

# The Wistar Institute of Anatomy and Biology

## Research Development Report

### Reporting Period:

July 1, 2009 - June 30, 2010

### Commercial Development of Research

Wistar has established procedures for the commercial development of new technology from Wistar research. These procedures were originally implemented in the 1980's and are regularly updated. The procedures and the supporting documents (e.g., sample license agreements) are summarized as follows:

- Wistar scientists are encouraged to disclose new inventions to the Office of Business Development, using the Wistar Invention Disclosure Form. Additionally, the Executive Director and Director of Business Development confer regularly with faculty and the President/CEO of The Wistar Institute to identify manuscripts in preparation that may contain new inventions with commercial potential.
- Inventions and related technologies are reviewed by the Office of Business Development and assessed for patentability and commercial potential. The Director of Business Development manages the preparation and prosecution of patent applications, which is performed by outside patent counsel. In addition, Wistar intellectual property includes proprietary biological materials which may be licensed exclusively or non-exclusively. The Wistar Material Transfer Agreement is used for materials with significant commercial potential; and the Uniform Biological Material Transfer Agreement (UBMTA), as approved by NIH, is used for transfer of other proprietary materials to academic collaborators.
- Once a new technology is identified as suitable for licensing and, when appropriate, the necessary patent applications have been filed, the technology is marketed to prospective licensees for commercial development. Technology is marketed via Wistar's web site ([http://www.wistar.org/tech\\_transfer/overview.html](http://www.wistar.org/tech_transfer/overview.html)), on which Technology Transfer is prominently displayed on the home page; via presentations at regional and national meetings; and via one-on-one meetings with prospective licensees. The Office of Business Development hosts visitors from biotechnology and pharmaceutical companies and investment firms who come to Wistar to meet our faculty and learn of research that may be of interest to their company for sponsored research support, licensing or startup.
- Once prospective partners are identified, the Office of Business Development, in conjunction with in-house counsel, negotiates sponsored research agreements, option agreements or license agreements. Depending on the technology and its applications, these license agreements may be exclusive or non-exclusive.

Wistar has a long history of successfully commercializing the results of its research. Today Wistar has 138 active licenses in a portfolio of technologies that includes research tools, vaccines, monoclonal antibodies, and patents for therapeutic agents.

The Association of University Technology Managers (AUTM) annual licensing survey is used as the established benchmark for reporting of technology transfer activities.

The following table summarizes Wistar’s technology transfer activities for 2009 versus 2008. Wistar continues to generate and file new patent applications jointly with other Pennsylvania institutions as the result of ongoing research collaborations funded by the Commonwealth, NIH and other institutions.

	<b>2009</b>	<b>2008</b>
<b>R&amp;D Spending</b>	\$56,190,000	\$50,357,000
<b>Invention Disclosures</b>	9	11
<b>New Patent Applications</b>	10	14
<b>Joint New Patent Applications with PA Institutions</b>	1	6
<b>Issued Patents</b>	6	5
<b>New License Agreements</b>	13	25
<b>License Revenues</b>	\$9,190,000 <sup>a</sup>	\$12,693,000
<b>New Corporate Sponsored Research Agreements</b>	2 <sup>b</sup>	5

<sup>a</sup> Decrease from 2008 to 2009 due to reduction in royalty from one product, rotavirus vaccine, where sales decreased due to competing products on the US market.

<sup>b</sup> 4 existing Corporate Sponsored Research Agreements were extended or amended to increase amount of funding

Wistar uses two strategies, training and relationship development, to ensure that we continue to meet best practice standards. Members of the Office of Business Development regularly attend meetings of AUTM, LES, BIO and other professional organizations, where they have the opportunity to learn what new initiatives are being implemented at peer institutions and what initiatives have and have not been successful. Additionally, we make a concerted effort to build relationships with both peer institutions and prospective licensees to enhance commercialization opportunities. For example, the Business Development staff meets regularly with peers at other regional institutions to compare best practices and discuss common problems and challenges. Additionally, the Director of Business Development sits on the Investment Advisory Committee of the Ben Franklin Partnership of Southeastern Pennsylvania, where in conjunction with members of the local venture community, she helps decide which early stage biotechnology companies will receive Ben Franklin funding. This service promotes very close ties with members of the local venture community. Wistar has representatives of venture capital firms on its Board of Directors and the chairman of the Intellectual Property Committee is a partner of Novitas Capital. This committee advises the Business Development office on how to improve communications with our industrial partners.

*Recent Programs to Advance Commercialization of Research:*

- Establishment of the Center for Chemical Biology and Translational Medicine (CCBTM). In May 2009, The Wistar Institute and University of the Sciences in Philadelphia established the Center for Chemical Biology and Translational Medicine (CCBTM). The CCBTM combines Wistar's strengths in basic biomedical research with University of the Sciences' expertise in medicinal chemistry and pharmacology. The CCBTM is lead by Wistar scientist Paul M. Lieberman, PhD, an expert in gene expression and regulation; additionally he is the McNeil Professor of Molecular Medicine and Translational Research. This partnership between two Pennsylvania institutions, The Wistar Institute and the University of the Sciences will enable more rapid translation of basic science discoveries into compounds with potential for refinement into new medicines and therapies for patients.
- Collaborations with Wharton Students. In 2009, the Office of Business Development at Wistar began collaborating with the Wharton School of Business at the University of Pennsylvania. Under this collaboration, Wharton students have completed two research projects to determine the market size and competitive landscape for a joint Wistar-Penn technology for the screening and monitoring of patients at risk for lung cancer.
- Establishment of the Melanoma Research Center. On May 27, 2010, The Wistar Institute announced the creation of The Wistar Institute Melanoma Research Center. The Center brings together scientists, physicians, the life sciences industry, and melanoma advocates in saving lives by advancing new and better therapies for this deadly disease. The goal of this Center is to take a comprehensive look at the nature of melanoma and plan out exactly the steps needed to take to develop new methods of detection, prevention and therapy. The Melanoma Research Center will focus on multiple translational research programs for the detection and treatment of melanoma, including:
  - **Melanoma Pathways:** All cells, cancerous or not, function through complex networks where genes and proteins relate to each other, either through direct contact or chemical signals. These pathways can be a factor in driving – or stopping – melanoma. Researchers believe that combination therapies, where multiple genes are targeted at once, may be the best bet for preventing drug resistance in melanoma.
  - **Melanoma Biomarkers:** The Center also seeks to determine the biological fingerprints – called biomarkers – which clinicians can use to categorize specific melanoma tumor types through either blood test or biopsy. These biomarkers will allow doctors to better diagnose patients and chart their course of treatment.
  - **Biological Basis for Melanoma Prevention:** Although Americans tend to spend less time in the sun today than our most recent generations of ancestors did, we are more likely to suffer from the effects of ultraviolet light, which can account for rising melanoma rates. If properly studied, the molecular changes in skin cells behind this phenomenon could one day be applied to preventing melanoma.

- High Throughput Screening. This facility includes a small molecule screening facility equipped with robotic liquid handling equipment and a multi-functional detector capable of using 96- and 384-well formats. The facility has performed multiple screens for Wistar investigators using both public compound libraries and a proprietary compound library obtained through the Lankenau Institute and the regional Chemical Genomics Alliance.

### **Research Licensing Agreements**

Wistar has developed standard licensing agreements which were provided to the Commonwealth as part of our application for Health Research Formula Funds. The standard agreements include a Material Transfer Agreement, Exclusive License Agreement, and a Non-exclusive License Agreement

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

Wistar has affiliations with several postsecondary schools to train students in the biomedical field, and is committed to increasing and broadening these relationships in the future. Wistar's charter, dating from 1893, mandates that it provide training to students in the medical sciences; however, because it is not authorized to grant degrees, Wistar has long collaborated with area colleges and universities to fulfill this obligation, helping to develop courses and provide training to their enrollees. A summary of these programs is provided below:

#### *Post-doctoral Training Program*

Wistar conducts a post-doctoral training program for individuals who have received a PhD, MD or DVM degree from another institution. These post-doctoral fellows work in individual laboratories at Wistar for periods of up to four years. In addition to gaining research experience, trainees attend seminars and courses at Wistar and the University of Pennsylvania, participate in symposia and journal clubs and contribute to laboratory and scientific meetings. There are currently 58 post-doctoral trainees participating in these programs. Historically, many of the MDs serving as fellows at Wistar have been affiliated with and supported by the Children's Hospital of Philadelphia and the University of Pennsylvania. Currently, there are 21 visiting scientists.

#### *Pre-doctoral Training Program*

Through formal agreement with the University of Pennsylvania, Wistar provides training to students enrolled in doctoral programs in immunology, cell and molecular biology, pharmacology, neuroscience, chemistry and biology at the university. During the first two years of their graduate education, these students primarily take courses at the university. Wistar researchers participate actively in the university curriculum committees responsible for developing these courses, and frequently serve as course instructors. Wistar also offers a course on cancer biology each fall, which graduate students may take for credit at the university.

At the end of their first two years, approximately six to ten graduate students annually elect to pursue their training in an individual Wistar laboratory. Currently, there are 13 pre-doctoral

trainees participating in these programs. This training culminates in the writing and defense of a dissertation. Typically, the head of the student's laboratory at Wistar serves as his or her dissertation advisor. Most students require approximately three years to successfully complete their dissertations, at which time they are awarded a PhD by the University of Pennsylvania.

### *Biomedical Technician Training (BTT) Program*

Wistar and the Community College of Philadelphia (CCP) jointly established the BTT Program in 2000 to train community college students for new careers as biomedical research technicians. Students accepted into the program take courses at CCP designed to give them fundamental knowledge of chemistry, biology, mathematics and English composition. The students receive intensive training in laboratory techniques and develop their practical skills at Wistar and other BTT Program-affiliated biomedical institutes. This dual experience of academic and practical training offers students seeking an associate's degree the opportunity to acquire the skills necessary to qualify for positions as research assistants (technicians) at academic institutions and at biotechnology and pharmaceutical companies. Traditionally, these positions have gone to graduates of four-year baccalaureate programs.

Upon successful completion of the program, students receive an associate's degree from CCP and a certificate from Wistar. To date, all of the students who have completed the program have found employment as technicians or have elected to continue their studies in a baccalaureate degree program. During this reporting period, 32 students participated in the program.

### **Commercial Research Development Training**

Detailed information on the patenting and licensing process is available to our scientists on Wistar's web site at ([http://www.wistar.org/tech\\_transfer/guidelines.htm](http://www.wistar.org/tech_transfer/guidelines.htm)). Technology Transfer has a section on the web site entitled, "Guidelines for Inventors". This section contains detailed information on the technology commercialization process, including:

- The Office of Business Development and the Inventor: Roles in Technology Transfer.
- What is a Patentable Invention?
- How to Disclose an Invention
- Patent and Licensing Process
- Transfers of Biological Materials

The Executive Director and Director of Business Development meet with all new inventors to introduce them to the patenting and licensing process when the Invention Disclosure form is filed. After a licensable technology has been identified, the Office of Business Development works closely with the inventor/scientist in identifying prospective licensees and refining the licensing strategy.

Wistar faculty members have the opportunity to take business courses at the Wharton School of Business of the University of Pennsylvania and other area business schools. The tuition for these courses is reimbursed by Wistar.

Wistar scientists are notified of area meetings of organizations that address commercialization of technology, such as the Entrepreneur's Forum, KIZ meetings, Technology Council, and the Pennsylvania Biotechnology Association. In addition, Wistar is an active member of many of these organizations.

In order to increase awareness and understanding of the commercialization process among scientists, the Office of Business Development instituted a new seminar series. Invited speakers include representatives of the biotech and pharmaceutical industry, venture capital firms, and patent law firms including industrial scientists and entrepreneurs. The Office of Business Development at Wistar has also established an internal newsletter for its faculty and scientific staff. In it we highlight visits of the industry representatives, news from the industry that are relevant to research activities at Wistar, as well as newsletters featuring major companies and their internal research that are relevant to Wistar.

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

Wistar's ongoing outreach programs include:

- Providing summaries of Wistar technologies available for licensing on Wistar web site ([http://www.wistar.org/tech\\_transfer/overview.html](http://www.wistar.org/tech_transfer/overview.html)).
- Preparing information packages on Wistar research which are regularly distributed to potential licensees identified at meetings such as the AUTM, Licensing Executives Society, BIO, etc.
- Providing marketing summaries of Wistar technologies to prospects identified from Business Development databases.
- Working with Wharton students who are seeking new partners for Wistar technologies overseas.
- Nurturing ongoing relationships with members of the local venture and biotech communities through participation in the Ben Franklin Partnership Investment Advisory Board, BioAdvance, the Pennsylvania Biotech Association and related economic development organizations.
- Participation in poster sessions at national and local biotechnology meetings; these posters showcase Wistar technologies for licensing.
- Hosting corporate R&D and venture capital groups at Wistar to enable them to meet with interested faculty with the goal of developing research collaborations.
- Encouraging Wistar scientists to publish their findings in peer reviewed scientific journals. These publications often attract the attention of scientists from prospective licensees who then contact the Office of Business Development or the scientists themselves about licensing opportunities.
- Working closely with Wistar's Communications department which prepares and distributes press releases of significant developments and publications arising from Wistar research. These press releases often result in articles in business publications

(e.g., *BioWorld Today*) that are read by prospective licensees at biotechnology and pharmaceutical companies.

- Participating regularly in local forums that provide opportunities to meet with prospective licensees, such as Ben Franklin Technology Partners of SE Pennsylvania, PA Biotech Association, and the local Technology Council.
- Working with local groups, including BioAdvance, the Science Center and the Greater Philadelphia Chamber of Commerce, to establish new programs and projects to advance early stage technology to the point where it will be attractive for licensing and commercialization.

### **Research Development Collaboration**

Wistar has a long history of collaborating with researchers at other institutes and universities in the region, and we expect this practice to continue. When new intellectual property develops from these collaborations, Wistar and the collaborating organization(s) enter into an inter-institutional agreement that covers the management of patents and licensing of technology.

Wistar, a leader in establishing and maintaining the Pennsylvania Cancer Alliance, seeks opportunities for the cancer institutes in Pennsylvania to collaborate on joint grants, research programs, and other development projects. Additionally, Wistar is an active member of the statewide Pennsylvania Cancer Alliance Bioinformatics Consortium (PCABC) and the regional Greater Philadelphia Bioinformatics Alliance (GPBA) that was organized by BioAdvance. Wistar's President and CEO is on the Board of BioAdvance and the University City Science Center. Most recently, Wistar established the Center for Chemical Biology and Translational Medicine (CCBTM) in partnership with the University of Sciences in Philadelphia.

Wistar has active research collaborations with the following Pennsylvania institutions:

- Cheney University
- Children's Hospital of Philadelphia
- Drexel University
- Philadelphia FIGHT
- Temple University
- University of Pennsylvania
- University of the Sciences in Philadelphia