vol. 29 no. 2

annual report 2006

Nobel Cause

Vitae:

The Magazine of
The University of Massachusetts Medical School

A New Chapter Begins

A Big Idea

At the Helm

Vitae: 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 students, faculty, staff, alumni, volunteers, benefactors and others who aspire to help this campus achieve national distinction in education, research and public service.

As you read about this dynamic community, you'll frequently come across references to partners and programs of UMass Medical School (UMMS), the Commonwealth of Massachusetts' only public medical school, educating physicians, scientists and advanced practice nurses to heal, discover, teach and care, compassionately:

Commonwealth Medicine

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

The Research Enterprise

UMass Medical School's world-class investigators, fueling discoveries in basic science and clinical research through receipt of over $175 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.

Vitae: Contents

Nobel Cause

At UMass Medical School, 2006 is defined by the highest form of recognition in research—the Nobel Prize. For our new Laureate, Craig Mello, PhD, it represents many things, personal and professional, sentimental and scientific.

A Big Idea

Associate Professor Andrew Fischer, MD, develops a faster, less invasive and more accurate diagnostic technology for patients' peace of mind.

At the Helm

The Department of Psychiatry welcomes Douglas Ziedonis, MD, MPH, a man of many interests and one focus—understanding the alarming connection between mental illness and addiction.

Vitae:

A NEW CHAPTER BEGINS

It is with a heavy heart that I have stepped aside from my role as Chancellor and Dean of the University of Massachusetts Medical School, effective March 15, 2007.

The decision was bittersweet for me. Beginning with the day I was appointed Dean of the Medical School in 1989, I have had an extraordinary vantage point as this institution has grown into its role as a health sciences campus of international distinction. To say that my work over the past 17 plus years has been professionally and personally rewarding is an utter understatement: It has been a privilege.

Since a kidney operation in the fall of 2005, I have been reminded almost continuously of the warmth and generosity of the campus and greater community, and for that, I am deeply appreciative. However, another health matter arose in the past month—a cardiac arrhythmia—and my efforts to manage the complexities and constituencies through the final stages of the search for a new Medical School Dean/Executive Deputy Chancellor and the attendant stresses of that effort have caused me to consider how I might best serve the University, my family and my health.

I have been fortunate to serve as Chancellor and Dean during a period of remarkable expansion, accomplishment and achievement. And yet, amidst all of the new growth, we have remained committed to the core values and core mission envisioned by Lamar Soutter when this thriving campus was still a meadow. Our commitment to health sciences education and service to the Commonwealth is more vital today than ever in our history. I truly believe that this is a special place, and that it is the rare community of faculty, students, friends, neighbors, benefactors, supporters, colleagues, staff and alumni who have made it so.

This annual report describes the state of our extraordinary institution. Signal accomplishments already defined 2006 at UMMS when, late in the year, the announcement came that our own Craig Mello had been awarded the 2006 Nobel Prize in Physiology or Medicine. October 2 was a day of incredible optimism and joy shared by the entire campus as we celebrated a truly collective sense of pride and achievement with Dr. Mello. And while I will treasure memories of that day, I am equally confident and gratified in the knowledge that our excitement and optimism goes beyond one achievement, albeit an amazing one, to reflect on our entire institution.

Much has already been said and written about Dr. Mello and his work, so we chose to take a slightly different, more personal approach with this report's Nobel coverage, offering Dr. Mello's own reflections on the experience, complemented by other individuals' impressions of the award's ripple effects. In another feature, you'll learn how the promises of scientific discoveries like those honored by the Nobel committee can and do become realized through the interconnected cycle of funding, research, development and commercialization that characterize an integrated academic medical center like ours. Steady increases in technology licensing and revenues at UMMS reflect the fertile environment for scientific invention and discovery that are exemplified by Associate Professor of Medicine Andrew Fischer, MD, and his new diagnostic tool. The final feature profiles new Professor and Chair of Psychiatry Douglas Ziedonis, MD, MPH, who takes the helm of an academic and clinical center of excellence that fulfills our multipart mission of education, research, clinical care and public service.

In chronicling so much good news emanating from all reaches of our institution, the 2006 UMMS Annual Report is testament to the numerous ways that UMass Medical School, with its clinical partner, UMass Memorial Health Care, continues to contribute to improved health and well-being of the communities we serve.

After a brief recovery period to restore my health, I look forward to returning to our academic community to continue my research and writing and spend more time with our students as a teacher, advisor and mentor. I am deeply grateful for your support and friendship.

Aaron Lazare

Vitae: Year in Review

New Graduate School of Nursing Dean is Longtime Faculty Member

In its relatively short history, the Graduate School of Nursing has quickly established itself as the Commonwealth's premier institution in developing tomorrow's nursing leadership. When Paulette Seymour, PhD, RN, was named dean of the Graduate School of Nursing in September 2006, the GSN's future success was assured.

A graduate of the Worcester City Hospital School of Nursing, with a BSN from Worcester State College and MSN from Boston College, Dr. Seymour earned her PhD from the GSN in 2001. On the faculty since 1990, she was associate dean for practice and assistant professor prior to becoming interim dean in 2005. Her research has focused on the adult cardiac population and organizational development in health care environments—interests she has applied to her clinical career, most recently as chief nursing officer and senior vice president for UMass Memorial Health Care.

Beyond her experience and credentials, Seymour has earned the respect and admiration of fellow faculty, clinicians and graduate students throughout the UMMS community. "I am so pleased that as dean, I can continue supporting both academic and clinical nursing in the setting that has been such a productive professional and academic home to me for so many years."

Paulette Seymour, PhD, RN, will lead the GSN as it participates in the Board of Higher Education/ Massachusetts Organization of Nursing Executives "Nurse of the Future" project, a statewide effort to build the framework for the future of nursing education and practice.

Department Established to Hasten Research Breakthroughs to Therapeutic Applications

To rapidly turn laboratory advancements into treatments, in 2006, UMass Medical School established the Clinical and Translational Science Department (CTSD) within the School of Medicine, positioning the institution to promote an innovative agenda in clinical and translational research that will positively affect the health of communities and populations nationwide. Clinical and translational science multiplies the opportunities for advances in health care by transforming basic research discoveries and patient observations into clinical practice.

According to CTSD Interim Chair John L. Sullivan, MD, vice chancellor for research and professor of pediatrics and molecular medicine, the new department will foster collaboration among existing clinical and basic science departments, institutes, centers and UMass Memorial Health Care, as well as accelerate the development of preventive and therapeutic strategies and enhance the translation of emerging technologies. A pilot program was initiated in 2006 with grants of $100,000 to encourage teams of clinical and basic science investigators to launch clinical and translational research projects.

Plans also include research education expansion and career development in clinical and translational science. This will be accomplished through the Clinical & Population Health Research doctoral program, a clinical research pathway, and a clinical research scholars program to train investigators and nurses with PhDs.

"This department will be a catalyst for UMass Medical School and UMass Memorial Health Care to become national leaders in improving public health by creating the ideal environment to promote innovative, interdisciplinary clinical research," said Dr. Sullivan.

High School Program for Future Scientists is Expanded

Stephen Doxsey, PhD, is in the back of the "classroom" at far right, but he doesn't mind. He's glad to be joining additional students from Worcester area high schools as they learn hands-on lessons in UMMS labs. New faculty to the program are: Ingolf Bock, PhD; Victor Boyartchuk, PhD; Lucio Castilla, PhD; Silvia Corvera, MD; Michael Czech, PhD; Job Dekker, PhD; Kirsten Hagstrom, PhD; Paul Kaufman, PhD; Nathan Lawson, PhD; Craig Mello, PhD; Gregory Pazour, PhD; Nicholas Rhind, PhD; William Theurkauf, PhD; Heidi Tissenbaum, PhD; Fumiko Urano, MD; Bert van den Berg, PhD; and Marian Walhout, PhD.

Under the guidance of co-founder Stephen J. Doxsey, PhD, professor of molecular medicine, the program *UMass Laboratories for Worcester Area High Schools* has been a hit with UMass Medical School faculty, Worcester's North High Advanced Placement (AP) Biology students and the teachers who help pilot the program. In fact, *UMass Laboratories,* which brings high school students to the UMMS campus for hands-on research experiences in state-of-the-art labs, has been so successful that in 2006 it was expanded to other research initiatives, advancing the development and study of innovative clinical and health services interventions for the elderly and providing training opportunities for new investigators.

Center Positions UMMS as a Leader in Geriatrics Care and Research

UMass Medical School, in partnership with the University of Massachusetts Boston, has established the Rosalie Wolf Interdisciplinary Geriatric Health Care Research Center through a development grant from the board of trustees of the John A. Hartford Foundation, in association with the RAND Corporation. The two-year, $200,000 award recognizes the University of Massachusetts as a leader in efforts to improve the health of the residents of the Commonwealth and the nation and its commitment to addressing the imminent public health concern related to a growing elderly population.

The new center, which will focus on improving the health of older adults through innovative, interdisciplinary research, is one of just seven centers nationwide to be established by RAND/Hartford in 2006. Principal investigators for the project are Jerry Gurwitz, MD, the Dr. John Meyers Professor in Primary Care Medicine, chief of the Division of Geriatric Medicine and executive director of the Meyers Primary Care Institute; Kathleen Miller, EdD, RN, professor and director of the Master's in Nursing Program for the Graduate School of Nursing; and Jan Mutchler, PhD, professor of gerontology and associate director of social and demographic research at the Gerontology Institute at UMass Boston. UMMS Assistant Professor of Medicine Elizabeth Dugan, PhD, will serve as project director.

The center was named in honor of the late Rosalie S. Wolf, PhD, a UMMS assistant professor of family medicine & community health and executive director of the Institute of Aging at UMass Memorial Health Care. It will position UMass as a national voice for quality health care for older people by advocating for expanding geriatric

The late Rosalie Wolf, PhD, made important contributions to the field of geriatrics, bringing international attention to the issue of elder abuse and neglect. In 1986, Wolf founded the National Committee for the Prevention of Elder Abuse and in 1989 became founder and editor of the *Journal of Elder Abuse and Neglect.*

Worcester high schools. The expansion provides opportunities for additional faculty to influence would-be young scientists as it supports the UMMS commitment to community outreach.

The high school science labs were launched seven years ago by Dr. Doxsey and North High Department of Science administrators. "The idea is to get kids interested in science as early as possible. Many faculty members have a story of an early mentor who was instrumental in getting them excited about a career in science, myself included," Doxsey explained. "My AP biology teacher brought us on field trips and planned other special activities. I still remember things I did in that class."

Each participating faculty member teaches one lab in their area of expertise during the year-long course, with students making four visits to UMMS. Current lab exercises include enzyme catalysis, mitosis/meiosis, genetics of organisms and molecular biology. Explaining why faculty make time in their already demanding schedules to participate, Doxsey said, "They feel strongly about educating young kids, especially in the face of a national shortage of scientists. It's a way for them to give back."

The original cohort of Doxsey, David Lambright, PhD, and Craig Peterson, PhD, professors of molecular medicine and biochemistry & molecular pharmacology; and Tony Ip, PhD, associate professor of molecular medicine, biochemistry & molecular pharmacology and cell biology, has grown to include 17 junior and senior faculty as well as some 30 graduate students and post-doctoral fellows.

Mammography Study Yields 'Alarming' Results

Mammography is widely considered to play an important role in the early detection of breast cancers, allowing diagnosis at a stage when these cancers are most treatable; in fact, the American Cancer Society recommends annual mammography screening for women beginning at age 40 and strongly recommends it for the 2.3 million women who have been treated for breast cancer. UMass Medical School researchers were surprised, therefore, by the results of their study that found only one in three breast cancer survivors continues to have regular annual mammograms in the five years after treatment.

Study author Chyke A. Doubeni, MD, MPH, assistant professor of family medicine & community health, called the findings "alarming." Dr. Doubeni, a researcher with the Meyers Primary Care Institute (MPCI)—a collaboration among UMMS, Fallon Clinic Foundation and Fallon Community Health Plan—and colleagues sought to identify patterns of mammography use in women with health insurance. Their study, published in the June 2006 issue of *Cancer*, examined mammography use among 797 breast cancer survivors who received care from sites affiliated with the National Cancer Institute's Cancer Research Network. In the first year after treatment, 80 percent of women received a mammogram, but in the fifth year, only 63 percent received a mammogram, and only one in three women had received a mammogram each year over the five years.

The study further revealed that patients seen by gynecologists or primary care physicians were more likely to receive mammograms. Doubeni hopes that the study's findings will encourage health care professionals to raise the topic with patients. "Women with a history of breast cancer face a threefold risk of new or recurrent cancer; it is imperative to increase awareness among health care providers and breast cancer survivors of the value of follow-up mammography," he said.

"Some studies indicate if you have a history of cancer, your awareness of your risk is much higher; we expected most breast cancer survivors to get regular mammograms," said Chyke Doubeni, MD, MPH.

Massachusetts Biologic Laboratories Partners with Serum Institute of India on Rabies

UMass Medical School's

Massachusetts Biologic Laboratories (MBL) and Serum Institute of India formed an historic partnership in 2006 to bring the world a new approach for preventing rabies in people. The institutions will collaborate to test and manufacture a new monoclonal antibody (MAB) created by scientists at the MBL in conjunction with the U.S. Centers for Disease Control and Prevention (CDC), which can neutralize multiple variants of the rabies virus. While deaths from rabies in the United States are rare, worldwide rabies remains a major public health problem. The World Health Organization estimates that at least 10 million people are exposed to rabid animals each year, resulting in some 55,000 deaths.

"Rabies is a major global public health problem, so we are very pleased to be partnering with Serum Institute to bring this new approach to the millions of people who need it each year," said Donna Ambrosino, MD, director of the MBL and a professor of pediatrics at UMMS. "The Institute's top level scientific resources, its commitment to public health and its global reach, make it the best partner for us in this important initiative." Based in Pune, India, Serum Institute is the world's largest manufacturer of vaccines and has a mission to bring cost-effective vaccines and biologics to the developing world.

Unlike blood-derived serums, MABs can be produced in large quantities and at much lower costs than blood products and can be stockpiled in liquid form, or freeze-dried, so they are easier to distribute to remote sites. And since MABs are not derived from serum, they have none of the safety issues associated with typical human blood products. As part of the collaboration agreement, scientists from the MBL will work with their counterparts in India to help Serum Institute build its own internal MAB production facility, thereby bringing this leading-edge biologics technology to India for the first time.

The MBL and Serum Institute plan to launch a Phase I clinical trial in India in 2007 to assess the safety and tolerability of the new MAB in people, with hopes of having the new, lower-cost treatment available within two years for those exposed to rabies. The treatment would then be made broadly available in India shortly thereafter.

UMass Memorial Foundation Welcomes New Chief Executive

Charles J. Pagnam, a highly regarded fund-raising and advancement professional with more than two decades of experience in higher education and health care, was appointed Vice Chancellor for Development at the University of Massachusetts Medical School. In this role, he will lead the joint development function of UMass Medical School and UMass Memorial Health Care and serve as the chief executive of the UMass Memorial Foundation, which raises philanthropic support for programs and initiatives at the two institutions. Pagnam joined the UMass Memorial Foundation from Mount Sinai Medical Center, where he served as Senior Vice President for Development, charged with overseeing all development operations as well as the implementation of a $1 billion capital campaign. He joined Mount Sinai from Yale University, where he spent the last seven of his 27 years as Vice President for Development. At Yale, Pagnam increased overall university-wide contributions from $203 million to an annual high of $350 million. New initiatives during his tenure included the establishment of the Parents Capital Giving Campaign and Special Gift Division aimed at younger alumni.

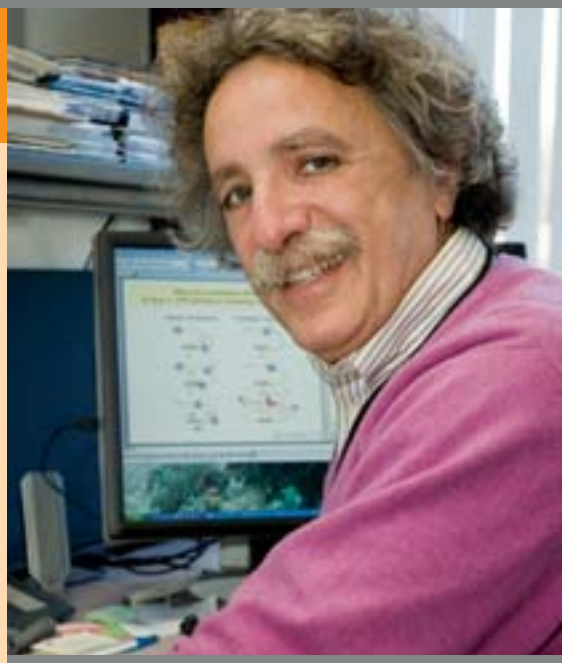
Long-time Genetics Researcher Earns Prestigious Grant Renewal

For years after the discovery of DNA, scientific tenets held that the most important steps influencing gene expression occurred during transcription—the process by which DNA's genetic message is copied to RNA. In the late 1970s, however, investigators began to find that what happened next, during the translation of RNA's message and the subsequent production of proteins, played an equally important role in the regulation of genetic activity. Professor and Chair of Molecular Genetics & Microbiology Allan Jacobson, PhD, then a new member of the UMass Medical School faculty, began the study of this post-transcriptional activity. Nearly three decades later, his pioneering efforts have been recognized with a prestigious National Institutes of Health award.

Totaling nearly $4 million, the Method to Extend Research in Time, or MERIT Award, recognizes Dr. Jacobson as an investigator whose research competence and productivity are distinctly superior. The award provides stable support and eliminates the administrative burdens of frequent grant renewals.

Jacobson's research has been primarily concerned with the function of messenger RNA (mRNA), which encodes and carries information from DNA to sites of protein synthesis. In normal function, the action of mRNA is dictated by a defined start and end on its genetic code. In some cases, however, the action of mRNA is prematurely terminated by the presence of "nonsense" codons, particular pieces of the genetic code that do not encode the amino acids necessary for the production of proteins. This premature termination not only results in the production of truncated or abnormal proteins, but also results in the rapid decay of the mRNA itself.

The clinical implications of a greater understanding of nonsense-mediated mRNA decay are significant. More than 1,800 inherited disorders, including cystic fibrosis and certain forms of muscular dystrophy, are known to develop from nonsense mutations. With the support of the MERIT Award, Jacobson will continue to investigate how specific proteins function in the rapid degradation of the mRNA as well as seek to define the links between normal translation and mRNA decay.



"There is a great deal of confidence that comes with such an award," said Allan Jacobson, PhD. "The greater flexibility afforded by the grant gives us the assurance that we can be more creative and try new approaches in the longer term."

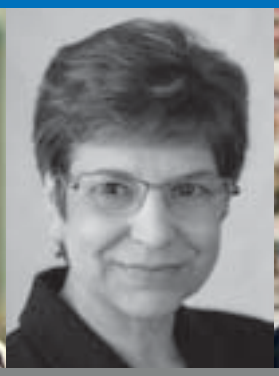
Zamore Named Gretchen Stone Cook Chair in Biomedical Sciences

Professor of Biochemistry & Molecular Pharmacology Phillip D. Zamore, PhD (right), was invested into the Gretchen Stone Cook Chair in Biomedical Sciences in October 2006. The chair was established through a bequest from Gretchen Cook, a longtime friend of the Worcester Foundation for Biomedical Research, to be held "by an outstanding faculty member . . . to advance research in the broadest sense." Dr. Zamore, an international figure in the exploration of gene-silencing RNA interference (RNAi), combines biochemistry, genetics and cell biology in his research to understand the mechanisms of RNAi, which may lead to new treatments for human genetic disorders. Stephen C. Harrison, PhD, Howard Hughes Medical Institute Investigator and professor at Harvard Medical School (left), who was chair of Zamore's department when he was a student there, said on the occasion of the investiture, "It is gratifying that a campus as relatively young as [UMMS] . . . has found generous and far-sighted donors to endow chairs for research . . . and that it recognizes with such chairs relatively young and wonderfully creative faculty like Professor Zamore."

Recognizing UMass Medical School Service and Expertise


Francis Bednarek, MD


Lucy Candib, MD


Marianne Felice, MD


William Fisher, PhD


Jeffrey Geller, MD, MPH


Michael Hirsh, MD

Francis J. Bednarek, MD, professor of pediatrics and obstetrics & gynecology, received the Career Achievement Award from the Worcester District Medical Society at its annual meeting. Also honored was **Lucy M. Candib,** MD, professor of family medicine & community health, who received the A. Jane Fitzpatrick Award for Community Service in recognition of her contributions to the Greater Worcester community.

Marianne E. Felice, MD, professor and chair of pediatrics, was a recipient of the YWCA of Central Massachusetts Katharine F. Erskine Award, presented each year to five women who have demonstrated a dedication to making life better for their community, particularly for women and girls. Dr. Felice was lauded for her work in adolescent medicine, particularly sexuality, teen pregnancy and cross-cultural health care.

William H. Fisher, PhD, professor of psychiatry, received the Massachusetts Department of Mental Health Commissioner's Distinguished Service Award. Dr. Fisher was recognized for his "long and distinguished record of significant contributions to academic research to improve public sector mental health services."

The Treatment Advocacy Center, a national nonprofit organization dedicated to removing barriers to treatment of severe mental illnesses, awarded one of three Torrey Advocacy Commendations to **Jeffrey L. Geller,** MD, MPH, professor of psychiatry. The award recognizes those who advocate for the right to treatment for individuals who are so severely disabled by mental illness that they don't recognize that they need treatment.

The Massachusetts Medical Society named **Michael P. Hirsh,** MD, professor of pediatrics and surgery, its Community Clinician of the Year for his dedication to the health and safety of the region's children.

The Computer and Instrumentation Council of the Society of Nuclear Medicine presented its Edward Hoffman Memorial Award to **Michael A. King,** PhD, professor of radiology, in recognition of his "outstanding scientific contributions to the field of computers and instrumentation in nuclear medicine."

Assistant Professor of Molecular Medicine **Brian Lewis,** PhD, received the American Association of Cancer Research Pancreatic Cancer Action Network Career Development Award. The award honors an investigator who shows outstanding promise in his or her field.

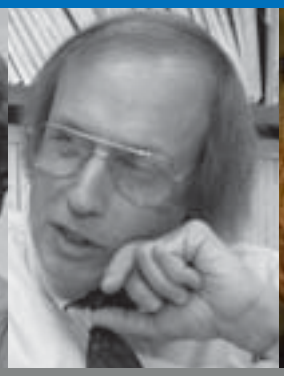
In recognition of their contributions to the regulation of genes that control skeletal development and tumor metastasis to bone, **Jane Lian,** PhD, professor of cell biology, and **Gary Stein,** PhD, the Gerald L. Haidak, MD, and Zelda S. Haidak Professor of Cell Biology and professor and chair of cell biology, received the William F. Neuman Award from the American Society for Bone and Mineral Research, the world's largest for research in skeletal biology and pathology.

The University of Massachusetts selected **Elaine R. Martin,** DA, director of the Lamar Soutter Library and assistant professor of family medicine & community health, as a recipient of the President's 2006 Public Service Award. The award honors UMass faculty who provide exemplary public service to the Commonwealth. Under Dr. Martin's direction, the library has been transformed into a nationally recognized repository that has become both a virtual and physical resource for the health information needs of the community and has twice been designated the New England Regional Medical Library.


Michael King, PhD


Brian Lewis, PhD


Jane Lian, PhD


Gary Stein, PhD


Elaine Martin, DA


Joanne Nicholson, PhD

Joanne Nicholson, PhD, professor of psychiatry, was presented the United States Psychiatric Rehabilitation Association Armin Loeb Award. She was recognized for conducting "the best designed and most useful research in the field of psychiatric rehabilitation in the preceding year or years based on quality, significance and contributions to the knowledge base underlying the current and future directions of the field."

UMass Memorial Health Care President and CEO **John G. O'Brien,** received the Paul Revere Award from the Massachusetts Public Health Association. One of the highest honors bestowed by the organization, the award is reserved for health care leaders "who have developed and promoted strong public health programs that have outstanding impact on community health."

The Society of Teachers of Family Medicine, committed to "improving the health of all people through education, research, patient care and advocacy," presented **Mark E. Quirk,** EdD, professor of family medicine & community health, its Excellence in Education Award.

Neal S. Silverman, PhD, assistant professor of medicine, was among a select group who gathered in Washington, D.C. to receive the Presidential Early Career Award for Scientists and Engineers (PECASE) from President Bush. Instituted in 1996, the PECASE awards are the highest honor bestowed by the U.S. government on outstanding scientists and engineers.

The Massachusetts Medical Society recognized **Henry Tulgan,** MD, FACP, clinical professor of medicine, for his exceptional leadership service to the Society. Dr. Tulgan, who received the Committee Chair Service Award, is the longstanding chairperson of the Society's Committee on Sponsored Programs, which reviews educational activities and continuing medical education for physicians and health care providers.

Sowmya Viswanathan, MD, assistant professor of medicine, was named one of 30 people worldwide to receive the Hind Rattan Award. Recipients are Indians residing abroad who have made significant contributions in various fields.


John O'Brien


Mark Quirk, EdD


Neal Silverman, PhD


Henry Tulgan, MD, FACP


Sowmya Viswanathan, MD

campus revampus Comes to a Successful Conclusion

The *campus revampus* project, which reshaped the UMass Medical School campus for the next generation of students, scientists, faculty and staff, wrapped up in 2006. In January, the official opening of a dramatic new lobby and entrance, an extensively remodeled Faculty Conference Room and a more functional office suite for campus administration signaled the project's last stages. Together with the façade replacement, the Student Wing expansion, construction of the South Road Parking Garage and the Remillard Family Pavilion and completion of the Lakeside Wing with a new emergency department, the four-year initiative was marked by careful planning, hard work and the cooperation of thousands.

Never an institution to rest when progress is possible, UMMS took the next step in its master plan with the start of construction of the Advanced Educational and Clinical Practice Center (AECPC) in December. This seven-story, 258,000-square-foot facility, which is being built directly adjacent to the South Road garage, will allow UMMS to continue to advance innovative research and educational initiatives as well as provide much-needed space for clinical partner UMass Memorial Health Care.

The AECPC will be the setting for the latest educational tools through its Center for Experiential Learning and Simulation, envisioned as an educational environment where students and health care practitioners can acquire and sharpen their professional skills and master new techniques through an array of medical simulation technology, including virtual reality trainers and simulators and the institution's renowned Standardized Patient Program.

The AECPC will also be home to the recently established Clinical and Translational Science Department, which fosters collaboration among existing clinical and basic science entities with the goal of shortening the time between laboratory breakthroughs and clinical applications, an initiative recently identified as a priority of the National Institutes of Health and integral to the UMMS research vision. (See page 3 for details.)

The Advanced Educational and Clinical Practice Center will attach directly to the west side of the South Road Garage, which was designed to accommodate the addition of this building. Architecturally, the front of the building mirrors the Aaron Lazare Medical Research Building, with its curved, glass exterior; inside, 258,000 square feet will be devoted to research, educational and clinical initiatives of UMMS and UMass Memorial Health Care.

Architectural rendering

Nobel Cause

At UMass Medical School, 2006 is defined by the highest form of recognition in research—the Nobel Prize. For our new Laureate, Craig Mello, PhD, it represents many things, personal and professional, sentimental and scientific.

By Alison M. Duffy

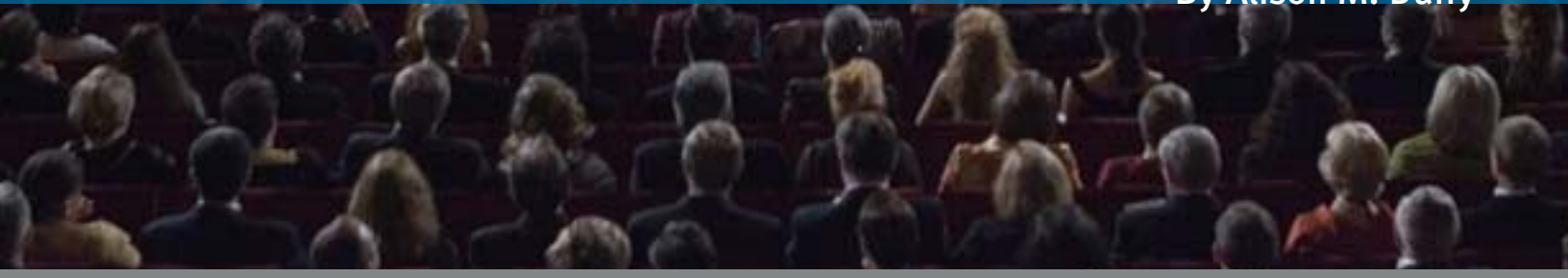


Photo: Reuters

By the time Craig Mello was greeted by jubilant colleagues at his laboratory on the morning of October 2, 2006, word that he and Andrew Fire, PhD, of Stanford had been awarded the 2006 Nobel Prize in Physiology or Medicine for their discovery of RNA interference had already ricocheted around the world. The official announcement had been made just hours earlier, but already photographers and reporters were waiting for Dr. Mello, eager to capture the excitement of the day and the reactions of the person behind the discovery. Mello and his wife Edit—who hung up on the Nobel Assembly's Karolinska Institutet's first call, certain it was a prank—barely had time to call their families before the international press began tying up their phone lines. By lunchtime, his face sore from grinning and his arm numb from shaking countless hands, Mello had lost count of the number of reporters he'd spoken to, and "RNAi" seemed on its way to becoming a household word.

Since that day, Mello, a Howard Hughes Medical Institute Investigator and the Blais University Chair in Molecular Medicine at UMass Medical School, has received innumerable calls for interviews, invitations to speaking engagements and requests for letters of recommendation. There have been thousands of news articles published and posted online not only about RNAi—its discovery, its use in laboratory science, and its potential for profound impact on medicine and even agriculture and the economy—but also about Mello himself. Interviews with his parents, Jim and Sally, have painted a picture of a single-minded and tenacious kid innately attracted to exploration, whether in a skiff on the bay near his grandparents' home in Rhode Island or in a frog-filled culvert under Route 66 behind his childhood home in Fairfax County, Virginia. The attraction grew in a supportive environment in which family dinners were a priority and lively, wide-ranging discussions at the table fostered a love of learning among the four Mello children.

Mello's parents—Jim, a retired paleontologist and assistant director of the Smithsonian Museum of Natural History, and Sally, who earned a degree in art from Brown University where she and Jim met—were the first in both their families to pursue higher education, thanks to sacrifices made by their own parents. "My grandparents had to work from a very early age—laboring in factories, driving delivery trucks—but they valued creativity and education and had a strong work ethic," said Mello. "They didn't get to have jobs where they could express those values and creativity each day, like I do."

Mello regrets that his grandparents are not alive to share in the glow of the Nobel Prize and to see where their grandson's curiosity about the world has taken him. If they had been, they might have joined the extended family for the once-in-a-lifetime trip to Stockholm for

On page 11: December 10, 2006—Craig Mello sits on stage at left with his fellow Laureates as the Nobel ceremony plays out in all its splendor in Stockholm, Sweden. In the audience were Mello's parents, Jim and Sally, who, with other family members and friends, watched proudly as he received his Nobel medal from the King. Mello was on stage again in January 2007 (below), this time back home in Worcester at a UMMS celebration honoring his achievement, and this time serving as presenter himself of a Nobel medal replica to Jim and Sally, the two people who instilled in him an affinity for exploration and discovery. Mello also gave a replica to the University of Massachusetts, accepted by its representatives, Board of Trustees Chairman Stephen Tocco, President Jack Wilson and Chancellor/Dean Aaron Lazare, and to benefactors Jack and Shelley Blais, who have generously supported Mello's research.

the Nobel Prize ceremonies. As has been the tradition for nearly 100 years, all of Sweden fêtes the Nobel Laureates, their families and guests with a week-long series of parties and events, both public and private, staid and raucous. Press conferences and academic presentations by each Laureate filled several days in December, and Mello and his guests—including Michael Czech, PhD, professor and chair of the Program in Molecular Medicine, who recruited Mello to UMMS, and institutional benefactors Jack and Shelley Blais—enjoyed a guided tour of the city, a concert featuring American soprano Renée Fleming accompanied by the Royal Stockholm Philharmonic Orchestra, and a visit to the Nobel Museum where each Laureate observed the tradition of autographing the bottom of a chair. In addition, there were all-night parties thrown by university students and even a serenade in the family's hotel suite performed by singers in traditional costumes complete with lighted candles atop their headdresses.

"The whole country was into it," said Mello, who is still a bit awestruck by the experience. "It's the equivalent of being in the Super Bowl in America—the public recognizes science at that level, and there were even people waiting outside the hotel to get autographs."

The highlight of the week was the awards ceremony itself, at which King Carl XVI Gustav formally presented each Laureate with the medal. The stage, lush with more than 13,000 flowers flown from San Remo, Italy, held luminaries involved with the Nobel Foundation, previous Laureates and the Royal Family together with the 2006 Laureates, resplendent in tuxedos and gowns. "It was incredible to see

Mello joins the 2006 Laureates in Sweden beneath a portrait of Alfred Nobel. "It was incredible to see some of the people who have had this honor before, and to think of people I've looked up to my entire career whose names are not there yet," he said. "I never expected mine to be among the names of Nobel Laureates."

Photo: Torbojn Zadig, Zbild

Ripple Effects

The impact of the Nobel Prize win was felt immediately within the labs, classrooms and offices at UMass Medical School, the epicenter, as some have called it, of the RNAi revolution. But what are some of the early reverberations in the wider scientific, educational and business communities? Here are some answers from observers in these realms, in their own words:

Kevin O'Sullivan, President and CEO, Massachusetts Biomedical Initiatives, a Worcester-based, non-profit group that runs business incubators for small life-science companies

"It doesn't get any better than this!

I'm really not surprised; there were murmurs of a win by Craig Mello in previous years. The UMass Medical School talent pool continues to break out. I travel around the state and Worcester and the Medical School—they're on everyone's radar screen. We have a growing life sciences sector, and Central Massachusetts is becoming more confident as a major player. The Nobel is a golden arrow in the Medical School's quiver and a tremendous help in promoting our life sciences agenda. I use it all the time when I speak. The reckoning has been coming, the reputation building, and this is the crescendo. The Nobel puts an exclamation point on it.

Ten years ago this might not have been believed—this Central Massachusetts potential for a future in health care and life sciences. But they're all believers now. With Craig's discovery, we are for real. Now, life sciences commercialization is the focal point, and the implications of RNAi for fighting disease are mind-boggling, the spin-offs tremendous. The potential for the future is just huge, and I'm looking forward to being a part of it and watching it serve as a springboard for the other stars at UMass Medical School.

This is a Massachusetts victory lap."

Mark Bilotta, CEO, Colleges of Worcester Consortium, Inc., a not-for-profit association of public and private accredited colleges and universities in Central Massachusetts

"The Nobel Prize will help raise visibility for Worcester and the region as a premier destination for students and faculty. An identity such as this outside of the region is so helpful. Demographically, we're experiencing an eight to

some of the people who have had this honor before, and to think of people I've looked up to my entire career whose names are not there yet," said Mello. "I never expected mine to be among the names of Nobel Laureates." The banquet following the ceremony left most speechless, with more than 500 waiters appearing simultaneously to serve the 1,300 guests a seemingly endless array of delicacies from a menu kept secret until that very evening.

Throughout the week, local newspapers followed the activities of the Laureates and, for only the third year, the Nobel Foundation allowed live television coverage of the ceremony and banquet. The minute-by-minute commentary accompanying the broadcast included not only explanations of the works being recognized but also personal anecdotes that helped portray the Laureates as regular people. Mello, according to the commentators, is the only Nobel Laureate known to both windsurf and snowboard, a fact relayed later in the week to Mello by a well-wisher who stopped him outside a restaurant to congratulate him and ask for an autograph.

"One of the amazing things about [events in] Stockholm was the juxtaposition of really great parties and interesting conversations." Mello was delighted to find common ground with physics winners John Mather and George Smoot who were jointly awarded the Nobel Prize in Physics for their discovery of evidence that supports the Big Bang theory. "It was fascinating to talk about the universe being 13.7 billion years old and to consider RNAi on that same timescale: RNAi had a common ancestor in plants and fungi about a billion years ago," Mello explained. "As the physicists

"All of us here at UMass Medical School realize what a tremendous opportunity we have, thanks to the support of our society and our government, but we can do so much more, and I think people want us to do more," said Mello, who is using the occasion of the Nobel Prize recognition as a platform from which to exhort opinion leaders to protect and increase funding for basic science research and accelerate the pace of discovery.

nine percent drop in the number of graduating high school students. Traditionally, our member colleges see 65 percent of students coming from Massachusetts, 75 percent from New England and 25 percent from other states and countries. In many cases, students are selecting a college that just so happens to be in the Worcester area. We want to be a destination instead.

In the past, students here got to know their own campus and not the other colleges. We want students to go back to their homes and talk up *all* the colleges. Then, after they graduate, we want to retain those students and think we can do so by actively engaging them in the community through internships at local businesses or through community and volunteer services. All students, including those at graduate institutions like UMass Medical School, can be involved in this. The Nobel Prize win encourages us at the Consortium to find a role that Craig Mello can play in achieving these goals."

W. Grant McGimpsey, PhD, Director, WPI Bioengineering Institute (BEI), an interdisciplinary research organization charged with commercializing life sciences and medical technologies under development in WPI laboratories. Dr. McGimpsey is also a WPI professor of chemistry and an adjunct research professor in anesthesiology at UMMS

"It's a challenge attracting life science faculty to the region, with such prestigious research institutions and hospitals to the east. Craig Mello's Nobel not only gives credibility to UMMS, but also to WPI and other local universities because it lets people know that this pinnacle of research can be achieved in Central Massachusetts. Now, when bright young faculty are considering where to build their careers, UMMS and WPI will be natural choices.

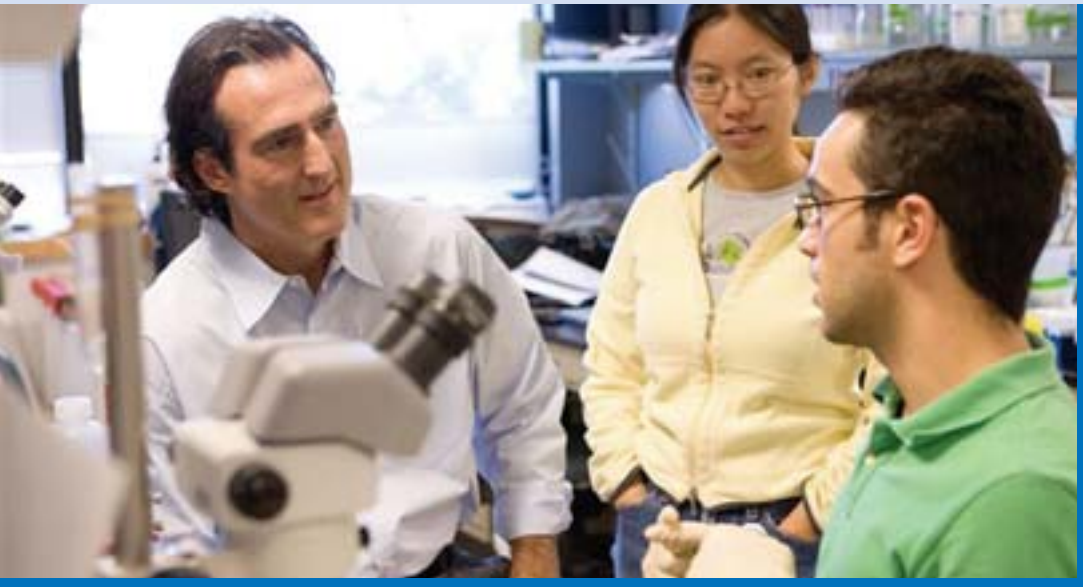
I expect a continuing explosion in the life sciences in Worcester, where every university can play its part. The Nobel makes it clear that UMMS has reached elite status as a basic research institution. Concurrently, WPI is striving for elite status in applied research, and by working with UMMS and other universities, I feel we can achieve this goal. For example, the WPI and BEI focus on medical device development and the clinical capabilities of UMMS to validate these devices will be a winning combination.

Our strong commitment to developing the life sciences in Worcester is evidenced by construction of the WPI Life Sciences and Bioengineering Center at Gateway Park. Here, investigators will work side by side, much like the Medical School's Lazare Research Building. It's the start of a vibrant, new community in that area of Worcester and the BEI

look back in time to understand our beginnings, RNAi is helping us to look forward at evolution and how we might alter disease-causing genes to let people live healthier lives."

Mello also recalls being riveted by the banquet speech of Orhan Pamuk, winner of the Nobel Prize in Literature, for the parallels he saw between the creative processes of writing and science. "Pamuk's comments were about how the creative process has to do with keeping alive that certain *something* as you grow up, that curiosity and that drive to discover, and reliving the wonderful feelings you had as a child when your creations were hung proudly on the refrigerator."

Most satisfying for Mello has been the sense, underscored during conversations with the physicists and in the message he heard in Pamuk's speech, that his work has a place in the world and that society recognizes RNAi not with awards and prizes but with support in the form of research grants. "All of us here at UMass Medical School realize what a tremendous opportunity we have, thanks to the support of our society and our government, but we can do so much more, and I think people want us to do more," said Mello, who is using the occasion of the Nobel Prize recognition as a platform from which to exhort opinion leaders to protect and increase funding for basic science research and accelerate the pace of discovery. With the National Institutes of Health budget level-funded for the past three years and little expectation of any immediate increase, competition for scarce research dollars has constrained investigators in the basic sciences, particularly innovative and bold young scientists trying to establish themselves. Mello has noted that if



In the wake of his Nobel win, Mello has taken on a number of new roles as his insights are sought by hundreds of individuals and organizations. He is now a public speaker, reviewer, consultant and nominator of potential Nobel Laureates. First and foremost, however, he is a scientist, teacher and mentor. He is excited about his current research examining other aspects of the RNAi mechanism and how they relate to gene expression and developmental regulation and is continually energized by his students and their ideas. "It's the students who aren't afraid to take on risky projects...often the ones that pay off the biggest," he said.

will be there to make sure that what happens in the labs with public money gets into the hands of the public."

Michael Cole, Director of Recruitment and Admission, Graduate School of Biomedical Sciences, UMass Medical School

"The moment I heard about Craig's Nobel win, I thought, 'This will help recruiting.' We are seeing the results. Our application tally this year looks to be 20 percent higher than any total in the graduate school's history and 25 percent higher than last year. This has a profound, positive effect based on potential students' attention to excellence in research. In reality, 98 percent of students who enroll won't do thesis research in Craig's lab, but there is a feeling that the overall experience will be great, that there are great faculty and students here. Because of Craig's accomplishment, every student in the school can benefit.

For anyone who doesn't see us making our own mark, the Nobel continues to prove that great science is going on in Massachusetts outside Route 128. In some ways, the student who is looking for overall prestige and excellence will take note. But the biggest thing for me is that people within this institution understand the excellence that exists here. The Nobel brings external affirmation of that.

Of course, my recruitment efforts changed right after the win. I recall a woman at one conference who walked by my new poster with the Nobel reference, pulled out a digital camera and asked, 'Is he here?' This just speaks to what students know and what's important to them. More than half of students knew within two weeks of the announcement; they watch what's going on in the scientific world and take note of institutions as well. Craig was always highlighted as a natural in our recruitment letters. But the Nobel news opens the letter now. It's truly a big reflection of the institution as a whole. It's the ultimate.

International students seem especially impressed. Many of those current students made sure they took pictures with Craig to send back to their families. Look where I am! International students seem very interested in the concept of 'what's best.' I expect to see increased interest from all students, but I am also hopeful and optimistic that Massachusetts students especially will look at us in an even more positive light, making us more competitive in student ranking with Boston-area institutions. One factor may be the discovery itself—students are already using RNAi in the lab and are at least familiar with it and anticipate they will run into it at some point in their research career.

One of the things I talk about with prospective

"It would be my biggest thrill of all to see another Nobel Prize go to a UMass colleague or student and be invited to that party! As an institution, if we keep doing what we're doing, I believe it will happen."

– Craig Mello, PhD

In January, UMass Medical School and the Central Massachusetts community honored Mello for his "splendid achievement." The University of Massachusetts Amherst Minuteman Marching Band trumpeted the pride each individual in attendance felt—and made Mello an honorary member.

students is that, up until his schedule changed dramatically, Craig taught one of the lectures in our introductory core course. I tell them, here at UMMS, every first-year student could interact with a Nobel winner. There is an enthusiasm for science from all faculty, and I'll keep selling that, as well as the collaborative environment, our serious mentoring efforts, and our structure that opens up the whole place to students."

Alla Grishok, PhD, a graduate student in Craig Mello's lab from the fall of 1997 through her thesis defense in September 2001. Dr. Grishok conducts research in Nobel Laureate Phillip Sharp's lab at the MIT Center for Cancer Research

"Dr. Sharp won a Nobel Prize for the discovery of splicing in 1993. He became very interested in RNAi and got involved in RNAi research shortly after its discovery. I continue working on RNAi and related mechanisms in *C. elegans*. My specific interest is in the connection between RNAi and chromatin, and I'll start my own lab at the Department of Biochemistry and Molecular Biophysics at Columbia University in New York this summer.

I was in the Mello lab shortly before and after the 1998 publication [of the discovery in *Nature*]. The discovery of RNAi in *C. elegans* gave me hope that there was indeed a big world of unknown and unappreciated gene regulatory circuits. I was very optimistic about the significance of the discovery, perhaps more than many other people were at that time. In my memory, though, this appreciation of the discovery is not particularly connected to the 1998 *Nature* publication. I was not thinking in terms of Nobel recognition at that time, just was excited about science.

I joined Craig's lab because I wanted to study RNAi, and I feel very lucky to have participated in the early RNAi research when little was known and everything was open to our imagination. I had a lot of fun designing experiments and asking all kinds of questions. One of Craig's favorite expressions was: 'There is no reason not to do an experiment.' Craig has this passion and intensity about science that makes the experience working in his lab very unique.

After RNAi became a tool everybody was using and showed promise for drug development, it became generally accepted that the RNAi discovery would be recognized by a Nobel Prize. The only question was when it would happen. I was thrilled when I heard the news, just thrilled.

I think that the results of my work on RNAi in Craig's lab and his support already helped me in getting to MIT for postdoctoral training and in getting a job offer from Columbia. I hope that Craig's win will be very positive for me as well."

faced with today's climate ten years ago, he and Andy Fire would likely have encountered difficulty in securing funding for the work that ultimately led to their discovery of RNAi.

"This isn't science for the sake of science, but science for the sake of medical advances and lives to be saved," he stressed. Using RNAi as an efficient and accurate laboratory tool, individual investigators are poised to unlock additional mysteries of the underlying mechanisms of genetic function. "We've sequenced the human genome and are linking genes to diseases left and right. How can we possibly tell our community that we're not going to fully support our scientists now?"

Mello feels strongly that society functions because everyone has a role, whether as laborers—like his grandparents—legislators or scientists. It is clear, through taxpayer-funded federal research programs, that society values science and expects researchers to make discoveries that in turn benefit mankind. "I think it's great that Worcester is feeling pride about the Nobel Prize. We need to bring our communities into the discovery process—without the community supporting us, we couldn't do this work."

Mello's advocacy in support of research funding represents one of many new jobs he has gained in the wake of the Nobel announcement. He has also suddenly become a public speaker, reviewer, consultant and nominator (as a Laureate, he may nominate others for the Nobel Prize) sought by hundreds of individuals and organizations since October. There's only so much one person can do, but Mello—also a researcher, teacher and mentor—has caught his breath and is dedicated to doing as much as he can at this important moment in his career and UMass Medical School's history. He seems to draw energy from his family and from working in the lab and is excited about his current research examining other aspects of the RNAi mechanism and how they connect to gene expression and developmental regulation. The fun part of his regular job, he says, is talking to his students about ideas. "It's the students who aren't afraid to take on risky projects. The riskier projects are often the ones that pay off the biggest. If you stick with it and it works out, you learn a lot."

Mello is thrilled that his Nobel Prize has cast a considerable glow over his lab, the University of Massachusetts and the Medical School, and that the institution as a whole, and his students and post-docs in particular, stand to benefit from the recognition the prize has brought. The glow that appeared in early October and intensified during the dream-come-true experience in Stockholm shows no sign of fading any time soon. Only one thing could possibly make that glow even brighter for Mello: "It would be my biggest thrill of all to see another Nobel Prize go to a UMass colleague or student and to be invited to that party! As an institution, if we keep doing what we're doing, I believe it will happen."

Christian Rocheleau, PhD, Canadian Research Chair in Signaling and Development and Assistant Professor of Medicine at McGill University Royal Victoria Hospital, Montreal, Canada. Dr. Rocheleau was a student in Craig Mello's lab from January 1995 through May 2000

"In Craig's lab I was studying embryonic development, using forward genetics and RNAi to determine how early embryonic cells become different from each other. As Craig's first graduate student, I was there from the beginning of the RNAi project. In fact, my first paper in 1997 was the first to use the term RNAi. It was a very exciting time to be in the lab as the RNAi mystery was slowly unraveling. Craig was often working at the bench alongside us. I recall him coming in and going straight to his microscope to check on an experiment without taking off his winter coat. His enthusiasm for science is very contagious and rubbed off on everyone in the lab.

In the early years of using RNAi, we did not know the nature of the RNA trigger. Andy Fire's and Craig's finding that double-stranded RNA was the trigger really expanded the capabilities of RNAi in the worm community and opened the door for its application in other organisms. We knew that RNAi was an amazing phenomenon, but at the time we didn't know whether this was a weird worm-specific phenomenon or if RNAi might work in higher organisms. I was very much aware of the huge potential of RNAi if it could be adapted to other organisms; however, I wasn't thinking about the Nobel Prize at that time.

[When I heard about the Nobel win] I was very excited for Craig. My mother and my mother-in-law called me the morning of the announcement to tell me they saw Craig in the morning news. I actually felt very confident that Craig and Andy would win the prize this year. However, when I talked to Craig on the phone a week before the announcement, I did not dare bring it up for fear I would jinx him.

UMMS has been growing dramatically in the last decade and earning a strong reputation for outstanding science. This Nobel Prize further proves that UMMS is a top-notch biomedical research institution and will bring more recognition to the school, which can potentially help UMMS graduates on the job market. After completing my PhD in Craig's lab, I joined Dr. Meera Sundaram's lab at the University of Pennsylvania to study the regulation of Ras signaling in *C. elegans*. Now, in my own lab at McGill University, we are studying how different cellular processes (including an endogenous RNAi pathway) regulate Ras signaling during *C. elegans* development. I am not yet sure how this Nobel Prize will impact my own career. Perhaps it is too early to tell."

– Compiled by Andrea L. Badrigian

A Big Idea

Associate Professor Andrew Fischer, MD, develops a faster, less invasive and more accurate diagnostic technology for patients' peace of mind.

By Kelly A. Bishop





Early in his career as a cytopathologist—a laboratory physician who studies and diagnoses disease at the cellular level—Associate Professor of Pathology and Cell Biology Andrew H. Fischer, MD, had a rare opportunity to observe a patient encounter. As a member of a select group of the nation's clinics, he participated in the critical procedure that yields the telltale tissue necessary to discover disease.

"I was humbled by the very human side of our work," recalled Dr. Fischer. "We saw the patients' fear as they faced the needles required to collect a biopsy and then their anxiety as they waited for more than a day for their results. It was so clear that this was a precious sample, and that it was essential that we not waste any of it."

More than just inform his approach as a physician, these crucial insights would prove to inspire the course of his research and fundamentally advance the field of pathology. For, even as the understanding and treatment of diseases such as cancer have vastly improved over the last century, the tools used by cytopathologists have lagged, creating a tremendous need for far more advanced and patient-friendly diagnostic technology. According to Fischer, "The tools that we use now would be very familiar to the pathologists at the beginning of the last century. Even the dyes that we use are the same. The field is especially ripe for a whole generation of new ideas and techniques."

For Fischer, who is also director of cytopathology for the Medical School's clinical partner, UMass Memorial Health Care, this dearth of advanced technologies was particularly frustrating given the precision required when examining such minute samples of tissue. Specifically, there are two methods for collecting cells for diagnosing and studying disease: exfoliative cytology, where cells are extracted from fluid shed into the body cavities (the most commonly known cytology test—the PAP smear—employs this method), and fine needle aspiration (FNA) cytology, where a smaller needle than is used for drawing blood can be safely inserted into almost any body site. It was the processing of tissue collected from FNA that most intrigued Fischer, particularly because the refinement of the technology could have a direct impact on the patient experience. The alternative to FNA is a much larger "core biopsy."

"We are using needles closer to the diameter of a pencil for core biopsies when we could be using acupuncture-like needles for FNA," he said. "If we can optimize our processing methods, we can ultimately greatly reduce the size of biopsy needles to greatly lessen the risks of performing a biopsy and alleviate a patient's pain and anxiety."

The method by which cells are processed after FNA requires the transfer of the tissue into a paraffin cell block that can then be sliced into thin sections readable through microscopy. To date,

The strip of images at left illustrate in sequence a UMMS Pathology lab histologist performing the tricky process of cutting thin slices (to only about 1/50 as thick as a human hair) of a microbiopsy sample that had been embedded in paraffin using the new technology developed at UMMS by Andrew Fischer, MD. In the right-most image, the histologist is mounting the slices on a glass microscope slide for examination.

that process has largely been managed by technicians who must manually hold the samples at various times in the process. For example, a technician transfers the sample by hand via forceps from the original collection medium to a processing cassette, where all of the water in the sample is removed and eventually replaced with paraffin. The samples are then manually transferred again from the processing cassette to the wax mold. Such handling inevitably results in the loss of cell fragments, potential for contamination with another patient's cell sample, opportunity for mislabeling and the uneven distribution of cells in the paraffin.

"Typically, when FNA is used, we would end up with just a few cells in a paraffin section. The impression is that we don't get enough tissue, but the fact is we get lots of tissue, it's just not recovered well. And that is the fundamental problem," Fischer explained.

Motivated by this challenge, Fischer determined he would develop a better processing machine. A casual tinkerer by nature, he set about it in the confines of his workshop nestled in an eighteenth-century barn on his Stow, Massachusetts property. He was energized by the notion that all of the cells could be efficiently delivered to a single plane in the wax if they were pulled together down to a filter. To that end, he first redesigned the vitally important cassette that holds the filter, tissue fragments and wax. The cassette, produced for Fischer by Sterling Manufacturing, a local plastics company, allowed for the delivery of the tissue and processing materials via disposable pipettes.

A trip to France to visit his in-laws brought Fischer closer to a viable prototype. While he and his wife made frequent trips to her native country, on this particular visit Fischer had work, as well as leisure, on his mind as he engaged his father-in-law's assistance in the important next step of his project. A sculptor by trade, Fischer's father-in-law, Georges Delahaie, guided him through the effort to construct a sturdy support in which to hold the cassette. Although he specialized in monumental works on

"The tools that we use now would be very familiar to the pathologists at the beginning of the last century. The field is especially ripe for a whole generation of new ideas and techniques. "

– Andrew Fischer, MD

a far greater scale than that of Fischer's machine, Georges' expertise in metals proved invaluable as the pair welded the initial support together by hand.

Similarly, his mother-in-law, Claudine, would make a vital, if involuntary, contribution. When rummaging through French hardware shops failed to produce a suitable material for the filter support—an essential part for transferring heat to the wax—Claudine made an important sacrifice: her coffee filter. "It was perfect, small with the right pore size," Fischer laughingly recalled, adding, "I don't think she was very happy."

After construction of the physical support and cassette, a spacer ring, clamp and heat source were added to finish the initial machine. With the spacer ring and cassette clamped into place and airtight, heat could then be added to melt the wax at the necessary stage. Fischer was able to add the cells directly to the filter and follow with all of the necessary processing steps without removing the cassette from the support. At the process's end, he was thrilled to find that all of the cells were in one plane and that there was ample material to be analyzed.

"I was amazed that things fell into place so quickly," Fischer said. "I was truly elated; I knew that I had made a real breakthrough."

With these promising results, Fischer approached UMass Medical School's Office of Technology Management (OTM) in 2002 for assistance in the pursuit of a patent. OTM staff were charged with evaluating Fischer's invention for its technical and commercial merit, particularly its clinical application.

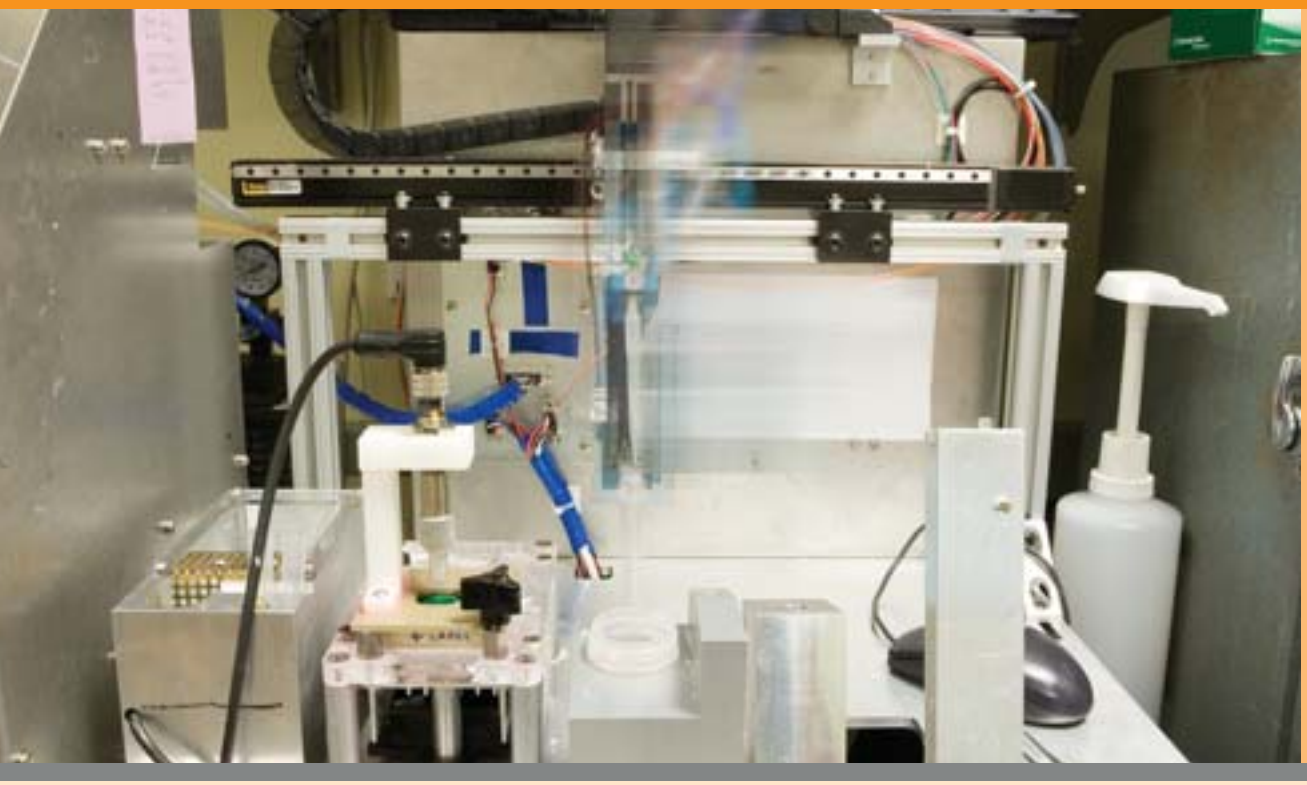
"My colleagues quickly realized that Andy's excitement was warranted. It was clearly evident that there was a real market for this type of advancement in the pathology field," said Licensing Associate Gary Sclar, Esq., who joined OTM in 2004.

As detailed in the Provisional Patent Application, the advantages to Fischer's system are numerous. First, it allows for full recovery of the sample. Because the cells are deposited via pipette directly in the collectable plane, the sample contains a much higher yield. Second, with the use of disposable pipettes and single-use reagents, the chance for cross contamination and mislabeling was eliminated. Third, the processing is much more rapid. Whereas previous techniques required overnight for processing and extractions, Fischer's technology brings completion in about 12 minutes!

Also recognizing the potential of Fischer's invention was the University of Massachusetts Office of Commercial Ventures and Intellectual Property (CVIP), which awarded him a $10,000 grant. Established in 2004, the CVIP Technology Development Fund assists the University's five campuses with the commercial development of important technologies through supplemental funding to researchers. "The grant was immensely valuable," said Fischer. "It allowed us to more fully demonstrate that the technology was feasible by

At Left: Pathology lab colleagues Mary Patricia Scott, Linda Moakley, Fischer and Donna Eaton each hold a component of Fischer's evolving invention. Fischer displays the original five cent hardware store washer and a filter flask that allowed him to demonstrate in 2002 that his proposed technique was feasible. Moakley, a cytopreparatory technologist, holds the device Fischer made using a coffee filter. Cytology Supervisor Scott grips the machined cassette support, funded by the Pathology Department in 2004. Cytopreparatory Technologist Eaton shows the semi-automated device built with UMMS Office of Technology Management funding that has been used in the lab since January 2005, until Cytyc brought in its device (in action on page 22).

To create his new and improved technology, Fischer looked to a key colleague outside of the lab—his father-in-law, French sculptor Georges Delahaie. Here the two work in Fischer's barn, much like they did on their way to creating what would be marketed as Cytyc's Cellient™ Automated Cell Block System. "I was amazed that things fell into place so quickly," said Fischer.



Cytyc's "Alpha prototype" whirs into action. In the forefront, from left to right, is the heated paraffin reservoir, an inverted L-shaped fluid level monitor seated over the green cassette, a white vial containing a sample that is made into the cell block, and the moving robotic arm that adds the sample and reagents to the cassette. Cytyc continues refinements to the prototype and hopes to offer the first units for sale in the fall of 2007.

allowing us to build a more sophisticated prototype."

When a patent was issued for Fischer's fully developed prototype in July 2005, OTM was ready to actively pursue commercialization and complete a license agreement with the right company. OTM chose Cytyc Corporation of Marlboro, Massachusetts, a leading provider of medical technology worldwide. Cytyc specializes in diagnostic and minimally invasive surgical products targeting cancer and women's health. With its record of success—Cytyc's ThinPrep PAP Test is the most widely used method for cervical cancer screening in the United States—OTM was confident in the company's estimation that the potential market for Fischer's technology was significant, clearly able to fill a gap in the marketplace.

"We were aware that cell blocks enhance the quality of the diagnosis that a pathologist can provide to clinicians, and our research indicated that cell blocks were being under utilized, since current sample preparation methods were inconvenient and time consuming," said Tony Kingsley, president of Cytyc Diagnostic Products. "Dr. Fischer's invention was an elegant method for the preparation of cell blocks that resulted in consistent, high-quality preparations."

In November 2006—an amazingly short timeframe for an invention—Cytyc unveiled the Cellient™ Automated Cell Block System to overwhelmingly positive feedback at the 54th Annual Scientific Meeting of the American Society of Cytopathology. With refinements and adjustments continuing, the company hopes to offer the first units for sale in the fall of 2007.

In addition, as a further testament to the viability and utility of the cell block system, Fischer and colleagues, including primary author and Cytopathology Fellow Smiljana Istvanic, MD, recently published a paper in *Diagnostic Cytopathology* that demonstrates Fischer's cell block technique enables smaller-sized fine-needle aspiration biopsies that can often provide as much information as the larger, more painful and expensive core biopsies for evaluating breast diseases. In "Cell Blocks of Breast FNAs Frequently Allow Diagnosis of Invasion or Histological Classification of Proliferative Changes," the investigators found that Fischer's cell block technique can overcome two major limitations of breast FNA when compared to the higher risk core needle biopsies; namely, their inability to determine whether a cancer is invasive and to classify those lesions that have proliferated.

With the realization of his technology nearly complete, the introduction of the system to the marketplace less than one year away, and publications clearly demonstrating scientific validity, Fischer is continually surprised and thrilled by his achievement. He most looks forward to the application of his technology for the benefit of the individual patient facing a too often frightening exam and prognosis. "The current system is set up to use core biopsies right away," he said. "I'd like to see practice change so that we start with the least invasive method possible, and only when that doesn't work, do we proceed to the next level."

Dr. Fischer's big idea surely guarantees it.

At the Helm

The Department of Psychiatry welcomes Douglas Ziedonis, MD, MPH, a man of many interests and one focus—understanding the alarming connection between mental illness and addiction.

By Sandra L. Gray

New Chair of Psychiatry

Douglas M. Ziedonis, MD, MPH, is first and foremost a people person, a worthy trait for a psychiatrist. Dr. Ziedonis also loves sharing knowledge with others, a fine attribute for an educator. And like any research scientist, he relishes exploring ideas and collaborating with others in the pursuit of knowledge. Accolades from patients and colleagues are tributes to his gifts as a clinician. His natural ability to inspire others is the hallmark of a strong leader. And, his track record as a tireless advocate for providing psychiatric care for society's most vulnerable populations secure him the title of public servant. Reflecting on the career evolution that led him here, Ziedonis said, "My work and interests all became unified through psychiatry."

Previously, he directed the Co-occurring Disorders Clinical and Research Program at Yale University, where he received a five-year Scientist Career Development Award from the National Institute of Drug Abuse and earned a master's degree in public health.

The son of Latvian immigrants growing up in Bethlehem, Pennsylvania—his father a minister, college professor and community activist who made the kitchen table neighborhood-central for lively intellectual discourse—Ziedonis could have pursued many paths, but his interest in medicine was sparked early by his next door neighbor, a "Marcus Welby-type of family physician." While still a medical student, Ziedonis experienced a fork-in-the-road moment that led him into psychiatry: "I didn't get a summer job in a local hospital; however, I did get a National Institutes of Health neuroscience research grant that became a summer job and an inspiration for an academic career. As a psychiatrist, I saw the opportunity to pursue my interests in research, teaching and connecting with patients and families—perhaps even more than I might have as a family doctor, because I could talk with them for a whole 50 minutes!" In his final year of medical school, Ziedonis had the opportunity to work with pre-eminent addiction scholar Griffith Edwards, MD, at the University of London's National Addiction Center. "Doing everything from laboratory research to making community visits with social workers gave me a positive attitude and realistic perspective about working with substance abusers and their families," he said. "It also became a goal to increase training in substance abuse for psychiatrists and primary care physicians alike."

"With the extensive infrastructure for both primary care and psychiatry already established by UMMS and its clinical partners, the timing is right for our department to become a national and international leader in primary care psychiatry."

– Douglas Ziedonis, MD, MPH

An expert in addiction psychiatry and treatment for patients with co-occurring mental illnesses and addictions, particularly to tobacco, Ziedonis succeeds Paul S. Appelbaum, MD, who, after 20 years as a faculty member and chair, returned to New York City for a position at Columbia University. Ziedonis comes to UMMS from the University of Medicine and Dentistry of New Jersey—Robert Wood Johnson Medical School, where he was a professor of psychiatry and director of the Division of Addiction Psychiatry.

After earning his MD in 1985 from the Pennsylvania State University School of Medicine, Ziedonis completed his psychiatry residency at the UCLA Neuropsychiatric Institute and then undertook a fellowship there in addiction psychiatry. "Early on, I was curious to understand why more than three out of four individuals with schizophrenia were tobacco smokers and how tobacco use affected their health and psychiatric illness," he said. "We now know that about 44 percent of all the tobacco consumed in the United States is by individuals with psychiatric disorders, and this is a primary reason for the increased morbidity and mortality found in this population." As the young psychiatrist received more and more referrals for patients with co-occurring mental illness and addiction and conducted related research, he earned recognition as an expert in treating the dually diagnosed.

Frustrated that mental illness and substance abuse were traditionally treated separately, Ziedonis developed a clinical therapy approach called dual recovery therapy (DRT). DRT blends traditional mental health and addiction psychosocial treatments for individuals with dual diagnoses. His research in this and related areas, supported by the National Institute of Drug Abuse, Center for Substance Abuse Treatment, Robert Wood Johnson Foundation and other organizations, has proven the efficacy of integrated treatment approaches for these patients.

With mental illness under-diagnosed and under-treated for millions of Americans and psychiatric patients often not receiving adequate medical care, Ziedonis is passionate about addressing these clinical issues through better integration of psychiatry and primary care. "Psychiatrists, internists, family medicine doctors and pediatricians need to work side by side because most patients with psychiatric disorders first present in the primary care setting," he noted. "With the extensive infrastructure for both primary care and psychiatry already established by UMMS and its clinical partners in both rural and urban settings, the timing is right for our department to become a national and international leader in primary care psychiatry." He also hopes these partnerships will increase access to medical services for individuals with psychiatric disorders.

Ziedonis also sees opportunities to bridge questions from substance abuse clinical practice with basic scientific research underway at the Brudnick Neuropsychiatric Research Institute, the Center for Comparative Neuroimaging (CCNI) and the Shriver Center. "There are many interesting clinical observations that might be better understood through translational research between these programs. For example, clues about the impact on the brain to young adults who are now smoking marijuana or cigarettes dipped in embalming fluid [an alarming trend in substance abuse] might be learned from CCNI studies, as well as clinical patient interviews."

Ziedonis will continue the commitment of the Department of Psychiatry to the public sector, including the mental health and addiction treatment services provided by the UMMS partnerships with other state health care agencies, particularly the Department of Mental Health. "An important goal is to enhance the way clinicians, researchers, consumers, families, and others work together to promote wellness and recovery. The essence of community and academic medicine partnerships is getting evidence-based practice into use and listening to the ideas and needs of clinicians and consumers," he said.

Ziedonis is an outdoor enthusiast and a classically trained pianist—as his psychiatry career has left less time to practice the piano, his musical interests have turned to world music, employing non-traditional instruments including the Latvian kokle, Native American Flute and African djembe, balafon and mbira. "These are fun instruments to learn and inspire me to be improvisational, a great way to express myself." In 2004, Ziedonis released "The Journey," a CD compilation of instrumental compositions arranged with these instruments. Nurturing spirituality—his own as well as others'—is also important; he has taught the courses Faith and Addiction and Spirituality and Health at the Princeton Theological Seminary.

Above and beyond the great compatibility between his sensibilities and expertise and the Department of Psychiatry's philosophy and infrastructure, Ziedonis is here to work with the people who make UMMS a unique place to learn and grow. "I was attracted by the collaborative, creative culture and the opportunity to work with great colleagues."

Douglas Ziedonis is a man of the mind and of the world. His office overlooking Lake Quinsigamond and Central Massachusetts' rolling hills is accented with symbols of Africa and Latvia, reflecting his interests in music and art. On a far wall hangs a painting by Latvian artist Janis Gailis (see page 23), who shares a homeland with Ziedonis' parents, immigrants to Bethlehem, Pennsylvania.

Vitae: Nota Bene

Timeline 2006—News Briefs from UMMS and UMass Memorial Health Care

January

Health care disparity is the topic of a presentation by civil rights pioneer Alvin F. Poussaint, MD, professor of psychiatry and faculty associate dean for student affairs at Harvard Medical School, during UMass Medical School's Annual Tribute to the Rev. Martin Luther King Jr. Dr. Poussaint explains that disparity is not a simple issue of discrimination, but rather an outgrowth of policy, funding and, on its most basic level, past segregation. Against a backdrop of images—including a photo of a youthful Dr. King that Poussaint himself took on the Selma to Montgomery March of 1965—he says that "despite the inroads made, we still have far to go to provide culturally competent health care for all Americans; there still are fewer minority physicians and medical school faculty across the U.S."

February

UMass Memorial Medical Center—University Campus enhances the delivery of emergency health care in Central New England with the opening of the Lakeside Wing. The 264,000-square-foot facility includes the Duddie Massad Emergency and Trauma Center, Central Massachusetts' only Level 1 Trauma Center for both adult and pediatric care, and LifeFlight, the region's only air ambulance. The Lakeside Wing was envisioned as an aggressive response to the exponential growth in the demand for emergency services in recent years; UMass Memorial sees more than 75,000 emergency visits per year, until now in a space built in 1970 to accommodate up to 2,000 patients a year.

March

UMass Medical School welcomes nearly 150 young women from Worcester's middle schools to the 10th Annual Women in Science Conference. Sponsored by UMMS, the EcoTarium and Girls, Inc., the conference introduces young women to careers in science-related fields, including health care, engineering and criminology, through a series of presentations by successful area women who apply science in their careers. Assistant Professor of Medicine and Family Medicine & Community Health Matilde Castiel, MD, delivers the keynote address, "Desire is the Recipe for Success."

April

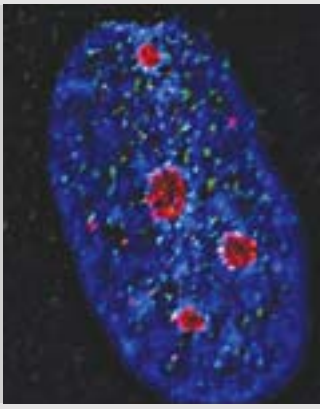
The Association of University Professors of Neurology bestows upon UMass Medical School's Department of Neurology the Successful Recruitment Award. The honor recognizes the department's ability to attract a percentage of students from the UMMS Class of 2006 to pursue the rapidly changing field of neurology as a specialty. In 2006, the UMMS Department of Neurology had the highest percentage of recruits of any medical school in the country.

May

Students, faculty and staff at UMMS celebrate the more than 60 nations that represent the institution's diverse population during the first International Festival. The event features cultural music and dance performances by students and employees as well as a marketplace abundant with international goods, such as instruments, jewelry, stationery and baskets. The successful festival will be held annually in May on the Worcester campus.

June

Recognizing the efforts put forth by a team of researchers at UMMS, the National Cancer Institute (NCI) renews a $6 million project grant for the program *Nuclear Structure and Gene Expression*. Originally funded in 2001, the project is led by Principal Investigator and Chair of Cell Biology Gary S. Stein, PhD, the Gerald L. Haidak, MD, and Zelda S. Haidak Professor of Cell Biology, with a multidisciplinary team of basic scientists and clinical investigators who will attempt to understand the dramatic reorganization of genes and regulatory proteins during the onset and progression of cancer.



July

UMass Memorial Medical Center—Memorial Campus and neighbors rejoice in the positive happenings occurring within their community as they celebrate National Night Out. More than 650 employees and residents unite for this crime and drug prevention event aimed at increasing awareness and building support for anti-crime programs in Worcester's Belmont Street community.

August

Local farmers on the Worcester campus quad become a familiar sight as UMMS and UMass Memorial Medical Center welcome a farmers' market featuring plants, fresh vegetables, fruits, herbs and home-baked breads and desserts. The weekly market serves as part of the *StepAhead* program, a four-year, randomized, controlled research project funded by the National Institutes of Health. The study focuses on hospital workers and promoting changes that support healthy eating and physical activity at work.

Vitae: Nota Bene

September

The Eighth Annual Walk to Cure Cancer proves once more to be an astounding success for support of cancer research programs at UMMS. More than 10,000 walkers, the largest in the Walk's history, participate in the five-mile walk around Lake Quinsigamond, which raised nearly $700,000 in cash donations and several hundred thousand dollars more in other forms. The Massachusetts AFL-CIO partners with Blue Cross Blue Shield of Massachusetts to sponsor the 2006 event.

October

UMass Memorial Medical Center joins forces with Common Pathways to award more than $200,000 in grants to programs aimed at community youth and young adults. Six agencies—Family Health Center of Worcester, Inc., Great Brook Valley Health Center, Health Awareness of Central Massachusetts HOPE Coalition, Lutheran Community Services and Multicultural Wellness Center (photo)—receive awards for projects directed at disease prevention, primary and preventative health services or related factors contributing to health disparities. The awards are for year one of a five-year funding cycle, which will total more than $1 million.

November

Maintaining its reputation as one of the top institutions in primary care medical education, UMMS celebrates the official opening of the UMMS Simulation Center. The center supports the use of simulation technology in training tomorrow's clinicians by recreating the clinical environment and exposing medical and nursing students and UMass Memorial Health Care residents to numerous medical scenarios. Three simulation mannequins are housed in the center, including a cardio-pulmonary simulator, which trains students how to diagnose and assess more than 30 cardiopulmonary conditions, and adult and pediatric mannequins that replicate numerous diseases and can be programmed to respond like real patients.

December

UMass Memorial Medical Center and the Lahey Clinic in Burlington, Mass. establish a collaborative program in liver, kidney and pancreas transplantation. The joint effort builds upon the strengths of both organizations to create a leading transplant program in Central Massachusetts. UMass Memorial patients with liver disease benefit from the Lahey Clinic's living donor liver transplant services, while Lahey Clinic patients have access to UMass Memorial's pancreas transplantation program. UMass Memorial and the Lahey Clinic continue to operate as separate transplant centers by providing care for their patients during all transplantation stages, including post-transplant care.

2006 Facts & Figures for UMMS

FY '06 Funding and Revenue

State appropriation	$40.8 million
State contracts*	$35.3 million
Public Service	$334.0 million
Research (sponsored activity)	$166.7 million
Sales and services**	$114.8 million
Other revenue	$47.3 million
Total	**$738.9 million**

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

***Examples include Continuing Education, Massachusetts Biologic Laboratories and New England Newborn Screening Program.*

Total Research Funding – Fiscal Year Ending:

June 30, 2002	$134,373,326
June 30, 2003	$151,288,571
June 30, 2004	$167,200,007
June 30, 2005	$174,181,453
June 30, 2006	$175,085,967

Education

Number of Faculty (including voluntary)	2,488
Basic science full- and part-time faculty	323
Clinical full- and part-time faculty	2,165
School of Medicine	
MD students	404
MD/PhD students	19
Alumni	2,742
Graduate School of Biomedical Sciences	
PhD students	320
MD/PhD students	18
Biomedical Engineering & Medical Physics students *(joint program with WPI)*	7
Clinical & Population Health Research students	9
Alumni	303
Graduate School of Nursing	
MS students	49
Graduate Entry Pathway students	119
Post-master's students	1
PhD students	26
Alumni	641
Continuing Medical Education Certificates	31,200
Allied Health Program students	1,484

Technology Management

For Fiscal Year:	2002	2003	2004	2005	2006
Invention Disclosures	48	139	112	66	74
U.S. Patent Applications	44	92	151	93	66
Licensing Agreements	17	32	9	28	32
Sponsored Research Agreements	$442	$3,760	$3,019	$993	$1,238
Licensing Revenue	$14,516	$19,161	$26,212	$27,694	$25,545

($ in thousands)

Teaching Affiliates

UMass Memorial Health Care, Teaching Partner
- UMass Memorial Medical Center (Hahnemann, Memorial and University campuses)

Member Hospitals
- UMass Memorial—Clinton Hospital
- UMass Memorial—HealthAlliance Hospitals (Fitchburg and Leominster campuses)
- UMass Memorial—Marlborough Hospital
- UMass Memorial—Wing Memorial Hospital and Medical Centers

Member Health Centers
- Barre Family Health Center
- Community Healthlink
- Hahnemann Family Health Center
- South County Pediatrics
- Tri-River Family Health Center

Major Teaching Hospital Affiliates
- Berkshire Medical Center
- Caritas St. Elizabeth's Medical Center
- Milford Regional Medical Center
- Saint Vincent Hospital

Other Teaching Hospital Affiliates
- Day Kimball Hospital
- Harrington Memorial Hospital
- Heywood Hospital
- Holyoke Hospital
- Hubbard Regional Hospital
- Noble Hospital
- Westborough State Hospital
- Worcester State Hospital

Other Educational Affiliates
- Community Health Connections Family Health Center
  - Greater Gardner Community Health Center
  - Family Health Center (Fitchburg)
- Fallon Clinic
- Family Health Center of Worcester
- Great Brook Valley Health Center
- Greater Lawrence Family Health Center
- Holyoke Health Center
- Lahey Clinic
- Metrowest Medical Center

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Vitae: The Last Word

By H. Maurice Goodman, PhD

recently retired founding Chair of the Department of Physiology at UMass Medical School

It was just about 37 years ago, when I was being recruited, that Dean Lamar Soutter drove me from his office in the partially renovated Shaw Building to Plantation Street to view the site of the Medical School. We parked where the top deck of the parking garage is now. The view of Lake Quinsigamond was unobstructed, and where the Medical School now stands, there was only a huge hole in the hillside. As we stood in that cold February wind, Dr. Soutter described what the school would look like and where the hospital would be. His enthusiasm was mesmerizing, and I, too, visualized the building rising out of the ground.

Dr. Soutter's goal of providing the opportunity of a medical education for children of working-class parents, who themselves might not have had the chance to go to college, was indeed compelling. The added appeal of a new enterprise unfettered by restraints of "that's the way it has always been done" was irresistible. I was hooked. My charge from Dr. Soutter "to build a Department of Physiology that would be second to none in New England" was a bit ambitious perhaps, but attainable and, ultimately, was attained.

After I moved my lab from Harvard to Worcester, reality set in. Only half of the temporary labs had been built in the cavernous ground floor of the Shaw Building, and there was no infrastructure to support either the teaching or research mission. Few colleagues were available to share the workload. The curriculum had to be developed, a faculty had to be recruited, and committees had to be staffed. In a single afternoon, I interviewed three candidates for the incoming class and one for the position of chief of medicine. At the same time, courses needed to be taught, research proposals needed to be written, and animal quarters, shops and other basic facilities had to be created to support already funded research.

Meanwhile our "friends" in the Boston medical community and their political allies were maneuvering to shut us down and divide our state budget allocation amongst themselves. Governor Sargent visited on a mission aimed at closing the Medical School. Local and statewide efforts were launched to block first the building and then the opening of the hospital. But we prevailed, and we emerged out of the uncertainty and threats to our survival with the almost unique culture of mutual respect, support and cooperation that still characterizes this faculty. We recognized that no department or group of investigators could succeed without support of colleagues who must also succeed.

The years have offered the privilege of serving this institution in many capacities in addition to more than 36 years as chairman of Physiology. I was rewarded by seeing my faculty attain international stature and having my earliest appointees continue to devote their careers to this department throughout my tenure. After spearheading the writing of governance and personnel policies in the mid-1970s, I was asked to fill in for a year while our provost was on leave. To counter mounting pressures to raise tuition to the levels of the private schools, we devised the plan for partial tuition deferral and debt forgiveness that became the Learning Contract, and in doing so kept Dr. Soutter's goal alive. With the departure of Chancellor and Dean Roger J. Bulger, MD, in 1978, I assumed that role for a year and dedicated myself to keeping the institution on course until the newly appointed president could find a replacement. My subsequent appointment as associate dean for scientific affairs provided the opportunity and resources to develop the infrastructure that brought this fledgling institution into the top third of all medical schools in federal research funding. In the 15 years of my tenure as associate dean, our annual research budget grew from less than $2 million to over $50 million. Policies and programs established then remain the underpinning of the even more spectacular growth of the past decade.

In less than four decades, our Medical School has become a national leader in primary care education, a partner in the leading health care provider in Central Massachusetts, the economic engine of Worcester and environs, an internationally acclaimed research institution, home of our first Nobel Laureate…and we have not yet heard the last word.

Vitae: the magazine of the University of Massachusetts Medical School, one of five campuses in the UMass system. The magazine is distributed three times a year to members, benefactors and friends of the UMMS community. Published by the Office of Public Affairs & Publications and paid for out of non-state funds.

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Page 27: June image courtesy of Young, D.W., Hassan, M.Q., Pratap, J., Galindo, M., Zaidi, S.K., Lee, S., Yang, X., Xie, R., Javed, A., Underwood, J., Furcinitti, P., Imbalzano, A.N., Penman, S., Nickerson, J.A., Montecino, M., Lian, J.B., Stein, J.L., van Wijnen, A.J., Stein, G.S. (2007) Mitotic occupancy and lineage-specific transcriptional control of rRNA genes by Runx2. *Nature*, 445(25):442-446.

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