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RNA Central

Vitae:

The Magazine of
The University of Massachusetts Medical School

Confronting a Crisis

Research Rewards

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 division that assists state agencies and health care organizations to enhance the value and quality of expenditures and improve access and delivery of care for at-risk and uninsured populations. www.umassmed.edu/commed

The Research Enterprise

UMass Medical School's world-class investigators, who make discoveries in basic science and clinical research and attract 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. www.umassmemorial.org

Vitae: Contents

With additional funding from the National Institutes of Health, Katherine Luzuriaga, MD (standing), and colleagues will have the means to translate the most promising scientific advances in HIV/AIDS to patients worldwide.

IMPAACT Funding Renewal Underscores AIDS Clinical Trials

Principal Investigator Katherine Ruiz de Luzuriaga, MD, a UMass Medical School professor of pediatrics and medicine, and colleagues recently received a funding renewal of nearly $1 million per year for seven years from "IMPAACT," the National Institutes of Health's reorganized International Maternal Pediatric Adolescent AIDS Clinical Trials. According to Dr. Luzuriaga, who has conducted vital research in this area since 1992, new and ongoing clinical trials will advance IMPAACT's mission to decrease HIV-related morbidity and mortality in pregnant women, children and adolescents.

"The Pediatric AIDS Clinical Trials Group and now IMPAACT are examples of NIH dollars well-spent," said Luzuriaga. "We have developed effective measures to prevent mother-to-child HIV transmission, and trials are focused on maintaining and improving long-term quality of life for HIV-positive women and children."

Dr. Luzuriaga and UMMS colleague John L. Sullivan, MD, professor of pediatrics, molecular medicine, molecular genetics & microbiology and pathology, earned international acclaim in the 1990s for breakthrough clinical trials that pioneered methods to diagnose, prevent and treat HIV infection in infants and children in ways that have dramatically altered the HIV/AIDS landscape. "It is the NIH that has by and large supported the research that has allowed us in just 15 years to make mother-to-child transmission extremely rare in the United States," Luzuriaga explained. "And for children who do become infected, HIV/AIDS is no longer a death sentence but rather a chronic infection that can be managed over many decades."

IMPAACT simultaneously addresses differences and commonalities in the HIV/AIDS epidemic in the developing, resource-poor world, as well as the United States and other developed countries. "The power of the NIH centers is that we can generate a protocol that can enroll kids from multiple centers to complete studies much more rapidly than a single site acting alone could. Our participation in the new IMPAACT network will allow us to translate the most promising scientific advances to patients around the world," said Luzuriaga.

Work by Richter and Witman Earn Extended NIH Awards

The National Institutes of Health grants its prestigious Method to Extend Research in Time (MERIT) Awards to investigators with excellent records of scientific productivity. MERIT awards provide continuous support and a grant extension to scientists, easing the administrative burdens of the grant renewal process.

Professor of Molecular Medicine Joel Richter, PhD (near left), has received a five-year renewal of his MERIT award for his research, *Translational Control in Early Mammalian Development,* which was originally funded by the NIH

Stephen Doxsey, PhD (above), and Grant McGimpsey, PhD, of Worcester Polytechnic Institute lead a new initiative that will leverage the strengths of each institution to address novel research questions through the application of math, engineering, physics, informatics, and basic and clinical science.

UMMS-WPI Collaborative Encourages Accelerated Translational Research

The National Institutes of Health (NIH) is challenging academic medical centers to accelerate the pace at which they integrate research findings into clinical practice. UMass Medical School and Worcester Polytechnic Institute (WPI) are committed to this challenge and are partnering to aggressively expand translational and clinical research with the objective to create an ideal environment to foster interdisciplinary research, while enhancing public health.

As part of this commitment, the University of Massachusetts and WPI are funding a new research initiative. The initiative seeks to establish partnerships between the two institutions that promote pioneering scientific discovery and develop highly innovative technologies, with a long-term view toward accelerating the translation of research from the bench to the bedside.

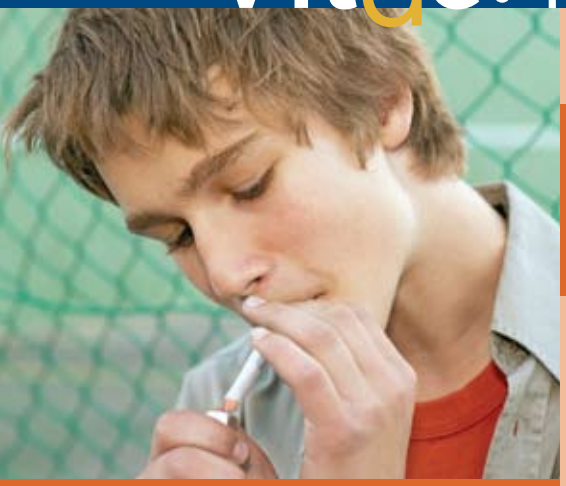
Collaborative teams, including one or more investigators from each institution, will leverage the combined strengths, expertise and facilities of each in order to address novel research questions. Projects that assemble teams of scientists from different disciplines, including but not limited to the life sciences, medicine, the physical sciences, engineering, mathematics, informatics and computer science, will receive the highest priority in terms of funding. Ultimately, the initiative will facilitate the submission of proposals for extramural funding that lead to long-term, sustainable collaborative research programs.

The initiative is coordinated by Grant McGimpsey, PhD, associate provost for Research and Graduate Studies, *ad interim,* at WPI, and Stephen Doxsey, PhD, UMMS professor of molecular medicine. "This initiative is exciting because it offers funding to establish liaisons between investigators at two world-recognized institutions with different strengths: WPI is a leader in applied research and UMass Medical School is focused on basic science discovery and clinical medicine," said Dr. Doxsey. "Together, innovative projects that merge these disciplines will spawn a new type of translational research."

Dr. McGimpsey added: "WPI recognizes the tremendous strength and depth of UMass Medical School's basic and clinical research programs. WPI's long tradition of applied research as well as our recent significant investments in the life sciences and bioengineering, particularly at Gateway Park, will complement those strengths and help push the development of translational research in both of our institutions."

in 1998. A scientist at the Worcester Foundation for Biomedical Research before becoming a UMass Medical School faculty member upon the institutions' 1997 merger, Dr. Richter has studied translational control for more than 20 years. Understanding these essential cellular mechanisms has important implications for early and ongoing development of numerous biological functions ranging from fertility to memory.

George B. Witman, PhD (far left), the *George F. Booth Chair in the Basic Sciences* and professor of cell biology, has received a new MERIT award for his research project, *Flagellar Motility and Assembly*. This project has been continuously funded by the NIH since 1974, and Dr. Witman is expected to receive nearly $3 million over the next five years for his studies focusing on tiny, hair-like structures that project from cells. Discoveries made by Witman and his collaborators show that flagella play important roles in diverse functions in cells and organs, and that defects can lead to a multitude of human disorders.



A UMass Medical School researcher's study found that 10 percent of youth who smoke cigarettes are addicted within two days of first inhaling, and 25 percent are addicted within a month.

UMMS Finds Inhaling From Just One Cigarette Can Lead to Addiction

More than four million American youth between the ages of 12 and 17 are smokers, according to a new study led by Joseph DiFranza, MD, a UMass Medical School professor of family medicine & community health, and published in the *Archives of Pediatric and Adolescent Medicine.* "Symptoms of Tobacco Dependence after Brief Intermittent Use," Dr. DiFranza's four-year study supported by the National Institute on Drug Abuse, looks at how easily youth can become addicted to nicotine.

The study monitored nearly 1,250 sixth-grade students in six Massachusetts communities over four years who were interviewed frequently about smoking and symptoms of addiction, such as difficulty quitting, strong urges to smoke, or nicotine withdrawal symptoms including cravings, restlessness, irritability and trouble concentrating. The study found that 10 percent of youth who smoke cigarettes are addicted within two days of first inhaling, and 25 percent are addicted within a month. The study also discovered that adolescents who smoke only a few cigarettes each month suffer withdrawal symptoms when deprived of nicotine.

"While smoking one cigarette will keep withdrawal symptoms away for less than an hour in long-time smokers, novice smokers find that one cigarette suppresses withdrawal for weeks at a time," explained Dr. DiFranza. "One dose of nicotine affects brain function long after the nicotine is gone from the body. The important lesson here is that youth have all the same symptoms of nicotine addiction as adults do, even though they may be smoking only a few cigarettes per month."

American Geriatrics Society Awards Interdisciplinary Grant to UMass Medical School

Jerry Gurwitz, MD (left), Sarah McGee, MD, MPH, and David Ayers, MD, will develop and implement a collaborative program to improve the quantity and quality of education in the geriatrics-related aspects of orthopedics.

To support joint efforts aimed at enhancing health care services for elderly patients at UMass Memorial Health Care (UMMHC), the American Geriatrics Society (AGS) has awarded a two-year Geriatrics Education for Specialty Residents grant to UMMHC partner UMass Medical School. David C. Ayers, MD, the *Arthur M. Pappas, MD, Chair in Orthopedics*, and his colleagues Jerry H. Gurwitz, MD, the *Dr. John Meyers Professor of Primary Care Medicine,* and Sarah McGee, MD, MPH, director of educational programs in the Division of Geriatric Medicine, are the grant's investigators. Part of the AGS Geriatrics-for-Specialists initiative, these grants support collaboration among geriatrics, surgical and related medical specialty faculty at medical schools and hospitals throughout the country. Since their inception in 2001, the grants have been funded by the John A. Hartford Foundation.

One of 25 recipients nationally, the team of Drs. Ayers, Gurwitz and McGee will develop and implement a collaborative program with the Department of Orthopedics and the Division of Geriatric Medicine to improve the amount and quality of education in the geriatrics-related aspects of orthopedics. The program will focus on enhancing residents' knowledge and skills in the principles of

Study Finds All Weight Loss Plans Not Equal

Over the past three decades, the obesity epidemic has been accompanied by a proliferation of weight-loss plans. A new study by researchers at UMass Medical School reveals that these plans vary significantly in their ability to positively affect heart health.

In "A Dietary Quality Comparison of Popular Weight-Loss Plans," published in the October issue of the *Journal of the American Dietetic Association,* several plans significantly outperformed others in their ability to reduce the risk of cardiovascular disease. Specifically, the investigators found that the Ornish, Weight Watchers High Carbohydrate and New Glucose Revolution plans scored highest when measured by the Alternate Healthy Eating Index (AHEI). Proven to be a strong predictor of cardiovascular disease, the AHEI is a measure that isolates dietary components that are most strongly linked to cardiovascular disease risk reduction, such as fruits and vegetables, higher whole grain composition and lower trans fats.

"Obviously, obesity is associated with an increased risk for cardiovascular disease," said Assistant Professor of Medicine Yunsheng Ma, PhD, MPH, one of the study's primary authors. "An optimal weight-loss plan should facilitate both weight loss and cardiovascular risk reduction."

Choosing weight-loss plans based on their status on *The New York Times* bestseller list during the past five years, Dr. Ma and colleagues evaluated the dietary quality of the New Glucose Revolution, Weight Watchers High Carbohydrate and Weight Watchers High Protein, Atkins 100- and 45-gram Carbohydrate, South Beach Phase 2 and Phase 3, The Zone, Ornish and the 2005 U.S. Department of Agriculture Food Guide Pyramid plans. (Weight Watchers and the 2005 Food Guide Pyramid plan were included because they are the largest commercial weight loss plan and the current government recommendation, respectively.)

"One of the unexpected findings is that the 2005 Food Guide Pyramid, the current government recommendation, fared significantly worse than the New Glucose Revolution, Weight Watchers High Carbohydrate and Ornish," said Ma. "The USDA diet guideline was originally devised to prevent nutrient deficiencies. It's clear that we need to modify or rebuild the pyramid to look into cardiovascular disease prevention, as it is the leading cause of death for Americans."

geriatric medicine as they relate to the care of older orthopedics patients. To accomplish these tasks, Ayers, Gurwitz and McGee will organize and implement multidisciplinary symposia, initiate resident conferences throughout the year and establish collaborative bedside rounds.

Other participants in the project include Zahra S. Sheikh, MD, assistant professor of medicine; Mary Ellen Keough, MPH, instructor in family medicine & community health; and Patricia Franklin, MD, MBA, MPH, associate professor of orthopedics & physical rehabilitation and family medicine & community health.

UMMS Awarded Contract for Landmark Children's Study

UMass Medical School has been awarded a contract by the National Institute of Child Health and Human Development to participate in the landmark National Children's Study (NCS), the largest study to be conducted in the United States to assess the effects of environmental and genetic factors on child and human health. The study will follow 100,000 children from before birth to age 21, seeking information to prevent and treat some of the nation's most pressing health problems, including autism, birth defects, diabetes, heart disease and obesity.

"This is a watershed moment for UMass Medical School as the Commonwealth's research institution," said Terence R. Flotte, MD, dean of the School of Medicine and executive deputy chancellor. "We have long held public health as our passion and our obligation, and we are proud to be chosen as one of a select few to make a contribution to the body of knowledge related to child health and development."

UMMS is one of 22 NCS study centers, and its contract represents more than $16 million for the first five-year phase, during which it will recruit and train staff and work with community leaders in preparation for study enrollment in 2009.

RNA Central

Two premier researchers join UMass Medical School—the global center for RNA-related exploration to unlock its critical role in genetic expression.

By Alison M. Duffy

Over the last decade or so, the chemical

ribonucleic acid, or RNA, has yielded some surprising new truths that have profoundly altered our understanding of molecular biology and function. RNA is now recognized as playing critical roles in some of the most important areas of genetic research underway; it is no longer considered simply a "messenger."

Found in both the nucleus and cytoplasm of cells, RNA's structure is similar to that of DNA. RNA comes in many forms and is involved in a variety of ways in the expression and repression of hereditary information. Its primary function is protein synthesis within a cell, and since proteins perform the majority of a cell's functions, the understanding of RNA and its many classes and purposes—messenger RNA, transfer RNA, ribosomal RNA, microRNAs—is vital work indeed.

The University of Massachusetts Medical School has positioned itself as the global center for RNA-related exploration by steadily building an impressive faculty of innovative and successful scientists who are contributing important insights to the body of biomedical knowledge. The recruitment of Victor R. Ambros, PhD, and Melissa J. Moore, PhD, is the institution's latest attempt to understand the importance of RNA.

Dr. Ambros, a National Academy of Sciences member whose discovery of microRNAs opened a dramatic new world of investigation into developmental biology, will arrive in January from Dartmouth Medical School. Dr. Moore, a Howard Hughes Medical Institute Investigator and self-described "project-oriented problem solver" and collaborator at heart, is an expert in pre-messenger RNA and messenger RNA metabolism, who moved her lab from Brandeis University in September.

"You know something will happen."

—Victor Ambros, PhD

Ambros is widely regarded as a central figure in RNA biology for his work in identifying microRNAs, the very short (20 to 24 nucleotide-long) single-stranded RNA molecules that are understood to play a critical role in gene regulation. microRNAs were originally discovered by Ambros and his lab in 1993 in the pathways controlling embryonic development in the nematode worm *C. elegans*, and at first seemed related only to a specific event in the worm's development, and nothing more. Some years later, however, colleagues at Massachusetts General Hospital, the Whitehead Institute and the Max Planck Institute found more microRNAs, and since then, Ambros and others have identified a wide variety of genes for diverse microRNAs in animals and plants, raising new questions about gene regulation and expression.

"It was hardly necessary to explain why I wanted to come. HHMI seems to recognize that UMass Medical School is on a very fast upward trajectory toward becoming one of the world's leading medical research institutions."

– Melissa Moore, PhD

"There's a real sense that in RNA biology, UMass Medical School has built a core of critically important expertise that's unique. When I heard Melissa Moore was coming, that was one of the clinchers for me. There's an exciting mix of people, especially young and newly recruited faculty."

– Victor Ambros, PhD

The discovery garnered the Newcomb Cleveland Prize in 2003 for the most significant paper published in the journal *Science*, an award given by the American Association for the Advancement of Science. In addition to naming researchers at Mass General, Whitehead and the Max Planck, the Newcomb Prize named both Ambros and Rosalind C. Lee, Ambros's lab manager and chief scientific partner for more than 20 years since the two worked together at Harvard. Ambros describes Lee, who is also his wife, as "the lead author on the two most important papers of my career," including the *Science* paper. They met as undergraduate students at MIT, where Ambros also received his graduate degree and completed postdoctoral work. They have three grown sons, ages 19, 22 and 26.

Interestingly, the genes Ambros and Lee have studied in *C. elegans*, called lin-4 and let-7, are identical in sequence to lin-4 and let-7 in the fruit fly, *Drosophila,* and nearly identical to those same genes in vertebrates like humans. "In worms, flies and vertebrates, we have the same regulator gene that was present in a common ancestor, still doing something important in each," said Ambros. "We want to understand what's common about how these regulators are employed, which will in turn tell us something about evolutionary flexibility."

Today, the Ambros lab is focused on understanding the genetic and molecular mechanisms that control cell division, differentiation and morphogenesis in animals, in particular how the timing of such developmental events is organized. In addition to Lee, Ambros will be accompanied by five post-doctoral fellows when he moves his lab. "I know my post-docs are going to be in a terrific environment where they can work with people who are the experts in almost anything they can imagine in RNA biology," said Ambros, whose lab will be located in Biotech Two, near a former student and fellow *C. elegans* researcher who remembers Ambros as a brilliant and thoughtful mentor: Nobel Laureate Craig C. Mello, PhD, who completed his PhD work in Ambros's lab at Harvard in the 1980s.

"Victor is inspirational to talk to," said Dr. Mello, Howard Hughes Medical Institute Investigator and the *Blais University Chair in Molecular Medicine.* "He asks great questions and pushes people to be critical thinkers. He's got the right attributes to make people excel, and he will build on our RNA strengths."

Though Mello initially contacted Ambros about joining UMMS, it was the school's roster of top researchers that sold him on the idea.

"There's a real sense that in RNA biology, UMass Medical School has built a core of critically important expertise that's unique," said Ambros, who can name UMMS scientists and details of their work like a baseball fanatic rattling off the batting averages of the World Series-winning Red Sox. "When I heard Melissa

Moore was coming, that was one of the clinchers for me. There's an exciting mix of people, especially young and newly recruited faculty, with vibrant labs who together create an atmosphere that's very attractive," said Ambros, who grew up in Vermont knowing he wanted to be a scientist, his interests cultivated by his farmer father, who Ambros describes as "brilliant" despite his own education being cut short in Poland by World War II. Ambros revels in an environment in which faculty work not to scoop each other but to set a lofty standard. "Why not try to do things as well as the top colleague in the field? If we're going to do biochemistry in *Drosophila,* for example, then let's see if we can do it as expertly as [UMMS Professor of Biochemistry & Molecular Pharmacology] Phil Zamore would."

"Victor Ambros represents the type of seasoned scientist who is excited about helping young faculty traverse the hurdles that one must navigate to do great science," said Michael P. Czech, PhD, professor and chair of molecular medicine. "He represents a terrific resource for our entire scientific enterprise, and of course, in the process, he continues his own brilliant acts of discovery."

"I run my mind up and down the hallways [at the Medical School] and see collaborations everywhere. It's exciting to anticipate the coming years," said Ambros, who likens the impending move to UMMS to being a young man eagerly starting college: "You don't know exactly what's going to happen, but you just know something will—and you can't wait to see what it is."

"Understanding all the parts at the molecular level." —Melissa Moore, PhD

Melissa Moore, like Victor Ambros, is enthusiastic when talking about her new colleagues at UMMS and the possible collaborations in RNA research.

"UMass Medical School already has a nucleus of incredible scientists who make it easy to recruit people like Victor and me," said Moore, 45, who was named a Howard Hughes Medical Institute (HHMI) Investigator in 1997. "We're both coming from very good environments, but in terms of the RNA research, we'll have a much more extensive community at the Medical School."

HHMI, which funds Moore's research in large part, gave her an enthusiastic thumbs-up about transferring her work to UMMS, where her lab is now located on the eighth floor of the Lazare Research Building. "It was hardly necessary to explain why I wanted to come," she said. "HHMI seems to recognize that UMass Medical School is on a very fast upward trajectory toward becoming one of the world's leading medical research institutions."

The Moore lab is interested in pre-mRNA splicing and its connections to intracellular mRNA localization, translation and degradation. "Splicing" is the process by which sequences called "introns" are removed from genetic transcripts so that the resultant strands can be used as blueprints to make proteins. Research currently underway in the lab includes monitoring individual pre-mRNA molecules via microscopy as they splice one at a time; investigating how cells rid themselves of old and dysfunctional RNAs; and studying the mechanisms by which neurons control protein expression at synapses using mRNAs that self-destruct once they've been used to make a protein. In addition to HHMI, Moore's research is currently funded by the National Institutes of Health.

"Melissa Moore is one of those scientists who asks big questions and takes risks," said C. Robert Matthews, PhD, the *Arthur F. and Helen P. Koskinas Professor* and chair of biochemistry & molecular pharmacology. "She has that special talent and perseverance that will no doubt lead to major scientific breakthroughs and medical advances."

HHMI Presence at UMMS Grows

Melissa Moore's arrival on campus brings to four the number of Howard Hughes Medical Institute Investigators at UMass Medical School. Moore, who was named an Investigator in 1997, joins esteemed colleagues Roger J. Davis, PhD, the *H. Arthur Smith Chair in Cancer Research* and professor of molecular medicine (named in 1990); Michael R. Green, MD, PhD, the *Lambi and Sarah Adams Chair in Genetic Research* and professor of molecular medicine and a member of the Program in Gene Function and Expression (1994); and Craig C. Mello, PhD, the *Blais University Chair in Molecular Medicine,* professor of molecular medicine and Nobel Laureate (2000).

Victor Ambros will be the Medical School's second member of the National Academy of Sciences, joining Craig Mello, who was elected in 2005. Ambros was elected in May 2007.

Moore's innate love of scientific exploration was fostered by early experiments she conducted as a child growing up in Virginia. "It's funny to think back on it and know that even as a kid, I had an interest in creating controls and comparing results." She holds her daughter, Anna.

Ambros, seen here during a break at this fall's UMass Medical School Research Retreat in Woods Hole, Massachusetts, is a native of Vermont who also always wanted to be a scientist. "I run my mind up and down the hallways [at UMass Medical School] and see collaborations everywhere. It's exciting to anticipate the coming years."

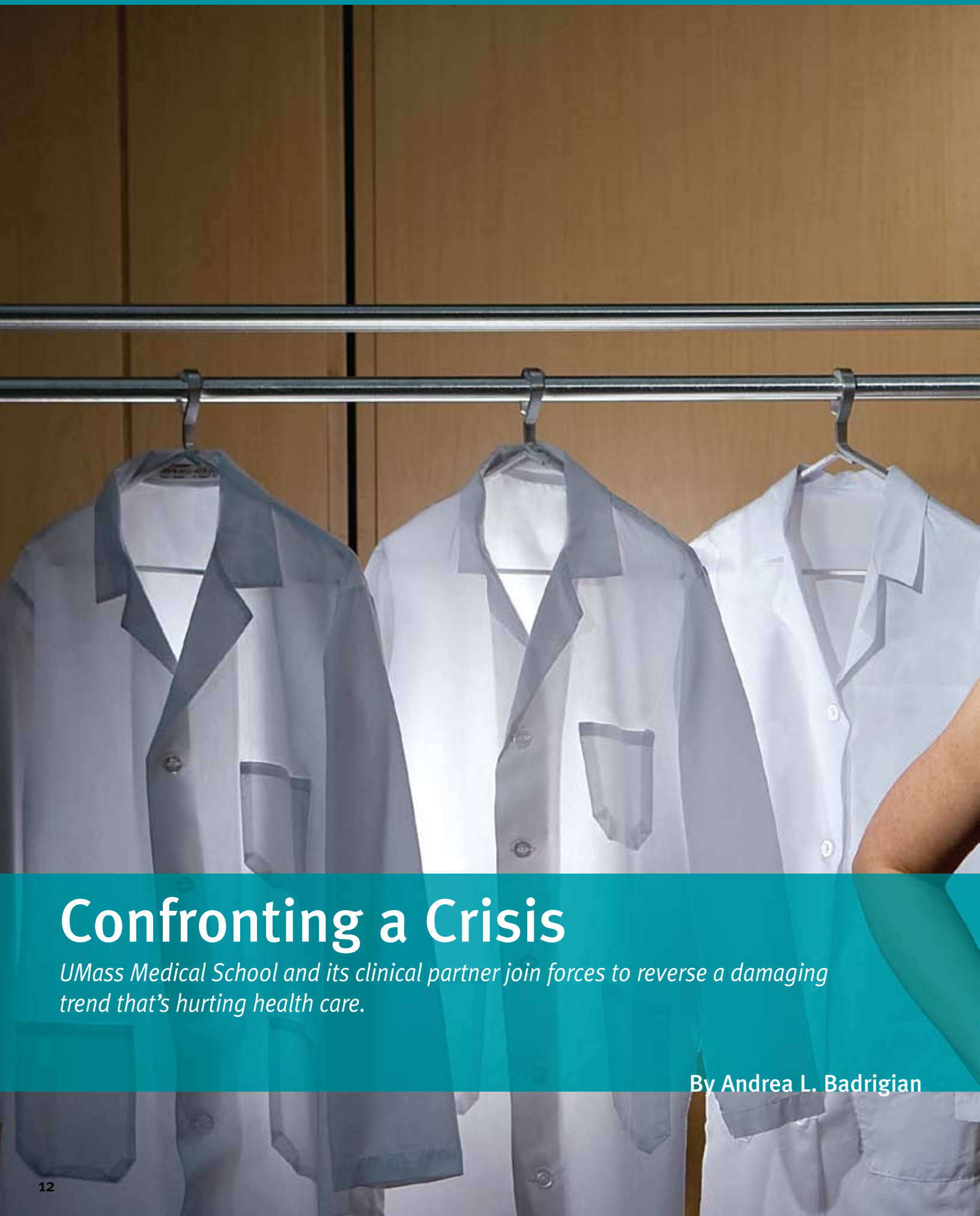
Growing up in Virginia's Shenandoah Valley, Moore, like Ambros, can't recall ever wanting to be anything but a scientist. She vividly remembers cutting branches off different plants and experimenting with various rooting methods—one in water, one in wet paper towels—to see which would work best. "It's funny to think back on it and know that even as a kid, I had an interest in creating controls in my experiments and comparing results." In high school Moore studied college-level physiology through a summer program for gifted and talented students and conducted graduate-level research at the University of Georgia's pharmacology department through a National Science Foundation summer research program. It was there that she became enchanted by research when she made a discovery—"just something small, not earth-shattering," she said—and experienced the thrill of science. "I was the first person to know that particular truth, a truth that had been there all along but had not yet been discovered. It was intoxicating to have that kind of experience."

Those early experiences that fostered her innate love of scientific exploration inform her approach to science education as a teacher and mentor. "Certainly a major goal of research is to make discoveries, but another important goal is to train the next generation. There's no replacement for the hands-on experience and one-on-one guidance a young scientist can get in the lab." Moore is joined at UMMS by her lab manager, two graduate students and two post-docs. She still likes to grow things and tends a small garden behind the house she shares with her partner, Janet Kosloff, and three children, ages 4, 6 and 9.

Moore, who received her bachelor's degree in chemistry and biology from the College of William and Mary and her PhD in biological chemistry from MIT, completed postdoctoral research under the supervision of Phillip A. Sharp, PhD, recipient of the 1993 Nobel Prize in medicine for his discoveries related to gene splicing. As a post-doctoral fellow, Moore began working on RNA metabolism and developed a widely adopted technique for manipulating RNA molecules.

"For me, the beauty of basic research is discovering interesting side leads you hadn't imagined were there and that want to take you in different directions. Those leads can steer you toward profound advances in biomedical research." Moore finds the Medical School's support of those pursuits refreshing and is particularly keen on the institution's focus on translational research. She hopes to eventually see her work in clinical trials and would also like to explore the commercialization of technology that comes from her lab. "UMass Medical School has a very good track record of professors founding successful biotech companies; I'd like to explore that route."

Moore's own mother, in fact, would be pleased to see her daughter's research translated into clinical applications. "She always wants to know what *disease* I'm working on," laughs Moore, who instead likes to explain her work as "helping to write the parts list" of humans on a molecular level. "We may see the outward manifestation of a disease or other malfunction, but we can't tell what the inward problem is without understanding all the parts at the molecular level—what each one is, what it does and where it goes wrong. Basic science provides the knowledge upon which clinical research can be built."



Confronting a Crisis

UMass Medical School and its clinical partner join forces to reverse a damaging trend that's hurting health care.

By Andrea L. Badrigian

Dr. Julia Andrieni wants to know each chapter

in her patients' stories. That's why she is a primary care physician.

"I like to know the whole patient and address all aspects of their care—physically, mentally, spiritually. I'm partnering with my patients for the long term, helping them figure out their problems today, tomorrow and going forward. I like seeing them again and again, and finding out what happened at the end of their particular health story."

Andrieni, assistant professor of medicine at UMass Medical School and vice chair of Medicine (Clinical Services) and division chief of General Internal Medicine at UMass Memorial Medical Center, tries to instill these primary care fundamentals in the internal medicine residents she teaches. "I teach them about listening to patients, learning about what makes them different and determining a continuum of care for them. I ask the residents, 'You did this intervention; don't you want to know what happened, if it worked?'"

However, in a continuing trend that began a little more than a decade ago, Andrieni and her colleagues in the primary care field—generally defined as internal medicine, geriatrics, family medicine, internal medicine-pediatrics and pediatrics—are posing that question to a declining number of medical students and residents. In June, the Massachusetts Medical Society released results of its 2006 Physician Workforce Study, an annual look at the state's physician workforce. The study contained an alarming finding: a shortage of primary care physicians, particularly in internal medicine and family practice. According to the medical society, the most critical shortage facing community hospitals is family practitioners: 54 percent of those hospitals are currently experiencing shortages in this specialty, more than double the average—21 percent—over the last three years. Internists were also in short supply.

The medical society's findings support similar warnings of a crisis from the American College of Physicians (ACP), which has called for changes in teaching, delivery and financing of primary care. In order to prevent "the collapse of primary care in the United States," the ACP seeks a national workforce policy for internal medicine, changes in undergraduate and graduate medical education and training, and reforms in physician payment and delivery systems.

UMass Medical School and clinical partner UMass Memorial Health Care have heeded the warnings as well, and have developed a joint strategy to confront the crisis. As the result of a Primary Care Task Force established last year by UMass Memorial President and CEO John G. O'Brien and led by Daniel H. Lasser, MD, chair of the Department of Family Medicine &

Julia Andrieni, MD

Community Health at the Medical School, in July the institutions created the Office of Primary Care System Integration. The office will carry out initiatives that tackle issues surrounding several key findings of the Task Force: that although 390 primary care physicians are on UMass Memorial's active medical staff, the number is deceptive because many primary care practices are closed to new patients and the average age of the physician workforce is increasing; that primary care physicians face the challenge of reengineering their practices to models of chronic care management with around-the-clock access and coordination of information; and that primary care is an increasingly essential component of the health care system to improve the movement of patients between generalists and specialists.

With input from an advisory group of community doctors, the office will address the issues outlined above and help to further develop UMass Medical School's nationally recognized focus on primary care education. "The hoped-for results will include better care for our patients and an increase in physician satisfaction," said Dr. Lasser.

That last hoped-for result—physician satisfaction—seems to be at the core of the shortage Massachusetts and the nation faces. According to Lasser, himself a practicing primary care physician for more than 30 years, reimbursement policies that reward procedure-oriented care over primary care, combined with practice environments that de-emphasize chronic disease management, discourage would-be general practitioners. "Sometimes, our medical students go out to clerkships at primary care practices and find a doctor who is bitter and angry because he is not making as much money as a specialist, he's having trouble attending to chronic disease, and he's trying to do things in 15-minute appointments. It can be a chaotic environment."

Andrew Miller, MD '79 (standing), discusses outpatient cases with Daniel Lee, MD, a third-year resident undergoing his longitudinal clinic training at Miller's Community Medical Group site in Douglas. "It's critical that we have a plan to attract students into...primary care," Miller said.

Meanwhile the demand for primary care physicians has increased substantially since 2003, according to Merritt Hawkins, a national physician recruiting company. The company reported in its 2006 Survey of Final Year Medical Residents that 79 percent of primary care residents reported receiving 26 or more job solicitations, compared to 22 percent in 2001, the last time the survey tracked this data.

Andrew Siber, MD, is a 2003 graduate of UMass Medical School who completed his residency training at the UMass Memorial Tri-River Family Health Center in Uxbridge, Massachusetts. He recently began his practice in internal medicine there. He has a favorable response to the creation of the Office of Primary Care System Integration because the field "needs a boost in a variety of ways. There is an increasing need for doctors and so we must encourage more people to do it," he said. Dr. Siber believes new perspectives on primary care and the creation of a more comfortable lifestyle for practitioners could increase interest on the part of future physicians. "Primary care is sometimes less glamorous than say, orthopedics or surgery, so people are not as attracted to it. If you like caring for the sickest of the sick," Siber emphasized, "then primary care is not for you.

"This field's importance primarily lies in prevention," he continued. "We keep people healthy and out of the hospital in the first place." While a medical student, Siber thought he was going to be a specialist, but during clinical training at Tri-River—where he had "excellent role models"—he became convinced he would practice primary care because of its emphasis on prevention.

But new in his practice, Siber has observed that "unfortunately, the current health insurance system doesn't pay for longer visits with patients. Payments must be structured to support more time with them."

Barbara Emerson, MD, is having second thoughts about a role as a primary care physician for that very reason. A graduate of the Oregon Health & Science University, Dr. Emerson is an internal medicine resident training in Tri-River's Continuity of Care clinic. "I have not decided if I am going the primary care route," she said, attributing her uncertainty to the power the insurance industry wields in directing issues in patient care. "I love caring for the adult population, and particularly in geriatrics, there is typically more than one health care issue," said Emerson. "But under today's insurance standard, a physician has time limitations. Some patients have a complicated health course, and for me, not being able to unravel more of the ball of yarn during the time I have is very frustrating."

Emerson realizes that as a primary care physician, she must know fully what's going on in her patients' lives. "If I only had 15 to 20 minutes more, I could maybe make a difference. But I don't always have that extra time." Emerson is considering becoming a hospitalist, a physician who specializes in the care of patients who are in the hospital. "In a hospital setting, you have more liberty to spend time with patients, and I'm happier when I can embrace the complete medical issue of the patient and understand their needs."

Ask a physician who has practiced primary care for 25 years, and you'll hear about the same issues—and more. Andrew Miller, MD, was a member of the UMass Medical School class of 1979, the first class of 100 students at the school. "The goal of this place was to turn out primary care physicians in underserved areas of the state, and a lot of us did that back then," said Dr. Miller, who has practiced in Douglas since 1982 after residency training at Memorial Hospital. He said that the establishment of the Office of Primary Care System Integration helps "reinvigorate" the fundamental mission of the Medical School, a concept echoed by Lasser.

Miller recalls that 50 percent of his class of residents trained in primary care, in general internal medicine. Residents came from three training entities—the Medical School, St. Vincent Hospital and City Hospital back then. Miller replaced a primary care physician who was 75 years old and ailing when he went to Douglas, where he spent two to three years building the old doctor's patient base back up and growing a business to sustain his family.

Today, Miller teaches medical students and residents at the UMass Memorial Medical Center–Memorial Campus and first- and second-year students at his Douglas practice during their longitudinal preceptor program. He also has a third-year student clerk during the ambulatory block in internal medicine, spending a month in a primary care office or in the community, such as at a health center. Finally, Miller, who is clinical division chief of Community Internal Medicine, hosts residents for an afternoon a week throughout their three years of training, so they can get a taste for what it is to be a working doctor.

"It's critical that we have a plan to attract students into the pipeline to practice primary care," said Miller. "There are more than 100 internists practicing in the local community, but our average age is 55. Two of us died last year, five of us have left for lifestyle issues or better pay. So, we've lost seven mature practices during my time as division chief. And two more are on medical leave. We're down nine spots in primary care. We are not replacing the people who have mature practices, and it's hard to get a new patient visit in Central Massachusetts. It is a crisis."

Miller points to enhancing the core curriculum to emphasize primary care techniques throughout the four years of medical

Daniel Lasser, MD (left), is part of the executive committee that will direct the new Office of Primary Care System Integration. His colleagues on the committee are Julia Andrieni, MD; Linda Sagor, MD, division director for General Pediatrics; Dennis Dimitri, MD, vice chair for clinical services for Family Medicine & Community Health; Jerry Gurwitz, MD, the *Dr. John Meyers Professor of Primary Care Medicine* and director of the Division of Geriatrics; Bill Corbett, MD, vice president of the UMass Memorial Community Medical Group; and Family Medicine & Community Health Administrator Alan Chuman.

school. "Those students interested in ambulatory care should be tracked out of the wards and hospital ICUs and placed in the community to learn how to do a gynecological exam, an orthopedics exam, to look in people's eyes," said Miller. Indeed, the Department of Family Medicine & Community Health, in collaboration with the departments of Medicine and Pediatrics, in September received a federal three-year, $856,000 grant that will be implemented under the umbrella of the Office for Primary Care System Integration and lead to a longitudinal curriculum devoted to quality improvement and patient safety. The curriculum will cross all four years of the Medical School's undergraduate curriculum, the graduate programs of the three primary care disciplines, and programs for primary care faculty who regularly interact with students and residents.

Miller also noted that residents often enter primary care training without a sense of what to expect as businesspeople running practices. "Finances are always important," said Miller. "We need to give them a good picture of what the business is like. When I'm with residents, some of the best give and take we have is, 'What can I expect out there? How do I negotiate? What kind of contracts are there?'"

One of the most forward-thinking initiatives the Office of Primary Care System Integration will champion is the "medical home," a concept that "will be our next mission. If our first mission was to put out primary care doctors in Massachusetts, then the medical home is the corollary," said Miller.

The medical home concept creates a primary care environment where care is accessible, coordinated, comprehensive, continuous, compassionate and culturally aware. Components include seamless access to appointments, screening tools and tests across

A leading expert in physician workforce issues, Kevin Grumbach, MD, recently spoke at UMass Medical School's Eighth Annual Putterman Memorial Lecture on *Primary Care: Essential, Endangered and Innovative*.

the system for all providers; a skill mix of staff within practices to effectively manage the needs of the patient mix in each practice—"right people, right tasks"; an effective electronic medical record system (as part of a new technology initiative, UMass Memorial is already at work to establish such a system); and ongoing training of physicians and staff in cultural awareness. A first step taken by Lasser's department toward accessibility and coordination was the hiring of nurse Jeanne McBride, who, as part of practice redesign initiatives underway, developed same-day, no appointment programs and group visits by patients with chronic diseases, such as diabetes. "The patients are in a room together at a practice, learning from each other," said Lasser.

"The medical home is a way of redesigning how we care for patients with chronic illnesses. My patients would come to my office and see not only me, but all of the people that make up their medical team," explained Andrieni. "The practice becomes the home, a place where you have a collaboration of services to meet your needs, and a place that is sensitive to your language and culture."

"There is good evidence to show that countries and states that have a greater focus on primary care have lower costs and higher quality," said Lasser, pointing to a UMass Memorial-produced bumper sticker exclaiming, "Quality Care Begins with Primary Care." The medical home brings that focus. "We have a lot of work to do here, easily," added Lasser, "but it will keep us on the cutting-edge."

Other office efforts aimed at improving the pipeline for new primary care physicians include advocacy when they launch their careers, navigate the system and coordinate care for their patients, as well as identifying and mentoring students and residents considering primary care. The office will also look at compensation and pay for performance incentives that have an impact on practitioners now. Andrieni says that support of the office by President and CEO John O'Brien and Dean of the School of Medicine Terry Flotte, MD, goes a long way. "They understand that primary care is the cornerstone and has value. We're at the front door, the first impression for an institution when a new patient comes to us or needs referral."

The Office of Primary Care System Integration also has a fan in one of the nation's leading experts in physician workforce issues, Kevin Grumbach, MD, chair of the University of California, San Francisco's (UCSF) Department of Family and Community Medicine and chief of Family and Community Medicine at San Francisco General Hospital.

One of Dr. Grumbach's areas of interest is innovations in the organization and delivery of primary care. "This plan is probably the most comprehensive and visionary plan for primary care emanating from an academic medical center I've seen," he said. Grumbach, who is also the director of the UCSF Center for California Health Workforce Studies and co-director of the Center for Excellence in Primary Care at UCSF, noted that offices at other academic medical centers tend to focus in a more narrow way on improving referrals, practice-based research or enhancing preceptor programs. "This office is impressive in how it brings all areas together in a comprehensive plan."

Grumbach concurs with experts here that "it's time for renewed recognition that health systems are at risk without primary care excellence. Currently, health care system payments and incentives point away from recruitment into the primary care fields." Medical schools have a leadership role in changing this, according to Grumbach.

"An educational institution can help to drive a vision forward for broad regional changes. Our health professional schools need to go beyond traditional disengaged academics, roll up our sleeves, and work with local physicians, community health centers and health departments to build coalitions," he said.

The primary care medical home is a crucial component that involves building teams of health care providers, encouraging computer-based medical records and promoting patient-centered care, he added. "Redesigning practices to achieve the goals of the the medical home is not only better for patients, but it will also make primary care more attractive to medical students."

The Office of Primary Care System Integration faces challenges, there's no doubt, Grumbach concluded. "Change is hard, but in this case, it's worth it. Institutions must convince stakeholders that change is necessary. It takes leadership to stir things up and inspire people on."

Research Rewards

Funds from the prestigious Keck Foundation award UMass Medical School scientists for their risk-taking work.

By Sandra L. Gray

The innovative, risk-taking approach to science

that characterizes the research enterprise at UMass Medical School is exemplified by the work of Stephen J. Doxsey, PhD, and Job Dekker, PhD. In recognition of both investigators and the institution at large, the W. M. Keck Foundation has awarded two prestigious honors: Dr. Doxsey has received a Keck Medical Research Grant for the project entitled *A new paradigm for longevity;* and Dr. Dekker has been named a Keck Distinguished Young Scholar in support of his project, *Unraveling chromatin interaction networks that regulate the human genome.*

Established in 1954 by Superior Oil Company founder William Myron Keck and now one of the largest private philanthropic organizations in the country, the Keck Foundation supports the work of researchers to lay the groundwork for breakthrough discoveries. The Medical Research Program seeks to advance the frontiers of medicine, while the Distinguished Young Scholars in Medical Research program specifically addresses the difficulty that promising young scientists have in securing sources of funding to pursue groundbreaking research early in their careers—despite the fact that this period is often when they make their boldest discoveries.

Nominations from institutions are accepted by Keck on an invitation-only basis, and the Foundation's criteria for inviting an institution to apply emphasize a history of institutional achievement. In choosing recipients, the Foundation relies on the opinions of its professional staff, site visits and a constant flow of current scientific and medical information, including presentations by experts in leading scientific and medical fields, to make its grant determinations.

Receiving either award alone in a single year would be notable, but two at once is exceptional—Doxsey and his interdisciplinary project team are the first at UMMS to secure a Keck Medical Research Grant, and Dekker becomes just the second Keck Distinguished Scholar at UMMS, the first being Phillip D. Zamore, PhD, the *Gretchen Stone Cook Chair in Biomedical Sciences* and professor of biochemistry & molecular pharmacology, in 2002.

"The fact that the Keck Foundation has recognized our faculty members with a major research grant and a Distinguished Young Scholar Award is further testimony to the outstanding research enterprise that has been developed here at UMass Medical School," said Vice Chancellor for Research John L. Sullivan, MD, professor of pediatrics, molecular medicine, molecular genetics & microbiology and pathology. "These awards further reflect our senior faculty research leaders' ability to recognize and recruit the very best talent in the country."

A new view of cell division aims to unravel the mysteries of aging

The intriguing premise of Doxsey's project is the kind of outside-the-box thinking encouraged at UMMS and now being supported by the $1.5 million Keck award. "Dr. Doxsey's exciting discoveries and his great leadership abilities in collaborating with an outstanding group of scientists have combined to make this an irresistible proposal for the Keck Foundation," said Professor and Chair of Molecular Medicine Michael P. Czech, PhD.

Doxsey, professor of molecular medicine, biochemistry & molecular pharmacology and cell biology, and an interdisciplinary group of collaborators will study how asymmetric cell division affects aging and longevity, building on his lab's remarkable finding, published by the journal *Cell* in 2005, that in the final moments before a human cell divides, one of the two new "daughter" cells actually causes the separation by blasting away from the other through the activation of a structure called the "midbody ring," which remains with the older cell. These findings have key relevance for the understanding of cell aging and cell death.

"Our work reverses the accepted notion that human cell division creates two equivalent 'daughter' cells," said Doxsey. "Rather, we discovered a process that produces cells with different life spans through asymmetric cell division. The goal of our project is to test whether cellular longevity contributes to human life span with a set of experiments designed to address the mechanism,

"How we age remains a mystery. Our cell biology studies on cell division turned a long-prevailing notion on its head and pointed us toward aging as a stem cell disease. This is the beginning of our new project. Our view is that aging may be a curable disease of stem cells rather than an inevitable process."

– Stephen Doxsey, PhD

"Very little is known about how genes are regulated. The novel technology we have developed makes it possible for us to map the spatial regulation of the genome to advance our understanding of normal and abnormal gene function."

– Job Dekker, PhD

significance and clinical applications of midbody inheritance in human stem cells and cancer cells."

A leader in the study of cell division, Doxsey received his undergraduate degree from the University of Connecticut and his PhD in cell biology from Yale University. He completed a post-doctoral fellowship at the University of California at San Francisco, where he was awarded Anna Fuller and Damon Runyon fellowships, before coming to UMMS in 1993.

New technology unravels the human genome

Dekker, an assistant professor of biochemistry & molecular pharmacology, proposes to map the spatial, three-dimensional organization of the genome inside cells, which may reveal how the genome normally works and what has gone awry in disease states. "Insights into the mechanisms that control the spatial organization of the genome will greatly contribute to a better understanding of gene regulation and may reveal causes of human diseases that are due to defects in these processes," Dekker explained.

Stephen Doxsey, PhD (left), and Job Dekker, PhD (right), both credit the unique culture of cooperation at UMMS for making their work and its funding possible. "People at our institution are collegial and looking for opportunities to collaborate, making the whole greater than the sum of its parts," said Doxsey. "It's one of the reasons I came here, and it has helped advance my career enormously."

He will do this with his own invention, the "Chromosome Conformation Capture" technology, called 3C, to detect physical interactions between genes and other genomic elements believed to be regulators. He will also employ 3C-Carbon Copy, or "5C," his further refinement of 3C that dramatically increases throughput to analyze millions of interactions simultaneously. "Our hypothesis is that if we can map the spatial organization of where regulatory elements are located in three dimensions relative to the genes they affect, we can systematize the study of gene regulation," Dekker said.

Dekker received his BS and PhD from the University of Utrecht, The Netherlands, then came to the United States for a post-doctoral fellowship at Harvard University before joining the UMMS Program in Gene Function and Expression in 2003. He is a member of the National Institutes of Health National Human Genome Research Institute's Encyclopedia of DNA Elements (ENCODE) project.

"Dr. Dekker is a very talented young scientist who had the courage and foresight to apply traditional chemical cross-linking techniques to probe the 3D structure of chromatin," said C. Robert Matthews, PhD, the *Arthur F. and Helen P. Koskinas Professor* and chair of biochemistry & molecular pharmacology. "With the vast amount of data that he will generate, he will be in a position to obtain unique and valuable insights into gene expression."

Collaboration is Key

UMass Medical School faculty members contributing to Doxsey's project, *A new paradigm for longevity,* are JeanMarie Houghton, MD, PhD, associate professor of medicine; Stephen Lyle, MD, PhD, assistant professor of cancer biology; Craig Mello, PhD, Howard Hughes Medical Institute Investigator, the *Blais University Chair in Molecular Medicine* and professor of molecular medicine; and Gregory Pazour, PhD, associate professor of molecular medicine. Also collaborating is Alexey Terskikh, PhD, assistant professor at the Burnham Institute for Medical Research.

Dekker has long collaborated with laboratories at Harvard Medical School, the Broad Institute at the Massachusetts Institute of Technology and the University of Washington, as well as receiving valuable input from ENCODE co-members.

Vitae: Grants and Research

New and competitive renewal grants of $100,000 or more are listed here according to department and funding sources.

BIOCHEMISTRY & MOLECULAR PHARMACOLOGY

National Institutes of Health

Phillip D. Zamore, PhD, the *Gretchen Stone Cook Chair in Biomedical Sciences* and professor: *Understanding the Mechanism of RNA Interference (RNAi),* one year, $459,382; recommended for three more years, $1.4 million.

CANCER BIOLOGY

National Institutes of Health

Stephen Lyle, MD, PhD, assistant professor: *LEF/TCF Function in Adult Stem Cell Fate and Tumorigenesis,* one year, $299,625; recommended for four more years, $1.14 million.

The Susan G. Komen Breast Cancer Foundation

Arthur M. Mercurio, PhD, professor: *Contribution of CUTL-1 to Basal Phenotype Breast Cancers,* three years, $135,000.

FAMILY MEDICINE & COMMUNITY HEALTH

National Library of Medicine

Elaine R. Martin, MSLS, DA, research assistant professor: *National Network of Libraries of Medicine,* eight months, $967,859; recommended for four more years, $5.3 million.

MEDICINE

Juvenile Diabetes Research Foundation International

Dale L. Greiner, PhD, professor: *iNKT Cell Regulation of Autoimmune Diabetes,* one year, $110,000.

National Institutes of Health

Shan Lu, MD, PhD, professor: *Polyvalent DNA Plus Protein HIV Vaccines,* one year, $394,321; recommended for three more years, $1.4 million.

Lori Pbert, PhD, associate professor: *Asthma and Mindfulness-Based Stress Reduction (MBSR),* one year, $324,750; recommended for one more year, $325,000.

Ravindra N. Singh, PhD, assistant professor: *Characterization of Complex Regulatory Element of Spinal Muscular Atrophy Genes,* one year, $362,813; recommended for four more years, $1.46 million.

MOLECULAR MEDICINE

National Institutes of Health

Roger J. Davis, PhD, Howard Hughes Medical Institute Investigator, the *H. Arthur Smith Chair in Cancer Research* and professor: *Mechanisms of Neurodegeneration,* one year, $292,275; recommended for four more years, $1.2 million.

Brian Lewis, PhD, assistant professor: *Molecular Mediators of Metastasis in Hepatocellular Carcinoma,* one year, $288,216; recommended for four more years, $1.2 million.

Craig L. Peterson, PhD, professor: *Analysis of the Yeast SWI1, SWI2 and SWI3 Protein,* one year, $429,463; recommended for four more years, $1.85 million.

NURSING

Department of Health and Human Services

Kathleen H. Miller, EdD, RN, professor: *Comprehensive Geriatric Education Program,* one year, $172,229; recommended for two more years, $340,370.

Advanced Education Nursing, one year, $252,521; recommended for two more years, $494,257.

NEUROBIOLOGY

National Institutes of Health

Laxminarayana R. Devireddy, PhD, research assistant professor: *Role of Lipocalin 24p3 in Apoptosis and Leukemia,* one year, $124,109; recommended for four more years, $589,586.

David R. Weaver, PhD, professor: *Mechanisms of Circadian Rhythmicity,* one year, $365,531; recommended for four more years, $1.5 million.

PATHOLOGY

National Institutes of Health

Francis K. Chan, PhD, assistant professor: *Regulation of TRAIL-Induces Apoptosis,* one year, $230,750; recommended for two more years, $461,500.

PEDIATRICS

National Institutes of Health

Mary M. Lee, MD, professor: MIS *Regulation of Leydig Cell Development,* one year, $303,469; recommended for four more years, $1.21 million.

Katherine F. Ruiz de Luzuriaga, MD, professor: *Evolution & Maintenance of Memory CD8 T Cells,* one year, $1.67 million; recommended for four more years, $6.8 million.

As I write this first message from my new post as interim chancellor of the University of Massachusetts Worcester, I might equate my new job excitement and expectations to those emotions I anticipate many of our incoming students are experiencing—boundless energy, intense passion and a drive to succeed at this academic health sciences center. As these students enter our halls for the first time to become physicians, nurses and scientists, they bring with them fresh perspectives, altruistic ideals and outstanding commitment that form the very cornerstone of an educational environment that drives interdisciplinary research and cutting-edge clinical care—an environment of which I am thrilled to be a part.

MESSAGE FROM MICHAEL F. COLLINS, MD

These latest students come here with backgrounds of academic achievement and unique life experience. Our School of Medicine class of 103 aspiring doctors not only claims an average incoming GPA of 3.6 from some of the nation's premier universities, but also a large cohort of students who are among the first in their families to graduate from college. Likewise, our 22 new traditional master's students in the Graduate School of Nursing bring up to 33 years of direct nursing experience to the university, while members of our fourth incoming class of Graduate Entry Pathway participants come from a variety of both health-related and lay backgrounds. Finally, in light of the recognition of research excellence brought by the Nobel Prize awarded to Craig C. Mello, PhD, as well as the resultant historic rise in applications to the Graduate School of Biomedical Sciences, this school has accepted 62 new students from around the world who boast a record-breaking cumulative GPA of 3.5.

It is this exceptional assemblage of students, coupled with new and existing faculty committed to educational and research achievement, that promote an ideal educational environment at UMass Worcester. And, it is the lasting effects of this environment on these students that will become an intrinsic part of their alumni experience. Following are stories of three exemplary alumni who personify the educational ideals of life-long learning and community advocacy:

Lena Dohlman, MD '77, MPH, an anesthesiologist at Massachusetts General Hospital, participates in the organization Health Volunteers Overseas (HVO), where she has introduced primary trauma care courses as part of HVO's anesthesia program in Vietnam. These first-of-their-kind courses garnered Dr. Dohlman a Golden Apple Award for Volunteerism in 2007.

Graduate School of Nursing alumna Nancy R. Kowal, MS, ANP, '95, has been so inspired by her patients over the past 40 years that she has played an integral role as a nurse practitioner in the field of pain management. As a cancer survivor, she has worked at the grassroots level to lobby members of Congress to increase their support of cancer research, advocacy and education.

Laurie Boyer, PhD '00, a new faculty member at MIT, is already crafting an impressive reputation for expertise in the study of embryonic stem cells. She recently published seminal findings with her primary investigator Richard Young, PhD, that led to both being named to *Scientific American* magazine's annual list of the world's top 50 leaders in research, business or policy.

As you will read, it is a wonderful time to be associated with the University of Massachusetts Worcester.

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

Vitae: Alumni Report

Laurie Boyer, PhD, GSBS '00

Laurie Boyer, PhD, entered the Program in Molecular Medicine in 1993 not only uncertain of her capacity to pursue a career as a scientist, but also of what form such a career might take. "I've always been fascinated by science, but was never cognizant of how you could turn that into a career," said Dr. Boyer.

Awakened to the world of professional science through experience as a research associate in academic and commercial labs after college, Boyer joined the GSBS and the lab of Craig L. Peterson, PhD, professor of molecular medicine. There, she investigated how manipulating chromosome structure influences gene regulation and wrote her thesis on the subject. Boyer said graduate school was a wonderful and challenging experience and described Peterson as a great mentor. "Craig has been extremely supportive over the years. His continued interest in my science and career has been very important for my success. When I have an exciting idea or issue that I want to discuss with another professional, I call him."

Boyer has quickly built a reputation as a young researcher to watch—she was among *Scientific American* magazine's Top 50 in 2006 and has published regularly in leading peer-reviewed scientific journals including *Cell, Science* and *Nature.* Her research focuses on the role of chromatin—the DNA and proteins that make up chromosomes—during mammalian development, using stem cells as a model system. "I want to understand how we can direct the differentiation of these cells and possibly create specific cells for regenerative medicine," said Boyer.

This year has been an exciting one for Boyer. Following the completion of her post-doctoral fellowship at the Whitehead Institute for Biomedical Research at the Massachusetts Institute of Technology, she joined MIT as an assistant professor of biology this fall. She was also the commencement speaker at her undergraduate *alma mater,* Framingham State College, and received an honorary doctorate.

With her scientific career now in focus, Boyer credits her success in large part to her experience at the GSBS, which she says gave her the skills and confidence she needed to pursue any and all possibilities in the competitive research arena. "It is currently very difficult to find an academic appointment. The GSBS put me in a position that I might not otherwise have enjoyed."–EC

Nancy R. Kowal, MS, ANP, GSN '95

Nancy R. Kowal, MS, ANP, has been a nurse for more than 40 years; she has cared for many patient populations, and those patients have been her inspiration as a national and regional advocate. By putting her patients' faces to clinical care issues, Kowal has created change along the way.

"Their journeys have had a great impact on me," said Kowal. "Through my work at UMass Memorial Health Care and the American Cancer Society, I've been able to have a positive influence on the care my patients receive."

As a cancer survivor and this year's keynote speaker at the kick-off breakfast for the annual Walk to Cure Cancer, held each fall on the UMass Medical School campus, Kowal is an American Cancer Society Ambassador on Capitol Hill. She and her fellow ambassadors meet with members of Congress and represent a grassroots movement to educate, provide research dollars for cancer treatments and support the battle against cancer on all fronts—education, research, advocacy and patient care.

Lena Dohlman, MD '77, MPH

Lena Dohlman, MD, MPH, has been an ambassador for medical education since she graduated from UMass Medical School, as her receipt of the 2007 Health Volunteers Overseas (HVO) Golden Apple Award demonstrates. The award is given annually to volunteers who exemplify the organization's mission to increase health care globally through clinical training, and for 20 years Dr. Dohlman, an anesthesiologist at Massachusetts General Hospital and Cambridge Health Alliance, has been fulfilling that mission. She and her husband, Tobin Gerhart, MD, an orthopedic surgeon, spent part of their honeymoon volunteering with Orthopedics Overseas (now HVO) in Indonesia. "It was a life-changing experience," said Dohlman. "To be integrated into a different culture and work alongside colleagues interested in exchanging their knowledge and experiences was eye-opening and enriching. I learned how to give ether anesthesia and how to eat durian fruit and giant prawns, among many other things. I discovered how much I enjoyed intercultural communication and how rewarding it is to teach."

Since that initial trip, Dohlman has traveled overseas as often as she could while raising a family and building a practice. She has been to Vietnam four times, where she introduced a primary trauma care course. Dohlman is credited by HVO as having had a tremendous impact on medical outcomes for local anesthesiologists and was nominated for the Golden Apple Award by HVO onsite program coordinator Nguyen Ngoc Chung, MD, with whom she has worked for years. Dohlman, who earned her master's in public health from Harvard in 1993, is interested in regional (local) anesthesia, which has become more prevalent in U.S. hospitals as a result of the increase in outpatient procedures and is well suited for an environment with limited resources.

Dohlman's volunteer experience has also influenced her own practice, particularly at Cambridge Health Alliance where the patient population is largely from underserved and immigrant communities. She sees international medical service as an essential element of medical education. "International service helps expose young physicians to cultural differences and languages, enabling them to better understand and communicate with their patients," she noted.

She attributes her love of continual learning in part to UMMS and particularly to Sam Clark, MD, founding chair of the anatomy department. "He was focused on self-education and life-long learning. At the time, I didn't understand its importance, but its value has become more evident as the years go by. It has become a part of what I try to instill in my students," said Dohlman. –EC

After graduating from the Graduate School of Nursing, Kowal developed new roles for nurse practitioners in the field of pain management and anesthesia. She worked with UMMS faculty members H. Brownell Wheeler, MD, the *Harry M. Haidak Distinguished Professor of Surgery Emeritus* and professor of surgery, and David M. Clive, MD, professor of medicine, to teach an End-of-Life Care course for medical students, and she extended her passion for education by helping to develop the first pain interclerkship for medical students. As an adjunct professor for the GSN, Kowal has broadened UMass Memorial's new eICU practice and teaches a pain course, which she created for acute care providers.

Recognized with the 2007-2008 UMass Memorial Nurse Practitioner Leadership Award for Excellence in Practice, Kowal mentors nursing students interested in anesthesia, pain management and acute care. She serves as a pain consultant and nurse practitioner in preadmission testing in the Department of Anesthesiology.

"My education has fostered my advocacy role. My patients have driven my passion for change, and my vision has designed a new path to quality patient care," said Kowal. "I have often stated that existing paths can be redundant. It is important to design a new path to foster a new vision. The future is something which everyone reaches one minute at a time, and the goal is to make every minute count." —NLS

Vitae: Class Notes

The Alumni Association presented scholarships to current School of Medicine students at a campus reception on September 27, 2007. From left to right the recipients include: Francis Magro '11 (William and Steven Putterman Memorial Scholarship); Michael Messina '11; Sui Li '10; Stephanie Ruest '11; Jessica Hoseason '09; Kevin Soares '09 (Charles Gomes Memorial Scholarship); Alisha Carson '11; Tara Slivinski '11 (Paul Vernaglia, MD, Memorial Scholarship); Rebecca Pike '08; Joanna Suski '10 (Neil Grover Memorial Scholarship); Sarah-Jo Stimpson '10 (Linda Rafuse Goudey, MD, Memorial Scholarship); Jaclyn Boulais '10; and Myrlene Jeudy '10. Andrew Miller, MD '79 (second from right), vice president and treasurer of the Alumni Association, and Irvin Heifetz, MD '79 (far right), president, presented the awards that are the result of donations to the association. Interim Chancellor Michael F. Collins, MD, and Dean of the School of Medicine and Executive Deputy Chancellor Terry Flotte, MD, joined the students and alumni at the reception.

1974

Richard V. Aghababian, MD, founding chair and professor of emergency medicine at UMass Medical School, was honored as one of *Worcester Business Journal's* 2007 Health Care Heroes. Dr. Aghababian serves as associate dean for Continuing Medical Education at UMMS.

1976

Bruce G. Karlin, MD, assistant professor of medicine at UMass Medical School, was recently elected president of the Worcester District Medical Society.

1977

Lorraine K. Bello, MD, is a *locum tenens* physician, seeing patients from Martha's Vineyard to Washington State. She also performs volunteer medical work in Mexico and Guatemala.

Krystyna D. Kiel, MD, was elected to the board of directors of the American Society of Breast Disease. Dr. Kiel is assistant professor of radiation oncology at Robert H. Lurie Comprehensive Cancer Center of Northwestern University.

1978

George W. Burke III, MD, has been studying the recurrence of type 1 diabetes after kidney/pancreas transplantation in a small number of recipients in his capacity as professor of surgery at the University of Miami Miller School of Medicine. He also serves as director of the Kidney, Kidney/Pancreas Transplant Program and co-Director of the Division of Transplantation.

Madeleine R. Fay, MD, an instructor in medicine at UMass Medical School, has two sons, Andrew and Nicholas, who are also graduates of UMMS and practicing in Western Massachusetts. Her daughter, Isabel, is a freshman at Cornell University.

Stephen R. Gorfine, MD, a colorectal surgeon, works in a group practice in New York and was recently elected president of the New York Society of Colon and Rectal Surgeons.

1979

Paul R. Clark, MD, was listed by New Hampshire Magazine as a "Top Doctor" for 2005 and 2007.

James A. Goldman, MD, has joined Harvard Vanguard Medical Associates in its Wellesley and Chelmsford, Mass. offices as a staff endocrinologist. He lives in Newton and says he would love to hear from any classmates in the area.

1981

Janet O. Yardley, MD, was appointed chief medical officer of the Great Brook Valley Health Center in Worcester in November 2006. Dr. Yardley married Harlee Strauss in November 2004, and they have a daughter, Lanie.

1982

Richard E. Chaisson, MD, received the 2006 World Lung Health Award from the American Thoracic Society for his scientific achievements.

Monica Donovan, MD, is celebrating her 20th anniversary at Santa Teresa Hospital in San Jose, Calif., where she practices adult primary care and participates in the Teen and Young Adult Clinic. Dr. Donovan and her husband, James Kern, are hoping to buy an avocado farm in the Santa Barbara area.

Ellen M. Michaelson, MD, is a primary care specialist in Portland, Ore., who has developed a "narrative" primary care approach, focusing on patients' stories to help improve their care. She is also writing a novel and longer non-fiction.

Christopher Tromara, MD, retired from the U.S. Army as a colonel. He is currently a contract physician for the Department of Family Practice at the Evans Army Community Hospital at Fort Carson in Colorado Springs, Colo.

1983

Robert P. Wespiser, MD, a primary care internist in Lee, Mass. and an assistant professor of medicine at UMass Medical School, was appointed chief of staff at Berkshire Medical Center.

1984

Libby Cone, MD, is practicing *locum tenens.* In 2006, Dr. Cone received a master's degree in Jewish Studies.

Alan P. Farwell, MD, associate professor of medicine at UMass Medical School, has been appointed attending physician in the endocrinology, diabetes and nutrition section at Boston Medical Center.

Marc C. Restuccia, MD, assistant professor of medicine at UMass Medical School, is medical director for Life Flight/EMS and MD•Access at UMass Memorial Medical Center. Both programs were recognized as "Champions of Excellence" by the Medical Center in April 2007.

1985

Mark E. Dowell, MD, is one of only two full-time infectious disease physicians in the state of Wyoming.

Elizabeth Kass, MD, has practiced at a non-profit internal medicine group for medically complex adult patients for more than 17 years. She lives in Brookline, Mass. with her daughter, Claudia.

Karen J. Shedlack, MD, was awarded a 2007 Distinguished Fellowship by the American Psychiatric Association during the 51st Convocation of Distinguished Fellows in May.

1987

Maureen F. McCarthy, MD, serves as interim chief of staff at the Salem VA Medical Center in Salem, Va. She is also on the faculties of the University of Virginia School of Medicine and the Virginia College of Osteopathic Medicine.

1989

Susan E. Bonadonna, MD, is working part time in a small family practice in New Rochelle, N.Y. Outside of work, she says her three sons and dog keep her busy.

Jon S. Jancaterino, MD, has moved from Worcester County to Honolulu, Hawaii. He says he would like to keep in touch and assist any visitors to the area or potential residency candidates.

1990

George F. Parker, MD, is associate professor of clinical psychiatry at the Indiana University School of Medicine, with special interests in forensic psychiatry, administrative psychiatry and mental health consequences of disasters.

1991

Lee S. Altman, MD, has joined the Harvard Vanguard Medical Associates behavioral health department at its Braintree, Mass. practice and will also be practicing at its Quincy location.

Jane E. Carleton, MD, practices at the Monter Cancer Center of the North Shore University Hospital in Lake Success, N.Y., specializing in lung and breast cancer. She lives in Brooklyn, with her husband, Joshua, and daughter, Kira.

Jeffrey A. Sorkin, MD, practices in Peabody, Mass. and at Children's Hospital in Boston, specializing in pediatric ophthalmology and adult strabismus. Dr. Sorkin and his wife, Amy, have two children, Amanda and Jeremy.

1992

Andrea Saperstein Gropman, MD, is an associate professor of neurology and pediatrics at George Washington School of Medicine and Health Sciences and an attending physician in child neurology at Children's National Medical Center in Washington, D.C.

Lynn Paikowsky, MD, is a staff physician at the Boston University Student Health Services and school physician for Fisher College in Boston.

1993

Patricia A. Sereno, MD, was elected president of the Massachusetts Academy of Family Physicians in May 2006 and is serving a two-year term.

Vitae: Class Notes

1994

Marcella W. Bradway, MD, was listed by *Connecticut* magazine in April 2007 as one of the Top Doctors-Surgeons in the state. Dr. Bradway welcomed her second child, Jonathan Caleb, on August 3, 2006.

Daniel J. McCullough, MD, was recently re-elected Northeast regional representative to the Massachusetts Academy of Family Practice. In addition, Dr. McCullough was selected to serve with the Medical Specialty Action Group of the American Society of Addiction Medicine and appointed the society's national co-chair of Membership.

Michael J. Misialek, MD, was promoted to chief of pathology at Rhode Island's Landmark Medical Center.

Daniel J. Quinn, MD, practices orthopedics and sports medicine at Newton-Wellesley Orthopedic Associates and is preparing for another season as team physician for the Boston Cannons, of Major League Lacrosse, and for Massachusetts Premier Soccer.

1995

Brenda G. Coutinho, MD, clinical assistant professor at UMass Medical School, is chair of the Department of Obstetrics & Gynecology at Milford Regional Medical Center.

1996

Barbara M. Walsh, MD, assistant professor of pediatrics at UMass Medical School, is engaged to Grant Flowers, with their wedding planned for December 30, 2007. Dr. Walsh has two children, Nicole and Riley.

1997

Neal R. Patel, MD, established Walpole [Mass.] Pediatrics in July 2007.

Yvonne H. Ting, MD, has practiced clinical family medicine in Delaware for the past five years. She and her husband, Christopher, have two children, Zane and Miranda.

1998

Kristen M. Armstrong, MD, is working part time as a primary care physician in Wilmington, Mass. and "full time taking care of three-year-old triplets, Anthony, Robert and Joseph."

Christopher Garofalo, MD, and **Marguerite Garofalo, MD '00,** joined the private practice, Family Medicine Associates, PC in South Attleboro, Mass., in July 2006. They have two children, Olivia and Matthew.

1999

Ethan Brackett, MD, married Dave Demerjian on October 7, 2006, in Buzzards Bay, Mass. Dr. Brackett received a Zuckerman Fellowship to pursue a master's degree in public administration at Harvard's Kennedy School of Government.

Henry Danis, MD, practices gastroenterology at Prime Healthcare, PC, an affiliate of Saint Francis Care in Hartford, Conn. He is married and has two children.

Kerri E. Osterhaus, MD, married Christopher L. Houle on August, 12, 2006, in Belmont, Mass. Dr. Osterhaus, a clinical instructor at UMass Medical School, is an obstetrician/gynecologist at UMass Memorial Health Care–Marlborough Hospital and a partner at Women's Health Center of Central Massachusetts.

2000

Philip Bolduc, MD, is a family practice physician and HIV medical director at the Greater Lawrence [Mass.] Family Health Center.

Marguerite M. Brackley, MD, married Kunal Jajoo, MD, at the Seaport Hotel in Boston on June 9, 2007. Dr. Brackley works as a medical director in the Global Safety Office of Boston Scientific.

Lucy Y. Chie, MD, practices at Beth Israel Deaconess Medical Center and South Cove Community Health Center, which serves Boston's Asian-American population. Dr. Chie and her husband Justin Campbell, MD, have a daughter, Zoe.

Andrew W. Hoyer, MD, is an assistant professor of clinical pediatrics in the Department of Pediatrics Division of Cardiology at the University of Virginia.

At the annual Alumni Graduation Breakfast sponsored by the Alumni Association and UMMS Student Affairs and held on June 1 this year, two days before Commencement, the following School of Medicine graduates received various memorial, humanitarian and medical society awards. The recipients from left to right are Matthew McGuiness, MD '07; Anne Garrison, MD '07; and Kerri Barnes Gosselin, MD '07. At center is Julia Marks, widow of the late UMMS faculty member Sandy Marks. They are joined by the president of the Alumni Association, Irvin Heifetz, MD '79, at far right.

Jennifer K. Litton, MD, has completed her medical oncology fellowship and joined the faculty at the University of Texas M.D. Anderson Cancer Center, specializing in breast cancer. Dr. Litton had three children during her fellowship; twin girls, Delia and Kate, in 2004 and Jack in 2006. She invites alumni visiting Houston to let her know they are in town.

2001

Elizabeth M. Gittinger, MD, has been appointed a generalist in the Department of Obstetrics and Gynecology at Boston Medical Center and instructor of obstetrics and gynecology at Boston University School of Medicine.

Brian S. Levitt, MD, completed his gastroenterology fellowship in June 2007 and joined a private practice in California's Bay Area. He and his wife, Jill, have two children.

David P. Mason, MD, served in Iraq from November 2005 to February 2006 as a major in the North Carolina Army National Guard. He was married on June 23, 2007.

Kathleen M. McGraw, MD, is the director of hospital medicine at Baystate Franklin Medical Center in Greenfield, Mass. and a board member of the Desmond Callan Community Health Center of Franklin County.

Randall S. Pellish, MD, is an attending emergency room physician at Memorial Hospital of Rhode Island. He and his wife, Elyssa, have two children.

2002

Shovon I. Ashraf, PhD (GSBS), recently joined the intellectual property law firm of Sterne, Kessler, Goldstein, Fox.

Alan Crunkleton, MD, is CEO of Correx, Inc. The company is developing a surgical tool to improve heart surgeries and make surgery an option for patients who are not candidates for aortic valve replacement.

Jeffrey S. Gold, MD, was recently featured in the *Swampscott* [Mass.] *Reporter* as a volunteer in Swampscott High School health classes, where he teaches a variety of adolescent health issues.

Maria Ida Sannella, MD, practices at the Children and Youth Clinic at Brockton Hospital as a primary care pediatrician.

2003

Joseph D. Burns, MD, is a fellow in cerebrovascular disease and critical care neurology at the Mayo Clinic in Rochester, Minn.

Thomas F. Castiglione, MD, is practicing internal medicine at South Shore Medical Center in Kingston, Mass. In 2006, Dr. Castiglione received the Lahey Clinic Patient Care Award.

Nelly (Godin) Heiman, MD, completed her residency at the University of Texas-Houston and has joined Tomball OB/GYN Associates in Tomball, Texas. Dr. Heiman says she would love to hear from classmates.

Jill E. Saunders, MD, married Alexander Feinstein, MD, on July 15, 2006. Dr. Saunders will be completing a fellowship in women's imaging at Brigham and Women's Hospital.

2004

Kristina M. (Galarneau) Deligiannidis, MD, and **Konstantinos E. Deligiannidis, MD,** MPH, recently celebrated the birth of their daughter. Konstantinos joined the UMass Medical School Department of Family Medicine & Community Health as an assistant professor at the Barre Family Health Center.

Timothy Farrell, MD, is finishing his family medicine residency at Brown University and will begin a geriatrics fellowship. He is engaged to Julia Ozbolt, a third-year medical resident at Brown University.

Heather Steinman, PhD (GSBS), is a senior licensing officer in the Office of Technology Management at UMass Medical School. She also holds a post-doc position in the UMMS lab of Stephen N. Jones, PhD.

2005

Andrew D. Cook, MD, and **Megan M. Lo, MD,** are moving to Cincinnati in 2008, where Dr. Lo will pursue a pediatric renal fellowship and Dr. Cook will join a family practice.

Christopher A. Graybill, PhD (GSBS), is a clinical research scientist at Gilead Colorado, Inc., in Westminster, Colo.

Daniel Young, PhD (GSBS), is a technology specialist in Biotech Intellectual Property Law at Wolf, Greenfield & Sacks, PC in Boston.

2006

Destin Heilman, PhD (GSBS), is a visiting professor in the Department of Chemistry and Biochemistry at Worcester Polytechnic Institute.

2007

Rachel Litman, PhD (GSBS), is a post-doctoral fellow in the Cancer Center at Massachusetts General Hospital.

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

Vitae: The Last Word

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

These are exciting times for those committed to the life sciences in the Commonwealth. I feel particularly fortunate to be here at the University of Massachusetts Medical School where we boast a Nobel laureate in our midst and a reputation as an integral member of the statewide University system—two attributes that position us to take an active role in engaging legislators with regard to the importance of funding basic research and shaping Governor Patrick's $1 billion life sciences initiative announced in July.

The Governor has introduced legislation that plans to commit this $1 billion in funding over 10 years, with $500 million to come from capital funds, $250 million from tax incentives and an additional $250 million from other programs. We anticipate that our Medical School will play a pivotal role in helping Massachusetts become a global leader in the life sciences by developing university-wide life sciences initiatives to promote capital spending on our campuses.

One aspect of these exciting plans, which won initial approval from the finance committee of the University's Board of Trustees in September, is the building of a new research facility on our Worcester campus. This building, which would house our "Advanced Therapeutics Cluster," would include a Center for Stem Cell Biology, focused on realizing the concept of using stem cells for regenerative medicine; an RNAi Therapeutics Center, which would emphasize translation of RNAi into specific products for human diseases; and a Gene Therapy Center, which, with the foresight of Dean and Executive Deputy Chancellor Terry Flotte, will interface with both of these sister centers and with researchers throughout the Commonwealth to develop clinical uses of gene delivery vectors.

As *the* global RNA powerhouse, we owe it to the world to establish such a research facility so that we can create clinical applications for the science we so successfully advance. If our scientists can develop the therapeutic modalities to turn off cells that are growing as a cancerous lesion and cure that cancer, we will have made a major therapeutic breakthrough—one that can bring hope to patients. That is the message we are delivering to the government.

In the short term, we have developed plans to establish a human embryonic stem cell registry and bank at the Medical School on our Shrewsbury campus. At this time, there is no comprehensive international registry of human embryonic stem cell lines anywhere in the world, and we have an opportunity to provide researchers with needed essential information about what stem cell lines are available, as well as the quality of these lines; also, we can advance the reputation of the University system by placing its insignia on this important work.

We have taken first steps with the University Board of Trustees to make this capital plan a reality; now it is up to all of us to face these challenges squarely. When I came to the Medical School as interim chancellor, I made a commitment to take action and together with key administrative staff here, we are making important advances. There is tremendous momentum at this point in time and we are fortunate to have a far-sighted board, university president, governor and legislature who understand the importance of investing in the life sciences. The University of Massachusetts and its Medical School are poised to seize the day.

At press time, the Massachusetts Life Sciences Center board approved $8.3 million for the establishment of a stem cell registry and stem cell bank at UMass Medical School.

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