



Advance Work

Vita^{ae}:

The Magazine of
The University of Massachusetts Medical School



Progress on Prostate Cancer



Year in Review



Teaching Time



Making it Better

Vital: the plural of life

The name of this magazine encompasses the lives of those who make up the UMMS community, for which it is published. They are students, faculty, staff, alumni, volunteers, benefactors and others who aspire to help this campus achieve national distinction in education, research and public service.

University of Massachusetts Medical School

The University of Massachusetts Medical School was created in 1962 by an act of the Massachusetts Legislature and today is comprised of three schools. Since accepting its first class in 1970, the School of Medicine has provided students with an accessible, comprehensive and personally rewarding medical education of the highest quality, one which optimally prepares them to excel as physicians. The Graduate School of Biomedical Sciences, opened in 1979, is a faculty-initiated PhD program that trains scientists in a specialty area with a broad background in the basic medical sciences, in preparation for conducting research with direct relevance to human disease. Opened in 1986, the Graduate School of Nursing, through its master's, post-master's and doctoral degree programs, provides professional education and training for advanced practice nurses within three specialties: adult acute/critical care nurse practitioners, adult ambulatory/community care nurse practitioners and advanced practice nurse educators.

UMass Memorial Foundation

The UMass Memorial Foundation, established in May 1998, is the charitable partnership created through a merger of the former University of Massachusetts Medical Center Foundation and the Memorial Foundation. The mission of the Foundation is to support the academic and research enterprises of UMass Medical School and the clinical initiatives of UMass Memorial Health Care.

Worcester Foundation for Biomedical Research

The Worcester Foundation for Biomedical Research is a nonprofit organization devoted to the support of research and the education and training of tomorrow's scientists at the University of Massachusetts Medical School. Founded in 1944 as an independent basic biomedical research institute, with research accomplishments that include the birth control pill and the work that led to *in vitro* fertilization, the Worcester Foundation merged with UMass Medical School in 1997.

UMass Memorial Health Care

UMass Memorial Health Care is Central Massachusetts' largest not-for-profit health care delivery system, covering the complete health care continuum with teaching hospitals, affiliated community hospitals, free-standing primary care practices, ambulatory outpatient clinics, long-term care facilities, home health agencies, hospice programs, a rehabilitation group and mental health services. UMass Memorial is the clinical partner of the University of Massachusetts Medical School.

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Dr. Pamela Ellsworth, UMMS alumna, one of a few female division chiefs in the country, is a leader in her field—and a compassionate caregiver.

All American medical schools undergo an accreditation process to ensure quality educational programs for their students. Ours, conducted by the Liaison Committee for Medical Education (LCME), occurs every eight years, and this



Message from the Chancellor/Dean

March, members of the official accrediting body will be canvassing our campus, speaking to students, faculty, staff and administrators and reviewing thorough self-assessment documents we've been preparing for almost a year now.

The self-assessment has helped reinforce for me how much the UMMS community takes its "mandate" to heart: its mission to serve the people of the Commonwealth through programs of national distinction in health sciences education, research and public service. It is interesting to note that, early on in our "self-study" process, we determined a committee should be established to take a look at the current mission statement, to see if it still rings true, still reflects our aspirations. Maybe, we wondered, the mission needed a rewrite to reflect new opportunities and challenges. Well, you know the old adage, "if it ain't broke..." Our mission statement still holds the appropriate breadth and depth of conviction to the goals we've set for ourselves.

The mission statement resonates throughout the wording of our newly polished set of values; we strive to:

Provide high quality, affordable educational programs for the training of physicians, advanced practice nurses, researchers and educators

Forge effective partnerships with the state, industry, our clinical and educational partners and the community

Promote a culturally diverse institution that fosters an atmosphere of compassion, courtesy and mutual respect

Maintain high ethical standards in all that we do

Provide ongoing evaluation of our educational, research, clinical practice and public service activities to improve their outcomes

Encourage scientific advancement into the causes, prevention and treatment of human disease by promoting excellence in basic science and translational research

Provide expertise to national, state and local agencies, promoting health, and providing care and advocacy for vulnerable populations

This annual report for 2003 includes stories that, as you read them, will remind you of the values UMMS embraces. For example, in coverage of our latest contributions to the effort against prostate cancer, UMMS researchers describe their creation of more accurate screening processes and their successes in the lab in halting the spread of the disease once it takes hold. Our medical education program has experienced important enhancements recently, with emphasis on helping physician-educators find more time to teach, as described in the following pages. In our profile of an outstanding alumna, Dr. Pamela Ellsworth, you'll discover she is a leader in her field, called upon to not only inform thousands of her colleagues around the globe, but also to serve as chief of a growing division within UMass Memorial—one of only three females currently in such a role in the nation. And you'll read that so many of our objectives are supported in the increasing number of endowments our dedicated donors are establishing here through their benevolence and belief in our mission and values.

A handwritten signature in blue ink that reads "Aaron Lazare".

Aaron Lazare, MD

Vitae: Year in Review

Campaign for Emergency Care—The Reason for Support

One year ago a fire leveled the Station nightclub in West Warwick, Rhode Island, instantly destroying 100 lives and indelibly altering those of the injured survivors. Ambulances and helicopters fanned out from the scene, taking burn victims to area hospitals for the start of what would be long periods of painful treatment and rehabilitation. Four Station fire victims arrived at UMass Memorial Medical Center—University Campus in the early hours following the blaze's first flicker, with one victim's story later recounted in a four-part series in *The Providence Journal* in October 2003. Descriptions of the excellence of the UMass Memorial emergency response and the expertise and compassion of the team of physicians, nurses and physician assistants served to punctuate the experience of patient Gina Gauvin:

"Luckily for Gauvin and other Station burn patients, UMass was well staffed with lovers of burn medicine—nearly a dozen intensive care nurses trained in burn care, a physician assistant who specializes in burns, plastic surgery residents and a team of plastic surgeons. While many burn doctors are general surgeons or trauma surgeons, UMass has cast in this role its plastic surgeons—doctors who have trained as general surgeons, but then learned reconstructive surgery."

"Gina Gauvin's Story—Part I, Against the Odds," The Providence Journal, October 26, 2003

"[UMass Memorial's Dr. Gary M.] Fudem, who had trained at Case Western Reserve University with Dr. Richard B. Fratianne, a champion of the team approach to burn care, was the leader of Gauvin's treatment team which included residents, nurses, physical therapists and the physician assistant Paul Savoie. In the weeks ahead, Fudem would meet with this team every two or three days. There would be so many details to attend to. Organ system by organ system, Fudem would check the readings and the treatments given to make sure that nothing had been overlooked, nothing duplicated."

"Gina Gauvin's Story—Part I, Against the Odds," The Providence Journal, October 26, 2003

"Savoie strives to give patients enough medication to ease that pain, typically using morphine and Versed. He says it has taken him 10 years to develop the knowledge and the nerve to provide the right amount. Often that means drugs in quantities that might stop an unburned person from breathing. 'Most people are too scared to give that degree of medication to the patient,' he says. 'It takes time to get there; to feel confident that you're not going to kill the patient by giving them that much medication.'"

"Gina Gauvin's Story—Part II, Saving the Patient," The Providence Journal, October 27, 2003

"Paul Savoie was elated. As the physician assistant specializing in burns, he had participated in every procedure per-

formed on Gauvin. ... This is why he does this delicate, grueling work: to bring patients back from the brink and make them well enough to move on. Asked when Gauvin had progressed to the point that he didn't fear for her life, he said, "The day she left."

"Gina Gauvin's Story—Part III, Road to Recovery," The Providence Journal, October 28, 2003

Gina Gauvin has returned home, to rehabilitate with her family in familiar surroundings. Meanwhile, UMass Memorial Medical Center emergency medicine personnel stand by for not only other, future burn victims, but also for victims of heart attacks, traffic accidents and violence. To support their lifesaving efforts, the Emergency Care Campaign has been launched to upgrade current facilities at the University Campus from their 1976 level. UMass Memorial will invest \$129 million in the construction of additional intensive care rooms and surgical suites, discreet waiting and treatment areas, a new LifeFlight heliport, and enhanced technological equipment and radiology services, tripling the current space at a hospital that treats the most severely injured and sickest patients in the region, with unparalleled skill and compassion.

To learn more about supporting the philanthropic campaign to raise \$20 million for Emergency Care at UMass Memorial Medical Center—University Campus, contact Patricia Kelleher Bartram of the UMass Memorial Foundation at 508-856-5520. ☉

Vita: Year in Review



Dateline: Worcester

In 2003, UMMS faculty and researchers contributed to the year's biggest health stories and were called upon by media on a national and international scale.



Obesity

As public health leaders grapple with the epidemic of obesity in the United States, a UMMS researcher and his colleagues reported in 2003 that the more often people eat each day, the less likely they are to be obese; and people who skip breakfast altogether are 4.5 times more likely to be obese. Their study also found that people who eat breakfast and dinner frequently away from home have approximately twice the risk of becoming obese than those who ate more meals at home.

These and other findings were reported in a study published July 1, 2003 in the *American Journal of Epidemiology* by lead author Yunsheng Ma, PhD, assistant professor of medicine at UMMS. "We found in observing these otherwise healthy people that it's much better for people to spread their caloric intake out over multiple smaller meals throughout the day," said Dr. Ma. "And people shouldn't skip breakfast, that is very important."

Ma theorizes that spreading out the calories keeps a more stable level of insulin in the blood. Eating fewer, larger meals spikes insulin levels in the blood that in turn causes more blood sugars to be taken up and stored in the body's fat cells.

Another UMMS faculty member, Associate Professor of Medicine George W. Reed, PhD, co-authored a paper published in *Science* magazine's February 7, 2003 edition on obesity that indicates as little as 15 minutes of extra walking a day, or leav-

ing just a few bites of food on the plate at each meal, may be enough to stop weight gain in most people. "What we've done with this work is to see what it takes to at least get people to stop gaining weight, and thereby avoid the medical problems that might result if they continued to gain weight," Dr. Reed said.

Reed analyzed eight years of weight data gathered on 40,000 adults and children across the U.S. through the National Health and Nutrition Examination Survey (NHANES) from 1988 through 1994 and then from 1999 to 2000. He found that during the eight-year period studied, Americans gained between 1.8 and two pounds per year on average. Based on NHANES and supporting data, Reed developed formulae to estimate how much the average person is overeating and how much additional physical activity (or how much less food intake) would be required on a daily basis to prevent additional weight gain. "By our calculations, it doesn't take much to at least prevent further weight gain," Reed said. "It can be done with measures nearly anyone can incorporate into a fast-paced life."

UMMS research was covered by: [Associated Press](#), [Boston Herald](#), [CKNW Radio Vancouver](#), [Web site of the American Cancer Society](#), [Prevention](#), [WCVB-TV Boston](#), [New England Cable News](#), [WBZ News Radio Boston](#), [Telegram & Gazette](#), and others. ©

Severe Acute Respiratory Syndrome (SARS)

Scientists at the Medical School's Worcester Campus and at the UMMS Massachusetts Biologic Laboratories (MBL) in Jamaica Plain, are at the forefront of research into the cause, treatment and prevention of severe acute respiratory syndrome, SARS. As a result of their latest efforts, a UMMS team, in collaboration with researchers at Harvard University and several Boston teaching hospitals, found that angiotensin-converting enzyme 2 (ACE2) is a functional receptor that allows the SARS virus to infect human cells. Details of the finding were published November 27, 2003 in the journal *Nature*.

The discovery identifies a likely target for developing therapeutics and designing vaccines effective against the virus that causes SARS. "We think this is a critical step forward in the research into SARS," said Thomas C. Greenough, MD, assistant professor of pediatrics and medicine, a co-author of the paper. "Once you understand how SARS gets into the cell, you open up avenues for developing treatment strategies and vaccines."

SARS, a viral respiratory illness caused by a coronavirus, was first reported in Asia in February 2003, and over the next few months spread to more than two dozen countries in North America, South America, Europe and Asia. According to the World Health Organization, a total of 8,098 people worldwide became sick with SARS and 774 died during the outbreak of 2003. The SARS outbreak was contained; however, it is expected that the disease could re-emerge in an annual cycle similar to the common flu.

The team led by Harvard's Michael Farzan, PhD, showed that the interaction between elements of the body's "Spike" or S protein, which the SARS virus uses like a hook to grab onto cells, works with ACE2 to enable cell membranes to fuse together, a process that is critical for a virus to enter a cell. After confirming the ACE2 receptor's role, the UMMS group went on to show that antibodies that target ACE2 could inhibit the growth of the SARS virus, adding to the evidence that this protein is critical for the virus to bind and enter the cell.

The study concludes that com-

pounds that inhibit ACE2 in humans may prove to be effective treatments against SARS. Since much is known about ACE inhibitors, the authors hope that the identification of ACE2 as a receptor for SARS will both focus and accelerate the ongoing research for a vaccine and therapeutics. "If SARS returns as a threat to human health, these studies may contribute to its control," the authors wrote in *Nature*.

In addition to Dr. Greenough, the other UMMS scientists who co-authored the paper are Mohan Somasundaran, PhD, Katherine Ruiz de Luzuriaga, MD, and John L. Sullivan, MD.

This latest news follows previous breakthroughs resulting from UMMS endeavors surrounding SARS. On October 11, 2003, at the annual meeting of the Infectious Disease Society of America, a team of scientists from UMMS and the MBL, in partnership with researchers at Medarex Inc., announced they had neutralized the SARS virus in non-human tissue cultures. This important progress came just six months after the U.S. Centers for Disease Control provided the SARS virus to UMMS to launch this research. The SARS work at MBL is led by William Thomas, PhD.

"We believe that both the world health community's response to the outbreak of SARS, and the pace of progress in our efforts at the Medical School, have been outstanding," said Dr. Sullivan, who also directs the UMMS Office of Research.

UMMS research was covered by: Associated Press, *The Boston Globe*, *The Washington Post*, *The Wall Street Journal*, *The Baltimore Sun*, *Boston Herald*, *American Medical News*, *Voice of America*, *WCVB-TV Boston*, *New England Cable News*, *CFRA News Radio Ottawa*, *Telegram & Gazette*, *WBIX Radio Boston*, and others. ©

UMMS SARS investigators Mohan Somasundaran, PhD, Katherine Ruiz de Luzuriaga, MD, John Sullivan, MD, and Thomas Greenough, MD



Monarch Migration/Circadian Rhythms

In the fall, Monarch butterflies travel up to 3,000 miles from North America to a small region in central Mexico to spend the winter. While scientists believe that Monarchs use the sun to navigate, they had known far less about how the butterflies adjust their direction each day as the sun's position in the sky changes. In a study published May 23, 2003 in the journal *Science*, a UMMS team led by Steven M. Reppert, MD, the *Higgins Family Professor of Neuroscience* and professor and chair of Neurobiology, helped answer that question. "Monarchs have a genetic program to undergo this marvelous long-term flight in the fall,"

Dr. Reppert said. "Now we have shown the requirement of the circadian clock for Monarch butterfly migration."

Understanding how the circadian clock assists the sun compass in the relatively simple navigation by Monarchs could provide a model for studying navigation by other animals, Reppert said, citing both foragers such as honeybees and desert ants, as well as long distance migrators such as songbirds. "Increasing knowledge of the genetic makeup of the Monarch circadian clock will help tease apart the entire migratory process, a process that remains one of the great mysteries of biology," said Reppert, who is

recognized nationally as a leading expert on circadian rhythms. His lab undertakes basic scientific research aimed at understanding the cellular and molecular mechanisms of circadian clocks, which in turn holds great promise for developing innovative treatment strategies for a wide range of clinical disorders.

UMMS research was covered by: CNN, *Christian Science Monitor*, *The Atlanta Journal-Constitution*, *The Washington Post*, Associated Press, CBS News, BBC Radio, and others. ©

West Nile Virus and Smallpox

By August 2003, the number of cases of the West Nile virus in the United States had already outpaced that of the year before. The virus, which is borne by mosquitoes and birds, causes two types of illnesses in humans: encephalitis/meningitis, responsible for most of the deaths associated with the virus, and a less serious fever that may not require hospitalization.

UMMS faculty have long been interested in emerging and re-emerging viral pathogens, particularly flaviviruses such as dengue, yellow fever, Japanese encephalitis and now, West Nile. As a result of this expertise, UMMS was awarded a seven-year, \$3.1 million subcontract in 2003 to investigate the disease process of West Nile virus, seeking clues as to why the virus causes serious illness and death in some people, while in others it manifests itself with simple flu-like symptoms. The Medical School's findings may lead to targeted treatment and

prevention of the disease.

The UMMS study is part of a National Institutes of Health (NIH) initiative awarded to the New York Department of Public Health entitled, "U.S. Based Collaboration in Emerging Viral and Prion Diseases." Under the leadership of Professor of Medicine Francis A. Ennis, MD, director of the UMMS Center for Infectious Disease and Vaccine Research, scientists will investigate the molecular mechanisms by which the virus causes infection and the immune system's response to it.

The ultimate goal of the collaborative studies is to determine the role of the immune system in disease pathogenesis, and to elucidate how T lymphocytes can protect individuals. Investigators expect that the study of the natural history of T lymphocyte responses in humans will be invaluable in the development and testing of future West Nile virus vaccine candidates.

RNA interference

One of the most important scientific developments in recent years, RNA interference (RNAi) is now the state-of-the-art method by which scientists can knock out the expression of specific genes in cells, to thus define the biological functions of those genes. But just as important has been the finding that RNAi is a normal process of genetic regulation that takes place during development. Thus, RNAi has provided not only a powerful research tool for experimentally knocking out the expression of specific genes, but has opened a completely new and totally unanticipated

window on developmental gene regulation.

UMMS cell biologist Craig C. Mello, PhD, the *Blais University Chair in Molecular Medicine* (see related story, page 10), is the internationally recognized co-discoverer of RNAi, hailed as the “Breakthrough of the Year” by *Science* magazine. Dr. Mello, an investigator of the prestigious Howard Hughes Medical Institute, and his Carnegie Institution colleague Andrew Fire, PhD, have collected numerous honors for their work in RNAi, including the Wiley Prize in the Biomedical Sciences and the

Award in Molecular Biology from the National Academy of Sciences; they were also nominated for the Lasker Award. They continue to be called upon to comment on the potential of the revolutionary gene-silencing technique.

UMMS research was covered by: *Science, Fortune, Mass High Tech, The Boston Globe, and others.* ©

UMMS was also named a “Cooperative Center for Translational Research on Human Immunology and Biodefense” in 2003 by the National Institute of Allergy and Infectious Diseases (NIAID), one of the National Institutes of Health. The center, funded by a \$16 million grant from the NIAID, is one of five in the nation selected to seek a better understanding of the human immune response to potential agents of bioterror and rapid development of countermeasures such as vaccines and therapies. The other centers are located at research institutions in Texas, Georgia, California and Boston.

The UMMS center will be a comprehensive, interdepartmental collaboration to address, as its overall scientific theme, the role of human T lymphocyte responses in the immunopathogenesis of and protection from a number of viral pathogens such as poxviruses, hantaviruses and flaviviruses. Both senior

and junior investigators with significant prior expertise in human immunology and research on biodefense pathogens, including translation to clinical studies, will contribute to the center’s efforts.

According to the NIAID, one of the key features of these new centers will be the high degree of information-sharing by all the members, fostering the synergy needed to fully characterize human immune responses to disease-causing organisms and develop therapies that strengthen these responses, whether the organisms are deliberately released or arise naturally in the environment.

UMMS faculty were called upon by: *WCVB-TV Boston, WebMD, American Medical News, Associated Press, WABC-TV New York, Telegram & Gazette, and others.* ©

Trends Explored in Clinical and Population Health Research

The UMMS clinical research enterprise continues to grow, comprising over 800 studies involving human subjects. UMMS principal investigators and their colleagues at UMass Memorial are conducting vital studies with relevance to a range of diseases and health care delivery practices. In addition, the UMMS Graduate School of Biomedical Sciences has launched a doctoral program in Clinical Research and Population Health that will prepare students to become experts in the fields of clinical and health services research. The program will integrate the medical, basic, health, social and behavioral sciences for practitioners who engage in translational research, part of the “bench to bedside” process.

In November, more than 120 UMMS and UMass Memorial researchers, clinicians and educators gathered for a retreat designed to develop the institutions’ efforts to further improve public health. The retreat included internationally recognized experts John Frank, scientific director of the Canadian Institute for Population and Public Health, and Mark Weiner, associate director of Research Informatics at the University of Pennsylvania Medical School, as well as Chancellor and Dean Aaron Lazare, Deputy Chancellor Thomas D. Manning, UMass Memorial CEO John G. O’Brien, Office of Research Director John L. Sullivan, MD, Vice Dean Michele P. Pugnaire, MD, and Chair of Family Medicine & Community Health Daniel H. Lasser, MD.

Conference sessions explored issues surrounding patient-oriented studies, such as how researchers can best access and interpret data from the clinical system and public health agencies; why research can result in better coordination of care, thereby reducing costs; and the need for medical and graduate nursing students’ greater awareness of the range of research that can be conducted to improve public health. Poster submissions from 20 entities and attendees’ discussions offered ideas to support the clinical research enterprise, informing the agenda of the 2004 Clinical Research Advisory Committee.

Conference proceedings will be available to the UMMS and UMass Memorial communities in March 2004. ©

Physician-Researcher Awarded UMMS’ Sixth Carballo

To recognize his achievements as a renowned scientist, accomplished educator and administrator, and compassionate physician, UMMS Professor of Pediatrics and Molecular Medicine and Director of the Office of Research John L. Sullivan, MD, was presented with the 2003 Manuel Carballo Governor’s Award for Excellence in Public Service.

“For more than 20 years, Dr. Sullivan has cared for the most vulnerable of Massachusetts’ patients—children afflicted with devastating illnesses,” said Chancellor and Dean Aaron Lazare. “In addition to this role as healer, he is an internationally recognized viral immunologist whose research efforts have made a significant contribution to the biomedical community’s arsenal in the fight against AIDS worldwide. He is the epitome of public service and truly

deserving of this prestigious award.”

The Carballo award is given annually to 10 state employees who exemplify “the highest standards of public service through exceptional accomplishment, superior leadership, creativity and productivity.” Sullivan’s receipt of the 2003 award brings the total for UMMS to six Carballo awards in the last eight years.

Sullivan provides care to children with HIV infection while offering them access to clinical trials as a physician at the UMass Memorial Children’s Medical Center. Active in HIV/AIDS study and treatment since tracking of the disease began in 1981, he has attracted millions of dollars for research direct-

ed at understanding how the immune system fights the virus. Sullivan and colleagues were also instrumental in the discovery of the anti-retroviral drug nevirapine, which—along with his hypothesis that the drug could prevent mother-to-infant transmission—has laid the groundwork for its investigation and distribution in the developing world. ©



President's Public Service Award Goes to GSN Faculty Member

Assistant Professor of Medicine and Nursing Carol A. Bova, CNP, PhD, became the first Graduate School of Nursing (GSN) faculty member to be honored with the President's Public Service Award, presented by the University of Massachusetts President's Office. The annual award recognizes faculty members from throughout the UMass system who have utilized their academic expertise to address a priority need of the Commonwealth; Dr. Bova was chosen in 2003 for her efforts to improve community-based clinical care for persons infected with HIV and hepatitis C and their families.

The award recognizes work Bova began 15 years ago as a clinician—work she

has expanded upon as a researcher and educator, reaching out to HIV-infected women in Central Massachusetts and beyond. Bova's current research is tracking the experience of adults co-infected with HIV and hepatitis C, recognizing the added challenges they face in managing two diseases, as well as struggling with the substance abuse that often accompanies their infections. Her outreach efforts have also become more far-flung, with periodic trips to provide HIV education in Armenia, funded by the World AIDS Foundation and co-sponsored by the Armenian Relief Society. "My hope is we can prevent widespread infection with education and outreach early in a developing epidemic," said Bova. ☉



Benefactors Support Innovative Adoption Research



Today in the U.S. more than 100,000 children in foster care need adoptive families, yet fewer than half will see their need fulfilled. According to the University of Massachusetts Center for Adoption Research, the costs to society of failing to meet this most basic need—and to the children themselves—are very high.

The Center for Adoption Research, based at UMMS, is the only university-based

research and policy program in the country exclusively dedicated to adoption and foster care. Established through the leadership of UMMS Chancellor and Dean Aaron Lazare, father of eight adopted children, the center has successfully influenced business, policy and legislative leaders and created educational programs for physicians, teachers and other professionals who work within the adoption and foster care realm.

Recently, the center implemented a fellowship program that promotes innovative and strategic research in multiple disciplines by bringing together established experts and promising academics and professionals from institutes, universities and

organizations around the nation. These leaders are infusing the fields of foster care and adoption with new ideas and energy, and the center has received major support from individuals who are committed to the program's success. The following generous friends have made leadership gifts to the fellowship program: Austin and Maria Cable of Boston; Evelyn Silver Acaso and Eduard Acaso of Northborough; Winnie Quick of Boca Raton, Florida; Neil and Maureen Ferris of Westborough; Michael and Leslie Gaffin of Weston; and Robert and Shirley Siff of Worcester. "These extraordinary benefactors have enabled us to take a vision for a unique and innovative program and make it a reality that will benefit children and families across the nation and around the world," said Peter Gibbs, director of the Center for Adoption Research. "Their support of the fellowship program complements the over two million dollars in philanthropic support the center has received, as well as the recent endowment of an academic chair." (See "The Last Word," page 24.)

For more information about the Center for Adoption Research fellowship program and its objectives, contact Maureen Hogan at 508-856-5397. ☉

Advance Work

The establishment of a University Chair is the latest in a trend for donors who support UMMS faculty excellence.

By Alison M. Duffy



Philanthropist Jack Blais peers into a microscope during a recent visit with Chancellor and Dean Aaron Lazare; Dr. Mello looks on.

Though John F. “Jack” Blais, mechanical engineer, entrepreneur, and magnanimous benefactor of UMass Medical School, holds no PhD in molecular medicine, he shares a unique camaraderie with internationally recognized UMMS cell biologist Craig C. Mello, PhD.

A tinkerer by nature, Blais could appreciate the practicality of a common laboratory technique when he recently peered through Dr. Mello’s microscope and watched scores of the worm *C. elegans* twirling in tiny circles—the result of some genetic tinkering on Mello’s part. As Mello explained, he had to devise some way to identify which worms have the genetic marker he’s investigating. So, the affected worms dizzy themselves in the dish while their untouched counterparts go about their business the usual way. “Craig’s keen understanding of these genetic functions is astounding,” said Blais. “My wife Shelley and I find it incredible that the genetic development of a microscopic worm can shed light on human genetic development.”

This fall, Blais and his wife endowed the *Blais University Chair in Molecular Medicine*, UMass Medical School’s first

University Chair. (Of the five campuses, only UMass Amherst also has a University Chair, endowed in 2002.) Named for the Blaises at the insistence of Chancellor and Dean Aaron Lazare, the chair will be held by Mello, co-discover of RNA interference (RNAi), called the 2002 “Breakthrough of the Year” by *Science* magazine. “This generous gift from the Blaises will help me and the scientists in my lab pursue a deeper understanding of RNAi that will be essential both for improving its utility and for developing its potential as a therapeutic,” said Mello.

While few laypersons spend time in the labs of world-renowned scientists—Mello, a Howard Hughes Medical Institute Investigator, received the prestigious Award in Molecular Biology from the National Academy of Sciences in 2003—UMMS is supported by hundreds of generous benefactors, several dozen of whom have forged lifelong relationships with individual faculty whose work they help advance through the endowment of named chairs and professorships. Since the first endowments in 1985 of the *Harry M. Haidak Professorship in Surgery* and the *Arnold F. Zeleznik Professorship in Psychiatry*, UMMS has seen the number of its



to the lab of Craig Mello, PhD, while at right, Shelley Blais speaks

endowments surge to 24, totaling more than \$30.5 million in support of some of the world's finest scholars, scientists, researchers and teachers.

"Endowments speak to the faith our benefactors have in us, as individuals and as an academic research institution, to understand and find the answers to life's most perplexing medical questions," said Dr. Lazare, the *Celia and Isaac Haidak Professor of Medical Education*.

In the last decade, UMMS has made a concerted effort under Lazare's leadership to pair benefactors who seek to fund a position with outstanding faculty in areas identified as crucial to the institution's core mission of serving the public through research and education. Doing so sets in motion a ripple effect that reaches beyond the initial financial benefit of the endowment: An endowment serves as a retention tool and better positions faculty to recruit to their labs and programs successful and sought-after colleagues who in turn attract additional funding, furthering UMMS research and educational endeavors.

"The problems we're tackling in the lab are increasingly complex, requiring advanced training and unique skills," said C. Robert Matthews, PhD, the *Arthur F. and Helen P. Koskinas Professor of Biochemistry & Molecular Pharmacology*. "The Koskinas endowment allows me to attract the best and the brightest postdoctoral fellows capable of making advances in this exciting scientific arena."

With competition fierce for not only brilliant postdoctoral candidates and lab technicians, but also for funding, the financial leeway afforded by an endowment can help researchers bridge delays in extramural funding and continue vital work uninterrupted. "Being able to move ahead quickly, instead of awaiting a National Institutes of Health grant, made a significant difference in our studies through which we discovered the role of the cilium in polycystic kidney disease," said George B. Witman III, PhD, the *George F. Booth Chair in the Basic Sciences*.

By all accounts, being awarded an endowment "serves to reinforce that the research being done is important and of value to the institution and the broader scientific community," according to Jerry H. Gurwitz, MD, the *Dr. John Meyers Professor of Primary Care Medicine*, which was created in conjunction with the Fallon Foundation.

"Funded positions are a cornerstone for the growing tradition of innovation and excellence at UMass Medical School," added Gary S. Stein, PhD, the *Gerald L. Haidak, MD, and Zelda S. Haidak Professor of Cell Biology*. For the donor, endowments represent an opportunity to support researchers who seek to ultimately affect change for all of mankind. Because donors are often compelled by very personal experiences—the loss of a loved one to a disease, for example—an endowment can be both a singular honor and a profoundly motivating challenge to the recipient.

"Sometimes it's easy to get caught up in the biological workings of HIV and become disconnected from the reality of the disease," said Mario Stevenson, PhD, who holds the *David J. Frelander Professorship in AIDS Research*, funded in memory of a young man felled by AIDS. "The professorship is a constant reminder to me of the impact of the disease. I'm honored by the confidence the Frelanders have placed in my research program, and I'm committed to using their support in the most effective way." ©

For a current listing of the Named Professorships at UMass Medical School, see page 22.



Progress on Prostate Cancer

UMMS makes strides in detection and prevention by linking basic science with clinical applications.

By Michael J. Cohen

Prostate cancer is now the most frequently diagnosed malignancy in American men, with 220,000 new cases and nearly 30,000 deaths in 2003. As baby boomers age, those numbers are expected to increase. Pushing for a breakthrough, UMass Medical School researchers are working to detect prostate cancer earlier and prevent it from spreading beyond the prostate.

Shuk-Mei Ho, PhD, professor of surgery and cell biology and director of translational research for the Department of Surgery, and Lucia R. Languino, PhD, professor of cancer biology, lead prostate cancer research at UMMS. Drs. Ho and Languino also co-direct the Genital Urinary Oncology Program at the UMass Memorial Cancer Center, which brings together researchers and clinicians to help translate basic science advances into clinical applications for prostate cancer. “Our group is in constant contact with each other, and that kind of interdisciplinary approach accelerates research,” Ho said.

Ho’s laboratory has made strides in detecting prostate cancer earlier and in identifying genetic risk factors that make people more likely to develop the disease. “Early detection of prostate cancer is important; when caught early, the median survival rate is almost 15 years,” she said. “But when the disease is caught in the advanced stage and has spread beyond the prostate, the survival rate is very poor.”

There is now just one marker used to test men for prostate cancer—prostate specific antigen (PSA). A rising PSA level can indicate cancer, but the PSA test has high false-positive and

high false-negative rates. So Ho’s lab is developing a new, more rigorous screening process. “So far, in the lab, we’ve had great success,” she said. “The platform we’ve developed is able to detect prostate cancer with better than a 90 percent accuracy rate.”

The new screening platform brings together clinical, technological and basic science disciplines. Ho’s team collects and examines serum samples from patients diagnosed with prostate cancer. Using mass spectrometry—a process that measures the mass and electrical charges of molecules in a sample to identify unknown substances and quantify known substances—the researchers identify hundreds of proteins that are overly expressed in the serum. The protein levels are digitized and processed by a special computer system that was designed in Ho’s lab. The results of the computer analysis are then correlated with the known clinical profiles and outcomes of the patients. “Instead of having one PSA level, multiple protein values are shown for each patient. That allows us to not only identify prostate cancer with a higher level of accuracy, but also to identify subtypes of prostate cancer,” Ho said.

Prostate cancer is not a singular disease—there are many variations, with some tumors developing slowly and others more aggressively; identifying subtypes of the cancer early on may help direct a patient’s treatment. Ho’s team is now testing the new process on a much larger scale, using hundreds of serum samples from tissue banks across the country. In the near future, she expects the process developed at UMMS will lead

to a more reliable and informative clinical prostate screening that will help catch the disease earlier and target the most effective treatment.

Much of Languino's work concerns the molecular mechanisms that prostate cancer cells use to grow and spread. "In prostate cancer, patients don't die of the primary tumor—what kills them is when the cancer spreads around the body," she said. "The cancer cells spread primarily to the bone, then destroy the tissue around them."

Several proteins are known to facilitate the movement of cancer cells out of the prostate and allow them to take hold and grow in other tissues. Languino's lab is working on ways to block those proteins, thereby inhibiting the spread of a prostate

We can collect a tumor biopsy, isolate cancer cells and study them. That's invaluable."

In one of her translational collaborations, Languino is working with Thomas J. Fitzgerald, MD, professor of radiology and chief of Radiation Oncology at UMass Memorial Medical Center. Dr. Fitzgerald had been exploring why some prostate cancer cells survive various radiation regimens while most of the malignant cells die. Too often in those patients, the surviving cancer cells go on to develop a more aggressive, treatment-resistant form of the cancer.

Bringing their respective minds and teams together, Fitzgerald and Languino developed a new radiation protocol combined with systematic therapies that kills all prostatic cancers cells in

Drs. Lucia Languino (left) and Shuk-Mei Ho with Dario Altieri, MD (center), the *Eleanor Eustis Farrington Chair in Cancer Research*. The scientists surround a two-viewer microscope with built-in camera, one of the latest advancements in histology study. Dr. Altieri, who chairs the Department of Cancer Biology and directs the UMass Memorial Cancer Center, says, "Our progress on prostate cancer reflects what translational research is all about, and it's the model we are actively pursuing for the other disease-based platforms within the Cancer Center."



tumor. "I believe we are very close," Languino said. "Inhibiting those proteins is very difficult, but we're having some success *in vitro* and our goal is to make this work for patients."

Having clinicians as partners is essential for her research, according to Languino. "We have access to human tissue, access to the patients and the physicians who treat them.

lab tests. Their finding may soon be used in a clinical trial for patients with advanced prostate cancer. "This novel finding about how radiation can affect cells' ability to grow outside of the prostate, I believe, will significantly influence patient care," Fitzgerald said. ☉



Teaching Time

UMMS formulates solutions to support and reward clinical faculty who make time to teach.

By Lynn C. Borella

As a primary care physician and associate professor of family medicine & community health at UMass Medical School, Michele P. Pugnaire, MD, makes every effort to balance her clinical duties with teaching, as a preceptor for students across all four years through her family practice in Fitchburg, Mass. And, as UMMS Vice Dean for Undergraduate Medical Education, she uses this teaching experience to help her better understand and support the efforts of clinical faculty who also work hard to balance the two.

Dr. Pugnaire realizes that the strain placed on physician-educators who teach in the clinical setting or who enter the classroom can be intense, given the challenge of caring for patients and teaching medical students. “Although I do face some limitations, I’m able to concurrently teach and see my patients because of flexibility in the ambulatory care setting,” said Pugnaire. “But other forms of teaching are less accommodating for our clinical teachers who, for example, can’t be in an operating room and give a lecture at the same time—that’s when the issue of revenue loss becomes more palpable. Add to this the responsibilities of the faculty who need protected time to

develop curricular innovations and the pressure increases even more.”

Despite this, Pugnaire remains resolute about institutional priorities: “Education is at the heart of our existence; we have to preserve time for it.”

At UMMS, the offices of Medical Education (OME) and Faculty Administration continuously work to formulate solutions to support and reward faculty who teach. Thematic programs have been created, incorporating both Web-based and take-home activities, which incentivize teaching for faculty by directly linking instructional quality and effort to recognition, compensation and advancement. One such workshop outlines the steps clinicians can take to create their own teaching portfolio (a collection that offers evidence of excellence in teaching) and highlights its importance for recognition, promotion and tenure. “As an emergency physician, I can demonstrate through this workshop that these concepts can be applied in even the most chaotic of clinical environments,” explained Jeffrey M. Cukor, MD '94, emergency medicine residency director and assistant professor, who co-directs the workshop

with the OME's Director of Curriculum and Faculty Development Susan J. Pasquale, PhD, an assistant professor of family medicine & community health. "Physicians are creative and industrious; they can find time and a way to teach. And the portfolio attempts to record and promote these achievements."

Less tangible than workshops are efforts to instill in the UMMS "psyche" the notion that clinical faculty can positively affect the patient care and research missions as well as the educational mission. "It's clearly evident that good teachers are better clinicians by virtue of their teaching," said Pugnaire. "Can we therefore not marry those two efforts to benefit all missions? If we start thinking even more this way, we'll be able to better weather the storms we face regarding restrictions of time and money."

In the face of fiscal challenges, however, UMMS is fortunate that numerous faculty are passionate about teaching. Pugnaire specifically noted the work of J. Mark Madison, MD, associate professor of medicine, (see story below) who was instrumental in implementing several key changes in the Year 2 curriculum, despite many other demands on his time. According to Pugnaire, "Mark was one of several Department of Medicine faculty who had a fire in their belly and wouldn't quit until these innovations came to fruition."

Pugnaire is confident that, although slow going, change is inevitable. "When I'm in need of care, I want to know that the person in the white coat looking back at me is someone

trained in a high quality educational program. Throwing our hands up and saying it's too difficult is not in the spirit of this institution, nor in the spirit of the profession." ©

Below, Susan Pasquale, PhD, and Jeffrey Cukor, MD, lead a workshop for physician-educators. At left, Pasquale and Cukor work one-on-one with Assistant Professor of Psychiatry and Family Medicine & Community Health Jeffrey Stovall, MD, to develop his teaching portfolio.



The clinic via computer

Associate Professor of Medicine J. Mark Madison, MD, is a model of the UMMS physician-educator. Deeply involved in all aspects of the Year 2 curriculum, Dr. Madison—who sees teaching, research, and practicing medicine as synergistic—was instrumental in implementing several major course revisions, including important contributions to the new Multisystem II block of the Biology of Disease course. Directed by Professor of Medicine David M. Clive, MD, Multisystem II is a portion of the course that helps students more effectively integrate material. Based on student feedback, Drs. Clive, Madison and other colleagues designed a facilitator-led "electronic classroom" through which stu-

dents address complex clinical cases via computer. The course was so well received by faculty and students, it will be offered twice in 2004.

Madison and his colleagues devote considerable time and energy to teaching because they realize how important course material is as a foundation for students' careers. "Faculty use their perspectives to illuminate the clinical importance of material and find it satisfying when they help students organize the volume of information into a format that is clinically relevant."

Highly dedicated faculty do face many challenges when finding time for teaching,

but Madison maintains that it's the infrastructure of an institution "that will ultimately determine success in this matter. For example, computer technology and software that facilitate chart access, acquisition of lab data, and improved billing and coding will be instrumental in helping physicians efficiently deliver high quality patient care, with time to teach."

The UMMS Medical Education Fund supports programs that allow clinical faculty more time to teach and is administered through the UMass Memorial Foundation. For more information, contact Meg Lansing at 508-856-1967.

Making it Better

UMMS alumna, one of a few female division chiefs in the country, is a leader in her field—and a compassionate caregiver.

By Kelly A. Bishop



Pamela Ellsworth, MD, loves her peanuts.

Not the edible legumes, but her pediatric patients—affectionately nicknamed “peanuts” by the chief of the Department of Surgery’s Division of Urology. They represent 90 percent of her clinical practice, and have made her decision to practice medicine one of the most profound and unquestioned in her life.

“Recently, I had a peanut come back—a little boy seen by other urologists who hadn’t been able to come up with a reason for his pain. We evaluated him, found an obstruction and performed surgery,” said Dr. Ellsworth, a UMass Medical School graduate and associate professor of surgery.

“Consequently, even as I reviewed his post-operative study and it was normal, the most important question I asked was ‘is the pain gone?’ He said yes. His parents say he’s a new kid because he doesn’t worry about pain anymore.” Ellsworth recalls that she went home “in seventh heaven, just to have this little boy and his parents happy. Such days are my simple pleasures in life.”

The pleasures of treating young patients coincide with Ellsworth’s duties as division chief (she is one of just three women in the nation currently serving in such a position), which call for administrative responsibility for the division and oversight of the urology residency program. Ellsworth is emphasizing growth in a number of areas, particularly residency training, to accentuate the vision of the Medical School’s clinical partner, UMass Memorial Health Care, to become one of the top ten academic medical centers in the country by 2008. “To become one of the top ten, we must provide state-of-the-art services and train professionals who are willing to immerse themselves in a specialty,” she said. “We want to contribute to the evolution of how physicians practice, take care of patients and pursue vital paths of research.”

The path to becoming a physician was made early in Ellsworth’s own life, at age seven in fact. Years later, with her

desire to pursue medicine as a career confirmed during undergraduate medical research at Boston College, Ellsworth enrolled at UMMS, attracted to the state medical school and its diverse student body. “The school offered a mix of students from different backgrounds, some with prior jobs and some who had started families,” she explained. “For me, coming right out of college a bit naïve and less mature, the awareness of what other people had accomplished prior to medical school was significant and contributed to my growth.”

Ellsworth, originally from a small town, pursued a residency in general surgery in Chicago after graduating from UMMS in 1987. “I chose the University of Illinois Cook County because I felt that the experience would open my eyes to another side of living. It did—I became more efficient, organized and appreciative of all I had.”

Her career direction sharpened after a rotation in urology. “There’s a continuity of care with urology that I enjoy,” she said. “We may perform a surgical procedure but often the nature of that surgery mandates that we provide continuous follow-up. Interested in not just the pathology but also the personality, growth and development of individuals, I knew urology provided an ideal combination.”

Ellsworth returned to UMMS in 1989 for an additional year of surgical residency, and in 1994, finished a urology residency at Dartmouth-Hitchcock Medical Center. Following a fellowship at the University of Florida and a position at Worcester’s Saint Vincent Hospital, Ellsworth soon answered the call of academic medicine. “I realized that I couldn’t be without the constant learning and challenge of academics.”

She returned to Dartmouth-Hitchcock and gained recognition as a leader in the fields of pediatric and adult urology. Today, Ellsworth lectures globally on pediatric urologic conditions and adult erectile dysfunction, another area of her professional expertise, and is a member of an international World Health

Organization panel studying voiding problems in children. She is the author of more than two dozen journal articles and 15 book chapters, and has written three books: *100 Questions & Answers About Erectile Dysfunction*, *100 Questions & Answers About Prostate Cancer* and *Blackwell's Primary Care Essentials: Urology*. She is currently working on a fourth book examining overactive bladder and urinary incontinence.

In June 2003, Ellsworth was appointed to her present role as division chief, recruited by her predecessor, Assistant Professor of Surgery Robert D. Blute Jr., MD. "It took me about five minutes

Dr. Andersen is also encouraged by Ellsworth's vision. In partnership with Associate Professor of Obstetrics & Gynecology Stephen B. Young, MD, she is directing an expansion of expertise in urodynamics and bladder dysfunction, and is also searching for a leader in laparoscopic urologic surgery.

Certainly pleased by professional accolades and encouraged by the support of her department chair and colleagues, it is nevertheless her patient interactions and their positive outcomes that make Ellsworth's "heart sing," she said. "There is nothing more rewarding than helping someone get better." ©



to make the decision to accept," Ellsworth said. "I think personally, professionally and emotionally it has been a wise one."

The Harry M. Haidak Professor and Chair of Surgery Dana K. Andersen, MD, confirms that UMMS has also gained from Ellsworth's choice. "The Division of Urology has expanded its programs under her leadership, including the residency program, and her expertise in pediatric urology greatly benefits our large community of pediatricians and their patients."

Dr. Pamela Ellsworth enjoys catching up with patient Jacqueline Borella outside the UMass Memorial Children's Medical Center.

Deeply rooted in its goal of providing quality medical, research and nursing education to its students, the University of Massachusetts Medical School, together with its clinical partner, UMass Memorial Health Care, is a vibrant academic medical center characterized by achievements and progress in a number of areas. From awards for excellence in education to internationally recognized research breakthroughs, public service initiatives and patient care innovations, the following pages highlight the exceptional people, extraordinary diversity and unique facilities that define the shared UMMS and UMass Memorial environment.

Timeline 2003

January

UMMS Professor of Surgery A. Alan Conlan, MD, chief of thoracic surgery at UMass Memorial Medical Center, performs what is believed to be the first minimally invasive total lung excision by video surgery in the country, resecting and removing a cancer patient's entire lung via three tiny incisions in the chest wall. The technique is a major advance in the treatment of a cancer that kills nearly 160,000 Americans each year.

February

Using simple video conferencing technology, doctors and nurses at UMass Memorial Medical Center implement a program of "remote interpreters" in exam rooms to provide interpretation services to deaf or Limited English Proficient patients, 24 hours a day, seven days a week. The service, a visual link to interpreters based in Chicago and Charlotte, North Carolina, provides a better mode of communication for the 45,000 patients per year who require interpreter services.

March

The Seventh Annual Women in Science Conference brings together 150 middle school girls from Worcester and successful local women who apply aspects of science in their careers. Sponsored by the UMMS Regional Science Resource Center, the EcoTarium and Girls, Inc., the day includes interactive workshops on occupational choices involving science, including professions in health care, engineering, marine biology, criminology, science education and environmentalism.

April

With the award of an unprecedented \$1.5 million grant from the National Institute of Mental Health, Principal Investigator Anthony J. Rothschild, MD, the *Irving S. and Betty Brudnick Chair* and professor of psychiatry, begins a double-blind study—the gold standard for drug trials—to compare two promising but unproven medication treatments for psychotic depression, a major mental illness characterized by delusional thoughts and behaviors accompanying severe depression.

May

A guest of special significance in the wake of the devastating loss of the space shuttle Columbia in February, former NASA Director of Mission Operations Eugene Kranz is the featured speaker at the Worcester Foundation for Biomedical Science's 18th annual Hudson Hoagland Society meeting. Kranz is widely recognized for his extraordinary leadership of the "Tiger Team" of flight directors who brought the Apollo 13 crew safely back to Earth on April 17, 1970.

June

According to a UMMS study authored by Assistant Professor of Medicine Leslie Harrold, MD, MPH, and colleagues and published by the *Journal of General Internal Medicine*, the treatment of men and women who present at a hospital with a heart attack (acute myocardial infarction, or AMI) continues to show gender differences. However, the gender gap, the study finds, has closed dramatically in recent years.

July

The W. K. Kellogg Foundation of Michigan awards a two-year grant totaling \$176,500 to UMMS to help expand the services of the Central Massachusetts Oral Health Initiative. The Kellogg grant, matched by funds from The Health Foundation of Central Massachusetts, will bring screening and sealant services to hundreds of schoolchildren, launch a dental residency program at UMMS and fund a pilot program to recruit area dentists to the Medicaid program to provide services for low-income people.

August

UMass Memorial Health Care Emergency Medical Services unveils and demonstrates new, specially equipped motorized scooters that will be used to augment EMS coverage during festivals and large public events. Given the number of these events in Worcester each year, EMS seeks to gauge the motorized scooters' effectiveness in enhancing coverage.

How We Rank

UMMS is consistently ranked in the top ten percent of the nation's 125 medical schools by weekly news magazine *U.S. News & World Report* in its much-anticipated annual review entitled "America's Best Graduate Schools." In 2003,

September

The UMass Memorial Medical Center Disaster Medical Assistance Team (DMAT-MA2), consisting of approximately 35 nurses, physicians, social workers and other medical personnel, are activated for deployment to Edison, New Jersey, to help prepare for Hurricane Isabel.

October

The University of Massachusetts Center for Adoption Research, based at UMMS, presents its Adoption Vision Awards to four recipients who have advanced the interests of children and families touched by adoption and foster care. Congressman Stephen F. Lynch, State Senator Therese Murray, American International Group, Inc., and Timothy Johnson, MD, of ABC News were recognized for their achievements.

November

Ali's Place, a pediatric infusion room at the UMass Memorial Children's Medical Center, is formally dedicated. The new private suites, made possible completely by philanthropy through the UMass Memorial Foundation, includes three infusion areas equipped with television, toys, books, games, puzzles and other items that patients can enjoy during treatment.

December

The second annual Goods for Guns program takes place, reaping 240 guns and 3,000 pieces of ammunition, and distributing 150 gun locks. The successful program is a collaboration between the Injury Free Coalition for Kids of Worcester, co-directed by UMMS Professor of Pediatrics and Surgery Michael P. Hirsh, MD, and Clinical Associate Professor of Pediatrics Mariann Manno, MD; UMass Memorial Children's Medical Center; UMass Memorial Trauma Center and the City of Worcester Police Department, with the endorsement of the Office of the District Attorney.

UMMS ranked 12th in the increasingly competitive "Primary Care" schools category and has held a spot near the top of the category since the magazine began its rankings in 1994. In addition to the School of Medicine's ranking, the Graduate School of Nursing placed 75th among more than 337 graduate nursing programs.

Members of the UMMS School of Medicine class of 2003 were accepted into some of the most competitive residency programs in the country, with 64 percent of graduates entering primary care. In addition, 60 percent of this class chose residencies within Massachusetts.

For the fifth straight year, UMMS earned a top 50 ranking in the overall list of research schools, sharing 49th with Jefferson Medical College of Pennsylvania and the Medical College of Wisconsin. Its total extramural funding of more than \$148 million in 2003 also placed UMMS in the top third of all research medical schools, public or private.

Rich in Research

UMMS is home to several laboratories studying RNA interference (RNAi), discovered by a UMMS researcher and his colleague at the Carnegie Institution of Washington. The discovery has had two extraordinary impacts on biological science. One is as a research tool: RNAi is now the state-of-the-art method by which scientists can knock out the expression of specific genes in cells, to thus define the biological functions of those genes. But just as important has been the finding that RNAi is a normal process of genetic regulation that takes place during development, opening a new window on the field.

UMMS, Joslin Diabetes Center, Dana-Farber Cancer Institute, Children's Hospital and Massachusetts Institute of Technology are currently conducting the Diabetes Genome Anatomy Project. The goal of DGAP is to reveal the sets of genes and gene products involved in insulin action and the predisposition to type 2 diabetes, as well as the secondary changes in gene expression that occur in response to the metabolic abnormalities present in diabetes.

UMMS is participating in a \$5 million clinical trial funded by the National Institutes of Health with the Immune Tolerance Network. Based on the Edmonton Protocol, the trial includes 40 participants with type 1 diabetes who will receive islet cell transplants to eliminate their dependence on insulin injections.

(cont.)

The UMMS component has four participants; over the last two years, two of these participants received transplants that immediately alleviated their need for insulin supplementation.

UMMS is one of 12 national and two statewide AIDS research institutions designated as a Center for AIDS Research (CFAR). Funded by the National Institutes of Health, CFARs provide a pool of shared resources, such as technical expertise, equipment and training to local AIDS researchers.

The UMMS Program in Chemical Biology, one of only a handful nationwide, applies the tools and principles of chemistry to understanding the processes of living cells, potentially leading to the development of novel therapeutics against a wide spectrum of diseases.

Outreach to the Community

The UMMS Worcester Pipeline Collaborative K-12 encourages minority and economically disadvantaged students to expect success in the health care and science professions where they are traditionally under-represented. The Pipeline's High School Health Careers Program provides academic preparation and health career exploration for Massachusetts students, motivating them to graduate from high school and prepare for college.

The Summer Enrichment Program for college sophomore and junior students reaches them early in their undergraduate years to help them increase their qualifications and competitive standing for admission to graduate and medical schools.

National Institutes of Health Research Fellowships through UMMS expose minority undergraduate students, graduate students and students in health professional schools to pursue careers in the basic sciences. The program consists of hands-on laboratory research experiences with investigators serving as mentors, role models and advisors.

UMMS provides a post-baccalaureate program for students from economically, culturally and educationally disadvantaged backgrounds who do not otherwise meet the criteria for admission to the Medical School but who show significant academic potential. Students take one course per semester offered as part of the first-year curriculum. If academically successful, they may then apply to the Medical School.

The UMMS Campuses—Far-reaching in Location and Scope

Irving S. and Betty Brudnick Neuropsychiatric Research Institute, Worcester

Irving S. and Betty Brudnick contributed funds toward the establishment of a research institute dedicated to the study of the brain's neurobiology and the biological causes of mental illness. The 25,000-square-foot Brudnick Neuropsychiatric Research Institute rises across from the main campus on the grounds of Worcester State Hospital, one of the oldest public psychiatric facilities in the country.

Massachusetts Biotechnology Research Park, Worcester

UMMS owns two buildings in the Massachusetts Biotechnology Research Park adjacent to the main campus. One Biotech houses the Office of Technology Management and the Center for Adoption Research, as well as the administrative offices of UMass Memorial Health Care. Two Biotech is home to the Program in Molecular Medicine.

100 Century Drive, Worcester

This facility contains administrative and program offices for a number of UMMS initiatives in Commonwealth Medicine.

Worcester Foundation Campus, Shrewsbury

Formerly the grounds of the Worcester Foundation for Biomedical Research, the campus in Shrewsbury has nine buildings on 80 acres, with wet and dry lab, office, conference and training facilities. Among the programs housed there are the Center for Health Policy and Research, the Center for International Health and Continuing Medical Education. The campus' Hoagland-Pincus Conference Center provides educational opportunities for faculty, staff, students and the general public.

Auburn Campus

The Commonwealth Medicine program offices located at the Auburn campus include the Center for Health Care Financing, Drug Utilization Review Program and Disability Evaluation Services.

Jamaica Plain Campus

In 1997, UMMS assumed responsibility for two programs at the Jamaica Plain campus: the New England Newborn Screening Program, offering New England's most comprehensive health screening programs to newborns, and the Massachusetts Biologic Laboratories, representing the country's only state-operated, Food and Drug Administration-licensed vaccine manufacturing facility.

Eunice Kennedy Shriver Center, Waltham

One of the first research institutions of its kind in the country, the Eunice Kennedy Shriver Center merged operations with UMMS in 2000. Scientists at the center conduct basic research to determine the biological and environmental factors that influence neurological and behavioral development, while professionals provide education and service programs that directly benefit individuals with mental retardation and other developmental disabilities and their families.

2003 Facts & Figures for UMMS

FY '03 Funding and Revenue

State appropriation	\$32.4 million
State contracts*	24.3 million
Public Service	143.1 million
Research (sponsored activity)	148.5 million
Other revenue**	111.1 million
Total	\$459.4 million

FY '04 Funding and Revenue (Projected)

State appropriation	\$26.4 million
State contracts*	21.8 million
Public Service	161.7 million
Research (sponsored activity)	162.1 million
Other revenue**	118.4 million
Total	\$490.4 million

*Provide mental health and pediatric services for those who cannot afford private care.

**Examples are continuing education and student fees, biologic labs and newborn screening programs and other non-state revenue sources.

Research Funding Increase—Last Five Years

1999	\$93 million
2000	\$99 million
2001	\$123 million
2002	\$126 million
2003	\$148 million

Technology Management

For Fiscal Year:	1998	1999	2000	2001	2002	2003
Invention Disclosures	42	49	49	49	48	139
U.S. Patent Applications	30	24	27	50	44	92
Licensing Agreements	13	17	14	15	17	32
Sponsored Research Agreements	\$2,494	4,509	2,117	2,450	442	3,760
Licensing Revenue	\$1,897	6,724	8,801	11,678	14,516	19,161

(\$ in thousands)

Education

<i>Number of Faculty</i>	
Full-time	845
Part-time	75
Basic science full- and part-time faculty	197
Clinical full- and part-time faculty	723

School of Medicine

MD students	408
PhD/MD students	17
Alumni	2,446
Residents and Fellows	531

Graduate School of Biomedical Sciences

PhD students	261
PhD/MD students	27
Biomedical Engineering w/Worcester Polytechnic Institute	6
Biomedical Engineering w/UMass campuses in Lowell, Dartmouth and Boston (est. 2003)	1
Alumni	227

Graduate School of Nursing

MS students	52
Post-master's students	3
PhD students	39
Part-time students	19
Alumni	547
Continuing Medical Education certificates	26,583
Allied Health Program students	968

(UMMS Facts & Figures continued, next page)

2003 Facts & Figures for UMMS

Educational Partners

UMass Memorial Health Care
UMass Memorial Medical Center
(Hahnemann, Memorial and University campuses)
Member Hospitals:
UMass Memorial—Clinton Hospital
UMass Memorial—HealthAlliance Hospitals
(Burbank and Leominster campuses)
UMass Memorial—Marlborough Hospital
UMass Memorial—Wing Memorial Hospital and Medical Centers
Medical Centers:
Barre Regional Family Health Center
Community HealthLink
Community Health Connections/Family Health Center, Fitchburg
Family Health Center, Queen Street
Hahnemann Family Health Center
South County Pediatrics
Tri-River Family Health Center

Major Affiliated Teaching Hospitals

Berkshire Medical Center
Milford-Whitinsville Regional Hospital
Caritas St. Elizabeth's Medical Center
Saint Vincent Hospital at Worcester Medical Center

Other Teaching Affiliates

Hospitals:
Day Kimball Hospital
Harrington Memorial Hospital
Heywood Hospital
Holyoke Hospital
Hubbard Regional Hospital
Noble Hospital
Westboro State Hospital
Worcester State Hospital
Health Centers:
Fallon Community Health Care
Holyoke Health Center
Lawrence Family Health Center
Metrowest Medical Center

Named Professorships

Named professorships are a precious and essential resource for UMMS and provide an opportunity for donors to specifically enrich academic and research excellence. UMMS currently has 24 named professorships; 18 have been established in the past four years, including eight through the Worcester Foundation for Biomedical Research. These professorships support UMMS efforts to continue to attract individuals distinguished in their fields and to retain the very best members of the faculty.

Established 1985

Harry M. Haidak Professorship in Surgery
H. Brownell Wheeler, MD • 1985 – 1999; Emeritus, 1999 –
William C. Meyers, MD • 1999 – 2001
Dana K. Andersen, MD • 2002 –

Arnold F. Zeleznik Professorship in Psychiatry
Paul S. Appelbaum, MD

Established 1988

Celia and Isaac Haidak Professorship in Medical Education
Gerald L. Haidak, MD • 1988 – 2000
Aaron Lazare, MD • 2001 –

Established 1991

Richard M. Haidack Professorship in Medicine
Neil R. Blacklow, MD • 1991 – 1999
Robert W. Finberg, MD • 2001 –

Established 1997

Irving S. and Betty Brudnick Chair in Psychiatry
Anthony J. Rothschild, MD

William and Doris Krupp Professorship in Medicine
Aldo A. Rossini, MD

Dr. John Meyers Professorship in Primary Care Medicine
Jerry H. Gurwitz, MD

Established 1999

George F. Booth Chair in the Basic Sciences
George B. Witman III, PhD

Eleanor Eustis Farrington Chair in Cancer Research
Peter J. Quesenberry, MD • 1999 – 2001
Dario C. Altieri, MD • 2003 –

Arthur M. Pappas, MD, Chair in Orthopedics
David C. Ayers, MD • 2003 –

H. Arthur Smith Chair in Cancer Research
Richard B. Vallee, PhD • 1999 – 2002
Roger J. Davis, PhD • 2002 –

Vitold Arnett Professorship in Cell Biology
Thoru Pederson, PhD

Edward Budnitz, MD, Professorship in Cardiovascular Medicine
Joel M. Gore, MD

Armand V. and Donald S. Feigenbaum Professorship in Quality
Gerald G. Steinberg, MD

David J. Frelander Professorship in AIDS Research
Mario Stevenson, PhD

Gerald L. Haidak, MD, and Zelda S. Haidak Professorship in Cell Biology
Gary S. Stein, PhD

Established 2001

Lambi and Sarah Adams Chair in Genetic Research
Michael R. Green, MD, PhD

Barbara and Nathan Greenberg Chair in Biomedical Research
Elliot J. Androphy, MD

Gladys Smith Martin Chair in Gastrointestinal Cancer
Timothy C. Wang, MD

Barbara Helen Smith Chair in Preventive & Behavioral Medicine
Judith K. Ockene, PhD

Higgins Family Professorship in Neuroscience
Steven M. Reppert, MD

David J. and Barbara D. Milliken Professorship in Preventive Cardiology
Ira S. Ockene, MD

Established 2002

Arthur F. and Helen P. Koskinas Professorship in Biochemistry & Molecular Pharmacology
C. Robert Matthews, PhD

Established 2003

Blais University Chair in Molecular Medicine
Craig C. Mello, PhD

Robert M. and Shirley S. Siff Chair in Family Health Research
Recipient: to be selected

Vitae: Leadership

Trustees of the University

Grace K. Fey of Boston
Chair

William E. Giblin of Wareham
Vice Chair

Dennis G. Austin of Duxbury

Lawrence Boyle of Milton

Christine K. Cassel, MD, of Philadelphia

John A. DiBiaggio of Snowmass Village, Colorado

Edward A. Dubilo of Weston

James J. Karam of Tiverton, Rhode Island

William F. Kennedy of Quincy

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Vitae: The Last Word

In the spring of 2003, Mr. Robert and Dr. Shirley Siff endowed the Robert M. and Shirley S. Siff Chair in Family Health Research at UMMS. Established in the University of Massachusetts Center for Adoption Research, the chair will allow multidisciplinary research to uncover the causes of, and to identify effective treatments for, neurological and developmental disorders, especially autism, in children of adoptive and birth families. Mr. Siff was chair and chief operating officer of B-W Footwear Company, Ambassador Shoe and



BWA International. Dr. Siff is an associate in the UMMS Department of Psychiatry, currently in private practice after serving the Worcester Public Schools. She is a member of the UMass Memorial Foundation Executive Committee and chairs its Community Partnership Committee. The following are the Siffs' comments about what motivates them to give:

Philanthropy is a dream-come-true for both of us. But, up until very recently, we did not consider ourselves philanthropists. Rather, we were, and continue to be, ordinary people of modest origins who wish to help others.

"Only in America" was Bob's father's favorite, oft-repeated phrase. He never stopped marveling over the freedoms and opportunities that became his as an immigrant to this country at the turn of the last century. He built a solid business that supported his own family and his employees' families, thus becoming the kind of "only in America" success story he so greatly admired. And he always helped others. He was a great role model.

Shirley's parents were equally extraordinary, raising her to find common ground and embrace diversity in a small, segregated southern community. They taught her to be herself and do her own thing while respecting others, a message she learned well and has since practiced to great effect.

Both of us have always been involved in the community, giving of our time and effort. And through our business in the

shoe industry Bob had the privilege to be part of the Two-Ten Charitable Group; few people know that shoe manufacturing and entertainment are the only two U.S. industries boasting their own national philanthropic organizations!

Now that we have the financial means, we feel privileged to be able to expand the scope of our helping, to help in ways that will have an impact on many, for years to come, long after we are gone.

The University of Massachusetts Medical School, its gifted investigators, and the flagship Center for Adoption Research, are doing work that can make that kind of far-reaching impact. We're so proud to have a major academic medical center of UMass Medical School's caliber right here in Worcester. With its overarching goal of helping families, we hope the chair will create a far-reaching legacy of commitment and of caring for future generations.

Our personal involvement with the Medical School began when we got to know Chancellor and Dean Aaron Lazare during Bob's tenure as a trustee of the UMass Foundation. The Lazares and we share kindred views on the importance of family and the value of adoption as a way to build families, and so we came on board to help establish the Center for Adoption Research.

Three personal experiences influenced our current focus on neurological diseases and their impact on adoptive and birth families. Although we didn't speak

of such things openly years ago, some explanation in today's more open times may be instructive. First, appreciating that Bob's adoption into a loving family gave him every opportunity, we have always held the institution of adoption in high esteem. Second, as an infantryman serving in the Battle of the Bulge and the liberation of the Nazi concentration camps in World War II, Bob was greatly affected by the suffering he saw, and appreciated being in a position to be helpful. Third, while our own grandchild has benefited from early and intense treatment for a diagnosis of pervasive developmental disorder (PDD), the understanding of PDD, autism and similar diseases' causes and treatments is severely limited despite their profound and growing impact on families.

Over the years, our philanthropy was also motivated by our parental desire to be good models for our own children. We are proud to report that they grew up to be charitable, community-oriented adults who are wonderful examples for their own children.

So to those of you who would be philanthropists, we have this advice: Don't worry about how much or how little you have to offer. Don't wait to get involved. We all have something important to offer, whether it be in the form of time, expertise or financial support. We never thought we could do what we have done. The same can be true for you. ©

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