

Thomas Jefferson University

Research Development Report

Reporting Period:

July 1, 2010 - June 30, 2011

Commercial Development of Research

The Office of Technology Transfer and Business Development (OTT) was implemented in 1984. Within this Office, Thomas Jefferson University (TJU) has established procedures for the commercial development of new technology from Jefferson research.

- TJU facilitates patent protection and proceeds with systematic marketing efforts to identify potential licensees where the research results have commercial value.
- TJU has actively promoted commercialization of its technologies since OTT was implemented.
- The OTT has actively engaged in networking with regional pharmaceutical industries and local state funded economic development agencies, to promote partnerships to help further TJU's research results. In the current funding period, OTT invited representatives from the local state-funded economic development agencies to faculty outreach events. Several technologies were evaluated by the Science Center, a Southeast Pennsylvania economic development agency, for its early stage quod erat demonstrandum (QED) proof-of-concept gap funding program. Five TJU faculty submitted proposals. One group, developing an early detection blood test for pancreatic cancer, revised and resubmitted a previous, unfunded proposal to the program after obtaining additional data with funding from a state technology development grant to OTT. Their proposal has been selected as one of 10 semi-finalists out of 48 submissions. The investigators will work with a business advisor appointed by the Science Center to develop a plan for further development and commercialization for the technology. While the remaining three proposals did not advance to the full application stage, the faculty members will receive valuable feedback from the review committee, so that they can revise and resubmit proposals in future funding rounds.
- The OTT aggressively markets TJU's research results in a systematic fashion coupled with flexible license arrangements.
- The flexible license arrangements provide incentives to TJU's external commercial partners that desire to commercialize TJU's research results.
- In the current funding period, OTT has conducted 53 outreach events, including networking opportunities, business meetings on TJU technologies, and formal training presentations for TJU employees. The training presentations, to research departments as well as to individual faculty members, educated TJU researcher participants about technology transfer and marketing processes, technology development funding opportunities, and licensing deal structures. The general audience presentations also involved speakers from industry sectors and patent attorneys.
- Small group sessions were held to address specific technology transfer related issues.

Based on the available AUTM FY2010 information, the results for Thomas Jefferson University are:

- \$99,193,267 in total federal and industrial research funding
- \$949,972 in gross license income
- 13 licenses or options were executed on a total of 13 TJU technologies.
- 53 active licenses or options yielding license income
- 12 start-up companies were still active.
- With 57 new disclosures received, 11 provisional patent applications were filed (19%) and 33 US applications were filed. One invention disclosure cited funding from the PA Department of Health.
- 10 US patents issued

Research Licensing Agreements

Thomas Jefferson University uses Exclusive and Non-Exclusive licensing agreements that were developed prior to June 30, 2004. The agreements are for use in the licensing of research results related to medical devices, drugs or other research discoveries. Copies of these agreements were previously submitted to the Commonwealth.

Training Students and Health Professionals

In addition to Thomas Jefferson University Hospital and Methodist Hospital, Jefferson's Medical College is affiliated with a wide range of academic medical centers in northeastern, southeastern, central and western Pennsylvania at which we educate our medical students. These institutions provide core undergraduate rotations for third year medical students and elective and subspecialty clerkships for fourth year medical students. These institutions include:

- ◆ Abington Hospital, Abington, PA
 - ◆ Albert Einstein Medical Center, Philadelphia, PA
 - ◆ Aria Health, Philadelphia, PA
 - ◆ Bryn Mawr Hospital, Bryn Mawr, PA
 - ◆ Crozier-Keystone Health System, Chester, PA
 - ◆ Excelsa Health Latrobe Hospital, Latrobe, PA
 - ◆ Lankenau Hospital, Wynnewood, PA
 - ◆ Magee Rehabilitation Hospital, Philadelphia, PA
 - ◆ Paoli Hospital, Paoli, PA
 - ◆ Reading Hospital, Reading, PA
 - ◆ Wills Eye Institute, Philadelphia, PA
 - ◆ York Hospital, York, PA
- The Affiliations Committee met as part of the two day Affiliations Day program with representation from all of the affiliates. The eleventh Annual Curriculum Retreat was held in May 2011.
 - During this academic year, the Division of Graduate Medical Education (GME) continued in its mission to provide oversight, guidance, and support to all GME programs at Jefferson and

the affiliates for which the Hospital is the sponsoring institution. Residents rotate to a number of affiliated hospitals for their specialty-specific core and subspecialty graduate programs. The affiliated hospitals for GME include:

- ◇ Albert Einstein Medical Center, Philadelphia, PA
- ◇ Bryn Mawr Hospital, Bryn Mawr, PA
- ◇ Children’s Hospital, Philadelphia, PA
- ◇ Frankford-Torresdale Hospital, Philadelphia, PA
- ◇ Lankenau Hospital, Wynnewood, PA
- ◇ Magee Rehabilitation Hospital, Philadelphia, PA
- ◇ Moss Rehabilitation Hospital, Philadelphia, PA
- ◇ Reading Hospital, Reading, PA
- ◇ Wills Eye Hospital, Philadelphia, PA

The ACGME Outcome Project and the implementation of competency-based education in all GME programs are fully implemented into all GME programs within the institution. Over the past year, continued institution-wide educational forums, assistance in outcomes-based curriculum development, pilot programs for the development of new resident evaluation instruments, and individualized consultations have occurred.

Jefferson sponsored over 120 CME certified activities in this last year. In FY 10 (latest completed data), Jefferson OCME designated these activities for 2077 *AMA PRA Category 1 credits*. These activities involved 23,763 participants.

- JMC has in place a patient encounter log system (PELS) for tracking core educational requirements during clinical clerkships. Counselling for smoking prevention and cessation are core requirements in three clerkships. These data were reported for the 2009-10 academic year. Compliance with this requirement is high.

Clerkship	Number of Students Reporting	% Students Reporting Counseling for Smoking Prevention/Cessation for 3 or more patients
Internal Medicine	257	77
Family Medicine	246	90
Pediatrics	248	82

- Abigail Kay MD (Department of Psychiatry and Human Behavior) continues to teach a large group session for all first year medical students, during the Introduction to Clinical Medicine course, on the physiology, impact and treatment of tobacco addiction that includes evaluation for readiness for smoking cessation. There are also a total of six lectures in the required second year class: Foundations in Clinical Medicine, that address tobacco-related pulmonary injury (three) and smoking and tobacco cessation (three).

Commercial Research Development Training

Jefferson’s Office of Technology Transfer (OTT) conducts numerous outreach training programs throughout the year to educate the faculty, new employees, and research staff about OTT’s

services and procedures for licensing the university's research results. In the past year, OTT hosted 8 events for the TJU research community on intellectual property and patenting topics, technology transfer activities and services, and industry partnering opportunities. OTT also visited individual departments for small group presentations on the invention disclosure and commercialization process, confidential disclosure agreements and material transfer agreements.

Jefferson's OTT has also formed strong partnerships with the other universities in Philadelphia and with the many Commonwealth agencies and biotech and pharmaceutical companies that support our technology commercialization programs. In particular, under four Keystone Innovation Grants (KIGs) from the Commonwealth of PA, Jefferson's OTT has provided technology commercialization services and mentoring to the newly formed Office of Technology Management (OTM) and director at University of the Sciences in Philadelphia (USP) and to Cheyney University and Widener University. The mentoring and partnership programs provided research collaboration opportunities drawing on the unique expertise at each university.

OTT has also received a second Technology Development Grant of \$80K, through a PA Commonwealth Innovation Grant, to obtain additional supporting data for commercially promising research. The Technology Development Grant was split among four research projects: (i) an early detection assay for pancreatic cancer; (ii) a cell-free fluorescence based drug discovery assay for novel antibiotics targeting a bacteria-specific enzyme; (iii) validating a new, selective radioprotection indication for a neurotherapeutic compound; (iv) design and synthesis of novel formulations of a prostate cancer therapeutic lead compound. The Technology Development Grant funding enabled the investigators to obtain additional preliminary data. Each faculty investigator then used the data to submit a proposal to the regional economic development agency, Science Center, QED proof-of-concept funding program. Two of the proposals have been selected as top ten finalists from 48 regional university submissions.

The top ten will be assigned a business advisor to guide and assist in preparing a full application and business plan, and three projects will receive \$200,000 development awards—with \$100,000 provided by the Science Center and \$100,000 matched by the awardee universities. In June 2011, OTT submitted a proposal to the Department of Commerce for a University Center competition for regional economic development, including \$110K for Mini Grants to support additional research projects with commercial potential. The awards will be announced in Fall 2011.

OTT continues its practice to understand and meet the needs and concerns of faculty members in order to enhance technology transfer services. The internal outreach efforts, including a Savvy Innovators seminar series on intellectual property and commercialization topics, continue to strengthen the working relationship between OTT and faculty members. A strong relationship between faculty members and OTT increases awareness and fosters interest in technology transfer among Jefferson researchers.

Outreach to Businesses Regarding Recent Research Developments

Dr. Nevalainen continues to receive requests from companies for a new prostate cancer cell line, following her publication describing the generation and characterization of the cell line. Several companies have also expressed interest in sponsored research projects in Dr. Nevalainen's laboratory.

OTT has facilitated a partnership with a regional medicinal chemistry start-up company for collaboration with faculty members on potential drug discovery and screening projects. One research collaboration has led to a proposal to the Science Center QED proof-of-concept program and a potential SBIR/STTR proposal.

Research Development Collaboration

Jefferson's faculty members are routinely engaged in collaborative research projects with investigators at other research centers or institutes both within the Commonwealth and around the country. Recent collaborations identified by our researchers receiving support from the Pennsylvania Health Research Formula Funds include the following:

Hallgeir Rui, MD, Ph.D. published novel findings in the Journal of Clinical Oncology entitled "Loss of Nuclear Localized and Tyrosine Phosphorylated Stat5 in Breast Cancer Predicts Poor Clinical Outcome and Increased Risk of Antiestrogen Therapy Failure." This work resulted from his collaborations outside of Thomas Jefferson University from the following Pennsylvania institutions:

Albert J. Kovatich - MDR Global Systems, LLC, Windber, Pennsylvania

Other institutions contributing to this work from around the world include: Alexander C. Klimowicz and Anthony M. Magliocco - Department of Oncology, Tom Baker Cancer Centre, Alberta Cancer Board, Alberta, Canada; Jeffrey A. Hooke and Craig Shriver of the Walter Reed Army Medical Center, Washington, DC; Guido Sauter - Department of Pathology, University Medical Center Hamburg-Eppendorf, Hamburg, Germany; and David L. Rimm - Department of Pathology, Yale University School of Medicine, New Haven, Connecticut.