurship require a healthy dose of both elements to achieve the kind of success experienced by the University of Pittsburgh and its innovators.

Behind the scenes, though, such endeavors also require a substantial investment of time and creativity in planning and implementing productive events and facilitating meaningful interactions internally and externally that foster collaboration and partnerships. As in past years, the Office of Technology Management (OTM) and the Office of Enterprise Development (OED), with support from the University's senior administration, have made that investment in an effort to proactively engage Pitt Innovators and potential partners.

That's where OTM and OED's proactive education and outreach; matchmaking; innovation showcases; and opportunities to pitch business opportunities to investors, entrepreneurs, and industry come into play. Our goal in these activities is to facilitate opportunities that enable Pitt Innovators to change the world with their imagination, ingenuity, and innovation.

Here's what OTM and OED have been doing this past year to engage Pitt Innovators and partners:

New Web Portal

To provide a more informative, educational Web portal for innovators and potential external partners, OTM and OED this past year worked with the Department of University Marketing Communications to undertake a major revamping and merging of their Web sites to create one central hub focused on the function of innovation commercialization. For Pitt Innovators, the new site showcases commercialization news; provides helpful links and directions for submitting invention disclosures; presents interactive opportunities; and includes links to policies, forms, and outside resources.

Among its highlights for innovators is the new Pitt Innovator Library section, with articles, how-to guides on commercialization and starting companies,

www.innovation.pitt.edu

videos, and other educational materials covering various stages of the commercialization process.

For potential Pitt Innovator partners, the site not only includes a searchable database of available technologies for licensing but also separate links to available computer software and newly developed research tools available for licensing by other researchers.

Education

In addition to the new educational Web portal, OTM and the Office of the Provost, in partnership with the Joseph M. Katz Graduate School of Business Center for Executive Education, once again conducted an innovation commercialization course this past year for Pitt faculty members, staff, and students titled Academic Entrepreneurship: The Business of Innovation Commercialization. This seven-week course, now in its 11th year, addresses the early stages of innovation development and commercialization, including creative application development, intellectual property issues, market analysis, communicating the value proposition, and commercialization strategy, among other hands-on topics. The course attracted at least 30 participants from a diversity of academic disciplines last year.

Similarly, last spring, OED held its own for-credit course, From Benchtop to Bedside: What Every Scientist Needs to Know, with a record attendance of 45 faculty members, staff, and students. This 16-week course not only examines commercialization and intellectual property issues, it also focuses on regulatory hurdles, health insurance reimbursement, funding, and other start-up company challenges.

The course this past year also was able to serve participants in the new Coulter Translational Research Partners II Program, which was launched in the fall of 2011 in the Swanson School of Engineering's Department of Bioengineering with a $3.54 million five-year grant from the Wallace H. Coulter Foundation. Pitt Innovators who were involved in 14 innovation development proposals that were submitted for funding consideration were required to take the course last spring as part of their training in preparation for their innovation commercialization efforts.

OTM and OED staff members also continued to provide introductory seminars and workshops to departments, centers, and institutes across campus throughout the year as well as seminars and lectures addressing patent law and entrepreneurship.

Learning and Competing

OED extended its educational endeavors this past year into several hands-on activities that not only educated participants in entrepreneurship and commercialization but also provided driven, competitive opportunities for Pitt Innovators to promote the business strategies for their innovations and win cash awards.

OED jumped into fiscal year 2012 with its Wells Student Health Care Entrepreneurship Competition, a new

Top: Paul Johnson (right), a doctoral student at the University of Pittsburgh School of Medicine, explains his TactSense technology during the Science2011 Technology Showcase.

Bottom: Johnson (left) with Pitt alumnus Michael Wells, who donated the funding to Pitt to create the Michael G. Wells Entrepreneurial Scholars Fund and Wells Student Health Care Entrepreneurship Competition

Engaging Pitt Innovators and Partners continued

Above: Innovators, business mentors, investors, entrepreneurs, and other Pitt partners share ideas and information during the Science2011 Technology Showcase. At least 250 people attended this interactive poster reception, aimed at bringing together Pitt Innovators and potential commercial partners to foster innovation commercialization.

Below: Pharmacy and therapeutics professor Amy Donihi, second from left, accepts her 2011 Pitt Innovator Award from Senior Vice Chancellor for the Health Sciences Arthur S. Levine, Provost Patricia E. Beeson, and Chancellor Mark A. Nordenberg. The award is given annually to Pitt Innovators whose innovations were licensed to industry or start-up companies during the previous fiscal year.

program funded by Pitt alumnus Michael Wells and his newly established Michael G. Wells Entrepreneurial Scholars Fund. The competition was designed to promote innovation development and entrepreneurship among Pitt's health sciences students. The inaugural winner of the competition was Paul Johnson, a doctoral student from the School of Medicine who developed a "tactile feedback" system for surgical tools. He was awarded $10,000 from the scholarship fund to move his innovation closer to commercialization.

OED also assisted the Katz School's Institute for Entrepreneurial Excellence in its Randall Family Big Idea Competition and worked with a number of Pitt student Innovators in preparing their business plans and elevator pitches. The winner, Swanson School student Noah Johnson, won $30,000 to further commercialize a drug delivery system developed by Yadong Wang, associate professor of bioengineering.

Other competitive educational activities included elevator pitch competitions cohosted by OED and other regional organizations promoting entrepreneurship and economic development and several technology showcases. The biggest of the showcase events last year was the opening reception and technology showcase for the University's annual Science conference. OED staff members worked for months beforehand with Pitt Innovators, matching them with external mentors and helping them to develop their business cases for their innovations. Nearly 300 people attended the event.

Other national showcases included an academia/industry showcase sponsored in part by Pitt at the annual conference of the Association of University Technology Managers in Anaheim, Calif.; the BIO International Convention, which was held this past June in Boston, Mass.; and Biotech 2011 in Philadelphia, Pa.

Start-up Drive

OTM and OED have stepped up their start-up development efforts considerably this past year, thanks in part to their new Executive in Residence program, an increase in mentoring activities, and the development of an enhanced start-up initiative that's being called Pitt Ventures. Still in the works, this new initiative includes a more assertive innovation and business development process and new activities aimed at building up a community of partners to support start-ups as they are spun out of the University.

A dedicated group of mentors from the community, meanwhile, continues to work closely with Pitt Innovators to better focus their innovation applications, create more effective value propositions and elevator pitches, and craft business-oriented showcase posters and planning documents.

Also working more closely with Pitt Innovators are OTM's own executives in residence, who are cultivating new ideas from University labs and guiding those with medical devices and computer software down the more entrepreneurial commercialization path. Their efforts this past year have led to several start-up companies and partnerships with entrepreneurs and investors. All told, OTM, with OED's assistance, spun out nine new companies based on Pitt innovations, and both offices anticipate similar levels of activity in FY 2013.

Partner with Pitt

Internally, OTM and OED have accepted leadership roles in at least two collaborative partnerships, both of which bring together Swanson School of Engineering faculty members, staff, and students with health sciences clinicians looking to solve clinical problems. The aim of the Coulter Translational Research Partners II Program is to pursue the joint development of later-stage innovations that ultimately will improve patient care. OTM and OED serve as the education and commercialization pillars of the program (see related feature on page 16).

On the earlier end of the development spectrum is a similar program, called the Center for Medical Innovation, aimed at cultivating research collaborations that lead to medical device development and commercialization. OTM and OED likewise play an integral role in that program, providing education, expertise, and commercialization guidance.

Externally, OTM and OED continue to develop and promote the Partner with Pitt campaign, taking it across the country to generate interest in Pitt Innovators, their innovations, and their research programs. The campaign includes an exhibit booth, brochures, and a growing series of booklets showcasing some of Pitt's greatest collaborative research strengths along with specific research programs and some of the University's most innovative thought leaders in those areas. Currently booklets are available for Pitt's endeavors in energy research, vaccine research, cancer research, and medical imaging research. This coming year, the team will focus on drug discovery and regenerative medicine, among others. All of the materials are available at www.innovation.pitt.edu.

The campaign also has led to dozens of meetings at several national conferences with potential licensing and collaborative research partners. Some of those meetings have resulted in technology licenses and sponsored research agreements with the likes of international pharmaceutical giants Sanofi Pasteur and Johnson & Johnson, among others.

Innovator Recognition

Once again, OTM, in partnership with the Office of the Provost, hosted its annual Celebration of Innovation, a reception designed to honor Pitt Innovators whose innovations were licensed during the previous fiscal year and recognize all who have participated in the commercialization process during the year. Participating in the program, which includes the Pitt Innovator Awards ceremony, were Chancellor Mark A. Nordenberg, Provost Patricia E. Beeson, and Senior Vice Chancellor for the Health Sciences Arthur S. Levine. Close to 150 Pitt Innovators, senior and departmental administrators, and local partners joined in the celebration.

Indeed, they have much to celebrate, as all of these activities have generated a level of momentum that has led to a much greater and more active and sustainable commercialization endeavor at the University of Pittsburgh. And we fully expect that to continue.

OTM's Partner with Pitt campaign includes a series of reports showcasing some of Pitt's collaborative research strengths, specific research programs, and thought leaders in those areas. OTM distributes these materials at national conferences via its Partner with Pitt exhibit booth, which showcases Pitt Innovators and their research.

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The 2012 OTM annual report
is dedicated to our Pitt Innovators,
whose imagination, ingenuity, and
innovation are changing the world.

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