Impact. It is defined in the Merriam-Webster Dictionary as "the force of impression of one thing on another: a significant or major outcome." At the University of Massachusetts Medical School, we are committed to making an impact in health sciences education, research and public service both for the Commonwealth and the nation. This impact takes the form of training physicians, scientists and nurses; making research discoveries to prevent and cure disease; providing expertise to many state agencies; and enhancing our special relationship with UMass Memorial Health Care. This annual report describes examples of such impact.

Before the summer of 2002, most Americans read or heard the words "West Nile virus" and imagined an exotic disease restricted to the banks of the ancient river. But when people across the country began to contract the illness and suffer its effects, the UMass Center for Infectious Disease and Vaccine Research was already conducting important research on the molecular basis of West Nile virus in order to develop effective vaccines. In the pages of this report, you'll read about the center's impact on the efforts to combat illnesses that plague developing countries—and, because our world is indeed so small—threaten the U.S. as well.

Another example of our impact through research is the discovery of the genetic cause of a neuromuscular disorder called facioscapulohumeral muscular dystrophy, the third most common form of muscular dystrophy. This discovery was the result of long-term collaboration between a UMass research team and colleagues in Italy's Program Project grants and research consortia, both growing trends at our institution and further described in this report, are all about alliances we forge and how they drive our objective to understand the complexities of diabetes, cancer, HIV/AIDS, mental retardation and other afflictions.

What helps us make an impact in our research enterprise? Collaborative creativity, and it emanates from ongoing interactions between our faculty and students. Each year, UMass encourages attendance from both groups at its Research Retreat, where science is shared and future directions are envisioned. As detailed in the following pages, the 2002 Retreat gave three Graduate School of Biomedical Sciences students the opportunity to enhance their scientific knowledge through face-to-face discussions with faculty from the institutions diverse research areas. In the words of one participant, "The Retreat provides a chance for all to make connections that promote interdisciplinary research and make this a superb academic institution."

Our medical students testify to the impact we are making every day in our mission of education, and nationally we have been recognized by U.S. News & World Report as fifth in the nation (out of 123 medical schools) in the 2002 Primary Care Rankings. The training of qualified and compassionate physicians and graduate nurses is critical to our core values.

Finally, we make an impact on the quality of care at our sister institution, UMass Memorial Health Care. Its affiliation with the Medical School attracts nationally distinguished physicians who are experts in the latest treatments and provide an educational atmosphere that brings out the best in our physicians and nurses. In this report, you'll meet the new leader of our clinical partner, John G. O'Brien, someone who shares my enthusiasm for the potential of our two great institutions. Together we know we can—and will—make an impact.

Aaron Lazare, MD
The University of Massachusetts Medical School and UMass Memorial Health Care have long-term plans for growth and development on the University Campus, essential to their complementary missions of education, patient care, research, and service. Currently, facilities initiatives have outgrown, changes in health care delivery, and the challenges of working in a structure that has seen a continuous use limit the ability to perform as effectively and expansively as the region demands. To meet these current and future demands, UMass and UMass Memorial initiated planning in 2002 for a complex array of projects that will change the face of the University Campus and its academic health center.

Through a carefully planned process, the assembly of a team of skilled construction and architectural/engineering experts and a committed leadership, the project’s key elements will become reality between now and 2006. They include replacement of the exterior granite façade and window system, redesign and improvement of campus building entrance, sidewalks, and exterior signage, expansion of the emergency department, catheterization labs, operating rooms and endoscopy suites, remodeling and expansion of space for diagnostic radiology, including on-site MRI, and construction of an additional parking garage. UMass hired Beviss-Lend Lease, one of the world’s most experienced and well-respected construction management firms to oversee Campus Modernization. Paytec Associates, one of the nation’s premier architectural/engineering firms experienced in health care and academic institutions, will design the façade, window system and entrance elements.

“Large and important changes are coming as a result of Campus Modernization,” said Dr. Lazare and CEO O’Brien. “There will be inconvenience, but through the resources of UCAMPUS, the patience, and goodwill of thousands of UMass Medical School and UMass Memorial employees, we’ll do everything we can to minimize the impact on those who depend on the campus for education, care, employment and scientific discovery. And, our commitment is that the safety of our patients, students and employees comes first.”

An intensive period of analysis, planning and conceptual design began in the fall. This January, some interior space and structural changes to accommodate the expansion of clinical space were made. This spring, the façade and window system component will begin in earnest, and architectural conceptualization of the new University Campus will be presented. Monitor the progress via the UMass Web site at www.umassmed.edu/campusreview campus.

Anthony Caruthers, PhD, was appointed the new dean of the Graduate School of Biomedical Sciences in December. Dr. Caruthers, a member of the UMass faculty since 1983, replaces Thomas B. Miller Jr., PhD, who retired in June 2000.

A highly regarded professor in the Department of Biochemistry & Molecular Pharmacology and internationally recognized for his research of glucose transport across membranes, Caruthers received his doctoral degree in physiology from King’s College London. He served as a visiting scientist with the Marine Biological Association of the United Kingdom and as a postdoctoral research associate in the Department of Physiology at King’s College before joining UMass in 1983 as a research associate. He became assistant professor of biochemistry in 1985, associate professor of biochemistry and physiology in 1990, and professor in 1996. He served as interim chair of biochemistry & molecular pharmacology from 1997-2001.

Leisle Berg, professor of pathology and chair of the search committee that identified Caruthers, said, “As Tony has been at UMass for most of his academic career, he has a deep understanding of the institution and is committed to the graduate program.”

As dean, Caruthers will lead a vibrant and valued part of the educational and research components at UMass. The GSBS attracts a select group of students each year, who benefit from the continual growth of a research enterprise currently receiving $135 million annually and faculty recognized throughout the world for their innovative investigations on the cutting-edge of biomedical science. Caruthers’ NIH research has led to significant revision and expansion of the understanding of glucose transport. “My research remains a life-motivating interest,” said Caruthers. “I am delighted to share my passion for research with the student body.”
The Worcester District Medical Society (WDMS), representing over 1,400 physicians and medical students in Central Massachusetts, chose UMass Medical School faculty for all three of its major awards presented at its Fall District Meeting in November.

The A. Jane Fitzpatrick Community Service Award honored H. Brownell Wheeler, MD, the Harry M. Haidak Distinguished Professor of Surgery Emeritus, who has served his patients as a caring, highly skilled surgeon; UMMS as founding chair of surgery; and the WDMS as both founding chair of its Board of Directors and the Annual Committee, which organized the society’s first state-wide annual meeting.

Dr. Wheeler has helped to bring together the community of physicians and its existing hospitals in long-lasting partnerships. The President’s Award, given only when physicians of exceptional stature are nominated, recognizes individuals for their outstanding contributions to the health of the community. Recipient Guido Majno, MD, emeritus professor and former chair of pathology, who retired after 30 years at UMMS in fall 2002, has achievements on multiple fronts. He is revered as a teacher by his students, distinguished as a research scientist, and noted as a clinical diagnostician who advanced understanding of health and disease at the cellular, molecular and genetic levels. The Career Achievement Award honors a member who has demonstrated compassion and dedication to the medical needs of patients and the public, and has made significant contributions to the practice of medicine. Recipient Daniel O’Donnell, MD, assistant professor of family medicine at community health, shows his commitment to individuals and communities from all socioeconomic levels as medical director of Worcester’s Great Brook Valley Health Center. Dr. O’Donnell blends active clinical practice with his administrative duties, and integrates quality care for individuals with improving care for the community through clinical research.

Chancellor and Dean Aaron Lazare spoke before an international audience of 500 in August at the Centre for Initiatives of Change in Caux, Switzerland. His Caux Lecture topic was on the healing power of apology, an especially appropriate one for the annual conference, which includes an Agenda for Reconciliation program for people from regions currently in conflict. According to Initiatives of Change, the organization credos with enhancing relations between Germany and France following World War II. “Just as peace depends on genuine processes of healing the past, when people have been at war or have suffered at the hands of others, building trust takes courage and is often painful. It involves a process of acknowledging past wrongs, and expressions of apology leading, when possible to explicit acts of both restitution and forgiveness.”

Dr. Lazare, a national authority in the subject of shame and humiliation in medical encounters and an expert on the apology process, described the offering and acceptance of apologies as “one of the most profound interactions of civilized people.” Apologies are the only cure for a wound and, to break the circle of grudges and vengeance. Apologies have grown in importance, he theorized, because the world of the millennium called for a “fresh start” and searching, a clean slate, a moral reckoning, that contributed to an “explosion of apologies in the 1990s,” including those made by Pope John Paul II for the so-called wranglings of the Catholic Church. “All of a sudden, apology became important—and I believe it will stay that way,” Lazare noted.

Outlining the four parts to an apology—acknowledgment of the offense; communicating remorse, lubrication and shame; offering an explanation for the offense; and making reparations—Lazare said that even a gesture can be enough, citing the Pope’s visit to the Wallingford and Yad Vashem, the memorial to the Holocaust in Jerusalem. He gave examples of a fake apology—using the passive phrase “mistakes were made” instead of saying “I made mistakes”—and dissuaded instances of genuine apology, including from a German president for his country’s crimes in World War II, and the head of the U.S. Bureau of Indian Affairs for the suffering of Native Americans.

Lazare answered questions from audience members, who had traveled from forty-eight countries, among them 70 other countries. He was moved to see how completely diverse audience had understood and accepted the major points of the talk. The management of apology is perhaps the greatest challenge to personal and international relations and that apology is the best—and perhaps only—cure for humiliation.” Lazare noted after his return to UMMS.

The Lamar Soutter Library celebrated completion of renovations in December. “Some people come into the library to use the computers, while others come to get away from the day-to-day grind and read the current journals or browse the stacks. We needed a combination of spaces that would not only provide areas to sit and do work, but also allow people some space to relax,” explained Janet Tuohy-Stamos, MLS, the library’s director. “In the end, although we have the same number of publications, computers and seating, the more comfortable and efficient arrangement enhances our services.” Changes include the reconfiguration of computers into individual cubicles to promote privacy; a new circulation desk, which makes all library loans and circulation services more accessible; the relocation and reconfiguration of the reference desk and display of photographs throughout the library to improve customer access; and the purchase of Aveda world travel kits, soaps and chairs to improve patron comfort.
The eight faculty and 30 postdoctoral fellows, graduate students and research staff of the CIDVR regularly tangle with viral pathogens such as West Nile virus, human anti, Japanese encephalitis, dengue fever, yellow fever and smallpox, in addition to more familiar infectious diseases like hepatitis C, HIV and influenza. Although some of these viruses haven’t crossed our borders recently with significant impact, their history of devastation in developing countries makes them a serious concern. The World Health Organization (WHO) predicts environmental and social determinants of infectious disease transmission will only expand in the coming decade: another billion people in the world, continued urbanization, and changes in global climate and local weather patterns increase the likelihood that these emerging and re-emerging viruses will become more familiar.

“Although still largely unseen in our country, many of these diseases are commonplace elsewhere,” said Francis A. Ennis, MD, professor of medicine and molecular genetics & immunology and director of the CIDVR. “The developing world simply doesn’t have the resources needed to combat disease and create vaccines.” That task falls to researchers like those in the CIDVR, who have dedicated their careers to understanding the molecular basis of human diseases caused by infectious agents and to the development of safe and effective vaccines against these agents. CIDVR faculty and staff focus on the disease process itself, scrutinizing the molecular mechanisms of the human T lymphocytes that dictate the immune response—or over-response—to infection. The researchers employ clinical research, cell culture and molecular biology approaches and call upon their colleagues in immunology, pathology and molecular genetics in other UMMS departments.

In 2002, CIDVR increased its focus on T lymphocytes, the immune system’s memory password to a variety of infections. Initial studies conducted with Professor Peter C. Doherty, Nobel Prize laureate in Medicine in 1996, revealed that adult T cells recognized the vaccinia virus from immunization received in infancy, indicating that immunity might last for longer than originally suspected. Investigations focused on whether such T-cell memory might be strong enough to fight off an actual viral exposure, or whether it might render reactivation tendencies in individuals who are bitten by the deadly virus before the immune system could trigger the needed protective response.

With a budget of nearly $4.5 million, CIDVR faculty work closely with researchers both in the U.S. and around the world, particularly in Thailand, where faculty have overseen clinical trials since the late 1990s. They also are regularly called upon to serve on key committees of the WHO, National Institute of Health and Centers for Disease Control. Working in conjunction with the New York State Department of Public Health, for example, the center was recently awarded a $3.1 million subcontract as part of an NIH initiative to understand why West Nile virus causes serious illness in some people while in others it simply mandates itself with flu-like symptoms. Faculty have forged relationships with health agencies in afflicted regions to obtain blood samples from infected patients, noting the variations in immune responses to gain information that may lead to new vaccines.

Similarly fears of an intentional release of smallpox, renewed by the Sept. 11 terrorist attacks and the ensuing spate of anthrax scares, have prompted much research. While other centers are focused on developing new vaccines, CIDVR researchers are examining the human memory in T lymphocytes responses to vaccination something Dr. Ennis began decades ago when he discovered that adult T cells recognized the vaccinia strain immunization received in infancy, indicating that immunity might last for longer than originally suspected. Investigations focused on whether such T-cell memory might be strong enough to fight off an actual viral exposure, or whether it might render reactivation tendencies in individuals who are bitten by the deadly virus before the immune system could trigger the needed protective response.

Such research is fueled by the active interest of not only the CIDVR faculty, but also graduate students and fellows involved in the center’s academic training mission. Funded in part by an ongoing NIH grant, the training program exposes physicians, graduate students, pregraduate students and fellows to all aspects of the multidisciplinary research. “We learn so much from the young scientists as we’re training them,” Ennis said. “They are entrepreneurs and creative, which is critical in this field.”

In the last two decades, more than 30 scientists have trained through the CIDVR, innovative students who then fan out across the globe to battle the viral pathogens threatening the population. Through our training and our research, and with the enthusiastic support of UMass Medical School,” said Ennis, “I believe we’re making a difference.”

Eavesdrop on the weekly two-hour staff meeting of the UMMS Center for Infectious Disease and Vaccine Research (CIDVR), and you might forget you’re in a laboratory in the cold northern hemisphere where mosquitoes die each fall and public health policies keep our water potable and our children immunized.

By Alison M. Duffy
Incredible excitement surrounded the announcement in June 2000 that a "rough draft" of the human genome had been produced. An overarching objective of the worldwide Human Genome Project (HGP)—begun over a decade ago to identify all of the genes in human DNA and ascertain the sequence that makes up that DNA—the draft's unveiling meant that 90 percent of the sequence was complete, with a "finished manuscript" just over the horizon, now expected sometime this year.

The fields of genomics and proteomics are, simply, the study of the DNA words that instruct the making of proteins, the actual building blocks of the cell. Both fields have accelerated dramatically in the wake of the successful HGP. Researchers have, of course, for some time realized the fundamental role genes play in disease development and progression—but now they are gaining access to genetic information on a grand scale that allows for the molecular pinpointing of "mistakes" made by genes as they direct human cells how to act, or act out. The National Institutes of Health (NIH) has responded quickly, supporting research endeavors aimed at mining the wealth of information provided by the HGP. One such effort is the Diabetes Genome Anatomy Project, funded in October 2002 with $10 million over five years, and granted to a consortium comprising UMass Medical School, Joslin Diabetes Center, Dana-Farber Cancer Institute, Children’s Hospital and Massachusetts Institute of Technology.

The project’s principal investigators at UMass are Michael P. Czech, PhD, chair of the Program in Molecular Medicine, and Silvia Corvera, MD, professor of molecular medicine. They feel an excitement not unlike that experienced at the time of the "rough draft" announcement. "Each partner in this consortium brings unique capabilities and technologies to take advantage of the spectacular revolution in gene discovery so that we can further understand type 2 diabetes," said Dr. Czech. "We are truly at the frontier of great discovery."

"It is an extraordinary privilege and incredibly inspiring to be a part of a consortium such as this in which each scientist realizes that attacking a problem as complex as diabetes is beyond the capabilities of a single lab," Dr. Corvera added. "We’ve all been friendly competition; now the data from this project will be presented without thought of ownership, and with a conviction that our best bet is to work together. UMass Medical School is honored that the NIH has given this concept a shot."

The Diabetes Genome Anatomy Project, or DGAP as it is called by its investigators, takes the Human Genome Project further, with the goal to "unravel the sets of genes and gene products involved in insulin action and the predisposition to type 2 diabetes, as well as the secondary changes in gene expression that occur in response to the metabolic abnormalities present in diabetes," according to the grant submission. Six projects and four cores form the DGAP; Czech heads Project 3—the anatomy of gene expression—while Corvera directs the Proteomics Core for Project 3 with UMass colleague John D. Leszyk, PhD, another leader in the field. Three additional UMass researchers, Sarah Coulter, Vancha Padik, PhD, and Sabina Serna, MD, add to the complement of 12 other scientists and labs making up the consortium. Their findings will be used to create an interactive database, protocols for gene expression and proteomic analysis and "gene chips," all for use by researchers in the field.

"One of the most exciting aspects of this consortium is that the data will get a fast track into the public domain through a Web site providing information from all five sites, in some cases before publication," explained Czech. "The consortium members are presenting this data to each other literally as it is coming off the instrumentation—which results in a great acceleration of the discovery process because we are talking at early stages of our thinking."

Corvera explained that the free and immediate flow of information is an imperative of the NIH. "The data must be made available to researchers as quickly as possible. We will be able to read very quickly gene functions that differ, for example, in the various stages of diabetes," noted Czech, "providing us snapshots of the genes at particular points in time, revealing their activity or inactivity, their defectiveness or responsibility for different aspects of the disease."

The DGAP is a revolutionary result of the Human Genome Project, itself a spectacular accomplishment that we look forward to applying to the disease of diabetes," Czech concluded. "We have our mandate and the expertise, equipment and energy to see it through."

A major NIH grant to UMMS and four other prestigious institutions accelerates type 2 diabetes research
A Strong Bond

The new president and chief executive officer of UMass Memorial Health Care, John G. O’Brien, speaks plainly about the partnerships he envisions—and has already begun to nurture—with the Medical School, the medical staff, the department chairs and the community:

“We simply have to have a relationship that will develop and flourish, because our interdependence is our strength. My first and last word about the school and the chairs is that ‘we’re partners.’ The successes of the Medical School in research, in teaching, in training and recruitment, in outreach, match up perfectly with our future prospects. In a way, it’s like an epoxy: two compounds that, when combined, form a strong bond—far stronger than either on its own. That’s the future of UMass Memorial.”

O’Brien’s gift for not only speaking plainly, but for his ability to lead, his ability to manage and—notably, after 25 years at Cambridge Health Alliance (and more than 15 years as its chief executive)—his ability to achieve, are well-known regionally and nationally. Under his leadership, a once small, financially ailing city hospital was transformed into the fiscally viable, integrated Cambridge Health Alliance health care system. In 1993, on behalf of the staff of Cambridge Hospital, O’Brien accepted the Foster G. McCaw Prize, a coveted award given by the American Hospital Association to a single hospital in the United States each year that displays its utmost commitment to improving the health status of its community. And what he sees when he looks at UMass Memorial is “tremendous opportunity.”

“This is a health care system that has been in some distress,” he observed, “but that distress doesn’t obscure its potential. As we do our work here, as we invest in the facilities and in the workforce, as we develop better access, better models for care and better systems to serve the patients, people will see just how much we can accomplish. The department chairs and the leadership of the medical staff will have significant responsibility to be more prominent and more active in the clinical administration of the institution, much as they have been with the Medical School. And we’re going to work closely with Dr. Laurier and the leadership of the Medical School to facilitate strong relationships that will enhance both of these great institutions.”

As O’Brien settles in, he has already become a familiar face around the campus and around Worcester, where he moved during his first week on the job. “It’s a challenge,” he tells everyone, “there really is so much to do.” But as he says this, he’s not only doing it, but smiling about it, as well.
The whole is greater than the sum of its parts. That is the simple but powerful premise behind National Institutes of Health (NIH) program project grants. At UMMS, 11 projects gather the collective minds of some of the best and the brightest in their respective departments (and, in some cases, other institutions) to bring their combined expertise and state-of-the-art technological tools to bear on important biomedical questions.

**Program project grants bring out the best in UMMS research expertise, equipment and effort.**

Leading over $58 million in 2002, the dramatically increasing volume of these grants acknowledges the growth of the UMMS research enterprise as the institution continues to accelerate its expansion. “Project grants are a treasure of a maturing research institution, one which has depth and breadth in multiple areas of biomedical research,” explained John L. Sullivan, MD, professor of pediatrics and molecular medicine and director of the UMMS Office of Research.

“Our program is a good example of one that cannot be tackled in the context of a single grant format,” said Michael P. Czech, PhD, chair of molecular medicine. He is principal investigator of Membrane topography of cell signaling complexes, which brings together diverse but equally powerful technologies, from X-ray protein crystallography to four-dimensional microscopy, to understand basic cellular functions that have enormous implications for understanding diseases such as diabetes.

“‘There is a remarkable openness and excitement about other people’s work here—a lot of cheerleading goes on among laboratories,’” said Gary S. Stein, PhD, the Gerald L. Haidak, MD, and Zelda S. Haidak Professor and chair of Cell Biology. Stein is principal investigator of two separate but related programs, Nuclear structure and gene expression and Bone cell structure and gene expression. “On a state-of-the-art campus like ours, with not a single instrument lacking, we can address any problem if people get together,” he said. Both projects seek to understand cellular processes involved in cancer and skeletal disorders, in the process expanding investigators’ own horizons along with those of the institution.

“Bringing many people together expands individual as well as collective knowledge, enhancing each scientist’s understanding,” Dr. Stein added.

A longstanding project grant, established over 30 years ago at the Eunice Kennedy Shriver Center in Waltham, which merged with UMMS in 2000, exemplifies how such grants help refine research over time. Firoze Jungalwala, PhD, professor of biochemistry and molecular pharmacology at the Shriver Center, was a project leader for many years before becoming the principal-investigator of Biochemical & genetic aspects of mental retardation. Recent discoveries under Dr. Jungalwala’s direction include identification of molecular signals and mechanisms that regulate and guide neural cells to their target during development of the brain and deficits in neuronal migration that could cause mental retardation. “Diverse teams and projects have come into the mix. The flavor of the grant has changed over the years as our research has become more sophisticated and focused,” he said.

The most recent UMMS project grant is its first to bring laboratories from several other institutions together with those here. Celia A. Schiffer, PhD, assistant professor of biochemistry & molecular pharmacology, is principal investigator and program director for Targeting ensembles of drug-resistant HIV proteases. The multidisciplinary collaboration, which has expertise ranging from patient therapy to organic chemistry, affords Dr. Schiffer and colleagues from Stanford University Medical Center, the University of North Carolina School of Medicine, the University of Maryland/Center for Advanced Research in Biotechnology and the Massachusetts Institute of Technology, the means to make strides against drug-resistant HIV.

Core laboratories are integral to fine tuning program project grants, then realizing their potential. Dr. Sullivan proudly enumerates the full spectrum of core facilities at UMMS that enable investigators to approach virtually every realm of biomedical inquiry with the best tools and technology available: proteomics, genomics, tissue culture, chemical biology, nuclear acid, to name a few. The UMMS laboratory of Professor Tanji M. Rama, PhD, director of the Program in Chemical Biology, for example, will serve as the Schiffer program’s core facility with a combinatorial chemical library of hundreds of thousands of potential drug compounds that can be rapidly and efficiently screened for their therapeutic effects on HIV. The UMMS Biomedical Imaging Group, which invented a unique, four-dimensional microscopy technique and serves as a major contributor to the Czech program, is another example of a core laboratory.

NIH program project grants maximize valuable research dollars while optimizing intellectual as well as technological capital, fostering the evolution of scientific enterprise. “They will be instrumental in fulfilling our research mission,” Dr. Sullivan said.

_The whole is greater than the sum of its parts. That is the simple but powerful premise behind National Institutes of Health (NIH) program project grants. At UMMS, 11 projects gather the collective minds of some of the best and the brightest in their respective departments (and, in some cases, other institutions) to bring their combined expertise and state-of-the-art technological tools to bear on important biomedical questions._

*By Sandra L. Gray*
Deeply involved in his thesis research into the genetic basis of autoimmune processes and the individual contributions of the dozens of genes that control diabetes, Pearson reiterates Dr. Matthews’ sentiments, acknowledging the Retreat for informing him on the continuing growth and success of the UMMS research enterprise. “After your first year of graduate school, you tend to find your own specialty and not pay as much attention to what everyone else is doing. But, especially in the last eighteen months, there has been such an explosion in new investigations that when I went to the Retreat, I was amazed at who is here now and the really great things that they are doing.” As a member of the lab of Aldo A. Rovati, MD, the William and Doris Knapp Professor of Medicine, Pearson was especially intrigued by recently-appointed Professor of Surgery Giacomo Basadonna, MD, PhD, and his presentation, “Operational Tolerance in Transplantation.”

“Dr. Basadonna is doing a lot of the same diabetes research that we are doing. In fact, after the Retreat he came to our lab and gave a seminar. I think the Retreat definitely opens your eyes to the possibility of collaboration within the institution.”

### Alejandro Murad and Todd Pearson—commend the Retreat as a highlight of the academic year

For Fischer, a third-year doctoral student whose research interests include understanding the mechanisms of Lyme disease that allow the bacterium to affect different physical systems in various infected organisms, the Retreat showcases the diverse programs that initially attracted him to UMMS. “Every year the focus changes a bit to highlight some of the programs that are lesser known to students as well as expose them to the investigations of other labs. It is an invaluable advertisement for students who are just starting to think about which labs they want to choose.”

Now in his second year of GSBS study, Murad credits the casual, amicable atmosphere of the Retreat with fostering meaningful conversations between students and faculty. For Murad, a native of Argentina who chose UMMS for its emerging Department of Neurobiology and its experts on circadian rhythms, such opportunities is particularly valuable. “It is a very comfortable environment because everyone seems to love science and truly enjoy what they do. With so many people attending, you can meet and talk with students and principal investigators that you rarely see on campus.”

According to C. Robert Matthews, PhD, the Arthur F. and Helen P. Koskinas Professor and chair of Biochemistry & Molecular Pharmacology, the exposure to others in the research community is invaluable for faculty as well. “The Retreat is a terrific opportunity for our students, postdoctoral fellows and faculty to share their discoveries and their excitement for science. The breadth of activities, the very high quality of the work and the dramatic increase in the faculty cadre are evident in the posters and presentations.”

The Retreat also provides a chance for all to make connections and build friendships that promote interdisciplinary research and make this a superb academic institution.”

With an appreciation for the great potential of individual and interdepartmental relationships to advance scientific inquiry, UMMS has continued to encourage the transfer of ideas at its annual Research Retreat. This year’s Retreat, held during the first week of October at the Marine Biological Laboratory in Woods Hole, provided attending Graduate School of Biomedical Sciences students, faculty, postdoctoral fellows and staff the opportunity to share insights, information and intriguing questions related to the basic sciences.

The three-day event organized by the UMMS Office of Research and made possible by the active participation of both clinical and basic science departments, featured faculty and student presentations on a wide range of contemporary and provocative topics. From discussions on survival checkpoints in cancer to the activation of the immune response in the brain, the Retreat’s scientific sessions were enhanced by an informal setting and a diverse audience of individuals at various educational and professional levels. This year’s Retreat also featured the inaugural Dan Mullen Poster Awards for Scientific Achievement. Honoring the late Dan Mullen, a 30-year veteran of both the Department of Physiology and the former Department of Pharmacology & Molecular Toxicology, the awards recognize students who demonstrate exceptional creativity, quality of science and overall excellence in their poster presentations at the Retreat. This year’s inaugural winners—Joshua Fischer, Alejandro Murad and Todd Pearson—commend the Retreat as a highlight of the academic year.

### A Highlight of the Academic Year

Fischer, a third-year doctoral student whose research interests include understanding the mechanisms of Lyme disease that allow the bacterium to affect different physical systems in various infected organisms, the Retreat showcases the diverse programs that initially attracted him to UMMS. “Every year the focus changes a bit to highlight some of the programs that are lesser known to students as well as expose them to the investigations of other labs. It is an invaluable advertisement for students who are just starting to think about which labs they want to choose.”

Now in his second year of GSBS study, Murad credits the casual, amicable atmosphere of the Retreat with fostering meaningful conversations between students and faculty. For Murad, a native of Argentina who chose UMMS for its emerging Department of Neurobiology and its experts on circadian rhythms, such opportunities is particularly valuable. “It is a very comfortable environment because everyone seems to love science and truly enjoy what they do. With so many people attending, you can meet and talk with students and principal investigators that you rarely see on campus.”

According to C. Robert Matthews, PhD, the Arthur F. and Helen P. Koskinas Professor and chair of Biochemistry & Molecular Pharmacology, the exposure to others in the research community is invaluable for faculty as well. “The Retreat is a terrific opportunity for our students, postdoctoral fellows and faculty to share their discoveries and their excitement for science. The breadth of activities, the very high quality of the work and the dramatic increase in the faculty cadre are evident in the posters and presentations.”

The Retreat also provides a chance for all to make connections and build friendships that promote interdisciplinary research and make this a superb academic institution.”

Joshua Fischer, Todd Pearson and Alejandro Murad
The number of individuals who will die from tuberculosis worldwide this year. In the slums of Lima, Peru, for example, Multidrug-Resistant Tuberculosis is of grave concern among health care providers, including UMass Memorial Medical Center. A recent study in the journal *The Lancet* revealed that 20 percent of tuberculosis cases in Lima are drug-resistant, a problem that affects not only the patients themselves but also those in close contact with them. The World Health Organization (WHO) and the U.S. Centers for Disease Control and Prevention (CDC) are working together to develop strategies for controlling the spread of MDR-TB. Through a partnership with the WHO, UMass Memorial is helping to implement a comprehensive Tuberculosis control program in Lima, Peru. This program includes outreach to high-risk populations, public education about the signs and symptoms of TB, and the provision of free antiretroviral therapy for HIV-positive patients. The program has been successful in reducing the incidence of TB in Lima, and is being used as a model for similar efforts in other countries. The program is funded by a grant from the U.S. Agency for International Development (USAID).
### TEACHING PARTNERS AND AFFILIATES

- UMass Memorial Health Care
- UMass Memorial Medical Center (Hahnemann, Memorial and University campuses)
- UMass Memorial–Clinton Hospital
- UMass Memorial–HealthAlliance Hospitals
- UMass Memorial–Marlborough Hospital
- UMass Memorial–Wing Memorial Hospital and Medical Centers
- Berkshire Medical Center
- Milford-Whitinsville Regional Hospital
- St. Elizabeth’s Hospital
- St. Vincent Hospital at Worcester Medical Center

### EDUCATION

<table>
<thead>
<tr>
<th>Number of Faculty</th>
<th>Full-time: 827</th>
<th>Part-time: 92</th>
</tr>
</thead>
</table>

**School of Medicine**
- MD students: 407
- PhD/MD students: 14
- Alumni: 2,387
- Residents & fellows: 532

**Graduate School of Biomedical Sciences**
- PhD students: 224
- PhD/MD students: 21
- Alumni: 190

**Graduate School of Nursing**
- MS students: 59
- Post master’s students: 6
- PhD students: 32
- Part-time students: 72
- Alumni: 501

**Continuing Medical Education Certificates**: 19,015

**Allied Health Program students**: 648

### Facts and Figures (continued)

#### The Campaign for Research (1999-2002)

The Campaign for Research, the University of Massachusetts Medical School’s first major capital fundraising effort, closed on June 30, 2002, having raised $41.6 million in cash, pledges and eligible planned gift intentions from approximately 1,300 generous donors. According to Campaign Chair Nancy Edman Feldman, this eclipsed the campaign goal of $38 million, and the planned timetable of five years.

**Highlights of the Campaign for Research include:**
- the University’s largest-ever charitable gift, $21 million, from Jack and Shelley Blais to name the new Aaron Lazare Medical Research Building;
- an increase in the endowment by more than $5 million, including the establishment of seven new named endowed chairs and professorships; and
- ten leadership gifts received representing $1 million or more, along with 27 gifts of amounts in the six-figures.

**Steering Committee**

- Nancy Edman Feldman, Chair
- Helen H. Beekman
- John Buckley
- Bruce M. Carlin
- David F. and Diane G. Dalton
- Elise V. and Monroe B. England
- Matthew F. Erskine, Esq.
- Michael T. Foley, MD ’76
- Stephen R. Gorfine, MD ’78

**All Other Contributors**

- Barbara and Nathan Greenberg
- Salah M. Hassanein
- Robert J. Haynes
- John Herron, Jr.
- Nina Jezewski-Kozuki
- Paul and Mimi La Camera
- Arthur M. Pappas, MD
- R. Norman Peters, Esq.
- Louise C. Riemer
- Ex Officio
  - Aaron Lazare, MD
  - Thoris Pederson, PhD
  - John L. Sullivan, MD

### The Center for Adoption Research

The Center for Adoption Research at the University of Massachusetts is the only university-based center in the nation dedicated solely to the study of adoption and foster care. By developing innovative research and educational programs, analyzing and helping develop practices and policies, and expanding public awareness and understanding, the center is making significant strides toward improving the lives of children and families who are touched by foster care and adoption. UMass Chancellor and Dean Aaron Lazare, who with his wife Louise has adopted eight children of several races, leads the center as executive director.

In January 2002, the center celebrated its accomplishments and recognized distinguished individuals who have helped advance critical issues in adoption and foster care at its first major fund-raising event in Boston. Proceeds from the gala dinner held at the Fairmont Copley Plaza Hotel support the center’s ongoing research programs and its initiatives aimed at affecting change and breaking down barriers to adoption and to improving foster care. Among those honored for their service to children were:

**Steering Committee**

- Barbara and Nathan Greenberg
- Salah M. Hassanein
- Robert J. Haynes
- John Herron, Jr.
- Nina Jezewski-Kozuki
- Paul and Mimi La Camera
- Arthur M. Pappas, MD
Dr. Dickson attributes success in two distinct research areas to not only good fortune but also to the mentorship he received during his medical and graduate education at UMMS. The first research ... the clinician-scientist to take what has been learned in the lab and use it to help a critically ill patient.”
In July 2002, the journal *Nature* published significant findings from research conducted by Michael Malim of King’s College London and colleagues at the University of Pennsylvania School of Medicine. It described their discovery of a viral gene in humans—CEM15—that defends against attack from HIV, the virus that causes AIDS. According to the research, CEM15 would normally shut HIV infection, but is suppressed by an HIV protein called vpr or vif. CEM15 could potentially become a form of natural resistance to viral activity, leading to the establishment of new drug treatments for HIV or AIDS. This is an important finding and one that is especially appealing to me because it is in the realm of investigations focused on answering a single basic research question—what are the functions of viral genes? While over seven years in the making, the discovery of CEM15 underscores the inspiring potential of basic research.

Mind you, we still have a very superficial understanding of how HIV works. We read in newspapers about the degree to which HIV is studied—we must, therefore, be aware of how viruses work. While over seven years in the making, the discovery of CEM15 underscores the inspiring potential of basic research.

On the other hand, the current targets, viral proteases, mutate so quickly that today’s drug regimens become useless in a matter of months for some patients. That’s because the virus uses evolution millions of times faster than we do, it adapts to its new environment easily and precisely when it senses change. In the case of the CEM15 gene, for example, at some point HIV encoded Vif to combat it. We must discover how we can help the innate CEM15 come out on top again.

A breakthrough of this magnitude in HIV research could come soon, or years from now. I often tell people who come through the lab that, as far as I’m concerned, the only characteristic one needs to work with HIV is stubbornness. While I’m not the one who invented the concept of HIV, I believe that HIV is a chronic disease. The advantage to targeting cellular processes is that those processes don’t change; they don’t mutate. On the other hand, HIV is fundamentally different from other types of retroviruses due to its ability to infect non-cycling cells. This property is what enables the virus to infect macrophages, which are supposed to recognize foreign pathogens and stimulate the immune system. Infection of macrophages may be essential to the replication of the virus; HIV likely uses them as a “transport” mechanism to disseminate the virus throughout the body. Stevenson’s research explores strategies to interrupt the virus’ ability to use macrophages in this way. When this transport mechanism is better understood, he believes it will give his team a target to exploit for new drug therapies.

Drs. Stevenson and his colleagues were the first to demonstrate that HIV is fundamentally different from other types of retroviruses due to its ability to infect non-cycling cells. This property is what enables the virus to infect macrophages, which are supposed to recognize foreign pathogens and stimulate the immune system. Infection of macrophages may be essential to the replication of the virus; HIV likely uses them as a “transport” mechanism to disseminate the virus throughout the body. Stevenson’s research explores strategies to interrupt the virus’ ability to use macrophages in this way. When this transport mechanism is better understood, he believes it will give his team a target to exploit for new drug therapies.

On course, HIV and AIDS are no longer a death sentence in our country because drugs—albeit ones with complicated side effects—have been aggressively developed and introduced over the years. Since our government declared war on AIDS, we are, although the annual AIDS budget is $3 billion, the money is spent quite thin. Project-oriented research receives no more than 1.5 percent of funds. The war is on education, vaccine development, production facilities for drugs and other essential components that make up the HIV/AIDS treatment. Thankfully, because of the support of UMMMS, provides its researchers in terms of laboratory facilities and mentorship, we were able to establish a Center for AIDS Research. The HIV/AIDS research is a proven commitment to the field and encourages us to continue to be stubborn and persistent, doing the best we can in our efforts to combat this disease.