fall/winter 2008, Vol. 31 No. 1

Expanding Excellence

Vitae:

The Magazine of
The University of Massachusetts Medical School

Discoveries from Data

Nursing's Next Level

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 $193 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

Expanding Excellence 6

UMass Medical School takes a new step to face the physician workforce shortage.

Discoveries from Data 13

UMass Medical School's bioinformatics experts use the tools and power of computing to interpret vast amounts of information for biomedical breakthroughs.

Nursing's Next Level 17

Whether at the bench or the bedside, in the classroom or the boardroom, the Doctor of Nursing Practice program promises advancements in patient care.

Chancellor Michael Collins: A Q. and A.

On September 26, 2008, Michael F. Collins, MD, was appointed UMass Medical School's sixth chancellor by the University of Massachusetts Board of Trustees. Dr. Collins had served as interim chancellor since July 2007 and will continue in his role as senior vice president for the Health Sciences at UMass. In an interview conducted at press time, Dr. Collins provides insights about his impressions of UMMS and vision for the future.

What has been most remarkable for you as you have come to know UMMS?

What I reflect on the most is the essence of community that is the hallmark of UMass Medical School. Ours is an incredible community of students, faculty and staff, spectacular people taking care of patients, providing education and doing research. People like [Professor of Molecular Medicine] Victor Ambros, who said he "owed it to mankind to come to UMass," and [Chair of Neurology] Bob Brown, who said he wanted to be at UMass, where he could conduct his research and provide patient care that would "leave something important to the world."

What is it about the UMass system you admire, and what makes UMMS special within the system?

Collaboration. I could give easily a hundred examples of where collaboration thrives, from the University-wide plan for the life sciences and such efforts between the Medical School, the state and the biotech industry in the region to our partnership with UMass Memorial to the programs we and the other colleges and universities sponsor in Worcester with community agencies and government officials.

UMass Medical School, at all levels—particularly our faculty and staff who are the heart and soul of the institution with their commitment to service, scholarship and teaching—is spectacular. As are the students we attract—enthusiastic young people who not only have an impressive record of academic accomplishments, but also have made an impact in their commitments to others at such early points in their careers.

How would you articulate your vision for the future and what role can students, faculty and staff play in carrying it out?

I am not so sure that any individual's vision should be the most important as it is our collective vision that matters. We want UMass Medical School to be an institution that shapes the health care environment of tomorrow and trains the health care professionals who will practice within that environment. Our commitments ensure that scientific inquiry, discovery and innovation are successful and translated to the benefit of human beings. In addition, the Medical School will continue to partner with our community to assure that its health and well-being are maintained. We will continue to recognize the responsibility we have to make an impact throughout the world.

These are the central elements of our new strategic plan, and if we can spend the next three to five years acting on those principles, then we will be successful. The best part about our strategic plan is that everyone was involved in creating it and everyone can be involved in living it. Our students represent the workforce of tomorrow and through their own discoveries, will have a global impact; faculty will continue to search for the answers our patients need and guide our students; and through the successes of Commonwealth Medicine and Mass Biologic Labs, we will support the scientific and human services commitments that set us apart as a world-class institution.

UMMS is attempting a broader reach outside the system with new partners and initiatives—what are your goals and objectives there?

We have made a broad outreach a most important element of our strategic plan, and I want to redouble the efforts the Medical School makes to meet our responsibility to protect and advance the health and well-being of the community. With our key clinical partner, UMass Memorial, we will identify a marquee initiative and spend the first part of 2009 discerning how we can make the most effective contribution to our local community.

What can UMMS do to appear unique and special to donors?

Our ability to align the needs of the institution with the passions of our donors is what will make our development efforts most successful. People support us for a variety of reasons, but the ties are strongest when there is that passion for a specific program or initiative. We are fortunate because many recognize that the early phases of science are the exact places to focus their resources, in part because of the "what if" factor. Translational research efforts are going to be important moving forward. The National Institutes of Health is focused on translational research, and we are applying for a Clinical and Translational Science Award because of the link between basic science discovery and its therapeutic application.

Ambros Receives Lasker Award, 'America's Nobel'

Victor Ambros, PhD, and his wife, Rosalind Lee, hold the Lasker Award, presented to Dr. Ambros in September. Lee is his lab manager and has been his chief scientific partner for more than 20 years since the two worked together at Harvard. They met as undergraduate students at MIT and have three grown sons.

"The [awards] honor investigators whose open-minded thinking and experimentation challenged conventional wisdom."

–Joseph Goldstein, MD

The Albert Lasker Medical Research Awards are the nation's most distinguished honor for outstanding basic and clinical medical research discoveries and for lifetime contributions to medical science. In September, the Lasker Award for Basic Medical Research went to UMass Medical School Professor of Molecular Medicine Victor R. Ambros, PhD, and colleagues David C. Baulcombe, PhD, of the University of Cambridge, and Gary B. Ruvkun, PhD, of Massachusetts General Hospital and Harvard Medical School. The three were honored for their discovery of tiny RNAs that regulate gene function. These RNAs, some of which are known as microRNAs, govern a multitude of activities in animals and plants, and they have been implicated in a wide range of diseases.

Drs. Ambros, Baulcombe and Ruvkun were presented the Lasker Awards at a luncheon ceremony on September 26 in New York City. Joseph L. Goldstein, MD, recipient of the 1985 Lasker Award for Basic Medical Research and the Nobel Prize in Medicine in 1985, chairs the 24-member international scientific jury that selects recipients of the Lasker Awards. He said that "the 2008 Lasker Awards honor investigators whose open-minded thinking and experimentation challenged conventional wisdom. Their work launched new fields of scientific research that have fostered significant advances in the medical arena."

The discovery of small regulatory ribonucleic acids (RNAs) by Ambros, Baulcombe and Ruvkun broke open an entire new field. Until that time, proteins, not RNAs, were thought to govern gene activity in animal cells. "No one imagined that such tiny RNAs could perform useful tasks. In fact, the notion that small RNAs could control gene expression was unheard of," Dr. Goldstein said. "Now, laboratories all over the world study hundreds of these RNAs." The tiny molecules control a vast number of genes in plants as well as animals and play roles in human health and disease, including cancer, viral infections and congestive heart failure.

Ambros and Ruvkun unearthed the first example of this type of molecule in animals and demonstrated how the RNAs turn off genes whose activities are crucial for development. Baulcombe established that small RNAs silence genes in plants as well, thus catalyzing discoveries of many such RNAs in a wide range of living things. His findings led to the identification of the biochemical machinery that unifies numerous processes by which small RNAs govern gene activity. Their work has led to the realization that these molecules are pivotal regulators of normal physiology as well as disease.

"It is wonderful and a true honor to receive this prestigious award with Drs. Baulcombe and Ruvkun. It reveals the many opportunities I have had to work with incredible mentors, students and collaborators," said Ambros.

The Lasker Awards are eagerly anticipated by the medical science community because of their singular prestige. The awards program, founded in 1945, is administered by the Albert & Mary Lasker Foundation, named for pioneer advertising executive Albert Davis Lasker and his wife Mary Woodard Lasker, a champion of medical research. The late Mary Woodard Lasker is widely recognized for her contribution to the growth of the National Institutes of Health and her commitment to government funding of medical research in the hope of curing devastating diseases. Her support for medical research spanned five decades and earned her the Presidential Medal of Freedom and the Congressional Medal of Honor. Since the first awards were presented in 1946, 75 Lasker Award recipients have received a Nobel Prize.

MassAHEC Marks Thirty Years of Health Careers Training

Joanne Calista, MS, executive director of Central Massachusetts AHEC (right) introduces her fellow directors who have cultivated the MassAHEC commitment to eliminating health care disparities through community engagement and workforce training. The directors are (left to right): Heidi Holland, MEd, AHEC of Southeastern Massachusetts; Peter Holtgrave, MA, MPH, Boston AHEC; Donna Rivera, MSW, Merrimack Valley AHEC; Brenda Evans, MPH, Pioneer Valley AHEC; and Timothy Diehl, MEd, Berkshire AHEC.

The Massachusetts Area Health Education Center (MassAHEC) Network celebrated thirty years of success at its "Accomplishment through Collaboration" reception at UMass Medical School in September. MassAHEC's six centers are hosted by UMMS across the state and connect students to careers, professionals to communities and communities to better health by inspiring and training a diverse range of health professionals to practice in communities where the need is greatest. The network focuses on eliminating health disparities through community engagement and fostering an ethnically and linguistically diverse, culturally competent health care workforce. Keynote speaker Joxel Garcia, MD, admiral of the United States Public Health Service and assistant secretary for health for the Department of Health and Human Services, noted the crucial role area health education centers play in addressing health care workforce shortages. "The model you have created in Massachusetts is a benchmark for replication in all 50 states," he said.

The reception also featured stories from participants. "I received the tools, education and network to help my community," said Rosa Fernandez-Penaloza, special projects coordinator in the UMass Memorial Department of Community Relations who graduated from the Central MassAHEC Outreach Worker Training Institute.

MassAHEC director Linda Cragin, MS, introduced the Health Careers Inspiration Fund, created to support activities for students from grade eight through post-graduate school and facilitated by the UMass Memorial Foundation.

President's Awards Recognize Faculty Public Service

Service to the commonwealth is a key element of the University of Massachusett's mission. Faculty members who apply their academic or professional expertise in addressing priority needs of the commonwealth, such as K-12 education, economic development, workforce development, health and environment innovation, or international linkages for Massachusetts, are recognized for their contributions. This year, Deborah Harmon Hines, PhD, professor of cell biology and vice provost for School Services, and Jean A. King, PhD, professor of psychiatry, vice chair of research for the Department of Psychiatry and director of the Center for Comparative NeuroImaging, are the UMass Medical School recipients of the UMass President's Public Service Award.

Dr. Harmon Hines led the development of the Worcester Pipeline Collaborative (WPC) to provide activities to local elementary, high school and college students. The WPC has grown to include mentoring, job shadowing, tutoring, clinical and research internships, laboratory opportunities, after-school science programs, visiting scientist programs and a speakers' bureau. The WPC has also expanded to encourage family involvement in activities and to offer teachers opportunities for professional development. Current WPC activities involve more than 6,000 K–12 students in eight Worcester elementary schools, a middle school and two high schools.

Dr. King has been instrumental in the work of Daybreak Resources for Women and Children of Worcester for a decade. Daybreak is a non-profit organization that provides shelters and services for victims of domestic violence. In her roles as board

Medical students Lara Jirmanus (left) and Olga Valdman were two of just five medical students throughout the country honored by the Pisacano foundation for their leadership as scholars, community service advocates and future physicians in family medicine.

School of Medicine Students Awarded for Leadership

The American Board of Family Medicine awards the annual Pisacano Leadership Scholarships to only five medical students throughout the country, and this year, two UMass Medical School students—Olga Valdman, SOM '08, and Lara Jirmanus, SOM '09—received the prestigious award.

"It is quite rare to have more than one scholar selected from any particular school," said Robert J. Cattoi, executive director of the Pisacano Leadership Foundation. "This speaks to the quality of candidates from UMass Medical School who embrace the philosophy of family medicine." Valdman and Jirmanus will participate in the Pisacano Scholars Leadership Program and will receive scholarship funds up to $7,000 per year for up to four years to support the cost of their education.

The Pisacano Leadership Foundation aims to identify and foster the future leaders in family medicine, and the Pisacano Scholars are selected through an extremely competitive process during their final year of medical school. Scholars are noted for their demonstrable leadership skills and superior academic achievement, as well as their community service.

Valdman started a non-profit organization called the African Community Education (ACE) Program as an outgrowth of her participation in the Community Health Clerkship on Immigrant and Refugee Health. ACE initiated a Saturday school for 40 immigrant children from Africa, focusing on English, mathematics and the arts. As a result of Valdman's leadership and grant-writing, ACE received funds from the Massachusetts Department of Education. Valdman has also helped with the development of an alternative Spring Break for UMass medical students that has led to an annual medical mission to the Dominican Republic.

"I am very excited about opportunities this award brings to meet other young leaders in family medicine who are motivated and passionate about bringing the best quality care to people from all over the world," said Valdman.

Jirmanus has served as student co-coordinator of Universities Allied for Essential Medicines, led UMass student relief efforts for the victims of Hurricane Katrina, initiated and co-coordinated an optional enrichment elective for medical students about health issues affecting Worcester residents, founded the Central Massachusetts Coalition for Middle Eastern Peace and helped organize Worcester's first Middle Eastern Film Festival. She has participated in Physicians for Human Rights, the Immigrant Rights Coalition and the Health Disparities Coalition. Her classmates awarded her the Student Body Committee Leadership Award in 2006.

"I'm truly honored to receive this award. It is a testament to the wonderful mentorship we have received as students pursuing careers in primary care," said Jirmanus.

member and chair, Dr. King has organized countless fund-raising events to support programs for battered women, and in doing so, has increased awareness and encouraged involvement on the part of the community in the prevention of domestic violence. She has also helped raise tens of thousands of dollars for shelters in the Worcester area.

Expanding Excellence

UMass Medical School takes a new step to face the physician workforce shortage.

This fall, 59 women and 55 men entered the

first-year class at UMass Medical School. Fourteen members of the class are first-generation college students, representing their families in graduate-level higher education for the first time. Students are undergraduates from schools including Boston College, Cornell, Georgetown, Harvard and UMass, and the class's average GPA is 3.65. They are socially and professionally as strong as they are academically; they have been music teachers, Peace Corps volunteers, hospice interns, camp counselors. One is a paralegal, one an Iraq war veteran. For fun, they love to ballroom dance, play the Scottish fiddle, write songs, act and compete in ultimate Frisbee.

The students in the Class of 2012 are much like members of previous School of Medicine classes—just as accomplished and just as committed to being the best physicians they can be. The difference this year is that there are more of them. Eleven more, in fact, and there will be even more in the fall of 2009, when the entering class size is expected to reach 125, up from 103 in 2007. Such an increase brings both opportunities and challenges for UMMS leaders, faculty and staff. More students in classrooms, clerkships and clinics create impacts on costs and curricula that are still being quantified by planning teams. UMMS has mobilized over the last several months to respond immediately to the needs of this year's entering class and to plan for those needs when expansion continues in the years ahead. The institution is doing so against the backdrop of national and state trends that go directly to the issues of access and delivery of health care services to millions of Americans.

In Massachusetts, the Health Care Reform Plan of April 2006 dramatically reduced the number of uninsured residents in the state, bringing more than 300,000 people into the health care system. But the demand for primary care physicians has increased as a result, with the existing supply of practitioners in the state straining to keep up. Meanwhile, the nation's population has grown by more than 40 million since 1980 and life spans of Americans continue to increase, creating need for more complex and longer lengths of stay for hospitalized patients.

At UMMS, a strategic planning initiative this year with clinical partner UMass Memorial Health Care brought to the fore the unique position the institutions hold in helping to build the physician workforce that will meet the needs of the commonwealth. A law Governor Deval Patrick signed in August will help UMMS in its proactive response by providing greater tuition incentives for students who agree to practice primary care in the state for four years.

So now, UMMS joins medical schools across the United States as they undergo the largest expansion in 40 years. In 2006, 93 of

By Andrea L. Badrigian

For adults, the physician shortage revolves around generalist care; for children, subspecialties are in demand. "We are reaffirming our commitment to train the primary care workforce in Massachusetts, but in a broader sense, we are being responsive to the health care needs of people of this state."

–Dean Terence Flotte, MD

the nation's 125 medical schools (there are now 129) reported an existing or expected increase in first-year enrollment over 2002 levels. Overall, medical student enrollment is expected to increase by at least 20 percent from 2002 to 2013, with most of that increase coming from expansion of class size. And as schools admit more students they must also build the necessary staff and services to assist them.

Physically Fit

UMMS must report its plans for expansion to its accrediting body, the Liaison Committee on Medical Education (LCME). In its September 2008 report, UMMS detailed impacts of the class size increase from 103 to 114 on educational space and facilities; instructional staff, such as faculty and residents; clinical facilities and patient volume for required clerkships and electives; capacity of student services such as student affairs and financial aid; and the depth of the applicant pool. The report assures the LCME that UMMS is balancing student enrollment with the total resources of the institution; a substantial imbalance in student enrollment relative to resources, the LCME states, may have a negative impact on educational program quality.

Assistant Vice Chancellor for Administration Paulette Goeden is a member of the UMMS team that prepared the LCME report on the class size expansion this fall. "My role was to go through all the data I received from the curriculum and clerkship directors as well as facilities, the library, registrar and financial aid concerning their needs and then put together a formula on the cost to the institution as a result of the class size increase."

Goeden said that resources are in place to accommodate the expansion of this year's entering class, while maintaining the quality, depth and richness of UMMS educational programs. This year's modest expansion will not call for substantial new resources, with departments absorbing minimal costs and already available institutional funds covering others.

"I think everyone really stepped up to the plate and was enthusiastic about the increase, but faculty and departments had legitimate concerns that we are addressing," she said. "In some of the first-year courses, Anatomy, for example, we want to make sure there are adequate faculty members in labs who can address student questions. Other areas concern financial aid, and the institution has agreed to increase aid available to students."

Goeden described areas where administrative staff increases are called for this year. "There is a constant accreditation process when it comes to graduate students, including those in medical school. The Registrar's Office must process daily licensing forms and provide additional supporting documents such as transcripts, certified copies of diplomas and Medical School Performance Evaluations to various institutions and agencies. We determined that the volume of work for the offices of the registrar and financial aid would increase and approved a position to be shared between the two."

Classroom spaces for first-year students were assessed and first-year classes moved to a larger amphitheater so that medical, nursing and biomedical sciences students who attend together can be comfortably accommodated. Breakout rooms and study spaces that reflect the current trend in medical education for small group learning have room reservation priority.

Several existing facilities are being modified for next year's expected larger class, and the state has committed capital funds—$3.68 million—for renovations and upgrades to lecture halls, small group teaching rooms, amphitheaters and other spaces that support education and the needs of students, according to Mark Armington, associate director of the Facilities Engineering and Construction Department.

Areas being considered for technology/AV upgrades are student-dedicated independent study spaces and the Anatomy and Pathology Teaching Labs. All changes are based on input from faculty and students and studies of how other leading medical schools are conducting their expansion work. "We're accomplishing this within existing space and if we can learn from similar institutions, we can use some established methods while still responding to our unique needs," said Armington.

Reflecting on these short-term measures, he added, "Paulette Goeden's group has no easy task—space is tight and all departments are working together to share the space we have."

Goeden looks down the road and notes, "As we go larger we are going to have to address space issues." Perhaps that space will be found in the Albert Sherman Center slated for groundbreaking in 2009 and completion in 2012. The space committee is actively discussing what programs will be located there, and teaching and student space is a high priority, Goeden said.

The Expansion of Diversity

Dean of the School of Medicine Terence R. Flotte, MD, has been in the thick of the strategic planning process, with a keen eye on the goal of designing the workforces of the future in medicine and the health sciences. "The preponderance of data and the official position of the Association of American Medical Colleges is that there is going to be a substantial shortage in this country, and we will not be immune from that," said Dr. Flotte, who also serves as provost and executive deputy chancellor. "We are reaffirming our commitment to train the primary care workforce in Massachusetts, but in a broader sense, we are being responsive to the health care needs of people of this state, and in this area, I put a finer point on it than some." Flotte explained that currently for adults, the physician shortage revolves around generalist care, while for children, subspecialties are in particular demand. "We need to be certain that the way we develop the expanded enrollment meets a variety of goals and objectives."

Along with these nuances in health care needs, Flotte is emphasizing the opportunity the expansion offers for increased diversity in the student population. Here again, there are distinctions. "We will define that diversity to meet the needs of the state," said Flotte. "Up until now, the diversity reporting generally to LCME has been students underrepresented in medicine nationally. Now, each school is allowed to define what its diversity goals are, and there are groups in Massachusetts not in the definition that we feel we need to be responsive to." He noted that Southeast Asian populations are not considered underrepresented in medicine nationally, yet they represent an important population in Massachusetts. Other recent first-generation immigrants to the state are not in the definition either. "The expansion allows us to have more flexibility" in recruiting students who reflect those populations.

Flotte said that the diversity effort must tap into the other UMass campuses. He noted that data on students from underrepresented groups who entered UMMS in 2007 showed that ten came from UMass undergraduate programs. UMass Boston, for example, is quite diverse, with close to 40 percent students of color on campus, according to Flotte. "The other campuses have lower percentages, but we've been in detailed discussions with the provosts about how to channel these students here in a better way." He also noted the long-standing success of the Worcester Pipeline Collaborative, the outreach initiative started more than ten years ago by UMMS and community partners to develop interest by Worcester school children in careers in health care. "We will continue to support its existing programs and reach out in even more active ways," said Flotte. The challenge UMMS faces is that it must admit students who are Massachusetts residents (unless they are MD/PhD students, who may be residents of any state). "The population of students who graduate from Massachusetts high schools who meet the residency requirement, who are underrepresented, and who are now at the stage of applying to medical school is just 50-60 each year. That's for the whole state," said Flotte. In most years, almost all of those students apply to UMMS, but many apply to other schools as well, and highly qualified students of color are sought after.

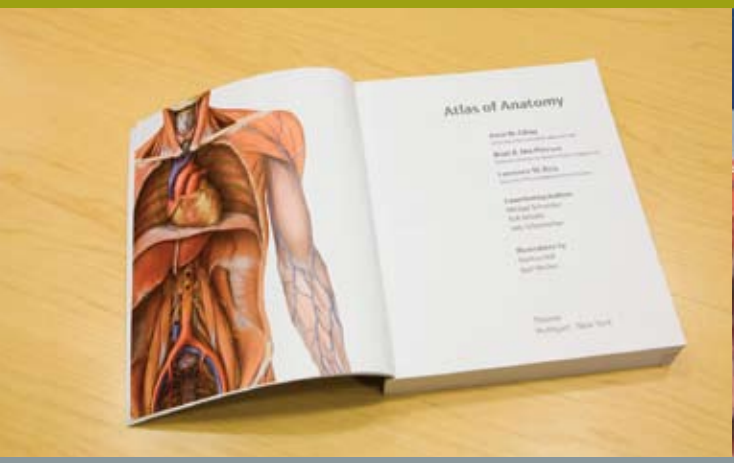
No matter what the background of the student, this year's class size expansion did not deplete the applicant pool, nor will the anticipated increase next year to 125 students and a potential 30 percent increase overall in the class size, according to Dean of Admissions John A. Paraskos, MD, and Karen J. Lawton, director of Admissions. Each year their office receives 600-800 applications. "Every year we are turning away people with excellent credentials," said Dr. Paraskos.

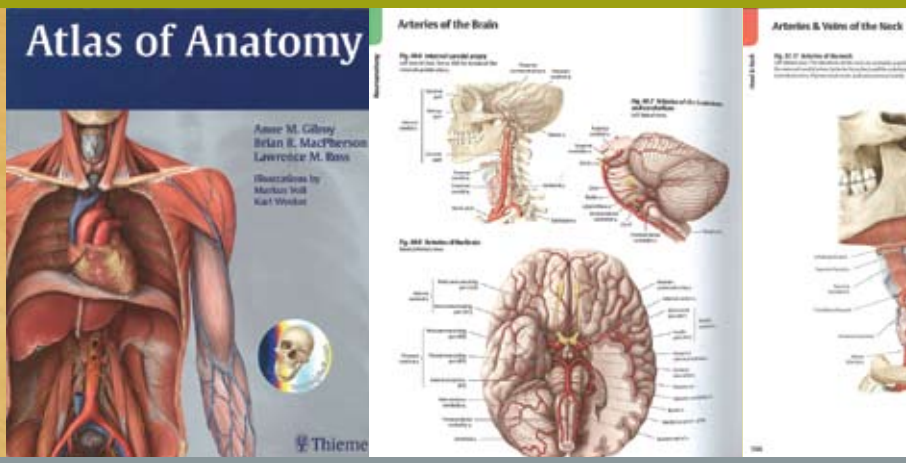
On the Ground, In the Clinic

The Office of Student Affairs provides a range of services for medical students throughout their four years at UMMS, from helping students form organizations to advising them on their academic and career paths. Another vital responsibility is helping to assign students to clerkships in their third year, according to Associate Dean for Student Affairs Mai-Lan Rogoff, MD.

"Our challenge will be to manage the fluctuation in the third-year class size that typically occurs as a result of the flexibility we offer our students upon completing their second year," said Dr. Rogoff. Each year, a number of students leave the ranks to take advantage of educational enrichment opportunities, such as research or international service programs or enrollment in a master's in public health program. Still other students may take a leave to start their families. Since these students don't all come back at the same time, planning must be done to anticipate the impact of the fluctuation on the third-year class size. Rogoff and her staff are working to ensure a high level of support for students who will need advising, career guidance and residency application services in their third and fourth years.

One of the clerkship directors Rogoff works with to place third-year students is Frank J. Domino, MD, associate professor of





All new medical students at UMMS study anatomy, and beginning in 2008, they are fortunate to open an innovative new volume on the subject, co-written by UMMS assistant professor of cell biology and surgery Anne Gilroy, MA. The *Atlas of Anatomy* is an unprecedented interpretation of the classic genre, illustrated by award-winning medical artists. Gilroy directed the book's organization and wrote the text that amplifies the 2,200 exquisite full-color drawings (examples above). The atlas leads students step by step through the regions of the body, beginning with each foundational skeletal framework. Subsequent chapters add the muscles, organs, vessels and nerves, finally presenting topographic anatomy for a comprehensive view. Each unit closes with surface anatomy accompanied by questions that ask the reader to apply knowledge learned for the real-life physical examination of patients. Companion flash cards and a Web site enhance the book with additional study tools.

Family Medicine & Community Health. He explained that during the six-week Family Medicine clerkship, students spend four days a week at their community preceptor's office. There, students typically arrive at ambulatory clinic settings at 8:30 a.m. and see patients with community-based preceptors until 5 p.m.

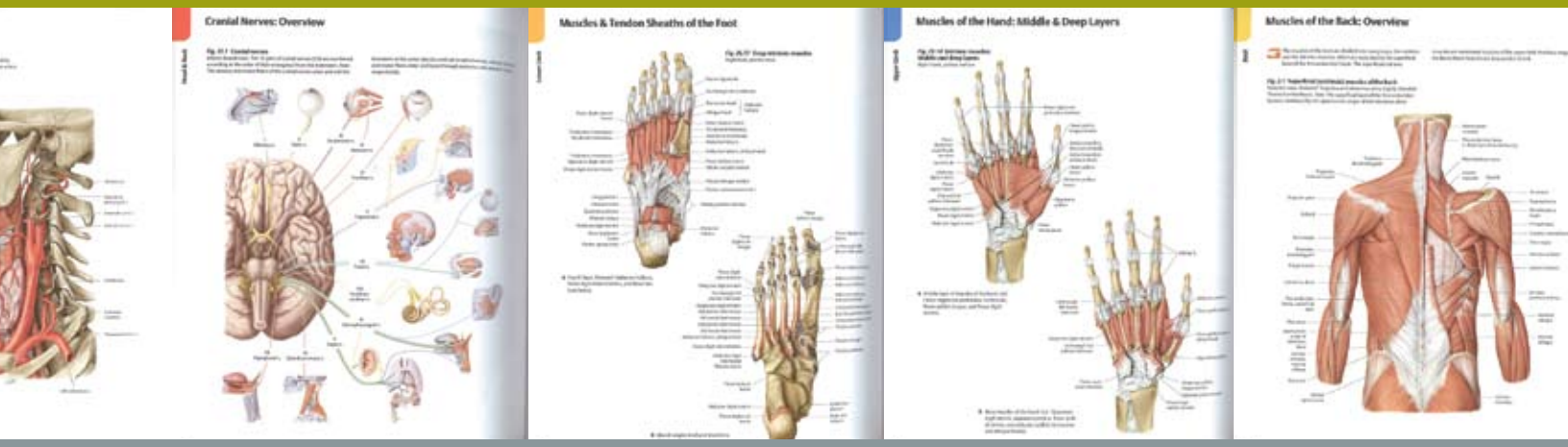
With a sufficient number of preceptors, the clerkship rotation works well and is evaluated positively by students. But Dr. Domino sees challenges ahead with the class expansion. "We are hearing increasingly that the community doctor has less time to discuss cases with students," said Domino, who cites the growing patient load primary care physicians are taking on as the reason.

"Increasing the class size is a fabulous idea and the goals are wonderful, but I'm concerned we will be asking our community preceptors to take on more students when their time and reimbursement are both severely lacking. Working with a rushed and stressed preceptor will likely make the student experience less valuable," Domino said. Along with other clerkship directors, he is working with the expansion planning team to recruit new community-based preceptors, building upon a large and well-developed pool of community-based faculty. Domino and his colleagues in the department will recruit through outreach to family medicine physicians who move to Massachusetts and at conferences such as those hosted by the Massachusetts Academy of Family Medicine. They also look to UMMS alumni and UMass Memorial Health Care member and affiliate hospitals as well as hospitals outside the system to offer clinical teaching opportunities.

Domino added that as the state has made a commitment to increasing the class size at UMMS, it is critical that a commitment also be made to increasing the attractiveness of practicing primary care in the commonwealth. "Strategies could include developing a universal billing system or improving the reimbursement structure, so a community-based primary care physician who is teaching our students need only see 16 patients per day rather than 22 to be adequately compensated. I would like to tell them: 'if you take a student, you can see even fewer patients so you have time to teach the learner.'"

Dean Flotte agrees that the biggest challenge presented by the class size expansion is developing additional teaching sites for clinical rotations in the third and fourth years, particularly the third year and particularly when the class size reaches the planned level of 125. "Bringing on a new clinical teaching site is complicated," he said, but he added that UMMS has an important opportunity through the increase to enhance clinical experiences around primary care. "We've been thinking of some additional sites that might provide more of a community hospital kind of feel to the experience and some innovative ways to structure those experiences to make them more longitudinal. How those sites are developed and how much primary care flavor they have, that is the major task yet to be solved. It will have the most added value, though."

Prime candidates, after adding sites at the UMass Memorial Medical Center University and Memorial campuses, include other member hospitals such as HealthAlliance Hospital in Leominster/Fitchburg and Marlborough Hospital. Rotations in ambulatory clerkships such as family medicine, as well as



Educational leaders are thrilled with the coincidence of the class size increase and the curriculum redesign process underway. "The stars are aligned on this in the sense that we have a vision for what we want our new curriculum to look like. Growth in the class... allows us to do it right the first time."

–Michele Pugnaire, MD

inpatient rotations in medicine, ob/gyn and surgery, have great potential there. Expansion at other educational affiliates, such as Milford Regional Medical Center, Saint Vincent Hospital and Berkshire Medical Center also provide opportunities in these and other rotations including pediatrics, neurology and psychiatry. "We will fit the additional sites to the specific rotations and look to more distant sites that have the facilities and technology, such as teleconferencing and electronic medical records that have value for students."

Flotte said that UMMS plans to stay at the level of 125 students for a period of "settling in and reassessment. It will depend on how that transition goes. If, as those students complete their clinical years we get feedback that the sites are terrific, we will listen to that. A critical aspect of our planning process will be continuous evaluation from our faculty and students. We will obviously take our cues on the pace of expansion based on this information."

Curriculum Changes Dovetail with Increase

As director of the Standardized Patient (SP) Program at UMMS, Wendy Gammon works with students during all four years of their medical school experience. The SP program provides highly trained actors who portray their patient roles for the students who conduct medical interviews, examine them and then receive the SP's feedback. The UMMS program, with its more than 100 SPs, is one of the most highly regarded in the country, not only training medical school and nursing students here but for all three sister medical schools in Boston.

Gammon's program sees every single student in their first year through small group medical interviewing practice sessions. In years two and three, students and SPs go one-on-one. During clerkship blocks, all students are allowed to take part in required multi-station clinical exams with SPs. It's no surprise then that Gammon will be recruiting more of them as the class size increases.

The SP program is an essential component of the Medical School curriculum, which has been going through a multi-phased redesign process begun in 2005 with a completion date expected sometime in 2012. But instead of feeling trepidation about the effect of the class size increase on that redesign, educational leaders at UMMS are thrilled with the coincidence of these two transformative events. "This is an exciting time to reinvent, if you will, our medical school education," said Dean Flotte.

"The stars are aligned on this in the sense that we have a vision for what we want our new curriculum to look like," said Michele P. Pugnaire, MD, senior associate dean for Educational Affairs. "So we will take everything up a notch. It makes sense to do it all together. Growth in the class as we are redesigning the curriculum allows us to do it right the first time."

For students interested in primary care, UMMS can invigorate the curriculum to encourage long-term relationships between students and faculty and students and patients, said Dr. Pugnaire. "Continuity is one of the greater rewards for students in primary care and we should shore this up," she said.

"The growth in size is right in keeping with where we are going anyway, which is more opportunity to learn interprofessionally, across all three schools at UMMS. All are pointing in the same direction with enhanced technology, experiential learning, faculty development, diversity and health care quality. The methods by which we teach and the resources we need are converging," said Pugnaire.

That is particularly true when it comes to technology and the role it increasingly plays in today's medical education. "The timing of the class size increase couldn't be better because of our current initiatives to introduce additional state-of-the-art learning technologies," said Chief Information Officer Robert P. Peterson. "The fact that the school has a plan allows us to make the correct investments in technologies that will improve the learning experience over time."

The school has explored establishing an advanced learning center and enhancing its virtual microscopy classrooms, where students break into groups to study a variety of organs through digitized slides, and if a question comes up, the instructor can project the answer to the whole class in the form of a three-dimensional model.

"The trend now is for flexible space, with chairs and tables that fold up so you can arrange a room as a traditional lecture class or for small groups," said Associate Chief Information Officer Ralph Zottola, PhD. "We're in these processes because of the way student learning is being done; we're moving from someone being at the head of the class to people breaking up into small teams." All along the way, technology questions regarding hard wiring vs. wireless, sound systems, plasma screens, video conferencing and microphones come to the fore.

"The faculty is ready, in the sense that with the curriculum redesign, they are looking for technology in the classroom to support their educational objectives," said Zottola. "It's not just changing the class size; it's changing how we teach."

Expanding Excellence

Senior Associate Dean for Educational Affairs Michele Pugnaire has noted that when it comes to class size increases, medical schools throughout the nation "have no reference text on this, so many of us are doing this for the first time. I see increasingly that one best practice is to communicate it broadly. The other is that you engage people across all aspects of the institution, because the devil is in the details" when it comes to ensuring educational excellence.

Dean D. Douglas Miller, MD, of the Medical College of Georgia (MCG) School of Medicine is in complete agreement. He has overseen one increase—from 180 to 190 freshmen in 2006—and will do so again in fall 2010, when 200 freshmen are scheduled to enter the MCG campus in Augusta. A school that already has the 19th largest class size in the nation, MCG plans to eventually reach a level of 300 students, an increase of 60 percent. Georgia has been experiencing the national trends, with a growing and aging population and shortage of physicians. (The state ranks 40th in the nation in the ratio of physicians per population, slipping three points in the last few years.)

Under the expansion plan, the school will grow at its home base of Augusta and at clinical campuses in southeast and southwest Georgia and through a whole new campus in Athens in partnership with the University of Georgia. By 2020, the university plans to have a class size of 240 in Augusta and 60 in Athens.

To enable growth to 200 students in Augusta by fall 2010, MCG renovated two major lecture halls, has increased the number of clinical preceptor sites and will spend about $3 million to expand and add classrooms. Plans include a new School of Medicine building for up to 250 students per class at the Augusta campus.

"A major ongoing expense is faculty expansion and recruitment, to go to a four-year campus in Athens in 2010," said Dr. Miller, who is in his third year at MCG after serving as chair of medicine at Saint Louis University School of Medicine. "The state has prioritized this funding and it is fully based on budget needs."

Miller has worked with many stakeholders and advises that "you can't over communicate enough to all of them." Throughout the process, he has maintained the core message of continued educational quality. Quoting Stephen R. Covey—"The main thing is to keep the main thing the main thing,"—Miller said that managing the quality vs. quantity trade off is essential. "Expansion is the vehicle, quality is at the forefront."

Discoveries from Data

UMass Medical School's bioinformatics experts use the tools and power of computing to interpret vast amounts of information for biomedical breakthroughs.

By James R. Fessenden

In today's research labs, biomedical scientists accumulate a suffocating amount of data. A single experiment can elicit thousands of molecular data points per day in the form of genome sequences, genes, proteins and nucleosomes (the "packing unit" containing the DNA double helix) and the interactions among them. Organizing, interpreting and making sense of the information are tasks that increasingly fall to bioinformaticians, such as Professor of Biochemistry & Molecular Pharmacology Zhiping Weng, PhD, director of the new program in Bioinformatics and Integrative Biology (BIB) at UMass Medical School.

Until recently, all this information had created a log jam for researchers—the computational tools and computing power needed to synthesize data had been missing. "It used to be that gathering data was the bottleneck," said Dr. Weng. "You might only get one or two data points per day from an experiment. Now you can get tens of millions of data points per day, and researchers are limited only by their ability to process all that data."

Weng uses cross-discipline expertise in computer science, applied mathematics, statistical modeling and biology to detect patterns in a genomic sequence, predict gene functions and expression, and develop models detailing how the cells, genes and proteins of a biological system interact. With bioinformatics, clinical applications come sharper into view.

"There's no question that for us in the labs, this is a hugely valuable resource," said Michael R. Green, MD, PhD, Howard Hughes Medical Institute Investigator and the *Lambi and Sarah Adams Chair in Genetic Research* at UMMS. Dr. Green was an early advocate for a program in bioinformatics at the Medical School. "As technologies have advanced and the amount of information available to bench scientists has increased, the ability to analyze large amounts of data has become increasingly critical to current research."

The field of bioinformatics has its roots in DNA sequencing, the mechanism used to determine the order of the nucleotide bases adenine, guanine, cytosine and thymine that make up DNA. Though bioinformatics has been around by one name or another since the 1970s, it wasn't until the late 1990s, with the Human Genome Project and other DNA sequencing projects, that the term began to populate scientific journals. The availability of sequenced genomes has been revolutionizing all aspects of basic and clinical research since.

To get a sense of the amount of information that these projects produced, you need only look at the size of a human genome. It has six billion nucleotides which, when each is represented as a letter, amount to slightly more information than would fit on a standard, 750MB compact disk.

The influx of data has been greatly expedited in the last several years due to low-cost, high through-put DNA sequencing technologies. For example, the Solexa sequencer currently available at UMMS generates 1.5 trillion bytes of raw data per run. These and upcoming sequencing technologies will allow routine re-sequencing of human genomes, making personalized medicine possible by allowing treatments to be tailored according to the genetic background of the patient.

Yet, most bench scientists are not trained to develop or apply the algorithms and computational tools that are needed to analyze the data. At the same time, computer scientists can write the algorithms but don't necessarily know how to approach problems like sequence alignment without understanding the basic biology, according to Jonathan Wren, associate editor of the journal *Bioinformatics*.

Bioinformatics scientists, versed in both biology and computational sciences, are the people who can deal with this staggering information overload.

As chair of the Department of Biochemistry & Molecular Pharmacology, C. Robert Matthews, PhD, joined Dr. Green in advocating for a bioinformatics program at UMMS. At that time, both scientists were looking to hire bioinformaticians for their labs to help them in their experimental research and recognized that to attract top talent in the field, the Medical School needed to build a strong core of faculty in the area.

"As a researcher, you want other like-minded researchers who you can bounce ideas off of and discuss problems with," said Dr. Matthews, the *Arthur F. and Helen P. Koskinas Professor.* "Having a program in bioinformatics on campus means there is a group of people keeping abreast of the latest techniques in the field, as well as propelling the field forward."

On the academic side, bioinformatics has become an increasingly hot area, said Green, who is a professor of molecular medicine, biochemistry & molecular pharmacology and surgery. While many of the pioneers in the field, such as Weng, were trained in other disciplines, tomorrow's leaders in the field will be coming out of academic programs such as the one at UMMS.

"Part of our goal is to educate students in the most exciting areas of biomedical science, and bioinformatics is an area where there is a lot of interest and demand in industry," said Green.

Weng has already hired one faculty member to join her in BIB, Assistant Professor Konstantin Zeldovich, PhD. She plans to hire four more faculty over the next three years.

Bioinformatics and the Lab

As the program grows, faculty members in the bioinformatics program will collaborate with experimental researchers to develop unique computational tools that address their specific research interests. What's more, and key to the power of bioinformatics, they will also perform their own research into biological problems and develop a hypothesis about them.

"We do experiments and feed bioinformaticians data to test our hypothesis," said Professor of Biochemistry & Molecular Pharmacology Phillip D. Zamore, PhD, Howard Hughes Medical Institute Investigator and the *Gretchen Stone Cook Chair in Biomedical Sciences.* "But it also works the other way. They look at data and form a hypothesis that might explain the patterns they see, which we can then test in the lab." Weng started to collaborate with Dr. Zamore soon after she arrived at UMMS.

"Letting the data speak for itself is a very important role for bioinformatics," said Weng. "Experimentalists tend to focus on their own data and have preexisting notions about the data. Researchers in bioinformatics look at the data generated by many groups without bias and oftentimes can discover novel biology as a result."

For example, using data sets from dozens of sequencing experiments done in different laboratories, Weng and graduate student Yutao Fu performed an integrative analysis and found a pattern that had been overlooked by all the data generators. They discovered that a human protein named CTCF—which normally binds to insulator elements in the human genome and prevents enhancer elements from activating the wrong genes—are flanked by well-positioned nucleosomes genome-wide. This phenomenon had never been reported for other DNA-binding proteins. From this observation, she formed a hypothesis: CTCF plays a role in positioning the nucleosomes.

To test the hypothesis, Weng approached Craig L. Peterson, PhD, professor of molecular medicine and biochemistry & molecular pharmacology, who said that his lab could easily test the reverse of the hypothesis—in other words, whether the pattern of nucleosomes around CTCF-binding sites remains the same without CTCF. The lab reconstituted nucleosomes in the absence of CTCF and observed a different pattern, suggesting that CTCF positions the nucleosomes. The study has been recently published in the high-profile, open access journal *PLoS Genetics.*

This kind of collaborative effort is a hallmark of research done at UMMS and is one of the reasons Weng was attracted to the University. "Collaboration brings out the best in both labs," she said.

Besides detecting patterns by integrative analysis, bioinformatics scientists also explore ways to predict how changes on the

Michael Green, MD, PhD (above), was an early advocate for a program in bioinformatics at UMass Medical School. "Part of our goal is to educate students in the most exciting areas of biomedical science, and bioinformatics is an area where there is a lot of demand in industry." On page 13, Zhiping Weng, PhD, director of the new program in Bioinformatics and Integrative Biology, is in her data element.

Organizing, interpreting and making sense of vast amounts of biomedical data are tasks that increasingly fall to bioinformaticians at UMass Medical School. "Having a program in bioinformatics on campus means there is a group of people keeping abreast of the latest techniques in the field, as well as propelling the field forward."

–C. Robert Matthews, PhD

molecular level might affect an organism. For instance, Dr. Zeldovich is investigating how protein structures influence biological evolution and how genetic mutations or changes to a particular gene sequence can change the reproductive rates of a virus. "There are some very interesting and testable predictions that emerge from this line of thinking," he said.

Using mathematical computations, Zeldovich, who has a background in polymer physics, can predict how a mutation might affect how a protein functions and thereby make a virus unstable. This could have significant implications for drug development. "Some antiviral therapies work by increasing the mutation rate of a virus," said Zeldovich. "Using algorithms we can determine what mutation rates might make the virus unstable. Drugs targeted to achieve this mutation rate might have a higher level of success in destabilizing the virus."

Perhaps one of the biggest opportunities—and challenges—for bioinformatics is modeling, or understanding how a biological system works on a molecular level. "For 50 years, biology has been using deductive reasoning to figure out how organisms work. We have to put all those pieces back together to see how it all fits," said Matthews. "Bioinformatics can help us put Humpty Dumpty back together again."

"There's no question that bioinformatics is very important clinically," said Terence R. Flotte, MD, dean of the School of Medicine, provost and executive deputy chancellor and professor of pediatrics. "The more we understand about how these processes relate to each other and how they might relate to disease, the closer we'll be to developing clinical answers."

Researchers are desperate for clinical answers to AIDS. There is a vast, interconnected network of 200 human and viral proteins involved in the life cycle of HIV, which causes AIDS. Scientists working in a lab would have to conduct thousands of experiments to determine how those proteins interact and what combination of proteins might be the most susceptible to treatment. "Not only would this be a tedious project, but you would have a hard time knowing where to start," said Matthews. "But with bioinformatics, it's possible that combination of variables can be reduced to a more manageable amount—perhaps as few as a dozen."

Indeed, understanding how biological systems, such as the HIV life cycle, work may be the ultimate frontier for the field of bioinformatics. "We're long past the point of the Renaissance man—one who understands many different fields," said Wren of *Bioinformatics*. "With so much information, our best bet for really understanding what is going on will be done at a computational level. Bioinformatics will be the way to figure out how to do that."

Zhiping Weng, PhD (left), was attracted to UMMS from Boston University because of its reputation for partnership among researchers. She says that such "collaboration brings out the best in labs" focusing on bioinformatics and basic biomedical science. C. Robert Matthews, PhD (center), chair of the Department of Biochemistry & Molecular Pharmacology, and bioinformatician and Assistant Professor Konstantin Zeldovich, PhD, join her in discussing data generated through cross-discipline expertise in computer science, mathematics, statistical modeling and biology.

Nursing's Next Level

Whether at the bench or the bedside, in the classroom or the boardroom, the Doctor of Nursing Practice program promises advancements in patient care.

By Sandra L. Gray

It is five o'clock and they've already put in

long days, but the four nurse practitioners are enthusiastic as they gather for an evening class. They are a dedicated and accomplished group: Dawn Carpenter, MS, RN, is the lead NP for the surgical intensive care units at the UMass Memorial Medical Center University and Memorial campuses; Vinetta M. McCann, MS, RN, splits her time between medical and surgical units; Robin M. Sommers is a medical oncology NP specializing in gastrointestinal cancers at the Dana-Farber Cancer Institute outpatient clinic; and Mary E. Sullivan, MS, RN, specializes in surgical oncology at UMass Memorial.

The inaugural class of the Graduate School of Nursing's Doctor of Nursing Practice (DNP) program, Carpenter, McCann, Sommers and Sullivan are excited to be pioneers on the newest frontier in advanced practice nursing education. "I have always wanted a doctorate but the nurse scientist PhD did not necessarily support my goals," said Sullivan. "The DNP offers the clinical niche I seek at the doctoral level."

In response to the increasing complexity of health care and shortages of both primary care physicians and advanced practice nurses, in 2004 the American Association of Colleges of Nursing (AACN) issued an historic position statement with the charge to elevate educational preparation for advanced practice nursing from the master's to doctoral level by the year 2015. With approval last spring from the University of Massachusetts Board of Trustees, the GSN joined nursing schools across the nation in preparing nurse practitioners to become leaders of interprofessional health care teams.

"The hallmark of the DNP is to improve quality and outcomes—the emphasis is on better health care for our patients," said Kathleen H. Miller, EdD, RN, professor of nursing, associate dean for Advanced Practice Programs and director of the DNP program. Along with GSN Dean Paulette Seymour Route, PhD, RN, Dr. Miller and the DNP faculty, including Rosemary Theroux, PhD, RN, launched the program well in advance of the AACN's 2015 target, putting the GSN at the vanguard of this significant transition.

The DNP prepares advanced practice nurses for leadership roles in clinical practice and education, distinct from the Doctor of Philosophy in Nursing which focuses on creating new knowledge through research. The GSN will continue to offer the PhD program for nurses interested in research-focused academic careers, while the DNP will be the degree for nurses interested in practice-focused careers with direct patient care that intersects with evidence-based practice, quality improvement, health care administration, program evaluation and clinical faculty roles. Both doctoral programs will share faculty and resources to enrich and inform each other.

Beginning with the launch this fall of the DNP program for advanced practice nurses already possessing a master's degree, the GSN will incrementally phase out the current master's program for nurse practitioners over the next five years; the current Graduate Entry Pathway (GEP) program will become a GEP to DNP pathway. The GSN will further collaborate with DNP programs at other University of Massachusetts campuses. In 2006 Amherst was the first UMass campus to establish its DNP, and UMass Lowell and UMass Boston had theirs approved along with UMass Medical School's this spring.

The GSN has added course work to its already rigorous foundational master's curriculum to achieve AACN standards for DNP programs. Students will take seven new courses including research and theory, health care economics and systems leadership, and population health. They will refine leadership skills during their clinical residencies. And they will complete a capstone project applying nursing science to measurably improve the quality of care and outcomes for patients in a particular setting.

"As nurse practitioners we are already turned to as experts. We teach nursing students, and our colleagues, including physicians, come to us for advice," said McCann. "A Doctor in Nursing Practice degree will make me a more effective leader by advancing my skills and knowledge in nursing as well as my ability to successfully interpret fundamental research findings."

Indeed, applying research findings to improve patient care is an essential goal of DNP practice and of UMass Medical School at large. Already engaged in the development of a gastrointestinal cancer database and a Phase I solid tumor vaccine trial with principal investigator and Professor of Surgery Giles F. Whalen, MD, Sullivan said, "I am reading research articles with a different eye and a new understanding since completing the Statistical Analysis of Data course."

Another new and essential component of the DNP curriculum is nursing informatics—the discipline that combines

"As nurse practitioners we are already turned to as experts. We teach nursing students, and our colleagues, including physicians, come to us for advice. A Doctor of Nursing Practice degree will make me a more effective leader by advancing my skills and knowledge in nursing as well as my ability to successfully interpret fundamental research findings."

–Vinetta McCann, MS, RN

nursing skills with information technology to translate data into applicable knowledge that will improve patient care. "Informatics skills differentiate doctorally prepared nurses from master's-level nurses, with the ability to manage information that will affect not only care of individuals but care across patient populations," noted Christine Curran, PhD, RN, associate chief nursing officer for professional and business development and nursing informatics officer for UMass Memorial Medical Center.

In addition to preparing advanced practice nurses with clinical, research translation and informatics skills, the DNP will train more doctorally prepared faculty who have the expertise to teach in clinical nursing programs. Noting that we are an aging society faced with a shortage of nurses and nursing faculty, Sommers said, "The DNP provides a great opportunity for mature, experienced advanced practice nurses to mentor a new generation of nurses. I will continue to precept students while in practice, with my goal to become a faculty member for an advanced nursing degree program."

Kathleen Miller, EdD, RN (far left), directs the new Doctor of Nursing Practice program, which prepares advanced practice nurses for leadership roles in clinical practice and education. Dr. Miller and Graduate School of Nursing Dean Paulette Seymour Route, PhD, RN (near left), along with GSN faculty, launched the program this year, putting the GSN at the forefront of the new approach to nursing. On page 17, DNP students Vinetta McCann, MS, RN (left), and Dawn Carpenter, MS, RN (center), discuss a patient record on the surgical ICU with Jeff Perras, MS, RN, a neurocritical care nurse practitioner.

Nursing and physician leadership at UMass Memorial Health Care and UMass Medical School will ensure DNP students and faculty have the resources and access they need to put theory into practice. UMass Memorial will support the DNP across the spectrum from prospective students to graduates. "Doctorally prepared nurses will elevate the caliber of our health care workforce," noted Curran. "We will encourage our advanced practice nurses to participate in the program and ultimately employ many of them."

With the DNP program, as with the traditional Master of Nursing, PhD in Nursing and Graduate Entry Pathway, the Graduate School of Nursing maintains its tradition of responding to changing needs in health care. Whether at the bench or the bedside, in the classroom or the boardroom, the program promises to advance nursing practice, science and leadership to improve patient care. "The diversity of experiences with other disciplines, the level of faculty expertise and the rigor of the program will get us where we want to go," said Carpenter.

Vitae: Grants and Research

With this issue of *Vitae*, we introduce a new format for highlighting research grants awarded to members of the UMass Medical School faculty.

In 1978, when UMMS first published its magazine, faculty received grant funding totaling $2 million; by 2008, funding had grown to $193 million, an amount that places us among the top research institutions in the country.

The volume of grants awarded to UMMS faculty monthly has grown so much that *Vitae* is no longer the best venue for quickly disseminating this news; we'll now be posting grants on the UMMS Web site at www.umassmed.edu/Vitae/grants as we receive them. Our new format in the magazine will feature researchers describing their funded work in their own words, as well as their hopes about how their findings may impact the world.

Job Dekker, PhD, *associate professor of biochemistry & molecular pharmacology*

Structural Annotation of the Human Genome, National Human Genome Research Institute, one year, $582,000; recommended for two more years, $1.1 million

My laboratory studies how chromosomes, which are very long DNA molecules along which all our genes are located, work. These genes are turned on and off by regulatory "switches" that are also located along chromosomes. Interestingly, switches can act remotely, regulating genes that can be located far away. How this remote control works is now becoming clear—chromosomes are folded into complex three-dimensional structures that bring distant switches in close spatial proximity to the genes they regulate. The three-dimensional folding of chromosomes, therefore, plays a critical role in regulating the genome. My lab has developed powerful new methods to study the spatial organization of genomes in unprecedented detail, bringing previously invisible aspects of chromosome biology into view.

Our project is part of an international NIH-funded consortium (The ENCODE Project: ENCyclopedia of DNA Elements) that is mapping all genes and regulatory switches in the human genome. We're focused on determining the three-dimensional organization of sections of the human genome, which will tell us which switches communicate with which genes. Ultimately, we will map all connections between all switches and all genes.

We believe such a diagram will be critical for understanding the genetic basis of human disease. Studies are currently determining the genetic defects that underlie a variety of human diseases and have shown that defective switches cause disease. However, this information is not helpful for understanding and treating disease when it is not known which genes are normally regulated by these switches. The three-dimensional structures of chromosomes that we are building can reveal which genes are normally contacted by these defective switches and, therefore, will greatly contribute to a molecular understanding of the cause of disease.

Sherry Lynn Pagoto, PhD, *assistant professor of medicine*

Treating Co-Morbid Obesity and Major Depressive Disorder, National Institute of Mental Health, one year, $500,030; recommended for four more years, $2.1 million

My research is centered on how behavior affects physical health. I'm particularly interested in how psychological problems increase risk for disease and in designing interventions to help people with psychological disorders live healthier lifestyles, both mentally and physically. For example, some of my work focuses on psychological factors that increase risk for obesity and type 2 diabetes. As a clinician in the UMass Weight Center, I discovered that about one-third of our obese patients are clinically depressed and these patients lose only half the weight of their peers in a supervised weight loss program. Because weight loss programs are not designed around the issues of patients who have depression, we designed one that is.

I received funding from the National Institutes of Mental Health last year to conduct a five-year study comparing two different behavioral weight loss interventions that have been designed to simultaneously treat depression and obesity. One condition combines behavior therapy with nutrition and exercise counseling while the other combines social support with nutrition and exercise counseling. We will enroll 174 women into our two-year treatment program to determine which approach is superior. We hope that the findings of the study will lead to new, more efficient approaches to treating weight loss and depression.

Behavioral treatments represent an effective and economical alternative to pharmaceutical treatments for many health conditions. The impact of behavioral treatments on public health will be maximized if well-controlled studies are performed that demonstrate their effectiveness. I'm a member of the Division of Preventive and Behavioral Medicine because it is devoted entirely to research, practice and education regarding behavioral approaches to the prevention and treatment of disease.

A complete list of grants is available at www.umassmed.edu/Vitae/grants

I am very grateful for the opportunity to serve as the sixth Chancellor of the University of Massachusetts Medical School. I appreciate the trust and confidence of President Wilson and the Board of Trustees of the University of Massachusetts. Moreover, I am encouraged by the enthusiastic support and most appreciative of the many kind words I have heard from throughout our campus community and beyond, including from alumni. As you know, our medical school is a special place, cared for deeply by those who teach, study, work and practice here, as well as those who call it their *alma mater.* The commitment each of us makes to work together to have an impact on our world is at the forefront of all that we do.

MESSAGE FROM THE CHANCELLOR

Over the past year, we have set in motion a number of initiatives, embodied in the UMass Life Sciences Task Force Report to the University; in our strategic planning process; in the steps taken by our Provost and School of Medicine Dean Terry Flotte and his team; in curriculum redesign and the increase in class size; and in the work in a number of areas we have begun with our clinical partner and our academic leadership, from the establishment of new relationships around the globe to new growth on our own campus, such as the ACCES building.

I invite you to read the strategic plan on our Web site (www.umassmed.edu/chancellor). This strategic plan crosses historic borders to bring together the entire academic health sciences center—the school and clinical system, basic science and clinical departments, as well as educators and researchers. The common objectives for our academic health sciences center form a blueprint for the paths and priorities that we will follow during the next five years. Collectively we will achieve our goals, which include transforming the practice of medicine around the world through continued excellence in basic, clinical and translational research, while recommitting the academic health sciences center to safe, high-quality health care, superior education and community service that sets us apart from our peers.

It is inspiring to be at our medical school, and indeed, I am excited about the future. It is a wonderful privilege for me to be leading this great institution at this important moment in our history. Thank you very much for your support and for all you do as alumni of our commonwealth's great academic health sciences center.

Michael F. Collins, MD
Chancellor, University of Massachusetts Medical School

Senior Vice President for the Health Sciences, University of Massachusetts

Vitae: Class Notes

School of Medicine

1974

The Massachusetts Medical Society elected **Richard V. Aghababian, MD,** associate dean for continuing medical education at UMass Medical School, to a one-year term as its secretary-treasurer.

1979

Carolyn M. Clancy, MD, was the 2008 commencement speaker and an honorary degree recipient at the School of Nursing and Health Studies at Georgetown University.

Celestia S. Higano, MD, has been promoted to professor of medicine in the departments of Oncology and Urology at the University of Washington School of Medicine.

Martin B. Weiss, MD, FACS, a plastic and reconstructive surgeon, was elected president of the medical staff of Newton-Wellesley Hospital.

1980

Michael A. Arsenian, MD, was named 2008 Community Clinician of the Year by the Essex South District Medical Society. The award was established by the Massachusetts Medical Society to recognize a physician from each of the society's 20 district medical societies who has made significant contributions to patients and the community.

Constance A. Buttlar, MD, is a pathologist practicing at Nashua Pathology, PA in New Hampshire. She continues to teach residents from Dartmouth Medical School and Boston University School of Medicine.

1981

An article by **Joseph R. DiFranza, MD**, was featured in *Scientific American*. The article highlights his research, which has overturned long-held beliefs that cigarette addiction takes years to develop.

1982

John P. Deveikis, MD, joined the University of Rochester Medical Center's (URMC) neuro-endovascular department. His wife, **Susan Deveikis, BSN, RN,** is the nurse coordinator for URMC's neuro-endovascular service.

1983

Howard N. Fixler, MD, has joined the Trustmark Insurance Disability and Long Term Care Benefits Division as medical director and second vice president.

Mark J. Liponis, MD '84

Mark Liponis, MD, uses his medical degree to explore boundaries—those that are too often erected between medical disciplines and philosophies. As Corporate Medical Director of Canyon Ranch Health Resorts, Dr. Liponis helps patients move from a state of illness to a state of health and employs tools from across the medical and spiritual spectrum—nutrition and exercise physiology, behavioral therapy, acupuncture, massage and more. "The standard medical model of patients seeing different doctors for different issues dissects the patient into pieces and maladies," said Liponis. "I have the opportunity to look at the whole person and support all of that person's needs."

Liponis recalls Alan Michelson, MD, at UMMS, who was the director of the residency in internal medicine at Berkshire Medical Center. "He taught me to think through a patient's problems and how to read medical literature. This thoroughness of process and philosophy has been the foundation of my work."

Liponis also values the diversity found at UMMS through not only his classmates—students of all ethnicities and ages and varied life experiences—but also through clerkship and clinical locations and care models. "It gave us exposure particularly in public and community health and how to improve public health one person at a time." The UMMS philosophy has also had an impact on Liponis's wife, Siobhan McNally (MD '84), a pediatrician. Dr. McNally has her MPH and is co-developer of the Pediatric Environmental Health Toolkit for use at well-child visits. She is also physician advisor to Healthy Beginnings at Berkshire Medical Center.

In addition to caring for patients one at a time, Liponis appears on radio and TV programs, such as "The View," "The Today Show," "The Rachael Ray Show," CNN, and "Get a Life with [comedian and motivational speaker] Loretta LaRoche" on PBS. He is the author of two health-related books, *Ultra-Longevity: The Seven-Step Program for a Younger, Healthier You* and *Ultra-Prevention,* and has contributed to numerous magazines including *Parade.*

Mark A. Goldberg, MD '86

What does it take to be chief operating officer of a leading global biopharmaceutical services provider, with 8,800 employees and locations in 52 countries? And what drives this executive officer of an organization *The Boston Globe* ranks as a top-performing publicly held company and top employer in Massachusetts?

For Mark Goldberg, MD, COO of PAREXEL International, which has provided clinical development know-how for more than 25 years, it's a passion for technology and medicine, manifested in a knack for erasing international borders to speed the development of therapeutics by expanding patient enrollment in clinical research. PAREXEL has supported thousands of clinical trials by accessing diverse patient populations to generate statistically robust data.

Goldberg, who received a degree in computer science and engineering from MIT and spent summers in the computer science lab at Mass General before UMMS, says that physicians are eager to link to global clinical trials to give their patients access to the most advanced therapies and care.

Goldberg chose UMMS because he found it "uniquely supportive, particularly of the opportunities I had to continue lab work at MGH" where he eventually trained in diagnostic radiology, served as chief resident and joined the staff. The result of an MD on top of an engineering degree, Goldberg said, "was a unique foundation to combine medicine and technology to support the development of new therapies."

After involvement in a telehealth spin-off from MGH, Goldberg joined PAREXEL in 1997 to establish its Medical Imaging Group and then helped found its technology subsidiary, Perceptive Informatics, in 2000. In 2005, he took responsibility for the company's Clinical Research Services business and has been able to combine his medical, technical and clinical expertise to provide evolving capabilities across a range of therapeutic areas and all phases of clinical research. He has also foreseen opportunities to help the industry move from paper-based, manual processes to greater use of technology. His goal is to increase the productivity and efficiency of clinical research and more rapidly bring safe and effective treatments to patients worldwide.

Jeffrey C. Schultz, MD, received his second board certification from the American Board of Clinical Lipidology.

1984

Gerald S. Gleich, MD, was named interim clinical chief of geriatrics at UMass Memorial Medical Center.

Mary Tanzer, MD, opened a new primary care practice, Internal Medicine at Riverside, in Nashua, New Hampshire. She is affiliated with Foundation Medical Partners and is on the active staff at Southern New Hampshire Medical Center.

1986

Timothy J. Babineau, MD, became the president and chief executive officer of Rhode Island Hospital on October 1. He had served as the senior vice president and chief medical officer for the University of Maryland Medical Center.

1988

(Celebrating the Class's 20th Reunion – November 8, 2008)

Lloyd Alderson, MD, DSc, is the new clinical director of neuro-oncology at UMass Memorial Medical Center.

Michelle Z. Schultz, MD, is medical director for the St. Louis VNA Hospice. She is board certified in medical oncology and hospice and palliative medicine.

1989

Jeffrey A. Scott, MD, joined UMass Memorial—Marlborough Hospital as medical director of the Sleep Health Center's Marlborough facility. Dr. Scott completed his residency at UMass Medical School and fellowships in pulmonology and critical care medicine at Dartmouth-Hitchcock Medical Center.

David R. Stebbins, MD, joined the cardiology practice of New Bedford Medical Associates. He has been an active member of the cardiology community in Fall River for many years at Prima CARE and recently practiced at Cardiovascular Associates of Rhode Island.

1991

Gregory R. Ciottone, MD, has been appointed chief medical officer of American Hospital Management Company. Dr. Ciottone will be responsible for continuing medical education, quality programs and medical staff issues for the company's network of international managed facilities.

Anthony R. Conti, MD, recently accepted a position at New England Medical Group of Andover as a family practice physician.

Vitae: Class Notes

Members of the School of Medicine Class of 1998 got together with their families at the home of Drs. Andrea and Paul Pettinato on August 9, 2008; left to right, first row: Jonathan Zellan, MD; Dan Winn, MD; Sophia Zervas Grant, MD; Andrea Agnello Pettinato, MD; Anu Dahiya, MD; AnnMarie DeAngelis, MD; Evelyn Cusack, MD; Nancy Long, MD; Rachel Inker Brown, MD; Beth Laton Brown, MD. Second row: Sharon Bachman, MD; Damon DeTeso, MD; Jeremy Shore, MD; Patrick McEnaney, MD; Jennifer Lindwall Schwab, MD; Matthew Russell, MD; Susan Braz-Martin, MD; Susan Springer, MD; John Coen, MD. Third row: Anthony Paglia; Eleanor Paglia, MD; Anne Weaver, MD; Alan Picarillo, MD; Alex Gadbois, MD; Rebecca Carrigan Shore, MD '99; Nick DeAngelis, MD. Fourth row: Paul Pettinato, MD; David Mooradian, MD

Elizabeth Steiner, MD, is a faculty member at Oregon Health and Science University. She also practices, serves as the medical director of a safety-net clinic and conducts research and is chair of the Legislative Affairs Committee of the Oregon Academy of Family Physicians.

1992

David J. Shih, MD, has joined Hawthorn Medical Associates in Dartmouth. He provides primary care and specialty care for patients who have kidney problems and hypertension.

1993

(Celebrating the Class's 15th Reunion – November 8, 2008)

Valerie R. Price, MD, is a nephrologist at Emerson Hospital.

David A. Townes, MD, is an associate professor in the Division of Emergency Medicine at the University of Washington School of Medicine in Seattle. He recently received his diploma from the London School of Hygiene and Tropical Medicine and is taking a leave of absence for an Epidemic Intelligence Service Fellowship with the Centers for Disease Control, Malaria Branch.

1994

Colette Desrochers, MD, balances part-time work as a primary care pediatrician for Children's Hospital of Philadelphia with raising four young children.

Russell K. Mitchell, MD, and his wife, DonnaMarie, welcomed a son, Matthew, on April 23, 2007. Matthew joins brothers Nicholas and William.

1995

Christine Rooney, MD, is site medical director at Greater Lawrence Family Health Center. She is also treasurer of the non-profit organization Oceanic Research Group and the executive producer for "Jonathan Bird's Blue World," an educational underwater adventure show which is airing on Public Television in 2008.

1997

Suniti Kumar, MD, works at a community health center in Oregon as a family practice/obstetrics physician. She was a medical volunteer in Myanmar and Niger and worked in rural Colorado and New Mexico. Last year, she married Brian Adair, a high-school classmate.

1999

Henry L. Danis, MD, joined The Carolina Clinic for Digestive and Liver Diseases, a member of Caromont Medical Group. He is on staff at Gaston Memorial Hospital in Gastonia, North Carolina.

Amy Thibault, MD, is a partner in a private ob/gyn practice at Fletcher Allen Hospital in Burlington, Vermont.

2000

Adam S. Feldman, MD, recently received a Young Investigator Award from the Prostate Cancer Foundation. Dr. Feldman is a member of the inaugural group of 19 recipients of the awards, which fund talented and innovative investigators who will undertake the next generation of prostate cancer research. Each three-year award will provide $75,000 per year.

David B. FitzGerald, MD, is board certified in neurology and practicing and researching aging, memory and traumatic brain injury at the Gainesville, Florida VA.

Julie N. (Wineinger) Meade, MD, has been living in Denver for the past four years and is practicing ob/gyn. She is married with a little girl and says she hopes to expand the family soon.

Daniel Weiswasser, MD, is living in Longmeadow with his wife, Amy, and sons, Jake and Alex. He is currently Director of Quality and Informatics at Riverbend Medical Group, the largest multispecialty group in Western Massachusetts.

Haya Yankelev, MD, and **Mark Krivopal, MD '98,** live in Needham. They have two girls. Dr. Yankelev has been working at Pediatric Associates of Wellesley for the last five years.

2001

Kathryn M. DeAnzeris, MD, and her husband, Chris, welcomed their daughter, Abigail, born on March 1, 2007. They also have a son, Matthew.

Brian S. Levitt, MD, and his wife, Jill, recently welcomed a son, Andrew. Andrew joins big brother, Alex, and family in the California Bay Area.

Heidi E. Huggett O'Connor, MD, finished her pulmonary and critical care fellowship in July. She has joined the staff at Tufts Medical Center and New England Sinai Hospital as an attending physician.

Elyssa A. Pellish, MD, completed her residency at Rhode Island Hospital/Brown University and is board certified in emergency medicine. She treats patients in the UMass Memorial—Marlborough Hospital Emergency Department and is an assistant professor of emergency medicine at UMass Medical School.

Randall Pellish, MD, joined the gastroenterology division at UMass Memorial Medical Center and is an assistant professor of medicine at UMass Medical School. He completed both a residency and fellowship at Rhode Island Hospital.

2003

(Celebrating the Class's Fifth Reunion – November 8, 2008)

Leah T. Belazarian, MD, joined the UMass Memorial Medical Center Division of Dermatology. Dr. Belazarian completed her residency in dermatology and a fellowship in pediatric dermatology. She is also an assistant professor of medicine and pediatrics at UMass Medical School.

Dori Goldberg, MD, is a member of UMass Memorial Medical Center's Division of Dermatology and an assistant professor of medicine at UMass Medical School.

Laura E. Bayon, MD, and her husband, Mark Ross, welcomed a daughter, Emilia Grace, on March 13, 2007.

2004

Katherine R. Caldwell, MD, completed her internal medicine residency and works part time as an adult primary care physician in Portland, Maine. She and her husband, Aaron Engebreth, have two children, Daphne and Cora.

Colby A. Hunter-Previte, MD, and **Gregory J. H. Previte, MD,** completed their residencies in ob/gyn and anesthesia, respectively, and have both taken faculty positions at the University of Rochester. They have a son, Carter.

2005

Andrew A. Monte, MD, completed his residency at UMass Memorial Medical Center—University Campus and is board certified in emergency medicine. He treats patients in both the University and Memorial campus emergency departments, and his clinical interests include toxicology and wilderness medicine. He is also an assistant professor of emergency medicine at UMass Medical School.

Joseph C. Tennyson, MD, completed his residency at UMass Memorial Medical Center—University Campus. He treats patients in the Memorial Campus Emergency Department. He is also an assistant professor of emergency medicine at UMass Medical School.

John Paul Verderese, MD, will be joining the hospitalist division of the Inova Fairfax Hospital in Falls Church, Virginia,

Vitae: Class Notes

The Alumni Association presented scholarship awards to School of Medicine students at the Annual Alumni Scholarship Dinner on September 24, 2008. Irvin Heifetz, MD '79, president of the Alumni Association, and Andrew Miller, MD '79, vice president and treasurer, presented the awards that are made possible through the generosity of alumni and friends of the Medical School. Left to right, first row: Ryan Hirschfeld '12; Bonnie Vallie '11; Jill Bradley '10; Gayle Pageau '09; Hannah Melnitsky '10; Anna Bingham '12; Kristy Webster '12; second row: Irvin Heifetz, MD; Mark O'Connor '12; Lisa Laskiewicz '11; Galina Korsunsky '09; Laurent Benedetti '09; Timothy Menz '11; Julie Lamusta '11; Gregory Murphy '11; Andrew Miller, MD; third row: Dean Terry Flotte, MD; Tania Visnaskas '11; Claudio Debarros '11; Angelo Clemenzi-Allen '12; April Inniss '09; Yaphet Tilahun '12; Laura Sullivan '10

after completing his residency in internal medicine at George Washington University.

Graduate School of Biomedical Sciences

1991

Shan Lu, MD, PhD, professor of medicine at UMass Medical School, and colleague Katherine Ruiz de Luzuriaga, MD, professor of pediatrics and director of the UMMS Division of Pediatric Immunology, are among the first five recipient teams to receive a Pediatric HIV Vaccine Research Program grant from the Elizabeth Glaser Pediatric AIDS Foundation, a world leader in the fight against pediatric AIDS. The UMMS team was chosen from 46 that competed for the grants.

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

Graduate School of Nursing

1989

Jay Cyr, RN, MS, MBA, vice president of the Heart and Vascular Center of Excellence at UMass Memorial Medical Center, was honored as a 2008 Health Care Hero by the *Worcester Business Journal.* He accepted the award along with others at the Medical Center for their program to provide rapid intervention for heart attack victims.

1997

Jill M. Terrien, PhD, is the new director of Clinical Specialties for the GSN.

2000

Eileen F. Terrill, PhD, has been appointed director of the GSN's Graduate Entry Pathway program.

2007

Lisa Ogawa, PhD, has been named director of the Nurse Educator Speciality for the GSN.

Christine E. Klucznik, MS '96; RN, BSN

"This is where I grew up," said Christine Klucznik of UMass Medical School's clinical partner, UMass Memorial Medical Center, where she was employed for 23 years before entering the Graduate School of Nursing. "I started out as a staff nurse and had many opportunities to develop professionally."

In fact, by the time she started her master's program focusing on nursing management, she had already been a nurse manager for oncology and the director of cancer services, handling daily operations and fiscal management for a variety of units and focusing on patient care redesign, service delivery, quality improvement and policy development. "During my tenure as director of cancer services, senior nursing leadership was informed of a new requirement to obtain a master's degree within five years," recalled Klucznik, who had already been considering continuing her education. "I saw it as a commitment to my future."

While a GSN student, Klucznik's role as the director of cancer services enabled her to be involved with the design, development and implementation of a bone marrow transplant program at UMass Memorial. "That project got me involved in leadership development as well, which was also a focus of my curriculum."

Klucznik has served as vice president of clinical services and chief nursing officer for Hebrew Rehabilitation Center since 2004. Responsible for daily operations and administration, she has worked with several teams to open a medical acute care unit, coordinate the roll out of provider order entry and the electronic medical record, and develop programs in a new facility in Dedham. She is particularly proud of the career development program for Hebrew Center staff interested in getting an LPN. "It provides an opportunity for a better life," said Klucznik. The program's first class graduated in September 2008.

CALENDAR

School of Medicine Alumni Reunion
Celebrating the classes of 1978, 1983, 1988, 1993, 1998, 2003
UMass Medical School Worcester Campus
Saturday, November 8, 2008

For more information,
contact the Alumni Relations Office at
alumni@umassmed.edu or 508-856-1593.

UMass Night at the Pops 2009
Thursday, May 7, 2009

For more information, e-mail pops@umassp.edu
or call 617-287-5772.

Join the UMass Medical School Alumni Online Community

The community is for alumni of the School of Medicine, Graduate School of Biomedical Sciences, Graduate School of Nursing and Graduate Medical Education Program.

It's easy:
Go to **www.NetworkUMass.com/Medical**
In the blue registration box, log in with your user ID and password or to register, click **"Register Now."**

Once you're connected:
- Find and catch up with friends and classmates.
- Share what's going on in your life through class notes.
- Update your directory listing.
- Check the events calendar.
- Get the latest UMMS news.
- Network with UMMS alumni, as well as alumni from UMass Boston, Dartmouth and Lowell.

Need your security number for registration?
E-mail alumni@umassmed.edu or call 508-856-1593.

Vitae: The Last Word

By Terence R. Flotte, MD, *Executive Deputy Chancellor and Provost and Dean of the School of Medicine, UMass Medical School*

In contemplating the "last word" for this edition of Vitae, *I am drawn to the idea that what I want to say is not really an endnote, but more of a preamble for the exciting new era our Medical School is entering with the enactment of the commonwealth's historic Life Sciences Initiative.*

This $1 billion investment in the life sciences will help Massachusetts maintain its leadership position in biomedical research, and ultimately clinical care, by accelerating translational research. The initiative directs substantial capital funding to our Medical School, and the university as a whole, and includes new statewide programs that our students, researchers and entrepreneurs can apply for.

Given the importance of this initiative, it's no wonder that it has generated tremendous excitement and curiosity on campus. In recent weeks, I've had many conversations with faculty, students and staff from every corner of the campus who want to know more about the initiative, and what it means for our Medical School. So I want to take this opportunity to summarize its specific impact.

First, it is important to note that the $1 billion authorized by the legislation is to be spread over 10 years, and half of that funding ($500 million) is allocated for capital projects such as buildings, equipment and related infrastructure. From that capital pool, UMass Medical School will receive $90 million to help pay for construction of the Albert Sherman Center to house the Advanced Therapeutics Cluster, a multi-faceted research enterprise aimed at developing new therapies for a range of serious diseases. The new facility will be about 40 percent larger than the Lazare Research Building and will cost a total of $449 million—the balance of the funds will be raised by the Medical School through borrowing, philanthropy and program revenue.

The site work to prepare for construction has already started, as have our recruiting efforts for the 70 to 80 new investigators who will one day work in the building. If all goes according to plan, we will cut the ribbon on the facility in 2012.

Of the $500 million in capital funding authorized by the legislation, $300 million is directed to specific projects across the state, including the Albert Sherman Center and major life science investments at the University of Massachusetts campuses in Amherst, Boston, Dartmouth and Lowell. The remaining $200 million in capital funds will be awarded over time by the Massachusetts Life Sciences Center (MLSC), the quasi-public agency assigned to implement the legislation. The MLSC is led by CEO Susan Windham-Bannister, PhD, the former managing vice president at Abt Bio-Pharma Solutions. By statute, UMass President Jack Wilson sits on the MLSC Board of Directors, and the chancellors of the five campuses of the UMass system sit on the center's 18-member advisory board.

Beyond the capital funds, the remaining $500 million authorized by the legislation is divided into two categories and will be spent over 10 years—$25 million annually to cover tax incentives for life sciences companies to grow and invest in Massachusetts and $25 million annually for research grants, graduate and post-doctoral support funding, equity investments and small business loans for life sciences companies, including a new program called the "Dr. Craig C. Mello Small Business Equity Investment Fund." Named for our colleague and Nobel Laureate, the fund will make seed-money investments in life science companies, up to a maximum of $250,000 per company, to help launch new endeavors based on the discoveries that flow from the hands and minds of innovative researchers across this state.

These new funding programs are open to all qualified life sciences students, researchers and entrepreneurs in Massachusetts. The MLSC will develop and oversee these new programs, including the application processes, reviews and awards. I encourage you to visit the center's Web site at www.masslifesciences.com to learn more and track the progress of these emerging programs.

In recent years we've seen a flood of scientific discoveries that may enable new therapies, perhaps even cures, for diseases heretofore considered incurable. Our challenge now is to do the painstaking work of translating those discoveries into therapies that will ease peoples' suffering. The resources available through the Life Sciences Initiative will help us sustain that mission.

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

Senior Vice President for the Health Sciences and Chancellor:	Michael F. Collins, MD
Dean of the School of Medicine, Executive Deputy Chancellor and Provost:	Terence R. Flotte, MD
Vice Chancellor for University Relations	Albert Sherman
Associate Vice Chancellor for University Relations and Managing Editor:	Mark L. Shelton
Administrator, Public Affairs & Publications:	Lanny Hilgar
Editor:	Andrea L. Badrigian
Writers:	Ellie Castano Michael I. Cohen Lisa R. Dayne Alison M. Duffy James R. Fessenden Sandra L. Gray
Design:	smith&jones
Printing:	Webster Printing Company, Inc.
Photography:	Robert Carlin Photography UMMS Technology and Media Services Albert & Mary Lasker Foundation, page 3

Readers are invited to comment on the contents of the magazine, via letters to the editor. Please address correspondence to:

Editor, Vitae
Office of Public Affairs & Publications
UMass Medical School
55 Lake Avenue North
Worcester, MA 01655

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

www.umassmed.edu

Vitae:

University of Massachusetts Medical School

UMass Medical School
55 Lake Avenue North
Worcester, MA 01655-0002

Non-Profit Org.
U.S. Postage
PAID
Worcester, MA
Permit No. 176

Current resident or:

Readers, because our mailing lists are supplied by several University departments, some of you may receive duplicate copies of this magazine. Thank you for passing them along to others who are interested in the Medical School.