

University of Pennsylvania

Research Development Report

Reporting Period:

July 1, 2013 – June 30, 2014

Commercial Development of Research

With direct oversight of University of Pennsylvania's vast research enterprise, the Office of the Vice Provost for Research (VPR) is responsible for administering the University's commercial and economic development endeavours as they pertain to research. The VPR office oversees Penn's research award base and is an active participant in Penn's commercialization efforts; leading the Office of Research Services' efforts to obtain federal and corporate sponsored funding for University research projects that hold commercial potential; collaborating with other Schools and Centers to forge Penn-industry partnerships with corporations; and working with the Center for Technology Transfer (CTT) to strategically reinvest monies obtained from the University's intellectual property (IP).

The University of Pennsylvania's Center for Technology Transfer (CTT) promotes and supports Penn's core academic research enterprise by creating relationships with industry to develop, protect, transfer, and commercialize discoveries. CTT's goals are to:

- Commercialize Penn research discoveries for the public good;
- Promote economic growth by launching new ventures based on Penn technology;
- Reward, recruit, retain faculty and students;
- Forge closer ties to industry; and
- Generate income for research and education.

To accomplish these goals, CTT performed a wide variety of technology development and commercialization enterprise functions. The technology transfer process begins with discoveries made by faculty, some of which may be funded by the health research formula fund. CTT has implemented an ambitious triage program to quickly and thoroughly assess incoming discoveries and business development opportunities. Assessments were made on the basis of technical merit, commercial potential, and protectability. A patenting, marketing, and licensing strategy is identified which is deemed to be most effective in moving each technology to companies and investor for eventual commercialization. Penn used the services of qualified post doctoral fellows to assist in this process to assure timely management of Penn intellectual property. A proactive start-up program makes this avenue to the marketplace a viable choice for select technologies.

Research Licensing Agreements

The University of Pennsylvania's Patent and Tangible Research Property Policies and Procedures were amended effective January 1, 2005. This policy incorporates several changes that are intended to promote the effective commercialization of inventions developed at Penn. Notably, the distribution of licensing income has changed to funnel more licensing income centrally to the University, enabling the University to develop and expand its commercialization program. Likewise, changes have been incorporated that ensure the timely review of all inventions submitted to the University. The policy has also changed in several ways that more wholly involve investigators in the technology commercialization process. Inventors now are asked to identify prospective licensees, and to voice any concerns and identify any licensees that they believe are problematic based on their experiences and knowledge of the field. Additionally, the consulting policies have been made more flexible to foster growing relationships between investigators and industry that often lead to sponsored research and licensing relationships.

In 2010 the University completed a formal review and revision of the patent policy to better account for the sustainability of ongoing research commercialization endeavours. The new policy was placed into effect as in 2011.

Training Students and Health Professionals

The University of Pennsylvania is a world renowned biomedical education and research institution housing a nationally ranked School of Medicine and fully integrated health care system.

In keeping with the University's historic tradition of educational excellence, Penn continually strives to train the best and the brightest students in life sciences research of great import to the continued wellbeing of our society.

Penn's School of Medicine counts 47 departments, each of which has an established mandate with respect to education and training of students and health professionals. In addition, many complimentary departments in the University's Schools of Arts and Sciences, Dental Medicine, Engineering and Applied Sciences, Nursing, Social Policy and Practice, Veterinary Medicine are likewise charged, particularly as some of the more robust biomedical research and training calls upon more than one discipline.

Within the School of Medicine, Penn employees >1450 full-time faculty; >975 residents and fellows; and >725 post-doctoral fellows, all of whom are active participants in the University's research and training educational offerings.

Penn has >500 Ph.D. students enrolled in Biomedical Graduate Studies and matriculates >90 new Ph.D. students per year. The School of Medicine has >700 medical students with >150 new students enrolled in the last year. Approximately 160 students are enrolled in combined degree programs leading to an M.D. combined with a Ph.D., Master of Bioethics, Master of Science in Clinical Epidemiology (MSCE), Master of Public Health (MPH), or Master of Business Administration (MBA).

Presently there is >1,100,000 net sq. ft. (nsf) of dedicated research education and research training space within the School of Medicine. This space is augmented by dedicated space in Penn's other Schools.

Penn is committed to maintaining and building upon the University's biomedical research and training opportunities.

Commercial Research Development Training

CTT continues to be an active participant in educating the faculty about their technology transfer options at Penn through a proactive program to get to know members of each department within the University which might generate commercializable technology to:

- Explain to faculty CTT's role in the technology transfer process;
- Educate faculty on the mechanics of recognizing and reporting a potentially commercializable discovery;
- Explain the importance of keeping accurate lab notebooks; and
- Encourage faculty to disclose "early and often."

CTT continues to grow the undergraduate student entrepreneurial education Commercialization Acceleration Program (CAP), supported in part by a Commonwealth grant. The program, built in collaboration with the Wharton Small Business Development Center, engages undergraduate and graduate students in projects that facilitate licensing and or new company development based on Penn investigator discoveries.

The University is appreciative that the Commonwealth has been a partner to many of CTT's more innovative projects through the Keystone Innovation Grant program.

Outreach to Businesses Regarding Recent Research Developments

As in prior years, CTT participates in numerous technology development and commercialization trade associations, fairs, and shows where licensing opportunities are featured. As part of the VPR office, CTT proactively pursues corporate relationships and is heavily engaged in Penn's economic development efforts. The Vice Provost for Research and CTT office meet regularly with companies, government agencies, and research organizations to discuss possible collaborative research and commercialization projects with Penn.

VPR and CTT are committed to creating and strengthening the University's corporate contacts. Along with Drexel University and Ben Franklin Technology Partners of Southeastern Pennsylvania (BFTP), Penn's development of and participation in the Nanotechnology Institute with its associated corporate members is a primary example of this commitment.

Likewise, government relations continue to be strong, with regular communication between the VPR office and the Commonwealth as we seek new ways to collaborate. The University remains actively engaged with our partners in the University City Keystone Innovation Zone (UCKIZ)

and it has taken advantage of Commonwealth Innovation grants that will ultimately benefit not just Penn but also the Philadelphia region and beyond.

Research Development Collaboration

Continued Collaboration: Keystone Innovation Zones and Nanotechnology Commercialization Group (NCG)

The Keystone Innovation Zone (KIZ) program is a state initiative to build knowledge-based economies and cultivate entrepreneurship in the Commonwealth through fostering the appropriate networks within existing communities to shape and cultivate the pipeline of burgeoning innovators and new companies to benefit the Pennsylvania economy as it continues to progress. Companies and institutions located within the borders of each KIZ are offered technical assistance and investment programs, along with numerous economic incentives, when invited to be an integral part of each community. The University City KIZ is supported by myriad partners across industry, government, economic development, and academia, including Penn. The UCKIZ Executive Committee is comprised of Penn, Drexel University, University of the Sciences in Philadelphia, the University City Science Center, and BioAdvance.

Viewed as a “KIZ model” project by the Department of Community and Economic Development (DCED), the Nanotechnology Commercialization Group (NCG) is a unique research commercialization partnership between Penn, Drexel University and Ben Franklin Technology Partners of Southeastern Pennsylvania. The Energy Commercialization Institute (ECI), an energy group modelled after the NCG in partnership between Penn, Drexel and BFTP, is up and running and has shown success in awarding new promising energy-related research projects that have some measure of demonstrated commercial potential.

Continued Collaboration: The Biotechnology Greenhouse Corporation of Southeastern Pennsylvania d/b/a BioAdvance

The University of Pennsylvania has been an active partner and contributes significant support to BioAdvance’s regional mission as one of the Commonwealth of Pennsylvania’s three life sciences greenhouses. BioAdvance was founded to accelerate the growth of the life sciences industry in Southeastern Pennsylvania by transforming the region’s strengths in biomedical research and development into commercial opportunities. To this end, BioAdvance formed the Greenhouse Fund to provide nearly \$30 million in post-grant, pre-seed funding to develop technologies from local research institutions and life sciences companies. Penn is also involved with BioAdvance’s regional bioinformatics alliance—the Greater Philadelphia Bioinformatics skills. Penn co-chairs the Alliance along with Drexel University. Finally, Penn is an active participant and a major investor in BioAdvanceVentures, a \$28m Venture Capital fund aimed at spurring life sciences business growth.