

# In brief

## Economic Development



### ECONOMIC STIMULUS BILL PROVIDES FOR STRATEGIC S&T INVESTMENTS IN UMASS

To Friends of UMass:

During the 2006 legislative session, the Commonwealth approved over \$76 million of appropriations and capital authorizations for an exciting array of science and technology initiatives at UMass. This unprecedented level of S&T support will greatly strengthen the university's ability to carry out our economic development mission. For these investments and show of confidence in the university, I am truly grateful.

Three years ago, a far-sighted economic stimulus bill made a significant commitment to science and technology-based economic development. The early returns have been impressive.

UMass leveraged \$7 million in support to Amherst and Lowell from the John Adams Innovation Institute to win two new NSF-sponsored centers for nanotechnology manufacturing (\$30 million in federal funds). Amherst has developed a promising regional life science partnership with Baystate Medical Center in the Pioneer Valley. Dartmouth and Boston have begun to do the same for marine science with MIT and Woods Hole in the South Coast. And the new Massachusetts Technology Transfer Center has become a focal point for innovative efforts at promoting technology transfer across the state.

In this year's economic stimulus bill, state policymakers went even further with a series of strategic investments, with a special focus on the life sciences. Key UMass initiatives include:

**Massachusetts BioManufacturing Center** — \$21 million in appropriations and \$24 million in capital authorizations for Lowell and Dartmouth to develop, in partnership with the Massachusetts Biotechnology Council, a center to help grow biomanufacturing in the state.

**Integrated Sciences Building** — \$20 million capital authorization to Amherst for a major new science facility as part of the Pioneer Valley Life Sciences Initiative.

**Venture Development Center** — \$5 million to Boston to develop a new facility to house its growing array of S&T partnerships with industry and other research institutions.

**Biomedical Institute for Discovery** — \$2.5 million to Worcester to develop new life science initiatives, including a center for stem cell biology.

**Massachusetts Technology Transfer Center** — \$3 million expansion of successful statewide efforts to improve university-industry linkages and foster technology commercialization and entrepreneurship.

**Commonwealth Information Technology Initiative** — \$1 million continuation of an IT K-16 workforce initiative, led by Amherst and the Donahue Institute.

In my meetings with the major candidates for governor, I sensed a strong commitment to continuing and even expanding this kind of support for S&T generally and at UMass in particular. Given the intense competition Massachusetts faces from other nations and states, I am encouraged that the Commonwealth is steadily moving toward a more serious and sustained S&T-based economic development strategy.

I pledge that the University of Massachusetts will position itself as a strategic asset for the Commonwealth and will continue to work hard to provide the state with an outstanding return on its investments in us.

Sincerely,

Jack M. Wilson, President

#### In This Issue

Conducting World-class R&D 2

Technology Commercialization & Entrepreneurship 4

Developing the Future Workforce 6

Economic Analysis for the Commonwealth 7

Key Contacts 8



“Tsinghua University values the relationship with the University of Massachusetts and looks forward to the implementation of programs bringing benefit to both universities as well as to the local economies of Massachusetts and Hebei province.”

— **ZHENG YANKANG,**  
Vice Chair, Tsinghua  
University Council and  
President, Tsinghua  
Hebei Institute

#### **President Wilson Launches International S&T Programs in China**

Recognizing its emerging importance on the world’s stage, President Wilson has launched several initiatives to support enhanced economic, intellectual, and cultural ties with China. Earlier this year, UMass announced an agreement with China’s government to establish at the UMass Boston campus a Confucius Institute to promote Chinese language and culture. The institute will be the first in New England and only the sixth in the United States. The program was established in 2004 by the Chinese government. UMass has also initiated partnerships with Tsinghua University in Beijing and Wuhan University in the province of Hubei. Collaborations will emphasize science and technology programs of shared interest. Later this year, President Wilson will lead a delegation to China comprised of UMass officials and economic development leaders. The aim of the visit will be to strengthen existing relationships, build and develop new channels of communication, and open a UMass office in China.

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#### **Amherst Establishes MASS-CREST for Renewable Energy Research**

With support from the president’s S&T Initiatives Fund, Amherst professors Bryan Coughlin and S. “Thai” Thayumanavan are leading the development of the Center for Renewable Energy Science and Technology (MASS-CREST). The center brings together world-class expertise in soft materials, nano-

technology, and microbiology. Its mission is to develop renewable energy technologies and enhance the performance of devices in the fields of photovoltaics (solar cells), chemical fuel cells and batteries, and bio-mass-based fuels, such as ethanol. The campus, through MASS-CREST and other large-scale research programs in wind energy, microbial fuel cells, and energy efficiency, expects to play a prominent role in the Commonwealth’s effort to reduce the cost of energy, increase supply, and become a global center for the renewable energy technology industry.

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#### **Lowell Researchers Join Tissue Engineering Consortium**

Lowell faculty members Susan Braunhut and Kenneth Marx will receive \$1.2 million for a research program that is part of a Department of Defense-funded consortium to study tissue and limb regeneration and develop medical technologies to harness this capability in mammals. Led by the University of Pittsburgh medical school, the consortium combines work in stem cells, tissue engineering, and expertise in species, such as salamanders, that exhibit these capabilities. The group hopes to develop an understanding of the mechanisms and processes that enable regenerative growth in response to injury rather than the usual formation of scar tissue.

The Lowell team's focus is specifically on proteins called growth factors, compounds that accelerate healing and have potential commercial application as a "smart bandage" that promotes production of specific growth factors based on the type of wound being treated.

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## **UMass System Continues to Grow R&D Program**

UMass's research enterprise continues to grow, totaling nearly \$377 million in expenditures in FY 2005. This is an increase of \$22 million from the previous year and nearly 50% since 2001. A majority of funding (63%) comes from federal agencies — especially the National Science Foundation (NSF) and the National Institutes of Health (NIH) — and includes large, high-profile grants such as NSF nanoscience and engineering centers at Amherst and Lowell and a DOE-funded project in microbial fuel cells at Amherst. Life sciences research comprises nearly 60% of total expenditures and the UMass Medical School has led system growth over the past five years. UMass is the third-largest research university in the Commonwealth and fourth-largest in New England. Nationally, UMass ranks 35th overall and 21st among public institutions.

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## **UMass President's S&T Initiatives Fund 2006 Projects**

The President's S&T Initiatives Fund annually awards \$1 million to promote faculty research in fields important to Massachusetts. The following projects have been selected for support in 2006:

### **MASS-CREST: CENTER FOR RENEWABLE ENERGY S&T (AMHERST)**

Collaboration between chemistry and polymer science, focusing on innovations in renewable energy and the development of marketable technologies, processes, and devices

### **WIRELESS COMMUNICATIONS CENTER OF EXCELLENCE (AMHERST)**

University–industry collaborative center addressing the technical challenges of pervasive and ubiquitous wireless connectivity

### **CENTER FOR COASTAL ENVIRONMENTAL SENSING NETWORKS (BOSTON)**

Multidisciplinary collaboration to develop novel environmental sensors and networks which measure human and natural activity both on land and in water

### **BIOENGINEERING INITIATIVE (DARTMOUTH)**

Program to leverage campus expertise in materials and textiles for applications in cellular and tissue engineering and build partnerships in the life sciences

### **GREEN CHEMISTRY COLLABORATIVE FOR PHARMACEUTICALS (LOWELL)**

Research program to introduce green chemistry practices to pharmaceutical manufacturing to increase productivity and minimize environmental impacts

### **TRANSLATIONAL RESEARCH CENTER (WORCESTER)**

Support for campus initiative to take results of fundamental research and move them more rapidly to the development of new drugs and medical devices

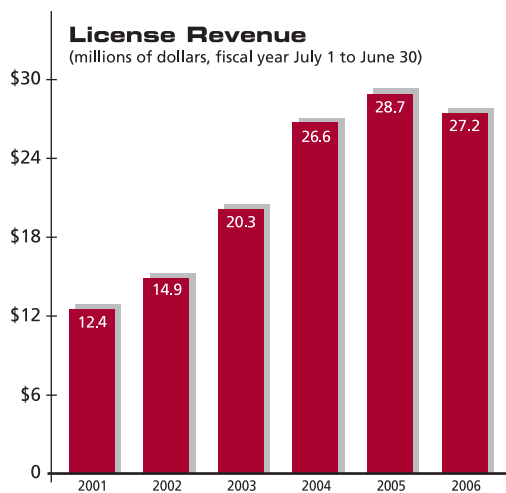
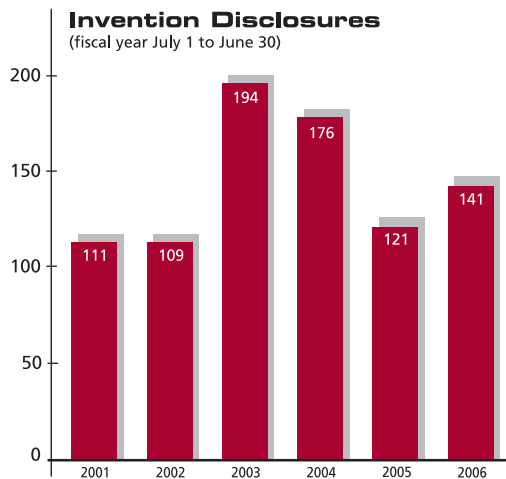
### **ORAL VACCINE INITIATIVE (WORCESTER)**

Research program on a platform technology for production of orally-administered vaccines

### **UMASS/CHINA S&T FACULTY EXCHANGE**

System-wide faculty exchange with China, building on existing collaborations

# Technology Commercialization &



## **UMass Technology Licensing Generates \$27.2 Million in Income**

The Office of Commercial Ventures and Intellectual Property (CVIP) reported continued strong income from its technology licensing activities in FY 2006, generating \$27.2 million, slightly down from last year's peak (reduction due to a change in accounting procedures by UMass's largest licensee). Technologies from the Worcester campus continue to provide the bulk of the university's revenues, highlighting the importance of academic research to the life sciences industry. Income generated from technologies from the Amherst campus totaled \$1.3 million, its largest ever. The university received 141 new invention disclosures from our investigators and 43 new license agreements were executed.

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## **UML Licenses Nanotechnology to Start-up Encapsion**

The Lowell campus recently announced the creation of a new start-up company, Encapsion, to commercialize a novel set of technologies for drug delivery and other applications. The company will focus on the development of creams and patches to provide dosages of drugs and nutrients through the skin, rather than orally or by injection. Professor Stephen McCarthy, an expert in biodegradable plastics, developed a self-assembling nanosphere that can carry nutrients and drugs. Professor Robert Nicolosi created a nanoemulsion which effectively turns lipid-soluble com-

pounds into water-soluble compounds and creates the base material. Dr. Jon Edelson, a successful serial entrepreneur and Harvard-educated research physician, has been recruited to serve as CEO of the company. Encapsion, which has raised its first round of financing, will be located in the UMass Lowell Technology Commercialization Center.

Contact: Paul Wormser, Entrepreneur-in-Residence, UMass Lowell Commercial Ventures and Intellectual Property, (978) 937-2038 x132, paul\_wormser@uml.edu

## **Bill Lyndon Joins CVIP as Licensing Associate**

Bill Lyndon recently joined CVIP in the President's Office with lead responsibility for the Boston and Dartmouth campuses. Bill has both considerable public and private experience having worked for the National Institute of Standards and Technology as a technology transfer officer and in a variety of engineering, marketing, and product management roles for technology-based companies, including Analog Devices, Millipore, Corning Lasertron, and most recently, Foresight Science and Technology. Bill has a BS in material sciences and engineering from Cornell University and an MBA from Carnegie Mellon University.

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# ENTREPRENEURSHIP

## **Sirna Licenses RNAi Technology from Worcester**

The UMass Medical School has entered into an exclusive license agreement with Sirna Therapeutics, Inc. for a new gene regulation technology developed by Phillip Zamore and Gyorgy Hutvagner of the department of biochemistry and molecular pharmacology. The researchers invented a way to regulate the production of proteins, the building blocks of life. When some proteins are inappropriately produced in a cell, they can lead to cancer, blindness, neurodegenerative diseases, and other maladies. Zamore and Hutvagner developed a way to target and block specific aberrant protein production and thereby possibly treat disease. Sirna Therapeutics plans to develop this new technology for application to a variety of human diseases. The license agreement provides for the an upfront payment and future milestones and royalties as potential new drugs are advanced.

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## **CVIP Provides Funds for Technology Development**

The Office of Commercial Ventures and Intellectual Property (CVIP) recently announced four Technology Development Awards to accelerate commercialization of new technologies. The grants provide support for work, such as proof-of-concept evaluation and prototyping, which is critical for attracting industry partners but rarely eligible for federal research funds. The program, in its third year, has demonstrated strong results from past investments.

Awardees include Shan Lu, Worcester (vaccine formulation for avian flu), Samson Mil'shtein, Lowell (infrared biomedical imaging system); Lloyd Semprevivo, Amherst (fascioliasis vaccine); and John Wixted and Jeremy McCormick, Worcester (hindfoot surgical screw).

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## **MTTC Makes Awards for Commercializing Research**

The Massachusetts Technology Transfer Center (MTTC), managed by UMass to support commercialization from all of the Commonwealth's higher education and research institutions, recently announced the results from its third competitive solicitation. UMass investigators received three of nine grants: Patricia Bianconi, Amherst (processing carbon polymer nanoparticles for industrial diamonds); Shan Lu, Worcester (vaccine formulation for seasonal and pandemic flu); and David Ryan and Dan Golomb, Lowell (enhanced oil recovery and extraction). All UMass projects were funded through the Technology Investigation Awards program.

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## **MASSACHUSETTS TECHNOLOGY TRANSFER CENTER**

### **CALENDAR OF EVENTS**

**September 22-23,  
2006**

#### **Advanced Invention to Venture**

MBI Incubator Center  
(Winthrop Street)  
Worcester

**October 20, 2006**

#### **Invention to Venture**

UMass Dartmouth – ATMC  
Fall River

**November 2, 2006**

#### **Clean Energy Conference II**

Hynes Convention Center  
Boston

**December 4, 2006**

#### **Nanotechnology Conference II**

Newton Marriott  
Newton

# DEVELOPING THE

# Future Workforce

“The University of Massachusetts played a key role in convincing Bristol-Myers Squibb that we have the talent the company needs for their new facility. Our partnership with UMass is an integral part of our strategy to grow the biomanufacturing sector.”

— **RANCH C. KIMBALL,**  
**Massachusetts**  
**Secretary of**  
**Economic**  
**Development**

## **UMass Supports State in Recruiting Bristol-Myers Squibb to Massachusetts**

UMass faculty and staff were integral to the Commonwealth’s successful recruitment to Devens of a new Bristol-Myers Squibb (BMS) biomanufacturing facility. Expecting to hire as many as 550 new employees, having access to a well-trained workforce will be a critical need for the company. Carl Lawton, a faculty member at UMass Lowell and director of the Massachusetts BioManufacturing Center, participated in a roundtable briefing for BMS officials to highlight research and education programs that will accelerate the industry’s growth. In addition, UMass staff, as part of the state’s Business Resource Team — a public-private partnership supporting business recruitment and retention — provided BMS with relevant data on statewide graduation rates in key fields.

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## **UMassOnline Continues Growth in 2006**

UMassOnline (UMOL), one of the nation’s premier online education programs, continued to expand the breadth and depth of its offerings over the past year. Annual revenues grew in FY 2006 by 28% to \$21 million and enrollments increased by 20% to over 21,000 students. Another element of UMOL’s business development and service to the Commonwealth is strategic partnerships: UMOL hosts or is the service provider for online programs of 11 other public and private colleges across the state. The arrangement provides support, such as additional servers for load balancing and 24-hour tech support, which would be difficult and/or expensive for partners to provide themselves. Each college, though, creates its own unique “look and feel” on

the web, just as each UMass campus does. Collaboration among colleges for a wide range of IT services is seen as an emerging trend that has both economic and practical benefits.

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## **Lowell to Establish Center for the Promotion of Health in the New England Workplace**

Lowell researchers from the School of Health and Environment will lead a team selected by the federal Centers for Disease Control and Prevention (CDC) to establish a center of excellence under the “Steps to a Healthier US Workforce” initiative. With a \$5 million grant from CDC’s National Institute for Occupational Safety and Health, the Center for the Promotion of Health in the New England Workplace (CPH-NEW) will focus on the integration of two core public health fields. One is occupational health and safety, especially prevention programs such as ergonomically-designed workstations for office workers or patient-lifting devices in nursing homes. The second is health promotion and education, which increasingly takes place at worksites. Coordinating these activities is expected to result in enhanced health benefits and be more cost-effective for employers. The CPH-NEW program includes research, education, translation to practice, and impact evaluation. Partners include the University of Connecticut, companies in the health care and insurance industries, labor organizations, and the Massachusetts and Connecticut public health departments.

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# ECONOMIC ANALYSIS for the COMMONWEALTH

## **Massachusetts High Tech Council Commissions Bio-Pharma Study**

The Massachusetts pharmaceutical and biotechnology industries are widely recognized as pillars of the Commonwealth's knowledge economy. While the industries are clearly interconnected, the specific ways in which they support one another's growth are not well understood. Sponsored by the Massachusetts High Tech Council, the UMass Donahue Institute will assess the interactions between these two important industries and identify obstacles to continued expansion in the state. A report for elected officials, policymakers, and opinion leaders will outline recommendations to accelerate growth.

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## **New Issue of *MassBenchmarks* Released**

The latest issue of *MassBenchmarks* provides an overview of the state of the Commonwealth's economy, as well as feature articles highlighting the Pioneer Valley region. Boston campus professor Alan Clayton-Matthews reports that the pace of economic growth in the state has increased significantly in the last year, reflecting improved global markets for information technology equipment. Nevertheless, the outlook for continued growth is unclear due to a number of factors. Amherst professor Robert Nakosteen dis-

cusses ongoing economic revitalization efforts in the Pioneer Valley, once a national manufacturing hub. The region seeks to build on a focused base of high-end and precision manufacturing, in addition to other innovation clusters fueled by its academic institutions and the medical and health care industries. In a related article, author Tim Brennan outlines the region's strategy for building physical, institutional, and social networks to leverage growth.

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## **Dartmouth Study Focuses on Innovation in Cranberry Industry**

The future success of the Massachusetts cranberry industry depends on technological innovation to increase productivity, implementation of best management practices such as renovation of bogs, and strategic expansion of markets, according to a study by the UMass Dartmouth Center for Marketing Research. The research was based on a survey of over 200 growers. The industry, which is dominated by family-owned farms, faces specific challenges resulting from an aging workforce and declining output. The study's recommendations include new industry association programs providing younger growers with mentoring and support to assure their continued participation in farming, educational workshops to disseminate information on best practices and applications of

new technology, agricultural research to improve the use of pesticides, and business research to develop and provide access to new markets.

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## **Costs and Benefits of Mixed-Income Housing Developments in Massachusetts**

The cost of living, especially housing, has been widely recognized as a major challenge for the Commonwealth. In considering development of new housing, municipalities confront the dual challenges of fiscal stress and the need for additional affordable housing. A key question for the public, local, and state officials is whether new mixed-income housing developments (often called "40B" projects) contribute to local budgetary shortfalls by costing more in services, particularly education, than is generated in taxes. The Citizens' Housing and Planning Association (CHAPA) has engaged the UMass Donahue Institute to conduct a major study analyzing the actual fiscal impacts of mixed-income housing developments. This project builds upon previous collaborations between CHAPA, the Donahue Institute, and faculty at UMass Amherst.

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