

# University of Pittsburgh

## Research Development Report

### Reporting Period:

July 1, 2013 – June 30, 2014

### Commercial Development of Research

The Office of Technology Management (OTM), along with its affiliate Office of Enterprise Development, Health Sciences (OED), serves as the hub of all innovation commercialization activities at the University of Pittsburgh. Together, OTM and OED assist in the fulfillment of the University's missions of education, research, and public service by facilitating the development of products and processes from University technology for the benefit of the University; its faculty, staff, and students; and the community. At the same time, OTM/OED work to foster long-term relationships with industry and the community in sponsored research, innovation development, technology licensing, and the formation of start-up companies.

To manage the University's ongoing commercialization activities, OTM/OED employs intellectual property protection experts, specialized licensing managers, business development and technology marketing professionals, marketing communication professionals, education and outreach teams, and reporting and compliance personnel.

OTM/OED services to Pitt innovators include:

- Assistance with preparing and submitting invention disclosure forms for commercial consideration
- Facilitation of the protection of intellectual property at the University via patents and copyrights
- Strategic planning for the successful transfer of innovations to the marketplace
- Negotiation of licenses and options for Pitt innovations to commercial interests
- Management of post-licensing reporting, revenue collection, and royalty distribution
- Educational opportunities in technology commercialization and "academic entrepreneurship"
- Unique opportunities for targeted interaction between Pitt innovators and industry, investors, and the community for the development of new partnerships that encourage and enhance Pitt's commercialization efforts
- Facilitated brainstorming to assist Pitt innovators in developing marketable commercial applications
- Annual recognition and awards for faculty, staff, and students who participate in the commercialization process

Pitt's total research expenditures (both direct and indirect costs) were an estimated \$759 million in fiscal year 2013 (the most recent figures available). In fiscal year (FY) 2014, this research

activity generated 274 invention disclosures, which are evaluated by OTM in conjunction with the University Technology Transfer Committee for technical merit, patentability, and market potential. That number is an increase of nearly 8 percent over 2013. Licensing numbers for FY2014, however, were unavailable at the time this report was due. Also, OTM/OED launched six new start-up companies in FY2014 and is working to develop at least a dozen additional start-up opportunities. The U.S. Patent and Trademark Office, meanwhile, issued 74 patents to the University of Pittsburgh, an increase of more than 45 percent from the previous year. Since 2001, the University and its innovators have been issued 507 U.S. patents. OTM actively develops commercialization strategies for these and other Pitt-developed technologies. Over the past year, OTM/OED conducted a wide range of interactive activities, including educational courses, innovation competitions, technology showcases, and an annual recognition event, among others, to generate interest among faculty, staff, and students in Pitt's innovation commercialization efforts, as well as to foster entrepreneurship. Chief among those activities was the launching of the University's new campus-wide Innovation Institute, whose goal is to promote and foster innovation and entrepreneurship on campus and in the community and serve as a central portal for the University regarding innovation and entrepreneurship, including innovation commercialization. OTM and OED, along with the University of Pittsburgh Institute for Entrepreneurial Excellence, are now officially part of the Innovation Institute.

In addition to the establishment of the new institute, OED launched a new Gear program, which is part education and part hands-on mentoring for cohorts of faculty, staff, and students who aspire to start companies based on their innovations. During the six months ending June 30, 2014, the new program has worked with three cohorts that represent, collectively, about 30 faculty, staff, and students, in addition to business mentors, executives in residence, and staff instructors. OED expects the first actual start-up company to emerge from the program in August 2014.

Concurrently, in spring 2014, the Innovation Institute took over the Randall Family Big Idea Competition, a student competition at Pitt that focuses on the best business ideas and/or promising innovations with start-up potential.

The Innovation Institute over the past six months provided extensive entrepreneurship training to more than 120 University of Pittsburgh students who participated in the Randall Family Big Idea competition. The competition included several extensive workshops, including a Start-up Weekend and boot camp. Students also participated in the Institute's Benchtop to Bedside: What Every Scientist Should Know course and Academic Entrepreneurship: The Business of Innovation Commercialization course.

### **Research Licensing Agreements**

Employing best-business practices in licensing requires the University to standardize license terms to the greatest extent possible. Standardizing terms levels the playing field for licensees and creates a common understanding of the balance of risks acceptable to a university (which may differ markedly from the for-profit sector). For example, the University's policies limit the amount of equity in a start-up company that can be owned collectively by participating faculty

innovators and the aggregate University to no more than 49 percent. OTM, in collaboration with Pitt's Office of General Counsel, has developed standard templates for exclusive and nonexclusive license agreements.

In the arena of nonexclusive licenses, templates have been developed for patented and non-patented technologies. In each case, license agreements have been designed to recognize the unique role of universities, as well as faculty members' continued needs to conduct research even as commercial entities begin to move their technologies into the marketplace. Thus, the University's license agreements always retain for the University and its faculty the nonexclusive right to continue to use licensed technology for non-commercial educational and research purposes. Publication of research results is another key requirement for universities, although this need must be balanced against the legitimate interests of a licensee.

As part of OTM's mission to assist in the retention of entrepreneurially minded faculty, the University also offers an "entrepreneurial leave of absence." However, faculty must still abide by University policy related to commercialization of innovations through independent companies (available upon request).

### **Training Students and Health Professionals**

The School of Medicine's Summer Premedical Academic Enrichment Program-Level I (SPAEP-I) is a seven-week program designed to be a preliminary education program for 12 minority and/or disadvantaged students who are graduating high school seniors or college freshmen or sophomores. The program reinforces science coursework, broadens competency in written and oral communication skills, and introduces health disparities issues. Participants for this institutionally funded program are selected from a national pool. However, preference is given to students from the University of Pittsburgh, Pittsburgh residents, and students from historically black colleges and universities (HBCUs).

The Summer Premedical Academic Enrichment and Research Program (SPAEP) Level II curriculum places six to eight underrepresented or disadvantaged upper level college students in laboratories for seven weeks to participate in research mentored by School of Medicine faculty. The program is supported by the School of Medicine, the participating research sites, and the Pennsylvania Department of Health. Each Friday afternoon, the students are engaged in medical school application skills seminars taught by the Office of Admissions, as well as study skills strategy sessions. They attend Medical College Admission Test (MCAT) and application preparation workshops on Saturday mornings during the program. Program participants spend one or two afternoons shadowing clinicians and attending weekly brown bag lunch seminars given by School of Medicine faculty, residents, fellows, and community physicians. They also participate in mentoring and networking activities held in conjunction with other summer programs. Each student has a "mock interview" with a School of Medicine faculty member and receives feedback on his/her performance. They also develop personal statements. In addition, participants complete an application timeline based on when they are planning to apply to medical school. The program's capstone experience is a presentation of the student's research with mentors and peers in attendance. Participants for this research program are selected from a

national pool; however, preference is given to students from Pennsylvania, the University of Pittsburgh, Pittsburgh residents, and students from HBCUs.

The Center for Public Health Practice (CPHP), established in 1995 with an appropriation from the Commonwealth of Pennsylvania, is a catalyst for engaged scholarship in public health through applied research, practice-based teaching, and professional service. Numerous activities interface with all departments at the Graduate School of Public Health (GSPH), the Office of the GSPH Dean, and the Multidisciplinary Master of Public Health (MMPH) program, utilizing and sharing expertise throughout the school. CPHP's goals are to:

- Develop innovative resources and practical solutions for public health problems at the local, state, and national levels
- Provide education and training for students, practitioners, and leaders in public health and other professions
- Create partnerships for mutual learning between academic institutions and public health agencies
- Apply principles of quality assurance and quality improvement to continuously improve performance in scholarship, professionalism, and management

CPHP houses several subsidiaries, including the Pennsylvania Public Health Training Center (PAPHTC). PAPHTC is one of 38 public health training centers across the United States funded by the Health Resources and Services Administration (HRSA). It is based at GSPH and operated in partnership with Drexel University School of Public Health and the public health workforce across the Commonwealth. PAPHTC helps prepare and equip today's public health professionals with the knowledge and skills needed to meet tomorrow's challenges by offering a wide variety of professional development opportunities to the Commonwealth's public health workforce. More than 80 different training events reached more than 2,700 public health professionals during the most recent reporting period. Example training titles show the variety of programs offered:

- Environmental Management of Pediatric Asthma
- Public Health, Farmers' Markets and Food Access: Lessons Learned
- Emerging Prevention and Public Health Policy Issues
- Overdose: Opportunities for Prevention and Intervention
- Finding Foundation and Government Grant Funding

PAPHTC provides resources and organizational development services to public health agencies in order to increase capacity and enhance the delivery of effective public health services. Additionally, PAPHTC offers experiential training opportunities to graduate students in the field of public health through partnerships with local health departments and community-based organizations that deliver public health services.

In fact, Ronald E. Vorhees, MD, MPH, associate professor of epidemiology, Pitt Public Health, served as acting director of the Allegheny County Health Department (ACHD) for more than a year following the June 2012 departure of longtime director Bruce Dixon, MD. Karen A. Hacker, MD, former chief medical officer of the Cambridge (Mass.) Health Department, assumed ACHD leadership in September 2013, at which time Dr. Voorhees returned full-time to his duties at Pitt.

## Commercial Research Development Training

Most of the University of Pittsburgh's training opportunities related to the commercial development of research take place through OTM/OED. During this program year, the following training activities took place:

- Educational Courses—In 2001, OED introduced its 10-week “Benchtop to Bedside: What Every Scientist Needs to Know” course, which helps health sciences-oriented faculty, staff, and students understand technology commercialization, including starting a company and navigating the regulatory approval process. The program was revised in 2012 and is now 14 weeks long, with academic credits available to students. Moreover, OED added a second 14-week course section exclusively for participating innovators in the Swanson School of Engineering's Coulter Translational Partnership II program. Both sections were offered to an estimated 60 Pitt faculty, staff, and students in spring 2014.

Meanwhile, OTM, in partnership with the Office of the Provost, launched a seven-week course in 2002, titled “Academic Entrepreneurship: The Business of Innovation Commercialization,” which focuses on the earliest stages of innovation development, including application development tools, business-opportunity development, market research, and communicating the right message to potential commercial partners. This course was conducted in fall 2013, with 25 faculty, staff, and students attending.

OTM/OED also continues to offer shorter introductory workshops for Pitt faculty, staff, and students on innovation commercialization. They typically partner with Pitt's human resources (HR) department and offer the session as part of HR's professional training/development. OTM/OED also took the workshops to various schools and departments over the past year.

- Start-up Education—OED launched its Gear program in early 2014, which is part education and part hands-on mentoring for cohorts of faculty, staff and students who aspire to start companies based on their innovations. During the six months ending June 30, 2014, the program has worked with three cohorts that represent, collectively, about 30 faculty, staff, and students, in addition to business mentors, executives in residence, and staff instructors. OED expects the first actual start-up company to emerge from the program in August 2014. Moreover, the institute, as part of the Big Idea Competition, provided hands-on educational workshops in the form of Start-up Weekends and boot camps to teach students about innovation and entrepreneurship.
- Educational Materials—OTM and OED have developed a number of materials that have been well received internally and among our academic peers. In 2010, OTM/OED published the first-ever “Pitt Innovator's Guide to Technology Commercialization,” which provides a comprehensive introduction to commercialization at Pitt, as well as other important considerations. OTM/OED is updating the guide and will continue to distribute copies at faculty orientation sessions and educational events. The guide also is available electronically on the OTM's website, [www.innovation.pitt.edu](http://www.innovation.pitt.edu). Among OTM's/OED's other educational

materials have been “Pitt Innovator’s Commercialization Coaching Cards,” which offer “10 things to remember when attracting industry or investors to your innovation.” The three-panel, business card-sized tools have been distributed by the hundreds on campus and beyond and are now being duplicated by at least eight other research institutions.

- Website—OTM/OED has a website that focuses more on the function of innovation, commercialization, and entrepreneurship than on OTM/OED office structure. The site provides information for potential commercial partners as well as information for Pitt innovators. It includes a Pitt innovator library, with educational articles, videos, and other educational resources about innovation and entrepreneurship.
- Entrepreneurship Education—This past fiscal year, the Innovation Institute’s Institute for Entrepreneurial Excellence provided business training and assistance to hundreds of entrepreneurs and small-business executives through its year-long Entrepreneurial Fellows and Urban Entrepreneurship programs, as well as its Small Business Development Center. Specific numbers were not available as of the deadline for submission this report.

### **Outreach to Businesses Regarding Recent Research Developments**

The University’s innovation commercialization efforts depend entirely on effective outreach to a variety of potential outside partners, whether entrepreneurs, investors, economic development organizations, or large companies that might be interested in licensing Pitt technologies. As such, OTM/OED did the following:

- Licensing manager calls/corporate relations—Throughout the year, OTM licensing managers contacted prospective licensees to initiate licensing discussions. Results, unfortunately, were not available in time for this reporting cycle.
- Technology showcase—OTM/OED take every opportunity available to showcase Pitt innovations at poster receptions, on campus, and around the country. Annually, OED hosts its First Look Technology Showcase reception at Pitt’s campus-wide science conference, held in the fall. The 2013 event attracted at least 250 attendees, including many outside participants.
- Conferences—OTM/OED staff members attended numerous national conferences over the past year that provided opportunities to meet with industry representatives, investors, and others interested in innovation commercialization and Pitt technologies. Conferences included the Association of University Technology Managers annual meeting, BIO International Conference, Licensing Executives Society; AdvaMed (medical devices); and others. We also participated as sponsors and exhibitors to give the University and its Pitt innovators additional exposure to potential commercial partners.
- Mentoring—Several OTM/OED programs, including the Gear program, the affiliated Coulter Foundation grant program, and others, include mentoring. As such, OTM/OED continued to work closely this past year with Pittsburgh’s business and economic development communities, which, in turn, provided valuable expertise to Pitt innovators in the development of their innovations and potential start-up companies. Likewise, the First Look Technology Showcase paired Pitt innovators with local mentors, as did the Institute’s Big Idea Competition.

- Celebration of Innovation—To celebrate the accomplishments of Pitt innovators, OTM and the Office of the Provost continue to host an annual Celebration of Innovation. Invitations to the event are limited to those who filed invention disclosures during the previous fiscal year, those whose innovations were licensed to industry or startups in the past year, senior administrators from across campus, and the local economic development community. Those whose innovations were licensed are recognized with Pitt Innovator Awards. The ninth annual event, which attracted more than 200 people, was held in November 2013.
- Institute for Entrepreneurial Excellence (IEEE)—This Innovation Institute program works exclusively with entrepreneurs and small businesses in the Pittsburgh region and surrounding counties. The IEE, through its many business assistance, education, and networking programs, worked with hundreds of business owners and entrepreneurs this past fiscal year.

### **Research Development Collaboration**

The University's principal partner in research development and commercialization is UPMC (University of Pittsburgh Medical Center), which directly supports selected research and research infrastructure initiatives, as well as investing in promising intellectual property developed by Pitt faculty members. During a previous reporting period, UPMC and the University of Pittsburgh entered into an agreement with the Italian president, the president of the region of Sicily, and Italy's National Research Council to operate a major new research center in Sicily. (This request complements the successful development by UPMC of a tertiary care hospital in Palermo, which specializes in organ transplantation and other complex procedures; the facility was funded by the Italian government and is managed by UPMC.) The \$400 million Biomedical Research and Biotechnology Center (BRBC) will house programs that build on Pitt's strengths in computational and structural biology, vaccine development, drug discovery, molecular imaging, tissue engineering/regenerative medicine, and neuroscience. Italy will construct the 300,000-square-foot center in the province of Palermo. Construction of the facility is expected to commence in 2015. In addition, a state-of-the-art cell factory in Palermo is one of the country's most innovative research projects. Developed in collaboration with the University of Pittsburgh McGowan Institute for Regenerative Medicine, the facility processes, stores, and distributes human cells to be used for regenerating damaged organs at transplantation centers throughout Europe.

During the current reporting period, the trilateral partnership among UPMC, the University of Pittsburgh, and the Italian government has continued a fellowship program established six years ago. To date, 18 young Italian researchers have received or are currently receiving research training and experience at the University of Pittsburgh in the fields of structural biology, computational biology, neurosciences, pharmaceutical research, vaccine development, tissue engineering/regenerative medicine, biomedical devices/development of nanotechnologies, molecular imaging, and related areas. The progress of these fellows, who will become the vanguard generation of investigators in the BRBC, is reviewed annually by the program's scientific committee, which is headed by Arthur S. Levine, MD, Pitt senior vice chancellor for the health sciences and John and Gertrude Petersen Dean of Medicine.

The University of Pittsburgh also works closely with UPMC's International and Commercial Services Division (ICSD), which invests in strategic partnerships, commercial ventures, and

clinical operations, joining with industry innovators to form and support businesses focused on developing breakthrough technologies and delivering advanced patient care. A number of the technologies ICSD has advanced have emerged from intellectual property created by Pitt faculty members. For example, the ICSD Office of Strategic Business Initiatives (SBI) created a wholly owned subsidiary of UPMC, SimMedical, in collaboration with the University of Pittsburgh's Peter M. Winter Institute for Simulation Education and Research (WISER). SimMedical provides expertise in the creation and management of integrated health-care simulation training programs, featuring curricula and a web-based simulation management system developed by leading health-care and simulation experts. Another innovation developed by University faculty/UPMC physicians is ImPACT, a user-friendly Windows-based testing program designed for the diagnosis and management of sports-related concussions. ImPACT, currently the most widely used computerized concussion treatment program in the world, is used by athletes from grade school to the professional level.

Omnyx, jointly created by GE and UPMC, is a digital pathology company based on University- and UPMC-derived technologies that aim to transform diagnostic processes that traditionally have relied on outdated manual methodologies. Omnyx's first product, a four-slide scanner and associated software, was commercially released in Europe in 2013. University of Pittsburgh School of Medicine faculty have worked with Revivacor Inc., a former ICSD investment, in testing and validating xenotransplantation. Revivacor is a regenerative medicine company focused on applying leading-edge animal biotechnology platforms to provide superior quality, high-volume, human-compatible, alternative tissue sources for treatment of human degenerative diseases. Revivacor was formed in 2003 as a spin-out of PPL Therapeutics, the company that produced the first cloned animal "Dolly the sheep." ICSD funded the company from its inception until its sale in 2011.

RheoGene, a gene therapy-related investment of ICSD and a Pennsylvania-based company, established a number of gene- and cell-therapy collaborations with researchers and clinicians at UPMC's McGowan Institute for Regenerative Medicine, the University of Pittsburgh Cancer Institute, and the University of Pittsburgh. It was later successfully merged with Intrexon, where its RheoSwitch Therapeutic System remains an integral piece of Intrexon's portfolio. Intrexon successfully completed an initial public offering in 2013.

ICSD and the University of Pittsburgh have also played critical roles in a Pittsburgh-based startup, BodyMedia. UPMC has provided funding since its inception in 2003, and the University of Pittsburgh has published several clinical trials using its technology platform as recently as July 2012. UPMC and the University of Pittsburgh remain actively involved in the company, which has experienced continued success over the past several years and is recognized as the market leader in body monitoring devices. BodyMedia was acquired by Jawbone Corporation in 2013.

Through its National Institutes of Health-funded Clinical and Translational Science Institute (CTSI), Pitt is working with UPMC to bolster participation in clinical research trials by developing an institutional registry of potential clinical trial participants. The Research Participant Registry is a database of individuals who are willing to participate in clinical research at the University of Pittsburgh and/or UPMC plus an ongoing list of current studies being conducted by Pitt/UPMC. The goals of the voluntary registry are to provide community members

and patients in the UPMC network opportunities to receive educational materials about clinical research and to get their permission to be contacted for study recruitment. Through the UPMC electronic health record, the registry matches patients who express interest in taking part in clinical studies with a list of current trials being conducted through the University and UPMC. The CTSI registry leverages not only UPMC's reach (more than 4.5 million outpatient visits and more than 220,000 inpatient admissions and observation cases a year) but also its investment of more than \$500 million in an interoperable, long-term electronic health record system. The Research Participant Registry is also available to patients who do not receive their care at a UPMC site, although these sites cannot provide the same level of electronic matching as UPMC sites. As of July 1, 2014, the registry had enrolled more than 70,380 people, including nearly 17,000 children.

In February 2014, CTSI partnered with the University's Office of the Provost and Innovation Institute to sponsor the first-ever Pitt Innovation Challenge (PInCh), a competition offering \$375,000 in awards to the most creative new ways to help people live healthier lives. Competitors were given just three months to field a team that included at least one Pitt faculty member and propose solutions to the question, "How do we empower individuals to take control of their own health outcomes?"

More than 90 teams submitted a video entry for the challenge. Twenty-nine teams were asked to provide a written description of their projects, and 10 finalists presented their ideas during a live, *Shark Tank*-style judging event held in May 2014. The Innovation Institute directed intellectual property management related to the competition.

Smartphone applications that will alert people with Parkinson's disease that it's time to take another dose of medicine and support smokers as they try to kick the habit, as well as a bioactive bandage designed to hasten the healing of diabetic skin ulcers were awarded top prizes of \$100,000 as the first PInCh winners.

Three additional teams of investigators received \$25,000 awards to help advance their plans to reduce hospital readmissions, monitor prescription drug adherence, and develop a text-based helpline for teens that focuses on sexual health issues.

Organizers were pleased by the large and diverse response and hope that the interdisciplinary teams that did not win—many of whom connected with each other because of PInCh—continue brewing innovations together.

In October 2013, the Sharing Partnership for Innovative Research in Translation (SPIRiT) Consortium invited investigators to submit their ideas for broad-based, high impact clinical and translational research projects that could be conducted across all six member institutions. Each provided \$50,000 to fund an award of up to \$300,000 for a project focusing on a common area of interest/expertise that cultivates each institution's individual strengths. In addition to the University of Pittsburgh's CTSI, the SPIRiT consortium includes Clinical and Translational Science Award sites at Johns Hopkins University, the University of Chicago, the University of Pennsylvania, Washington University, St. Louis, and Yale University.

One project was chosen to receive award funds and principal investigators were notified of its selection in February 2014. “Imaging and inflammatory biomarkers in anti-retroviral neuro-intensification” is a SPIRiT-wide collaboration that will attempt to elucidate mechanisms underlying human immunodeficiency virus (HIV)-associated neurocognitive disorders using imaging, blood biomarkers, and studies of anti-retroviral-based treatment strategies.

SPIRiT Consortium goals include promoting a sharing infrastructure for research data, tools, resources, and bio-specimens; establishing a network of scientists and supporting their collaborative research; and enabling inter-institutional collaborations among key CTSA functions such as career development, pilot funding, and regulatory support. In addition to its initial efforts focusing on informatics-based projects like tissue-banking and data sharing, SPIRiT provides opportunities for sites to share best practices, such as those related to education and training, research participant recruitment, and research management.

#### *Pitt-Carnegie Mellon University Collaborations*

The University of Pittsburgh and Carnegie Mellon University (CMU) collaborate on research and the development of licensable products resulting from that research. The two universities continue to improve and streamline data-sharing capabilities through the Pittsburgh Supercomputing Center (PSC). Established by Pitt, CMU, and the Westinghouse Electric Company in 1986, PSC houses some of the most powerful resources currently available for high-performance computing, communications, data handling, and data storage. At Pitt, next-generation DNA sequencing, proteomics, and other computing-intensive investigations related to congenital heart defects, cancer, infectious agents, and other diseases benefit greatly from this collaboration. Examples of Pitt-CMU collaborations include the Center for Excellence in Autism Research, the Center for the Neural Basis of Cognition, and the National Science Foundation-funded Quality of Life Technology Center.

The University of Pittsburgh School of Medicine’s clinical partner, UPMC (University of Pittsburgh Medical Center), also collaborates with CMU. As part of its mission to advance health care information technology, UPMC’s new Technology Development Center (TDC) has awarded grants worth \$550,000 to five innovative research projects at CMU. The proposals, covering such areas as chronic care management and streaming-data analytics, are part of TDC’s Healthcare Technology Innovation (HTI) grants. The \$1 million initiative has already attracted more than 25 proposals from cross-disciplinary research teams at CMU.

Several biomedical education programs are jointly administered by Pitt and CMU. In addition to the joint Pitt-CMU programs in computational and systems biology and molecular biophysics and structural biology, the collaboration includes the Medical Scientist Training Program (MSTP). MSTP was established in 1983 to offer exceptionally talented individuals the opportunity to undertake a physician-scientist training program tailored to their specific research interests. Funded partly by the National Institutes of Health (NIH), the MSTP serves as a bridge between the University of Pittsburgh School of Medicine and several graduate programs in basic sciences or engineering at either the University of Pittsburgh or Carnegie Mellon University. Interdisciplinary endeavors within and between Pitt and CMU have given rise to world-class facilities where MSTP students can pursue their research interests.

Another collaborative biomedical training program is the Multimodal Neuroimaging Training Program (MNTP), a short-term program of study within the Center for the Neural Basis of Cognition. The NIH-funded, joint Pitt-CMU program was developed so that neuroscience students and investigators can learn about and gain experience in the rapidly advancing *in vivo* imaging fields. The MNTP teaches underlying principles of current neuroimaging methods, as well as their inherent limitations, applications, and modeling for integrative research. Methodologies include structural magnetic resonance imaging (MRI), functional MRI, positron emission tomography, magnetoencephalography, and optical imaging. To fulfill these aims, MNTP has developed two programs: The Graduate Training Program in Neuroimaging, administered through the Center for the Neural Basis of Cognition (CNBC) Graduate Program, and the MNTP Summer Workshop.

### Pitt-RAND Collaboration

The RAND-University of Pittsburgh Health Institute (RUPHI) is a formal collaboration between RAND Health, a division of the RAND Corporation, and the University of Pittsburgh Schools of the Health Sciences. RUPHI's primary goal is to build a collaborative, interdisciplinary health services research enterprise focused on addressing important local and national health care problems. The collaboration encompasses shared activities in research, education, and training, with a particular focus on creating and broadening synergies in women's health, behavioral health, patient safety, translation of new knowledge into evidence-based practice, comparative effectiveness research, patient-centered outcomes research, and global health.

RUPHI staff currently includes 99 faculty from the University of Pittsburgh and 46 health researchers and staff from the RAND Pittsburgh office, including two faculty members with joint appointments at the University of Pittsburgh and RAND. To date, RAND and University of Pittsburgh investigators have conducted more than 50 collaborative research projects, supported by over \$126,000,000 in external funding.

Beginning in fall 2006, RUPHI instituted a pilot grant program designed to forge productive working relationships among junior and senior investigators at both RAND and the University of Pittsburgh that would lead to more substantial externally funded RUPHI grant applications. To date, RUPHI and its co-sponsors have issued 23 pilot grant awards ranging from \$25,000 to \$250,000 each in varied areas of research, including: translating research into practice (with Pitt's Clinical and Translational Science Institute [CTSI]), women's health (with Magee-Womens Research Institute), mental health (with Western Psychiatric Institute and Clinic), comparative effectiveness research (with CTSI), health disparities, health policy (with the University of Pittsburgh Health Policy Institute), and patient-centered outcomes research. Most Innovation Institute activities around innovation commercialization and entrepreneurship at Pitt focus on collaboration, both internally and externally.

Pitt's Innovation Institute, including OTM and OED, engage in collaborative activities that advance the development of research. During this program year, the following activities took place:

- Swanson School of Engineering—OTM/OED worked closely with the Swanson School of Engineering to support a number of initiatives driven by innovation commercialization and entrepreneurship. Among them: the Coulter Translational Partnership II program, a five-year

grant to fund collaborative translational research projects between engineers at the Swanson School and clinicians in the Schools of the Health Sciences, and the Center for Medical Innovation, which works hand-in-hand with the Coulter program to develop innovation/commercialization teams and educational programs to support those collaborators. OTM/OED also supported a student competition called the Pitt Health Innovation Case Competition this past year.

- MIT Enterprise Forum of Pittsburgh—OTM/OED continues to partner with this regional entrepreneurial education organization to educate Pitt faculty, staff, and students about technology-based entrepreneurship. OTM/OED also remains a sponsor and board member of the nonprofit.
- Pittsburgh Technology Council—The Innovation Institute has cosponsored several events with other regional partners during this past year. These events focused on promoting innovation/entrepreneurship in the region, coupled with Pittsburgh’s creative community.
- Local Economic Development Organizations—OTM/OED collaborated extensively with organizations like Innovation Works, the Pittsburgh Life Sciences Greenhouse, Idea Foundry, the Urban Redevelopment Authority, and others to provide a continuum of funding and advisory support for early-stage start-up companies coming out of the University of Pittsburgh.
- Carnegie Mellon University—OTM/OED have also worked extensively with Carnegie Mellon University to promote and support innovation commercialization collaborations, joint start-up ventures, and educational programs.
- Entrepreneur’s Growth Conference—Once again, OTM/OED supported this annual regional conference for local entrepreneurs with sponsorship support and an exhibit presence.