

University of Maryland, Baltimore

Technology

Annual Report 2004

Commercialization



TECHNOLOGY COMMERCIALIZATION AT THE UNIVERSITY OF MARYLAND, BALTIMORE

REPORT ON FY04 ACTIVITIES

The Office of Research and Development is charged with directing technology transfer activities at UMB -- managing intellectual property and advancing faculty inventions to the stage of market readiness. With an increasing base of extramural support for research, UMB faculty in both basic and clinical departments are making discovery an important part of their work. FY04 was a record year for UMB technology commercialization activity.

Fiscal Year 2004
70 inventions disclosed
38 patents issued
18 license agreements completed
10 option agreements completed

Intellectual Property: Disclosures

In FY04, **70 new inventions** were disclosed to ORD, a record number in any fiscal year, up from 63 in FY03. Of these, 58 originated in the School of Medicine, eight from faculty in the School of Pharmacy, two from Dental School faculty and one from the School of Nursing. The inventions for FY04 are mostly therapeutics in areas of great need including cancer and immune and inflammatory disease. The School of Social Work disclosed its first invention ever; Associate Professor, Dr. Diane Depanfilis' "Family Connections" evaluation tool was quickly licensed to a number of centers with child abuse prevention programs.

Defining a Decade - Technology Commercialization FY95 - 04

Invention disclosures: **592** Patents filed: **965**
 Patents issued: **176** Licenses and agreements: **122**

Scientific Review Committee

The Scientific Review Committee (SRC) assists ORD in evaluating and advancing the R&D aspects of UMB invention disclosures. In cooperation with the SRC, ORD assesses each disclosure for protectability, commercial potential, technical merit and commitment of resources for continued development of the invention. Fifty to sixty inventions per year are presented to the Committee by UMB inventors.

SRC Active Members (FY 2004)

Name	Title	Department or Center	School
Larry L. Augsburger, PhD	Professor	Pharmacy Practice and Science	Pharmacy
Renty B. Franklin, PhD	Professor	Oral and Craniofacial Biological Sciences	Dental
Alexander D. Mackerell, PhD	Associate Professor	Pharmaceutical Sciences	Pharmacy
John J. Sauk, DDS	Assistant Dean and Chair	Diagnostic Sciences and Pathology	Dental
Edward A. Sausville, MD	Associate Director	Clinical Research	Medicine
Stephanie Vogel, PhD	Professor	Microbiology and Immunology	Medicine
John W. Warren, MD	Professor	Division of Infectious Disease	Medicine

Protecting Intellectual Property

The patent portfolio at UMB is varied and abundant with 500 patents and patent applications pending. ORD is managing and marketing 142 issued patents and 403 pending patent applications. In FY04, **38 patents issued**, double the 18 issued in FY03, pushing the total number of issued patents on UMB technologies to 182. As of June 30, 2004, 130 patented technologies were available for licensing. Approximately 70% of UMB's patent portfolio is made up of patents issued in the last five years. This represents a significant foundation for marketing and new business development activities.

Despite increases in fees, UMB filed **104 new patent applications** during fiscal 2004 including applications for:

- 52 provisionals
- 20 U.S. utilities
- 20 Patent Cooperation Treaty (PCT)
- 8 foreign countries
- 3 copyrights
- 1 trademark.

For additional information, see Appendix A.

Mid-Atlantic Regional Center of Excellence for Bio-defense and Emerging Infectious Diseases (MARCE)

The Center for Vaccine Development leads a consortium of fifteen universities in developing public health tools to strengthen our nation's bioterrorism preparedness and ability to combat emerging infectious diseases. The management of the Center's intellectual property resulting from the special efforts, is being handled by ORD. Additionally, ORD manages the intellectual property policies and procedures for the consortium at large.

Marketing UMB's Inventions

Industry outreach is a critical activity in ORD. In FY04, active marketing efforts to 474 companies resulted in **1,845 company interactions**. ORD works to cultivate industry interest in the portfolio of technologies available for licensing, opportunities for industry sponsored research and the prospect of a collaborative operational presence in the UMB BioPark.

The portfolio of technologies available for licensing included **130 active technologies** as of June 30, 2004; 80% of these disclosures were developed by School of Medicine faculty. The portfolio includes mostly therapeutics with the remainder consisting of diagnostic tools, medical devices and research tools in equal proportions. Each technology represents a novel approach to an unmet patient need in the clinical setting.

Agreements in 2004

Positioning UMB technology across industry, a total of **28 agreements** including 18 license agreements and 10 options were executed in FY04 for UMB intellectual property. These agreements confer rights to intellectual property for commercial or research use. This is the highest level of activity in the history of the office, more than double the success from FY03. The licenses and options include both exclusive and non-exclusive agreements and cover **20 different technologies**.

Companies benefiting from UMB intellectual property assets range from big pharma's **Merck & Company** and **Novartis Pharma AG**, to Maryland-based **BBI Biotech** and **Gene Logic**. Through development at small start-ups as well as established companies, UMB's technologies are advancing to the marketplace. For example, the "multi-drug resistance protein" discovered by the Departments of Medicine and Pathology was licensed to Merck for drug screening research, adding to previous licenses with Pfizer and Pharmacia. The "Drug Concentration Optimizer" program, developed by Vinay Vaidya, MD, Department of Pediatrics was licensed to a number of hospitals via a simple "click-wrap" procedure, whereby licensees accessed a website and clicked a button to complete the license. Some additional highlights include:

UPM Pharmaceuticals, a company established out of the UMB School of Pharmacy in the early 1990s, has expanded its drug formulation assets with a license to the "Novel direct compression rapid-dispersion tablet technology" and the "Novel co-processing method for oral drug delivery". Both inventions were the result of a collaboration between Larry Augsburger, PhD, School of Pharmacy and UPM employees. These improved approaches to drug formulation enhance UPM's service offerings and complement UPM's drive to move into development of novel therapeutics. UPM has licensed several other UMB technologies.

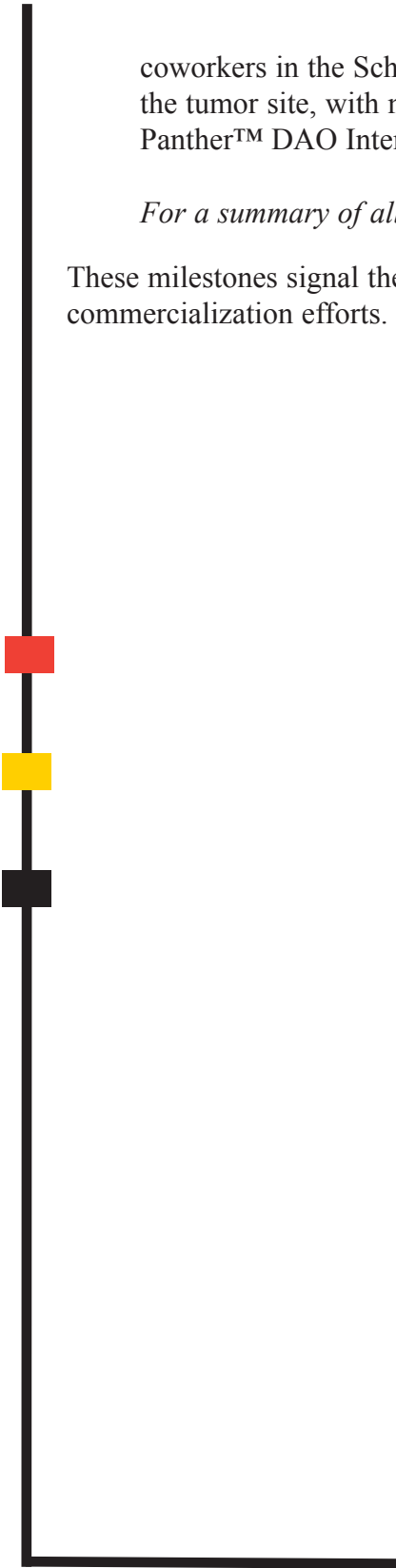
Seven non-profit organizations received licenses to "**Family Connections**", a novel instrument for intervention and prevention of child abuse in families at risk. Developed by Diane Depanfilis, PhD, School of Social Work, this technology is a computer-assisted interview for families at risk, complete with guidelines training social workers to deal with the subjects. The Department of Health and Human Services has singled out this instrument as demonstrated effective in preventing child abuse, and demand is high among social work organizations.

Prowess, an international provider of medical software products for radiation therapy, has exclusively licensed "Direct Aperture Optimization (DAO) for Radiation Therapy". This patented software algorithm, developed by Matthew Earl, PhD and

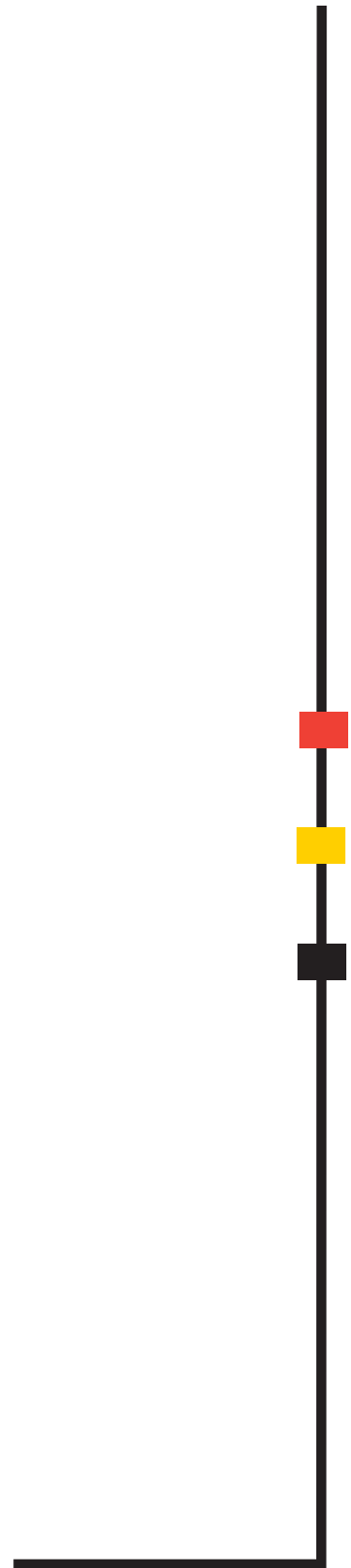
coworkers in the School of Medicine, allows radiation therapy to be focused strictly on the tumor site, with no overflow to healthy tissue. Prowess launched its Prowess Panther™ DAO Intensity Modulated Radiation Therapy in March 2004.

For a summary of all the licenses and agreements in FY04, see Appendix B.

These milestones signal the continued, significant growth and success of UMB's technology commercialization efforts.



Appendix



Appendix A - UMB Issued Patents: FY04

Title	Country of Issuance	UMB Inventor(s)	UMB School(s)	Departments
Pro-Gut Maturation and Anti-Inflammatory Effects of Lactobacillus and Lactobacillus Secreted Proteins, Carbohydrates, and Lipds	United States	Panigrahi	Medicine	Pediatrics
Environmental Health-Advocacy Module (copyright)	United States	Sattler, Afzal, Stair	Nursing	Behavioral & Community Health
Dosage Composition for Nasal Delivery and Method of Use the Same	Germany, Spain, France, United Kingdom, Italy	Fasano	Medicine	Pediatrics
Method for Introducing and Expressing Genes in Animal Cells, and Live Invasive Bacterial Vectors for Use in the Same	United States	Hone, Powell, Lewis	Medicine	Medicine
Plasmid Maintenance System for Antigen Delivery	United States	Galen	Medicine	Pediatrics
Bioactive Glass Compositions and Methods of Treatment Using Bioactive Glass	Hong Kong	Litkowski, Hack	Dentistry	Restorative Dentistry
Methods and Compositions for Whitening Teeth	China	Litkowski, Hack	Dentistry	Restorative Dentistry
Escherichia coli Secreted Protein B	United States	Kaper, Jarvis	Medicine	Microbiology & Immunology, Medicine
Vaccine Composition for Herpes Simplex Virus and Methods of Use	Austria	Aurelian	Medicine	Pharmacology & Experimental Therapeutics
Substantially Pure Zonulin, a Physiological Modulator of Mammalian Tight Junctions	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, Monaco, Netherlands, Portugal, Spain, Sweden, Switzerland, United Kingdom	Fasano	Medicine	Pediatrics
Engineered Proteins for Analyte Sensing	Australia	Lakowicz	Medicine	Biochemistry
Peptide Antagonists of Zonulin and Methods of Use of the Same	New Zealand, Russia, United States	Fasano	Medicine	Pediatrics
Method of Using Zot or Zonulin to Inhibit Lymphocyte Proliferation in an Antigen Specific Manner	Russia, United States	Fasano, Sztejn, Lu, Tanner	Medicine	Pediatrics, Medicine
Luminescence Spectral Properties of CdS Nanoparticles	United States	Lakowicz, Gryczynski, Gryczynski	Medicine	Biochemistry
Method of Identifying Bacterial Genes Incompatible with Bacterial Pathogenicity and the Use of Such Genes as cadA to Reduce Pathogenicity in a Bacteria or to Combat Pathogenic Bacterial Infections	Australia	Fasano	Medicine	Pediatrics

Appendix B - Profiles of Agreements Executed During FY04

Agreement Type	Company or Institution	UMB Inventor	Department and/or Center	Technology
License	Dartmouth College	Carraccio-Lentz	Pediatrics	Web-based evaluation for residency programs
License	JDA Medical Technologies, Inc.	Line, Van Echo, Kennedy, Ghandehari, Nan	Diagnostic Radiology	Instant radioactive microspheres for microarterial imaging and radiotherapy
License	Prowess, Inc.	Earl, Yu, Shepard	Radiation Oncology	Direct Aperture Optimization Algorithm for Radiation Therapy
License	Gene Logic, Inc.	McLenithan, Shuldiner	Endocrinology, Diabetes & Nutrition	Samples of gene discovery
License	Guided Delivery Systems, Inc.	Downing	Surgery	Minimally Invasive Diagnostic and Surgical Procedures Inside of a Beating Heart
License	RespiteCare of San Antonio, Inc.; Children's Institute International; Depelchin Children's Center; Black Family Development, Inc.; Special Services Group; Child & Family Tennessee; Youth Health Services	DePanfilis	Center for Families	Family Connections evaluation tool to prevent child abuse
License Option	UPM Pharmaceuticals, Inc.	Augsburger	Pharmaceutical Sciences	Novel drug formulations
License	Merck & Co.	Ross	Program in Oncology	Multi-drug resistance protein
License	Cyndi Reid from Children's Hospital of Michigan; Jared Cash from Primary Children's Medical Center; Michael Veltri from Johns Hopkins University; Paul Mialon, Children's Medical Center	Vaidya	Pediatrics	Concentration Optimizer algorithm to calculate pediatric drug doses
Option	BodyMedia, Inc.	Shuldiner	Medicine	Genetic markers predict response to exercise training
Option	Novartis	Carpenter Koenig	Psychiatry	Schizophrenia associated genes
Option	Naviscan PET Systems, Inc.	Mease	Diagnostic Radiology	Preparation of F-18 labeled annexin V for cancer radiotherapy
Option	BBi Biotech	Barletta	Pathology	Blood assay for prior proteins in bovine spongiform encephalopathy
Option	ZionPharma, LLC	Fasano	Pediatrics/CVD	Zonulin-related therapies for celiac disease and diabetes