

**Office of Technology Transfer  
and Economic Development**

**Report to the  
Hawai'i State Legislature**

**November 30, 2003**

**Manoa Innovation Center  
2800 Woodlawn Drive  
Honolulu, Hawai'i 96822  
University of Hawai'i**



## Preface

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This report was produced by the Office of Technology Transfer and Economic Development (OTTED) of the University of Hawai'i in accordance with the provisions of Section 304-8.92, Subsection (b), Hawai'i Revised Statutes.

Funding for the establishment of a technology transfer and economic development program at the University of Hawai'i was authorized by the 1988 Legislature as part of the Governor's supplemental budget request. In addition, the Legislature approved the establishment of the Discoveries and Inventions Revolving Fund (Act 40, SLH 1988) to provide the University with a funding mechanism "to develop technologies that have potential commercial value, support the administration of technology transfer activities and facilitate economic development through education and research undertaken at the University." The Board of Regents formally approved the establishment of the Office of Technology Transfer and Economic Development in April 1989.

During the period of this Report those changes implemented in the past few years have begun to bear fruit, with increases in licensing activity and licensing revenue, improved communication with UH faculty and research staff, and more focused outreach to the State's business community. These successes have been achieved despite significant reductions in OTTED's budget; OTTED is a much leaner and more efficient organization. OTTED now reports to the University's Vice President of Research and, in close coordination with the Office of Research Services and University Connections, is working to help build the research enterprise at the University of Hawai'i.



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# Technology Transfer

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## Program Profile

The Office of Technology Transfer and Economic Development performs an essential, on-going service for the University of Hawai'i — identifying, evaluating, protecting, marketing, and commercializing valuable intellectual property owned by the University. The activities of the program are guided by UH Executive Policy E5.500, which sets forth the following objectives:

- To define, clarify and protect the rights and equities of inventors and authors, the University, governmental or private sponsors of research and the public in inventions and original works by providing for just and equitable recognition of the legitimate interests of each in such innovations.
- To encourage broad utilization of the results of University research and to provide a vehicle for the transfer of new technology and ideas from the University to the community at large, by permitting exploitation of research results—in the public interest and for the public benefit—while protecting the integrity of the academic process and the goal of public dissemination of research results.
- To stimulate innovative and creative scholarship, research and writing and its recognition, by facilitating, where appropriate, the receipt of fair economic rewards from such activities in the form of royalty payments to inventors and authors from licensees and publishers.
- To protect and benefit scholars and researchers in the University by encouraging recourse to the patenting and copyright process and by providing information and support on the procedures and problems involved.
- To encourage and assist scholars and researchers in identifying patentable discoveries; to require prompt and early reporting of such discoveries to the Patent and Copyright Committee; and to promote scholarly publication in a manner that does not prejudice the obtaining of a patent.
- To devise and promulgate clear and practical regulations, procedures and forms for reporting and disclosing original works and ensuring the timely prosecution of patent applications.
- To provide for the patenting and licensing of any invention or the registration and licensing of the copyright in any work, where appropriate, in cooperation with the Patent and Copyright Committee.
- To protect the rights of any government or other sponsor of research in any invention or work that may be generated and to ensure compliance with the other terms of research grants.
- To protect the rights of the University in inventions or other original works which result from the use of University funds or facilities by its faculty and other employees.

Previously, OTTED was realigned to focus more closely on commercializing University technology, and new standard operating procedures for marketing, licensing and patenting were developed and implemented. Those efforts are now paying off with increased licensing activity and decreased expenses. In addition to an increase in the number of licenses signed and increased licensing revenues, OTTED is contributing to the University's research programs by helping to attract industrial research sponsors interested in partnering with UH faculty in cutting edge research. OTTED has also introduced new programs to bring faculty, staff, and students together to foster interdisciplinary research opportunities, to encourage students to participate in the invention process, and to promote UH technologies and licensing opportunities to Hawai'i businesses.

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## **Program Objectives**

- Transfer University-developed technologies to industry in the public interest and for the public benefit.
- Work with faculty researchers, department chairs, deans and directors to identify promising new technologies developed at the University and encourage their participation in the technology commercialization effort.
- Market, promote, and license the University's inventory of intellectual property.
- Secure the rights to commercially viable discoveries and inventions.
- Negotiate and draft all appropriate contractual agreements related to technology transfer, including confidentiality agreements, materials transfer agreements, license option agreements, inter-institutional agreements for technologies co-developed and co-owned by other universities.
- Work with the Office of Research Services to negotiate and provide for appropriate intellectual property terms in industry-sponsored research agreements.
- Participate in efforts to assist faculty entrepreneurs in the creation of new companies to commercialize University-owned technologies.
- Conduct ongoing outreach efforts to inform faculty members on all campuses about TLG services and activities, and technology transfer and commercialization concepts, principles and procedures.
- Conduct ongoing outreach efforts to alert Hawai'i businesses and others about the research capabilities, programs, and technologies available at the University of Hawai'i.

## **Program Accomplishments**

The new technology assessment and licensing strategy that was developed and implemented by OTTED over the past few years is starting to pay off, as is evident from the results of the most recent fiscal year. That approach, which treats patents as economic tools, tends to discourage investments in patents that will not appreciably contribute to the licensability of a technology. Rather, the approach used by OTTED presently focuses on evaluating the true market potential of technologies before making significant investments in patents. To that end, OTTED is filing provisional patent applications on virtually all technologies disclosed by faculty to the Office, but is using the first year after filing to market technologies to potential licensees. Provisional patents, which can be filed for as little as \$80, and more selective patenting practices by OTTED's Licensing Associates have contributed to the 50% decrease in patent and legal expenses over the past 3 years.

Concurrent with the decrease in overall legal expenses, the level of licensing activity has increased. In FY2003, OTTED signed 33 license agreements. While this is a notable achievement, it must be pointed out that 15 of those licenses were to 5 taro growers in Hawai'i, who each licensed 3 different varieties of taro developed at the UH College of Tropical Agriculture and Human Resources.

Licensing revenues have also grown over the past couple of years, from less than \$200,000 3 years ago to more than \$500,000 in FY2003. However, OTTED is less focused on licensing revenues, which can fluctuate quite widely from year to year, and more focused on increasing the number of active licenses. Thus, OTTED has worked

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diligently to increase the number of active licenses, which has grown to more than 50 as of the end of FY2003.

### **Licensing and Other Agreements Executed**

#### **P&R LLC**

P&R LLC is a Hawai'i based company formed to help commercialize the technologies developed by Dr. Piera Sun related to producing virus-resistant shrimp. Dr. Sun's work has confirmed the ability to confer viral resistance to shrimp through her unique transgenic techniques. Viruses cause an estimated \$6 billion each year to the world wide shrimp market and so P&R was formed by local entrepreneurs to help advance the technology in Dr. Sun's laboratory and to move it into the commercial marketplace. As part of the license, UH will receive royalties and small equity share in the company and the company has pledged its support for up to \$1.5 million in research support.

#### **Pacific Carbon & Graphite, LLC**

Pacific Carbon & Graphite is also a Hawai'i company that has taken a license to another of UH's promising technologies. In this case, PC&G has obtained an exclusive license to exploit Dr. Michael Antal's flash carbonization technology in a restricted geographic territory on the U.S. mainland and within well-defined fields of us. Charcoal produced via Dr. Antal's technology, which permits the rapid carbonization of green waste, has a very high carbon content and has a number of market applications, including the production of charcoal for industrial purposes, as a soil amendment, for heating purposes, and for cooking. PC&G has also committed to the further development of Dr. Antal's technology via its participation in the Accelerated Research Commercialization program begun in FY2003 by University Connections.

#### **I-PHA Biopolymers**

I-PHA Biopolymers is a Hong Kong company that has received an exclusive territorial license to Dr. Jian Yu's method for producing biodegradable plastics from organic waste. Food wastes and other organic wastes are a major contributor to landfills worldwide. Dr. Yu's technology permits the extraction of organic polymers from such wastes and results in the production of biodegradable plastics commonly used in packaging materials. I-PHA Biopolymers, which has erected a demonstration unit at its site in Hong Kong, is also supporting Dr. Yu's further development and refinement of the technology.

#### **Other Agreements**

47 confidentiality agreements (incoming, outgoing, and mutual), 3 inter-institutional agreements, and 41 material transfer agreements, 1 memorandum of understanding, and 3 testing agreements were executed during the period of this report. These agreements protect the interests of the University in research collaborations and in the commercialization of UH intellectual property.

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## Program Activity Indicators and Measures of Effectiveness

### Program Activity Indicators

FY 2001-2002    FY 2002-2003

|                                    |    |    |
|------------------------------------|----|----|
| Invention Disclosures Received     | 34 | 26 |
| U.S. Patents Filed                 | 45 | 26 |
| U.S. Provisional Patents Filed     | 41 | 21 |
| U.S. Patents Issued                | 8  | 7  |
| License/Option Agreements Executed | 3  | 33 |

### Measures of Effectiveness

FY 2001-2002    FY 2002-2003

|   |           |           |
|---|-----------|-----------|
| Intellectual Property Held (Cumulative) | 160       | 180       |
| Active License/Option Agreements        | 53        | 83        |
| Gross License Income Received           | \$407,000 | \$521,851 |

# Economic Development

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## Program Profile

### Overall

The goal of the OTTED's economic development outreach activities is to help Hawai'i businesses and the community gain access to academic, technical, and research expertise at the University of Hawai'i. In cooperation with other State and local economic development organizations, OTTED helps Hawai'i businesses find R&D funding, research partners at UH, student interns, and technical experts.

## Program Objectives and Accomplishments

### Outreach Activities

OTTED's economic development outreach activities complement the licensing activities of the Office and focus on promoting UH research, discoveries and inventions, facilitating University-industry collaborations, and supporting University-based economic development. To meet these objectives, OTTED initiated several new activities in FY2003, including a UH Faculty Seminar Series called Ke Ka'ana 'Ike, The Sharing of Knowledge. Ke Ka'ana 'Ike lectures feature invited faculty who present an overview of their research, or hot topics in their area of research, and discuss the social and academic significance of such research. The brown bag seminars are held during 8 months of the year on the UH Manoa campus to bring individuals together for interdisciplinary interaction and to raise awareness of the notable achievements of faculty and their departments. Topics that have been covered include UH oceanographic research, support for Hawaii's travel industry, female juvenile justice, performance supplements, marine algae, mummy research, non-invasive sensor research, and new academic programs.

A second activity initiated by OTTED in FY2003 is the UH Technology Showcase Series where UH-developed technologies are presented to Hawaii companies, venture investors, and individuals interested in UH research. The event was created in response to interest expressed by these groups in learning about commercially-applicable UH research projects and opportunities for research collaborations with the University. Two showcase events were held during FY2003, and a third is planned for Fall 2003. At each event, selected UH researchers are invited to present their technologies, highlighting the commercial potential and explaining the advantages and benefits to users, in an effort to spark interest among companies and potential investors in establishing research partnerships, licensing arrangements, or in providing research funding support to help advance the technology.

The Technology Showcase Series is held semi-annually and technologies showcased to date include methods of producing biodegradable plastic from organic waste, solar-powered hydrogen production, biomedical imaging technology, transgenic shrimp production, biometric devices, unmanned underwater submersibles, and advanced hydrogen storage materials. The Showcase Series has already proven a great success; two spin-off companies have since been formed by faculty members seeking to commercialize the technologies they developed at the University, one technology has been licensed to a Hawai'i-based start-up company, and there are negotiations underway with Hawai'i and mainland companies interested in other technologies that were presented.

### Kaua'i Tropical Fruit Disinfestation Facility

The Kauai Tropical Fruit Disinfestation Facility was a State and federally funded project through that utilized UH-developed technology for the treatment and packing of papaya for

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export, to enhance and stimulate diversified agriculture and economic development on Kauai. OTTED administered the facility for several years until it fell into disuse following the dramatic slowdown in papaya production on Kauai in FY2001. However, in FY2003 the Hawaii State Legislature transferred management of the facility to the Hawaii Department of Agriculture to create a community kitchen.

# Financial Allocations

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## Discoveries and Inventions Revolving Fund Statement of Cash Balances, FY2002-03

|   |                 |                  |
|---|-----------------|------------------|
| Beginning cash balance, July 1, 2002                    |                 | \$919,362        |
| Income:   |                 |                  |
| Royalty revenues  | 521,851         |                  |
| Indirect overhead (sec. 304-8.92(a), HRS)               | <u>425,000</u>  |                  |
| Total Income:   |                 | \$946,851        |
| Expenses:   |                 |                  |
| Technology transfer program                             | 996,073         |                  |
| Royalty distributions to inventors                      | <u>248,093</u>  |                  |
| Subtotal Expenses:                                      | 1,244,166       |                  |
| Other Expenses:   |                 |                  |
| Prepayment to RCUH                                      | <u>(45,289)</u> |                  |
| Subtotal Other Expenses                                 | (45,289)        |                  |
| Total Expenses:   |                 | \$1,198,878      |
| Ending cash balance, June 30, 2003                      |                 | <u>\$667,335</u> |
| Outstanding obligations, June 30, 2003                  |                 |                  |
| Act 107 – UH Software Development and Marketing Program | 76,117          |                  |
| Reserve for vacation pay                                | <u>45,000</u>   |                  |
| Total obligated funds                                   |                 | \$121,117        |
| Working capital   |                 | <u>\$546,218</u> |