

A woman with shoulder-length brown hair, wearing a white lab coat and a pearl necklace, is focused on her work in a laboratory. She is using a pipette to transfer liquid into a small blue vial. The background shows laboratory shelves with various bottles and equipment. The lab coat has "Mary E. K MD" and "Chief" printed on it.

Mount Sinai was one of only two AIDS programs highlighted in *New York* magazine's "Best Hospitals" issue in 2006

## DIVISION OF INFECTIOUS DISEASES

DR. MARY KLOTMAN was elected to membership in the Association of American Physicians in 2006.

## Mount Sinai's Division of Infectious Diseases is widely recognized as one of the leading centers for research and clinical care of HIV infection. In the 2006 US News & World Report "Best Graduate Schools Rankings," Mount Sinai was ranked 14th in the nation for the quality of its AIDS programs.

Mount Sinai was one of only two AIDS programs highlighted in *New York* magazine's "Best Hospitals" issue in 2006. In 2006 Division Chief, Mary Klotman, MD, Irene and Arthur M. Fishberg, MD, Professor of Medicine, was elected to membership in the Association of American Physicians.

The past five years have witnessed a period of tremendous growth for the Division, with the addition of 16 faculty members between 2001 and 2006.

### HIV/AIDS Care

Because Mount Sinai is located in a highly populated urban center where the rate of HIV/AIDS infection is high, the Medical Center is uniquely positioned to address research and treatment of this disease. Michael Mullen, MD, Associate Professor, an acknowledged expert on infectious disease and HIV medicine, joined the faculty in 2005 as Clinical Director.

Under his leadership, the Division reported an astounding 145 percent per annum increase in patient visits to its faculty practice in 2006. The language and clinical skills of recent recruits Gabriela Rodriguez, MD, Assistant Professor of Medicine and Daniel Caplivski, MD, Assistant Professor of Medicine, have helped fuel this growth.

Division members staff the Jack Martin Fund Clinic, one of only a handful of New York State Designated AIDS Centers. The Jack Martin Fund Clinic provides primary outpatient and inpatient treatment for adults and children with infectious diseases, and specialty referrals as needed. To meet the expanding needs of patients infected with both HIV and hepatitis, Dawn Fishbein, MD, Assistant Professor of Medicine, recently started a "clinic within the clinic" specifically for this patient population.

As part of its overall commitment to the local community, the Division also sponsors numerous HIV/AIDS community education and prevention initiatives. For example, Richard Mackay, MD, Assistant Professor of Medicine, and Infectious Disease fellow Charu Jain, MD, trained a group of medical students to perform rapid HIV testing for the annual community health fair held in 2006. Because of the student's involvement, 15 percent of all fair attendees were tested.

Reaching beyond Mount Sinai's immediate community Debbie Indyk, PhD, Associate Professor of Medicine, is the principal investigator on an NIH grant that instructs Argentinean health care providers and researchers in HIV prevention, especially during pregnancy and delivery.

An HIV/AIDS Health Care Twinning Partnership was established between Mount Sinai-affiliate Elmhurst Hospital Center and the Orenburg AIDS Center in Orenburg, Russia in 2004. Funding for this enterprise came from the American International Health Alliance and the US Agency for International Development.

In recognition of their contributions, six physicians from the Partnership received the 2006 Presidential Voluntary Service Awards from the US Agency for International Development.

Under the leadership of coordinator, Joseph Masci, MD, Professor of Medicine, the Partnership's efforts have resulted in an increased number of patients placed in treatment, improvements in adherence to medication regimens, the establishment of infection-control best practices, improved surveillance and management of patients exposed to or co-infected with TB, and an expanded role for nurses and social workers to address the many psychosocial factors associated with HIV in Russia.

## HIV/AIDS Research

Division faculty members have received significant funding for and had numerous publications related to the development of topical microbicides to prevent the spread of HIV.

In 2005 Dr. Mary Klotman, Marla Keller, MD, Assistant Professor of Medicine, and associates conducted a clinical pilot study demonstrating that when a microbicide was vaginally applied, cervical vaginal samples from women using the microbicide showed significant anti-HIV and anti-herpes simplex (HSV) activity compared to women using a placebo. The promising results of this trial were published in the *Journal of Infectious Diseases*<sup>1</sup> and have sparked additional work in this area.

As part of the Division's commitment to microbicide development, Dr. Klotman and infectious disease fellow, Natalia Teleshova, MD, in collaboration with members of the Departments of Obstetrics and Gynecology and Pathology, established the cervical vaginal explant model to study the determinants of HIV transmission in the setting of sexually transmitted diseases.

Theresa Chang, PhD, Assistant Professor of Medicine, has been studying the role of defensins—small proteins—in the prevention and treatment of HIV infection. In a study published in the *Journal of Clinical Investigation* in 2005,<sup>2</sup> Dr. Chang and colleagues were the first to identify the mechanism by which alpha-defensin-1 inhibits HIV infection. Research by Drs. Klotman and Chang on defensins resulted in a comprehensive review of the literature in the *Nature Review of Immunology* in 2006.<sup>3</sup>

Also in 2006 Viviana Simon, MD, PhD, Assistant Professor of Medicine, was recruited to build a research program in HIV host resistance and its implications for antiretroviral resistance and the development of new therapies.

Faculty from the Division of Infectious Diseases have worked closely with colleagues in the Division of Liver Diseases to make Mount Sinai a

major center for research and treatment related to HIV/hepatitis C co-infection. They have found very early evidence of hepatic fibrosis in HIV-infected patients newly infected with hepatitis C.

In 2006 Dr. Fishbein published an intriguing paper in the *Journal of Acquired Immune Deficiency Syndrome*<sup>4</sup> that investigated, prospectively, the predictors of HCV RNA levels in drug users.

Dr. Mary Klotman and Daniel Fierer, MD, Assistant Professor of Medicine, are both working with Paul Klotman, MD, Chairman of Medicine, on a program project grant from the National Institute of Diabetes and Digestive and Kidney Diseases to study the pathogenesis and genetics of HIV-Associated Nephropathy (HIVAN).

## Travel Health

Recruited to the Division in 2005, Dr. Caplivski is a former Mount Sinai fellow. During his fellowship, he participated in the Gorges Course in Tropical Medicine to hone his skills in global health. In 2006 he was appointed medical director of Mount Sinai School of Medicine's Travel Health Program, which is a designated Yellow Fever Center and one of only 27 worldwide sites in the GeoSentinel Network for the surveillance of emerging diseases.

## Antibiotic Management

In 2005 the Division launched the Antibiotic Assistance Program (AAP), under the direction of Nathalie Casau, MD, Assistant Professor of Medicine, with goals of reducing pharmacy antimicrobial expenditures and other hospital costs associated with antimicrobial use, improving patient outcomes, and preventing the emergence of drug-resistant pathogens.

After only its first year of operation, the AAP reported 5,963 initial requests for restricted antimicrobial agents. By promoting compliance with antimicrobial-related indications issued by regulatory and payer agencies, Dr. Casau and her team were able to achieve an estimated


<sup>1</sup>J Infect Dis. 2006 Jan 1;193(1):27-35.

<sup>2</sup>J Clin Invest. 2005 Mar;115(3):765-73.

<sup>3</sup>Nat Rev Immunol. 2006 Jun;6(6):447-56.

<sup>4</sup>J Acquir Immune Defic Syndr. 2006 Apr 1;41(4):471-6.

Under Dr. Mullen's leadership the infectious diseases faculty practice reported an astounding 145 percent per annum increase in patient visits in 2006.



DR. SIMON DAEFLER heads Mount Sinai's Biosafety Laboratory Level 3+ where infectious pathogens are safely isolated for study.

## **FIGHTING BIOTERRORISM AND INFECTION: THE EMERGING PATHOGENS INSTITUTE AT MOUNT SINAI**

National boundaries offer no protection against new and recurring pathogens that threaten human life. West Nile virus, SARS, hepatitis C, HIV, BSE (bovine spongiform encephalopathy, or "mad cow disease")—each requires intensive, coordinated research and a sophisticated plan of attack to prevent or manage outbreaks. In addition, the threat of bioterrorism adds to the list of potential dangerous epidemics.

The Emerging Pathogens Institute of the Mount Sinai School of Medicine, co-directed by Division Chief Mary Klotman, MD, and Adolfo Garcia Sastre, PhD, Professor of Microbiology, was created to undertake basic and clinical research to develop novel therapies and strategies

for prevention and treatment of emerging pathogens. The Institute facilitates creation of a frame-work for scientific exchange between diverse clinical and research disciplines—microbiologists, immunologists, cell biologists, and infectious disease specialists—to foster collaboration and to allow rapid mobilization of personnel and resources.

In 2006 Mount Sinai completed construction of a Biosafety Laboratory Level 3+ to provide a safe environment in which to study emerging pathogens. Simon Daepler, MD, PhD, Assistant Professor of Medicine, was recruited to run the facility, where he is continuing his own research on the molecular mechanisms of host-pathogen interactions during infections with intracellular bacteria.

antibiotic-acquisition cost-savings of \$415,203. A major bonus to the program, is an increase in the appropriate use of antibiotics in the hospital setting, thereby reducing the risk of hospital-acquired resistant infections.

### **Infection Control**

Soon after David P. Calfee, MD, Assistant Professor of Medicine, was recruited to Mount Sinai in 2004 as Director of Infection Control, he initiated several protocols to reduce hospital-based infections at Mount Sinai.

Dr. Calfee lectures and participates in grand rounds concerning the ways in which hospital staff can minimize their exposure to infectious pathogens. His hand washing protocol increased hospital-wide compliance with routine hand washing. Together with the Antibiotic Assistance Program, this initiative has resulted in a dramatic decrease in microbial infection at Mount Sinai. His expertise in infection control was recently recognized by his appointment to a Society for Healthcare Epidemiology of America workgroup, which was formed to create evidence-based guidelines that address detection, prevention and reporting of common hospital-acquired infections.

### **Transplantation Infectious Diseases Program**

Mount Sinai's Recanati/Miller Transplantation Institute (RMTI) has been a leading center for organ transplantation for four decades. The same medications that help prevent organ rejection also weaken the immune system, paving the way for new infections, many from antimicrobial-resistant pathogens. Infectious disease specialists therefore work closely with the RMTI to prevent and treat such infections.

During his fellowship in infectious disease at Mount Sinai, Shirish Huprikar, MD, developed specific expertise in this area. Upon graduation in 2004, he joined the Division and is now Director of the Transplantation Infectious Diseases Program.

### **Education and Training**

The Infectious Diseases Fellowship program recruits to fill three positions annually. For the

class entering in 2007, 115 applications were received and, according to Dr. Mary Klotman, "We had one of our best matches in history."

Dr. Klotman is principal investigator on a training grant from the National Institute of Allergy and Infectious Diseases that supports extended training periods for physicians interested in pursuing a research career in viral pathogenesis. The candidates enter into their research training track during their second year of fellowship and become eligible for funding through the training grant for two subsequent years.

During the 2006/07 academic year, the Division piloted a longitudinal HBV/HCV curriculum for second-year clinical fellows. This is one of the first curricula of its kind to be created within an infectious diseases training program.

In recent years, fellows have received prestigious awards that include a travel grant from the Infectious Diseases Society of America and a Bristol-Myers Squibb Virology Fellow Research Award. Many graduates have gone on to pursue academic careers, including several who have joined the Division as faculty.