SOMnews
University of Maryland School of Medicine
February 2008 Vol.9 No.6

Legislative Day 2008

The Maryland General Assembly handles a lot of business in its 90-day session, and January 15 was the day all about the University of Maryland School of Medicine. Faculty members, students and staff gathered in Annapolis for the second annual advocacy day in the state capital. Last year, it was the first event on the school's bicentennial schedule.

Legislative Day 2008 began in the Miller Senate Office Building with a breakfast briefing for the 26 students, 15 faculty members and staff from the dean's office, development and public affairs. By the end of the day, at least 75 of the 188 members of the House of Delegates and Senate had spoken directly with at least one representative from the school.

(L-R) UMB President David Ramsay, State Senator Ulysses Currie, UMB Vice President for External Affairs T. Sue Gladhill, MSW, and Dean Reece at the legislative lunch in Annapolis.

After a briefing by the University of Maryland, Baltimore government affairs staff, the school's advocates met with legislators from their own districts to make a case for student scholarship funding and to express the need for a third health sciences facility, envisioned for construction on the northwest side of Baltimore Street at Penn Street on the site formerly occupied by the Dental School.

The School of Medicine group then returned to the senate office building for a luncheon. Dean E. Albert Reece, MD, PhD, MBA, presided over the lunch session, which attracted 150 legislators and legislative staff. Also making remarks were University System of Maryland Chancellor William E. Kirwan, PhD, UMB President David J. Ramsay, DM, DPhil, Speaker of the House of Delegates Michael Busch and Senate President Thomas V. Mike Miller, Jr.

Speaker Busch said, "The good works the School of Medicine delivers to the state are exceptional. Its students are dazzling, and its role as a catalyst for the redevelopment of West Baltimore is significant." President Miller complimented the School of Medicine for educating more than half of Maryland's practicing physicians and generating $24 for every $1 invested in it by the state. Mr. Busch and Mr. Miller concluded their remarks by promising continued support for the education, research, patient care and service mandates at the school.

Next on the agenda was third-year medical student Amir Abdel-Wahab, who recounted his story of receiving a phone call from Mickey Foxwell, MD, associate dean for Admissions, on Christmas Day four years ago. "Dr. Foxwell told me I would receive a full scholarship if I chose Maryland. It was the day that changed my life for I knew my dream of being a pediatrician would come true," he said.

Mandeep Mehra, MD, professor, Department of Medicine, and head of the Division of Cardiology, then spoke about heart disease and tobacco smoke. Claudia Baquet, MD, MPH, associate dean for Policy and Planning, professor, Department of Medicine, and director of the Center for Health Disparities Research and Outreach, explained the scope and depth of the school's reach around the state, primarily through the three Area Health Education Centers. Paul S. Fishman, MD, PhD, professor, Department of Neurology, and chief of neurology service at the Maryland VA Health Care System, discussed bringing new neurologic therapies to Marylanders.

As lunch adjourned, Dean Reece promised the legislators that the school would be prominent at the 2008 legislative session.

(L-R) Patrica Turner, MD, assistant professor, Department of Surgery, Delegate Karen Montgomery, Kristin Powell, MSIII, and Jeanette Balotin, MA, MPA, assistant dean for Programs and Planning, met to discuss the importance of funding to the University of Maryland School of Medicine.

Tissue Transplant Research Program Receives $3 Million from Congress

The tissue transplant research program at the University of Maryland School of Medicine received $3 million in new federal funding to develop new transplantation techniques that could benefit soldiers and others who have been severely maimed by traumatic injury. The funding was orchestrated by U.S. Senator Benjamin L. Cardin (D-MD) and was strongly supported by U.S. Senator Barbara A. Mikulski (D-MD) and U.S. Representative Dutch Ruppersberger (D-MD).

The School of Medicine's groundbreaking research, under the direction of Stephen Bartlett, MD, professor and chair, Department of Surgery, would allow for tissue transplants with reduced doses of powerful immunosuppression drugs. Currently, transplants require the use of powerful drugs to dampen the body's natural immune system, which would otherwise reject the transplanted tissue. These drugs can cause serious side effects, especially if they are used over many years. Soldiers with war injuries who might benefit from massive tissue transplants of skin, muscle and bone, which are known as composite tissue transplants, would require a lifetime of immunosuppression drugs.

This new funding will allow further research into the development of composite tissue transplants—including facial and limb transplants—which would not require high doses of immunosuppression therapy. With a reduced immune suppression protocol, composite tissue transplantation, including facial transplants, becomes feasible.

(L-R) Senator Benjamin Cardin presents Dean Reece and Stephen Bartlett, MD, with a check for $3 million to aid in the tissue transplantation research.

"Every day we hear news of suicide bombs and land mines killing and maiming Americans. I am proud to announce $3 million in new federal funding that will help the University of Maryland School of Medicine move forward with its groundbreaking research that could enable many of our wounded soldiers to avoid serious complications from tissue transplantation," said Senator Cardin.

"Our research is possible because of Senator Cardin's hard work, vision and leadership," said Dr. Bartlett. "He understands the scientific importance and the opportunity to translate this scientific work into new treatments for military and civilian casualties."

"The support of our longtime friends Senator Benjamin Cardin and Congressman Dutch Ruppersberger is invaluable to the University of Maryland School of Medicine," said Dean E. Albert Reece, MD, PhD, MBA. "The exciting developments in Dr. Bartlett's tissue transplant research will one day soon have a direct benefit to the men and women of our armed forces and will reach beyond the walls of this campus and into the operating rooms of our nation's military hospitals. I am very pleased to say that the University of Maryland School of Medicine truly has a world-wide impact."

State Task Force Examines Physician Workforce Shortage

Robert Barish, MD

A new comprehensive study of Maryland's physician workforce shows that the state has a growing shortage of doctors in clinical practice. The study, led by Robert Barish, MD, vice dean for Clinical Affairs, found that overall, Maryland is 16 percent below the national average in the number of physicians in clinical practice. The most severe shortages occur in rural parts of the state and will worsen by 2015.

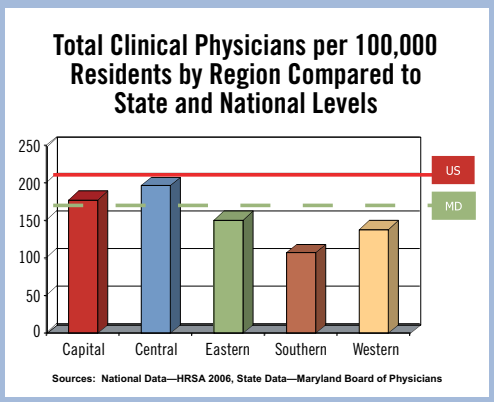
Spurred by reports of projected national shortages in physician supply and specific concerns about the professional environment in Maryland, the Maryland Hospital Association invited MedChi, the Maryland State Medical Society, to join them in a comprehensive examination of the physician workforce. A steering committee was formed that included physician, hospital and state agency representation.

According to the study, the widest gaps are in primary care, emergency medicine, anesthesiology, hematology/oncology, thoracic and vascular surgery, psychiatry and dermatology. The study also finds that Maryland has only a borderline supply of orthopaedic surgeons.

The situation in Southern Maryland, Western Maryland and the Eastern Shore is the most alarming. All three regions fall significantly below national levels in currently practicing physicians. Southern Maryland at present has critical shortages in 25 of the 30 categories (83.3 percent); Western Maryland has shortages in 20 of 30 categories (66.7 percent); and the Eastern Shore in 18 of 30 categories (60 percent).

Dr. Barish pointed out that one of the reasons for these shortages is an aging workforce. "In Maryland, 10 percent of clinical physicians are 65 years or older and 33.4 percent of them are 55 years or older," he said. "By 2015, 32 percent of the current workforce is expected to retire. The current supply of general surgeons statewide now only meets 90 percent of what is needed; by 2015, the supply of surgeons is expected to shrink even further to 80 percent of what is needed statewide."

According to Dr. Barish, the number of residents trained at Maryland's hospitals who opt to practice in-state is insufficient to make up for this wave of retirements. "Residency program directors indicate that the 52 percent of residents who now go on to practice in Maryland could fall to as low as 25 percent by 2015. Not enough clinical practitioners will be moving into Maryland to offset these factors," he said. "Therefore, it is crucial we act now to increase the number of residents staying in Maryland to practice medicine at the conclusion of their training."



The physician workforce shortage study found that overall, Maryland is 16 percent below the national average for the number of physicians in clinical practice. The most severe problems occur in rural parts of the state and will worsen by 2015.

"On the national level, we need to educate more physicians, and concurrently increase the number of federally funded residency positions," Dr. Barish added. "It will take until 2022 to have a meaningful impact on increasing the supply of fully-qualified clinical physicians."

The study calls for a number of legislative remedies including higher physician fees so Maryland is competitive nationally, and a state loan forgiveness program that will draw young physicians to regions most in need.

Seed Grant Program Created to Spur Collaborative Health Research

Six University of Maryland School of Medicine faculty are among initial collaborators who will receive start-up funding through a new joint "seed grant" program created by the University of Maryland, Baltimore (UMB) and the University of Maryland, College Park (UMCP). The grant program is designed to stimulate collaborative research between faculty at the two institutions, including UMB's dental and pharmacy schools as well as scientists and engineers at UMCP.

Supported with combined funding from the two institutions that totals more than $450,000, the program will foster cross-disciplinary teams of faculty researchers drawn from both institutions. It will enable these researchers to collaborate on new avenues of research that they might not otherwise have explored and attract federal grants they might not have otherwise received.

"Through this program we're connecting researchers from our two top institutions, and starting vital new research focused at the interfaces between engineering, life science, computer science, the physical sciences and medicine," said Mel Bernstein, vice president for Research at UMCP. "This is a critical effort because the future of biomedical research and the keys to new life-saving breakthroughs will be found at these interfaces."

"These new joint research teams of engineers, chemical and life scientists and clinicians, are working together to address specific health issues. This will offer us important opportunities for new medical discoveries and additional federal support," said Bruce Jarrell, MD, vice dean for Research and Academic Affairs.

The new program will build on a recent history of faculty from the two institutions joining together in cutting-edge research related to the life sciences and bioengineering.

"We've already established cross-disciplinary teams in nanotechnology research and in developing new means of drug delivery," said William Bentley, the Herbert Rabin Distinguished Professor and chair of the Fischell Department of Bioengineering at the University of Maryland, College Park's A. James Clark School of Engineering. "We want to build upon these strong research relationships and this program will give us added stimulus to do so."

Funding for this program is planned for next year.

Selected Research Projects

From the more than 30 proposals submitted, the first cohort of winning projects with their respective principle investigators are:

- **Christopher Plowe, MD**, professor of medicine and a Howard Hughes Medical Institute Investigator, will work with Michael Cummings, associate professor of biology at UMCP, to better understand the basis for resistance in a parasite causing malaria to a class of drugs derived from a Chinese herb.
- **Bartley Griffith, MD**, professor of surgery, will work with Peter Kofinas, professor of bioengineering at UMCP, to develop molecular imprinted polymer coatings to enhance the biocompatibility of artificial lungs.
- **Robert Bloch, PhD**, professor of physiology, will work with Sameer Shah, assistant professor of bioengineering at UMCP, to examine the roles of intermediate filaments in the stability and function of skeletal muscle.
- Angela Wilks, PhD, associate professor of pharmaceutical science at the University of Maryland School of Pharmacy, will work with Iqbal Hamza, assistant professor of animal and avian sciences at UMCP, using genetic, genomic and cell biochemical approaches to elucidate the molecular mechanisms that underlie host-pathogen interactions.
- **Abdu Azad, PhD**, professor of microbiology and immunology, will work with Siba Samal, professor and associate dean VA-MD Regional College of Veterinary Medicine, to develop an efficacious and safe vaccine for a highly pathogenic avian influenza virus (H5N1 Vietnam/1203/04 strain).
- **Scott Thompson, PhD**, professor of physiology, will work with Hey-Kyoung Lee, assistant professor of biology at UMCP, to explore the concept of using homeostatic synaptic plasticity to better understand how the human brain responds to changes in activity after injury or loss in peripheral sensory inputs.
- **Alan Shuldiner, MD**, professor of medicine and director of the Program in Genetics and Genomic Medicine, will work with Adam Hsieh, assistant professor of bioengineering at UMCP, to study genetic modifiers of disease phenotypes as they relate to osteogenesis imperfecta, an inheritable form of osteoporosis.
- Sarah Michel, PhD, assistant professor of pharmaceutical science at the University of Maryland School of Pharmacy, will work with Steve Rokita, professor of chemistry and biochemistry at UMCP, to develop a new class of gene therapy agents based upon a zinc finger protein platform.

(L-R) Michael Shipley, PhD, professor and chair, Department of Anatomy & Neurobiology, Hey-Kyoung Lee, assistant professor, Department of Biology, University of Maryland, College Park, and Scott Thompson, PhD, professor, Department of Physiology, at a reception celebrating the seed grant recipients.

Center for Vaccine Development Receives $23.7 Million Grant

The National Institute of Allergy and Infectious Diseases (NIAID) has renewed a contract with the University of Maryland School of Medicine to conduct clinical trials of promising vaccines and therapies for infectious diseases. The School of Medicine's Center for Vaccine Development (CVD) will receive $23.7 million over seven years as a Vaccine and Treatment Evaluation Unit (VTEU) for NIAID. The CVD VTEU and seven other VTEUs will enhance NIAID's ability to quickly respond to emerging public health needs.

"As a VTEU, the Center for Vaccine Development has been testing vaccines for the federal government for more than three decades, focusing on preventing a wide array of infectious diseases that affect children, adults and the elderly," said Karen Kotloff, MD, professor, Departments of Pediatrics and Medicine, and principal investigator on the VTEU grant. "Investigators at the CVD have a tremendous appreciation for the potential impact of vaccines as a public health tool. This renewal from the NIAID provides us with a wonderful opportunity to continue our commitment to bringing new and improved vaccines to populations who can benefit from them the most."

Established in 1962, the VTEUs are a national resource for vaccine development.

"The program has been instrumental in facilitating the clinical development of vaccines that are important for public health," said Dr. Kotloff. "These include vaccines for diseases such as pandemic and seasonal influenza, whooping cough, Norwalk virus, and sexually transmitted diseases such as herpes, which are common in the United States, as well as malaria, dysentery, cholera and typhoid fever—illnesses that primarily affect people in developing countries. New and improved vaccines to protect the public against a bioterrorism threat with smallpox, anthrax and other diseases have also been tested. The program has also advanced the development of vaccines that pose particular scientific challenges such as those for group A streptococcal infections," said Dr. Kotloff.

Karen Kotloff, MD

"The Center for Vaccine Development has been testing vaccines for the federal government for more than three decades, focusing on preventing a wide array of infectious diseases that affect children, adults and the elderly."

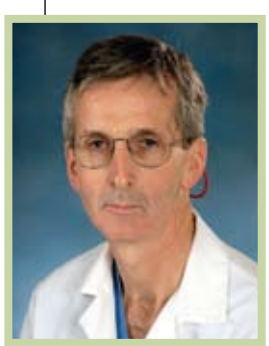
"We have conducted several hundred studies at our VTEU over the years, and many innovative approaches for vaccine delivery have been tried, including edible vaccines, needle-free injections and skin patches," Dr. Kotloff added.

Most recently, the CVD VTEU participated in a large-scale trial to evaluate the seasonal influenza vaccine Fluarix for use in healthy adults in the United States. The trial yielded the clinical information needed to win approval from the U.S. Food and Drug Administration (FDA) in August 2005—less than a year after the trial began. This approval helped reduce the impact of future delays or shortages of seasonal influenza vaccines in the United States.

The CVD VTEU also conducted multiple studies in 2005 and 2006 on a vaccine for a potential pandemic strain of influenza to determine the most effective dose. Those studies led to the licensure of the first FDA-approved vaccine against a strain of H5NI avian influenza virus. In the future, the CVD VTEU and the seven other VTEUs will conduct studies to determine the best timing of vaccinations in different populations against the H5N1 influenza virus.

Maryland Researchers Report Positive Results for CT Scans as Alternative to Autopsy

Researchers from the University of Maryland School of Medicine and the Office of the Chief Medical Examiner, State of Maryland, say that "virtual autopsy" using a computed tomography, or CT, scanner may offer a reliable alternative to conventional autopsy in certain cases and serve as a tool for gathering forensic evidence. The researchers presented findings from their preliminary study at the Radiological Society of North America meeting in November 2007.



Barry Daly, MD

"CT is a sensitive imaging tool for detecting injuries and cause of death in victims of blunt trauma," explained Barry Daly, MD, professor, Department of Diagnostic Radiology & Nuclear Medicine. "Our study shows that when there are major injuries, such as those resulting from a motor vehicle accident, CT may provide enough information so that a conventional autopsy would not be needed."

"If we can show that image-assisted autopsy is as reliable as physical autopsy, it has the potential for a significant savings in time, effort and expenditure. It may also offer a possible compassionate alternative for those families whose religious and personal beliefs preclude a full autopsy," said David R. Fowler, MD, chief medical examiner for the state of Maryland and a clinical instructor in the Department of Pathology at the School of Medicine.

In the study, investigators used a whole-body, multi-detector CT to evaluate the cause of death and forensic evidence in 20 cases: 14 were victims of blunt trauma and six were victims of a penetrating wound made by either a knife or gun. Two radiologists reviewed the scans to determine a cause of death and compared their conclusion with the results of a conventional autopsy performed by state forensic medical examiners.

The CT evaluation matched the medical examiner's cause of death in all 14 blunt trauma cases and in five of the six penetrating wound cases. In terms of evidence gathering, the radiologists and forensic medical examiners concluded that the CT findings were comparable to conventional autopsy in 13 of the 14 blunt trauma cases. In five of the six penetrating wound cases, they found that CT provided additional information to help with the investigation, including locating all 26 major ballistic fragments recovered from the victims in the conventional autopsies.

"Autopsy is mandatory in deaths involving gunshot wounds, so CT may serve as a powerful complement to the conventional exam," said Dr. Daly. "Performing CT imaging first may speed up a conventional autopsy, especially when it comes to locating ballistic fragments, which are important in criminal investigations."

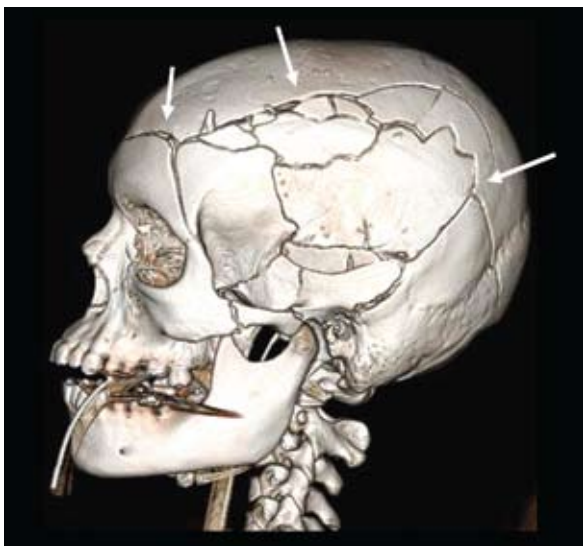
Most states require an autopsy in cases of sudden or unexplained death. Maryland conducted approximately 4,000 full autopsies last year. While a forensic medical examiner requires several hours to conduct a full autopsy, a multi-detector CT scan can be performed in about 30 minutes, including interpretation of the images. Also, the CT is non-invasive, so it does not damage or destroy key forensic evidence.

"CT has been used in autopsies of American soldiers and in a few countries around the world. While the preliminary results are promising, more research is needed to show that CT could be widely used within the U.S. medical examiners' system," said Dr. Daly.

The researchers have also received a $292,000 grant from the National Institute of Justice, part of the U.S. Department of Justice, to look at the use of CT autopsy to investigate deaths related to possible elder abuse. The two-year project will evaluate 80 cases referred to the Office of the Medical Examiner because of suspected abuse.

"The use of image-assisted autopsy to detect possible abuse of the elderly offers great potential," said Dr. Fowler. "Our office and those of medical examiners nationwide are seeing increasing numbers of suspected elder abuse cases. With some state governments considering mandatory autopsies for all deaths in residential care and assisted living facilities, we have been challenged to find new ways to accurately and rapidly assess the causes of these deaths."

Investigators will use a full-body CT scan that generates up to 3,000 detailed, high-resolution images. Radiologists will then use special computer software to reconstruct the separate images into three dimensional views, tailored to the specific needs of each case. The imaging evaluation will be compared with results of the medical examiner's visual assessment and full autopsy.



This image shows multiple skull and facial bone fractures resulting from fatal blunt trauma to the head in a pedestrian struck by a car; arrows point to some of the fractures.

Study Compares Three Popular Diets for Risk of Cardiovascular Problems

Three popular diets, the Atkins, South Beach and Ornish, may all help you take off weight, but which one puts you at higher risk of heart disease after only one month?

Michael Miller, MD, associate professor, Department of Medicine, and a team of researchers compared the three diets for their impact on cholesterol, their effect on the lining of blood vessels and the presence of inflammation associated with hardening of the arteries. Dr. Miller presented the findings of the study, "Comparative Effects of Three Popular Diets on Lipids, Endothelial Function and Biomarkers of Atherothrombosis in the Absence of Weight Loss," in November 2007 at the American Heart Association's Scientific Sessions in Orlando, Florida.

Michael Miller, MD

Dr. Miller found that people on the Atkins Diet, which is 50 percent fat, experience increased levels of "bad" (LDL) cholesterol, as well as a negative change in blood vessel dilation and an increase in markers for inflammation. The South Beach Diet is 30 percent fat, while the fat content of the Ornish Diet is 10 percent.

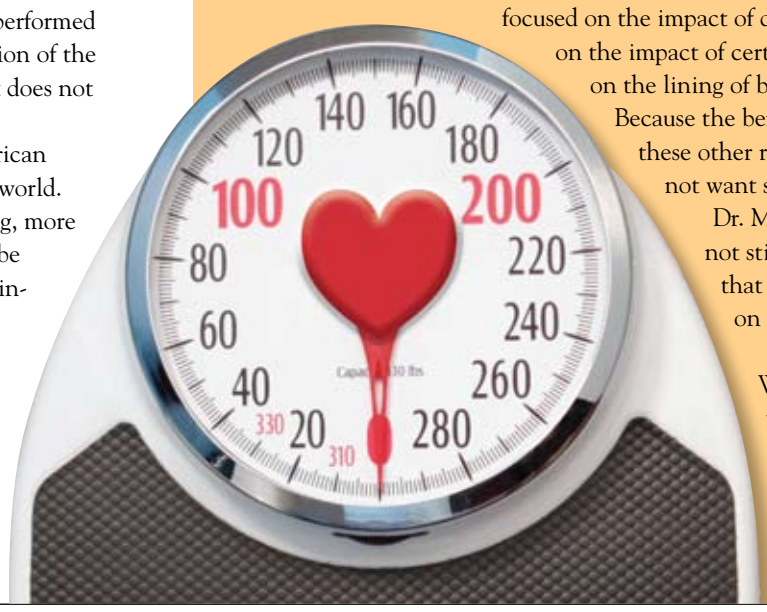
Eighteen healthy adults (nine men and nine women) completed the study. They were randomly assigned one of the diets for one month, and then they ate their normal diet for one month. Following that, they began the second diet, and, after another month with their normal diet, switched to the third diet.

Volunteers were weighed each week while they were on the test diets. The diet was adjusted if there was more than a two-pound weight loss or gain.

The researchers used blood tests to determine levels of blood fats, including cholesterol, and markers for inflammation. They used ultrasound equipment to measure whether blood vessels dilated after a month on each diet, which is a healthy response, or whether the vessels constricted, an unhealthy response.

Dr. Miller said he was surprised by the extent of some of the changes in such a short time, particularly the pro-inflammatory characteristics of the Atkins Diet. "Some markers of inflammation were increased by as much as 30 to 40 percent during the Atkins phase," said Dr. Miller, "whereas during the South Beach and Ornish phases, the markers either were stable or went down, some by as much as 15–20 percent."

This study took the unusual tack of not including weight loss to investigate the connection between dieting and heart disease, which is the leading cause of death in the United States. Recent studies have focused on the impact of diets on weight loss. But there has been little research on the impact of certain diets on heart disease risk factors such as the effect on the lining of blood vessels and the presence of inflammatory markers. Because the benefits of weight loss may initially mask the impact of these other risk factors, the University of Maryland researchers did not want study participants to lose weight.



Dr. Miller added that many people on the Atkins Diet cannot stick to it, so the weight starts coming back. Because of that diet's tendency for inflammation, he said weight gain on Atkins could be a double whammy.

Bottom line: "We don't recommend the Atkins Diet. Why not start out with a diet that will be healthier for you in the long run after weight loss?" said Dr. Miller.

The study was supported by a Veterans Affairs Merit award to Dr. Miller and a grant from the National Institutes of Health.

A Special Experience for First-Year Med Students

Medical Family Day and White Coat Ceremony

The Class of 2011

The third annual Medical Family Day on November 1, 2007, welcomed the families of first-year students to the University of Maryland School of Medicine. This special event also gave family members a glimpse into what medical school is like for their loved one. Answering questions about the school and careers in medicine was a panel comprised of fourth-year medical student Yvonne Pierpont; Gina Perez-Madrinan, MD, assistant professor, Department of Psychiatry; Joseph Martinez, MD, assistant dean for Student Affairs and assistant professor, Department of Emergency Medicine; and Barbara Friedman, mother of fourth-year med student Erica Friedman and co-chair of the Medical Family Annual Fund.

Member of the Class of 2011 Brandi Knight receives her white coat from Michael Kleinberg, MD, PhD, associate professor, Department of Medicine.

Ms. Friedman encouraged families to support the Medical Family Annual Fund, which is used to enhance the academic experiences of medical students in a variety of ways, from helping them pay for research trips and conferences to creating a student lounge on campus where they can gather in comfort. To inspire families to give, Ms. Friedman and her husband David Blanken presented Dean Reece with a check for $10,000 for the fund.

Following Medical Family Day was the event first-year students have long been waiting for—the White Coat Ceremony. This tradition involves the presentation of white coats, the symbol of physicians and scientists, to students. The coats are put on the students by School of Medicine faculty to welcome their new colleagues. After being "coated," students recited an oath acknowledging their acceptance of the obligations of the medical profession. They also added their signatures to the school's honor book, a leather-bound volume signed by all med students in their first year and their final year, in which they pledge to maintain integrity throughout their medical careers.

"I'm so excited," said Lorraine Beraho, a member of the Class of 2011. "I had no idea I'd be this excited. S&D (the nine-week Structure & Development course) is over, we have our white coats, so now it's becoming real. We're really going to be doctors, it's really going to happen, and it feels great."

Lorraine Beraho poses proudly in her newly-donned white coat.

Stats on the Class of 2011

Total Applications (AMCAS) (#)	4503
Men	2203
Women	2300
Resident	864
Non-Resident	3939
Secondary Applications Returned (#)	2864
Applicants Interviewed (#)	470
Acceptances Offered (#)	317
Men	133
Women	184
Resident	220
Non-Resident	97
New Entrants (#)	160
Resident/Non-Resident Matriculants (%)	81/19
Male/Female Matriculants (%)	42/58
Underrepresented in Medicine (%)	13
Age Range in Years	21–35
Colleges/Universities Represented (#)	67
Average GPA	
Science	3.62
Overall	3.67
Average MCAT Scores	
Verbal Reasoning	10.12
Physical Sciences	10.46
Biological Sciences	10.83
MD/PhD Program	
Total Applications	106
Applicants Interviewed	28
Acceptances Offered	13
New Entrants	5
MD/MPH Program	
Total Applications	89
Applicants Interviewed	25
Acceptances Offered	12
New Entrants	6

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Mark Your Calendars!

You are invited to attend UMB's 2008 Black History Month/MLK, Jr. commemorative event.