UNIVERSITY of MARYLAND
SCHOOL OF MEDICINE

somnews

February 2016 Vol.17 No.6

Point of Pride

In 2003, following a series of deadly anthrax attacks through the mail, the Center for Vaccine Development was the first to test the safety of a new genetically engineered vaccine for anthrax.

This makes us proud!

DEAN'S MESSAGE: What's On My Mind

What's on my mind this month is the need to remain ahead of the next big health crisis, such as the current Zika outbreak, both here in the United States and around the world.

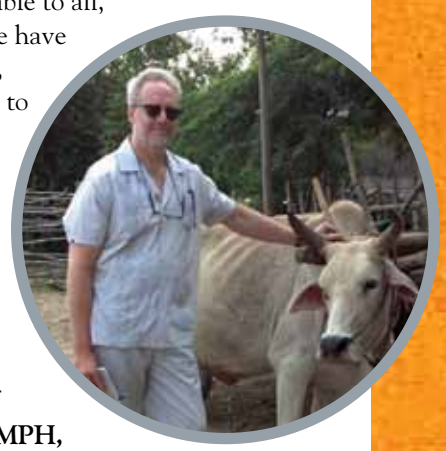
In January 2016, the World Health Organization (WHO) announced an end to the Ebola outbreak that ravaged the West African countries of Liberia, Guinea and Sierra Leone. According to WHO surveillance, nearly 29,000 cases were recorded, and over 11,000 deaths were caused by the virus. Despite these numbers, the international medical community's actions led to an unprecedented response to the Ebola crisis: from few diagnostic services, no vaccine and few trained medical teams and responders in July 2014, to six diagnostic tests, a viable Ebola vaccine, and a global network of trained experts by December 2015. The global community rallied around the victims of this devastating epidemic with impressive skill.

We at the School of Medicine can be proud to know that our faculty members were on the front lines of fighting the Ebola outbreak—not by only treating patients in affected countries in West Africa, but by conducting the groundbreaking research to develop the Ebola vaccine. These efforts led to human clinical trials of an Ebola vaccine candidate in Baltimore and Mali, West Africa. The results of the trials were published online in *Lancet Infectious Diseases* in November 2015, and revealed that the vaccine was safe, and stimulated a strong immune response in the study volunteers. These findings have led to larger trials to test the vaccine's efficacy.

While the Ebola outbreak story ended in relative success—the epidemic appears to be over and a vaccine against the deadly virus is on the horizon—it is but one of many large-scale health crises needing the support of the global biomedical community. In December 2014, at the height of the Ebola outbreak, we held the second annual **Festival of Science**, the theme of which was "Infections, Inflammation and Vaccines." Fittingly, we invited **Anthony S. Fauci, MD**, Director of the National Institute of Allergy and Infectious Diseases at the NIH, to serve as our keynote speaker. Although the majority of Dr. Fauci's remarks were about the international response to the growing number of Ebola cases in West Africa, he reminded the audience of a sobering fact: Malaria kills more people annually than the Ebola virus ever has. In 2015 alone, the WHO estimated that malaria affected 214 million people, killed 438,000 and is a risk for approximately 3.2 billion people. Yet we hear very little about the "malaria crisis" on the evening news, despite it warranting just as much of our attention as the Ebola crisis does.

Perhaps the reason why malaria does not receive the same attention as West Nile Virus, SARS (Severe Acute Respiratory Syndrome), HIV/AIDS, or Ebola is that it affects and kills people primarily in developing countries. Rarely do we hear of someone from an industrialized nation dying of malaria because we have very effective vaccines and treatments for the parasite. However, biomedical advances should be available to all. As investigators working at an academic medical center, our core values include the idea that every life is sacred and every life is worth saving.

Because we believe that the medical advances to which our research leads should be available to all, we have devoted major resources to studying diseases that affect people all over the world. We have supported the work of the Institute of Human Virology and its goal of eradicating HIV/AIDS, which claimed the lives of 1.2 million people in 2014 alone. For 40 years we have been home to the Center for Vaccine Development (CVD), which has gained an international reputation for developing and testing vaccines against cholera, typhoid fever, bacillary dysentery, Escherichia coli diarrhea, and influenza, among others.



Therefore, when we began planning for the new iteration of the CVD and decided to launch the Institute for Global Health (IGH) last year, we established a Division of Malaria Research, led by IGH's Founding Director **Christopher Plowe, MD, MPH, FASTMH**, to tackle the significant public health concern of malaria and the increasing issue of drug-resistant malaria, in addition to continuing the mission of the CVD. The center spread of this issue of the newsletter gives an overview of the new IGH, its scope and mission, and the perspectives of its Director, Dr. Plowe, and Deputy Director and Director of the CVD, **Kathleen Neuzil, MD, MPH, FIDSA**.

Already the IGH is making progress, as you will see in our feature story.

Although we cannot predict the next major public health outbreak, we are fortunate at the School of Medicine to have an entire Institute of investigators devoting their careers to unraveling diseases that affect people in developed and developing countries. I am excited to see how IGH impacts our global and local community, and believe it is on the right track to significantly and measurably improving human health worldwide.

In the relentless pursuit of excellence, I am

Sincerely yours,

E. Albert Reece, MD, PhD, MBA
Vice President for Medical Affairs, University of Maryland
John Z. and Akiko K. Bowers Distinguished Professor and Dean, University of Maryland School of Medicine

WE HAVE A QUESTION FOR YOU

As we begin the new year, we are evaluating the various publications that we distribute. Specifically for *SOM News/The Buzz*, please send an email to: PublicAffairsRSVP@som.umaryland.edu with your one-word reply to the following question: Would you prefer to receive these publications in "print" or "electronic" form or "both"?

You may also circle your answer here and send your reply back via campus mail to: the Office of Public Affairs, Bressler Research Building, BRB 14-002.

If we do not hear back from you, you will continue to receive these publications in both forms. Thank you for your cooperation!

New Institute for Global Health Hits the Ground Running…

Over the past half century, great progress has been made against many deadly global health problems. Smallpox has been eradicated; rates of polio have dropped precipitously in recent decades; and rates of malaria have dropped by nearly half since 2000.

But many global health challenges remain. Infectious diseases remain a major threat. In recent weeks, Zika Virus has emerged as a threat in South and Central America, and may pose a problem to the U.S. And every year, around 2.5 million people are infected with HIV, including more than 300,000 children; despite recent gains, malaria still kills more than half a million people annually, most of them under the age of 10. Besides Zika, other infectious diseases have recently emerged or have spread to new parts of the world. In recent years, there have been serious outbreaks of Severe Acute Respiratory Syndrome (SARS), Chikungunya, West Nile Virus and Ebola.

IN MARCH 2015, in response to these global challenges, the University of Maryland School of Medicine established the Institute for Global Health (IGH), bringing together an impressive team of researchers with decades of experience in a variety of areas, including vaccines, malaria, and emerging diseases.

IGH is led by Founding Director **Christopher Plowe, MD, MPH, FASTMH**, Professor of Medicine, Microbiology & Immunology, and Epidemiology & Public Health.

The institute will focus on vaccine development and malaria research, and consists of the existing Center for Vaccine Development (CVD), as well as the newly-formed Division of Malaria Research (DMR), the latter of which is also led by Dr. Plowe. The CVD is led by **Kathleen Neuzil, MD, MPH, FIDSA**, who is also Deputy Director of IGH.

"Kathy Neuzil is the perfect person to lead the CVD," says Dr. Plowe. "She is a leading vaccinologist known worldwide for her work on influenza vaccines and on getting vaccines to the people who need them."

For the past 40 years CVD has conducted research on vaccines for a variety of diseases, including cholera, typhoid fever, malaria, and other infectious illnesses. The center focuses on maternal and child mortality, especially on preventing diarrhea and pneumonia, which are leading causes of death in children under five around the world. CVD has worked in Africa, Asia and Latin America, and has research and treatment facilities in Mali, Chile and Malawi. One of the center's key principles is to inform policy and field interventions, and ultimately to save lives.

Dr. Plowe travels the world to share his malaria knowledge and conduct further research on the disease.

DMR will focus on the prevention and treatment of malaria, which infects 200 million people a year. It will develop and deploy innovative tools for malaria treatment, prevention and surveillance. Working in Baltimore and in other countries, DMR will lead clinical trials of drugs and vaccines, and will investigate a range of topics related to the disease; it is also about to begin testing of a new malaria vaccine in Burkina Faso, in West Africa.

Dr. Plowe, who has been studying malaria for more than 30 years, has been on the CVD faculty since 1995, building a multidisciplinary malaria research group that works around the world. He has received a Doris Duke Distinguished Clinical Scientist Award, the American College of Physicians Award to recognize distinguished contributions in science as related to medicine, and the Bailey K. Ashford Medal for distinguished work in tropical medicine from the American Society of Tropical Medicine and Hygiene (ASTMH). He is also the immediate past president of ASTMH.

Dr. Neuzil, an expert in the study of vaccines, was previously a professor at the University of Washington, and directed vaccine access and delivery at PATH, an international nonprofit global health organization based in Seattle. She has led large trials of influenza, rotavirus and other vaccines that have directly informed policy and introduction decisions, and has been a strong advocate for wider access to vaccines in low-income countries. The new post is a kind of homecoming for her: She received her BS in Zoology from the University of Maryland, College Park, and her MD from the Johns Hopkins University School of Medicine in Baltimore.

IGH faculty will include a range of well-known scientists, among them **Myron Levine, MD, DTPH**, the Simon and Bessie Grollman Distinguished Professor in Medicine at UM SOM. Dr. Levine, who founded CVD four decades ago, continues to work in vaccine development, and over the past 18 months has played an important role in research into a promising Ebola vaccine. These trials are now taking place in Baltimore and Mali, and include a range of partners, among them the National Institutes of Health, GlaxoSmithKline and the Ministry of Health of Mali.

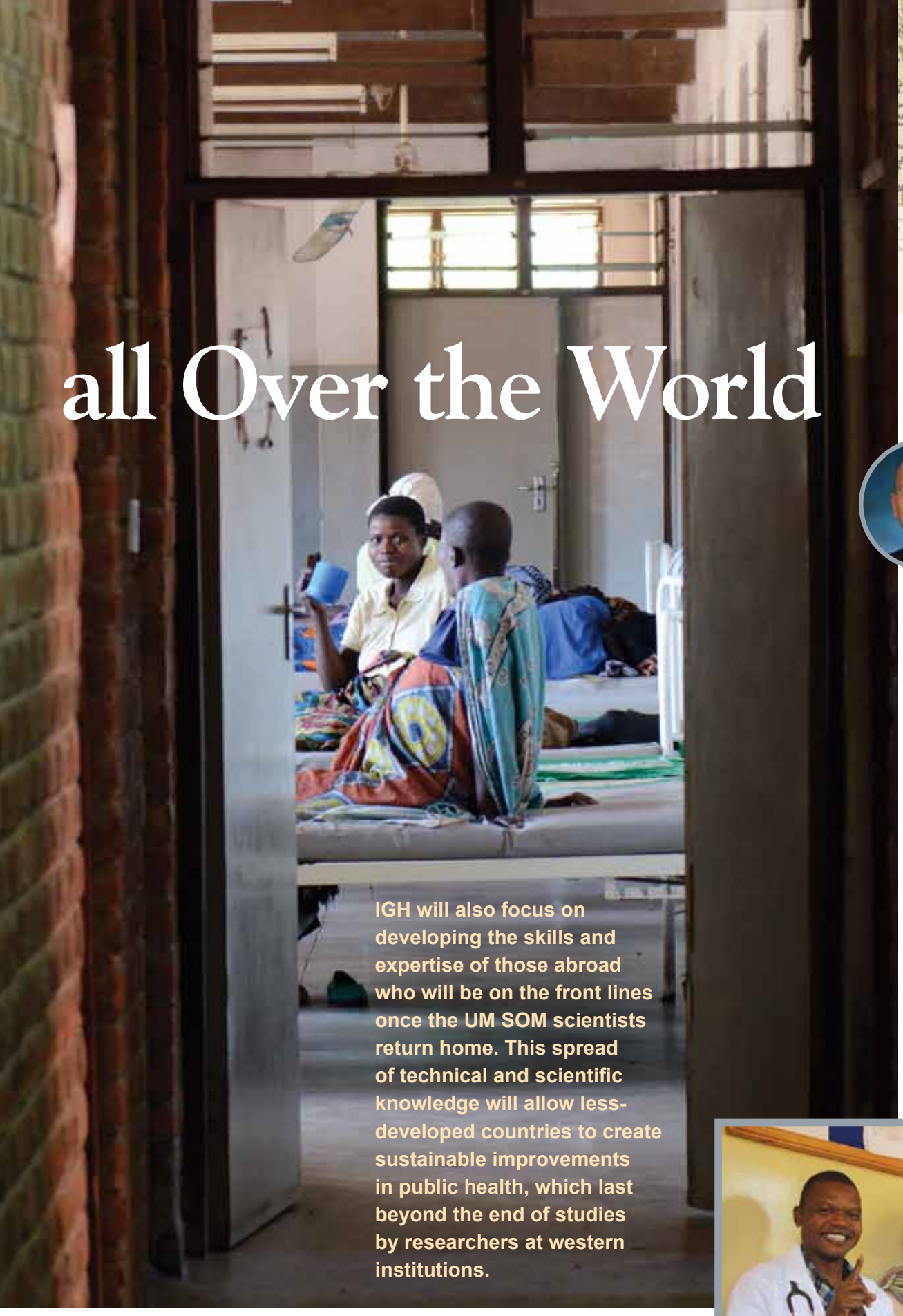
IGH joins two other Institutes at the school: the Institute for Human Virology (IHV), under the direction of **Robert Gallo, MD**, the Homer & Martha Gudelsky Distinguished Professor in Medicine; and the Institute for Genome Sciences (IGS) under the direction of **Claire Fraser, PhD**, the Dean's Endowed Professor of Medicine.

IGH has already had several successes. In August, after years of work, Dr. Plowe and his colleague and wife, **Myaing Myaing Nyunt, MD, MPH, PhD**, Assistant Professor of Medicine and Director of IGH's efforts in Myanmar, helped engineer an unprecedented meeting to battle malaria in Myanmar. A diverse array of groups in the country, many deeply antagonistic to each other, met in Washington, DC to discuss strategies to eradicate malaria within the struggling, deeply divided country. The groups—which include the government; the military; the main opposition party the National League for Democracy; and the Shan, Karenni, and Kayin ethnic minorities—agreed to a long-term plan to eliminate malaria. The disease is a major problem in many parts of the country; in some areas, more than half the population is infected. The meeting was convened jointly by IGH, the Center for Strategic and International Studies, and the American Society of Tropical Medicine and Hygiene.

Drs. Plowe and Nyunt are now extending their work into China and Bangladesh, neighboring countries where some refugees from Myanmar are now living. In January, Dr. Plowe traveled to both of these countries to connect with potential partners. "Our work has to go where the parasites and mosquitos go," Dr. Plowe said, "and these bugs don't respect international borders when they infect people."

IGH will also focus on developing the skills and expertise of those abroad who will be on the front lines once the UM SOM scientists return home. This spread of technical and scientific knowledge will allow less-developed countries to create sustainable improvements in public health, which last beyond the end of studies by researchers at western institutions. IGH is working to ensure that training and funds extend to locals in historically underserved areas; these workers can help ensure a long-term public health benefit.

all Over the World



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and **Matthew Laurens, MD, MPH**, Associate Professor of Pediatrics, who is also leading field testing of the vaccine in Africa.

At CVD, **Karen Kotloff, MD**, Professor of Pediatrics, is involved in several projects to prevent diarrheal disease in developing countries, particularly in Africa. "Often, in Africa, diarrhea is a death sentence for kids, because they don't have access to care," Dr. Neuzil says. "That's why this is so important in these countries." Dr. Kotloff, Dr. Levine and others conducted a landmark trial of diarrhea etiology demonstrating that rotavirus is the leading cause of severe diarrhea in young children throughout the world. This work informed rotavirus introduction decisions, and 32 countries in Africa now include rotavirus vaccines in their national immunization programs. Dr. Kotloff leads the Vaccine Impact on Diarrhea in Africa (VIDA) study, a four-year, $23 million effort funded by the Bill and Melinda Gates Foundation. VIDA will examine the impact of the rotavirus vaccine in decreasing severe diarrhea in Africa and will identify what other diarrhea pathogens might be important to prevent or treat in the future.

CVD's center in Mali is also working on these problems. CVD-Mali, which is led by **Samba Sow, MD, MS**, an Adjunct Professor of Medicine, and

Dr. Laufer and staff at the clinic in Malawi celebrating the treatment of their first patient.

Milagritos Tapia, MD, Associate Professor of Pediatrics, oversaw studies that led to the introduction of a vaccine that has played a major role in reducing Meningitis A in areas of Africa where the disease was once common. As of last year, more than 220 million people had received the vaccine in 26 countries. CVD Mali continues to study this vaccine, as well as vaccines for other deadly diseases.

These projects and others have kept Dr. Plowe very busy over the past few months. But he doesn't mind. "What a joy and a privilege it is to be able to do this for a living," he says. "It's incredibly rewarding to be part of the global health community on campus that does such important work here in Maryland and around the world."

Dr. Kotloff with some of her patients in Africa

IGH has other irons in the fire too. **Miriam Laufer, MD, MPH**, who is IGH's Associate Director for Global Health and directs the institute's work in Malawi, is examining potential links between HIV and malaria. Laufer, who is an Associate Professor of Pediatrics at UM SOM, is known for her studies of the malaria drug chloroquine. Due to its wide use, malaria parasites in many areas have developed resistance to this lifesaving drug. Dr. Laufer found that after several years of being held out of use, this resistance disappears, meaning that the drug can be used once again. This "drug rotation" strategy is now being tested in Africa.

IGH is also in the midst of clinical tests of a malaria vaccine. These tests take place in Baltimore, on healthy volunteers who are given the vaccine and then exposed to malaria-infected mosquitoes. Those who are infected are followed very closely, and if they become ill they are treated aggressively and experience few if any symptoms. These tests are being led by **Kirsten Lyke, MD**, Associate Professor of Medicine,

CLAIRE FRASER, PHD: Inaugural Recipient, Dean's Endowed Professorship

Claire Fraser, PhD, was presented with the inaugural Dean's Endowed Professorship in the School of Medicine on December 7, 2015. The ceremony, which took place in Westminster Hall, also honored **Robert E. Fischell, ScD**, and his wife **Susan R. Fischell** for their generous support. The couple funded the professorship but chose not to put it in their names.

Endowed professorships provide faculty with critical resources needed to sustain and expand promising research, launch innovative clinical initiatives, and educate and train future physicians. The University of Maryland School of Medicine has more than 70 endowed chairs and professorships. Faculty members such as Dr. Fraser are crucial to helping the School of Medicine maintain high standards in research and patient care.

"It is because of endowed professorships like this that we can recruit faculty members of great significance to these positions, which continues a tradition going back 500 years," said **E. Albert Reece, MD, PhD, MBA**, Vice President for Medical Affairs, University of Maryland, and the John Z. and Akiko K. Bowers Distinguished Professor and Dean, University of Maryland School of Medicine. "The talented faculty members who hold endowed chairs and professorships inspire our students, advance the frontiers of knowledge, and make discoveries that change people's lives."

Dr. Fraser, a Professor of Medicine and Microbiology & Immunology at the University of Maryland School of Medicine (UM SOM), is Director of the Institute for Genome Sciences, which she helped establish at UM SOM in 2007, at the behest of Dean Reece. "There were times during the negotiations when I think both of us were not sure we could pull this off," admitted Dr. Fraser. "In the end it worked out, though, and looking back now, I think we delivered on the promise to make the University of Maryland School of Medicine one of the leading institutions in the field of genomics."

Dr. Fraser, who was previously the President and Director of The Institute for Genomic Research (TIGR) in Rockville, MD, has played a seminal role in the sequencing and analysis of human, animal, plant and microbial genomes to better understand the role that genes play in development, evolution, physiology and disease. She led the teams that first sequenced the genomes of several microbial organisms, including important human and animal pathogens, and as a consequence helped to initiate the era of comparative genomics. Her current research interests are focused on the structure and function of the human gut microbiota.

Dr. Fraser has been the recipient of numerous awards and honors including the Promega Biotechnology Award and the E.O. Lawrence Award from the Department of Energy, she is a Fellow of AAAS and the American Association of Microbiology, and she has been elected into the Maryland Women's Hall of Fame and the National Academy of Medicine (formerly the Institute of Medicine).

Dr. Fischell is a physicist, inventor and holder of more than 200 U.S. and foreign patents on medical devices and spacecraft. With the active assistance of his wife Susan, his inventions have led to the creation of several biotechnology companies. These inventions include a rechargeable implantable pacemaker that can be programmed with radio waves (Pacesetter Systems, Inc., now St. Jude Medical), which he and his team later helped miniaturize, to save even more lives; the implantable insulin pump (now a product of Medtronic MiniMed); numerous coronary stents used to open clogged arteries (IsoStent, Inc., which merged with Cordis, a Johnson & Johnson company); and two feedback systems that provide early warning signs of both epileptic seizures (NeuroPace, Inc.) and heart attacks (Angel Medical Systems, Inc.). In 2005, Dr. Fischell was awarded a $100,000 TED prize to pursue his work on the design of a device to cure migraines without medication. That device (eNeura, Inc.) received FDA approval in May 2014. Dr. Fischell also was a co-inventor on a device to treat epilepsy that received FDA approval in November 2013.

"I am honored to be the inaugural recipient of the Dean's Endowed Professorship," said Dr. Fraser. "Dr. Fischell, particularly, is inspired by a pioneering spirit, something he has obviously leveraged multiple times, first to usher in the modern era of space satellites in his former career, and now to invent multiple life-saving devices. Perhaps he and I will find a project on which we can collaborate. I would like to think that between the two of us we could bring all the elements of success to the table."

somnews

University of Maryland School of Medicine February 2016 Vol.17 No.6

SOMnews is produced by the University of Maryland School of Medicine, Office of Public Affairs
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▲ Submitting information to SOMnews: Please email your submission six weeks prior to the month you wish to see your submission included to Caelie Haines, Public Affairs Manager, at chaines@som.umaryland.edu.
▲ Printed using environmentally-responsible low VOC inks.

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