



SOM 13-15

Academic Departments

Almost four decades ago, UMass Medical School held commencement ceremonies for its first class. Since then, more than 3,500 students have graduated to become health care professionals in virtually all fields of medicine and research. As an institution dedicated to the highest academic and ethical standards, we expect our students to be effectively prepared for the world of health care, which is changing at an unprecedented rate. To help students hone those skills required in the complex health care environment of the 21st century, UMMS has assembled a superior, dedicated faculty, supported by a strong foundation of academic departments that are continually evolving to meet the needs of our medical students, so they may realize their full potential as practitioners and researchers.

Anesthesiology

Biochemistry & Molecular Pharmacology

Cancer Biology

Cell and Developmental Biology

Emergency Medicine

Family Medicine & Community Health Medicine

- Cardiovascular Medicine
- Dermatology
- Diabetes
- Endocrinology & Metabolism
- Gastroenterology
- General Internal Medicine
- Geriatric Medicine
- Hematology/Oncology
- Hospital Medicine
- Infectious Disease & Immunology
- Medicine/Pediatrics
- Palliative Medicine
- Preventive and Behavioral Medicine
- Pulmonary, Allergy & Critical Care
- Renal Medicine
- Rheumatology
- Transfusion Medicine

Microbiology & Physiological Systems

Molecular Medicine

Neurobiology

Neurology

Neurosurgery

Obstetrics & Gynecology

Ophthalmology

Orthopedics & Physical Rehabilitation

Otolaryngology

Pathology

Pediatrics

Psychiatry

Quantitative Health Sciences

Radiation Oncology

Radiology

Surgery

- Bariatric Surgery
- Cardiothoracic Surgery
- General Surgery
- Minimally Invasive Surgery (Endosurgery)
- Neurosurgery
- Organ Transplantation
- Pediatric Surgery
- Plastic & Reconstructive Surgery
- Surgical Oncology
- Thoracic Surgery
- Trauma and Surgical Critical Care Services
- Vascular Surgery

Urology

Information in this section is provided by the departments and the Office of Faculty Affairs; it is current as of March 2013.

Anesthesiology

Members of the Department of Anesthesiology are involved in teaching first- and second-year students in the basic science fields of pharmacology and physiology.

The Department of Anesthesiology provides both third- and fourth-year medical students with a variety of educational experiences related to the perioperative management of patients.

Third-year students are able to take an introductory elective in clinical anesthesia of one week duration during their core surgical clerkship. Basic lectures on pre-operative assessment, choice of anesthesia agents and techniques of administration are presented during these rotations. In addition, fundamentals of airway management, endotracheal intubation, regional and invasive monitoring are taught. These rotations also focus on the pharmacology and physiologic alterations associated with the administration of an anesthetic. Students are exposed to the techniques of general anesthesia administration as well as to a range of regional anesthetic procedures, including spinal, epidural, intravenous and peripheral nerve blocks. Students learn ancillary methods of patient management during surgery, such as fluid and electrolyte replacement, acid base balance, controlled hypotension and cardiopulmonary bypass. Students who have completed the introductory elective may take an additional week of a Flexible Clinical Experience (FCE) in a variety of subspecialty areas including cardiac, acute pain, pediatrics, neuroanesthesia, chronic pain, obstetrics and critical care. Students who were unable to take the introductory elective may take it as part of the FCE.

Fourth-year elective rotations are designed to meet the needs of the medical student who is interested in entering the field of anesthesiology. In addition to required rotation time at the UMass Memorial University Campus, students are given the option of rotating at any or all of our other residency training sites, in order to gain an exposure to a wide variety of anesthesia clinical settings. Sites include the UMass Memorial Hahnemann Campus for

ambulatory/regional anesthesia experience, the UMass Memorial Medical Center, Memorial Campus for obstetric anesthesia and chronic pain management experience and the University Campus SICU.

A fourth-year student rotation focused on the management of critically ill surgical patients is also available. In addition, students have the option to participate in clinical research. Third- and fourth-year students have worked with various faculty members to conduct research and have presented their research findings at regional and national meetings.

We welcome students to spend time with us and learn about the intricacies of anesthesiology as well as the multiple career paths available within the specialty.

Professor and Chair

Stephen O. Heard, MD*

Professor Emeritus

Babs R. Soller, PhD*

Professor

Mark Dershwitz, MD, PhD*

Shubjeet Kaur, MD

Jack L. Leonard, PhD*

Craig M. Lilly, MD*

Associate Professor

Jens M. Walz, MD*

Clinical Associate Professor

Bronwyn Cooper, MD

Elifce O. Cosar, MD

Manisha S. Desai, MD

Eleanor M. Duduch, MD

Khaldoun Faris, MD*

Peter J. Foley, MD*

Farajallah Habib, MD*

Robert B. Hennessy, MD*

John Pullerits, MD*

Sudershan Singla, MD*

Assistant Professor

Gustavo G. Angaramo, MD

Antonio Aponte-Feliciano, MD*

Rana Badr, MD

Hyun Kee Chung, MD

Andrew J. Cocchiarella, MD

Gilbert A. Fishbein, MD

Chandra S. Joshi, MD

Issam Khayata, MD*

Diana I. Kouznetsov, MD

Robert E. Lee, MD

Astrid E. Liland, MD

Eileen E. Maltais, MD

Theofilos P. Matheos, MD

Raimis Matulionis, MD*

Susanne Muehlschlegel, MD, MPH*

Christian P. Mueller, MD

Costin C. Negroiu, MD

Alan Orquiola, MD

M. Richard Pavao, MD

Robert I. Richmond, MD*

Ronald B. Rubin, MD

Steven D. Salt, MD

Shaheen F. Shaikh, MD

Zafar I. Siddiqui, MD

Nathanael A. Slater, DO

Victorija L. Smith, MD

Spiro G. Spanakis, DO*

Rebecca A. Zanonato, MD*

Maksim Zayaruzny, MD*

Voluntary Faculty

Professor Emeritus

Danna B. Peterson, MB CHB MHA*

Research professor

William G. McGimpsey, PhD

Clinical Associate Professor

Mark Shulman, MD*

Assistant Professor

Rene Aillon, MD

Mahmoud Aliouche, MD

Arnel Almeda, MD

Nicholas J. Barnard, MD

Agatha Anna. Boland, MD

Richard Jay Breed, MD

Richard A. Browning, MD

David L. Drexler, MD, PhD

Russell M. Flatto, MD

Stephen P. Kapaon, MD

Gabriella Kovi, MD

Gordan Nicholas Kuhar, MD

Tanya Lucas, MD

Talal Makkaoui, MD

Robert Malinowski, MD

* joint appointment

Carlos C. Maramag Jr., MD
 David Isaac Pomerantz, MD
 Mohammed Mushtaque, MD
 Andrew A Proos, MD
 Fred A. Rotenberg, MD
 Anthony L. Schwagerl, MD, PhD
 Julie B. Selbst, MD
 Raymond G. Sohl, MD
 Borovann Ung, MD
 Mark P. Vanden Bosch, MD
 Anil M. Vyas, MD

Research Assistant Professor

Albert Shahnarian, PhD

Instructor

Carl Schwartz, MD

Biochemistry & Molecular Pharmacology

Biochemistry & Molecular Pharmacology's notable faculty include:

- two Howard Hughes Medical Institute Investigators; a recipient of the Schering-Plough Award from the American Society for Biochemistry and Molecular Biology;
- a Pew Scholar and a W. M. Keck Foundation Distinguished Young Scholar;
- two recipients of the Burroughs Wellcome Fund Career Awards in Biomedical Sciences;
- investigators awarded a second five-year, \$8.5 million NIH program grant focused on drug resistance in HIV protease and rational inhibitor design;
- a recipient of the Young Investigator Award from the American Society for Biochemistry and Molecular Biology;
- a recipient of the William C. Rose Award from the American Society for Biochemistry and Molecular Biology;
- a chair who served a two-year term as president of the Protein Society and is currently the chair of the Public Affairs Advisory Committee for the American Society of Biochemistry and Molecular Biology.

The Department of Biochemistry & Molecular Pharmacology provides medical students with an understanding of the molecular mechanisms underlying normal and disease processes in humans as well as of the fundamental principles and biochemical and physiological bases of drug action. This is accomplished through the offering of two first-year courses: the Building Working Cells and Tissues course and the Principles of Pharmacology course.

The Building Working Cells and Tissues course is designed to incorporate the fundamental concepts of biochemistry in a series of lectures, clinical correlations, medical vignettes, problem-solving sessions and problem-based cases. These concepts are integrated with those from cell physiology and histology to provide students with a comprehensive understanding of the structure and function of cells and tissues.

The Principles of Pharmacology course familiarizes students with basic pharmacology concepts (pharmacokinetics, pharmacodynamics, drug metabolism, toxicology) and introduces drugs affecting the autonomic nervous system (muscarinic, nicotinic and adrenergic drugs). These drugs are also used to explore the concepts of mechanism of action, clinical use and adverse effects, thereby providing a framework for the learning of additional drugs in subsequent courses.

Professor and Chair

Charles Robert Matthews, PhD

Professor Emeritus

Sumner H. Burstein, PhD

Professor

Anthony Carruthers, PhD*
 Michael P. Czech, PhD*
 Roger J. Davis, PhD*
 Job Dekker, PhD
 Mark Dershitz, MD, PhD*
 Stephen J. Doxsey, PhD*
 James Reid Gilmore, PhD
 Heinrich Gottlinger, MD, PhD*
 Michael R. Green, MD, PhD*
 Lawrence Hayward, MD, PhD*
 Yicktung T. Ip, PhD*
 Kendall L. Knight, PhD
 David Lambright, PhD*
 Jose R. Lemos, PhD*
 Shan Lu, MD, PhD*

Jeremy Luban, MD*
 Martin G. Marinus, PhD
 John R. McCullough, PhD
 Melissa J. Moore, PhD
 Thoru Pederson, PhD
 Craig L. Peterson, PhD
 Alonzo H. Ross, PhD
 William E. Royer, PhD
 Charles G. Sagerstrom, PhD
 Celia A. Schiffer, PhD
 Joshua Jay Singer, PhD*
 Lawrence Stern, PhD*
 John Vincent Walsh, MD*
 Zhiping Weng, PhD
 Zuoshang Xu, MD, PhD*
 Phillip D. Zamore, PhD

Research Professor

Scott A. Shaffer, PhD

Associate Professor

Graham F. Barnard, MD, PhD*
 Daniel N. Bolon, PhD
 Lucio H. Castilla, PhD*
 William R. Kobertz, PhD
 Omanand Koul, PhD*
 Haley E. Melikian, PhD*
 Stephen C. Miller, PhD
 Maryann Munson, PhD*
 Oliver J. Rando, MD, PhD
 Nicholas R. Rhind, PhD*
 Sean P. Ryder, PhD
 Scot Wolfe, PhD*

Research Associate Professor

Akbar Ali, PhD
 Osman S. Bilal, PhD
 John Leszyk, PhD
 Elisabet Mandon, PhD
 Jill A. Zitzewitz, PhD

Assistant Professor

Daryl A. Bosco, PhD*
 Cynthia Nichole Fuhrmann-Kelch, PhD
 David Grunwald, PhD
 Gang Han, PhD
 Brian Anthony Kelch, PhD
 Andrei A. Korostelev, PhD
 Francesca Massi, PhD
 Konstantin B. Zeldovich, PhD

Research Assistant Professor

Hong Cao, PhD
 Weijun Chen, PhD
 Nese Kurt Yilmaz, PhD
 Jeffry Nichols, PhD
 Brian G. Pierce, PhD
 Thom Vreven, PhD

* joint appointment

Instructor

Sagar V. Kathuria, PhD
 Lingtao Peng, PhD
 Victor Y. Serebrov, PhD
 Guramrit Singh, PhD
 Jie Wang, PhD
 Lutfu S. Yilmaz, PhD

Voluntary Faculty**Professor Emeritus**

J. P. Flatt, PhD

Professor

Tariq M. Rana, PhD
 George Wright, PhD

Assistant Professor

Balaji Bhyravbhatla, PhD

Instructor

Inna V. Shcherbakova, PhD

Cancer Biology

The Department of Cancer Biology is the nexus of cancer research at UMMS. Faculty members are engaged in research on fundamental mechanisms that lead to the onset, progression and dissemination of cancer, and on the translation of these mechanisms to improve the prevention,

detection and treatment of human cancers.

The goal is to integrate the powerful and innovative biology that derives from the study of model organisms with the complex behavior of human tumors.

The department is a key component of the UMass Memorial Cancer Center of Excellence and home to several translational programs that bridge basic science and clinical cancer care, including the breast cancer, gastrointestinal cancer, genomic instability and leukemia programs. One of the most valuable resources is the tissue bank of the UMass Memorial Cancer Center, which accrues specimens from a variety of human cancers and provides them to researchers throughout UMMS as well as to other institutions.

Training the next generation of cancer researchers is a fundamental mission of the department. The cancer biology PhD program of the Graduate School of Biomedical Sciences is based here. This program provides students with outstanding training in cancer biology as well as an appreciation and understanding of cancer as a disease and the importance of translational research. This program brings together faculty and students from most of the basic science and clinical departments at the Medical School, and

it fosters the role of the department as the center of cancer-related activities on campus. We are also proud to have a training grant from the National Cancer Institute that funds both pre-doctoral students and post-doctoral fellows throughout the school.

Professor and Chair

Arthur M. Mercurio, PhD, *ad interim*

Professors

Eric H. Baehrecke, PhD
 Andreas Bergmann, PhD
 Chung-Cheng Hsieh, DSc
 Stephen N. Jones, PhD*
 Michelle A. Kelliher, PhD*
 Peter E. Newburger, MD*
 Alonzo H. Ross, PhD*
 Leslie M. Shaw, PhD
 Janet Stavnezer, PhD*

Research Professor

Hira Lal Goel, PhD*
 Paul W. Mak, PhD

Associate Professor

Ingolf M. Bach, PhD*
 Sharon B. Cantor, PhD
 Lucio H. Castilla, PhD*
 Jeanmarie Houghton, MD, PhD*
 Stephen R. Lyle, MD, PhD*
 Merav Socolovsky, MD, PhD

* joint appointment



UMMS again ranked in top 10 nationally for primary care education

UMass Medical School was ranked ninth in primary care education among 126 medical schools and 23 schools of osteopathic medicine surveyed by weekly news magazine *U.S. News & World Report* in its 2014 edition of the "Best Graduate Schools" issue. UMMS has been listed near the top of the category since 1994 when the magazine began publishing the rankings. Of note, UMMS is the only school in the top 50 that accepts only in-state students into its medical degree program.

"UMass Medical School's consistently high ranking is a reflection of our dedication to our mission and the faculty's unwavering commitment to providing an outstanding education to our students," said Chancellor

Michael F. Collins. "As we enter a period of unprecedented change in health care, the part our medical school, faculty and students play in shaping this future has never been more essential."

The School of Medicine, which had accepted just 100 students per year since the 1970s, recently expanded the class size to 125 to help increase the pool of physicians, particularly primary care providers, trained to meet the needs of the commonwealth and the nation. Traditionally, more than 50 percent of each year's graduates enter a primary care residency program. In addition, more than half of each class stays in the state for residency, totaling 260 new residents in the last five years alone.

Assistant Professor

Craig J. Ceol, PhD*
 David A. Guertin, PhD*
 Brian Lewis, PhD*
 Junhao Mao, PhD
 Karl J. Simin, PhD

Instructor

Seema Paliwal, PhD

Voluntary Faculty**Professor**

Tomi Sawyer, PhD

Assistant Professor

William C. Strohsnitter, DSc

Instructor

David S. Garlick, DVM

Cell and Developmental Biology

The Department of Cell and Developmental Biology (CDB) offers exceptional strengths in the analysis of cell structure and function, with many cutting-edge research projects in the areas of cell structure and dynamics or in epigenetics and developmental biology. Developmental cell biology is a resurgent area of research, which is key to the promise of regenerative medicine. Much current research in the department relates to fundamental questions of how cells with the same genome can give rise to the varied cell-types and associated structures that comprise a whole organism. These questions are central to understanding not only normal development, but also stem cell biology, cancer, and a variety of specific human genetic disorders.

Examples of ongoing projects include studies of cell cycle control (in normal cells, cancer and cell senescence), reproduction and early embryogenesis, musculoskeletal and bone biology, and neurogenesis. Several CDB investigators have strong programs in transcriptional control and epigenetic regulation, particularly as it relates to nuclear structure, genome organization and chromosome biology. Current research has impact for numerous diseases, including cancer, Down syndrome, Alzheimer Disease, Facioscapulohumeral muscular dystrophy,

skeletal disorders, congenital blindness, infertility, and includes novel approaches to gene therapy.

Currently the CDB is host to a number of specialized centers that serve UMMS, including the electron microscopy, confocal microscopy and transgenic animal modeling core facilities, as well as the broader scientific community, as exemplified by the International Stem Cell Registry. The CDB is the home to an NIH training grant in reproductive biology, and our department also hosts and recently initiated the cross-campus Epigenetics Club, which has drawn wide interest. In addition, our department proudly operates the Anatomical Gift Program, which coordinates the donation and distribution of bodies that are such a critical resource for medical teaching, and research.

The department has exceptional accomplishments in education, and its superb teaching faculty members have attained national distinction in medical education, and are consistently recognized by awards for excellence and innovation in teaching and curriculum development. Faculty train medical, graduate and post-doctoral students in subjects ranging from molecular cell biology to human genetics, organ biology and neuroanatomy. In addition to several Advanced Topics Courses, CDB faculty are responsible for courses that include Building Working Cells and Tissues, Principles of Human Genetics, and Development, Structure and Function (histology, anatomy, embryology, physiology, imaging), and Brain: Nervous System and Behavior. Thus, CDB faculty provide a unique resource for students and trainees seeking to gain insights for pursuing careers with a teaching component or focus. Our graduate program aims to provide an exceptionally strong environment to train PhD students not only as researchers, but also as educators, and to prepare students for a diversity of careers in science.

Overall, research in the CDB seeks to advance discovery in basic biological processes with relevance to biomedicine and clinical/translational medicine. In addition to top-line imaging and structural analyses, research incorporates innovative cellular, biochemical, genetic and genomic or bioinformatic approaches to advance the

understanding of cell growth, differentiation and development, and the genetic and epigenetic contributions to tumorigenesis and other human genetic disorders.

Medical students, graduate students and postgraduate physicians and scientists actively participate in CDB research programs, and interactivity is fostered via seminars, chalk talks and special interest clubs, such as the Program in Cell Dynamics or the Epigenetics Club. A priority is an environment that fosters multi-disciplinary team approaches, where shared concepts and expertise of physicians and scientists can expedite the translation of fundamental biological discoveries to clinical problems.

Professor and Chair

Jeanne B. Lawrence, PhD*

Distinguished Professor

Craig Mello, PhD*

Professor

Neil Aronin, MD*
 Alexei A. Bogdanov, PhD*
 Silvia Corvera, MD*
 Roger W. Craig, PhD
 Stephen J. Doxsey, PhD*
 Raymond M. Dunn, MD*
 Andrew H. Fischer, MD*
 Harvey M. Florman, PhD
 Susan B. Gagliardi, PhD*
 Ellen M. Gravalles, MD*
 Lawrence Hayward, MD, PhD*
 Deborah Harmon Hines, PhD
 Anthony N. Imbalzano, PhD
 Yicktung T. Ip, PhD*
 Stephen N. Jones, PhD*
 Mary M. Lee, MD*
 Elizabeth J. Luna, PhD
 Gerald Schwarting, PhD
 Greenfield Sluder, PhD
 George B. Witman, PhD
 Zuoshang Xu, MD, PhD*

Associate Professor

Athena Andreadis, PhD
 John M. Cooke, PhD
 Douglas A. Cotanche, PhD
 Daniel Z. Fisher, MD, PhD*
 Anne M. Gilroy, MA*
 Peter Lawrence Jones, PhD
 Daniel L. Kilpatrick, PhD*
 Maryann Munson, PhD*
 Jeffrey Alan Nickerson, PhD

* joint appointment

Nicholas R. Rhind, PhD*

Jie Song, PhD*

Research Associate Professor

Gregory M. Hendricks, PhD

David S. Lapointe, PhD

Paul R. Odgren, PhD

Kelly P. Smith, PhD

John Woodhead, PhD

Assistant Professor

Charles P. Emerson Jr., PhD

Christopher Louis Hall, PhD

Krista S. Johansen, MD*

Oliver Davis King, PhD

Zdenka Matijasevic, PhD

Maria A. Morabito, PhD

Jaime Rivera Perez, PhD

Hong Zhang, PhD

Research Assistant Professor

Lisa L. Hall-Anderson, PhD

Timothy Henion, PhD

Melissa K. Jungnickel, PhD

Keith A. Sutton, PhD

Troy W. Whitfield, PhD

Xiufeng Wu, MD, PhD*

Instructor

Eustathia Lela Giannaris, PhD

Jun Jiang, PhD

Lara I. Strittmatter, PhD

Yumi Uetake, PhD

Voluntary Faculty

Associate Professor

Steven B. Koevary, PhD

Assistant Professor

Jeanne D. Keller, MD*

Emergency Medicine

The Department of Emergency Medicine holds the distinction of caring for more than 185,000 patients annually; hosting both air and ground ambulance services; having several specialized divisions with fellows in Ultrasound, Disaster Medicine and Emergency Management, Toxicology, Prehospital Care, International Emergency Medicine and Global Health Administration; having a vigorous basic science and clinical research division with numerous grant-supported projects; and being one of the beneficiaries of a \$129

million renovation to create a state-of-the-art emergency department on the University Campus of UMass Memorial Medical Center.

The knowledge of life supportive measures as well as the recognition and management of common medical emergencies are fundamental for all medical students. Emergency Medicine faculty are committed to these priorities by providing instruction through lectures, workshops and bedside teaching throughout the four year curriculum. Members of the department offer career guidance and support by acting as individual advisors and preceptors as well as holding panel discussions several times a year.

Emergency Medicine faculty direct a number of courses in the first and second-year curriculum, including: a) Integrated Case Exercises, which provides clinical case presentations as they relate to the foundational sciences such as anatomy and microbiology; b) Instruction in Basic Life Support and c) Enrichment Electives in Wilderness Medicine. The department also instructs with other disciplines in the Care for the Seriously Ill, Pharmacology, Anatomy and Cultural Awareness courses.

In the third year, students may enroll in Flexible Clinical Experiences at one week intervals to gain early exposure to Emergency Medicine. Students also spend a portion of their core surgery, inpatient medicine and pediatric outpatient experiences in the emergency department, participating in patient evaluations.

During the fourth year, students complete the newly developed required course Emergency Clinical Problem Solving. Goals are to learn the systematic approaches to diagnosis, treatment and disposition of emergencies, using advanced clinical reasoning when caring for undifferentiated patients, and to develop effective teamwork and communication skills. The course uses a combination of didactics, acute care clinical experiences and simulated encounters with procedures. For students exploring a career in Emergency Medicine, the department offers eight clerkships per month for fourth-year medical students to gain a broad understanding of acute care medicine. During this rotation, students play primary roles in patient assessment and care, develop

problem solving skills and learn a variety of procedures. Emphasis is placed on providing students with direct and expanded exposure to a wide range of conditions, including those that are life-threatening, and their immediate management. Prehospital experience, including paramedic ambulance rides, can also be included. The department also offers fourth-year electives in toxicology, emergency ultrasound and a research elective that pairs the student with one of our research faculty in the laboratory or clinical areas of interest.

At any time during medical school, students can explore a career in Emergency Medicine with faculty who are Longitudinal Program Preceptors or advisors, or by attending informative events coordinated with the student Emergency Medicine Interest Group (EMIG). Hands-on experiences in the simulation lab and suturing, airway, phlebotomy and splinting workshops are offered during the academic year. Additionally, research and international emergency medicine opportunities are available

Professor and Chair

Gregory A. Volturo, MD*

Professor

Edwin D. Boudreaux, PhD*

Edward Boyer, MD, PhD

Eric W. Dickson, MD

Mariann M. Manno, MD*

Associate Professor

Steven B. Bird, MD

David Blehar, MD

Chad E. Darling, MD

Romolo J. Gaspari, MD

Andrew M. Milsten, MD

Clinical Associate Professor

D. Eric Brush, MD

Bryan L. Cheshire, MD

Robert P. Ferm, MD

Marc A. Gautreau, MD

Debra W. Heitmann, MD

Kathryn Kennedy, MD

Robert F. McCarron, MD

Marie T. Mullen, MD

Constance G. Nichols, MD

Peter G. Paige, MD

Marc C. Restuccia, MD

Eric W. Schmidt, MD

Stacy Weisberg, MD

* joint appointment

Assistant Professor

Harry M. Arters, DO
 Kavita Manyam Babu, MD
 Mark C. Bisanzo, MD*
 Tara B. Brigham, MD
 John P. Broach, MD
 Michael Christopher Butler, MD
 Ravishankar B. Channappa, MD
 Richard J. Church, MD
 John P. Haran, MD
 Christian G. Heinis, MD
 Gregg M. Helland, DO
 Christina H. Hernon, MD
 Catherine Elizabeth Jones, MD
 Allison E. LaRusso, MD
 Marc A. Lieberman, MD*
 Rochelle Lima-Babigian, MD
 Mary Elise Manuell, MD
 Carlos Melero-Montes, DO
 Michelle L. Mendoza, MD
 Anthony M. Montoya, MD
 Mary J. O'Neill, MD*
 Elyssa A. Pellish, MD
 David L. Polan, MD
 Martin A. Reznick, MD, MBA
 Sean H. Rhyee, MD
 Joyce S. Rosenfeld, MD
 Sneha H. Shah, MD
 Ajeet J. Singh, MD
 Veera R. Sudireddy, MD
 Joseph C. Tennyson, MD
 Benjamin M. Terry, MD, MPH
 Ann M. Testarmata, MD
 Jeanine Ann Ward, MD
 Kathryn W. Weibrecht, MD

Clinical Assistant Professor

Paul A. Zgurzynski, MD

Instructor

Jennifer Lee Carey, MD
 Benjamin Chin, DO
 Adam C. Darnobid, MD
 Matthew Colin Dayno, MD
 George E. Deering III, MD
 Mark Robert Gallagher, MD
 Kevin A. Kotkowski, MD
 Melissa K. Leming, MD
 Susan Y. Ly, MD
 Virginia B. Mangolds, MS
 Mark John Neavyn, MD
 David St. Laurent, MD
 William Wallace Tollefsen, MD
 Bryan J. Wexler, MD
 Jorge D. Yarzebski, BA

Rothsoyann Yong, MD
 Matthew Zuckerman, MD

Clinical Instructor

Justin K. Briones, MD
 Birendra Sinha, MD
 Brian J. Wolk, MD

Affiliate

Gideon Bosker, MD

Voluntary Faculty**Professor**

Christopher H. Linden, MD

Clinical Associate Professor

Mary C. Burke, MD
 Gayle M. Galletta, MD

Assistant Professor

Jarrett Burns, DO
 Vivek Chander, MD
 Samuel T. Connolly, MD
 James Courtney, DO
 Thomas J. Evans, MD
 Octavio J. Diaz, MD, MPH
 Peter E. Fishman, MD
 Eric Goedecke, DO
 Jonathan Grayzel, MD, PhD
 Ronald F. Hayden, MD
 Jeffrey B. Hopkins, MD
 Joshua Jarbeau, MD
 Julian L. Kadish, MD
 Kevin P. Kent, MD
 Roderick W. Lewin, DMD*
 Andre B. Markarian, MD
 Mariah McNamara, MD, MPH
 Kathleen O. Northrup, MD
 Jeffrey Randazza, MD
 Christopher D. Rosenbaum, MD
 Steven Francis Siraco, MD

Clinical Assistant Professor

Michael A. Coyne, MD
 Joseph Currier, MD
 Alexander Matolcsy, MD

Instructor

Janine Gould, DO
 Brian Mongillo, MD
 Robert Srebnik, MD
 Gregory Steinberg, MD

Clinical Instructor

Richard M. Calderon, OD
 John M. Sholl, MD

Affiliate

Gideon Bosker, MD

Family Medicine & Community Health

The Department of Family Medicine & Community Health's faculty are

- recognized nationally and by the University for their commitment to public service and community health;
- pioneers in community-based medical education; and
- nationally renowned leaders in faculty development.

One of the founding departments of UMass Medical School, the Department of Family Medicine & Community Health offers students a wide variety of educational, research and service activities. Family Medicine faculty include a large number of family physicians working in a variety of settings across Central Massachusetts, ranging from urban and rural health centers to more traditional private practice settings.

Health care provided to underserved populations is also a major focus of the department. In Community Health, faculty interests include population medicine, prevention, evidence-based medicine, health care for the homeless and health policy. A leader in providing primary care and community-based educational experiences for the Medical School, the department's undergraduate programs include involvement in several courses during the first and second years, such as the Doctoring and Clinical Skills course and the Determinants of Health course.

In addition to serving as student advisors, faculty members precept students in the Doctoring and Clinical Skills course, placing students with a practicing family physician in the community for several sessions each semester, allowing them to interact with patients and develop their interviewing skills. For students interested in learning more about family medicine, the department supports a student-run Family Medicine Interest Group, which meets several times each year.

* joint appointment

Research opportunities in the department are varied, and student involvement is supported by several summer work-study programs which have led to publication, national presentations and international experiences. Service opportunities include programs that link international health experiences with specialized educational tracks, and are designed to enhance cultural awareness.

The department's major predoctoral focus for the third year is sponsorship of the Family Medicine Core Clinical Experience. This required experience places students in community-based practices. Sites include community health centers, family medicine residency training sites, HMOs and private practices. The department also sponsors the four-year Pathway on Serving Underserved and Multicultural Populations and the Rural Health Scholars Program as well as graduate training programs in family medicine, sports medicine, preventive medicine and primary care psychology.

A variety of fourth-year electives are available to students interested in exploring additional areas of family medicine and community health. These include preceptorships in urban underserved areas, rural medicine, student health, Indian Health Service and global health, and electives in medical writing and scientific writing. A subinternship in Family Medicine is also available. Additionally, the department participates in the Senior Scholars Program, allowing students to choose from numerous areas of interest.

Professor and Chair

Daniel Lasser, MD, MPH

Professor

Robert A. Baldor, MD
 Suzanne B. Cashman, DSC*
 Sharon Cermack, EdD
 Marjorie A. Clay, PhD*
 Joseph R. DiFranza, MD*
 Frank J. Domino, MD
 Catherine E. DuBeau, MD*
 N Lynn Eckhert, MD, MPH*
 Warren J. Ferguson, MD
 Patricia D. Franklin, MD, MBA, MPH*
 Michael A. Godkin, PhD*
 Jerry H. Gurwitz, MD*

Jay S. Himmelstein, MD, MPH
 Joanne Nicholson, PhD*
 Michele P. Pugnaire, MD
 Carole C. Upshur, EdD*
 Linda F. Weinreb, MD*

Clinical Professor

Alexander Blount, EdD*
 Jeremy Golding, MD
 David M. Keller, MD*
 Michael D. Kneeland, MD, MPH*
 Leonard J. Morse, MD*

Research Professor

Carol Curtin, MSW

Associate Professor

Brian D. Busconi, MD*
 Robin E. Clark, PhD*
 Michael Ennis, MD
 Maria Garcia, MD*
 Roger S. Luckmann, MD, MPH
 Elaine Martin, DA
 Patricia H. Maxson, MD*
 Stacy E. Potts, MD
 Barry G. Saver, MD, MPH
 Joseph Stenger, MD
 John H. Stevenson, MD*

Clinical Associate Professor

Nicholas Apostoleris, PhD
 Matilde Castiel, MD*
 Dennis M. Dimitri, MD
 Stephen T. Earls, MD
 Phillip O. Fournier, MD
 Mary S. Lindholm, MD
 Rebecca Lubelczyk, MD

Beth Kurtz Mazyck, MD
 Peter C. McConarty, MD
 Christine N. Runyan, PhD
 Judith L. Steinberg, MD*

Research Associate Professor

Judith A. Savageau, MPH*

Assistant Professor

Sassan Abdollahzadeh, PhD
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 Mohammad Alhabbal, MD
 Luna Asrar, MD
 Jeffrey D. Baxter, MD
 Paul J. Block, MD*
 James B. Broadhurst, MD
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 Stephanie T. Carter-Henry, MD
 Margarita C. Castro-Zarraga, MD
 Atreyi Chakrabarti, MD
 Felix Chang, MD
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 Konstantinos E. Deligiannidis, MD, PhD
 Cheryl T. DiVito, DO
 Anna Doubeni, MD
 Alan M. Ehrlich, MD
 Emily R. Ferrara, MA
 Mary K. Flynn, MD



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Kristin L. Foley, DO*
 Erik J. Garcia, MD
 Lorrie Gehlbach, PhD
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 Gerald S. Gleich, MD*
 Pamela L. Grimaldi, DO
 Thomas A. Groblewski, DO
 Deborah Ann Gurewich, PhD
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 Christopher Kennedy, MD*
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 James J. Ledwith, MD
 Roderick W. Lewin, DMD*
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 Kristin A. Mallett, MD
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 Stephen A. Martin, MD
 Kristen Kavulich McCarthy, DO
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 Rocco Perla, EdD*
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 Jeanne Rousseau, DO
 Rola N. Saab, MD

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 Michael A. Tutty, MHA
 Scott D. Wellman, MD*
 Peter B. Wilson, MD*
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 Edmond J. Zaccaria, MD
 Zi Zhang, MD

Clinical Assistant Professor

Alexandra Bonardi, MHA

Instructor

Teresa E. Anderson, PhD
 Stephanie Anthony, JD, MPH
 Danuta J. Antkowiak, MD
 Fred Baker, MD
 Douglas S. Brown, JD, BA
 Michael Burdulis, MD
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 Joyce A. Murphy, MPA
 Zainab Nawab, MD
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 Dorota K. Poluha, MD, PhD
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 Marilyn Riza, MS
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 Jennifer Lynn Schott, MD*
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 Barbara Sullivan, NP
 Jean C. Sullivan, JD
 Apeksha Tripathi, MD, MPH

Clinical Instructor

Malabika Dey, MD

Lecturer

Maria L. Angeles, MD
 Leora Fishman, MD
 Aysha Hameed, MD
 Ernest P. Liacopoulos, DDS
 Dhansukhlal C. Mandalaywala, MBBS
 Angela Joan Rubineau, MD
 Patricia Ruze, MD

Adjunct Professor

Stephen Gehlbach, MD*

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 Robert J. Wellman, PhD

Professor Emeritus

Mary K. Alexander, EdD

Clinical Professor

Sara G. Shields, MD, MS
 Anthony Valadini, MD

Associate Professor

G. Dean Cleghorn, EdD
 Darlene O'Connor, PhD
 Samuel Pickens, MD
 Glenn Pransky, MD*
 David A. Rosenfield, MD
 Charles P. Sweet, MD, MPH



Clinical Associate Professor

Lisa S. Gussak, MD*
Hugh J. Silk, MD

Research Associate Professor

J. Lee Hargraves, PhD

Assistant Professor

Wayne Jay Altman, MD
Genevieve G. Anand, MD, MPH
Carolyn Laura Augart, MD
Robert A. Babineau Jr., MD
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Elizabeth A. Erban, MD
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Leonard Martin Finn, MD
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Margo L. Kaplan Gill, MD
Eydie I. Kasendorf, PhD
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Candace Kim, MD
Anita Louise Kostecki, MD
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Laurel A. Ruzicka, MD

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Theodore M. Shoemaker, MD
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Elizabeth Anne Siraco, MD
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Martha Sullivan, DDS
Robert B. Swotinsky, MD, MPH
Lise J. Tardif, MD
Evan Teplow, MD
Stefan Topolski, MD
Olga Valdman, MD
Suryadutt Venkat, MD
Bernard A. Westerling III, MD
Craig B. Wiener, EdD

Clinical Assistant Professor

Martin Lesser, DO

Instructor

Janet C. Abrahamian, MD
Sara T. Adams, MA
Rani Alexander, MD
Shaun T. Alfreds, BS
Sam Alkhoury, DMD
David Ammerman, MD
Srilaakshmi Anamandala, MD
Sarah E. Anderson, PhD
Frances M. Anthes, MSW
Katherine J. Atkinson, MD
Christopher I. Bechara, MD
Nancy K. Berley, MD
Franklin F. Bido, MD
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Cristina Blejan, MD
Kelton Miller Burbank Jr., MD
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Joanne L. Calista, LICSW
Nita Chatterjee, MD
Elizabeth A. Coates, MD
Michael L. Dern, MD
Andrea Martinucci Damour, MD
Mary DiGangi, PA-C, MS
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Brian Dressel, MD, MPH
Jocelyn C. Duffy, MD
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Jack M. Dutzar, MD

Kimberly W. Ebb, MD
Ronald Ebb, MD
Daniel H. Ervin, DO
Carmen Patricia Fater, MD
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Kathy Opal Goff, MD
Darius K. Greenbacher, MD, FACEP
Kent S. Greenwood, MD
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Charles A. Greffrath, DMD
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Paul F. Halfmann, MPH
John D. Hackett, MD
Cindy Handler, MD
Jennifer Hartman, MD
David N. Havlin, MD
Thoedor T. Herwig, MD
Greg Hinson, MD
Heidi Holland, MEd
James P. Hoye, MD
Michael E. Huppert, MPH*
Dilip M. Jain, MD
Daria M. Karos, MD
Stefan G. Karos, MD
Mary Ellen Keough, MPH
Inna Ketsler, MD
Ramzi Khazen, MD
Charles D. Labonte, BA
Jennifer W. LaBonte, MD
Stephen Kenneth Lane, MD
Anna Langman, MD
Stephen J. Levine, MD
Richard Levrault, MD
Shipin Li, MD
Benjamin L. Lieberman, MD
Gregory W. Little, MD
Michael J. Lowney, MD
Jeffrey D. Manning, MD
Edith H. Mas, MS, MSW, RN
Jeanne D. Mase, MD
Jacquelyn Ruth McKean, MD
Donald H. Miller, MD
Jennifer Jo Averill Moffitt, BA, CNM, RN, MSN
Valerie Molinaro-Gudas, RN, OD, CCHP
Robert R. Moore, MD, PhD
Valerie Moreland, MD
Wade A. Munroe, PsyD
Dan Sy Nguyen, MD

* joint appointment

Lisa Noble, MD
 Gabriel Ochoa, DDS
 Terry F. Osborne, DO
 Nancy E. Otovic, MD
 Barrie Paster, MD
 Naveen C. Pandaraboyina, MD
 Binu Pathrose, MD
 Michelle Pici, DO
 Michael Polseno, DC
 Barry R. Portnoy, BA
 Donna Rivera, MSW
 Jan Claire Rockwood, MD
 Katherine Rosenfield, MD
 Shiva Saboori, MD
 Elizabeth Saich, MD
 Sunil Sarin, MD
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 Linda M Smith, MD
 Henry E. Simkin, MD
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 Mary F. Sullivan, MSN, FNP
 Lisa D. Sweeney, MD
 Marcia V. Tanur, MD
 Andrew J. Ting, MD, MPH
 Audrey A. Tracey, MD
 Tammy E. Vargas, MD
 Chengeto M. Vera, DMD, MPH
 Santosh K. Verma, MPH, MBBS
 Janet L. Wale, PhD
 Beverly F. Wedda, MD
 Oren L. Weisberg, MD
 Thomas O. Weisman, MD
 Robert Weitzman, MD
 Jennifer Weyler, MD
 John Lorimer Worden IV, MD
 Khalid Yacoub, MD
 Shelly N. Yarnie, MPH
 Iryna V. Yeuchyk, MD
 Wankin Joseph Yu, MD

Clinical Instructor

Laura M. Garber, MA, PA-C
 Nidhi K. Lal, MD, MPH
 Raffia Qutab, MD

Affiliate

Gary H. Asher, MD
 Neil F. Cannon, MD
 Paul H. Etkind, DRPH
 Sunita Godiwala, MD
 Tammy C. Harris, MD
 Michael S. Kaplan, MD
 Monica Escobar Lowell, BA
 Maurice Martin, MD
 Francis J. McLaughlin, MD
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 Rochelle Weber, MD
 Susan M. Young, MD

Medicine

The Department of Medicine consists of:

- eighteen subspecialty and general medicine divisions, each of which is successful and growing in key areas, including clinical practice, teaching and research;
- more than 800 full- and part-time faculty members; and
- the major expansion of centers of excellence programs in cancer, heart and vascular, musculoskeletal disease and diabetes.

The Department of Medicine participates extensively in and promotes broadly the education of medical students in several venues and across the undergraduate curriculum by fostering faculty leadership as course directors, classroom teachers, inpatient and outpatient clinical educators, mentors and advisors, and as lecturers in clinical and basic research seminars.

Department faculty teach students to develop a comprehensive and in-depth understanding of the pathophysiology of disease; the techniques for history taking, physical examination and generation of a differential diagnosis and management plans; the impact of illness on the patient and family; and wellness promotion and disease prevention. Throughout the four-year

curriculum, the department works to ensure that students are well-trained in general internal medicine, are exposed to key aspects of the subspecialties of Medicine and are prepared clinically and academically for internship and residency in all disciplines.

The Department of Medicine introduces first-year students to medical interviewing and clinical problem-solving in the Doctoring and Clinical Skills course. In the Longitudinal Preceptorship Program, first-year students serve as observers in general internal medicine offices and participate in the first phase of Physical Diagnosis, which emphasizes normal physical findings and their relationship to anatomy and physiology. Department of Medicine faculty also participate in the medical student Learning Communities as House Mentors and Subspecialty Advisors over the course of their training.

Faculty members are involved extensively in the Foundations of Medicine (FOM) curriculum. They direct and staff the Doctoring and Clinical Skills 2 course, wherein students begin to develop clinical skills, including the generation of problem lists, differential diagnoses, management plans, admission notes, medical orders and progress notes as well as critical analysis and use of medical literature. In addition, department faculty lead and teach in FOM 1 and 2 courses, including Building Working Cells and Tissues, Cancer Concepts, Infections, Patients, and the Organ Blocks. Faculty members also teach in electives in Caring for the Seriously Ill and Therapeutics.

Third-year students participate in a comprehensive clinical experience in Medicine. Inpatient rotations allow each student to experience tertiary care medicine at the UMass Memorial Medical Center University Campus and care of more common medical problems at a community hospital. An ambulatory rotation allows students to work closely with primary care internists in office or outpatient clinic settings. A rigorous core curriculum is provided through regularly scheduled conferences and seminars. The opportunity for flexible clinical experiences in medical subspecialties are provided in medicine. A senior geriatrician is director of the Core Clinical Curriculum Assessment

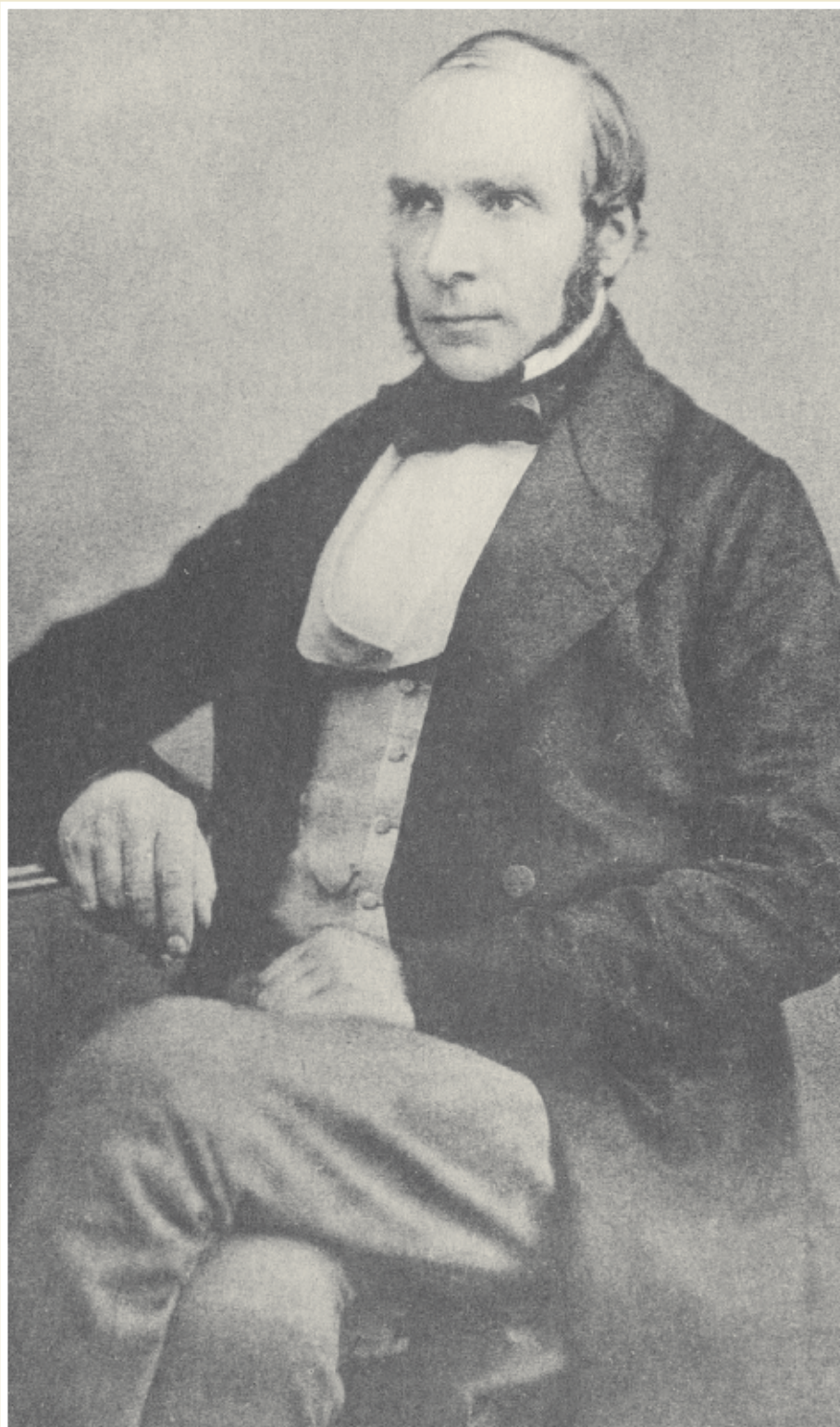
Elective views medical advances through history's lens

Why would students training for a future at the cutting edge of health care want to look back in time? For those who understand that the history of medicine holds useful lessons for their profession, the History of Medicine elective at UMass Medical School is a valuable course selection.

"Through a better understanding of medical history, students can gain needed perspective on the social, professional, economic and moral climate in which they will be practicing," agreed course co-founder Ellen More, PhD, professor of psychiatry and head of the Office of Medical History and Archives at the Lamar Soutter Library. "We want students to see the history of medicine as something that contributes to their own sense of professional development, and helps them understand their own place in medical history."

The History of Medicine seminar series is an optional enrichment course offered as a pass/fail credit elective to students in the School of Medicine and a non-credit elective for Graduate School of Biomedical Sciences and Graduate School of Nursing students. This year's topic was infectious disease, as illustrated in the book *Better: A Surgeon's Notes on Performance*, by physician and medical writer Atul Gawande, MD. In the book, Dr. Gawande documents how doctors strive to become better at what they do—often in matters of life or death.

Examples included ingenuity in ancient China's attempts at a smallpox vaccine; the diligence of 19th century British physician John Snow, known as the father of modern epidemiology because he figured out how to contain a cholera epidemic; and doing right despite widespread panic to learn as quickly as possible how HIV spreads—and doesn't spread—so that nurses and doctors could provide care, and scientists could fast-track discovery of the lifesaving retroviral drugs.



(CCCA) program and directs curriculum integration in the UMMS Simulation Center.

The majority of fourth-year students select Medicine as the discipline for their required subinternship experience; this inpatient block provides students with more advanced, challenging and responsible roles in patient management than the third-year Core Clinical Experience. The department provides electives for fourth-year students in a variety of disciplines, including cardiovascular medicine, dermatology, diabetes, endocrinology, gastroenterology, general medicine/primary care, geriatric medicine, hematology/oncology, infectious diseases, preventive/behavioral medicine, pulmonary medicine, renal medicine, rheumatology and intensive care medicine. Many creative Flexible Clinical Experiences have also been created for medical students to have experiences in a broad range of topics to include Primary Care Practice Management and Quality Improvement. Research opportunities are provided in medical subspecialties and general medicine through the Senior Scholars Program. The department encourages students to participate in laboratory-based and clinical research projects during their time in medical school. A broad variety of research opportunities are available with scientists and clinical investigators in the Department of Medicine, with robust science and discovery programs in basic, clinical and translational research areas.

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James G. Dobson, MD*
Liberto Pechet, MD*

Professor

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Neil Aronin, MD*
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Marjorie A. Clay, PhD*
David M. Clive, MD
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Sybil L. Crawford, PhD

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Jennifer S. Daly, MD*
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William A. Durbin, MD*
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Richard Glew, MD*
Michael A. Godkin, PhD*
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Mark Steven Joel Klempner, MD
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Shaoguang Li, PhD
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Nicholas A. Smyrniotis, MD
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William G. Muller, MD
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Research Professor

Frederick Anderson, PhD*

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Laura Cristina Alonso, MD
Raj Kumar Anand, MD
Julia D. Andrieni, MD
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Carol A. Bova, PhD, RN, ANP*
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Maria Garcia, MD*
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Leroi S. Hicks, MD, MPH*
Jeanmarie Houghton, MD, PhD*
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Stephenie C. Lemon, PhD
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Wenjun Li, PhD*
Daniel Libraty, MD
Egil Lien, PhD*
Yunsheng Ma, MD, PhD, MPH
Pranoti Mandrekar, PhD
Dominic J. Nompleggi, MD, PhD*

** joint appointment*

Sherry L. Pagoto, PhD
 Glenn Pransky, MD*
 Sanjay Ram, MD
 Lawrence S. Rosenthal, MD, PhD
 Dianne L. Silvestri, MD
 Frederick Spencer, MD
 Andrew J. Sussman, MD
 Masanori Terajima, MD, PhD
 Jennifer Tjia, MD*
 Jennifer Wang, MD
 Shixia Wang, PhD, DVM
 Mireya Wessolossky, MD

Clinical Associate Professor

Abigail Adams, MD
 Howard Alfred, MD
 Joseph A. Antaki, MD
 Peter H. Bagley, MD
 Nancy E. Bennet, MD
 Matilde Castiel, MD*
 Sonia N. Chimienti, MD
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 Raul E. Davaro, MD
 Stephen B. Erban, MD
 George Eypper, MD
 Pang-Yen Fan, MD
 Richard M. Forster, MD
 Mitchell Jay Gitkind, MD
 Lisa S. Gussak, MD*
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 Brant L. Viner, MD
 William V. Walsh, MD
 Bruce R. Weinstein, MD
 Mark M. Wilson, MD

Research Associate Professor

Susan E. Andrade, DSc
 Sunita Gulati, DSc
 Charles A. Specht, PhD
 Jorge L. Yarzebski, MD, MPH*

Assistant Professor

Konstantin Abramov, MD
 Philip Adamo, MD
 Sarika Agarwal, PhD
 Sarika Aggarwal, MD
 Mohammed W. Akhter, MD
 Christina N. Alavian, MD
 Tasneem Ali, MD
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 Papa K. Badoe, MD
 Parmender Bagga, MD
 Sonia Bagga, MD
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 Kurt G. Barringhaus, MD
 Curtis T. Barry, MD
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 Clifford John Behmer, MD
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 Kanishka Bhattacharya, MD
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 Lisa M. Bocelli, DO
 Mamatha Bollineni, MBBS
 Joseph Bouchard, MD
 Clifford A. Browning, MD
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 David Carlson, MD*
 Daniel Carlucci, MD
 Maria A. Casal, MD
 Jan Cerny, MD, PhD
 Allen Chang, MD
 Saqib Chaudhary, MD

Kai Chen, MD, PhD
 Vishesh G. Chhibber, MD*
 Nidhi Chojar, MD
 Michael Christakis, MD
 Marydawn Co, MD
 Ursula P. Collinson, MD
 Marcus P. Cooper, MD
 Sarah L. Cutrona, MD, MPH
 Ravi Dashnamoorthy, PhD
 Nicolina Cordaro Davis, MD*
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 Leslie J. Domalik, MD
 Christine Donahue, MD
 Nancy A. Dragoon, MD*
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 Michael Galica, MD
 Julia M. Gallagher, MD
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 Wendy L. Gammon, MEd
 Ronnesia Behne Gaskins, PhD, MSPH
 Thomas Gassert, MD
 Cristina A. Gavala, MD
 Mitra Ghasemi, MD
 Laura L. Gibson, MD*
 Peter B. Gibson, MD
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 Dori Goldberg, MD
 Nivedita Gour, MD
 Piotr Grabias, MD
 Bruce A. Greenberg, MD, MBA
 Thomas C. Greenough, MD*
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 Douglas L. Groves, MD
 Fei Gu, MD, PhD
 Mary M. Gulla, MD
 Ish Gupta, DO
 Richard Allen Haas, MD
 Shirin Haddady, MD*
 Heather-Lyn Haley, PhD*
 Hesham M. A. Hammouda, MD
 Ainun Haq, MD

** joint appointment*

John E. Harris, MD, PhD
 Catriona McDonald Harrop, MD
 Steven C. Hatch, MD
 Marguerite A. Hawley, MD
 Catherine A. Hay, PhD*
 Rashelle B. Hayes, PhD
 Mona Zaidi Hinrichsen, MD
 Elizabeth Woodcome Howard, MD
 Camy Thu M. T. Huynh, DO
 Benjamin J. Hyatt, MD
 Farhan Ibrahimi, MD
 Eric S. Iida, MD
 Gayatri Devi Ika, MD
 Saud A. Javed, MD
 Nikolaos Kakouros, MD
 Rebecca N. Kasenge, DO, MPH
 Vijay K. Kasturi, MD
 Abdo C. Kataya, MD
 Devinder Kaur, PhD
 Sally C. Kent, PhD
 Umar A. Khan, MD
 Joan Kheder, MD
 Ajay Kher, MD
 Michael S. Kiernan, MD
 Dagmar Klinger, MD
 Neil J. Kluger, MD
 Praveen Koneru, MD
 Scott E. Kopec, MD
 Jayanthi Kumar, MD
 Jason M. Kurland, MD
 Joseph Kuruvilla, MD
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 Jaroslav Zivny, MD

Research Assistant Professor

Roger S. Anderson, PhD*
 Richard F. Konz, BS
 Jutamas Shaughnessy, MD
 Kahraman Tanriverdi, PhD
 Zhongfa Yang, MD

* joint appointment

Instructor

Maria Del Carmen Al-Homsi, MD
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Susan N. Tarrant, MA

Senior Affiliate

Jonathan Stuart Rothman, MD*

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The choice of a White Coat helper can be tough, but meaningful

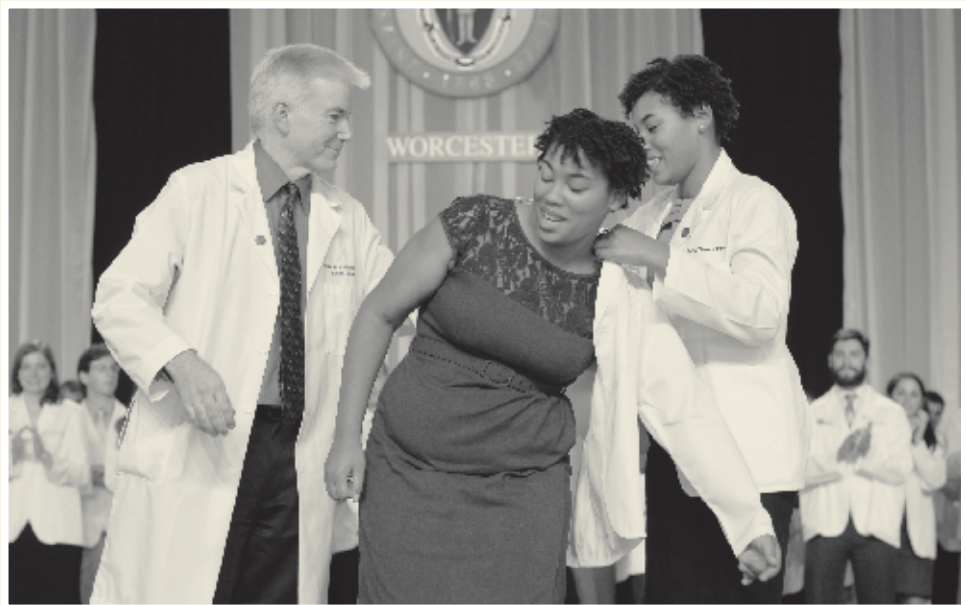
When first-year School of Medicine students cross the stage to be presented with the symbolic mantle of their profession at the White Coat Ceremony, they are helped by two people: a UMMS Learning Community mentor and another meaningful person in their lives they've chosen themselves—someone whose support they want to acknowledge in a very public way. Choosing that one person can be a tough decision for some students, but one that adds to the significance of the event.

Evan Gale chose his grandmother, Shoshana Gale, who is in her late 80s, to help him with his white coat because she is the matriarch of a family deeply involved in the health care field. A former social worker, she is the glue that keeps his family together, he said.

"I don't want to speak for her, but I think she's overjoyed. I'm so glad she's up for doing it," said Gale. "Whether she knows it or not, she was responsible for encouraging the critical thinking and discussions around health care in our family" that inspired him to become a doctor.

MD/PhD students Asia Matthew and her twin sister Ashley will be putting a twist on the tradition by helping each other with their coats.

"We've been together all our lives, even from the womb, so we've always had each other's support. We decided we'll robe each other to the finish," said Asia. The choice provided some logistical issues as students and helpers are paired up prior to arriving on stage, so the sisters received special rehearsal time to iron out the details.



Sometimes deciding between two equally important people can be so difficult that it's best to let them work it out themselves, as Gianna Wilkie discovered. She had her parents decide which of them would get the honored role.

"My mother told my father she has known me for nine months longer, so she should get to do it," said Wilkie. "He agreed, but he said that this was the only time she could use this rationale for any future decisions."

A relatively new tradition for medical students, the White Coat Ceremony was started in 1993 by the Arnold P. Gold Foundation at Columbia University College of Physicians & Surgeons. The tradition emphasizes the importance of both scientific excellence and compassionate care for the patient, according to the foundation.

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 Marjorie Ann Zyirek-Bacon, MD

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Senior Affiliate

Leo L. Stolbach, MD

Affiliate

Turner Edward Bynum, MD
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Microbiology & Physiological Systems

Microbiology & Physiological Systems features:

- research focused on specific genes that regulate disease processes, host defense mechanisms and basic cellular controls;
- investigators who exploit classic, molecular and genomic approaches to the genetics of several model systems;
- a multifaceted research approach designed to understand normal and dysfunctional molecular and cellular mechanisms in human physiology and disease in all organs of the body;
- faculty members internationally known for their expertise in bacteriology, virology, molecular biology, immunology, neural science, reproduction, aging, cell growth and cancer, stem cell research, cardiovascular physiology, endocrinology, smooth muscle biology and contractile proteins; and
- excellence in integrative physiological and microbiological education of medical and graduate students that is essential to fostering translational research involving physicians and researchers and has been consistently recognized by numerous teaching awards

Faculty in the Department of Microbiology & Physiological Systems are extensively involved in the leadership and teaching of microbiology and physiology, providing students with the basic knowledge necessary to understand and intervene in disease processes. Much of this teaching takes place in Foundations of Medicine (FOM) 1 courses, in interdisciplinary collaboration with faculty in other basic science and clinical departments. A key underlying tenet of the department's educational approach is that the practice of medicine will be linked

more and more closely with the expanding knowledge of basic biological phenomena.

Accordingly, in the Development Structure & Function course and the Building Working Cells and Tissues course, department faculty teach medical students the fundamental aspects of physiology. This knowledge serves as the foundation for understanding the functional basis of human health and disease—a foundation that students need as they prepare to become physicians and lifelong learners. Coursework emphasizes the physical and biochemical principles that govern the function of various cell types and organ systems—understanding these principles is far more important for understanding physiological and pathophysiological processes than rote memorization of facts. In the FOM curriculum, the teaching of human physiology strikes a balance between broad coverage and in-depth analysis of certain topics that are particularly illustrative of basic principles or methods. In observance of the same principles, part of the Infections course covers the basic biology of bacteria and viruses, emphasizing the molecular mechanisms of microbial processes that are targets or potential targets for antibacterial or antiviral chemotherapy. In coursework, students learn about the pathogenic mechanisms employed by microbes to establish human infection, cause tissue damage and spread to other hosts. Finally, the acquired knowledge of the biology and pathogenic strategies of these microorganisms is used as a foundation for students to learn how to diagnose, treat and prevent human infectious disease

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Molecular Medicine

Molecular Medicine's stellar faculty includes:

- the co-recipient of the 2006 Nobel Prize in Physiology or Medicine;
- three Howard Hughes Medical Institute Investigators;
- the co-recipient of the 2008 Lasker Award for Basic Medical Research;
- two members of the National Academy of Science;
- two foreign members of the European Molecular Biology Organization; and
- a fellow of the Royal Society.

Molecular Medicine is characterized by a diverse faculty of both basic biomedical scientists and physician-scientists. The program occupies its own modern 80,000-square-foot research building adjacent to the UMass Medical School campus—Biotech Two—and includes additional faculty appointments in the Program in Gene Function and Expression, the Program in Cell Dynamics, the Program in Bioinformatics and Integrative Biology, the Diabetes Center of Excellence, the RNA Therapeutic Institute and the Program in Systems Biology. The program's strategy for scientific development has been to assemble outstanding investigators with overlapping scientific interests who apply their unique knowledge to molecular mechanisms that underlie physiological processes and associated diseases. Areas of expertise include chemistry; structural biology; biochemistry; cell, developmental and molecular biology; cell signaling and regulation; genomics and proteomics; genetics; and immunology and virology. Molecular Medicine faculty are active in teaching these disciplines in both core and advanced courses to graduate and medical students.

The laboratory groups in the program are led by academic leaders in their respective fields of biology and medicine. Strong research programs related to Stem cell technology, RNA and cancer biology, AIDS, diabetes and obesity are also represented. The multidisciplinary nature of the program has led to scientific collaboration and diversity, providing an exceptional training ground for students and postdoctoral fellows alike.

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 Amy K. Walker, PhD
 Yong Xu Wang, PhD
 Maria L. Zapp, PhD*

Research Assistant Professor

Dean. Bellve, PhD
 Anil K. Chawla, PhD
 Darryl Conte, PhD
 Philip J. d'Iorio, PhD
 Kevin E. Fogarty, MS*
 Susan J. Gray, PhD
 Weifeng Gu, MD, PhD
 Adilson L. Guilherme, PhD
 Norman J. Kennedy, PhD
 Ellen Kittler, PhD
 Ashwini Mishra, PhD
 Serguei A. Popov, MD, PhD
 John S. Reece Hoyes, PhD
 Masaki Shirayama, PhD
 Juerg R. Straubhaar, PhD
 Rossella Tupler, MD, PhD
 Joseph V. Virbasius, PhD

Research Instructor

Maria Gonzalez Perez, PhD
 Yoshiko Usami, PhD

Instructor

Sanchita Bhatnagar, PhD
 Maria Jose Duenas Decamp, PhD
 Randall Friedline, PhD
 Olga Gealikman, PhD
 Dae Young Jung, PhD
 Agata Jurczyk, PhD
 Caroline Morel, PhD
 Dongning Pan, PhD
 Paul Peters, PhD
 Aleksandr Repik, PhD
 Jovenal T. San Agustin, PhD*
 Corey L. Smith, PhD
 Shinya Watanabe, PhD
 Ping Xu, MD, PhD
 Chaoxing Yang, PhD
 Zhong Yu, MD, PhD

Voluntary Faculty

Professor

Juleen R. Zierath, PhD

Assistant Professor

Andrea S. Foulkes, PhD

Research Assistant Professor

Alexey Dmitriyevich Wolfson, PhD

* joint appointment

Neurobiology

Neurobiology faculty conduct cutting-edge research into the:

- assembly and plasticity of synapses, the structures through which nerve cells communicate with each other;
- development and function of glia that may identify targets for pharmaceutical intervention in spinal cord injuries or neurodegenerative disease;
- mechanisms of neural circuitry formation and its impact on the developing brain;
- mechanisms of learning and memory in fruit flies and behavioral plasticity in worms, and their relevance to those of humans; and
- mechanisms of circadian rhythm generation in insects and mammals that are therapeutic targets for some sleep and psychiatric disorders.

Brain function embodies the very essence of the human experience as well as that of our relatives in the animal kingdom, and its study represents one of the most exciting scientific endeavors. Established in 2001, the Department of Neurobiology is the driving force for basic neuroscience research on campus. The department's activities encompass the study of fundamental neural mechanisms, with implications for disorders ranging from Sudden Infant Death Syndrome to Alzheimer's disease.

Department faculty are focused on elucidating fundamental mechanisms of brain function using model genetic systems and unconventional models, such as the monarch butterfly. These research results will add to the understanding of the roles of genes and their protein products in normal neuronal and glial function, with the goal of finding innovative therapies to prevent, combat and cure neurological and neuropsychiatric disorders.

Chair and Professor

Steven M. Reppert, MD

Professor

Vivian Budnik, PhD

David R. Weaver, PhD

Associate Professor

Patrick Emery-Le, PhD

Marc R. Freeman, PhD

Mary E. Lane, PhD

Hong-Sheng Li, PhD

Carlos Lois, MD, PhD

Assistant Professor

Mark Alkema, PhD

Claire Y. Benard, PhD

Michael M. Francis, PhD

Yang Xiang, PhD

Motojiro Yoshihara, PhD

Neurology

Our faculty experts are currently engaged in a number of funded research programs, including investigations into the:

- genetic defects that cause familial forms of Lou Gehrig's disease (amyotrophic lateral sclerosis, or ALS);
- molecular events that trigger non-familial forms of ALS and drug screening for small molecules that ameliorate ALS;
- genetic basis and approaches to therapy of selected other neuromuscular disorders, including a form of limb girdle muscular dystrophy (LGMD-2B, also known as Miyoshi myopathy), periodic paralysis, hereditary sensory and autonomic neuropathy (HSAN1) and a form of adrenoleukodystrophy (Lorenzo's Oil disease) known as adrenomyeloneuropathy;
- physiology of the visual cortex;
- pathology, genetics and biology of other neurodegenerative disorders, with a particular focus on Alzheimer's disease;
- molecular control of circadian functions and the molecular genetics of membrane channel function and dysfunction;
- pathophysiology of disorders of the central and peripheral autonomic nervous systems;
- therapeutic approaches to multiple sclerosis; and
- pathobiology of brain tumors.

The University of Massachusetts Medical School's Department of Neurology is the largest training, research and clinical neurology facility in central New England. The department acquaints SOM students with diseases that affect the nervous system and equips them with fundamental skills in clinically relevant neuroscience, neurologic diagnosis and management. Because neurological disorders are common among patients in virtually every medical specialty,

** joint appointment*

this instruction is designed for students entering all branches of medicine.

During the Foundations of Medicine curriculum, medical students learn neuro-anatomy and physical diagnosis in courses that stress clinical correlations of neuro-anatomic principles and are introduced to nervous system disorders, emphasizing observational methods, regional problems, specific diseases, clinical patterns and neuropathological correlates as well as clinical neurological problems.

The major portion of clinical neurology instruction is carried out during the clinical years as a part of the neurology clerkship. Students experience clinical neurology through the inpatient, consult or ambulatory experiences at one of the teaching hospitals affiliated with the Medical School. Seminars and lectures discussing major clinical problems are conducted, and elective programs are offered in the department's clinical and basic research laboratories.

Students interested in careers in neurology are encouraged to join the Student Interest Group in Neurology (SIGN) or work as a summer trainee in the Multiple Sclerosis clinic.

In 2006, the department received national recognition by the Association of University Professors of Neurology (AUPN) for the highest portion of medical school class members entering neurology, as compared to all other medical schools in the United States.

The Neurology Residency Program is clinically and intellectually at the very center of our department, and the training of new neurologists is among our most important and most enjoyable responsibilities. Designed to encompass both the richness of traditional clinical neurology and the excitement of contemporary clinical neuroscience, our goal is to train superb clinical neurologists who are experienced in the principles of neurological disease and are also well-educated clinical neuroscientists informed about the structure, function and molecular physiology of the nervous system.

This is an exciting time in neurology, as powerful new technologies in basic neurobiology and the clinical neurosciences have rapidly improved our understanding of neurological illnesses. Prospects have never been better for finding effective new treatments for even the most devastating neurological disorders. While our program centers on a first-rate core clinical experience, our residents and faculty are encouraged to continually advance their training through customized residency programs, specialized fellowships and research opportunities. The laboratories of our skilled faculty explore the exciting and growing fields of neurology, as new technologies accelerate our understanding of the central nervous system and the diseases that plague it.

Faculty basic research interests include the neurophysiology of vision; the biology of respiratory and circulatory control; the molecular genetics, structure and function of nerve and muscle ion channels; approaches to understanding the causes and therapies for neurodegenerative disorders, with an emphasis on ALS and Alzheimer's disease; the molecular basis of circadian rhythms and neural stem cell biology; stroke and penumbral survival; pathogenesis of human development disorders, especially brain dysfunction; and autonomic function pathogenesis. Clinical research interests include the neurology of aging and Alzheimer's disease and dementia, epilepsy, Parkinson's disease, multiple system atrophy, multiple sclerosis, neuro-oncology, neuromuscular disorders and cerebrovascular disease.

Professor and Chair

Robert H. Brown, DPhil, MD

Professor

Sheldon Benjamin, MD*
David A. Drachman, MD
Marc Fisher, MD*
Susan B. Gagliardi, PhD*
Fen-Biao Gao, PhD
Edward I. Ginns, MD, PhD*
Lawrence Hayward, MD, PhD*
Robert J. Milner, PhD
Majaz Moonis, MD*
David Paydarfar, MD
Daniel A. Pollen, MD
William J. Schwartz, MD

Thomas W. Smith, MD*
Ajay K. Wakhloo, MD, PhD*

Clinical Professor

Peter N. Riskind, MD, PhD
Jane Cummin Sargent, MD*
Joan M. Swearer, PhD*

Associate Professor

John Landers, PhD
Paul C. Marshall, MD*
Peter Novak, MD
Miguel S. Sena Esteves, PhD

Clinical Associate Professor

Ursula E. Anwer, MD
Isabelita Bella, MD
Nancy M. Fontneau, MD
Neeta Garg, MD
Carolina Ionete, MD, PhD
Ann L. Mitchell, MD
Catherine A. Phillips, MD
Lan Qin, MD, PhD
Paula D. Ravin, MD

Assistant Professor

Josna Adusumilli, MD
Alan J. Bell, MD
Daryl A. Bosco, PhD*
Raphael A. Carandang, MD*
Felicia Chu, MD
Janice Ann Dominov, PhD
Jordan H. Eisenstock, MD*
Mark R. Gibson, MD
Richard Paul Goddeau Jr., DO
Shirin Haddady, MD*
Wiley R. Hall, MD*
Nils Henninger, MD*
Jaya B. Kumar, MD
Jennifer Dunbar Moodie, MD
Susanne Muehlschlegel, MD, MPH*
Shashidhara Nanjundaswamy, MD
Audrey J. Painchaud, MD
Grazyna Pomorska, MD
Colin C. Quinn, MD, MSPT
Muhammad Ramzan, MD
Johnny S. Salameh, MD
Elisabeth Salisbury, PhD
Ellen Salurand, MD
Naren B. Sodha, MD
Mikhail Vydrin, MD, PhD

Clinical Assistant Professor

JJill S. Damon-Minow, PhD
Brian K. Dessureau, PhD*
Andreja Strahonja, MD
Banu Sundar, MD

** joint appointment*

Research Assistant Professor

Premananda Pai Indic, PhD

Instructor

Maria Pilar Elisa T. Dayaw, MD, FAAN

Jeremy F. Gill, MD

Affiliate

Elizabeth W. Henrikson, PhD*

Voluntary Faculty**Clinical Associate Professor**

Thomas F. Mullins III, MD

Jaishree T. Narayanan, MD, PhD

Jayant G. Phadke, MD

William A. Tosches, MD*

Assistant Professor

Ellen M. Deibert, MD

Steven P. Donhowe, MD

Martha Ann Fehr, MD

Gary R. Keilson, MD

Alexander Kloman, MD

Matthew E. Tilem, MD

Laurence J. Ufford, MD

Research Assistant Professor

Andrzej Przybyszewski, PhD

Paul D. Wright, PhD

Affiliate

Zahra Ayub, MD

Neurosurgery

The Department of Neurosurgery, previously a specialty division within the Department of Surgery, became an independent department in 2012. This new status aids in the recruitment of high quality faculty, the re-establishment of the neurosurgery residency program, the formation of the Neurosciences Center of Excellence and the allocation of resources to expand our clinical programs and research initiatives.

Department faculty are intimately involved in leading research related to RNAi-based gene therapy for neuro-degenerative disease, brain cancer therapeutics, cerebrovascular pathology and minimally invasive surgery. Supported by National Institutes of Health grants, other funding organizations and private donations, faculty regularly publish findings in peer-reviewed journals as contributing members in highly collaborative team

science. Our spirit of innovation has resulted in several patent applications over the last few years.

The Department of Neurosurgery offers clinical rotations for medical students during their third year Core Clinical Experience and the fourth year electives. Students participate fully in the patient care activities from the outpatient clinics through the operating room and all didactic conferences including neuroradiology, critical care, tumor board and stroke. Additional global health and independent study opportunities are available for undergraduate, graduate and medical students in both clinical and basic science areas. We regularly support Senior Scholar electives and tailor sub-internship experiences to enhance student access to competitive graduate medical education opportunities.

Professor and Chair

Richard P. Moser, MD* *ad interim*

Professor

Oguz I. Cataltepe, MD*

Associate Professor

John P. Weaver, MD

Assistant Professor

Frederik A. Pennings, MD

Voluntary Faculty**Assistant Professor**

Gerald T. McGillicuddy, MD

Arno S. Sungarian, MD

Affiliate

Julie G. Pilitsis, MD, PhD

Obstetrics & Gynecology

The mission of the Department of Obstetrics & Gynecology is to deliver exemplary patient care in ambulatory and inpatient settings while providing excellent education and cutting-edge research in obstetrics, gynecology and human reproduction. The primary objectives of the department are to develop clinical care programs that are high quality and patient-focused; perform research that improves quality of future care for our community; provide services that improve the quality of life in the community; train residents and fellows to be future leaders in obstetrics and gynecology; and offer students exposure to the academic and practical aspects of obstetrics, gynecology and related sub-specialties. OB/GYN faculty are committed to medical student education and are involved in first-year Learning Communities, physician skills course, second-year reproductive medicine course, third-year clerkship and fourth-year electives. The faculty and residents in OB/GYN will demonstrate to students the rewards of this surgical specialty, which allows long-term, compassionate care of the women in our community.

The department provides students with the opportunity to gain the knowledge and clinical skills that are fundamental to the practice of women's health. The Reproductive Medicine course, overseen by OB/GYN faculty, is taught in the second year and prepares students to consider health issues for both genders throughout their reproductive years. Also, the Maternal-Child Health Program allows students to have a longitudinal experience with individual patients during their pregnancy, delivery and early infant period. First- and second-year students are welcome to spend time in the Labor and Delivery unit observing residents and faculty as they interact with obstetrical patients. The major clinical experience for medical students occurs during the third-year Core Clinical Experience in inpatient and ambulatory settings. Opportunities are also available for a continuing relationship with a single mentor during medical school through the preceptorship component of the Doctoring

* joint appointment

and Clinical Skills course. Fourth-year electives include general obstetrics and gynecology as well as intensive learning experiences in all of the subspecialty areas.

Students develop history-taking and physical examination skills in both obstetrics and gynecology and the field's four subspecialties. Communication, learning to be an educator and sensitivity to cultural issues are emphasized. The obstetric experience includes prenatal care, complicated pregnancy, normal and abnormal labor, childbirth and operative delivery. In gynecology, students learn about preventive reproductive health examinations, family planning and treatment of benign disease as well as cancers of the reproductive tract and infertility evaluations. The diagnosis and treatment of pelvic floor dysfunction and incontinence are also covered. The department offers fourth-year electives and clerkships in gynecologic oncology, urogynecology, reproductive endocrinology and infertility, maternal-fetal medicine, ambulatory obstetrics and gynecology, and a flexible elective that allows students to create their own experience in the field.

Students also participate in the educational components of the residency program. This program features innovative experiences in simulation; the gross anatomy laboratory for pelvic and perineal dissection; curricula in effective communication with patients and referring physicians, patients and staff; and Health Care Economics, which encompasses billing, coding and documentation, hospital and medical group economics, and state and federal health care policy and advocacy.

Obstetrics & Gynecology is actively engaged in research in the areas of cancers of the reproductive tract, infertility outcomes, pelvic floor disorders, urinary and anal incontinence, psychosocial stressors in pregnancy outcomes, weight gain and obesity in pregnancy and risk of hormonal contraceptives. Students are welcome to participate in clinical research with OB/GYN faculty, residents and fellows.

Professor and Chair

Julia V. Johnson, MD, MS

Professor Emeritus

Harrison G. Ball, MD*

Professor

Francis J. Bednarek, MD*

Joanna M. Cain, MD

Catherine E. DuBeau, MD*

Marianne E. Felice, MD*

Thomas J. Fitzgerald, MD*

Karen W. Green, MD

Thomas F. Halpin, MD

Clinical Professor

Machelle M. Seibel, MD

Associate Professor

Michael K. Flynn, MD, MHS

Tiffany A. Moore Simas, MD, MEd, MPH*

Katharine K. O'Dell, RN, CNM, WHNP, PhD

Susan Zweizig, MD*

Clinical Associate Professor

Brian M. Clark, MD

Ellen H. Delpapa, MD

Phyllis Pollack, MD*

Joel H. Weiner, MD*

Assistant Professor

Patricia K. Aronson, MD

Erin E. Barlow, MD

Stephen A. Bean, MD*

Petra H. Belady, MD

Leslie S. Bradford, MD

Nancy Byatt, DO*

Shaila V. Chauhan, MD

Kristina M. Deligiannidis, MD*

Leonard G. DiGiovanni Jr., DO

Anne E. Garrison, MD

Finda Lee Guyton, MD

Mary M. Herlihy, MD

Sarah H. Hughes, MD

David Jonathan Kanter, MD

Kitsa Kondylis-Deblois, MD

Sharmilee B. Korets, MD

Tara Neubert Kumaraswami, MD

Alison C. Madden, MD

Mark Manning, DO

William J. McLaughlin, MD

Debra M. Papa, MD

Reshma Parikh, MD

Bhalchandra G. Parulkar, MD*

Danielle Patterson, MD

James William Pellegrini, MD*

Alan Peter Picarillo, MD*

Thomas B. Pokoly, MD

Gabrielle M. Reine, MD

Jennifer L. Rylander, MD*

Jyot D. Saini, MD

Dawn S. Tassilo, MD

Stuart A. Weisberger, MD*

Clinical Assistant Professor

Paula B. Bellin, MD*

Wayne B. Glazier, MD*

Hayley Marshall-Drohan, DO

Instructor

Wendy Ackley, MSW

Patricia J. Giardina, CNM

Padmasini Kandadai, MD

Marie Narducci, MD

Cathy Violette, MSN, NP

Patricia Yranski, RN, MS, NP

Clinical Instructor

Tiffany M. Forti, MD

Mary Elizabeth Gamache, RN, CNM, NP

Julie M. King, RN, NP

Kerri E. Osterhaus-Houle, MD

Brenna W. Wiberger, MSN, NP

Affiliate

Bettyann Cirillo, MD

Mark Collins, MD

Sridhar Iyer, MD

Meredith Kern, MD

Judith McNicholas, MD

Mary Kay Myers, MD

Kirti Patel, MD

Diane Power, MD

Bailoo Rohatgi, MD

Stanley Surette, MD

Gary Wilson, DO

Voluntary Faculty

Associate Professor

B. Dale Magee, MD

Clinical Associate Professor

Craig L. Best, MD

Assistant Professor

Alan J. Albert, MD

Jaimee A. DeMone, MD

Kathryn J. Go, PhD

Todd W. Hunter, MD

David A. Klein, MD

Aaron M. Mendel, MD

Brenda Anne Neary, MD, PhD

Jean W. Noel Jr., MD

Robin S. Richman, MD

Michael J. Shreefter, MD
Hiral Warner, MD
Samuel Zylstra, MD

Clinical Assistant Professor

Andrew W. Beckwith, MD
Robert R. Benner, MD
Andrea M. Bodine, MD
Bonnie H. Herr, MD
Herbert M. Kantor, MD
Joan E. Lister, MD
Gretchen Loebel, MD
Farazeneh Nabizadeh, MD
Cassandra V. Service, MD

Instructor

Mark A. Aversa, MD
Patricia D. Chernosky, MD
Peter C. Davidow, MD
Dina M. Deldon-Saltin, DO
Paul S. Dunn, MD
John Farricy, MD
Karen Ferroni, MD
Abraham Fischer, MD

Brenda Hallenbeck, MD
Patrick P. Hogan, MD
Diego S. Illanes, MD
Karen K. Jeng, MD, MBA
Jane A. Molinari, MD
June O'Connor, MD
Mary E. Scannell, MD
Steven M. Solano, MD
Elizabeth Kopin, MD

Affiliate

Karen Sue Ammerman, MD
Michael N. Schatz, MD
Susan Kraft, MD
Don P. Deprez, MD

Ophthalmology

The Department of Ophthalmology is recognized for combining basic, translational and clinical research in clinical practice, including novel small molecules, gene therapy and stem cell therapy for retinal and optic nerve disorders.

The Department of Ophthalmology was re-established at UMass Medical School in 2009. The department includes state-of-the-art basic research laboratories, where its staff performs biochemical research, particularly with retinal degeneration and related topics, to better understand the causes of eye diseases and help develop new treatments and potential cures. Students are encouraged to join the department in investigating these basic and clinical research efforts.

The department also provides comprehensive clinical ophthalmology

WooFoods aims to make the healthy choice the easy choice

The menu featured the Flying Rhino Café's hearty but healthy version of the restaurant's most popular dish, the Ivory Tusk—grilled chicken with caramelized onions and half the usual amount of American cheese on a whole grain wrap instead of Italian bread, accompanied by a crunchy broccoli slaw rather than the usual fries. For dessert, an elegant panna cotta and berry parfait from Sweet Worcester, featuring 75 percent fresh fruit, was low-fat, lightly sweetened and delicious.

Participants at a WooFood Town Hall meeting held in January at UMass Medical School enjoyed these tasty as well as healthful dishes contributed by WooFood-certified Worcester restaurants, while they learned more about the WooFood initiative to "make the healthy choice the easy choice" at local eateries.

Medical students Mitchell Li, SOM '13, Matthew DeWolf, SOM '14, and Adam Chin, SOM '14, founded WooFood in 2010 to bring a positive approach to improving public health that aligns the pleasure of dining out with healthful eating. WooFood does this by certifying restaurants and other dining establishments that are committed to putting food on their menus that is healthful as well as appetizing.

Eleven Worcester establishments have been certified in less than three years, making the WooFood logo a recognizable and reputable symbol



of a commitment to a business model that emphasizes patrons' health along with their palates.

"I was really impressed by how far WooFood had come since they started working in the past couple of years. The food served set an inspirational mood for the forum," said Abbot "Cotton" Widdicombe, SOM '15. "I could tell that the chefs enjoyed the creative challenge of adapting dishes or creating new ones to meet the WooFood criteria."

services, specializing in vitreoretinal diseases, glaucoma, macular degeneration and vascular diseases of the retina. Services include the latest technologies for imaging, perimetry and electrophysiology. Faculty are also developing international research and clinical trial collaborations with colleagues at major eye hospitals.

Chair and Professor

George K. Asdourian, MD *ad interim*

Assistant Professor

Mark D. Barsamian, DO
Hemant Khanna, PhD
Raymond G. Magauran, MD
Patricia H. Pepper, MD
Claudio Punzo, PhD

Voluntary Faculty

Clinical Associate Professor

Edward L. Kazarian, MD*

Assistant Professor

Michael J. Bradbury, MD*
Diane P. Karalekas, MD
Frank J. McCabe, MD*
Alan P. Moss, MD
Pascale Perusse, MD
Gisela Velez, MD, MPH, MA
Joseph M. Williams, MD, PhD

Clinical Assistant Professor

William M. Tang, MD

Affiliate

Brad J. Baker, MD
Melvyn H. Defrin, MD
Richard M. Eisenberg, MD
Denis J. Fitzgerald, MD
Jeffrey P. Gallo, MD
Robert Gise, MD
Jeffrey D. Levine, MD
Willard G. Rice Jr., MD
Susan M. Yeomans, MD

Orthopedics & Physical Rehabilitation

The Department of Orthopedics & Physical Rehabilitation features world-class, comprehensive and multidisciplinary subspecialty centers of excellence for central New England, including:

- Arthritis and Joint Replacement Center, a patient-centered program dedicated to arthritis and joint pain (Memorial Campus);
- Foot and Ankle Center, dedicated to treatment of the full range of foot and ankle conditions (University Campus);
- Hand/Upper Extremity Center, dedicated to the treatment of the full range of hand and upper extremity conditions (Hahnemann Campus);
- Pediatric Orthopedic Center, dedicated to the treatment of the full range of pediatric orthopedic conditions and injuries (University Campus);
- Sports Medicine Center, dedicated to the prevention, diagnosis and treatment of all athletic injuries (Hahnemann Campus);
- Spine Center, a state-of-the-art facility offering expert care for congenital, degenerative and traumatic spinal disorders in adults (Memorial Campus); and
- Trauma and Fracture Center, dedicated to the diagnosis and treatment of orthopedic injuries and fractures (University Campus).

The elective program in the Department of Orthopedics & Physical Rehabilitation provides students with an opportunity to observe and participate in a clinical mentorship with orthopedic surgeons. Students attend conferences and participate in the surgical, office and emergency practices of preceptors who practice at UMass Memorial Medical Center or in other communities throughout the state.

UMMS offers two electives that require medicine and surgery clerkships. The first, recommended for fourth-year students who

intend to pursue a residency in orthopedic surgery, is an in-depth course in musculoskeletal disorders, emphasizing inpatient and outpatient diagnosis and management of a wide variety of musculoskeletal disorders. Students will gain experience in diagnostic methods, surgical procedures, postoperative care and non-operative treatment of musculoskeletal conditions.

The second elective is recommended for fourth-year students who intend to pursue a residency other than orthopedic surgery, such as family practice, rheumatology, neurology, radiology, pediatrics, anesthesiology, physical medicine and rehabilitation, plastic surgery, emergency medicine, occupational medicine and infectious diseases. It is an in-depth and faculty-supervised overview of outpatient musculoskeletal problems that aims to develop skills in history taking, physical examination, and diagnosis and treatment of a broad spectrum of musculoskeletal diseases.

Professor and Chair

David Ayers, MD

Professor

Norman E. Beisaw, MD
Patricia D. Franklin, MD, MBA, MPH*
Thomas P. Goss, MD
Arthur M. Pappas, MD*
Faren H. Williams, MD

Clinical Professor

Patrick J. Connolly, MD
Walter J. Leclair, MD

Associate Professor

Carlton M. Akins, MD*
Thomas F. Breen, MD*
Brian D. Busconi, MD
Leslie R. Harrold, MD, MPH*
Marci D. Jones, MD
Jie Song, PhD*
John H. Stevenson, MD*

Clinical Associate Professor

Mark S. Kaplan, MD
Herbert O. Bote, MD
Michael A. Brown, MD*
Trista A. Brown, MD
Edward R. Calkins, MD
Nicola Anthony Deangelis, MD
Christian P. Dipaola, MD
Paul Fanning, PhD*

* joint appointment

Glen David Gaebe, MD
 Hwa Hsin Hsieh, MD
 Mark T. Kraus, MD
 Anthony S. Lapinsky, MD*
 David P. Magit, MD
 David A. Mazin, MD
 Jeffrey N. Metzmaker, MD
 Errol Mortimer, MD*
 Mathew J. Most, MD
 Abhay R. Patel, MD
 Mark D. Price, MD, PhD
 Joseph M. Pugleasa, MD
 Yvonne A. Shelton, MD*
 Judith A. Siegel, MD
 Debra Ann Twehous, MD
 John J. Wixted, MD
 Angela Z. Yang, MD, PhD

Clinical Assistant Professor

Robert L. Deters, MD
 Marshall Katzen, MD
 Frances J. Lagana, DPM
 George E. Lewinnek, MD

Voluntary Faculty

Professor

Jane B. Lian, PhD

Assistant Professor

David M. Grygier, MD
 Philip J. Lahey Jr., MD
 William D. Shea, MD
 Joshua T. Yurfest, MD

Clinical Assistant Professor

Jeffrey P. Cella, MD
 Anthony E. DeFelice, DO
 Andrew J. DeMaggio, MD
 Kevin G. Mitts, MD

Instructor

Donald Hale Hangen, MD
 Israel S. Hurwitz, MD
 Steven H. Sewall, MD
 Markian D. Stecyk, MD
 Harvey A. Taylor, MD

Affiliate

Peter P. Anas, MD
 Russell W. Cournoyer Jr., DPM
 John George, DPM
 Henry M. Toczyłowski Jr., MD
 Joseph A. Veneziano, MD

Otolaryngology Head and Neck Surgery

With its clinical partner, UMass Memorial Health Care, Otolaryngology-Head and Neck Surgery features:

- a regionally renowned pediatric and adult cochlear implant program that provides complete evaluation screening, surgery and extensive rehabilitation services for patients with hearing disabilities;
- comprehensive multidisciplinary diagnosis and treatment of head and neck cancer;
- comprehensive surgical management of thyroid and parathyroid disease;
- state-of-the-art endoscopic sinus surgery;
- medical and surgical treatment of balance disorders;
- evaluation and management of tumors in the ear and temporal bone;
- evaluation and treatment of facial nerve paralysis;
- treatment of acute and chronic ear infection; and
- evaluation and surgical treatment of congenital ear malformations.

The Department of Otolaryngology-Head and Neck Surgery strives to acquaint students with the many clinical issues affecting the ears, nose and throat, including head and neck surgery, pediatric otolaryngology, otology and neurotology.

Attending staff will supervise the students during all clinical activities. Students are allowed increasing responsibility in accordance with their level of skills and fund of knowledge. Students are encouraged to participate in the full spectrum of patient care encompassed within the practice of otolaryngology. The attending staff member determines the degree of supervision indicated during a student's participation in any given clinical situation to maintain the highest standards of patient care.

In the third year, students rotate through the otolaryngology clinics during the subspecialty portion of their Surgery core clinical experience. The faculty also presents a didactic series on the principles of head and neck surgery. Included are lectures and case presentations highlighting the major subdivisions of general and pediatric otolaryngology, endoscopic sinus surgery, otologic and neurotologic and skull base surgery, cochlear implantation in children and adults, and head and neck oncologic surgery and reconstruction.

An elective fourth-year clerkship is also offered for interested students who intend to pursue a career in otolaryngology or who wish to enter other fields but develop and refine their otolaryngologic diagnostic skills. Students work in both the outpatient and inpatient setting, participating in diagnosis, treatment and management of otolaryngologic problems and in a wide variety of surgical procedures and postoperative management. Research electives are also available.

Students rotating through the Department of Otolaryngology-Head and Neck Surgery have a chance to be introduced to the six competencies required during future residency training:

1. Patient care that is compassionate, appropriate and effective for the treatment of health problems and the promotion of health.
2. Medical knowledge about established and evolving biomedical, clinical and cognate (e.g., epidemiological and social-behavioral) sciences and the application of this knowledge to patient care.
3. Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.
4. Interpersonal and communication skills that result in effective information exchange and teaming with patients, their families and other health professionals.
5. Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population.

* joint appointment

6. System-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care, and the ability to effectively call on system resources to provide care that is of optimal value.

Chair and Associate Professor

Daniel Y. Kim, MD*

Professor

Richard R. Gacek, MD*

Assistant Professor

Sarah S. Seo, MD

Weiru Shao, MD, PhD*

Clinical Assistant Professor

Syed H. Kamil, MD

Voluntary Faculty

Professor Emeritus

William G. Lavelle, MD

Assistant Professor

Giulio I. Cavalli, MD

James P. Hughes, MD

David B. Wexler, MD

Sarah Foster Poissant, PhD

Clinical Assistant Professor

John A. Loiodice, MD

Affiliate

Min S. Ahn, MD

John R. Bogdasarian, MD

Andrea C. Chiamonte, MD

Frank Peter Fechner, MD

Neri Holzer, MD

Joseph H. Oyer, MD

Jonathon Scott Sillman, MD

Pathology

Pathology faculty have been widely recognized for their commitment to medical students through a number of UMMS teaching awards, including the:

- Lamar Soutter Award for Excellence in Medical Education;
- Educational Achievement Star Award;
- Retired and Outstanding Medical Educator Awards; and
- Faculty Marshall Award.

The Department of Pathology offers medical students their first formal encounter with disease through an integrated pathology curriculum. This includes an introduction to the basic manifestations of disease at the cellular and tissue levels and an analysis of specific diseases as they affect all organs and systems. This "organ system" approach to disease is taught in an integrated manner with diverse clinical and basic science departments in the Organ System Diseases course. This course provides students with an in-depth understanding of disease by correlating underlying molecular mechanisms with structural, functional and clinical aspects.

Diseases of the nervous system are also taught as an integrated course (Brain: Nervous System and Behavior) with contributing departments that include psychiatry, neurology, pathology and cell biology. The Department of Pathology also plays a major teaching role in the integrated immunology curriculum (Host Defense and Blood course), providing students with an understanding of the basic mechanisms that protect the body against infectious agents and how these mechanisms contribute to diseases, including autoimmunity, immune deficiency and transplantation rejection.

Elective opportunities in various areas of Pathology are available to medical students. Students in their third year have the opportunity to take one week electives in pathology as part of the Flexible Clinical Experience course. Electives are also available in the fourth year (Advanced Studies) and are usually about four weeks in duration. Research experience is also available, primarily in Immunology.

Laboratories in the department are investigating the immune response to viruses and cancers, antigen presentation, T-lymphocyte activation and T-cell development. Clinical research is focused on the study of varied aspects of pathogenesis, disease and diagnostic pathology

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Andrew H. Fischer, MD*

Armando E. Fraire, MD

Edward I. Ginns, MD, PhD*

Zhong Jiang, MD

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Clinical Professor

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Associate Professor

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Amanda Jenkins, PhD

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Charles R. Kiefer, PhD

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Eva Tsuda, MD

Hongbo Yu, MD, PhD

Clinical Associate Professor

Ediz F. Cosar, MD

Abby Melinda Hornstein, MD

Yao Tek Kaw, MD

Patricia M. Miron, PhD*

Michael J. Mitchell, MD

Nader A. Morad, PhD

Lokinendi V. Rao, PhD

* joint appointment

Assistant Professor

Ali Akalin, MD, PhD
 M. Rabie Al-Turkmani, PhD
 Michael A. Brehm, PhD*
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 Gina Teresa Cunto-Amesty, MD
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 Vijay K. Vanguri, MD
 Stephen N. Waggoner, PhD
 Otto Walter, MD
 Xiaofei Wang, MD, PhD

Clinical Assistant Professor

Marzena Galdzicka, PhD*
 Neng Yu, MD*

Research Assistant Professor

Roger S. Anderson, PhD*
 Lianjun Shen, MD, PhD

Instructor

Jaime M. Calvo-Calle, PhD
 Karl K. McKinstry, PhD
 Jerzy Sobota, MD
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Voluntary Faculty**Clinical Professor**

Rebecca L. Johnson, MD

Assistant Professor

Daniel J. Carter, MD
 Marcia B. Cohen, MD
 Teri L. Cooper, MD
 James P. Yang, MD

Clinical Assistant Professor

Charles Abbott, MD
 Jessica D. Krochmal, MD

Senior Affiliate

Herbert E. Nieburgs, MD

Affiliate

Kamala Murali, MD

Pediatrics

Pediatrics is distinguished by:

- a special immunology clinic for children with HIV that provides access to state-of-the-art treatment;
- a cystic fibrosis center that treats more patients with the disease than any other facility in Central and Western Massachusetts;
- a 43-bed Newborn Intensive Care Unit that has earned benchmark status as a model for similar units worldwide; and
- a juvenile diabetes center that is the only program in Central and Western Massachusetts to be certified by the American Diabetes Association.

The Department of Pediatrics introduces students to the career of pediatrician. During the four years of medical school, students learn how to diagnose and manage acute and chronic illnesses that are commonly seen in infants, children and adolescents. Students are also exposed to the biopsychosocial and developmental aspects of pediatrics. The curriculum helps students acquire the necessary skills to establish rapport with children and their parents in order to obtain a meaningful history, conduct a thorough physical examination, manage clinical problems and serve as a child and family advocate. As a result of their pediatric experiences, students should be able to make an enlightened career choice concerning this specialty.

During the Foundations of Medicine curriculum, faculty members participate in interdepartmental lectures and conferences on neuroanatomy, genetics, nutrition, microbiology, hematology, immunology and behavioral sciences that incorporate clinical correlations with the basic science topics the students are learning; the biopsychosocial aspects of health and disease in infants, children and adolescents are woven into this series.

Department faculty have specific teaching responsibilities in the Doctoring and Clinical Skills course and as longitudinal preceptors. In addition, the department has developed an elective seminar in Teen Pregnancy, which has been well received by students.

The third-year Pediatrics Core Clinical Experience (CCE) emphasizes clinical problem solving in both clinical situations and conferences. The experience includes inpatient pediatric settings and primary care offices. Students use this experience to become familiar with the primary care and subspecialty nature of the field and the important role that the pediatrician plays in the physical and emotional development of children of all ages.

During the CCE, students participate as members of a health care team in a variety of community outpatient and inpatient settings, allowing them to apply their interviewing and clinical problem-solving skills in the health care of children. In addition, the department provides an opportunity for approximately 30 students to participate in a 12-week combined obstetrics and gynecology and pediatric/maternal-child health elective, during which the student is responsible for a woman's prenatal care as well as the health supervision of her infant. Students who have a special interest in the welfare of children can also participate in an elective Special Interest Group in Pediatrics, which meets regularly to discuss such topics as the ethical issues of reproductive choice and severe prematurity, human sexuality, teenage pregnancy, sexual abuse, divorce and adoption. These seminars are developed by the students with the help of a faculty advisor.

Fourth-year students can choose to participate in the Senior Scholars program, designed to provide in-depth clinical and/or research experience in an area of special interest. Electives are also available in pediatric subspecialties, general pediatrics, pediatric emergency service and pediatric or neonatal intensive care.

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Danna B. Peterson, MD, MHA*

Professor

Anthony J. Alario, MD
 Francis J. Bednarek, MD*
 Adel Bozorgzadeh, MD*
 Oguz I. Cataltepe, MD*
 Sarah H. Cheeseman, MD*
 Anne Marie Comeau, PhD
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 N. Lynn Eckhert, MD, MPH*
 Marianne E. Felice, MD*
 Thomas J. FitzGerald, MD*
 Terence R. Flotte, MD*
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 Janice F. Lalikos, MD*
 Jeanne B. Lawrence, PhD*
 Mariann M. Manno, MD*
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 Alan D. Michelson, MD*
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 Brian P. O'Sullivan, MD
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 Ronald J. Steingard, MD*
 John L. Sullivan, MD*
 Susan L. Sullivan-Bolyai, DNSC, CNS, RN*
 Linda F. Weinreb, MD*
 Karen Wiss, MD*
 Martin H. Young, PhD
 Robert G. Zwerdling, MD

Clinical Professor

Kathleen Braden, MD
 Geri S. Fuhrmann, PsyD*
 Neil J. Grossman, MD
 David M. Keller, MD*
 Peter W. Metz, MD*
 Richard Moriarty, MD
 Linda D. Sagor, MD, MPH
 Ann L. Sattler, MD

Research Professor

Gary R. Ostroff, PhD*

Associate Professor

Carlton M. Akins, MD*
 Linda Bandini, PhD
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 Tiffany A. Moore Simas, MD*
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 Benjamin Nwosu, MD
 Mai-Lan A. Rogoff, MD*
 Darshak M. Sanghavi, MD
 Leslie A. Soyka, MD
 Janet Sue Twyman, PhD
 Kathleen E. Walsh, MD
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Clinical Associate Professor

Scot T. Bateman, MD
 Angela L. Beeler, MD
 Peter J. Foley, MD*
 Farajallah Habib, MD*
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 Ghazala Naheed Usmani, MD
 Mark A. Vining, MD
 Barbara Walsh, MD

Research Associate Professor

Judith A. Savageau, MPH*
 Mohan Somasundaran, PhD*

Assistant Professor

Seema Adhami, MD
 Jeremy T. Aidlen, MD, FACS*
 Amanda Angelescu, MD
 Carrie C. Armsby, MD
 Onesky Aupont, MD, MPH, PhD
 John H. Backman, MD*
 Erin E. Barlow, MD*
 Negar Beheshti, MD*
 Leah Belazarian, MD*

Mark C. Bisanzo, MD*
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 David Carlson, MD*
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 Jacquelyn M. Cotter, MD
 Nicolina Cordaro Davis, MD*
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 Alexandra Evindar, MD
 Michael C. Fahey, MD
 Penny Meryl Feldman, MD
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 David J. Fish, MD*
 Jay G. Fong, MD
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 Timothy E. Gibson, MD
 Laura L. Gibson, MD*
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 Thomas C. Greenough, MD*
 Thomas J. Guggina, MD
 Neena R. Gupta, MD
 Katy-Ann E. Hannigan, DO
 Beverly Hay, MD
 Christina R. Hermos, MD, MS
 Anne Whalen Higgins, PhD*
 Ho-Wen Hsu, MD
 Barry M. Hugo, MD
 Catherine A. James, MD
 Frank Jehle, MD, MPH
 Anne F. Josephs, MD
 Eugene Jura, MD
 David A. Kane, MD
 Christopher P. Keuker, MD
 Doris Kim, MD
 Kimberlee Kusiak, MD*
 Anthony S. Lapinsky, MD*
 Marc A. Lieberman, MD*
 Jessica L. Ludy, PsyD*
 Jeffrey C. Lukas, MD
 Joseph Makris, MD*
 Ann E. Maloney, MD*
 Louise Maranda, PhD*
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 Bonnie L. Mathews, MD
 John Baird McCahan, MD*
 Jeanne M. McCoy, MD
 Erin M. McMaster, MD
 Mudita Mittal, MD
 Rebecca L. Moles, MD
 Errol Mortimer, MD*
 Christian Muller, PhD

* joint appointment

Peter J. Murphy, MD
 Erin C. O'Hara, MD*
 Mary J. O'Neill, MD*
 Monika Lynn Page, MD
 Anne C. Powell, MD
 David R. Remis, MD*
 Robert I. Richmond, MD*
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 Elizabeth Anne Weiner, MD, MFA
 Scott D. Wellman, MD*
 Falgun Patel Wylie, MD
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 Hana Zibdeh-Lough, DO

Clinical Assistant Professor

Brian K. Dessureau, PhD*
 Marzena Galdzicka, PhD*
 Safdar Medina, MD

Research Assistant Professor

Li Zhong, PhD*

Instructor

David Avila, DO
 Paula Beaver, RNC, MS
 Lisa M. Blazejewski, MS
 Linda Ciu, MD
 Deborah Elaine Francis, MD
 James Gleason, MS
 Deborah Gurski, MD
 Tatiana A. Hamawi, MD*
 Nancy Harger, RN, MS, LIS*
 Kathryn L. Harris, RN, ACNP-BC
 Michael E. Huppert, MPH*
 Mary Jeffers-Terry, MSN*

Asavari U. Kamerkar, DO
 Carolyn Marie Keiper, MD
 Janice Kennedy, MD
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 You Fu Li, MD*
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 Mary L. Naples, RN, BSN
 Dorothy R. Page, MSN, FNP
 Matthew William Ryzewski, DO
 Todd B. Sauter, MA, CCC-A*
 Patrica A. Segerson, MBA
 Kerinna E. Silvestri, BSN, MS
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 Audrey Beth Smolkin, MPP
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 Susan M. Swanson, MA
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 Kristine Tingley, MA
 Mayra Silvina Tisminetzky, MPH, MD, PhD*
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 Mary Whalen, RN, DNP
 Julia A. Wilkinson, MS
 Robert Wing, MA, CCLS
 Robyn D. Wing, MD
 Xueqing Zhang, PhD

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Professor Emeritus

John A. Duggan, MD
 Peter H. Viles, MD

Clinical Professor

James M. Seltzer, MD
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Associate Professor

Jonathan Rhodes, MD
 Maria Victoria T. Tantengco, MD

Clinical Associate Professor

Phyllis Pollack, MD*
 Jyoti P. Ramakrishna, MD
 Joel H. Weiner, MD*

Research Associate Professor

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 Ali Yalcindag, MD

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Theresa Callahan, MD
 Fernando Catalina, MD, PhD
 Christopher P. Giuliano, MD
 Karen A. Heveron, MD
 William D. Selim, MD
 Janet A. Slota, MD
 William W. Woodruff, MD

Research Assistant Professor

Xiufeng Wu, MD, PhD*

Instructor

Mark Andrews, MPA
 Karen Back, MD
 Robert D. Basow, MD
 Matthew Benz, MD
 Sharon Burdulis, MD
 Sang K. Chung, MD
 Angela Ciamarra, MD

* joint appointment

Kathleen M. Cleary, MD
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 Mark L. Cohen, MD
 Jose Correa, MD
 Linda Cozzens, MD
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 Brian J. Dempsey, MD
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Lorraine M. Schratz, MD
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 Deborah Shipman, MD
 David G. Sidebottom, MD
 John S. Sullivan, MD
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 Haya Yankelev, MD
 Michael Zackin, MD, PhD
 William E. Zawatski, MD, MPH

Affiliate

Achal Aggarwal, MD
 Robert Beckmann, MD
 Vincent M. Biggs, MD
 Kimberly D. Boullard, MS
 Sheila C. Callahan-Butler, MD
 Sharon M. Champion, MD
 Lisa E. Carson, RNC-PNP
 Anne C. Chaffee, MD
 Kathy L. Chrismer, MD
 Ruth Yu Chu, MD
 Robert A. Ciottone, PhD*
 Idris Dahodwala, MD
 Nancy W. Detora, MD
 Brooke Di, DO
 Elena Dragoi, MD
 Patricia Anne Dykstra, MD
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 Robert Gedachian, MD
 Amy B. Gonroff, MD
 Muddana Haribabu, MD
 William F. Horgan, DO
 Patricia F. Maalouli, MD, FAAP
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 Brenda McHugh, MD
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 Himabindu Muddana, MD
 John Francis Mulqueen, MD
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 Deborah A. O'Driscoll, MD
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 Swati S. Sane, MD
 Susan Shawver-Matthews, MD
 Dale G. St. Lawrence, MD
 Donna Marie Staton, MD, MPH
 Sarah Monaghan Wegiel, MD
 Suzanne M. Weiss, MD
 Michelle L. Whitham, MD

Psychiatry

The Department of Psychiatry features:

- an emphasis on psychiatric problems that frequently arise in primary care medicine;
- the use of an integrative model of psychiatry emphasizing the biologic, psychodynamic, and social and behavioral aspects of treatment; and
- a broad research base in neuroscience, psychopharmacology, psychosocial rehabilitation, mental health policy, psychiatric treatment, and adult and child psychiatric subspecialties.

The Department of Psychiatry provides educational programs throughout all four years of the UMass Medical School curriculum. Courses during the first three years encompass interviewing, diagnostic and etiologic issues as well as treatment and management modalities. Normal and abnormal development and psychological functioning are considered, and social, behavioral, biological and psychodynamic models are integrated throughout the curriculum.

During the third year, a Core Clinical Experience gives students an opportunity to further develop the interviewing, reasoning and communication skills that are fundamental to psychiatric diagnosis and intervention. An integrative model is stressed, emphasizing the biological, psychodynamic, social and behavioral aspects of treatment in both inpatient and outpatient settings.

The department offers a Senior Scholars Program and a number of fourth-year electives, including advanced clinical rotations on inpatient or consultation units as well as experience in specialized areas such as law and psychiatry, addiction psychiatry, child and adolescent psychiatry, child maltreatment, community psychiatry, psychiatry for the homeless, women's mental health and neuropsychiatry.

Professor and Chair

Douglas M. Ziedonis, MD, MPH

Professor

Sheldon Benjamin, MD*
 Philip Noyes Chase, PhD
 Marjorie A. Clay, PhD*
 Joseph R. Difranza, MD*
 Jean A. Frazier, MD*
 Jeffrey L. Geller, MD, MPH
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 Majaz Moonis, MD*
 Ellen S. More, PhD
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 Evgeny I. Rogaev, PhD
 Anthony Rothschild, MD
 David A. Smelson, PsyD

Clinical Professor

Kenneth L. Appelbaum, MD
 Alexander Blount, EdD *
 Alan P. Brown, MD
 Geri S. Fuhrmann, PsyD*
 Peter W. Metz, MD*
 Ira K. Packer, PhD
 Joan M. Swearer, PhD*

Research Professor

Charles W. Lidz, PhD*

Associate Professor

Erin L. Boudreaux, PhD
 Philip J. M. Candilis, MD
 Curtis Deutsch, PhD
 Gregory J. DiGirolamo, PhD
 William V. Dube, PhD*
 Xiaoduo Fan, MD, MPH
 Carl E. Fulwiler, MD, PhD
 Paul D. Gardner, PhD
 Gerardo Gonzalez-Haddad, MD
 Alexis D. Henry, ScD
 Madelyn Jane. Hicks, MD
 Haley E. Melikian, PhD*
 Eric O. Mick, ScD*
 Constance M. Moore, PhD
 Mai-Lan A. Rogoff, MD*
 Andrew R. Tapper, PhD
 William Vogel, PhD

Clinical Associate Professor

Albert J. Grudzinskas, JD
 Marie H. Hobart, MD
 Anthony Haig Jackson, MD
 Daniel J. Kirsch, MD
 Charles R. Swenson, MD

Research Associate Professor

Maryann Davis, PhD
 Gina Vincent, PhD

Assistant Professor

Mary S. Ahn, MD
 Rasim Arikan, MD, PhD
 John H. Backman, MD*
 Negar Beheshti, MD*
 Mathieu Bermingham, MD
 Serge Botsaris, MD
 Daniel L. Breslin, MD
 Philip R. Burke, MD
 Nancy Byatt, DO*
 Annmarie Caracansi, MD
 Robert J. Carey Jr., PhD
 Eduardo Jesus Caussade-Rodriguez, MD
 Nancy Hsiu Sheng Chan, MD
 Lauren R. Charlot, PhD
 Karl Stanley Chiang, PhD*
 Cezar I. Cimpeanu, MD
 David Micah. Cochran, MD
 Kristina M. Deligiannidis, MD*
 Brian M. Denietolis, PsyD
 Yael Dvir, MD
 Jordan H. Eisenstock, MD*
 Barry N. Feldman, PhD
 Deborah Field, MD
 Stuart Fisher, PhD
 Kathryn Scarlett Fleming-Ives, MD
 Richard Ribon Fletcher, PhD
 Lisa R. Fortuna, MD
 Aaron Louis Frenz, MD
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 Kensuke Futai, PhD
 Scott Gonzalez, MD
 Ronald T. Greene, DO
 Ruth B. Grossman, PhD, CCC-SLP
 Laura S. Guy, PhD
 Judith A. Haran, MD
 Amy L. Harrington, MD
 Kamlyn R. Haynes, MD
 Nils Henninger, MD*
 Kenneth Holbert, PhD
 John J. Iwuc, MD
 Christopher Kennedy, MD*
 Sun S. Kim, PhD, RN, APN-BC

Teresa M. Kohlenberg, MD
 Monika E. Kolodziej, PhD
 Kimberlee Kusiak, MD*
 Sarah C. Langenfeld, MD
 Kimberly A. Larson, PhD, JD
 Jennifer Lauretti, PhD
 Ivy S. Lessin, MD
 Karen Lionello-Denolf, PhD
 Boris Lorberg, MD
 Jessica L. Ludy, PsyD*
 Rebecca Lundquist, MD
 Anne Lutz, MD
 Ann E. Maloney, MD*
 Wendy K. Marsh, MD, MS
 Gilles E. Martin, PhD
 Kristin Mattocks, PhD, MPH*
 David L. McGarry, MD
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 Mercedes E. Menendez, MD
 Lauren Christina Miller, PhD
 Lisa A. Mistler, MD
 Kenneth P. Mitchell, MD
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 Nelly Nabokin, MD
 Zafar N. Naqvi, MD
 Paul E. Noroian, MD
 Syeda S. Nuzhat, MD
 Mary E. Olson, PhD
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 Amy Prince, MD
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 Rodolfo E. Reni, MD
 Anastasia Star L. Rizos, DO
 Ruthann Rizzi, MD
 Stephanie C. Rodrigues, PhD
 Karla M. Rodriguez Perez, MD
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 Daniel F. Rowe, MD
 Sameer P. Sarkar, MD
 Ralph J. Seymour, MD
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 Tatyana Shteinlukht, MD, PhD
 Nawras Shukair, MD
 Kathryn Ruth Sickorez, MD
 Van R. Silka, MD
 Patrick Smallwood, MD
 Marianne L. Smith, MD
 Sarah S. Spratt, MD
 Andrea B. Stone, MD
 Brian Szetela, MD

* joint appointment

Subha Thiagarajan, MD
 David Jonathan Tobin, PhD
 Rosalie A. Torres Stone, PhD
 Lina C. Vawter, MD
 Amy B. Wachholtz, PhD
 Melodie Wenz-Gross, PhD
 Nanyin Zhang, PhD

Clinical Assistant Professor

Marzena Galdzicka, PhD*
 Carla A. Lourenco, PsyD
 Terry M. Smith, MD

Research Assistant Professor

Kathleen M. Biebel, PhD
 Marsha L. Ellison, PhD
 Liwang Liu, MD

Instructor

Lisa Beittel, MBA
 Deborah A. Carter, MEd, LICSW
 Paul Pasquale Christopher, MD
 Steven M. Hodge, MA
 Mary Innis, MSN
 Toni Michelle Irsfeld, MA
 Mary Jeffers-Terry, MSN*
 Henrietta Kernan, DO
 Margaret M. Manning, PhD
 Thomas D. Manning, MA
 Merleen A. Mills, LICSW, MSW
 Karen E. Nordstrom, MS
 William H. O'Brien, MSW
 Mustafa M. Syed, MD
 Amy Nicole Fox Tapper, PhD
 Lee E. Vorderer, MEd*

Clinical Instructor

Caroline S. McGrath, RN, BSN

Research Instructor

Rubing Zhao-Shea, MD

Lecturer

Terrie M. Burda, PsyD
 Peter W. Cohen, MD
 Christophe Jean Gerard, PhD
 Sureyya Iscan, PhD
 Choudhary B.S. Patel, MD
 Tuong Q. Tran, MD
 Mitchell W. Wangh, MD

Voluntary Faculty

Professor

Schahram Akbarian, MD
 Ursula Drager, MD
 William H. Fisher, PhD
 Stephanie W. Hartwell, PhD
 Joanne Nicholson, PhD*
 Ronald J. Steingard, MD*
 Steven Treistman, PhD*
 Krista M. Wilkinson, PhD

Clinical Professor

Linda M. Cavallero, PhD

Associate Professor

Leonard A. Doerfler, PhD
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 Gregory Hanley, PhD
 David W. Kalman, PhD
 Patricia H. Maxson, MD*
 Kevin R. Murphy, PhD
 Jayendra K. Patel, MD
 Rupal K. Patel, PhD
 Debra Pinals, MD
 Richard Serna, PhD
 William Stempsey, MD, PhD, MDiv
 Rachel Thompson, PhD

Clinical Associate Professor

Steven A. Adelman, MD
 Stuart Anfang, MD
 Robert Bass, PhD
 Kenneth Freedman, MD
 Thomas L. Horn, MD
 Julia A. Matthews-Bellinger, MD, PhD
 Gary S. Moak, MD
 Alex N. Sabo, MD

Research Associate Professor

Brent M. Jones, PhD

Assistant Professor

William Ahearn, PhD
 John Franken Aney, MD
 Elizabeth T. Austin, PsyD
 David W. Ayer, PhD
 Michael A. Cirillo, PhD
 Joseph M. Cocozzella, MD
 Nitigna Desai, MD
 Elizabeth W. Donlon, MD
 Leslie Fishbein, MD
 Raymond B. Flannery Jr., PhD
 Mary Ellen G. Foti, MD

Frank M. Gatti, MD
 Neil S. Glickman, PhD
 Philip D. Gottlieb, MD
 David Hoffman, MD
 Rocco A. Iannucci, MD
 J. Anthony Irsfeld, PhD
 Cuneyt Iscan, MD
 Gregg Januszewski, PsyD
 Megan Kelly, PhD
 Stacey C. Kimmelman, PsyD
 Genevieve A. Laforet, MD, PhD
 Duncan C. MacCourt, MD
 Ljiljana Markovic, MD
 Joseph C. McGill, LICSW
 Jennifer Michaels, MD
 Ruben Miozzo, MD
 Peter W. Moran, PhD
 Sharon Mozian, MD
 Mary O'Malley, MD, PhD
 R. Kaan Ozbayrak, MD
 Nancy E. Pratt, MD
 Melinda Randall, MD
 Tina Irene Render, MD
 Eileen Roscoe, PhD
 Maria Russo-Appel, MD
 Eric G. Smith, MD
 Stephen D. Starr, MD
 John P. Terry, PhD
 Peter F. Toscano, PhD
 Meenakshi Vemuri, MD
 Dana D. Weaver, PhD
 Ruth Westheimer, MD
 Lewis D. Wurgaft, PhD

Research Assistant Professor

Jonathan Delman, MPH, JD, PhD

Instructor

Phyllis Atwell, MD
 Jonathan Ryan Coffman, MPH, CHES, CTTS-M
 Deborah Ekstrom, MA, MPP
 Virginia Merritt, BA
 Linda Smothers, MD
 Zayda Vallejo, MLITT

Clinical Instructor

David H. Levoy, MD

Research Instructor

Valerie F. Williams, MA, MS



Second-year students learn about international medical care on a personal level

Twenty-seven members of the School of Medicine's Class of 2015 traveled all over the world last summer to learn about international medical care on a very personal level. Some visited countries completely unfamiliar to them, while others returned home to countries they left as children. A few conducted research while others shadowed health care professionals or served in local health care clinics.

The second-year students presented posters detailing their global adventures in August. Also presenting posters were students in the Summer Service-Learning Assistantship Program, who conducted service learning projects domestically.

Some of those presenting international posters were participants in the Pathway on Serving Multicultural and Underserved Populations elective, a course designed to help students develop linguistic and

cultural competence and sensitivity to the hardships that many immigrants and poor people face. As part of the elective, they received a stipend to help with travel and living costs.

Jeremy Konstam said he had an "incredible experience" during his four weeks in Ecuador, where he lived with a local family, took language classes, volunteered to teach English at a local school and observed at a family health clinic. "It was interesting to see how health care is delivered in a low-resource setting," he said, noting he was impressed with the skill of the local doctors and the overall continuity of care.

Other students traveled to Argentina, El Salvador, Guatemala, India, Albania, Tanzania and China, among other countries.

Senior Affiliate

Stuart H. Bartle, MD
 David M. Bear, MD
 Richard M. Berlin, MD
 Sherrill A. Conna, MD
 Rachid M. Och, MD
 Richard A. Prager, PhD
 Jonathan Stuart Rothman, MD*

Affiliate

Prudence Baxter, MD
 Richard C. Bedrosian, PhD
 Alan P. Birnbaum, PhD
 Kevin Bradley, MEd
 Harvey M. Budner, MD
 Robert A. Ciotto, PhD*
 Christy Clark, PhD
 Lori R. Cohen, PhD
 Daniel Comiskey, MD
 Stuart A. Copans, MD
 Robert B. Diener, MD
 Robert Dingman, EdD
 Laura Dove, MD
 Emad H. Eskander, MD
 Daniel B. Fisher, MD, PhD
 Ann M. Foley, MEd
 William Fortier, DMin
 Nancy Fuller, MEd
 Alicia Gavalya, MD
 David H. Gill, MD
 Robert C. Guerette Jr., MD
 Bruce Hauptman, MD
 Elizabeth W. Henrikson, PhD*
 Arnold J. Hill, MD
 Rebecca S. Kardon, MA, RNCS
 Steven Kessler, MD
 Imad Khreim, MD
 Clara S. Kim, MD
 Jamie Krauss, PhD
 Janice LeBel, PhD
 Steven I. Lessin, PhD
 Richard Listerud, MD
 Leslie E. Malkiewich, PhD
 Julianne Miller, MD
 Patrice M. Muchowski, ScD
 Christopher L. Myers, MD, MPH, TM
 Ronald F. Pike, MD*
 John V. Pruitt III, MD
 Daniel Reinstein, PhD
 Paul M. Rosen, PhD
 Shirley S. Siff, EdD
 Madeline L. Spadola, PsyD

Laurie A. Stalker, PhD
 Ludmilla L. Tonkonogy, MD
 Susan Tritell, PsyD
 Ann Van Dyke, MD
 Karen L. Wentworth, PsyD
 Susan Williams, CNS

Quantitative Health Sciences

The Department of Quantitative Health Sciences offers research expertise, comprehensive training programs and services that focus on:

- Biostatistics
- Epidemiology
- Health services research
- Health informatics
- Implementation science
- Health disparities
- Patient-reported outcomes measurement

Established in 2009, the Department of Quantitative Health Sciences (QHS) is enhancing the clinical and translational research enterprise at UMass Medical School. The department complements the recently established UMass Center for Clinical and Translational Science and is organized around four academic divisions: Biostatistics and Health Services Research; Epidemiology of Chronic Disease and Vulnerable Populations; Health Informatics and Implementation Science; and Outcomes Measurement Science.

By consolidating, linking and expanding resources for quantitative methods and study design at UMMS, QHS promotes team-based research programs across quantitative, clinical and basic-science disciplines. As a central strategy in the start up of this new department, QHS has recruited some 30 new junior and senior faculty to date. QHS academic faculty are independent investigators and also collaborative methodologists in joint projects with other investigators across campus.

QHS faculty lead and teach in programs such as the Master of Science in clinical investigation and the PhD in clinical and population health research (CPHR). QHS faculty also serve as advisers and mentors for trainees at all levels, from medical students through junior faculty.

QHS and the CPHR program are located in about 23,000 square feet of new space in the Albert Sherman Center in close proximity to the RNAi Therapeutics Institute and other research labs as well as to novel medical student training facilities. This proximity lends itself to the development of unique clinical and translational research partnerships.

Professor and Chair

Catarina I. Kiefe, MD, PhD*

Professor

Jeroan J. Allison, MD, MS*
 Eric J. Alper, MD*
 Arlene S. Ash, PhD
 Edwin D. Boudreaux, PhD*
 Suzanne B. Cashman, DSC*
 Michael F. Collins, MD, FACP*
 Jennifer Daley, MD*
 Patricia D. Franklin, MD, MBA, MPH*
 Robert J. Goldberg, PhD*
 Joel M. Gore, MD*
 Jerry H. Gurwitz, MD*
 Jay S. Himmelstein, MD, MPH*
 David C. Hoaglin, PhD
 Thomas K. Houston, MD
 Kate L. Lapane, PhD
 Thomas J. McLaughlin, ScD*
 Judith K. Ockene, PhD, MEd, MA*
 Deborah L. Plummer, PhD*
 Amy K. Rosen, PhD
 Carole C. Upshur, EdD*
 John E. Ware, PhD
 Linda F. Weinreb, MD*
 Norman W. Weissman, PhD
 Hong Yu, PhD

Research Professor

Frederick Anderson, PhD*
 Bruce A. Barton, PhD

Associate Professor

Becky A. Briesacher, PhD*
 Robin E. Clark, PhD*
 Philimon Gona, PhD
 Leroi S. Hicks, MD, MPH*
 Robert A. Klugman, MD*

* joint appointment

Wenjun Li, PhD*
 Eric O. Mick, ScD
 Ann M. Moormann, PhD, MPH*
 Sharina D. Person, PhD
 Sowmya R. Rao, PhD
 Matthias S. F. Rose, MD, PhD
 Allison B. Rosen, MD, MPH, ScD
 Andres Schanzer, MD*
 Jennifer Tjia, MD*

Research Associate Professor

Jorge L. Yarzebski, MD, MPH*

Assistant Professor

Milena D. Anatchkova, PhD
 Nina Deng, EdD
 Hua Fang, PhD
 Timothy Patrick Hogan, PhD
 Louise Maranda, PhD*
 David D. McManus, MD*
 Jane S. Owens, PhD*
 Lori R. Pelletier, PhD
 Rajani S. Sadasivam, PhD
 Heena Pravin Santry, MD*
 Molly E. Waring, PhD
 Mary L. Zanetti, EDD

Research Assistant Professor

Catherine E. Dube, EdD

Instructor

Thomas M. English, PhD
 Ralph J. Zottola, PhD

Voluntary Faculty

Assistant Professor

Kristin Mattocks, PhD, MPH*
 Stephanie L. Shimada, PhD

Instructor

Tze Chao Chiam, PhD
 Mayra Silvina Tisminetzky, MPH, MD, PhD*

Radiation Oncology

The Department of Radiation Oncology remains one of the largest clinical and academic departments in the eastern United States. The department manages eight clinical facilities with 12 linear accelerators, with the majority of facilities equipped with daily image guidance and four dimensional planning. Each campus is fully equipped for advanced technology therapy, including intensity modulation treatment and stereotactic radiosurgery and body radiotherapy. The department maintains a strong brachytherapy service in multiple disease sites. Each radiation oncologist maintains strong relationships with our disease based multi-disciplinary programs within the Cancer Center to ensure outstanding patient care and clinical service. The department campuses are at Holyoke Hospital, Harrington Hospital, Health Alliance-Fitchburg, University and Memorial campuses in Worcester, Marlboro Hospital (open 2013), Holy Family Hospital (Methuen-Steward) and St. Elizabeth Hospital (Brighton-Steward).

The department is the home to the Quality Assurance Review Center (QARC). QARC is the quality assurance vehicle for the National Cancer Institute (NCI) clinical trials program with emphasis in diagnostic radiology and radiation oncology. QARC houses data from clinical trials dating from 1970 and currently provides real time review of imaging and radiation therapy treatment objects for NCI and industry clinical trials. QARC writes all protocols for the cooperative group programs and interfaces daily with all of the NCI clinical cooperative groups for protocol case management and publications. The QARC campus is housed in Lincoln, RI. The department has an active clinical trials program with several internal IRB approved protocols evaluating process changes in radiation therapy.

The department is actively engaged in many educational activities both in the medical school and in allied health. Radiation oncology requires a dedicated group of therapy technologists and physics planning staff, and there are few educational and training programs. The department has a

therapy school with yearly graduates since 1989. The department manages the Cancer Concepts Course for the Medical School in collaboration with our colleagues in medical oncology and has sponsored many fifth year students in performing research supporting their applications to radiation oncology and other residency programs.

The department participates in many basic science and translational research activities in collaboration with several clinical and basic science colleagues at UMMS. We have demonstrated that cell adhesion modulation therapy through an anti-integrin mechanism promotes enhanced sensitivity to radiation therapy in disease sites not always amenable to chemotherapy and have identified a neuroendocrine phenotype of prostate cancer that is particularly resistant to radiation therapy. With our colleagues in pathology we have evaluated the role of immune modulation with repair of radiation injury, and with our colleagues in plastic surgery, we have demonstrated that optical imaging models can predict vascular changes from radiation therapy within 12 hours of treatment.

The department promotes active integration of outstanding clinical service with education and research objectives to move new ideas from the bench to daily patient care.

Professor and Chair

Thomas J. FitzGerald, MD

Professor Emeritus

Harrison G. Ball, MD*

Professor

Jesse N. Aronowitz, MD
 Oguz I. Cataltepe, MD*
 Richard R. Gacek, MD*
 Richard P. Moser, MD*

Clinical Professor

Sidney Kadish, MD

Associate Professor

Daniel Y. Kim, MD
 Susan Zweig, MD*

Clinical Associate Professor

Bruce A. Bornstein, MD
 Maria G. Cicchetti, MD
 Yuan-Chyuan Lo, PhD
 Janaki Moni, MD

* joint appointment

Richard S. Pieters, MD*
Kenneth Ulin, PhD

Assistant Professor

Wade J. Gebara, MD
David J. Goff, MD
Alan J. Stark, MD

Clinical Assistant Professor

Linda Ding, PhD
Allison H. Sacher, MD

Research Assistant Professor

Hira Lal Goel, PhD*
Tao Wang, PhD*

Instructor

Harry Bushe, MS
Michael SY Chin, MD
I-Lin Kuo, MS
Paul S. Rava, MD
Shirin Sioshansi, MD

Voluntary Faculty

Assistant Professor

Wade J. Gebara, MD

Instructor

Mark J. Brenner, MD

Radiology

Faculty from the Department of Radiology interact with students throughout their four years at UMass Medical School. In the Foundations of Medicine curriculum, radiologists employ the full spectrum of diagnostic imaging studies in correlation with gross anatomic findings. In the Development, Structure and Function course, the comprehensive introductory radiology curriculum includes thoracic, abdominal, musculoskeletal, vascular and neurological imaging. All modalities (x-ray, CT, MRI, Pet-CT, ultrasound, angiography, mammography and nuclear medicine) are incorporated into the curriculum.

Month-long elective clerkship experiences in all areas of radiology are offered for fourth-year students from both UMass Medical School and for visiting students. Opportunities to observe the entire spectrum of imaging procedures, both diagnostic and interventional/therapeutic, are provided. Additional month-long advanced clerkships are available in vascular interventional radiology, neuroradiology and pediatric radiology, as are other individually tailored sub-specialty rotations including specialized research opportunities.

The Department of Radiology maintains core labs specializing in nuclear medical physics, molecular imaging probes and small animal imaging. Our Advanced MRI Center and the New England Stroke Research Center provide the foundation for several world-class programs focused on the diagnosis and treatment of stroke. Our new breast CT serves as the focal point for the Program in Innovative Breast Imaging. The department maintains and fosters close, collaborative relationships with numerous other departments throughout the school. These interactions support innovative translational research in numerous areas of diagnostic imaging.

Chair and Professor

Max Paul Rosen, MD, MPH

Professor and Chair Emeritus

Edward H. Smith, MD

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Jerry P. Balikian, MD
Alexei A. Bogdanov, PhD
Joseph T. Ferrucci, MD
Marc Fisher, MD
Stephen J. Glick, PhD
Sarwat Hussain, MD
Andrew Karellas, PhD
Michael A. King, PhD
Ajay K. Wakhloo, MD, PhD

Associate Professor

Seth T. Dahlberg, MD
Matthew J. Gounis, PhD
Young H. Kim, MD, PhD
Robert Licho, MD
Petrus H. Pretorius, PhD
Deepak Takhtani, MD
Srinivasan Vedantham, PhD

Clinical Associate Professor

Susan A. Afonso, MD
Charu S. Desai, MD
Mona M. Korgaonkar, MD
Eugenio L. Suran, MD
Gopal R. Vijayaraghavan, MD, MPH

Research Associate Professor

Guozheng Liu, PhD
Mary Rusckowski, PhD

Assistant Professor

Robert John Adamo, MD
Herlen J. Alencar, MD
Steven J. Baccei, MD
Keith A. Cauley, MD, PhD
Christopher A. Cerniglia, DO, MEng
Andrew P. Chen, MD
Byron Yoeh-Yee Chen, MD
Dennis Coughlin, MD
Carolynn Michelle DeBenedictis, MD
Joyoni Dey, PhD
Sathish K. Dundamadappa, MD
Carolyn Suzanne Dupuis, MD
Jean-Marc Gauguier, MD, PhD
Erica Ghosh, MD
Morris Hayim, MD
Matthew L. Hoimes, MD, MS
Samuel Y. Hou, MD, PhD
Rebecca Hultman, DO

Adib R. Karam, MD
 Jeanne D. Keller, MD
 Hao S. Lo, MD
 Sue Ann Macmaster, MD
 Joseph Makris, MD
 Hesham H. Malik, MD
 Louis Marone, MD
 Ajit S. Puri, MD
 Farhana R. Riaz, MD
 Abhijit Roychowdhury, MD
 Eric J. Schmidlin, MD
 John G. Schneider, MD
 Daniel M. Schwartz, MD
 Hartley M. Sirkis, MD
 Charles Stout, MD
 Padmaja Surapaneni, MD
 Patricia H. Sutman, MD
 Ellen D. Waitzkin, MD
 Ellen C. Wallace, MD
 Larry Z. Zheng, MD

Instructor

Joyeeta Mitra Mukherjee, PhD
 J. Michael O'Connor, PhD
 Surong Zhang, PhD
 Shaokuan Zheng, PhD

Voluntary Faculty

Professor

Jeffrey A. Leppo, MD

Assistant Professor

Curtis J. Brasseur, DO
 Mazen Ghani, MD
 Sanjay Kedia, MD
 Eric S. Korenman, MD
 Lisa Ann Loring, MD
 Prakash Malkani, MD
 Mark S. Smyczynski, MD

Instructor

Xinrong Liu, PhD

Surgery

Along with the recruitment of exceptional faculty and the maintenance of its strong tradition in providing outstanding trauma services, the Department of Surgery continues its growth with:

- the development of a Cardiovascular Center of Excellence;
- a focus on enhancing minimally invasive techniques in all disciplines; and
- an increasing concentration in surgical oncology.

The Department of Surgery has a long history of dedication to the education and mentorship of medical students. It is the aim of the department to provide a broad-based body of knowledge and basic technical skills that are applicable to all areas of medicine, with additional opportunities for more specialized study based on individual student interest. These goals are accomplished in collaboration with several community hospitals throughout Massachusetts.

The third-year Core Clinical Experience in Surgery features general/vascular surgery, where students have an opportunity to become an active and integral member of the care team, including the day-to-day treatment of patients as well as regular participation in the operating room setting. This experience is complemented by attendance at surgical clinics and offices, where students are able to assist in providing outpatient care. The experience also provides exposure to a variety of surgical subspecialties, including thorough outpatient, inpatient and operating room experiences. Enhancement of learning opportunities occurs through student participation in regular conferences and lectures.

Fourth-year students are encouraged to enroll in a variety of month-long general surgery or subspecialty electives in order to obtain more advanced knowledge. Students may choose an individual preceptor or design a more formal subinternship. Selected students who are interested

in pursuing a career in surgery may also choose to participate in a two-month Senior Scholars elective, accomplished under the guidance of a faculty preceptor and involving both clinical and research training.

Professor and Chair

Demetrius Litwin, MD, MBA

Professor and Chair Emeritus

Edward H. Smith, MD*

Professor Emeritus

Bruce S. Cutler, MD
 Babs R. Soller, PhD*

Professor

Elias J. Arous, MD
 Giacomo P. Basadonna, MD, PhD
 Adel Bozorgzadeh, MD*
 Raymond M. Dunn, MD*
 Uri Galili, PhD
 Geoffrey M. Graeber, MD
 Michael R. Green, MD, PhD*
 Stephen O. Heard, MD*
 Michael P. Hirsh, MD*
 Janice F. Lalikos, MD*
 Craig M. Lilly, MD*
 Louis M. Messina, MD
 Nsidinanya Okike, MD
 Nilima Patwardhan, MBBS
 Robert Quinlan, MD
 Douglas M. Rothkopf, MD
 Ajay K. Wakhloo, MD, PhD*
 Giles Whalen, MD

Clinical Professor

Gary M. Fudem, MD
 Jane Cummin Sargent, MD*

Research Professor

Frederick Anderson, PhD*

Associate Professor

Mustafa Akyurek, MD
 Thomas F. Breen, MD*
 Mitchell A. Cahan, MD
 Anne M. Gilroy, MA*
 John J. Kelly, MD
 Anne Larkin, MD
 Dominic J. Nompleggi, MD, PhD*
 Andres Schanzer, MD*
 Bruce J. Simon, MD
 William B. Sweeney, MD
 Stanley Tam, MD
 Jens M. Walz, MD*

Clinical Associate Professor

Philip Ayvazian, MD*
 John M. Castle, MD
 Timothy A. Emhoff, MD
 Khaldoun Faris, MD*
 Mitchell Jay Gitkind, MD*
 Divakar Mandapati, MD
 John V. Shufflebarger, MD

Assistant Professor

PPaulo Ney Aguiar Martins, MD
 Jeremy T. Aidlen, MD, FACS*
 Francesco Anthony Aiello, MD
 Karim Alavi, MD
 Antonio Aponte-Feliciano, MD*
 Donald T. Baril, MD
 Michael J. Bradbury, MD*
 Allen F. Browne, MD, FACS, FAAP
 Raphael A. Carandang, MD*
 Philip A. Cohen, MD
 Hongyi Cui, MD
 Donald Czerniach, MD
 Melinda Darrigo, PhD, NP
 Jon David. Dorfman, MD
 Nancy A. Dragoon, MD*
 Wiley R. Hall, MD*
 Margaret M. Hudlin, MD
 Issam Khayata, MD*
 Nam Heui Kim, MD
 Jennifer LaFemina, MD
 Laura A. Lambert, MD
 Raimis Matulionis, MD*
 Justin A. Maykel, MD
 Frank J. McCabe, MD*
 Vinetta Marie McCann, RNCS, NP*
 Theodore P. McDade, MD
 Patrick Michael McEnaney, MD
 Babak Movahedi, MD, PhD
 Susanne Muehlschlegel, MD, MPH*
 Pradeep P. Nazarey, MD
 David T. Noyes, MD*
 Ashling O'Connor, MD
 Richard A. Perugini, MD
 Syed M. Quadri, MD
 William P. Robinson, MD
 William E. Rockett, MD
 Reza F. Saidi, MD
 Heena Pravin Santry, MD*
 Sheila O. Stille, DMD*

Paul R. Sturrock, MD
 Mary E. Sullivan, RNCS, ANP-BC*
 Ulises Torres Cordero, MD
 Karl Fabian L. Uy, MD
 Maksim Zayaruzny, MD*

Clinical Assistant Professor

Jose M. Heisecke, MD

Research Assistant Professor

Gordon A. FitzGerald, PhD
 Frederick H. Hooven, PhD

Instructor

Katherine Bailey, APRN, BC
 Peter J. Gentile, PA-C
 You Fu Li, MD
 Erik Greg Lough, MD
 Melinda F. Taylor, BS

Research Instructor

Guodong Tie, PhD
 Jinglian Yan, PhD

Voluntary Faculty**Professor**

Parviz J. Sadighi, MD
 Michael D. Wertheimer, MD, FACS*

Clinical Professor

Norman Harmon Schulman, MD

Associate Professor

Timothy C. Counihan, MD
 Robert D. Fanelli, MD
 Francis J. Podbielski, MD
 Richard S. Swanson, MD
 Jennifer F. Tseng, MD, MPH*
 Marc E. Uknis, MD*

Clinical Associate Professor

Richard T. Silverman, MD

Assistant Professor

Edward L. Amaral, MD
 Richard M. Basile, MD
 Kristen L. Billiar, PhD
 Marcella W. Bradway, MD, FACS, FASCRS
 Harvey G. Clermont, MD
 Michael S. Cohn, MD
 George A. Csank, MD
 Eugene L. Curletti, MD
 Michael R. DiSiena, DO*
 David L. Dykhuizen, MD

Susan C. Fiorillo, DMD
 Jeffrey J. Fong, PharmD
 Christian R. Galvez-Padilla, MD
 Iraklis G. Gerogiannis, MD, FACS
 Subhash C. Gulati, MD
 Andrew B. Lederman, MD
 Peter J. Miotto, MD
 Richard D. Montilla, MD
 Fadi Nukta, MD
 Michael A. O'Shea, MD
 Rodrigo Santamarina, MD
 James M. Shenko, MD
 Mark E. Stoker, MD
 Richard H. Whitten, MD
 Jacqueline Wu, MD

Clinical Assistant Professor

Paul L. Arcand, MD
 Deborah K. Ekstrom, MD
 Gregory J. Gallivan, MD
 Abraham W. Haddad, DMD
 Leon G. Josephs, MD
 John R. Kearns, MD
 Marc S. Lessin, MD
 Basil M. Michaels, MD
 Theodore J. Patsos, MD, FACS

Affiliate

Stuart H. Bentkover, MD
 Benjamin Grajales, MD
 W. David Kelly, DMD
 Mohan K. Korgaonkar, MD
 Cynthia M. Poulos, MD
 Charanjit S. Rao, MD

Instructor

Elise Gates, MD
 Larry Lockerman, DDS
 Nicole J. Pecquex, MD

Clinical Instructor

Mark S. DiStefano, MD

Urology

The Department of Urology was created in July 2012. Prior to that time it was a division of the Department of Surgery. Since its inception, the department has concentrated on the recruitment of urologists with excellent clinical skills and a strong desire to teach in an academic environment.

In the last year, the Department of Urology has recruited several accomplished faculty who joined urologists who have been faculty members for many years. Together these urologists offer the full spectrum of urologic care including pediatric urology, GU oncology, female urology, infertility, incontinence, stone disease, treatment of various conditions of the prostate, minimally invasive surgery, both laparoscopic and robotic and urodynamic evaluation of various neurologic conditions.

The urology faculty now teaches residents and fellows from the departments of Family Medicine & Community Health, Obstetric & Gynecology, Internal Medicine, Pediatrics and Surgery. In addition, clerkships are now available for third- and fourth-year medical students. The faculty also participates in a variety of protocols for the treatment of urologic malignancies and they collaborate with UMass Medical School colleagues on clinical research projects. Finally, the department has re-established other scholarly pursuits in the form of monthly Urology Grand Rounds and visiting professorships. The long range plan is to re-establish a urology residency program.

Chair and Associate Professor

Stephen E. Tosi, MD, *ad interim*

Clinical Associate Professor

Mitchell Hal Bamberger, MD

Assistant Professor

Peter Howard Bernhard, MD, FACS

Aminuddin Rathore, MD

Charles A. Steiger, MD

Clinical Assistant Professor

Paula B. Bellin, MD*

Robert S. Bennett, MD

Research Assistant Professor

Cheng Du, PhD

Voluntary Faculty

Clinical Associate Professor

Philip Ayvazian, MD*

Timothy B. Hopkins, MD

Michael R. Wollin, MD

Assistant Professor

Robert D. Blute Jr., MD

Robert J. Cherry, MD

Philip J. Howard Jr., MD

David T. Noyes, MD*

Bhalchandra G. Parulkar, MD*

Paul R. Silverstein, MD

Clinical Assistant Professor

Brett M. Carswell, MD

Wayne B. Glazier, MD*