



SOM 13-15

University of Massachusetts Medical School

The University of Massachusetts Medical School (UMMS) was founded by proclamation of the governor and an act of the legislature to meet the health care needs of the residents of the commonwealth. Its mission is to advance the health and well-being of the people of the commonwealth and the world through pioneering education, research and health care delivery with its partner, UMass Memorial Health Care. UMMS is one of five campuses that make up the University of Massachusetts. Other campuses are located in Amherst, Boston, Dartmouth and Lowell.

The UMMS Educational Community

As of January 1, 2013

Faculty (including voluntary)	3,085
Basic science full- and part-time faculty	323
Clinical full- and part-time faculty	2,570
Nursing faculty	192
School of Medicine	
MD students	484
MD/PhD students	35
Alumni	3,401
Graduate School of Biomedical Sciences	
PhD students	338
MD/PhD students	35
Clinical and Population Health Research students	21
Master of Science in Clinical Investigation students	5
Alumni	705
Graduate School of Nursing	
MS students	51
Graduate Entry Pathway students	87
PhD students	21
Doctor of Nursing Practice students	28
Alumni	927

A local, regional and statewide health resource, UMMS comprises the School of Medicine, opened in 1970; the Graduate School of Biomedical Sciences, opened in 1979; and the Graduate School of Nursing, opened in 1986. UMMS also offers dynamic graduate medical education and continuing medical education programs.

Beyond fulfilling its core missions of health sciences education and public service, UMMS is home to a thriving biomedical research enterprise. With major funding from the \$1 billion Massachusetts Life Sciences Bill signed into law in 2008, UMMS research programs are central to the Massachusetts Life Sciences Initiative. Federal and private research grants and contracts reached almost \$250 million in fiscal year 2012, making UMMS one of the fastest-growing research institutions in the country.

In 2006, UMMS professor Craig C. Mello, PhD, and his colleague Andrew Fire, PhD, of Stanford University, were awarded the Nobel Prize in Medicine by the Nobel Assembly at Karolinska Institute for their discoveries related to RNA interference (RNAi). First published in the journal *Nature* in 1998, their research showed that a particular form of ribonucleic acid or RNA—the cellular material responsible for the transmission of genetic information—can silence targeted genes. This RNAi process offers astounding potential

for understanding and manipulating the cellular basis of human disease and for the development of new therapeutics for disease treatment and cure.

Educational Mission

Consistently ranked by *U.S. News & World Report* as one of the leading medical schools in the nation for primary care education, the School of Medicine has a foremost responsibility to provide our students with an accessible, comprehensive and personally rewarding medical education of the highest quality, and one that optimally prepares them to excel as tomorrow's physicians—caring, competent, productive and fulfilled in their chosen career, serving a diversity of patients, communities and the health sciences. The school is committed to training in the full range of medical disciplines, with an emphasis on practice in the primary care specialties, in the public sector and in underserved areas of Massachusetts.

Our educational program is supported by state-of-the-art educational and research facilities that have recently been expanded with the completion of the Albert Sherman Center. Opened in 2013, the Sherman Center provides cutting-edge research space in its six-story research tower, as well as educational resources that include the interprofessional Center for

Where Our Students and Residents Learn

UMass Memorial Health Care

- UMass Memorial Medical Center (Hahnemann, Memorial and University campuses)
- UMass Memorial-Clinton Hospital
- UMass Memorial-HealthAlliance Hospitals (Fitchburg and Leominster campuses)
- UMass Memorial-Marlborough Hospital

- UMass Memorial-Wing Memorial Hospital and Medical Center
- Barre Family Health Center
- Hahnemann Family Health Center
- South County Pediatrics
- Tri-River Family Health Center

Inpatient

- Baystate Medical Center
- Berkshire Medical Center
- Day Kimball Hospital
- Harrington Memorial Hospital
- Heywood Hospital
- Holyoke Medical Center
- Lahey Clinic Hospitals
- Milford Regional Medical Center
- Providence Behavioral Health Hospital
- Saint Vincent Hospital
- St. Elizabeth's Medical Center
- Mercy Medical Center
- Worcester State Hospital

Outpatient

- Community Health Connections
 - Fitchburg Family Health Center
 - Greater Gardner Community Health Center
 - Leominster Community Health Center
- Community Healthlink
- New Bedford Community Health Center
- Edward M. Kennedy Community Health Center
- Family Health Center of Worcester
- Greater Lawrence Family Health Center
- Reliant Medical Group
- RiverBend Medical Group
- Southborough Medical Group
- Steward Medical Group

And 200 volunteer practices and clinics across the commonwealth.

Experiential Learning and Simulation (iCELS), a 24,000-square-foot comprehensive, full-service simulation center, as well as our 10,000-square-foot Learning Communities Suites, dedicated to supporting the five houses of our School of Medicine's Learning Communities Program. Located on-campus and easily accessible to all other campus facilities for education and research, the Sherman Center provides unparalleled space for our entire campus community, including a 350-seat amphitheater, dining facilities, conference rooms, relaxation areas, a three-story atrium, sky walk access to other campus buildings and a new fitness center with a full array of equipment and wellness programs.

After four years of planning, the School of Medicine has also launched its new curriculum, designed to fully integrate the clinical and basic sciences in a competency-

based framework, aligned with our six competencies for medical education: physician as professional, scientist, communicator, clinical problem solver, patient and community advocate, and person.

Our new Learner-centered Integrated Curriculum (LnC) is now in place, with the first year of LnC inaugurated with the entering class of 2010. The redesigned LnC program features comprehensive integration of the clinical and basic sciences; enhanced flexibility in the clinical clerkships allowing dedicated time for elective experiences in year three; educational methods that offer hands-on, team-based small group learning; technology enhanced educational methods that support independent, self-directed learning; personalized, continuity-based mentorship with dedicated faculty through the learning community model; and an

opportunity for all students to engage in scholarship and scientific inquiry through a capstone project experience.

To support our new curriculum, the school's educational facilities have been renovated and expanded to create the ideal learning environment that will best prepare today's students as tomorrow's physicians.

Among these enhancements are our recently renovated anatomy labs with computer technology at each dissection table; our upgraded classrooms and amphitheatres with campus-wide wireless connectivity; our newly built integrated Teaching and Learning Center (iTLC) that serves as our cutting-edge, technology-infused classroom for interactive small group learning; and the newly opened iCELS, which provides access to an unparalleled array of simulation resources for hands-on teaching and learning. Centrally located in the Sherman Center and adjacent to the Learning Communities Suites, the iCELS features two floors of simulation technology, providing "one stop" access to the full range of simulation resources in a single, comprehensive facility.

iCELS is designed as a fully interprofessional resource for learning across the health professions, including medicine, nursing and the allied health professions, and across the spectrum of learners, from students and residents to trainees and licensed professionals. The first floor of iCELS features a 12-bed clinical skills lab, two surgical skills suites, four large team-training scenario rooms and a comprehensive array of task trainers that include "Harvey" and the "Anatomage" virtual dissector. Complementing the technology-based simulation resources, the second floor of iCELS houses our nationally recognized Standardized Patient (SP) program. Serving our educational program across all four years of the curriculum, the SP program provides UMMS students with hands-on practice and learning in physical exams, communication skills, medical interviewing and clinical problem solving. The second floor of iCELS houses a virtual outpatient clinic with 20 rooms, fully equipped for ambulatory care in the office setting. Throughout the iCELS facility, a system of web-based, digital recording and high-definition video play back

is fully integrated into the iCELS debriefing rooms and conference rooms.

At UMMS, our curriculum is nationally recognized for the outstanding clinical training of our students, preparing them for diverse career choices beyond medical school, whether in primary care or the medical specialties. In parallel with this exceptional clinical preparation, our fast-paced growth, leadership and worldwide recognition in health sciences research offers extraordinary research opportunities for our students.

The educational mission of the School of Medicine is further enhanced by 52 accredited residency and fellowship programs; cooperative degree programs with area colleges and universities; diverse community-based education programs across Massachusetts; outstanding achievements in clinical and translational research in the health sciences; and the Commonwealth Medicine division, dedicated to serving the state's broad community of health care and service agencies. As the commonwealth's only public medical school, UMMS places an emphasis on partnerships with the community, creating opportunities for students to learn in and contribute to serving Massachusetts communities and the care of its vulnerable and underserved populations.

The School of Medicine's educational program has been enriched through national grant awards that promote quality, innovation and national distinction in medical education. Over the past 10 years, these awards have included:

- **Integrated Geriatrics Education:** A Model Curriculum across the Medical Education Continuum, Donald W. Reynolds Foundation Aging and Quality of Life Program (2009-2013), addresses the special health care needs of the elderly through targeted, comprehensive curricula.
- **NIDA Centers of Excellence for Physician Information,** National Institute on Drug Abuse (2007-2011), providing targeted curriculum in prescription drug abuse education.

- **American Medical Association's, Innovative Strategies for Transforming the Education of Physicians (ISTEP)** (2005-present), a national consortium of medical schools dedicated to furthering rigorous research in medical education.
- **Stemmler Medical Education Grant,** National Board of Medical Examiners (2003-2005), investigating the use of standardized patients in assessing medical students' behaviors and skills in the domain of professionalism.
- **Educational Development for Complementary and Alternative Medicine** (2003-2007), integrating educational objectives and curricula in complementary and alternative medicine into the mainstream of the Medical School curriculum.
- **A Comprehensive Approach to Sexual Health in Undergraduate Medical School Curricula,** Pfizer, Inc. (2001-2003), promoting the development of curricular innovations in sexual health.
- **Enhancing Gerontology and Geriatric Medicine Education in Undergraduate Medical Education,** AAMC/John A. Hartford Foundation (2001-2003), dedicated to enhancing our students' preparedness and commitment to care for the needs of the elderly.
- **Macy Initiatives in Health Communication, Josiah Macy, Jr. Foundation** (1998-2006), a multi-staged project designed to catapult communication skills into the mainstream of medical education.

Educational Partners and Affiliates

UMass Memorial Health Care

UMass Memorial Health Care, Inc. is the clinical partner of the University of Massachusetts Worcester and the largest health care system in Central and Western Massachusetts. It is a not-for-profit, integrated system designed to provide all levels of health care from primary to quaternary. UMass Memorial Health Care delivers care through the UMass Memorial Medical Center and community hospitals (Clinton Hospital, HealthAlliance Hospital, Marlborough Hospital and Wing Memorial Hospital and Medical Centers) with health

care services further enhanced and augmented by community primary care practices, ambulatory outpatient clinics, home health agencies, hospice programs, rehabilitation and mental health services.

As the region's tertiary referral center, UMass Memorial Medical Center offers a full complement of advanced technology and support services, providing the region with a broad range of specialists renowned for their expertise in clinical areas, including the Centers of Excellence—heart and vascular, cancer, musculoskeletal and diabetes—as well as emergency medicine, surgery, women's health and children's medical services.

UMass Memorial Medical Center is a 781-licensed-bed facility on three campuses: Hahnemann, Memorial and University. UMass Memorial Medical Center records 138,000 visits per year at its two emergency departments located on the University and Memorial campuses. In 2010, for the third year in a row, UMass Memorial Medical Center ranked number one in Massachusetts and New England for surviving a heart attack. UMass Memorial Medical Center is also the region's transplantation center and provides liver, kidney, pancreas and bone marrow transplantation.

On the University Campus, clinical services are focused on radiation therapy and cancer care, neurology, trauma and critical care, psychiatry, surgery and advanced cardiovascular care. The Cardiovascular Center of Excellence at the UMass Memorial Medical Center provides integrated, patient-centered heart and vascular care by utilizing the latest research and technology available in cardiovascular medicine and surgery.

The Weight Center provides medical and multidisciplinary support services in the specialty of bariatric medicine, including gastric bypass surgery, behavioral therapy and comprehensive follow-up care for weight management. The University Campus is also home to the Children's Medical Center, providing extensive services, including the internationally recognized newborn intensive care unit, orthopedics, gastroenterology, neurology, pulmonology, oncology and surgery, and the only pediatric intensive care unit in Central Massachusetts. The Children's

Medical Center offers the Child Protection Program, providing evaluations of children for suspected abuse, neglect and maltreatment. The Children's Medical Center is accredited by the prestigious National Association of Children's Hospitals and Related Institutions, a designation that identifies it as a facility that delivers exceptional care to children.

Also located on the University Campus, the Duddie Massad Emergency and Trauma Center, the region's only Level I trauma center, is the home base of Life Flight, New England's first hospital-based air ambulance and the only emergency helicopter service in Central Massachusetts. Since its founding in 1982, Life Flight has become one of the busiest single-aircraft services in the country, with more than 25,000 patient flights. The Duddie Massad Emergency and Trauma Center provides training and consultation to providers and appoints medical directors for area towns' emergency medical services. UMass Memorial also sponsors the Disaster Medical Assistance Team – Massachusetts (DMAT-MA2), a volunteer group of professional and paraprofessional medical personnel who augment local medical efforts and provide emergency medical care during a disaster or other adverse event.

The University Campus is the site of the new Ambulatory Care Center (ACC), offering a unique complement of state-of-the-art patient care clinics and translational research programs in a seven-story, 258,000-square-foot building. The ACC opened in 2010 and provides convenient access to outpatient services for cancer, diabetes, heart and vascular, and orthopedics as well as diagnostic testing services.

The Memorial Campus is a leading provider of acute care services in the greater Worcester area and offers a broad array of primary, secondary and tertiary care services. The maternity center delivers more than 4,000 babies a year, more than any hospital in the region. It is the regional referral center for women with high-risk pregnancies, and it provides the region's only Level III Newborn Intensive Care Unit, a 49-bed unit providing the most advanced life-saving care for fragile infants. The Levine Ambulatory Care Center

on the Memorial Campus is the site of the New England Hemophilia Center and provides cancer services, including radiation oncology, gynecological oncology and infusion treatments. The Department of Urology is also located on the Memorial Campus, with clinics in the Levine Ambulatory Care Center. The full spectrum of urologic care is offered including cancer care, infertility, stone disease and robotic surgery, among others. The Levine Center is also the hub for all of UMass Memorial Medical Center's presurgical evaluation services.

In addition, the Spine Center and the Arthritis and Joint Replacement Center, also located on the Memorial Campus, provide a full spectrum of multidisciplinary care for orthopedic patients, including arthroscopic and open surgery for injury and orthopedic disease. Cardiologists also see patients for routine visits and diagnostic testing.

The Hahnemann Campus is a patient-centered, full-service outpatient center, focusing on dermatology, hand and upper extremity surgery and therapy, sports medicine, ophthalmology and cosmetic surgery. This state-of-the-art ambulatory surgery and specialty care practice center offers day surgeries in many specialties as well as laboratory, mammography and X-ray services and primary care services at the Hahnemann Family Health Center.

Clerkships are offered in family medicine, medicine, obstetrics & gynecology, pediatrics, psychiatry, surgery and neurology.

Major Teaching Hospital Affiliates

In addition to UMass Memorial Medical Center, UMMS has major educational affiliations with Saint Vincent Hospital in Worcester, Berkshire Medical Center in Pittsfield and Milford Regional Medical Center in Milford.

Saint Vincent Hospital at the Worcester Medical Center is a 348-bed acute care hospital that offers a variety of specialty care centers, including laparoscopic surgery, cardiovascular medicine, cancer medicine, family-centered maternal and child health services, general and vascular surgery, neurosurgery, psychiatric services, orthopedics and advanced diagnostic

services. An extensive array of outpatient services, including same-day surgery, radiation oncology and a pain clinic, are also available. Clerkships available to UMMS students include medicine, neurology, obstetrics & gynecology and surgery, and subinternship in medicine. Independent residency programs are offered in cardiology, internal medicine, podiatry, sleep medicine, MICU and radiology.

Berkshire Medical Center in Pittsfield is a 293-bed acute care community teaching hospital serving residents of Berkshire County as well as Eastern New York, Northern Connecticut and Southern Vermont. It offers a full range of medical services, including anesthesiology, cardiology, dentistry, emergency medicine, family medicine, internal medicine, neurology and neurosurgery, obstetrics & gynecology, ophthalmology, orthopedic surgery, otorhinolaryngology, pathology, pediatrics, psychiatry, radiation oncology, radiology, rehabilitation, substance abuse, cardiac rehabilitation, a sleep disorders program and others. Clerkships are available to UMMS students in medicine, obstetrics & gynecology, neurology, psychiatry and surgery. Fourth-year subinternships are available in medicine, psychiatry and general surgery. An extensive list of fourth-year electives includes cardiology, consultation psychiatry, emergency medicine, infectious disease, laboratory hematology and hematopathology, nephrology, occupational health, orthopedic surgery, pathology (anatomic and clinical), physical medicine and rehabilitation, primary care internal medicine, pulmonary medicine and radiology (diagnostic and/or interventional). Independent residency programs are offered in internal medicine, psychiatry, surgery, osteopathic medicine and dentistry. The UMMS associate dean for medical education for Berkshire Medical Center is onsite to supervise all clerkship rotations and is available to all students for career discussions.

Milford Regional Medical Center is a nonprofit, acute care, full-service, 121-bed community and regional teaching hospital, serving a region comprising 20 towns. In addition to providing basic acute care services such as medical, surgical, family-centered obstetrics and pediatrics, Milford Regional provides a full range of clinical services, from adolescent health to women's services. Clerkships are available in medicine, obstetrics & gynecology, and neurology. There are also electives in cardiology and gastroenterology.

UMMS Schools and Other Sites

Along with the School of Medicine, UMMS comprises the Graduate School of Biomedical Sciences (GSBS) and the Graduate School of Nursing (GSN). The GSBS has two divisions—Basic & Biomedical Sciences and Clinical & Translational Sciences—that offer 10 programs of study. Students are trained in their selected specialty area and receive a broad background in the basic medical sciences, in preparation for research with direct relevance to human disease. Graduates are equipped to collaborate with scientists and physicians involved in basic research and clinical observations and are prepared to initiate careers as educators in schools of the health professions or in the biotechnology industry.

The GSN offers master's, post-master's and doctoral degrees, providing high quality education to prepare registered professional and advanced practice nurses within nurse practitioner and nurse educator specialties for faculty, research and other nursing leadership positions. Subspecialty professional and clinical education is also offered in selected areas. The basis for study includes theoretical foundations of professional and advanced practice nursing, research process and design, societal forces that influence nursing, advanced pathophysiology, pharmacology, health assessment, clinical decision making, specialty content and clinical education.

The UMMS extended campus includes the Brudnick Neuropsychiatric Research Institute and labs and offices within the



Massachusetts Biotechnology Research Park in Worcester; sites in Shrewsbury and Auburn; the Eunice Kennedy Shriver Center; and the New England Newborn Screening Program and MassBiologics, with facilities in Jamaica Plain and Mattapan.

Public Service Mission

The faculty, students and staff at UMass Medical School are committed to making an impact on the health and well-being of the people of the commonwealth and the world. Every day, in ways large and small, our institutional community is actively and passionately engaged in the communities we serve, undertaking numerous and varied outreach initiatives with partners in the academic, business and philanthropic fields. Collaborations include a new partnership with Special Olympics of Massachusetts to advance its Healthy Athletes initiative; the long-running Worcester Pipeline Collaborative and Regional Science Resource Center, both award-winning programs recognized as national models for K-12 science, technology, engineering and mathematics education outreach; and student-run, faculty-supervised free clinics that provide care for underserved and economically disadvantaged patients.

By working with schools, community groups and social service organizations, UMass Medical School has extended its reach into places where we can make a difference. And by creating and sustaining relationships with the social and cultural fabric of the region—and, indeed, much of the world—we provide both real-world help and role models for the next generation of nurses, doctors, researchers and leaders.

The Office of Global Health is the latest method to broaden the Medical School's reach. The office coordinates and optimizes current and future endeavors in global medicine to elevate it to a more visible, high-impact initiative; is developing a network of international activities that can inspire UMMS medical, nursing and basic science students as on-site teachers and practitioners; and enhances training of health care providers internationally. The Office of Global Health also works with the Office of Research to help coordinate specific clinical trials and epidemiological studies as these opportunities arise.

Commonwealth Medicine

UMass Medical School brings its public mission beyond the walls of the University through its public service consulting and operations division, **Commonwealth Medicine (CWM)**. The division reaches beyond the traditional boundaries of academia to establish research initiatives, training programs and clinical services focusing on the public sector. This approach—instrumental in creating groundbreaking programs in health care reform, public sector financing, clinical training and policy research—has met with remarkable success.

Today, CWM offers a range of programs and service lines, working with public health and human service agencies and other clients in 20 states and internationally. CWM provides these clients with health care consulting, service delivery, policy and program development, and financing services and strategies. Current efforts—and many successes—are the building blocks of the health care delivery model of the future.

The nation is experiencing some of the most profound changes to our health care system in generations, and the scope and complexity of these changes present real challenges for health care providers and payers, both in the government and private sectors. CWM experts help clients deal with this tidal wave of transformation by providing expertise in building the infrastructure to make health care reform a reality.

Improving care for people with complex health care conditions is critical to improving their quality of life and also to managing the cost of care. An example of this is the Community Case Management program, which coordinates needed services for children disabled by complex, chronic medical problems. And CWM experts have helped manage one of Massachusetts' largest primary care transformation efforts with our involvement in the Patient Centered Medical Home Initiative—a program that is helping strengthen primary care practices throughout the commonwealth.

Facilitating educational opportunities for UMMS students, Commonwealth Medicine experts are frequent presenters of course material. They have developed many topics that are covered through Optional Enrichment Electives, the Interstitial Curriculum, and

the Flexible Clinical Experience Course. These include areas such as health policy, disabilities and multiculturalism. Commonwealth Medicine experts have also participated in many clerkships, grand rounds presentations and monthly seminars in collaboration with UMMS faculty.

CWM was instrumental in launching the Graduate Entry Pathway in the Graduate School of Nursing as a response to the growing need for professional nursing staff. In addition, we partnered with the Graduate School of Biomedical Sciences to develop the PhD program in Clinical & Population Health Research, one of the first in the nation to promote graduate study that fosters the analytic skills and methods necessary to conduct both health services and clinical research.

Commonwealth Medicine plays a critical part in the academic success and economic viability of UMMS. In fiscal year 2012, it produced nearly 150 scholarly articles and other publications. Additionally, the division generated more than \$380 million in grants and contracts during that time, which translates to millions of dollars for UMMS—funds that support the quality and sustainability of its world-class research and education programs.

Learn more about Commonwealth Medicine at <http://commed.umassmed.edu>.

Research Mission

The research mission of UMMS is to promulgate scientific inquiries that produce groundbreaking discoveries in the basic and clinical sciences. Currently supporting more than 300 investigators, the growing UMMS research enterprise has led to stimulating advances in the treatment of disease and injury, as UMMS scientists undertake research to discover the causes of and cures for the most devastating diseases of our time.

Accomplished faculty members include a Nobel Prize winner; a Lasker Award recipient; two members of the National Academy of Sciences; a member of the Royal Society; six Howard Hughes Medical Institute Investigators; Banting Medal awardees; Pew and Keck scholars; MERIT awardees; a Fellow of the American Association for the

Advancement of Science; cancer research award recipients and many other winners of scientific accolades. Capitalizing on a collaborative environment, UMMS research expertise lies in both basic and clinical areas with concentrations in diabetes, molecular genetics, immunology, virology, HIV/AIDS, cancer, signal transduction, structural biology (with attention to innovative drug design), bone cell biology, chemical biology, gene function and expression, neuroscience, imaging, and occupational and environmental health.

Research growth is reflected in increased funding levels. Extramural funding has more than doubled, from \$89 million in fiscal year 1998 to almost \$250 million in fiscal year 2012.

Today, UMMS is proud to be at the forefront of the commonwealth's life sciences initiative, having received funding in 2007 and 2008 to establish an Advanced Therapeutics Cluster (ATC) on campus. The ATC brings together an interdisciplinary group of research faculty and physician-scientists in three interconnected research clusters—stem cell biology, RNA biology and gene therapy. RNA studies at UMMS are conducted by world leaders in the field.

The ATC is housed in the Albert Sherman Center, a new research and education facility opened in 2013 that adds approximately 512,000 square feet to a campus that has grown exponentially over the past 10 years. The Albert Sherman Center doubles the campus's research capacity and follows on the heels of the Aaron Lazare Medical Research Building, an innovatively designed research facility that added 360,000 square feet of laboratory space to UMMS when it opened in the fall of 2001.