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Growing Green

Vita^{ae}:

The Magazine of
The University of Massachusetts Medical School



Tackling TB



Finally Physicians

Vital: L., the plural of life

The name of this magazine encompasses the lives of those who make up the University of Massachusetts Medical School community, for which it is published. They are medical, research and nursing students; faculty; staff; alumni; volunteers; benefactors and others who aspire to help UMMS, Massachusetts' only public medical school, advance the health and well-being of the people of the commonwealth and the world through pioneering advances in education, research, public service and health care delivery.

As you read about this dynamic community, you'll frequently come across references to UMMS partners and programs, including the following:

Commonwealth Medicine

UMass Medical School's innovative public service division that assists state agencies, nonprofits and managed care organizations to enhance the value and quality of expenditures and improve access and delivery of care for at-risk and uninsured populations.

www.umassmed.edu/commed

The Research Enterprise

UMass Medical School's world-class investigators, who make discoveries in basic science and clinical research and attract more than \$200 million in funding annually.

UMass Memorial Foundation

The charitable entity that supports the academic and research enterprises of UMass Medical School and the clinical initiatives of UMass Memorial Health Care by forming vital partnerships between contributors and health care professionals, educators and researchers.

www.umassmed.edu/foundation

UMass Memorial Health Care

The clinical partner of UMass Medical School and the Central New England region's top health care provider and employer.

www.umassmemorial.org



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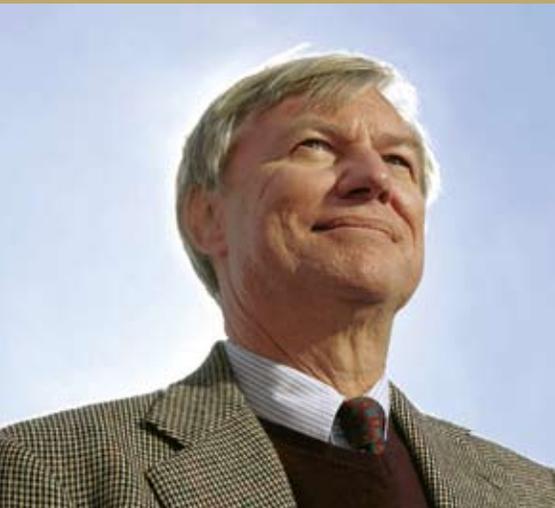


Finally Physicians

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UMass Medical School graduates move into residency.

UMMS Researchers Report Oral Delivery System for RNAi Therapeutics



Researchers at UMass Medical School report in the April 30, 2009, issue of *Nature* on a novel approach to the delivery of small bits of genetic material in order to silence genes using RNA interference—and in the process, discovered a potent method of suppressing inflammation similar to what occurs in a range of human diseases.

Michael P. Czech, PhD, chair and professor of molecular medicine and biochemistry & molecular pharmacology (pictured above) and colleagues describe the engineering of small encapsulating particles containing short pieces of RNA that dramatically silenced genes in animal models following oral administration in small doses. The paper, “Orally delivered siRNA targeting macrophage MAP4K4 suppresses systemic inflammation,” provides a possible pathway to address the most common—and daunting—challenge in the new field of RNA therapeutics: how to deliver the short strands of RNA used in gene silencing to specific tissues and cell types.

“We are very encouraged by these results, which show that oral delivery of a therapeutic dose of small, interfering RNA (siRNA) to a specific cell type in an animal model is possible, and that evidence of gene silencing using this delivery system is measurable,” said Dr. Czech.

“In the future, this paper will be viewed as a landmark in the process of translating RNAi into effective new therapies for human diseases,” said Terence R. Flotte,

immune response. Because macrophages control the inflammatory response in diseases such as rheumatoid arthritis and atherosclerosis (a precursor to heart disease), they represent an attractive target for drug delivery.

To move short strands of RNA into the macrophages, the researchers exploited a distinctive characteristic of yeast particles: their ability to be engulfed and digested by macrophages. By using yeast particles as a delivery shell, they were able to deliver

“In the future, this paper will be viewed as a landmark in the process of translating RNAi into effective new therapies for human diseases.”

—Dean Terence Flotte, MD

MD, provost, executive deputy chancellor and dean of the School of Medicine. “It addresses one of the most fundamental problems in the field, that of delivery of the RNAi molecule to the cells affected by the disease process.”

The discovery in 1998 that short strands of RNA can silence the action of a given gene changed the scientific world’s understanding of how genes are regulated, but how to get genetic material into cells has been an obstacle. In this paper, Czech and colleagues chose to target the macrophage, a type of white blood cell that engulfs and digests cellular debris and responds to invading organisms by stimulating the

siRNAs targeting a gene known for its key role in the inflammatory response—and turn it off. The macrophages spread the RNAi effect throughout an organism as they circulated from the digestive system, with the result that over time, a large portion of the organism’s macrophages were found to contain the ingested yeast.

The method of treating yeast particles—called “beta1,3-D glucan”—to remove components that would cause an immune response and use them as an oral delivery vehicle targeting macrophages was developed by paper co-author Gary R. Ostroff, PhD, UMMS research professor of molecular medicine and pediatrics. ●

Massachusetts Biologic Laboratories and Partners Target *C. difficile* Infection



“Discovering and developing an effective new treatment for a significant public health threat is the mission of MBL. We are delighted that through this license agreement this candidate will advance toward final clinical studies and thus will potentially be available to patients in the shortest possible time.”

—MBL Executive Director Donna Ambrosino, MD (left)

UMass Medical School’s Massachusetts Biologic Laboratories (MBL), Merck & Co., Inc. and Medarex, Inc. have signed an exclusive worldwide license agreement for an investigational fully human monoclonal antibody combination developed to target and neutralize *Clostridium difficile* toxins A and B, for the treatment of *C. difficile* infection (CDI). The monoclonal antibody combination, CDA-1 and CDB-1, were co-developed by Medarex and MBL.

The incidence of CDI in the United States is rapidly increasing, with rates doubling from 2000 to 2005. The Centers for Disease Control and Prevention has projected that there will be as many as 750,000 cases of CDI per year by 2010.

“Discovering and developing an effective new treatment for a significant public health threat is the mission of MBL,” said Donna Ambrosino, MD, executive director of MBL and professor of pediatrics at UMMS. “We are delighted that through this license agreement this candidate will

advance toward final clinical studies and thus will potentially be available to patients in the shortest possible time.” Results from a Phase II controlled trial evaluating CDA-1/CDB-1 provided evidence of a statistically significant reduction in the rate of recurrence of CDI compared with placebo.

C. difficile is a spore-forming bacterium that is common in the environment and can colonize in the gastrointestinal (GI) tract. The infection can be easily spread among hospitalized patients and residents of long-term care facilities, but also can be found in otherwise healthy individuals in the community. The disease most often develops in the presence of antibiotics administered for other infections, in which the complex microbial makeup of the GI tract is altered, and *C. difficile* spores may germinate, grow, and produce toxins A and B. The toxins cause damage to the GI tract lining in the colon, resulting in severe diarrhea, and may lead to perforation of the colon, and even death.

Treatment of severe disease requires administration of additional antibiotics to kill the bacteria, but because of the persistence of spores, as well as the difficulty of the intestinal flora to re-normalize in the setting of antibiotics, relapse or recurrence of CDI is common. Recurrence can be difficult to manage and is a challenging complication of CDI; however, the use of non-antibiotic-based approaches, such as human monoclonal antibodies, to neutralize toxins may be important options to facilitate recovery of the GI flora.

The MBL is the only non-profit FDA-licensed manufacturer of vaccines and other biologic products in the United States. MBL produces 30 percent of the nation’s tetanus/diphtheria vaccine supply. In addition to the *C. difficile* program, MBL has discovered and developed human monoclonal antibodies for rabies and hepatitis C, which are expected to enter clinical trials in 2009. MBL has been a part of UMMS since 1997. ●

UMMS Recognized for Community Engagement

UMass Medical School, with support from clinical partner UMass Memorial Health Care, was selected for 2008 Community Engagement Classification by the Carnegie Foundation for the Advancement of Teaching, a recognition of the “collaboration between institutions of higher education and their larger communities—local, regional/state, national, global—for the mutually beneficial exchange of knowledge and resources.” UMMS is the only medical school to earn this distinction as a “Community Engaged Campus.” In addition, the four other University of Massachusetts campuses—Amherst, Boston, Dartmouth and Lowell—now hold this classification as well.

“It is clear that our academic health sciences center shares with the Carnegie Foundation the belief that to be relevant, education must be focused on community needs,” said UMMS Chancellor Michael F. Collins and UMass Memorial Health Care President and CEO John G. O’Brien in their letter to the Carnegie Foundation. “For more than 30 years our faculty and students have forged far-reaching partnerships with a wide range of communities . . .



Medical Student Michelle St. Fleur (above) has served as program director at the Center for Healthy Kids and is part of a student-led effort to establish an optional enrichment elective based on their experiences at the center. Faculty mentors will monitor students’ work and the elective’s curriculum will allow each student participant to create an advocacy project. Here, St. Fleur shows children at Worcester’s Great Brook Valley public housing facility how to prepare healthy snacks.

relationships that have ‘informed, enriched and strengthened our curriculum.’”

Institutions were classified in one of three categories: curricular engagement; outreach; and partnerships. UMMS was recognized for all three based on its descriptions of practices of community engagement that showed alignment among mission, culture, leadership, teaching, resources and practices.

Among the examples cited to illustrate how UMMS and UMass Memorial engage with the community were partnerships such as

those built by Commonwealth Medicine with state agencies; the institutions’ roles in the grassroots organization Common Pathways; the Medical School’s longstanding support of MassAHEC; curricular engagement through programs such as Community Health Clerkships and Pathway on Serving Multicultural and Underserved Populations; and outreach such as the work of the Infant Mortality Reduction Task Force, the student-run Center for Healthy Kids and the Worcester Pipeline Collaborative. 

Walk to Cure Cancer Embarks on Second Decade

The 11th annual Walk to Cure Cancer takes place on Sunday, September 13, 2009. Walkers from across New England and the nation will be raising funds for cancer research at UMass Medical School.

“Physicians and scientists are dedicated to working in a collaborative environment where discoveries in the laboratory provide our patients with a competitive advantage to challenge cancer,” said Gary Stein, PhD,

the *Gerald L. Haidak, MD, and Zelda S. Haidak Professor of Cell Biology* and interim director of the UMass Memorial Cancer Center. “Partnerships in cancer research, detection and treatment at the Cancer Center make the decisive difference.”

Dr. Stein, who chairs the Department of Cell Biology at UMMS, described recent advances that are having an impact on

cancer diagnosis and therapy, including strategies for prostate cancer therapy based on targeting integrated gene regulatory networks; breast imaging that enhances detection and localization of early stage tumors; development of drugs that selectively prevent survival of cancer cells; enhanced capabilities for bone marrow transplantation based on new insights into stem cells; models for pancreatic cancer that provide opportunities to develop

U.S. News Ranks UMass Medical School Seventh in Primary Care

UMass Medical School was ranked seventh in primary care among the nation's 129 fully accredited medical schools and 20 schools of osteopathic medicine by weekly news magazine *U.S. News & World Report* in its annual "America's Best Graduate Schools" issue.

UMMS has been listed near the top of the category since 1994 when the magazine began publishing the rankings. In its listing of top research schools, *U.S. News* ranked UMMS 48th. In addition, the Department of Family Medicine & Community Health was 14th on the list of best medical school specialty rankings for family medicine.

"Once again, UMass Medical School is being recognized as a national leader in the area of primary care medical education, which is reflective of the Medical School's culture of service and academic excellence," said University of Massachusetts President Jack M. Wilson. "In addition, the Medical School is ascending to new heights in the research rankings, reflecting the school's great



"UMass Medical School provides education, research and service that is of inestimable value to the commonwealth and its citizens."

—UMass President Jack Wilson

contributions and successes in the areas of RNA biology, stem cell biology, gene therapy, diabetes and cancer research. UMass Medical School provides education, research and service that is of inestimable value to the commonwealth and its citizens."

"Our top 10 ranking in primary care reflects our ongoing, mission-driven commitment to meet the workforce needs of the future," added Terence R. Flotte, MD, dean of the School of Medicine and UMMS provost and executive deputy chancellor. "Our commonwealth's leadership in providing affordable health care for all will create an increasing demand for primary care providers and new models for delivery of preventive medicine and primary care

services. As the state's only public medical school, we are uniquely suited to address those issues."

The Medical School, which had accepted just 100 students per year, expanded the class of 2012 to include 114 students, to help meet the needs of the commonwealth. The class will again expand, to 125, starting with the class of 2013.

Graduates of UMMS are poised to excel in their medical careers. Members of the UMMS class of 2009 were accepted into some of the most competitive residency programs in the country, with 59 percent entering primary care (63 percent when including obstetrics/gynecology and emergency medicine; see feature article on page 17). ●

capabilities for early-stage diagnosis; a combined chemotherapy/surgery procedure for advanced-stage cancer; a novel strategy for radiation treatment that is faster, more comfortable and more precise in targeting tumors; discovery of gene expression signatures associated with breast and prostate tumor metastasis to bone; and clinical trials underway with clinical partner UMass Memorial Medical Center.

On Thursday, July 16, 2009, Walk team leaders will gather to begin organizing for the event; to register for the team leader breakfast, visit www.walktocurecancer.com or call 508-856-1318. There is no registration fee or minimum amount to raise. ●

"Partnerships in cancer research, detection and treatment at the Cancer Center make the decisive difference."

—Gary Stein, PhD



GSBS Student Receives Weintraub Award

“Marcus’ achievements will revolutionize the mapping and understanding of transcription factor sites in genomes and his contributions to gene knockout experiments will have a similar impact on biology.”

—Chair of Biochemistry & Molecular Pharmacology C. Robert Matthews, PhD

The Weintraub Award was established in 2000 and honors the late Harold “Hal” M. Weintraub, PhD, a founding member of the Basic Sciences Division at the Fred Hutchinson Center, who died of brain cancer in 1995 at age 49. Marcus Noyes (above) participated with other award recipients in a scientific symposium in May at the center in Seattle.

Marcus Noyes didn’t grow up dreaming of becoming a researcher who expands the frontiers of medical science. In fact, he initially put off attending college to pursue a music career.

“I came to academia a little later in life. I wanted to play music, start a band. And if ‘American Idol’ had been around 10 years ago, who knows what might have happened,” Noyes joked.

Though he might not be playing in front of thousands of cheering fans, Noyes still finds himself getting noticed for his work. Selected to receive the 2009 Harold M. Weintraub Graduate Student Award sponsored by the Basic Sciences Division of the Fred Hutchinson Cancer Research Center in Seattle, Noyes is now recognized as one of the best graduate students in the life sciences in the nation and world. He

is one of only 13 students selected this year for the award, which is given on the basis of quality, originality and significance of his work.

A student in the Program in Biochemistry & Molecular Pharmacology of the GSBS Basic & Biomedical Sciences Division and the Program in Gene Function and Expression, Noyes is researching ways to accurately and quickly predict which DNA sequences a transcription factor is able to bind to in a genome. The bacterial one-hybrid system developed by Noyes can not only predict where a transcription factor might bind in a genome, it can also be tailored to engineer artificial transcription factors capable of binding new sequences of DNA. Knowledge of the interaction between proteins and specific DNA sequences can help scientists better understand how a network of proteins and DNA sequences interact and control cellular functions.

“Marcus’ achievements will revolutionize

the mapping and understanding of transcription factor sites in genomes and his contributions to gene knockout experiments will have a similar impact on biology,” said C. Robert Matthews, PhD, the *Arthur F. and Helen P. Koskinas Professor of Biochemistry & Molecular Pharmacology* and chair and professor of biochemistry & molecular pharmacology.

Noyes, who is graduating in 2009, is the second biochemistry & molecular pharmacology student and the third student from UMMS to win the prestigious award, following in the footsteps of Dianne Schwarz, PhD, who won in 2005, and Alla Grishok, PhD, who received the award in 2002 after graduating from the GSBS in 2001.

Noyes has joined the Lewis-Sigler Institute for Integrative Genomics at Princeton University as an independent Lewis-Sigler Fellow this summer, where he will continue to pursue research into predicting the interaction between proteins and DNA. ●



The bulldozers and backhoes are not idle for long at UMass Medical School.

Over the institution's four-decade history, facilities that foster excellence in education and science have continuously sprung up on the comparatively small amount of acreage that is the foundation for a thriving academic health sciences center. In September 2009, construction equipment will rev up again to fulfill the Medical School's architectural vision of the future in clinical and translational research and educational inventiveness. Construction of the Albert Sherman Center (above in a rendering by ARC/Architectural Resources Cambridge) will start this fall with ground-breaking shovels, but by 2012, when the Center opens, crews will have sparked an educational and life sciences evolution here in Central Massachusetts.

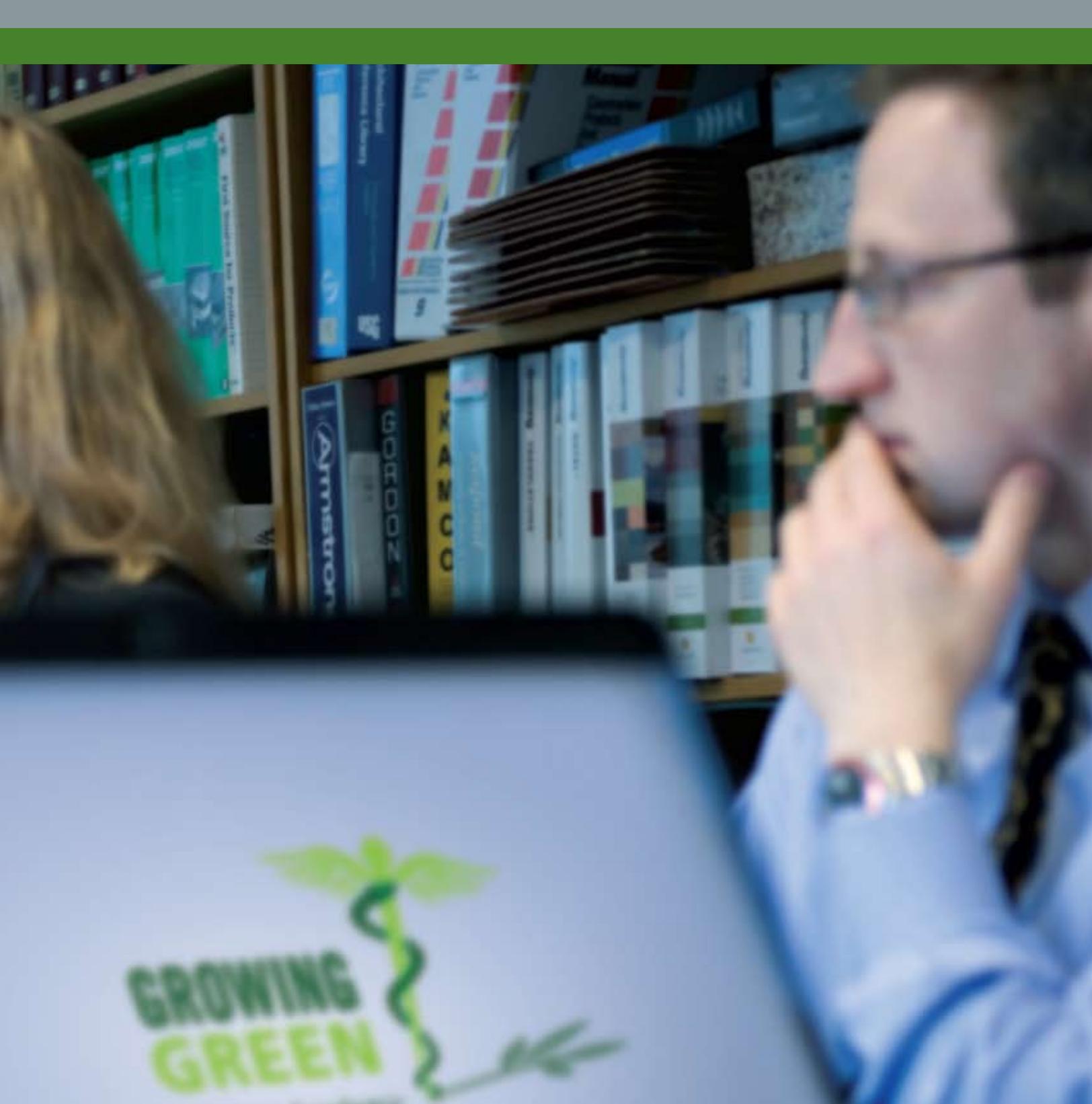
"The Albert Sherman Center will be transformative for the growth of clinical and translational research at the Medical School and UMass Memorial Medical Center. The Center will house the Advanced Therapeutics Cluster, which will harness RNA biology, stem cell biology and gene therapy to create innovative therapies for debilitating diseases affecting mankind," said John L. Sullivan, MD, Vice Provost for Research at UMMS.

"This is an exhilarating time for our educational programs, with the development of the Albert Sherman Center perfectly aligned with our strategic plan for education: to design the ideal learning environment and prepare the

health sciences workforce of the future," said Senior Associate Dean for Educational Affairs Michele P. Pugnaire, MD. "With our growth in class size, redesign of our curriculum, and establishment of new programs in our graduate schools of nursing and biomedical sciences, our educational mission has clear and compelling guidelines for what that learning environment must provide for our students and faculty. We are looking ahead with excitement and commitment to realizing our vision of world-class teaching and scholarship within the learning communities of the Albert Sherman Center."

To learn more about the Albert Sherman Center and to follow its progress, visit www.umassmed.edu/shermacenter





Growing Green

Sustainability plan takes root at UMass Medical School.

By Michael I. Cohen

Growth is the watchword for the University of Massachusetts Medical School. Cranes and construction equipment are a perennial sight at the University Campus in Worcester, as new buildings rise and older ones are renovated to accommodate the expanding programs in research, education and clinical care.

With that growth, however, comes the responsibility to make sure the school's progress is not damaging the environment. To achieve the dual goals of institutional advancement and environmental stewardship, UMass Medical School and its clinical partner UMass Memorial Medical Center are working on a multi-layered sustainability program to reduce energy consumption and greenhouse gas emissions, expand recycling and take other measures that collectively limit the carbon footprint of the campus.

"Beyond the environmental benefits, which are important in their own right, our sustainability effort is fundamental if we are going to continue expanding our science and clinical operations," said UMMS Chancellor Michael F. Collins. "We need to grow, but in ways that have as little additional environmental impact as possible."

The sustainability program covers a wide range of projects, from relatively small-scale but important items like installing motion sensors in hallways to shut off lights when no one is in the area to large-scale projects like designing the new seven-story, 258,000-square-foot Advanced Center for Clinical Care, Education and Sciences (ACCES) building to meet the Leadership in Energy and Environmental Design (LEED) criteria. Developed by the U.S. Green Building Council, the LEED certification program is the nationally accepted benchmark for green buildings.

"Our sustainability plan formalizes and expands upon things we've been doing here for a long time," noted John Baker, PE, associate vice chancellor for Facilities Management and chair of the school's Sustainability Committee. "We've always been trying to save energy, use less fuel and make sure we're doing everything possible to protect the environment. Now, we're taking things to a new level. We're pushing to take bigger steps to be as efficient as possible and to reduce greenhouse gas emissions as much as possible."

The Medical School has had a standing Sustainability Committee working on these issues since 2004. Its ongoing mission has now been fine-tuned to address the goals of two recent policy directives. In the spring of 2007, Governor Deval Patrick issued Executive Order 484, "Leading By Example—Clean Energy and Efficient Buildings," that requires all state entities to initiate specific programs to reduce energy consumption and environmental impacts and to report on the progress of those efforts. "State government has an obligation to lead by example and demonstrate that large entities such as state colleges and universities, prisons, hospitals and others can make significant progress in reducing their environmental impacts, thereby providing a model for businesses and private citizens," Gov. Patrick wrote in the order.

Also in 2007, UMass President Jack Wilson signed the American College & University Presidents Climate

A component of UMMS sustainability efforts is recycling, which can take many forms and serve a number of purposes. In March, students from the Grafton Job Corps Center picked up materials at the UMMS warehouse facility in Shrewsbury. Several pallets of lighting fixtures, wiring, ceramic tiles and carpets were left over from construction and renovation projects at the Medical School. They will be installed by students learning carpentry, plumbing and electrical trades in vocational classrooms at the Job Corps Center including Catalina Baez and Keith Johnson (right). Paul Bonhanson, director of finance and administration at the center, said that a donation as significant as this represents a windfall for his organization. "These are items we wouldn't normally have access to. With this donation, we'll have materials to support our educational needs for a year or more." Job Corps is a no-cost education and vocational training program administered by the U.S. Department of Labor that helps young people ages 16 through 24 improve the quality of their lives through vocational and academic training.



Commitment, a pledge now adopted by more than 600 institutions of higher learning across the country. The commitment states, in part, “the undersigned presidents and chancellors are deeply concerned about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects. We recognize the scientific consensus that global warming is real and largely being caused by humans. We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality.”

Synthesizing the goals of the governor’s order and the presidents’ commitment into a specific plan, the Medical School is working to achieve several sustainability targets by fiscal year 2012, including reducing greenhouse gas emissions (primarily from the school’s power plant and the number of cars driven to campus) by 25 percent, reducing overall energy consumption by 20 percent, reducing potable water consumption by 10 percent and procuring 15 percent of its annual electricity consumption from renewable sources.

These milestones must be reached in ways that do not affect any ongoing operations, Baker noted. The University Campus, for example, doesn’t have the ability to shut down at night or on weekends to save energy. With its sensitive research programs, Level 1 Trauma Center and associated clinical services, the campus must be fully functional and powered at all times. “These are very aggressive goals, considering that we must operate 24/7 and considering how dramatically this



John Baker (above right, end of table) leads the Sustainability Committee, whose members bring expertise from departments across UMass Medical School. Two of those members are Alan Levine, UMass Memorial Food Services (which is introducing a new recycling center in the University campus cafeteria) and Charleen Sotolongo, director of UMMS Environmental Health and Safety.



“Our sustainability plan formalizes and expands upon things we’ve been doing here for a long time. We’ve always been trying to save energy, use less fuel, and make sure we’re doing everything possible to protect the environment. Now, we’re taking things to a new level.”

—Associate Vice Chancellor John Baker



*Sustaining the UMass Academic
Health Sciences Center*

The Growing Green campaign will inform the community about the ongoing efforts to help UMass Medical School and UMass Memorial Medical Center become more sustainable by reducing the carbon footprint of their shared University campus. Look for the logo to sprout on Web pages, in e-mails and on signage around campus this year.

campus is growing,” Baker said. “For example, the reduction of greenhouse gases is an absolute reduction, it doesn’t allow for us to factor in the needs of the new buildings. That being said, there are things we can do to reduce emissions and to improve efficiencies, and that’s what our sustainability program is all about.”

The UMMS Sustainability Committee is made up of representatives from numerous school and clinical departments. The team meets monthly to report on progress and to consider new initiatives. The committee will soon be launching a campus-wide awareness program with a Web site, e-mail newsletter and other communications tools to inform the community about its efforts and to encourage greater participation in the sustainability programs.

“This is a challenge for an institution as large and complex as ours, but it’s important that we take it on and that we all do our part to achieve the goals of the sustainability plan,” Chancellor Collins said. ●

Advocates for Sustainability

For the Medical School to achieve its sustainability goals, it will take more than just building sleek new energy-efficient labs and offices. It will take the cooperation of the entire campus community.

“We’ve been working on the big projects for a long time; now we need to reach out to everyone on campus and ask for their help,” said John Baker, PE, associate vice chancellor for Facilities Management and chair of the school’s Sustainability Committee. Baker said big projects, like expanding the campus power plant to maximize its co-generation capability, replacing air-handlers, cooling towers and lighting fixtures, and designing new construction projects to be energy-efficient, will all deliver significant environmental benefits over time. Even greater gains, however, can be realized if everyone who works or studies on campus takes action. “The first thing I ask people to do is to understand how much energy they use on a given day,” Baker said. “Until you can quantify things, you can’t take steps to improve.”

There are several carbon calculators available on the Internet designed for individuals and families; www.nature.org or www.epa.gov both have such calculators. Baker suggests people take a few minutes to use one and determine their carbon footprint, and how many trees are required to offset the emissions of their daily activities.

With that knowledge in hand, people may be more inclined to take the small steps that will collectively have a major impact on energy use and sustainability on campus, Baker believes. For example, turning off computers at the end of the work day, turning off lights when leaving the office or lab, closing lab fume hood sashes when not in use, using a network printer rather than individual desktop printers, paying more attention to recycling—all these acts, if widespread, can have dramatic results.

“I encourage people to look around their office or their lab and start asking questions about the equipment they use on a daily basis,” said Baker. “Is it old? Is it Energy Star rated? Can items be consolidated or replaced with a more efficient model? If more people get involved and become advocates for sustainability, we will really see major improvements.”

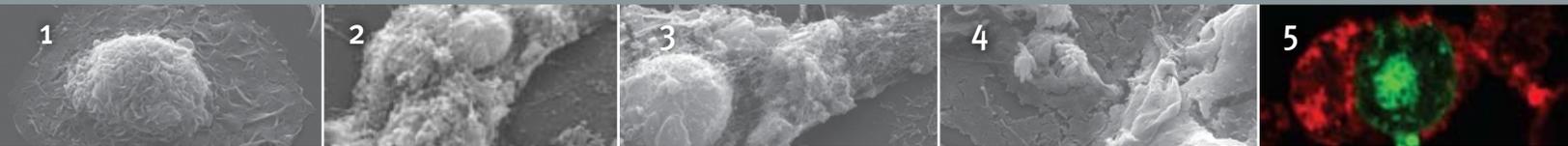


Tackling TB

*Tuberculosis continues to pose a world-wide public health threat—
UMMS researchers and clinicians are taking it on.*

By James R. Fessenden

For more than a century, physicians and scientists have known that *Mycobacterium tuberculosis* causes the deadly disease known as tuberculosis or “TB.” Despite this knowledge and decades of research, tuberculosis remains stubbornly resistant to treatment and one of the most pervasive diseases in the world. More than two billion people – roughly one-third of the world’s population – harbor the infectious pathogen. Many have latent TB that may become active in some cases, especially in those with compromised immune systems. Each year, active tuberculosis kills more than two million people worldwide and is the leading cause of death among women of reproductive age and people with HIV/AIDS. Additionally, treatment for active TB can call for six months to two years of daily antibiotics.



Anatomy of TB infection: An uninfected macrophage (image 1) is often TB’s entry point into the lungs. A macrophage infected with active TB in experiments can begin dying after only six hours (2), with consumption of the cell membrane exposing the underlying cytoskeleton (3). Once cell death is triggered, the TB bacteria exit (4). One way the immune system may contain TB is by having healthy macrophages (dye green, 5) consume infected cells (dye red, 5) before cell death occurs and bacteria are released. Images provided by Hardy Kornfeld, MD.

Tuberculosis is largely a disease of the developing world, and most of the cases in Massachusetts are found in foreign-born patients. But even in Massachusetts, where control programs have successfully contained the disease, physicians and public health officials remain concerned about the spread of tuberculosis due to a number of factors, including an increase in drug-resistant strains of the disease. Jennifer S. Daly, MD, professor of medicine at the University of Massachusetts Medical School, who oversees the Getchell-Ward Tuberculosis Program at the Family Health Center in Worcester, said the number of active TB cases in Massachusetts, though trending downward in recent years, actually rose by 17 percent in 2008. Of the roughly 200 confirmed cases in the state that year, 20 percent were resistant to at least one type of anti-tuberculosis drug.

In the developing world, additional factors, such as an increase in HIV-infected patients and inadequate funding for public health programs, have led to renewed fears that the rate of the pathogen’s decline isn’t occurring fast enough.

To combat the disease, scientists at UMass Medical School are working to discover the basic biology of *M. tuberculosis*. Understanding how it grows and survives inside host cells, how it interacts with the body’s immune system and why it remains dormant for long periods of time are a few of the questions researchers are attempting to answer.

A Hidden Killer

One of the more puzzling biological questions surrounding tuberculosis is being explored by Christopher M. Sassetti, PhD, assistant professor of molecular genetics & microbiology. Dr. Sassetti is trying to unravel the mechanisms through which the tuberculosis bacteria remain inactive for long periods of time

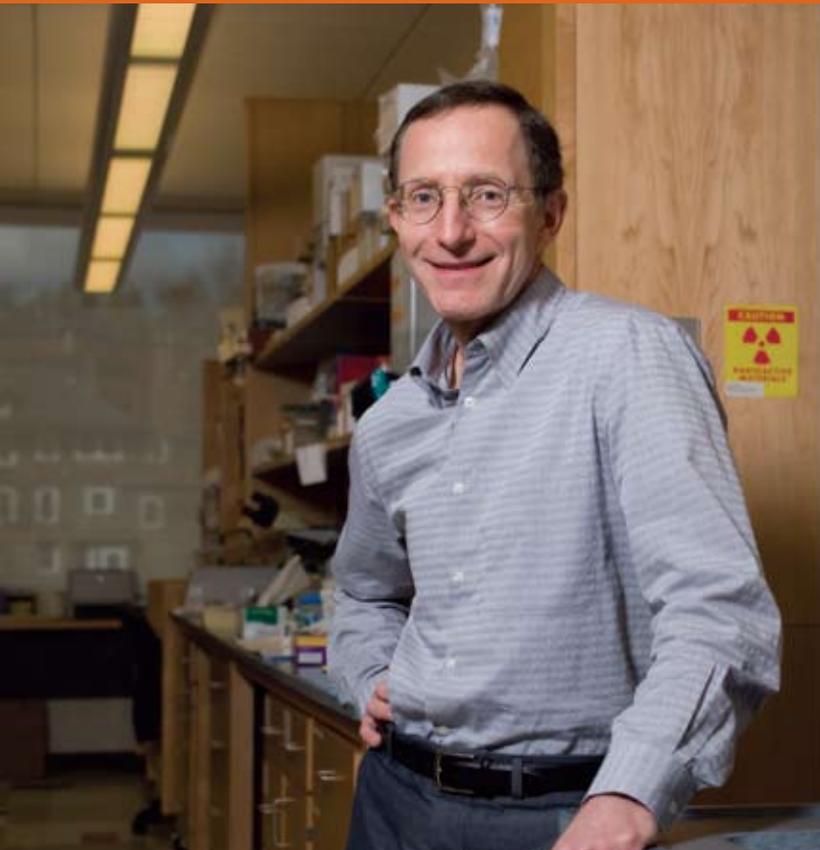
inside immune cells in the lungs called macrophages. In some cases, patients can remain asymptomatic for years, making detection and treatment of the disease difficult.

“Our research uses genetics as a tool to understand how the bacterium causes disease,” said Dr. Sassetti. “We want to be able to identify the genes that are required for it to survive in a latent state and what those genes produce that makes this possible.” To do this, members of Sassetti’s lab have generated mutant bacteria that are unable to become dormant and are using them to define the unique physiology of the latent cell.

Another important question focuses on the cause of the reactivation of latent disease years or even decades after the initial infection. Currently, scientists don’t know if it is the pathogen itself or the host that controls latency and resuscitation. “It’s not clear whether the host’s immune system becomes overwhelmed by the disease, somehow triggering it to become active, or whether something is happening in the bacterium itself that causes it to become active,” Sassetti said.

Sassetti’s research could have considerable implications for patients with latent TB. If researchers can find quicker and more efficient ways to destroy the disease while it is inactive, the spread of TB could be significantly curtailed and the rate of active cases could decline. “It’s possible we could interrupt the disease’s dormancy,” said Sassetti. “Ultimately, if we’re successful in waking it up, it will be more sensitive to drugs and easier to eradicate from its host.”

Determining the reasons behind the latency of *M. tuberculosis* builds on Sassetti’s earlier discovery that the bacterium obtains its nourishment by devouring cholesterol. “That it grows on cholesterol came as a surprise,” he said. “It is something we never would have predicted.” Until recently, scientists



“Our research uses genetics as a tool to understand how the [tuberculosis] bacterium causes disease. We want to be able to identify the genes that are required for it to survive in a latent state... Ultimately, if we’re successful in waking it up, it will be more sensitive to drugs...”

—Christopher Sassetti, PhD

Hardy Kornfeld, MD, left, is exploring how the disease interacts with the immune system. He is focused on people with diabetes and their increased susceptibility to tuberculosis. In diabetics, TB seems to have a shorter latency period.

assumed that tuberculosis, like most bacteria, fed on simpler compounds such as sugars or fatty acids. Using a unique method of zeroing in on the genes that are essential for the survival of the bacterium, Sassetti was able to identify a cluster of proteins it uses to feed itself on cholesterol from the host organism, providing it the nutrients it needs to remain alive during chronic infection and perhaps also while in the latent state.

Sassetti is now busy exploring the consequences of this revelation. “This knowledge changes the way we approach the metabolism of the bacterium and its interaction with the host,” he said. “It also changes the way we think about developing new drugs to fight the disease.” Now, Sassetti grows bacteria cultures in the lab by feeding them lipids and has determined that the bacteria cells develop a tougher cell wall than when fed sugar. “When developing treatments for the disease, drug companies can now zero in on compounds that would inhibit growth on physiologically relevant nutrients such as cholesterol,” he said.

TB and the Immune System

Another mystery to physicians and researchers exploring tuberculosis centers on how the disease interacts with the body’s immune system. For example, while it is known that people with compromised immune systems, such as patients with HIV/AIDS or diabetes, are at higher risk for active tuberculosis, it still is not known why this is the case.

Hardy Kornfeld, MD, professor of medicine at UMass Medical School, is working to uncover why people with diabetes are more susceptible to tuberculosis and why the pathogen seems to have a shorter latency period in diabetics. “We know surprisingly little about how diabetes impairs the body’s ability to respond to the tuberculosis infection,” he said.

One observation Dr. Kornfeld has extrapolated from mouse models is that diabetics seem to have a stronger immune response to tuberculosis than other groups of patients. “One possible explanation,” said Kornfeld, “is that it takes longer for the immune system to generate a response to the disease. As a result, by the time the body starts reacting to the presence of the pathogen, there are more bacteria present and a correspondingly larger immune response is needed to fight it.”

In a bench-to-bedside investigation, Kornfeld is working with physicians and researchers at the University of Texas at Brownsville, a city with a high rate of diabetics in its population, to identify immune responses and what affect diabetes may have on making patients more prone to drug-resistant strains of tuberculosis. (He has also just reached a collaborative agreement with the National Masan Tuberculosis Hospital in South Korea.) “What we’re learning has profound clinical applications,” said Kornfeld. “Because diabetics respond differently to the disease than other patients, treatment strategies may need to be different.” Kornfeld also noted that as the incidence of diabetes increases, especially

in developing countries such as China and India, an increasing number of people will become susceptible to tuberculosis. “There’s a real need to focus on these populations that are especially vulnerable to the disease,” he said.

Kornfeld is also investigating how tuberculosis, once it has invaded and killed macrophage cells in the lungs, exits those cells and spreads. “This is another piece of the puzzle,” he said. “It’s possible that the process of cell death may have some bearing on how the disease is spread,” said Kornfeld. “If we could interrupt that process we may be able to eradicate the disease from its host.”

In the Classroom

In the fight against TB, the training medical students receive about the disease is just as important as the research being conducted in the lab, according to Daly, who teaches second-year medical students about TB with Sassetti. “Our students go all over the world and practice medicine in all kinds of environments,” said Daly. “It’s critical that they learn to recognize and understand the disease.”

Team teaching tuberculosis with a scientist such as Sassetti gives students added insights into the latest research and has proven invaluable to their understanding of the disease, said Daly. “Knowing the basic biology and modes of gene expression of the bacterium is critical to understanding the mechanism of action for antibiotics that fight the disease and the problem of antibiotic resistance.”

Along with learning about TB in the classroom, third- and fourth-year medical students also complete a clinical elective rotation in the Getchell-Ward Tuberculosis Program, where they learn to recognize the disease in a clinical setting. “TB can be a difficult disease to diagnose because we don’t often think about it,” said Daly. “By having students rotate through the TB clinic and seeing the disease in patients, we hope that they’ll be better equipped to recognize it in their own patients.”

For both the scientists and clinicians working with TB, the impact it has on patients and families is unavoidable. “It’s impossible to work in this field and not be aware that this is a serious and devastating disease,” said Sassetti. “Outside of the labs and the classrooms, the work we’re doing could have a profound impact on people all over the world.” ●



HHMI Supports Research Innovations

Christopher Sassetti’s research into TB’s latency received extraordinary recognition and a remarkable funding boost earlier this year from the prestigious Howard Hughes Medical Institute (HHMI). Sassetti was named one of 50 inaugural Early Career Scientists by HHMI and awarded a six-year, \$1.5 million research grant. HHMI backing frees young investigators from the burden of having to pursue multiple research grants, which in today’s constrained funding environment are increasingly difficult to obtain, and gives them the flexibility and resources to pursue new and creative ideas that might not fall within the scope of a traditional research grant. “HHMI funding allows us to pursue TB latency in a more directed way than we could before,” said Dr. Sassetti, who completed post-doctoral work in microbiology at the Harvard School of Public Health. He received his PhD in immunology at the University of California San Francisco.

Chosen by HHMI from a field of more than 2,000 applicants across the country, Sassetti is joined by UMass Medical School assistant professor of neurobiology Marc R. Freeman, PhD, as a 2009 Early Career Scientist. “This is a huge honor because the competition for the program was so strong,” said Dr. Freeman, pictured above. “It’s exciting and humbling. At the same time, it shows an enthusiasm for the ideas and the research that we’re pursuing in the lab.”

Freeman is exploring how glial cells, which represent 90 percent of the cells in the brain, sense brain injury, respond immunologically to neuron death or degeneration and manage brain recovery from trauma. Understanding the basic roles glial cells perform in these events may prove critical for developing therapies for spinal nerve injuries or neurodegenerative diseases. Freeman’s research was featured in the spring/summer 2005 issue of *Vitae*.

Freeman received his PhD in biology from Yale University and completed a post-doctoral fellowship at the Institutes of Molecular Biology and Neuroscience at the University of Oregon.

Finally Physicians

UMass Medical School graduates move into residency.

By Sandra L. Gray



Match Day provides the moment each year when graduating fourth-year medical students across the United States receive a letter naming the hospital residency program where they'll begin their medical careers. This year 104 members of the University of Massachusetts Medical School Class of 2009 gathered together to discover where their years of study are leading them to next.

Among the graduates are four who each took a different path to the same endpoint: a match with their first-choice residency program. While Match Day marks the end of years of preparation, it also heralds a new beginning as, with “Doctor” in front of their name and “MD” after it, each medical school graduate commences professional life in earnest.



Samuel Ayala, MD: Emergency Medicine

Energetic and outgoing, Dr. Samuel Ayala looks forward to the adrenalin-fueled, fast-paced life in the ER as he heads to Jacobi-Montefiore Medical Center in the Bronx for Albert Einstein College of Medicine's emergency medicine residency.

Emergency medicine is a specialty but, consistent with the primary care culture that predominates at UMMS, Ayala views hospital emergency departments as vital links to primary care. “A big part of our job in the emergency department is directing patients, many of whom are getting their only medical care there, to get a primary care physician for follow-up,” he explained.

Ayala discovered early in his medical training that, while he engaged easily with most patients he encountered, connecting with distressed patients in the hectic ER environment was a larger challenge, one he took on with relish. Recognizing that communicating well is a critical component of medical practice, he learned by observing how his emergency medicine teachers and mentors, each in their own ways, communicate with their patients. Ayala also loves the teamwork with auxiliary ER staff such as social workers to help address socioeconomic and lifestyle issues affecting patients' health.

Ayala obtained his degree in human biology from Brown University in 2004,

the first member of his family to graduate from college. Of Puerto Rican descent, Ayala's innate appreciation of Latino cultures was augmented by international service learning and multicultural volunteer work during medical school, including mentoring young Latinos interested in attending medical school and completing an international service learning project in Puerto Rico. Envisioning a career in academic medicine in a large city, he looks forward to working in New York City's melting pot and becoming the kind of role model and mentor he encountered during his own education. “I couldn't have done it alone,” he said. “The people I have met at UMass Medical School are like a family to me.”

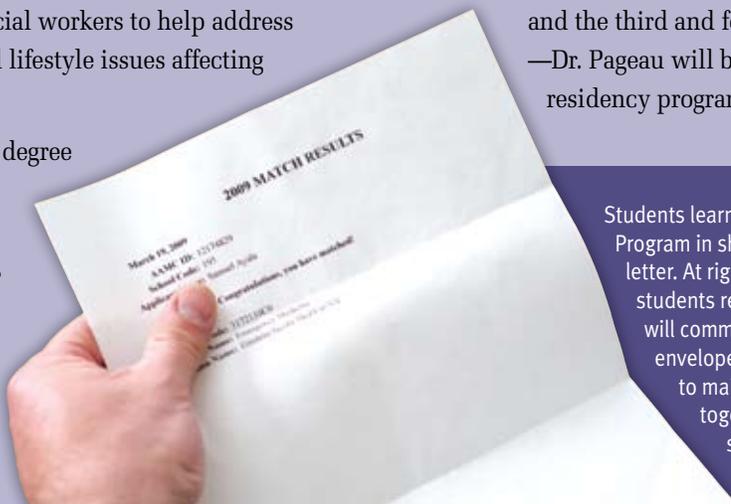


Gayle Pageau, MD, PhD: Pediatrics

Long planning to attend medical school, Gayle Pageau, MD, PhD, got hooked on the thrill of scientific inquiry during a required large-scale research project in her senior year at Colby College, from which she graduated *summa cum*

laude and Phi Beta Kappa in 2002 with a degree in cell and molecular biology and biochemistry. “I found I enjoyed being in the laboratory and the independent learning it inspired,” she recalled. Her desire to advance medical understanding as well as provide care led her to enroll in the combined MD/PhD program at UMMS.

Seven years later—having spent three years conducting dissertation research sandwiched between two preclinical years and the third and fourth clinical years at the School of Medicine—Dr. Pageau will begin a Harvard Medical School pediatric residency program at Children's Hospital in Boston. During



Students learn of their match from the National Residency Matching Program in short and (typically) sweet terms. At left is Samuel Ayala's letter. At right, scenes from Match Day, as Class of 2009 medical students react with family and friends after learning where they will commence their residencies. This year, students opened their envelopes simultaneously (photo, page 20), reflecting their wish to maintain a sense of unity, cultivated over their four years together. In prior years, envelopes were opened as each student's name was called.

the years focused on her dissertation investigating the breast cancer gene BRCA1 in the laboratory of Professor of Cell Biology and Pediatrics Jeanne Lawrence, PhD, Pageau kept a hand in her medical training, volunteering at the UMMS student-run Epsworth Free Medical Clinic in Worcester.

A rotation in pediatric oncology solidified her decision to match in pediatrics. Pageau anticipates continuing her training with a pediatric oncology fellowship after completing her residency, noting that, “there is so much we don’t know and need to learn.” Her ultimate career goals are to care for children while conducting research as a faculty member at an academic medical center.

For now, she looks forward to availing herself of the research opportunities available at Children’s Hospital while becoming an experienced pediatrician at an institution with a sterling reputation for clinical care. After so many years as a student, “I’m excited to finally be setting out on my life as a physician-scientist,” she said.



**Olga Valdman, MD:
Family Medicine**

Born and raised in Moscow, Dr. Olga Valdman took the biggest international trip of her life when she immigrated to the United States at age 15, not speaking a word of English. Now fluent in American English and Spanish, Valdman embarks

on a family medicine residency at the Greater Lawrence Family Health Center (GLFHC) for which her language skills and international perspective will be vital—70 percent of patients are of Latino origin.

Valdman’s choice was shaped by the people who supported her and the opportunities she embraced throughout medical school. In her second year, Valdman started a non-profit organization called the African Community Education (ACE) Program as an outgrowth of her participation in the first-year Community Health clerkship group on Immigrant and Refugee Health. She extended her medical school studies for a fifth year to launch a

project bringing health care records to migrant workers in the Dominican Republic. For these and other accomplishments, in 2008 Valdman was named a Pisacano Scholar by the American Academy of Family Medicine in recognition of her strong commitment and promise to become a leader in the field.

The underserved patient population in the state’s second poorest city combined with GLFHC’s focus on teaching, particularly obstetrics, for which residents perform more than the minimum number of deliveries required for board certification, sealed Lawrence as Valdman’s first choice. “The residents there are committed to serving the underserved and bring many shared interests to the program,” she noted. With enrollment in a master of public health program on her agenda following residency, Valdman anticipates a career in public health focused on international development. “My dream is to practice medicine in a community center like Lawrence while conducting large international projects in an academic setting.”



**William Zawatski,
MPH, MD: Pediatrics**

Happy to make his home locally and eager to tackle the health challenges of the increasingly diverse rural and urban populations in Central Massachusetts, Dr. William Zawatski is delighted to be commencing his pediatric residency at

UMMS and the UMass Memorial Children’s Medical Center. He chose pediatrics because, “I want to be able to influence healthy development. Pediatricians can play a role in psychosocial as well as physical development to help children become healthy and productive adults.”

Zawatski’s boyish looks belie the years of experience and training already under his belt. Graduating *magna cum laude* from Saint Anselm College in 2003 with a degree in biology and certificates in Spanish and Latin American studies, he heeded the callings to science and service early on. Zawatski volunteered in Costa Rica and Peru during college and realized





Matching Up

Upon completing four years of undergraduate medical education, a new physician will proceed to additional years of study as a graduate medical student in a residency training program, comprising hands-on learning during employment as a full-time, practicing doctor. The third Thursday of March is the annual Match Day, when fourth-year medical students learn where they will begin their careers as doctors. Match Day is an exciting time of celebration, but the day's festive mood belies the serious consideration and considerable efforts leading up to it, as decision making and application for residency is lengthy and involved. "Achieving the MD is just one step along the path to becoming a doctor," explained Associate Dean for Student Affairs Mai-Lan Rogoff, MD.

Matches are made via computer by the National Residency Matching Program (NRMP). The entire process involves students determining in which primary care or specialty field they would like to pursue residency, evaluating and ranking their preferences for programs in that field, applying to and interviewing with each program, being ranked by the programs to which they applied and, finally, being matched with a single program. The NRMP's computer algorithm takes both student and institutional rankings into account, bringing fairness and order to the more hit-or-miss outcomes of typical job searches in other professions.

Consistent with the UMMS emphasis on training primary care physicians, half of this year's fourth-year School of Medicine students chose primary care residencies. And, out of 48 pursuing residencies in Massachusetts, 19 are staying at UMass Medical School.

that underlying health care issues were public health issues; thus, his combined career goals in public health and pediatrics. Deciding to get a master of public health degree before the long haul of medical school, he earned his MPH *summa cum laude* from Boston University in 2005, where he conducted award-winning research in toxicology. Formative experiences at UMass Medical School were the first-year infant mortality interclerkship and the third-year pediatrics clerkship. "The Department of Pediatrics is very welcoming," Zawatski recalled. "I knew I could learn and be happy here."

Even with so many decisions behind him, Zawatski's future is wide open. As someone who likes having in-depth knowledge, he may consider a fellowship, or he may continue in the vital role of the frontline physician. He is also interested in doing more work internationally. In the meantime, he's eager for the next step. "I'm excited about starting residency along with some familiar faces—including five UMass Medical School classmates—and new ones from all over the country." 📍

Vitae: Grants and Research

In 1978, when UMMS first published its magazine, faculty received grant funding totaling \$2 million; by 2009, funding had grown to \$200 million, an amount that places us among the top research institutions in the country. Due to the high volume of grants awarded to UMMS faculty, we now post a comprehensive list at www.umassmed.edu/Vitae/grants. In this section, we feature researchers describing their funded work in their own words, as well as their hopes about how their findings may impact the world.



Lori Pbert, PhD, *associate professor of medicine*

A School Nurse-Delivered Intervention for Overweight and At-Risk Adolescents, National Institute of Child Health and Human Development, one year, \$257,611; recommended for one more year, \$185,868

My research team studies how health care clinicians and

practices can best help people make changes in behaviors to improve their physical health and quality of life and lower their risk for future disease. The primary focus of our work has been in preventing and treating obesity and nicotine dependence to reduce the risk of cancer and heart disease, with an emphasis on working with adolescents in school health and pediatric care settings. Our goal is to translate research results into everyday practice so that our existing health care system can help adolescents learn to make healthy choices in their lives, now and when they are adults.

We've discovered that teens want to make healthy changes and respond well to interventions that engage them personally. For example, we found that, compared to usual care, teens were much more likely to stop smoking when they received an intervention from their school nurse that walked them through the steps of quitting and solicited their ideas about what would work best for them.

We're conducting a two-year pilot study to translate our successful model of school nurses delivering patient-centered counseling with teens to address the growing challenge of obesity in adolescence by comparing two interventions that school nurses can deliver in the school setting: one using patient-centered counseling and the other providing written materials on how to make the same healthy changes. We'll follow 84 adolescents over six months to determine which approach best helps them with behavior changes and reduction in their body mass index.

The UMMS Division of Preventive and Behavioral Medicine is dedicated to translating research into practice in order to have an impact on public health. So my research team's hope is that the findings of this study will lead to the development of weight management programs for overweight and obese adolescents that can be widely delivered by school health care providers.



Marcus P. Cooper, MD, *assistant professor of medicine*

Functional Analysis of PGC1- α Holo-complex in Diabetes, National Institute of Diabetes and Digestive and Kidney Diseases, one year, \$132,570; recommended for one more year, \$131,490

The mission of my lab is to identify and understand genes that reduce obesity. Humans

have two types of fat cells—white and brown fat cells. Though not prevalent, brown fat cells burn fat as heat and protect against obesity. It is a special kind of fat found in mammals, including humans, important for warming the body in cold environments. We are interested in the subset of genes that make this “fat burning” capacity possible. The goal is to activate these pathways in white fat and safely promote weight loss. In order to fully understand this complex problem, the laboratory employs a comprehensive “molecule to human” approach.

The work began by purifying binding partners for a powerful metabolic regulator called PGC-1 alpha. This led to the identification of a factor called LRP130, which is mutated in patients with a metabolic and neurologic disorder called Leigh Syndrome French Canadian variant. Studies on LRP130 advanced novel concepts on glucose regulation in the liver and more recently established a role in the anti-obesity properties of brown fat.

Because of the unique fat-burning property of brown fat, interest has intensified in unraveling the molecular mechanisms that regulate brown fat cells. I was recently recruited to the Division of Cardiovascular Medicine to expand our molecular program in energy metabolism and diabetes. This is of particular importance since the epidemic of obesity in the United States has ushered in a devastating epidemic of type 2 diabetes.

[A complete list of grants is available at www.umassmed.edu/Vitae/grants](http://www.umassmed.edu/Vitae/grants)

Vitae: Alumni Report

Commencement has come home. On June 7, our Commencement ceremonies were held on campus for the first time. Over the course of the eventful weekend, thousands of graduating students and parents, alumni and faculty, and distinguished guests and friends celebrated on the new Campus Green. We were privileged that distinguished figures in medicine and nursing joined us, making the ceremonies even more inspirational and memorable.



CHANCELLOR'S MESSAGE



Keynote speaker Benjamin S. Carson, MD (above), renowned pediatric neurosurgeon, author and philanthropist, inspired us with his life story and encouraging message to our graduates. Our two other honorary degree recipients were equally remarkable through their examples of commitment to underserved populations both in this country and internationally: Project HOPE President John P. Howe III, MD, and Ruth W. Lubic, CNM, EdD.

Dr. Carson is director of Pediatric Neurosurgery, co-director of the Johns Hopkins Craniofacial Center and professor of neurological surgery, oncology, plastic surgery and pediatrics at the Johns Hopkins Hospital. He has authored more than 100 neurosurgical publications, along with three best-selling books, and has been awarded the Presidential Medal of Freedom, the nation's highest civilian honor.

As a youngster, Dr. Carson struggled in school, but when he started reading books, the world and its incredible diversity of people and places opened up to him. He went on to major in psychology at Yale and graduated from the University of Michigan School of Medicine. Dr. Carson's career is marked by surgical innovations that have enriched his patients' lives.

Dr. Howe is familiar with the UMass Worcester campus, but was amazed by its transformation since he was recruited to the Medical School in 1975 to start the cardiology program with the department's first chair, James Dalen. Dr. Howe later assumed the role of vice chancellor and academic dean, a position he held before leaving the Medical School in 1985 to serve as

president of the University of Texas Health Sciences Center at San Antonio. In 2001 he became president and CEO of Project Hope, an international health foundation that has brought care to the disadvantaged, especially women and children.

Dr. Lubic is a leading women's health advocate, who received a "Genius" Grant from the MacArthur Foundation for her contribution to the development of the birth center model in New York State and for providing quality health care to women and infants for decades. When Dr. Lubic received her grant, she moved her efforts from New York City to Washington, D.C., where the infant mortality rate was twice the national average, and started a birth center in one of the city's poorest areas.

As our campus came to know these amazing individuals over Commencement weekend, I could not help but draw parallels to our own UMass Worcester alumni, who have achieved so much in their own right through patient care and research efforts to which they commit their relentless enthusiasm and deep knowledge. It is indeed fitting to have launched our newest graduates from the very place where they attained their skills and compassion. May the traditions of UMass Worcester that culminate in Commencement continue with each passing year and graduating class, here on the UMass Worcester Campus Green.

Michael F. Collins, MD
Chancellor, University of Massachusetts Medical School
Senior Vice President for the Health Sciences, University of Massachusetts



Richard Aghababian, MD '74, founding chair of the Department of Emergency Medicine, and his wife, Ann, were recognized on April 14, 2009, for their generous financial support of the Emergency Care Campaign that helped fund construction of the UMass Memorial Medical Center's University campus Emergency Department. The Clinical Decision Unit in the Emergency Department is named in the couple's honor. Left to right are: UMass Memorial Health Care President and CEO John O'Brien; Ann Aghababian; Dr. Aghababian; Gregory Volturo, MD, chair of Emergency Medicine; and UMass Memorial Medical Center President Walter Ettinger, MD, MBA.



Adam S. Feldman, MD '00 MA

How medical students select their post-graduate career paths is as individual as the students themselves. For Adam S. Feldman, MD, his surgery rotation and participation in the Senior Scholars program at UMass Medical School piqued his interest in urology and urologic oncology. "During my rotation, I

studied under then-Chief of Urology Bob Blute, who was exciting and inspiring," recalled Dr. Feldman. "As part of the Senior Scholars program, I worked as a research fellow in the Laboratory for Cellular Therapeutics and Tissue Engineering at Children's Hospital Boston, which gave me a solid foundation in molecular biology, immunohistochemistry and tissue culture methods."

Recognizing his clinical and research objectives, Feldman aspired to fulfill them in a field that allows practitioners to establish ongoing relationships with patients. "Urology is a field in which you can perform big and small surgical cases, positively affect patients and conduct research, especially in the field of urologic oncology."

Feldman focused on translational biomarker research using the proteomic method as a resident at Mass General Hospital. During his fellowship in urologic oncology, also at MGH, and as a member of the faculty, he developed novel biomarkers for bladder and prostate cancers. Working on this and other projects in renal cell carcinoma led to the presentation of research abstracts at national meetings and publications, a patent on a novel biomarker, a peer-reviewed institutional grant and other funding. Recently, Feldman became one of the first recipients of a three-year Young Investigator Award from the Prostate Cancer Foundation that will support his research in proteomic discovery and analysis for novel biomarkers in prostate cancer. "I was honored to receive this award from the PCF, which not only provided me with financial support, but opened doors to potential collaborations within the field."

Feldman's clinical focus has been in urologic oncologic surgery, both open and laparoscopic techniques, in the management of patients with genitourinary cancer. He has also directed his research efforts toward clinical projects, including active surveillance for prostate cancer and an upcoming collaboration investigating smoking cessation in bladder cancer patients. And to refine his ability to design and implement translational research programs, Feldman is pursuing an MPH in Clinical Effectiveness at Harvard.

1975

William B. Holgerson, MD, received the Samuel O. Thier Physician Leadership Award from his colleagues at Partners Community Health, Inc. in recognition of his vision, courage, energy, resilience and integrity.

1976

Christine K. Cassel, MD, president and CEO of the American Board of Internal Medicine and former dean of the School of Medicine and vice president for Medical Affairs at Oregon Health & Science University, has been appointed to President Barack Obama's Council of Advisors on Science and Technology (PCAST). PCAST is made up of the nation's leading scientists and engineers who will advise the president and vice president and formulate policy in the many areas where understanding of science, technology, and innovation is key to strengthening the economy and forming effective policy. PCAST is part of the Executive Office of the President and is administered by the Office of Science and Technology Policy. Dr. Cassel, a member of the Institute of Medicine, is a leading expert in geriatric medicine and quality of care.

Vitae: Class Notes



Jason P. Laliberte, PhD '08

Jason Laliberte, PhD, is currently a resident of Washington, D.C., and says that he hopes to “get a run in with some of the local rugby clubs.” Until then, this lover of doing battle on the sports field is fighting a different one in the laboratories of the National Institutes of Health.

As a post-doctoral fellow in Dr. Bernard Moss’ group at the Laboratory of Viral Diseases within the National Institute of Allergy and Infectious Diseases, Dr. Laliberte is studying *vaccinia* virus and the molecular mechanisms the virus uses to enter host cells. He hopes to identify and define the factors on the virus itself and those on the cell that are necessary for *vaccinia* to gain entry and initiate its replicative life cycle. “As the prototypic member of the *Poxviridae* family of large DNA viruses, *vaccinia* virus remains quite relevant due to its use as the vaccine against the smallpox virus—a potential bioterrorism agent,” explained Laliberte.

Although there hasn’t been a “eureka moment” yet, Laliberte said his post-doctoral experience has revealed the first encouraging result to come from his project. “Our initial thoughts regarding the question we were asking have been confirmed and have led to a series of more exciting experiments and results to support our ideas on how the virus may be entering cells.”

Before starting his work at the NIH, Laliberte expected to find a number of scientific, technical and career development resources to foster his training. He has indeed discovered that guiding post-doctoral fellows is one of the NIH’s highest priorities.

This is similar to his experience at the GSBS, Laliberte noted, as the school provided the opportunity to choose from a variety of quality research areas and laboratories in which to perform his thesis work. “The GSBS, and certainly the Immunology and Virology Program where I had great scientific mentors, prepared me well in that I was exposed to many of the facets of what it is to be a good research scientist. I was trained to conduct quality independent research and to effectively communicate my science to my peers in the form of scientific manuscripts and presentations. The skills I learned in these areas were crucial to my development.”

Working at the NIH is truly a testament to Laliberte’s achievements so far.

1977

Krystyna D. Kiel, MD, is a radiation oncologist at Memorial Health University Medical Center in Savannah, Georgia. She recently served as an assistant professor of radiology at Northwestern University.

1979

(Celebrating the Class’s 30th Reunion – October 17, 2009)

Kathryn E. Reilly, MD, is teaching family medicine in Oklahoma City and enjoying practicing medicine. She and her husband, Steven Hull, recently bought a 40-acre farm north of the city and are raising alpacas, with Steven also teaching seminars about the industry.

James I. Whynot, MD, is a hospitalist at Maui Medical Group in Wailuku, Hawaii. He most recently served as an internist at Addison Gilbert Primary Care in Gloucester, Mass.

1985

Coral A. Quiet, MD, co-founded Arizona Breast Specialists and serves as medical director of the Arizona Institute for Breast Health, a nonprofit service organization, which she co-founded. Dr. Quiet’s areas of specialization include breast cancer (breast preservation and wellness), high dose-rate radiation brachytherapy (both endobronchial and esophageal) and traditional external beam radiation therapy.

1988

Damian E. Dupuy, MD, has been elected a fellow in the American College of Radiology. He is director of Tumor Ablation at Rhode Island Hospital and a professor of diagnostic imaging at The Warren Alpert Medical School of Brown University.

1995

Eric W. Dickson, MD, has joined UMass Memorial Medical Center as senior medical director of the Medical Group. Prior to joining UMass Memorial, he was with the University of Iowa as its founding chair of emergency medicine and later as the interim COO of the 750-bed University of Iowa Hospitals and Clinics.

1997

Cheryl A. Pikora, MD, PhD, has joined the Division of Pediatric Immunology, Infectious Disease and Rheumatology at UMass Memorial Medical Center. She received her medical and doctoral degrees from UMass Medical School and completed her residency and a fellowship in infectious diseases at



Jeffrey Cukor, MD '94, was the keynote speaker at the 2009 UMass Medical School Annual Parent Dinner held on March 25, 2009, in the Aaron Lazare Medical Research Building. Dr. Cukor, emergency medicine residency director and assistant professor of emergency medicine at UMMS, presented "From Student to Physician: The UMass Medical School Journey."

The first school-wide *Conference on Transitioning from Medical School to Medical Professional* took place on campus in April 2009. School of Medicine alumni who participated as panelists in the annual event are, left to right: AnnMarie DeAngelis, MD '98; Janet Yardley, MD '81; Lanu Stoddart, MD '92; Gerald Gleich, MD '84; Mary Herlihy, MD '94; Marc Restuccia, MD '84; and Leslie Shaff, MD '84. Panelists not pictured are: Lynn Baden, MD '86, Timothy Gibson, MD '99, and Barbara Stewart, MD '81.



Children's Hospital Boston.

Gabriel R. Wilson, MD, is associate medical director of the St. Luke's—Roosevelt Emergency Department, which covers much of the West Side of Manhattan. He has discussed medical issues affecting the community on CNN (*Larry King Live*, *Lou Dobbs*), MSNBC (*Chris Matthews Hardball*), Fox News (*Greta Van Susteren On The Record*) and Bloomberg radio and TV. He has also appeared on ABC and CBS news, *The Daily Show with Jon Stewart* and local New York affiliates' evening news programs. Dr. Wilson lives in New York City with his wife, Kanami, and one-year-old son, Yuki.

1998

Nancy E. Long, MD, and her husband, Don, moved to Maui, Hawaii, in January 2009. She is Hospice Maui's first full-time medical director and will soon start a palliative care consult service at Maui Memorial Medical Center. She says, "Aloha!"

1999

(Celebrating the Class's 10th Reunion – October 17, 2009)

Larissa J. Lucas, MD, is deputy editor of DynaMed (www.dynamicmedical.com), an online point-of-care reference tool for physicians and health care practitioners. Dr. Lucas has a three-

year-old daughter.

2000

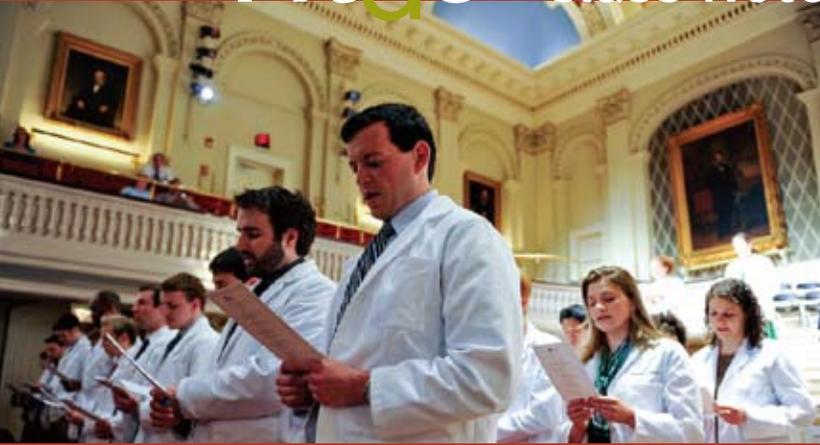
Marguerite Mary Brackley, MD, was married on June 9, 2008, to Dr. Kunal Jajoo at the Seaport Hotel in Boston. She has a one-year-old daughter and is now living in New York City. Dr. Brackley said she is looking forward to catching up with everyone at the next reunion!

2001

Elisabeth Richard, MD, and her husband, Glenn, have two children: Madeline, 5, and Alex, 3. They have lived in Guam for the past three years and are now moving back to Washington, D.C., where Glenn will be stationed at the National Naval Medical Center. Being the only dermatologist for a population of 150,000 in the tropics has kept Dr. Richard very busy, but she reports they have had a great time filled with travel and new friends. "Biba Guam!"

Gilberto Sustache, MD, and his wife, Hanya, just had their second child, Nadia, who now joins big brother, Caleb, in "adding spice and laughter to our lives." The family lives in Houston. Dr. Sustache is a partner in Sugar Land Family Practice and was recently named Physician of the Quarter

Vitae: Class Notes



Members of the Class of 2011 and their families and friends gathered at Worcester's Mechanics Hall for the Second Year Oath Ceremony on April 28, 2009. Medical students embarking on their clinical years heard an address from Michael Hirsh, MD, UMMS professor of surgery and pediatrics. Above, students recite the oath they as a class wrote for the ceremony.

by Methodist Hospital. With the added duties of fatherhood, however, Dr. Sustache no longer performs hospital duties. The couple said that visitors to Texas are welcome to spend the night in their "bed and breakfast" anytime.

Matthew J. Velsmid, MD, is a general internist at a large practice affiliated with Waterbury Hospital. He has also enjoyed teaching outpatient medicine to Yale primary care residents. Dr. Velsmid and his wife, Kristen, live in Southbury, Conn., with their two daughters, Ashley, 3, and Kaitlyn, 1.

2002

Ceara McNiff, MD, married Vincent Deno on June 28, 2008, in Ipswich, Mass. They are expecting their first child this summer. Dr. McNiff completed her neonatology fellowship in June 2008 at Tufts Medical Center and in July began work at Beverly Hospital in the Level 2B Special Care Nursery. She will also spend one month a year at St. Elizabeth's Medical Center in the Level 3 NICU.

In Memoriam

Jennifer Songer, PhD '09, died on December 9, 2008. She received her degree posthumously from the Program in Biochemistry & Molecular Pharmacology of the GSBS.

Alumni of the School of Medicine, Graduate School of Biomedical Sciences and Graduate School of Nursing may send their latest news to alumni@umassmed.edu



Jennifer Markey, FNP '07

Jennifer Markey, FNP, loves traveling and experiencing new cultures. Thanks to her role as a family nurse practitioner at the Great Brook Valley Health Center (GBVHC) in Worcester, she doesn't have to go far. "My patients teach me so much about their languages, foods, customs and beliefs, I feel

like I've been to their countries without even leaving the exam room."

Markey's patients have ties to five continents and speak more than ten languages, and as a result, face barriers to receiving appropriate health care. "The health center works hard to remove these barriers by making health care more affordable and accessible to these patients, and it's my responsibility to provide culturally acceptable care by becoming familiar with their backgrounds and beliefs," said Markey.

Markey's experience as a student in the Graduate School of Nursing's community clerkship during her first year in the Graduate Entry Pathway (GEP) program exposed her to the importance of evidence-based practice and the vital role of community health centers. Visiting GBVHC, she "was amazed at the number of services that were available to patients under one roof." In her practice, Markey addresses health care disparities she first learned of while studying the increased infant mortality rate among immigrant women from Ghana, and today provides comprehensive primary care to her patients across their life span. "Much of my time is spent providing education to patients," she added.

Markey enrolled in the GEP program after graduating from UMass Amherst with a degree in biology; she was drawn to the medical field after working as a certified EMT while a student there. "The idea of earning a degree as a nurse and a nurse practitioner in a three-year span was daunting and exciting at the same time. In retrospect I had no idea what the field of nursing was all about until I got to the GSN." After her first few weeks of classes, Markey said she realized, "This is it! Nursing was exactly what I had been looking for. It was a combination of all of my interests including anatomy and physiology, biology, psychology, pathology, nutrition, health, sociology, medicine and education. It is the perfect profession for me."

CALENDAR

School of Medicine Alumni Celebration for Underrepresented Groups

UMass Medical School Campus
Sunday, June 28, 2009

Annual Alumni Scholarship Dinner

UMass Medical School Campus
Tuesday, September 22, 2009

School of Medicine Alumni Reunion Celebrating the classes of

1974, 1979, 1984, 1989, 1994, 1999, 2004
UMass Medical School Campus
Saturday, October 17, 2009

For more information about these events, visit www.NetworkUMass.com/Medical or contact the Office of Alumni Relations at alumni@umassmed.edu or 508-856-1593.



Susan Hou, MD '75

On the day in 2001 that Centro Medico Humberto Parra opened, the clinic had no electricity or running water. “A patient came in with a chest X-ray and we looked at it by candlelight,” said Susan Hou, MD, co-founder (with her husband, Mark Molitch, MD, and Bolivian endocrinologist

Douglas Villarroel, MD) of the clinic located 72 miles from Santa Cruz, Bolivia. In the months following the opening, doctors were available sporadically and two volunteers went from village to village to determine health care needs. Today, Centro Medico—the only free medical clinic in an area of 40,000 people—sees about 5,000 patients a year, treats conditions ranging from diabetes to Dengue fever and provides primary care, emergency and infirmary care, medication, dentistry and eye services, and referrals and funding for surgery. “In 2004, we had a full-time American doctor for six months and our first residents—the clinic has a formal rotation program for students and residents,” said Dr. Hou.

Centro Medico has become an invaluable health education resource. In turn, the villagers have become indispensable to the clinic’s operations. Each of the 12 communities served maintains a clinic support group that meets with nurses to discuss health issues and clinic programming. The groups also provide feedback to clinic staff, make donations to the clinic’s emergency fund, and send volunteers to work there and organize festivities.

The clinic is funded by the Daniels Hamant Foundation and its private donations. Hou’s classmate, Anita Karcz, MD '75, has also been important to the clinic. “Anita has become a great supporter with her contacts and ability to help us get equipment and supplies,” Hou said.

Hou was partly inspired to establish Centro Medico because of her desire to practice family medicine in an underserved country, a desire that was strengthened by the UMMS curriculum and faculty.

Hou spends four weeks a year in Bolivia and maintains her practice and teaches at Loyola University Strich School of Medicine. Her love of service through the clinic has been passed on to her children; Ethan became a doctor himself; Michael was the clinic coordinator, and Tamara and her husband spent time there just after their honeymoon.

Join the UMass Medical School Alumni Online Community

Since its launch, the Alumni Online Community has become a helpful tool for graduates to stay in touch with each other and the Medical School. All alumni from the School of Medicine, Graduate School of Biomedical Sciences and Graduate School of Nursing are encouraged to register.

It’s easy:

Go to www.NetworkUMass.com/Medical

In the blue registration box, log in with your user ID and password or to register, click “**Register Now.**”

Once you’re connected:

- Find and catch up with friends and classmates.
- Share a class note.
- Update your directory listing.
- Check the events calendar.
- Get the latest UMMS news.

Need your security number for registration?

E-mail alumni@umassmed.edu or call 508-856-1593.

Vitae: The Last Word



By Charles J. Pagnam, Vice Chancellor for Development,
University of Massachusetts Medical School

UMass Medical School and clinical partner UMass Memorial Health Care have developed an unconventional vision of how to combine basic science innovation with the potential of clinical investigations to move our academic health sciences center to the next level of translational research. This vision is embodied in the design of the Advanced Center for Clinical Care, Education and Sciences (ACCES) building, which locates clinical care and clinical research in adjacent space on each floor. This configuration allows physician-scientists and patients to move seamlessly from where they receive treatment to where they can participate in trials of investigative therapies.

We believe this building and the programmatic design within it will catalyze dramatic advances in the application of stem cell technology and molecular therapy that will reach the patients of Central Massachusetts, New England, the nation and beyond. Specifically, the Clinical Facility for Innovative Research and Education (CFIRE), to be located in the ACCES building when it opens in 2010, will be linked to a number of clinical programs operated by UMass Memorial Medical Center. It is precisely this type of innovative collaboration that attracts the support of benefactors, such as the Wayne and Gladys Valley Foundation of California, which makes grants intended to have a lasting impact upon organizations and their surrounding communities.

The Valley Foundation has awarded our institutions a \$12.5 million matching grant to support the capital build-out of CFIRE and the seven-story, 258,000-square-foot ACCES building, as well as the recruitment and staffing costs related to programs to be housed inside. The grant will provide \$7.5 million to be used for the immediate capital components of the project and \$5 million to fill the building with the researchers, clinicians and equipment

required to manage the programs.

The hospital's Centers of Excellence—Heart and Vascular, Diabetes and Endocrinology, Musculoskeletal and Cancer—will be located in the building, providing closer collaboration between clinicians and researchers. Additionally, ACCES will house the recently established UMMS Department of Quantitative Health Sciences (QHS), which fosters collaboration among existing clinical and basic science entities with the goal of shortening the time between laboratory breakthroughs and clinical applications. QHS is integral to our research vision and aligns with a central priority of the National Institutes of Health.

Over the years, we have recruited world-class innovators in the basic laboratory sciences and established one of the most respected research institutions in the country. Leaders in the fields of RNA, molecular medicine and gene therapy call UMass Medical School home. And now, building on that foundation, our institutions have attracted a number of brilliant clinician-researchers who share our vision to become a powerhouse in clinical and translational research. ACCES is their setting for success.

Cutting-edge clinical research requires a superstructure to house clinical physician-scientists, epidemiologists and data

analysts, together with the requisite computer software and hardware at the site of patient contact. This clinical research team will require specialized technology to facilitate communication with large national and international databases to study the genetic bases for these diseases. Clinical trials are desperately needed to power the advances in molecular medicine, gene therapy and other innovative developments in science. The Valley Foundation has set the stage for our bold action in this realm.

As a challenge grant, receipt of the money from the Valley Foundation is contingent upon UMMS and UMass Memorial Medical Center raising additional funds, as follows: The first \$2.5 million raised from private sources for capital programs related to the CFIRE Initiative will be matched three-for-one by the Valley Foundation, up to \$7.5 million. The second portion of the challenge will provide a \$5 million one-for-one match for CFIRE personnel and programming. Thus, we will raise \$7.5 million from other sources in order to receive \$12.5 from the Valley Foundation, for a total of \$20 million dedicated to the CFIRE and ACCES building programs. ©

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